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# LSS

## Manual

# DMX-View



**Date:** 16.05.2013  
**Software valid:** 1.24

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# Preamble

## Notes for the reader

This manual provides advices and information's about the function and configuration of the *DMX-View*.

Like all devices of LSS GmbH the *DMX-View* is constantly evolving technology. It is therefore possible that this manual does not explain later development forms.

This manual uses the following symbols to indicate important information for your safety and for configuration.



Here you will get additional information.



Attention alerts you to situations in which decisions can provoke to technical problems with the equipment or losing data.



A Warning statement indicates situations in which can result in injury or damage to life and limb.

## Security advices

Proper care of the *DMX-View* is not dangerous. However please note the following:



- Never operate with visibly damaged devices!
- If the suspect prior to a defect, immediately disconnect the device from the power supply! Secure the device to restart!
- Disconnect the device from the power supply before open the case!
- Employees of the LSS GmbH may only make repairs!

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## Instruction for use

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The *DMX-View* is designed for continuous operation. However please note the following:



- Use the device only for its intended purpose!
- Avoid extreme mechanical loads!
- Avoid extreme mechanical loads on the display!
- To clean the display, turn off the power! Use a damp cloth only.
- Avoid direct exposure of moisture and excessive heat on the device!
- Do not cover the ventilation openings! Risk of fire!
- Don't mount the unit directly above headlights!

## General Overview

The LSS *DMX-View* is a lightweight and portable diagnostic device for DMX and Ethernet-based light protocols. It is able to receive process and visually present Ethernet network protocols and / or the standard DMX protocol, as they are transmitted by, for example, a lighting console. The presentation is clearly on a matrix of 512 fast-response and dimmable LEDs. Freely selectable DMX universes and subnets can be monitored. Faults, such as temporal offsets, DMX instabilities ("FlickerFinder") or even failure of individual channels can be detected quickly.

The LSS *DMX-View* can be operated with an external power supply or with an installed rechargeable battery. The battery is designed for a maximum power output of at least two hours. This makes the LSS *DMX-View* to a device for use in decentralized and difficult places for maintenance and monitoring. It can even be used in acoustically critical situations due its fanless cooling.

### Supported

#### Protocols:

Art-Net	ShowNet
AVAB/UDP	AVAB/IPX
sACN	DMX512

#### Monitor matrix:

Display a complete DMX Universe with 512 dimmable LEDs  
Linear or logarithmic characteristics selectable

#### Menu:

20x4 LCD-Display with 4 Button-Menu system

#### Connectors:

1x LAN RJ45, 100MBit  
1x DMX-In, 5-pin XLR, optical isolated  
1x DMX-Thru, 5-pin XLR

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## Remote configuration

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For all devices of LSS the freeware LSS ConfigCore is recommended. All features of the *DMX-View* and other LSS devices, but also Art-Net compatible devices of other manufacturers will be supported. Only with this freeware it is possible to find all devices on the network and configure the *DMX-View* fully remotely. Because the *DMX-View* is an Art-Net compatible device itself so it works fine with Art-Net software tools of other manufacturers, especially DMX Workshop (download at [www.artisticlicence.com](http://www.artisticlicence.com)). Of course, like all other Art-Net devices the *DMX-View* has an own OEM ID (identified and supported by DMX Workshop version 3.57 and higher). Using this tool, also a restricted remote configuration is possible. By using DMX Workshop note Art-Net can only configure a subset of the *DMX-View*.



If other protocols than Art-Net will be set the *DMX-View* will be always configurable with ConfigCore. Providing that the PC with ConfigCore is in the same IP address range like the *DMX-View*.

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## Merge settings

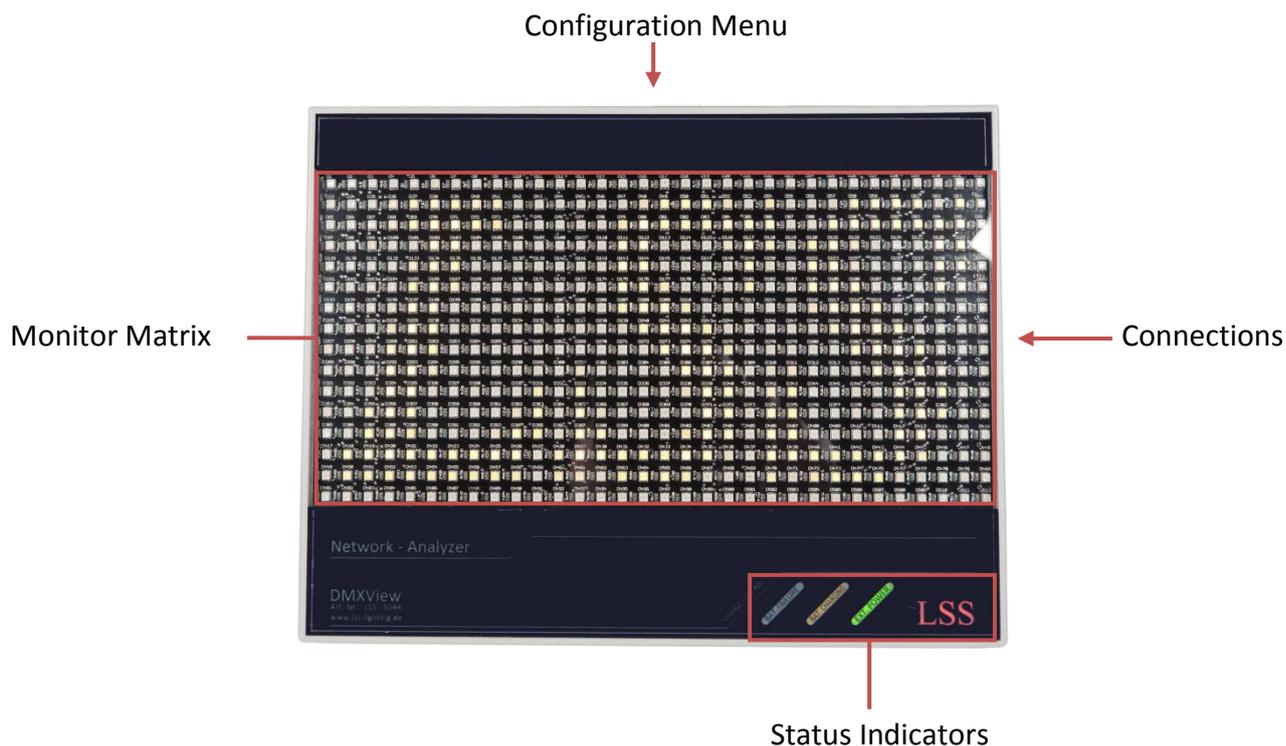
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The *DMX-View* is able to merge up to four channels on HTP when they send on the same subnet / universe. This distinguishes this device from most of other nodes. For instance Art-Net supports one or two transmitters only.

