# Functional Resource Model

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| **Functional Resource Stratum** | **Functional Resource Set** | **Functional Resource** |
| Aperture | RF Aperture | |  | | --- | | [Antenna](" \l "id0x4ff180) | |
| Aperture | Antenna Array | |  | | --- | |  | |
| Physical Channel | CCSDS 401 Physical Channel Transmission | |  | | --- | | [Ccsds401SpaceLinkCarrierXmit](#id0x565300) | | [RngXmit](#id0x5b5880) | |
| Physical Channel | CCSDS 415 Physical Channel Transmission | |  | | --- | |  | |
| Physical Channel | CCSDS 401 Physical Channel Reception | |  | | --- | | [Ccsds401SpaceLinkCarrierRcpt](#id0x6d4c00) | | [RngAndDopplerExtraction](#id0x75b080) | |
| Physical Channel | CCSDS 415 Return Channel Reception | |  | | --- | |  | |
| Synchronization and Channel Coding | TC Synchronization and Channel Encoding | |  | | --- | | [TcPlopSyncAndChnlEncode](#id0x7a7a00) | |
| Synchronization and Channel Coding | Fixed Length Frame Synchronization, Channel Encoding, and OID Generation | |  | | --- | | [FlfSyncChnlEncodeAndOidGen](#id0x7df280) | |
| Synchronization and Channel Coding | Fixed-Length Frame (FLF) Synchronization and Channel Decoding | |  | | --- | | [FlfSyncAndChnlDecode](#id0x7fb780) | |
| Space Link Protocol | TC Space Link Protocol Transmission | |  | | --- | | [TcMcMux](#id0x840500) | | [TcVcMux](#id0x85b280) | |
| Space Link Protocol | AOS Space Link Protocol Transmission | |  | | --- | | [AosMcMux](#id0x87a900) | | [AosVcMux](#id0x88fc00) | |
| Space Link Protocol | Variable Length Frame (VLF) Unified Space Data Link Protocol Transmission | |  | | --- | |  | |
| Space Link Protocol | Fixed Length Frame (FLF) Unified Space Link Protocol Transmission | |  | | --- | | [FlfUslpMcMux](#id0x8a5a80) | | [FlfUslpVcMux](#id0x8b9d00) | |
| Space Link Protocol | TM/AOS Space Link Protocol Reception | |  | | --- | | [TmAosMcDemux](#id0x8cdf80) | | [TmAosVcDemux](#id0x9e5680) | |
| Space Link Protocol | Variable-Length Frame (VLF) Unified Space Data Link Protocol Reception | |  | | --- | |  | |
| Space Link Protocol | Fixed-Length Frame (FLF) Unified Space Data Link Protocol Reception | |  | | --- | |  | |
| SLS Data Delivery Production | Frame Data Sink | |  | | --- | | [FrameDataSink](#id0x9fd280) | |
| SLS Data Delivery Production | Cfdp File Data Production | |  | | --- | |  | |
| SLS Data Delivery Production | Packets File Data Transmission Production | |  | | --- | |  | |
| SLS Data Delivery Production | Packets File Reception Production | |  | | --- | |  | |
| SLS Radiometric Data Production | Real-Time Radiometric Data Collection | |  | | --- | | [TdmSegmentGen](#id0xa11c80) | |
| SLS Radiometric Data Production | Non-Validated Radiometric Data Collection | |  | | --- | |  | |
| SLS Radiometric Data Production | Delta-DOR Raw Data Collection | |  | | --- | |  | |
| SLS Radiometric Data Production | Open-Loop Receiver/Formatter | |  | | --- | |  | |
| Offline Data Storage | Offline Frame Buffer | |  | | --- | | [OfflineFrameBuffer](#id0xa42800) | |
| Offline Data Storage | TDM Recording Buffer | |  | | --- | | [TdmRecordingBuffer](#id0xa54f00) | |
| Offline Data Storage | Non-Validated Radiometric Data Store | |  | | --- | |  | |
| Offline Data Storage | Validated Radiometric Data Store | |  | | --- | |  | |
| Offline Data Storage | Delta-DOR Raw Data Store | |  | | --- | |  | |
| Offline Data Storage | Open-Loop Data Store | |  | | --- | |  | |
| Offline Data Storage | Return File Data Store | |  | | --- | |  | |
| Offline Data Storage | Forward File Data Store | |  | | --- | |  | |
| Data Transfer Services | SLE Forward Space Packet | |  | | --- | |  | |
| Data Transfer Services | SLE Forward CLTU | |  | | --- | | [FCltuTsProvider](#id0xa71c00) | |
| Data Transfer Services | Forward Frame CSTS | |  | | --- | | [FwdFrameCstsProvider](#id0xaab680) | |
| Data Transfer Services | SLE Return All Frames | |  | | --- | | [RafTsProvider](#id0xaf2b80) | |
| Data Transfer Services | SLE Return Channel Frames | |  | | --- | | [RcfTsProvider](#id0xb29e80) | |
| Data Transfer Services | SLE Return Operational Control Fields | |  | | --- | | [RocfTsProvider](#id0xb66c80) | |
| Data Transfer Services | Tracking Data CSTS | |  | | --- | | [TdCstsProvider](#id0xbb7480) | |
| Data Transfer Services | Terrestrial Generic File Transfer (TGFT) Host | |  | | --- | |  | |
| Service Management | Monitored Data CSTS | |  | | --- | | [MdCstsProvider](#id0xbea180) | |
| Service Management | Service Control | |  | | --- | |  | |
| Space Internetworking | Delay Tolerant Networking | |  | | --- | |  | |

# Functional Resource 'Antenna' [(back to top)](#toc)

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| FR Stratum: 'Aperture' FR Set: 'RF Aperture' |
| **Definition:** The Antenna FR accepts as input the carrier signal that shall either be radiated into space or into a water load, provided the given FR instance has the transmit capability. The Antenna FR provides as output the carrier signal received from space to the Ccsds401SpaceLinkCarrierRcpt FR or the Ccsds415SpaceLinkCarrierRcpt FR and to open-loop receivers. The azimuth and elevation pointing angles are forwarded to the TdmSegmentGen FR and NonValRmDataCollection FR, provided the given FR instance has the receive capability. The pointing angles are provided only while the antenna is in some form of 'closedLoop' pointing mode. For the correction of radiometric observables weather data are required which should be collected close to the antenna used to obtain the radiometric observables. Therefore the Antenna FR is regarded as the source of the weather data provided to the TdmSegmentGeneration FR and the NonValRmDataCollection FR. Note: An Antenna FR may be limited to 'transmit-only' or 'receive-only'. The Antenna provides as output the carrier signal of which the nominal frequency is specified by the applicable FR of the Physical Channel stratum downconverted to the IF used by the local implementation. This IF signal is forwarded to the Ccsds401SpaceLinkCarrierRcpt FR or the Ccsds415SpaceLinkCarrierRcpt FR. The azimuth and elevation pointing angles are pased on to the TdmSegmentGen FR and NonValRmDataCollection FR, provided the given FR instance has the receive capability. The pointing angles are provided only while the antenna is in some form of 'closedLoop' pointing mode. For the correction of radiometric observables weather data are required which should be collected close to the antenna used to obtain the radiometric observables. Therefore the Antenna FR is regarded as the source of the weather data provided to the TdmSegmentGeneration FR and the NonValRmDataCollection FR. Note: An Antenna FR may be limited to 'transmit-only' or 'receive-only'. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .10100   |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antResourceStat**' (ant-resource-stat) OID .1.3.112.4.4.2.1.10100.1.1.1 | | **Definition:** This enumerated parameter reports the overall status of the antenna and can take on four values:  - 'configured': the antenna system has been configured, but is not yet tracking because it is still moving to the initial pointing or the spacecraft is not yet or no longer in view;  - 'operational': the antenna is tracking in the reported pointing mode (cf. antennaPointingMode);  - 'interrupted': a failure has been detected that prevents the antenna from tracking nominally;  - 'halted': the antenna has been taken out of service, e.g. due to wind speed requiring the antenna to be put into stow position. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  AntResourceStat ::= ResourceStat | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antId**' (ant-id) OID .1.3.112.4.4.2.1.10100.1.2.1 | | **Definition:** This parameter identifies the antenna that is involved in providing a given support. The antenna may either be identified by its name where typically this name is defined by the operating agency so that no guarantee can be given that the identifier is globally unique. Alternatively the antenna may be officially registered in SANA in which case it has a globally unique Object Identifier. Knowledge of which antenna is being used is needed for a number of aspects, e.g. to assess the observed signal levels with respect to the antenna performance or to perform time correlation that requires knowledge of the exact geographical location of the given antenna.  Note: In case the antennas used for uplink and downlink are not identical, the Functional Resource (FR) instance number shall be used to differentiate them.  Antenna arrays will be modeled by a dedicated FR type | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  AntId ::= CHOICE  {  antennaName [0] VisibleString (SIZE( 3 .. 16))  , antennaOid [1] OBJECT IDENTIFIER  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antActualPointing**' (ant-actual-pointing) OID .1.3.112.4.4.2.1.10100.1.3.1 | | **Definition:** This parameter reports the current antenna azimuth and elevation pointing in 1/1000 degrees, where for the azimuth 0 degrees corresponds to pointing north and 90 degrees corresponds to pointing east and for the elevation 0 degrees corresponds to pointing to the horizon and 90 degrees corresponds to zenith pointing. Depending on the way the antenna is built, azimuth values above 360 degrees may be reported in cases where the antenna enables such azimuth range as to mitigate the cable unwrap issue. Elevation values above 90 degrees may be reported in cases where the antenna enables such elevation range as to mitigate the azimuth singularity at zenith. For antennas with a mount different from elevation over azimuth (e.g. x/y mount), the antenna pointing shall be converted to the azimuth/elevation presentation. This also applies to antennas having a tilt mode as to overcome the zenith track singularity.  Note: Time-tagged antenna pointing is regarded a radiometric product and therefore not part of monitoring provided by this FR type. | | **Engineering Unit:** 1/1000 degree / 1/1000 degree | | **Configured:** false | | **Type Definition:**  AntActualPointing ::= AntennaPointing | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antCommandedPointing**' (ant-commanded-pointing) OID .1.3.112.4.4.2.1.10100.1.4.1 | | **Definition:** This parameter reports the azimuth and elevation pointing in 1/1000 degrees commanded to the servo system while the antPointingMode is either 'programTrack' or 'closedLoop', where for the azimuth 0 degrees corresponds to pointing north and 90 degrees corresponds to pointing east while for the elevation 0 degrees corresponds to pointing to the horizon and 90 degrees corresponds to zenith pointing. Depending on the way the antenna is built, azimuth values above 360 degrees may be reported in cases where the antenna enables such azimuth range as to mitigate the cable unwrap issue. Elevation values above 90 degrees may be reported in cases where the antenna enables such elevation range as to mitigate the azimuth singularity at zenith.  For antennas with a mount different from elevation over azimuth (e.g. x/y mount), the antenna pointing shall be converted to the azimuth/elevation presentation. This also applies to antennas having a tilt mode as to overcome the zenith track singularity. | | **Engineering Unit:** 1/1000 degree / 1/1000 degree | | **Configured:** false | | **Type Definition:**  AntCommandedPointing ::= AntennaPointing | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antContrPointing**' (ant-contr-pointing) OID .1.3.112.4.4.2.1.10100.1.5.1 | | **Definition:** This parameter configures and reports the azimuth and elevation in 1/1000 degrees the antenna shall point to when the pointing-mode is set to 'fixedPosition', where for the azimuth 0 degrees corresponds to pointing north and 90 degrees corresponds to pointing east while for the elevation 0 degrees corresponds to pointing to the horizon and 90 degrees corresponds to zenith pointing. Depending on the way the antenna is built, azimuth values above 360 degrees may be reported in cases where the antenna enables such azimuth range as to mitigate the cable unwrap issue. Elevation values above 90 degrees may be reported in cases where the antenna enables such elevation range as to mitigate the azimuth singularity at zenith.  For antennas with a mount different from elevation over azimuth (e.g. x/y mount), the antenna pointing shall be converted to the azimuth/elevation presentation. This also applies to antennas having a tilt mode as to overcome the zenith track singularity. | | **Guard Condition:** In most cases, the service agreement will state that this parameter can only be set by local EM. | | **Engineering Unit:** 1/1000 degree / 1/1000 degree | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 degree.  AntContrPointing ::= AntennaPointing | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antContrAngularRate**' (ant-contr-angular-rate) OID .1.3.112.4.4.2.1.10100.1.6.1 | | **Definition:** The parameter configures and reports the azimuth and elevation angular rates in 1/1000 degrees per second at which the antenna shall move when antPointingMode is set to 'slew'. | | **Guard Condition:** In most cases, the service agreement will state that this parameter can only be set by local EM. | | **Engineering Unit:** 1/1000 degree/s / 1/1000 degree/s | | **Configured:** true | | **Type Definition:**  AntContrAngularRate ::= SEQUENCE  {    -- The engineering unit of this element is 1/1000 degree per second  azimuthAngularRate INTEGER (-15000 .. 15000)  ,  -- The engineering unit of this element is 1/1000 degree per second  elevationAngularRate INTEGER (-15000 .. 15000)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antPointingResidual**' (ant-pointing-residual) OID .1.3.112.4.4.2.1.10100.1.7.1 | | **Definition:** This parameter reports the azimuth residual (actual azimuth in closed-loop tracking minus the azimuth calculated for antPointingMode = 'programTrack') and the elevation residual (actual elevation in closed-loop tracking minus the elevation calculated for antPointingMode = 'programTrack') in 1/1000 degrees. Consequently this parameter will only be valid if antPointingMode = 'closedLoop'. Antennas not having or not being operated in any closed-loop tracking mode cannot provide this parameter and in this case the parameter shall be flagged as unavailable.  Note: Time-tagged antenna pointing is regarded a radiometric product and therefore not part of monitoring. | | **Engineering Unit:** 1/1000 degree / 1/1000 degree | | **Configured:** false | | **Type Definition:**  AntPointingResidual ::= SEQUENCE  {    -- The engineering unit of this element is 1/1000 degree.  azimuth INTEGER (-540000 .. 540000)  ,  -- The engineering unit of this element is 1/1000 degree.  elevation INTEGER (-180000 .. 180000)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antPointingAberration**' (ant-pointing-aberration) OID .1.3.112.4.4.2.1.10100.1.8.1 | | **Definition:** This parameter reports the azimuth and elevation aberration between the forward beam and the return beam in 1/1000 degree. In case the provider applies aberration correction, the effect of this correction shall be factored into the aberration values reported.  A valid parameter can only be reported if antPointingMode is 'closedLoop' or 'programTrack'. | | **Engineering Unit:** 1/1000 degree / 1/1000 degree / 1/1000 degree / 1/1000 degree | | **Configured:** false | | **Type Definition:**  AntPointingAberration ::= SEQUENCE  {  azimuthAberration SEQUENCE  {    -- The engineering unit of this element is 1/1000 degree.  fwdBeamAberration INTEGER (-1000 .. 1000)  ,  -- The engineering unit of this element is 1/1000 degree.  rtnBeamAberration INTEGER (-1000 .. 1000)  }    , elevationAberration SEQUENCE  {    -- The engineering unit of this element is 1/1000 degree.  fwdBeamAberration INTEGER (-1000 .. 1000)  ,  -- The engineering unit of this element is 1/1000 degree.  rtnBeamAberration INTEGER (-1000 .. 1000)  }    } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antPointingMode**' (ant-pointing-mode) OID .1.3.112.4.4.2.1.10100.1.9.1 | | **Definition:** This enumerated parameter configures and reports the pointing mode of the antenna servo system. The values this parameter can take on are:  - 'stow': the antenna is in or is moving to its stow position; the angular rates applied in this case are not those specified by the antContrAngularRate parameter, but depend on the specifics of the antenna implementation;  - 'halt': the antenna has been stopped in its current position;  - 'fixedPosition': the antenna is moving to or has moved to the specified azimuth and elevation;  - 'slew': the antenna is moving at commanded angular rates;  - 'programTrack': the antenna is pointed in accordance with spacecraft trajectory predicts;  - 'closedLoop': the antenna is pointing in closed-loop mode.  Antenna implementations will typically support only a subset of the above listed pointing modes. | | **Guard Condition:** In most cases, the service agreement will state that this parameter can only be set by local EM. If the antenna servo system does not support the pointing mode commanded by means of the antSetContrParams directive, the Functional Resource will reject the setting of the antPointingMode parameter with the diagnostic 'parameter out of range'.  antResourceStatus ≠ 'halted'  Setting antPointingMode to 'fixedPosition' shall be rejected unless the parameter antContrPointing has valid values.  Setting antPointingMode to 'slew' shall be rejected unless the parameter antContrAngularRate has valid values. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AntPointingMode ::= ENUMERATED  {  stow (0)  , halt (1)  , fixedPosition (2)  , slew (3)  , programTrack (4)  , closedLoop (5)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antClosedLoopConfiguration**' (ant-closed-loop-configuration) OID .1.3.112.4.4.2.1.10100.1.10.1 | | **Definition:** This parameter configures and reports the settings applied to 'closedLoop' antenna pointing mode, either to monopulse tracking or to conical scan tracking. For conical scan the parameter specifies the cone of the conical scan. | | **Guard Condition:** antPointingMode ≠ 'closedLoop' | | **Engineering Unit:** N/A / 1/1000 degrees | | **Configured:** true | | **Type Definition:**  AntClosedLoopConfiguration ::= CHOICE  {    -- For monopulse tracking no required configuration parameters have been identified.  monopulse [0] NULL  ,  -- The engineering unit of this element is 1/1000 degrees  conicalScan [1] INTEGER (1 .. 5000)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxMode**' (ant-tracking-rx-mode) OID .1.3.112.4.4.2.1.10100.1.11.1 | | **Definition:** This parameter reports the mode in which the return signal is tracked for antenna steering provided the antPointingMode = 'closedLoop'. The mode is chosen depending on the modulation scheme.  The values the parameter may have are:  - 'carrierTrackingMode': the receiver tracks the remnant carrier by means of a carrier tracking PLL when ccsds401CarrierRcptModulationType is either 'subcarrier' or 'direct';  - 'crossCorrelationMode': the receiver tracks the return link signal by means of checking for the spectral symmetry when ccsds401CarrierRcptModulationType is neither 'subcarrier' nor 'direct'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  AntTrackingRxMode ::= ENUMERATED  {  carrierTrackingMode (0)  , crossCorrelationMode (1)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingSignalPolarization**' (ant-tracking-signal-polarization) OID .1.3.112.4.4.2.1.10100.1.12.1 | | **Definition:** This enumerated parameter configures and reports the polarization of the channel that shall be used for tracking purposes. If 'autoHysteresis' is chosen, the parameter specifies how much larger in 1/10 dB the power observed for the unselected polarization must be before a switch-over to the polarization with the stronger signal is performed. If 'combining' is chosen, the parameter specifies the bandwidth around the residual carrier that shall be evaluated to determine the necessary phase rotation and gain setting of the two channels for obtaining the best possible result from the diversity combining.  If the same receiver is used for telemetry reception and antenna steering, setting of this parameter is not possible and the value reported by this is a copy of the ccsds401CarrierRcptPolarization parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Guard Condition:** Setting of this parameter is only possible if a dedicated receiver for antenna steering is used.  Setting the antTrackingSignalPolarization parameter to 'combining' is only permissible for a modulation scheme with residual carrier. | | **Engineering Unit:** N/A / N/A / 1/10 dB / Hz | | **Configured:** true | | **Type Definition:**  AntTrackingSignalPolarization ::= CHOICE  {  lhc [0] NULL  , rhc [1] NULL  ,  -- The engineering unit of this element is 1/10 dB.  autoHysteresis [2] INTEGER (0 .. 100)  ,  -- The engineering unit of this element is Hertz.  combining [3] INTEGER (10 .. 100000)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxInpLevel**' (ant-tracking-rx-inp-level) OID .1.3.112.4.4.2.1.10100.1.13.1 | | **Definition:** This parameter reports the return link signal level in tenth of dBm as observed by the tracking receiver, i.e., the signal level derived from the tracking receiver AGC reading. As to have comparable, i.e., station level plan independent values, the level reading should be calibrated to the LNA input. Due to the levels to be expected, the numbers will always be negative.  If the same receiver is used for telemetry reception and antenna steering, the value reported by this is a copy of the ccsds401CarrierRcptSignalLevel parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set.  If a tracking receiver is not available or not used, this parameter shall be flagged as undefined.  In some implementations one receiver may be used both for antenna tracking and reception of telemetry and ranging. If so, the parameters of that receiver will be represented in both the Antenna FR type and the Rtn401SpaceLinkCarrierRcpt FR type. | | **Engineering Unit:** 1/10 dBm | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this 1/10 dBm  AntTrackingRxInpLevel ::= INTEGER (-2000 .. -30) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxNominalFreq**' (ant-tracking-rx-nominal-freq) OID .1.3.112.4.4.2.1.10100.1.14.1 | | **Definition:** This parameter configures and reports the nominal return carrier frequency disregarding any Doppler shift.  If the same receiver is used for telemetry reception and antenna steering, setting of this parameter is not possible and the value reported by this is a copy of the ccsds401CarrierRcptNominalFreq parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Guard Condition:** Setting of this parameter is only possible if a dedicated receiver for antenna steering is used. | | **Engineering Unit:** Hz | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  AntTrackingRxNominalFreq ::= INTEGER (2200000000 .. 32300000000) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxFreqSearchRange**' (ant-tracking-rx-freq-search-range) OID .1.3.112.4.4.2.1.10100.1.15.1 | | **Definition:** This parameter configures and reports the bandwidth in Hz centered around the antTrackingRxNominalFreq, possibly corrected for the expected Doppler offset (as configured by the antTrackingRxPredictMode parameter) in which the receiver shall search for the carrier signal. This parameter is also valid in case of a suppressed carrier modulation scheme.  If the same receiver is used for telemetry reception and antenna steering, setting of this parameter is not possible and the value reported by this is a copy of the ccsds401CarrierRcptFreqSearchRange parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Guard Condition:** Setting of this parameter is only possible if a dedicated receiver for antenna steering is used. | | **Engineering Unit:** Hz | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  AntTrackingRxFreqSearchRange ::= INTEGER (0 .. 1500000) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxPredictMode**' (ant-tracking-rx-predict-mode) OID .1.3.112.4.4.2.1.10100.1.16.1 | | **Definition:** This enumerated parameter configures and reports for which condition the Doppler predicts have been calculated. It can take on four values:  - 'none': no information regarding the expected Doppler shift is available and therefore the nominal frequency (see antTrackingRxNominalFreq) is used;  - 'oneWay': this mode will be used when the spacecraft is not locked to a forward link signal or while the spacecraft transponder is commanded to non-coherent mode or when the spacecraft receiver is in 'coherency enabled' mode and the forward link carrier frequency is ramped such that the Doppler on the forward link is compensated, i.e., the spacecraft always 'sees' the nominal forward link frequency; in this case it does not matter if the forward link is radiated by the same station as the one that is receiving the return link or a different station;  - 'twoWay': this mode is applied when the spacecraft receiver is commanded to 'coherency enabled' mode and the station that is receiving the return link also radiates the forward link, the latter at a constant frequency;  - 'threeWay': this mode is applied when the spacecraft receiver is in 'coherency enabled' mode and a station different from the one receiving the return link is radiating the forward link signal at a known constant frequency.  If the same receiver is used for telemetry reception and antenna steering, setting of this parameter is not possible and the value reported by this is a copy of the ccsds401CarrierRcptPredictMode parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Guard Condition:** Setting of this parameter is only possible if a dedicated receiver for antenna steering is used. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AntTrackingRxPredictMode ::= ENUMERATED  {  none (0)  , oneWay (1)  , twoWay (2)  , threeWay (3)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxLoopBwdth**' (ant-tracking-rx-loop-bwdth) OID .1.3.112.4.4.2.1.10100.1.17.1 | | **Definition:** This parameter configures and reports the dual-sided tracking loop bandwidth in tenth Hz of the receiver. Depending on the mode the tracking receiver operates in, this is either the bandwidth of the PLL tracking the remnant carrier or the frequency range observed for checking spectral symmetry.  This parameter also configures and reports the duration in seconds within which the bandwidth reduction to a newly commanded loop bandwidth shall be reached. This gradual change of the loop bandwidth is intended to avoid loss of lock. The duration for the gradual bandwidth change can be set to 'auto' or set to a specific duration. If the duration is set to '0', the newly commanded bandwidth is applied immediately.  If the same receiver is used for telemetry reception and antenna steering, setting of this parameter is not possible and the value reported by this is a copy of the ccsds401CarrierRcptTrackingLoopBwdth parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Guard Condition:** Any attempt to set the antTrackingRxLoopBwdth parameter such that the loop bandwidth is too narrow to track the predicted Doppler rate shall be rejected.  Setting of this parameter is only possible if a dedicated receiver for antenna steering is used. | | **Engineering Unit:** 1/10 Hz and (N/A or s) | | **Configured:** true | | **Type Definition:**  AntTrackingRxLoopBwdth ::= SEQUENCE  {    -- The engineering unit of this element is 1/10 Hertz  trackingLoopBwdth INTEGER (1 .. 50000000)  , loopBwdthChangeDuration CHOICE  {    -- The time during which the bandwidth is gradually changed to the newly set value is  -- chosen automatically.  auto [0] NULL  ,  -- The engineering unit of this element is second.  bwdthChangeDuration [1] INTEGER (0 .. 100)  }    } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxOrderOfLoop**' (ant-tracking-rx-order-of-loop) OID .1.3.112.4.4.2.1.10100.1.18.1 | | **Definition:** This enumerated parameter configures and reports the order of the carrier tracking loop. It can take on the following values:  - 'first order': such loop is hardly ever used because it has a static phase error even in case of a constant return link carrier frequency;  - 'second order': this is the most commonly used loop as it has no static phase error for a constant return link carrier frequency;  - 'third order': such configuration may have to be used in case of high Doppler rates, as such loop has no static phase error even when the return link carrier frequency is sweeping, but initial acquisition is more difficult with such loop.  If the same receiver is used for telemetry reception and antenna steering, setting of this parameter is not possible and the value reported by this is a copy of the ccsds401CarrierRcptOrderOfLoop parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Guard Condition:** Setting of this parameter is only possible if a dedicated receiver for antenna steering is used. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AntTrackingRxOrderOfLoop ::= ENUMERATED  {  firstOrder (0)  , secondOrder (1)  , thirdOrder (2)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxAntiSideBandStat**' (ant-tracking-rx-anti-side-band-stat) OID .1.3.112.4.4.2.1.10100.1.19.1 | | **Definition:** This parameter configures and reports the status of the Anti-Side-Band system of the tracking receiver. The spectrum is expected to be symmetrical around the carrier. In the absence of this symmetry one can conclude that the receiver did not lock on the carrier but on some side band and acquisition will be restarted if the antTrackingRxAntiSideBandStat is 'enabled'. For very weak signals the wide bandwidth required to check the spectral symmetry may prevent signal acquisition due to the reduced sensitivity. Therefore the Anti-Side-Band system can be turned off, i.e., antTrackingRxAntiSideBandStat is set to 'disabled'. If the receiver does not have an Anti-Side-Band system, the reported value shall be 'notApplicable' and configuring of the parameter is prevented by the guard condition. | | **Guard Condition:** antTrackingRxAntiSideBandStat ≠ 'notApplicable' | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AntTrackingRxAntiSideBandStat ::= ENUMERATED  {  enabled (0)  , disabled (1)  , notApplicable (2)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antAcqThreshold**' (ant-acq-threshold) OID .1.3.112.4.4.2.1.10100.1.20.1 | | **Definition:** This parameter configures and reports the SNR threshold of the received signal at which the transition from the antPointingMode from 'fixedPosition' to 'closedLoop' or 'programTrack' shall occur. In case of the transition to 'programTrack' the time offset observed for the signal acquisition is applied when accessing the trajectory predicts.  In case of a remnant carrier, the threshold specifies the carrier power to spectral noise density ratio in dBHz. In case of the carrier being suppressed, the threshold specifies the data power to spectral noise density ratio in dBHz.  This parameter is used for contingency acquisition, i.e., when the spacecraft trajectory is somewhat uncertain and the spacecraft may be early or late with respect to the time when signal acquisition at the antenna 'fixedPosition' pointing was expected. | | **Guard Condition:** None | | **Engineering Unit:** dBHz | | **Configured:** true | | **Type Definition:**  -- The engineering unit is dBHz.  AntAcqThreshold ::= INTEGER (1 .. 100) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antTrackingRxLockStat**' (ant-tracking-rx-lock-stat) OID .1.3.112.4.4.2.1.10100.1.21.1 | | **Definition:** This enumerated parameter reports the lock status of the receiver and as such is only supported by antennas that are configured to operate in antPointingMode = 'closedLoop' mode. The values the parameter may have are:  - 'notLocked': the tracking receiver is not locked on the return link signal and therefore cannot drive the antenna pointing;  - 'locked': the tracking receiver has locked on the return link signal and consequently is driving the antenna pointing.  When the receiver loses lock, the antPointingMode will change to 'programTrack' and won't return to 'closedLoop' until receiver lock is (re-)acquired.  If the same receiver is used for telemetry reception and antenna steering, the value reported by this is a copy of the element carrierLock of the ccsds401CarrierRcptCarrierLockStat parameter or a TBD parameter of the CCSDS 415 Return Channel Reception FR Set. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  AntTrackingRxLockStat ::= ENUMERATED  {  notLocked (0)  , locked (1)  } | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antWindIntegrationTime**' (ant-wind-integration-time) OID .1.3.112.4.4.2.1.10100.1.22.1 | | **Definition:** This parameter configures and reports the length in seconds of the period during which the wind speed and peak wind speed are observed for the calculation of the antMeanWindSpeed and antPeakWindSpeed parameters. | | **Guard Condition:** None | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is seconds.  AntWindIntegrationTime ::= INTEGER (1 .. 3600) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antMeanWindSpeed**' (ant-mean-wind-speed ) OID .1.3.112.4.4.2.1.10100.1.23.1 | | **Definition:** This parameter reports the wind speed as observed close to the antenna. This parameter is measured in tenth m/s and averaged over the most recent period where the length of the period is specified by the antWindIntegrationTime parameter. | | **Engineering Unit:** 1/10 m/s | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/10 meter per second.  AntMeanWindSpeed ::= INTEGER (0 .. 1000) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antPeakWindSpeed**' (ant-peak-wind-speed) OID .1.3.112.4.4.2.1.10100.1.24.1 | | **Definition:** This parameter reports the highest wind speed observed close to the antenna during the most recent period where the length of the period is specified by the antWindIntegrationTime parameter. This parameter is measured in tenth m/s. | | **Engineering Unit:** 1/10 m/s | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/10 meter per second.  AntPeakWindSpeed ::= INTEGER (0 .. 1000) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antWindDirection**' (ant-wind-direction) OID .1.3.112.4.4.2.1.10100.1.25.1 | | **Definition:** This parameter reports the current wind direction in degrees, where 0 degrees corresponds to north and 90 degrees to east. | | **Engineering Unit:** degree | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is degree.  AntWindDirection ::= INTEGER (0 .. 359) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antAccumulatedPrecipitation**' (ant-accumulated-precipitation) OID .1.3.112.4.4.2.1.10100.1.26.1 | | **Definition:** This parameter reports the amount of precipitation in mm that accumulated since 0:00 UTC of the current day. | | **Engineering Unit:** 1/1000 m | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is millimeter.  AntAccumulatedPrecipitation ::= INTEGER (0 .. 2400) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antPrecipitationRate**' (ant-precipitation-rate) OID .1.3.112.4.4.2.1.10100.1.27.1 | | **Definition:** This parameter reports the precipitation rate in mm/h as observed during the most recent hour. | | **Engineering Unit:** 1/1000 m/h | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is millimeter per hour.  AntPrecipitationRate ::= INTEGER (0 .. 100) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antRelativeHumidity**' (ant-relative-humidity) OID .1.3.112.4.4.2.1.10100.1.28.1 | | **Definition:** This parameter reports the relative humidity in % as observed by an outdoor meteorological sensor close to the antenna. This parameter shall be flagged as invalid if the value from the meteo unit is invalid and it shall be flagged as unavailable if this parameter is not available at this time.  Note: Time-tagged meteo data (relative humidity, atmospheric pressure, temperature) is regarded a radiometric product and therefore not part of the monitoring data. | | **Engineering Unit:** % | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is percent.  AntRelativeHumidity ::= INTEGER (0 .. 100) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antAtmosphericPressure**' (ant-atmospheric-pressure ) OID .1.3.112.4.4.2.1.10100.1.29.1 | | **Definition:** This parameter reports the atmospheric pressure in hPa as observed by an outdoor meteorological sensor at the station. This parameter shall be flagged as invalid if the value from the meteo unit is invalid and it shall be flagged as unavailable if this parameter is not available at this time. | | **Engineering Unit:** hPa | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 100 Pascal (hPa).  AntAtmosphericPressure ::= INTEGER (800 .. 1100) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) parameter '**antAmbientTemperature**' (ant-ambient-temperature) OID .1.3.112.4.4.2.1.10100.1.30.1 | | **Definition:** This parameter reports the temperature in °C as observed by an outdoor meteorological sensor at the station. This parameter shall be flagged as invalid if the value from the meteo unit is invalid and it shall be flagged as unavailable if this parameter is not available at this time. | | **Engineering Unit:** °C | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is degree Celsius.  AntAmbientTemperature ::= INTEGER (-100 .. 100) | |  |  |  | | --- | | [**Antenna**](#id0x4ff180) event '**antResourceStatChange**' (ant-resource-stat-change) OID .1.3.112.4.4.2.1.10100.2.1.1 | | **Definition:** This event notifies any change of the antResourceStat parameter value. | | |  | | --- | | [**antResourceStatChange**](#id0x556e80) value '**antResourceStatChangeEvtValue**' (ant-resource-stat-change-evt-value) | | **Definition:** The event value reports the antResourceStat parameter value that applies since the notified antResourceStatChange event occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  AntResourceStatChangeEvtValue ::= AntResourceStat | |  | |  |  | | --- | | [**Antenna**](#id0x4ff180) event '**antTrackingRxLockStatChange**' (ant-tracking-rx-lock-stat-change) OID .1.3.112.4.4.2.1.10100.2.2.1 | | **Definition:** This event notifies any change of the antTrackingRxLockStat parameter. | | |  | | --- | | [**antTrackingRxLockStatChange**](#id0x559a00) value '**antTrackingRxLockStatChangeEvtValue**' (ant-tracking-rx-lock-stat-change-ev-value) | | **Definition:** The event value reports the antTrackingRxLockStat that applies since the notified antTrackingRxLockStatChange event occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  AntTrackingRxLockStatChangeEvtValue ::= AntTrackingRxLockStat | |  | |  |  | | --- | | [**Antenna**](#id0x4ff180) event '**antWindSpeedWarning**' (ant-wind-speed-warning) OID .1.3.112.4.4.2.1.10100.2.3.1 | | **Definition:** This event notifies that gusts exceed the nominal wind speed the antenna can withstand in operation and therefore the antenna may have to or will be moved to its stow position. | | |  | | --- | | [**antWindSpeedWarning**](#id0x55c600) value '**antWindSpeedWarningEvtValue**' (ant-wind-speed-warning-evt-value) | | **Definition:** The event value reports if the wind condition is critical in the sense that stowing of the antenna might become necessary ('warning') or that the wind speed necessitates the immediate stowing of the antenna ('stowing'). | | **Engineering Unit:** N/A | | **Type Definition:**  AntWindSpeedWarningEvtValue ::= ENUMERATED  {  stowing (0)  , warning (1)  } | |  | |  |  | | --- | | [**Antenna**](#id0x4ff180) event '**antOperatorNotify**' (ant-operator-notify) OID .1.3.112.4.4.2.1.10100.2.4.1 | | **Definition:** This event passes text messages intended for logs and/or operators involved in the service provision. | | |  | | --- | | [**antOperatorNotify**](#id0x55f400) value '**antOperatorNotifyMessage**' (ant-operator-notify-message) | | **Definition:** The messages passed by means of the antOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  AntOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**Antenna**](#id0x4ff180) directive '**antSetContrParams**' (ant-set-contr-params) OID .1.3.112.4.4.2.1.10100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the Antenna FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**antSetContrParams**](#id0x561f80) qualifier '**antContrParamIdsAndValuesDirQual**' (antenna-controlled-parameter-identifiers-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the Antenna FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  AntContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'Ccsds401SpaceLinkCarrierXmit' [(back to top)](#toc)

