BOTEX
STAGE TECHNOLOGY

NETcon 8-3 / 8-5

User Manual

ArtNet DMX converter

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1 General information

This document contains important instructions for the safe operation of the product. Read and follow the safety instructions and all other instructions. Keep the document for future reference. Make sure that it is available to all those using the product. If you sell the product to another user, be sure that they also receive this document.

Our products and documentation are subject to a process of continuous development. They are therefore subject to change. Please refer to the latest version of the documentation, which is ready for download under *www.thomann.de*.

1.1 Symbols and signal words

In this section you will find an overview of the meaning of symbols and signal words that are used in this document.

Signal word	Meaning
DANGER!	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
NOTICE!	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.

Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

2 Safety instructions

Intended use

This device is designed to convert DMX signals into ArtNet signals or vice versa. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damage resulting from improper use.

This device may be used only by persons with sufficient physical, sensory, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

Safety

DANGER!

Risk of injury and choking hazard for children!

Children can suffocate on packaging material and small parts. Children can injure themselves when handling the device. Never allow children to play with the packaging material and the device. Always store packaging material out of the reach of babies and small children. Always dispose of packaging material properly when it is not in use. Never allow children to use the device without supervision. Keep small parts away from children and make sure that the device does not shed any small parts (such knobs) that children could play with.

DANGER!

Danger to life due to electric current!

Within the device there are areas where high voltages may be present. Never remove any covers. There are no user-serviceable parts inside. Do not use the device when covers, safety equipment or optical components are missing or damaged.

DANGER!

Danger to life due to electric current!

A short circuit could lead to a fire hazard and risk of death. Do not modify the mains cable or the plug! In case of isolation damage, disconnect immediately the power supply and arrange repair. If in doubt, seek advice from a qualified electrician.

NOTICE!

Risk of fire due to covered vents and neighbouring heat sources!

If the vents of the device are covered or the device is operated in the immediate vicinity of other heat sources, the device can overheat and burst into flames. Never cover the device or the vents. Do not install the device in the immediate vicinity of other heat sources. Never operate the device in the immediate vicinity of naked flames.

NOTICE!

Damage to the device if operated in unsuitable ambient conditions!

The device can be damaged if it is operated in unsuitable ambient conditions. Only operate the device indoors within the ambient conditions specified in the "Technical specifications" chapter of this user manual. Avoid operating it in environments with direct sunlight, heavy dirt and strong vibrations. Avoid operating it in environments with strong temperature fluctuations. If temperature fluctuations cannot be avoided (for example after transport in low outside temperatures), do not switch on the device immediately. Never subject the device to liquids or moisture. Never move the device to another location while it is in operation. In environments with increased dirt levels (for example due to dust, smoke, nicotine or mist): Have the device cleaned by qualified specialists at regular intervals to prevent damage due to overheating and other malfunctions.

NOTICE!

Damage to the device due to high voltages!

The device can be damaged if it is operated with the incorrect voltage or if high voltage peaks occur. In the worst case, excess voltages can also cause a risk of injury and fires. Make sure that the voltage specification on the device matches the local power grid before plugging in the device. Only operate the device from professionally installed mains sockets that are protected by a residual current circuit breaker (FI). As a precaution, disconnect the device from the power grid when storms are approaching or it the device will not be used for a longer period.

NOTICE!

Risk of fire by exceeding the maximum current

The device can supply power to other devices of identical design and connected in series. If too many devices are connected, the power consumption can exceed the maximum permitted power consumption, which can cause the device to overheat and burst into flames. Only connect devices of identical design to the device. When deciding how many devices you can connect in series, make sure that the maximum permitted power consumption as stated on the device is not exceeded. Also refer to the specifications in the technical specifications for the device. Only use power cords with a cable cross-section designed for the required current intensity when connecting the devices in series.

NOTICE!

Possible staining due to plasticiser in rubber feet!

The plasticiser contained in the rubber feet of this product may react with the coating of the floor and cause permanent dark stains after some time. If necessary, use a suitable mat or felt slide to prevent direct contact between the device's rubber feet and the floor.

