AISG Extension:
Antenna Line Device Clock Source

Clock Source Extension to the Control Interface for Antenna Line Devices

Extension to AISG version 2.0

Revision History

DATE	ISSUE	NOTES
31 January 2013	8	First Release

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CONTENTS

1. FOREWORD

The Antenna Interface Standards Group (AISG) published the AISG standard to facilitate the introduction of antenna line products with remote control and monitoring facilities. The purpose of that standard is to ensure basic interoperability of antennas and control infrastructure. The AISG standard covers two basic types of Antenna Line Devices: Actuators capable of altering the electrical downtilt of the antenna and tower mounted amplifiers.

It has become evident that commercial antenna line devices are evolving beyond this set of capabilities. The AISG has decided to publish extensions to the basic standard rather than adding all possible branches to the core specification. For purposes of compliance, users should note that this entire Extension Standard is *optional*. However, once a given Extension Standard is elected for inclusion in a device, the entire option becomes mandatory.

This extension to the AISG standard adds procedures for antenna line devices that maintain, store and report time. Some proposed and current Antenna Line Devices require a reliable clock source for ongoing synchronized operations. As a separate logical and/or physical component, a common clock source helps hardware vendors realize cost savings by reducing redundant hardware within the system.

2. SCOPE

This document contains extensions to layers 2 and 7 of AISG specification, version 2.0 [1], for Antenna Line Devices implementing Antenna Clock Source (ACS).

3. REFERENCES

This AISG standard incorporates provisions from other publications. These are cited in the text and the referenced publications are listed below. Where references are dated, subsequent amendments or revisions of these publications apply only when specifically incorporated by amendment or revision of this AISG extension. For undated references the latest edition of the publication referred to applies.

1   AISG Version 2.0, "Control Interface for Antenna Line Devices"

2   3GPP TS25.460 UTRAN Iuant Interface General Aspects and Principles Release 6

3   3GPP TS25.461 UTRAN Iuant Interface Layer 1, Release 6

4   3GPP TS25.462 UTRAN Iuant Interface Signalling Transport, Release 6

5   [Not used]

6   3GPP TS25.463 UTRAN Iuant Interface: Application Part, Release 6

Note the 3GPP references are to Release 6 unless otherwise indicated. These documents are referred to in AISG Version 2.0, although they may have been superseded.

4. ABBREVIATIONS

Where abbreviations or acronyms are used in this document they have the following meanings:

ACS	Antenna Clock Source
TCP	Time Consuming Procedure
UTC	Universal Time Coordinated

5. TERMINOLOGY AND DEFINITIONS

Where the following terms are used in this document, they have the meanings listed below.

Current Date/Time	Current date and time is reported with separate values for year, month, day, hours, minutes, seconds. The date and time is in Universal Time Coordinated. UTC Date/Time is not affected by local daylight savings time regulations.

6. LAYER 1

All definitions and specifications for RET devices in the reference [1], [2] and [3] regarding Iuant layer 1 apply to ACS devices complying with this Extension Standard unless otherwise stated by requirements in this document.

6.1. DC supply

6.1.1. ACS DC power consumption

Power consumption shall be given by the product data sheet.

6.1.2. ACS Power-up characteristics

Devices complying with this Extension Standard shall have a maximum power-up period of 3 seconds.

After the power-up period, the device shall be fully functional.

6.2. Resumption of operation after interruption of supply

Normal operation shall be resumed after restoration of the power supply after any interruption or arbitrary reduction of the voltage supplied (brown-out) in accordance with [3].

NOTE: Clock information may not be immediately available.

6.2.1. ACSs

No data shall be retained by the ACS.

7. LAYER 2

All definitions and specifications for RET devices in reference [4] regarding Iuant layer 2 shall be valid for all antenna line devices included in this Extension Standard regardless of whether the device implements RET functionality.

Extended specifications for layer 2 are defined in the following chapter.

