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HDQ 1

HDMI into QAM/DVB-T Encoder



Operating manual

Before starting operation of the device

NOTE: *Read this operating manual through carefully! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).*

The ASTRO company confirms that the information in this manual was correct at the time of printing, but it reserves the right to make changes, without prior notice, to the specifications, the operation of the device and the operating manual.



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Symbols and conventions used

Symbols used in these instructions

Pictograms are visual symbols with specific meanings. You will encounter the following pictograms in this installation and operating manual:



Warning about situations in which electrical voltage and non-observance of the instructions in this manual pose a risk of fatal injuries.



Warning about various dangers to health, the environment and material.



Recycling symbol: indicates components or packaging materials which can be recycled (cardboard, inserts, plastic film and bags). Used batteries must be disposed of at approved recycling points. Batteries must be completely discharged before being disposed of.



This symbol indicates components which must not be disposed of with household rubbish.

Proper use

The HDQ 1 is an HDMI to QAM/DVB-T converter. It is solely intended for the conversion of signals.

Modification of the devices or use for any other purpose is not permitted, and will immediately void any guarantee provided by the manufacturer.

Target group of this manual

Installation and starting operation

The target group for installation and starting operation of the ASTRO headend technology are qualified experts who have training enabling them to perform the work required in accordance with EN 60728-11 and EN 60065. Unqualified persons are not allowed to install and start operation of the device.

Device configuration

Target group for the configuration of the ASTRO headend are persons who have received instructions and have training enabling them to perform a configuration. Knowledge of EN 60728-11 and EN 60065 is not necessary for configuration.

Device description

The delivery is comprised of the following parts:

- ☐ HDMI to QAM/DVB-T converter HDQ 1
- ☐ Power supply unit
- ☐ Operating manual

- [1] Display
- [2] Operating status lamp
- [3] Alarm control lamp I
- [4] USB control lamp
- [5] Menu control, lock button
- [6] JTAG connection (used at the factory for maintenance)
- [7] USB port
- [8] Earth connection
- [9] HF output
- [10] HF input
- [11] HDMI input socket
- [12] Power supply socket



Figure 1: HDQ 1 signal converter

The HDQ 1 signal converter encoder has a CE marking. This confirms that the products comply with the relevant EC directives and adhere to the requirements specified therein.





Important safety information

To avoid any potential risks to the greatest extent possible, you must adhere to the following safety information:

ACHTUNG: *Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!*

Proper use

- ☐ Only use the device at the approved operating sites and in the ambient conditions allowed (as described in the following), and only for the purpose described in the section "Proper use".

Before starting operation of the device

NOTE: *Read this operating manual attentively! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).*

- ☐ Check the packaging and the device for transport damage immediately. Do not start operation of a device that has been damaged.
- ☐ Transporting the device by the power cable may damage the mains cable or the strain relief, and is therefore not permitted.

Installation and operation

- ☐ The device may only be installed and operated by qualified persons (in accordance with EN 60065) or by persons who have been instructed by qualified persons. Maintenance work may only be carried out by qualified service personnel.
- ☐ An installation site must be provided that prevents children from playing with the device and its connections.
- ☐ The electrical connection conditions must correspond to the specifications on the device type plate.



- ☐ To avoid damage due to overheating, the device may only be installed on vertical surfaces. The connection for the power supply unit must point to the right. The installation basis should be level and non-flammable. Operating position: Device vertical, with HF sockets at the bottom and external DC power supply connection on the right.
- ☐ The permitted ambient temperatures specified in the technical data must be complied with. If the device overheats, the insulation used to isolate the mains voltage may be damaged.
- ☐ The device and its cable may only be operated away from radiant heat and other sources of heat.
- ☐ To avoid trapped heat, ensure there is good ventilation on all sides (minimum interval of 20 cm to other objects). Installing the device in recesses or covering the installation location, e.g. with curtains, is not permitted. Ventilation openings may not be covered.
- ☐ If the device is installed in a cabinet, ensure adequate air convection is possible to avoid exceeding the maximum permitted ambient temperature.
- ☐ Do not place any objects on the device or on the external power supply unit.
- ☐ The subscriber network must be earthed in accordance with EN 60728-11, and must remain earthed even when the device is removed.
- ☐ The device and the power supply unit do not provide protection against water and may therefore only be operated and connected in dry rooms. The device and the external power supply unit must not be exposed to splashing or dripping water, condensation or similar effects of water, as this may impair the isolation from the mains voltage.
- ☐ The mains plug of the external power supply unit is used as a mains voltage disconnection unit in the event of servicing and danger, and must therefore be accessible and usable at any time. The external power supply unit is operational when connected to the mains power. If the power supply unit is also connected to the DC socket of the device, the device is also in operation.
- ☐ The device may only be powered by the supplied external power supply unit. The supplied external power supply unit may only be used to power the device supplied with the external power supply unit.



