HITACHI
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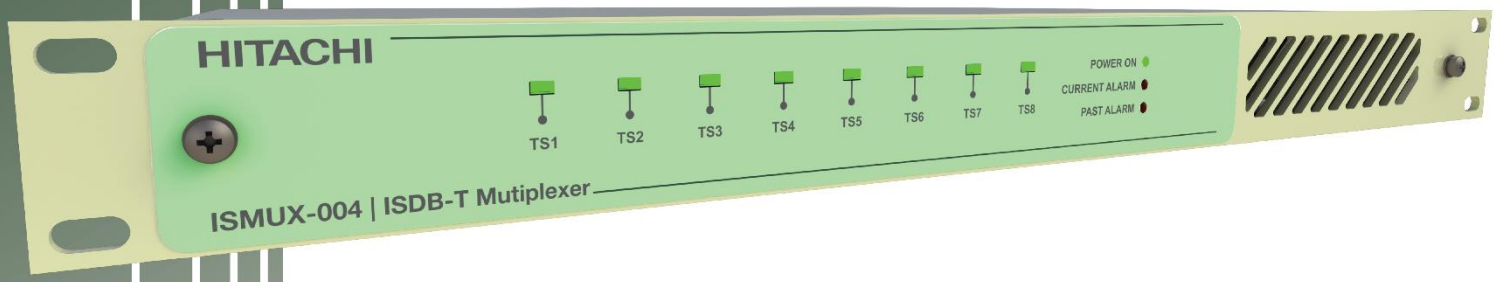
ISMUX-004

ISDB-Tb Digital TV Multiplexer

BTS Compressor and Decompressor



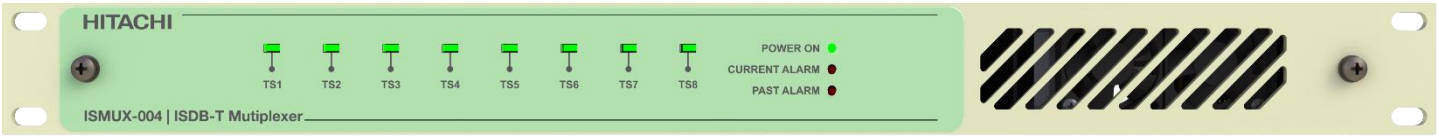
Hitachi Kokusai Linear

ISMUX-004

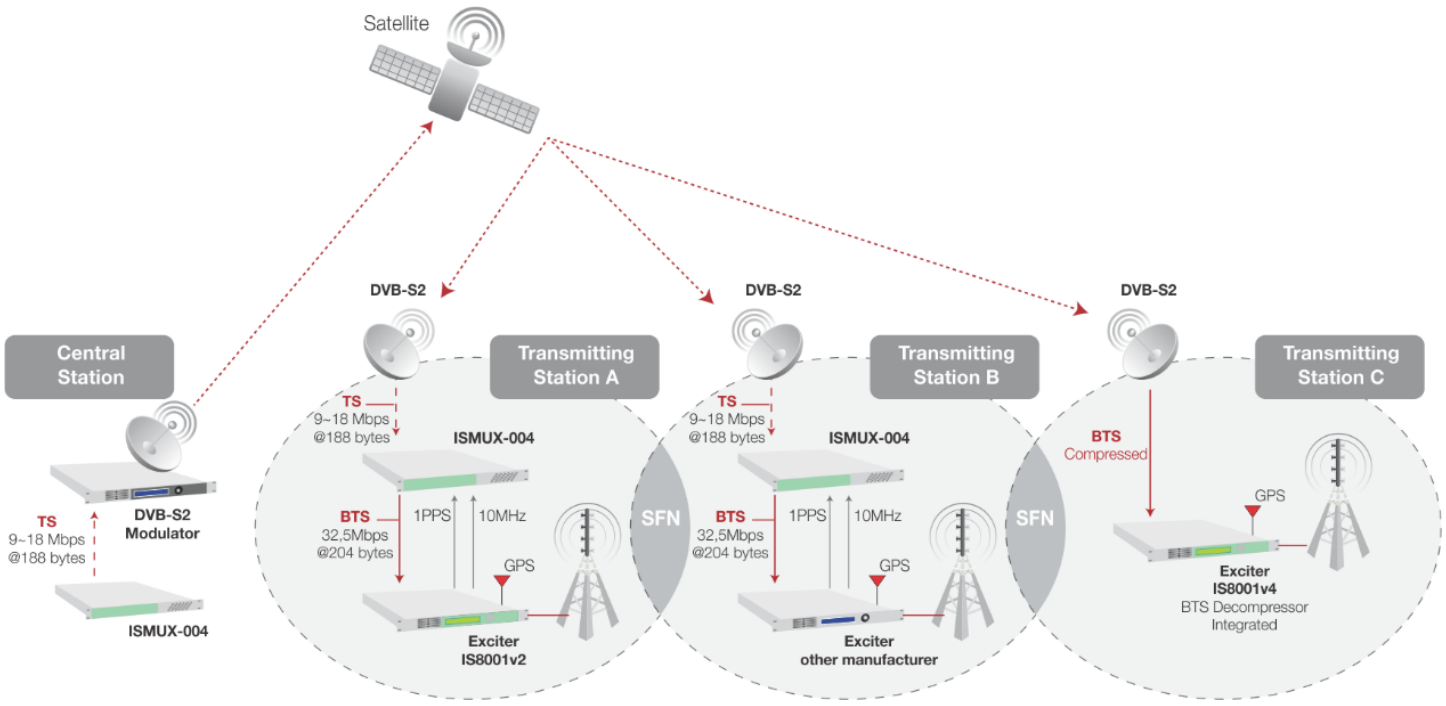
Multiplexes up to 8 TS (Transport Stream) inputs and performs the necessary processing to generate the BTS (Broadcast Transport Stream), which is the ready-to-transmission stream of the standard ISDB-T signal.

