MOD200 User Manual

HD Modulator

View CCTV as Digital TV Channel ~ Full 1080p HD

HDMI Input with Pass-Thru ~ RF Pass-Thru

Backlit LCD Display

Version 1.7   *Last Revised 08/08/2018*

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1.   Introduction

Most homes still use coaxial cable as a way to distribute TV signals from the aerial to the various TVs within the property. The new MOD200 modulator allows you to make the best out of this set up and use it to distribute your home CCTV through this same coaxial cable network.

It works by allowing the HDMI output of a DVR (or other equipment such as a Satellite box) to be converted into a digital RF signal or "Digital TV channel" so you can distribute it around a home and watch it on any TV just like it was a real digital TV channel.

The MOD200 produces a high quality 1080p picture far superior to an analogue modulated signal and as all new TVs contain a digital tuner it's a great way to distribute CCTV in a home or a commercial building via coaxial cable.

The HDMI input to the MOD200 also carries sound alongside the video, so any connected TVs will also be able to playback sound from the DVR or other device too.

The MOD200 is also extremely useful for distributing the output from DVRs to multiple "TVs" in commercial environments such as pubs or clubs as it can all be done over low cost coax using an off-the-shelf RF distributor.

The unit is configured to run out of the box as settings have been defaulted to UK specifications, with low insertion loss of -3dB and wide output attenuation capability down to -30dB making it particularly versatile over shorter distances. However if you do need to make other changes there is an Advanced Menu section for advanced users.

Accessories Included

MOD200 HD Modulator

12vDC 1A plug-in Power Supply with a **1.35mm** DC connection

75Ohm RF Terminator for use when there is no RF input to the MOD200

2.   User Information

a.   The modulator must be installed in a clean, dry environment where it will not be exposed to high temperatures, moisture or excessive dust.

b.   Do not touch the modulator or any of its connections with wet hands.

c.   Ensure the power is switched off if the modulator isn't used for a long period of time.

d.   There are no user serviceable parts in the modulator and opening or attempting to repair the product will void the warranty.

e.   Only use the power supply originally supplied with the product.

f.   Do not install or use the device if the power cable is damaged.

g.   Ensure the power to the modulator is switched off when connecting or removing cables.

h.   In general, it is not necessary to re-configure the modulator to generate a signal compatible with a UK digital terrestrial television receiver. UK modulation parameters are the default.

Special Note

The MOD200 has to process and digitise the HDMI input from the DVR and this creates a small delay or "latency" on the output, typically in the region of 1.5 seconds. This means that the TV picture will be approximately 1.5 seconds behind what the source output is actually doing. This is similar to the latency effect that you get with IP camera systems.

3.   Front Panel – For unit configuration
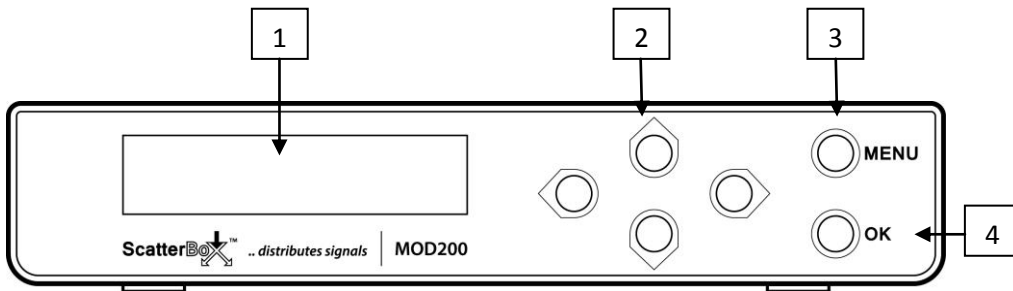
No	Feature	Function
1	LCD Display	Backlit display shows video information, Menu options and parameters
2	Navigation Buttons	Used to navigate through menu and select parameters to edit
3	Menu Button	To display menu system
4	OK Button	To select menu options and confirm changes

