SLOVENSKI STANDARD
SIST-TS CLC/TS 50607:2013

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Distribucija satelitskih signalov po enojnem koaksialnem kablu - Druga generacija inštalacij

Satellite signal distribution over a single coaxial cable - Second generation

Verteilen von Satellitensignalen über ein Koaxialkabel - Zweite Generation

Distribution de signaux satellitaires sur un unique câble coaxial - Installations de seconde génération

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TECHNICAL SPECIFICATION

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English version

Satellite signal distribution over a single coaxial cable – Second generation

Distribution de signaux satellitaires sur un unique câble coaxial - Installations de seconde génération

Verteilen von Satellitensignalen über ein Koaxialkabel – Zweite Generation

This Technical Specification was approved by CENELEC on 2013-09-04.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This document (CLC/TS 50607:2013) has been prepared by CLC/TC 209 "Cable networks for television signals, sound signals and interactive services".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Introduction

In EN 61319-1:1996/A11:1999, the interfaces for the control and command of the devices associated with the satellite receivers are described in the following clauses:

- Clause 4: Interfaces requirements for polarizer and polar switchers;
- Clause 5: Interfaces requirements for low-noise block converters (LNB).

In these clauses, analogue techniques are described for controlling the LNB and polar switchers.

In the DiSEqC™ Bus Functional Specification, the “Digital Satellite Equipment Control Bus” (called DiSEqC) is introduced as a single method of communication between the satellite and the peripheral equipment, using only the existing coaxial cables. The existing EN 50494 “Satellite signal distribution over a single coaxial cable in single dwelling installations” describes a system for distributing signals via single coaxial cable issued from different bands and polarisations to several satellite receivers This specification is limited to 8 units per output of the Single Cable Interface and to 8 Satellite IF banks (bands, feeds, polarisations).

The second generation described in this Technical Specification is intended for single and multiple dwelling installations and includes the following enhancements compared to EN 50494:

- The number of demodulators is extended to a maximum of 32 units per output of the Single Cable Interface (hereafter referred to as SCIF) device.
- The system is scaled for a maximum number of 256 Satellite IF banks (bands, feeds, polarisations)
- The SCIF replies, which may be used during installation process, are also based on DiSEqC.
- Equipment according to this Technical Specification is downwards compatible to the specifications provided by EN 50494.

1 Scope

This Technical Specification describes:

- the system physical structure;
- the system control signals, which implement a set of messages using DiSEqC physical layer but not the DiSEqC message structure;
- the definition of identified configurations;
- the management of the potential collisions in the control signals traffic.

Figure 1 illustrates the physical system configuration considered in this Technical Specification.

Several satellite signal demodulators can receive signals from any of the input signal banks (Bank 1, Bank 2, ···· Bank M, with M ≤ 256) of the LNB or the switch. The signals selected by the demodulators (or receivers) are transported via a single cable to these demodulators (Receiver 1, Receiver 2, ···· Receiver N, with N ≤ 32).

To achieve these single cable distributions, the Single Cable Interface (SCIF, likely embedded in a LNB or a Switch) features some specific functions and characteristics.

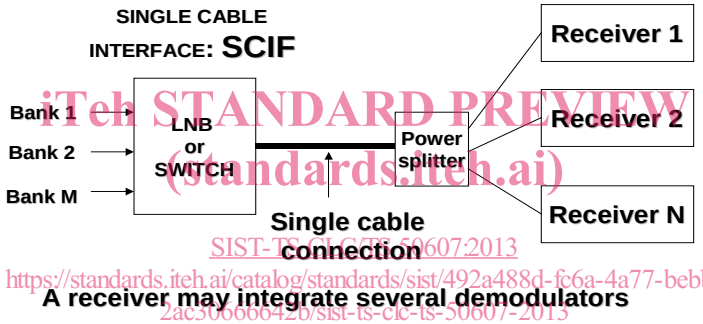

Figure 1 — General architecture of the single cable distribution

2 Normative references

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

EN 50494	*Satellite signal distribution over single coaxial cable in single dwelling installations*
EN 60728-4	*Cable networks for television signals, sound signals and interactive services – Part 4: Passive wideband equipment for coaxial cable networks*
EN 61319-1:1996 + A11:1999	*Interconnections of satellite receiving equipment – Part 1: Europe (IEC 61319-1:1995)*
ISO/IEC 13818-1	*Information technology – Generic coding of moving pictures and associated audio information – Part 1*
DiSEqC™ Bus Functional Specification	Version 4.2, February 25, 1998 http://www.eutelsat.com/satellites/4_5_5.html

