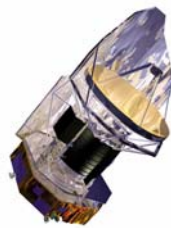




HCSS MIB Clarification and Tailoring Note



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Issue: 1.5

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Document Change Record

Issue/Revision	Date	Modified Sectionss	Summary of Changes
0.1	14 Jan 2003		
0.2	31 Jan 2003	1.2, 3, 4.1, 5.1, 5.2, 6	Updates based on comments from E Wiezorrek, M Benedettini, L Dubbledam, S Sidher and K Galloway.
1.0	18 Feb 2003	5, 6 (new section)	Added a new section describing the interface for version 0.1.2 of the software. Reformatted section 5.1 (Required Tables) based on comments from R Prades.
1.1	13 June 2003	See changebars	Added comments from Rik Huygen, Silvano Manganeli. Updated list of checks performed.
1.2	16 October 2003	See changebars	Added PID_DESCR field to the list of 'short description' fields, and added further checks for short description fields.
1.3	2 April 2004	See changebards	Added constraints to TXP table
1.4	3 August 2004	See changebars	Added list of fields considered for semantical checking. Updated final interface to state that all tables will be checked.
1.5	21 December 2004	See changebars	Added further checks related to CPC_RADIX and PID_INTER. Updated applicable issue numbers for SCOS Database Import ICD to 5.2, and to H/P Naming Convention to 2.1



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1 Introduction

1.1 Overview

This document provides, in conjunction with external interface documents, a complete specification of the interface to the Herschel Common Science System (HCSS) of Mission Information Base (MIB) ASCII datasets.

1.2 Purpose

The MIB interface to the HCSS should in principle be defined by [RD-1] and [RD-2], with the latter taking precedence in case of conflict. These two external interface documents are however found to be ambiguous in places, so require clarification such that the interface is fully understood.


This document aims to address these two limitations, by providing firstly a clarification of external interface documents, and then describing the Herschel-specific constraints applied to the generic interface. These three documents thus provide a complete description of the interface to the HCSS.

It is expected that in due time the ambiguous parts of the external interface documents will be reworded by the document authors. As this document notes, Document Change Requests (DCRs) have already been raised for some unclear parts of [RD-1]. This document will be updated in line with such changes so that it always complements the external interface documents.


In addition to clarifying and tailoring the HCSS MIB interface, this document lists the checks performed by the HCSS MIB Ingestion Software to validate the interface.

1.3 Background

The common software system of the Herschel science ground segment is the HCSS. The HCSS uses MIB data to define instrument-related commands to the spacecraft and to aid the interpretation of downlink data for clients such as the Quick Look Assessment (QLA) subsystem and the Interactive Analysis (IA) subsystem. The raw MIB data is generated by a MIB Editor external to the HCSS (section 3.1.6 of [RD-4]), and made available to the HCSS in the form of a set of ASCII files. The HCSS MIB ingestion software is responsible for reading the input MIB data into the HCSS. During the ingestion process, this software performs validity checks against the agreed HCSS MIB interface. This document in addi-


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tion to [RD-1] and [RD-2] describe that interface with respect to the final release of the HCSS prior to launch. It also describes the interface for the most recent upcoming version of the HCSS. Finally, it lists the major checks performed by the software.

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2 Referenced Documents


- RD-1: SCOS-2000 Database Import ICD (S2K-MCS-ICD-0001-TOS-GCI), Issue 5.2
- RD-2: Herschel/Planck Naming Convention Specification Document (H-P-ASPI-SP-0141), Issue 2.1
- RD-3: Herschel/Planck Operations Interface Requirements Document (SCI-PT-RS-07360), Issue 2.1
- RD-4: Herschel Ground Segment Design Description (FIRST/FSC/DOC/0146), Issue 1.1

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3 Definitions

These definitions should be applied only to the fields specified, and only in the context of this document:

1. The term *short name* refers to the fields CCF_CNAME, CPC_PNAME and PCF_NAME of section 3.3 of [RD-1]. (Note that these fields are also referred collectively as either *identifiers* or *mnemonics* in section 8.
2. The term *short description* refers to the fields CCF_DESCR, CPC_DESCR, PCF_DESCR and PID_DESCR of section 3.3 of [RD-1].
3. The term *long description* refers to the field CCF_DESCR2 of section 3.3 of [RD-1].

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4 Clarification

This section provides clarification of ambiguous sections of [RD-1] and [RD-2].