4.   Rear Panel – For Connections
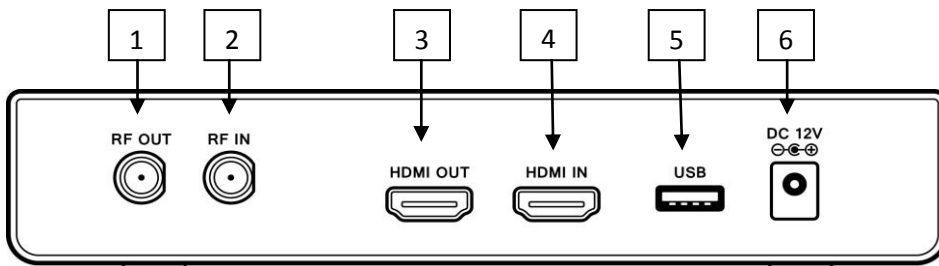
| No	Feature	Function
1	RF Out	F-Type socket used to output the modulated signal generally to an RF distribution system
2	RF In	F-Type socket for connecting to aerial or cascading from another MOD200 RF Out. If not using any RF in, then terminate with 75 Ohm Terminator provided.
3	HDMI Out	HDMI (video and Audio) output for HDMI pass-thru
4	HDMI In	HDMI (Video and Audio) input signal to be modulated
5	USB	For updating Firmware of unit
6	DC 12V in	1.35mm DC socket for 12V DC 1Amp Power Supply

5.   Typical Installation (Using one HDMI input)

Below is a typical example of how the MOD200 may be installed into a residential property. Although the MOD200 has a built-in combiner this will not provide power if a "Masthead" amplifier is being used so an external DC combiner such as the AER190 which will pass DC power to the "Masthead amplifier" must be used in such circumstances. See section 7.

Example of combining a single modulated channel to aerial output for distribution
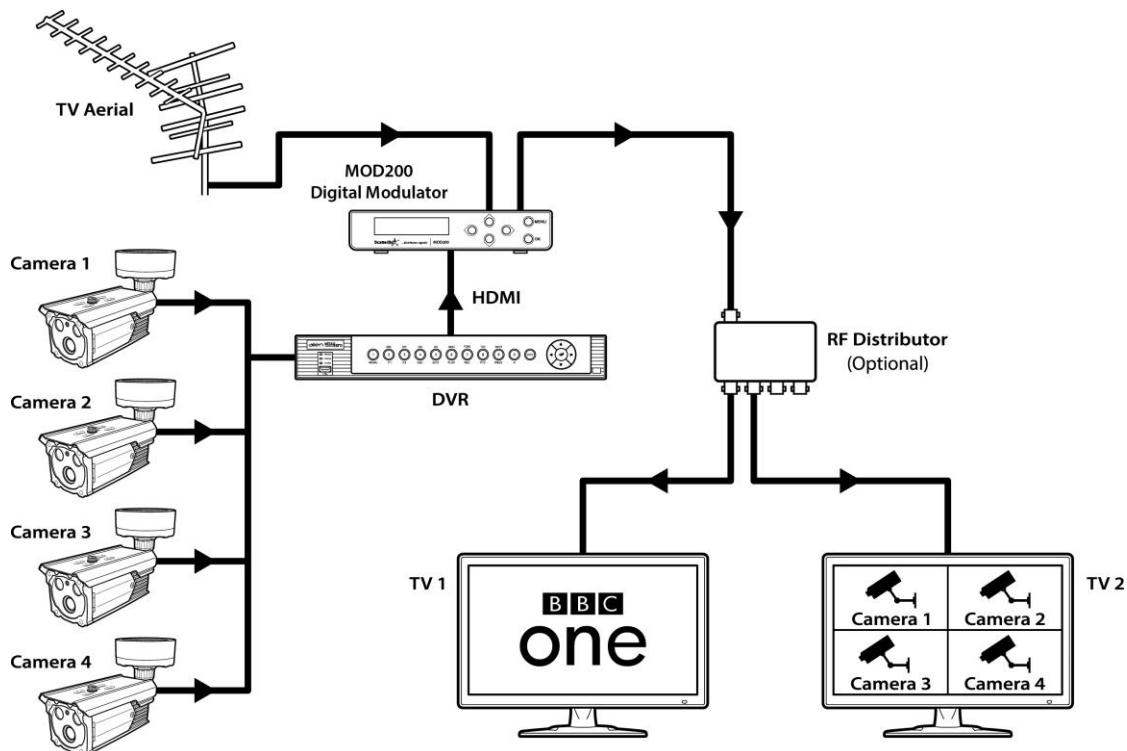
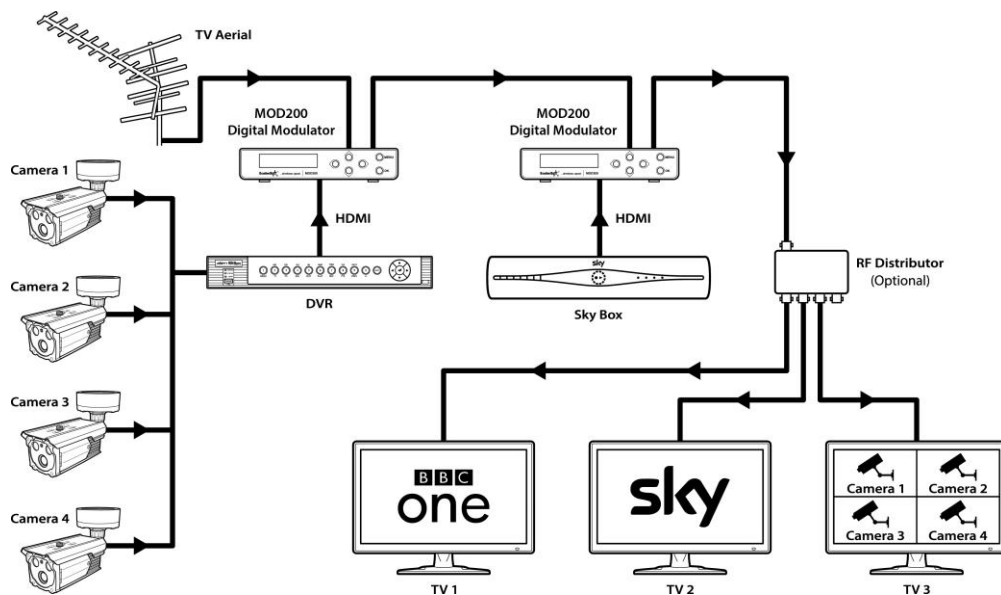**Step 1:**   Connect the DVR (or other video equipment) to the HDMI input on the MOD200.