- ☐ All adhere to all applicable national safety regulations and standards.
- ☐ Excess mechanical loads (e.g. falling, impacts, vibrations) may damage the insulation used to provide protection from mains voltage.
- ☐ High excess currents (lightning strike, surges in the power utility grid) may damage the insulation used to provide protection from mains voltage.
- ☐ If there is no information about intended use (e.g. operating site, ambient conditions), or the operating manual does not include the corresponding information, then you must consult the manufacturer of this device to ensure that the device may be installed. If you do not receive any information on this from the manufacturer, do not start operating the device.
- ☐ The device may only be operated in rooms in which the permissible ambient temperature can be maintained should climatic conditions vary (e.g. due to sunlight).
- ☐ Do not install the device and external power supply unit in locations with excessive dust formation, as this may impair the isolation from the mains voltage.

Electromagnetic compatibility (EMC)

In order to avoid malfunctions from occurring when operating radio and telecommunications equipment, as well as other operating units or broadcasting services, the following points must be observed:

- ☐ Before installation, the device must be checked for mechanical damage. Damaged or bent covers or housings may not be used.
- ☐ During operation, the device must always be covered by the components provided for this purpose. Operation with an opened cover is not permitted.
- ☐ The braided line or the contact springs may not be damaged or removed.

Maintenance

- ☐ The operating display only shows whether the DC current, which supplies the device components, has been disconnected. However, operating displays (on the power supply unit or the device) that are not lit up in no way indicate that the device is completely disconnected from the mains voltage. There may still be voltages in the external power supply unit that are dangerous to touch. Even after disconnection from the mains, there may still be voltages in the external power supply unit that remain dangerous to touch for several minutes. Do not open the case of the device or the external power supply unit.
- ☐ Read carefully: EN 60728-11 – Part 1, Safety requirements / No service tasks during electrical storms!
- ☐ Disconnect the mains plug before cleaning the device!

Repair

- ☐ Repairs may only be performed by the manufacturer. Improperly performed repairs may result in considerable dangers for the user.
- ☐ If malfunctions occur, the device must be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

General information

- ☐ Store or use the device in a safe location, well out of reach of small children. It may contain small parts that can be swallowed or inhaled. Dispose of any small parts that are not needed.
- ☐ Plastic bags may have been used for packaging the device. Keep these plastic bags away from babies and children in order to avoid any danger of suffocation. Plastic bags are not toys.
- ☐ Do not store the device near chemicals or in places in which any leakage of chemicals may occur. Organic solvents or fluids in particular may cause the housing and/or cables to melt or disintegrate, presenting a danger of fire or electric shock. They may also cause device malfunctions.
- ☐ Do not connect the mains adapter provided to any other products.



Warranty conditions

The general terms and conditions of ASTRO Bit GmbH apply. You will find these in the current catalogue or on the Internet under “www.astro-kom.de”.

Performance description

The HDQ 1 is used to modulate local HDMI sources (e.g. camera, set-top box, PC) into a QAM or DVB-T output channel. The device offers the following performance features:

- ☐ TS loop via USB (playback of a recorded transport stream from a USB stick in loop)
- ☐ QAM signal is fed out via the F socket
- ☐ Different resolutions
- ☐ Local operation via keypad and LCD
- ☐ Power supply via 12 V plug-in power supply unit
- ☐ Wall mounting

To use the device properly, carefully read the following safety and operating instructions.

Disposal



All of our packaging material (cardboard boxes, inserts, plastic film and bags) is completely recyclable.

After use, this device must be disposed of in an orderly manner as electronic scrap in accordance with the current disposal regulations of your district / country / state.

ASTRO Bit is a member of the Elektro system solution for the disposal of packaging materials. Our contract number is 80395.

Installation proposal

PREPARATION:

Before you fix the device in place, first drill four holes in a perpendicular mounting surface and insert suitable wall plugs. To do this place the device on the wall and mark the four points at which the holes are to be drilled.

Proceed as follows to fasten the device:

TASK

1. Place the back of the device against the mounting surface so that its attachment points are exactly above the four screw heads. The connection sockets of the device must point downwards.
2. Now push the housing slightly downwards until the upper edges of the attachment points press against the screws.