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| FR Stratum: 'Physical Channel' FR Set: 'CCSDS 401 Physical Channel Transmission' |
| **Definition:** The Ccsds401SpaceLinkCarrierXmit FR accepts as input for modulation of the carrier the optionally convolutionally encoded physical channel symbol stream from the FlfFrameSyncChnEncodeAndOidGen FR or from the TcPlopSyncAndChnlEncode FR. It also accepts from the RngXmit FR the ranging signal for modulation of the carrier. The Ccsds401SpaceLinkCarrierXmit FR provides the to be radiated carrier signal to the antenna FR and the actual carrier frequency and phase to the NonValRmDataCollection FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .20100   |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitResourceStat**' (ccsds-401-carrier-xmit-resource-stat) OID .1.3.112.4.4.2.1.20100.1.1.1 | | **Definition:** This enumerated parameter reports the ccsds401SpaceLinkCarrierXmit FR resource status and can take on four values:  - 'configured': the transmit equipment has been configured and, if applicable, the warm-up is completed, but the carrier has not been brought up or has been taken down;  - 'operational': the transmit link is active, i.e., the carrier is up;  - 'interrupted': a failure has been detected, e.g. carrier still on outside the transmission mask, that resulted in the carrier being shut down;  - 'halted': the transmit link has been taken out of service, e.g. due to failed HPA cooling or, if applicable, the warm-up of the HPA is not yet completed and therefore the carrier can not yet be brought up. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierXmitResourceStat ::= ResourceStat | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitPhysChnlName**' (ccsds-401-carrier-xmit-phys-chnl-name) OID .1.3.112.4.4.2.1.20100.1.2.1 | | **Definition:** This parameter configures and reports the name assigned to the physical transmission channel. This name is a Visible String which has a length of 1 to 32 characters. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitPhysChnlName ::= VisibleString (SIZE( 1 .. 32)) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitStat**' (ccsds-401-carrier-xmit-stat) OID .1.3.112.4.4.2.1.20100.1.3.1 | | **Definition:** This enumerated parameter configures and reports the current state of the carrier radiation and can take on three values:  - 'nonRadiating': the carrier is presently down, i.e., no signal is being radiated;  - 'radiatingIntoSpace': the carrier is presently up and the signal is radiated via the antenna;  - 'radiatingIntoTestLoad': the carrier is presently up and the signal is radiated into the water load. | | **Guard Condition:** The ccsds401CarrierXmitStat can be set to 'radiating into space' only if - in view of the given antenna pointing, the EIRP and the spectrum of the radiated signal - the ITU limits regarding the permitted spectral power density are respected.  Furthermore, the following parameters must have a valid value:  - ccsds401CarrierXmitEirp;  - ccsds401CarrierXmitPolarization;  - ccsds401CarrierXmitNominalCarrierFreq. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitStat ::= ENUMERATED  {  nonRadiating (0)  , radiatingIntoSpace (1)  , radiatingIntoTestLoad (2)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitEirp**' (ccsds-401-carrier-xmit-eirp) OID .1.3.112.4.4.2.1.20100.1.4.1 | | **Definition:** This parameter configures and reports the current transmit link signal level expressed as Equivalent Isotropically Radiated Power (EIRP) in dBW. | | **Guard Condition:** The commanded signal level must not result in a radiated signal that exceeds the spectral power density limits defined in the pertinent ITU regulations.  Note: The applicable limit depends on the pointing of the antenna and the local horizon. | | **Engineering Unit:** dBW | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is dBW.  Ccsds401CarrierXmitEirp ::= INTEGER (0 .. 150) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitPolarization**' (ccsds-401-carrier-xmit-polarization) OID .1.3.112.4.4.2.1.20100.1.5.1 | | **Definition:** This enumerated parameter configures and reports the configured transmit link polarization and can take on two values:  - 'lcp': the carrier is radiated with left hand circular polarization;  - 'rcp': the carrier is radiated in right hand circular polarization.  Note: Polarization is defined from the point of view of the source, i.e., in the direction of the wave propagation. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitPolarization ::= ENUMERATED  {  lhc (0)  , rhc (1)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitNominalCarrierFreq**' (ccsds-401-carrier-xmit-nominal-carrier-freq) OID .1.3.112.4.4.2.1.20100.1.6.1 | | **Definition:** This parameter configures and reports the nominal transmit link frequency in Hz and - if known - the observed best-lock-frequency of the spacecraft receiver in terms of offset from the nominal transmit frequenccy. Furthermore, the parameter configures and reports if the transmit link frequency shall be ramped to compensate the 1-way Doppler offset and rate. | | **Guard Condition:** Ramping is only permissible for category B missions. | | **Engineering Unit:** Hz / Hz / N/A | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is Hertz / none.  Ccsds401CarrierXmitNominalCarrierFreq ::= SEQUENCE  {  nominalAndBlfXmitFreq SEQUENCE  {    -- The engineering unit is Hz.  nominalXmitFreq INTEGER (2025000000 .. 40500000000)  ,  -- The engineering unit is Hz  blfOffset INTEGER (-10000 .. 10000) OPTIONAL  }    , xmitLinkRamping ENUMERATED  {  rampingOff (0)  , rampingOn (1)  }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitActualCarrierFreq**' (ccsds-401-carrier-xmit-actual-carrier-freq) OID .1.3.112.4.4.2.1.20100.1.7.1 | | **Definition:** This parameter reports the currently measured transmit frequency in Hz. In general, the frequency will be constant, except during the transmit link sweep and for Category B missions in case the transmit link is being ramped to compensate the Doppler shift and rate on the transmit link. | | **Engineering Unit:** Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  Ccsds401CarrierXmitActualCarrierFreq ::= INTEGER (2015000000 .. 40500000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitReferenceFreqLock**' (ccsds-401-carrier-xmit-reference-freq-lock) OID .1.3.112.4.4.2.1.20100.1.8.1 | | **Definition:** This enumerated parameter reports if the frequency generation of the FR is locked to a reference frequency or free running. It can take on the values  - 'noRefFreqAvailable';  - 'lockedToRefFreq'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierXmitReferenceFreqLock ::= ENUMERATED  {  noRefFreqAvailable (0)  , lockedToRefFreq (1)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSweepProcStat**' (forward-401-carrier-xmit-sweep-proc-stat) OID .1.3.112.4.4.2.1.20100.1.9.1 | | **Definition:** This enumerated parameter configures and reports the current state of the carrier sweep and can take on two values:  - 'active': the carrier is presently being swept;  - 'not active': the carrier is presently not being swept, i.e., the nominal frequency possibly compensated for Doppler and offset in accordance with the spacecraft receiver's BLF is being radiated.  Modulation shall be forced off, whenever the sweep is active. In case the transmit link frequency is being ramped to compensate Doppler shift and rate on the transmit link (Category B missions only), this is not regarded to be a sweep.  The sweep procedure is started by setting the ccsds401CarrierXmitSweepProcStat parameter to 'active' by means of the ccsds401CarrierXmitSetContrParams directive. Once the sweep procedure as specified by the parameter ccsds401CarrierXmitSweepProfile is completed, the ccsds401CarrierXmitSweepProcStat parameter is set automatically to 'notActive' and modulation by data and ranging is (re-)enabled.  If necessary, the sweep procedure while executing can be stopped by setting the ccsds401CarrierXmitSweepProcStat parameter to 'notActive' using the ccsds401CarrierXmitSetContrParams directive. In that case the transmit link carrier frequency jumps back to the frequency set by the ccsds401CarrierXmitNominalCarrierFreq parameter, compensated for 1-way Doppler and BLF offset if so configured. | | **Guard Condition:** ccsds401CarrierXmitStat ≠ 'nonRadiating'  Furthermore, the parameter ccsds401CarrierXmitSweepProfile must have a valid value. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitSweepProcStat ::= ENUMERATED  {  active (0)  , notActive (1)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSweepProgress**' (ccsds-401-carrier-xmit-sweep-progress) OID .1.3.112.4.4.2.1.20100.1.10.1 | | **Definition:** This parameters reports the progress of the sweep procedure if that procedure is active. The progress is reported in terms of the number of the sweep leg being performed, the time until the current leg including the dwell time will be completed and the time until all legs will have been performed. | | **Engineering Unit:** N/A / s / s | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierXmitSweepProgress ::= SEQUENCE  {    -- The engineering unit is N/A  numberOfCurrentLeg INTEGER (1 .. 5)  ,  -- The engineering unit is second  timeToLegCompletion INTEGER (1 .. 900)  ,  -- The engineering unit is second  timeToSweepCompletion INTEGER (1 .. 3600)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSweepProfile**' (ccsds-401-carrier-xmit-sweep-profile) OID .1.3.112.4.4.2.1.20100.1.11.1 | | **Definition:** This complex parameter configures and reports the start frequency ('startFreq') in Hz of the first leg of the sweep and for each leg it then specifies the end frequency ('endFreq') in Hz, the sweep rate ('sweepRate') in Hz/s and the duration of the dwell time ('dwellTime') in seconds (i.e., the time during which the carrier frequency is not changed) before the next leg is started or for the last leg when carrier modulation will be enabled. The assumption is that there are no frequency discontinuities, i.e., the start frequency of a sweep leg is always equal to the end frequency of the previous leg.  If parameter ccsds401CarrierXmitNominalCarrierFreq is configured such that by means of ramping of the transmit link frequency the 1-way Doppler is compensated, then the specified sweep profile frequencies will be modified automatically in accordance with the Doppler offset applicable at the given time.  If parameter ccsds401CarrierXmitNominalCarrierFreq specifies the offset of the spacecraft receiver's best-lock-frequency from the nominal carrier frequency, then the specified sweep profile frequencies will be modified automatically by that offset.  The end frequency of the last leg must be the nominal carrier frequency, possibly offset by ramping and for the spacecraft receiver's best-lock-frequency.  If desired, the ccsds401CarrierXmitSweepProfile can also be configured to accomplish a tune-out tune-in station handover such that at the incoming ESLT no sweep needs to be performed. Rather, the spacecraft receiver stays locked. | | **Guard Condition:** None | | **Engineering Unit:** Hz / for each leg: s / Hz/s / Hz | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitSweepProfile ::= SEQUENCE  {    -- The engineering unit of this parameter is Hertz.  startfreq INTEGER (2025000000 .. 40500000000)  , sweepLegs SEQUENCE (SIZE( 1 .. 5)) OF SEQUENCE  {    -- The engineering unit of this parameter is second  dwellTime INTEGER (0 .. 20)  ,  -- The engineering unit of this parameter is Hertz per second.  sweepRate INTEGER (1 .. 32000)  ,  -- The engineering unit of this parameter is Hertz.  endFreq INTEGER (2025000000 .. 40500000000)  }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitMod**' (ccsds-401-carrier-xmit-mod) OID .1.3.112.4.4.2.1.20100.1.12.1 | | **Definition:** This enumerated parameter configures and reports the current state of the carrier modulation and can take on two values:  - 'off': the carrier is presently not being modulated;  - 'on': the carrier is presently being modulated.  Note: This parameter reports the modulation being off also when this is not explicitly commanded, e.g. when it is forced to 'off' automatically because the transmit link sweep is active (ccsds401CarrierXmitSweepProcStat = 'active'). | | **Guard Condition:** Turning on of the modulation is not permitted while ccsds401CarrierXmitSweepProcStat = 'active'.  Turning off the modulation must not result in exceeding the ITU spectral power density limits.  Furthermore, the modulation can be turned on only if at least one of the two sets of parameters listed below comprises only parameters of which all values are valid:  Set 1:  - ccsds401CarrierXmitSymbolStreamModType;  - ccsds401CarrierXmitSubcarrierFreq;  - ccsds401CarrierXmitSymbolRate.  Set 2:  - ccsds401CarrierXmitRngModIindex. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitMod ::= ENUMERATED  {  off (0)  , on (1)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitModInpStat**' (ccsds-401-carrier-xmit-mod-inp-stat) OID .1.3.112.4.4.2.1.20100.1.13.1 | | **Definition:** This parameter reports the status of the two modulator inputs for TC and Rng. Both will be disabled when ccsds401CarrierXmitMod = 'off' or ccsds401CarrierXmitSweepProcStat = 'active'. The TC input will be enabled when ccsds401CarrierXmitMod = 'on' and ccsds401CarrierXmitSweepProcStat = 'notActive'. The Rng input will be enabled under the same conditions except if the TC input is being used and ccsds401CarrierXmitTcPriority = 'yes'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierXmitModInpStat ::= SEQUENCE  {  tcInp ENUMERATED  {  disabled (0)  , enabled (1)  }    , rngInp ENUMERATED  {  disabled (0)  , enabled (1)  }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitTcPriority**' (ccsds-401-carrier-xmit-tc-priority) OID .1.3.112.4.4.2.1.20100.1.14.1 | | **Definition:** This enumerated parameter configures and reports if the ranging signal shall be suppressed in the presence of a to be radiated telecommand signal. It can take on the values:  'yes';  'no'. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitTcPriority ::= ENUMERATED  {  yes (0)  , no (1)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSymbolStreamModType**' (ccsds-401-carrier-xmit-symbol-stream-mod-type) OID .1.3.112.4.4.2.1.20100.1.15.1 | | **Definition:** This parameter configures and reports whether (1) the symbol stream directly bpsk modulates the transmit carrier such that the carrier is suppressed or (2) directly bi-phase modulates the carrier such that there is a remnant carrier or (3) bpsk modulates a subcarrier that in turn modulates the carrier. It can take on the following values:  - 'bpsk': the carrier is bpsk modulated by the input data symbol stream;  - 'direct': the carrier is directly bi-phase modulated by the input data symbol stream;  - 'subcarrier': the carrier modulating signal is the subcarrier which in turn is BPSK modulated by the to be radiated symbol stream.  For all three modulation options the parameter specifies if the Doppler shift of the symbol stream shall be compensated and if so, if a fixed offset (in 1/10000 Hz) shall be applied or if the symbol rate shall be continuously updated (ramped) such that the spacecraft does not "see" any Doppler shift of the symbol rate. Given that CCSDS 401.0 prescribes that subcarrier and symbol rate have to be coherent, the subcarrier if applicable is Doppler shift compensated in the same way as the symbol rate.  As applicable, the nominal symbol rate (in 1/10000 Hz) and nominal subcarrier frequency (in 1/10000 Hz) and the associated modulation index (in 1/100 rad) are specified. | | **Guard Condition:** None | | **Engineering Unit:** depends on the applicable choices. | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitSymbolStreamModType ::= SEQUENCE  {  symbolRateDopplerCompensation CHOICE  {  noCompensation [0] NULL  ,  -- The engineering unit of this parameter is 1/1000 Hertz.  staticOffset [1] INTEGER (-30000000 .. 30000000)  ,  -- Given that CCSDS requires coherency of subcarrier and symbol clock, ramping of the  -- symbol rate implies that also the subcarrier frequency is ramped, in case a subcarrier  -- is used.  ramping [2] NULL  }    , modType CHOICE  {  bpsk [0] SEQUENCE  {    -- The filter may be of the type Square Root Raised Cosine, 6-pole Butterworth, or equivalent  -- provided that the spectral mask limits are respected.  bandpassFilter ENUMERATED  {  notApplied (0)  , applied (1)  }    , bpskSymbolRateAndPcmFormat CHOICE  {  ccsds [0] SEQUENCE  {  symbolRate INTEGER (100000000 | 200000000 | 400000000 | 800000000 | 1600000000 | 3200000000 | 6400000000 | 12800000000 | 25600000000 | 51200000000 | 102400000000 | 204800000000)  , pcmFormat PcmFormat (nrzL)  }    , nonCcsds [1] SEQUENCE  {  symbolRate INTEGER (100000000 .. 204800000000)  , pcmFormat PcmFormat (nrzL | nrzM | nrzS)  }    }    }    , direct [1] SEQUENCE  {    -- The engineering unit of this parameter is 1/100 radian  symbolStreamDirectModulationIndex INTEGER (20 .. 140)  , directSymbolRateAndPcmFormat CHOICE  {  ccsds [0] SEQUENCE  {  symbolRate INTEGER (400000000 | 800000000 | 1600000000 | 3200000000 | 6400000000 | 12800000000 | 25600000000)  , pcmFormat PcmFormat (biPhaseL)  }    , nonCcsds [1] SEQUENCE  {  symbolRate INTEGER (400000000 .. 25600000000)  , pcmFormat PcmFormat (biPhaseL | biPhaseM | biPhaseS)  }    }    }    , subcarrier [2] SEQUENCE  {  subcarrierFreqSymbolRateAndPcmFormat CHOICE  {  ccsds [0] SEQUENCE  {  subcarrierFreqAndSymbolRate CHOICE  {  subcarrier8Khz [0] SEQUENCE  {    -- The engineering unit of this parameter is 1/100000 Hertz.  subcarrierNominalFrequency INTEGER (800000000)  ,  -- The engineering unit of this parameter is 1/100000 Hertz.  nominalSymbolRate INTEGER (781250 | 1562500 | 3125000 | 6250000 | 12500000 | 25000000 | 50000000 | 100000000 | 200000000)  }    , subcarrier16Khz [1] SEQUENCE  {    -- The engineering unit of this parameter is 1/100000 Hertz.  subcarrierNominalFrequency INTEGER (1600000000)  ,  -- The engineering unit of this parameter is 1/100000 Hertz  nominalSymbolRate INTEGER (781250 | 1562500 | 3125000 | 6250000 | 12500000 | 25000000 | 50000000 | 100000000 | 200000000 | 400000000)  }    }    , pcmFormat PcmFormat (nrzL | nrzM)  }    , nonCcsds [1] SEQUENCE  {    -- The engineering unit of this parameter is 1/100000 Hertz.  nominalSubcarrierFrequency INTEGER (800000000 .. 1600000000)  ,  -- The engineering unit of this parameter is 1/100000 Hertz.  nominalSymbolRate CHOICE  {    -- The engineering unit of this element is 1/10000 symbols per second.  nonCoherent [0] INTEGER (781250 .. 400000000)  ,  -- This element specifies the integer divisor of the subcarrier frequency for specifying  -- the symbol rate in symbols per second.  coherent [1] INTEGER (4 .. 2048)  }    , pcmFormat PcmFormat (nrzL | nrzM | nrzS)  }    }    ,  -- The engineering unit of this parameter is 1/100 radian.  subcarrierModIndex INTEGER (20 .. 140)  }    }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitRngModIndex**' (ccsds-401-carrier-xmit-rng-mod-index) OID .1.3.112.4.4.2.1.20100.1.16.1 | | **Definition:** This parameter configures and reports the peak modulation index for the ranging signal in 1/100 radians. If the ccsds401CarrierXmitSymbolStreamModType is 'bpsk', concurrent transmission of telecommands and ranging signals is not possible. | | **Guard Condition:** If modType in the ccsds401CarrierXmitSymbolStreamModType parameter is 'bpsk', the values of the ccsds401CarrierXmitRngModIndex parameter elements must be set to 0. | | **Engineering Unit:** 1/100 rad / 1/100 rad | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 radian.  Ccsds401CarrierXmitRngModIndex ::= SEQUENCE  {    -- The engineering unit of this element is 1/100 radian.  duringAmbiguityResolution INTEGER (0 .. 140)  ,  -- The engineering unit of this element is 1/100 radian  afterAmbiguityResolution INTEGER (0 .. 140)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSubcarrierFreq**' (ccsds-401-carrier-xmit-subcarrier-freq) OID .1.3.112.4.4.2.1.20100.1.17.1 | | **Definition:** This parameter reports the actual subcarrier frequency in 1/1000 Hz. The fine resolution is specified here as to enable reporting of the fine tuning of the subcarrier frequency in cases where Doppler shift compensation is applied. In case that no subcarrier is used (modType element of ccsds401CarrierXmitSymbolStreamModType ≠ 'subcarrier'), this parameter shall report '0'.  Note: The specified range is intended to also cover the case of missions not conformant with CCSDS. | | **Engineering Unit:** 1/10000 Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/10000 Hertz  Ccsds401CarrierXmitSubcarrierFreq ::= INTEGER (0 .. 320000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSubcarrierMod**' (ccsds-401-carrier-xmit-subcarrier-mod) OID .1.3.112.4.4.2.1.20100.1.18.1 | | **Definition:** This enumerated parameter configures and reports if the subcarrier is currently being modulated by the TC symbol stream and can take on two values:  - 'off': the subcarrier is currently not being modulated;  - 'on': the subcarrier is currently being modulated.  In case no subcarrier is used (mod type element of ccsds401CarrierXmitSymbolStreamModType ≠ subcarrier'), this parameter shall be flagged as undefined. | | **Guard Condition:** modType element of ccsds401CarrierXmitSymbolStreamModType = 'subcarrier'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierXmitSubcarrierMod ::= ENUMERATED  {  off (0)  , on (1)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) parameter '**ccsds401CarrierXmitSymbolRate**' (ccsds-401-carrier-xmit-symbol-rate) OID .1.3.112.4.4.2.1.20100.1.19.1 | | **Definition:** This parameter reports the actual transmit link symbol rate in 1/10000 Hz, | | **Engineering Unit:** 1/10000 Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/10000 Hertz.  Ccsds401CarrierXmitSymbolRate ::= INTEGER (78125 .. 204800000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) event '**ccsds401CarrierXmitResourceStatChange**' (ccsds-401-carrier-xmit-resource-stat-change) OID .1.3.112.4.4.2.1.20100.2.1.1 | | **Definition:** This event notifies any change of the ccsds401CarrierXmitResourceStat parameter value. | | |  | | --- | | [**ccsds401CarrierXmitResourceStatChange**](#id0x5ace00) value '**ccsds401CarrierXmitResourceStatChangeEvtValue**' (ccsds-401-carrier-xmit-resource-stat-change-evt-value) OID | | **Definition:** The event value reports the ccsds401CarrierXmitResourceStat parameter value that applies since the notified ccsds401CarrierXmitResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  Ccsds401CarrierXmitResourceStatChangeEvtValue ::= Ccsds401CarrierXmitResourceStat | |  | |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) event '**ccsds401CarrierXmitOperatorNotify**' (ccsds-401-carrier-xmit-operator-notify) OID .1.3.112.4.4.2.1.20100.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**ccsds401CarrierXmitOperatorNotify**](#id0x5afa80) value '**ccsds401CarrierXmitOperatorNotifyMessage**' (ccsds-401-carrier-xmit-operator-notify-message) | | **Definition:** The messages passed by means of the ccsds401CarrierXmitOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  Ccsds401CarrierXmitOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**Ccsds401SpaceLinkCarrierXmit**](#id0x565300) directive '**ccsds401CarrierXmitSetContrParams**' (ccsds-401-carrier-xmit-set-contr-params) OID .1.3.112.4.4.2.1.20100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the Ccsds401SpaceLinkCarrierXmit FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**ccsds401CarrierXmitSetContrParams**](#id0x5b2680) qualifier '**ccsds401CarrierXmitContrParamIdsAndValuesDirQual**' (ccsds-401-carrier-xmit-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the Ccsds401SpaceLinkCarrierXmit FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  Ccsds401CarrierXmitContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'RngXmit' [(back to top)](#toc)

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| --- |
| FR Stratum: 'Physical Channel' FR Set: 'CCSDS 401 Physical Channel Transmission' |
| **Definition:** This FR does not take any input. It provides the to be radiated ranging signal to the spacecraft to the Ccsds401SpaceLinkCarrierXmit FR for modulation onto the forward carrier. It provides the timing information needed by the RngAndDopplerExtraction FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .20101   |  | | --- | | [**RngXmit**](#id0x5b5880) parameter '**rngXmitResourceStat**' (rng-xmit-resource-stat) OID .1.3.112.4.4.2.1.20101.1.1.1 | | **Definition:** This enumerated parameter reports the RngXmit FR resource status and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RngXmitResourceStat ::= ResourceStat | |  |  |  | | --- | | [**RngXmit**](#id0x5b5880) parameter '**rngXmitMod**' (rng-xmit-mod) OID .1.3.112.4.4.2.1.20101.1.2.1 | | **Definition:** This enumerated parameter configures and reports if the ranging system is active and can take on two values:  - 'disabled': the ranging system is presently not active as far as the transmit link is concerned, i.e., no ranging signal is modulated onto the transmit carrier;  - 'enabled': the ranging system is presently active, i.e., the ranging system is generating the ranging signal and modulating it onto the transmit carrier.  If rngXmitMod = 'enabled', the parameter also specifies if the ranging shall be performed with the spacecraft or with the calibration translator in the ranging calibration loop. The applicable transponder ratio and therefore the ranging translator configuration is specified by the parameter Ccsds401SpaceLinkCarrierRcpt: ccsds401CarrierRcptTransponderRatio. | | **Guard Condition:** rngXmitRngType must have a valid value. Ccsds401SpaceLinkCarrierXmit: modType element of ccsds401CarrierXmitSymbolStreamModType ≠ 'bpsk'. | | **Engineering Unit:** N/A / N/A | | **Configured:** true | | **Type Definition:**  RngXmitMod ::= CHOICE  {  disabled [0] NULL  , enabled [1] ENUMERATED  {  tracking (0)  , calibrating (1)  }    } | |  |  |  | | --- | | [**RngXmit**](#id0x5b5880) parameter '**rngXmitRngType**' (rng-xmit-rng-type) OID .1.3.112.4.4.2.1.20101.1.3.1 | | **Definition:** This enumerated parameter configures and reports the type of ranging that is being used. It can take on the following values:  - 'toneCode': the system performs range measurements in accordance with ECSS-E-50-02A or similar;  - 'pseudoNoise': the system performs range measurements in accordance with CCSDS 414.1-B-2.  In addition it permits to choose the Doppler compensation applied to the ranging signal on the transmit carrier. It may be  - 'noCompensation';  - 'oneWay': the spacecraft "sees" the nominal ranging signal;  - 'twoWay': the ESLT "sees" the nominal ranging signal. | | **Guard Condition:** rngXmitMod = 'off' and:  if the element rngType of the parameter rngXmitRngType = 'toneCode', then all values of the element toneCode of the parameter rngXmitRngType must be valid;  if the element rngType of the parameter rngXmitRngType = 'pseudoNoise', then the values of the element pseudoNoise of the parameter rngXmitRngType must be valid. | | **Engineering Unit:** depends on the elements of the CHOICEs and SEQUENCEs | | **Configured:** true | | **Type Definition:**  RngXmitRngType ::= SEQUENCE  {  dopplerCompensation ENUMERATED  {  noCompensation (0)  , oneWay (1)  , twoWay (2)  }    , rngType CHOICE  {  toneCode [0] SEQUENCE  {    -- The engineering unit of this parameter is Hertz.  toneFreq INTEGER (100000 .. 1500000)  , rngCodeLength INTEGER (1 .. 24)  , codeComponentAndToneXmitDuration SEQUENCE  {    -- The engineering unit of this element is second.  codeComponent INTEGER (1 .. 10000)  , toneOnly CHOICE  {    -- The engineering unit of this element is second. The transmission of the code sequence  -- is restarted when either the toneOnlyDuration has expired or the RngXmit FR is notified  -- by the RngAndDopplerExtraction FR that a range measurement has been completed.  maxToneOnlyDuratiom [0] INTEGER (1 .. 100000)  ,  -- The ranging system remains in tone-only mode until either tone lock is lost or the  -- ranging system is disabled.  unlimitedToneOnlyDuration [1] NULL  ,  -- On occurence of an ambiguity resolution failure notified by the RngAndDopplerExtraction  -- FR the RngXmit FR can either be paused or the transmission of the code sequence  -- can be restarted.  ambiguityResolutionFailure [2] CHOICE  {    -- The parameter rngXmitMod is set to 'disabled'.  pauseRngXmit [0] NULL  ,  -- The transmission of the code sequence is restarted.  restartCodeSequence [1] NULL  }    }    }    }    , pseudoNoise [1] SEQUENCE  {  chipRate CHOICE  {  ccsds [0] CHOICE  {  i-is-2 [0] SEQUENCE  {  i INTEGER (2)  , k INTEGER (8 .. 10)  }    , k-is-6 [1] SEQUENCE  {  i INTEGER (1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 16 | 32 | 64)  , k INTEGER (6)  }    }    ,  -- The engineering unit of this element is chips per second.  nonCcsds [1] INTEGER (30000 .. 17000000)  }    , codeType ENUMERATED  {  t2b (0)  , t4b (1)  }    ,  -- Positive means that positive input data advance the carrier phase.  modulationSense CHOICE  {    -- The modulation sense is positive.  ccsds [0] NULL  ,  -- The modulation sense is negative.  nonCcsds [1] NULL  }    }    }    } | |  |  |  | | --- | | [**RngXmit**](#id0x5b5880) parameter '**rngXmitPnChipRate**' (rng-xmit-pn-chip-rate) OID .1.3.112.4.4.2.1.20101.1.4.1 | | **Definition:** This parameter reports the nominal PN ranging chip rate in Hertz which is given by the transmitted carrier frequency and the parameters k and i (see the parameter rngXmitRngType) and shall be calculated as specified in Table 3.1 of CCSDS 414.1. | | **Engineering Unit:** chips/s | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is chips per second.  RngXmitPnChipRate ::= INTEGER (30000 .. 17000000) | |  |  |  | | --- | | [**RngXmit**](#id0x5b5880) event '**rngXmitResourceStatChange**' (rng-xmit-resource-stat-change) OID .1.3.112.4.4.2.1.20101.2.1.1 | | **Definition:** This event notifies any change of the rngXmitResourceStat parameter value. | | |  | | --- | | [**rngXmitResourceStatChange**](#id0x5c9380) value '**rngXmitResourceStatChangeEvtValue**' (rng-xmit-resource-stat-change-evt-value) | | **Definition:** The event value reports the rngXmitResourceStat parameter value that applies since the notified rngXmitStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  RngXmitResourceStatChangeEvtValue ::= RngXmitResourceStat | |  | |  |  | | --- | | [**RngXmit**](#id0x5b5880) event '**rngXmitOperatorNotify**' (rng-xmit-operator-notify) OID .1.3.112.4.4.2.1.20101.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**rngXmitOperatorNotify**](#id0x5cbf00) value '**rngXmitOperatorNotifyMessage**' (rng-xmit-operator-notify-message) | | **Definition:** The messages passed by means of the rngXmitOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  RngXmitOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**RngXmit**](#id0x5b5880) directive '**rngXmitSetContrParams**' (rng-xmit-set-contr-params) OID .1.3.112.4.4.2.1.20101.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the RngXmit FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**rngXmitSetContrParams**](#id0x5ceb00) qualifier '**rngXmitContrParamIdsAndValuesDirQual**' (rng-xmit-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the RngXmit FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  RngXmitContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'Ccsds401SpaceLinkCarrierRcpt' [(back to top)](#toc)