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4.1 Clarification of [RD-1]

Point	Section of [RD-1]	Clarification	Comments
4.1.1	Section 2.3, first and second sentences	<p>A 'line' as described in that section, is regarded as a sequence of characters in the file in question, terminated by the line termination character or character sequence that is appropriate for the operating system in question. The line termination character/sequence will be a linefeed character for Unix, and a carriage-return + linefeed sequence for Windows.</p> <p>Each line corresponds to one and only one record of the database table reflected by that file.</p> <p>The number of fields per record of a table (N) corresponds to the total number of fields T specified for that table in section 3.3 of [RD-1]. The sole exception being those tables in which the last G fields are ignored by the SCOS-2000 system (marked in [RD-1] with grey backgrounds; see also section 3.3, bullet 5 of [RD-1]). In this case the minimum number of fields of that table must be such that $N = T - G$.</p> <p>Each field is separated by a tabulation character <TAB> such that if there are N fields per record, then there should be N-1 tabulation characters present.</p>	
4.1.2	Section 2.4, paragraph 4	<p>Mandatory fields (those marked with an 'M' in the M/Def column in [RD-1]), must have a value consistent with the type of that field, and in the case of a numerical value, must not be left null or contain solely whitespaces.</p>	<p>There may be a problem in cases where the field is not deemed Mandatory and contains a null value. There are cases where a null value is valid, and specifies a special meaning or corresponds to situations where such a field is of no relevance. However, it is difficult to distinguish such legitimate cases from situations where a non-null value should have been entered, but the dataset creator has failed to do so.</p>

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4.1.3	Section 3.3, last 3 bullets	<p>These bullets refer to the concept of 'Mandatory fields'. Mandatory fields are those for which a value must be assigned by the creator of these tables.</p> <p>Such fields are flagged with the value 'M' in the 'Ma/Def' column of the relevant document table in this section.</p> <p>For fields which are not 'Mandatory', a default value may or may not be explicitly given in the Ma/Def column. For fields which are not mandatory and have no default value specified in the Ma/Def column, the default value is 0 for integers, 0.0 for floating point numerical types, and an empty string for string types.</p> <p>Note that the non-'Mandatory' fields described above differ in concept to those fields that have grey backgrounds described in bullet 5 of section 3.3 of [RD-1]; such fields are not used by SCOS-2000 for any processing.</p>	See "Comments on [RD-2]" on page 20, bullet 2.
4.1.4	Section 3.3, second bullet from last	Fields which are not mandatory may or may not be explicitly given a value. An non-optional field can be left null, i.e. only the separator (no-value) appears. In other words the separator must always be present, but the value can be left empty.	The clarification text is the text ESOC raised as part of DCR-286 (section "ESOC response to comments by HS" on page 22, bullet 3).
4.1.5	Section 3.3.2.3.2, bullet 8	An OOL condition is raised only if the parameter value is less than the lower limit, or greater than the higher limit. This constraint is applicable to both hard and soft limits.	
4.1.6	Section 3.3.2.5.1, field names PLF_OFFBI & PLF_OFFBY of document table	<p>The field values refer to the location of the TM parameter value with respect to the end of the SCOS-2000 packet header. Depending on the mission-specific packetiser employed to create the SCOS-2000 packets, this may or may not coincide with the start of the TM source packet header.</p> <p>If the generic SCOS-2000 packetiser is being used, these field values do coincide with the start of the TM source packet header.</p>	ESOC have raised DCR 309 to address this. See also "ESOC response to comments by HS" on page 22, bullet 4.
4.1.7	Section 3.3.2.5.1, field name PLF_OFFBI of document table	Bit number 0 refers to the most significant bit.	ESOC have raised DCR 308 to address this. See also "ESOC response to comments by HS" on page 22, bullet 5.
4.1.8	Section 2	There should be a statement about the format for floating point numbers (the NUMBER type). The format should be in accordance to US conventions, with the decimal point '.' used instead of a comma ',' to indicate the start of the fractional component of the number.	

4.2 Clarification of [RD-2]


Of the requirements specified in [RD-2], only two could affect MIB data ingestion into the HCSS. These are NMCVT-0100-C and NMCVT-7600-C.

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Point	[RD-2] Requirement	Clarification	Comments
4.2.1	NMCVT-0100-C	No clarification necessary.	See also “Comments on [RD-2]” on page 20. This requirement disallows the use of the characters I, O and Q as leading characters in a short name
4.2.2	NMCVT-7600-C	<p>The short and long descriptions shall:</p> <p>Consist of characters contained in the union of the following sets:</p> <p>The set of upper case [A-Z] and lower case [a-z] characters of the English alphabet;</p> <p>The set of digits [0-9];</p> <p>The characters ' ' (space), '+' (plus), '-' (minus) and the '_' underscore.</p> <p>Have meaningful content for a human reader.</p> <p>Use understandable abbreviations and acronyms.</p> <p>The short description should not be left empty.</p>	See section 3 for definitions and also “Comments on [RD-2]” on page 20

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5 Constraints for the FINAL interface

This section describes the constraints that will be applied to the generic interface described by [RD-1] and [RD-2] and clarified in section 4, to form the *final* interface between the HCSS and the external world with respect to MIB ingestion prior to launch.

5.1 Required Tables for HCSS

The input ASCII dataset must contain, in a single directory, ASCII files for all tables described in [RD1].

Synthetic parameter definitions, in the subdirectory 'synthetic' will be accepted.

All other files and subdirectories will be ignored.

