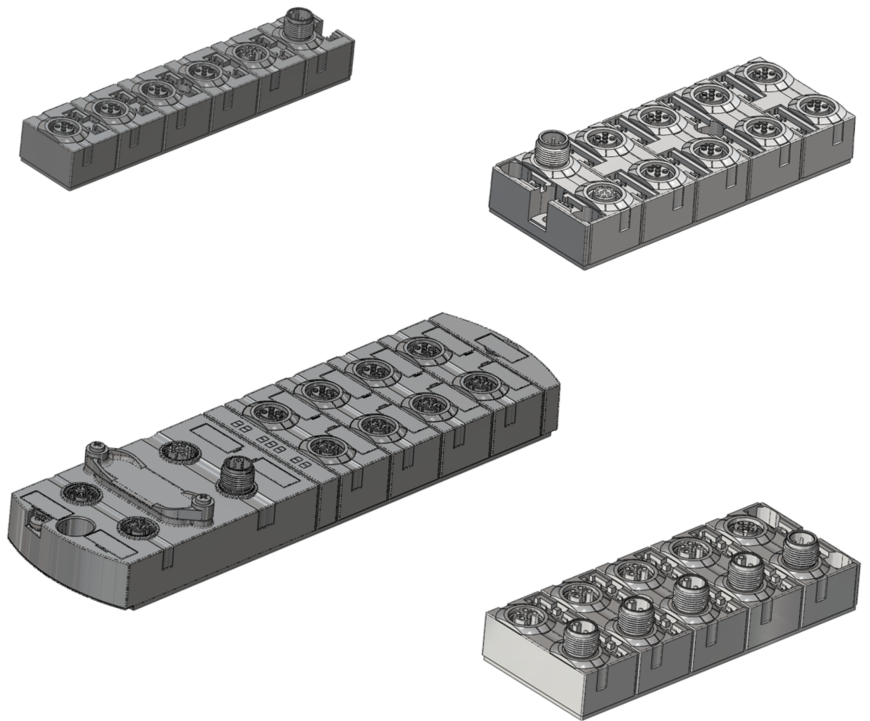


Cognex I/O User Guide



2022 February 21
Revision: 6.3.1.2

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Precautions


To reduce the risk of injury or equipment damage, observe the following precautions when you install the Cognex product:


- This product is intended for industrial use in automated manufacturing or similar applications.
- The safety of any system incorporating this product is the responsibility of the assembler of the system.
- Do not install Cognex products where they are exposed to environmental hazards such as excessive heat, dust, moisture, humidity, impact, vibration, corrosive substances, flammable substances, or static electricity.
- Route cables and wires away from high-current wiring or high-voltage power sources to reduce the risk of damage or malfunction from the following causes: over-voltage, line noise, electrostatic discharge (ESD), power surges, or other irregularities in the power supply.
- This product does not contain user-serviceable parts. Do not make electrical or mechanical modifications to product components. Unauthorized modifications can void your warranty.
- Changes or modifications not expressly approved by the party responsible for regulatory compliance could void the user's authority to operate the equipment.
- Include service loops with cable connections.
- Ensure that the cable bend radius begins at least six inches from the connector. Cable shielding can be degraded or cables can be damaged or wear out faster if a service loop or bend radius is tighter than 10X the cable diameter.
- This device should be used in accordance with the instructions in this manual.
- All specifications are for reference purposes only and can change without notice.

Symbols

The following symbols indicate safety precautions and supplemental information:

 **WARNING:** This symbol indicates a hazard that could cause death, serious personal injury or electrical shock.

 **CAUTION:** This symbol indicates a hazard that could result in property damage.

 **Note:** This symbol indicates additional information about a subject.


 **Tip:** This symbol indicates suggestions and shortcuts that might not otherwise be apparent.

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Getting Started

This section provides general information about the Cognex I/O components, accessories, and systems.

About the Cognex I/O

The Cognex I/O system offers higher flexibility and scalability and helps you set up cable kits in line with logistics standards.

Box	Product Number	Image
Hybrid Switch	CIO-HS-4	
Master Breakout Box, NPN	CIO-MB-NPN	
Master Breakout Box, PNP	CIO-MB-PNP	
Power Breakout Box	CIO-PB-4	
Distribution Box	CIO-PD-4	

For more details about the basic functions of the system, please consult the corresponding Murrelektronik GmbH Hybrid Switches MANAGED Series manual.


Accessories

Note: Cables are sold separately.





CAUTION: All cable connectors are keyed to fit the connectors on the vision system. Do not force the connections or damage may occur.

For a list of options and accessories, contact your local Cognex sales representative.

Cables and Power Supplies

Accessory	Product Number	Image
Emparro Power Supply 4A 7/8" - L	CPS-4A-7/8-L	
Emparro Power Supply 8A 7/8" - L	CPS-8A-7/8-L	

Accessory	Product Number	Image
US plug Emparro input cable (length: 2 m)	CCB-CPS-A3N01-200	
EU plug Emparro input cable (length: 2 m)	CCB-CPS-A3E01-200	
Emparro output 7/8 to L-coded cable (length: 0.5 m)	CCB-CPS-P4541-050	
Power chain L-coded cable (length: 0.5 m, 1 m, 2 m, 3 m, 4 m)	CCB-CIO-P4141-050 CCB-CIO-P4141-100 CCB-CIO-P4141-200 CCB-CIO-P4141-300 CCB-CIO-P4141-400	
Ethernet X-coded to RJ45 cable (length: 0.5 m)	CCB-CIO-51101-050	
Ethernet chain X-coded cable (length: 0.5 m, 1 m, 2 m, 3 m)	CCB-CIO-51001-050 CCB-CIO-51001-100 CCB-CIO-51001-200 CCB-CIO-51001-300	
Primary Cable 12pin (length: 2 m)	CCB-CIO-53001-200	
Shielded Secondary Cable 4pin (length: 0.5 m, 1 m, 2 m, 3 m)	CCB-CIO-40507-050 CCB-CIO-40507-100 CCB-CIO-40507-200 CCB-CIO-40507-300	
External/Light Connector cable (length: 1 m, 2 m, 3 m, 4 m)	CCB-CIO-40021-100 CCB-CIO-40021-200 CCB-CIO-40021-300 CCB-CIO-40021-400	

Accessory	Product Number	Image
Field-wireable M12 female, L-coded cable	CCB-CIO-P4421-L	
Field-wireable M12 male, X-coded cable	CCB-CIO-21101-X	
Field-wireable M12 male, A-coded cable	CCB-CIO-12721-A	
M12 female x-coded cable- RJ45 male cable 0° Gigabit Adapter	CCB-CIO-51531-RJ45	

Supported Devices

The Power Over I/O system supports the following readers:

- DataMan 260 readers
- DataMan 370 readers
- DataMan 470 readers
- In-Sight 3D-A1000 vision systems
- In-Sight 7000 vision systems
- In-Sight 8000 vision systems

All supported devices are powered through a Power and I/O Breakout cable and have X-coded Ethernet connection.

Setting Up Cognex I/O

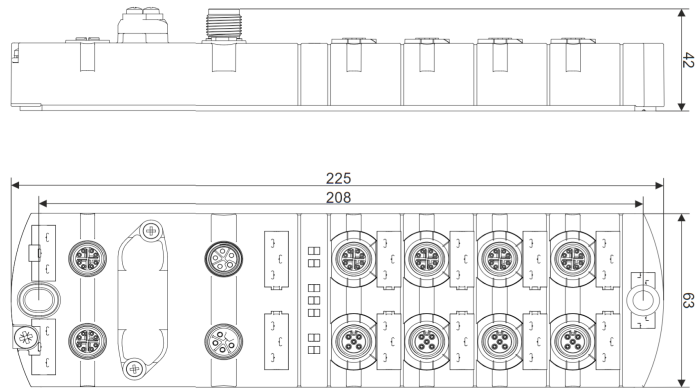
Read this section before setting up the Cognex I/O system.

Dimensions

This section presents the dimensional characteristics of the boxes.

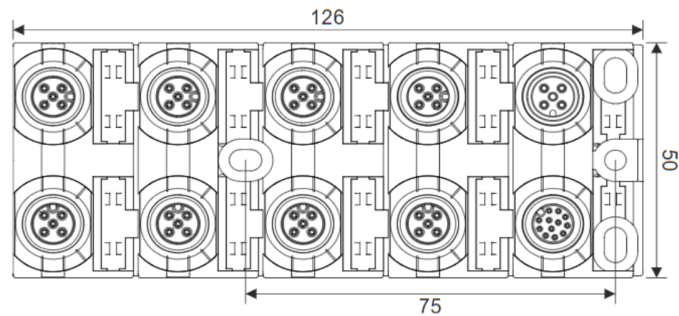
Hybrid Switch

See the dimensional characteristics of the hybrid switch.



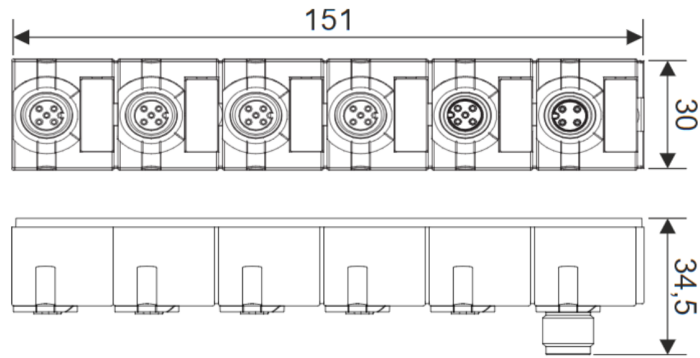
Master Breakout Box

See the dimensional characteristics of the master breakout box.



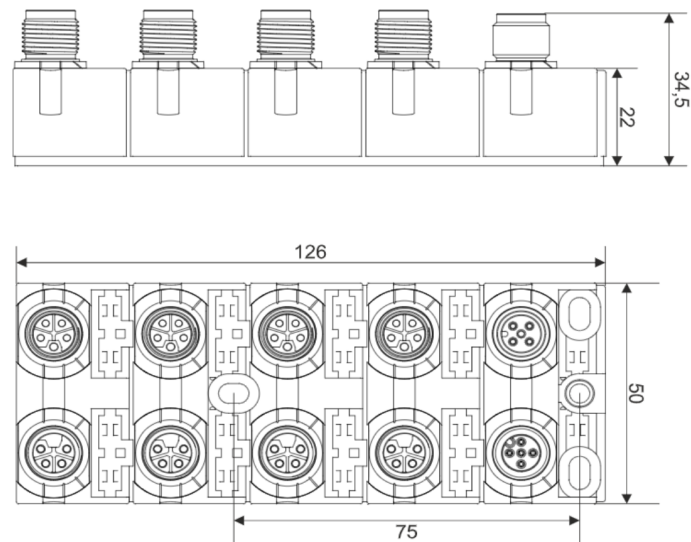
Power Breakout Box

See the dimensional characteristics of the power breakout box.



Distribution Box

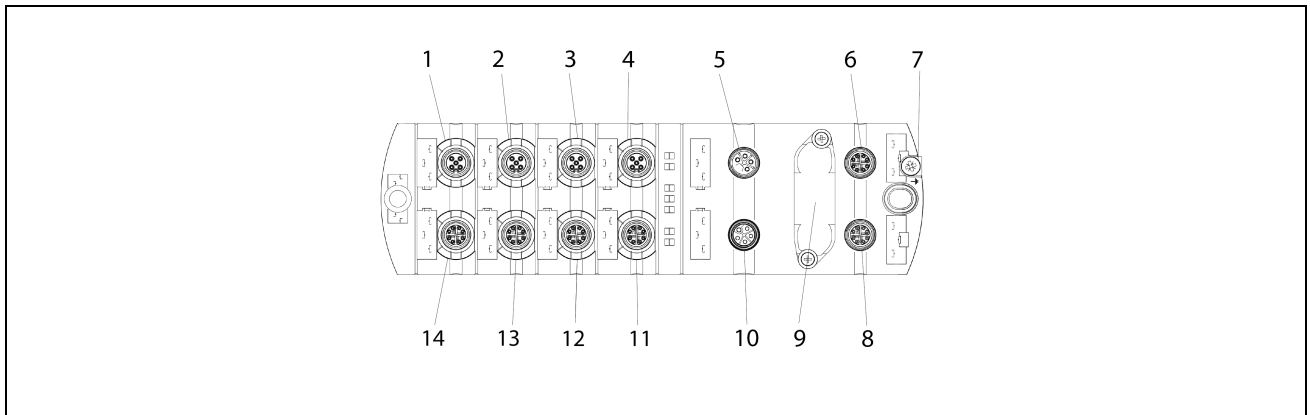
See the dimensional characteristics of the distribution box.



Layout and Connectors

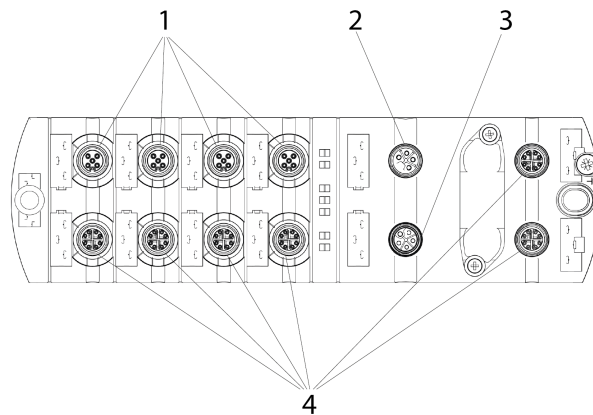
The following images and tables describe the layout of the boxes.

