INTERNATIONAL STANDARD

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Cable networks for television signals, sound signals and interactive services –

Part 7-3:
Hybrid Fibre Coax Outside Plant Status Monitoring – Power supply to Transponder Interface Bus (PSTIB) Specification

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CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 7-3: Hybrid Fibre Coax Outside Plant Status Monitoring – Power Supply to Transponder Interface Bus (PSTIB) specification

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International Standard IEC 60728-7-3 has been prepared by technical area 5: Cable networks for television signals, sound signals and interactive services, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This standard was submitted to the national committees for voting under the Fast Track Procedure as the following documents:

CDV	Report on voting
100/578/CDV	100/685/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

The following differences exist in some countries:

The Japanese *de facto* standard (NCTEA S-006) concerning requirements for the HFC outside plant management, which was published in 1995, has already been available in Japan. The purpose of this standard is to support the design and implementation of interoperable management systems for HFC cable networks used in Japan.

INTRODUCTION

Standards of the IEC 60728 series deal with cable networks for television signals, sound signals and interactive services including equipment, systems and installations for

- head-end reception, processing and distribution of television and sound signals and their associated data signals, and
- processing, interfacing and transmitting all kinds of signals for interactive services

using all applicable transmission media.

All kinds of networks like

- CATV-networks,
- MATV-networks and SMATV-networks,
- individual receiving networks

and all kinds of equipment, systems and installations installed in such networks, are within this scope.

The extent of this standardization work is from the antennas, special signal source inputs to the head-end or other interface points to the network up to the system outlet or the terminal input, where no system outlet exists.

The standardization of any user terminals (i.e. tuners, receivers, decoders, multimedia terminals, etc.) as well as of any coaxial and optical cables and accessories therefore is excluded.

CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 7-3: Hybrid Fibre Coax Outside Plant Status Monitoring – Power Supply to Transponder Interface Bus (PSTIB) specification

1 Scope

This part of IEC 60728 specifies requirements for the Hybrid Fibre Coax (HFC) Outside Plant (OSP) Power Supplies (PS). This standard is part of a series developed to support the design and implementation of interoperable management systems for evolving HFC cable networks. The purpose of the standards is to support the design and implementation of interoperable management systems for evolving HFC cable networks. The Power Supply to Transponder Interface Bus (PSTIB) specification describes the physical (PHY) interface and related messaging and protocols implemented at the Data Link Layer (DLL), layers 1 and 2 respectively in the 7-layer ISO-OSI reference model, that support communications between compliant transponders and the managed OSP power supplies and other related power equipment to which they interface.

This standard describes the PSTIB PHY and DLL layer requirements and protocols that must be implemented to support reliable communications between all *type 2* and *type 3* compliant OSP transponders on the HFC plant and managed OSP power supplies and related hardware. Any exceptions to compliance with this staneard will be specifically noted as necessary. Refer to Table 1 for a full definition of the type classifications.

Transponder type classifications referenced within the HMS series of standards are defined in Table 1.

Table 1 – Transponder type classifications

Type	Description	Application
Type 0	Refers to legacy transponder equipment which is incapable of supporting the specifications	• This transponder interfaces with legacy network equipment through proprietary means. • This transponder could be managed through the same management applications as the other types through proxies or other means at the head-end
Type 1	Refers to stand-alone transponder equipment (legacy or new), which can be upgraded to support the specifications	• This transponder interfaces with legacy network equipment through proprietary means. • Type 1 is a standards-compliant transponder (either manufactured to the standard or upgraded) that connects to legacy network equipment via a proprietary interface
Type 2	Refers to a stand-alone, compliant transponder	• This transponder interfaces with network equipment designed to support the electrical and physical specifications defined in the standards. • It can be factory or field-installed. • Its RF connection is independent of the monitored NE
Type 3	Refers to a stand-alone or embedded, compliant transponder	• This transponder interfaces with network equipment designed to support the electrical specifications defined in the standards. • It may or may not support the physical specifications defined in the standards. • It can be factory-installed. It may or may not be field-installed. • Its RF connection is through the monitored NE

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EIA RS-485, Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following definitions apply.

