Televes®

T.0X SERIES

Refs. 563832

EN **TWIN HDMI/YPbPr MPEG2/4 ENCODER/MODULATOR - QAM/COFDM**

QUICK INSTALLATION GUIDE

Safety instructions

Caution statements

Product inspection - Inspect the equipment for shipping damage. Should any damage be discovered, immediately file a claim with the carrier.

Important Safety Instructions - To ensure proper installation and operation, take a moment to read this guide before proceeding with the installation. If you have any questions or comments about the T.0X Series - Encoders, please contact your dealer.

WARNING:

TO PREVENT FIRE OR ELECTRICAL SHOCK DO NOT EXPOSE TO RAIN OR MOISTURE.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER.

NO USER-SERVICEABLE PARTS INSIDE.

REFER SERVICING TO QUALIFIED PERSONNEL.

	A product and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the product and cart combination to overturn.
	The lightning flash with arrow head symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

DO NOT OPEN THE CABINET,

REFER SERVICING TO QUALIFIED PERSONAL ONLY.

CAUTION:

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

Important Safety Instructions

1. **Read and Follow All Instructions** - All the safety and operating instructions should be read prior to and followed while operating this product.

2. **Retain Instructions** - The safety and operating instructions should be retained for future reference.

3. **Heed Warnings -** All warnings on the product and in the operating instructions should be adhered to.

4. **Cleaning** - Disconnect this product from any electrical source before cleaning. Use a damp cloth; do not use liquid or aerosol cleaners.

5. **Attachments** - Do not use attachments that are not recommended by the product manufacturer as they may cause hazards.

6. **Water and Moisture** - Do not use this product near any source of water.

7. **Mounting –** Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to persons or nearby objects, and serious damage to this product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

8. **Ventilation** – Slots and openings in the chassis or cabinet are provided for ventilation and to ensure reliable operation of the product. These openings should never be blocked or covered in any way. This product should not be placed in any case, cabinet, or rack unless proper ventilation is provided and the manufacturer's instructions have been adhered to.

9. **Power Sources** - This product should be operated only from the type of power source indicated on the label.

10. **Grounding or Polarization** - Do not bypass or defeat electrical plug polarization or grounding. Doing so will violate the warranty and may pose a risk of fire or electrocution.

11. **Wire Protection** – Ensure all connected wiring is routed correctly to avoid damage including pinching, excessive bends, or compression.

12. **Electrical Supply, Grounding, and Surge Protection –** Ensure that all local or national electrical codes are followed. Seek the advice of a licensed electrician, professional engineer, or other licensed expert.

13. **Power Lines** - Always use caution and avoid operating this or any connected equipment near uninsulated power line or any other hazards.

14. **Object and Liquid Entry** - Never allow objects or liquid of any kind into this product through openings. Doing so could result in fire or electric shock.

15. **Servicing** - There are no user serviceable parts. Do not attempt to service this product or remove covers. Doing so may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel. Examples of damage requiring service include but are not limited to:
    • Damage to power-supply wiring.
    • If liquid has been spilled, or objects have fallen into the product.
    • If the product has been exposed to rain or water.
    • If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
    • If the product has been dropped or physically damaged.
    • When the product exhibits a distinct change in performance.

16. **Replacement Parts** - Ensure that repairs are performed by qualified technicians and that only manufacturer supplied or authorized parts are used.

17. **Safety Check -** Upon completion of any service or repairs to this product, ensure safety checks to determine that the product is functioning per manufacturer specifications are performed.