Hybrid Switch Layout



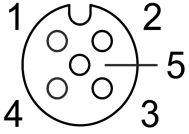
Number	Item	Description
1	Power, I/O (X4)	M12 A coded female power I/O connector
2	Power, I/O (X3)	M12 A coded female power I/O connector
3	Power, I/O (X2)	M12 A coded female power I/O connector
4	Power, I/O (X1)	M12 A coded female power I/O connector
5	Supply voltage power output (XD2)	M12 L coded male power out connector
6	Ethernet port 2 (XF6)	M12 X coded female ethernet connector
7	Grounding strap	
8	Ethernet port 1 (XF5)	M12 X coded female ethernet connector
9	Rotary switch	
10	Supply voltage power input (XD1)	M12 L coded male power connector
11	Ethernet port (XF1)	M12 X coded female ethernet connector
12	Ethernet port (XF2)	M12 X coded female ethernet connector
13	Ethernet port (XF3)	M12 X coded female ethernet connector
14	Ethernet port (XF4)	M12 X coded female ethernet connector

Hybrid Switch Connectors

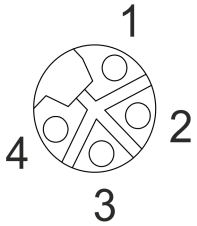


CAUTION: All cable connectors are keyed to fit the connectors on the device. Do not force the connections or damage may occur.

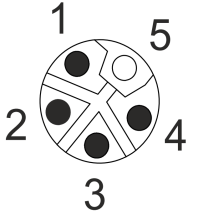
1. The Power I/O (X1, X2, X3, X4) connectors on the Hybrid Switch are for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	Encoder (IN1)
	3	Common (GND)
	4	Trigger (IN0)
	5	N.C.

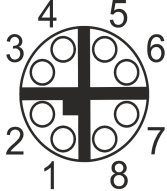
2. The Power Out (XD2) connectors on the Hybrid Switch are for M12 L coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	Encoder
	3	Common (GND)
	4	Trigger

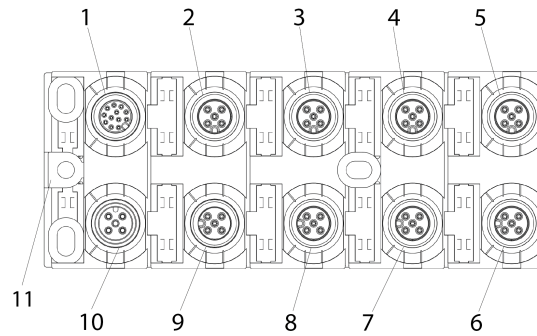
3. The Power In (XD1) connectors on the Hybrid Switch are for M12 L coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	Encoder
	3	Common (GND)
	4	Trigger
	5	N.C.

4. The Ethernet port (XF1, XF2, XF3, XF4, XF5, XF6) connectors on the Hybrid Switch are for M12 X coded cables.

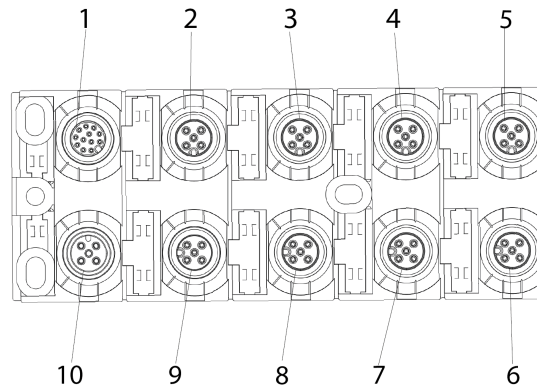
Connector	Pins	Pin Description
	1	DB+
	2	DB-
	3	DA+
	4	DA-
	5	DC+
	6	DC-
	7	DD-
	8	DD+

Master Breakout Box Layout



Number	Item	Description
1	Power Out to Cognex device (OUT)	M12 A coded female power out connector
2	GPIO_1 (X5)	M12 A coded male GPIO connector
3	GPIO_0 (X6)	M12 A coded male GPIO connector
4	Output 1 (X7)	M12 A coded male GPIO connector
5	Output 0 (X8)	M12 A coded male GPIO connector
6	Trigger input (X4)	M12 A coded male trigger connector
7	Encoder input (X3)	M12 A coded male encoder connector
8	AUX power out (X2)	M12 A coded male power connector
9	Serial (X1)	M12 A coded male serial connector
10	Power input (IN)	M12 A coded male power input connector
11	Grounding strap	

Master Breakout Box Connectors



CAUTION: All cable connectors are keyed to fit the connectors on the device. Do not force the connections or damage may occur.

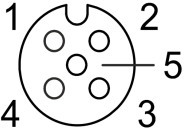
- The Cognex device (OUT) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	GPIO 2 ≤ 1.5 A
	2	TxD
	3	RxD
	4	GPIO 1 ≤ 1.5 A
	5	Encoder IN 1 ≤ 25 mA
	6	Common IN ≤ 1.5 A
	7	OUT 24 V ≤ 1.5 A
	8	GND
	9	Common OUT ≤ 1.5 A
	10	Trigger IN 0 ≤ 25 mA
	11	OUT 0 ≤ 1.5 A
	12	OUT 1 ≤ 1.5 A

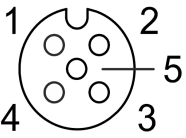
- The GPIO_1 (X8) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	N.C.
	3	GND
	4	GPIO 3
	5	PE

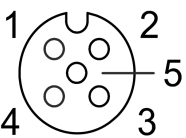
3. The GPIO_0 (X7) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	N.C.
	3	GND
	4	GPIO 2
	5	PE

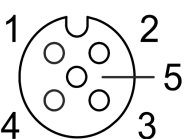
4. The OUT1 (X6) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	OUT 0
	3	GND
	4	OUT 1
	5	PE

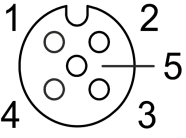
5. The OUT0 (X5) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	OUT 1
	3	GND
	4	OUT 0
	5	PE

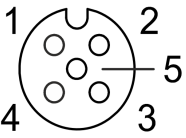
6. The Trigger IN (X4) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	N.C.
	3	GND
	4	Trigger IN
	5	PE

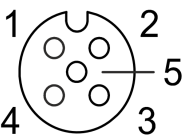
7. The Encoder IN (X3) connector on the master breakout box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	N.C.
	3	GND
	4	Encoder IN
	5	PE

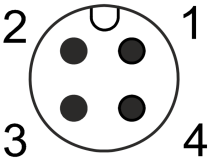
8. The AUX Power (X2) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	N.C.
	3	GND
	4	N.C.
	5	PE

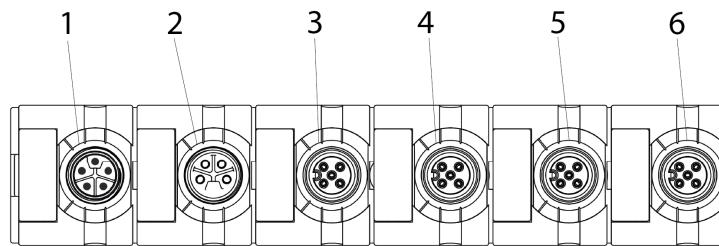
9. The RS232 (X1) connector on the Master Breakout Box is for M12 A coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	TxD
	3	GND
	4	RxD
	5	PE

10. The Power IN connector on the Master Breakout Box is for M12 A coded cables.

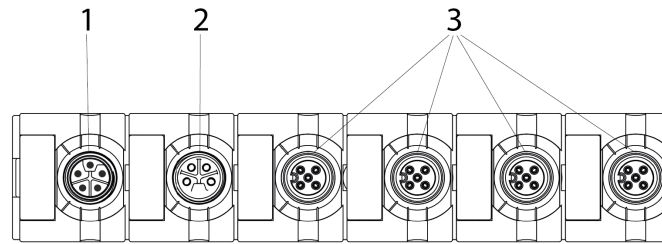
Connector	Pins	Pin Description
	1	24 V \leq 1.5 A
	2	Encoder OUT \leq 25 mA
	3	GND
	4	Trigger OUT \leq 25 mA

Power Breakout Box Layout



Number	Item	Description
1	Power input	M12 X coded male power input connector
2	Power output	M12 X coded female power output connector
3	Power out (X1)	M12 A coded female power out connector
4	Power out (X2)	M12 A coded female power out connector
5	Power out (X3)	M12 A coded female power out connector
6	Power out (X4)	M12 A coded female power out connector

Power Breakout Box Connectors



CAUTION: All cable connectors are keyed to fit the connectors on the device. Do not force the connections or damage may occur.

- The Power IN connector on the Power Breakout Box is for M12 X coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	Encoder
	3	GND
	4	Trigger

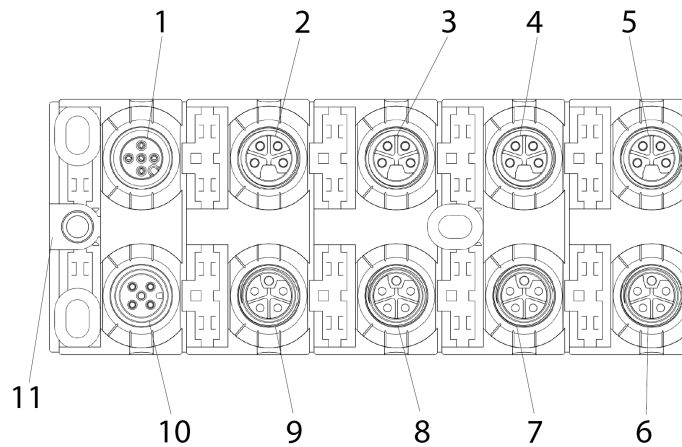
- The Power OUT connector on the Power Breakout Box is for M12 X coded cables.

Connector	Pins	Pin Description
	1	24 VDC
	2	Encoder
	3	GND
	4	Trigger

- The Output (X1, X2, X3, X4) connectors on the Power Breakout Box are for M12 A coded cables.

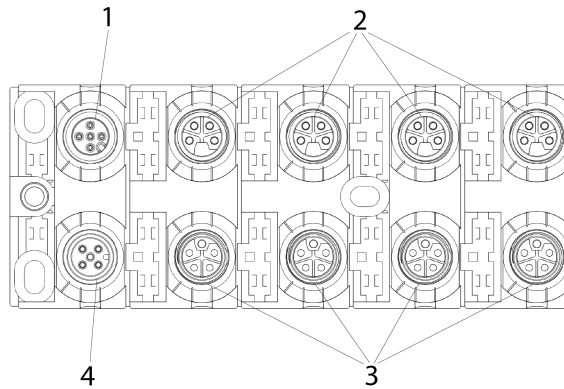
Connector	Pins	Pin Description
	1	24 VDC
	2	N.C.
	3	GND
	4	N.C.
	5	N.C.

Distribution Box Layout



Number	Item	Description
1	Digital input (IN)	M12 A coded male digital input connector
2	Power out (XD2)	M12 L coded female power out connector
3	Power out (XD4)	M12 L coded female power out connector
4	Power out (XD6)	M12 L coded female power out connector
5	Power out (XD8)	M12 L coded female power out connector
6	Power in (XD7)	M12 L coded male power in connector
7	Power in (XD5)	M12 L coded male power in connector
8	Power in (XD3)	M12 L coded male power in connector
9	Power in (XD1)	M12 L coded male power in connector
10	Digital output (OUT)	M12 A coded female digital output connector
11	Grounding strap	

Distribution Box Connectors



CAUTION: All cable connectors are keyed to fit the connectors on the device. Do not force the connections or damage may occur.

1. The Digital IN/ Power OUT connector on the Distribution Box is for M12 A coded cables. Daisy chain another distribution box if you need it in the design.

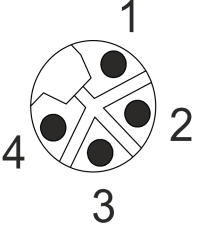
Note: Always start powering from Port 1, it powers the actual module electronics.

Connector	Pins	Pin Description
	1	24 VDC 1 OUT
	2	Encoder IN
	3	GND
	4	Trigger IN
	5	PE

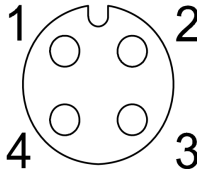
2. The Power OUT/Digital OUT (XD2, XD4, XD6, XD8) connector on the Distribution Box is for M12 female L coded cables. This port runs independent chains of power from the left port to the right.

Connector	Pins	Pin Description
	1	24 VDC OUT
	2	Encoder OUT
	3	GND
	4	Trigger OUT

3. The Power IN (XD1, XD3, XD5, XD7) connector on the Distribution Box is for M12 L coded cables. This port runs independent chains of power from the left port to the right.

Connector	Pins	Pin Description
	1	24 VDC IN
	2	N.C.
	3	GND
	4	N.C.

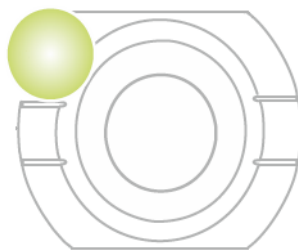
4. The Digital OUT connector on the Distribution Box is for M12 A coded cables. Connect power to the master breakout box to get the signals.

Connector	Pins	Pin Description
	1	N.C.
	2	Encoder OUT
	3	GND
	4	Trigger OUT

LED Indicators

To identify the displayed information clearly, every LED on the front panel of the modules is labeled. Indication takes place by means of static lighting or blinking LEDs.

Each port has a separate status display LED.



Hybrid Switch LED Indicators

This section describes the LED indicators of the hybrid switch.

The following table describes the I/O port status LED indications.

