

Recommendation for Space Data System Standards

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| CCSDS Global Spacecraft Identifier Field:Code Assignment Control Procedures |



April 2015

AUTHORITY

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This document has been approved for publication by the Management Council of the Consultative Committee for Space Data Systems (CCSDS) and represents the consensus technical agreement of the participating CCSDS Member Agencies. The procedure for review and authorization of CCSDS documents is detailed in *Organization and Processes for the Consultative Committee for Space Data Systems* (CCSDS A02.1-Y-3), and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the address below.

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STATEMENT OF INTENT

The Consultative Committee for Space Data Systems (CCSDS) is an organization officially established by the management of its members. The Committee meets periodically to address data systems problems that are common to all participants, and to formulate sound technical solutions to these problems. Inasmuch as participation in the CCSDS is completely voluntary, the results of Committee actions are termed **Recommended Standards** and are not considered binding on any Agency.

This **Recommended Standard** is issued by, and represents the consensus of, the CCSDS members. Endorsement of this **Recommendation** is entirely voluntary. Endorsement, however, indicates the following understandings:

o Whenever a member establishes a CCSDS-related **standard**, this **standard** will be in accord with the relevant **Recommended Standard**. Establishing such a **standard** does not preclude other provisions which a member may develop.

o Whenever a member establishes a CCSDS-related **standard**, that member will provide other CCSDS members with the following information:

 -- The **standard** itself.

 -- The anticipated date of initial operational capability.

 -- The anticipated duration of operational service.

o Specific service arrangements shall be made via memoranda of agreement. Neither this **Recommended Standard** nor any ensuing **standard** is a substitute for a memorandum of agreement.

No later than three years from its date of issuance, this **Recommended Standard** will be reviewed by the CCSDS to determine whether it should: (1) remain in effect without change; (2) be changed to reflect the impact of new technologies, new requirements, or new directions; or (3) be retired or canceled.

In those instances when a new version of a **Recommended Standard** is issued, existing CCSDS-related member standards and implementations are not negated or deemed to be non-CCSDS compatible. It is the responsibility of each member to determine when such standards or implementations are to be modified. Each member is, however, strongly encouraged to direct planning for its new standards and implementations towards the later version of the Recommended Standard.

FOREWORD

This document is a Recommended Standard that establishes control procedures for Spacecraft Identifier (SCID) codes. As such, it defines the procedure governing assignment, relinquishment, and management of SCIDs.

To make the most efficient use of the available identification space in the several CCSDS-recommended data structures that contain a SCID field, all CCSDS-compatible missions are assigned SCIDs by the Space Assigned Numbers Authority (SANA).

As specified in this Recommended Standard, SANA accepts only requests from designated Agency Representatives and only when received on approved Request Forms.

This Recommended Standard also provides a form for requesting and relinquishing SCIDs.

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommended Standard is therefore subject to CCSDS document management and change control procedures, which are defined in the *Organization and Processes for the Consultative Committee for Space Data Systems* (CCSDS A02.1-Y-3). Current versions of CCSDS documents are maintained at the CCSDS Web site:

http://www.ccsds.org/

Questions relating to the contents or status of this document should be addressed to the CCSDS Secretariat at the address indicated on page i.

At time of publication, the active Member and Observer Agencies of the CCSDS were:

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* Agenzia Spaziale Italiana (ASI)/Italy.
* Canadian Space Agency (CSA)/Canada.
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* Space and Upper Atmosphere Research Commission (SUPARCO)/Pakistan.
* Swedish Space Corporation (SSC)/Sweden.
* Swiss Space Office (SSO)/Switzerland.
* United States Geological Survey (USGS)/USA.