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| --- |
| FR Stratum: 'Physical Channel' FR Set: 'CCSDS 401 Physical Channel Reception' |
| **Definition:** The Ccsds401SpaceLinkCarrierRcpt FR accepts as input the carrier signal from the Antenna FR. It provides the symbol stream demodulated from the physical channel to the FlfSyncAndChnlDecode FR. It provides observables needed for the creation of radiometric data to the RangeAndDopplerExtraction FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .20300   |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptResourceStat**' (ccsds-401-carrier-rcpt-resource-stat) OID .1.3.112.4.4.2.1.20300.1.1.1 | | **Definition:** This enumerated parameter reports the csds401SpaceLinkCarrierRcpt resource status and can take on four values:  - 'configured': the carrier reception equipment has been configured and the antenna moved to point, but due to geometry or spacecraft timeline, no carrier signal is expected to be seen at this time or the expected LOS time has passed where again LOS may be due to geometry or due to the spacecraft timeline;  - 'operational': the carrier reception is active, i.e., all receiving equipment is in nominal condition, the expected AOS time has passed and the expected LOS has not yet been reached;  - 'interrupted': a failure has been detected, e.g. a receiver malfunction, that prevents the reception of the carrier signal;  - 'halted': the carrier reception has been taken out of service, e.g. due to a power failure affecting the carrier reception string. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierRcptResourceStat ::= ResourceStat | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptPhysChnlName**' (ccsds-401-carrier-rcpt-phys-chnl-name) OID .1.3.112.4.4.2.1.20300.1.2.1 | | **Definition:** This parameter configures and reports the name assigned to the physical channel being received. This name is a Visible String which has a length of 1 to 32 characters. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptPhysChnlName ::= VisibleString (SIZE( 1 .. 32)) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptModType**' (ccsds-401-carrier-rcpt-mod-type) OID .1.3.112.4.4.2.1.20300.1.3.1 | | **Definition:** This parameter configures and reports the carrier modulation type and the associated parameters of the carrier being received. The following options are selectable:  - 'subcarrier': the symbol stream BPSK modulates a subcarrier which in turn phase modulates the carrier;  - 'direct': the symbol stream directly bi-phase-L modulates the carrier with a modulation index resulting in a remnant carrier.  - 'bpsk': the symbol stream bpsk modulates the carrier which means that the carrier is suppressed.  - 'qpsk': the quadrature phase shift keying uses four phase constellatioin points so that each constellation point represents two symbols of the modulating symbol stream. The carrier is suppressed.  - 'oqpsk': as qpsk, offset quadrature phase shift keying uses four phase constellatioin points, but the modulation by the odd and even symbol are offset by one symbol time which prevents the occurrence of 180° phase shifts.  - 'gmsk': the symbol stream is passed through a Gaussian filter and then modulates the carrier by means of minimum-shift-keying. This suppresses the carrier. | | **Guard Condition:** None | | **Engineering Unit:** depends on the element of the complex type | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptModType ::= CHOICE  {  subcarrier [0] SEQUENCE  {  symbolRate CHOICE  {  ccsdsSubcarrierFrequencySymbolRateRatio [0] INTEGER (2 .. 1024)  ,  -- The engineering unit of this element is 1/1000 symbols per second.  nonCcsdsAbsoluteSymbolRate [1] INTEGER (1000 .. 32000000)  }    , subcarrierWaveform ENUMERATED  {  square (0)  , sine (1)  }    ,  -- The engineering unit of this element is 1/100 radian.  modIndexTelemetry INTEGER (1 .. 150)  , pcmFormat PcmFormat (nrzL)  }    , direct [1] SEQUENCE  {    -- The engineering unit of this parameter is 1/1000 symbols per second.  symbolRate INTEGER (8000000 .. 256000000)  ,  -- The engineering unit of this parameter is 1/100 radian.  modIndexTelemetry INTEGER (1 .. 150)  , pcmFormat PcmFormat (biPhaseL)  }    , bpsk [2] SEQUENCE  {    -- The engineering unit of this parameter is 1/1000 symbols per second.  symbolRate INTEGER (64000000 .. 20000000000)  , pcmFormat PcmFormat (nrzS)  ,  -- Enable or disable the square-root raised cosine matched filter depending on the filtering  -- applied on the spacecraft side.  matchedFilter ENUMERATED  {  matchedFilterOff (0)  , matchedFilterOn (1)  }    }    ,  -- This element specifies the symbol rate in 1/1000 per second.  qpsk [3] SEQUENCE  {    -- This element specifies the symbol rate in 1/1000 symbols per second  symbolRate INTEGER (1000 .. 20000000000)  , constellationConfiguration CHOICE  {    -- symbol assignment to I and Q channel and the mapping of IQ pairs to the carrier phase  -- complies with CCSDS 401  ccsds [0] NULL  , nonCcsds [1] SEQUENCE  {  symbolToIqMapping CHOICE  {    -- This is as specifiied in CCSDS 401  evenSymbolOnIchannel [0] NULL  , evenSymbolOnQchannel [1] NULL  }    , symbolPairToPhaseAssignment SEQUENCE  {    -- Carrier phase in degrees  symbolPair00 INTEGER (45 | 135 | 225 | 315)  ,  -- Carrier phase in degrees  symbolPair01 INTEGER (45 | 135 | 225 | 315)  ,  -- Carrier phase in degrees  symbolPair10 INTEGER (45 | 135 | 225 | 315)  ,  -- Carrier phase in degrees  symbolPair11 INTEGER (45 | 135 | 225 | 315)  }    }    }    ,  -- Enable or disable the square-root raised cosine matched filter depending on the filtering  -- applied on the spacecraft side.  matchedFilter ENUMERATED  {  matchedFilterOff (0)  , matchedFilterOn (1)  }    }    ,  -- This element specifies the symbol rate in 1/1000 symbol per second.  oqpsk [4] SEQUENCE  {    -- This element specifies the symbol rate in 1/1000 symbols per second  symbolRate INTEGER (1000 .. 20000000000)  , constellationConfiguration CHOICE  {    -- symbol assignment to I and Q channel and the mapping of IQ pairs to the carrier phase  -- complies with CCSDS 401  ccsds [0] NULL  , nonCcsds [1] SEQUENCE  {  symbolToIqMapping CHOICE  {    -- This is as specifiied in CCSDS 401  evenSymbolOnIchannel [0] NULL  , evenSymbolOnQchannel [1] NULL  }    , symbolPairToPhaseAssignment SEQUENCE  {    -- Carrier phase in degrees  symbolPair00 INTEGER (45 | 135 | 225 | 315)  ,  -- Carrier phase in degrees  symbolPair01 INTEGER (45 | 135 | 225 | 315)  ,  -- Carrier phase in degrees  symbolPair10 INTEGER (45 | 135 | 225 | 315)  ,  -- Carrier phase in degrees  symbolPair11 INTEGER (45 | 135 | 225 | 315)  }    }    }    ,  -- Enable or disable the matched filter depending on the filtering applied on the spacecraft  -- side. The filter type may be of type Square Root Raised Cosine α = 0.5 or Butterworth  -- 6 poles, BT = 0.5 or similar bandpass filters with BT ≤ 0.5.  matchedFilter ENUMERATED  {  matchedFilterOff (0)  , matchedFilterOn (1)  }    }    , gmsk [5] SEQUENCE  {    -- This element specifies the symbol rate in 1/1000 symbol per second.  symbolRate INTEGER (1000 .. 20000000000)  ,  -- The scaling factor of this parameter is 1/100  bandwidthSymbolPeriodProduct INTEGER (0 .. 1000)  , concurrentGmskAndPnRng ENUMERATED  {  yes (0)  , no (1)  }    }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptPolarization**' (ccsds-401-carrier-rcpt-polarization) OID .1.3.112.4.4.2.1.20300.1.4.1 | | **Definition:** This parameter configures and reports the channel (polarization) that shall be used as input for reception and demodulation. It can take on the following values:  - 'lhc';  - 'rhc';  - 'autoHysteresis';  - 'combining'.  If 'autoHysteresis' is chosen, the parameter specifies how much larger in 1/10 dB the power observed for the unselected polarization must be before a switch-over to the polarization with the stronger signal is performed.  'combining' means that diversity combining of the lhc and rhc channels is performed. This is only permissible for modulation schemes with remnant carrier. This element of the choice specifies the bandwidth in Hertz centered around the carrier frequency which shall be used to determin the required phase rotation and gain setting of the LHC and RHC channels for obtaining the optimum combining result. | | **Guard Condition:** 'combining' is only permissible if the ccsds401CarrierRcptModulationType is either 'subcarrier' or 'direct'. | | **Engineering Unit:** N/A or N/A or 1/10 dB or Hz | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptPolarization ::= CHOICE  {  lhc [0] NULL  , rhc [1] NULL  ,  -- The engineering unit of this element is 1/10 dB.  autoHysteresis [2] INTEGER (0 .. 100)  ,  -- The enginnering unit of this element is Hertz.  combiningBwdth [3] INTEGER (10 .. 100000)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptPolarizationAngle**' (ccsds-401-carrier-rcpt-polarization-angle) OID .1.3.112.4.4.2.1.20300.1.5.1 | | **Definition:** This parameter reports (after acquisition of signal) the power ratio of the signal received with left hand circular (LHC) polarization and the signal received with the orthogonal, i.e., right hand circular (RHC) polarization. If the angle reported is 0 degrees, then the full power is received via the LHC channel. At 45 degrees, the power in the LHC and the power in the RHC channels are equal, as if the input signal were linearly polarized. At 90 degrees, the full power is received with RHC polarization.  Only stations supporting concurrent reception of LHC and RHC polarization provide this information. When this is not possible or the station is configured to use a single channel only, this parameter shall be flagged as unavailable. | | **Engineering Unit:** degree | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is degree.  Ccsds401CarrierRcptPolarizationAngle ::= INTEGER (0 .. 90) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptExpectedSignalLevel**' (ccsds-401-carrier-rcpt-expected-signal-level) OID .1.3.112.4.4.2.1.20300.1.6.1 | | **Definition:** This parameter configures and reports the expected level of the received signal in dBm as observed at the LNA input. It shall be the total signal power so that the same parameter specification applies regardless of the modulation scheme. | | **Engineering Unit:** dBm | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is dBm  Ccsds401CarrierRcptExpectedSignalLevel ::= INTEGER (-250 .. -30) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSignalLevelResidual**' (ccsds-401-carrier-rcpt-signal-level-residual) OID .1.3.112.4.4.2.1.20300.1.7.1 | | **Definition:** This parameter reports the difference between the actual and the predicted signal level of the received signal as observed at the LNA input in 1/10 dB (actaul value minus predicted value). | | **Engineering Unit:** 1/10 dB | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/10 dB  Ccsds401CarrierRcptSignalLevelResidual ::= INTEGER (-500 .. 500) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSystemNoiseTemperature**' (ccsds-401-carrier-rcpt-system-noise-temperature) OID .1.3.112.4.4.2.1.20300.1.8.1 | | **Definition:** This parameter reports the system noise temperature in K derived from the noise density observed at the receiver input. As such, it takes into account all contributions to the noise temperature such as antenna microwave components, atmospheric noise and cosmic microwave background noise. The noise temperature varies with weather conditions and antenna elevation due to variation of the path length through the atmosphere and ground noise received by the antenna side lobes. | | **Engineering Unit:** K | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is Kelvin.  Ccsds401CarrierRcptSystemNoiseTemperature ::= INTEGER (1 .. 1000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptNominalFreq**' (ccsds-401-carrier-rcpt-nominal-freq) OID .1.3.112.4.4.2.1.20300.1.9.1 | | **Definition:** This parameter configures and reports the nominal officially assigned frequency of the return link carrier disregarding any Doppler shift. | | **Guard Condition:** None | | **Engineering Unit:** Hz | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  Ccsds401CarrierRcptNominalFreq ::= INTEGER (2200000000 .. 32300000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptTransponderRatio**' (ccsds-401-carrier-rcpt-transponder-ratio) OID .1.3.112.4.4.2.1.20300.1.10.1 | | **Definition:** This enumerated parameter configures and reports the transponder ratio applicable when the spacecraft transponder is operationg in coherent mode and that is also to be used for ranging calibration.  If the supported spacecraft supports more than one forward link, this parameter indicates indirectly the forward link to which the return link will be coherent provided that the coherency of the spacecraft transponder is enabled and the transponder is locked to the forward link carrier.  This parameter permits also the specification of non-standard transponder ratios. That way also missions can be supported where several spacecraft share the same forward physical channel, but have different SCIDs or separate VCID sets or separate APID sets and different transponder ratios. This way although having a shared forward physical channel the spacecraft can have separate return physical channels. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptTransponderRatio ::= CHOICE  {  ccsdsTransponderRatio [0] CHOICE  {  transponderRatio221To240 [0] SEQUENCE  {  transponderRatioNumerator INTEGER (221)  , transponderRatioDenominator INTEGER (240)  }    , transponderRatio749To880 [1] SEQUENCE  {  transponderRatioNumerator INTEGER (749)  , transponderRatioDenominator INTEGER (880)  }    , transponderRatio221To900 [2] SEQUENCE  {  transponderRatioNumerator INTEGER (221)  , transponderRatioDenominator INTEGER (900)  }    , transponderRatio765To240 [3] SEQUENCE  {  transponderRatioNumerator INTEGER (765)  , transponderRatioDenominator INTEGER (240)  }    , transponderRatio221To880 [4] SEQUENCE  {  transponderRatioNumerator INTEGER (221)  , transponderRatioDenominator INTEGER (880)  }    , transponderRatio749To240 [5] SEQUENCE  {  transponderRatioNumerator INTEGER (749)  , transponderRatioDenominator INTEGER (240)  }    , transponderRatio749To3344 [6] SEQUENCE  {  transponderRatioNumerator INTEGER (749)  , transponderRatioDenominator INTEGER (3344)  }    , transponderRatio3599To3344 [7] SEQUENCE  {  transponderRatioNumerator INTEGER (3599)  , transponderRatioDenominator INTEGER (3344)  }    , transponderRatio3599To3360 [8] SEQUENCE  {  transponderRatioNumerator INTEGER (3599)  , transponderRatioDenominator INTEGER (3360)  }    , transponderRatio749ToSet2652To2800 [9] SEQUENCE  {  transponderRatioNumerator INTEGER (749)  , transponderRatioDenominator INTEGER (2652 | 2662 | 2678 | 2688 | 2704 | 2720 | 2736 | 2754 | 2772 | 2784 | 2800)  }    , transponderRatio221To2772 [10] SEQUENCE  {  transponderRatioNumerator INTEGER (221)  , transponderRatioDenominator INTEGER (2772)  }    , transponderRatio221To2850 [11] SEQUENCE  {  transponderRatioNumerator INTEGER (221)  , transponderRatioDenominator INTEGER (2850)  }    , transponderRatio749ToSet836To864 [12] SEQUENCE  {  transponderRatioNumerator INTEGER (749)  , transponderRatioDenominator INTEGER (836 | 840 | 846 | 850 | 854 | 858 | 864)  }    }    , nonCcsdsTransponderRatio [1] SEQUENCE  {  transponderRatioNumerator INTEGER (100 .. 10000)  , transponderRatioDenominator INTEGER (100 .. 10000)  }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptFreqSearchRange**' (ccsds-401-carrier-rcpt-freq-search-range) OID .1.3.112.4.4.2.1.20300.1.11.1 | | **Definition:** This parameter configures and reports the frequency range in Hz centered around the ccsds401CarrierRcptNominalFreq, possibly corrected for the expected Doppler shift at acquisition time, in which the receiver shall search for the carrier signal. This parameter is also valid in case of a suppressed carrier modulation scheme. | | **Guard Condition:** None | | **Engineering Unit:** Hz | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  Ccsds401CarrierRcptFreqSearchRange ::= INTEGER (0 .. 1500000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptPredictMode**' (ccsds-401-carrier-rcpt-predict-mode) OID .1.3.112.4.4.2.1.20300.1.12.1 | | **Definition:** This enumerated parameter configures and reports for which condition the Doppler predicts have been calculated. It can take on four values:  - 'none': no information regarding the expected Doppler shift is available and therefore the nominal frequency is used;  - 'oneWay': this mode will be used when the spacecraft is not locked to a forward link signal or while the spacecraft transponder is commanded to non-coherent mode or when the spacecraft receiver is in 'coherency enabled' mode and the forward link carrier frequency is ramped such that the Doppler on the forward link is compensated, i.e., the spacecraft always 'sees' the nominal forward link frequency; in this case it does not matter if the forward link is radiated by the same station as the one that is receiving the return link or radiated by a different station;  - 'twoWay': this mode is applied when the spacecraft receiver is commanded to 'coherency enabled' mode and the station that is receiving the return link also radiates the forward link, the latter at a constant frequency;  - 'threeWay': this mode is applied when the spacecraft receiver is in 'coherency enabled' mode and a station different from the one receiving the return link is radiating the forward link signal at a known constant frequency. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptPredictMode ::= ENUMERATED  {  none (1)  , oneWay (2)  , twoWay (3)  , threeWay (4)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptTrackingLoopBwdth**' (ccsds-401-carrier-rcpt-tracking-loop-bwdth) OID .1.3.112.4.4.2.1.20300.1.13.1 | | **Definition:** This parameter configures and reports the dual-sided tracking loop bandwidth in tenth Hz of the receiver and the duration in seconds within which the bandwidth reduction to a newly commanded loop bandwidth shall be reached. This gradual change of the loop bandwidth is intended to avoid loss of lock. The duration for the gradual bandwidth change can be set to 'auto' or set to a specific duration ('bwdthChangeDuration'). If the duration is set to '0', the newly commanded bandwidth is applied immediately. | | **Guard Condition:** Any attempt to set the 401CarrierRcptTrackingLoopBwdth parameter such that the loop bandwidth is too narrow to track the predicted Doppler rate shall be rejected. | | **Engineering Unit:** 1/10 Hz and (N/A or s) | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptTrackingLoopBwdth ::= SEQUENCE  {    -- The engineering unit of this element is 1/10 Hertz.  trackingLoopBwdth INTEGER (1 .. 30000)  ,  -- The engineering unit of this element is second.  loopBwdthChangeDuration CHOICE  {    -- The time during which the bandwidth is gradually changed to the newly set value is  -- chosen automatically.  auto [0] NULL  ,  -- The engineering unit of this element is second. If it is set to 0, the newly commanded  -- bandwidth is applied immediately.  bwdthChangeDuration [1] INTEGER (0 .. 100)  }    } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptOrderOfLoop**' (ccsds-401-carrier-rcpt-order-of-loop) OID .1.3.112.4.4.2.1.20300.1.14.1 | | **Definition:** This enumerated parameter configures and reports the order of the carrier tracking loop. It can take on the following values:  - 'firstOrder': such loop is hardly ever used because it has a static phase error even in case of a constant carrier frequency being received;  - 'secondOrder': this is the most commonly used loop as it has no static phase error for a constant carrier frequency being received;  - 'thirdOrder': such configuration may have to be used in case of high Doppler rates, as such loop has no static phase error even when the carrier frequency being received is changing because of the given Doppler rate, but initial acquisition is more difficult with such loop. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptOrderOfLoop ::= ENUMERATED  {  firstOrder (0)  , secondOrder (1)  , thirdOrder (2)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptAntiSideBandStat**' (ccsds-401-carrier-rcpt-anti-side-band-stat ) OID .1.3.112.4.4.2.1.20300.1.15.1 | | **Definition:** This parameter configures and reports the status of the Anti-Side-Band system. The spectrum is expected to be symmetrical around the carrier. In the absence of this symmetry one can conclude that the receiver did not lock on the carrier but on some side band and acquisition will be restarted if the ccsds401CarrierRcptAntiSideBandStat is 'enabled'. For very weak signals the wide bandwidth required to check the spectral symmetry may prevent signal acquisition due to the reduced sensitivity. Therefore the Anti-Side-Band system can be turned off, i.e., ccsds401CarrierRcptAntiSideBandStat is set to 'disabled'. If the receiver does not have an Anti-Side-Band system, the reported value shall be 'notApplicable' and configuring of the parameter is prevented by the guard condition. | | **Guard Condition:** ccsds401CarrierRcptAntiSideBandStat ≠ 'notApplicable' | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptAntiSideBandStat ::= ENUMERATED  {  enabled (0)  , disabled (1)  , notApplicable (2)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptLockStat**' (ccsds-401-carrier-rcpt-lock-stat) OID .1.3.112.4.4.2.1.20300.1.16.1 | | **Definition:** This parameter reports the lock status for the carrier, and, if applicable, for the subcarrier, and for the symbol stream. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierRcptLockStat ::= LockStat | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptCarrierLoopSnr**' (ccsds-401-carrier-rcpt-carrier-loop-snr) OID .1.3.112.4.4.2.1.20300.1.17.1 | | **Definition:** This parameter reports the signal-to-noise ratio in the carrier tracking loop. It is derived from the carrier-loop-phase-error-std-deviation (std) as follows: SNR in 1/100 dB is given by 1000 log (2/(2PI std)^2) where log is to the base of 10. The carrier loop phase error standard deviation (or rms value) in rad over n samples, i.e. the sum of (Ei - M)^2 for i = 1 .. n is calculated, then divided by n and then the square root taken.  A given implementation shall specify the number of samples used to calculate this parameter. This shall be recorded in the Service Agreement. | | **Engineering Unit:** 1/100 dB | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 dB  Ccsds401CarrierRcptCarrierLoopSnr ::= INTEGER (-2800 .. 10000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptCarrierLoopMeanPhaseError**' (ccsds-401-carrier-rcpt-carrier-loop-mean-phase-error) OID .1.3.112.4.4.2.1.20300.1.18.1 | | **Definition:** This parameter reports the mean value of the phase error in 1/100 radians in the carrier tracking loop by summing up the loop errors Ei over a period of n samples and then dividing the sum by n. The mean M should be zero unless the loop is subject to a static phase error.  A given implementation shall specify the number of samples used to calculate this paramter. This shall be recorded in the Service Agreement. | | **Engineering Unit:** 1/100 rad | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 radian.  Ccsds401CarrierRcptCarrierLoopMeanPhaseError ::= INTEGER (-629 .. 629) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptActualFreq**' (ccsds-401-carrier-rcpt-actual-freq) OID .1.3.112.4.4.2.1.20300.1.19.1 | | **Definition:** This parameter reports the observed carrier frequency being received in Hz. This parameter therefore varies with the Doppler shift induced by the radial velocity of the transmitting antenna (in general the spacecraft) relative to the receiving antenna (in general the ESLT antenna). In 1-way mode, the Doppler shift applies only once, but also the onboard oscillator drift affects the observed return link carrier frequency. In 2-way mode in combination with a constant forward link frequency, the Doppler shift approximately doubles with respect to the 1-way case, but the contribution of the onboard oscillator drift is eliminated. | | **Engineering Unit:** Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of the parameter is Hertz.  Ccsds401CarrierRcptActualFreq ::= INTEGER (2199700000 .. 38500000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptFreqOffset**' (ccsds-401-carrier-rcpt-freq-offset) OID .1.3.112.4.4.2.1.20300.1.20.1 | | **Definition:** This parameter reports the observed frequency offset in Hz of the carrier being received with respect to the nominal carrier frequency. As such it reports on the oscillator drift (in case of oneWay operation) on the transmitting side plus the Doppler shift induced by the radial velocity between the transmitting and receiving antennas. In twoWay mode, the effect of the oscillator drift at the transmitting end is eliminated. In combination with a constant forward link frequency, the Doppler shift approximately doubles compared to the oneWay case. | | **Engineering Unit:** Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  Ccsds401CarrierRcptFreqOffset ::= INTEGER (-5000000 .. 5000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptDopplerStdDeviation**' (ccsds-401-carrier-rcpt-doppler-std-deviation) OID .1.3.112.4.4.2.1.20300.1.21.1 | | **Definition:** This parameter reports the Doppler offset standard deviation in Hz over n samples. Each sample Si is the difference between the actual return link frequency and the predicted return link frequency where the predict takes into account the expected Doppler shift. Based on these samples, the mean Doppler offset M is calculated by forming the sum of n samples Si and dividing it by n. Then the sum of (Si - M)^2 for i = 1 .. n is calculated, divided by n and then the square root taken.  A given implementation shall specify the number of samples used to calculate this paramter. This shall be recorded in the Service Agreement. | | **Engineering Unit:** Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  Ccsds401CarrierRcptDopplerStdDeviation ::= INTEGER (0 .. 5000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptBestLockFreq**' (ccsds-401-carrier-rcpt-best-lock-freq) OID .1.3.112.4.4.2.1.20300.1.22.1 | | **Definition:** This parameter reports the frequency in Hz of the to be transmitted carrier that corresponds to the non-coherent frequency of the received carrier divided by the transponder turnaround ratio in the Doppler free case. The spacecraft is expected to lock on the transmitted carrier, when it 'sees' this frequency. | | **Engineering Unit:** Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is Hertz.  Ccsds401CarrierRcptBestLockFreq ::= INTEGER (2024956000 .. 40501863000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptNominallSubcarrierFreq**' (ccsds-401-carrier-rcpt-nominal-subcarrier-freq) OID .1.3.112.4.4.2.1.20300.1.23.1 | | **Definition:** This parameter configures and reports the nominal subcarrier frequency in 1/1000 Hz. If the applicable modulation scheme does not use a subcarrier, this parameter shall be flagged as 'undefined'.  Except if ccsds401CarrierRcptPredictMode is set to 'none', the demudulator shall however be configured to the nominal subcarrier frequency corrected for the 1-way Doppler offset because in general the subcarrier is generated by the transmitting end, i.e., the spacecraft, independently of a carrier received by the spacecraft and therefore subject to the 1-way Doppler shift. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 Hz | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 Hertz.  Ccsds401CarrierRcptNominallSubcarrierFreq ::= INTEGER (2000000 .. 4000000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptActualSubcarrierFreq**' (ccsds-401-carrier-rcpt-actual-subcarrier-freq) OID .1.3.112.4.4.2.1.20300.1.24.1 | | **Definition:** This parameter reports the actually received subcarrier frequency in 1/1000 Hz, i.e., this parameter reflects the Doppler shift of the subcarrier frequency. If the applicable modulation scheme does not use a subcarrier, this parameter shall be flagged as 'undefined'. | | **Engineering Unit:** 1/1000 Hz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 Hertz.  Ccsds401CarrierRcptActualSubcarrierFreq ::= INTEGER (2000000 .. 4000000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSubcarrierDemodLoopBwdth**' (ccsds-401-carrier-rcpt-subcarrier-demod-loop-bwdth) OID .1.3.112.4.4.2.1.20300.1.25.1 | | **Definition:** This parameter configures and reports the subcarrier demodulator loop bandwidth expressed as dual-sided subcarrier loop bandwidth to subcarrier frequency ratio. If the applicable modulation scheme does not use a subcarrier, this parameter shall be flagged as undefined. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptSubcarrierDemodLoopBwdth ::= REAL (1E-5 .. 1E-1) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSubcarrierLoopMeanPhaseError**' (ccsds-401-carrier-rcpt-subcarrier-loop-mean-phase-errror) OID .1.3.112.4.4.2.1.20300.1.26.1 | | **Definition:** This parameter reports the mean value of the phase error in 1/100 radians in the subcarrier tracking loop by summing up the loop errors Ei over a period of n samples and then dividing the sum by n. The mean M should be zero unless the loop is subject to a static phase error.  A given implementation shall specify the number of samples used to calculate this paramter. This shall be recorded in the Service Agreement. | | **Engineering Unit:** 1/100 rad | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 radian  Ccsds401CarrierRcptSubcarrierLoopMeanPhaseError ::= INTEGER (-629 .. 629) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSubcarrierLevelEstimate**' (ccsds-401-carrier-rcpt-subcarrier-level-estimate) OID .1.3.112.4.4.2.1.20300.1.27.1 | | **Definition:** This parameter reports the subcarrier to carrier power ratio expressed in 1/100 dBc. If the applicable modulation scheme does not use a subcarrier, this parameter shall be flagged as 'undefined'. | | **Engineering Unit:** 1/100 dBc | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 dBc.  Ccsds401CarrierRcptSubcarrierLevelEstimate ::= INTEGER (-20000 .. 0) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptNominalSymbolRate**' (ccsds-401-carrier-rcpt-nominal-symbol-rate) OID .1.3.112.4.4.2.1.20300.1.28.1 | | **Definition:** This parameter configures and reports the nominal received symbol stream rate in 1/1000 symbols/second.  Except if ccsds401CarrierRcptPredictMode is set to 'none', the demudulator shall however be configured to the nominal symbol rate corrected for the 1-way Doppler offset because in general the symbol clock is generated by the transmitting end, i.e., the spacecraft, independently of a carrier received by the spacecraft and therefore subject to the 1-way Doppler shift. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 symbols/s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 symbols per second.  Ccsds401CarrierRcptNominalSymbolRate ::= INTEGER (4000 .. 160000000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptActualSymbolRate**' (ccsds-401-carrier-rcpt-actual-symbol-rate) OID .1.3.112.4.4.2.1.20300.1.29.1 | | **Definition:** This parameter reports the actually received symbol stream rate in 1/1000 symbols/second, i.e., this parameter reflects the Doppler shift of the symbol rate. | | **Engineering Unit:** 1/1000 symbols/s | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 symbols per second.  Ccsds401CarrierRcptActualSymbolRate ::= INTEGER (4000 .. 160000000000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSymbolSynchronizerLoopBwdth**' (ccsds-401-carrier-rcpt-symbol-synchronizer-loop-bwdth) OID .1.3.112.4.4.2.1.20300.1.30.1 | | **Definition:** This parameter configures and reports the symbol synchronizer loop bandwidth expressed as dual-sided symbol synchronizer loop bandwidth to symbol rate ratio. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  Ccsds401CarrierRcptSymbolSynchronizerLoopBwdth ::= REAL (1E-5 .. 1E-2) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptSymbolLoopMeanPhaseError**' (ccsds-401-carrier-rcpt-symbol-loop-mean-phase-error) OID .1.3.112.4.4.2.1.20300.1.31.1 | | **Definition:** This parameter reports the mean value of the phase error in 1/100 radians in the symbol tracking loop by summing up the loop errors Ei over a period of n samples and then dividing the sum by n. The mean M should be zero unless the loop is subject to a static phase error.  A given implementation shall specify the number of samples used to calculate this paramter. This shall be recorded in the Service Agreement. | | **Engineering Unit:** 1/100 rad | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 radian  Ccsds401CarrierRcptSymbolLoopMeanPhaseError ::= INTEGER (-629 .. 629) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptExpectedEsOverNo**' (ccsds-401-carrier-rcpt-expected-es-over-no) OID .1.3.112.4.4.2.1.20300.1.32.1 | | **Definition:** This parameter configures and reports the expected symbol energy over noise density ratio (Es/No) in 1/100 dB. Depending on the equipment, the value may be used to optimize carrier acquisition and lock detection in particular for very low values (e.g. - 2 dB) as they may be encountered for turbo coding with coding rates > 1/2. | | **Guard Condition:** None | | **Engineering Unit:** 1/100 dB | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 dB.  Ccsds401CarrierRcptExpectedEsOverNo ::= INTEGER (-1000 .. 60000) | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) parameter '**ccsds401CarrierRcptEsOverNoResidualAndSoftSymbolDistribution**' (ccsds-401-carrier-rcpt-es-over-no-residual-and-soft-symbol-distribution) OID .1.3.112.4.4.2.1.20300.1.33.1 | | **Definition:** This parameter reports the difference in 1/10 db between the expected symbol energy over noise density ratio (Es/No) and the actually observed Es/No (observed minus predicted value). The algorithms used to calculate the observed Es/No tend to saturate at a certain Es/No level so that the reported residual may correspond to an observed Es/No that is significantly lower than expected. However, this saturation happens at levels that are so high that the telemetry is anyway virtually error free.  It also reports the distribution of the soft symbols in percent. For each symbol the deviation from the perfect +1 and -1 as visible from the soft bits is normalized to +/- 50%. The observed deviation is summed and devided by the number of samples taken.  The duration used for averaging the values reported by the ccsds401CarrierRcptEsOverNoResidualAndSoftSymbolDistribution parameter should be documented in the Service Agreement. | | **Engineering Unit:** 1/10 dB / % | | **Configured:** false | | **Type Definition:**  Ccsds401CarrierRcptEsOverNoResidualAndSoftSymbolDistribution ::= SEQUENCE  {    -- The engineering unit of this element is 1/10 dB  esOverNoResidual INTEGER (-500 .. 500)  ,  -- This element is reported in percent  softBitDistribution INTEGER (-50 .. 50)  } | |  |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) event '**ccsds401CarrierRcptResourceStatChange**' (ccsds-401-carrier-rcpt-resource-stat-change) OID .1.3.112.4.4.2.1.20300.2.1.1 | | **Definition:** This event notifies any change of the ccsds401CarrierRcptResourceStat parameter value. | | |  | | --- | | [**ccsds401CarrierRcptResourceStatChange**](#id0x74f200) value '**ccsds401CarrierRcptResourceStatChangeEvtValue**' (ccsds-401-carrier-rcpt-resource-stat-change-evt-value) | | **Definition:** The event value reports the ccsds401CarrierRcptResourceStat parameter value that applies since the notified ccsds401CarrierRcptResourceSatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  Ccsds401CarrierRcptResourceStatChangeEvtValue ::= Ccsds401CarrierRcptResourceStat | |  | |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) event '**ccsds401CarrierRcptLockStatChange**' (ccsds-401-carrier-rcpt-lock-stat-change) OID .1.3.112.4.4.2.1.20300.2.2.1 | | **Definition:** This event notifies any change of the lock status occurring when receiving or trying to acquire the to be received carrier and reports the lock status as given since the occurrence of the event. | | |  | | --- | | [**ccsds401CarrierRcptLockStatChange**](#id0x751d80) value '**ccsds401CarrierRcptLockStatChangeEvtValue**' (ccsds-401-carrier-rcpt-lock-stat-change-evt-value) | | **Definition:** The event value reports the lock status as given since the occurrence of the ccsds401CarrierRcptLockStatChange event. It should be noted that loss of carrier lock implies loss of subcarrier lock if a subcarrier is used and loss of symbol lock. Loss of subcarrier lock, if a subcarrier is used, implies loss of symbol lock. | | **Engineering Unit:** N/A | | **Type Definition:**  Ccsds401CarrierRcptLockStatChangeEvtValue ::= Ccsds401CarrierRcptLockStat | |  | |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) event '**ccsds401CarrierRcptOperatorNotify**' (ccsds-401-carrier-rcpt-operator-notify) OID .1.3.112.4.4.2.1.20300.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**ccsds401CarrierRcptOperatorNotify**](#id0x754900) value '**ccsds401CarrierRcptOperatorNotifyMessage**' (ccsds-401-carrier-rcpt-operator-notify-message) | | **Definition:** The messages passed by means of the ccsds401CarrierRcptOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  Ccsds401CarrierRcptOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**Ccsds401SpaceLinkCarrierRcpt**](#id0x6d4c00) directive '**ccsds401CarrierRcptSetContrParams**' (ccsds-401-carrier-rcpt-set-contr-params) OID .1.3.112.4.4.2.1.20300.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the Ccsds401SpaceLinkCarrierRcpt FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**ccsds401CarrierRcptSetContrParams**](#id0x757500) qualifier '**ccsds401SpaceLinkCarrierRcptContrParamIdsAndValuesDirQual**' (ccsds-401-space-link-carrier-rcpt-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the Ccsds401SpaceLinkCarrierRcpt FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  Ccsds401SpaceLinkCarrierRcptContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'RngAndDopplerExtraction' [(back to top)](#toc)

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| FR Stratum: 'Physical Channel' FR Set: 'CCSDS 401 Physical Channel Reception' |
| **Definition:** The RngAndDopplerExtraction FR accepts as input the timing information from the RngXmit FR and the range and Doppler data from the Ccsds401SpaceLinkCarrierRcpt FR. It provides range and Doppler observables to the TdmSegmentGen FR and to the NonValRmDataCollection FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .20301   |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionResourceStat**' (rng-and-doppler-extraction-resource-stat) OID .1.3.112.4.4.2.1.20301.1.1.1 | | **Definition:** This enumerated parameter reports the rngAndDopplerExtractionResourceStat and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RngAndDopplerExtractionResourceStat ::= ResourceStat | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionPresteering**' (rng-and-doppler-extraction-presteering) OID .1.3.112.4.4.2.1.20301.1.2.1 | | **Definition:** This parameter configures and reports if the ranging signal acquisition shall be presteered in accordance with the expected Doppler shift. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RngAndDopplerExtractionPresteering ::= ENUMERATED  {  dopplerPresteeringOff (0)  , dopplerPresteeringOn (1)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionRngPowerOverNo**' (rng-and-doppler-extraction-rng-power-over-no) OID .1.3.112.4.4.2.1.20301.1.3.1 | | **Definition:** This parameter reports the actual ranging signal power (tone or pn chips) to noise density ratio expressed in 1/100 dBHz. | | **Engineering Unit:** 1/100 dBHz | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 dBHz.  RngAndDopplerExtractionRngPowerOverNo ::= INTEGER (1 .. 10000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionRngPowerOverNoResidual**' (rng-and-doppler-extraction-rng-power-over-no-residual) OID .1.3.112.4.4.2.1.20301.1.4.1 | | **Definition:** This parameter reports the difference between actual and the predicted ranging signal power to noise density ratio expressed in 1/10 dB (actual value minus predicted value). | | **Engineering Unit:** 1/10 dB | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/10 dB.  RngAndDopplerExtractionRngPowerOverNoResidual ::= INTEGER (-1000 .. 1000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionRngLoopBwdth**' (rng-and-doppler-extraction-rng-loop-bwdth) OID .1.3.112.4.4.2.1.20301.1.5.1 | | **Definition:** This parameter reports, in 1/1000 Hz, the dual sided bandwidth of the ranging tracking loop. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 Hz | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 Hz  RngAndDopplerExtractionRngLoopBwdth ::= INTEGER (1 .. 30000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionPredictedRngLoopSnr**' (rng-and-doppler-extraction-predicted-rng-loop-snr) OID .1.3.112.4.4.2.1.20301.1.6.1 | | **Definition:** This parameter configures and reports the expected ranging signal power to noise spectral density ratio within the ranging tracking loop bandwidth in 1/10 dB. | | **Guard Condition:** None | | **Engineering Unit:** 1/10 dB | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/10 dB.  RngAndDopplerExtractionPredictedRngLoopSnr ::= INTEGER (0 .. 400) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionRngSignalAcqProbability**' (rng-and-doppler-extraction-rng-signal-acq-probability) OID .1.3.112.4.4.2.1.20301.1.7.1 | | **Definition:** This parameter reports the probability in percent of successful ranging signal acquisition derived from the predicted Pr/No and the configured ranging loop bandwidth, i.e. from the predicted ranging loop SNR (see parameter rngAndDopplerExtractionPredictedRngLoopSnr). | | **Engineering Unit:** % | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is percent.  RngAndDopplerExtractionRngSignalAcqProbability ::= INTEGER (0 .. 100) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionOpenLoopTime**' (rng-and-doppler-extraction-open-loop-time) OID .1.3.112.4.4.2.1.20301.1.8.1 | | **Definition:** This parameter configures and reports the duration of the period in milliseconds during which the ranging tracking loop is operated in open-loop mode. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 second.  RngAndDopplerExtractionOpenLoopTime ::= INTEGER (1 .. 10000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionLoopSettlingTime**' (rng-and-doppler-extraction-loop-settling-time) OID .1.3.112.4.4.2.1.20301.1.9.1 | | **Definition:** This parameter configures and reports the duration of the period in milliseconds after closure of the ranging tracking loop until loop lock is reported and range measurements can start. This allows any residual loop transient to die away. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 second.  RngAndDopplerExtractionLoopSettlingTime ::= INTEGER (1 .. 10000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionLoopLockStat**' (rng-and-doppler-extraction-loop-lock-stat) OID .1.3.112.4.4.2.1.20301.1.10.1 | | **Definition:** This enumerated value reports the tone respectively PN chip loop lock status. It can take on two values:  - 'not locked';  - 'locked'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RngAndDopplerExtractionLoopLockStat ::= ENUMERATED  {  notLocked (0)  , locked (1)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionRngToCarrierPowerRatio**' (rng-and-doppler-extraction-rng-to-carrier-power-ratio) OID .1.3.112.4.4.2.1.20301.1.11.1 | | **Definition:** This parameter reports the tone / pn-chip power to carrier power ratio expressed in 1/100 dBc. | | **Engineering Unit:** 1/100 dB | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 dB  RngAndDopplerExtractionRngToCarrierPowerRatio ::= INTEGER (-20000 .. 0) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionExpectedRngModIndex**' (rng-and-doppler-extraction-expected-rng-mod-index) OID .1.3.112.4.4.2.1.20301.1.12.1 | | **Definition:** This parameter configures and reports in 1/100 radians the expected ranging modulation index on the received carrier. | | **Guard Condition:** None | | **Engineering Unit:** 1/100 rad | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/100 radian.  RngAndDopplerExtractionExpectedRngModIndex ::= INTEGER (0 .. 140) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionIntegrationTime**' (rng-and-doppler-extraction-integration-time) OID .1.3.112.4.4.2.1.20301.1.13.1 | | **Definition:** If the ranging type is 'toneCode' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR), then this parameter configures and reports the tone integration time in milliseconds.  If the ranging type is 'pseudoNoise' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR), then this parameter configures and reports the integration time in seconds used by the PN code correlator. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 s / s | | **Configured:** true | | **Type Definition:**  RngAndDopplerExtractionIntegrationTime ::= CHOICE  {    -- The engineering unit of the tone integration time is 1/1000 second.  toneCode [0] INTEGER (1 .. 100000)  ,  -- The engineering unit of the integration time used by the PN code correlator is second.  pseudoNoise [1] INTEGER (1 .. 3600)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionCodeNumberCorrelated**' (rng-and-doppler-extraction-code-number-correlated) OID .1.3.112.4.4.2.1.20301.1.15.1 | | **Definition:** This parameter reports up to which code number the replica has been correlated with the received signal. This parameter is only applicable if the ranging type is 'toneCode' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR). If the ranging type is 'pseudoNoise' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR), this parameter shall be flagged as 'undefined'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RngAndDopplerExtractionCodeNumberCorrelated ::= INTEGER (0 .. 24) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionAmbiguityResolved**' (rng-and-doppler-extraction-ambiguity-resolved) OID .1.3.112.4.4.2.1.20301.1.16.1 | | **Definition:** This enumerated parameter reports in case of tone/code ranging if the ambiguity has been resolved and in case of PN ranging if lock on the PN sequence has been achieved. It can take on two values:  - 'no': correlation of the replica of the sent signal with the received signal has not yet been achieved or has failed;  - 'yes': the ranging system has reached the state where range measurements can be performed.  This parameter is only applicable if the ranging type is 'toneCode' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR). If the ranging type is 'pseudoNoise' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR), this parameter shall be flagged as 'undefined'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RngAndDopplerExtractionAmbiguityResolved ::= ENUMERATED  {  no (0)  , yes (1)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionSpacecraftTransponderMode**' (rng-and-doppler-extraction-spacecraft-transponder-mode) OID .1.3.112.4.4.2.1.20301.1.17.1 | | **Definition:** This enumerated parameter configures and reports for Doppler and PN ranging the mode in which the spacecraft transponder is supposed to operate. | | **Guard Condition:** If the ranging type is 'toneCode' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR), the 'ranging' element of the rngAndDopplerExtractionSpacecraftTransponderMode parameter must not be set to 'regenerative'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RngAndDopplerExtractionSpacecraftTransponderMode ::= SEQUENCE  {  doppler ENUMERATED  {  nonCoherent (0)  , coherent (1)  }    , ranging ENUMERATED  {  passthrough (0)  , regenerative (1)  }    } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionExpectedSpacecraftPnAcqDuration**' (rng-and-doppler-extraction-expected-spacecraft-pn-acq-duration) OID .1.3.112.4.4.2.1.20301.1.18.1 | | **Definition:** This parameter configures and reports the expected duration in seconds of the PN code acquisition by the spacecraft. It shall be set to 'notApplicabe' if the ranging type is 'toneCode' (see the element rngType of the parameter rngXmitRngType of the the RngXmit FR and if the 'ranging' element of the rngAndDopplerExtractionSpacecraftTransponderMode is not set to 'regenerative'. | | **Guard Condition:** None | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  RngAndDopplerExtractionExpectedSpacecraftPnAcqDuration ::= CHOICE  {    -- The currently used ranging method is not regenerative.  notApplicable [0] NULL  ,  -- The engineering unit of this parameter is second.  applicable [1] INTEGER (1 .. 1000)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionRngMeasurementSamplingRate**' (rng-and-doppler-extraction-rng-measurement-sampling-rate) OID .1.3.112.4.4.2.1.20301.1.19.1 | | **Definition:** This parameter configures and reports the ranging measurement sampling rate in 1/1000 seconds. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 second  RngAndDopplerExtractionRngMeasurementSamplingRate ::= INTEGER (1 .. 3600000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionDopplerMeasurementSamplingRate**' (rng-and-doppler-extraction-doppler-measurement-sampling-rate) OID .1.3.112.4.4.2.1.20301.1.20.1 | | **Definition:** This parameter configures and reports the Doppler measurement sampling rate in 1/1000 seconds. | | **Guard Condition:** None | | **Engineering Unit:** 1/1000 s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is 1/1000 second  RngAndDopplerExtractionDopplerMeasurementSamplingRate ::= INTEGER (1 .. 3600000) | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionDataCollection**' (rng-and-doppler-extraction-data-collection) OID .1.3.112.4.4.2.1.20301.1.21.1 | | **Definition:** This parameter configures and reports the status of the collection and delivery of radiometric observables. It can take on three values:  - 'notActive';  - 'auto';  - 'active'.  Setting this parameter to 'notActive' disables or terminates the collection of radiometric data.  When this parameter is 'auto', the time during which the data collection is performed in accordance with the period during which the parameter rngXmitMod of the RngXmit FR is set to 'enabled' shifted by the two-way light time. When the rngXmitMod parameter indicates that ranging calibration is performed, the two-way-light time is disregarded and the delivered range measurements are annotated as calibration data.  When the parameter rngAndDopplerExtractionDataCollection is set to 'active', the collection of radiometric observables is attempted regardless of the state of the RngXmit FR. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RngAndDopplerExtractionDataCollection ::= ENUMERATED  {  notActive (0)  , auto (1)  , active (2)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionObservableAndResidual**' (rng-and-doppler-extraction-observable-and-residual) OID .1.3.112.4.4.2.1.20301.1.22.1 | | **Definition:** This parameter reports the latest Doppler and range measurement and the associated residual, i.e., the measured value minus the predicted value and for range measurements also the differenced range versus integrated Doppler (DRVID) measurement (latest range value minus previously measured range value minus the integrated Doppler for the period between the times when the latest range measurement and the previous range measurement has been taken).  It should be noted that the reported range measurement value is neither corrected for station and spacecraft delays nor for tropospheric effects. The residual therefore is not correct in absolute terms, but it should be small and stable and therefore is a good indication of the quality of the range measurements.  DRIVD can only be provided if range and Doppler measuremnts are taken at the same times. | | **Engineering Unit:** Hz / Hz/km / 1/100 m / 1/100 m | | **Configured:** false | | **Type Definition:**  RngAndDopplerExtractionObservableAndResidual ::= SEQUENCE  {  doppler SEQUENCE  {    -- The engineering unit of this element is Hz.  dopplerShift INTEGER (-1000000 .. 1000000)  ,  -- The engineering unit of this element is Hz.  dopplerShiftResidual INTEGER (-100000 .. 100000)  }    , range SEQUENCE  {    -- The engineering unit of this parameter is km  rangeValue INTEGER (0 .. 5000000000)  ,  -- The engineering unit of this element is 1/100 m.  rangeValueResidual INTEGER (-100000000 .. 100000000)  ,  -- Differenced Range versus Integrated Doppler (DRVID) measurement in 1/100 m.  drvid INTEGER (-100000000 .. 100000000)  }    } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) parameter '**rngAndDopplerExtractionObservablesCount**' (rng-and-doppler-extraction-observables-count) OID .1.3.112.4.4.2.1.20301.1.23.1 | | **Definition:** This parameter reports the number of Doppler and range observables generated since the most recently automatically started data collection (rngAndDopplerExtractionDataCollection = 'auto' or the most recent start of the collection of observables by setting the parameter rngAndDopplerExtractionDataCollection to 'active'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RngAndDopplerExtractionObservablesCount ::= SEQUENCE  {  dopplerObservablesCount INTEGER (0 .. 4294967295)  , rangeObservablesCount INTEGER (0 .. 4294967295)  } | |  |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) event '**rngAndDopplerExtractionResourceStatChange**' (rng-and-doppler-extraction-resource-stat-change) OID .1.3.112.4.4.2.1.20301.2.1.1 | | **Definition:** This event notifies any change of the rngAndDopplerExtractionResourceStat parameter value. | | |  | | --- | | [**rngAndDopplerExtractionResourceStatChange**](#id0x79ba00) value '**rngAndDopplerExtractionResourceStatChangeEvtValue**' (rng-and-doppler-extraction-resource-status-change-evt-value) | | **Definition:** The event value reports the rngAndDopplerExtractionResourceStat parameter value that applies since the notified rngAndDopplerExtractionResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  RngAndDopplerExtractionResourceStatChangeEvtValue ::= RngAndDopplerExtractionResourceStat | |  | |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) event '**rngAndDopplerExtractionStatChange**' (rng-and-doppler-extraction-stat-change) OID .1.3.112.4.4.2.1.20301.2.2.1 | | **Definition:** By means of this event any change in the capability to deliver radiometric observables is notified. This is reported both for Doppler and for range measurements. The reporting for range measurements refers to the ranging mode selected by the rngXmitRngType parameter of the RngXmit FR. | | |  | | --- | | [**rngAndDopplerExtractionStatChange**](#id0x79e580) value '**rngAndDopplerExtractionStatChangeEvtValue**' (range-and-doppler-extraction-stat-change-evt-value.) | | **Definition:** This parameter reports if radiometric observables can be delivered. Data collection may not be possible because e.g. the receiver is not locked on the carrier or for range measurements the ambiguity resolution has failed. | | **Engineering Unit:** N/A | | **Type Definition:**  RngAndDopplerExtractionStatChangeEvtValue ::= SEQUENCE  {  dopplerDataCollection ENUMERATED  {  notOkay (0)  , okay (1)  }    , rngDataCollection ENUMERATED  {  notOkay (0)  , okay (1)  }    } | |  | |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) event '**rngAndDopplerExtractionOperatorNotify**' (rng-and-doppler-extraction-operator-notify) OID .1.3.112.4.4.2.1.20301.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**rngAndDopplerExtractionOperatorNotify**](#id0x7a1c00) value '**rngAndDopplerExtractionOperatorNotifyMessage**' (rng-and-doppler-extraction-operator-notify-message) | | **Definition:** The messages passed by means of the rngAndDopplerExtractionOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  RngAndDopplerExtractionOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**RngAndDopplerExtraction**](#id0x75b080) directive '**rngAndDopplerExtractionSetContrParams**' (rng-and-doppler-extraction-set-contr-params) OID .1.3.112.4.4.2.1.20301.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the RngAndDopplerExtraction FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**rngAndDopplerExtractionSetContrParams**](#id0x7a4780) qualifier '**rngAndDopplerExtractionContrParamIdsAndValuesDirQual**' (rng-and-doppler-extraction- contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the RngAndDopplerExtraction FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  RngAndDopplerExtractionContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'TcPlopSyncAndChnlEncode' [(back to top)](#toc)