Display	Description
GREEN, steady	Error-free operation
GREEN, blinking at 1 Hz	Load >90 %
RED, steady	Supply voltage <11 V, channel is switched off

Display	Description
RED, blinking at 1 Hz	Over voltage (d), channel is switched off
RED, blinking at 5 Hz	Internal error, channel is switched off
OFF	No voltage

The following table describes Ethernet port status XF1 ... XF6 LED indications.

Display	Description
GREEN, steady	Error-free operation
GREEN, blinking	Data communication Data rate 1000/2500Mbit/s
YELLOW, steady	Link with a data rate of 10/100Mbit/s
YELLOW, blinking	Data communication Data rate 10/100Mbit/s
OFF	No voltage

Master Breakout Box LED Indicators

This section describes the LED indicators of the master breakout box.

LED status	Description
GREEN, steady	<ul style="list-style-type: none"> • Operation voltage display UB1 Port IN • Trigger signal Trigger IN • Encoder signal Encoder IN • Signal GPIO_1 • Signal GPIO_0 • Signal OUT0 • Signal OUT1
RED, steady	<ul style="list-style-type: none"> • Check operation voltage UB1 Power IN • Overvoltage or undervoltage
OFF	No voltage

Power Breakout Box LED Indicators

This section describes the LED indicators of the power breakout box.

LED status	Description
GREEN, steady	Port operates normally
RED, steady	Inadequate voltage; check voltage supply
OFF	No voltage

Distribution Box LED Indicators

This section describes the LED indicators of the distribution box.

LED status	Description
GREEN, steady	Load <90 %
GREEN, blinking at 1 Hz	Load >90 %
RED, steady	Undervoltage Supply voltage <11 VDC
RED, blinking at 1 Hz	Load >100 %
OFF	

Mounting and grounding

This section describes the mounting and grounding process of the hybrid switch, the master breakout box, the power breakout box and the distribution box.

Note: General mounting and grounding instructions are applicable to every box.

CAUTION:

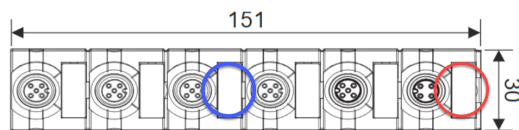
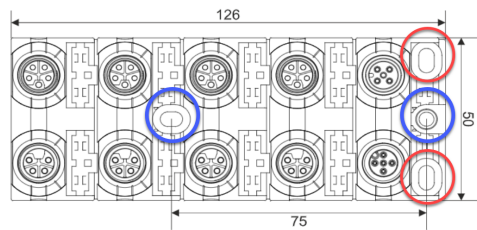
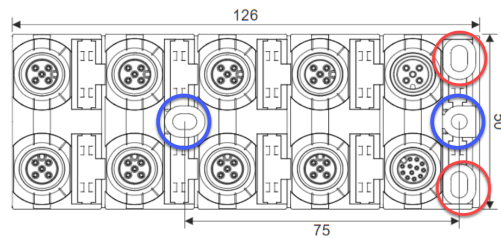
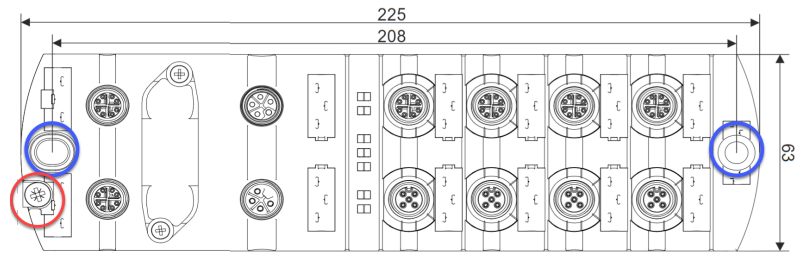
- Install the modules in such a way that they cannot be used as climbing aid!
- Observe the bending radii of the cables! For details, please refer to the data sheet of the cable or the Murrelektronik online shop.
- Make sure that the subsurface is stable and take any external factors into consideration, for example: moving parts!

1. Install the boxes in field or in an IP67-rated area.

Note:

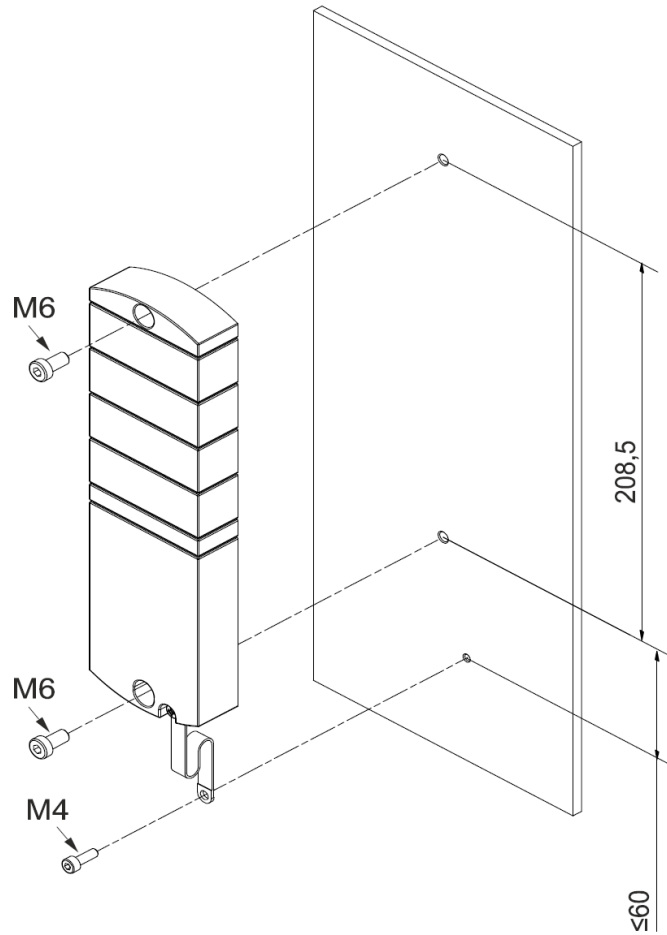
- When you mount the boxes, leave enough space for easy device replacement and attachment of the connector. Keep at least 60 mm.
 - If you use angled male connectors, keep a minimum distance of 50 mm from the wall, ceiling and between the modules.
- Make sure that the diagnostic LEDs of the boxes are visible during operation.
- Make sure that the mounting surface is even in order to avoid mechanical tension.
- Make sure to place the boxes in a way so no human interaction or another device can tear them off or damage them.

2. Install the boxes using their fixing points. Refer to the illustration for the respective fixing (marked with blue circles) and grounding (marked with red circles) points of the hybrid switch, the master breakout box, the power breakout box and the distribution box.



- The fastening screws and tightening torques depend on the surface of the installation site. Use fastening screws that are suitable for the mounting surface structure!

The example image shows the fastening of the hybrid switch.



4. All fixing points have grounding contacts. Grounding contacts shield the M12 connectors and the housing against external interference.

Note: The external shielding is not connected to the internal electronics.

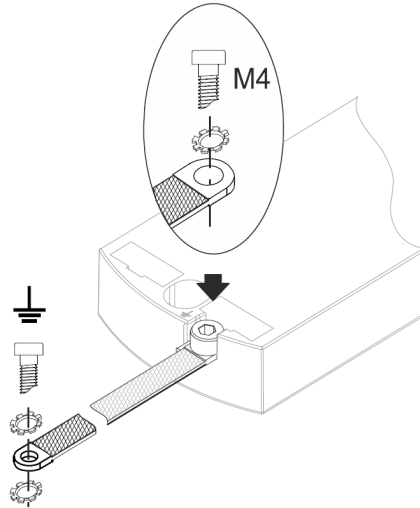
CAUTION:



- A lack of grounding can lead to the switches malfunctioning!
- Ground the switches with a low impedance!

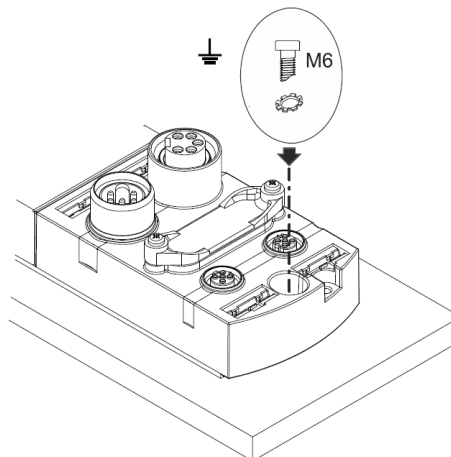
- a. Grounding with grounding strap:

- i. Use a conductive screw to attach the grounding strap.



- b. Grounding without a grounding strap:

- i. Remove the grounding strap and secure the module to the metal substrate with a conducting screw.



Delivery State

In the delivered state, the switch is configured as follows:

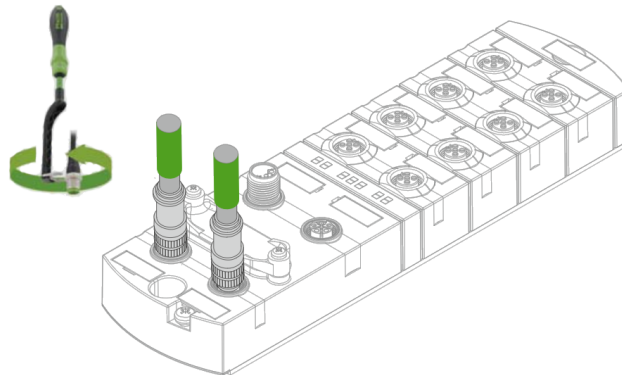
- PROFINET Configuration
 - The PROFINET device name is open: empty string
 - DCP is enabled
 - MRP is disabled
- Port Configuration
 - TX and RX ports are in the auto-configuration mode.
 - Auto-negotiation and auto-crossover are active for each TX port.
- IP Configuration
 - The IP address is set to 192.168.100.2/24.
 - The subnet mask is set to 255.255.255.0.
 - The standard addressing mechanism is set to static.

Setting Up Hybrid Switch

This section describes the setup of the Hybrid Switch component.

Setting Up Ethernet Bus

Connect an X Coded to Ethernet cable (CCB-CIO-51101-050) to the Ethernet ports.

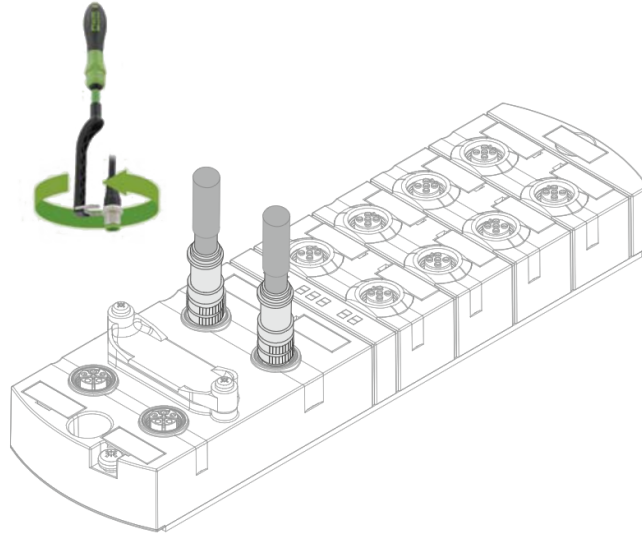


Use an M12 0,6 Nm torque wrench. (Art.No. 7000-99102-0000000)

Setting Up Power Supply

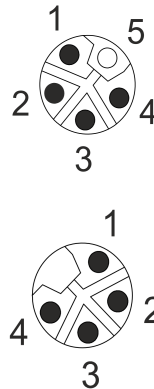
In case of EMC interferences, a fifth stranded wire, that does not connect to the module can increase the interferences on the 24 V connector by capacitive coupling.

Connect a power chain L-Coded cable (CCB-CIO-P4141-xxx) to the supply voltage input and output ports.



Use an M12 0,6 Nm torque wrench. (Art.No. 7000-99102-000000)

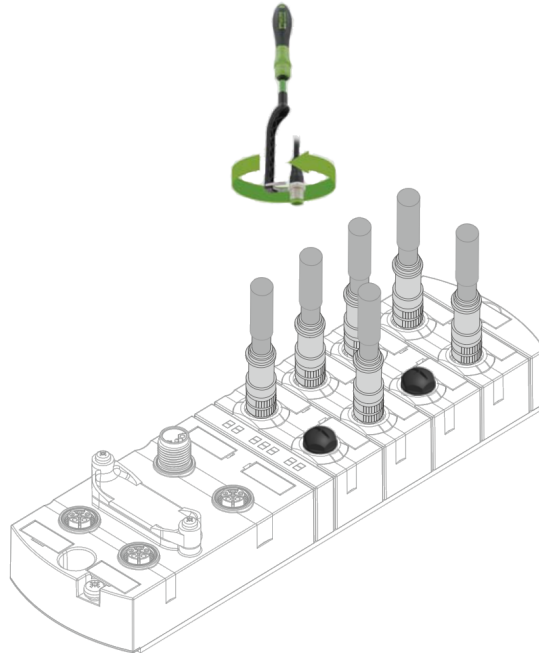
Ports:



Setting Up Ethernet Ports

Use X Coded to Ethernet cables. These cables have the required technical specifications, for example the necessary impedance. The Switch is designed for this impedance level. Using cables with a different impedance level may lead to signal reflections in the cable.

Connect an X Coded to Ethernet cable (CCB-CIO-51101-050) to the Ethernet ports.



Use an M12 0,6 Nm torque wrench. (Art.No. 7000-99102-000000)

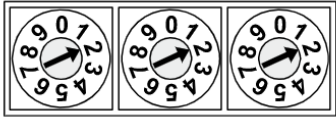
Note: Connection lines must be thermally suitable. The lines must be suited for a maximum load and ambient temperature of 85 °C.

Setting Up the Rotary Switch

Rotary switches are set to 000 by default.

