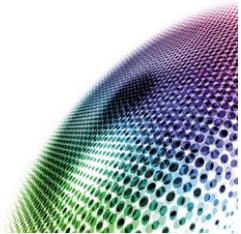


VISION[®]

**FULL HD – DVB-T
VIDEO & AUDIO MODULATOR
V40-10HD**

Installation Manual



FULL HD – DVB-T VIDEO & AUDIO MODULATOR V40-10HD

IMPORTANT! Read these warnings carefully because they include important safety information about the installation, operation and maintenance of this product. Follow all instructions to maintain manufacturer warranty and for your own safety.

- Read all instructions in this Installer Manual and on the product carefully **BEFORE** operating this device.
- The latest version of this handbook can be found at www.vision-products.co.uk
- This product is intended for indoor use only. Under no circumstances must this product be used outdoors.
- To prevent risk of fire or electric shock, do not expose this product to rain, moisture or areas of high humidity.
- If the modulator has been stored in cold conditions for a long time, bringing it into a warm environment may cause condensation. Allow it to warm up for at least 2 hours before plugging it into the mains.
- To ensure proper ventilation do not block the ventilation openings.
- Make sure there are no flammable materials close to the unit during operation.
- Clean the exterior of the product with a clean and dry, non-abrasive cloth. Do not use solvents or liquids to clean the product.
- There are no installer replacement parts inside the product. Do not open the product for any reason. This will invalidate your Manufacturer Warranty and may impair the safety features of the product.
- Do not use the product if you suspect it has been damaged in any way, including being dropped, is malfunctioning or has been exposed to liquids or moisture.
- The unit must only be repaired by an VISION authorised service centre.

- The manufacturer's warranty is void if unit is opened or adapted in any way.
- Operator safety may be compromised if this product is not operated and maintained in accordance with the details contained in this Handbook.
- This modulator is powered from a 12 V DC power supply unit. This voltage is not dangerous to life.
- Do not connect the 12 V power supply unit into the mains socket until all other connections to and from the modulator have been correctly connected.
- Do not "hot-swap" the HDMI cable, USB cable, CVBS or coaxial cables when the modulator is powered.
- Disconnect the modulator power supply by removing the power supply cable from the mains socket before removing any other connections.
- Always secure the product to a wall, system board or other suitable vertical surface.
- Ensure there is sufficient air flow around the product to ensure proper cooling. Restricting cool air flow may cause the device to overheat and fail. This type of product failure is not covered by the manufacturer's warranty.



This product complies with the relevant clauses of the European Directive 2002/96/EC. The unit must be recycled or discarded according to applicable local and national regulations.



This equipment is intended for indoor use only.



Vision Products (Europe) Ltd confirms that this product is manufactured in accordance to following norms of EU EMC norm EN50083-2 and safety norm EN60065.

FULL HD – DVB-T VIDEO & AUDIO MODULATOR V40-10HD

Features

- HDMI and CVBS inputs with auto select
- HD signal up to 1920 x 1080p and SD signal up to 720x576
- RF loop-through output to combine other modulators or RF signal sources
- Output Frequency 174 – 862MHz
- H.264 HD encoder 1-19Mb/s
- HDCP support
- Vision Easy-Set™ front panel installer set-up for quick installation with four selectable pre-programmed “Profiles”
- Computer interface set up for advanced installation via USB port

Product Description

Vision V40-10HD is a high quality professional modulator intended to produce High Definition television pictures up to 1080p from an HD source via the HDMI input in DVB-T2 COFDM format. This modulator can also accept standard definition signal sources via the CVBS input and modulate these in DVB-T2 MPEG4 COFDM format, which will require a TV with an HD tuner to view.

The V40-10HD modulator is designed for a coaxial cable system with VHF/UHF television signals compatible with Freeview^(TM) HD televisions and set-top box receivers with an HD tuner only**.

**** IMPORTANT! Some TVs and set top boxes (including some “HD Ready” products) DO NOT have an HD TV Tuner. These will not receive HD signals.**

In this case please use an SD modulator such as Vision V40-1100.

Using a screened aluminium ventilated housing for high interference immunity which is easy to mount, the V40-10HD is ideal for hotel, commercial and domestic applications where the output of an HD FTA satellite receiver, SkyTV, Freesat TV receiver, BluRay, DVD player or camera is required to be viewed on an MATV system over small, medium or large installation. (additional amplification may be required).