3 Features

Bidirectional ArtNet DMX converter for professional demands with the following features:

- Configuration via display on the device
- Adjustable DMX repetition rate (10 … 40 Hz)
- 4096 channels
- Up to eight DMX universes
- LEDs to visualize the transmission status of network and DMX signal
- Supported protocols: DMX, RDM, ArtNet, sACN
- Clear OLED display (four lines each with a maximum of 16 characters)
- 2 × lockable RJ45 Ethernet port
- 8 × XLR in / output socket (female), 3-pin (item no. 464561) or 5-pin (item no. 464598)
- Power Twist in and outputs (on the back)
- 19" rack-mountable

4 Installation and starting up

Unpack and check carefully there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the product against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

Create all connections while the device is off. Use the shortest possible high-quality cables for all connections. Take care when running the cables to prevent tripping hazards.

NOTICE!

Data transfer errors due to improper wiring!

If the DMX connections are wired incorrectly, this can cause errors during the data transfer.

Do not connect the DMX input and output to audio devices, e.g. mixers or amplifiers.

Use special DMX cables for the wiring instead of normal microphone cables.

Rack mounting

The unit has been designed for rack mounting in a standard 19-inch rack; it occupies one rack unit.

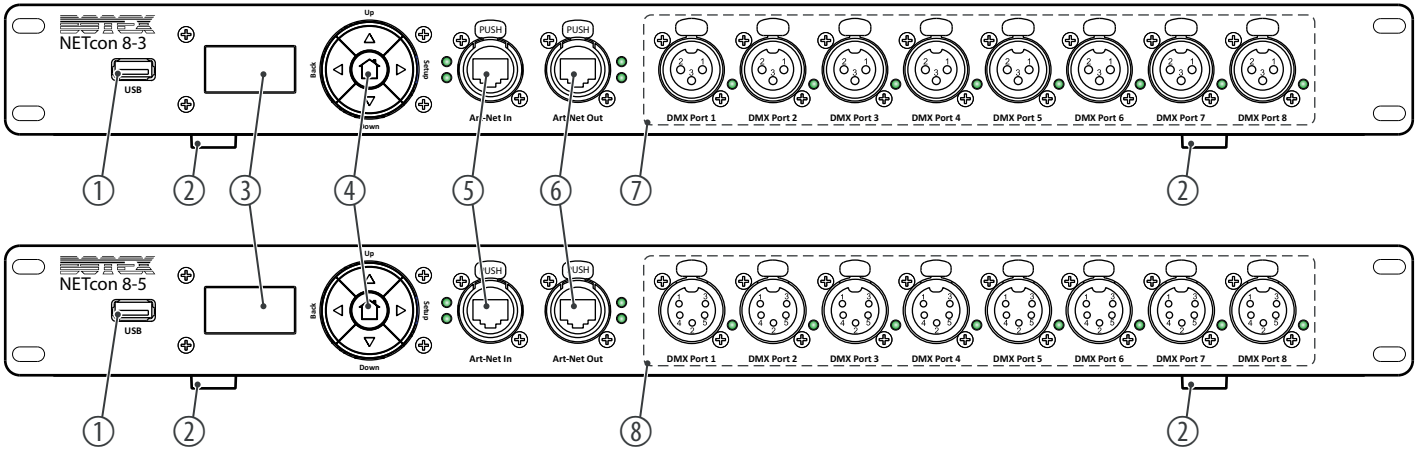
Data connections

The converter is connected to a computer network via one of the Ethernet interfaces or via an Ethernet switch or directly to a PC or notebook. The data is transferred to the converter and then sent internally to the XLR connectors for DMX output. If more than eight universes are needed, the other Ethernet interface can be used to daisy-chain multiple converters.

The data can also be received via the correspondingly configured DMX connections and transmitted via the Ethernet interfaces to a set IP address or via a broadcast device via ArtDMX.

5 Connections and controls

Front NETcon 8-3 (464561) and NETcon 8-5 (464598)



1	*[USB]* | USB interface for updates
2	Rubber feet
3	OLED display (4 lines of 16 characters each)

4	Operating key panel
	[Up] | Increases the value by one
	[Down] | Reduces the value by one
	[Back] | Menu level up
	[Setup] | Confirms the selection
	⌂ | Calls up the lock screen or activates the display.
5	*[Art-Net In]* | Network input (RJ45)
6	*[Art-Net Out]* | Network output (RJ45)
7	*[DMX Port 1]*…*[DMX Port 8]* | DMX connection jack, XLR, 3-pin (item no. 464561)
8	*[DMX Port 1]*…*[DMX Port 8]* | DMX connection jack, XLR, 5-pin (item no. 464598)