Note: Assign an unambiguous and unique IP address to every network user.

The following table describes address ranges.

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">x 100</div> <div style="text-align: center;">x 10</div> <div style="text-align: center;">x 1</div> </div> 	
Address range	1...999
x1	Rotary coding switch (Ones)
x10	Rotary coding switch (Tens)
x100	Rotary coding switch (Hundreds)

The following table describes explanations for individual address ranges.

Position / Range	Description	
0	DHCP / static remanent	Saves the last set network setting. Default state: DHCP
1 ... 254	IP address byte 4	Sets the last byte (4) of the IP address. Default setting: 192.168.100.xxx
255	DHCP with saving	The system automatically uses the assigned IP address of the DHCP server as static IP address.
256 ... 993	Reserved	
994	Static IP	If you set this position, the device uses the currently saved static IP. Default setting is 192.168.100. if there is no saved static IP address.
995 ... 997	Reserved	
998	Factory setting	This setting deletes all parameters, configurations, description files, and language files. The description file and language files of the web server are restored, and the system performs a factory reset.
999	Default IP	If you set this address, the system always uses the static IP. Default state: 192.168.100.2

Start-up

Note: Uncontrolled processes may happen during all start-up phases, for example, upon the first start-up, a restart or upon making configuration changes.

Always perform start-up in this sequence:

1. Insert the module.
2. System check performed by a qualified person.
3. Start operation.

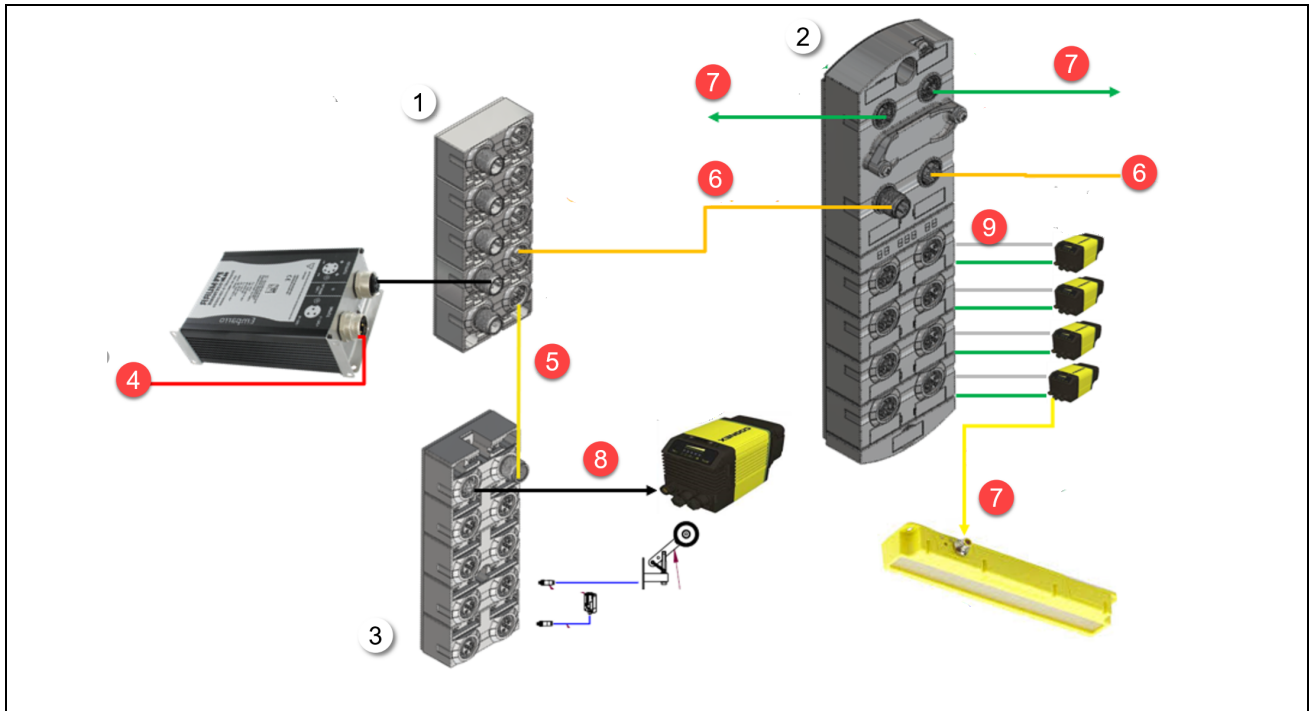
Note: Make sure to take measures to avoid interferences in residential areas that devices of ECM Class A may cause.

Possible Network Structures

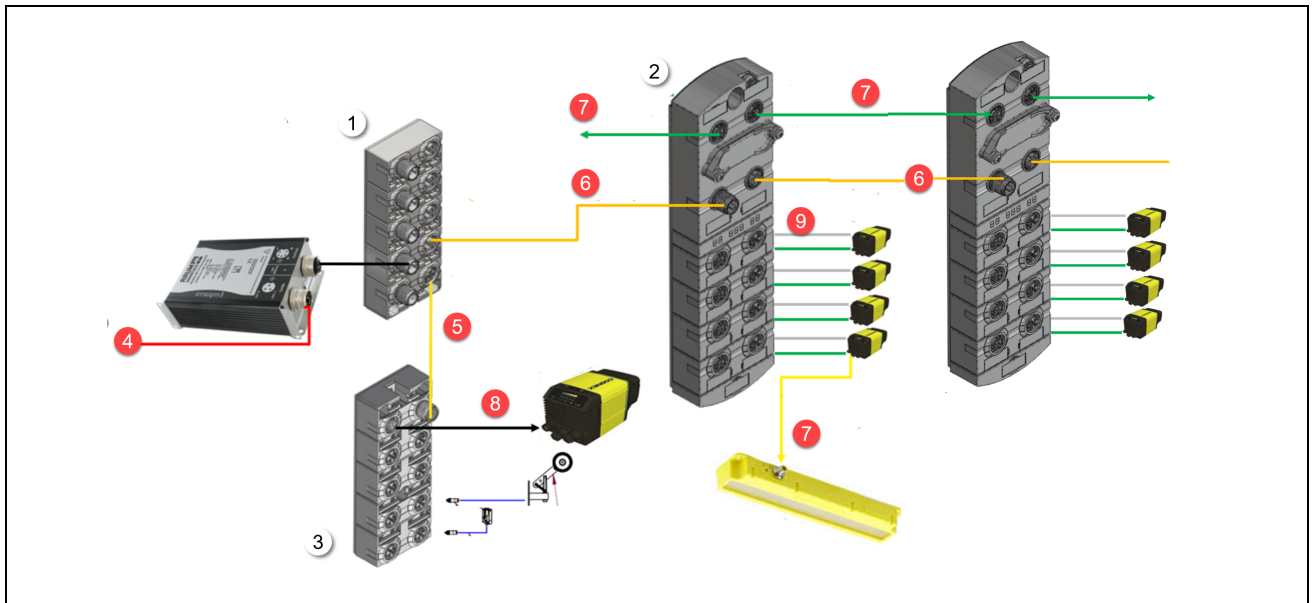
The following sections describe applications with one or more connected readers.

Application Layout for 2-5 readers

The following table shows application layout for 2-5 connected readers.



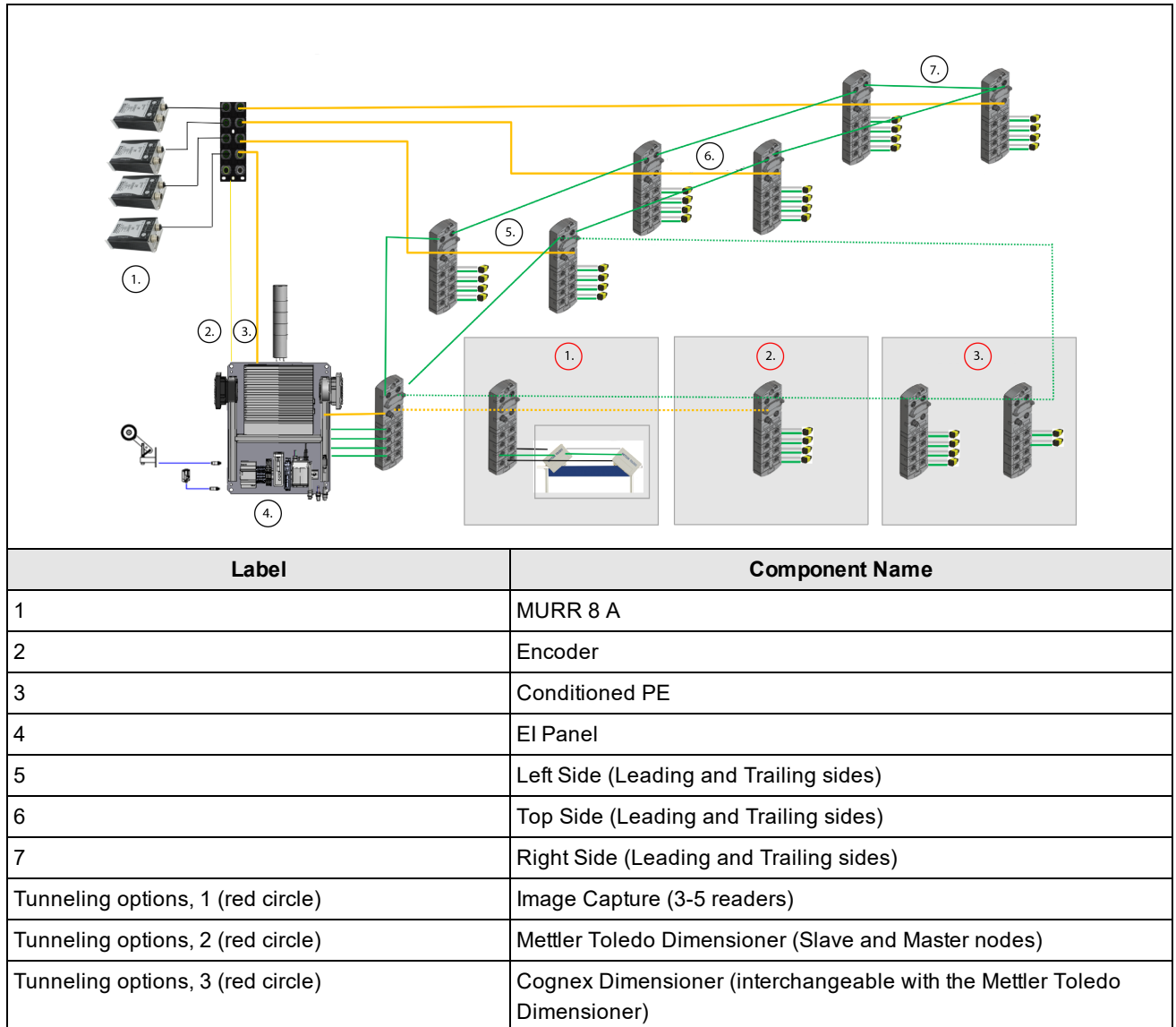
Label	Name	Supplier ID
1.	Power Distribution Box	CIO-PD-4
2.	Hybrid Switch	CIO-HS-4
Unindicated	Power Breakout Box	CIO-PB-4
3	Master Breakout Box, PNP and NPN	CIO-MB-PNP, CIO-MB-NPN
Unindicated	Emparro Power Supply 4A 7/8" - L	CPS-4A-7/8-L
Unindicated	Emparro Power Supply 8A 7/8" - L	CPS-8A-7/8-L
4.	US Emparro input	CCB-CPS-A3N01-200
	EU Emparro input	CCB-CPS-A3E01-200
Unindicated	Emparro output 7/8 to L-coded	CCB-CPS-P4541-050
5.	External/Light Cable (length: 1 m, 2 m, 3 m)	CCB-CIO-40021-100 CCB-CIO-40021-200 CCB-CIO-40021-300



Label	Name	ID
1.	Power Distribution Box	CIO-PD-4
2.	Hybrid Switch	CIO-HS-4
Unindicated	Power Breakout Box	CIO-PB-4
3	Master Breakout Box, PNP and NPN	CIO-MB-PNP, CIO-MB-NPN
Unindicated	Emparro Power Supply 4A 7/8"- L	CPS-4A-7/8-L
Unindicated	Emparro Power Supply 8A 7/8" - L	CPS-8A-7/8-L
4.	US Emparro input	CCB-CPS-A3N01-200
	EU Emparro input	CCB-CPS-A3E01-200
Unindicated	Emparro output 7/8 to L-coded	CCB-CPS-P4541-050
5.	External/Light Cable (length: 1 m, 2 m, 3 m)	CCB-CIO-40021-100 CCB-CIO-40021-200 CCB-CIO-40021-300
6.	Power chain L-coded (length: 0,5 m,1 m, 2 m, 3 m, 4 m)	CCB-CIO-P4141-050 CCB-CIO-P4141-100 CCB-CIO-P4141-200 CCB-CIO-P4141-300 CCB-CIO-P4141-400
Unindicated	Ethernet X-coded to RJ45 (length: 0,5 m)	CCB-CIO-51101-050
7.	Ethernet chain X-coded (length: 0,5 m,1 m, 2 m, 3 m)	CCB-CIO-51001-050 CCB-CIO-51001-100 CCB-CIO-51001-200 CCB-CIO-51001-300
8.	Primary Cable, 12-pin	CCB-CIO-53001-200

Unit	Name	Average (A)	Peak (A)
Other units	EI-700	2	3
	3D-A1000	3	3
	Mettler Toledo	2	3
	RTM	0.5	1
	RFID Scanner	1	2

Ship Sorter Power Distribution



Web Interface

The following chapters describe accessing, the structure and othe options of the Web interface.