# Connections, display and controls

## Device overview

All Connections, displays and operating elements of the LSS *DMX-View* are clear and well arranged on the housing. A simple connection of control cables is ensured even in low light conditions.



## Monitor Matrix

The 512 LED of the monitor matrix represent a fully universe. Each individual LED corresponds to a circle or a channel. The number of the circuit is shown below the LED. The LEDs are dimmable; the values of the individual circles will be shown visually.

From Software Version 1.24 also the numbers of the Universe and the subnet are displayed.

## Status Indicators

The status indicators show the status of the power supply.



LED	Colour	Meaning
Bat. Failure	red	The temperature of the rechargeable battery is too high. Charging process is interrupted just before full charge and reboot → Cool down battery (can last up to 1 hour).  Repeated message: Battery defective Please send us your device for service, battery must be replaced.
Bat. Charging	yellow	Battery is charging.
Ext. Power	green	External power supply available.

## Connections

The connectors for DMX, Ethernet and power supply are located on the right housing side.



Connection	Connector
12 V DC	External power supply 12V DC, 3A (Coaxial power connector 5,5/2,1mm)
Ethernet	Ethernet RJ45, 100MBit
DMX-In	DMX, 5-pin XLR male, optical isolated
DMX-Thru	DMX, 5-pin XLR female

## Configuration menu

The *DMX-View* is configured locally via a convenient menu system. For this purpose, the device includes a brilliant blue-white 20x4 LCD display with energy-saving LED backlighting and long life. The lifetime is increased significantly when the screen saver is used.

The setting of the menu uses a four-buttons-system which is already known from other devices of LSS.



Button	Meaning
MENU	Access to the main menu and submenus
←	Scrolling the menu
→	Scrolling the menu
OK	Confirmation of settings

Above the display two operating states are indicated by LEDs.

LED	Meaning
POWER (blue)	The device is on.
ACTIVE (yellow)	On: Ethernet available, no data exchange Flash: Ethernet available, data traffic runs Off: Ethernet is not available

# Configuration of the DMX-View

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## Menu

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The menu is handled by using the buttons below the menu display. The function of the four buttons impacts in detail is slightly different depending on the menu, but in principle it's always the same. The ← and → buttons have an acceleration function which facilitates the entry of large numbers during holding. From 100 or 1000 the entry is accelerated respectively by a factor of 10.

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## Input of parameters or numbers

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The input of parameters or numbers is as follows:

- Select parameter line with ← or →
- „Ok“
- A cursor will flash at the parameter
- Changing parameter with ← or → (activate acceleration function by permanent holding)
- „Ok“ for changing or „Menu“ for abort (the cursor will stop flashing)

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## Input of letters or IP addresses

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The input of letters or IP addresses is as follows:

- Select parameter line with ← or →
- „Ok“
- Below the first location an underline “\_” will flash
- Select location with ← or →
- „Ok“
- On the location now a cursor will flash
- Changing number/letter with ← or → (activate acceleration function by permanent holding)
- „Ok“ for changing or „Menu“ for abort (the cursor will be an underline now)
- Select next location and change number/letter and so on
- if the complete text or IP address has been changed, press "Menu", the underline disappears

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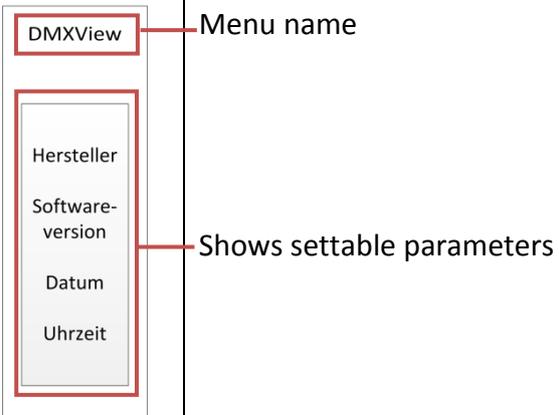
## Save settings

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If parameters have been really changed, a “\*” behind the parameter indicates it. For leaving the menu push the button "Menu". Are changed parameters available on this menu page, the query "Save?" will appear. Answering with button "Ok", the changed parameters are saved and take effect immediately. If the query is answered with button "Menu", all changes are discarded.

