

**SETUP GUIDE
FOR
«MTI» xPSK-COFDM TRANSMODULATORS**

DVB-S/S2 ▶ DVB-T

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1 - THE START SCREENS


1.1 - Module Basic Information

As explained in the Basic Handling guide supplied with the SPI-300, when you connect it to the module all data for identification, configuration and status of the module are loaded on the SPI-300. A detection screen appears for a short time, and next the display shows the Basic Information screen, which identifies the module and presents its most representative configuration and status data:

MTI-900	Alarm : No
F01.95	f01.15
Adq: X	BER: 4.29E-5
	OK

These are the meanings of the expressions and data displayed:

- Name of the module.
- Alarm : Informs about the existence or not of module operating failures.
- F01.93 : Version of the main firmware of the module (the firmware is the software stored in the module that manages its basic running).
- f01.15: Firmware version of the internal FPGA device.
- Adq : "X" means that synchronization with the input signal is acquired. Absence of synchronization is signalled with "0".
- BER : Is the BER of the input signal channel.

The screen closes using the OK command (key ). Then the Main Menu Screen appears.

1.2 - Main Menu

As explained in the Basic Handling guide (www.ikusi.tv), the **General** and **Language** menu is identical for all the ClassA modules. The **Settings** and **Info** menus include, however, options and information which are peculiar to each type of module. Those for the MTI transmodulators are the following:

GENERAL Menu

1	General	
2	Settings	
3	Info	
4	Language	SEL

The General menu is identical for all ClassA modules and the commands are the following:

1▶	Detect	
2	Send	
3	Update	
ESC	▼	SEL

4	Recall	
5	Save	
6	Factory Reset	
ESC	▼▲	SEL

7	About	
ESC	▲	SEL

- Detect: Runs the detection process of the connected module.

MTI-900	Alarm : No
F01.95	f01.15
Adq: K	BER: 4.29E-5
	OK

- Send: Establishes on the module the parameter values that have been modified.
- Update: This option does not apply to this model. The firmware update is performed only through the web interface (see manual www.ikusi.tv).
- Recall: Returns the configuration of the module previously created with the Save command. This menu is useful to quickly load repetitive data in multiple modules.
- Save: Saves the module configuration in the memory of the SPI-300 remote.
- Factory Reset: Restores all parameter values that were set up in the module when it left the factory
- About ... : Simply reports the firmware version of the SPI-300.

SPI-300	
vXX.XX (DD/MM/YY)	
Copyright 2009	
IKUSI	OK

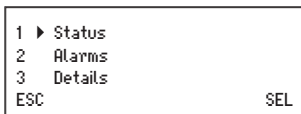
SETTINGS Menu


1	▶ Country	
2	Input	
3	Output	
4	TS Processing	
5	Conditional Access	
ESC		SEL

- Country: Must be selected to have the specific configurations operating in each country such as the ONID or LCN mode.
- Input: Select one of the input types available on the module.

- **Output**: This menu quickly accesses the output channel (default channel 21) and attenuation in COFDM mode.
- **TS Processing** : It must be selected to carry out the Transport Stream processing operations.
- **Conditional Access** : Through this section, access to operator services reception of the encrypted signal is obtained.

INFO Menu : Provides detailed information about the operation of the module, further on the one provided by the basic information screen (see previous page). Information is distributed in three screens, each one related to a menu option:




- **Status** : Informs about the module operating conditions.
 - Signal Acquired** : Informs about the synchronization with the input signal. Affirmative answer is pointed out with "X" and negative answer with "0".
 - Modulator** : Indicates whether the output COFDM modulator works correctly ("X") or not ("0").
 - SI** : It refers to DVB-SI (Service Information). Indicates whether the DVB signalling of the output transport stream is correct ("X") or incorrect ("0").
 - %Free** : The number in the middle expresses the percentage of null PIDs (without information) that currently exists in the output transport stream; the higher is the number, the less overflow risk exists (in other words, less risk of loss of data). The numbers at the left and right are respectively the maximal and minimal values reached all through the period of operation of the module since the last power connection.
 - T** : Is the value in °C of the internal temperature of the module. (Only available in equipment that includes temperature sensor).
 - BER** : Displays the channel BER value for input signal in scientific notation.
 - Use the STOP command (key ) to stop the status information update. The OK command appears then in the same place; use now this one to close the screen.