3.2
data link layer (DLL)
layer 2 in the Open System Interconnection (OSI) architecture; the layer that provides services to transfer data over the physical transmission link between open systems

3.3
network element (NE)
an active element in the outside plant (OSP) that is capable of receiving commands from a head-end element (HE) in the head-end and, as necessary, providing status information and alarms back to the HE

3.4
open system interconnection (OSI)
framework of International Organization for Standardization (ISO) standards for communication between multi-vendor systems that organizes the communication process into seven different categories that are placed in a layered sequence based on the relationship to the user. Each layer uses the layer immediately below it and provides services to the layer above. Layers 7 through 4 deal with end-to-end communication between the message source and destination, and layers 3 through 1 deal with network functions

3.5
physical (PHY) layer
layer 1 in the Open System Interconnection (OSI) architecture; the layer that provides services to transmit bits or groups of bits over a transmission link between open systems and which entails electrical, mechanical and handshaking procedures

3.6
transponder
device that interfaces to outside plant (OSP) NEs and relays status and alarm information to the HE. It can interface with an active NE via an arrangement of parallel analogue, parallel digital and serial ports

3.7 Abbreviations

DLL Data Link Layer

EMS Element Management System

Gnd Grund

HE Head-end Element

HFC Hybrid Fibre Coax

ISO International Organization for Standardization

ISO	International Organization for Standardization
LED	Light Emitting Diode
MAC	Media Access Control
NE	Network Element
OSI	Open System Interconnection
OSP	Outside Plant
PHY	Physical
PSTIB	Power Supply to Transponder Interface Bus
RF	Radio Frequency
Rx	Receive
SNMP	Simple Network Management Protocol
Tx	Transmit
Tx En	Transmit Enable
xpndr	Transponder

4 Reference architecture forward and return channel specifications

The reference architecture for the series of specifications is illustrated in Figure 1.

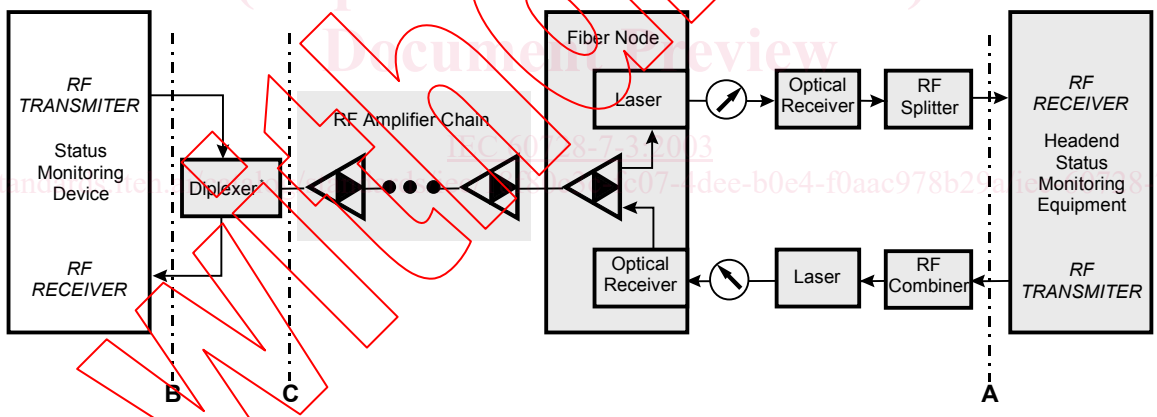

Figure 1 – Reference architecture diagram

All quantities relating to forward channel transmission or reverse channel reception are measured at point A in Figure 1. All quantities relating to forward channel reception or reverse channel transmission are measured at point B for two-port devices and point C for single-port devices as shown in Figure 1.

5 Power supply to transponder interface bus specification overview

PSTIB specification defines a status monitoring topology intended to replace existing analog, discrete status monitoring interfaces used today for monitoring power supplies and other power-related equipment deployed in HFC networks. In this topology, the transponder is simplified by moving all measurements and sensors to the monitored equipment, i.e. power supply or other power equipment. The transponder interfaces to the monitored equipment