## Legend of the scheme of the menu

The structure of the menu and the configuration options are described below schematically. The used symbols have the following meanings:

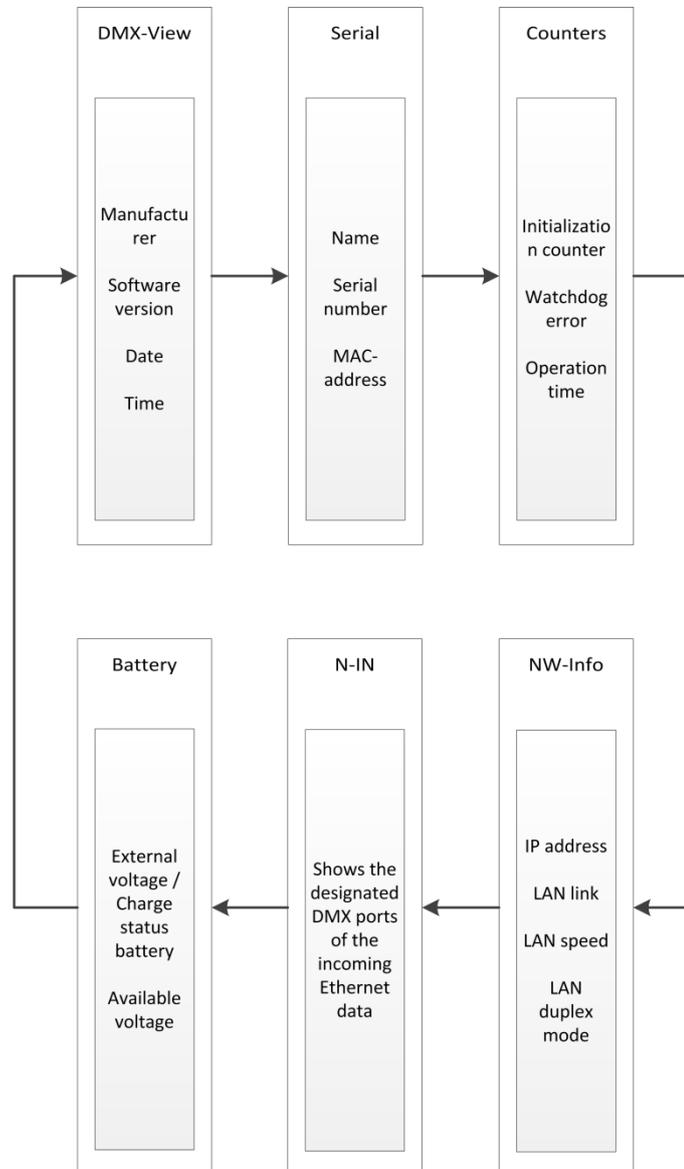
Symbol	Meaning
OK →	Select "OK" to proceed to the next menu point or has the following effect
MENU →	Select "Menu" to proceed to the next menu point or has the following effect
	Display  Menu name  Shows settable parameters
↔	Selection with the arrow buttons

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## First level

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The First Level of the menu of the *DMX-View* scrolls through different diagnostic pages. These pages give a quick overview of different settings and the operating status of the device.



If the buttons are not pressed a long time in the menus, the *DMX-View* will automatically return to the First level.

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## Displaying of universes and subnets

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From software Version 1.24 is no longer possible to manually scroll through the First level. The universe and associated subnets can be displayed on the monitor matrix instead. For this use the arrow buttons ← and →.

## PIN request

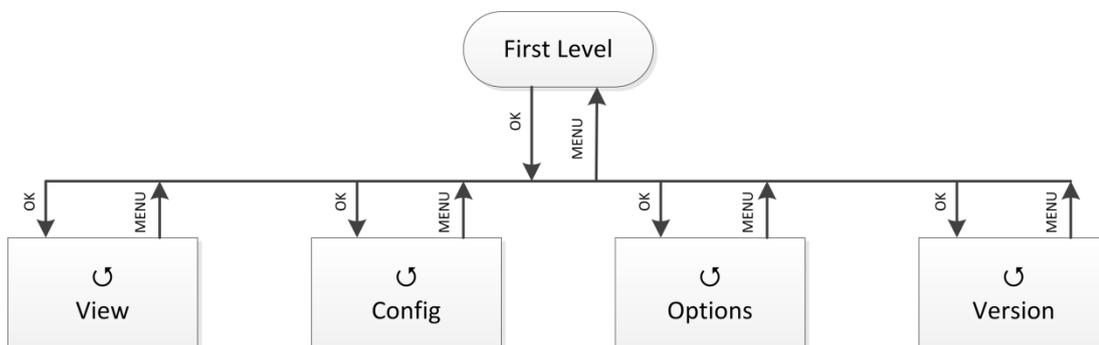
All submenus, such as display, configuration and other settings menus, are accessed from the main menu. If a PIN has been assigned, it will be requested before the main menu appears:



Using the buttons enters the PIN-code input. For safety appears before and after scrolling [\*\*\*\*\*] will be displayed only.

## Main menu

The main menu is divided into different submenus. All submenus will be accessed from the main menu. To access the main menu from the First Level push the button "Menu".