18. **Heat** - The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat. Ensure that ambient temperature is maintained in the manufacturer specified operating range.
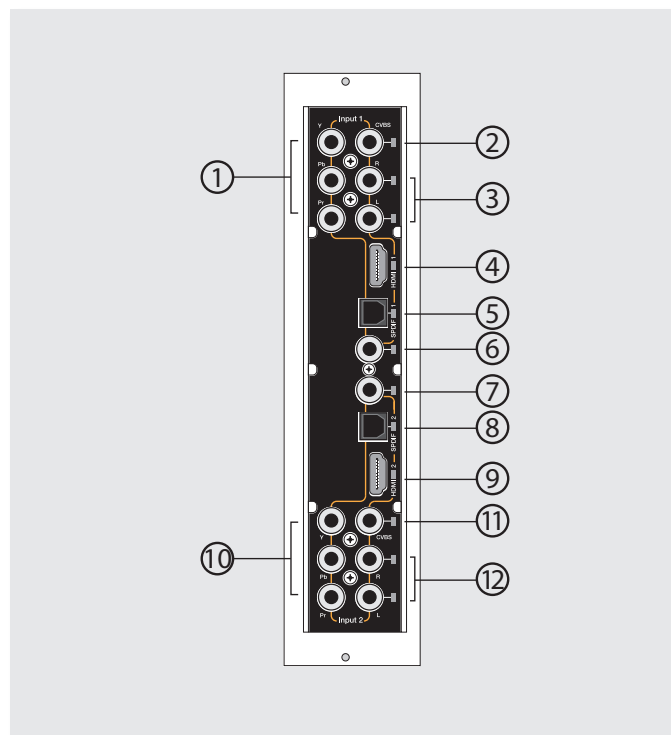
Description of connectors

Front view
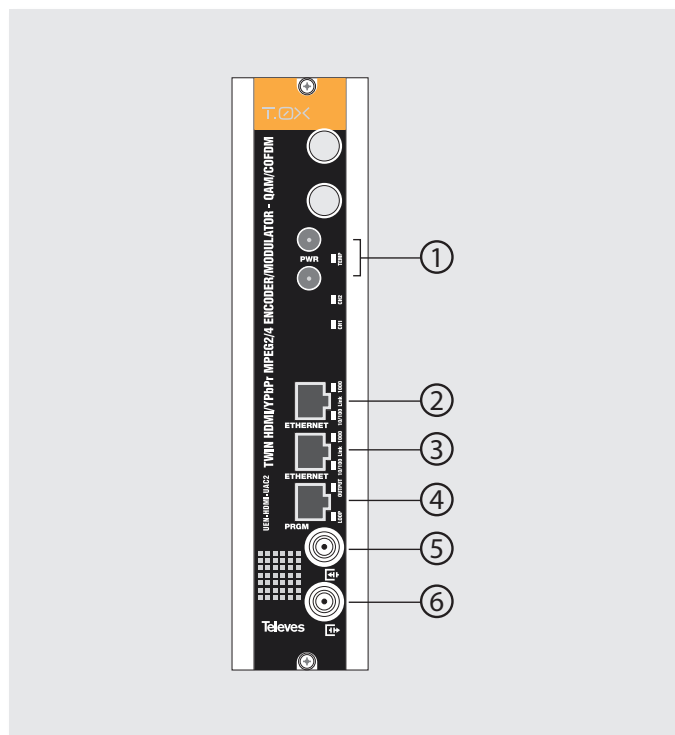
Rear view

1.- Power connectors
2.- Ethernet connector
3.- Ethernet connector
4.- Programmer connector
5.- RF loop through input
6.- RF output

1.- YPbPr component input. Channel 1
2.- CVBS input. Channel 1
3.- Analog (L/R) audio input. Channel 1
4.- HDMI input. Channel 1
5.- SPDIF digital optical audio input. Channel 1
6.- SPDIF digital coaxial audio input. Channel 1
7.- SPDIF digital coaxial audio input. Channel 2
8.- SPDIF digital optical audio input. Channel 2
9.- HDMI input. Channel 2
10.- YPbPr component input. Channel 2
11.- CVBS input. Channel 2
12.- Analog (L/R) audio input. Channel 2

LED indicators

		Color	Internal temp	Comment
Front LED alarms	TEMP	Solid green	Normal	Safe
		Slow blink orange	High	Warning
		Fast blink red	Very High	Danger
		Color	**Channel status**	**Comment**
	CH1 – CH2	Off	Disabled	Channel disabled.
		Solid green	Lock	Input locked and unit encoding audio/video.
		Solid red	Unlock	Input unlocked and unit not encoding audio/video.
		Blinking red	Boot	Unit starting up.
		Color	**Output mode**	**Comment**
	OUTPUT	Solid green	Normal	Output RF channel is ON, broadcasting audio/video (normal mode).
		Slow blinking green	Carrier wave, null, or muted	Output RF channel is OFF or in an alternate signal mode.
		Solid orange/red	Normal	Config bitrate doesn´t fit in output
		Color	**Output loop status**	**Comment**
	LOOP	Solid green	ON	Output loop-through enabled. Units may be daisy-chained using the internal combiner.
		Off	OFF	Output loop-through disabled. Units must be combined using an external combiner.
Back LED indicators	A/V inputs	Indicate the currently selected audio and video inputs and where the input signals should be connected.		