DOCUMENT CONTROL

|  |  |  |  |
| --- | --- | --- | --- |
| **Document** | **Title** | **Date** | **Status** |
| CCSDS 320.0-B-1 | CCSDS Global Spacecraft Identification Field: Code Assignment Control Procedures, Issue 1 | October 1993 | Original Issue (superseded) |
| CCSDS 320.0-B-2 | CCSDS Global Spacecraft Identification Field: Code Assignment Control Procedures, Issue 2 | November1998 | Superseded  |
| CCSDS 320.0-B-3 | CCSDS Global Spacecraft Identification Field: Code Assignment Control Procedures, Issue 3 | April2003 | Superseded |
| CCSDS 320.0-B-4 | CCSDS Global Spacecraft Identification Field: Code Assignment Control Procedures, Issue 4 | January 2006 | Superseded |
| CCSDS 320.0-B-5 | CCSDS Global Spacecraft Identification Field: Code Assignment Control Procedures, Issue 5 | September 2007 | Superseded |
| CCSDS 320.0-B-6 | ,  |  | Previous issue (note):* designates SANA as official registrar for SCIDs and ARs;
* reorganizes document for conformance with modern CCSDS publication requirements, rephrases some statements for clarity, and eliminates obsolete material.
 |
| Cor. 1 | Technical Corrigendum 1 |  | Clarifies procedure on page 3-3.NO |
| CCSDS 320.0-B-7 | CCSDS Global Spacecraft Identification Field: Code Assignment Control Procedures, 7 | April 2015 | Current issue (note):* aligns with CCSDS Registry Management Policy changes for SANA
* adopts use of CCSDS Organization and Person registries
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# INTRODUCTION

## Purpose

This Recommended Standard establishes the procedures governing requesting, assigning, and relinquishing CCSDS Spacecraft Identifier (SCID) field codes, which are contained in the data unit formats specified in references [1], [2], [3], and [4]. It specifies the organizations and personnel authorized to participate in the performance of those procedures, the requirements for configuration management, and the acceptable use of SCIDs.

## Applicability

This Recommended Standard applies to users of the CCSDS protocols defined references [1], [2], [3], and [4]. These procedures shall be followed by all missions who use CCSDS protocols for space communication and require a spacecraft identifier and by the SANA, which registers these identifiers.

## NOMENCLATURE

### Normative Text

The following conventions apply for the normative specifications in this Recommended Standard:

1. the words ‘shall’ and ‘must’ imply a binding and verifiable specification;
2. the word ‘should’ implies an optional, but desirable, specification;
3. the word ‘may’ implies an optional specification;
4. the words ‘is’, ‘are’, and ‘will’ imply statements of fact.

NOTE – These conventions do not imply constraints on diction in text that is clearly informative in nature.

### Informative Text

In the normative sections of this document, informative text is set off from the normative specifications either in notes or under one of the following subsection headings:

* Overview;
* Background;
* Rationale;
* Discussion.

## Definitions

**Agency Representative, AR**: An individual designated by a CCSDS Agency Head of Delegation as the person authorized to request and relinquish SCIDs on behalf of the respective agency.

**CCSDS Agency**: A CCSDS Member or Observer Agency.

**CCSDS Agency Head of Delegation**: The individual who serves as principal representative of a CCSDS Agencyin dealings with the CCSDS. The CCSDS Agency HoD is usually the CMC member.

**Global Spacecraft Identifier, GSCID**: The concatenation of the 2-bit Version Number (VN) and the SCID. Thus,

GSCID = VN **.** SCID

Where ‘**.**’ refers to the concatenation operator.

**Spacecraft Identifier, SCID**: A value used in specified fields of CCSDS-defined data structures.

NOTE – Other non-CCSDS-compatible data structures may also use this term; however, this document does not apply to the assignment and use of identification codes for non-CCSDS-compatible data structures. In such cases the potential for misinterpretation is negligible because of differences in the overall data structures.

**Version Number, VN**: A field value used to differentiate CCSDS-defined transfer frames. The valid range of the currently defined VN field is shown in table 1‑1.

Object Identifier (OID): the unique ISO identifier assigned to every spacecraft registered in the CCSDS spacecraft database. [9]

NOTE - while the SCID is only valid for the operational lifetime of the mission the OID is permanently assigned.