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| FR Stratum: 'Synchronization and Channel Coding' FR Set: 'TC Synchronization and Channel Encoding' |
| **Definition:** The TcPlopSyncAndChannelEncoding FR accepts as input one of the following: - CLTUs; - TC frames to be radiated via a specific physical channel. It also accepts the CLCWs extracted from the telemetry link associated with the telecommand link used by this FR. This FR provides the symbol stream to be used for modulating the transmitted carrier of the physical channel associated with this FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .30100   |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncResourceStat**' (tc-plop-sync-resource-stat) OID .1.3.112.4.4.2.1.30100.1.1.1 | | **Definition:** This enumerated parameter reports the TcPlopSyncAndChnlEncode FR resource status and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TcPlopSyncResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncInputDataFormat**' (tc-plop-sync-input-data-format) OID .1.3.112.4.4.2.1.30100.1.2.1 | | **Definition:** This parameter configures and reports the input data format (frames or CLTUs) and depending on the applicable input data format the related configuration.  In case frames are input to this FR, the maximum CLTU length is indirectly specified. It is determined by the maximum length of the incoming frames and the maximum number of frames per CLTU (see element maxNumberOfFramesPerCltu of this parameter). | | **Guard Condition:** None | | **Engineering Unit:** depends on the element | | **Configured:** true | | **Type Definition:**  TcPlopSyncInputDataFormat ::= CHOICE  {    -- The FR is configured to handle TC Frames as input.  frame [0] SEQUENCE  {    -- Either more than one frame per CLTU or repeated transmission of a CLTU is possible,  -- but never both.  maxCltuRepetitionsMaxFramesPerCltu CHOICE  {    -- If more than one frame per Cltu is permitted, the CLTU may be transmitted only once.  maxNumberOfFramesPerCltu [0] INTEGER (1 .. 15)  ,  -- In this case only one frame per CLTU is permitted. The parameter specifies how many  -- times the CLTU may be transmitted.  maxNumberOfCltuRepetitions [1] INTEGER (1 .. 5)  }    , encodeType CHOICE  {  bchEncoding [1] Randomization  , ldpcEncoding [2] SEQUENCE  {  randomizationCodingSequence ENUMERATED  {  randomizationFirst (0)  , codingFirst (0)  }    , ldpcCoding CHOICE  {  code1 [0] SEQUENCE  {  n INTEGER (128)  , k INTEGER (64)  , tailSequence ENUMERATED  {  used (0)  , notUsed (1)  }    }    , code2 [1] SEQUENCE  {  n INTEGER (512)  , k INTEGER (256)  }    }    }    }    }    ,  -- The FR is configured to handle CLTUs as input data.  cltu [1] SEQUENCE  {    -- The engineering unit is octet  maxCltuLength INTEGER (12 .. 4096)  ,  -- This parameter specifies how many times a CLTU may be transmitted at most.  maxCltuRepetion INTEGER (1 .. 5)  }    } | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncPlop**' (tc-plop-sync-plop) OID .1.3.112.4.4.2.1.30100.1.3.1 | | **Definition:** This enumerated parameter configures and reports the Physical Layer Operation Procedure that the TcPlopSyncAndChannelEncode FR applies (PLOP1 or PLOP2). If PLOP1 applies, the parameter also specifies the length of the idle sequence (in octets).  The exact behavior of the FR as determined by the selected PLOP in effect is further described in the F-CLTU specification CCSDS 912.1-B-4. | | **Guard Condition:** None | | **Engineering Unit:** octet / N/A | | **Configured:** true | | **Type Definition:**  TcPlopSyncPlop ::= CHOICE  {    -- The engineering unit of this element is cotet.  plop1IdleSequenceLength [0] INTEGER (0 .. 255)  , plop2 [1] NULL  } | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncAcqAndIdlePattern**' (tc-plop-sync-acq-and-idle-pattern) OID .1.3.112.4.4.2.1.30100.1.4.1 | | **Definition:** This parameter configures and reports the size, in octets, and the bit pattern to be radiated to enable the spacecraft telecommand system to achieve bit lock (acquisition sequence) and the bit pattern to be radiated to maintain bit lock while no command is being radiated (idle pattern). The radiation of the acquisition and idle sequences will be performed in accordance with the applicable Physical Layer Operations Procedure (PLOP). See parameter tcPlopSyncPlop of this FR. | | **Guard Condition:** None | | **Engineering Unit:** N/A / octet / N/A | | **Configured:** true | | **Type Definition:**  TcPlopSyncAcqAndIdlePattern ::= SEQUENCE  {  acquisitionSequence SEQUENCE  {  acquisitionPattern CHOICE  {    -- The pattern specified in CCSDS 232.0-B-3 starting with 0.  ccsds0 [0] OCTET STRING ('55'H) (SIZE( 1))  ,  -- The pattern specified in CCSDS 232.0-B-3 starting with 1.  ccsds1 [1] OCTET STRING ('AA'H) (SIZE( 1))  , nonCcsds [2] OCTET STRING (SIZE( 1))  }    ,  -- The engineering unit of this element is octet  acquisitionSequenceLength INTEGER (1 .. 256)  }    , idlePattern CHOICE  {    -- The pattern specified in CCSDS 232.0-B-3 starting with 0.  ccsds0 [0] OCTET STRING ('55'H) (SIZE( 1))  ,  -- The pattern specified in CCSDS 232.0-B-3 starting with 1.  ccsds1 [1] OCTET STRING ('AA'H) (SIZE( 1))  , nonCcsds [2] OCTET STRING (SIZE( 1))  }    } | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncMinDelayTime**' (tc-plop-sync-min-delay-time) OID .1.3.112.4.4.2.1.30100.1.5.1 | | **Definition:** This parameter configures and reports the minimum time that the FR instance will ensure between the completion of the radiation of one CLTU and the beginning of the radiation of the following CLTU. There are two ways in which this guard time can be specified:  - absolute time ('absoluteGuardTime') in microseconds (the exact effect of the delay time depending on the PLOP is further described in the F-CLTU specification CCSDS 912.1-B-4);  - number of times the post-CLTU pattern (if applicable) and the pre-CLTU pattern shall be repeated ('postPreCltuPatternRepetition') before the next CLTU may be radiated (it should be noted that in this case the length of the guard time varies with the TC symbol rate). | | **Guard Condition:** None | | **Engineering Unit:** 1/1000000 s / N/A | | **Configured:** true | | **Type Definition:**  TcPlopSyncMinDelayTime ::= CHOICE  {    -- The engineering unit of this element is 1/1000000 s (microsecond).  absoluteGuardTime [0] INTEGER (0 .. 1000000)  , postPreCltuPatternRepetition [1] INTEGER (0 .. 10000)  } | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncTcLinkStat**' (tc-plop-sync-tc-link-stat) OID .1.3.112.4.4.2.1.30100.1.6.1 | | **Definition:** This enumerated parameter reports the status of the forward link as it can be derived from the Communication Link Control Word (CLCW) in the associated telemetry stream. It can take on the following values:  - 'fwdLinkStatNotAvailable': no CLCWs from the spacecraft have been received by the service provider;  - 'noRfAvailable': the service provider has received at least one CLCW; in the last CLCW received by the service provider, the bit that flags ‘No RF Available’ was set to ‘1’;  - 'noBitLock': the service provider has received at least one CLCW; in the last CLCW received by the service provider, the bit that flags ‘No RF Available’ was set to ‘0’, and the bit that flags ‘No Bit Lock’ was set to ‘1;  - 'nominal': the provider has received at least one CLCW; in the last CLCW received by the provider, the bit that flags ‘No RF Available’ was set to ‘0’, and the bit that flags ‘No Bit Lock’ was set to ‘0’. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TcPlopSyncTcLinkStat ::= TcLinkStat | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) parameter '**tcPlopSyncClcwEvaluation**' (tc-plop-sync-clcw-evaluation) OID .1.3.112.4.4.2.1.30100.1.7.1 | | **Definition:** This parameter configures and reports the Master or Virtual Channel that carries the CLCW to be used to determine the telecommand link RF and/or bit lock status, if applicable, and if and how the CLCW shall be evaluated for the Carrier Modulation Modes (CMM) transitions of the PLOP. The CLCW source is identified by the concatenation of the CCSDS assigned Spacecraft Identifier (SCID), the Transfer Frame Version Number (TFVN) and, if applicable, the Virtual Channel Identifier (VCID). The range of the Spacecraft Identifier and the Virtual Channel Identifier depends on the TFVN as follows:  - TFVN = binary '00' (version 1) - SCID = (0 .. 1023), VCID = (0 .. 7);  - TFVN = binary '01' (version 2) - SCID = (0 .. 255), VCID = (0 .. 63);  - TFVN = binary '1100' (version 4) - SCID = (0 .. 65535), VCID = (0 .. 63). | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcPlopSyncClcwEvaluation ::= CHOICE  {  noEvaluation [0] NULL  , evaluation [1] SEQUENCE  {  linkCondition ENUMERATED  {  noEvaluationToBePerformed (0)  , rfAvailableToBeVerified (1)  , bitLockToBeVerified (2)  , rfAvailableAndBitLockToBeVerified (3)  }    , clcwSource CHOICE  {    -- This choice is for CLCW extraction from telemetry (TM) frames.  tfvn0 [0] SEQUENCE  {  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 7)  }    }    ,  -- This choice is for CLCW extraction from AOS frames.  tfvn1 [1] SEQUENCE  {  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  , vcid CHOICE  {  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    ,  -- This choice is for CLCW extraction from USLP frames.  tfvn4 [2] SEQUENCE  {  tfvn BIT STRING ('1100'B)  , scid INTEGER (0 .. 65535)  , vcid CHOICE  {  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    }    }    } | |  |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) event '**tcPlopSyncResourceStatChange**' (tc-plop-sync-resource-stat-change) OID .1.3.112.4.4.2.1.30100.2.1.1 | | **Definition:** This event notifies any change of the tcPlopSyncResourceStat parameter value. | | |  | | --- | | [**tcPlopSyncResourceStatChange**](#id0x7c9500) value '**tcPlopSyncResourceStatChangeEvtValue**' (tc-plop-sync-resource-stat-change-evt-value) | | **Definition:** The event value reports the tcPlopSyncResourceStat parameter value that applies since the notified tcPlopSyncResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TcPlopSyncResourceStatChangeEvtValue ::= TcPlopSyncResourceStat | |  | |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) event '**tcPlopSyncTcLinkStatChange**' (tc-plop-sync-tc-link-stat-change) OID .1.3.112.4.4.2.1.30100.2.2.1 | | **Definition:** This event notifies any change of the tcPlopSyncTcLinkStat parameter. | | |  | | --- | | [**tcPlopSyncTcLinkStatChange**](#id0x7cc080) value '**tcPlopSyncTcLinkStatChangeEvtValue**' (tc-plop-sync-tc-link-stat-change-evt-value) | | **Definition:** The event value reports the tcPlopSyncTcLinkStat value that applies since the notified tcPlopSyncTcLinkStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TcPlopSyncTcLinkStatChangeEvtValue ::= TcPlopSyncTcLinkStat | |  | |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) event '**tcPlopSyncDataUnitProcessingCompleted**' (tc-plop-sync-data-unit-processing-completed) OID .1.3.112.4.4.2.1.30100.2.3.1 | | **Definition:** This event notifies that processing of the given data unit is completed. The data unit is identified by its data-unit-id and the service-instance-id of the service that submitted the data unit for processing. | | |  | | --- | | [**tcPlopSyncDataUnitProcessingCompleted**](#id0x7cec00) value '**tcPlopSyncDataUnitProcessingCompletedEvtValue**' (tc plop-sync-data-unit-processing-completed-evt-value) | | **Definition:** The event value identifies the data unit that completed processing by reporting the data-unit-id of the data unit and the id of the service instance that submitted the data unit for processing. Note that the data unit may either be a frame or a CLTU. | | **Engineering Unit:** N/A | | **Type Definition:**  TcPlopSyncDataUnitProcessingCompletedEvtValue ::= SEQUENCE  {  dataUnitId INTEGER (0 .. 4294967295)  , serviceInstanceIdentifier CHOICE  {  sleServiceInstance [0] SleSvcInstanceId  , cstsServiceInstance [1] CstsSvcInstanceId  }    } | |  | |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) event '**tcPlopSyncOperatorNotify**' (tc-plop-sync-operator-notify) OID .1.3.112.4.4.2.1.30100.2.4.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tcPlopSyncOperatorNotify**](#id0x7d6480) value '**tcPlopSyncOperatorNotifyMessage**' (tc-plop-sync-operator-notify-message) | | **Definition:** The messages passed by means of the tcPlopSyncOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TcPlopSyncOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) directive '**tcPlopSyncSetContrParams**' (tc-plop-sync-set-contr-params) OID .1.3.112.4.4.2.1.30100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TcPlopSyncAndChnlEncode FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tcPlopSyncSetContrParams**](#id0x7d9080) qualifier '**tcPlopSyncContrParamIdsAndValuesDirQual**' (tc-plop-sync-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TcPlopSyncAndChnlEncode FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  TcPlopSyncContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**TcPlopSyncAndChnlEncode**](#id0x7a7a00) directive '**tcPlopSyncDiscardDataUnits**' (tc-plop-sync-discard-data-units) OID .1.3.112.4.4.2.1.30100.3.2.1 | | **Definition:** When the FR receives this directive, it discards all data units that are associated with the service-instance-id specified in the directive qualifier. | | **Guard Condition:** None | | |  | | --- | | [**tcPlopSyncDiscardDataUnits**](#id0x7dbc00) qualifier '**tcPlopSyncFrAndServiceInstanceIdDirQual**' (tc-plop-sync-fr-and-service-instance-id-dir-qual) | | **Definition:** The qualifier of this directive specifies the service-instance-id of the SLE Transfer Service instance or the CSTS instance for which the data units are to discarded when the tcMcMuxDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  TcPlopSyncFrAndServiceInstanceIdDirQual ::= CHOICE  {  sleServiceInstanceId [0] SleSvcInstanceId  , cstsServiceInstanceId [1] CstsSvcInstanceId  } | |  | | |

# Functional Resource 'FlfSyncChnlEncodeAndOidGen' [(back to top)](#toc)

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| FR Stratum: 'Synchronization and Channel Coding' FR Set: 'Fixed Length Frame Synchronization, Channel Encoding, and OID Generation' |
| **Definition:** This FR can be configured to accept one of the following input types: - CADUs to be radiated via a specific physical channel; - fixed-length frames (including, but not necessarily limited to, AOS and USLP) to be radated via a specific physical channel. This FR provides the symbol stream to be used for modulating the forward carrier of the physical channel associated with this FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .30200   |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) parameter '**flfSyncEncResourceStat**' (flf-sync-enc-resource-stat) OID .1.3.112.4.4.2.1.30200.1.1.1 | | **Definition:** This enumerated parameter reports the FlfSyncChnlEncodeAndOidGen FR resource status and can take on four values:  - 'configured': the associated equipment has been configured;  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncEncResourceStat ::= ResourceStat | |  |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) parameter '**flfSyncEncSlpduLength**' (flf-sync-enc-slpdu-length ) OID .1.3.112.4.4.2.1.30200.1.2.1 | | **Definition:** This parameter configures and reports the length in octets of the fixed-length SL-PDUs (transfer frames or CADUs) that are input to the FR. | | **Guard Condition:** None | | **Engineering Unit:** octet | | **Configured:** true | | **Type Definition:**  FlfSyncEncSlpduLength ::= INTEGER (6 .. 4294967295) | |  |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) parameter '**flfSyncEncCodingSelection**' (flf-sync-enc-coding-selection) OID .1.3.112.4.4.2.1.30200.1.3.1 | | **Definition:** This parameter configures and reports the selected coding scheme and related configuration parameter values. The ASM is attached for all choices except 'cadu', where it is disallowed. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfSyncEncCodingSelection ::= CHOICE  {    -- optional randomization, ASM attachment, optional convolutional encoding only  encodingBypass [0] SEQUENCE  {  randomization Randomization  , convolutionalEncoding ConvolutionalEncoding  }    , reedSolomon [1] SEQUENCE  {  randomization Randomization  , convolutionalEncoding ConvolutionalEncoding  , errorCorrectionCapability ENUMERATED  {  eight (0)  , sixteen (1)  }    , interleavingDepth RsInterleavingDepth  }    ,  -- ASM is applied, convolutional encoding is disallowed for the LDPC Frame coding choice.  ldpcFrame [2] SEQUENCE  {  randomization Randomization  , ldpcCodeRateAndInfoBlockLength LdpcCodeRateAndInfoBlockLength  }    ,  -- randomization is required and convolutional coding is disabled for LDPC slicing  ldpcSlice [3] SEQUENCE  {  ldpcCodeRateAndInfoBlockLength LdpcCodeRateAndInfoBlockLength  , ldpcCodeblockSize INTEGER (1 .. 8)  }    ,  -- Only optional convolutional encoding is available for the CADU option  cadu [4] ConvolutionalEncoding  } | |  |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) parameter '**flfSyncEncOidDataUnit**' (flf-sync-enc-oid-data-unit) OID .1.3.112.4.4.2.1.30200.1.4.1 | | **Definition:** This parameter configures and reports the OID data unit that is to be injected into the data stream as necessary to keep the flow continuous and contiguous when no user-supplied data unit is available.  The OID data unit must be of the same length (see flfSyncEncSlpduLength) and format as the SLPDUs being input to the FR. It defines the fixed transfer frame header, the mission-specific OID frame data field content and, if applicable, the frame trailer. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- Pattern of the fixed OID Data Unit  FlfSyncEncOidDataUnit ::= OCTET STRING | |  |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) event '**flfSyncEncResourceStatChange**' (flf-sync-enc-resource-stat-change) OID .1.3.112.4.4.2.1.30200.2.1.1 | | **Definition:** This event notifies any change of the flfSyncEncResourceStat parameter value. | | |  | | --- | | [**flfSyncEncResourceStatChange**](#id0x7ed800) value '**flfSyncEncResourceStatChangeEvtValue**' (flf-sync-enc-resource-stat-change-evt-value) | | **Definition:** The event value reports the flfSyncEncResourceStat parameter value that applies since the notified flfSyncEncResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncEncResourceStatChangeEvtValue ::= FlfSyncEncResourceStat | |  | |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) event '**flfSyncEncDataUnitProcessingCompleted**' (flf-sync-enc-data-unit-processing-completed) OID .1.3.112.4.4.2.1.30200.2.2.1 | | **Definition:** This event notifies the completion of processing of a data unit. This event is emitted only for data units that are transferred through an instance of a Cross Support Transfer Service (CSTS) that uses the CSTS Specification Framework Data Processing procedure or a procedure derived from it. Each data unit received from such a CSTS is annotated with the service-instance-id of the source CSTS instance and the data-unit-id of the PROCESS-DATA invocation that carries that data unit. | | |  | | --- | | [**flfSyncEncDataUnitProcessingCompleted**](#id0x7f0380) value '**flfSyncEncDataUnitProcessingCompletedEvtValue**' (flf-sync-enc-data-unit-processing-completed-evt-value) | | **Definition:** This parameter contains the data-unit-id of the data unit that has completed processing, and the service-instance-identifier of the CSTS instance through which the data unit was received. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncEncDataUnitProcessingCompletedEvtValue ::= DataUnitProcessingCompletedEventValue | |  | |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) event '**flfSyncEncOperatorNotify**' (flf-sync-enc-operator-notify) OID .1.3.112.4.4.2.1.30200.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**flfSyncEncOperatorNotify**](#id0x7f2f00) value '**flfSyncEncOperatorNotifyMessage**' (flf-sysnc-enc-operator-notify-message) | | **Definition:** The messages passed by means of the flfSyncEncOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncEncOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) directive '**flfSyncEncSetContrParams**' (flf-sync-enc-set-contr-params) OID .1.3.112.4.4.2.1.30200.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the flfSyncChnlEncodeAndOidGen FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**flfSyncEncSetContrParams**](#id0x7f5b00) qualifier '**flfSyncEncContrParamIdsAndValuesDirQual**' (flf-sync-enc-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the flfSyncChnlEncodeAndOidGen FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  FlfSyncEncContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**FlfSyncChnlEncodeAndOidGen**](#id0x7df280) directive '**flfSyncEncDiscardDataUnits**' (flf-sync-enc-discard-data-units) OID .1.3.112.4.4.2.1.30200.3.2.1 | | **Definition:** Upon receipt of this directive, the FlfSyncChnlEncodeAndOidGen FR discards all data units that are accompanied by the service-instance-id that is identified in the directive qualifier.  The qualifier of this directive event is the service-instance-id of the CSTS for which the data units are to be discarded.  This directive is applicable only for data units that are annotated with the service-instance-id of the CSTS instance that provided those data units. | | **Guard Condition:** None | | |  | | --- | | [**flfSyncEncDiscardDataUnits**](#id0x7f8680) qualifier '**flfSyncEncDiscardDataUnitsSvcInstanceIdDirQual**' (flf-sync-enc-discard-data-units-svc-instance-id-dir-qual) | | **Definition:** The service-instance-id of the CSTS for which the data units are to discarded when the flfSyncEncDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncEncDiscardDataUnitsSvcInstanceIdDirQual ::= CstsSvcInstanceId | |  | | |

# Functional Resource 'FlfSyncAndChnlDecode' [(back to top)](#toc)

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| FR Stratum: 'Synchronization and Channel Coding' FR Set: 'Fixed-Length Frame (FLF) Synchronization and Channel Decoding' |
| **Definition:** The FlfSyncAndChnlDecode FR accepts as input the symbol stream from the Ccsds401SpaceLinkCarrierRcpt FR. It provides the decoded and annotated telemetry frames to the RafTsProvider, the RcfTsProvider, the RocfTsProvider, to the McDemuxReception and to the TmFrameDataSink FRs. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .30300   |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecResourceStat**' (flf-sync-dec-resource-stat) OID .1.3.112.4.4.2.1.30300.1.1.1 | | **Definition:** This enumerated parameter reports the fixed length frame synchronization and decoding resource status and can take on four values:  - 'configured': the synchronization and decoding equipment has been configured, but no incoming symbol stream is present;  - 'operational': the telemetry reception is active, i.e., all syncronization and decoding is in nominal condition;  - 'interrupted': a failure has been detected, e.g. the incoming data cannot be decoded;  - 'halted': the telemetry reception has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecResourceStat ::= ResourceStat | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecAsmConfig**' (flf-sync-dec-asm-config) OID .1.3.112.4.4.2.1.30300.1.2.1 | | **Definition:** This parameter configures and reports the ASM pattern, the frame synchronizer behavior in terms of the correlation error threshold for declaring 'ASM lock' and for declaring 'ASM out of lock', the number of consecutive frames with 'ASM lock' required to transition from 'notLocked' to 'verify', the number of consecutive frames with 'ASM lock' required to transition from 'verify' to 'locked' and the number of consecutive frames with 'ASM out of lock' required to transition from 'locked' to 'notLocked' and the to be tolerated ASM position error in number of symbols (i.e. unexpected frame length) for not triggering the transition to 'notLocked'. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfSyncDecAsmConfig ::= SEQUENCE  {  asmPattern CHOICE  {  ccsdsPattern [0] NULL  ,  -- The length of the ASM pattern is indirectly specified by the length of the octet  -- string.  nonCcsdsPattern [1] OCTET STRING  }    , asmThresholds SEQUENCE  {  asmCorrelationLockThreshold INTEGER (0 .. 191)  , asmCorrelationOutOfLockThreshold INTEGER (1 .. 192)  , verifyThreshold INTEGER (1 .. 15)  , lockedThreshold INTEGER (1 .. 15)  , notLockedThreshold INTEGER (1 .. 15)  ,  -- in number of symbols  frameLengthErrorThreshold INTEGER (-10 .. 10)  }    } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecAsmCorrelationError**' (flf-sync-dec-asm-correlation-error) OID .1.3.112.4.4.2.1.30300.1.3.1 | | **Definition:** This parameter reports the number of symbols in the most recently received ASM that differ from the nominal ASM pattern. When comparing these numbers, one needs to take into consideration whether the synchronization is done on the (pre Viterbi decoder) symbol stream or on the (post Viterbi decoder) bit stream which may be the case if flfSyncDecDecode is either 'convolutional' or 'concatenated'.  The frame synchronization is also used to remove the phase ambiguity of some modulation schemes. To that end, the correlation process is performed both for the standard ASM pattern and its inversion.  A given implementation will specify if the the synchronization is performed in the symbol or bit domain. This shall be recorded in the Service Agreement. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecAsmCorrelationError ::= INTEGER (0 .. 192) | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecFrameSyncLockStat**' (flf-sync-dec-frame-sync-lock-stat) OID .1.3.112.4.4.2.1.30300.1.4.1 | | **Definition:** This enumerated parameter reports the frame synchronizer lock status. It can take on the following values:  - 'notLocked': the frame synchronizer has just started looking for ASMs or has been in the 'locked' or 'verify' status and the specified number of frames has been processed without finding an ASM with correlation and position error limit below the acceptable limit specified in flfSyncDecAsmConfig;  - 'locked': The synchronizer has been in the 'verify' status and then has found the specified number of Attached Sync Markers required for the transition to 'locked' with the expected number of symbols or bits between them and with each ASM having a correlation error that is lower than the configured error limit (see flfSyncDecAsmConfig);  - 'verify': the frame synchronizer is 'notLocked' and has found one ASM in the symbol or bit stream with the correlation error lower than the configured threshold; it is looking for further ASMs at the expected number of symbols or bits after the previous ASM; if the number specified in flfSyncDecAsmConfig of such ASMs is found, the lock status changes to 'verify'; if such ASMs are not found where expected, the lock status remains 'not locked'; if an ASM is found, but at a larger distance in terms of symbols or bits than expected, that newly found ASM will be the reference for searching the next verification ASM. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecFrameSyncLockStat ::= ENUMERATED  {  notLocked (0)  , locked (1)  , verify (2)  } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecSymbolInversion**' (flf-sync-dec-symbol-inversion) OID .1.3.112.4.4.2.1.30300.1.5.1 | | **Definition:** This enumerated parameter reports if, based on the observed polarity of the ASM, the symbol stream had to be inverted or not. It can take two values:  - 'yes': the frame synchronizer locked on the inverted ASM pattern and therefore inverts the polarity of the symbol stream;  - 'no': the frame synchronizer locked on the ASM with the pattern in positive logic and therefore does not invert the symbol stream.  As long as flfSyncDecFrameSyncLockStat ≠ 'locked', this parameter shall be flagged as unavailable. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecSymbolInversion ::= ENUMERATED  {  yes (0)  , no (1)  } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecFrameErrorRate**' (flf-sync-dec-frame-error-rate) OID .1.3.112.4.4.2.1.30300.1.6.1 | | **Definition:** The parameter reports the ratio of erred frames to the total number of frames processed for the most recent n frames. The value of n shall be documented in the Service Agreeemnet. If the frames are RS or LDPC encoded, then frames for which the RS or LDPC correction is not possible are considered erred. Frames are also considered erred if the FECF is present and the check of the FECF is negative. In all other cases, i.e., if the frames are neither RS nor LDPC encoded nor do they contain a CCSDS compliant FECF, this parameter shall be flagged as 'undefined'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecFrameErrorRate ::= REAL (0 .. 1) | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecNumberOfRsErrorsCorrected**' (flf-sync-dec-number-of-rs-errors-corrected) OID .1.3.112.4.4.2.1.30300.1.7.1 | | **Definition:** This parameter reports the number of bits in the frame corrected by means of the RS trailer. The number of bits that can be corrected depends on the coding and the interleaving depth. If flfSyncDecDecode is neither 'reedSolomon' nor 'concatenated', this parameter shall be flagged as 'undefined'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecNumberOfRsErrorsCorrected ::= INTEGER (0 .. 128) | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecErtAnnotationLockedToReference**' (flf-sync-dec-ert-annotation-locked-to-reference) OID .1.3.112.4.4.2.1.30300.1.8.1 | | **Definition:** This enumerated parameter reports if the time tags used to annotate the telemetry frames with the Earth Receive Time (ERT) are generated by a time code generator slaved to a high precision reference or if this generator is free running. It can take on two values:  - 'no' - the system generating the time tags is free-running;  - 'yes' - The time tags are generated by a system that is locked to the station's frequency and timing system. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfSyncDecErtAnnotationLockedToReference ::= ENUMERATED  {  no (0)  , yes (1)  } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecCaduLength**' (flf-sync-dec-cadu-length) OID .1.3.112.4.4.2.1.30300.1.9.1 | | **Definition:** This parameter configures and reports the length in octets of the CADU the frame synchronizer shall attempt to lock on. Depending on the implementation, the frame synchronizer may operate on the convolutionally encoded symbol stream or the already convolutionally decoded symbol stream, if convolutional encoding is applied at all. | | **Guard Condition:** None | | **Engineering Unit:** number of symbols | | **Configured:** true | | **Type Definition:**  FlfSyncDecCaduLength ::= INTEGER (48 .. 32768) | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecDerandomization**' (flf-sync-dec-derandomization) OID .1.3.112.4.4.2.1.30300.1.10.1 | | **Definition:** This enumerated parameter configures and reports if the FR is configured to derandomize the incoming frames. This parameter can take on two values:  - 'noDerandomization';  - 'derandomization'.  The details regarding the randomization are specified in CCSDS 131.0-B-3. Randomization is strongly advised, but mandatory only for punctured convolutional codes and for LDPC encoded slices. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfSyncDecDerandomization ::= ENUMERATED  {  noDerandomization (0)  , derandomization (1)  } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecDecode**' (flf-sync-dec-decode) OID .1.3.112.4.4.2.1.30300.1.11.1 | | **Definition:** This parameter configures and reports the decoding the FlfSyncAndDecode FR is configured to apply to the incoming frames. This parameter can take on the following values:  - 'no decoding';  - 'convolutional';  - 'reedSolomon';  - 'concatenated';  - 'turbo';  - 'ldpc';  - 'slicedLdpc'.  For the configured decoding option the parameter also specifies the associated configuration details.  Note: The length and pattern of the ASM is implicitly specified by the decoding that is to be applied except if for parameter flfSyncDecAsmConfig the nonCcsds asmPattern choice is selected. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfSyncDecDecode ::= SEQUENCE  {    -- If applicable, the CCSDS recommendation is NRZ-M.  differentialDecode ENUMERATED  {  notApplicable (0)  , inputIsNrzM (1)  , inputIsNrzS (2)  }    , symbolDecode CHOICE  {  noDecoding [0] NULL  , convolutional [1] ConvolutionalCodeConfiguration  , reedSolomon [2] SEQUENCE  {  rsCorrectionCapabilty ENUMERATED  {  corrects8 (0)  , corrects16 (1)  }    , rsInterleavingDepth RsInterleavingDepth  }    , concatenated [3] SEQUENCE  {  convolutional ConvolutionalCodeConfiguration  , rsCorrectionCapabilty ENUMERATED  {  corrects8 (0)  , corrects16 (1)  }    , rsInterleavingDepth RsInterleavingDepth  }    , turbo [4] SEQUENCE  {  maxNumberOfIterations INTEGER (1 .. 20)  , codeRate ENUMERATED  {  rate1Over2 (0)  , rate1Over3 (1)  , rate1Over4 (2)  , rate1Over6 (3)  }    }    ,  -- The information block length shall be derived from the CADU length (see flfSyncCaduLength)  ldpc [5] ENUMERATED  {  rate1Over2 (0)  , rate2Over3 (1)  , rate4Over5 (2)  , rate223Over255 (3)  }    , slicedLdpc [6] SEQUENCE  {    -- Number of LDPC codewords  codeBlockSize INTEGER (1 | 2 | 3 | 4 | 5 | 6 | 7 | 8)  , codeRateAndSliceLength CHOICE  {  codeRate1Over2 [0] SEQUENCE  {  codeRate LdpcCodeRate (rate1Over2)  , sliceLength INTEGER (1024 | 4096 | 16384)  , csmPattern CHOICE  {  ccsds [0] OCTET STRING ('034776C7272895B0'H)  , nonCCSDS [1] OCTET STRING (SIZE( 4 .. 16))  }    }    , codeRate2Over3 [1] SEQUENCE  {  codeRate LdpcCodeRate (rate2Over3)  , sliceLength INTEGER (1024 | 4096 | 16384)  , csmPattern CHOICE  {  ccsds [0] OCTET STRING ('034776C7272895B0'H)  , nonCCSDS [1] OCTET STRING (SIZE( 4 .. 16))  }    }    , codeRate4Over5 [2] SEQUENCE  {  codeRate LdpcCodeRate (rate4Over5)  , sliceLength INTEGER (1024 | 4096 | 16384)  , csmPattern CHOICE  {  ccsds [0] OCTET STRING ('034776C7272895B0'H)  , nonCCSDS [1] OCTET STRING (SIZE( 4 .. 16))  }    }    , codeRate223Over255 [3] SEQUENCE  {  codeRate LdpcCodeRate (rate223Over255)  , sliceLength INTEGER (7136)  , csmPattern CHOICE  {  ccsds [0] OCTET STRING ('1ACFFC1D'H)  , nonCCSDS [1] OCTET STRING (SIZE( 4 .. 16))  }    }    }    }    }    } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecFecfPresent**' (flf-sync-dec-fecf-present) OID .1.3.112.4.4.2.1.30300.1.12.1 | | **Definition:** This parameter configures and reports if in the frame to be processed the FECF is present. It can take on two values:  - 'no';  - 'yes'. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfSyncDecFecfPresent ::= ENUMERATED  {  no (0)  , yes (1)  } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) parameter '**flfSyncDecDecodeQualityIndications**' (flf-sync-dec-decode-quality-indications) OID .1.3.112.4.4.2.1.30300.1.13.1 | | **Definition:** This parameter provides decoding type specific quality indications regarding the decoding process and an estimates of the bit error rate (BER).  The provided BER estimates are not precise. The ASM pattern derived estimate does not reflect the coding gain (except that related to convolutional coding). The RS decoding derived BER estimate also disregards the RS coding gain, but also disregards the errors associated with not decodable RS code words. However, the number of not decodable RS codewords are reported indirectly by the element ratioBadCodeWordsToTotalCountOfCodeWordsInTheSample. The BER estimates are determined for n consecutive frames where the value of n shall be documented in the Service Agreement. | | **Engineering Unit:** depends on the element | | **Configured:** false | | **Type Definition:**  FlfSyncDecDecodeQualityIndications ::= SEQUENCE  {    -- This count rolls over to zero.  countOfFramesProcessed INTEGER (0 .. 4294967295)  , berEstimates SEQUENCE  {    -- Ratio of erred ASM bits to total count of ASM bits evaluated in n consecutive frames  -- where the value of n shall be documented in the Service Agreement.  asmDerivedBerEstimate REAL (0 .. 1)  ,  -- Ratio of sum of corrected bits in the RS code words to total count of bits in the  -- code words in n consecutive frames where the value of n shall be documented in the  -- Service Agreement. Not decodable code words shall be disregarded.  rsDerivedBerEstimate REAL (0 .. 7E-2)  }    , qualityIndications CHOICE  {  noDecoding [0] CHOICE  {    -- No quality indication possible.  fecfAbsent [0] NULL  ,  -- Ratio of frames with bad FECF to the total count of frames over the most recent n  -- frames. The value of n shall be documented in the Service Agreement.  fecfPresent [1] REAL (0 .. 1)  }    ,  -- The Viterbi decoder does not provide specific quality indications.  convolutional [1] NULL  , reedSolomonOrConcatenated [2] SEQUENCE  {  rsDecoderLockStatus ENUMERATED  {  notLocked (0)  , locked (1)  }    ,  -- This count rolls over to zero.  countOfRsCodeWordsProcessed INTEGER (0 .. 4294967295)  ,  -- This ratio is valid for the most recent n code words processed. The value of n shall  -- be documented in the Service Agreement.  ratioBadCodeWordsToTotalCountOfCodeWordsInTheSample REAL (0 .. 1)  }    , turbo [3] SEQUENCE  {  turboDecoderLockStatus ENUMERATED  {  notLocked (0)  , locked (1)  }    , iterationsCount SEQUENCE  {    -- Value for the most recent n frames. The value of n shall be documented in the Service  -- Agreement.  maxNumberOfIterationsPerFrame INTEGER (1 .. 20)  ,  -- The average number multiplied with 1000. The average shall be calculated for the  -- most recent n frames processed. The value of n shall be documented in the ServiceAgreement.  averageNumberOfIterationsPerFrame INTEGER (1000 .. 20000)  }    ,  -- Ratio valid for the most recent n frames processed. The value of n shall be documented  -- in the Service Agreement.  ratioBadFramesToTotalCountOfFramesInTheSample REAL (0 .. 1)  }    , ldpc [4] SEQUENCE  {  ldpcDecoderLockStatus ENUMERATED  {  notLocked (0)  , locked (1)  }    , iterationsCount SEQUENCE  {    -- Value for the most recent n frames. The value of n shall be documented in the Service  -- Agreement.  maxNumberOfIterationsPerFrame INTEGER (1 .. 2047)  ,  -- The average number multiplied with 1000. The average shall be calculated for the  -- most recent n frames processed. The value of n shall be documented in the ServiceAgreement.  averageNumberOfIterationsPerFrame INTEGER (1000 .. 2047000)  }    ,  -- Ratio valid for the most recent n frames processed. The value of n shall be documented  -- in the Service Agreement.  ratioBadFramesToTotalCountOfFramesInTheSample REAL (0 .. 1)  }    }    } | |  |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) event '**flfSyncDecResourceStatChange**' (flf-sync-dec-resource-stat-change) OID .1.3.112.4.4.2.1.30300.2.1.1 | | **Definition:** This event notifies any change of the flfSyncDecResourceStat parameter value. | | |  | | --- | | [**flfSyncDecResourceStatChange**](#id0x834d80) value '**flfSyncDecResourceStatChangeEvtValue**' (flf-sync-dec-resource-stat-change-evt-value) | | **Definition:** The event value reports the flfSyncDecResourceStat parameter value that applies since the notified flfSyncDecResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncDecResourceStatChangeEvtValue ::= FlfSyncDecResourceStat | |  | |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) event '**flfSyncDecFrameSyncLockStatChange**' (flf-sync-dec-frame-sync-lock-stat-change) OID .1.3.112.4.4.2.1.30300.2.2.1 | | **Definition:** This event notifies any change of flfSyncDecFrameSyncLockStat and the value of flfSyncDecFrameSyncLockStat that applies since the event has occurred. | | |  | | --- | | [**flfSyncDecFrameSyncLockStatChange**](#id0x837980) value '**flfSyncDecFrameSyncLockStatChangeEvtValue**' (flf-sync-dec-frame-sync-lock-stat-change-evt-value) | | **Definition:** The event value reports the flfSyncFrameSyncLockStat value that applies since the notified flfSyncDecFrameSyncLockStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncDecFrameSyncLockStatChangeEvtValue ::= FlfSyncDecFrameSyncLockStat | |  | |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) event '**flfSyncDecOperatorNotify**' (flf-sync-dec-operator-notify) OID .1.3.112.4.4.2.1.30300.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**flfSyncDecOperatorNotify**](#id0x83a500) value '**flfSyncDecOperatorNotifyMessage**' (flf-sysnc-dec-operator-notify-message) | | **Definition:** The messages passed by means of the flfSyncDecOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfSyncDecOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FlfSyncAndChnlDecode**](#id0x7fb780) directive '**flfSyncDecSetContrParams**' (flf-sync-dec-set-contr-params) OID .1.3.112.4.4.2.1.30300.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the FlfSyncAndChnlDecode FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**flfSyncDecSetContrParams**](#id0x83d100) qualifier '**flfSyncDecContrParamIdsAndValuesDirQual**' (flf-sync-dec-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the FlfSyncAndChnlDecode FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  FlfSyncDecContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'TcMcMux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'TC Space Link Protocol Transmission' |
| **Definition:** This FR accepts TC frames without FECF belonging to one Master Channel. It provides all TC frames for one physical channel which optionally contain FECFs. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40100   |  | | --- | | [**TcMcMux**](#id0x840500) parameter '**tcMcMuxResourceStat**' (tc-mc-mux-resource-stat) OID .1.3.112.4.4.2.1.40100.1.1.1 | | **Definition:** This enumerated parameter reports the TcMcMux resource status and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TcMcMuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TcMcMux**](#id0x840500) parameter '**tcMcMuxMaxNumberOfFramesPerCltu**' (tc-mc-mux-max-number-of-frames-per-cltu) OID .1.3.112.4.4.2.1.40100.1.2.1 | | **Definition:** This parameter configures and reports the maximum number of TC MC frames that may be converted to a single CLTU. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcMcMuxMaxNumberOfFramesPerCltu ::= INTEGER (1 .. 15) | |  |  |  | | --- | | [**TcMcMux**](#id0x840500) parameter '**tcMcMuxMaxFrameLength**' (tc-mc-mux-max-frame-length) OID .1.3.112.4.4.2.1.40100.1.3.1 | | **Definition:** This parameter configures and reports the maximum length in octets of a TC MC frame the FR accepts for further processing. The reported length refers to the frame length after insertion of the Frame Error Control Field if applicable. | | **Guard Condition:** None | | **Engineering Unit:** octet | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is octet.  TcMcMuxMaxFrameLength ::= INTEGER (1 .. 1024) | |  |  |  | | --- | | [**TcMcMux**](#id0x840500) parameter '**tcMcMuxContr**' (tc-mc-mux-contr) OID .1.3.112.4.4.2.1.40100.1.4.1 | | **Definition:** This parameter configures and reports how the TC Master Channels are multiplexed onto the physical channel.  In case tcMcMuxContr = ‘fifo’, no further specification applies.  If tcMcMuxContr = 'absolutePriority', then the associated configuration value is a sequence of the SCIDs used on the telecommand link where the first SCID in the sequence has the highest priority, the second has the second-highest priority etc. Consequently the sequence has as many elements as Spacecraft Identifiers are permitted on the given physical channel.  If tcMcMuxContr = 'pollingVector', then the associated sequence consists of up to 3072 elements where each element is a SCID. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcMcMuxContr ::= CHOICE  {  fifo [0] NULL  , absolutePriority [1] SEQUENCE (SIZE( 1 .. 1024)) OF INTEGER (0 .. 1023)  , pollingVector [2] SEQUENCE (SIZE( 1 .. 3072)) OF INTEGER (0 .. 1023)  } | |  |  |  | | --- | | [**TcMcMux**](#id0x840500) parameter '**tcMcMuxPresenceOfFecf**' (tc-mc-mux-presence-of-fecf) OID .1.3.112.4.4.2.1.40100.1.5.1 | | **Definition:** This enumerated parameter configures and reports if the FR inserts the Frame Error Control Field into each frame before passing it to the TcPlopSyncAndChnlEncode FR. This parameter can take on two values:  - 'present';  - 'absent'.  The details regarding the FECF are specified in CCSDS 232.0-B-2. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcMcMuxPresenceOfFecf ::= ENUMERATED  {  present (0)  , absent (1)  } | |  |  |  | | --- | | [**TcMcMux**](#id0x840500) event '**tcMcMuxResourceStatChange**' (tc-mc-mux-resource-stat-change) OID .1.3.112.4.4.2.1.40100.2.1.1 | | **Definition:** This event notifies any change of the tcMcMuxResourceStat parameter value. | | |  | | --- | | [**tcMcMuxResourceStatChange**](#id0x84fc80) value '**tcMcMuxResourceStatChangeEvtValue**' (tc-mc-mux-resource-stat-change-evt-value) | | **Definition:** The event value reports the tcMcMuxResourceStat parameter value that applies since the notified tcMcMuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TcMcMuxResourceStatChangeEvtValue ::= TcMcMuxResourceStat | |  | |  |  | | --- | | [**TcMcMux**](#id0x840500) event '**tcMcMuxOperatorNotify**' (tc-mc-mux-operator-notify) OID .1.3.112.4.4.2.1.40100.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tcMcMuxOperatorNotify**](#id0x852800) value '**tcMcMuxOperatorNotifyMessage**' (tc-mc-mux-operator-notify-message) | | **Definition:** The messages passed by means of the tcMcMuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TcMcMuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TcMcMux**](#id0x840500) directive '**tcMcMuxSetContrParams**' (tc-mc-mux-set-contr-params) OID .1.3.112.4.4.2.1.40100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TcMcMux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tcMcMuxSetContrParams**](#id0x855400) qualifier '**tcMcMuxContrParamIdsAndValuesDirQual**' (tc-mc-mux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TcMcMux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  TcMcMuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**TcMcMux**](#id0x840500) directive '**tcMcMuxDiscardDataUnits**' (tc-mc-mux-discard-data-units) OID .1.3.112.4.4.2.1.40100.3.2.1 | | **Definition:** When receiving this directive, the FR discards all currently buffered data units that have been received through the transfer service instance identified in the directive qualifier. | | **Guard Condition:** None | | |  | | --- | | [**tcMcMuxDiscardDataUnits**](#id0x857f80) qualifier '**tcMcMuxDiscardDataUnitsDirQual**' (tc-mc-mux-discard-data-units-dir-qual) | | **Definition:** The qualifier of this directive specifies the service-instance-id of the SLE Transfer Service instance or the CSTS instance for which the data units are to discarded when the tcMcMuxDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  TcMcMuxDiscardDataUnitsDirQual ::= CHOICE  {  sleServiceInstanceId [0] SleSvcInstanceId  , cstsServiveInstanceId [1] CstsSvcInstanceId  } | |  | | |