7.1. Device Type

For the purposes of reverse compliance with [4], devices implementing this Extension Standard shall report the device type in compliance with provisions in [6].

The following table shows the additional device type for this Extension Standard:

Table 7.1.1: Device type

Device Type	1-octet hexadecimal code
Antenna Line Device Clock Source	0x26

8. LAYER 7

This chapter defines which procedures defined in [1] shall be re-used by ACS devices. This chapter also includes additional procedures which are specific to ACS devices.

8.1. General Aspects

8.1.1. Geometry and Numbering

All ACS devices shall be defined as multiple subunit devices.

NOTE: Devices with single ACS units shall be implemented as multiple subunit devices with the number of subunits equal to 1.

8.1.2. Parallel Procedure Handling for Time Consuming Procedures (TCPs)

The ACS device does not define any TCPs. Parallel procedure handling is not supported by the ACS.

8.2. Return and alarm codes

A table of return and alarm codes is given in [6].

8.3. Elementary Procedures for the ALD Clock Source

To avoid prematurely exhausting the available space in the command table through the proliferation of extensions, certain codes defined for other devices are reused by this extension. This process is called "overloading".

For device compliant with this extension, the overloaded code shall refer to a member of the ACS procedure set defined herein, and not to the procedure assigned by the original specification.

This section defines those procedures that are defined by overloading existing procedure codes without any significant changes in the procedure initiation message, response message, and/or return code values. For clarity, only differences from the language of the referenced specification are elaborated for these procedures.

Table 8.3.1 Common elementary procedures

ACS Command	Overloads	Code Value	Requirement
ACSAlarmIndication	TMAAlarmIndication [1]	0x76	Mandatory
ACSClearActiveAlarms	TMAClearActiveAlarms [1]	0x77	Mandatory
ACSGetAlarmStatus	TMAGetAlarmStatus [1]	0x78	Mandatory

These commands shall be implemented as specified in the corresponding paragraphs of [1].

8.4. Device-Specific Elementary Procedures for ACS Subunits

This section defines procedures that are defined by overloading existing procedures in [1] that include significant changes in the procedure message initiation, response, and/or return code values or formats. No requirements from the corresponding procedure clauses in [1] shall be inferred unless re-stated in this Extension Standard.

Table 8.4.1 Antenna Line Device Clock Source elementary procedures for all supported functions

The following elementary procedures shall be included by all ACS implementations, regardless of supported functions.

ACS Command	Overloaded command	Code Value	Requirement
ACSGetSupportedFunctions	TMAGetSupportedFunctions[1]	0x7A	Mandatory
ACSGetTime		0xA8	Mandatory

Table 8.4.2 ACS Internal Time Source function specific elementary procedures

If the Internal Time Source function flag is set, the ACS is operating as a time keeping device which is updated using a local clock source. In this case, ACSSetTime must be supported and used to set the current time before ACSGetTime is used to query the updated time.

ACS Command	Overloaded command	Code Value	Requirement
ACSSetTime		0xA9	Mandatory

If the Internal Time Source function flag is cleared, the ACS is operating as a read-only time reporting device which is updated using an external clock source. In this case, the ACSSetTime elementary procedure is not supported.

ACS Command	Overloaded command	Code Value	Requirement
ACSSetTime		0xA9	Not Supported

8.4.1. ACS Set Time

Table 8.4.1.1: Elementary procedure ACSSetTime

Name: **ACSSetTime**				
Code:	Issued by:	Procedure class:	DownloadMode state:	Power mode:
0xA8	**Primary device**	**1**	**No**	**Low**

Table 8.4.1.2: Initiating message parameters and format for ACSSetTime

Field	Length	Type	Description
1	1 octet	Unsigned integer	Subunit number
2	2 octets	Unsigned integer	UTC date/time - Year
3	1 octet	Unsigned integer	UTC date/time - Month
4	1 octet	Unsigned integer	UTC date/time - Day
5	1 octet	Unsigned integer	UTC date/time - Hour
6	1 octet	Unsigned integer	UTC date/time - Minute
7	1 octet	Unsigned integer	UTC date/time - Second