Table 1‑ : Bit Structure of Currently Defined VN Fields

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version** | **Binary****Encoded****VN**  | **Range of SCID** | **No. of Bits****in SCID****Encoded** | **Relevant****CCSDS****Documents** |
| 1 | 00 | 0–1,023 | 10 | Ref. [1] & [2] |
| 23 | 0110 | 0–255 0–1,023 | 810 | Ref. [3]Ref. [4] |
| NOTE – The binary encoded VN value of ‘11’ is reserved for possible future use and should not be used for project-unique purposes prior to formal agreement within CCSDS for such use. |

## REFERENCEs

The following publications contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All publications are subject to revision, and users of this document are encouraged to investigate the possibility of applying the most recent editions of the publications indicated below. The CCSDS Secretariat maintains a register of currently valid CCSDS publications.

[] *TC Space Data Link Protocol*. Issue 2. Recommendation for Space Data System Standards (Blue Book), CCSDS 232.0-B-2. Washington, D.C.: CCSDS, September 2010.

[] *TM Space Data Link Protocol*. Issue 1. Recommendation for Space Data System Standards (Blue Book), CCSDS 132.0-B-1. Washington, D.C.: CCSDS, September 2003

[] *AOS Space Data Link Protocol*. Issue 2. Recommendation for Space Data System Standards (Blue Book), CCSDS 732.0-B-2. Washington, D.C.: CCSDS, July 2006.

[4] *Proximity-1 Space Link Protocol—Data Link Layer*. Issue 4. Recommendation for Space Data System Standards (Blue Book), CCSDS 211.0-B-4. Washington, D.C.: CCSDS, July 2006.

[] “Agency Representatives.” Space Assigned Number Authority. http://sanaregistry.org/r/agency\_representatives.

[] “Spacecraft Identifiers.” Space Assigned Number Authority. <http://sanaregistry.org/r/spacecraftid>.

[7] “CCSDS Agency Registry” Space Assigned Number Authority. http://sanaregistry.org/r/agency.

[8] “CCSDS Agency HoD Registry” Space Assigned Number Authority. http://sanaregistry.org/r/agency\_HoD.

[9] “CCSDS OID Registry” Space Assigned Number Authority. http://sanaregistry.org/r/ OID.

[10] *Space Assigned Numbers Authority (SANA)--Role, Responsibilities, Policies, and Procedures*, CCSDS 313.0-Y-1, July 2011

[11] *CCSDS Registry Management Policy,* CCSDS 000.0-Y-0, April 2015, in development

# Overview

## Purpose of the CCSDS SCID

The CCSDS SCID serves as a mechanism for the identification of:

– a simple spacecraft having only one logical space-ground link; or

– an association between space-based and ground-based application processes with complex spacecraft having more than one logical space-ground link. Therefore, a single spacecraft may be assigned more that one SCID.

The procedures contained in this document are intended to eliminate the possibility that

* data from any given CCSDS-compatible vehicle will be falsely interpreted as being from another CCSDS-compatible vehicle during the periods of simulation, testing, or mission operations; or
* commands sent to a CCSDS-compatible vehicle will be received and acted upon by application processes for which they were not intended.

Since the data structure (synchronization code and virtual channel data unit/transfer frame/telecommand frame) are common to many missions, misinterpretation of the identity of space vehicle or ground-based simulator assemblies is possible unless procedures are developed and followed to identify uniquely each vehicle or assembly during its active phases.

Because the SCID field is only eight or ten bits long, the SCID is not intended to provide unique identification for all times. It is inevitable that the SCIDs will have to be reused; however, at any one time, the number of vehicles under simulation, test, or active operational control is not anticipated to exceed the available numbering domains. In order to provide a unique, unambiguous, persistent spacecraft identifier the SCID registration process also assigns a globally unique object identifier (OID), reference [9]. The OID is a permanent identifier for each spacecraft, tied to the agency or other organization that requested it.

NOTE - it is possible for an organization to request an OID assignment for a spacecraft that does not have a SCID assigned. Any spacecraft that receives communication services from a CCSDS agency or service provider communication asset may have an OID assigned.