RESULT:

The device is now fixed and can be connected to the power supply unit.

PREPARATION:

To connect the HDQ 1 connectors proceed as follows:

AUFGABE

1. Plug one F connector each into the input [10] and output [9] jack (see left) of the device. Make sure that the coaxial cables are laid with a sufficient bending radius.
2. Connect the ground terminal [8] of the HDQ 1.
3. Insert the plug of the HDMI cable into the HDMI socket [11] of the HDQ 1.
4. Insert the plug of the second HDMI cable into the HDMI socket of the device whose transport stream is to be processed by the HDQ 1 (e.g. camera signal, DVD player).

RESULT:

The device is now connected and you can start the configuration (see next section "Configuration").

ATTENTION: *If F-connectors are handled improperly or carelessly, compliance with the EMC limit values cannot always be ensured.*

Figure 3 shows a connection example for the HDQ 1:

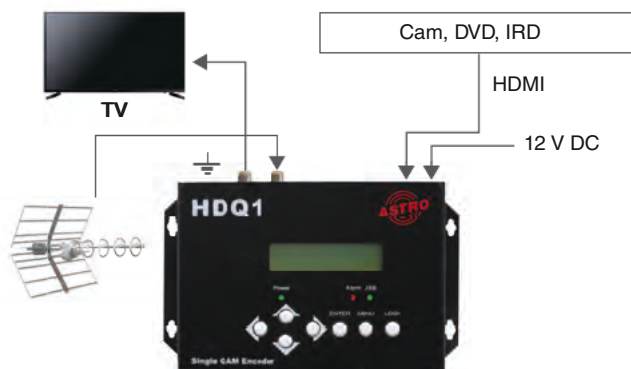


Figure 3: Connection example

Figure 4 shows a connection example with cascade connection of two HDQ 1 devices. In order to create additional capacities for input signals, several HDQ 1 can be interconnected. To do this, you must connect the HF output of one device to the HF input of another.

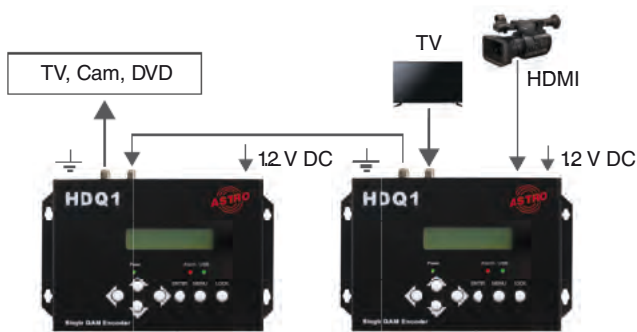


Figure 4: Connection example with cascade connection

Starting operation

To start operation of the HDQ 1, you must connect the device to the mains using the supplied power supply unit. You do so like this:

- ☐ Insert the plug of the power supply unit into the power supply socket of the device [12] (see left).
- ☐ Connect the mains plug of the power supply unit to the mains.

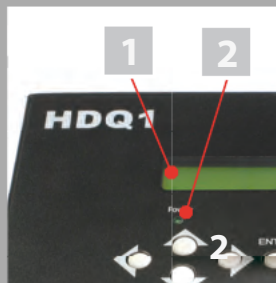
If the operating status lamp [2] (see left, below) is glows continuously the unit is ready for operation.

ATTENTION: *If the operating status light flashes or does not light up, it may be that*

- *The power supply unit is defective*
- *The device is defective, or*
- *An inadmissible operation is present (e.g. operating error, wrong power supply unit).*

(See "Maintenance and repair" section)

NOTE: *The use of another power supply unit with a different output voltage or polarity can lead to the destruction of the device as well as to malfunctions and voids the warranty!*



Operating elements and display

The HDQ 1 is operated via an LC display and a keypad on the top of the device. Here you will also find three LEDs that indicate the status of the device.



Figure 5: Operating elements

LC display

Displays the selected menu and parameter settings. The backlight is activated as soon as the power supply unit of the device is connected to the mains voltage.

LED

- ☐ **Power:** Lights up as soon as the device is connected to the operating voltage.
- ☐ **Alarm:** Lights up in the event of an error, e.g. if no input signal is present.
- ☐ **USB:** Lights up when a USB data source is connected.