Step 2:   The MOD200 merges the TV aerial signal via the RF input with the modulated HDMI signal from the DVR to produce a combined RF output that can be connected to an RF distributor for viewing on multiple TVS at the property.

Step 3:   The final step is to re-tune all the TVs to discover and view the video images as digital TV channels. These channels are identified by their LCN number.

6.   Cascading MOD200s (Using multiple modulators)

On larger commercial or retail installs such as bars, shopping centres and hotels you could connect multiple units together to enable a number of devices to be viewed as separate digital TV channels. This could be used to distribute sports channels around a pub or information channels to hotel rooms. Up to five MOD200s can be connected using the method shown below.

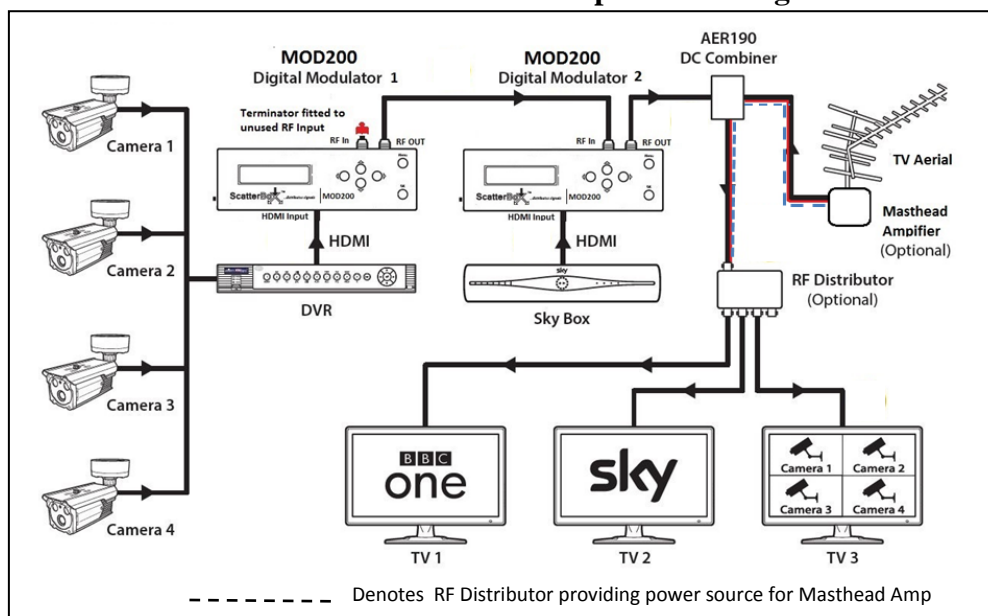**Example of combining two modulated channels with an aerial output for distribution**

