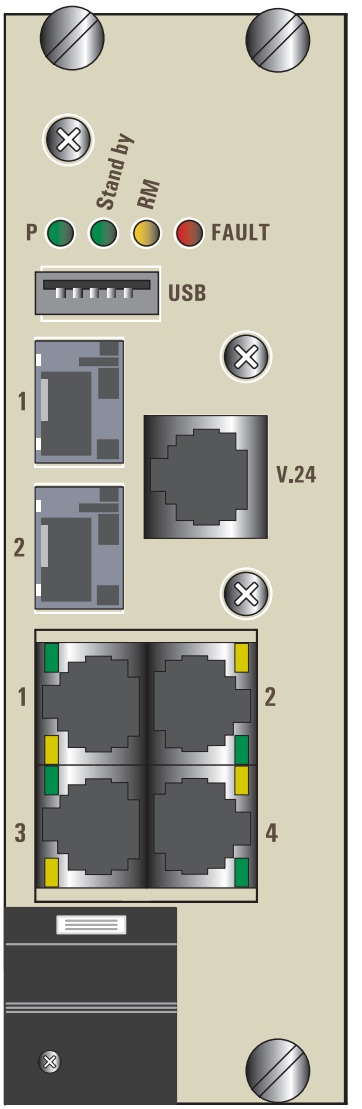
User Manual

Installation
Gigabit ETHERNET Compact PCI Switch
CS30



CS30-0202

039694001010107000

Technical support
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Content

Safety instructions

This manual contains instructions which must be observed to ensure your own personal safety and to avoid damage to devices and machinery.

Certified usage

Please observe the following: The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by Hirschmann. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Shielding ground

The shielding ground of the connectable twisted pairs lines is connected to the front panel as a conductor.

- ☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Housing (basic device)

- ☐ Please pay attention to the manufacturer's description and operating instructions of the chassis in which the CS30 interface card is to be installed.

Environment

The device may only be operated in the listed maximum surrounding air temperature range at the listed relative air humidity range (non-condensing).

- ☐ The installation location is to be selected so as to ensure compliance with the climatic limits listed in the Technical Data.
- ☐ To be used in a Pollution Degree listed in the Technical Data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- trained in providing first aid.

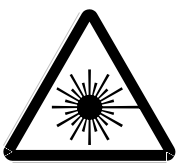
General Safety Instructions

This device is electrically operated. Adhere strictly to the safety requirements relating to voltages applied to the device as described in the operating instructions!

Failure to observe the information given in the warnings could result in serious injury and/or major damage.

- ☐ Only personnel that have received appropriate training should operate this device or work in its immediate vicinity. The personnel must be fully familiar with all of the warnings and maintenance measures in these operating instructions.
- ☐ Correct transport, storage, and assembly as well as careful operation and maintenance are essential in ensuring safe and reliable operation of this device.
- ☐ Only use umdamaged parts!
- ☐ These products are only to be used in the manner indicated in this version of the manual.
- ☐ Any work that may have to be performed on the electrical installation should be performed by fully qualified technicians only.

Warning!
LED- or LASER components according to IEC 60825-1 (2001):
CLASS 1 LASER PRODUCT.
LIGHT EMITTING DIODE - CLASS 1 LED PRODUCT.



Warning
LED LIGHT
DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (e.g. lens, microscope).
Failure to observe this warning within a distance of 100 mm can endanger your eyes. Light is emitted from the optical connections or from the ends of the optical fibers that are connected to them. Light Emitting Diode CLASS 2M, Wave length 650 nm, Power <2 mW, according to IEC/CEI 60825-1:2003-10.

National and international safety regulations

☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

ESD guidelines

The interface card contains components highly sensitive to electrostatic fields. These components can be easily destroyed or have their lives shortened by an electrical field or by a discharge caused by touching the card. For these reasons, the cards are delivered in a conducting ESD protective bag. This packing can be reused.

Be sure to observe the following precautions for electrostatic sensitive devices when handling the components:

☐ Establish electrical potential equality between yourself and your surroundings, e.g. with the aid of a wrist bracelet that you attach to the basic device (via the screw on the front panel of the interface card). The basic device is grounded via the power connection.