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1.1
bank
group of contiguous channels belonging to a polarisation and/or a band

3.1.2
channel
radio frequency transponder signal

3.1.3
demodulator
electronic device integrating at least a tuner and a demodulator

3.1.4
receiver
electronic equipment embedded in a cabinet and integrating all functions for demodulating and decoding the received satellite signals (a receiver may integrate several demodulators)

3.1.5
universal LNB
LNB with the following characteristics: operation in the Ku bands (10,7 GHz → 12,75 GHz); local oscillator frequency is 9,75 GHz for signal frequencies lower than 11,7 GHz and local oscillator frequency is 10,6 GHz otherwise

3.2 Abbreviations

CW	Continuous Wave
DC	Direct Current
DiSEqC	Digital Satellite Equipment Control
IF	Intermediate Frequency
LNB	Low Noise Blockconverter
MDU	Multiple Dwelling Unit
MSB	Most Significant Bit
ODU	Out-Door Unit
PCR	Program Clock Reference
PIN	Personal Identification Number
PWK	Pulse Width Keying
SCD2	Single Cable Distribution 2 (second generation)
SCIF	Single Cable Interface
STB	Set-Top Box
UB	User Band

4 System architecture

In the single coaxial cable distribution system, the bandwidth of the shared coaxial cable is divided into slots (user band: UB). The number of slots Nb_ub varies from one application to another; the number of slots Nb_ub is a characteristic of the SCIF.

The system defined in this Technical Specification limits the number of UB slots to 32 per output of the SCIF.

Each receiver connected to the single coaxial cable distribution is allocated to one UB slot. This allocation is done either in static or other modes.

In the static mode, the allocation of the UB slot is done during the installation of the satellite receiver. Only the static mode is considered in this document.

NOTE Other modes are not described in this document but could be considered in a further release or annex of this document.

After the slot allocation, the tuner of the receiver operates at a single frequency (centre of the slot UB). To select a desired channel (frequency Fd), the demodulator sends a SCIF control signal that provides the following information:

- select the bank (band, feed, polarisation) that carries the desired signal;
- select the frequency (Fd) of the desired signal;
- designate the UB slot on which the desired signal is expected.

Figure 2 illustrates the frequency mapping for such a single coaxial cable system.

Figure 3, Figure 4 and Figure 5 illustrate various examples for implementing the single cable distribution system (other application scenarios are possible).