Keypad

- ☐ **Arrow buttons:** Use these buttons to navigate through the individual menus and to change parameter settings.
Up and down arrow: Scroll through the menu
Left and right arrow: Set parameters
- ☐ **Enter:** Use this button to access a submenu (if a triangle is visible in front of the currently displayed menu item) or to save a new setting.
- ☐ **Menu:** Use this button to switch from a submenu to the next higher menu level.
- ☐ **Lock:** Use this button to block input via the keypad to prevent accidental misuse. Press the Lock button again to enable the keypad again.

NOTE: *Immediately after the device is connected to the operating voltage, it is started and the keypad is initially blocked. If you want to operate the HDQ 1, press the Lock button to unlock the keypad.*

Programming

After switching on, the device is initialised. The display shows the information in a set sequence:

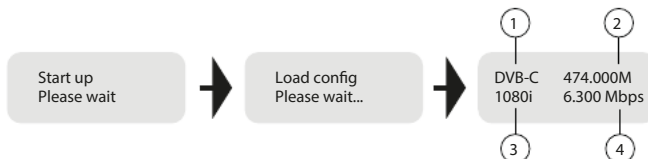


Figure 6: The display after switching on

- ☐ 1 : Modulation of the output signal
- ☐ 2 : Output frequency
- ☐ 3 : resolution of the input signal
- ☐ 4 : Data rate of the output signal

Now press the Lock button to unlock the keypad.

You are now in the main menu. This contains the following menu items:

- ☐ **Status** : Here you will find the status indicators of the device (Alarm, Uptime).
- ☐ **Encoder** : Here you set the parameters for the encoder of the device (video, audio).
- ☐ **Modulator** : Here you set the parameters for the modulator (HF frequency, symbol rate, HF level, etc.).
- ☐ **Stream** : Here you set the parameters for the transport stream (TSID, ONID, NIT, EIT).
- ☐ **USB device** : Here you can configure the use of the USB port (record transport stream, play transport stream, update software, etc.).
- ☐ **System** : Here you can make various system settings (save configuration, factory reset, display system version, etc.).

Operating elements for navigation in the menu structure

Use the ENTER button to move to the next menu level. Press the MENU button to return to the next higher menu level.



Use the up and down arrow buttons to move within a menu level to the next or previous menu item.

↓↑ Buttons

To change individual parameters, use either the up or down arrow buttons, the left and right arrow buttons or all four, depending on the parameter.