## Background

SCID codes appear in many of the CCSDS-recommended data structures used for the space-ground links and other purposes. Typical of the space-ground data structures that incorporate the SCID are:

– the conventional mission telemetry frame (reference [2]);

– the conventional mission telecommand transfer frame (reference [1]);

– the Advanced Orbiting Systems Virtual Channel Data Unit (reference [3]);

* the Proximity-1 transfer frame (reference [4]);

The CCSDS Recommended Standards on Data Link Layer protocols (references [1], [2], [3], [4] provide a mechanism for establishing an association (either temporary or permanent) between space-based application process(es) and corresponding ground-based application process(es).

The data streams transmitted between space and ground processes contain identifiers that specify the relevant association. These identifiers are managed parameters (i.e., the specific association implied by a given identifier must have been previously established). The utilization of the SCID field on a global scale necessitates its concatenation with the VN of the data structure in which it is used; the concatenation of VN and SCID is the Global SCID or GSCID.

# SCID CODE ASSIGNMENT CONTROL PROCEDURES

## CCSDS SCID Management System Duties and Responsibilities

### Overview

CCSDS SCID assignment and management, on an international basis, must be viewed as a cooperative effort among the CCSDS Agencies, with each constituent acting as agent for the users under its cognizance. The management system comprises four elements:

* the CCSDS Secretariat;
* the CCSDS Agency Heads of Delegation;
* the Agency Representatives;
* the Space Assigned Numbers Authority (SANA).

### CCSDS Secretariat Responsibilities

The CCSDS Secretariat shall

* serve as the focal point for the resolution of any issues not adequately covered by these procedures;
* act as intermediary for SCID requests from organizations not affiliated with a CCSDS Agency by assigning an existing AR to handle the request.

### CCSDS Agency Head of Delegation Responsibilities

Each CCSDS Agency Head of Delegation shall appoint an official Agency Representative to handle all SCID requests from his or her Agency.

As needed, CCSDS Agency Heads of Delegation shall provide current AR name and contact information via e-mail to info@sanaregistry.org with CC to secretariat@mailman.ccsds.org.

NOTE – The official list of CCSDS Agencies is maintained at reference [7]. The official list of CCSDS Agency Head’s of Delegation is maintained at reference [8]. The official list of ARs is maintained at reference [5].

The CCSDS Agency Heads of Delegation shall update the AR name and contact information whenever there is a change, via e-mail to info@sanaregistry.org with CC to secretariat@mailman.ccsds.org.

NOTE to Editor: We should probably consider having on-line web forms for any of these registry changes, and have them verify that the user of the form has the correct permissions.

### Agency Representative Responsibilities

The Agency Representative shall

– submit SCID requests in accordance with the provisions of this Recommended Standard;

– interact directly with SANA with regard to any issues relating to a specific SCID assignment request;

– monitor the life of those CCSDS missions within his or her agency and relinquish all SCIDs at the earliest practical time, which shall not in any event be later than two months after the last communication with the spacecraft;

– inform the applicable agency personnel of any relevant actions (i.e., SCID assignment, relinquishment) taken by SANA relating to that agency.

### SANA Responsibilities

SANAshall

* maintain the official list of Agencies;
* maintain the official list of Agency HoD;
* maintain the official list of ARs;
* serve as the SCID assignment manager;
* accept, from authorized ARs, requests for SCID assignments;
* review and log SCID assignment requests;
* assign one or more SCIDs in response to the request and notify the appropriate AR of the assignment(s);
* assign a unique, persistent, OID for each spacecraft in response to the request and notify the appropriate AR of the assignment(s);

– interact directly with the appropriate AR in matters dealing with a particular SCID assignment request;

– maintain complete and independent catalogs of SCID assignments for each version number as registries on the SANA site;

NOTE – The official list of SCIDs is maintained at reference [6].

* maintain a complete catalog of spacecraft OID assignments for each version number as a registry on the SANA site;
* optionally record, in the spacecraft OID registry, the name, abbreviation, and any aliases for the spacecraft;

NOTE – The official list of OID assignments is maintained at reference [9].

