SLOVENSKI STANDARD
SIST EN 50494:2008

01-januar-2008

Distribucija satelitskega signala po enojnem koaksialnem kablu v enostanovanjskih inštalacijah

Satellite signal distribution over a single coaxial cable in single dwelling installations

Signalverteilung von Satellitensignalen über ein einziges koaxiales Kabelverteilnetz

Distribution de signaux satellites sur un seul câble coaxial dans les résidences individuelles

Ta slovenski standard je istoveten z: EN 50494:2007

ICS:

33.060.30	Radiorelejni in fiksni satelitski komunikacijski sistemi	Radio relay and fixed satellite communications systems
33.120.10	Koaksialni kabli. Valovodi	Coaxial cables. Waveguides

SIST EN 50494:2008 **en**

EUROPEAN STANDARD

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English version

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Distribution de signaux satellites sur un seul câble coaxial dans les résidences individuelles

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 206, Consumer equipment for entertainment and information and related sub-systems.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50494 on 2007-03-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2008-05-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2010-03-01

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Introduction

In EN 61319-1:1995 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 EN 61319-1/A11, 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 purpose of this document is to introduce a complete system for distributing via a single coaxial cable signals issued from different bands and polarizations to several satellite receivers.

The presented system is intended for single dwelling installation (individual subscriber installations) but in Clause 9 of this document there is also described an optional extension for multiple dwelling installations.

The presented system is scaled for installations in which the number of demodulators is limited to a maximum number of 8 units per output of the Single Cable Interface (hereafter referred to as SCIF) device.

1 Scope

This European Standard describes:

– the system physical structure;

– the system control signals, which implement an extension of the DiSEqC set of commands described in the DiSEqC bus functional specification;

– the definition of identified configurations;

– management of the potential collisions in the control signals traffic.

Figure 1 illustrates the physical system configuration considered in this European Standard.

Several satellite signal demodulators can receive signals from any of the input signal banks 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).

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.

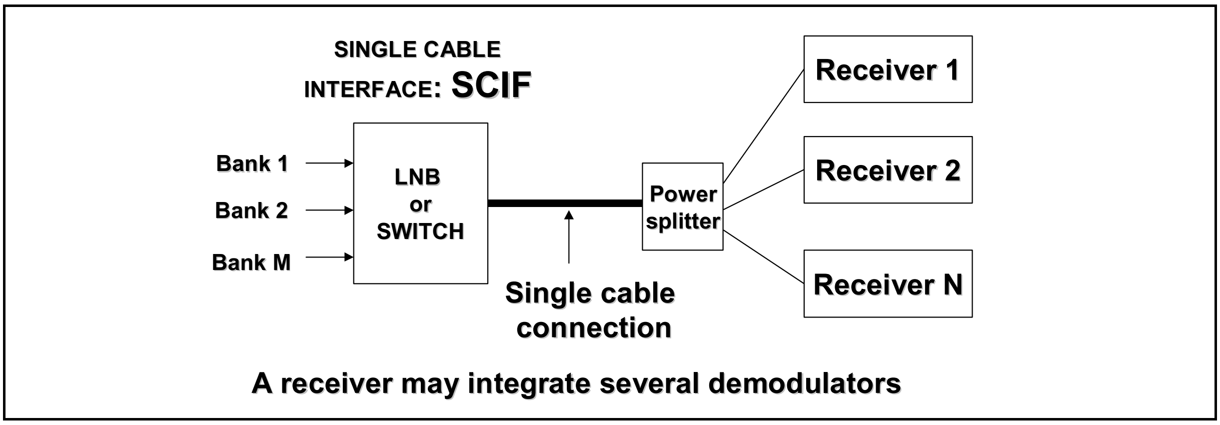

Figure 1 – General architecture of the single cable distribution

2 Normative references

The following 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.

EN 50083-4	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)
EN ISO/IEC 13818-1	Information technology – Generic coding of moving pictures and associated audio information – Part 1: Systems (ISO/IEC 13818-1)

“DiSEqC^{TM}” Bus Functional Specification Version 4.2, February 25, 1998
http://www.eutelsat.com/satellites/4_5_5.html

3 Acronyms and definitions

3.1 Acronyms

CW	Continuous Wave
DiSEqC	Digital Satellite Equipment Control
LNB	Low Noise Block
LUT	Look-up Table
MDU	Multiple Dwelling Unit
MSB	Most significant bit
ODU	Out-door Unit
PCR	Program clock reference
PWK	Pulse Width Keying
SCIF	Single Cable Interface

SDU Single Dwelling Unit

UB User Band

3.2 Definitions

3.2.1
bank
group of contiguous channels belonging to a polarization and or a band

3.2.2
channel
radio frequency transponder signal

3.2.3
demodulator
electronic device integrating at least a tuner and a demodulator

3.2.4
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

3.2.5
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

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 standard limits the number of UB slots to 8 (eight) per output of the SCIF.