Installation

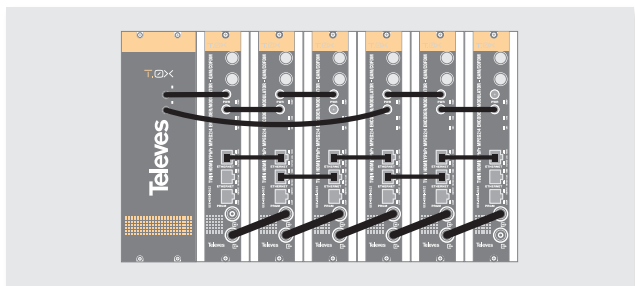**1.** Install all units in the rack and connect them as shown in Figure 1.

Figure 1

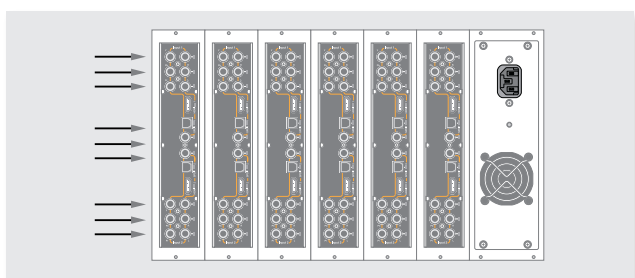**2.** The audio and video input signals connect to the back of the modules.

Figure 2

3. If a network is available that provides IP addresses through DHCP, connect the encoders to the network as shown in Figure 3. If such a network is not available, then a computer will need to be connected as shown in Figure 4.
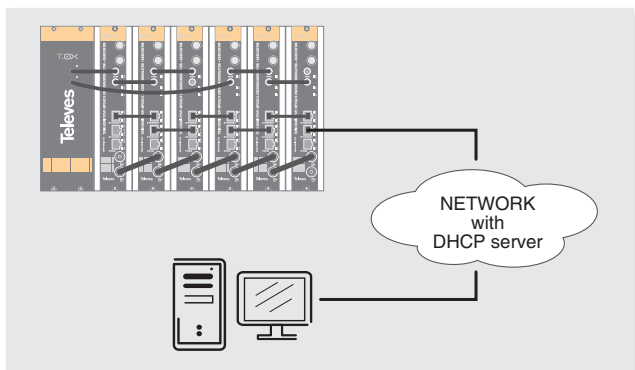

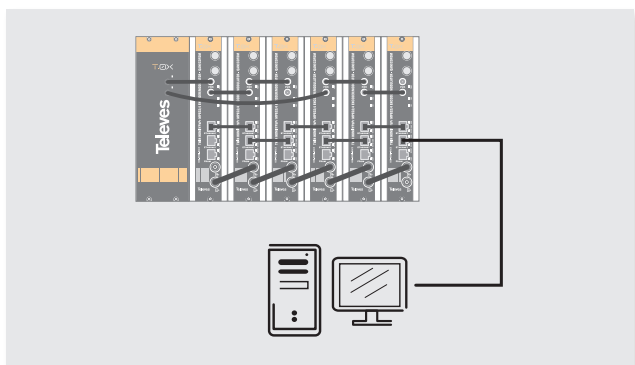Figure 3 - Rack with DHCP server.

4. Power on the units.

Figure 4 - Rack without DHCP server.

5. Connect the programmer to each unit and set a unique number in the "# ID" field according to the order of installation of the units in the rack.
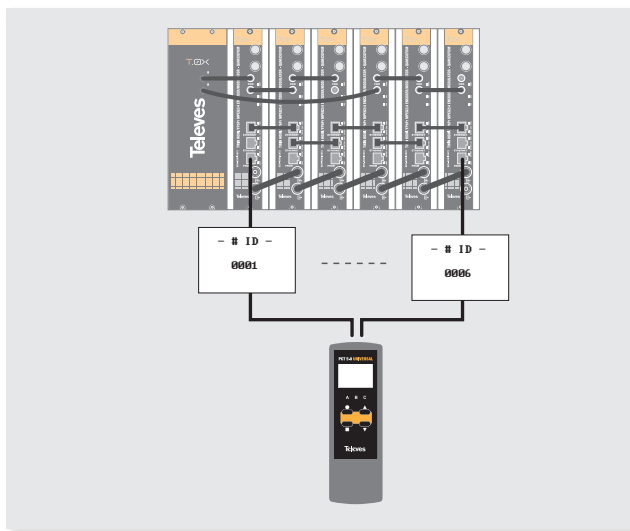

Figure 5 - Set a # number different for each unit.