Submenu	Meaning
View	Network and DMX monitors
Config	Configuration of the DMX-View
Options	Configuration of optional settings
Version	Show detailed hard- and software information
MENU	Return to First level
OK	Confirm selection

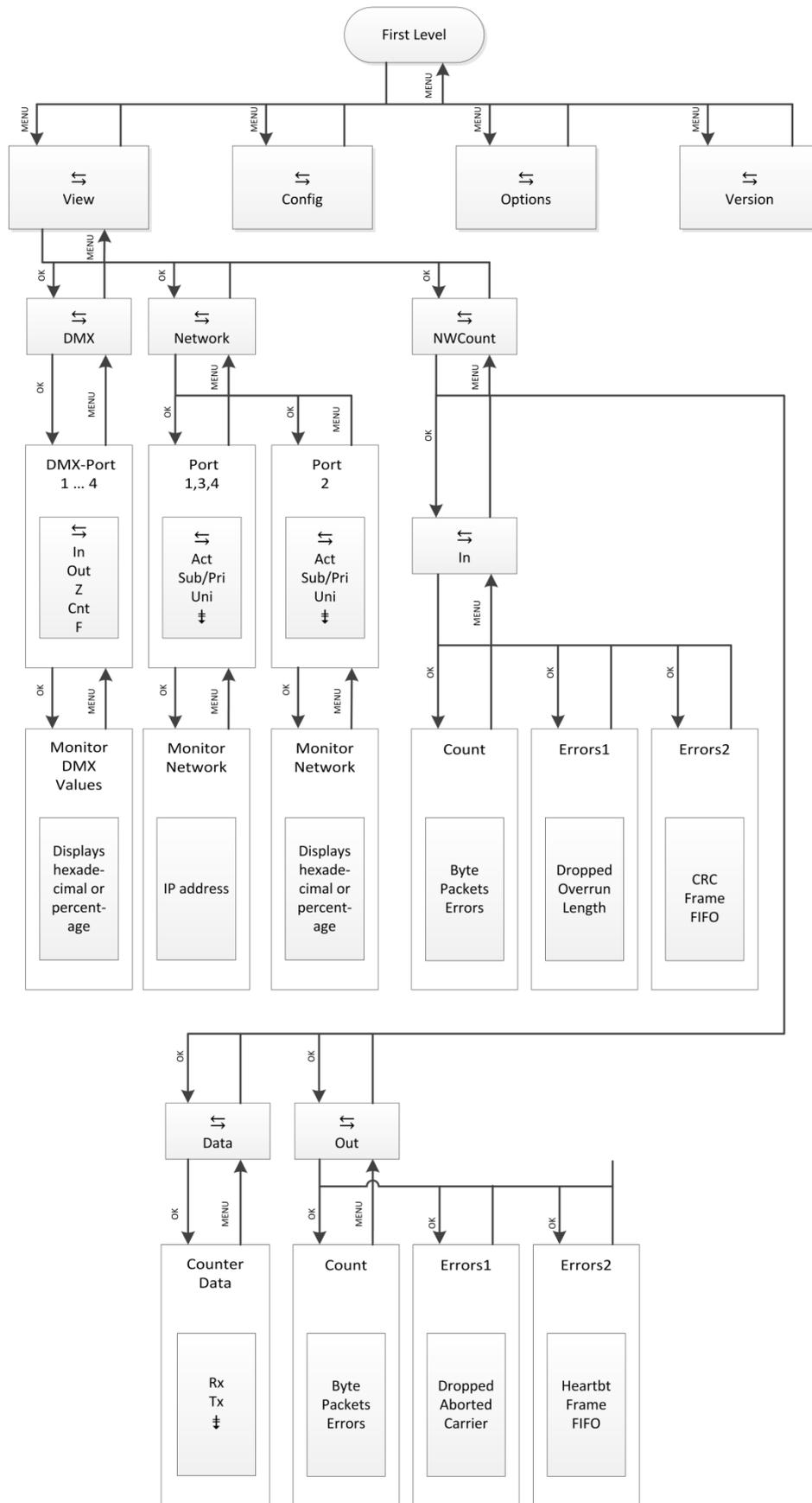
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## View Menu

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The displays in the View Menu will give you an overview of the current state of the *DMX-View*. Current events, data traffic and the merge behaviour are presented. The displays in the View Menu are in real time. So they can be used easily as a monitoring and diagnostic tool.

# Structure of the View Menu



## View→DMX

This monitor provides an overview of the activities at the DMX-In port. The submenus for ports 1 and 2 can be represented in hexadecimal or percentage. The settings for ports 3 and 4 have no meaning.

Submenu	Meaning
DMX 1...4	DMX port 1...4 Port 3 and 4 have no meaning!
IN	Full: On the DMX-In a correct DMX protocol is received E: DMX protocol on the input is invalid (start code or timing) Empty: No signal on the DMX input
Out	The monitor matrix is defined as port 2 and controlled as DMX out. Full: At the DMX-Out a signal with DMX protocol is sent H: DMX-Out is on HOLD and holds the last data Z: DMX-Out is on HOLD and sends zero values Empty: DMX-Out is switched off
Cnt	Displays the number of packets sent per second.
F	Displays the frame rate per second.
MENU	Return to parent menu.
OK	Confirm selection.

## View→Network

This monitor displays the current settings of the DMX ports. The submenus for ports 1 and 2 can be represented in hexadecimal or percentage. The settings for ports 3 and 4 have no meaning.