Back

9	*[Power In]* | Power Twist input socket for the power supply of the device
10	*[Power Out]* | Power Twist output socket for powering further devices

6 Operating

Configuring DMX interfaces

1. Press ⌂ to show the main menu. Use *[Up]* | *[Down]* to select the menu item *'Port-Config'* and confirm with *[Setup]*. The display shows the mode of the 8 interfaces. The displayed values have the following meaning:

Display	Name	Function	
'O'	DMX output	When an interface is set to output mode, DMX data packets are sent at the set intervals. Immediately after switching on, all channel values are sent with 0. After receiving an ArtDMX packet, the channel values of the corresponding interfaces are updated.	
		'Hold'	Select *'Hold'* to maintain the DMX output function, that is, the device does not receive ArtNet/sACN data, but still outputs DMX signals (default setting).
		'Off'	Select *'Off'* to not maintain the DMX output, that is, the device does not receive ArtNet/sACN data and does not output DMX signals.
'I'	DMX input	When an interface is set to input mode and DMX data is received at the interface, the data is sent immediately to the configured IP address or via the broadcast device via ArtDMX. If the 15-bit interface address matches, the other device will accept the DMX data.	

Display	Name	Function
'R'	RDM	In RDM mode, the interface initiates a test of the device after power up or after changing the interface mode, and incrementally checks the device every 3 seconds. When the ArtNet controller issues an ArtTodRequest instruction, the converter immediately creates a list of the UIDs of the connected devices. It supports ArtRdm when sending other RDM instructions.
'U'	Online upgrade	This is the support function of the device. Here you can update the converter yourself or the device that is in connection mode through the interface through an encrypted upgrade file provided by the ArtFirmwareMaster instruction.

2. Select *'All'* if you want to set the interfaces all the same. Now select one of the four options and confirm with *[Setup]*.

If you want to configure the interfaces differently, select individual interfaces *'Port1'* … *'Port8'* to set them to one of the four values.

3. Press *[Back]* to go to the higher menu level.

Interface address

The current version of the ArtNet protocol supports 15-bit addresses and allows multiple converters to be connected. There is only one Net Switch and Sub Switch of a device and the physical 8-channel interface of the device can be used as output or input accordingly. The lower 4 bits of the 15-bit address can be set accordingly. The default output address as well as the input address of 8 interfaces is *'0/1/2/3/4/5/6/7'*. This way, both devices – one as an 8-port input and the other as an 8-port output – can be used as an 8-channel DMX signal repeater via the network cable after setting the local IP address and destination IP address over the network connection.

If two devices are used simultaneously as an output or input, the interface address of the second device can be set to *'8/9/10/11/12/13/14/15'* and the Net Switch and Sub Switch of both devices can be identical. To separate the physical interfaces when using more than three devices, different Net Switches and Sub Switches must be set to have a unique 15-bit address for each interface.

If eight interface addresses of the device match, they are treated as one interface. For example, if Interface 1 and Interface 2 are set to 0x0000, the DMX data sent by the ArtNet controller to the 0x0000 interface will be simultaneously transmitted to both interfaces.

For the sACN protocol, the interface address corresponds to the universe and the value for the universe is the address of interface 1 and is then incremented with the interfaces (the universe at interface 1 is 1, the universe at interface 2 is 2, etc.). The converter sends DMX data to the appropriate interface associated with the universe in the sACN packets sent by the converter.

Configuring ArtNet

1. Select *'ArtNet-Config'* to enable ArtNet and set up the network connections.

2. Select *'Enable'* and then the option *'On'* or *'Off'* to enable or disable ArtNet.

3. In *'Net Switch'*, enter a value between *'0'* and *'127'* for the upper 7 bits of the 15-bit address in the ArtDMX.
4. In *'Sub Switch'*, enter a value between *'0'* and *'15'* for the middle 4 bits of the 15-bit address in the ArtDMX.
5. In *'SwOut'*, enter a value between *'0'* and *'15'* for the lower 4 bits of the 15-bit address of the output in the ArtDMX.
6. In *'SwIn'*, enter a value between *'0'* and *'15'* for the lower 4 bits of the 15-bit address of the input in the ArtDMX.

Configuring sACN

1. Select *'sACN-Config'* to enable sACN and set the domain area for the sACN protocol.
2. Select *'Enable'* and then the option *'On'* or *'Off'* to enable or disable sACN.
3. In *'Universe'*, choose a value between *'00001'* … *'63999'*.