5.1.1 Additional table - Command durations table

In addition to the above SCOS 2000 tables, the MIB ingestion software requires a table specifying the duration of each uplinked command. This is used by the HCSS Common Uplink System (CUS) to compute the total duration of a set of commands.

This table comprises of two fields: field 1 corresponds to the short name of the command, and field 2 to the duration of that command. For information as to the units for the duration, and general information in relation to the CUS, please consult the CUS documentation under <ftp://astro.estec.esa.nl/pub/HERSCHEL/csdt/releases/doc/index.html> .

5.2 Tailoring of [RD-1]

This section provides complementary information across [RD-1] on a section-by section basis.



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5.2.1 (Section removed)

5.2.2 Detailed Table Structure Points


Point	Section of [RD-1]	Herschel Constraint	Comments
5.2.3	Section 3.3.1.1	The VDF table is ignored by the HCSS.	
5.2.4	PCF_NATUR field and Sections 3.3.2.1.2, 3.3.2.1.3 & 3.3.2.1.4	Monitoring parameters of 'constant' nature, i.e. PCF_NATUR='C', will be ignored. All other nature types will be accepted.	
5.2.5	Sections 3.3.2.4.1 and 3.3.2.5.1	The SCOS-2000 Packet ID (SPID) is <i>the</i> only means for identifying the location of a parameter value in a fixed packet. Within the Herschel mission, a packet is identified by its PUS type, subtype, APID, and, where appropriate, the SID. It is assumed that there is a unique SPID for each and every packet type.	See section 10 The constraints with regards to variable packets is still under investigation.
5.2.6	Sections 3.3.2.4.1 and 3.3.2.4.2	For rows in the PID table and in the PIC table that correspond to the same type/subtype (ie the compound key (PID_TYPE+PID_SUBTYPE match the compound key (PIC_TYPE and PIC_SUBTYPE), there cannot be a situation where the field PID_PI1_VAL (specifying the SID value) is greater than zero, but the corresponding PIC_PI1_OFF value is -1. The latter value indicates that the SID is <i>not</i> required, so the SID value should be set to zero.	
5.2.7	Section 3.3.3.1.3 and 3.3.3.2.1	With the exception of commands that have short names that begin with 'Z' (pseudo commands), the IDs of the packet headers for each command described the CCF table (CCF_PKID) also must be specified in the PCDF table (PCDF_TCNAME). There must be at least 4 rows in the PCDF table matching that packet ID, corresponding to the VERSION, TYPE, DHFLAG, and APID for that packet.	This raises an issue with [RD-1]: The constraint here, and the common usage of this table, requires that the field PCDF_TCNAME must not unique. This is in contradiction with [RD-1], which states that PCDF_TCNAME must be unique across all rows.
5.2.8	Section 3.3.2.5.2	<i>(Constraint removed)</i> <i>The constraint was for the HCSS to ignore the VPD table. Variable Packet Definitions will now be supported.</i>	
5.2.9	Section 3.3.3.2.3, fields CDF_CNAME and CDF_PNAME	It is assumed that for any value of CDF_CNAME, there are no duplicate values for CDF_PNAME. In other words, the key combination of CDF_CNAME and CDF_PNAME is unique. Should more than one value for a command parameter be necessary, the repeated groups concept should be employed.	

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5.2.10	Section 3.3.3.3	Command sequences are not considered by the HCSS. This means that the tables CSF, CSS, SDF and CSP are ignored by the HCS MIB ingestion software.	
5.2.11	Section 3.3.3.5	Command/sequence parameter sets are not considered by the HCSS. This means that the tables PST, PSV, CPS and PVS are ignored by the HCSS MIB ingestion software.	
5.2.12	Section 3.3.2.2.4	The numerical value for the field TXP_FROM should not exceed that for the field TXP_TO for the same record.	
5.2.13	Section 3.3.2.2.4	Ranges should not overlap. In other words, the value of either the TXP_FROM or TXP_TO fields for one record should not reside in bounds defined by the TXP_FROM and TXP_TO fields of another record.	

5.3 Tailoring of [RD-2]

Point	Requirement of [RD-2]	Herschel Constraint	Comments
5.3.1	NMCVT-0100-C, NMCVT-7600-C	The characters '+' (plus), '-' (minus) and ' ' (space) characters are not allowed in the short description field. This means that the allowed character set for short description fields is in accordance to the regular expression [a-zA-Z0-9_]+	Applicable only to the short description fields (section 3, bullet 2)
5.3.2	NMCVT-0100-C, NMCVT-7600-C	The combination of the first character of the field CCF_CNAME and the entire value of the field CCF_DESCR must be unique.	The CCF_DESCR field value must be unique per instrument.
5.3.3	NMCVT-0100-C, NMCVT-7600-C	The combination of the first character of the field CPC_PNAME and the entire value of the field CPC_DESCR must be unique.	The CPC_DESCR field value must be unique per instrument.
5.3.4	NMCVT-0100-C, NMCVT-7600-C	The combination of the first character of the field PCF_NAME and the entire value of the field PCF_DESCR must be unique.	The PCF_DESCR field value must be unique per instrument.
5.3.5	NMCVT-0100-C, NMCVT-7600-C	The combination of the field PID_APID and the value of the field PID_DESCR must be unique.	The PID_DESCR field value must be unique per instrument.