Accessing the Web Interface

The web server of the hybrid switch is enabled by default. To call up the web server:

1. Start up the hybrid switch and connect it to the host computer through an Ethernet cable.
2. Open an internet browser of your choice.

i Note: Make sure to use a HTTPS compatible browser.

3. Enter the IP address of the switch into the address bar.
4. If the connection is successful, the login page appears.
5. Enter your credentials.

Note:

If the web interface does not open, do the following:

- i**
- Adjust the IP configuration of the calling host to contact the web server of the hybrid switch.
 - Reconfigure any firewalls that might block access to the web server.

Structure of the Web Interface

Menu	Sub-menu	Application
Information		
	General	Connected to Device information Connection Log
	Neighborhood	Neighborhood
	ARP table	MAC addresses
Device Configuration		
	System description	
	IP configuration	
	Manage configuration	Configuration management Transfer (HTTP) Transfer (FTP)
	NTP settings	NTP state Peer state

Menu	Sub-menu	Application
	Security	Password management SNMP V2 communities SNMP V3 passwords Web server root certificate
Ports		
	Port table	Port table
	Statistics	
	Port mirroring	Port mirroring Destination port
Network		
	RSTP configuration	Status overview Configuration
	RSTP ports	State table of the ports Port configuration table
	SNMP	SNMP protocol versions SNMP trap SNMP trap events SNMP trap destination
Software		
	Plugin overview	Plugins
	Install	
Log		
	Log	Messages
	Settings	Syslog server destination

Information Menu

After logging in, the Information Menu window appears.

General

In this window, you can see the active network connection to the switch.

To identify a LED indicator of the hybrid switch:

1. Click Flash LEDs.
2. The corresponding LED flashes on the switch.

Item	Description
Connected to	Displays an active network connection to the hybrid switch.
Device Name	Freely assignable fields (maximum length: 256 characters)
Device Description	<p>Note: Entries in these fields change the entries in the MIB-II (RFC 1213) system group. ⓘ You can view them using SNMP (Simple Network Management Protocol) queries. Please comply with local requirements for SNMP queries if required.</p>
Location	
Contact	

Device information

This section describes the Device information window of the web interface.

In this window, you can perform the following actions:

- To generate a license information list, click Show link for a list of open source libraries that are used by the hybrid switch.
- To reset temperature, click the Temperature reset link. This resets the minimum and maximum temperatures and updates the temperature values.
- You can change system time in the NTP settings sub-menu.

Note: The time displayed is UTC (Universal Time Zone), not in local time.

The following table summarizes the options.

Item	Description
Serial number	The serial number of the hybrid switch.
Order number	The order number of the hybrid switch for replacement or followup orders.
Hardware version	The hardware version is the specific version of the electronics installed.
Bootloader version	The version of the bootloader in use. The bootloader and firmware can be replaced/exchanged separately.
Firmware build	The build date and time of the firmware
License info	Displays the license info for the software packages.
Device temperature	Displays the current temperature. Here you can see the highest and lowest temperatures recorded since you last clicked Temperature reset.
Supply voltage	Displays the minimum, maximum and current value of supply voltage.
System time	The system time of the switch. By default, the switch uses January 1 of the year in which the firmware was created as the time.
Firmware RAM	Displays the amount of memory currently in use and the maximum amount of memory.
CPU utilization	Displays the rate of CPU utilization.


Connection

This section describes the Connection window. You can configure connection in this window.

To configure the connection:

1. Click the Edit icon.
2. The IP configuration window pops up.
3. Perform changes under IP configuration menu.

The following table summarizes the available options.

CONNECTION 	
IP address	10.82.81.27
IP assignment	DHCP
Subnet mask	255.255.252.0
Default gateway	10.82.80.1


Item	Description
IP address	The IP address of the switch.
IP assignment	The IP assignment of the switch.
Subnet mask	The subnet mask of the switch.
Default gateway	The default gateway of the switch.

Log

This section describes the Log window.

In this window, you can display all log messages in the following way:

1. Click the Arrow icon.
2. The LOG > Log window appears, displaying all of the messages in the log.

LOG 		
Mon Feb 06 2012 07:33:24 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 07:16:38 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 07:02:38 GMT+0100 (Central European Standard Time)	INFO	logout : user admin
Mon Feb 06 2012 06:55:49 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 05:50:29 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin

Neighborhood

This section describes the Neighborhood tab, where you can see the list of devices in the network proximity.

Item	Description
Device port	The port on which the neighbor was found.
ID	Chassis ID of the neighbor.
IP address	IP address of the neighbor.
Neighbor port	The port on which the switch is connected to the neighbor.
Neighbor name	Name of the neighbor.
Description	Description of the neighbor.

ARP (Address Resolution Protocol) Table

This section describes the ARP Table panel.

On this window, you can read the ARP table of the switch and update the MAC address table. To do this, click the circular arrow button.

Item	Description
MAC address	List of MAC addresses of the available devices.
Status	Learned or Static
Port	The port number on which the MAC address was seen

Note: You cannot synchronize entries in the neighborhood detection (LLDP) and in the ARP table simultaneously. The reason of this is that entries in the ARP table and the LLDP-Heartbeat have an independent timeout. Consequently, the lack of simultaneous synchronization can result in missing entries in the ARP table.

Device Configuration

The pages under the Device Configuration menu item provide information about the switch and basic configuration settings.

System Description

This section describes the System Description tab.

In this tab, you can change the general information of the hybrid switch. You can change the following options:

- Device name
- Device description
- Physical location
- Contact

Click Apply to save the changes.

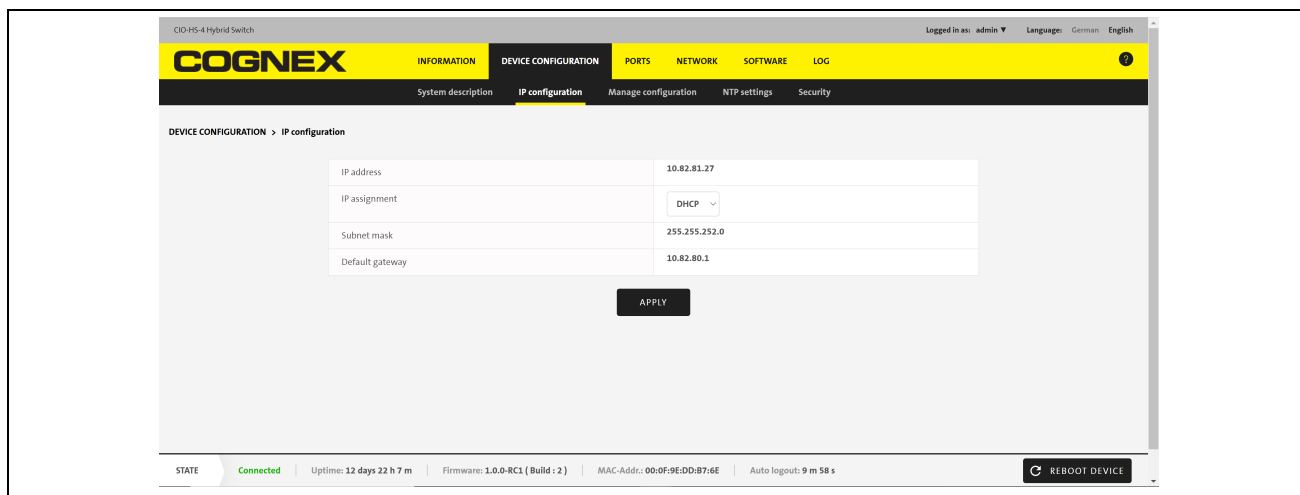
Item	Description
Device name	Name of the device.
Device description	Description of the device.
Physical location	Physical location of the device.
Contact	Contact of the device.

IP Configuration

This section describes IP Configuration window.

On this window, you can configure IP settings.

Click Apply to save changes.

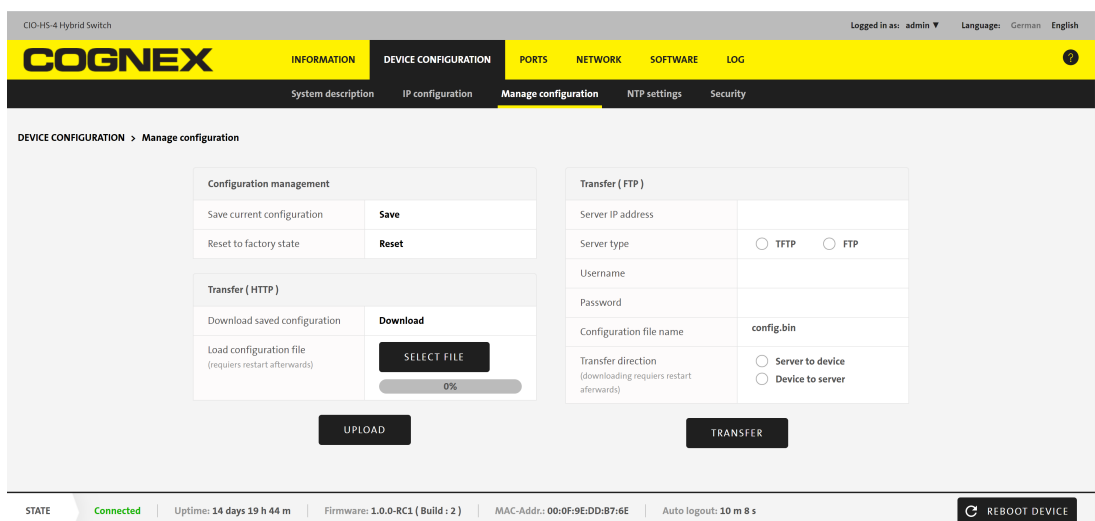


Item	Description
IP address	IP address of the device.
IP assignment	The available options are: <ul style="list-style-type: none"> • Static • DHCP • BootP
Subnet mask	Subnet mask of the device.
Default gateway	Default gateway of the device.

Note: If you change the static address, the IP address is not checked. When entering an invalid IP address, it is not possible to reach and configure the switch using the serial interface. Make sure that the entered IP address is correct.

Manage Configuration

This section describes Manage Configuration window.



In this window, you can manage configurations. The available options are the following:

- In Configuration Management:
 - Save the current switch configuration. The switch upkeepes the configuration at the next reboot.
 - Reset factory settings.

Configuration management	
Save current configuration	Save
Reset to factory state	Reset

- In Transfer (HTTP):
 - You can download the configuration in BIN format.
 - You can upload an existing configuration file.

Note: If you load an existing configuration file, restart the system when the upload is finished.

Transfer (HTTP)	
Download saved configuration	Download
Load configuration file (requires restart afterwards)	SELECT FILE 0%
UPLOAD	

- In Transfer (FTP):

You can load the current configuration from a server.

- To load the configuration from the server::
 1. Enter the following data in the relevant fields:
 - Server IP address
 - Username
 - Password
 2. Select the server type (TFTP or FTP).
 3. Select the transfer direction **Server to device**.
 4. Select a file.
 5. Click **Transfer**.

Note: Reboot the hybrid switch after loading the configuration from a server. Click Reboot Device.

Transfer (FTP)	
Server IP address	
Server type	<input type="radio"/> TFTP <input type="radio"/> FTP
Username	
Password	
Configuration file name	config.bin
Transfer direction <small>(downloading requires restart afterwards)</small>	<input type="radio"/> Server to device <input type="radio"/> Device to server
<div style="background-color: #333; color: white; padding: 5px 20px; display: inline-block; border-radius: 3px;">TRANSFER</div>	

NTP Settings

Under the Network Time Protocol (NTP) menu item, you can synchronize the system time with times NTP serves in the connected network provide. You can enter a maximum of 16 NTP servers. You can use the switch as a time server. You can also synchronize time with the PC's time management.

To synchronize system time with server time:

- Enter the IP address of a connected NTP server.
- Click the + (plus icon).
- You can enter a maximum of 16 NTP servers.

Note: It can take a few minutes to synchronize the time with the time server. You can see the synchronization status in the status column. The algorithm decides which NTP server to use for synchronization purposes. This is a dynamic process and dependent on the availability and relative accuracy of the time servers you have entered.

To synchronize with PC time:

- Click the Take time from PC button.

Note: All times are given in Universal Time Zone (UTC). The actual time can be different depending on where the switch is used.

Item	Description
NTP server	The field for entering the IP address of the NTP server. Use + to add the NTP server.
System time	The current system time and date. The switch always uses UTC. This means that only the UTC component is transferred when taking the time from a PC set to the correct time zone. The switch is able to configure a time zone.
Leap	Leap second synchronization status.
Source	Provides the source for the system time.
Event	The last event reported by the NTP client.

To delete the peer connection:

- Click the X button.

Item	Description
IP address	IP address of the NTP server.
Status	Status of the state machine.
Last event	Last event of the NTP server.
Dispersion	The largest error relative to the primary reference. 32 bit field. Fixed point number in seconds.
Offset	The difference between the system time of the switch and the server time.
Delay	Entire round-trip delay to the primary reference source.
X	Button for deleting the Peer state.

Security

You can change security settings on the Security pages.

To install a root certificate in the web browser:

- Follow the instructions of your web browser to install the root certificate. Once the root certificate is installed, an icon will be displayed in the address line of the browser to indicate that communication is taking place over HTTPS.

To obtain a switch-created root certificate:

- If no root certificate is available, use a root certificate created by the switch. A new certificate is created every time the IP address is changed.

To download the root certificate:

- Download the certificate from Device Configuration / Security.

Note: Keep the password safe. Make a note of the password and keep it in a secure location. If you forget a user password, you can set up a new user password if you are logged in as an administrator.

Note: The root certificate is valid for two years.