Display	Meaning
1...4	DMX 1...4
Act	Full: on this subnet/universe combination light data will be received Empty: on this subnet/universe combination are no light data
Sub	Logical subnet (depends on the used protocol) A “-“ is displayed if the DMX-Port is disabled in the routing menu or the used protocol has no subnets.
Uni	Universe (depends on the used protocol) A “-“ is displayed if the DMX-Port is disabled in the routing menu or the used protocol has no univeses.
OK	Confirm selection.
MENU	Return to parent menu.

## View→NWCount

This submenu shows monitors that provide an overview of incoming and outgoing data and data packets. The monitors display very comprehensive information. This information can be used for network diagnostics.

Submenu	Meaning
In	Calls up received data network counter
Out	Calls up sent data network counter
Data	Calls up data packets counter
OK	Confirm selection.
MENU	Return to parent menu.

## View→NWCount→In/Out

Selection	Meaning
<b>Count</b>	
Kbyte	Total received Kbyte
Packets	Total received packets
Errors	Total RX errors
<b>Errors1</b>	
Dropped	Total dropped packets
Overrun (In only)	Total overrun
Aborted (Out only)	Total aborted packets
Length (In only)	Total length error
Carrier (Out only)	Total lost carrier
<b>Errors2</b>	
CRC (In only)	Total CRC errors
Heartbt (Out only)	Total lost Ethernet heartbeat
Frame	Total frame errors
FIFO	Total FIFO overrun
MENU	Return to parent menu

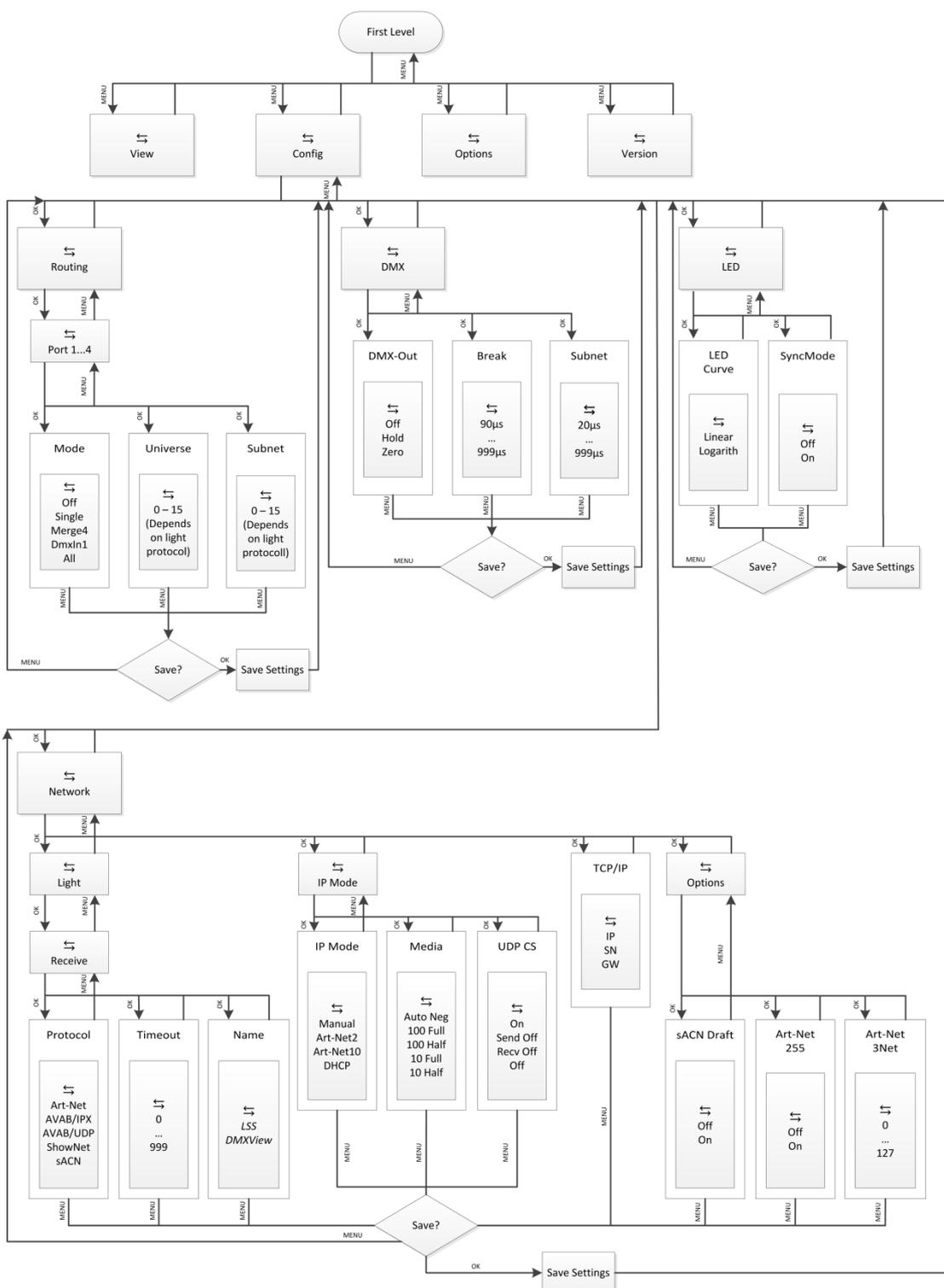
**View→NWCount→Data**

<b>Display</b>	<b>Meaning</b>
Rx	Received data traffic
Tx	Sent data traffic
Pack./s	Packets per second
Kbyte	Data traffic in Kbyte
MENU	Return to parent menu

# Configuration Menu

The range of setting options of the *DMX-View* can be changed easily in the configuration menu. Any change in the configuration must be confirmed. This is for your safety.

