



IKUSI

# Transmodulation Equipment DVB-S/S2 to DVB-T

The solution to receive free-to-air channels (HD or SD) via satellite and watch them in DTT format.



Solutions for communal use  
and hospitality



Fixed signaling  
(to edit ONID, NID, SID, TSID)



DVB-S/S2 Signal  
input

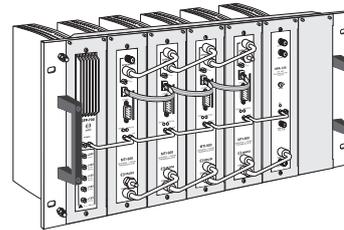
MTI-900 Transmodulator

## Main features

- Digital transmutation (DVB-S/S2 to DVB-T) with Transport Stream Processing.
- Prepared to receive pay TV channels.
- LCN (Logical Channel Number) Support.
- SD & HD channels support.
- Fixed signaling (to edit ONID, NID, SID, TSID).

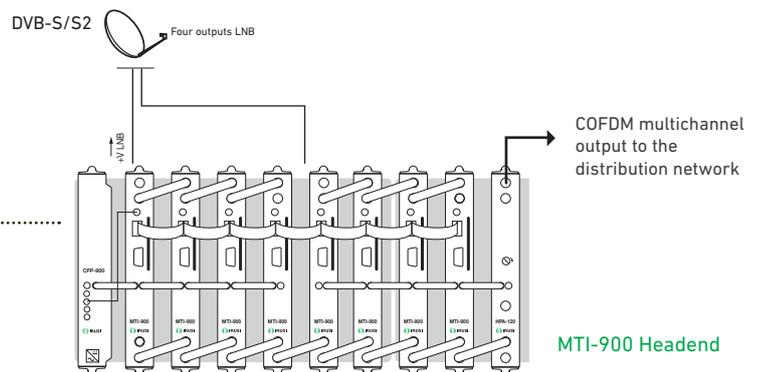
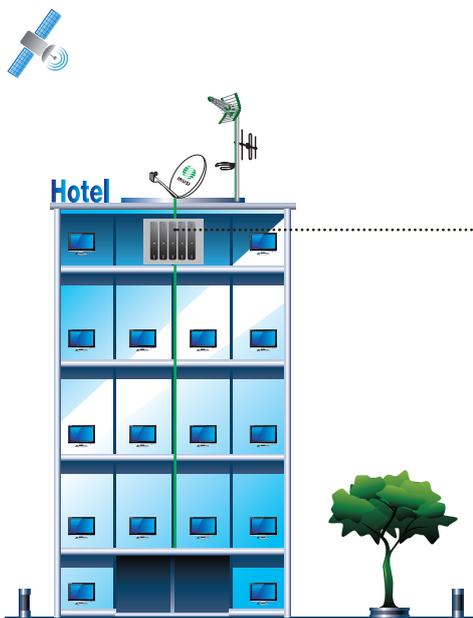
MODEL		MTI-900
REF.		4098
Reception		DVB-S (QPSK) DVB-S2 (QPSK/8PSK)
Transport Stream (TS) processing		Yes
Common interface slot (EN 50221)		Yes
Number of encrypted programmes being supported		Variable (depends on the CAM)
DVB-S/S2 Input section		
Standard		EN 300 421
Input frequency	MHz	950 - 2150
Input level	dBµV	44 ... 84 (DVB-S) 39 ... 84 (DVB-S2)
Input loop-through gain	dB	0 (±1)
AFC pull-in range	MHz	±5
Input Symbol rate	MS/s	2 ... 45 (DVB-S) 10 ... 30 (DVB-S2)
DVB-T Re-modulation section		
Data processing		EN 300 744
Output operation modes		2K .. 4K (DVB-H) .. 8K
Constellation		QPSK .. 16QAM .. 64QAM
Code rate		1/2 .. 2/3 .. 3/4 .. 5/6 .. 7/8
Guard interval		1/4 .. 1/8 .. 1/16 .. 1/32
MER (Modulation Error Ratio)	dB	> 38 (typ.)

DVB-T Output section		
Selectable output channel located between:	MHz	47 - 862
Bandwidth	MHz	5 (DVB-H) .. 6 .. 7 .. 8
Adjustable output level	dBµV	65 to 80
Frequency stability	ppm	±30
Output loop-through loss	dB	1.1
Spurious in band	dBc	< -50
Broadband noise (ΔB=5 MHz)	dBc	< -75
General		
Supply voltage	VDC	+12
Consumption	mA	730 (without CAM) 870 (with CAM)
Operating temperature	°C	0 ... +45
Input RF connector type		(2x) female F
Output RF connector type		(2x) female F
DC connector type		banana socket
CAM entrance		1 slot (EN 50221)
Programming interface		RS-232 / DB-9
IKUSUP bus connector		(2x) 4 pin socket
Dimensions	mm	230 x 195 x 32



Four transmodulators MTI-900, one power supply CFP and one amplifier HPA, installed in rack SMR-601

## Example d'installation



8 transmodulators MTI-900, one power amplifier HPA and one power supply CFP-900. The DVB-S/S2 channels located in the Sat-IF frequency band (950-2150 MHz) are transformed to COFDM channels located in the 47-862 MHz band.