Powered with 12V DC at 400mA from the V40-125 PSU power supply the V40-10HD modulator is easy to set up from the front panel buttons and the 7-segment LED display. With front panel setup, the modulator will create a choice of 4 pre-programmed DVB-T2 profiles with pre-set LCN at any VHF/UHF TV channel compatible with UK Freeview™ TVs.

Using a suitable “Windows compatible” PC the installer can enter the advanced setup mode for customised settings as desired. The advanced mode allows changes of the LCN, Programme and Provider names and parameters to be displayed in the EPG of any Freeview™ HD TV.

The modulator’s RF output is fitted with a loop-through for combining with modulators and signals from other sources such as an aerial and is provided with a 0 - 20dB level control to balance the modulator output with these other signals. This makes it easy to “cascade” up to four other V40-10HD modulators.

Set-Up options

There are two ways to set up the parameters of the V40-10HD.

- 1) Quick method using Vision Easy-set™, selecting one of the four pre-programmed incremental “profiles”.
- 2) Advanced method using a computer via the USB port for access to all installer settings.

Quick set-up using Vision Easy-set™ Profile settings

The V40-10HD is pre-programmed with four pre-set profiles (1...4).

By default each profile has the RF output set to UHF channel 21 which the installer can set independently to any VHF or UHF channel.

Each profile uses pre-programmed factory settings that increment the programme parameters by one. E.G. LCN 781, 782, 783, 784. The transport stream IDs are also incremented by one, so that when more than one modulator is installed they will not conflict if each successive modulator is set to a different profile.

Setting	Profile “1”	Profile “2”	Profile “3”	Profile “4”
Programme Name	DTV1	DTV2	DTV3	DTV4
Service ID	1	2	3	4
Transport Steam ID (TSID)	2240	2241	2242	2243
LCN Enabled/Disabled	Enabled	Enabled	Enabled	Enabled
Logical Channel Number	781	782	783	784

In each profile 1 to 4, the LCN is incremented by one from LCN781 in an unused area of the EPG (*as of February 2015*). If customised LCN numbers are required then use the advanced settings menu to set the desired LCN. The pre-programmed LCN numbers can only be changed by using the advanced set up.

Front Panel Set-Up - Single modulator installation

Complete all RF, video and audio cable connections to the modulator.

Connect the DC power supply to the modulator before plugging in the power supply to the mains.

The LED display will show a “rotating” dot array for about 20 seconds while the default profile is loaded.

1) If there are two red LED “DOTS” between the channel number digits, this indicates that the button interface is locked.

To unlock the setting buttons - Press and hold the “UP” and “DOWN” buttons simultaneously until the red LED “DOTS” between the channel number digits are extinguished (Typically 10 secs).

2) Select the required RF channel number using the “UP” and “DOWN” buttons in “channel” mode. (Press the “Channel” / “Profile” button to toggle between each mode)

3) Press the “PROFILE” button. The green **Profile** LED will illuminate.

4) Using the “UP” & “DOWN” buttons select the profile required.
We recommend for a single modulator installation using “Profile 1”

5) Using a good quality signal meter or spectrum analyser, set the RF output level by turning the level control on the front panel (0-20dB).

This sets the output level between 70dB μ V and 90dB μ V. This setting can be used to balance the levels between the modulator and other signals .

WARNING: At maximum output the RF output level is very high (90dB μ V) This level may overload some signal level meters and give a false reading or may damage the meter. If in doubt, use an attenuator between the modulator and the meter.

6) After a period of 1 minute of inactive use, the modulator will store these settings and become locked.

Front Panel Set-Up - Multi- modulator installation

Complete all audio, video and RF cable connections to the modulators. Connect the power supplies to the modulators. The modulators can be connected using the RF loop-through and “daisy-chaining” two or more modulators together. (Maximum of 4)

Power on the modulators by connecting the power supplies to the mains. The LED display will show a “rotating” dot array in each modulator for about 20 seconds while the default profile is loaded.

- 1) If there are two red LED “DOTS” between the channel number digits, this indicates that the button interface is locked. To unlock the setting buttons - Press and hold the “UP” and “DOWN” buttons simultaneously until the red LED “DOTS” between the channel number digits are extinguished (Typically 10 secs).
- 2) Select the required RF channel number on each modulator, using the “UP” and “DOWN” buttons in “Channel” mode as described in the previous set-up procedure.
- 3) Set each modulator to a different one of the four “profiles” as described in the previous section.
- 4) Each profile will increment the settings by a factor of one so that the TVs will see each modulator in succession in the EPG.
- 5) After a period of 1 minute each modulator will store these settings and become locked again.