# Functional Resource 'TcVcMux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'TC Space Link Protocol Transmission' |
| **Definition:** This FR accepts TC frames not containing FECFs for a specific TC VC as input. It provides the TC frames not containing FECFs for a specific TC Master Channel. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40101   |  | | --- | | [**TcVcMux**](#id0x85b280) parameter '**tcVcMuxResourceStat**' (tc-vc-mux-resource-stat) OID .1.3.112.4.4.2.1.40101.1.1.1 | | **Definition:** This enumerated parameter reports the TcVcMux resource status and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TcVcMuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TcVcMux**](#id0x85b280) parameter '**tcVcMuxMaxFrameLength**' (tc-vc-mux-max-frame-length) OID .1.3.112.4.4.2.1.40101.1.2.1 | | **Definition:** This parameter configures and reports the maximum TC VC frame length in octets that the FR accepts as input for further processing where the specified length shall not take into account the Frame Error Control Field, if present on the physical channel.  Note: The value of the tcVcMaxFrameLength parameter of an instance of this FR must be less than or equal to the parameter tcMcMuxMaxFrameLength of the TcMcMux FR consuming the TC MC frames generated by this TcVcMux FR instance. | | **Guard Condition:** tcVcMaxFrameLength ≤ tcMcMuxMaxFrameLength | | **Engineering Unit:** octet | | **Configured:** true | | **Type Definition:**  TcVcMuxMaxFrameLength ::= INTEGER (1 .. 1024) | |  |  |  | | --- | | [**TcVcMux**](#id0x85b280) parameter '**tcVcMuxAdFrameRepetitions**' (tc-vc-mux-ad-frame-repetitions) OID .1.3.112.4.4.2.1.40101.1.3.1 | | **Definition:** This parameter configures and reports how an AD frame on the given Virtual Channel shall be annotated in terms of number of times it shall be transmitted to the spacecraft. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcVcMuxAdFrameRepetitions ::= SET (SIZE( 1 .. 64)) OF SEQUENCE  {  vcid INTEGER (0 .. 63)  , repetitions INTEGER (1 .. 5)  } | |  |  |  | | --- | | [**TcVcMux**](#id0x85b280) parameter '**tcVcMuxBcFrameRepetitions**' (tc-vc-mux-bc-frame-repetitions) OID .1.3.112.4.4.2.1.40101.1.4.1 | | **Definition:** This parameter configures and reports how a BC frame on the given Virtual Channel shall be annotated in terms of number of times it shall be transmitted to the spacecraft. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcVcMuxBcFrameRepetitions ::= SET (SIZE( 1 .. 64)) OF SEQUENCE  {  vcid INTEGER (0 .. 63)  , repetitions INTEGER (1 .. 5)  } | |  |  |  | | --- | | [**TcVcMux**](#id0x85b280) parameter '**tcVcMuxMc**' (tc-vc-mux-mc) OID .1.3.112.4.4.2.1.40101.1.5.1 | | **Definition:** This parameter configures and reports the Master Channel that is provided by the given FR instance. The Master Channel ID is the concatenation of TFVN and SCID. Given that this FR type handles only TC frames, the TFVN is fixed (version 1, binary '00') and only the SCID is variable. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcVcMuxMc ::= SEQUENCE  {  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  } | |  |  |  | | --- | | [**TcVcMux**](#id0x85b280) parameter '**tcVcMuxContr**' (tc-vc-mux-contr) OID .1.3.112.4.4.2.1.40101.1.6.1 | | **Definition:** This parameter configures and reports how the Virtual Channels are multiplexed into the Master Channel formed by this FR instance.  In case tcVcMuxContr = ‘fifo’, no further specification applies.  If tcVcMuxContr = 'absolutePriority', then the associated configuration value is a sequence of VCIDs used on the given MC where the first VCID in the sequence has the highest priority, the second has the second-highest priority etc. Consequently the sequence has as many elements as VCs are permitted on the given MC.  If tcVcMuxContr = 'pollingVector', then the associated sequence consists of up to 192 elements where each element is a VCID. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TcVcMuxContr ::= CHOICE  {  fifo [0] NULL  , absolutePriority [1] SEQUENCE (SIZE( 1 .. 64)) OF INTEGER (0 .. 63)  , pollingVector [2] SEQUENCE (SIZE( 1 .. 192)) OF INTEGER (0 .. 63)  } | |  |  |  | | --- | | [**TcVcMux**](#id0x85b280) event '**tcVcMuxResourceStatChange**' (tc-vc-mux-resource-stat-change) OID .1.3.112.4.4.2.1.40101.2.1.1 | | **Definition:** This event notifies any change of the tcVcMuxResourceStat parameter value. | | |  | | --- | | [**tcVcMuxResourceStatChange**](#id0x86f100) value '**tcVcMuxResourceStatChangeEvtValue**' (tc-vc-mux-resource-stat-change-evt-value) | | **Definition:** The event value reports the tcVcMuxResourceStat parameter value that applies since the notified tcVcMuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TcVcMuxResourceStatChangeEvtValue ::= TcVcMuxResourceStat | |  | |  |  | | --- | | [**TcVcMux**](#id0x85b280) event '**tcVcMuxOperatorNotify**' (tc-vc-mux-operator-notify) OID .1.3.112.4.4.2.1.40101.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tcVcMuxOperatorNotify**](#id0x871c80) value '**tcVcMuxOperatorNotifyMessage**' (tc-vc-mux-operator-notify-message) | | **Definition:** The messages passed by means of the tcVcMuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TcVcMuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TcVcMux**](#id0x85b280) directive '**tcVcMuxSetContrParams**' (tc-vc-mux-set-contr-params) OID .1.3.112.4.4.2.1.40101.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TcVcMux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tcVcMuxSetContrParams**](#id0x874800) qualifier '**tcVcMuxContrParamIdsAndValuesDirQual**' (tc-vc-mux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TcVcMux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) that shall be set | | **Type Definition:**  TcVcMuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**TcVcMux**](#id0x85b280) directive '**tcVcMuxDiscardDataUnits**' (tc-vc-mux-discard-data-units) OID .1.3.112.4.4.2.1.40101.3.2.1 | | **Definition:** When receiving this directive, the FR discards all data units buffered at that time for the virtual channel multiplexing. | | **Guard Condition:** None | | |  | | --- | | [**tcVcMuxDiscardDataUnits**](#id0x877400) qualifier '**tcVcMuxDiscardDataUnitsDirQual**' (tc-vc-mux-discard-data-units-dir-qual) | | **Definition:** The qualifier of this directive specifies the service-instance-id of the SLE Transfer Service instance or the CSTS instance for which the data units are to discarded when the tcMcMuxDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  TcVcMuxDiscardDataUnitsDirQual ::= CHOICE  {  sleServiceInstanceId [0] SleSvcInstanceId  , cstsServiceInstanceId [1] CstsSvcInstanceId  } | |  | | |

# Functional Resource 'AosMcMux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'AOS Space Link Protocol Transmission' |
| **Definition:** This FR accepts AOS frames without FECF belonging to one Master Channel. It provides all AOS frames for one physical channel which optionally contain FECFs. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40200   |  | | --- | | [**AosMcMux**](#id0x87a900) parameter '**aosMcMuxResourceStat**' (aos-mc-mux-resource-stat) OID .1.3.112.4.4.2.1.40200.1.1.1 | | **Definition:** This enumerated parameter reports the AosMcMux FR resource status and can take on four values:  - 'configured': the associated equipment has been configured  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  AosMcMuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**AosMcMux**](#id0x87a900) parameter '**aosMcMuxContr**' (aos-mc-mux-contr) OID .1.3.112.4.4.2.1.40200.1.2.1 | | **Definition:** This parameter configures and reports how the AOS Master Channels are multiplexed onto the physical channel.  - If aosMcMuxContr = ‘fifo’, no further specification applies.  - If aosMcMuxContr = 'absolutePriority', then the associated configuration value is a sequence of the SCIDs used on the transmission link where the first SCID in the sequence has the highest priority, the second has the second-highest priority etc. Consequently the sequence has as many elements as Spacecraft Identifiers are permitted on the given physical channel.  - If aosMcMuxContr = 'pollingVector', then the associated sequence consists of up to 768 elements where each element is a SCID. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AosMcMuxContr ::= CHOICE  {  fifo [0] NULL  , absolutePriority [1] SEQUENCE (SIZE( 1 .. 256)) OF INTEGER (0 .. 255)  , pollingVector [2] SEQUENCE (SIZE( 1 .. 768)) OF INTEGER (0 .. 255)  } | |  |  |  | | --- | | [**AosMcMux**](#id0x87a900) parameter '**aosMcMuxPresenceOfFecf**' (aos-mc-mux-presence-of-fecf) OID .1.3.112.4.4.2.1.40200.1.3.1 | | **Definition:** This enumerated parameter configures and reports if the FR inserts the Header Error Control Field into each AOS frame. This parameter can take on two values:  - 'present';  - 'absent'. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AosMcMuxPresenceOfFecf ::= ENUMERATED  {  present (0)  , absent (1)  } | |  |  |  | | --- | | [**AosMcMux**](#id0x87a900) event '**aosMcMuxResourceStatChange**' (aos-mc-mux-resource-stat-change) OID .1.3.112.4.4.2.1.40200.2.1.1 | | **Definition:** This event notifies any change of the aosMcMuxResourceStat parameter value. | | |  | | --- | | [**aosMcMuxResourceStatChange**](#id0x884900) value '**aosMcMuxResourceStatEvtValue**' (aos-mc-mux-resource-stat-evt-value) | | **Definition:** The event value reports the aosMcMuxResourceStat parameter value that applies since the notified aosMcMuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  AosMcMuxResourceStatEvtValue ::= AosMcMuxResourceStat | |  | |  |  | | --- | | [**AosMcMux**](#id0x87a900) event '**aosMcMuxOperatorNotify**' (aos-mc-mux-operator-notify) OID .1.3.112.4.4.2.1.40200.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**aosMcMuxOperatorNotify**](#id0x887500) value '**aosMcMuxOperatorNotifyMessage**' (aos-mc-mux-operator-notify-message) | | **Definition:** The messages passed by means of the aosMcMuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  AosMcMuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**AosMcMux**](#id0x87a900) directive '**aosMcMuxSetContrParams**' (aos-mc-mux-set-contr-params) OID .1.3.112.4.4.2.1.40200.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the AosMcMux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**aosMcMuxSetContrParams**](#id0x88a080) qualifier '**aosMcMuxContrParamIdsAndValuesDirQual**' (aos-mc-mux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the AosMcMux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  AosMcMuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**AosMcMux**](#id0x87a900) directive '**aosMcMuxDiscardDataUnits**' (aos-mc-mux-discard-data-units) OID .1.3.112.4.4.2.1.40200.3.2.1 | | **Definition:** When receiving this directive, the FR discards all currently buffered data units that have been received through the transfer service instance identified in the directive qualifier. | | |  | | --- | | [**aosMcMuxDiscardDataUnits**](#id0x88cc00) qualifier '**aosMcMuxDiscardDataUnitsDirQual**' (aos-mc-mux-discard-data-units-dir-qual) OID | | **Definition:** The qualifier specifies the service-instance-id of the CSTS for which the data units are to discarded when the aosMcMuxDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  AosMcMuxDiscardDataUnitsDirQual ::= CstsSvcInstanceId | |  | | |

# Functional Resource 'AosVcMux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'AOS Space Link Protocol Transmission' |
| **Definition:** This FR accepts AOS frames not containing FECFs for a specific AOS VC as input. It provides the AOS frames not containing FECFs for a specific AOS Master Channel. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40201   |  | | --- | | [**AosVcMux**](#id0x88fc00) parameter '**aosVcMuxResourceStat**' (aos-vc-mux-resource-stat) OID .1.3.112.4.4.2.1.40201.1.1.1 | | **Definition:** This enumerated parameter reports the AosVcMux FR resource status and can take on four values:  - 'configured': the associated equipment has been configured  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  AosVcMuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**AosVcMux**](#id0x88fc00) parameter '**aosVcMuxMc**' (aos-vc-mux-mc) OID .1.3.112.4.4.2.1.40201.1.2.1 | | **Definition:** This parameter configures and reports the Master Channel that is provided by the given FR instance. The Master Channel ID is the concatenation of TFVN and SCID. Given that this FR type handles only AOS frames, the TFVN is fixed and only the SCID is variable. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AosVcMuxMc ::= SEQUENCE  {    -- AOS frames have the TFVN 2 which is encoded as binary '01'.  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  } | |  |  |  | | --- | | [**AosVcMux**](#id0x88fc00) parameter '**aosVcMuxContr**' (aos-vc-mux-contr) OID .1.3.112.4.4.2.1.40201.1.3.1 | | **Definition:** This parameter configures and reports how the Virtual Channels are multiplexed into the Master Channel formed by this FR instance.  - If aosVcMuxContr = ‘fifo’, no further specification applies.  - If aosVcMuxContr = 'absolutePriority', then the associated configuration value is a sequence of VCIDs used on the given MC where the first VCID in the sequence has the highest priority, the second has the second-highest priority etc. Consequently the sequence has as many elements as VCs are permitted on the given MC.  - If aosVcMuxContr = 'pollingVector', then the associated sequence consists of up to 192 elements where each element is a VCID. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  AosVcMuxContr ::= CHOICE  {  fifo [0] NULL  , absolutePriority [1] SEQUENCE (SIZE( 1 .. 64)) OF INTEGER (0 .. 63)  , pollingVector [2] SEQUENCE (SIZE( 1 .. 192)) OF INTEGER (0 .. 63)  } | |  |  |  | | --- | | [**AosVcMux**](#id0x88fc00) event '**aosVcMuxResourceStatChange**' (aos-vc-mux-resource-stat-change) OID .1.3.112.4.4.2.1.40201.2.1.1 | | **Definition:** This event notifies any change of the aosVcMuxResourceStat parameter value. | | |  | | --- | | [**aosVcMuxResourceStatChange**](#id0x89a400) value '**aosVcMuxResourceStatEvtValue**' (aos-vc-mux-resource-stat-evt-value) | | **Definition:** The event value reports the aosVcMuxResourceStat parameter value that applies since the notified aosVcMuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  AosVcMuxResourceStatEvtValue ::= AosVcMuxResourceStat | |  | |  |  | | --- | | [**AosVcMux**](#id0x88fc00) event '**aosVcMuxOperatorNotify**' (aos-vc-mux-operator-notify) OID .1.3.112.4.4.2.1.40201.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**aosVcMuxOperatorNotify**](#id0x89cf80) value '**aosVcMuxOperatorNotifyMessage**' (aos-vc-mux-operator-notify-message) | | **Definition:** The messages passed by means of the aosVcMuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  AosVcMuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**AosVcMux**](#id0x88fc00) directive '**aosVcMuxSetContrParams**' (aos-vc-mux-set-contr-params) OID .1.3.112.4.4.2.1.40201.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the AosVcMux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**aosVcMuxSetContrParams**](#id0x89fb80) qualifier '**aosVcMuxContrParamIdsAndValuesDirQual**' (aos-vc-mux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the AosVcMux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Type Definition:**  AosVcMuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**AosVcMux**](#id0x88fc00) directive '**aosVcMuxDiscardDataUnits**' (aos-vc-mux-discard-data-units) OID .1.3.112.4.4.2.1.40201.3.2.1 | | **Definition:** When receiving this directive, the FR discards all currently buffered data units that have been received through the transfer service instance identified in the directive qualifier. | | |  | | --- | | [**aosVcMuxDiscardDataUnits**](#id0x8a2700) qualifier '**aosVcMuxDiscardDataUnitsSvcInstanceIdDirQual**' (aos-vc-mux-discard-data-units-svc-instance-id-dir-qual) OID | | **Definition:** The qualifier specifies the service-instance-id of the CSTS for which the data units are to discarded when the aosVcMuxDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  AosVcMuxDiscardDataUnitsSvcInstanceIdDirQual ::= CstsSvcInstanceId | |  | | |

# Functional Resource 'FlfUslpMcMux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'Fixed Length Frame (FLF) Unified Space Link Protocol Transmission' |
| **Definition:** This FR accepts fixed-length USLP frames without FECF belonging to one Master Channel. It provides all fixed-length USLP frames for one physical channel which optionally contain FECFs. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40400   |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) parameter '**flfUslpMcMuxResourceStat**' (flf-uslp-mc-mux-resource-stat) OID .1.3.112.4.4.2.1.40400.1.1.1 | | **Definition:** This enumerated parameter reports the FlfUslpMcMux FR resource status and can take on four values:  - 'configured': the associated equipment has been configured  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfUslpMcMuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) parameter '**flfUslpMcMuxContr**' (flf-uslp-mc-mux-contr) OID .1.3.112.4.4.2.1.40400.1.2.1 | | **Definition:** This parameter configures and reports how the USLP Master Channels are multiplexed onto the physical channel.  - If flfUslpMcMuxContr = ‘fifo’, no further specification applies.  - If flfUslpMcMuxContr = 'absolutePriority', then the associated configuration value is a sequence of the SCIDs used on the transmission link where the first SCID in the sequence has the highest priority, the second has the second-highest priority etc. Consequently the sequence has as many elements as Spacecraft Identifiers are permitted on the given physical channel.  - If flfUslpMcMuxContr = 'pollingVector', then the associated sequence consists of up to 196608 elements where each element is a SCID. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfUslpMcMuxContr ::= UslpMcMuxContr | |  |  |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) parameter '**flfUslpMcMuxPresenceOfFecf**' (flf-uslp-mc-mux-presence-of-fecf) OID .1.3.112.4.4.2.1.40400.1.3.1 | | **Definition:** This parameter configures and reports if the FR inserts the Frame Error Control Field into each USLP frame before providing it to the encoding FR. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfUslpMcMuxPresenceOfFecf ::= ENUMERATED  {  present (0)  , absent (1)  } | |  |  |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) event '**flfUslpMcMuxResourceStatChange**' (flf-uslp-mc-mux-resource-stat-change) OID .1.3.112.4.4.2.1.40400.2.1.1 | | **Definition:** This event notifies any change of the flfUslpMcMuxResourceStat parameter value. | | |  | | --- | | [**flfUslpMcMuxResourceStatChange**](#id0x8aea00) value '**flfUslpMcMuxResourceStatEvtValue**' (flf-uslp-mc-mux-resource-stat-evt-value) | | **Definition:** The event value reports the flfUslpMcMuxResourceStat parameter value that applies since the notified tcMcMuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfUslpMcMuxResourceStatEvtValue ::= FlfUslpMcMuxResourceStat | |  | |  |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) event '**flfUslpMcMuxOperatorNotify**' (flf-uslp-mc-mux-operator-notify) OID .1.3.112.4.4.2.1.40400.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**flfUslpMcMuxOperatorNotify**](#id0x8b1600) value '**flfUslpMcMuxOperatorNotifyMessage**' (flf-uslp-mc-mux-operator-notify-message) | | **Definition:** The messages passed by means of the flfUslpMcMuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfUslpMcMuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) directive '**flfUslpMcMuxSetContrParams**' (flf-uslp-mc-muc-set-contr-params) OID .1.3.112.4.4.2.1.40400.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the FlfUslpMcMux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**flfUslpMcMuxSetContrParams**](#id0x8b4180) qualifier '**flfUslpMcMuxContrParamIdsAndValuesDirQual**' (flf-uslp-mc-mux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the FlfUslpMcMux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  FlfUslpMcMuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**FlfUslpMcMux**](#id0x8a5a80) directive '**flfUslpMcMuxDiscardDataUnits**' (flf-uslp-mc-mux-discard-data-units) OID .1.3.112.4.4.2.1.40400.3.2.1 | | **Definition:** When receiving this directive, the FR discards all currently buffered data units that have been received through the transfer service instance identified in the directive qualifier. | | **Guard Condition:** None | | |  | | --- | | [**flfUslpMcMuxDiscardDataUnits**](#id0x8b6d00) qualifier '**flfUslpMcMuxDiscardDataUnitsDirQual**' (flf-uslp-mc-mux-discard-data-units-id-dir-qual) OID | | **Definition:** The qualifier of this directive specifies the service-instance-id of the CSTS instance for which the data units are to discarded when the when the flfUslpMcMuxDiscardDataUnits directive is invoked. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfUslpMcMuxDiscardDataUnitsDirQual ::= CstsSvcInstanceId | |  | | |

# Functional Resource 'FlfUslpVcMux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'Fixed Length Frame (FLF) Unified Space Link Protocol Transmission' |
| **Definition:** This FR accepts fixed-length USLP frames not containing FECFs for a specific USLP VC as input. It provides the USLP frames not containing FECFs for a specific USLP Master Channel. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40401   |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) parameter '**flfUslpVcMuxResourceStat**' (flf-uslp-vc-mux-resource-stat) OID .1.3.112.4.4.2.1.40401.1.1.1 | | **Definition:** This enumerated parameter reports the FlfUslpVcMux FR resource status and can take on four values:  - 'configured': the associated equipment has been configured  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FlfUslpVcMuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) parameter '**flfUslpVcMuxMc**' (flf-uslp-vc-mux-mc) OID .1.3.112.4.4.2.1.40401.1.2.1 | | **Definition:** This parameter configures and reports the Master Channel that is provided by the given FR instance. The Master Channel ID is the concatenation of TFVN and SCID. Given that this FR type handles only USLP frames, the TFVN is fixed and only the SCID is variable. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfUslpVcMuxMc ::= UslpVcMuxMc | |  |  |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) parameter '**flfUslpVcMuxContr**' (flf-uslp-vc-mux-contr) OID .1.3.112.4.4.2.1.40401.1.3.1 | | **Definition:** This parameter configures and reports how the Virtual Channels are multiplexed into the Master Channel formed by this FR instance.  - If flfUslpVcMuxContr = ‘fifo’, no further specification applies.  - If flfUslpVcMuxContr = 'absolutePriority', then the associated configuration value is a sequence of VCIDs used on the given MC where the first VCID in the sequence has the highest priority, the second has the second-highest priority etc. Consequently the sequence has as many elements as VCs are permitted on the given MC.  - If flfUslpVcMuxContr = 'pollingVector', then the associated sequence consists of up to 192 elements where each element is a VCID. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FlfUslpVcMuxContr ::= UslpVcMuxContr | |  |  |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) event '**flfUslpVcMuxResourceStatChange**' (flf-uslp-vc-mux-resource-stat-change) OID .1.3.112.4.4.2.1.40401.2.1.1 | | **Definition:** This event notifies any change of the flfUslpVcMuxResourceStat parameter value. | | |  | | --- | | [**flfUslpVcMuxResourceStatChange**](#id0x8c2a00) value '**flfUslpVcMuxResourceStatEvtValue**' (flf-uslp-vc-mux-resource-stat-evt-value) | | **Definition:** The event value reports the flfUslpVcMuxResourceStat parameter value that applies since the notified flfUslpVcMuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfUslpVcMuxResourceStatEvtValue ::= FlfUslpVcMuxResourceStat | |  | |  |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) event '**flfUslpVcMuxOperatorNotify**' (flf-uslp-vc-mux-operator-notify) OID .1.3.112.4.4.2.1.40401.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**flfUslpVcMuxOperatorNotify**](#id0x8c5600) value '**flfUslpVcMuxOperatorNotifyMessage**' (flf-uslp-vc-mux-operator-notify-message) | | **Definition:** The messages passed by means of the flfUslpVcMuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfUslpVcMuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) directive '**flfUslpVcMuxSetContrParams**' (flf-uslp-vc-mux-set-contr-params) OID .1.3.112.4.4.2.1.40401.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the FlfUslpVcMux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**flfUslpVcMuxSetContrParams**](#id0x8c8180) qualifier '**flfUslpVcMuxContrParamIdsAndValuesDirQual**' (flf-uslp-vc-mux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the FlfUslpVcMux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** N/A | | **Type Definition:**  FlfUslpVcMuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | |  |  | | --- | | [**FlfUslpVcMux**](#id0x8b9d00) directive '**flfUslpVcMuxDiscardDataUnits**' (flf-uslp-vc-mux-discard-data-units) OID .1.3.112.4.4.2.1.40401.3.2.1 | | **Definition:** When receiving this directive, the FR discards all currently buffered data units that have been received through the transfer service instance identified in the directive qualifier. | | **Guard Condition:** None | | |  | | --- | | [**flfUslpVcMuxDiscardDataUnits**](#id0x8cad00) qualifier '**flfUslpVcMuxDiscardDataUnitsDirQual**' (flf-uslp-vc-mux-discard-data-units-dir-qual) OID | | **Definition:** The qualifier specifies the service-instance-id of the CSTS for which the data units are to discarded when the flfUslpVcMuxDiscardDataUnits directive is invoked. | | **Type Definition:**  FlfUslpVcMuxDiscardDataUnitsDirQual ::= CstsSvcInstanceId | |  | | |

# Functional Resource 'TmAosMcDemux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'TM/AOS Space Link Protocol Reception' |
| **Definition:** The TmAosMcDemux FR accepts suceessfully decoded frames and passes on all frames of the configured Master Channels. If so configured it also extracts and delivers the CLCWs of the selected Master Channel. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40500   |  | | --- | | [**TmAosMcDemux**](#id0x8cdf80) parameter '**tmAosMcDemuxResourceStat**' (tm-aos-mc-demux-resource-stat) OID .1.3.112.4.4.2.1.40500.1.1.1 | | **Definition:** This enumerated parameter reports the TmAosMcDemux FR resource status and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TmAosMcDemuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TmAosMcDemux**](#id0x8cdf80) parameter '**tmAosMcDemuxMcIds**' (tm-aos-mc-demux-mc-ids) OID .1.3.112.4.4.2.1.40500.1.2.1 | | **Definition:** This parameter reports the Master Channel IDs the given FR instance is configured to process. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- All frames on a Master Channel must have the same TFVN.  TmAosMcDemuxMcIds ::= CHOICE  {  tmFrames [0] SET (SIZE( 1 .. 1024)) OF SEQUENCE  {    -- For Tm frames the Transfer Frame Version Number is 1, encoded as binary '00'.  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  }    , aosFrames [1] SET (SIZE( 1 .. 256)) OF SEQUENCE  {    -- For AOS frames the Transfer Frame Version Number is 2, encoded as binary '01'.  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  }    } | |  |  |  | | --- | | [**TmAosMcDemux**](#id0x8cdf80) parameter '**tmAosMcDemuxClcwExtraction**' (tm-aos-mc-demux-clcw-extraction) OID .1.3.112.4.4.2.1.40500.1.3.1 | | **Definition:** This enumerated parameter configures and reports if the FR instance shall extract CLCWs and if so from which MC. The extracted CLCWs are forwarded to the FR types that consume them. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TmAosMcDemuxClcwExtraction ::= ClcwMcExtraction | |  |  |  | | --- | | [**TmAosMcDemux**](#id0x8cdf80) event '**tmAosMcDemuxResourceStatChange**' (tm-aos-mc-demux-resource-stat-change) OID .1.3.112.4.4.2.1.40500.2.1.1 | | **Definition:** This event notifies any change of the tmAosMcDemuxResourceStat parameter value. | | |  | | --- | | [**tmAosMcDemuxResourceStatChange**](#id0x9dcc80) value '**tmAosMcDemuxResourceStatChangeEvtValue**' (tm-aos-mc-demux-resource-stat-change-evt-value) | | **Definition:** The event value reports the tmAosMcDemuxResourceStat parameter value that applies since the notified tmAosMcDemuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TmAosMcDemuxResourceStatChangeEvtValue ::= TmAosMcDemuxResourceStat | |  | |  |  | | --- | | [**TmAosMcDemux**](#id0x8cdf80) event '**tmAosMcDemuxOperatorNotify**' (tm-aos-mc-demux-operator-notify) OID .1.3.112.4.4.2.1.40500.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tmAosMcDemuxOperatorNotify**](#id0x9df880) value '**tmAosMcDemuxOperatorNotifyMessage**' (tm-aos-mc-demux-operator-notify-message) | | **Definition:** The messages passed by means of the tmAosMcDemuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TmAosMcDemuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TmAosMcDemux**](#id0x8cdf80) directive '**tmAosMcDemuxSetContrParams**' (tm-aos-mc-demux-set-contr-params) OID .1.3.112.4.4.2.1.40500.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TmAosMcDemux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tmAosMcDemuxSetContrParams**](#id0x9e2400) qualifier '**tmAosMcDemuxContrParamIdsAndValuesDirQual**' (tm-aos-mc-demux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TmAosMcDemux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the parameters being set | | **Type Definition:**  TmAosMcDemuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'TmAosVcDemux' [(back to top)](#toc)