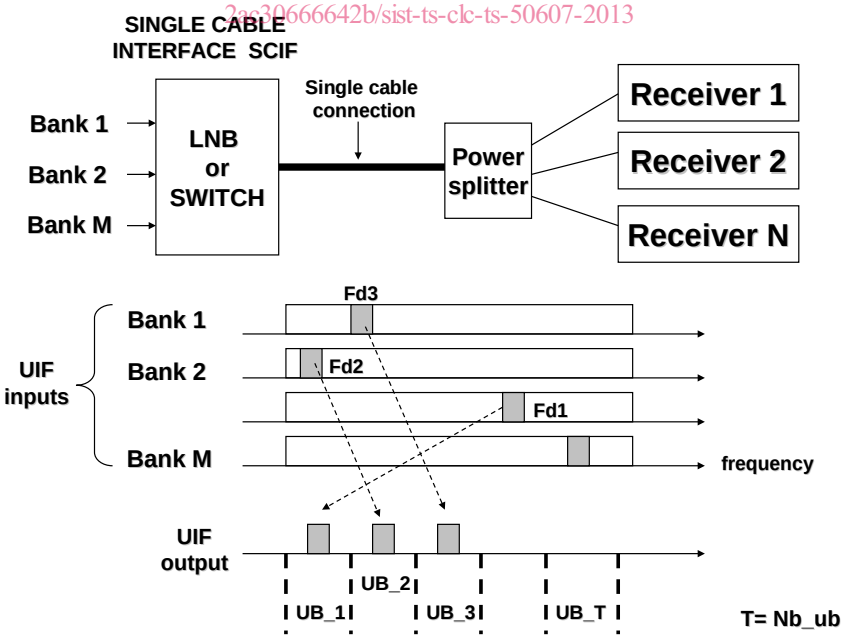

Figure 2 — General system operation and UB slot frequency mapping

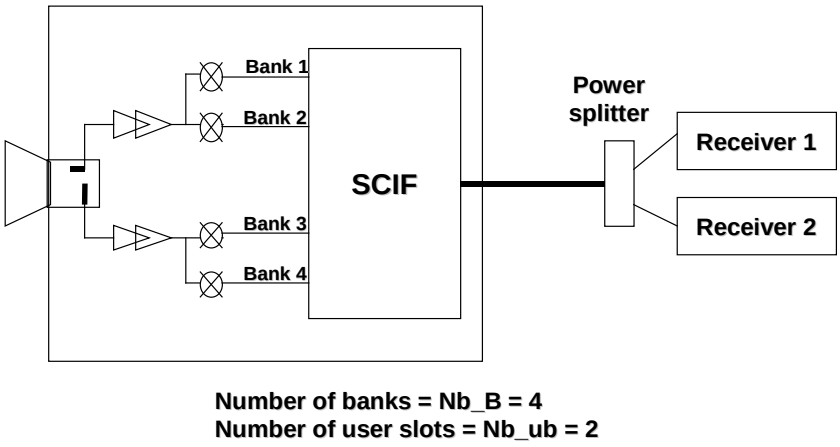

Figure 3 — Installation example, system with reception of one orbital position (4 Satellite IF banks) by two receivers (2 UB slots)

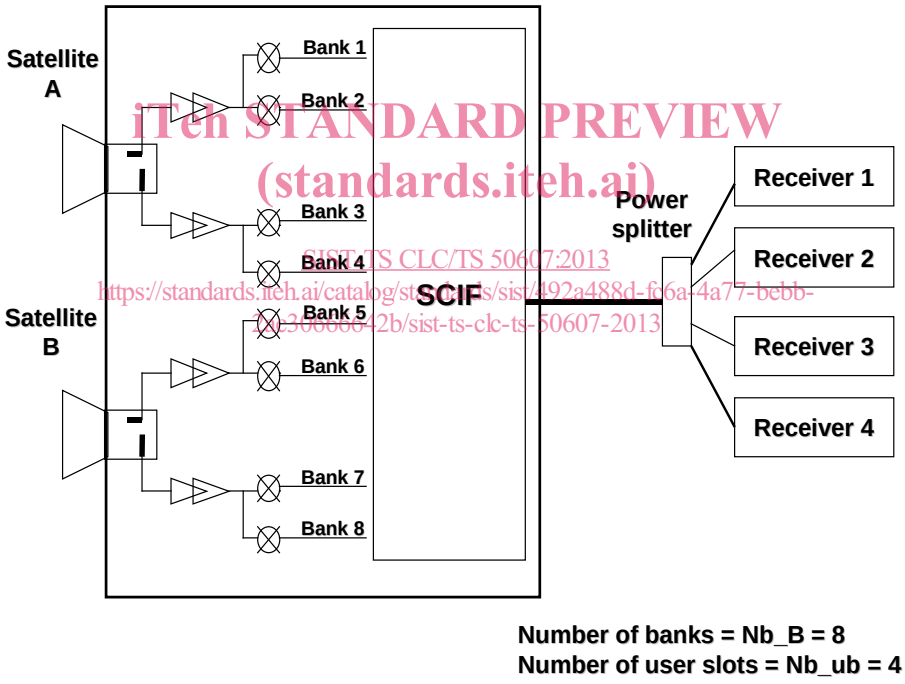

Figure 4 — Installation example implementing the reception of two orbital positions (8 satellite IF banks) by four receivers (4 UB slots)