It can also operate as a BTS Decompressor or as a BTS Compressor, fully configurable and compatible with systems from different manufacturers.

Highlights



- **Dedicated hardware, in FPGA for processing and multiplexing.**
- **On-board parameterizable BTS compressor and decompressor that allows for compatibility with systems from other manufacturers.**
- **Main PSI/SI Tables: Generator with the main PSI/SI Tables (PAT, NIT, CAT, BIT, SDT and PMT) and their respective descriptors.**
- **Integrated satellite signal receiver option.**
- **Embedded WEB Server.**
- **Operation in SFN (Single Frequency Network):**



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Available Resources

Embedded WEB Server Remote access[3] of the settings and management of the transmitter through the Ethernet[4] port is possible, using a PC or Smartphone browser, without the need to install drivers or applications.	STANDARD
Integrated BTS Compressor and Decompressor Parameterizable system that allows the transport of the BTS without loss of useful information, using less transmission bandwidth with 188-byte packets. Compressor and decompressor parameterization allows for compatibility with systems from other manufacturers.	STANDARD
Embedded Multiplexer and Remultiplexer (Software Supported) PID filtering and remapping, insertion of PSI/SI static tables and TMCC parameterization, responsible for controlling transmission parameters such as hierarchical layer settings, number of segments, coding rate, modulation type and temporal interleaver, in addition to interval guard and operating mode.	STANDARD
SI/PSI Table Generator Software Capture and storage of necessary system tables (PAT, PMT, NIT, SDT, BIT and CAT) in case of shutdown of the function implementer;	STANDARD
Digital manuals in English.	STANDARD
SAT Tuner (Satellite Reception) L-Band DVB-S/S2 receiver compatible with C-band and Ku-band LNBs. Electric surge protector included.	OPTIONAL
GPS time base High precision time base sync via GPS. High performance running on SFN (Single Frequency Network). Features an external GPS antenna and surge protector.	OPTIONAL
Manuals printed in English.	OPTIONAL

General features

- **Standard 19” Rack, 1RU high;**
- **Developed for H.264 and MPEG-2;**
- **Allows the transmission of GINGA[1], Closed Caption[1] and EPG[1] interactivity;**
- **8 DVB-ASI inputs, one of which is dedicated to the Function Implementer;**
- **2 independent ASI outputs, with a choice of four formats: BTS, compressed BTS, compressed BTS from external source or BTS decompressor;**
- **1 TSoIP output;**
- **Filter and remap up to 40 PIDs per ASI input;**
- **Allows hierarchical transmission (up to 3 layers);**
- **PCR correction;**
- **Network configuration in SFN of up to 29 transmitters, with configurations of Maximum Delay, Time-Offset, Polarity, Dynamic-Static, among others;**
- **Dedicated input for role implementer;**
- **Monitoring of signals through alarms;**
- **Generation of test signals (example: PN23) for testing microwave links and other equipment;**
- **Ability to work in redundant transmission chain;**
- **Cross redundancy in Hold on mode;**
- **Capture and storage of necessary system tables (PAT, PMT, NIT, SDT, BIT and CAT) in case of shutdown of the function implementer;**
- **Allows changing the virtual channel;**
- **Operates as BTS Stand Alone Compressor.**
- **Performs BTS decompression, including DVB-S/S2 satellite signals when optional Sat Tuner is included.**
- **Sending EWBS information;**