If an aerial is being added to the system care must be taken to avoid setting the modulator on the same channel as an existing transmission. In some areas of the UK it is possible to receive duplicate transmissions of broadcasts on two or more channels. In this case we recommend the use of a “blocking” or “overlap” filter to create a clean RF spectrum. In addition we advise avoiding channels 31-37 as this area is reserved for additional HD and local TV programmes. Use a spectrum analyser to identify clear parts of the TV spectrum.

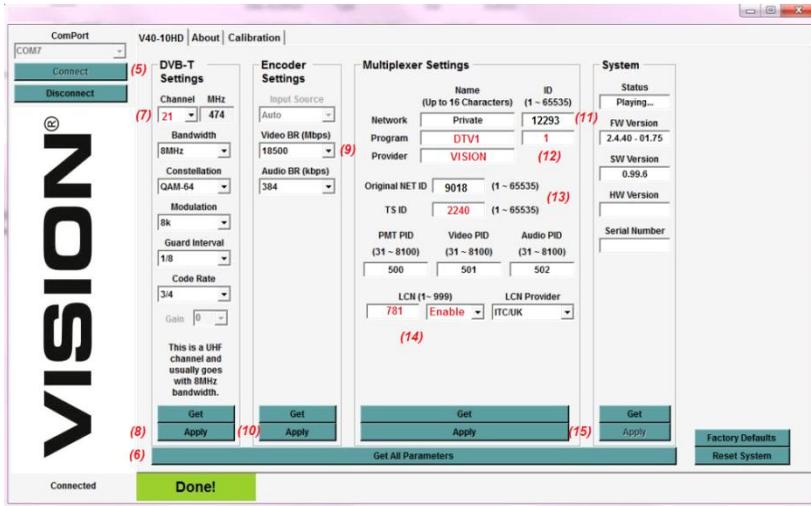
Avoid setting any modulator to any TV channel that is already occupied even where the off-air level is extremely low. Channel “collision” or conflict may cause some TVs to lose the modulator settings randomly.

Advanced Set-Up

Where an installation requires customised settings not covered by the “Profile” Set-Up, the advanced settings menu can be accessed by using a PC running either Windows XP, Vista or 7 & 8.1 (32 & 64 bit).

- 1) Insert the supplied software CDrom in the CD drive of your computer. Copy the software onto your desktop or into a suitable folder.

- 2) Connect the V40-10HD to your computer using a suitable USB lead.
- 3) Power the modulator.
- 4) Run the Vision software and the main screen will appear.



Main screen showing editable settings in red relating to the following paragraphs.

- 5) Select the **COM Port** from the “drop-down” box, then press the **connect** button and establish communications with the modulator. If communication fails to connect, change the COM port setting and repeat.
- 6) Press the “**Get All Parameters**” bar. This will show the parameters currently set.
- 7) Under **DVB-T settings**, change the channel number.
If using a UK UHF channel, all of the other settings in this section will be correct. E.G. Bandwidth 8MHz, QAM64, 8K modulation, 1/8 Guard Interval, 3/4 code rate.
- 8) Press the “**APPLY**” button in the **DVB-T settings** column, to upload the new parameters to the modulator. Wait for the green “**DONE!**” to illuminate.

9) Under “**Encoder Settings**”, Using the “drop-down” range choose a suitable Video bit-rate. Normally this is set to 18,500 Mb/s. Setting the Video bit-rate to a lower setting may cause errors and blocking in the output.

10) Press the “**APPLY**” button in the Encoder settings column, to upload the new parameters to the modulator. Wait for the green “**DONE!**” to illuminate.

11) Under “**Multiplexer Settings**”, ensure the “Network ID” is set to 12293 in all modulators. *This is important for all UK TVs and is the default setting.*

12) Set the **Programme Name** as required E.G. “DTV1”, Camera 1, Satellite 1, etc. Set the Programme ID to “1” on the first modulator in the system followed by an increment of 1 for each modulator.

Set the **Programme Provider**. You can use any name here such as your company, customer name or “VISION”.

13) **IMPORTANT:** *Do not change the original NET ID “9018”, under any circumstances. This is unique to the UK operation of digital TV. The LCN system will not work in the UK with an error in this number.*

Set the **TSID** (Transport stream ID) This should be unique for each modulator. We suggest using incremental number for each modulator. E.G 2240, 2241.

14) In the **LCN section**, check that the **LCN Provider** is set to **ITC/UK**.

Choose and set an LCN (1~999) which does not conflict with Freeview™ or any other services on the network. Check that the “drop-down” box that **LCN** is “**enabled**”.