- **Alarms** : Informs about the existence of failures in the internal circuitry of the module or in the signal processing. Character "X" indicates there is an alarm situation and "0" means that the status or operation are correct:


Ent: X	FIFO: 0	NIT: 0
Hw: 0	Ins.: 0	Tmp: 0
CAM: 0		
Cod: 0030F0A1		ALMSTOP

- Input : Operation of the tuner and the demodulation stage
- FIFO : Character "X" warns of overflow, in other words, data loss in the output stream. (If the unreferenced PIDs are not blocked, the immediate action to do should be to block these PIDs).
- NIT : Regeneration of the NIT table.
- Hardware : General hardware of the module.
- Insertion : Insertion of tables into the output stream.
- Tmp : Internal temperature of the module.
- CAM : Operating of the Conditional Access Module. Only MTI-900.
- Code : This is a global alarms code that is useful when contacting IKUSI's technical support.

Use the ALMSTOP command (key ) to stop the alarms information update. The OK command appears then in the same place; use now this one to close the screen.


- **Details** : This screen identifies the module and displays software and hardware versions.

MTI-900		
F: 01.93	f: 01.00	
L: 01.15	Vers HW: 01.00	
		OK

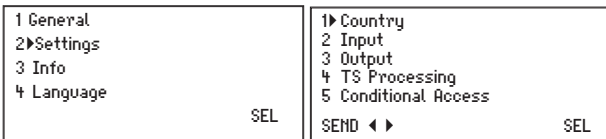
- F : Version of the main firmware of the module.
- f : Firmware version of the internal FPGA device.
- L : Version of the bootloader.
- Hardware Version : Version of the hardware of the module.
- Use the OK command (key ) to close the screen.

LANGUAGE Menu



To change the language, press "4" on the numerical keypad. A list of languages appears. Place the slide on the wished line and press .

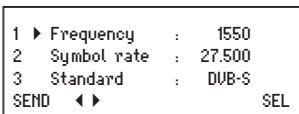
2 - THE SETTING SCREENS



2.1 - Country: Select the country of reference. The module will set the specific parameters of that country as ONID, LCN, etc.




2.2 - INPUT: This screen appears when you select the Input option in the Settings menu. It is used to enter the values of the following parameters:



□ Frequency : Is the central frequency of the input channel, in MHz. There is a numerical field where you must enter the number by any one of the ways that were described in the Basic Handling guide.

□ Symbol Rate : Is the symbol rate of the input channel, in MS/s. The number is entered in the same way.


□ Standard : Is the DVB system type of received signal. Use the SEL command (key ) and perform the appropriate selection (AUTO, DVB-S, DVB-S2) at the pick list that appears.

2.3 - OUTPUT: This screen appears when you select the Output option in the Settings menu. It has two pages. The first one is the following:

```

1 ▶ Frequency      : 658.000
2  Mode           : 8K
3  Bandwidth      : 7
SEND ◀ ▶         ▼          SEL
  
```

The setting values to be entered are the following:

- Frequency : Is the central frequency of the output channel, in MHz. There is a numerical field where you must enter the number by any one of the ways that were described in paragraph 1.3 of the Basic Handling guide (www.ikusi.tv).
- Mode : It refers to the number of subcarriers of the output channel. Open the pick list by using the SEL command (key ) and choose the mode: 2K, 8K or 4K (the latter is for using with DVB-H standard only).
- Bandwidth : Is the bandwidth of the output channel, in MHz. It is selected in the same way from a pick list that offers these options: 8, 7, 6 and 5 MHz (the latter is for using with DVB-H standard only).

Press the key ↓. The second page of the Output Signal Parameters screen appears:

```

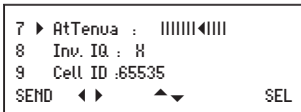
4 ▶ Guard Inter : 1/32
5  Constella. : 64QAM
6  Code Rate : 3/4
SEND ◀ ▶       ▲▼         SEL
  
```

The following data are selected:

- Guard Interval : Select from the pick list the desired value: 1/4, 1/8, 1/16 or 1/32.
- Constelación : Is the modulation scheme of the subcarriers of the output channel. Select QPSK, 16QAM or 64QAM from the pick list.
- Code Rate : It refers to the convolutional code of the FEC encoder. Select 1/2, 2/3, 3/4, 5/6 or 7/8 from the pick list.