## Structure of the configuration menu



Submenu	Setting options
Routing	Merge settings
DMX	DMX settings
Network	Ethernet settings
LED	Monitor matrix settings
OK	Confirm selection.
MENU	Return to parent menu.

## Config→Routing

In the menu Routing the merging settings will be set. Up to four Ethernet sources and one DMX source can be merged. The output of data is only possible via DMX port 2 (monitor matrix).

Selection	Meaning
Mode	<p>Off: Ethernet will not receive. DMX-Out is disabled.</p> <p>Single: The first active data source is used until it fails with a time out. Then the data of another active source on the same subnet and universe are used.</p> <p>The data-source detection in place for</p> <ul style="list-style-type: none"> <li>- AVAB / IPX by direct evaluation of the MAC address</li> <li>- sACN by the device ID</li> <li>- All other protocols through the IP address of the data source. This must be specific to each data source.</li> </ul> <p>Merge4: Data from up to four data sources can be merged (HTP - Highest Takes Precedence). If more than four sources transmit on the same subnet and universe, the data of the source(s) coming up after the first four will be ignored. If one of the first four data sources fails, automatically advances the data source from the ignored, which first sends data after the failure (principle "First come, first serve").</p> <p>DMX-In x: DMX data from the selected input will be used only.</p> <p>All: All data from Ethernet and DMX-In will be used.</p>
Universe	Setting of the sending universe (depends on the protocol)
Subnet	Setting of the sending subnet (depends on the protocol)
OK	Confirm selection.
MENU	Return to parent menu.

## Config→DMX

In this menu the settings of the monitor matrix will be set. Note the settings "Break" and "MAB" of the *DMX View* have no meaning.

Selection	Meaning
DMX-Out	In case of data reception loss: Off:           The DMX port will be disabled. Hold:         Last received value will be hold and transmitted unchanged Zero:         Data packets with the value "0" are transmitted
Break	Has no meaning
MAB	Has no meaning
OK	Set parameter
MENU	Return to parent menu / Save parameter

## Config→Network

In the submenu "Network" all protocols based on Ethernet will be set:

### Config→Network→Light

Selection	Meaning
Protocol	Setting the receiving data protocol: - Art-Net                   - ShowNet - AVAB/IPX                 - AVAB/UDP - sACN
Timeout	Setting the timeout for receiving data 1 to 999s (0 = HOLD)
Name	Setting the Art-Net short name for naming the <i>DMX-View</i>
OK	Set parameter
MENU	Return to parent menu / Save parameter

**Config→Network→IP Mode**

In this submenu the reception of the IP address will be set.

Selection	Meaning
IP Mode	Getting the IP address: Manual: Free adjustment (see submenu Config→Network→TCP/IP) Art-Net 2: Art-Net address for 2 network Art-Net 10: Art-Net address for 10 network DHCP: If a DHCP server is on the network
Media	Setting the transmission rate Autoneg. Enables automatic detection of transmission rate (Autonegotiation) 10 Half Enables 10MBit/s Half Duplex 10 Full Enables 10MBit/s Full Duplex 100 Half Enables 100MBit/s Half Duplex 100 Full Enables 100MBit/s Full Duplex
UDP CS	Setting to calculate the checksum of UDP packets On Enables checksum for received and transmitted packets Send off Enables checksum for received packets only Recv off Enables checksum for transmitted packets only Off Disabled checksum
OK	Set parameter
MENU	Return to parent menu / Save parameter

**Config→Network→TCP/IP**

Is "Manual" in submenu set, the IP, net mask and gateway address will be set here. In all other selections the gateway address can be set only.

Selection	Meaning
IP	IP address Manual adjustment is possible when "IP Mode = Manual"
SN	Net mask Manual adjustment is possible when "IP Mode = Manual"
GW	Gateway Usually changing the pre-set address is not necessary.
OK	Set parameter
MENU	Return to parent menu / Save parameter

**Config→Network→Options**

Special Ethernet features can be set here.

Selection	Meaning
sACN Draft	Setting the supported version of sACN Off: <i>DMX-View</i> sends sACN according to E1.31 2009 On: <i>DMX-View</i> sends sACN according to E1.31 R0 Draft
Art-Net 255	Art-Net is sent as broadcast. It's necessary for the cooperation with systems by ADB.
Art-Net 3Net	Setting the IP address Art-Net3-networks. 0: Art-Net3 is disabled. 1 to 127: Art-Net3 is active and the number indicates the IP address.
OK	Set parameter
MENU	Return to parent menu / Save parameter

**Config→LED**

In this menu the dimmer curves and the response of the monitor matrix will be set.