Select with
↓↑ Buttons, then Enter

switch on or of RF-carrier

Select with
←→Buttons, then ENTER

Key lock, selection: Yes or No

Select with
↓↑ ←→Buttons, then ENTER

Password, selection: type in a six-figure
numerical code

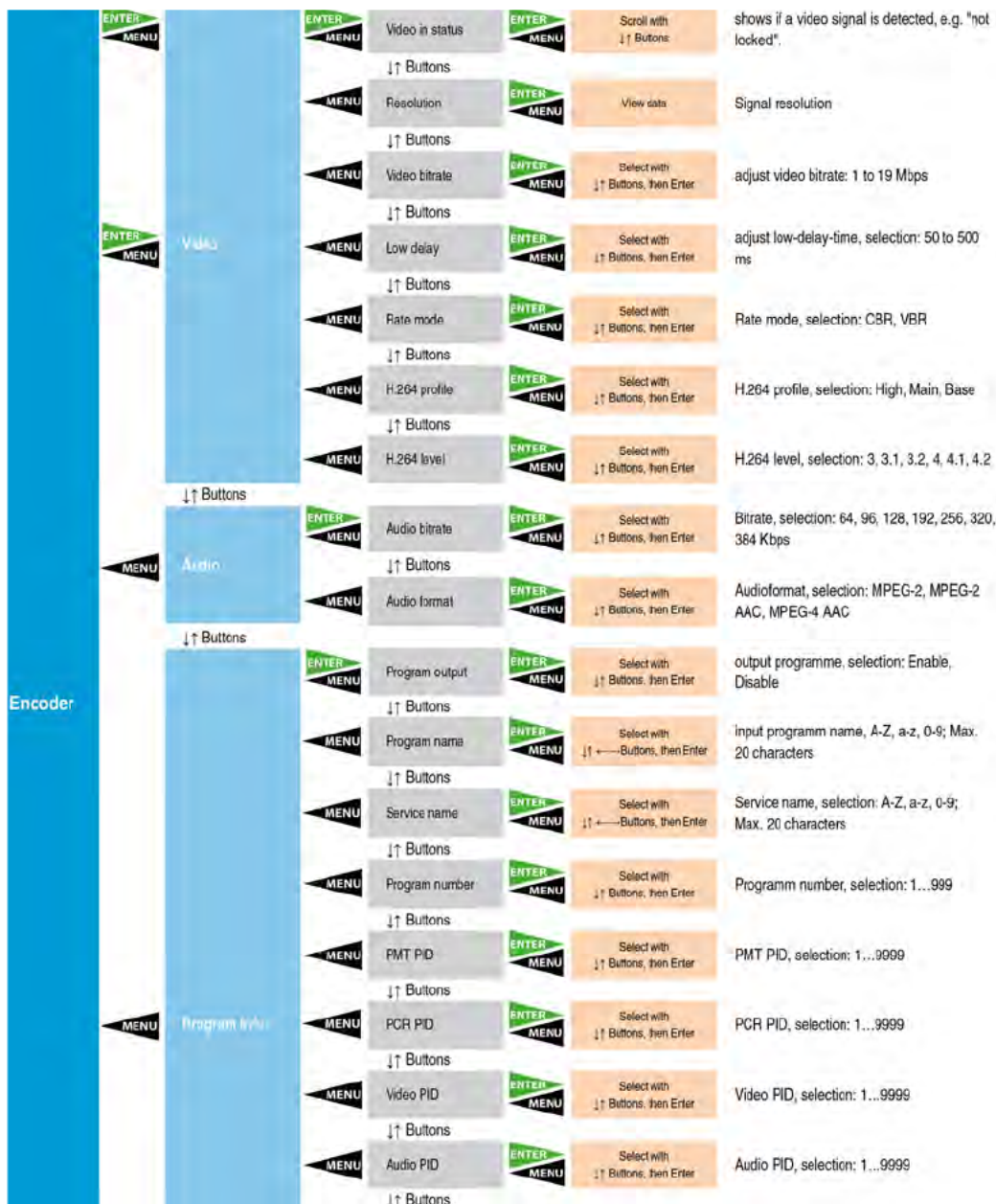
“Status” menu



If no HDMI signal available: Message o. g.
„Video 1 not lock“. Alarm LED is red (also
when there is a data overflow at the output).