6. Connect the programmer to a unit, usually the first one, and read the IP address.
Each unit can work as a master controller for the other units. All units can be configured by connecting to only one.
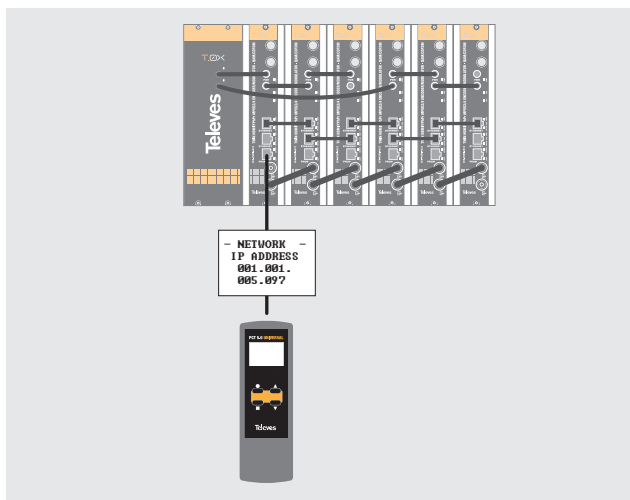
Figure 6 - Read the IP address of one unit.

7. If a network was connected in Step 3 then proceed to step 8. If not, set the address of you computer as follows:

IP value = 172.20.0.2
netmask = 255.0.0.0
gateway = 172.20.0.3

NOTE: *The default factory configuration of the units has an IP address in this range (it should be different for each unit). If a unit was ever provided an address before, manually or through DHCP, this unique address may no longer exist. Resetting to IP factory defaults, will return the original unique private address though.*

8. In your web browser, enter the IP address from Step 6 as the URL.
A login prompt will appear. By default the parameters are:

Login: encoder
Password: encoder

The **Status** > **Summary** page should appear as the first page.
This provides a summary of all the units installed in the network and the units will be sorted by the number entered in Step 5.
The "Change Password" option only changes the password of the encoder currently logged in to. To change the password for the remaining modules, each one will need to be logged into with its unique IP address and the change made for each.
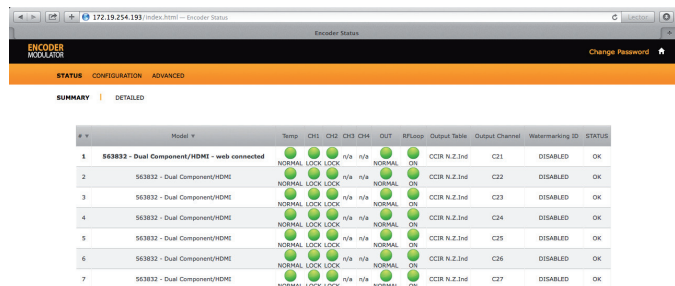

Figure 7 - Status > Summary tab.

Figure 8 shows an example of a detailed status page.
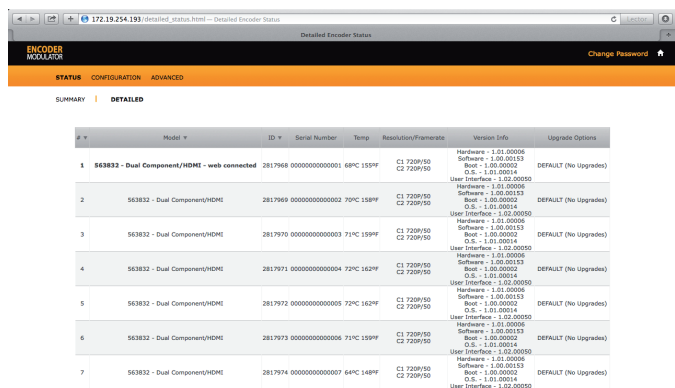
Figure 8 - Status > Detailed tab.