See IMPORTANT! – LCN notes below.

15) Press the “**APPLY**” button. Wait for the green “**DONE!**” to illuminate.

Should you be unsure or get into difficulty you can press the “**Factory Defaults**” to return the modulator to the factory settings.

Note: Each time a “**Profile**” is selected in the front panel set-up, the modulator will reset itself and this process may take 20 – 30 seconds while the new parameters are uploaded.

Using the USB interface and a computer allows the installer to customise the field values in the main software window. Care must be taken not to create conflicting data with other parameters or settings in other modulators. The green LED “**LOCK**” will show when the HDMI cable is connected and signal is present.

Encoder bit-rate

The output bit-rate is pre-set to 18,500 Mb/s which is more than adequate for all HD TV signals. The modulation settings must be applied with care in order to have an adequate output bit-rate for the programme content. The output bit-rate must be equal or greater than the total sum of the bit-rate of the programme content applied to the HDMI input encoder.

If the input bit-rate exceeds the output bit-rate, the encoder may become overloaded and stop working.

IMPORTANT! - LCN

Logical Channel Numbers in the UK are primarily pre-allocated for Freeview™ by the TV companies and DMOL. These LCNs are set by the programme type / genre and programme content as agreed by DMOL and the broadcasters. E.G. National TV programme, documentary, HD channel, adult channel, radio programme, DATA channel.

The installer must take care not to choose an LCN that is reserved or set by DMOL. A gap in the EPG list does not necessarily indicate the LCN number is available to use as it may be reserved for future transmission by a broadcaster.

If you choose an LCN that conflicts with Freeview LCNs, the TV may be “confused” and refuse to accept your LCN choice. Depending on the make of TV, it may operate in 3 different ways:-

- a) Move the modulated channel(s) to Channel 800 and/or channels above
- b) Move one or more of the Freeview™ channel(s) to Channel 800 and/ or above
- c) Not display or store the modulated channel at all or display it intermittently.

Built in protection system

1. System monitor. During normal operation the V40-10HD main CPU monitors all the internal parts to ensure the device is working properly. If the CPU detects an internal error or module failure the V40-10HD immediately initiates the recovery procedure by resetting the appropriate module of the device.

2. CPU Watchdog. If the system detects the CPU itself is not operating correctly, the watchdog timers will reset automatically.

Technical Specification

Inputs	HD via HDMI and SD (CVBS) via RCA phono female
Video Coding Profile	MPEG-4 AVC/H.264 High Profile 4
Resolution	1920x1080p at 30fps for HDMI PAL 720x576 at 25fps
HDCP	Supported
Audio	Digital HDMI & Analogue via 2 x RCA phono female
Audio Standard	MPEG-1 Layer II
Audio bit-rate	64, 96, 128, 192, 256, 320, 384 kb/s
Audio level	0.5Vpp to 1.0Vpp fixed
H.264 Encoder Standard	MPEG-4 AVC/H.264
Bit-rate	1 – 19Mb/s adjustable
Configurable Parameters	Service Name, Service ID, Video PID, Audio PID, PMT, PID, PCR PID
Transport Stream Processing	
Automatic Regeneration	NIT, PAT, CAT, SDT, PMTs EITs tables.
Configurable Parameters	TS ID, Original Network ID, Network ID, Provider Name
LCN Support	Yes
LCN Providers	Nordin, ITC / UK, EICTA / Europe, New Zealand
DVB-T Output	
Standard	EN 300 744
Bandwidth Selectable	5, 6, 7, 8MHz
COFDM Mode	2K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
RF Output	
Type	RF DVB-T2 (COFDM)
Output Frequency Range	174MHz to 862MHz (1MHz steps)
Output Level / adjustment	90dB μ V / 0 – 20dB output variable attenuator
MER	-35dB (typical)
Shoulder Attenuation	>45dB
Output Loop-Through Attenuation	<1dB
Connectors	2 x F-female 75 Ω
Programming Interface	Seven Segment LED display with 3 button keypad USB interface via Windows XP, Vista, 7 & 8.1 (32 & 64 bit).
General	
Power Supply / Consumption	12V DC @ 400mA with 2.1mm DC Jack
PSU Model Number:	Vision V40-125 with DC plug adapter.
Operating Temperature	0 $^{\circ}$ C to +50 $^{\circ}$ C
Storage Temperature	-10 $^{\circ}$ C to +70 $^{\circ}$ C
Humidity	up to 90%
Dimension / Weight	205mm x 102mm x 41mm / 0.3kg

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