Runtime from the moment of activation

“Encoder” menu





“QAM Modulator” menu



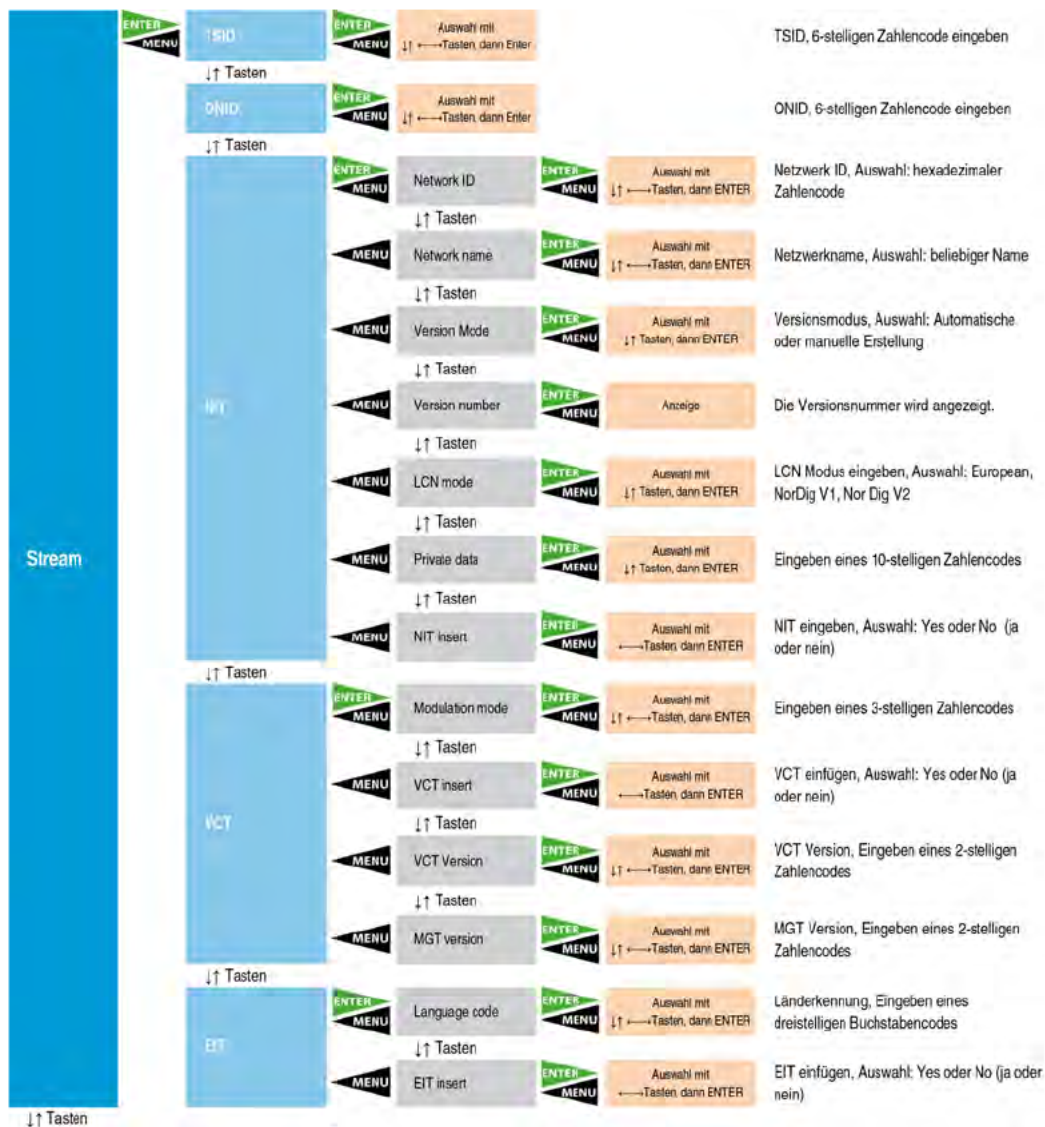
“DV-T Modulator” menu

DVB-T Modulator	ENTER MENU	Bandwidth	ENTER MENU	Current value	ENTER MENU	Select with ↓↑ Buttons, then Enter	Bandwidth, selection: 6, 7, 8 MHz
	↓↑ Buttons						
	MENU	Constellation	ENTER MENU	Current value	ENTER MENU	Select with ↓↑ Buttons, then Enter	QAM mode, selection: QPSK, 16 QAM, 64 QAM
	↓↑ Buttons						
	MENU	FFT	ENTER MENU	Current value	ENTER MENU	Select with ←→ Buttons, then ENTER	FFT, selection 2k, 8k
	↓↑ Buttons						
	MENU	Guard interval	ENTER MENU	Current value	ENTER MENU	Select with ↓↑ Buttons, then Enter	Guard interval, selection: 1/4, 1/8, 1/16, 1/32
	↓↑ Buttons						
	MENU	Code rate	ENTER MENU	Current value	ENTER MENU	Select with ↓↑ Buttons, then Enter	Code rate, selection: 1/2, 2/3, 3/4, 5/6, 7/8
	↓↑ Buttons						
	MENU	RF frequency	ENTER MENU	Current value	ENTER MENU	Select with ↓↑ ←→ Buttons, then Enter	RF frequency, selection: 30 to 960 MHz
	↓↑ Buttons						
	MENU	RF level	ENTER MENU	Current value	ENTER MENU	Select with ↓↑ ←→ Buttons, then Enter	Level range, selection: -36 dBm to -16 dBm
	↓↑ Buttons						
	MENU	RF on	ENTER MENU	Current value	ENTER MENU	Select with ←→ Buttons, then ENTER	RF-carrier, selection: On or OFF
	↓↑ Buttons						
	MENU	Rate	ENTER MENU	Current value			The current and maximum bit rate are displayed.
	↓↑ Buttons						