☐ Only then remove the card from the conducting bag.

☐ Store the card in its conducting bag whenever it is not in the basic device.

ESD protective field kits are available for working with electrostatic sensitive devices.

You can find more information about devices vulnerable to electrostatic fields in DIN EN 61340-5-1 (2001-08) and DIN EN 61340-5-2 (2002-01).

Note on the CE marking

The devices comply with the regulations contained in the following European directives:
89/336/EEC
Directive of the council for standardizing the regulations of member states on electromagnetic compatibility (changed by RL 91/263/EEC, 92/31/EEC and 93/68/EEC).
In accordance with the above-named EU directives, the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Straße 45-51
D-72654 Neckartenzlingen
Germany
Phone ++49 7127 14 1480

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- Interference immunity: EN 61000-6-2:2001
- Emitted interference: EN 55022:1998 + A1 2000 + A2 2003, Class A

Warning!
This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.
The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC value limits.

Recycling note:

After usage, this product must be disposed of properly as electronic waste in accordance with the current disposal regulations of your county / state / country.

About this manual

The following manuals are included as PDF files on the enclosed CD ROM:

- User manual „Installation“
- User manual „Basic configuration“
- User manual „Redundancy configuration“
- Reference manual „Web-based Interface“ and
- Reference manual „Command Line Interface“

If you use Network Management Software HiVision you have further opportunities to:

- have an event logbook.
- configure the „System Location“ and „System Name“.
- configure the network address range and SNMP parameters.
- save the configuration on the Switch.
- simultaneous configuration of several Switches.
- configure the relevant ports to be displayed red if there is no link state.

Legend

The commendations used in this manual have the following meanings:

▶	Listing
□	Work step
■	**Subheading**

1 Device description

1.1 Funktional range

The CS30-0202 switch (in short: CS30) supports Fast ETHERNET 100Mbit/s and Gigabit ETHERNET 1000 Mbit/s. It offers you two 10/100/1000 Mbit/s ETHERNET ports (combo ports: SFP slot or alternatively RJ45 connector) and two 10/100 Mbit/s ETHERNET ports (twisted pair, RJ45 connector). The switch is contructed for corresponding basic devices with cPCI backplane as Compact PCI interface card. The interface card is hot swapable. It is supplied with power via the backplane of the basic device.

The CS30 devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility. The switches are very quickly mounted by inserting them into the basic device.

The HIPER-Ring redundancy concept enables you to quickly carry out a reconfiguration, and also a simple configuration with only one additional connection. The diagnosis display and the display of the operating parameters and IP address information field provide a quick overview.

It can be easily managed via a Web browser, via Telnet, with a management software product (such as HiVision) or locally on the switch (V.24 interface).

The CS30 allows you to construct switched industrial ETHERNET networks that conform to the IEEE 802.3 and 802.3u standards using copper wires or optical fibers in a bus or ring topology. You can connect terminal devices and other infrastructure components via twisted pair cables, multi-mode LWL and single-mode LWL. The twisted pair ports support autocrossing, autonegotiation and autopolarity.

The devices provide you with a large range of functions:

- Redundancy functions
  (Rapid Spanning Tree, Redundant Ring Structure, HIPER-Ring, Redundant Coupling, Link Aggregation)
- Protection from unauthorized access
- Synchronized system time in the network
- Network load control
- Function diagnosis
- Diagnostics (hardware self-testing)
- Reset
- Priority

- VLAN
- Topology recognition
- Web-based interface
- Command Line Interface - CLI
- SNMP
- 802.1x port authentication

The addition, to the CS30 switches, the RS20/RS30 Open Rail range, the MICE range of switches, the MACH range of backbone switches, the BAT wireless transmission system, the EAGLE security system, and products for the LION control room, provides continuous communication across all levels of the company.

Further characteristics:

- Temperature range: Extended (-40 °C to +70 °C)
- Certifications / Declarations: CE
- Software variant: Enhanced

The devices comply with the specifications of the standards:
ISO/IEC 8802-3u 100BASE-TX/-1000BASE-T,
ISO/IEC 8802-3 100BASE-FX and
ISO/IEC 8802-3 1000BASE-SX/LX.