* work with the respective ARs to recover all SCIDs, corresponding to those spacecraft whose operational phases have been completed, for subsequent reassignment.

### SANA REGISTRY EXTENSIONS

This document depends upon registries, such as the Agency Registry, that are defined in other documents [5], [8]. This document defines registries [6], [9] that may be referenced in other standards. Furthermore, the Agency Representative registry, in particular, may be adopted by other standards as the means to unambiguously identify the specific persons who have responsibility for managing the registration of different types of information than SCIDs.

If such extensions of this Agency Representative registry are proposed they shall be reviewed with the SANA and the Registration Authority for this registry. It is recommended that any such extensions follow the pattern established in this registry and add any necessary new roles in addition to AR for SCID assignment.

## SCID CODE Lifetime

An assigned SCID may be used throughout a spacecraft’s active phases, e.g., simulations, prelaunch testing, and in-orbit operations.

As quickly as practical after reception of telemetry data, the SCID should be replaced with the OID, a globally unique, unambiguous, permanent, and SCID-independent label, for the spacecraft and/or payload data set(s).

NOTE – A globally unique, persistent, OID is created and assigned to the spacecraft for this purpose. It may be used during the entire operational life of the spacecraft and persists after termination of active operations.

Thereafter, access to and identification of these data sets should be by means of this OID rather than the SCID field described in this document.

NOTE – Because CCSDS SCIDs are reused, identification of archived data by SCID is problematic. The OID is permanent and unambiguous; it may be represented in several different, but inter-changeable, forms, as needed.

## SCID Assignment Request Procedures

All SCID Assignment Requests by an Agency shall be submitted by the designated AR (see reference [5]).

Organizations that are not affiliated with a CCSDS Agency shall contact the CCSDS Secretariat for SCID assignments.

All SCID Assignment Requests shall be submitted on the approved request form contained in annex A.

A separate form shall be used for each SCID requested.

All SCID Assignment Requests shall be submitted via e-mail to info@sanaregistry.org with CC to secretariat@mailman.ccsds.org.

## SCID Code Assignment Procedures

All CCSDS SCID Assignments shall be made by SANA.

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SANA shall assign the specific SCID codes based on availability.  Only in exceptional circumstances will user requests for specific numerical code assignments be honored.

Each SCID Code Assignment shall be globally unique during its assignment period.

SCID Code Assignments shall be made on a spacecraft-by-spacecraft basis.

Each request for a SCID Code Assignment shall also return a unique, persistent, OID identifier for each spacecraft.

User requests for reservation of a sequence of ID numbers for unspecified spacecraft shall not be accepted; however, multiple SCIDs may be assigned for those missions which have multiple spacecraft.

NOTE: Agencies which desire separate designations for protoflight spacecraft or simulations may request a unique OID for each such instance.

User requests for assignment of specific numerical codes may be accepted in exceptional circumstances and only if those numerical codes are available.

The user should refer to the catalog of existing SCID assignments (reference [6]) to avoid requesting assignments that could result in duplication, and, therefore, denial of a request.

If a request for a specific numerical code cannot be honored the SANA shall assign a SCID based on availability.

All OID assignments are made in an OID sub-tree that is directly associated with the Agency making the request.

## SCID Relinquishing Procedures

The AR shall determine, in conjunction with the mission manager, exactly when the operational phase of a mission is complete and when the related SCIDs can be relinquished.

The AR shall submit to SANA a copy of the original Assignment Request/ Relinquishment form with signature and date opposite ‘RELINQUISH current GSCID’ in the **AUTHORIZATION** section. If the original Assignment Request/Relinquishment form cannot be located, a simple letter relinquishing the SCID shall provided.

Only an authorized AR for the Agency shall be permitted to relinquish an assigned SCID.

SANA shall place the relinquished SCID code number at the bottom of the stack of SCIDs available for assignment.