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6 Constraints for version 0.2 of the HCSS

Not all the constraints described in section 5 have been implemented. This section describes the constraints that will be applied to the generic interface described by [RD-1] and [RD-2] and clarified in section 4, to form the interface between the HCSS and the external world for software release 0.2 of the HCSS.

6.1 Required Tables for HCSS

All tables described in [RD-1], with the exception of the DST table, are now considered during the initial syntactical checking phase of the software, which only includes checks corresponding to Point 7.0.1, Point 7.0.2, Point 7.0.3, Point 7.0.4 and Point 7.0.5 of section 7.

For the remaining checks of section 7, The following tables are applicable. Note that synthetic parameter definitions, in the subdirectory 'synthetic' will be ignored.

Category	Table Names	Comments
Monitoring Tables	pcf, cap, txp, ocf, ocp, pid, pic, plf	
Commanding Tables	pcdf, ccf, cpc, cdf	
Calibration Curves	ccs, paf, pas	

6.2 Fields interpreted by the software

The tables below list those fields that are considered during the semantical checking phase of the software.

PCF
PCF_NAME
PCF_DESCR
PCF_PID
PCF_UNIT
PCF_PTC



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PCF_PFC

PCF_CATEG

PCF_NATUR

PCF_CURTX

CAP

CAP_NUMBR

CAP_XVALS

CAP_YVALS

TXP

TXP_NUMBR

TXP_FROM

TXP_TO

OCF

OCF_NAME

OCF_CODIN

OCP

OCP_NAME

OCP_LVALU

OCP_HVALU

PID

PID_TYPE

PID_STYPE

PID_APID

PID_PI1_VAL



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PID_DESCR

PID_INTER

PIC

PIC_TYPE

PIC_STYPE

PIC_PI1_OFF

PLF

PLF_NAME

PLF_SPID

PLF_OFFBY

PLF_OFFBI

PCDF

PCDF_TCNAME

PCDF_VALUE

CCF

CCF_CNAME

CCF_DESCR

CCF_CTYPE

CCF_PKTID

CPC

CPC_PNAME

CPC_DESCR

CPC_PTC

CPC_DISPfmt

CPC_RADIX



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CPC_UNIT
CPC_CATEG
CPC_CCAREF
CPC_PAFREF
CPC_INTER
CPC_DEFVAL

CDF

CDF_CNAME
CDF_ELTYPE
CDF_BIT
CDF_GRPsize
CDF_INTER
CDF_VALUE

CCA

CCA_NUMBR
CCA_ENGFMT
CCA_RADIX

CCS


CCS_NUMBR
CCS_XVALS
CCS_YVALS

PAF

PAF_NUMBR

PAS

PAS_NUMBR
PAS_ALTXT

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PAS_ALVAL

6.3 Tailoring of [RD-1]

This section provides complementary information across [RD-1] on a section-by section basis.

6.3.1 Detailed Table Structure Points

The constraints for the final interface described in section 5.2.2 are applicable, with the following limitations:

Point	Section of [RD-1]	Herschel Constraint	Comments
6.3.2	PCF_NATUR field and Sections 3.3.2.1.2, 3.3.2.1.3 & 3.3.2.1.4	Only monitoring parameters of 'raw' nature, i.e. PCF_NATUR='R', are considered during MIB ingestion. All other nature types are ignored, including synthetic parameters.	
6.3.3	Section 3.3.2.3.1	Currently, the only supported values for OCF_CODIN are 'R' and 'I'.	
6.3.4	Section 3.3.2.5.2	Variable packet definitions are not supported. This means that the VPD table is ignored by the HCSS	
6.3.5	Section 3.3.3.2.2, fields CPC_CATEG and CPC_INTER and section 3.3.3.2.3, field CDF_INTER	<p>A command parameter is regarded as being of type 'Raw' if the field CPC_CATEG has a value of 'N'. Otherwise it is of type 'Engineering'.</p> <p>A command parameter of type 'Engineering' cannot have a default value that is of 'Raw' representation. In other words, CDF_INTER cannot be 'R', or if CDF_INTER is set to 'D', then CPC_INTER cannot be 'R'.</p>	<p>See also SCR-0272</p> <p>[RD-1] already disallows the situation where a parameter of type 'Raw' has a default value represented in 'Engineering' form. (See description for CPC_INTER).</p>

6.4 Tailoring of [RD-2]

All constraints described in section 5.3 for the final interface have been implemented for version 0.2 of the HCSS.

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7 Checks performed by the HCSS MIB software

This section outlines the major checks to be performed by the MIB software, with references to the clarification or tailoring sections of this document where necessary. Checks that are not in place for version 0.2 of the HCSS are marked by the text '*To be implemented*' in the Comments section.