The MTIs have fixed signaling, which allows ONID, NID, SID and TSID to be edited. A function that provides great flexibility to the user by making it possible to change the TV schedule grid from the headend, without the need to make changes in each room in which there is a television installed, and without the need to re-tune each and every one of the televisions.

## MTI HEADEND

Digital transmodulation (DVB-S/S2 to DVB-T) with Transport Stream Processing. The DVB-S/S2 channels located in the Sat-IF frequency band (950-2150 MHz) are transformed to DVB-T channels located in the 47-862 MHz band. Range includes two transmodulators: MTI-900 and MTI-800. The MTI-900 has Common Interface (EN 50221) for discretionary de-encrypting of TV programmes.

### A MTI headend includes:

- As many MTI transmodulators as COFDM channels to be distributed. At MTI-900 module, one CAM (Conditional Access Module) containing the Operator's Smart Card must fit the front panel slot.
- One HPA that amplifies the sum of the output DVB-T channels from the transmodulators.
- One or more CFP Power Supplies.
- One or more Rack-Frames or wall-fixing Base-Plates. The base-plates can be joined horizontally.
- Usually, housing units for the base-plates.
- If the headend is large, one or more AMX-400 combiners.

The MTI headends provide a DVB-T multichannel signal whose level is appropriate to feed the distribution network. An extension input at the HPA amplifier allows easy coupling of the wideband 47-862 MHz signal provided by another existing headend. You can use your TV DTT (Digital Terrestrial Television) for programs receiving satellite channels treated at the station MTI.

## FUNCTIONAL DESCRIPTION OF THE MTI TRANSMODULATORS

An MTI transmodulator carries out the complete channel processing from the input to the output:

- tunes a DVB-S/S2 digital channel of the 950-2150 MHz band, demodulates the signal being received,
- processes the transport stream (with programme de-encrypting in the MTI-900, if this one has a "CAM + Operator Card" couple installed), and
- re-modulates it in DVB-T format on an RF channel that is selectable within the 47-862 MHz frequency range.

### Main features:

- Central xPSK Input Frequency (1 MHz steps)
- Input Symbol Rate (0.001 MS/s steps)
- Central COFDM Output Frequency (1 kHz steps)
- Output Channel Bandwidth (6, 7 or 8 MHz; also 5 MHz on DVB-H)
- Output Operation Mode (2K or 8K; also 4K on DVB-H)
- RF Output Level
- FFT Window (Fast Fourier Transform), to reduce interference on adjacent channel
- In-depth interleaving (only on DVB-H; with 2K and 4K modes)
- Discretionary de-encrypting of one or more Services (only for MTI-900)
- Optional Blockade of Services, PIDs and Conditional Accesses, with Regeneration of Tables
- NIT Adaptation

### Simple cabling of MTI headends

The MTI transmodulators feature two directionally coupled input and output ports. SAT-IF signal can therefore be directly fed into the input port of the first module, which in turn passes in through the coupler to the next and so forth. On the output side, the same procedure is repeated which forms the channel coupling. The sum of the combined channels is then connected in the same way to the drive amplifier\_ the HPA module or an external wideband amplifier\_ which then feeds the distribution network. For power connection, each module has two DC banana sockets that allow to build a +12 VDC cascade. A third banana socket is available to connect the power for the attached LNB.

Local programming is carried out either with the SPI-300 unit, which is connected to each module individually. In order to perform NIT adaptation, the IKUSUP bus must be installed. The last module at the right end of the IKUSUP cascade carries out the control function.

Remote programming may be carried out only if the HMS control unit is installed in the headend.

## FUNCTIONS OF THE TS PROCESSING

- Bit Rate adaptation with PCR restamping
- Adaptation of NIT table
- Adaptation to the particular adjustments of the headend is automatic. Name and identifier of the new network can be edited.
- Service and CA blockade
- Blockade is at service level and at conditional access level.  
Automatic regeneration of PAT, SDT and CAT tables.
- TS monitoring  
Usage level of the Transport Stream —percentage of null packets— is presented along the programming process.
- LCN insertion.
- TS\_ID, SID, ONID and NID edition.