Table 8.4.1.3: Response message parameters and format for ACSSetTime

Field	Length	Type	Description
1	1 octet	Unsigned integer	Subunit number
2	1 octet	Return code	Return code: OK

Table 8.4.1.4: Return codes for ACSSetTime

OK	FAIL	Comment
	FormatError	See [1]
	HardwareError	
	WorkingSoftwareMissing	
	UnsupportedProcedure	

8.4.2. ACS Get Time

Table 8.4.2.1: Elementary procedure ACSGetTime

Name: **ACSGetTime**				
Code:	Issued by:	Procedure class:	DownloadMode state:	Power mode:
0xA9	**Primary device**	**1**	**No**	**Low**

Table 8.4.2.2: Initiating message parameters and format for ACSGetTime

Field	Length	Type	Description
1	1 octet	Unsigned integer	Subunit number

Table 8.4.2.3: Response message parameters and format for ACSGetTime

Field	Length	Type	Description
1	1 octet	Unsigned integer	Subunit number
2	1 octet	Return code	Return code: OK
3	2 octets	Unsigned integer	UTC date/time - Year
4	1 octet	Unsigned integer	UTC date/time - Month
5	1 octet	Unsigned integer	UTC date/time - Day
6	1 octet	Unsigned integer	UTC date/time - Hour
7	1 octet	Unsigned integer	UTC date/time - Minute
8	1 octet	Unsigned integer	UTC date/time – Second

Table 8.4.2.4: Return codes for ACSGetTime

OK	FAIL	Comment
	FormatError	See [6]
	HardwareError	
	WorkingSoftwareMissing	
	UnsupportedProcedure	
	NotConfigured	Prerequisite data has not been set. Unable to fulfill request.
	NotReady	The ACS has been correctly configured, but the clock is currently unavailable. The ACS is busy collecting the required data.

8.4.3. ACS Get Supported Functions

On receipt of the initiating message, the secondary device shall respond with the function flags and parameters indicating the supported functionality of the addressed Antenna Line Device Time Source.

Table 8.4.3.1: Elementary procedure ACSGetSupportedFunctions

Name: **ACSGetSupportedFunctions**				
Code:	Issued by:	Procedure class:	DownloadMode state:	Power mode:
0x7A	**Primary device**	**1**	**No**	**Low**

Table 8.4.3.2: Initiating message parameters and format for ACSGetSupportedFunctions

Field	Length	Type	Description
1	1 octet	Unsigned integer	Subunit number

Table 8.4.3.3: Response message parameters and format for ACSGetSupportedFunctions

Field	Length	Type	Description
1	1 octet	Unsigned integer	Subunit number
2	1 octet	Return code	Return code: OK
3	1 octet	Unsigned integer	Function Flags

Table 8.4.3.4: Return codes for ACSGetSupportedFunctions

OK	FAIL	Comment
	FormatError HardwareError WorkingSoftwareMissing	See [1]

Table 8.4.3.5: Function Flags for ACSGetSupportedFunctions

On receipt of the initiating message, the ACS shall respond with the function flags and parameters indicating the supported functionality of the addressed ACS unit.

Bit	7 to 1	0
Function	Spare	Internal Time Source

Bits are numbered from 0…7, bit number 0 set to 1 represents the value 0x01
Bit value 0 represents function is not supported
Bit value 1 represents function is supported
Spare bits shall be set to zero

9. PRODUCT IDENTIFICATION

9.1. Marking of conforming products with extensions

In order to allow users to identify products which conform with the requirements of this extension standard, member companies are encouraged to use the AISG logo on conforming products and on any brochures, advertisements or product literature associated with them. In addition, the legends 'AISG 2.0 (Antenna Line Device Clock Source Extension)' or 'Conforms with interface standard AISG 2.0 with Antenna Line Device Clock Source Extension ' may be used on such products and associated literature.