Settings

1. Select *'Settings'* to make general settings.
2. In *'Sub-Mask '*, select one of the three address ranges.
3. In *'Local IP'*, enter the desired local IP address of the device.
4. In *'Broadcast'*, in Input mode, select the option *'Broadcast'* or *'Unicast'*.

5. In *'Target IP'* under *'All'*, enter an IP destination address uniformly for all 8 interfaces, or under *'IP1'* … *'IP8'*, enter a separate IP destination address for each interface. The first byte of the IP address is not displayed. The *'Target IP'* is relevant when the device should receive DMX signals and transform them into ArtNet or sACN signals and output them.
6. In *'Input-Switch'*, you can select the protocol with which you want to receive the data at the serial interface (*'ArtNet'* or *'sACN'*).
7. To set the backlight in *'Backlight'*, select the value *'Disable'* (no backlight) or a value of *'1 Min'* … *'60 Min'* (duration of illumination). If no action is taken on the device within the set time, the backlight turns off.
8. Turn keylock on and off in *'KeyLock'*.

   Press ⌂ for 3 seconds if you want to activate the display while the keylock is activated.
9. For the DMX intervals in output mode, select a value of *'25'* … *'100'* (unit ms) in *'DMX-Interval'*.
10. In *'Factory'*, you can reset the device to factory default settings.

Display of the settings

1. *'Version'* displays the current software version.
2. *'Devices'* shows how many RDM devices are connected to the respective interface (display shows *'Port1:0'* … *'Port8:0'*).

Lock screen

The lock screen displays:

1. In the first line: the local IP address of the device
2. In the second line: Value of the ArtNet universe (calculated from Net Switch, Sub Switch, and Interface 1 value)
3. In the third line: Value of the sACN universe
4. In the third line: Keylock and software version

Changing the MAC address

The network device has a unique MAC address (48 bits, 6 bytes), with the front 24 bits being the registered manufacturer identifier and the back 24 bits being a proprietary assignment by the manufacturer. The first two bytes of the MAC address are factory set to 0xE0FE and the last four bytes are calculated by the MCU's UID to prevent duplication. Do not change the MAC address without absolute necessity!

If you need to resolve a MAC conflict by changing the MAC address, follow these steps:

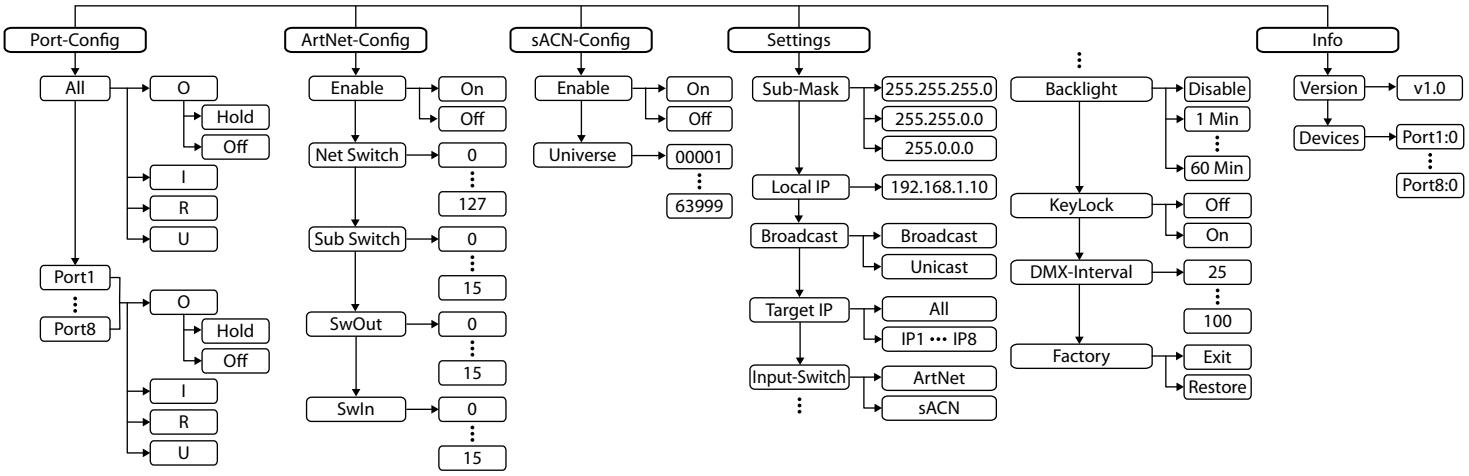
1. In the *'Info'* menu, call up the submenu *'Version'*, press *[Down]* twice and then *[Setup]* to open the password menu.
2. Change the password with *[Up]* | *[Down]* to *'254'* uand press *[Setup]* to open the menu for changing the MAC address.
3. Change 6 consecutive bytes, press *[Setup]* to change the next one, save all changes and go with *[Back]* back to the main menu.