Step 1:   Connect the DVR (or other video equipment) to the HDMI input on the MOD200.

Step 2:   The MOD200 merges the TV aerial signal via the RF input with the modulated HDMI signal from the DVR to produce a combined RF output that can be connected to the RF in on the second MOD200 that will combine the HDMI signal from the Sky box. The RF out from the second MOD200 then connects to the RF distributor for viewing on multiple TVS at the property.

Step 3:   When introducing a second MOD200, you will need to change the LCN and Channel Number (RF Frequency) in this and subsequent MOD200s cascaded, so they are uniquely identified.

Step 4:   The final step is to re-tune all the TVs to discover and view the video images as digital TV channels. These channels are identified by their LCN number.

7.   Installation when using a Masthead Amplifier

Although the MOD200 has a built-in combiner you may encounter problems where a "masthead" amplifier powered remotely up the coaxial cable is being used, as the MOD200 internal combiner will not pass this power. We recommend that you use an external DC combiner such as the AER190 which will pass DC power to the "Masthead amplifier". If the "Masthead" amplifier is being powered locally (to the amplifier) then the AER190 will not be necessary. If the amplifier has its own up the coax PSU then this can be inserted between the amplifier and the RF IN of the first MOD200.

Example of combining multiple MOD200s with an aerial output for distribution using an AER190 DC Combiner when a Masthead Amplifier is being used.

Step 1:   Connect the DVR (or other video equipment) to the HDMI input on the MOD200. Fit the 75 Ohm Terminator supplied to the MOD200 RF in.

Step 2:   The MOD200 merges the TV aerial signal via the RF input with the modulated HDMI signal from the DVR to produce a combined RF output that can be connected to the RF in on the second MOD200 that will combine the HDMI signal from the Sky box. The RF out from the second MOD200 then connects to the AER190 DC Combiner, combining that and the TV aerial input, then into the RF distributor for viewing on multiple TVS.

Step 3:   When introducing a second MOD200, you will need to change the LCN and Channel Number (RF Frequency) in this and subsequent MOD200s cascaded, so they are uniquely identified.

Step 4:   The final step is to re-tune all the TVs to discover and view the video images as digital TV channels. The channels will be identified by their LCN number.

8.   Navigating the Menu System

The MOD200 features an easy to use menu system for setting up and managing the unit itself and the new digital TV channels. The parameters in bold below, are those that may need changing.

Step backwards and forwards through menu sections or parameter digits

Increment and decrement parameter or digit/character value

MENU   Go to Menu or exit the Menu. If there are changes pending upon exit the MOD200 will prompt you to **Apply Settings? Yes/No**

OK

Menu

Section	Parameter	Current Value – Defaults shown
Network Setting	Country	UK
	Original Net ID	9018
	Network ID	12289
	Network Name	Private Network
	TS ID	128
	NIT Version	28
CH&Enc Setting	***Service Name**	**AlienDVR**
	*Provider Name	**AlienDVR**
	Service ID	1
	*LCN	**800**
	Video Output	H.264
	Audio Output	MPEG-2
	Video Bitrate	12Mbit
	Audio Bitrate	192Kbit
RF Setting	***Frequency**	**CH60 786.00 MHz**
	Constellation	64QAM
	Guard Interval	1/32
	Code Rate	7/8
	FFT Carrier	8K
	Bandwidth8 MHz	8 MHz
	*RF Level Adj	**-30db**
Information		FW: 5.1.2.3.4APP: 1D.B0.D0.06
Load Default		
*Change Password		

9.   Menu settings that may require change

The MOD200 has been designed for use in the UK. Therefore the standard default parameters are those for the UK and will only need changing as per details below. They are highlighted in bold and asterisked in the menu structure chart above and also listed below:

Service Name: **The default is AlienDVR**. This name is displayed as a reference name on the TV and may require changing. For instance if the service is not for connecting an **Alien DVR** HDMI input but for a Sky box. This is for display information only.