**Config→LED→LedCurve**

Selection	Meaning
Linear	Enabled linear dimming curve
Logarith	Enabled quadratic dimming curve
OK	Set parameter
MENU	Return to parent menu / Save parameter

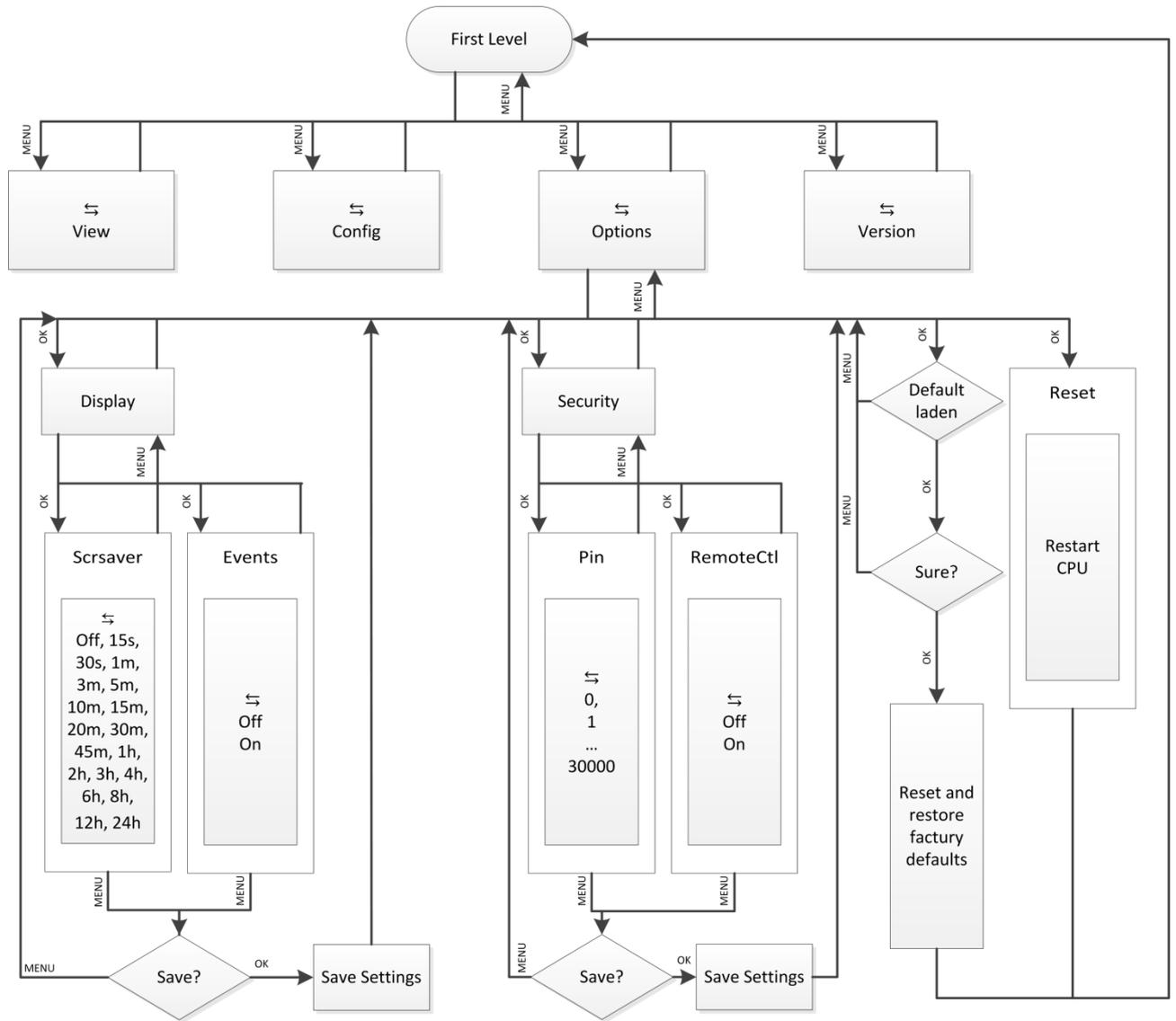
**Config→LED→SyncMode**

Selection	Meaning
Off	Incoming data are displayed asynchronously
On	Incoming data are displayed synchronously
OK	Set parameter
MENU	Return to parent menu / Save parameter

## Options Menu

In this menu additional settings of the *DMX-View* will be set.

### Structure of the Options menu



## Options→Display

In this submenu the settings of the configuration display on top of the device will be set.

Selection	Meaning
ScreenSaver	Timeout setting for the screensaver. After the set time the screensaver turns off the screen. This measure increases the lifetime of the display significantly. Inputs by the encoder or by remote control and events turn on the screen. (OFF, 15s, 30s, 1m, 3m, 5m, 10m, 15m, 20m, 30m, 45m, 1h, 2h, 3h, 4h, 6h, 8h, 12h, 24h)
Events	Changes to the DMX or Ethernet can trigger events, which can be automatically displayed on the screen. This can lead to disruptive effects of light. On: Changes turn on the screen und will be displayed Off: Changes have no effect on the screen
OK	Set parameter
MENU	Return to parent menu / Save parameter

## Options→Security

In this menu the security setting will be set.

Selection	Meaning
Pin	PIN for access main menu 0...30000s (0 = off)
Remote	On: Access by remote is possible Off: Access by remote is not possible
OK	Set parameter
MENU	Return to parent menu / Save parameter



The system offers a range of 30,000 possible pins. But absolute security cannot be guaranteed! To prevent unauthorized access, additional specific safety measures must be taken.

## Options→Factory Defaults

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All settings of the control unit of the *DMX-View* can be restored to the factory settings. To prevent loss of data, a double confirmation for restoring is required. See also chapter Default settings!

## Options→Reset

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By selecting this menu, a CPU reset is triggered. After the reset, the saved parameters will be loaded.

If you change the following settings in the configuration, the CPU will automatically reset:

- Receiving protocol
- IP mode
- Net mask
- Restore factory defaults
- Transmission protocol
- IP address
- Gateway

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## Version

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Selecting this menu the current firmware version will display.