9. Configure all units:

Select "CONFIGURATION". This page has 4 options, INPUT, TRANSPORT, OUTPUT, and NETWORK, shown in Figures 9, 10, 11, and 12 respectively.
For each configuration page, the last column is "Select". Any changes made, will be saved only to the units with this associated "Select" box checked when "Apply Selected" is clicked. This applies to all 4 of the sections under the Configuration Menu.
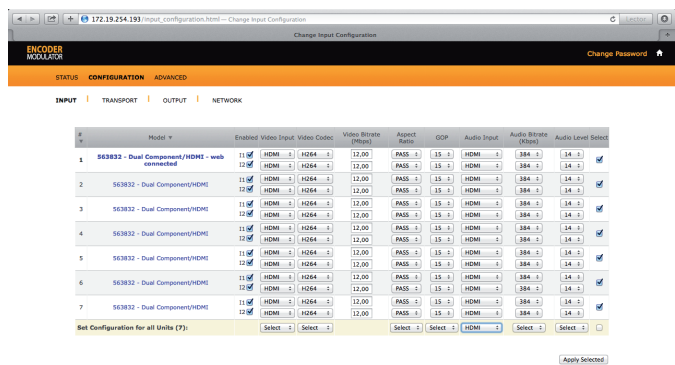
Figure 9 - Configuration > Input tab.

Some items have an automatic configuration option, such as "Automatic channel numbering" shown in figure 10.
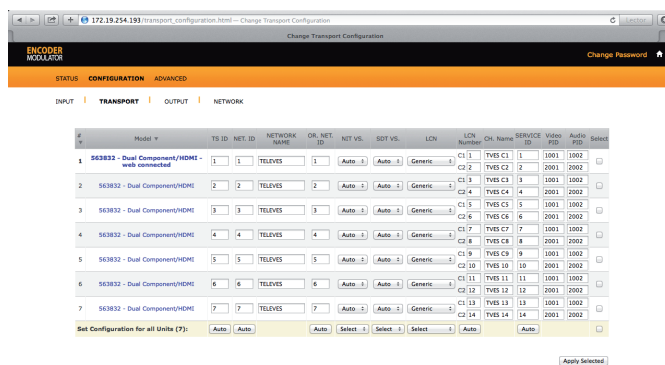
Figure 10 - Configuration > Transport tab.
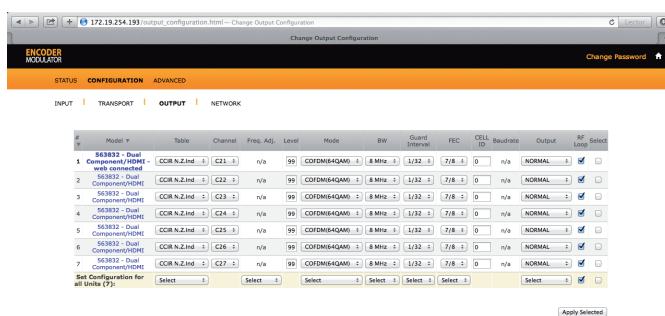
Figure 11 - Configuration > Output tab.

The network configuration page allows a change to the Number assigned in Step 5. This option also has an "Auto" assignment feature.

The "Auto" option will ask for confirmation since it will overwrite the settings of all units set in Step 5 and the ordering will likely not be as the units were placed in the rack.
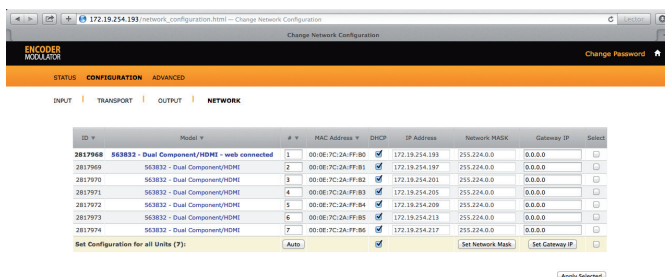
Figure 12 - Configuration > Network tab.