Check	Description	Action if Check fails	Reference	Comments
7.0.1	The names of the expected input files are validated	An error is raised	Section 5.1 of this document.	
7.0.2	The field combinations identified by [RD-1] as being unique, are tested for uniqueness	An error is raised	Bullet 2 of section 3.3 of [RD-1]	<i>To be implemented, but see temporary checks 7.0.18, 7.0.19, 7.0.20 and 7.0.21</i>
7.0.3	For each table, the number of fields per line are checked against the expected number according to [RD-1].	An error is raised.	Point 4.1.1	The MIB software is currently more lenient in that if there are trailing fields that are ignored by the SCOS-2000 system (marked as 'grey' fields in section 3.3 of [RD-1]), these are not counted by the ingestion software as mandatory fields
7.0.4	For a field of a numerical type, a value is encountered that is either empty or one or more whitespaces	An informative message is now raised	Point 4.1.2	A warning is now longer raised, just an informative message
7.0.5	The value of a field of a numeric type does not match the type of that field.	A warning is raised, and the appropriate null value for that type is assigned.	Point 4.1.2	An error, not warning, should be raised?
7.0.6				<i>(check removed)</i>
7.0.7	The field PCF_NATUR has a value that is not 'R' (Raw)	Raise a warning and assume the parameter length to be -1.	Point 5.2.4	The MIB software currently uses this field only to compute the length of the monitoring parameter in question.



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7.0.8	There is no calibration entity found for a monitoring parameter.	A warning is raised, and the parameter is assumed to have no calibration. Subsequent access to calibration-related services for that parameter will result in an exception.		
7.0.9	MIB Command definitions are tested for compliancy with the HCSS Common Uplink System	An error is raised.	Point 5.3.1	
7.0.10	Synthetic parameter definitions are invalid	An error is raised		<i>To be implemented</i>
7.0.11	Variable packet definitions are invalid	An error is raised		<i>To be implemented</i>
7.0.12	SIDs defined in the PIC table with values > 0 should not be listed in the PID table as not being required	An error is raised	Point 5.2.6	
7.0.13	There should be more than 4 rows in the PCDF table for all commands (except those that have short names that begin with 'Z').	An error is raised	Point 5.2.7	
7.0.14	There is no entry in the PID table for a SPID specified in the PLF table	An error is raised		
7.0.15	The PCF_CATEG field has a value 'S' (indicating that the associated parameter is a status parameter), but the PCF_CURTIX is null.	An error is raised		
7.0.16	The PCF_CATEG field has a value not listed in [RD-1]	An error is raised		
7.0.17	The CPC_INTER field contains a value other than 'R' or 'E'	An error is raised		
7.0.18	The PCF_NAME field is not unique	An error is raised		
7.0.19	The OCF_NAME field is not unique	An error is raised		
7.0.20	The CPC_PNAME field is not unique	An error is raised		
7.0.21	The CCF_CNAME field is not unique	An error is raised		
7.0.22	The short description is not compliant with Point 5.3.1	An error is raised	Point 5.3.1	
7.0.23	The CCF_DESCR field plus the first char of the CCF_CNAME field is non unique	An error is raised	Point 5.3.2	

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7.0.24	The CPC_DESCR field plus the first char of the CPC_PNAME field is non unique	An error is raised	Point 5.3.3	
7.0.25	The PCF_DESCR field plus the first char of the PCF_NAME field is non unique	An error is raised	Point 5.3.4	
7.0.26	The PID_APID field plus the PID_DESCR field is non unique	An error is raised	Point 5.3.5	
7.0.27	The numerical value of the field TXP_TO is greater than that of the field TXP_FROM.	An error is raised	Point 5.2.13	
7.0.28	The range defined by the TXP_FROM and TXP_TO fields overlaps with the range defined in another record in the TXP table	An error is raised	Point 5.2.13	
7.0.29	There are zero, or more than one, corresponding entries in the CCA_NUMBR field for a CPC_CCAREF value for which the related CPC_CATEG value is 'C'.	An error is raised		
7.0.30	There are no corresponding entries in the CCS_NUMBR field for a CPC_CCAREF value for which the related CPC_CATEG value is 'C'.	An error is raised		
7.0.31	The value for the field CCS_YVALS is not consistent with the fields CCA_RAWFMT and CCA_RADIX	An error is raised		
7.0.32	If CPC_CATEG='C' or 'T', the corresponding value for CDF_INTER is 'E', but the CDF_VALUE is not consistent with the decalibration curve specified by CPC_CCAREF or CPC_PARREF	An error is raised		
7.0.33	CPC_RADIX is not one of the allowed values 'D', 'H' or 'O'	An error is raised		
7.0.34	PID_INTER is not null for a non-periodic packet, ie packets that do not have a type/subtype combination such that PID_TYPE=3 and PID_STYPE=25.	An error is raised.	Section 3.3.2.4.1 of [RD-1], description for PID_INTER field	

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8 Comments on [RD-2]

The following text are comments on [RD-2], circulated by email to the Herschel Common Science Development Team by Hassan Siddiqui of the HSC on 6 December 2002.