Display	Meaning
© 2011 LSS GmbH	Manufacturer
Ver. 1.20 Rev. 04	Software version
Feb 29 2012 13:04:00	Date and Time
MENU	Return to parent menu

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## Default settings

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- Merge settings: Merge4
- merged universe: 0
- merged subnet: 0
- DMX-Out in case of data loss: OFF
- LED dimming curve: Linear
- SyncMode: off
- Ethernet protocol: Art-Net (receiving and transmitting)
- IP-Mode: Art-Net 2 network
- IP: According to Art-Net (2.x.y.z)
- Net mask: 255.0.0.0
- Gateway: 192.168.172.254
- Receiving rate: 8 s
- Art-Net name: LSS DMX-View
- Screensaver: 15 min, Events off
- Pin: off
- Art-Net remote control: on

## Maintenance and Care

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### Rechargeable battery

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The LSS *DMX-View* is equipped with a 7.2 V/2400mAh NiMH rechargeable battery. The high energy density of a NiMH battery provides a constant voltage output with high current in battery mode. For operation and charging note the following instructions.

#### Charge cycles

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NiMH rechargeable batteries tend to have a relatively rapid self-discharge and react negatively to deep discharges. One must assume that the batteries used in the *DMX-View* are discharged three months after the last load when the device is not used. To maintain the charging capacity the NiMH batteries should be charged regularly every three months. The *DMX-View* is able to charge the internal battery independently from the main switch. With the connection with an external power supply the charging will start.

#### Generation of heat during charging and operation

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The rechargeable batteries are charged during operation of the LSS *DMX-View*. It is completely normal that the battery warming during charging and use. The heat is dissipated through the housing. The batteries are monitored by intelligent temperature controller internally, the interrupt operation or charging in extreme cases.

#### Errors or problems when switching on

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The status indicators on the front panel provide information about the used power supply, but also show error messages and warnings. Responsible for this is the indicator "Bat. Failure".

#### **Red „Bat. Failure“ during operation**

The temperature of the battery is too high. The *DMX-View* must be turned off and cool down. This may take up to an hour.

#### **Frequent display "Bat. Failure "during operation**

If the display lights regularly and after approximately the same time after power on, this is an indication that the battery needs to be replaced. To do this, please contact the service department of the LSS GmbH in and send back the device.

**Device does not switch on**

If the DMX viewer turned on again shortly after turning it off, it is possible that the device does not turn on. This is a completely normal situation!

At the first operation the battery is charged and it was warm. The time between switching off and on was too short, that the battery was allowed to cool. For switch on the device the rechargeable battery have to have a significantly lower temperature than at the end of charging. When switching on the current temperature measured by the internal temperature controllers, which release the operation or not.

In this case, the battery needs to cool further.

## Technical data

### General technical specifications

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Design:	Desktop device with rechargeable battery
CPU:	Infineon XC161
Clock rate:	40MHz
Cooling:	Fanless
Dimensions W x D x H:	245 mm x 110 mm x 190 mm
Power supply:	Rechargeable battery / external power supply 12V DC / 3A
Weight:	1,5kg
EMV standards:	EN 55022, class B, FCC part 15, level B
RoHS directive:	conform
Supply:	Ready device

### Connections

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DMX:	XLR 5 pin, optical isolated
Ethernet:	RJ45 IEEE standard for 100BaseTx und

### DMX

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#### General

DMX protocol:	DMX-512
Standards:	USITT 1990, DIN 56930-2, ANSI E1.11
Baud rate:	250 kbps
Input:	optical isolated (ISOLATED ANSI E1.11 A1)
Isolation:	Optocoupler
Isolation voltage:	1000V DC
Isolation resistance:	$10^9 \Omega$
EMC:	filter circuit according to state of technology

## **Receiving**

Start code:	=0 Light protocol (in display ●) <>0 No light protocol (in display E)
Minimum protocol length:	Start code only
Maximum protocol length:	Start code + 512 values (More than 512 values will be lost)
Minimum pass through delay:	44 µs
Maximum pass through delay:	22,5 ms
Receiving timeout:	2 s
Max. distance between two protocols:	2 s
Minimum realized break:	48 µs
Maximum permissible break:	1,95 s

## **Ethernet**

### **General**

Connection:	10/100 BaseT (IEEE 802.3u, 802.3x)
Speed:	10MBit/s, 100MBit/s; Autonegotiation
Duplex mode:	half, full; Autonegotiation Auto-MDI/MDIX
Displaying:	Link-LED, Data-LED, speed and duplex mode will be displayed in the screen
Light protocols:	Art-Net (ArtisticLicence) AVAB-IPX (AVAB, transtechnik, LDDE,...) AVAB/UDP (transtechnik) ShowNet (Strand Lighting) sACN (ANSI E1.17)
Further network protocols:	ARP, IP, IPX, UDP, IGMPv2

### **Receiving**

Maximum packet rate:	>1000/s (1 light frame/packet)
Minimum pass through delay:	4 µs
Maximum pass through delay:	22,7ms
Max. distance between two protocols:	1...999 s (HOLD setable for DMX outs)

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## Pinouts

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### DMX Ports

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#### 5 Pin XLR

Pinout is according to DMX512 standard.

Pin	Description
1	Ground
2	Data -
3	Data +
4	Spare
5	Spare

PE can be connected to the cable shielding.

### Ethernet

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Pin	Description
1	Rx +
2	Rx -
3	Tx +
4	
5	
6	Tx -
7	
8	
S	Cable shield