ArtCommands

The device can also be controled using ArtCommands. For the possible commands and their functions refer to the following table.

ArtCommand format	Functions
`Command=Restart`	Restarts the device
`Command=Search RDM`	Find a port for a new RDM device
`Command=Clear RDM List`	Clears the UID list of the RDM devices for each port
`Command=Clear RDM List` `Command=Search RDM`	Refind the RDM device for each port
`Command=Research RDM1`	Refind the RDM device on port 1
`Command=Research RDM2`	Refind the RDM device on port 2
`Command=Research RDM3`	Refind the RDM device on port 3
`Command=Research RDM4`	Refind the RDM device on port 4
`Command=Research RDM5`	Refind the RDM device on port 5
`Command=Research RDM6`	Refind the RDM device on port 6
`Command=Research RDM7`	Refind the RDM device on port 7
`Command=Research RDM8`	Refind the RDM device on port 8

6.1 Menu overview



7 Technical specifications

		ArtNet DMX converter NETcon 8-3 (464561)	ArtNet DMX converter NETcon 8-5 (464598)
Input connections	DMX control	8 × XLR chassis socket, 3-pin	8 × XLR chassis socket, 5-pin
	Network	1 × Ethernet RJ45, lockable	
	Power supply	1 × Power Twist input socket	
Output connections	USB	1 × USB port, 5 V, 1 A	
	Network	1 × Ethernet RJ45, lockable	
	Power supply	1 × Power Twist output socket	
Control protocols		DMX512, RDM, ArtNet, sACN	
Power consumption		6.5 W	
Supply voltage		100 - 240 V ~ 50/60 Hz	
Installation properties		19 inches, 1 RU	
International Protection Rating		IP20	
Dimensions (W × H × D)		463 mm × 49 mm × 169 mm	
Weight		2.0 kg	

		ArtNet DMX converter NETcon 8-3 (464561)	ArtNet DMX converter NETcon 8-5 (464598)
Ambient conditions	Temperature range	0 °C…40 °C	
	Relative humidity	20%…80% (non-condensing)	

Further information

19-inch rack-mountable	Yes
Internal memory	No
RDM compatible	Yes
Housing	Metal
Colour	Black

8 Plug and connection assignment

Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment so that a perfect light experience is guaranteed.

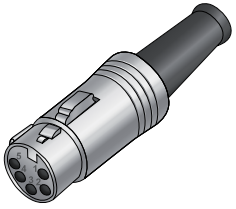
Please take our tips, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into a socket, the result of an incorrect connection may be a destroyed DMX controller, a short circuit or 'just' a not working light show!

DMX connections

The unit offers a 3-pin XLR socket for DMX output and a 3-pin XLR plug for DMX input. Please refer to the drawing and table below for the pin assignment of a suitable XLR plug.

Pin	Configuration
1	Ground, shielding
2	Signal inverted (DMX–, 'cold signal')
3	Signal (DMX+, 'hot signal')

DMX connections



A five-pin XLR socket serves as DMX output, a five-pin XLR plug serves as DMX input. The drawing below and the table show the pin assignment of a matching coupling.

Pin	Assignment
1	Ground (shielding)
2	Signal inverted (DMX–, 'cold')
3	Signal (DMX+, 'hot')
4	unused / second connection (DMX–)
5	unused / second connection (DMX+)

9 Protecting the environment

Disposal of the packaging material

For the transport and protective packaging, environmentally friendly materials have been chosen that can be supplied to normal recycling.

Ensure that plastic bags, packaging, etc. are properly disposed of.

Do not just dispose of these materials with your normal household waste, but make sure that they are collected for recycling. Please follow the notes and markings on the packaging.

Disposal of your old device

This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE) in its currently valid version. Do not dispose with your normal household waste.

Dispose of this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.