Provider Name: **The default is AlienDVR**. This could be the company installing or supplying the equipment or contact telephone number and is only for information purposes.

LCN: Logical Channel Number. **The default setting is 800**. If you are using more than one MOD200 e.g cascading two or more MOD200s, then each additional unit will need a different LCN. Example call them 801, 802 etc.

Frequency: **The default setting is CH60 786.00 MHz.** This setting may clash with the channels used locally in the area. Also when cascading two or more MOD200s, then each additional unit will need a different channel number e.g CH61, CH62 dependent on channels not used in the area installed.

RF Level Adj: The RF Level adjustment is **set by default to -30dB**. This normally works okay when you are inputting a strong HDMI signal. However if longer runs are involved you may need to reduce this setting.

Change Password: **The unit is set by default to 0000** and therefore does not need a password to enter the menu. Just press OK. Use the menu option to set if required.

The above parameters will need changing when you are cascading multiple MOD200 units and or the default channel 60 clashes with an identical channel used locally in your area.

10.   Using the Menu

As the MOD200 is built for UK use and default menus use UK settings, in many instances there will be no requirement to change menu parameters. As explained previously there are a few settings that will need changing if you are utilising multiple MOD200 units i.e cascading units or when the default channel 60 is already being used.

The following takes you through the menu structure for making these specific changes only. Advanced menu options can be found later in the menu **11.2 Advanced Settings**.

10.1   Changing Basic Menu Parameters

When the modulator is first connected to power it will display
> **Initial ….**
> **Please Wait …..**

If you have no input signal connected it will display   **Keyboard Locked**
                                                         NO SIGNAL IN

else it will display   **Enter Password**
                         0000

If no password has been set, click on **OK** button else enter the correct password

The MOD200 will then display **Network Setting** the first menu section. Click on the right arrow button to move to the next menu heading called **CH&Enc Settings** then click **OK** to update this section parameters. The first parameter in this section is **Service Name.**

CH&Enc
Service Name:
Press the **OK** button if you are changing the **Service Name** and the default name first letter, will start flashing. Pressing the **UP** or **DOWN** arrow key will change the character to alpha upper case format, followed by numbers, followed by alpha lower case.
This may be necessary if you are cascading MOD200s so you can identify the HDMI input connected. The **UP** arrow goes forward through this character selection and the **DOWN** arrow goes backwards. Use the **RIGHT** arrow button to move to the next character. Then press the **OK** button to select the full name. This name will be displayed on the TV screen. Now click the **RIGHT** arrow again to move to the **Provider Name**.

Provider Name:
Press the **OK** button if you are changing the **Provider Name** and the default name first letter, will start flashing. Pressing the **UP** or **DOWN** arrow key will change the character to alpha upper case format, followed by numbers, followed by alpha lower case.
This may be necessary if you are cascading MOD200s so you can identify the installer or contact telephone number. The **UP** arrow goes forward through this character selection and the **DOWN** arrow goes backwards. Use the **RIGHT** arrow button to move to the next character. Then press the **OK** button to select the full name. This name is for information only. Now click the **RIGHT** arrow again twice move to the **LCN** (Logical Channel Number).

LCN (Logical Channel Number):
Press the **OK** button if you are changing the LCN.
The LCN must be unique if you are cascading MOD200s. Use the **RIGHT** arrow key to select the digit to be changed. Then use the **UP** or **DOWN** arrow buttons to select the required digit. Use the **RIGHT** arrow key to select the next digit to be changed. Then use the **UP** or **DOWN** arrow buttons to select the required digit. Then press the **OK** button to select the required number string. Then click on the **MENU** button and using the **RIGHT** arrow button select **RF Setting** then click **OK** to update this section parameters. The first parameter in this section is **Frequency.**