Item	Description
Root certificate	<p>For security reasons, install a root certificate for the web browser if the web browser requires a safe connection encrypted connection with the hybrid switch. The root certificate ensures that that communication occurs only through one hybrid switch and one encryption type of your choosing.</p> <p>Note: Internal regulations already exist for certificates depending on the user. Discuss installing the root certificate with your IT department.</p>

Ports

Switch ports can be configured individually. This section contains basic settings.

Port Table

The port table provides an overview of existing ports and port statuses. You can configure the most important parameters of the ports here.

To change the configuration of a port:

- Click the combo box of the relevant entry.
- Click Apply to save changes.

Port table					
Port-No.	Port type	Port state	Port link state	Port mode	Port link SNMP monitoring
1	Port type TX 1G	Activate ▾	Port not connected	Auto-Negotiation ▾	Deactivate ▾
2	Port type TX 1G	Activate ▾	Port not connected	Auto-Negotiation ▾	Deactivate ▾
3	Port type TX 1G	Activate ▾	Port not connected	Auto-Negotiation ▾	Deactivate ▾
4	Port type TX 1G	Activate ▾	Port not connected	Auto-Negotiation ▾	Deactivate ▾
5	Port type TX 2,5G	Activate ▾	1 GBit FD	Auto-Negotiation ▾	Deactivate ▾
6	Port type TX 2,5G	Activate ▾	Port not connected	Auto-Negotiation ▾	Deactivate ▾

APPLY

Item	Description
Port no.	Number of the port.
Port type	Port transfer type.
Port state	Activates or deactivates the port.
Port link state	Specifies the link state. For example, 100 Mbit FD.
Port mode	Configure the port mode. Settings options: <ul style="list-style-type: none"> • Auto-negotiation • 10 MBit half-duplex • 10 MBit, full-duplex • 100 MBit half-duplex • 100 MBit, full-duplex • 1 GBit, full-duplex • 2.5 GBit, full-duplex
Port link SNMP monitoring	Activates or deactivates port link SNMP monitoring.

Note: As a precautionary measure an error message pops up if you try to deactivate the last port ensuring. This precautionary measure ensures that you are always able to reach the port.

Statistics

Statistics are available for you port by port on the Statics window.

In this window, you can:

- Display statistics, if you click on the tab of the desired port.
- Clear statistics for all ports: Click Clear Port Statistics.

PORT 1	PORT 2	PORT 3	PORT 4	PORT 5	PORT 6
Packets count		243,961		Data rate	0.00 kB/s
64 Octets		31,628		Downlink rate	0.00 kB/s
127 Octets		190,213		Uplink rate	0.00 kB/s
255 Octets		3,076		Fragments	0
511 Octets		4,223		Undersized packets	0
1023 Octets		378		Oversized packets	0
1518 Octets		14,443		Jabbers	0
Broadcast		220		Collision	0
Multicast		26		CRC errors	0

CLEAR PORT STATISTIC

Port Mirroring

This section describes the Port Mirroring window.

Port mirroring

Port-No.	Port mirroring ingress	Port mirroring egress
1	Deactivate ▾	Deactivate ▾
2	Deactivate ▾	Deactivate ▾
3	Deactivate ▾	Deactivate ▾
4	Deactivate ▾	Deactivate ▾
5	Deactivate ▾	Deactivate ▾
6	Deactivate ▾	Deactivate ▾

Destination port

Port-No.	Deactivate ▾
----------	--------------

APPLY

The following table summarizes the options in this window.

Action	Instruction
Read data	Port mirroring passively reads incoming (ingress) and outgoing (egress) data that passes through a selected port. You can use the Port mirroring page to activate or deactivate ports for port mirroring and configure a destination port. You can select any destination port.

Action	Instruction
Record data	<p>You can connect a measurement device (PC) at the destination port to record data for port mirroring purposes.</p> <p>Note: The measurement device must not send data actively.</p>
Port utilization	<p>The web interface can monitor multiple ports. The function is limited by the maximum utilization of the destination port.</p> <p>Note: The destination port can be overloaded if the utilization level of the ingress/egress ports is high. This can lead to data being lost at the destination port. However, it does not affect the data transfer.</p>

Network

You can configure RSTP connections, RSTP ports and SNMP protocol connections.

COGNEX

INFORMATION DEVICE CONFIGURATION PORTS NETWORK SOFTWARE LOG

RSTP configuration RSTP ports SNMP

NETWORK > RSTP configuration

Status overview	
Bridge state	Root bridge
Time since last topology change	3 days 1 h 21 m 44 s
Numbers of topology changes	11
Root bridge	32768 / 00:0F:9E:DD:B7:6E
Root port	0
Root cost	0
Max age [s]	20
Hello time [s]	2
Forward delay [s]	15

Configuration	
RSTP state	<input checked="" type="radio"/> Activate <input type="radio"/> Deactivate
Priority	32768
Max age [s]	20
Hello time [s]	2
Forward delay [s]	15

APPLY

STATE Connected | Uptime: 14 days 19 h 55 m | Firmware: 1.0.0-RC1 (Build : 2) | MAC-Addr.: 00:0F:9E:DD:B7:6E | Auto logout: 9 m 49 s | REBOOT DEVICE

RSTP (Rapid Spanning Tree Protocol) Configuration

You can configure RSTP details under RSTP configuration.

Status overview describes basic overview.

Status overview	
Bridge state	Root bridge
Time since last topology change	3 days 1 h 21 m 44 s
Numbers of topology changes	11
Root bridge	32768 / 00:0F:9E:DD:B7:6E
Root port	0
Root cost	0
Max age [s]	20
Hello time [s]	2
Forward delay [s]	15

Item	Description
Bridge state	Displays whether the switch is the root bridge.
Time since last topology change	The amount of time in days, hours, and minutes since the network topology last changed.
Numbers of topology changes	Number of topology changes since RSTP was activated.
Root bridge	The current root bridge in the network.
Root port	With this port, you can reach the root bridge.
Root cost	Root path cost.
Max age [s]	Controls how long a switch port retains configuration information.
Hello time [s]	The amount of time after which the RSTP sends a BPDU (Bridge Protocol Data Unit).
Forward delay [s]	Time spent in the listening and learning state.

Configuration describes configuration data.

Configuration	
RSTP state	<input checked="" type="radio"/> Activate <input type="radio"/> Deactivate
Priority	32768 ▾
Max age [s]	20
Hello time [s]	2
Forward delay [s]	15
<input type="button" value="APPLY"/>	
Item	Description
RSTP enabled	Enable or disable RSTP here.
Priority	Enter the priority of the switch (ID).

Configuration	
RSTP state	<input checked="" type="radio"/> Activate <input type="radio"/> Deactivate
Priority	32768 ▾
Max age [s]	20
Hello time [s]	2
Forward delay [s]	15
<input type="button" value="APPLY"/>	

Item	Description
Max age [s]	Enter the maximum age of an RSTP message.
Hello time [s]	Enter the amount of time after which RSTP sends a BPDU.
Forward delay [s]	Enter the amount of time spent in the listening and learning state.
Saving settings	Click Apply to save the latest changes.

RSTP Ports

This section describes RTSP ports window.

State table of the ports			
Port-No.	Edge port	Port state	Port role
1	true	disconnected	deactivated
2	true	disconnected	deactivated
3	true	disconnected	deactivated
4	true	disconnected	deactivated
5	true	forwarding	designated
6	true	disconnected	deactivated

Port configuration table					
Port-No.	RSTP state	Auto edge port	Admin edge port	Admin path cost	Priority
1	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
2	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
3	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
4	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
5	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
6	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128

The following table summarizes State table of the ports.

Parameters	Options	Description
Edge port	true false	Displays whether the port is an edge port. Edge ports are ports that only connect to end stations (workstations, servers) cannot create loops.
Port state	discarding learning forwarding disconnected	Displays the state of the port.
Port role	designated root deactivated alternate backup	Displays the current role of the port.

State table of the ports			
Port-No.	Edge port	Port state	Port role
1	true	disconnected	deactivated
2	true	disconnected	deactivated
3	true	disconnected	deactivated
4	true	disconnected	deactivated
5	true	forwarding	designated
6	true	disconnected	deactivated

The following table summarizes the Port configuration table.

Parameters	Description
Port-No.	Number of the port
RSTP state	Activates or deactivates RSTP at this port.
Auto edge port	Activates or deactivates Auto Edge at this port.
Admin edge port	Specify whether this port acts as an edge port.
Admin path cost	Specify the maximum path cost.
Priority	Set the priority (ID) here.
Save settings	Click Apply to save the latest changes.

Port configuration table					
Port-No.	RSTP state	Auto edge port	Admin edge port	Admin path cost	Priority
1	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
2	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
3	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
4	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
5	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
6	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128

SNMP (Simple Network Management Protocol)

Use this page to configure Simple Network Management Protocol (SNMP) settings.

COGNEX

INFORMATION DEVICE CONFIGURATION PORTS NETWORK SOFTWARE LOG

RSTP configuration RSTP ports **SNMP**

NETWORK > SNMP

SNMP protocol versions	
SNMP v1	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
SNMP v2c	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
SNMP v3	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
SNMP trap	
SNMP trap send configuration	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
SNMP trap events	
Authentication failure	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Link	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
RSTP	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
LLDP	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled

SNMP trap destination	
1. destination IP address Trap Community	0.0.0.0 public
2. destination IP address Trap Community	0.0.0.0 public
3. destination IP address Trap Community	0.0.0.0 public
4. destination IP address Trap Community	0.0.0.0 public
5. destination IP address Trap Community	0.0.0.0 public
6. destination IP address Trap Community	0.0.0.0 public
7. destination IP address Trap Community	0.0.0.0 public
8. destination IP address Trap Community	0.0.0.0 public

APPLY

STATE **Connected** | Uptime: 14 days 19 h 58 m | Firmware: 1.0.0-RC1 (Build : 2) | MAC-Addr.: 00:0F:9E:DD:87:6E | Auto logout: 9 m 52 s

REBOOT DEVICE

To configure SNMP:

- Activate or deactivate the sending of traps in SNMP Trap using the option SNMP trap send configuration.
- You can enter up to 8 IP addresses in the SNMP trap destination section. The IP addresses serve as destinations for the following SNMP trap events:
 - SNMP trap authentication failure
 - SNMP Trap Link
 - SNMP Trap RSTP
 - SNMP Trap LLDP

Note: SNMP trap events can be activated or deactivated individually.

- Click Apply to save changes.

Software

This section describes the Software window.

The screenshot shows the COGNEX web interface for a CID-H5-4 Hybrid Switch. The top navigation bar includes 'INFORMATION', 'DEVICE CONFIGURATION', 'PORTS', 'NETWORK', 'SOFTWARE', and 'LOG'. The 'SOFTWARE' tab is active, and the 'Plugin overview' sub-tab is selected. The main content area shows a table of plugins with columns for Plugin name, State, RAM, Reboot needed, and Actions. The status bar at the bottom indicates the device is 'Connected' and provides system information like uptime and firmware version.

Plugin name	State	RAM	Reboot needed	Actions
DiscoverDCP	Activated	2092 kB		STOP DEACTIVATE
LLDP	Activated	3184 kB		STOP DEACTIVATE
NAT	Deactivated			ACTIVATE
NTP	Activated	2476 kB		STOP DEACTIVATE
OpenVPN Client	Deactivated			ACTIVATE
RSTP	Activated	2312 kB		STOP DEACTIVATE
SNMP	Activated	3584 kB		STOP DEACTIVATE
SSH Server	Activated	2808 kB		STOP DEACTIVATE
Webserver	Activated	10140 kB		STOP DEACTIVATE

Plugin Overview

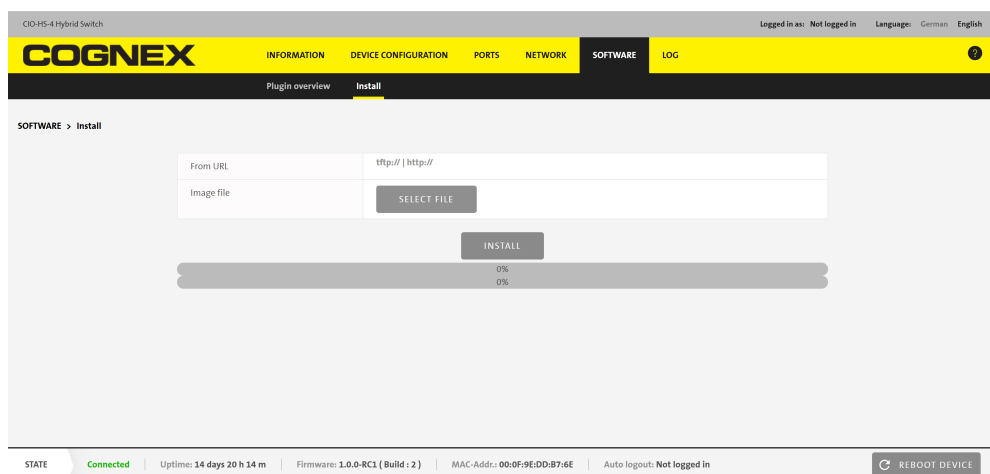
The Plugin overview window provides an overview of the software plugins available in the switch.

- Click start/stop to start or stop the respective plugin.
- Click activate/deactive to activate or deactivate the respective plugin.

Item	Description
DiscoverDCP	Device detection protocol (PNIO).
LLDP	Neighborhood detection.
NAT	IP address translation between networks.
NTP	Time server client and server function.
OpenVPN_Client	OpenVPN_Client.
RSTP	Protocol for tree and ring topologies.
SNMP	Network management protocol.
SSH_Server	SSH access to terminal.
Web server	Web interface for switch administration.

Install

On this window, you can install plugins or new firmware.