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| FR Stratum: 'Space Link Protocol' FR Set: 'TM/AOS Space Link Protocol Reception' |
| **Definition:** The TmAosVcDemux FR accepts frames from a given master channel and passes on all frames of the configured Virtual Channels. If so configured it also extracts and delivers the CLCWs of the selected Virtual Channel. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .40501   |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) parameter '**tmAosVcDemuxResourceStat**' (tm-aos-vc-demux-resource-stat) OID .1.3.112.4.4.2.1.40501.1.1.1 | | **Definition:** This enumerated parameter reports the TmAosVcDemux FR resource status and can take on four values:  - 'configured';  - 'operational';  - 'interrupted';  - 'halted'. | | **Guard Condition:** This parameter can only partially be set by local EM and not at all by an x-support user. Setting of the tmAosVcDemuxResourceStat to 'operational' or 'interrupted' by means of the directive tmAosVcDemuxSetContrParams is not permissible. | | **Engineering Unit:** none | | **Configured:** false | | **Type Definition:**  TmAosVcDemuxResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) parameter '**tmAosVcDemuxVcId**' (tm-aos-vc-demux-vc-id) OID .1.3.112.4.4.2.1.40501.1.2.1 | | **Definition:** This parameter configures and reports the Virtual Channel IDs the given FR instance is configured to process. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TmAosVcDemuxVcId ::= CHOICE  {  tmFrames [0] SET (SIZE( 1 .. 8)) OF INTEGER (0 .. 7)  , aosFrames [1] SET (SIZE( 1 .. 64)) OF INTEGER (0 .. 63)  } | |  |  |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) parameter '**tmAosVcDemuxClcwExtraction**' (tm-aos-vc-demux-clcw-extraction) OID .1.3.112.4.4.2.1.40501.1.3.1 | | **Definition:** This parameter configures and reports if the FR instance shall extract CLCWs and if so from which VC. The extracted CLCWs are forwarded to the FR types that consume them. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TmAosVcDemuxClcwExtraction ::= ClcwVcExtraction | |  |  |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) parameter '**tmAosVcDemuxGvcid**' (tm-aos-vc-demux-gvcid) OID .1.3.112.4.4.2.1.40501.1.4.1 | | **Definition:** This parameter reports the GVCIDs of the frames being delivered by this FR instance. The Master Channel Id being part of the GVCID is redundant in the sense that it is determined by the configuration of the TmAosMcDemux FR delivering frames to the given tmAosVcDemux FR instance. However, the GVCID is a frequently used parameter and is provided by the TmAosVcDemux FR for convenience. | | **Engineering Unit:** none | | **Configured:** false | | **Type Definition:**  TmAosVcDemuxGvcid ::= CHOICE  {  tmGvcid [0] SET (SIZE( 1 .. 8)) OF SEQUENCE  {    -- For Tm frames the Transfer Frame Version Number is 1 which is encoded as binary '00'.  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid INTEGER (0 .. 7)  }    , aosGvcid [1] SET (SIZE( 1 .. 64)) OF SEQUENCE  {    -- For AOS frames the Transfer Frame Version Number is 2 which is encoded as binary  -- '01'B.  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  , vcid INTEGER (0 .. 63)  }    } | |  |  |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) event '**tmAosVcDemuxResourceStatChange**' (tm-aos-vc-demux-resource-stat-change) OID .1.3.112.4.4.2.1.40501.2.1.1 | | **Definition:** This event notifies any change of the tmAosVcDemuxResourceStat parameter value. | | |  | | --- | | [**tmAosVcDemuxResourceStatChange**](#id0x9f4380) value '**tmAosVcDemuxResourceStatChangeEvtValue**' (tm-aos-vc-demux-resource-stat-change-evt-value) | | **Definition:** The event value reports the tmAosVcDemuxResourceStat parameter value that applies since the notified tmAosVcDemuxResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TmAosVcDemuxResourceStatChangeEvtValue ::= TmAosVcDemuxResourceStat | |  | |  |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) event '**tmAosVcDemuxOperatorNotify**' (tm-aos-vc-demux-operator-notify) OID .1.3.112.4.4.2.1.40501.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tmAosVcDemuxOperatorNotify**](#id0x9f6f00) value '**tmAosVcDemuxOperatorNotifyMessage**' (tm-aos-vc-demux-operator-notify-message) | | **Definition:** The messages passed by means of the tmAosVcDemuxOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TmAosVcDemuxOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TmAosVcDemux**](#id0x9e5680) directive '**tmAosVcDemuxSetContrParams**' (tm-aos-vc-demux-set-contr-params) OID .1.3.112.4.4.2.1.40501.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TmAosVcDemux FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tmAosVcDemuxSetContrParams**](#id0x9f9b00) qualifier '**tmAosVcDemuxContrParamIdsAndValuesDirQual**' (tm-aos-vc-demux-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TmAosVcDemux FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the parameter(s) being set | | **Type Definition:**  TmAosVcDemuxContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'FrameDataSink' [(back to top)](#toc)

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| FR Stratum: 'SLS Data Delivery Production' FR Set: 'Frame Data Sink' |
| **Definition:** The Frame Data Sink FR filters the stream of received annotated transfer frames from a physical channel for subsequent recording in an instance of the Offline Frame Buffer (classifier 'OfflineFrameBuffer'). The purpose of this FR is to accommodate data capture policies of Agencies that pre-determine which subset of all received frames are recorded for subsequent off-line retrieval. Each instance of the Frame Data Sink is tied to (and scheduled as part of) a specific Space Link Session Service Package, whereas the Offline Frame Buffer persists across the execution of multiple SLS Service Packages. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .50100   |  | | --- | | [**FrameDataSink**](#id0x9fd280) parameter '**frameDataSinkResourceStat**' (frame-data-sink-resource-stat) OID .1.3.112.4.4.2.1.50100.1.1.1 | | **Definition:** This enumerated parameter reports the FrameDataSink FR resource status and can take on four values:  - 'configured': the associated equipment has been configured  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FrameDataSinkResourceStat ::= ResourceStat | |  |  |  | | --- | | [**FrameDataSink**](#id0x9fd280) parameter '**frameDataSinkStorageSelection**' (frame-data-sink-storage-selection) OID .1.3.112.4.4.2.1.50100.1.2.1 | | **Definition:** This parameter configures and reports the section of received annotated transfer frames to be stored in the associated Offline Frame Buffer instance. The values are:  - 'all': which specifies that all annotated frames from the received physical channel are to be recorded, or  - 'channelList': which specifies the set of master channels and/or virtual channels that are to be stored. The valid values are specfic to the space data link protocol - TM, AOS, or USLP. The channel list is specified as a SEQUENCE OF SCIDs, each of which contains either 'all' (indicating that all VCs of the master channel are to be stored) or the SEQUENCE OF VCIDs that are to be stored. The ranges of the SCID and VCID fields are limited to the selected space data link protocol. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FrameDataSinkStorageSelection ::= CHOICE  {  all [0] NULL  , channelList [1] CHOICE  {  tm [0] SEQUENCE (SIZE( 1 .. 1024)) OF SEQUENCE  {    -- The TFVN of TM frames is version 1 (binary '00').  tmTfvn BIT STRING ('00'B)  , tmScid INTEGER (0 .. 1023)  , tmVcSelection CHOICE  {  allTmVcids [0] NULL  , selectedTmVcids [1] SEQUENCE (SIZE( 1 .. 8)) OF INTEGER (0 .. 7)  }    }    , aos [1] SEQUENCE (SIZE( 1 .. 256)) OF SEQUENCE  {    -- The TFVN of AOS Frames is version 2 (binary '01').  aosTfvn BIT STRING ('01'B)  , aosScid INTEGER (0 .. 255)  , aosVcSelection CHOICE  {  allAosVcids [0] NULL  , selectedAosVcids [1] SEQUENCE (SIZE( 1 .. 64)) OF INTEGER (0 .. 63)  }    }    , uslp [2] SEQUENCE (SIZE( 1 .. 65536)) OF SEQUENCE  {    -- The TFVN of USLP frames is version 4 (binary '1100').  uslpTfvn BIT STRING ('1100'B)  , uslpScid INTEGER (0 .. 65535)  , uslpVcSelection CHOICE  {  allUslpVcids [0] NULL  , selectedUslpVcids [1] SEQUENCE (SIZE( 1 .. 64)) OF INTEGER (0 .. 63)  }    }    }    } | |  |  |  | | --- | | [**FrameDataSink**](#id0x9fd280) event '**frameDataSinkResourceStatChange**' (frame-data-sink-resource-stat-change) OID .1.3.112.4.4.2.1.50100.2.1.1 | | **Definition:** This event notifies any change of the frameDataSinkResourceStat parameter value. | | |  | | --- | | [**frameDataSinkResourceStatChange**](#id0xa08f00) value '**frameDataSinkResourceStatChangeEvtValue**' (frame-data-sink-resource-status-change-evt-value) OID | | **Definition:** The event value reports the frameDataSinkResourceStat parameter value that applies since the notified frameDataSinkResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FrameDataSinkResourceStatChangeEvtValue ::= FrameDataSinkResourceStat | |  | |  |  | | --- | | [**FrameDataSink**](#id0x9fd280) event '**frameDataSinkOperatorNotify**' (frame-data-sink-operator-notify) OID .1.3.112.4.4.2.1.50100.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**frameDataSinkOperatorNotify**](#id0xa0bc00) value '**frameDataSyncOperatorNotifyMessage**' (frame-data-sync-operator-notify-message) | | **Definition:** The messages passed by means of the frameDataSyncOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FrameDataSyncOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FrameDataSink**](#id0x9fd280) directive '**frameDataSinkSetContrParams**' (frame-data-sink-set-contr-params) OID .1.3.112.4.4.2.1.50100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the FrameDataSink FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**frameDataSinkSetContrParams**](#id0xa0e780) qualifier '**frameDataSinkContrParamIdsAndValuesDirQual**' (frame-data-sink-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the FrameDataSink FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** N/A | | **Type Definition:**  FrameDataSinkContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'TdmSegmentGen' [(back to top)](#toc)

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| FR Stratum: 'SLS Radiometric Data Production' FR Set: 'Real-Time Radiometric Data Collection' |
| **Definition:** TdmSegmentGen performs the production functions associated with collecting: angle measurements from the antenna; receive frequency, carrier power, carrier power to noise spectral density, and Doppler measurements from the return space link; range and ranging power to noise spectral density measurements from the received space links; and transmit frequency and transmit frequency rate from the transmitted space link in order to generate Tracking Data Message (TDM) segments containing those measurements. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .60100   |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenResourceStat**' (tdm-segment-gen-resource-stat) OID .1.3.112.4.4.2.1.60100.1.1.1 | | **Definition:** This enumerated parameter reports the TdmSegmentGen resource status and can take on four values:  - 'configured': the associated equipment has been configured to ingest tracking data measurements and produce TDM atomic segments  - 'operational': the associated equipment is ingesting tracking data measurements and produce TDM atomic segments;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TdmSegmentGenResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenCarrierPowerPathTable**' (tdm-segment-gen-carrier-power-path-table) OID .1.3.112.4.4.2.1.60100.1.2.1 | | **Definition:** This complex-valued parameter configures and reports the set of Carrier Power tracking data paths for which Carrier Power Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenCarrierPowerPathTable ::= CHOICE  {  noCarrierPowerSegments [0] NULL  , carrierPowerSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The frequency band of the carrier received from the Space user Node.  rcvFreqBand FreqBand  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenPcOverNoPathTable**' (tdm-segment-gen-pc-over-n0-path-table) OID .1.3.112.4.4.2.1.60100.1.3.1 | | **Definition:** This complex-valued parameter configures and reports the set of Pc/No tracking data paths for which Pc/No Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenPcOverNoPathTable ::= CHOICE  {  noPcOverNoSegments [0] NULL  , pcOverNoSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The frequency band of the carrier received from the Space user Node.  rcvFreqBand FreqBand  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenPrOverNoPathTable**' (tdm-segment-gen-pr-over-no-path-table) OID .1.3.112.4.4.2.1.60100.1.4.1 | | **Definition:** This complex-valued parameter configures and reports the set of Pr/No tracking data paths for which Pr/No Atomic Segments are to be generated during the execution of the Service Package | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenPrOverNoPathTable ::= CHOICE  {  noPrOverNoSegments [0] NULL  , prOverNoSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The frequency band of the carrier received from the Space user Node.  rcvFreqBand FreqBand  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenDoppInstPathTable**' (tdm-segment-gen-dopp-inst-path-table) OID .1.3.112.4.4.2.1.60100.1.5.1 | | **Definition:** This complex-valued parameter configures and reports the set of Doppler (instantaneous) tracking data paths for which Doppler (instantaneous) Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenDoppInstPathTable ::= CHOICE  {  noDopplInstSegments [0] NULL  , doppInstSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The name of the receiving aperture, which populates the PARTICIPANT\_3 field of the  -- generated TDM segment. Used only if three-way Doppler measurements are taken with  -- both transmitting and receiving apertures at the same ESLT.  threeWayRcvAperture VisibleString OPTIONAL  ,  -- The frequency band of the carrier signal received from the Space User Node  rcvFreqBand FreqBand  ,  -- The frequency band of the carrier signal transmitted to the Space User Node. Not  -- used for 1-way Doppler.  xmitFreqBand FreqBand OPTIONAL  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenDoppIntegPathTable**' (tdm-segment-gen-dopp-integ-path-table) OID .1.3.112.4.4.2.1.60100.1.6.1 | | **Definition:** This complex-valued parameter configures and reports the set of Doppler (integrated) tracking data paths for which Doppler (integrated) Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenDoppIntegPathTable ::= CHOICE  {  noDoppIntegSegments [0] NULL  , doppIntegSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The name of the receiving aperture, which populates the PARTICIPANT\_3 field of the  -- generated TDM segment. Used only if three-way Doppler measurements are taken with  -- both transmitting and receiving apertures at the same ESLT.  threeWayRcvAperture VisibleString OPTIONAL  ,  -- The frequency band of the carrier signal received from the Space User Node.  rcvFreqBand FreqBand  ,  -- The frequency band of the carrier signal transmitted to the Space User Node. Not  -- used for 1-way Doppler.  xmitFreqBand FreqBand OPTIONAL  ,  -- The interval over which the Doppler measurements are to be integrated, in seconds.  integrationInterval ShortIntUnsigned  ,  -- The integration reference specifies whether the timetag represents the start, middle,  -- or end of the integration period.  integrationRef ENUMERATED  {  start (0)  , middle (1)  , end (2)  }    }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenRngPathTable**' (tdm-segment-gen-rng-path-table) OID .1.3.112.4.4.2.1.60100.1.7.1 | | **Definition:** This complex-valued parameter configures and reports the set of Range tracking data paths for which Range Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenRngPathTable ::= CHOICE  {  noRngSegments [0] NULL  , rngSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The name of the receiving aperture, which populates the PARTICIPANT\_3 field of the  -- generated TDM segment. Used only if three-way range measurements are taken with  -- both transmitting and receiving apertures at the same ESLT.  threeWayRcvAperture VisibleString OPTIONAL  ,  -- The frequency band of the carrier signal received from the Space User Node.  rcvFreqBand FreqBand  ,  -- The frequency band of the carrier signal transmitted to the Space User Node.  xmitFreqBand FreqBand  , rangeUnits ENUMERATED  {  km (0)  , seconds (1)  }    ,  -- The interval over which the Range measurements are to be integrated, in seconds.  integrationInterval ShortIntPos  ,  -- The integration reference specifies whether the timetag represents the start, middle,  -- or end of the integration period.  integrationRef ENUMERATED  {  start (0)  , middle (1)  , end (2)  }    }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSeqmentGenRcvFreqPathTable**' (tdm-segment-gen-rcv-freq-path-table) OID .1.3.112.4.4.2.1.60100.1.8.1 | | **Definition:** This complex-valued parameter configures and reports the set of Receive Frequency tracking data paths for which Receive Frequency Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSeqmentGenRcvFreqPathTable ::= CHOICE  {  noRcvFreqSegments [0] NULL  , rcvFreqSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The frequency band of the carrier signal received from the Space User Node.  rcvFreqBand FreqBand  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenXmitFreqPathTable**' (tdm-segment-gen-xmit-freq-path-table) OID .1.3.112.4.4.2.1.60100.1.9.1 | | **Definition:** This complex-valued parameter configures and reports the set of Transmit Frequency tracking data paths for which Transmit Frequency Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenXmitFreqPathTable ::= CHOICE  {  noXmitFreqSegments [0] NULL  , xmitFreqSegments [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The frequency band of the carrier signal transmitted to the Space User Node.  xmitFreqBand FreqBand  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenXmitFreqRatePathTable**' (tdm-segment-gen-xmit-freq-rate-path-table) OID .1.3.112.4.4.2.1.60100.1.10.1 | | **Definition:** This complex-valued parameter configures and reports the set of Transmit Frequency Rate tracking data paths for which Transmit Frequency Rate Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdmSegmentGenXmitFreqRatePathTable ::= CHOICE  {  noXmitFreqRateSegments [0] NULL  , xmitFreqRate [1] SEQUENCE OF SEQUENCE  {    -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  pathTableCommonElements TdmPathTableCommonElements  ,  -- The frequency band of the carrier signal transmitted to the Space User Node.  xmitFreqBand FreqBand  }    } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) parameter '**tdmSegmentGenAntAnglesPathTable**' (tdm-segment-gen-ant-angles-path-table) OID .1.3.112.4.4.2.1.60100.1.11.1 | | **Definition:** This complex-valued parameter configures and reports the set of Antenna Angles tracking data paths for which Antenna Angles Atomic Segments are to be generated during the execution of the Service Package. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- trackingDataPathId, apertureName, spaceUserNodeName,reportingPeriod, and frName  TdmSegmentGenAntAnglesPathTable ::= CHOICE  {  noAntAnglesSegments [0] NULL  , antAnglesSegments [1] TdmPathTableCommonElements  } | |  |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) event '**tdmSegmentGenResourceStatChange**' (tdm-segment-gen-resource-stat-change) OID .1.3.112.4.4.2.1.60100.2.1.1 | | **Definition:** This event notifies any change of the tdmSegmenrGenStatus parameter value. | | |  | | --- | | [**tdmSegmentGenResourceStatChange**](#id0xa39880) value '**tdmSegmentGenResourceStatChangeEvtValue**' (tdm-segment-gen-resource-stat-change-evt-value) OID | | **Definition:** The event value reports the tdmSegmentGenResourceStat parameter value that applies since the notified tdmSegmentGenResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TdmSegmentGenResourceStatChangeEvtValue ::= TdmSegmentGenResourceStat | |  | |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) event '**tdmSegmentGenOperatorNotify**' (tdm-segment-gen-operator-notify) OID .1.3.112.4.4.2.1.60100.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tdmSegmentGenOperatorNotify**](#id0xa3c500) value '**tdmSegmentGenOperatorNotifyMessage**' (tdm-segment-gen-operator-notify-message) | | **Definition:** The messages passed by means of the tdmSegmentGenOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TdmSegmentGenOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TdmSegmentGen**](#id0xa11c80) directive '**tdmSegmentGenSetContrParams**' (tdm-segment-gen-set-contr-params) OID .1.3.112.4.4.2.1.60100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TdmSegmentGen FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tdmSegmentGenSetContrParams**](#id0xa3f100) qualifier '**tdmSegmentGenContrParamIdsAndValuesDirQual**' (tdm-segment-gen-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TdmSegmentGen FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  TdmSegmentGenContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'OfflineFrameBuffer' [(back to top)](#toc)

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| FR Stratum: 'Offline Data Storage' FR Set: 'Offline Frame Buffer' |
| **Definition:** The Offline Frame Buffer is a repository of return transfer frames that are subsequently retrieved by offline SLE transfer service instances that carry transfer frames or space link data units that have been transferred across the space link within those transfer frames. The OfflineFrameBuffer FR corresponds to the Offline Frame Buffer production entity defined in the SLE RAF and RCF Service Specification Recommended Standards. An instance of the OfflineFrameBuffer FR represents the allocation of resources of a physical mass storage device to the Mission. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .70100   |  | | --- | | [**OfflineFrameBuffer**](#id0xa42800) parameter '**offlineFrameBufferResourceStat**' (offline-frame-buffer-resource-stat) OID .1.3.112.4.4.2.1.70100.1.1.1 | | **Definition:** This enumerated parameter reports the OfflineFrameBuffer FR resource status and can take on four values:  - 'configured': the associated equipment has been configured  - 'operational': the associated equipment is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated equipment has been taken out of service. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  OfflineFrameBufferResourceStat ::= ResourceStat | |  |  |  | | --- | | [**OfflineFrameBuffer**](#id0xa42800) parameter '**offlineFrameBufferStorage**' (offline-frame-buffer-storage) OID .1.3.112.4.4.2.1.70100.1.2.1 | | **Definition:** This parameter reports the total storage (in megabytes) that has been allocated to the Offline Frame Buffer instance and the how much storage (in megabytes) is currently still available. The allocation is made by the Provider Cross Support Service System and is not reconfigurable by User Missions. | | **Engineering Unit:** megabytes | | **Configured:** false | | **Type Definition:**  OfflineFrameBufferStorage ::= SEQUENCE  {    -- The engineering unit of this element is megabyte.  totalAllocatedStorage LongIntPos  ,  -- The engineering unit of this element is megabyte.  currentlyAvailableStorage LongIntPos  } | |  |  |  | | --- | | [**OfflineFrameBuffer**](#id0xa42800) parameter '**offlineFrameBufferDataRetentionPolicy**' (offline-frame-buffer-data-retention-policy) OID .1.3.112.4.4.2.1.70100.1.3.1 | | **Definition:** This parameter configures and reports the policy for retention of buffered frames. The parameter has a choice of two values:  - 'never': all frames are retained unless and until the used data storage reaches the allocated storage amount, at which point frames are purged.  - 'timeLimited': the time period (in hours) between the time of receipt of each frame and its automatic purge from the buffer.  Note - Data may be purged prior to the period specified by the timeLimited value if the data storage usage reaches the allocated storage amount. | | **Guard Condition:** None | | **Engineering Unit:** N/A / hours | | **Configured:** true | | **Type Definition:**  OfflineFrameBufferDataRetentionPolicy ::= CHOICE  {  never [0] NULL  , timeLimited [1] LongIntPos  } | |  |  |  | | --- | | [**OfflineFrameBuffer**](#id0xa42800) event '**offlineFrameBufferResourceStatChange**' (offline-frame-buffer-resource-stat-change) OID .1.3.112.4.4.2.1.70100.2.1.1 | | **Definition:** This event notifies any change of the offlineFrameBufferResourceStat. | | |  | | --- | | [**offlineFrameBufferResourceStatChange**](#id0xa4c080) value '**offlineFrameBufferResourceStatChangeEvtValue**' (offline-frame-buffer-resource-status-change-evt-value) OID | | **Definition:** The event value reports the offlineFrameBufferResourceStat value that applies since the notified offlineFrameBufferResourceStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  OfflineFrameBufferResourceStatChangeEvtValue ::= OfflineFrameBufferResourceStat | |  | |  |  | | --- | | [**OfflineFrameBuffer**](#id0xa42800) event '**offlineFrameBufferOperatorNotify**' (offline-frame-buffer-operator-notify) OID .1.3.112.4.4.2.1.70100.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**offlineFrameBufferOperatorNotify**](#id0xa4ed00) value '**offlineFrameBufferOperatorNotifyMessage**' (offline-frame-buffer-operator-notify-message) | | **Definition:** The messages passed by means of the offlineFrameBufferOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  OfflineFrameBufferOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**OfflineFrameBuffer**](#id0xa42800) directive '**offlineFrameBufferSetContrParams**' (offline-frame-buffer-contr-param-ids-and-values) OID .1.3.112.4.4.2.1.70100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the OfflineFrameBuffer FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**offlineFrameBufferSetContrParams**](#id0xa51900) qualifier '**offlineFrameBufferContrParamIdsAndValuesDirQual**' (offline-frame-buffer-contr-param-ids-and-values-dir-qual) OID | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the OfflineFrameBuffer FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  OfflineFrameBufferContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'TdmRecordingBuffer' [(back to top)](#toc)

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| FR Stratum: 'Offline Data Storage' FR Set: 'TDM Recording Buffer' |
| **Definition:** The TDM Recording Buffer is a repository of tracking data segments that are subsequently retrieved by Tracking Data CSTS Provider instances operating in the complete data transfer mode. The TdmRecordingBuffer FR corresponds to the Recording Buffer production entity defined in annex F3 of the Cross Suppport Transfer Service - Tracking Data Service Recommended Standard. An instance of TdmRcordingBuffer records all TDM Atomic Segments generated by the TdmSegmentGen FR instance with which it is associated. A TdmRecordingBuffer instance makes available all TDM Atomic Segments that it retains to any TdCstsProvider FR instance with which it is associated. The applied data retention policy is FIFO. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .70200   |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) parameter '**tdmRecordingBufferProdStat**' (tdm-recording-buffer-prod-stat) OID .1.3.112.4.4.2.1.70200.1.1.1 | | **Definition:** This parameter reports the production status of the TdmRecordingBuffer FR. This FR reports such parameter although it does not represent a service provider. The reason is that the filling of the recording buffer depends on the underlying resources forming the production chain for the data to be collected by the recording buffer. Therefore the recording buffer shall, based on the status of the underlying production FRs, determine an aggregate production status the changes of which are recorded by the recording buffer synchronously with the TDM segments.  This parameter can take on one of four values:  - 'configured': all production functions needed to support the TDM segment recording have been configured ;  - ‘operational’: all production functions have been enabled to generate the TDM segments to be recorded by the recording buffer;  - ‘interrupted’: one or more production functions have been stopped because of an error condition that may be temporary;  - ‘halted’: one or more production functions have been stopped by management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TdmRecordingBufferProdStat ::= ProdStat | |  |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) parameter '**tdmRecordingBufferResourceStat**' (tdm-recording-buffer-resource-stat) OID .1.3.112.4.4.2.1.70200.1.2.1 | | **Definition:** This enumerated parameter reports the TdmRecordingBuffer FR resource status and can take on four values:  - 'configured': the associated resource has been configured  - 'operational': the associated resource is active;  - 'interrupted': a failure has been detected;  - 'halted': the associated resource has been taken out of service.  NOTE - Because it is an offline data storage FR, the resource status of the TdmRecordingBuffer FR is independent of any Service Package that it may be included in. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TdmRecordingBufferResourceStat ::= ResourceStat | |  |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) parameter '**tdmRecordingBufferAllocatedStorage**' (tdm-recording-buffer-allocated-storage) OID .1.3.112.4.4.2.1.70200.1.3.1 | | **Definition:** This parameter configures and reports the maximum storage (in megabytes) allocated to the FR instance for all TDM Atomic Segment types. | | **Guard Condition:** None | | **Engineering Unit:** megabytes | | **Configured:** true | | **Type Definition:**  TdmRecordingBufferAllocatedStorage ::= LongIntPos | |  |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) parameter '**tdmRecordingBufferAvailableStorage**' (tdm-recording-buffer-available-storage) OID .1.3.112.4.4.2.1.70200.1.4.1 | | **Definition:** This parameter reports the size (in megabytes) of the currernly available storage in the TDM Recording Buffer. | | **Engineering Unit:** megabytes | | **Configured:** false | | **Type Definition:**  TdmRecordingBufferAvailableStorage ::= LongIntUnsigned | |  |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) event '**tdmRecordingBufferProdStatChange**' (tdm-recording-buffer-prod-stat-change) OID .1.3.112.4.4.2.1.70200.2.1.1 | | **Definition:** This event notifies any change of the tdmRecordingBufferProdStat parameter value. | | |  | | --- | | [**tdmRecordingBufferProdStatChange**](#id0xa60680) value '**tdmRecordingBufferProdStatChangeEvtValue**' (tdm-recording-buffer-prod-stat-change-evt-value) | | **Definition:** The event value reports the tdmRecordingBufferProdStat value that applies since the notified tdmRecordingBufferProdStatChange event has occurred. | | **Type Definition:**  TdmRecordingBufferProdStatChangeEvtValue ::= TdmRecordingBufferProdStat | |  | |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) event '**tdmRecordingBufferResourceStatChange**' (tdm-recording-buffer-resource-stat-change) OID .1.3.112.4.4.2.1.70200.2.2.1 | | **Definition:** This event notifies any change of the tdmRecordingBufferResourceStat parameter. | | |  | | --- | | [**tdmRecordingBufferResourceStatChange**](#id0xa63280) value '**tdmRecordingBufferStatusChangeEvtValue**' (tdm-recording-buffer-status-change-evt-value) OID | | **Definition:** The event value reports the tdmRecordingBufferResourceStat value that applies since the notified dmRecordingBufferResourceStatChange event occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TdmRecordingBufferStatusChangeEvtValue ::= TdmRecordingBufferResourceStat | |  | |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) event '**tdmRecordingBufferProdConfigurationChange**' (tdm-recording-buffer-prod-configuration-change) OID .1.3.112.4.4.2.1.70200.2.3.1 | | **Definition:** This event notifies that the configuration of the production FRs filling the recording buffer has changed. | | |  | | --- | | [**tdmRecordingBufferProdConfigurationChange**](#id0xa65f00) value '**tdmRecordingBufferProdConfigurationChangeEvtValue**' (tdm-recording-buffer-prod-configuration-change-evt-value) | | **Definition:** The event does not report any additional information. | | **Engineering Unit:** N/A | | **Type Definition:**  TdmRecordingBufferProdConfigurationChangeEvtValue ::= ProdConfigurationChangeEvtValue | |  | |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) event '**tdmRecordingBufferOverflow**' (tdm-recording-buffer-overflow) OID .1.3.112.4.4.2.1.70200.2.4.1 | | **Definition:** This event notifies the overflow of the TDM Recording Buffer beyond its allocated storage space. | | |  | | --- | | [**tdmRecordingBufferOverflow**](#id0xa68a80) value '**tdmRecordingBufferOverflowEvtValue**' (tdm-recording-buffer-overflow-evt-value) | | **Definition:** This event does not provide any additional information. | | **Engineering Unit:** N/A | | **Type Definition:**  TdmRecordingBufferOverflowEvtValue ::= NULL | |  | |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) event '**tdmRecordingBufferOperatorNotify**' (tdm-recording-buffer-operator-notify) OID .1.3.112.4.4.2.1.70200.2.5.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tdmRecordingBufferOperatorNotify**](#id0xa6b680) value '**tdmRecordingBufferOperatorNotifyMessage**' (tdm-recording-buffer-operator-notify-message) | | **Definition:** The messages passed by means of the tdmRecordingBufferOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TdmRecordingBufferOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TdmRecordingBuffer**](#id0xa54f00) directive '**tdmRecordingBufferSetContrParams**' (tdm-recording-buffer-set-contr-params) OID .1.3.112.4.4.2.1.70200.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TdmRecordingBuffer FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tdmRecordingBufferSetContrParams**](#id0xa6e200) qualifier '**tdmRecordingBufferContrParamIdsAndValuesDirQual**' (tdm-recording-buffer-contr-param-ids-and-values-dir-qual) OID | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TdmRecordingBuffer FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  TdmRecordingBufferContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'FCltuTsProvider' [(back to top)](#toc)

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| FR Stratum: 'Data Transfer Services' FR Set: 'SLE Forward CLTU' |
| **Definition:** The FCltuTsProvider FR provides the to be radiated CLTUs to the TcPlopSyncAndChnlEncode FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .80200   |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuProdStat**' (f-cltu-prod-stat) OID .1.3.112.4.4.2.1.80200.1.1.1 | | **Definition:** This enumerated parameter reports the status of the service production process used by the given instance of the F-CLTU service. It can take on the following values:  - 'configured': equipment has been assigned to support the service instance, but the production process is not yet capable of radiating CLTUs;  - 'operational': the production process has been configured for support, has completed the acquisition sequence, and is capable of radiating CLTUs;  - 'interrupted': the production process is stopped due to a fault;  - 'halted': the production process is stopped and production equipment is out of service due to management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuProdStat ::= ProdStat | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuSvcInstanceId**' (f-cltu-svc-instance-id) OID .1.3.112.4.4.2.1.80200.1.2.1 | | **Definition:** This parameter configures and reports the identifier of the given service instance. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FCltuSvcInstanceId ::= SleSvcInstanceId | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuSvcInstanceState**' (f-cltu-svc-instance-state) OID .1.3.112.4.4.2.1.80200.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the F-CLTU service. It can take on the following values:  - 'unbound': all resources required to enable the provision of the Forward CLTU service have been allocated, and all objects required to provide the service have been instantiated; however, no association yet exists between the user and the provider, i.e., the F-CLTU transfer service provider port is not bound;  - 'ready': an association has been established between the user and the provider, and they may interact by means of the service operations. However, sending of CLTUs from the user to the provider (by means of the CLTU-TRANSFER-DATA operation) is not permitted; the user may enable the delivery of CLTUs by means of the appropriate service operation (CLTU-START), which, in turn, will cause the provider to transition to the state 'active';  - 'active': this state resembles state ‘ready’, except that now the user can send CLTUs and the provider is enabled to radiate CLTUs to the spacecraft; the service continues in this state until the user invokes either the CLTU-STOP operation to cause the provider to suspend transmission of CLTUs and transition back to state 'ready' or the user invokes the PEER-ABORT operation to cause the service to transition back to the 'unbound' state. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuSvcInstanceState ::= SleSvcInstanceState | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuInitiatorId**' (f-cltu-initiator-id) OID .1.3.112.4.4.2.1.80200.1.4.1 | | **Definition:** This parameter configures and reports the identifier of the peer application, i.e., the authority on whose behalf the SLE application entity is initiating an association with the FCLTU service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FCltuInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuResponderId**' (f-cltu-responder-id) OID .1.3.112.4.4.2.1.80200.1.5.1 | | **Definition:** This parameter configures and reports the identifier of the FCLTU application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FCltuResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuResponderPortId**' (f-cltu-responder-port-id) OID .1.3.112.4.4.2.1.80200.1.6.1 | | **Definition:** This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the  responding SLE application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FCltuResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuRtnTimeoutPeriod**' (f-cltu-rtn-timeout-period) OID .1.3.112.4.4.2.1.80200.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed F-CLTU operation is invoked until the return has to be received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** second | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second.  FCltuRtnTimeoutPeriod ::= SvcResponseTimeout | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuDeliveryMode**' (f-cltu-delivery-mode) OID .1.3.112.4.4.2.1.80200.1.8.1 | | **Definition:** This enumerated parameter reports the delivery mode of the given instance of the F-CLTU service. For the present version of this service only the ‘fwdOnline’ delivery mode is defined. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuDeliveryMode ::= ENUMERATED  {  fwdOnline (0)  } | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuNotificationMode**' (f-cltu-notification-mode) OID .1.3.112.4.4.2.1.80200.1.9.1 | | **Definition:** This enumerated parameter configures and reports how the F-CLTU provider notifies certain changes of fCltuProdStat to the service user. It can take on two values:  - 'immediate': the user is notified of a fCltuProdStat change to 'interrupted' as soon as this transition is detected;  - 'deferred': the user is notified about the fCltuProdStat change only if and when the radiation of a CLTU is affected. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FCltuNotificationMode ::= ENUMERATED  {  immediate (0)  , deferred (1)  } | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuProtocolAbortMode**' (f-cltu-protocol-abort-mode) OID .1.3.112.4.4.2.1.80200.1.10.1 | | **Definition:** This enumerated parameter configures and reports the way the F-CLTU service provider will act in the event of a protocol abort. This parameter can take on two values:  - 'abort': service production will cease in the event of a protocol abort;  - 'continue': service production will disregard the protocol abort event and continue radiating the CLTUs already buffered at the time of the event. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FCltuProtocolAbortMode ::= ENUMERATED  {  abort (0)  , continue (1)  } | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuMinReportingCycle**' (f-cltu-min-reporting-cycle) OID .1.3.112.4.4.2.1.80200.1.11.1 | | **Definition:** This parameter configures and reports the minimum time in seconds between successive CLTU-STATUS-REPORT invocations sent by the FCLTU service provider that may be requested in a CLTU-SCHEDULE-STATUS-REPORT invocation. | | **Guard Condition:** Setting of this parameter by means of the fCltuSetContrParams directive is only permissible while fCltuSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The enginneering unit is second.  FCltuMinReportingCycle ::= MinAllowedReportingCycle | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuReportingCycle**' (f-cltu-reporting-cycle) OID .1.3.112.4.4.2.1.80200.1.12.1 | | **Definition:** This parameter reports the current setting of the time in seconds between successive CLTU-STATUS-REPORT invocations sent by the F-CLTU service provider provided fCltuReportingCycle is 'on'. When fCltuReportingCycle is 'off', no cycle time is reported. | | **Engineering Unit:** s | | **Configured:** false | | **Type Definition:**  -- If applicable, the engineering unit of this parameter is second.  FCltuReportingCycle ::= SleReportingCycle | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuExpectedCltuId**' (f-cltu-expected-cltu-id) OID .1.3.112.4.4.2.1.80200.1.13.1 | | **Definition:** This parameter reports the value of the cltu-identification the F-CLTU service provider expects to receive in the next CLTU-TRANSFER-DATA invocation for this invocation to be valid. As long as fCltuSvcInstanceState ≠ 'active', the value reported will be zero ('0'). | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuExpectedCltuId ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuExpectedEventInvocId**' (f-cltu-expected-event-invoc-id) OID .1.3.112.4.4.2.1.80200.1.14.1 | | **Definition:** This parameter reports the value of the event-invocation-identification the F-CLTU service provider expects to receive in the next CLTU-THROW-EVENT invocation for this invocation to be valid. The initial value of this parameter is zero ('0'). | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuExpectedEventInvocId ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuNumberOfCltusReceived**' (f-cltu-number-of-cltus-received) OID .1.3.112.4.4.2.1.80200.1.15.1 | | **Definition:** This parameter reports the total number of CLTUs received while the given service instance has been accessible to the user. Only CLTUs that the service provider accepted and consequently buffered are counted in the total. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuNumberOfCltusReceived ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuNumberOfCltusProcessed**' (f-cltu-number-of-cltus-processed) OID .1.3.112.4.4.2.1.80200.1.16.1 | | **Definition:** This parameter reports the number of CLTUs that the provider attempted to radiate while the given service instance has been active including:  - CLTUs that radiated successfully;  - CLTUs that expired;  - CLTUs that aborted;  - a CLTU in the process of being radiated. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuNumberOfCltusProcessed ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) parameter '**fCltuNumberOfCltusRadiated**' (f-cltu-number-of-cltus-radiated) OID .1.3.112.4.4.2.1.80200.1.17.1 | | **Definition:** This parameter reports the number of CLTUs that the provider successfully radiated completely during the service provision period. A CLTU in the process of being radiated is not included in this count. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FCltuNumberOfCltusRadiated ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) event '**fCltuProdStatChange**' (f-cltu-prod-stat-change) OID .1.3.112.4.4.2.1.80200.2.1.1 | | **Definition:** This event notifies any change of the fCltuProdStat parameter. | | |  | | --- | | [**fCltuProdStatChange**](#id0xaa0580) value '**fCltuProdStatChangeEvtValue**' (f-cltu-prod-stat-change-evt-value) | | **Definition:** The event value reports the fCltuProdStat value that applies since the notified fCltuProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FCltuProdStatChangeEvtValue ::= FCltuProdStat | |  | |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) event '**fCltuProdConfigurationChange**' (f-Cltu-prod-configuration-change) OID .1.3.112.4.4.2.1.80200.2.2.1 | | **Definition:** This event triggers when one or more parameters controlling the configuration of service production of the service instance identified by the fCltuSvcInstanceId parameter have been changed.  This event carries no additional information. | | |  | | --- | | [**fCltuProdConfigurationChange**](#id0xaa3180) value '**fCltuProdConfigurationChangeEvtValue**' (f-Cltu-prod-configuration-change-evt-value) | | **Definition:** The event-value of this event is 'empty'. | | **Engineering Unit:** N/A | | **Type Definition:**  FCltuProdConfigurationChangeEvtValue ::= ProdConfigurationChangeEvtValue | |  | |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) event '**fCltuOperatorNotify**' (f-cltu-operator-notify) OID .1.3.112.4.4.2.1.80200.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**fCltuOperatorNotify**](#id0xaa5d00) value '**fCltuOperatorNotifyMessage**' (f-cltu-operator-notify-message) | | **Definition:** The messages passed by means of the fCltuOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FCltuOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FCltuTsProvider**](#id0xa71c00) directive '**fCltuSetContrParams**' (f-cltu-set-contr-params) OID .1.3.112.4.4.2.1.80200.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the FCltuTsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**fCltuSetContrParams**](#id0xaa8880) qualifier '**fCltuContrParamIdsAndValuesDirQual**' (f-cltu-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the FCltuTsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  FCltuContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'FwdFrameCstsProvider' [(back to top)](#toc)