NOTE – The relinquished SCID code number is placed at the bottom of the stack of unassigned SCIDs in order to maximize the period of time before the relinquished number is reassigned

1. SCID REQUEST FORM

(Normative)

This annex provides the official form to be used by Agency Representatives for requesting and relinquishing SCIDs.

**TO:** Space Assigned Numbers Authority (info@sanaregistry.org)

**FROM:** (Name & Address of Agency Representative)

E-MAIL

Telephone Facsimile TELEX
(Include Country & City/Area Codes

**SPACECRAFT INFORMATION:**

Pre-Launch Name of Spacecraft:

Transmitting Frequencies:

Expected Launch Date (or Year):

Version ID (see table 1‑1): Version-1 Version-2 Version-3

Intended Use: TLM only TC only Both TLM & TC

(TLM = telemetry; TC = telecommand)

**SPACECRAFT OPTIONAL INFORMATION:**

Spacecraft Name Abbreviation:

 Spacecraft Alliases:

**SPECIAL INSTRUCTIONS/REQUEST:**

**AUTHORIZATION:** (to assign or to relinquish GSCID assignment)

ASSIGN new GSCID:

 Signature of Agency Representative Date

RELINQUISH current GSCID:

 Signature of Agency Representative Date

1. ACRONYMS AND ABBREVIATIONS

(Informative)

Term Meaning

AR Agency Representative

GSCID Global Spacecraft Identifier

Hex Hexadecimal

OID Object Identifier (ISO)

S/C Spacecraft

SANA Space Assigned Numbers Authority

SCID Spacecraft Identifier

TC Telecommand

TLM Telemetry

VN Version Number

**(NORMATIVE)**

**SANA Considerations**

**Name**: CCSDS Spacecraft Identifier

**Structure**: Tabular (one table for each SCID Version), 12 columns by the number of rows needed for the SCID count (8 or 10 bits)

|  |  |  |  |
| --- | --- | --- | --- |
| **Column Name** | **Data Type** | **Data Range** | **Notes** |
| **Spacecraft Name** | Character (64) | Any valid alpha-numeric | Assigned by the agency |
| **Channel** | Character (3) | TC, TLM  | TLM used for AOS |
| **Version** | Integer (short) | 1, 2, or 3 | May be extended |
| **SCID** | Hex (3) | 001-max  | Max is maximum SCID value for Version |
| **GSCID** | Hex (3) | 001-max |  |
| **Object ID** | ISO OID | 1.3.112.4.7… | OID is assigned to an agency or other org |
| **Requestor Name** | Character (64) | Valid person name in English | Name must be in AR registry |
| **Requestor Affiliation** | Character (64) | Valid organization name | Name must be in Organization registry |
| **Requestor Affiliation Country** | Character (2) | Valid 2 character country code | Name must be valid ISO country code |
| **Last Request Date** | Date | yyyy-mm-dd |  |
| **Updater** | Character (4) | Valid person name in English | Initials of registrar making assignment |
| **Status** | Enumerated | “Assigned”, “Returned”, NULL |  |
| **Spacecraft Name Abbreviation** | Character (8) | Any valid alpha-numeric | Agency assigned abbreviation or acronym |
| **Spacecraft Name Alias(es)** | Character (128) | Comma separated list of any valid alpha-numeric | Agency assigned alias list (pre/post launch, familiar) |
| **Transmitting Frequency** | Float (32) | KHz, MHz, or GHz | Actual frequency, not just band designator |
| **Expected Launch Date** | Date | yyyy-mm-dd | Assignment will typically be pre-launch |
| **Expected Mission End Date** | Date | yyyy-mm-dd | May be extended upon request to SANA |
| **Note** | Char (64) |  |  |

**Registration Authority: SLS Area**

**Registration Rule:**

1. Request must come from an assigned Agency Representative. If there is no Agency Representative for the agency, or if the Agency (or other organization) is not registered, then those registry entries must first be created.
2. Requestor may ask for specific assignment, but this is not guaranteed.
3. Requestor may just ask for OID assignment, not just SCID.
4. OIDs shall be assigned sequentially in an agency section of the spacecraft OID tree.