Action	Instruction
Installing plugins or new firmware	<ol style="list-style-type: none"> 1. Download so-called containers over HTTP or TFTP if necessary. 2. Enter a source into the URL field. 3. Select a file in the Image file field. 4. Click Install. The interface downloads and installs the plugin..
Alternative method for installing firmware	<ol style="list-style-type: none"> 1. Drag&Drop the file into the Upload field. 2. Click Install. The interface downloads and installs the firmware.

Note: Reboot your system after each software update.

Log Menu

This section describes the Log window.

COGNEX

INFORMATION DEVICE CONFIGURATION PORTS NETWORK SOFTWARE LOG

Log Settings

LOG > Log

Messages 20 entries

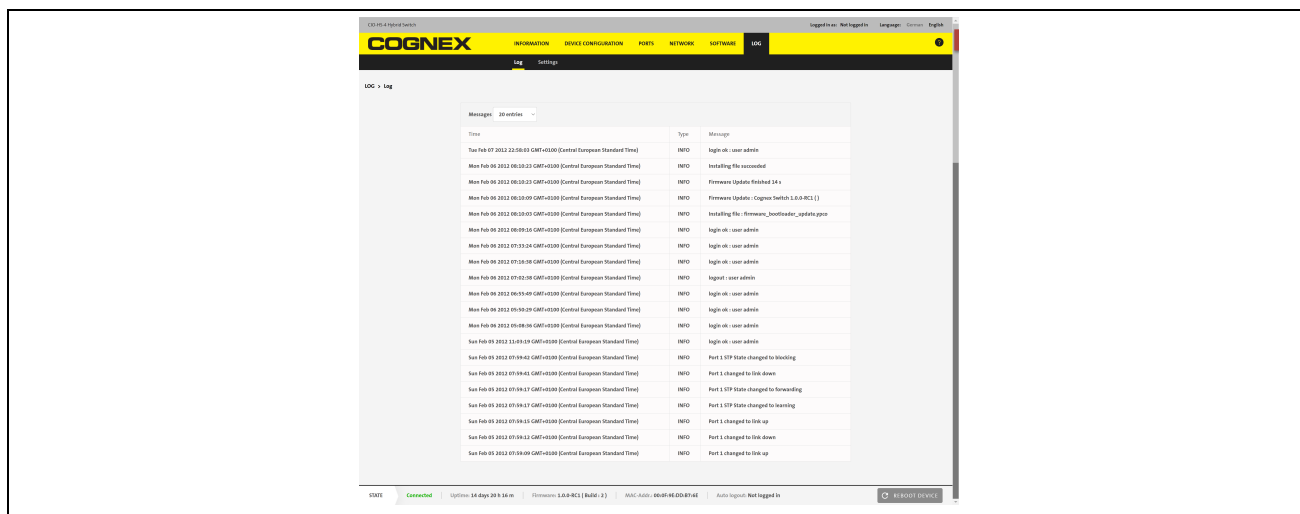
Time	Type	Message
Tue Feb 07 2012 22:58:03 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 08:10:23 GMT+0100 (Central European Standard Time)	INFO	Installing file succeeded
Mon Feb 06 2012 08:10:23 GMT+0100 (Central European Standard Time)	INFO	Firmware Update finished 14 s
Mon Feb 06 2012 08:10:09 GMT+0100 (Central European Standard Time)	INFO	Firmware Update : Cognex Switch 1.0.0-RC1 ()
Mon Feb 06 2012 08:10:03 GMT+0100 (Central European Standard Time)	INFO	Installing file : firmware_bootloader_update.ypro
Mon Feb 06 2012 08:09:16 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 07:33:24 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 07:16:38 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 07:02:38 GMT+0100 (Central European Standard Time)	INFO	logout : user admin
Mon Feb 06 2012 06:55:49 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 05:50:29 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Mon Feb 06 2012 05:08:36 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Sun Feb 05 2012 11:03:19 GMT+0100 (Central European Standard Time)	INFO	login ok : user admin
Sun Feb 05 2012 07:59:42 GMT+0100 (Central European Standard Time)	INFO	Port 1 STP State changed to blocking
Sun Feb 05 2012 07:59:41 GMT+0100 (Central European Standard Time)	INFO	Port 1 changed to link down
Sun Feb 05 2012 07:59:17 GMT+0100 (Central European Standard Time)	INFO	Port 1 STP State changed to forwarding
Sun Feb 05 2012 07:59:17 GMT+0100 (Central European Standard Time)	INFO	Port 1 STP State changed to learning
Sun Feb 05 2012 07:59:15 GMT+0100 (Central European Standard Time)	INFO	Port 1 changed to link up
Sun Feb 05 2012 07:59:12 GMT+0100 (Central European Standard Time)	INFO	Port 1 changed to link down
Sun Feb 05 2012 07:59:09 GMT+0100 (Central European Standard Time)	INFO	Port 1 changed to link up

STATE Connected | Uptime: 14 days 20 h 16 m | Firmware: 1.0.0-RC1 (Build : 2) | MAC-Addr: 00:0F:9E:DD:B7:6E | Auto logout: Not logged in | RERBOOT DEVICE

Log

This section describes the Log window.

To display log messages, click the Entries combo box next to Messages. Set the number of messages you wish to display.



Item	Description
Time	The time at which the message was created. Note: Time = UTC (Universal Time Zone) if time was synchronized. If the time has not been synchronized, time refers to the time after the device is started.
Type	Type can be: <ul style="list-style-type: none"> • INFO • WARNING • ERROR
Message	Text of the message. Note: Up to 2000 log messages are stored in a round-robin process, meaning, once the number of messages reaches 2000, the oldest message is removed whenever a new message is created. It is not possible to overrun internal memory.

Settings

On this page, you can configure the Syslog server. You can configure up to 3 Syslog servers that can be reached in the network. The switch sends log messages to these servers.

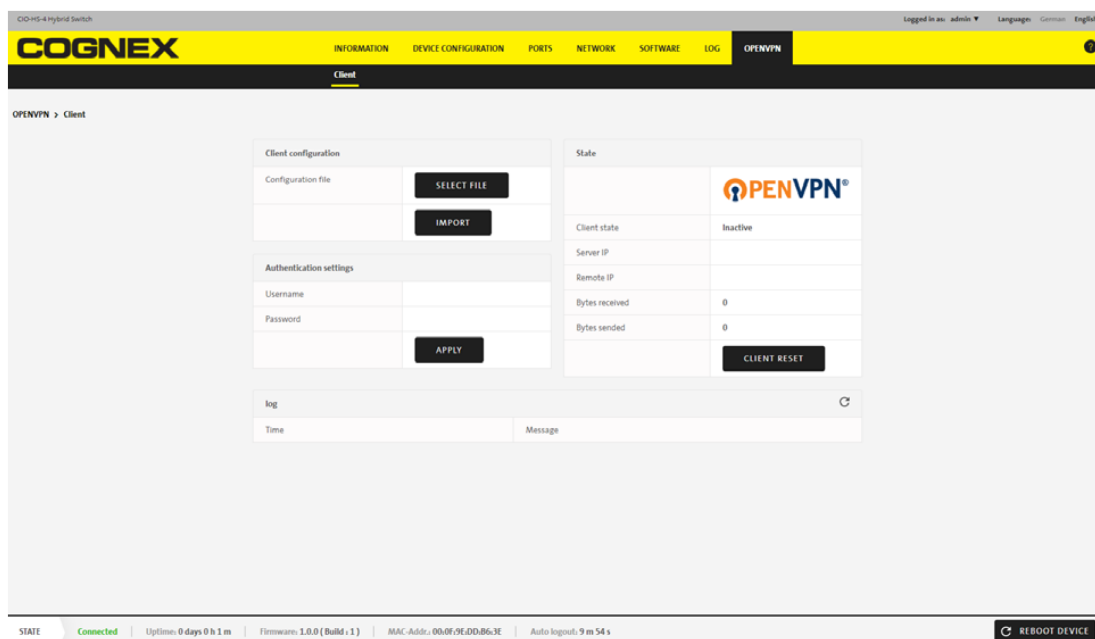
Click Apply to save changes.

Syslog server destination

1. Destination IP	0.0.0.0
2. Destination IP	0.0.0.0
3. Destination IP	0.0.0.0

OpenVPN menu

On the OpenVPN screen, you can import a configuration file that makes the switch an OpenVPN client. For example, you can generate an OpenVPN configuration with an OpenVPN server.



Client

On the Client screen, you can:

- configure or import a client;
- set authentication;
- reset an OPNVPN client;
- and observe log messages.

To configure a client:

1. Click Select file in Client Configuration.
2. Select an OpenVPN configuration file.
3. Click Import.

The web server imports the OpenVPN configuration file.

To set authentication:

1. Enter your user code in User name.
2. Enter your password in Password.
3. Click Apply.

To enable an OPENVPN client:

1. Click Client Reset.

The web server executes the OpenVPN configuration file.

Client state message	Meaning, notes and possible causes	
Inactive	<ul style="list-style-type: none"> The OpenVPN client is not active as a plugin, or it is not started. There are no available OpenVPN configuration files. 	
Server not accessible	The OpenVPN client cannot access the OpenVPN server.	A firewall blocks the connection.
		The OpenVPN server is not ready to receive data.
		You have not set the time in the client. You can only open an OpenVPN connection if the the client and the server uses the same time. For setting the time, see NTP Settings on page 47 .
		You have entered the route information incorrectly into the switch. See IP Configuration on page 44 .
Connected	An encrypted connection to the OpenVPN server has been established.	<p>In case of an established connection, you can see the following additional information:</p> <ul style="list-style-type: none"> Server IP address: IP address of the OpenVPN server. Assigned IP address: IP address at which other OpenVPN clients can access this switch via this network. Bytes sent/received: Number of bytes exchanged over the OpenVPN connection.

Note: Following a reset, the switch attempts to restore an OpenVPN connection, even if the connection was interrupted.

In Log messages, you can determine whether the web server established a connection to the OpenVPN server.

1. To stop the OpenVPN service:
 - a. You can deactivate the OpenVPN service in Software > Plugin Overview. See [Plugin Overview on page 57](#).

Specifications

The following topics provide specification data of all components.

Hybrid Switch Specifications

The following sections detail the specification data for the Hybrid Switch.

Electrical Data

The tables below describe the electrical specifications of the Hybrid Switch.

Bus Data		
Fieldbus protocol		TCP/IP
Transfer rate	Participants	10/100/1000 Mbit
	Ethernet backbone	10/100/1000/2500 Mbit

Switch Management		
Sort of switch		Managed switch
Webserver		HTTP, HTTPS
VLAN (QoS) IEEE 802.p		Yes
Port Mirroring		Yes
Protocols / Features		DHCP, SNMP (v1, v2c, v3), RSTP, STP, LLDP, NTP, RMON, SSH (CLI), NAT
Remote maintenance		Open VPN Client
Alarm contact	Full load	No

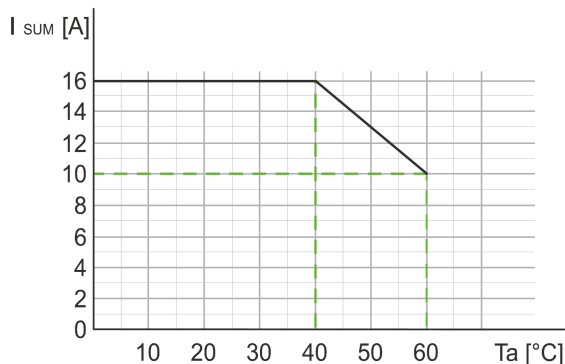
Performance record		
Voltage drop	per channel, at 50 % load	0.06 V
Efficiency	at 50 % load	99.7 %

Supply		
Operating voltage US		24 VDC
Voltage range US		18...28 VDC
Current summon US		≤16 A
Current consumption	At idle, at operating voltage	0.35 A
Protection against reverse polarization US		Yes
Reverse polarity protection		Yes
Galvanic isolation		None

Ethernet Functionality		
Ports		6
Functionality		(Fast) Ethernet Switch
Transfer rate	Participants	10/100/1000 Mbit
	Ethernet backbone	10/100/1000/2500 Mbit
Duplex		Full- or half-duplex
Operating principle		Store & Forward
Auto-negotiation		Yes
Auto-crossover		Yes
Auto-sensing		Yes
Auto-polarity		Yes

Interface for Supply	Interface for Supply	Interface for Supply
Outputs		4
Connector for power supply		M12 A-coded
Diameter of the connecting cables	Rigid/flexible	0,2 ... 2,5 mm2 AWG 24 ... 12

Derating total current sensor supply:



Environmental Characteristics

The tables below describe the environmental characteristics of the Hybrid Switch.

Climatical		
Operating temperature range		-25 °C ... +60 °C
Storage temperature		-40 °C ... +85 °C provide acclimatization for commissioning
Transport temperature range		-40 °C ... +85 °C provide acclimatization for commissioning
Air humidity (Operation and storage)		≤95 %
Installation height	(Above sea level)	≤3000 m

Mechanical		
Oscillation test	EN 60068 Part 2-6	3 ... 60 Hz Oscillation angle 3,5 mm 60 ... 150 Hz, 10 g
Shock test	IEC 60068 Part 2-27	30 g, duration 11 ms
Free fall	EN 61131-2	0,3 m

EMC Emitted Interference		
Generic standards - Emission standard for equipment in residential environments	IEC 61000-6-3	residential, commercial and light-industrial
Generic standards - Immunity standard for industrial environments	EN 61000-6-2	industrial environments

EMC Immunity		
Electrostatic discharges (ESD)	EN 61000-4-2 Criterion B	4 kV contact discharge 8 kV aerial discharge
Radiated HF	EN 61000-4-3 Criterion A	20 V/m (80 MHz ... 1 GHz), 10 V/m (1,4 GHz ... 2 GHz), 5 V/m (2 GHz ... 2,7 GHz) 3 V/m (5,1 GHz ... 6 GHz)
Burst on 24 VDC power supply	EN 61000-4-4 Criterion B	2 kV
Burst on data line	EN 61000-4-4 Criterion B	2 kV
Surge on 24 VDC power supply	EN 61000-4-5 Criterion A	0,5 kV symmetrical and asymmetrical
Surge on data lines	EN 61000-4-5 Criterion B	1 kV
Conducted	EN 61000-4-6 Criterion A	10 V (150 kHz ... 80 MHz)
Magnetic fields	EN 61000-4-8 Criterion A	30 A/m, 1 min

Protection Specifications

The tables below describe the protection specifications of the Hybrid Switch.