Press the key ↓. The third page of the Output Signal Parameters screen appears:

The following data are selected:

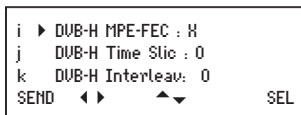


Attenuation : Is the attenuation for the COFDM channel output level. A slider bar is available. Setting is carried out in real time: when you move the slider with the keys ← and → the new value is instantaneously established in the module, that is to say, you don't have to use the SEND command. To state exactly the value in dB you need a spectrum analyzer or a field strength meter.

IQ inversion : s the I-Q format of the output channel spectrum. The character "0" means normal spectrum and "X" means inverted spectrum. To change from one to the other you have to use the SEL command (key ↻).

Cell ID : This is a datum dedicated mainly to DVB-H. It is a cell number to be assigned to the COFDM output channel. Enter one zero ("0") if no assignation is desired.

Press the key ↓. The fourth page of the Output Signal Parameters screen appears:



The following data are entered in this screen:

DVB-H MPE-FEC : Here must be indicated whether the source transport stream has applied the DVB-H's MPE-FEC (multi-protocol encapsulation forward error correction) code or not. Application will be marked with "X" and nonapplication with "0". To change from one to the other use the SEL command (key ↻).

DVB-H Time Slicing : In a similar way, here must be indicated whether the transport stream uses DVB-H's Time Slicing or not.

DVB-H Interleaving" : It refers to an in-depth interleaving, particular for DVB-H, applicable with 2K and 4K modes. When applied, it gives greater mobility and impulse noise tolerance to the receivers. Select "X" to apply and "0" to not apply. To change from one to the other use the SEL command (key ↻).

Press the key ↓. The fifth and last page of the Output Signal Parameters screen appears:

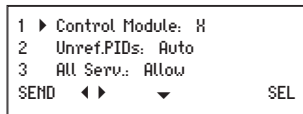



En esta ventana se introduce un dato de uso exclusivo en DVB-H:

FFT Window : This setting (fast Fourier transform window) is applicable when there is an adjacent analogue channel. Setting is carried out, in real time, with the keys ← and → . On displacing the slider towards the left, both edges of the COFDM output spectrum are retracted —therefore interference on the adjacent channel lowers—, but at the same time, attention, guard interval effectiveness lowers proportionately, which, in the presence of echoes, may get to make the synchronization of receivers impossible.

With no adjacent channel the slider must be kept at the right end.

2.4 - TS PROCESSING: It appears when you select the TS Processing option in the Settings menu. It has three pages. This is the first one:




Control Module : Here you must indicate whether the connected transmodulator performs or not the control function of the headend (the control transmodulator must be compulsorily the last one at the right end of the IKUSUP bus cascade). You must enter the character "X" if the module is the control module or the "0" if it is not. Changing from one character to other is done using the SEL command (key .

Unreferenced PIDs : Open the pick list by using the SEL command. A list appears with the following three options:

-Auto : The transmodulator itself decides what to do with the unreferenced PIDs of the input channel transport stream, either to block or to let pass them. (Unreferenced PIDs are those that are not related with any service, table or CA).

-Block : All the unreferenced PIDs are blocked.

-Allow : All the unreferenced PIDs are let pass (are unblocked).

All Services : Open the pick list by using the SEL command (key ). A list appears with the following two options:

-Block : All the services (TV programmes) present at the transport stream are blocked. When a service is blocked, all the related PIDs —video, audio, teletext and others— are blocked.

-Allow : All the services of the transport stream are let pass, unblocking those that were blocked. When a service is unblocked, all the related PIDs —video, audio, teletext and others— are unblocked and the tables are updated.

ATTENTION : The two aforementioned options are "reset" actions that erase all the blocking or unblocking settings that have been done before for concrete services.

Press the key ↓. The second page of the Transport Stream Processing screen appears :

```
4 ▶ Action   :Unlock Srv
5  Select: 45566
6  Value
ENVIAR ◀ ▶      ▼      SEL
```

Here you can do the following selections :

Action : Open the list using the SEL command on your SPI-300. A list will appear where we will choose the settings we want to perform with the next options:

-Unlock Service : It must be selected to unblock a service in the "Select" option (second line of this screen page).

-Block Service : Idem to block a service.

-Edit LCN : Must be choose if you want to configure LCN for each service.

-Renumb Serv : Must be choose if you want to configure SID for each service.

-De-encrypt Service : It must be selected to de-encrypt a service (TV programme) in the "Select" option.

Important: the de-encrypting action only can be carried out for a blocked service; to de-encrypt an unblocked service, you must block it before. The service will be automatically unblocked on de-encrypting it.