RF Setting
Frequency:
Set the channel and frequency band required for the output signal. Check that the selected channel is not already being used by a current television distribution channel in either your area, or if your TV is already using this channel. This will need changing if you are using cascaded MOB200s as each MOB200 must be on a different channel and frequency. Note that the frequency is automatically configured using the Bandwidth setting which by default is set to 8MHz. So when the default is set on the first MOB200 to CH60 @ 786.00MHz when you change the channel to CH61 the device will automatically add 8MHz to the CH60 setting giving a frequency of 794.00MHz. To change the channel and frequency click on the **OK** button to edit the setting and use the **UP** or **DOWN** button to increase or decrease the channel number. You will see that the frequency setting will increase or decrease by 8MHz as the channel number changes. Then click on the **OK** button to set the new values. To move down the menu press the **RIGHT** arrow button.

RF Level Adj:
The MOD200 RF Level Adjustment is set by default to -**30dB**. The range for adjustment is 0dB ~ -30dB. This sets the level of RF amplification output but it is best to start at a very low level so that amplification is balanced across the devices connected and signals do not swamp the resultant receiving device/s. To change the **RF Level Adj** setting move down to the setting using the **RIGHT** arrow button and then click on **OK** to edit the setting. If you click the **DOWN** arrow button the **-30dB** will reduce to **-29dB**, then **-28dB** and so on, but if you press the **UP** arrow key it will increase the setting to **00dB**, then **-01dB**, then **-02dB** and so on. To accept the new setting click **OK** to stop the value flashing.

Load Default?
If you wish to return to manufacturer's settings select **Load Default?** with **RIGHT** arrow button and then click on **OK.** You will now see **Yes or No** flashing. Ensure the correct one is highlighted and click on **OK.** The MOD200 will now be defaulted following save.

New Password
Although there is no need to set a password the default is **0000.** If you select **New Password** with **RIGHT** arrow button and then click **OK** the first 0 will be flashing. Use the **UP** arrow button to advance numbers from 0~9 and after setting the first number use the **RIGHT** arrow button to move to the next number. Complete the number which can be 0000 ~ 9999 and select **OK** button.

Save Settings
Once a parameter has been successfully changed the menu category will have an asterisk *
attached. If you return to the menu by clicking **MENU** button and then click **MENU** again to
close the menu, you will see the following message displayed: **Apply Setting?**
                                                                                        Yes No
With the YES flashing click on **OK** and you see the message
Processing   Wait a moment …. And return to **Network Setting** menu for a few seconds
and then when unit times out, returns to **Keyboard Locked** display.

10.2   Changing Advanced Menu Parameters
If you need to change other menu settings, which should not be necessary in the UK, these
are described in the menu structure in section **8. Navigating the Menu System**.

11.   Troubleshooting Options and HDMI Pass-Thru

11.1   Compatibility
The MOD200 converts an HDMI signal into a digital RF signal for distribution to TVs containing HD digital tuners. Note that the MOD200 outputs MPEG-4 and not all TV's support this as some are MPEG-2.

11.2   HDMI Resolution
As HDMI TVs can be either 720P HD Ready or 1080P Full HD, the first step is to check that the DVR resolution input matches that of the TV. So if the TV is 720P HD Ready then the DVR resolution must also be set to 720P. The MOD200 will output the same resolution as input. Resolve this first before continuing.

11.3   Installation method
In order to undertake the installation of the MOD200 it is recommended to start by just connecting the DVR direct to the MOD200 and the MOD200 via the RF out to one TV. Then re-tune the TV. This will prove that the MOD200 is working correctly and one TV proves that the setup used is correct.

Now connect the main TV aerial feed from the roof, to the MOD200 RF IN feed. When this stage works okay, take the RF OUT feed into the RF distribution amplifier and from that into the single TV. If that works okay add extra TVs.

Note that if the aerial has a Masthead amplifier please refer to "Section 7. Installation when using a Masthead Amplifier."

11.4   HDMI Pass-Thru
The MOD200 incorporates an HDMI Pass-Thru option so that when using the Alien DVR HDMI output into the MOD200, you still have the option for an HDMI feed for other functionality.

12.   Menu Table

12.1   Basic Menu Settings Explained

1.-   Service Name: The default is ALIENDVR. This is displayed on screen so can be edited.