Comments on Alcatel's Naming Convention Specification H-P-ASPI-SP-0141, Issue 1.2
Herschel/ HSC/ DOC/ 0293

Includes comments from JRR & KG, plus a comment from JBr that was previously omitted -see the final sentence at the end of the proposed revision of the NMCVT-7600-C text.
Cheers -Hassan.

Here are my comments on the Alcatel Naming Convention Specification document H-P-ASPI-SP-0141, issue 1.2:

There are two top-level requirements that could in principle have some impact on MIB support within the HCSS, these are NMCVT-0100-C and NMCVT-7600-C:

Definitions

There are various terms employed in that Alcatel document that presumably refer to elements in the SCOS Database Import ICD (s2k-mcs-icd-0001-tos-gci v5. 1, hereafter referred to as the 'SCOS-ICD'), These references are not made clear in the Alcatel document, so I make my assumptions here. I understand the term:

1. 'Identifier' to refer to the mnemonic of a MIB command, command parameter or monitoring parameter definition, specifically the fields CCF_ CNAME, CPC_ PNAME and PCF_ NAME described in section 3.3 of the SCOS-ICD
2. 'Short description' to refer to the field CCF_ DESCR, CPC_ DESCR and PCF_ DESCR of sect.3.3 of the SCOS-ICD.
3. 'Long description' to refer to the field CCF_ DESCR2 of sect 3.3 of the SCOS-ICD.

NMCVT-0100-C

This requirement refers to the identifiers (or mnemonics) for each MIB parameter. For example, PC004380 is the mnemonic for a PACS command parameter. This requirement allows alphanumeric characters and the underscore '_' character, and disallows the use of '+', '-', and '.' characters. This entirely compatible with the HCSS (specifically the Common Uplink System [CUS] of the HCSS). There is one issue that needs to be considered in that this requirement DISALLOWS the use of the characters 'I', 'O', and 'Q' as leading character in a mnemonic. These leading characters have currently been reserved by ICCs to refer to HIFI, PACS and SPIRE EGSE-ILT parameters.
(ftp://astro.esa.int/pub/HERSCHEL/csdt/releases/doc/mib/guide/user-guide.html#longnames)

I believe that EGSE-ILT related MIB naming constraints should not be reflected in the Alcatel document, as these parameters only exist in ILT-MIBs. I need confirmation from the HCSSMG that the MIB used during the IST phase will not contain EGSE-ILT related parameters. This would imply that any instrument MIBs sent to industry for incorporation into the spacecraft database would not use parameters that have mnemonics that lead with any of the disallowed characters I, O or Q.

NMCVT-7600-C

This requirement refers to the short and long descriptions for MIB parameters. The requirement is slightly more problematic than NMCVT-0100-C. It mentions that spaces, '+' 's and '-' 's are allowed, but, in bullet 3, the underscore character is not recommended 'unless it is absolutely necessary to define the data item'. I believe the text in the requirement requires clarification, but I read this statement as saying that the underscore character is allowed, but frowned upon.



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It is a strong preference within the Herschel team to support the underscore character in the short description field of a MIB parameter. This is because the short description can be used to store more descriptive names for MIB parameters, e. g. DPU_START_AUT_FUN instead of the mnemonic PC004380, and so some name separator would be very useful.

The scripting language of the CUS cannot use '+' 's or '-' characters, so it would be useful if requirement NMCVT-7600-C were relaxed to fully accept the underscore.

After discussions with Felix Chatte and John Dodsworth on 5 Dec 02, it was understood that this requirement actually came from an OIRD requirement (Section A4. 2 of SCI-PT-RS-07360, v2. 1). John has mentioned that the OIRD will be updated by end Jan 2003 such that this requirement will be replaced with a reference to NMCVT-7600-C of the Alcatel document, and that Project has no problems with accepting the underscore character.

As the text in this requirement is ambiguous in places, I have proposed to send Felix changes to the text of NMCVT-7600-C, which Felix would accommodate into the next release of the Alcatel document. Felix and John accepted this proposal. Note that the Alcatel requirement for description fields allows for '+' and '-' characters (which is correct) but the HCSS CUS does not. This is entirely acceptable -the short descriptions are only used to store descriptive names for MIB parameters deemed as 'instrument-related' -ie those parameters whose mnemonics start with 'H', 'P', 'S' and (for the ILT phase) 'I', 'O' and 'Q' (see again ftp://astro.esa.int/pub/HERSCHEL/csdt/releases/doc/mib/guide/user-guide.html# longnames).

For these parameters, the short description must not include '+' 's and '-''s. This further constraint, which only applies within the HCSS, is outside the scope of the Alcatel document and will be documented in the forthcoming HCSS MIB Tailoring Document.