10. Change configuration of one unit:

Select "CONFIGURATION". Click on the Model name of the desired unit and the page below will be shown. From this page you can change any parameter of the configuration of the desired unit.
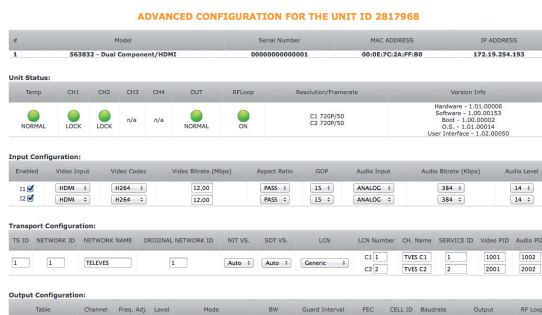
Figure 13 - Configuration > Advanced configuration

Menu flow chart

For programming Unit operation

MAIN → **EXTENDED** → **MONITORING**

- ● Enable edit mode / Position cursor (in edit mode) / Disable edit mode.
- ■ Change section / Save parameters (press and hold for 3 sec.)
- ▲▼ Change menu / Modify value (in edit mode)

MAIN

```
SELECT
A/V INPUT

INPUT 1
```
```
- INPUT  1 -
STATUS

ENABLED
```
```
- INPUT  1 -
ASSIGN PIDs
VIDEO 1001
AUDIO 1002
```
```
- INPUT  1 -
SERV_NAME:
TVES C1
```
```
- INPUT  1 -
SERVICE ID
00001
```
```
- INPUT  1 -
AUDIO CONF>>
IN: DIG_HDMI
OUT: AUTO
```
```
- INPUT  1 -
-AUDIO CONF-
LEVEL: 14
RATE:384kbps
```
```
- INPUT  1 -
VIDEO INPUT
HDMI
```
```
- INPUT  1 -
VIDEO CONF>>
OUT: MPEG 2
05.00Mbps
```
```
- INPUT  1 -
-VIDEO CONF-
GOP:15
Asp_rat:16/9
```
```
- INPUT  1 -
LCN
0001
```

A B C

EXTENDED

```
- OUT MODE -
COFDM
```
```
- OUTPUT -
SELECT OUT
MODULATION
64 QAM
```
```
- OUTPUT -
SELECT OUT
SPECTRUM
NORMAL
```
```
- OUTPUT -
SELECT QAM
BAUD RATE
6.900 Kbaud
```
```
- OUTPUT -
BANDWIDTH
8 MHz
```
```
- OUTPUT -
GUARD.
INTERVAL
1/32
```
```
- OUTPUT -
CODE RATE
7/8
```
```
- OUTPUT -
CELL ID
00000
```
```
- OUTPUT -
FREQ STEP
166 KHz
```
```
- OUTPUT -
SELECT OUT
FREQ / CHAN
CCIR N.Z.Ind
```
```
- OUTPUT -
OUT CHANNEL
C02
<50.500MHz>
```
```
- OUTPUT -
SELECT OUT
MODE
NORMAL
```
```
- OUTPUT -
TS ID

00001
```
```
- OUTPUT -
SELECT OUT
LEVEL
99
```
```
- OUTPUT -
SELECT OUT
LOOP MODE
LOOP
```

```
SELECT
PASS DEFAULT
SETTINGS
Hold ● key
```
```
SELECT
IP DEFAULT
SETTINGS
Hold ● key
```
```
SELECT
DEFAULT
SETTINGS
Hold ● key
```
```
- UNIT ID -

0001
```
```
- NETWORK -
SELECT
MODE
DHCP ON
```
```
- NETWORK
NAME:
TELEVES00000
```
```
-NETWORK ID
0x0001
-ORI. NET ID
0x0001
```
```
- LCN TYPE -
Generic
```
```
- SDT VERSION
MANUAL
NUMBER:
00
```
```
- NIT VERSION
AUTOMATIC
```

A **B** C

## MONITORING

```
FW VERSION>>
MODULE REF

563822
```
```
FW VERSION>>
FPGA SW/HW
1.01.06
1.00.153
```
```
-FW VERSION-
EN.APP/WEB
01.01.00013
01.01.00017
```
```
- INPUT 1 -
INPUT: LOCK
720x576
50fps_i
```
```
- INPUT 1 -
ENC: OFF
VIDEO: LOCK
AUDIO: LOCK
```
```
- TEMP -
NOW: 116°F
MAX: 187°F
```
```
SYSTEM CLOCK
01:00:00 PM
SUNDAY
02/04/13
```
```
- NETWORK -
IP ADDRESS
001.001.
008.017
```
```
- NETWORK -
NET MASK
255.224.
000.000
```
```
- NETWORK -
GATEWAY
172.031.
000.000
```
```
- NETWORK -
MAC
00:0E:7C
2A:FF:FF
```
```
- SERIAL -
NUMBER
0000000
0000001
```