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| FR Stratum: 'Data Transfer Services' FR Set: 'Forward Frame CSTS' |
| **Definition:** The Forward Frame CSTS Provider functional resource provides service-user-generated Space Link Protocol Data Units (SL-PDUs: transfer frames or Channel Access Data Units) to a functional resource in the Synchronization and Channel Coding FR Stratum. Each instance of the Forward Frame CSTS Provider FR type must be configured to transfer SL-PDUs that conform to the specific Synchronization and Channel Coding FR Set that it accesses. The functions of the Forward Frame CSTS Provider are specified in CCSDS 922.3. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .80300   |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffProdStat**' (ff-prod-stat) OID .1.3.112.4.4.2.1.80300.1.1.1 | | **Definition:** This parameter reports the production status of the Forward Frame service instance. This parameter can take on one of four values:  - 'configured': all production functions needed to support this service instance have been configured ;  - ‘operational’: all production functions have been enabled to process data for this service instance;  - ‘interrupted’: one or more production functions have been stopped because of an error condition that may be temporary;  - ‘halted’: one or more production functions have been stopped by management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FfProdStat ::= ProdStat | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffSvcInstanceId**' (ff-svc-instance-id) OID .1.3.112.4.4.2.1.80300.1.2.1 | | **Definition:** This parameter configures and reports the service instance identifier used in establishing the association between the user and provider of the Forward Frame service instance. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfSvcInstanceId ::= CstsSvcInstanceId | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffSvcInstanceState**' (ff-svc-instance-state) OID .1.3.112.4.4.2.1.80300.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the Forward Frame service. It can take on the following values:  - 'unbound': all resources required to enable the provision of the service have been allocated, and all objects required to provide the service have been instantiated; however, no association yet exists between the user and the provider, i.e., the transfer service provider port is not bound;  - 'boundReady': an association has been established between the user and the provider, and they may interact by means of the service operations. However, sending of SLPDUs from the user to the provider (by means of the PROCESS-DATA operation) is not permitted; the user may enable the transfer of SLPDUs by means of the appropriate service operation (START), which, in turn, will cause the provider to transition to the state 'boundActive';  - 'boundActive': this state resembles state ‘boundReady’, except that now the user can send SLPDUs and the provider is enabled to radiate them to the target Space User Node; the service continues in this state until the user invokes (a) the STOP operation to cause the provider to suspend transmission of SLPDUs and transition back to state 'boundReady' or (b) the PEER-ABORT invocation to cause the service to transition back to the 'unbound' state. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FfSvcInstanceState ::= StatefulCstsInstanceState | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffInitiatorId**' (ff-initiator-id) OID .1.3.112.4.4.2.1.80300.1.4.1 | | **Definition:** This parameter reports the identifier of the peer application, i.e., the authority on whose behalf the CSTS application entity is initiating an association with the Forward Frame service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffResponderId**' (ff-responder-id) OID .1.3.112.4.4.2.1.80300.1.5.1 | | **Definition:** This parameter reports the identifier of the Forward Frame service application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffResponderPortId**' (ff-responder-port-id) OID .1.3.112.4.4.2.1.80300.1.6.1 | | **Definition:** This parameter configures and reports the logical name of the port used by the underlying communication service to respond to invocation on this service instance. The logical name is translated internally by the service provider to a port identifier that is appropriate to the underlying communication service.  This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the responding CSTS application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffResponseTimeout**' (ff-response-timeout) OID .1.3.112.4.4.2.1.80300.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed FwdFrame operation is invoked until the return has to be received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Engineering Unit:** second | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second.  FfResponseTimeout ::= SvcResponseTimeout | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffDataProcessingMode**' (ff-data-processing-mode) OID .1.3.112.4.4.2.1.80300.1.8.1 | | **Definition:** This parameter configures and reports the data processing mode of the service instance. This complex parameter can have one of two values:  - 'sequenceControlled': the Sequence-Controlled Frame Data Processing procedure is the prime procedure type;  - 'bufferedData’: the Buffered Frame Data Processing procedure is the prime procedure type.  The ‘bufferedData’ value is further qualified to (a) specify the transfer mode as either:  - 'complete'; or  - timely‘;  and (b) to specify the Maximum Forward Buffer Size and Processing Latency Limit. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState ≠'boundActive'. | | **Engineering Unit:** either N/A or N/A / N/A / 1/1000 s | | **Configured:** true | | **Type Definition:**  FfDataProcessingMode ::= CHOICE  {  sequenceControlled [0] NULL  , bufferedData [1] SEQUENCE  {    -- This parameter configures and reports the buffered-data transfer mode of the service  -- instance.  dataTransferMode ENUMERATED  {  complete (0)  , timely (1)  }    ,  -- This parameter configures and reports the initial value of the maximum size allowed  -- in for incoming Forward Buffers, in number of PROCESS-DATA invocations  maxFwdBufferSize LongIntPos  ,  -- The initial value of the processing latency limit in milliseconds, for the data processing  -- procedure of the service instance  processingLatencyLimit LongIntPos  }    } | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffAuthorizedGvcidAndBitMask**' (ff-authorized-gvcid-and-bit-mask) OID .1.3.112.4.4.2.1.80300.1.9.1 | | **Definition:** This parameter configures and reports (a) the bit pattern that specifies the Global VCID that is authorized to use the Forward Frame service instance, and (b) the bit mask to be applied to the first four octets of each incoming transfer frame) to mask out any bits that are not used to ascertain whether the Global VCID of that transfer frame is authorized to use the Forward Frame service instance.  For TC and AOS frames, only the bits corresponding to the TFVN, SCID, and VCID are set to their correct values, and all other bits in the 4-octet field are set to 0.  For USLP frames, only the bits corresponding to the TFVN, SCID, Source or Destination ID, and VCID are set to their correct values, and all other bits in the 4-octet field are set to 0.  For TC, AOS, or USLP frames, the bit mask values are predefined and do not need to be specified in the configuration paramters.  For CADUs, the headers are not checked, regardless of the enclosed frame types, and the bit mask is predefined to allow any values in the forst 4 octets of the CADU.  For frames that do not conform to TC, AOS, or USLP frame formats but still need to have the first 4 octets validated, the 'other' value allows the user to specify the allowed bit pattern and the bit mask that validates that bit pattern. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState ≠'boundActive'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfAuthorizedGvcidAndBitMask ::= CHOICE  {    -- When TC frames are used, the bits corresponding to the TFVN (bits 0-1 = '00' binary)  -- , SCID (bits 6-15), and VCID (bits 16-21) are set to their correct values, and all  -- other bits in the 4-octet field are set to 0. The value of the gvcid-bit-mask configuration  -- parameter shall be C3 FF FC 00 Hex.  tcGvcid [0] SEQUENCE  {    -- The TFVN of TC frames is version 1 (binary '00')  tcTfvn BIT STRING ('00'B)  , tcScid INTEGER (0 .. 1023)  , tcVcid INTEGER (0 .. 63)  }    ,  -- When AOS frames are used, the bits corresponding to the TFVN (bits 0-1 = '01' binary),  -- SCID (bits 2-9), and VCID (bits 10-15) are set to their correct values, and all  -- other bits in the 4-octet field are set to 0. The value of the gvcid-bit-mask configuration  -- parameter shall be FF FF 00 00 Hex  aosGvcid [1] SEQUENCE  {    -- The TFVN of AOS frames is version 2 (binary '01').  aosTfvn BIT STRING ('01'B)  , aosScid INTEGER (0 .. 255)  , aosVcid INTEGER (0 .. 63)  }    ,  -- When USLP frames are used, the bits corresponding to the TFVN (bits 0-3 = '1100'),  -- SCID (bits 4-19), Source or Destination ID (bit20),and VCID (bits 21-26) are set  -- to their correct values, and all other bits in the 4-octet field are set to 0. The  -- value of the gvcid-bit-mask configuration parameter shall be FF FF FF E0 Hex  uslpGvcid [2] SEQUENCE  {    -- The TFVN of USLP frames is version 4 (binary '1100').  uslpTfvn BIT STRING ('1100'B)  , uslpScid INTEGER (0 .. 65535)  , uslpVcid INTEGER (0 .. 63)  }    ,  -- When a CADU is used, no frame header checking is performed, regardeless of the space  -- link protocol. The first 4 octets may contain any value, and the value of the gvcid-bit-mask  -- configuration parameter shall be 00 00 00 00 Hex.  cadu [3] NULL  ,  -- For frames that do not conform to the TC, AOS, or USLP formats, the content of the  -- Authorized GVCID and the structure of the Bit Mask is defined by the user.  other [4] SEQUENCE  {  otherBitMask OCTET STRING (SIZE( 4))  ,  -- For other frame types, the authorized value can be any bit pattern that is appropriate  -- to the first 4 octets of that frame type.  otherAuthorizedValue OCTET STRING (SIZE( 4))  }    } | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffMinFrameLength**' (ff-min-frame-length) OID .1.3.112.4.4.2.1.80300.1.10.1 | | **Definition:** This parameter configures and reports the minimum permitted length, in octets, for incoming space link protocol data units (e.g., transfer frames). | | **Guard Condition:** ffMinFrameLength must be less than or equal to ffMaxFrameLength.  If the Forward Frame CSTS Provider instance is configured to supply frames to a variable-length frame multiplexer, then the ffMinFrameLength must be within the frame length range configured for that multiplexer.  If the Forward Frame CSTS Provider instance is configured to supply frames to a fixed-length frame multiplexer, then ffMinFrameLength must be equal to the frame length configured for that multiplexer. | | **Engineering Unit:** octets | | **Configured:** true | | **Type Definition:**  FfMinFrameLength ::= ShortIntPos | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffMaxFrameLength**' (ff-max-frame-length) OID .1.3.112.4.4.2.1.80300.1.11.1 | | **Definition:** This parameter configures and reports the maximum permitted length, in octets, for incoming space link protocol data units (e.g., transfer frames).  The maximum permitted length must be equal to or greater than the minimum permitted length (ffMinFrameLength). | | **Guard Condition:** ffMaxFrameLength must be greater than or equal to ffMinFrameLength.  If the Forward Frame CSTS Provider instance is configured to supply frames to a variable-length frame multiplexer, then the ffMaxFrameLength must be within the frame length range configured for that multiplexer.  If the Forward Frame CSTS Provider instance is configured to supply frames to a fixed-length frame multiplexer, then ffMaxFrameLength must be equal to the frame length configured for that multiplexer. | | **Engineering Unit:** octets | | **Configured:** true | | **Type Definition:**  FfMaxFrameLength ::= ShortIntPos | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffInputQueueSize**' (ff-input-queue-size) OID .1.3.112.4.4.2.1.80300.1.12.1 | | **Definition:** This parameter configures and reports the initial value of the Input Queue size (that is, the size of the queue upon the binding of the service instance), in number of PROCESS-DATA invocations, for the data processing procedure of the service instance. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState ≠'boundActive'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfInputQueueSize ::= LongIntPos | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffMinAllowedDeliveryCycle**' (ff-min-allowed-delivery-cycle) OID .1.3.112.4.4.2.1.80300.1.13.1 | | **Definition:** This parameter configures and reports the minimum allowed delivery cycle, in milliseconds, to which any instance of the Cyclic Report procedure can be set.  If the Cyclic Report procedure is not present in the implementation of the service, this paramter shall be undefined. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** 1/1000 s | | **Configured:** true | | **Type Definition:**  FfMinAllowedDeliveryCycle ::= MinAllowedDeliveryCycle | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffNamedEventLabelLists**' (ff-named-event-label-lists ) OID .1.3.112.4.4.2.1.80300.1.14.1 | | **Definition:** This parameter configures and reports the set of Event Label Lists used by the Notification procedure of the service instance.  The Notification procedure is optional for implementations of the Forward Frame service. If the service implementation does not support this procedure, or if it is supported but there are no label lists, this parameter is not set and if queried the parameter qualifier shall be 'undefined'. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- The values of the paramOrEventId components are constrained to be event identifiers  FfNamedEventLabelLists ::= LabelListSet | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffMasterThrowEventEnabled**' (ff-master-throw-event-enabled) OID .1.3.112.4.4.2.1.80300.1.15.1 | | **Definition:** This parameter configures and reports whether the service instance is enabled to invoke directives on the production functional resources instances that directly support it. This parameter can take on two values:  - 'enabled';  - ‘disabled’.  If the Master Throw Event procedure is not implemented for the service instance, this parameter is undefined and ignored in the configuration of the functional resource. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  FfMasterThrowEventEnabled ::= ENUMERATED  {  enabled (0)  , disabled (1)  } | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffNamedParamLabelLists**' (ff-named-param-label-lists) OID .1.3.112.4.4.2.1.80300.1.16.1 | | **Definition:** This parameter configures and reports the set of Parameter Label Lists used by the Cyclic Report and/or Information Query procedures of the service instance.  NOTE - Both the Cyclic Report and Information Query procedures are optional for implementations of the Forward Frame service. If the service implementation supports neither of these procedures, or if either or both are supported but there are no label lists, this parameter is not set and if queried the parameter qualifier shall be 'undefined'. | | **Guard Condition:** Setting of this parameter by means of the ffSetContrParams directive is only permissible while ffSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- the values of the paramOrEventId components are constrained to be parameter identifiers  FfNamedParamLabelLists ::= LabelListSet | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffNumberOfDataUnitsRcvd**' (ff-number-of-data-units-rcvd) OID .1.3.112.4.4.2.1.80300.1.17.1 | | **Definition:** This parameter reports the number of space link protocol data units (e.g., frames), in number of PROCESS-DATA invocations, received by the data processing procedure of the service instance since the beginning of the Service Instance Provision Period. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FfNumberOfDataUnitsRcvd ::= LongIntUnsigned | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffNumberOfDataUnitsSubmittedToProcessing**' (ff-number-of-data-units-submitted-to-processing) OID .1.3.112.4.4.2.1.80300.1.18.1 | | **Definition:** This parameter reports the number of spalce link protocol data units (e.g., frames) , in number of PROCESS-DATA invocations, submitted by the data processing procedure of the service instance to service production processing since the beginning of the Service Instance Provision Period. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FfNumberOfDataUnitsSubmittedToProcessing ::= LongIntUnsigned | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) parameter '**ffNumberOfDataUnitsProcessed**' (ff-number-of-data-units-processed) OID .1.3.112.4.4.2.1.80300.1.19.1 | | **Definition:** This parameter reports the number of space link protocol data units (e.g., frames) in number of PROCESS-DATA invocations, that have been reported by service production to have completed processing – i.e., to have been radiated - since the beginning of the Service Instance Provision Period | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  FfNumberOfDataUnitsProcessed ::= LongIntUnsigned | |  |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) event '**ffProdStatChange**' (ff-prod-stat-change) OID .1.3.112.4.4.2.1.80300.2.1.1 | | **Definition:** This event notifies any change of ffProdStat parameter value. | | |  | | --- | | [**ffProdStatChange**](#id0xae7b00) value '**ffProdStatChangeEvtValue**' (ff-prod-stat-change-evt-value) | | **Definition:** The event value reports the ffProdStat value that applies since the notified ffProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  FfProdStatChangeEvtValue ::= FfProdStat | |  | |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) event '**ffProdConfgurationChange**' (ff-prod-configuration-change) OID .1.3.112.4.4.2.1.80300.2.2.1 | | **Definition:** This event triggers when a one or more parameters controlling the configuration of service production have been changed.  This event carries no additional information. | | |  | | --- | | [**ffProdConfgurationChange**](#id0xaea680) value '**ffProdConfgurationChangeEvtValue**' (ff-prod-configuration-change-evt-value) | | **Definition:** The value of this event is 'empty'. | | **Type Definition:**  FfProdConfgurationChangeEvtValue ::= ProdConfigurationChangeEvtValue | |  | |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) event '**ffOperatorNotify**' (ff-operator-notify) OID .1.3.112.4.4.2.1.80300.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**ffOperatorNotify**](#id0xaed280) value '**ffOperatorNotifyMessage**' (ff-operator-notify-message) | | **Definition:** The messages passed by means of the ffOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  FfOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**FwdFrameCstsProvider**](#id0xaab680) directive '**ffSetContrParams**' (ff-set-contr-params) OID .1.3.112.4.4.2.1.80300.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the FwdFrameCstsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**ffSetContrParams**](#id0xaefe00) qualifier '**ffContrParamIdsAndValuesDirQual**' (ff-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a sequence of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the FwdFrameCstsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  FfContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'RafTsProvider' [(back to top)](#toc)

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| FR Stratum: 'Data Transfer Services' FR Set: 'SLE Return All Frames' |
| **Definition:** The RafTsProvider accepts as input the frames provided by the FlfSyncAndDecode and the OfflineFrameBuffer FRs. Furthermore, the RafTsProvider FR type is specified to accept variable length frames delivered by the TcPlopSyncChnlDecode FR. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .80400   |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafProdStat**' (raf-prod-stat) OID .1.3.112.4.4.2.1.80400.1.1.1 | | **Definition:** This enumerated parameter reports the status of the service production process used by the given instance of an RAF service. It can take on the following values:  - 'running' - the RAF production process is capable of processing a return space link physical channel, if available;  - 'interrupted' - the RAF production process is stopped due to a fault;  - 'halted' - the RAF production process is stopped and production equipment is taken out of service due to management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RafProdStat ::= SleRtnProdStat | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafSvcInstanceId**' (raf-svc-instance-id) OID .1.3.112.4.4.2.1.80400.1.2.1 | | **Definition:** This parameter configures and reports the identifier of the given service instance. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafSvcInstanceId ::= SleSvcInstanceId | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafSvcInstanceState**' (raf-svc-instance-state) OID .1.3.112.4.4.2.1.80400.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the RAF service. It can take on the following values:  - 'unbound' - All resources required to enable the provision of the RAF service have been allocated, and all objects required to provide the service have been instantiated; however, no association yet exists between the user and the provider, i.e., the RAF transfer service provider port is not bound;  - 'ready'- An association has been established between the user and the provider, and they may interact by means of the service operations. However, sending of telemetry frames from the provider to the user (by means of the RAF-TRANSFER-DATA operation) is not permitted; the user may enable the delivery of telemetry frames by means of the appropriate service operation (RAF-START), which, in turn, will cause the provider to transition to the rafSvcInstanceState 'active';  - 'active' - This state resembles the rafSvcInstanceState ‘ready’, except that now the provider will send telemetry frames provided frames of the selected characteristics are made available by the RAF production process; the service continues in this state until the user invokes either the RAF-STOP operation to cause the provider to suspend delivery of telemetry frames and transition back to the rafSvcInstanceState 'ready' or the PEER-ABORT invocation to cause the service to transition back to the rafSvcInstanceState 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RafSvcInstanceState ::= SleSvcInstanceState | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafInitiatorId**' (raf-initiator-id) OID .1.3.112.4.4.2.1.80400.1.4.1 | | **Definition:** This parameter configures and reports the identifier of the peer application, i.e., the authority on whose behalf the SLE application entity is initiating an association with the RAF service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafResponderId**' (raf-responder-id) OID .1.3.112.4.4.2.1.80400.1.5.1 | | **Definition:** This parameter configures and reports the identifier of the RAF application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafResponderPortId**' (raf-responder-port-id) OID .1.3.112.4.4.2.1.80400.1.6.1 | | **Definition:** This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the responding SLE application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafRtnTimeoutPeriod**' (raf-rtn-timeout-period) OID .1.3.112.4.4.2.1.80400.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed RAF operation is invoked until the return is received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second.  RafRtnTimeoutPeriod ::= SvcResponseTimeout | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafDeliveryMode**' (raf-delivery-mode) OID .1.3.112.4.4.2.1.80400.1.8.1 | | **Definition:** This enumerated parameter configures and reports the delivery mode of the given RAF service instance. It can take on three values:  - 'onlineTimely' - this delivery mode limits the size of the backlog of not yet delivered data that is allowed to accumulate by discarding data that cannot be delivered within a certain time. Furthermore, when data is discarded, it is discarded ‘in chunks’, i.e., as a sufficiently large block of contiguous frames rather than as random frames here and there; in general, this approach maximizes the usefulness of the data that is delivered.  - 'onlineComplete' - this delivery mode attempts to deliver all acquired frames having the user selected characteristics, in order, with minimum delay consistent with the available ground communications bandwidth. To that end, the service provider has a buffer sufficiently large to deal with communications service delays, outages, and bandwidth limitations;  - 'offline' - in this delivery mode, the provider buffer (see OfflineFrameBuffer FR) enables data to be delivered hours or days after their acquisition. To that end, this buffer is sufficiently large to hold all data that might be accumulated during several space link sessions. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafDeliveryMode ::= SleRtnDeliveryMode | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafLatencyLimit**' (raf-latency-limit) OID .1.3.112.4.4.2.1.80400.1.9.1 | | **Definition:** This parameter configures and reports the maximum allowable delivery latency time, in seconds, for the online delivery modes, i.e., the maximum delay from when the frame has been acquired by the provider until it is delivered to the user. If rafDeliveryMode = 'offline', rafLatencyLimit has no effect. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second  RafLatencyLimit ::= INTEGER (1 .. 100) | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafTransferBufferSize**' (raf-transfer-buffer-size) OID .1.3.112.4.4.2.1.80400.1.10.1 | | **Definition:** This parameter configures and reports the number of frames the provider shall block in one RAF-PDU before passing it to the underlying communications layer except if expiry of the rafLatencyLimit requires earlier release of the RAF-PDU. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafTransferBufferSize ::= INTEGER (1 .. 1000) | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafPermittedFrameQuality**' (raf-permitted-frame-quality) OID .1.3.112.4.4.2.1.80400.1.11.1 | | **Definition:** This enumerated parameter configures and reports the set of the quality of the frames that the user may select with the given RAF service instance. The permitted frame quality settings must be chosen from the following set of values:  - 'good' - only frames that based on successful RS or LDPC decoding/correcting and/or based on the check of the FECF are assumed to be error free will be delivered to the user;  - 'erred' - only frames that based on unsuccessful RS or LDPC decoding/correcting or based on the failed check of the FECF were found to contain errors will be delivered to the user;  - 'all' - all frames regardless if error free or not are delivered to the user; this includes telemetry frames for which due to lack of compatibility with the pertinent CCSDS Recommendations the quality cannot be determined. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RafPermittedFrameQuality ::= SET (SIZE( 1 .. 3)) OF ENUMERATED  {  good (0)  , erred (1)  , all (2)  } | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafRequestedFrameQuality**' (raf-requested-frame-quality) OID .1.3.112.4.4.2.1.80400.1.12.1 | | **Definition:** This enumerated parameter reports the quality of the frames that shall be delivered by the given RAF service instance. It can take on one of three values:  - 'good' - only frames that based on successful RS or LDPC decoding/correcting and/or based on the check of the FECF are assumed to be error free will be delivered to the user;  - 'erred' - only frames that based on unsuccessful RS or LDPC decoding/correcting and/or based on the failed check of the FECF were found to contain errors will be delivered to the user;  - 'all' - all frames regardless if error free or not are delivered to the user; this includes telemetry frames for which due to lack of compatibility with the pertinent CCSDS Recommendations the quality cannot be determined.  If the given service instance does not constrain this parameter to a single value, it shall be flagged 'undefined' whenever rafSvcInstanceState ≠ 'active'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RafRequestedFrameQuality ::= ENUMERATED  {  good (0)  , erred (1)  , all (2)  } | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafMinReportingCycle**' (raf-min-reporting-cycle) OID .1.3.112.4.4.2.1.80400.1.13.1 | | **Definition:** This parameter configures and reports the minimum time in seconds between successive RAF-STATUS-REPORT invocations sent by the RAF service provider that may be requested in an RAF-SCHEDULE-STATUS-REPORT invocation. | | **Guard Condition:** Setting of this parameter by means of the rafSetContrParams directive is only permissible while rafSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The enginneering unit is second.  RafMinReportingCycle ::= MinAllowedReportingCycle | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafReportingCycle**' (raf-reporting-cycle) OID .1.3.112.4.4.2.1.80400.1.14.1 | | **Definition:** This parameter reports the current setting of the time in seconds between successive RAF-STATUS-REPORT invocations sent by the RAF service provider provided rafReportingCycle is 'on'. When rafReportingCycle is 'off', no cycle time is reported. | | **Engineering Unit:** s | | **Configured:** false | | **Type Definition:**  -- The engineering unit of this parameter is second.  RafReportingCycle ::= SleReportingCycle | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafNumberOfErrorFreeFramesDelivered**' (raf-number-of-error-free-frames-delivered) OID .1.3.112.4.4.2.1.80400.1.15.1 | | **Definition:** This parameter reports the total number of telemetry frames that have been annotated with a frame-quality of ‘good’ and delivered to the user since the start of the service instance provision period. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RafNumberOfErrorFreeFramesDelivered ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) parameter '**rafNumberOfFramesDelivered**' (raf-number-of-frames-delivered) OID .1.3.112.4.4.2.1.80400.1.16.1 | | **Definition:** This parameter reports the total number of telemetry frames that have been delivered to the user since the start of the service instance provision period. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RafNumberOfFramesDelivered ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) event '**rafProdStatChange**' (raf-prod-stat-change) OID .1.3.112.4.4.2.1.80400.2.1.1 | | **Definition:** This event notifies any change of the rafProdStat parameter. | | |  | | --- | | [**rafProdStatChange**](#id0xb1ec80) value '**rafProdStatChangeEvtValue**' (raf-prod-stat-change-evt-value) | | **Definition:** The event value reports the rafProdStat parameter value that applies since the notified rafProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  RafProdStatChangeEvtValue ::= RafProdStat | |  | |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) event '**rafProdConfigurationChange**' (raf-prod-configuration-change) OID .1.3.112.4.4.2.1.80400.2.2.1 | | **Definition:** This event triggers when one or more parameters controlling the configuration of service production of the service instance identified by the rafServiceInstanceId parameter have been changed.  This event carries no additional information. | | |  | | --- | | [**rafProdConfigurationChange**](#id0xb21880) value '**rafProdConfigurationChangeEvtValue**' (raf-prod-configuration-change-evt-value) | | **Definition:** The event-value of this event is 'empty'. | | **Engineering Unit:** N/A | | **Type Definition:**  RafProdConfigurationChangeEvtValue ::= ProdConfigurationChangeEvtValue | |  | |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) event '**rafOperatorNotify**' (raf-operator-notify) OID .1.3.112.4.4.2.1.80400.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**rafOperatorNotify**](#id0xb24400) value '**rafOperatorNotifyMessage**' (raf-operator-notify-message) | | **Definition:** The messages passed by means of the rafOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  RafOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**RafTsProvider**](#id0xaf2b80) directive '**rafSetContrParams**' (raf-set-contr-params) OID .1.3.112.4.4.2.1.80400.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the RafTsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**rafSetContrParams**](#id0xb26f80) qualifier '**rafContrParamIdsAndValuesDirQual**' (raf-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the RafTsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  RafContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'RcfTsProvider' [(back to top)](#toc)

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| FR Stratum: 'Data Transfer Services' FR Set: 'SLE Return Channel Frames' |
| **Definition:** The RcfTsProvider accepts as input the frames provided by the FlfSyncAndChnlDecode and the OfflineFrameBuffer FRs. Furthermore, the RcfTsProvider FR type is specified to accept variable length frames delivered by the TcPlopSyncChnlDecode FR. It delivers the frames of the selected Master or Virtual Channel. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .80500   |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfProdStat**' (rcf-prod-stat) OID .1.3.112.4.4.2.1.80500.1.1.1 | | **Definition:** This enumerated parameter reports the status of the service production process used by the given instance of an RCF service. It can take on the following values:  - 'running' - the RCF production process is capable of processing a return link Master or Virtual Channel, if available;  - 'interrupted' - the RCF production process is stopped due to a fault;  - 'halted' - the RCF production process is stopped and production equipment is taken out of service due to management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RcfProdStat ::= SleRtnProdStat | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfSvcInstanceId**' (rcf-svc-instance-id) OID .1.3.112.4.4.2.1.80500.1.2.1 | | **Definition:** This parameter configures and reports the identifier of the given service instance. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfSvcInstanceId ::= SleSvcInstanceId | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfSvcInstanceState**' (rcf-svc-instance-state) OID .1.3.112.4.4.2.1.80500.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the RCF service. It can take on the following values:  - 'unbound' - All resources required to enable the provision of the RCF service have been allocated, and all objects required to provide the service have been instantiated; however, no association yet exists between the user and the provider, i.e., the RCF transfer service provider port is not bound;  - 'ready'- An association has been established between the user and the provider, and they may interact by means of the service operations. However, sending of telemetry frames from the provider to the user (by means of the RCF-TRANSFER-DATA operation) is not permitted; the user may enable the delivery of telemetry frames by means of the appropriate service operation (RCF-START), which, in turn, will cause the provider to transition to the state 'active';  - 'active' - This state resembles state ‘ready’, except that now the provider will send telemetry frames provided frames of the selected characteristics are made available by the RCF production process; the service continues in this state until the user invokes the RCF-STOP operation to cause the provider to suspend delivery of telemetry frames and transition back to state 'ready' or the PEER-ABORT invocation to cause the service to transition back to the 'unbound' state. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RcfSvcInstanceState ::= SleSvcInstanceState | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfInitiatorId**' (rcf-initiator-id) OID .1.3.112.4.4.2.1.80500.1.4.1 | | **Definition:** This parameter configures and reports the identifier of the peer application, i.e., the authority on whose behalf the SLE application entity is initiating an association with the RCF service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfResponderId**' (rcf-responder-id) OID .1.3.112.4.4.2.1.80500.1.5.1 | | **Definition:** This parameter configures and reports the identifier of the RCF application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfResponderPortId**' (rcf-responder-port-id) OID .1.3.112.4.4.2.1.80500.1.6.1 | | **Definition:** This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the responding SLE application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfRtnTimeoutPeriod**' (rcf-rtn-timeout-period) OID .1.3.112.4.4.2.1.80500.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed RCF operation is invoked until the return is received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second.  RcfRtnTimeoutPeriod ::= SvcResponseTimeout | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfDeliveryMode**' (rcf-delivery-mode) OID .1.3.112.4.4.2.1.80500.1.8.1 | | **Definition:** This enumerated parameter configures and reports the delivery mode of the given RCF service instance. It can take on three values:  - 'onlineTimely' - this delivery mode limits the size of the backlog of not yet delivered data that is allowed to accumulate by discarding data that cannot be delivered within a certain time. Furthermore, when data is discarded, it is discarded ‘in chunks’, i.e., as a sufficiently large block of contiguous frames rather than as random frames here and there; in general, this approach maximizes the usefulness of the data that is delivered.  - 'onlineComplete' - this delivery mode attempts to deliver all acquired frames having the user selected characteristics, in order, with minimum delay consistent with the available ground communications bandwidth. To that end, the service provider has a buffer sufficiently large to deal with communications service delays, outages, and bandwidth limitations;  - 'offline' - in this delivery mode, the provider side buffer (see OfflineFrameBuffer FR) enables data to be delivered hours or days after their acquisition. To that end, this buffer is sufficiently large to hold all data that might be accumulated during several space link sessions. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfDeliveryMode ::= SleRtnDeliveryMode | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfLatencyLimit**' (rcf-latency-limit) OID .1.3.112.4.4.2.1.80500.1.9.1 | | **Definition:** This parameter configures and reports the maximum allowable delivery latency time, in seconds, for the online delivery modes, i.e., the maximum delay from when the frame has been acquired by the provider until it is delivered to the user. This parameter shall be flagged as undefined if rcfDeliveryMode = 'offline'. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second.  RcfLatencyLimit ::= INTEGER (1 .. 100) | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfTransferBufferSize**' (rcf-transfer-buffer-size) OID .1.3.112.4.4.2.1.80500.1.10.1 | | **Definition:** This parameter configures and reports the number of frames the provider shall block in one RCF-PDU before passing it to the underlying communications layer except if expiry of rcfLatencyLimit requires earlier release of the RCF-PDU. If rcfDeliveryMode = 'offline', rcfLatencyLimit has no effect. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfTransferBufferSize ::= INTEGER (1 .. 100) | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfPermittedGvcidSet**' (rcf-permitted-gvcid-set ) OID .1.3.112.4.4.2.1.80500.1.11.1 | | **Definition:** This parameter configures and reports the set of Master and/or Virtual Channel that the given RCF service instance permits the user to select. The parameter is a set of the concatenation of the CCSDS assigned Spacecraft Identifier (SCID), the Transfer Frame Version Number (TFVN) and, if applicable, the Virtual Channel Identifier (VCID). The range of the Spacecraft Identifier and the Virtual Channel Identifier depend on the TFVN as follows:  - TFVN = binary '00' (version 1) - SCID = (0 .. 1023), VCID = (0 .. 7);  - TFVN = binary '01' (version 2) - SCID = (0 .. 255), VCID = (0 .. 63);  - TFVN = binary '1100' (version 4) - SCID = (0 .. 65535), VCID = (0 .. 63). | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RcfPermittedGvcidSet ::= CHOICE  {  tm [0] SET (SIZE( 1 .. 9216)) OF SEQUENCE  {    -- The TFVN of TM frames is version 1 (binary '00').  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 7)  }    }    , aos [1] SET (SIZE( 1 .. 16640)) OF SEQUENCE  {    -- The TFVN of AOS frames is version 2 (binary '01').  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    , uslp [2] SET (SIZE( 1 .. 4194304)) OF SEQUENCE  {    -- The TFVN of USLP frames is version 4 (binary '1100').  tfvn BIT STRING ('1100'B)  , scid INTEGER (0 .. 65535)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    } | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfRequestedGvcid**' (rcf-requested-gvcid) OID .1.3.112.4.4.2.1.80500.1.12.1 | | **Definition:** This parameter reports the Master or Virtual Channel that the given RCF service instance shall deliver to the user. The parameter is the concatenation of the CCSDS assigned Spacecraft Identifier (SCID), the Transfer Frame Version Number (TFVN) and, if applicable, the Virtual Channel Identifier (VCID). The range of the Spacecraft Identifier and the Virtual Channel Identifier depend on the TFVN as follows:  - TFVN = binary '00' (version 1) - SCID = (0 .. 1023), VCID = (0 .. 7);  - TFVN = binary '01' (version 2) - SCID = (0 .. 255), VCID = (0 .. 63);  - TFVN = binary '1100' (version 4) - SCID = (0 .. 65535), VCID = (0 .. 63).  If the global VCID is not constrained to a single value by the given RCF service instance (see rcfPermittedGvcidSet), then this parameter shall be flagged undefined as long as rcfSvcInstanceState ≠ 'active'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RcfRequestedGvcid ::= CHOICE  {  tm [0] SEQUENCE  {    -- The TFVN of TM frames is version 1 (binary '00').  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {    -- In case the Master Channel is selected, the VCID remains unspecified.  masterChannel [0] NULL  , vcid [1] INTEGER (0 .. 7)  }    }    , aos [1] SEQUENCE  {    -- The TFVN of AOS frames is version 2 (binary '01').  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  , vcid CHOICE  {    -- When a Master Channel is selected, the VCID remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    , uslp [2] SEQUENCE  {    -- The TFVN of USLP frames is version 4 (binary '1100').  tfvn BIT STRING ('1100'B)  , scid INTEGER (0 .. 65535)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    } | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfMinReportingCycle**' (rcf-min-reporting-cycle) OID .1.3.112.4.4.2.1.80500.1.13.1 | | **Definition:** This parameter configures and reports the minimum time in seconds between successive RCF-STATUS-REPORT invocations sent by the RCF service provider that may be requested in an RCF-SCHEDULE-STATUS-REPORT invocation. | | **Guard Condition:** Setting of this parameter by means of the rcfSetContrParams directive is only permissible while rcfSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The enginneering unit is second.  RcfMinReportingCycle ::= MinAllowedReportingCycle | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfReportingCycle**' (rcf-reporting-cycle) OID .1.3.112.4.4.2.1.80500.1.14.1 | | **Definition:** This parameter reports if cyclic reporting is active and if so it reports the current setting of the time in seconds between successive RCF-STATUS-REPORT invocations sent by the RCF service provider. | | **Engineering Unit:** s | | **Configured:** false | | **Type Definition:**  RcfReportingCycle ::= SleReportingCycle | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) parameter '**rcfNumberOfFramesDelivered**' (rcf-number-of-frames-delivered) OID .1.3.112.4.4.2.1.80500.1.15.1 | | **Definition:** This parameter reports the total number of telemetry frames that have been delivered to the user since the start of the service instance provision period. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RcfNumberOfFramesDelivered ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) event '**rcfProdStatChange**' (rcf-prod-stat-change) OID .1.3.112.4.4.2.1.80500.2.1.1 | | **Definition:** This event notifies any change of the rcfProdtat parameter value. | | |  | | --- | | [**rcfProdStatChange**](#id0xb5bc00) value '**rcfProdStatChangeEvtValue**' (rcf-prod-stat-change-evt-value) | | **Definition:** The event value reports the rcfProdStat parameter value that applies since the notified rcfProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  RcfProdStatChangeEvtValue ::= RcfProdStat | |  | |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) event '**rcfProdConfigurationChange**' (rcf-prod-configuration-change) OID .1.3.112.4.4.2.1.80500.2.2.1 | | **Definition:** This event triggers when one or more parameters controlling the configuration of service production of the service instance identified by the rcfSvcInstanceId parameter have been changed.  This event carries no additional information. | | |  | | --- | | [**rcfProdConfigurationChange**](#id0xb5e780) value '**rcfProdConfigurationChangeEvtValue**' (rcf-prod-configuration-change-evt-value) | | **Definition:** The event value of this event is 'empty'. | | **Engineering Unit:** N/A | | **Type Definition:**  RcfProdConfigurationChangeEvtValue ::= ProdConfigurationChangeEvtValue | |  | |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) event '**rcfOperatorNotify**' (rcf-operator-notify) OID .1.3.112.4.4.2.1.80500.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**rcfOperatorNotify**](#id0xb61380) value '**rcfOperatorNotifyMessage**' (rcf-operator-notify-message) | | **Definition:** The messages passed by means of the rcfOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  RcfOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**RcfTsProvider**](#id0xb29e80) directive '**rcfSetContrParams**' (rcf-set-contr-params) OID .1.3.112.4.4.2.1.80500.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the RcfTsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**rcfSetContrParams**](#id0xb63f00) qualifier '**rcfContrParamIdsAndValuesDirQual**' (rcf-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the RcfTsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  RcfContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'RocfTsProvider' [(back to top)](#toc)