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Technical Characteristics

Inputs ASI (TS)

Quantity	08
Format	DVB-ASI 188/204 bytes Burst or continuous mode
Input Rate[4]	until 23,234 Mbps - BW 6 MHz until 30,979 Mbps - BW 8 MHz
Connector / Impedance	BNC-F / 75 Ω

Satellite tuner input (optional)

Reception band	L band
Polarization	Vertical / Horizontal
LNB voltage	+13 V, +18 V
Standard	DVB-S / DVB-S2
Connectors	SMA Female (Exciter) F Female (connection w/ LNB)
Impedance	75 Ω
Accessories	surge protector

ASI Outputs (BTS)

Quantity	02
Format	DVB-ASI 188/204 bytes Burst or continuous mode
BTS Specification	Data structure based on ARIB STD-B31 and ABNT NBR 15601 standards.
Bit rate[3]	~32,508 Mbps - BW 6 MHz ~43,344 Mbps - BW 8 MHz
Connector / Impedance	BNC-F / 75 Ω

TSoIP (BTS) Output

Quantity	01
Standard	IEEE802,3u 10 Base-T /100Base TX
Connector	RJ45
Encapsulation	UDP
IP assignment	Static
Format	DVB-ASI 188/204 bytes Burst or continuous mode
BTS Specification	Data structure based on ARIB STD-B31 and ABNT NBR 15601 standards.
Bit rate[3]	~32,508 Mbps - BW 6 MHz ~43,344 Mbps - BW 8 MHz

GPS antenna input (optional)

Connectors	SMA Female
Impedance	50 Ω
Accessories	External antenna, cable and surge protector

10MHz external references - Input / output

Quantity	01 input, 01 output
Connector	BNC Female
Impedance	50 Ω
Input level	0 a +10dBm
Output Level	+10 dBm

1PPS external references - Input / output

Quantity	01 input, 01 output
Connector	BNC Female
Impedance	1 kΩ
Input level	3V3 LVTTL
Output Level	3V3 LVTTL

Interfaces

USB	USB 2.0 type B
Remote access	Connector RJ45 (frontal) Format IEEE802,3u 10 Base-T /100Base TX
Serial communication	RS232
Communication interfaces	Ethernet[2] WEB server SNMP

TMCC

Mode OFDM	Mode 1: 2K (2048/3,96 KHz) Mode 2: 4K (4096/1,98 KHz) Mode 3: 8K (8192/0,99 KHz)
Guard interval	1/4, 1/8, 1/16, 1/32
Partial reception	Single segment for mobile devices (1-Sec)
Hierarchical Transmission	Support for 3 layers (A, B and C)
Segments	1 to 13
Modulation	QPSK, DQPSK, 16QAM, 64QAM
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Time Interleaving	0, 1, 2, 4

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Electrical Characteristics

AC input voltage	90~254 VAC
AC frequency	43~63 Hz
AC consumption	20W
Thermal dissipation	68 BTU/h

Environment Features

Operating altitude	Up to 2500 meters (8200 ft) above sea level
Environment temperature range	0°C (32°F) to + 45°C (113°F) +25°C (77°F) recommended
Environment humidity range	0 to 95 % non-condensing

Dimensions

Height	44 mm (1RU)
Width	483 mm (19 in)
Length	406 mm (16 in)
Weight	5,8 Kg (12,8 lb)

IMPORTANT

The BTS compression method developed by Hitachi Kokusai Linear allows other DVB-S/S2 receiving equipment to decode the TS normally. The BTS compression algorithm is not defined in the ARIB or ABNT standard and has a particular implementation for each provider. Through the exclusive compression and decompression parameterization, the method developed by Hitachi Kokusai Linear can allow interoperability with compressors and decompressors of different brands, even when operating in SFN networks.

Notes:

[1] Operation with EPG, Closed Caption and GINGA is only possible with function implementer (optional).[2]Ethernet é uma trademark da Xerox Corporation.

[3] Rate depends on TMCC configuration.

[4] The input rate must comply with the hierarchical layer settings (ARIB STD-B31).

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