Each demodulator connected to the single coaxial cable distribution is allocated a UB slot; this allocation is done either in static or other modes.

– 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.

– 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, polarization) 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.

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

– Figure 3: a single coaxial cable distribution is implemented between a LNB and two demodulators.

– Figure 4: a single coaxial cable distribution is implemented between a double feed LNB and a set of 4 demodulators.

– Figure 5: In an installation that shall serve more than 8 demodulators, a SCIF device with several outputs (Out) is implemented; each output can serve a maximum number of demodulators (Nb_ub). In the illustrated example, there are 2 outputs, each output can serve up to 6 demodulators, the output Out 2 could serve two additional demodulators before reaching the limit of the installed hardware.

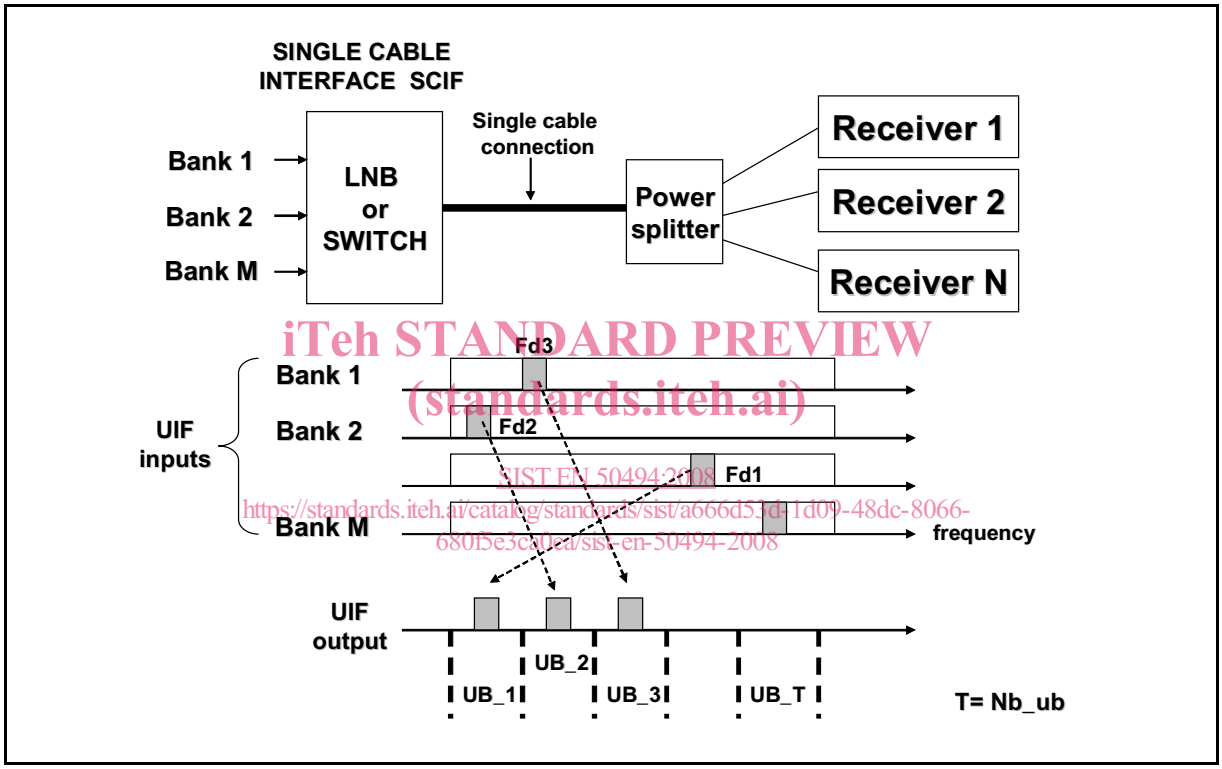

Figure 2 – General system operation and UB slot frequency mapping

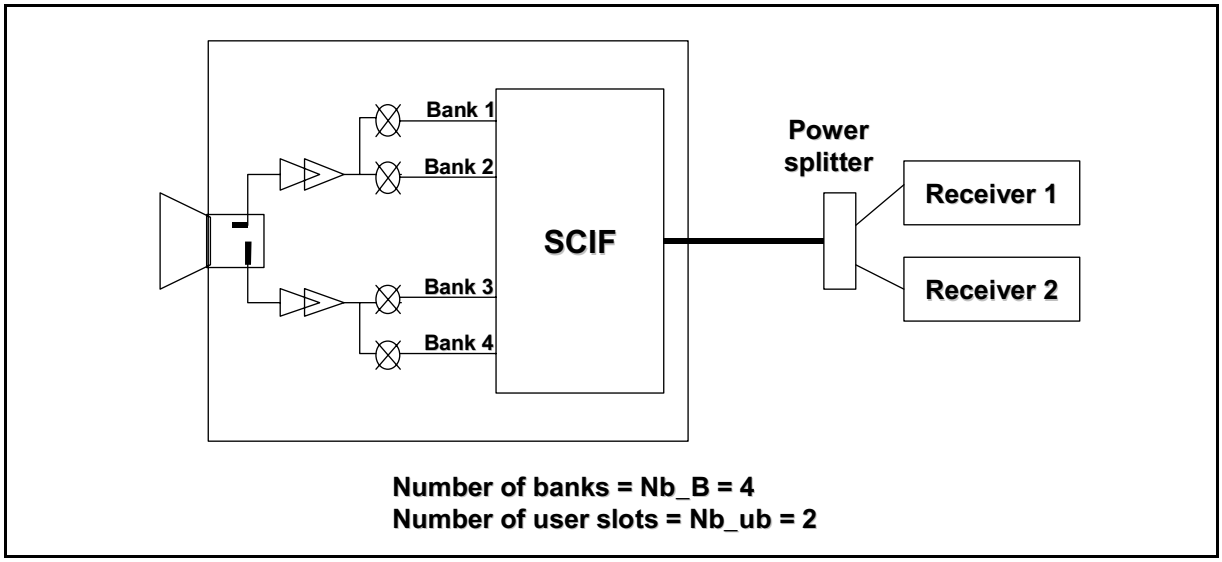

Figure 3 – Installation example, system with two UB slots

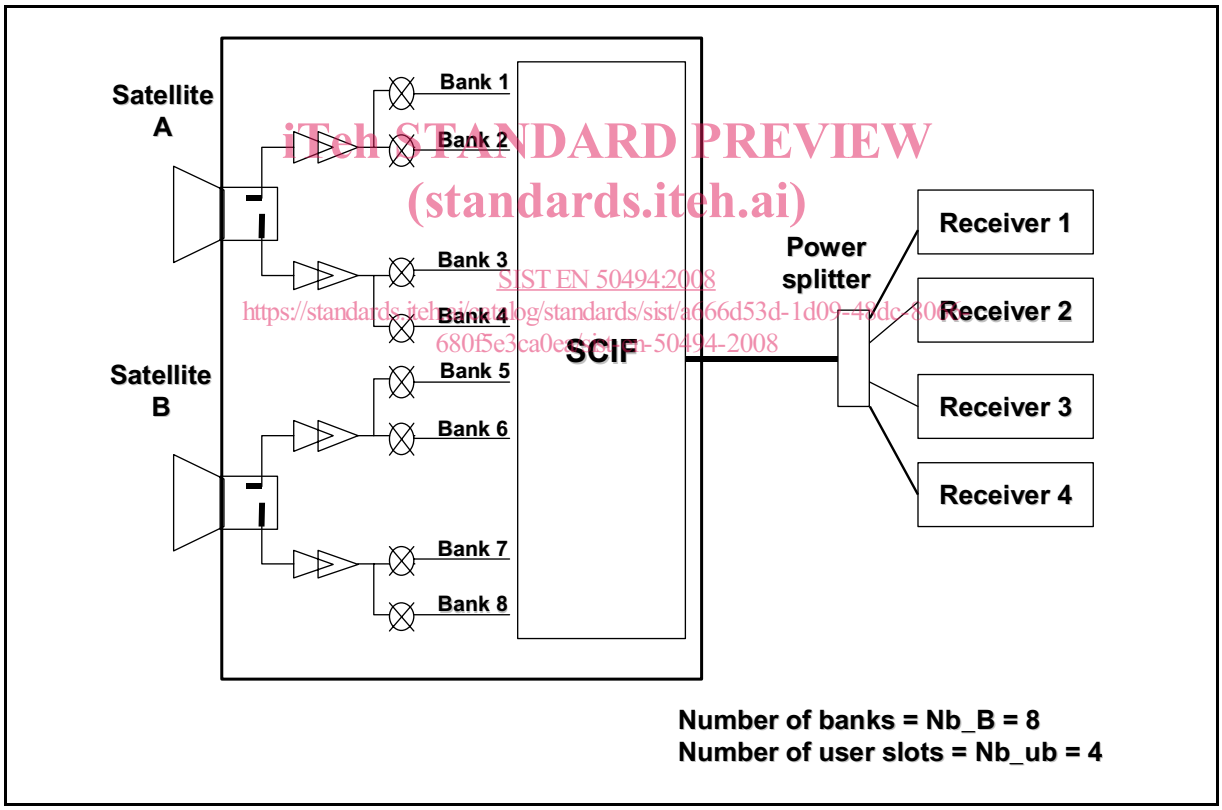

Figure 4 – Installation example implementing a monobloc LNB with four UB slots

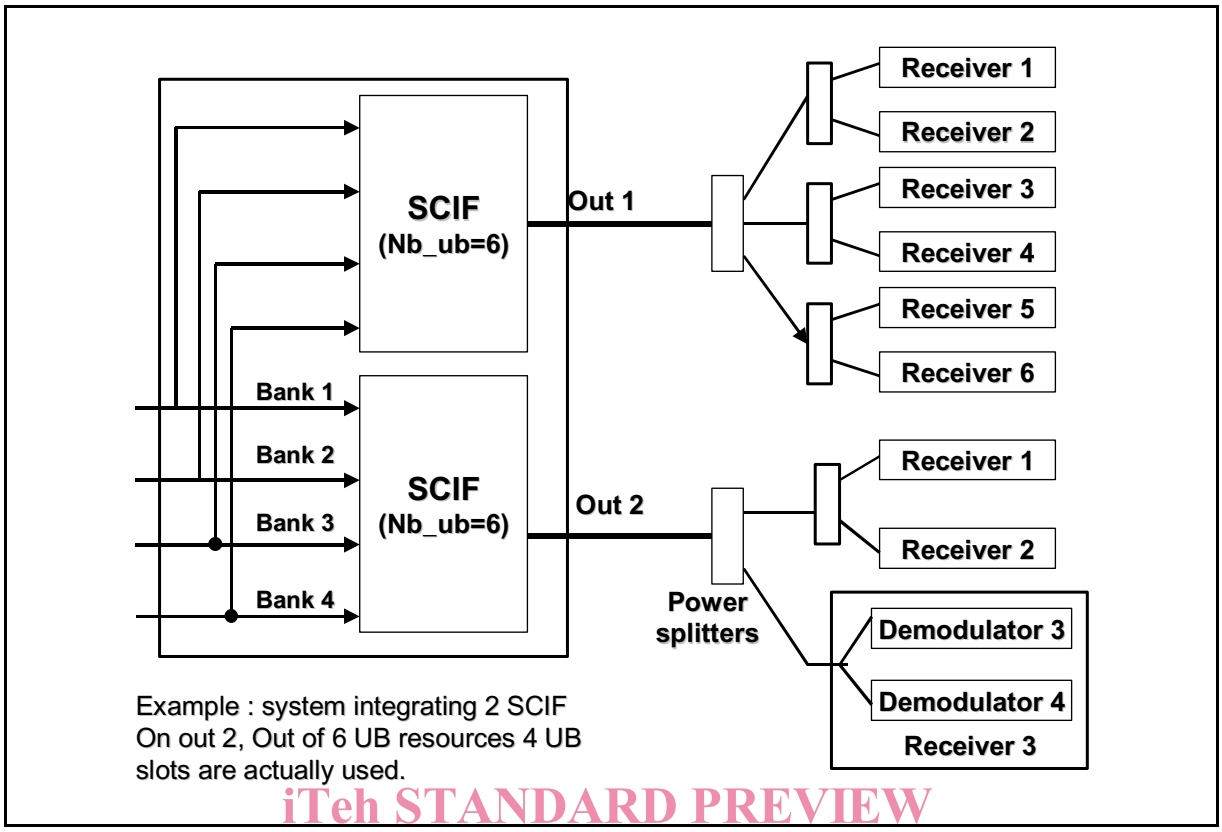

Figure 5 – Example of a switcher with two outputs serving six UB slots each

5 SCIF control signals

5.1 DC levels

In a single coaxial cable distribution system, all controls issued by the receivers (demodulators) are done according to the DiSEqC format.

The single coaxial cable distribution system is not backwards compatible with the former 13/18 V control associated with a continuous 22 kHz tone. The single coaxial cable distribution system is also not backwards compatible with the tone burst signalling.

In single coaxial cable distribution systems, the signal-sending receiver generates a high DC level upon which the DiSEqC control signals are added. After sending the DiSEqC control signal the receiver returns to an idle mode in which it generates a low DC level onto the single cable distribution system (refer to Figure 6). With reference to EN 61319-1, the low and high DC level shall have the following limits on the signal-sending- receiver side:

– LOW _DC value: 12,5 V to 14 V

– HIGH_ DC value: 17 V to 19 V

The delays (td & ta) shall have the following limits:

– td_{min} > 4 ms and td_{max} < 22 ms

– ta_{min} > 2 ms and ta_{max} < 60 ms