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| FR Stratum: 'Data Transfer Services' FR Set: 'SLE Return Operational Control Fields' |
| **Definition:** The RocfTsProvider accepts as input the frames provided by the FlfSyncAndDecode and the OfflineFrameBuffer FRs. Furthermore, the RocfTsProvider FR type is specified to accept variable length frames delivered by the TcPlopSyncChnlDecode FR. It delivers the Operational Control Fields (OCF) extracted from the frames of the selected Master or Virtual Channel provided the OCFs meet the other selection criteria set by the ROCF service user. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .80600   |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfProdStat**' (rocf-prod-stat) OID .1.3.112.4.4.2.1.80600.1.1.1 | | **Definition:** This enumerated parameter reports the status of the service production process used by the given instance of an ROCF service. It can take on the following values:  - 'running' - the ROCF production process is capable of processing a return link Master or Virtual Channel, if available;  - 'interrupted' - the ROCF production process is stopped due to a fault;  - 'halted' - the ROCF production process is stopped and production equipment is taken out of service due to management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfProdStat ::= SleRtnProdStat | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfSvcInstanceId**' (rocf-svc-instance-id) OID .1.3.112.4.4.2.1.80600.1.2.1 | | **Definition:** This parameter configures and reports the identifier of the given service instance. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfSvcInstanceId ::= SleSvcInstanceId | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfSvcInstanceState**' (rocf-svc-instance-state) OID .1.3.112.4.4.2.1.80600.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the ROCF service. It can take on the following values:  - 'unbound' - All resources required to enable the provision of the ROCF service have been allocated, and all objects required to provide the service have been instantiated; however, no association yet exists between the user and the provider, i.e., the ROCF transfer service provider port is not bound;  - 'ready'- An association has been established between the user and the provider, and they may interact by means of the service operations. However, sending of Operational Control Fields (OCFs) from the provider to the user (by means of the ROCF-TRANSFER-DATA operation) is not permitted; the user may enable the delivery of OCFs by means of the appropriate service operation (ROCF-START), which, in turn, will cause the provider to transition to the state 'active';  - 'active' - This state resembles state ‘ready’, except that now the provider will send OCFs provided frames of the selected characteristics are made available by the ROCF production process; the service continues in this state until the user invokes the ROCF-STOP operation to cause the provider to suspend delivery of OCFs and transition back to state 'ready' or the PEER-ABORT invocation to cause the service to transition back to the 'unbound' state. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfSvcInstanceState ::= SleSvcInstanceState | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfInitiatorId**' (rocf-initiator-id) OID .1.3.112.4.4.2.1.80600.1.4.1 | | **Definition:** This parameter configures and reports the identifier of the peer application, i.e., the authority on whose behalf the SLE application entity is initiating an association with the ROCF service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfResponderId**' (rocf-responder-id) OID .1.3.112.4.4.2.1.80600.1.5.1 | | **Definition:** This parameter configures and reports the identifier of the ROCF application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfResponderPortId**' (rocf-responder-port-id) OID .1.3.112.4.4.2.1.80600.1.6.1 | | **Definition:** This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the responding SLE application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfRtnTimeoutPeriod**' (rocf-rtn-timeout-period) OID .1.3.112.4.4.2.1.80600.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed ROCF operation is invoked until the return is received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second  RocfRtnTimeoutPeriod ::= SvcResponseTimeout | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfDeliveryMode**' (rocf-delivery-mode) OID .1.3.112.4.4.2.1.80600.1.8.1 | | **Definition:** This enumerated parameter configures and reports the delivery mode of the given ROCF service instance. It can take on three values:  - 'onlineTimely' - this delivery mode limits the size of the backlog of not yet delivered data that is allowed to accumulate by discarding data that cannot be delivered within a certain time. Furthermore, when data is discarded, it is discarded ‘in chunks’, i.e., as OCFs extracted from a sufficiently large block of contiguous frames rather than as OCFs from random frames here and there; in general, this approach maximizes the usefulness of the data that is delivered.  - 'onlineComplete' - this delivery mode attempts to deliver the OCFs having the user selected characteristics from all acquired frames, in order, with minimum delay consistent with the available ground communications bandwidth. To that end, the service provider has a buffer sufficiently large to deal with communications service delays, outages, and bandwidth limitations;  - 'offline' - in this delivery mode, the provider side buffer (see OfflineFrameBuffer FR) enables data to be delivered hours or days after their acquisition. To that end, this buffer is sufficiently large to hold all data that might be accumulated during several space link sessions. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfDeliveryMode ::= SleRtnDeliveryMode | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfLatencyLimit**' (rocf-latency-limit) OID .1.3.112.4.4.2.1.80600.1.9.1 | | **Definition:** This parameter configures and reports the maximum allowable delivery latency time, in seconds, for the online delivery modes, i.e., the maximum delay from when the provider extracts an OCF from a newly acquired frame until it is delivered to the user. This parameter shall be flagged as undefined if rocfDeliveryMode = 'offline'. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The engineering unit of this parameter is second.  RocfLatencyLimit ::= INTEGER (1 .. 100) | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfTransferBufferSize**' (rocf-transfer-buffer-size) OID .1.3.112.4.4.2.1.80600.1.10.1 | | **Definition:** This parameter configures and reports the number of OCFs the provider shall block in one ROCF-PDU before passing it to the underlying communications layer except if expiry of rocfLatencyLimit requires earlier release of the ROCF-PDU. If rocfDeliveryMode = 'offline', rocfLatencyLlimit has no effect. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfTransferBufferSize ::= INTEGER (1 .. 100) | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfPermittedGvcidSet**' (rocf-permitted-gvcid-set ) OID .1.3.112.4.4.2.1.80600.1.11.1 | | **Definition:** This parameter configures and reports the set of Master and/or Virtual Channel that the given RCF service instance permits the user to select. The parameter is a set of the concatenation of the CCSDS assigned Spacecraft Identifier (SCID), the Transfer Frame Version Number (TFVN) and, if applicable, the Virtual Channel Identifier (VCID). The range of the Spacecraft Identifier and the Virtual Channel Identifier depend on the TFVN as follows:  - TFVN = binary '00' (version 1) - SCID = (0 .. 1023), VCID = (0 .. 7);  - TFVN = binary '01' (version 2) - SCID = (0 .. 255), VCID = (0 .. 63);  - TFVN = binary '1100' (version 4) - SCID = (0 .. 65535), VCID = (0 .. 63). | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfPermittedGvcidSet ::= CHOICE  {  tm [0] SET (SIZE( 1 .. 9216)) OF SEQUENCE  {    -- The TFVN of TM frames is version 1 (binary '00').  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 7)  }    }    , aos [1] SET (SIZE( 1 .. 16640)) OF SEQUENCE  {    -- The TFVN of AOS frames is version 2 (binary '01').  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    , uslp [2] SET (SIZE( 1 .. 4194304)) OF SEQUENCE  {    -- The TFVN of USLP frames is version 4 (binary '1100').  tfvn BIT STRING ('1100'B)  , scid INTEGER (0 .. 65535)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfRequestedGvcid**' (rocf-requested-gvcid) OID .1.3.112.4.4.2.1.80600.1.12.1 | | **Definition:** This parameter reports the Master or Virtual Channel of which the given ROCF service instance shall deliver the OCFs to the user. The parameter is the concatenation of the CCSDS assigned Spacecraft Identifier (SCID), the Transfer Frame Version Number (TFVN) and, if applicable, the Virtual Channel Identifier (VCID). The range of the Spacecraft Identifier and the Virtual Channel Identifier depend on the TFVN as follows:  - TFVN = binary '00' (version 1) - SCID = (0 .. 1023), VCID = (0 .. 7);  - TFVN = binary '01' (version 2) - SCID = (0 .. 255), VCID = (0 .. 63);  - TFVN = binary '1100' (version 4) - SCID = (0 .. 65535), VCID = (0 .. 63).  If the global VCID is not constrained to a single value by the given ROCF service instance (see rocfPermittedGvcidSet), then this parameter shall be flagged undefined as long as rocfSvcInstanceState ≠ 'active'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfRequestedGvcid ::= CHOICE  {  tm [0] SEQUENCE  {    -- The TFVN of TM frames is version 1 (binary '00').  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {    -- In case the Master Channel is selected, the VCID remains unspecified.  masterChannel [0] NULL  , vcid [1] INTEGER (0 .. 7)  }    }    , aos [1] SEQUENCE  {    -- The TFVN of AOS frames is version 2 (binary '01').  tfvn BIT STRING ('01'B)  , scid INTEGER (0 .. 255)  , vcid CHOICE  {    -- When a Master Channel is selected, the VCID remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    , uslp [2] SEQUENCE  {    -- The TFVN of USLP frames is version 4 (binary '1100').  tfvn BIT STRING ('1100'B)  , scid INTEGER (0 .. 65535)  , vcid CHOICE  {    -- For the Master Channel the vcid remains unspecified.  masterChannel [0] NULL  , virtualChannel [1] INTEGER (0 .. 63)  }    }    } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfPermittedContrWordTypeSet**' (rocf-permitted-contr-word-type-set ) OID .1.3.112.4.4.2.1.80600.1.13.1 | | **Definition:** This parameter configures and reports the set of OCF types that the given ROCF service instance permits the user to select. Three types are defined:  - 'allControlWordTypes' - all OCFs shall be delivered regardless of their type;  - 'clcwsOnly' - only OCFs containing the CCSDS defined Communication Link Control Word (CLCW) data structure shall be delivered;  - 'nonClcwsOnly' - only privately defined OCFs shall be delivered. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfPermittedContrWordTypeSet ::= SET (SIZE( 1 .. 3)) OF ENUMERATED  {  allControlWordTypes (0)  , clcwsOnly (1)  , nonClcwsOnly (2)  } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfRequestedContrWordType**' (rocf-requested-contr-word-type) OID .1.3.112.4.4.2.1.80600.1.14.1 | | **Definition:** This enumerated parameter reports the type of the OCFs that shall be delivered. It can take on three values:  - allControlWordTypes' - the service provider delivers all OCFs extracted from the selected telemetry channel, regardless of the control word type they contain;  - 'clcwsOnly' - the service provider delivers the OCFs extracted from the selected telemetry channel that contain CLCW reports;  - 'nonClcwsOnly' - the service provider delivers the OCFs extracted from the selected telemetry channel that contain reports different from CLCWs. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfRequestedContrWordType ::= ENUMERATED  {  allControlWordTypes (0)  , clcwsOnly (1)  , nonClcwsOnly (2)  } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfPermittedTcVcidSet**' (rocf-permitted-tc-vcid-set) OID .1.3.112.4.4.2.1.80600.1.15.1 | | **Definition:** This parameter configures and reports the TC Master Channel and/or the Virtual Channels that the CLCWs that shall be extracted are associated with. If rocfRequestedContrWordType ≠ 'clcwsOnly', this parameter shall be flagged as undefined. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfPermittedTcVcidSet ::= SET (SIZE( 1 .. 66560)) OF SEQUENCE  {    -- The TFVN of TC frames is version 1 (binary '00').  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {    -- When the Master Channel is selected, the VCID remains unspecified.  masterChannel [0] NULL  , vcid [1] INTEGER (0 .. 63)  }    } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfRequestedTcVcid**' (rocf-requested-tc-vcid) OID .1.3.112.4.4.2.1.80600.1.16.1 | | **Definition:** This parameter reports which TC Master Channel or Virtual Channel the OCFs to be delivered shall be associated with. The parameter is the concatenation of the CCSDS assigned Spacecraft Identifier (SCID), the Transfer Frame Version Number (TFVN) and, if applicable, the Virtual Channel Identifier (VCID).  If rocfRequestedContrWordType ≠ 'clcwsOnly', this parameter shall be flagged as undefined. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfRequestedTcVcid ::= SEQUENCE  {    -- The TFVN of TC frames is version 1 (binary '00').  tfvn BIT STRING ('00'B)  , scid INTEGER (0 .. 1023)  , vcid CHOICE  {    -- When the Master Channel is selected, the VCID remains unspecified.  masterChannel [0] NULL  , vcid [1] INTEGER (0 .. 63)  }    } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfPermittedUpdateMode**' (rocf-permitted-update-mode) OID .1.3.112.4.4.2.1.80600.1.17.1 | | **Definition:** This parameter configures and reports the update modes that the given ROCF service instance permits. The update modes are:  - 'continuous': the given ROCF service permits the 'continuous' mode, i.e. the OCF service provider delivers each OCF that fulfills the delivery criteria specified by the ROCF-START invocation parameters start-time, stop-time, requested-global-VCID, control-word-type, and tc-vcid;  - 'onChange': the ROCF service provider delivers those OCFs that fulfill the delivery criteria specified by the ROCF-START invocation parameters start-time, stop-time, requested-global-VCID, control-word-type, and tc-vcid provided the content of the OCF is different from the one of the OCF with the same tc-vcid value previously delivered. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  RocfPermittedUpdateMode ::= SET (SIZE( 1 .. 2)) OF ENUMERATED  {  continuous (0)  , onChange (1)  } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfRequestedUpdateMode**' (rocf-requested-update-mode) OID .1.3.112.4.4.2.1.80600.1.18.1 | | **Definition:** This enumerated parameter reports the update mode applied by the ROCF service provider for the delivery of OCFs. It can take on two values:  - 'continuous' - the ROCF service provider delivers each OCF that fulfills the delivery criteria specified by the ROCF-START invocation parameters start-time, stop-time, requested-global-VCID, control-word-type, and tc-vcid;  - 'onChange' - the ROCF service provider delivers those OCFs that fulfill the delivery criteria specified by the ROCF-START invocation parameters start-time, stop-time, requested-global-VCID, control-word-type, and tc-vcid provided the content of the OCF is different from the one of the OCF with the same tc-vcid value previously delivered. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfRequestedUpdateMode ::= ENUMERATED  {  continuous (0)  , onChange (1)  } | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfMinReportingCycle**' (rocf-min-reporting-cycle) OID .1.3.112.4.4.2.1.80600.1.19.1 | | **Definition:** This parameter configures and reports the minimum time in seconds between successive ROCF-STATUS-REPORT invocations sent by the RCF service provider that may be requested in an ROCF-SCHEDULE-STATUS-REPORT invocation. | | **Guard Condition:** Setting of this parameter by means of the rocfSetContrParams directive is only permissible while rocfSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  -- The enginneering unit is second.  RocfMinReportingCycle ::= MinAllowedReportingCycle | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfReportingCycle**' (rocf-reporting-cycle) OID .1.3.112.4.4.2.1.80600.1.20.1 | | **Definition:** This parameter reports if cyclic reporting is active and if so it reports the current setting of the time in seconds between successive ROCF-STATUS-REPORT invocations sent by the ROCF service provider. | | **Engineering Unit:** s | | **Configured:** false | | **Type Definition:**  RocfReportingCycle ::= SleReportingCycle | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) parameter '**rocfNumberOfOcfsDelivered**' (rocf-number-of-ocfs-delivered) OID .1.3.112.4.4.2.1.80600.1.21.1 | | **Definition:** This parameter reports the total number of OCFs that have been delivered to the user since the start of the service instance provision period. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  RocfNumberOfOcfsDelivered ::= INTEGER (0 .. 4294967295) | |  |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) event '**rocfProdStatChange**' (rocf-prod-stat-change) OID .1.3.112.4.4.2.1.80600.2.1.1 | | **Definition:** This event notifies any change of the rocfProdStat parameter value. | | |  | | --- | | [**rocfProdStatChange**](#id0xbac380) value '**rocfProdStatChangeEvtValue**' (rocf-prod-stat-change-evt-value) | | **Definition:** The event value reports the rocfProdStat parameter value that applies since the notified rocfProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  RocfProdStatChangeEvtValue ::= RocfProdStat | |  | |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) event '**rocfProdConfigurationChange**' (rocf-prod-configuration-change) OID .1.3.112.4.4.2.1.80600.2.2.1 | | **Definition:** This event triggers when one or more parameters controlling the configuration of service production of the service instance identified by the rocfServiceInstanceId parameter have been changed.  This event carries no additional information. | | |  | | --- | | [**rocfProdConfigurationChange**](#id0xbaef00) value '**rocfProdConfigurationChangeEvtValue**' (rocf-prod-configuration-change-evt-value) | | **Definition:** The event-value of this event is 'empty'. | | **Engineering Unit:** N/A | | **Type Definition:**  RocfProdConfigurationChangeEvtValue ::= ProdConfigurationChangeEvtValue | |  | |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) event '**rocfOperatorNotify**' (rocf-operator-notify) OID .1.3.112.4.4.2.1.80600.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**rocfOperatorNotify**](#id0xbb1b00) value '**rocfOperatorNotifyMessage**' (rocf-operator-notify-message) | | **Definition:** The messages passed by means of the rocfOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  RocfOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**RocfTsProvider**](#id0xb66c80) directive '**rocfSetContrParams**' (rocf-set-contr-params) OID .1.3.112.4.4.2.1.80600.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the RocfTsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**rocfSetContrParams**](#id0xbb4680) qualifier '**rocfContrParamIdsAndValuesDirQual**' (rocf-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the RocfTsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  RocfContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'TdCstsProvider' [(back to top)](#toc)

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| FR Stratum: 'Data Transfer Services' FR Set: 'Tracking Data CSTS' |
| **Definition:** The TD-CSTS provider transfers certain types of periodically measured tracking data as soon as they are generated by a Cross Support Complex or anytime thereafter. These tracking data are associated with the signal-related and angle-related TDM keyword categories as specified in CCSDS 503.0-B-1. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .80700   |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdProdStat**' (td-prod-stat) OID .1.3.112.4.4.2.1.80700.1.1.1 | | **Definition:** This parameter reports the production status of the Tracking Data service instance. This parameter can take on one of four values:  - 'configured': all production functions needed to support this service instance have been configured;  - ‘operational’: all production functions have been enabled to process data for this service instance;  - ‘interrupted’: one or more production functions have been stopped because of an error condition that may be temporary;  - ‘halted’: one or more production functions have been stopped by management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TdProdStat ::= ProdStat | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdSvcInstanceId**' (td-svc-instance-id) OID .1.3.112.4.4.2.1.80700.1.2.1 | | **Definition:** This parameter configures and reports the identifier of the given service instance. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdSvcInstanceId ::= CstsSvcInstanceId | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdSvcInstanceState**' (td-svc-instance-state) OID .1.3.112.4.4.2.1.80700.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the Tracking Data service. It can take on the following values:  - 'unbound': all resources required to enable the provision of the service have been allocated, and all objects required to provide the service have been instantiated. However, no association yet exists between the user and the provider, i.e., the transfer service provider port is not bound;  - 'boundReady': an association has been established between the user and the provider, and they may interact by means of the service operations. The user may invoke the GET invocation of the Information Query procedure and receive the requested parameter values.  - 'boundActive': this state resembles state ‘boundReady’, except that in addition the user also receives periodically the requested tracking data. The service instance remains in the 'boundActive' state until the user either invokes (a) the STOP operation to cause the service to cease sending tracking data and to transition back to state 'boundReady' or (b) the PEER-ABORT invocation to cause the service to transition back to the 'unbound' state. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TdSvcInstanceState ::= StatefulCstsInstanceState | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdInitiatorId**' (td-initiator-id) OID .1.3.112.4.4.2.1.80700.1.4.1 | | **Definition:** This parameter reports the identifier of the peer application, i.e., the authority on whose behalf the CSTS application entity is initiating an association with the TD-CSTS service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdResponderId**' (td-responder-id) OID .1.3.112.4.4.2.1.80700.1.5.1 | | **Definition:** This parameter reports the identifier of the TD-CSTS application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. Also the accessibility by an MD-CSTS instance may be restricted. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdResponderPortId**' (td-responder-port-id) OID .1.3.112.4.4.2.1.80700.1.6.1 | | **Definition:** This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the responding CSTS application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdResponseTimeout**' (td-response-timeout) OID .1.3.112.4.4.2.1.80700.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed TD-CSTS operation is invoked until the return is received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  TdResponseTimeout ::= SvcResponseTimeout | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdDeliveryMode**' (td-delivery-mode) OID .1.3.112.4.4.2.1.80700.1.8.1 | | **Definition:** This parameter configures and reports the data delivery mode of the Buffered Tracking Data Message Delivery procedure instance. See "Cross Support Transfer Service - Tracking Data Service", CCSDS 922.2. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdDeliveryMode ::= ENUMERATED  {  realtime (0)  , complete (1)  } | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdRtnBufferSize**' (td-rtn-buffer-size) OID .1.3.112.4.4.2.1.80700.1.9.1 | | **Definition:** This parameter configures and reports the return buffer size (in TRANSFER-DATA and/or NOTIFY invocations) to be used by the Buffered Tracking Data Message Delivery procedure instance. See "Cross Support Transfer Service - Tracking Data Service", CCSDS 922.2. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdRtnBufferSize ::= LongIntPos | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdDeliveryLatencyLimit**' (td-delivery-latency-limit) OID .1.3.112.4.4.2.1.80700.1.10.1 | | **Definition:** This parameter configures and reports the delivery latency limit (in seconds) to be used by the Buffered Tracking Data Message Delivery procedure instance. See "Cross Support Transfer Service - Tracking Data Service", CCSDS 922.2. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  TdDeliveryLatencyLimit ::= ShortIntPos | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdNamedLabelLists**' (td-named-label-lists) OID .1.3.112.4.4.2.1.80700.1.11.1 | | **Definition:** This parameter configures and reports the set of named label lists to be used by the Information Query procedure instance. See "Cross Support Transfer Service - Tracking Data Service", CCSDS 922.2. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- the values of the paramOrEventId components are constrained to be parameter identifiers  TdNamedLabelLists ::= LabelListSet | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdPathList**' (td-path-list) OID .1.3.112.4.4.2.1.80700.1.12.1 | | **Definition:** This parameter configures and reports the list of trackingDataPathIds for which this TD service instance will report the TDM Atomic Segments. See the TdmSegmentGen FR. | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  TdPathList ::= SEQUENCE OF VisibleString | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) parameter '**tdTrackingDataTypes**' (td-tracking-data-types) OID .1.3.112.4.4.2.1.80700.1.13.1 | | **Definition:** This parameter configures and reports the types of tracking data that are contained in TDM Atomic Segments transferred by this TD service instance. The parameter contains one or more of the following types:  - dopplerInstantaneous;  - dopplerIntegrated;  - range;  - carrierPower;  - carrierPowerToNoiseSpectralDensity;  - ranginghPowerToNoiseSpectralDensity;  - receiveFrequency;  - transmitFrequency;  - transmitFrequencyRate;  - antennaAngles | | **Guard Condition:** Setting of this parameter by means of the tdSetContrParams directive is only permissible while tdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  TdTrackingDataTypes ::= SET OF TrackingDataType | |  |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) event '**tdProdStatChange**' (td-prod-stat-change) OID .1.3.112.4.4.2.1.80700.2.1.1 | | **Definition:** This event notifies any change of the tdProdStat parameter value. | | |  | | --- | | [**tdProdStatChange**](#id0xbdec80) value '**tdProdStatChangeEvtValue**' (td-prod-stat-change-evt-value) | | **Definition:** The event value reports the tdProdStat parameter value that applies since the notified tdProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  TdProdStatChangeEvtValue ::= TdProdStat | |  | |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) event '**tdProdConfigurationChange**' (td-prod-configuration-change) OID .1.3.112.4.4.2.1.80700.2.2.1 | | **Definition:** This event triggers when a one or more parameters controlling the configuration of service production of the service instance identified by the tdSvcInstanceId parameter have been changed.  This event carries no additional information. | | |  | | --- | | [**tdProdConfigurationChange**](#id0xbe1880) value '**tdProdConfigurationChangeEvtValue**' (td-prod-configuration-change-evt-value) | | **Definition:** The event-value of this event is 'empty'. | | **Engineering Unit:** N/A | | **Type Definition:**  TdProdConfigurationChangeEvtValue ::= ProdConfigurationChangeEventValue | |  | |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) event '**tdOperatorNotify**' (td-operator-notify) OID .1.3.112.4.4.2.1.80700.2.3.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**tdOperatorNotify**](#id0xbe4580) value '**tdOperatorNotifyMessage**' (td-operator-notify-message) | | **Definition:** The messages passed by means of the tdOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  TdOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**TdCstsProvider**](#id0xbb7480) directive '**tdSetContrParams**' (td-set-contr-params) OID .1.3.112.4.4.2.1.80700.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the TdCstsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**tdSetContrParams**](#id0xbe7180) qualifier '**tdContrParamIdsAndValuesDirQual**' (td-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the TdCstsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  TdContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |

# Functional Resource 'MdCstsProvider' [(back to top)](#toc)

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| FR Stratum: 'Service Management' FR Set: 'Monitored Data CSTS' |
| **Definition:** The MonitoredDataCSTSProvider FR has read-access to all parameters and is capable of being notified of all events of all functional resource instances that are executing within the same Service Package that contains the Monitored Data service instance. The Monitored Data CSTS Provider FR corresponds to the functions specified in the Monitored CSTS Recommended Standard. NOTE 1 - The Monitored Data service does not support the production-configuration-change event because it is redundant with information that is already available through the MD service. NOTE 2 - The MonitoredDataCSTSProvider FR has no dynamically-modifiable configuration parameters because the CSTS procedures that comprise the Monitored Data service have no dynamically-modifiable configuration parameters. |
| Functional Resource OID .1 .3 .112 .4 .4 .2 .1 .90100   |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdProdStat**' (md-prod-stat) OID .1.3.112.4.4.2.1.90100.1.1.1 | | **Definition:** This parameter reports the production status of the Monitored Data service instance. This parameter can take on one of four values:  - 'configured': all production functions needed to support this service instance have been configured;  - ‘operational’: all production functions have been enabled to process data for this service instance;  - ‘interrupted’: one or more production functions have been stopped because of an error condition that may be temporary;  - ‘halted’: one or more production functions have been stopped by management action. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  MdProdStat ::= ProdStat | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdServiceInstanceId**' (md-service-instance-id) OID .1.3.112.4.4.2.1.90100.1.2.1 | | **Definition:** This parameter configures and reports the identifier of the given service instance. | | **Guard Condition:** Setting of this parameter by means of the mdSetContrParams directive is only permissible while mdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  MdServiceInstanceId ::= CstsSvcInstanceId | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdSvcInstanceState**' (md-svc-instance-state) OID .1.3.112.4.4.2.1.90100.1.3.1 | | **Definition:** This enumerated parameter reports the status of the given instance of the Monitored Data service. It can take on the following values:  - 'unbound': all resources required to enable the provision of the service have been allocated, and all objects required to provide the service have been instantiated. However, no association yet exists between the user and the provider, i.e., the transfer service provider port is not bound;  - 'boundReady': an association has been established between the user and the provider, and they may interact by means of the service operations. The user may invoke the GET invocation of the Information Query procedure and receive the requested parameter values. The user may activate instances of the Notification procedure and receive event notifications. The user may activate secondary instances of the On-Change-Option Cyclic Report procedure and receive periodic reports of the values of the parameters associated with those secondary procedure instances. The user may activate the prime instance of the On-Change-Option Cyclic Report procedure, which causes the provider to transition to the state 'active';  - 'boundActive': this state resembles state ‘boundReady’, except that in addition the user also receives periodic reports of the values of the parameters associated with the prime On-Change-Option Cyclic Report procedure instance. The service instance remains in the 'boundActive' state until the user either invokes (a) the STOP operation of the prime On-Change-Option Cyclic Report procedure instance to cause the provider to cease sending periodic reports of the values of the parameters associated with the prime On-Change-Option Cyclic Report procedure instance and transition back to state 'boundReady' or (b) the PEER-ABORT invocation to cause the service to transition back to the 'unbound' state. | | **Engineering Unit:** N/A | | **Configured:** false | | **Type Definition:**  MdSvcInstanceState ::= StatefulCstsInstanceState | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdInitiatorId**' (md-initiator-id) OID .1.3.112.4.4.2.1.90100.1.4.1 | | **Definition:** This parameter reports the identifier of the peer application, i.e., the authority on whose behalf the CSTS application entity is initiating an association with the Monitored Data service provider. The provider performs access control based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. | | **Guard Condition:** Setting of this parameter by means of the mdSetContrParams directive is only permissible while mdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  MdInitiatorId ::= AuthorityIdentifier | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdResponderId**' (md-responder-id) OID .1.3.112.4.4.2.1.90100.1.5.1 | | **Definition:** This parameter reports the identifier of the Monitored Data service application. The user performs access conrol based on this parameter. It may also serve as key to further security relevant information such as the authentication level and method and the related password.  Given the security relevance of this parameter, specific mechanisms for setting this parameter when the FR instance is created and for the transfer of associated security relevant data might be specified in a bilateral agreement between service user and service provider. | | **Guard Condition:** Setting of this parameter by means of the mdSetContrParams directive is only permissible while mdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  MdResponderId ::= AuthorityIdentifier | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdResponderPortId**' (md-responder-port-id) OID .1.3.112.4.4.2.1.90100.1.6.1 | | **Definition:** This parameter configures and reports the port identifier to be used by the user to connect to the service provider. However, the parameter value is only a logical name that needs to be translated into the technology-specific addressing information required to establish a connection with the specific port of the responding CSTS application entity. As such this parameter is irrelevant for the service provider, but it may be needed for certain kind of gateways between service user and service provider application. | | **Guard Condition:** Setting of this parameter by means of the mdSetContrParams directive is only permissible while mdSvcInstanceState = 'unbound'. | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  MdResponderPortId ::= ResponderPortId | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdResponseTimeout**' (md-response-timeout) OID .1.3.112.4.4.2.1.90100.1.7.1 | | **Definition:** This parameter configures and reports the setting of the maximum time period in seconds permitted from when a confirmed MD-CSTS operation is invoked until the return is received by the invoker.  If a response is not received within that time period, the invoker may invoke the PEER-ABORT operation. | | **Guard Condition:** Setting of this parameter by means of the mdSetContrParams directive is only permissible while mdSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  MdResponseTimeout ::= SvcResponseTimeout | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdMinAllowedDeliveryCycle**' (md-min-allowed-delivery-cycle) OID .1.3.112.4.4.2.1.90100.1.8.1 | | **Definition:** This parameter configures and reports the minimum allowed delivery cycle of the On-Change-Option Cyclic Report procedure instance. | | **Guard Condition:** Setting of this parameter by means of the mdSetContrParams directive is only permissible while mdSvcInstanceState = 'unbound'. | | **Engineering Unit:** s | | **Configured:** true | | **Type Definition:**  MdMinAllowedDeliveryCycle ::= MinAllowedDeliveryCycle | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdNamedLabelLists**' (md-named-label-lists) OID .1.3.112.4.4.2.1.90100.1.9.1 | | **Definition:** This parameter configures and reports the set of named parameter label lists to be used by the On-Change-Option Cyclic Report procedure instance(s) and the Information Query procedure instance. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- the values of the paramOrEventId components are constrained to be parameter identifiers  MdNamedLabelLists ::= LabelListSet | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) parameter '**mdNamedEventLists**' (md-named-event-lists ) OID .1.3.112.4.4.2.1.90100.1.10.1 | | **Definition:** This parameter configures and reports the set of named event label lists to be used by the Notification procedure. | | **Guard Condition:** None | | **Engineering Unit:** N/A | | **Configured:** true | | **Type Definition:**  -- The values of the paramOrEventId components are constrained to be event identifiers  MdNamedEventLists ::= LabelListSet | |  |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) event '**mdProdStatChange**' (md-prod-stat-change) OID .1.3.112.4.4.2.1.90100.2.1.1 | | **Definition:** This event notifies any change of the mdProdStat parameter value. | | |  | | --- | | [**mdProdStatChange**](#id0xc05600) value '**mdProdStatChangeEvtValue**' (md-prod-stat-change-evt-value) | | **Definition:** The event value reports the mdProdStat parameter value that applies since the notified mdProdStatChange event has occurred. | | **Engineering Unit:** N/A | | **Type Definition:**  MdProdStatChangeEvtValue ::= MdProdStat | |  | |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) event '**mdOperatorNotify**' (md-operator-notify) OID .1.3.112.4.4.2.1.90100.2.2.1 | | **Definition:** This event passes text messages intended for logs or operators involved in the ongoing service provision. | | |  | | --- | | [**mdOperatorNotify**](#id0xc08180) value '**mdOperatorNotifyMessage**' (md-operator-notify-message) | | **Definition:** The messages passed by means of the mdOperatorNotify event are classified in terms of severity as 'info', 'warning' or 'alarm'. To simplify filtering and searching for specific messages, a unique numerical identifier is assigned to each message string. The messages are free text such that equipment specific issues can be reported. | | **Engineering Unit:** N/A | | **Type Definition:**  MdOperatorNotifyMessage ::= OperatorNotifyMessage | |  | |  |  | | --- | | [**MdCstsProvider**](#id0xbea180) directive '**mdSetContrParams**' (md-set-contr-params) OID .1.3.112.4.4.2.1.90100.3.1.1 | | **Definition:** This directive permits setting of the controllable parameters of the MdCstsProvider FR type. | | **Guard Condition:** The guard condition depends on the parameter(s) that shall be set. | | |  | | --- | | [**mdSetContrParams**](#id0xc0ad00) qualifier '**mdContrParamIdsAndValuesDirQual**' (md-contr-param-ids-and-values-dir-qual) | | **Definition:** The directive qualifier specifies the FR instance the directive shall act on and contains a set of parameter identifier and parameter value pairs. To be valid, the parameter identifier must reference a controllable parameter of the MdCstsProvider FR and the parameter value must be of the same type as the parameter value that shall be set. | | **Engineering Unit:** depends on the specific paramter(s) being set | | **Type Definition:**  MdContrParamIdsAndValuesDirQual ::= DirectiveQualifier | |  | | |