Draft revision to text of NMCVT-7600-C

Here is my proposed change to the text of this description. It is still unclear to me what the authors of the Alcatel document/ OIRD mean by bullet 3, but I hope to seek clarification before the final proposal is sent to Alcatel. I've also added a final sentence to inform the reader that missions can impose further constraints, as is the case for Herschel.

I also intend to contact John Dodsworth to seek clarification of the terms outlined in the section 'Definitions' of this note.

<<< start proposed text >>>

"The short and long descriptions shall:

1. Consist of characters contained in the union of the following sets:

a) the set of upper case [A-Z] and lower case [a-z] characters of the English alphabet;

b) the set of digits [0-9];

c) the characters ' ' (space), '+ ', '- ' (minus), and the '_ ' (underscore).

2. Have meaningful content for a human reader,

3. Use understandable abbreviations and acronyms [HS NOTE: NEEDS CLARIFICATION].

4. The short description must not be left empty.

Note that missions may impose their own additional restrictions within the above constraints."

<<< end of proposed text >>>



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9 ESOC response to comments by HS

Hassan Siddiqui (HS) of the HSC raised a number of queries with regards to parts of [RD-1]. This is the response from Eduardo Gomez of the SCOS development team at ESOC, sent as an email to HS on 5 December 2002:

Dear Mr Siddiqui,
Please find below the answers to your comments. You will notice that we have reissued DCRs in those cases where the text was not clear.
Best regards
Eduardo Gómez

> Please find below the responses from S2K guys

> 1. Section 2.3 describes the structure of the ASCII tables, mentions the default separator and the end-of-file convention. It does not mention explicitly that there is an entry in the ASCII table output for EACH AND EVERY FIELD of each table in the database.
> [ESOC] Ok, this statement will be added in future releases of this document.

HS reply. OK, answer accepted.


> 2. Section 3.3 of the SCOS-ICD, last 3 bullets: It mentions that "An 'M' in the final column [of each table structure definition] indicates a mandatory field", and that "Fields which are not mandatory *may or may not be explicitly given a value*". What is the situation regarding fields of numerical type that are not mandatory but are not assigned a default value? There are many cases where this occurs across the ICD (eg PCF_PFC, PCF_CURTIX). Fields that are of a 'Choice' type (ie those that require the value to be of one of a set of values, eg PCF_INTER='P' or 'F'), it is not clear what default value can be assigned if that field is not mandatory and there is not a default value explicitly specified in the ICD.

>[ESOC] Fields with no default value that are not mandatory >are left null. It is recognised that in the case of >PCF_INTER a default value must be applied. We will look >into the code and define the applicable default value in >the ICD.
HS: Could you clarify the first sentence of your response? Do you mean that 'Fields with no default value that are not mandatory are implicitly assumed to have a default value of null'? Or do you mean the actual VALUE of such fields in real data is always set to null? If it is the former, this is accepted.
[ESOC] Fields with no default value that are not mandatory are implicitly assumed to have a default value of null

> 3. Section 3.3 second bullet from last: "[...] Optional or unused fields which are left Null shall anyway be considered in that field separator character corresponding to that field shall be present". This does not seem correct English and I am not sure what the intended meaning is.
> [ESOC] This means what you stated in point 1 above i.e. that, even if a record field is null, the field separator must anyhow be present.
HS: Will the document be updated to clarify this? - section 2.3 is where such an update could be made.

[ESOC] A DCR has been raised (see text below)
DCR 286:

Reword second bullet starting from the bottom as follows:
"Fields which are not mandatory may or may not be explicitly given a value. An non-optional field can be left null, i.e. only the separator (no value)

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appears. In other words, the separator must always be present, but the value can be left empty"

> 4. It is not clear how to interpret the values PLF_OFFBY and PLF_OFFBI. In other words, what is the location of the parameter value relative to the end of the TM source packet header? After some discussions last year with Pierre Maigne and Johnnie Houser, it appears that these values are with respect to the START of a TM source packet header.

> [ESOC] The PLF_OFFBY and PLF_OFFBI are with respect to the end of the SCOS-2000 packet header. Depending on how the mission specific packetiser creates the SCOS-2000 packets, this may or may not coincide with the start of the TM sourcepacket header. If you are using the generic SCOS-2000 packetiser, the PLF reference byte does coincide with the start of the TM source packet header (as the complete TM source packets are filed in the SCOS-2000 packed body).

HS: Will the document be updated to say this?

[ESOC] DCR raised.

DCR 309:

Add an aclaratory note to the description of PLF_OFFBY stating that If the generic SCOS-2000 packetiser is used, the PLF reference byte does coincide with the start of the TM source packet header since the complete TM source packets are filed in the SCOS-2000 packed body.

> 5. The description for PLF_OFFBI does not definite clearly the location of the bit, within that octet. Does a value 0 correspond to the least-significant bit of that octet?

> [ESOC] (TBC)A value 0 corresponds to the most significant bit of that octet.

HS: Will the document be updated to say this once it has been confirmed.

