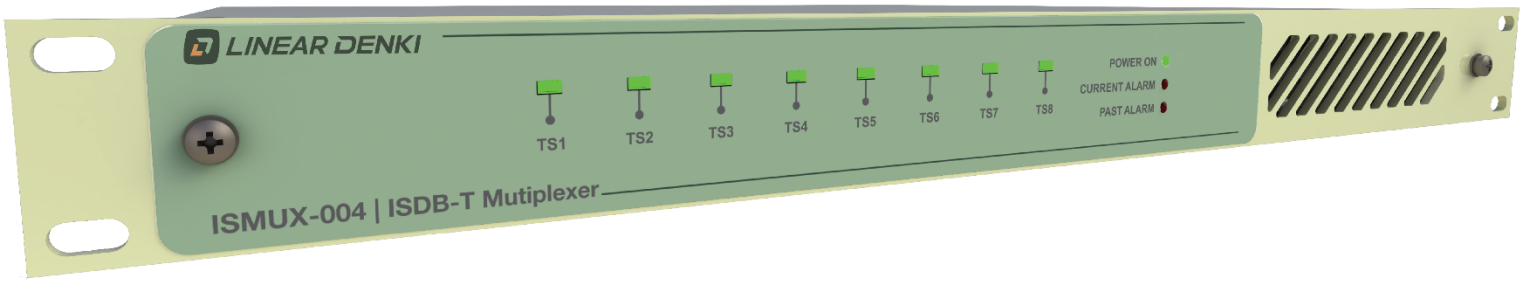
LINEAR DENKI

# ISMUX-004

## ISDB-Tb Digital TV Multiplexer
## BTS Compressor and Decompressor



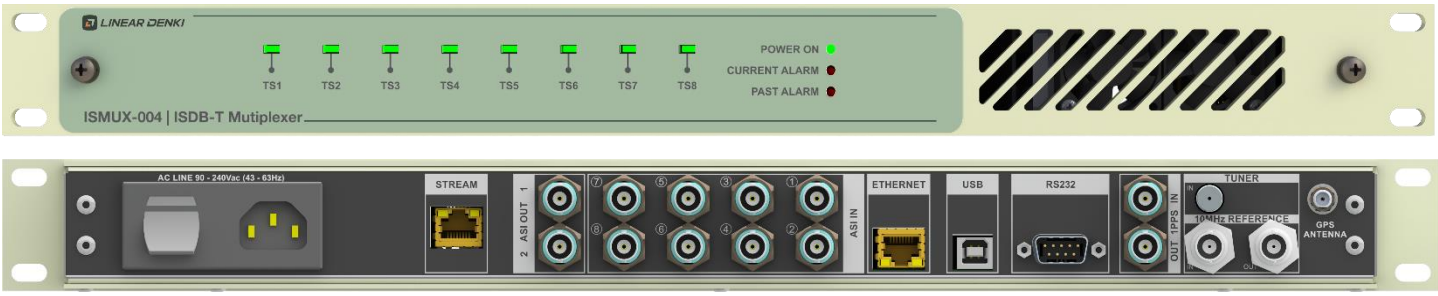

English

## ISMUX-004

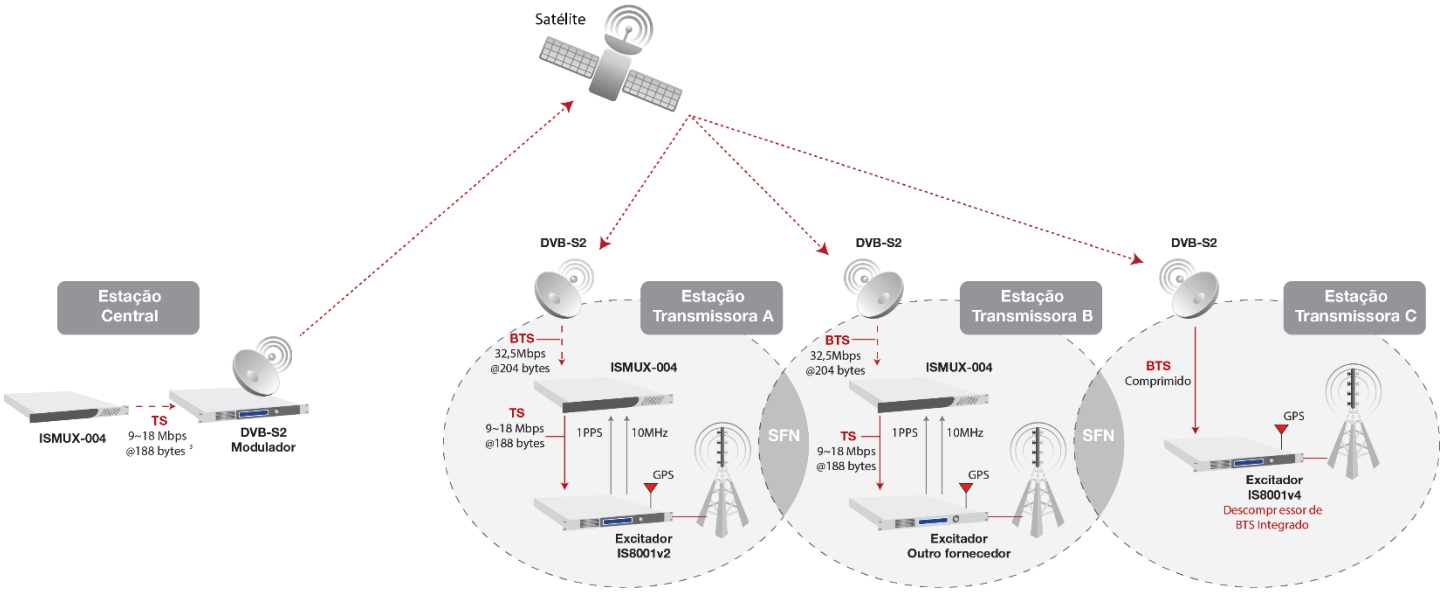
**Multiplexes up to 8 TS (Transport Stream) inputs and performs the necessary processing to generate the BTS (Broadcast Transport Stream), which is the ready-to-transmission stream of the standard ISDB-T signal.**

**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):**



## Available Resources

| | |
|---|---|
| **Embedded WEB Server**<br>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**<br>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)**<br>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**<br>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)**<br>L-Band DVB-S/S2 receiver compatible with C-band and Ku-band LNBs. Electric surge protector included. | **OPTIONAL** |
| **GPS time base**<br>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;**

## Technical Characteristics

### Inputs ASI (TS)

| | |
|---|---|
| **Quantity** | 08 |
| **Format** | DVB-ASI 188/204 bytes<br>Burst or continuous mode |
| **Input Rate[4]** | until 23,234 Mbps - BW 6 MHz<br>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)<br>F Female (connection w/ LNB) |
| **Impedance** | 75 Ω |
| **Accessories** | surge protector |

### ASI Outputs (BTS)

| | |
|---|---|
| **Quantity** | 02 |
| **Format** | DVB-ASI 188/204 bytes<br>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<br>~43,344 Mbps - BW 8 MHz |
| **Connector / Impedance** | BNC-F / 75 Ω |

### TSoIP (BTS) Output

| | |
|---|---|
| **Quantity** | 01 |
| **Standard** | IEEE802,3u 10 Base-T<br>/100Base TX |
| **Connector** | RJ45 |
| **Encapsulation** | UDP |
| **IP assignment** | Static |
| **Format** | DVB-ASI 188/204 bytes<br>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<br>~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)<br>Format IEEE802,3u 10 Base-T /100Base TX |
| **Serial communication** | RS232 |
| **Communication interfaces** | Ethernet[2] WEB server<br>SNMP |

### TMCC

| | |
|---|---|
| **Mode OFDM** | Mode 1: 2K (2048/3,96 KHz)<br>Mode 2: 4K (4096/1,98 KHz)<br>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 |

## 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 KOKUSAI DENKI Electric Linear S/A 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 KOKUSAI DENKI Electric Linear S/A 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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***REV11 – JANUARY/2025***