A B **C**

# Technical specifications

| Reference | | | | 563832 |
|---|---|---|---|---|
| **INPUTS** | VIDEO | Connectors | | 2 sets - 3x RCA for Video (Y, Pb, Pr) |
| | | | | 2 sets - 1x RCA for CVBS Video |
| | AUDIO | Connectors | | 2 sets - 2x RCA for Analog Audio (L, R) |
| | | | | 2 sets - 1x RCA for Digital Audio |
| | | | | 2 sets - 1x Toslink for Digital Audio (Optical) |
| | VIDEO + AUDIO | Connectors | | 2 sets - 1x HDMI |
| | QAM | Connectors | | "F" Female (loop-through combiner input) |
| **ENCODING PROFILE** | VIDEO | Output Format | | MPEG-2 /  H.264 |
| | | Resolution | | 480i, 480p, 576i, 576p, 720p, 1080i & 1080p Supports auto-scan for input resolution |
| | | Aspect Ratio | | 4:3, 16:9, and pass through |
| | | GOP | | 10, 12, 15, 16, 18, 20, 24 or 30 |
| | | Transport rate | | Variable |
| | | Video bit rate | | Variable |
| | AUDIO | Output format | | Dolby Digital AC-3 (only digital passthrough) or MPEG1 Layer2 (analog input or HDMI uncompressed PCM audio) |
| | | Sampling rate | kHz | 48 |
| | | Output bitrate | | Variable |
| **OUTPUT** | RF | Connectors | | 1x "F" Female |
| | | Frequency Range | MHz | 46 ... 862 |
| | | Max output level | dBµV | +115  (+103 with loop-through) |
| | | MER | dB | >40 (typ) |
| | | Spurious | dBc | -60 |
| | | Impedance | Ω | 75 |
| | | I/Q Phase Error | º | <1 |
| | | I/Q Amplitude Imbalance | % | <1 |
| | QAM | Modulation format | | 16, 32, 64, 128, 256 |
| | | BaudRate | Mbaud | 6,9 |
| | | Roll-off | % | 15 |
| | | Code | | Reed Solomon |
| | | Spectrum Mode | | Normal / Inverted |
| | | Frequency Step | KHz | 250 |
| | COFDM | Modulation format | | QPSK, 16QAM, 64QAM |
| | | Guard Interval | | 1/4, 1/8, 1/16, 1/32 |
| | | FEC | | 1/2, 2/3, 3/4, 5/6, 7/8 |
| | | Bandwidth | MHz | 6, 7, 8 |
| | | Cell_id | | Editable |
| | | Frequency Step | KHz | 125 / 166 |
| **PSI PARAMETERS** | | Transport Stream ID | | Editable |
| | | Original Network ID | | Editable |
| | | Network ID | | Editable |
| | | Logical Channel Number | | Editable |
| | | NIT Version | | Manual / Automatic |
| | | SDT Version | | Manual / Automatic |
| | | Type LCN | | Generic / UK / NorDig V1 / NorDig V2 |
| | | Network Name | | Editable |
| | | Service PID | | Editable |
| | | Service Name | | Editable |
| | | Service ID | | Editable |
| **MONITORING / CONTROL** | | Local control | | Full configuration with LCD handheld programmer |
| | | Local monitoring | | LOOP status LED |
| | | | | OUTPUT status LED |
| | | | | TEMP status LED |
| | | | | CH1/CH2 status LEDs |
| | | | | Ethernet status LEDs |
| | | Remote monitoring | | Centralized web based remote control, management, alarms, and software upgrades |
| | | Control | | Daisy-chain integrated ethernet switch |
| **GENERAL** | | Power supply | Vdc | 24 |
| | | Power disipation | W | <20.4 |
| | | Operating Temperature | ºF / ºC | 32 to 113 / 0 to 45 |

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