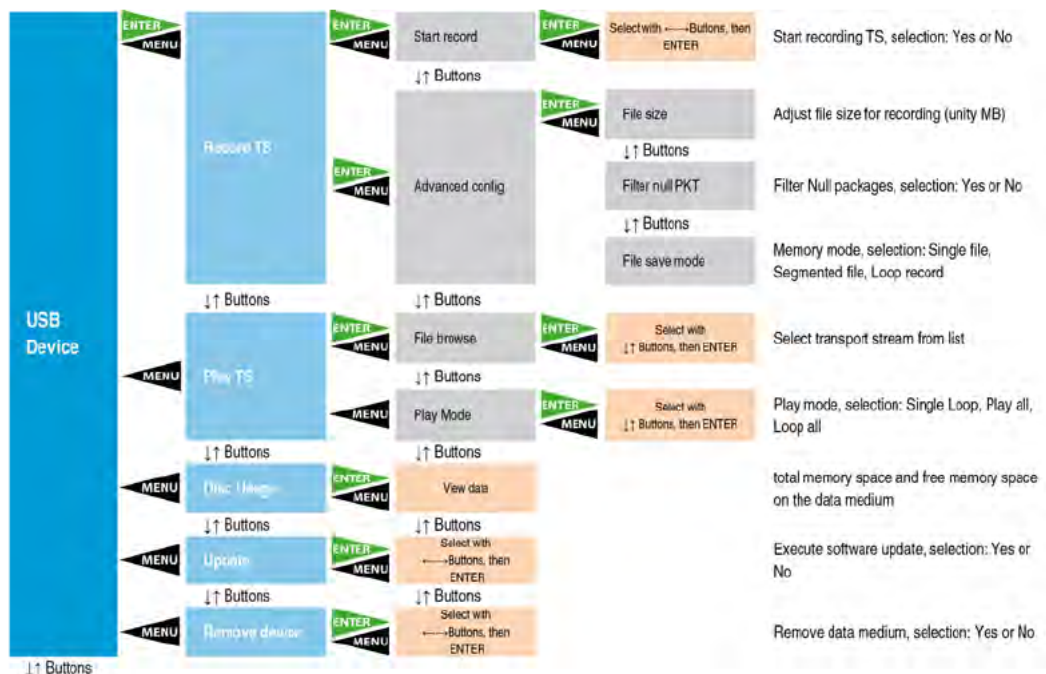
“Stream” menu

Stream		TSID		Select with ↓↑ Buttons, then Enter		TSID, type in six-figure numerical code	
	↓↑ Buttons	ONID		Select with ↓↑ Buttons, then Enter		ONID, type in six-figure numerical code	
	↓↑ Buttons	NIT		Network ID		Select with ↓↑ Buttons, then ENTER	Network ID, selection: hexadecimal numerical code
			↓↑ Buttons	Network name		Select with ↓↑ Buttons, then ENTER	Network name, selection: any name
			↓↑ Buttons	Version Mode		Select with ↓↑ Buttons, then ENTER	Version mode, selection: automatic or manual
			↓↑ Buttons	Version number		View data	The version number is displayed.
			↓↑ Buttons	LCN mode		Select with ↓↑ Buttons, then ENTER	Type in the LCN mode, selection: European, NorDig V1, Nor Dig V2
			↓↑ Buttons	Private data		Select with ↓↑ Buttons, then ENTER	Type in a numerical code
			↓↑ Buttons	NIT insert		Select with ↔ Buttons, then ENTER	Input a NIT, selection: Yes or No
	↓↑ Buttons		VCT		Modulation mode		Select with ↓↑ Buttons, then ENTER
		↓↑ Buttons		VCT insert		Select with ↔ Buttons, then ENTER	Insert VCT, selection: Yes or No
		↓↑ Buttons		VCT Version		Select with ↓↑ Buttons, then ENTER	VCT version, type in a two-figure numerical code
		↓↑ Buttons		MGT version		Select with ↓↑ Buttons, then ENTER	MGT version, type in a two-figure numerical code
	↓↑ Buttons	EIT			Language code		Select with ↓↑ Buttons, then ENTER
			↓↑ Buttons	EIT insert		Select with ↔ Buttons, then ENTER	Insert EIT, selection: Yes or No

“Stream” menu



“USB Device” menu



“System” menu

System		Self config		Current value		Select with ←→Buttons, then ENTER	Save adjustments, selection: Yes or No
		↓↑ Buttons		↓↑ Buttons			
		Load saved CFG		Current value		Select with ←→Buttons, then ENTER	Restore last values, selection: Yes or No
		↓↑ Buttons		↓↑ Buttons			
		Factory reset		Current value		Select with ←→Buttons, then ENTER	Restore factory setup, selection: Yes or No
		↓↑ Buttons		↓↑ Buttons			
		LCD time-out		Current value		Select with ↓↑ Buttons, then ENTER	Switch off display; selection: after 5, 10, 30, 45, 60, 90, 120 seconds
		↓↑ Buttons		↓↑ Buttons			
		Key password		Current value		Select with ↓↑ Buttons, then ENTER	Password, selection: type in a six-figure numerical code
		↓↑ Buttons		↓↑ Buttons			
		Lock keyboard		Current value		Select with ←→Buttons, then ENTER	Key lock, selection: Yes or No
		↓↑ Buttons		↓↑ Buttons			
		Product ID		Current value		View data	The Device number is displayed. (Serial number ...)
		↓↑ Buttons		↓↑ Buttons			
		Version		Current value		View data	Soft- and Hardwareversion is displayed.
		↓↑ Buttons		↓↑ Buttons			
		Modulator mode		Current value		Select with ↓↑ Buttons, then ENTER	Modulation mod, selection: DVB-C, DVB-T, ATSC-T

Troubleshooting

If the device is not functioning correctly, please perform the following checks:

- ☐ Check whether the device has been connected to the specified mains voltage.
- ☐ Check whether the coaxial cables are connected correctly, and that there are no breaks or short circuits in the connectors.
- ☐ Check whether the output level on the device is within the permissible limits for the operating level.