1.2 Ports and media

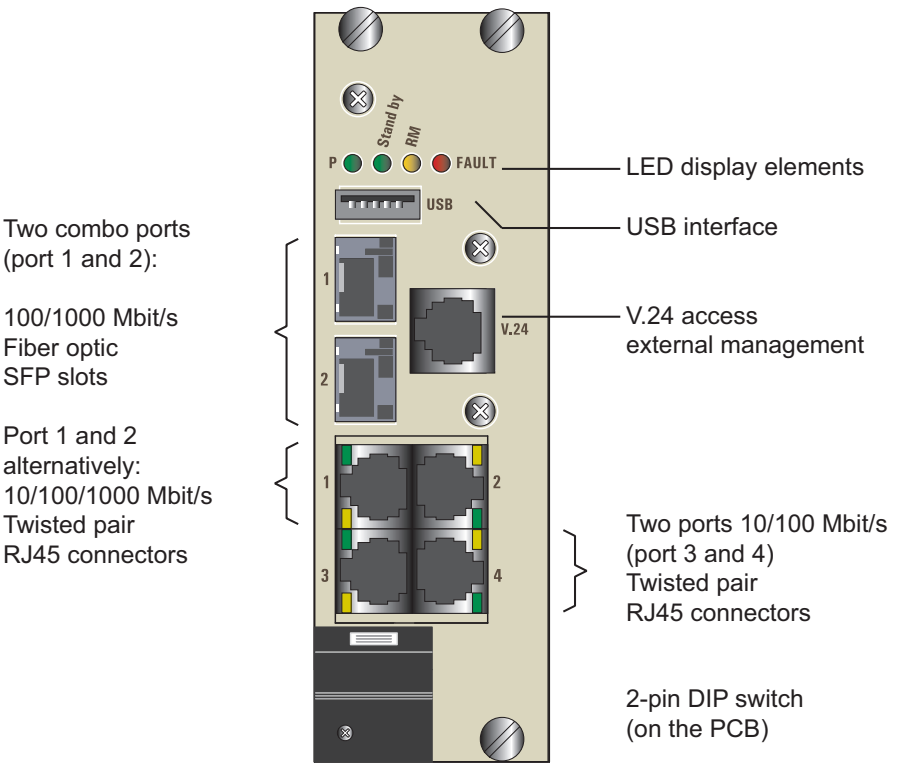


Fig. 1: Interfaces and display elements on CS30-0202

For connecting data terminal equipments or further network segments, the CS30 has the following interfaces:

- **Two combo ports (port 1 and 2)**
  - Fiber optic, 100/1000 Mbit/s ETHERNET, SFP slot multimode, singlemode or longhaul, depending on the SFP transceiver being used (see “Accessories” on page 22).
  - Or alternatively: twisted pair 10/100/1000 Mbit/s ETHERNET RJ45 connector

  The SFP slot has the priority if both the SFP and the RJ45 connector should be used at the same time.

- **Two RJ45 ports (port 3 and 4)**
  Twisted pair, 10/100 Mbit/s ETHERNET
  RJ45 connector

The twisted pair ports support autonegotiation and autopolarity.

The housing of the RJ45 socket is electrically connected to the front panel of the CS30 interface card.

2 Assembly and startup procedure

The device has been developed for practical application in a harsh industrial environment. Accordingly, the installation process has been kept simple. On delivery, the device is ready for operation.

The following procedure is appropriate for assembly:

- Unpacking and checking
- Adjusting the DIP switch settings
- Fitting the CS30 interface card into the basic device
- Starting the device
- Connecting the data lines

2.1 Device installation

2.1.1 Unpacking and checking

☐ Check whether the package was delivered complete see “Scope of delivery” on page 22.

☐ Check the individual parts for transport damage.

2.1.2 Adjusting the DIP switch settings

The 2-pin DIP switch on the PCB of the device offers you the following possibilities:

RM switch	Stand by switch	Ring redundancy	Ring coupling	Redundancy Manager	Ring port	Control port	Coupling port	Software configuration
OFF	OFF	on	off	off	1 + 2			
ON	OFF	on	off	on	1 + 2			
OFF	ON	on	on	off	1 + 2	3	4	
ON	ON							SW configuration takes priority over DIP switch settings

Fig. 2: 2-pin DIP switch

State of delivery: both DIP switches (RM, Stand by) are in the "OFF" position

☐ Check whether the switch default settings match your requirements before starting the device.