[ESOC] Yes, DCR raised (see text below)

DCR 308:

Add an aclaratory note to the description of PLF_OFFBI stating that bit 0 corresponds to the most significant byte (MSB)

> 6. Numeric type checking is difficult, as in many occasions, an integer is expressed as a character array (eg CCS_YVALS of the CCS table).

> [ESOC] You can manage these fields as numbers in your editors but the exported tables shall be compliant with the S2K ICD.

HS: OK, answer accepted.

> 7. Structure: Some cases, information normally expected as a new FIELD in a table is entered as a new RECORD - eg soft/hard limits in OCP table. Difficult to check in ingestion time.

> [ESOC] On the TM side, the database structure has been inherited from previous control systems at ESOC. There is no intention to change it in the short term. You can however manage this data in your off-line editors in the way you want, provided that when exporting to SCOS-2000 the output is compliant with the ICD.

HS: OK, answer accepted.

> 8. Choice of key field sometimes deferred to a separate field flag - eg in table PID, the PID_VALID flag tells one which key field in a combination of records is valid!!




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> [ESOC] We have no intention to change this in the near future.

HS: OK, answer accepted.

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10 Discussions on SPID Uniqueness

Point 5.2.5 assumes that the SPID identifier is unique for all TM packets. However, it appears for a subset of packet types, the same SPID is assigned.

The following text are excerpts of email exchanges between B Vandenbussche (BV) of PACS and Nestor Peccia (NP) of the SCOS development team at ESOC. These emails were exchanged through Kevin Galloway (KG) of the HSC.

10.1 Email from BV to KG

```
From: Bart Vandenbussche <Bart.vandenbussche@ster.kuleuven.ac.be>
To: Kevin Galloway <kgallowa@rssd.esa.int>
CC: Luis Aloy <Luis.Aloy@esa.int>, Pierre Estaria <Pierre.Estaria@esa.int>,
    Ana Heras <aheras@rssd.esa.int>, Nestor Peccia <Nestor.Peccia@esa.int>,
    Pjotr Roelfsema <PJOTR@sron.rug.nl>, Sunil Sidher <S.D.Sidher@rl.ac.uk>
Subject: HGSSE#20 actions and pseudo-actions
```

[...]

- HGSSE AI 110902/6: MIB problems (Pjotr: can you verify this is the same MIB problem you mentioned ?)

The key to relate the parameter location table (plf.dat) and the packet type (pid.dat) in the MIB is the SPID. Unfortunately this key is not unique in the present version of the PACS MIB, all TC verification packets have SPID 10006 because the present version of S2K does not allow a range of SPIDs to indicate packet type=1. Changing S2K to allow different SPIDs for TC verification packets would be a major work package, according to Erich.

Strictly speaking, this makes that the current version of the PACS plf.dat file is not according to the S2K Database Import ICD, e.g. :

3.3.2.4.1: "The structure of the SCOS-2000 TM packets (and thus the way to extract parameters out of them) is uniquely defined by the SCOS-2000 Packet ID"

3.3.2.5.1: "it is not allowed to have more than one record per TM parameter in the same packet".

S2K does not seem to have problems with it. It is using (in my opinion abusing) the PCF_VALID field in the pcf.dat table to know if a parameter location in the plf.dat table is valid based on the value of the parameter type or subtype ID. In my opinion this is also against the ICD, since the ICD says that the PCF_VALID field indicates the validity of the value, not of the location in the packet. (in relational database terms, if it said something about the validity of the location, it would be an attribute of the location, and appear as a column in the plf.dat table)

10.2 Email from NP to BV

```
From: Nestor.Peccia@esa.int
To: Bart Vandenbussche <Bart.vandenbussche@ster.kuleuven.ac.be>
cc: Ana Heras <aheras@rssd.esa.int>, Kevin Galloway <kgallowa@rssd.esa.int>,
```



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Luis.Aloy@esa.int, Pierre.Estaria@esa.int,
Pjotr Roelfsema <PJOTR@sron.rug.nl>, Sunil Sidher <S.D.Sidher@rl.ac.uk>
Message-ID: <41256C3D.00388A99.00@esocmail2.esoc.esa.int>
Date: Mon, 23 Sep 2002 11:17:50 +0100
Subject: Re: HGSSE#20 actions and pseudo-actions

Please find below some comments wrt

HGSSE AI 110902/6: MIB problems

It is true that the current version of SCOS-2000 imposes that all TM packets with type=1, subtype=x are given the same SCOS Packet ID. This is due to the fact that the Verifier only 'listens' to a predefined list of SPIDs for the report based verification. However, a modification to allow for any SPID to be used for Service 1 TM packets has been implemented by Rosetta. A modification to allow for a range of SPIDs to be used by Service 1 packets was also implemented for Cryosat.

The current plan is to integrate all 'useful' Rosetta / CRYOSAT changes (including the one mentioned above) in the area of Verifier / OBQM in S2K R3.1.

CHANGE Description

One function was added that reads all SPIDs from the pid.dat with a service type of 1, and adds them to an existing list of packet SPIDs. This is later used to create a filter to the TM cache interface.