2.-   Provider Name: The default is ALIENDVR. This can be edited if required.

3.-   LCN: Logical Channel Number. The default is 800. It specifies the channel for the service sorting on the digital terrestrial television receiver. Values 1 ~ 999. E.g. 1 for BBC1.

4.-   Frequency: The default is 60 and sets the frequency value for the output signal. **Important:** Ensure the selected frequency is not already used by a current television distribution channel.

5.-   RF Level Adj: The default is -30dB. It adjusts the power level of the output signal, in in the range from 0 to -30dB.

6.-   New Password: It allows the user to change to a new password to access the menu.

7.-   Load Default: It returns to the default values.

12.2   Advanced Menu Settings Explained

8.-   Bandwidth: Audio Channel bandwidth (6, 7 , 8 , 7 - 8 MHz).

9.-   FFT Carriers: Signal transmission mode(2K, 8K).

10.-   Guard Interval: Safety signal margin(1/4, 1/8, 1/16, 1/32).

11.-   Constellation: Constellation type used to transmit signal(QPSK,16QAM, 64QAM).

12.-   Code Rate: Available values are (1/2, 2/3, 3/4, 5/6, 7/8).

13.-   Video Output: Video encode. H.264 of the video output.

14.-   Audio Output: Audio encode. Selection between MPEG-2 and AAC

15.-   Video Bitrate: Select video bit rate (2,4,6,8,10,12 Mbit/S).

16.-   Audio Bitrate: Bitrate to encode the audio. Available values are between 192 kbit/s.

17.-   Country: The default is UK

18.-   Original Net ID: Identifier of the original network. It is the number to identify the network from where the signal comes.

19.-   Network ID: It is the number that identifies the network where the signal is distributed.

20.-   Network Name: Private Network

21.-   TS ID: It is the transport stream identifier.

22.-   NIT Version: Network Information Table version.

23.-   Information: It shows the firmware version installed in the instrument and is not editable.

24.-   Apply Setting: Saves the current configuration in the non-volatile memory of the MOD200.

13.   Specifications

Source input	
· Input Channel	1
· Video	HDMI
· Video System	480i/p, 576i/p, 720p, 1080i/p
· Audio system	HDMI
Compression	
· Video	H.264 Baseline Profile Level4.0
· Video Resolution	1080p30
· Video Bit rate	12Mbps MAX
· Audio	MPEG-2 / AAC
· Audio Bit rate	192 Kbit/S
· DVB insertion tables	SDT, NIT
· Editable field	SERVICE NAME , Network Name , Provider Name , TS ID , NETWORK ID , ORIGINAL NET ID , LCN , NIT VERSION , PRIVATE DATA , Country
RF Output	
· Type	1 Multiplex DVBT with a digital TV service
· Frequency	177 – 858 MHz
· MER	30 dB
· Output level	100 dBuV
· RF Level Adj	0 dB ~ -30dB
· Attenuation step	1dB per step
Connections	
· HDMI IN I	HDMI IN
· HDMI OUT	HDMI PASS THROUGH
· RF Output	1 DVBT (HDMI Modulated) RF output with type F female, 75 ohm
· RF Input	1 DVBT RF input with type F female, 75 ohm

RF Input	
· Type	1 Multiplex DVBT (digital TV) service
· Frequency	177 – 858 MHz
· Insertion Loss	-3dB

14.   Operational Parameters

Modulation	Standard	DVBT (ETSI EN 300 744)
	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
	FFT Carriers Mode	2K, 8K
	Bandwidth	6MHz, 7MHz, 8MHz, 7-8MHz
Power Supply	12v DC 1A Power Adaptor	
Display	LCD panel @ 2 x 16 characters (on front panel).	
Configuration	6 Local keys on front panel : ·OK Key : Select parameter, or menu · L / R Keys : Move menu, or characters ·Up / down : Select value of the figure, or field ·MENU keys : Return to start menu	
Environmental Operation	Temperature range	5°C- 40°C
	Relative Humidity	80% @ 30°C

This symbol on the products and/or accompanying documents means that used electronic equipment must not be mixed with general household waste. For treatment, recovery and recycling please return this unit to your trade supplier or local designated collection point as defined by your local council.

WEE/CG0783SS

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