-Stop Service De-encrypting : Idem to stop the current de-encrypting action for a service. The service returns to its original encrypting status and comes to be blocked.

-Unlock PID : Idem to unblock a PID. (The tables are not updated).

-Block PID : Idem to block a PID.


-Force PID : It must be selected to enable a concrete PID, either referenced or not, which could be blocked as a consequence of the blockade action for a determined service or CA, or the blockade of unreferenced PIDs. This action may also be used to invalidate a by-default regenerated PSI/SI table, and to restore the original one.

-Unlock Conditional Access : It must be selected to unblock a CA in the "Select"

option. When a CA is unblocked, the PIDs of the ECM and EMM are unblocked and the tables are updated.

-Block Conditional Access : Idem to block a CA.

Select : You must choose the service in which you want to apply the configuration that you have choose in the "Action" menu.

Value: Assign a value to the chosen parameter in the "Action" menu if that parameter is editable like LCN mode or SID remapping. If that parameter is not an editable one you will see the service SID for informational purposes. use the SEND command (key ) to perform the action.

Press the key ↓. The third and last page of the Transport Stream Processing screen appears :

```
7 ▶ ModoMIT: NIT-paso
8   Red : ASTRA
9   NID : 65537
ENVIAR ◀ ▶ ▲ SEL
```

Here you can do the following selections :

NIT Mode : Open the pick list by using the SEL command. A list appears with the three following options:

-NIT-auto : When this option is selected in the transmodulator that performs control function, the input NIT (which may change or not) is regenerated in an automatic way to a new NIT that contains, amongst other parameters, the output frequencies of the transmodulators of the headend, the LCN descriptors (if any) and the Transport Stream id, with the corresponding changes that could have been made (see next page). This new NIT (or output NIT) belongs to a new network whose name and identification number are defined in the next 8 and 9 options. The new NIT is sent continuously via IKUSUP bus to the rest of transmodulators of the headend, where it remains stored (and updated as either the input NIT or the headend parameters change) if in these modules the "NIT-auto" option has been also selected.

-NIT-fixed : If you select this option, the current NIT stored in the module stays locked, unaware of the input NIT. (On future versions of the MTI-800 and MTI-900, an external, expressly created NIT will be able to be loaded).

-NIT-pass : If you select this option, the output NIT is at any time the same as the input NIT. The option can be applied individually to each transmodulator; any NIT stored in the module is erased.

Net : Is the name that you want to assign to the new network generated by the MTI headend.

NID : Network IDentifier. It is the identification number that you want to assign to the new network.

NOTE : If you enter the number "0" for the NID parameter, both the name and the NID of the output network will be the same as those of the input network.

IMPORTANT : The "Net", "NID", "LCN Mode" and "Star.LCN" options are applicable only to the transmodulator that performs control function (last module at the right end of the IKUSUP bus cascade). Data being entered in other transmodulators don't take effect.

TS-ID : Allows assigning a new id to the Transport Stream. This Option is useful when there are two modules in the headend processing data from the same Transport Stream.

ON-ID : Allows assigning a new id to the ONID.

LCN Mode : Logical Channel Number Mode. The LCN system allows DVT tuners to automatically tune stations on certain channel numbers. This option indicates the module what to do with the received LCN. The list of options is the following:

- Pass: The module does no processing to the possible LCN that could be found.
- Block: Found LCN are removed and will not appear on the new stream.
- Europe
- Nordig 1
- Nordig 2
- Generic

These last four options insert LCN descriptors with the corresponding format starting from the number set in the next option.

2.5 - CONDITIONAL ACCESS: Available in the Settings menu. When you select a waiting screen appears first as an exchange of information between the module and the SPI-300 is developed. Then the Conditional Access screen, which provides various information about the card and contracted services appears.

Abbreviations

CA : Conditional Access,

CAT : Conditional Access Table

ECM : Entitlement Control Messages

EIT : Event Information Table

EMM : Entitlement Management Messages

MPTS : Multiple Program Transport Stream

NIT : Network Information Table

PAT : Program Association Table

PID : Packet Identifier

PMT : Program Map Table

PSI : Program Specific Information

SDT : Service Description Table

SI : Service Information

SPTS : Single Program Transport Stream

TDT : Time and Date Table

TS : Transport Stream

PSI Tables : PAT , PMT , CAT

SI Tables : NIT , SDT , EIT , TDT



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