If the problem cannot be resolved, please contact the ASTRO customer service.

Maintenance and repair

The following safety information must be observed when performing maintenance and repair work. Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!

- ☐ The operating display only shows whether the DC current, which supplies the device components, has been disconnected from the mains voltage. If the operating display (for the power supply unit or the device) does not light up, this does not mean that the device has been fully disconnected from the mains voltage. There may still be voltages in the external power supply unit that are dangerous to touch. Do not open the case of the device or the external power supply unit.
- ☐ Read carefully: EN 60728 - Part 1 Safety requirements: No service work during thunderstorms.
- ☐ A defective device may only be repaired by the manufacturer to ensure that components with the original specification are used (e.g. power cable, fuse). Improperly performed repairs may result in considerable dangers for the user or installer. If malfunctions occur, the device must therefore be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.



Country	ONID	NID	PDS
Others	0x0000	0x0000	0x00000000
Australia	0x2024	0x3201	0x0000233A
Austria	0x2028	0x3301	0x00000028
Belgium	0x2038	0x3401	0x00000028
Taiwan	0x209E	0x3301	0x00000028
Czech Republic	0x20CB	0x3101	0x00000028
Denmark	0x20DO	0x3201	0x00000028
Estonia	0x20E9	0x3201	0x00000028
Finland	0x20F6	0x3301	0x00000028
France	0x20FA	0x3301	0x00000028
Germany	0x2114	0x3002	0x00000028
Indonesia	0x2168	0x2005	0x00000028
Ireland	0x2174	0x3201	0x00000028
Israel	0x2178	0x3301	0x00000028
Italy	0x217C	0x3001	0x00000028
Latvia	0x21AC	0x3001	0x00000028
Netherlands	0x2210	0x3101	0x00000028
New Zealand	0x222A	0x3401	0x00000028
Norway	0x2242	0x3401	0x00000028
Philippines	0x2260	0x3103	0x00000028
Poland	0x2268	0x3401	0x00000028
Singapore	0x22BE	0x3201	0x00000028
Slovak Republik	0x22BF	0x3001	0x00000028
Slovenia	0x22C1	0x3201	0x00000028
South Africa	0x22C6	0x3001	0x00000028
Hungary	0x22C7	0x3401	0x00000028
Portugal	0x22C8	0x3401	0x00000028
Spain	0x22D4	0x3101	0x00000028
Sweden	0x22F1	0x3101	0x00000028
Switzerland	0x22F4	0x3201	0x00000028
UK	0x233A	0x3002	0x0000233A

TSID default: 0x01(editable)

Technical data

Type		HDQ 1	
Order number		380 274	
EAN-Code		4026187197476	
Encoding			
Encoding of video files		yes, TS via USB	
Video-Encoding		MPEG 4 AVC / H.264	
Interface		HDMI	
Resolutions		1920x1080 60P, 1920x1080 50P; 1920x1080 60i, 1920x1080 50i; 1280x720 60p, 1280x720 50P, 720x480 60i, 720x576 50i	
Video bitrates	[Mbps]	1 ... 19	
Audio encoding		MPEG1 Layer II, MPEG2-AAC, MPEG4-AAC	
Sample rate	[kHz]	48	
Bit rate	[kbps]	64, 96, 128, 192, 256, 320, 384	
Modulation		DVB-T	QAM
Standard		DVB-T	J.83A (DVB-C), J.83B, J.83C
Constellations		QPSK, QAM 16, QAM 64	16-, 32-, 64-, 128-, 256 QAM (depending on standard)
Output frequency	[MHz]	30 ... 960 (1 kHz - steps)	
Output level	[dBμV]	71 ... 91 (0,1 dB - steps)	
Symbol rate	[MS/s]	5 ... 9	
Bandwidth	[MHz]	8 oder 6 (depending on standard)	
Common data			
Management		buttons on device, LCD	
Dimensions	[mm]	153 x 110 x 50	
Power supply	[VDC]	12	
Weight	[kg]	< 1	
Ambient temperature	[°C]	0 ...+45	



ASTRO Strobel Kommunikationssysteme GmbH

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Change management and copyright:

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