Climatic		
Overvoltage protection		Yes

Climatic		
Overload protection module supply	Ensured by the power supply	Yes
Inverse-polarity protection module supply		Yes
Short-circuit protection Ethernet ports		Galvanically isolated
Protective circuit input	Internal	Varistor and Suppressor diode

Electrical Safety	Electrical Safety	Electrical Safety
Protection degree	EN 60529	IP67
Protection class	Using a SELV- or PELV-power supply	III
Pollution degree		2

Mechanical Data

The tables below describe the mechanical specifications of the Hybrid Switch.

Materials		
Housing material		Zinc die-cast
Flame resistance	IEC 60695-2-1	

Mounting Data		
Dimension	L x W x H	225 x 63 x 42 mm
Weight	Net	966 g

Master Breakout Box Specifications

The following sections detail the specification data for the Master Breakout Box.

Electrical Data

The tables below describe the electrical specifications of the Master Breakout Box.

Voltage Supply		
Operation voltage	SELV / PELV	24 VDC
Input voltage range		9...36 VDC
Total current IN		24 VDC
Output current per supply pin	Holding current at 20 °C	4 A
Connection Power Breakout Box	Tripping current at 20 °C	2,2 A

Input Trigger and Encoder		
Switch form		PNP
Repeater	Internal	Yes
Short circuit protection		Yes
Output current		50 mA

Environmental Characteristics

The tables below describe the environmental characteristics of the Master Breakout Box.

Climatical		
Operation temperature		-25 °C ... +50 °C
Storage temperature		-25 °C ... +85 °C
Degree of protection	EN 60529	IP67

Mechanical		
Vibration test	EN 60068 Part 2-6	5 ... 150 Hz; 1 g
Shock test	EN 60068 Part 2-27	15 g, duration 11 ms

Protection Specifications

The tables below describe the protection specifications of the Master Breakout Box

Protection		
Current limit sensor supply	Temperature 20 °C	Holding current 0,75 A Tripping current 1,5 A
Derating		Detailed in derating diagram
Short circuit protection		Yes
Reverse polarity protection		Yes

Mechanical Data

The tables below describe the mechanical specifications of the Master Breakout Box.

Materials		
Housing material		PBT UL 94V-0, black
Potting compound	according to UL 94V-0	2 component potting compound
Contact carriers		PA UL 94V-0, black
Contact female		Plastic
O-ring		Silicone
Insulating material group	according to UL 94V-0	Group III

Mounting Data		
Dimension	L x W x H	126 x 50 x 34,5 mm
Net weight		210 g
Mounting dimension		75 ±0,5 mm
Installation height	(Above sea level)	≤2000 m

Power Breakout Box Specifications

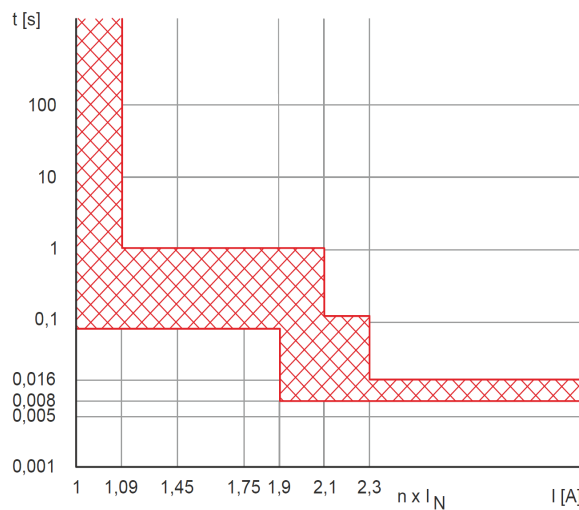
The following sections detail the specification data for the Power Breakout Box.

Electrical Data

The tables below describe the electrical specifications of the Power Breakout Box.

Inputs		
Operation voltage		24 VDC
Input voltage range		18...30 VDC

Outputs X1 ... X4		
Circuit element		Static switch
Module initialization time		10 ms
Parallel connection		Not possible
Disconnecting characteristics accuracy	Current	0 ... +9 %
Nominal output voltage		same as input
Turn-on capacity		4,7 mF
Tripping current	Full load	2 A (+9 %)



Performance record		
Voltage drop	per channel, at 50 % load	0.06 V
Efficiency	at 50 % load	99.7 %

Environmental Characteristics

The tables below describe the environmental characteristics of the Power Breakout Box.

Climatic		
Relative humidity		No condensation
Storage temperature		-25 °C ... +70 °C
Surrounding air temperature range		-25 °C ... +45 °C

Climatic		
Installation height	Above mean sea level	-500 ... 6000 m
Mechanical		
Vibration test	IEC 60068-2-6 Test Fc; EN 60068-2-6	sin 5 ... 17.8 Hz: 1.6 mm; 17.8 ... 500 Hz: 2.3 g 10x f
Shock test	IEC 60068-2-27 Test Ea; EN 60068-2-27	1/2 sin 30 g, 11 ms
Shocks caused by rough handling	Drop test	1 m

Electrical Safety		
Degree of protection	EN 60529	IP65 / IP67
Pollution degree		2
Overvoltage category	Drop test	III

EMC Interference		
Generic standards - Emission standard for equipment in residential environments	EN 61000-6-3	Residential, commercial and light-industrial environments
Generic standards - Immunity standard for industrial environments	EN 61000-6-3	Industrial environments

EMC immunity		
Fast transients / burst DC inputs and outputs	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Fast transients / burst signal connections	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Surge voltage DC inputs and outputs	EN 61000-6-2, EN 61000-4-5	±0,5 kV DM
Electrostatic discharge housing	EN 61000-6-2, EN 61000-4-2	Kontakt ±4 kW; Luft ±8 kW
Conducted HF DC connections	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM Sine
Conducted HF control terminals	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM Sine
High-frequency electrical RF fields housing	EN 61000-6-2, EN 61000-4-3	80 MHz ... 1,0 GHz: 10 V/m

Protection Specifications

The tables below describe the protection specifications of the Power Breakout Box.

Protection		
Short circuit protection		Short circuit-proof
Overvoltage protection input		Suppressor diode 36 V
Overvoltage protection output		Suppressor-Diode 36 V
Voltage monitoring		No

Mechanical Data

The tables below describe the mechanical specifications of the Power Breakout Box.

Materials		
Flame resistance	EN 60695-2-1	Low flammability
Housing material		Plastic

Mounting Data		
Dimension	L x W x H	151 x 30 x 34,5
Net weight		158 g

Distribution Box Specifications

The following sections detail the specification data for the Distribution Box.

Environmental Characteristics

The tables below describe the environmental characteristics of the Distribution Box.

Climatical		
Operation temperature		-25 °C ... +50 °C
Storage temperature		-25 °C ... +85 °C
Degree of protection	EN 60529	IP67

Mechanical		
Vibration test	EN 60068 Part 2-6	5 ... 150 Hz; 1 g
Shock test	EN 60068 Part 2-27	15 g, duration 11 ms

Protection Specifications

The tables below describe the protection specifications of the Distribution Box.

Protection		
Current limit sensor supply	Temperature 20 °C	PBT UL 94V-0, black
Derating	according to UL 94V-0	2 component potting compound
Contact carriers		PA UL 94V-0, black
Contact female		Plastic
O-ring		Silicone
Insulating material group	according to UL 94V-0	Group III

Mechanical Data

The tables below describe the mechanical specifications of the Distribution Box.

Materials		
Housing material		Zinc die-cast
Potting compound	IEC 60695-2-1	2 component potting compound
Contact carriers		PA UL 94V-0, black
Contact female		Plastic
O-ring		Silicone
Insulating material group	according to UL 94V-0	Group III

Troubleshooting

This topic provides an overview about troubleshooting the most frequent issues and errors.

Problem	Cause	Solution
Hybrid Switch LED indicator is steadily RED	Supply voltage under 11 V, channel is switched off	Check voltage supply.
Hybrid Switch LED indicator is blinking in RED at 1 Hz	Overvoltage, channel is switched off	Ensure the input voltage and the DC bus voltages are within specifications.
Hybrid Switch LED indicator is blinking in RED at 5 Hz	Internal error, channel is switched off	Power off the equipment and contact your Cognex representative.
Hybrid Switch Ethernet port status LED is steadily YELLOW	Data transmission speed is slow (10/100Mbit/s)	Troubleshoot slow Ethernet connection.
Hybrid Switch Ethernet port status LED is blinking in YELLOW,	Data communication is slow (10/100Mbit/s)	Troubleshoot slow Ethernet connection.
Master Breakout Box LED is steadily RED	<ul style="list-style-type: none"> • Check operation voltage on UB1 Power IN • Overvoltage or undervoltage 	<ul style="list-style-type: none"> • Check voltage supply. • Ensure the input voltage and the DC bus voltages are within specifications.
Power Breakout Box LED is steadily RED	Inadequate voltage.	Check voltage supply.
Distribution Box LED is steadily RED	<ul style="list-style-type: none"> • Undervoltage • Supply voltage under 11 VDC 	Check voltage supply.
Distribution Box LED is blinking RED, 1 Hz	Load is over 100 %	Reduce load on the box.

Connection Rejection

The screenshot displays a network configuration interface with a yellow navigation bar. The 'RSTP ports' tab is selected. Below the navigation bar, there are two tables. The first table, 'State table of the ports', has columns for Port-No., Edge port, Port state, and Port role. The second table, 'Port configuration table', has columns for Port-No., RSTP state, Auto edge port, Admin edge port, Admin path cost, and Priority. Both tables have a red box highlighting the row for port 4.

Port-No.	Edge port	Port state	Port role
1	true	disconnected	deactivated
2	true	disconnected	deactivated
3	true	forwarding	designated
4	true	Deactivated	deactivated
5	true	forwarding	designated
6	true	disconnected	deactivated

Port-No.	RSTP state	Auto edge port	Admin edge port	Admin path cost	Priority
1	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
2	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
3	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
4	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
5	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128
6	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input checked="" type="radio"/> Activated <input type="radio"/> Deactivated	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated	200000	128

Description	Cause	Resolution
<p>When you connect the Hybrid Switch to the network, the system rejects the connection and closes the port. Connection LED next to the port is OFF, even when you have connected the cables.</p>	<p>The switch uses Bridge Protocol Data Unit. It is very common that IT departments block this protocol.</p>	<ol style="list-style-type: none"> 1. Ensure that your IT department is not blocking Bridge Protocol Data Unit. 2. Open the WEBUI and disable RSTP for the corresponding port. See RSTP Ports on page 54.


Common Issues

This section lists commonly occurring issues, their causes and their resolutions.

Cleaning and maintenance

This chapter gives an overview about the cleaning and maintenance of the devices.

To clean the outside of the device housing, use a small amount of mild detergent cleaner or isopropyl alcohol on a cleaning cloth. Do not pour the cleaner on the device housing.

 **CAUTION:** Do not attempt to clean any DataMan product with harsh or corrosive solvents, including lye, methyl ethyl ketone (MEK) or gasoline.

Regulations/Conformity

Note: For the most current CE declaration and regulatory conformity information, see the Murrelektronik GmbH support site.

Safety and Regulatory	
Manufacturer	Murrelektronik GmbH Falkenstraße 3 71570 Oppenweiler GERMANY

Hybrid Switch Conformity and Approvals

The tables below describe the conformity and approvals for the Hybrid Switch.

Conformity, Approvals		
ULus	61010	Conform
cUL	CSA C22.2 NO. 61010-1-19	Conform
ULus	UL2367 - Addition to Mico Port	Conform
ULus	UL1310 - Addition to NECClass2 Port	Conform
CE	2014/30/EU & 2011/65/EU	Conform
KC	KN 61000-6-2, KN 61000-6-3	Conform

Master Breakout Box Conformity and Approvals

The tables below describe the conformity and approvals for the Master Breakout Box.

Conformity, Approvals		
ULus	UL61010	Conform
cUL	CSA C22.2 NO. 61010-1-19	Conform
CE	2014/30/EU & 2011/65/EU	Conform
KC	KN 61000-6-2, KN 61000-6-3	Conform

Power Breakout Box Conformity and Approvals

The tables below describe the conformity and approvals for the Power Breakout Box.

Conformity, Approvals		
ULus	61010	Conform
cUL	CSA C22.2 NO. 61010-1-19	Conform
ULus	UL2367 - Addition to Mico Port	Conform
ULus	UL1310 - Addition to NECClass2 Port	Conform
CE	2014/30/EU & 2011/65/EU	Conform
KC	KN 61000-6-2, KN 61000-6-3	Conform

Distribution Box Conformity and Approvals

The tables below describe the conformity and approvals for the Distribution Box.

Conformity, Approvals		
ULus	UL61010	Conform
cUL	CSA C22.2 NO. 61010-1-19	Conform
ULus	UL2367 - Addition to Mico Port	Conform
ULus	UL1310 - Addition to NECClass2 Port	Conform
CE	2014/30/EU & 2011/65/EU	Conform
KC	KN 61000-6-2, KN 61000-6-3	Conform