2.1.3 Fitting the CS30 interface card into the basic device

The interface cards can be inserted into or removed from the basic device during network operation (hot swappable).

⚠ Observe the ESD guidelines and the safety instructions (see “ESD guidelines” on page 6 and “Safety instructions” on page 4) and the manufacturer’s instructions of your basic devices.

- ☐ If necessary, remove the blank panel, so as to be able to insert the CS30 interface card into the basic device.
- ☐ If necessary, prize the black rocker lever from the locked into the unlocked position (see figure below, step 1):
  - ☐ Press the white button being integrated in the lever and
  - ☐ Simultaneously turn the lever by approx. 45° down
- ☐ Push the CS30 interface card into the selected slot as far as it will go on the upper and lower guide rails (see figure below, step 2).
- ☐ Ensure that there is a good connection of the edge connector of the CS30 interface card to the corresponding spring contact strip of the bus board.
- ☐ Prize the black rocker lever into the locked position by turning it up by approx. 45° (see figure below, step 3).
- ☐ Tighten the four screws in the front panel of the CS30 interface card down to the frame of the basic device (see figure below, step 4).

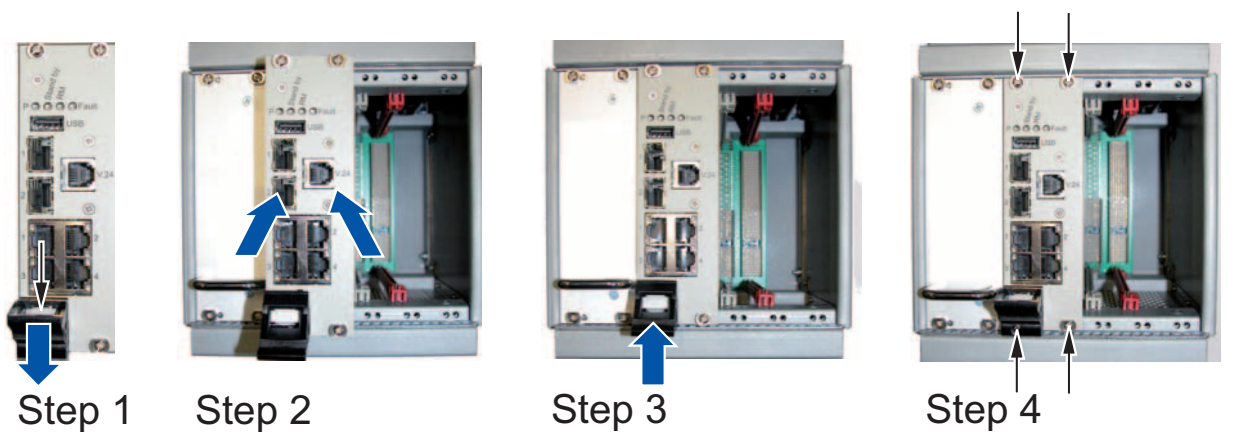


Fig. 3: Fitting the CS30 interface card into the basic device

Supply voltage

The CS30 interface card is supplied with power via the Compact PCI backplane of the basic device

Grounding

The front panel of the CS30 interface card is grounded via the Compact PCI base unit.

Note: The shielding ground of the connectable twisted pair lines is connected to the front panel as a conductor.

2.1.4 Starting the device

☐ The basic devices can only be connected to a mains power line whose voltage corresponds to the value shown on the rating plate. Connect the power cord according to the operating instructions of the basic device.

☐ Switch the basic device on.

By connecting the supply voltage to the basic device and switching it on, you start the operation of the inserted CS30 switch.

2.1.5 Connecting the data lines

You can connect terminal devices and other segments at the ports of the device via twisted pair cables and LWL cables.

- **10/100 Mbit/s twisted pair connection**

  10/100 Mbit/s ports (R45 socket) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-TX / 10BASE-T standards. These ports support:
  - autonegotiation
  - autopolarity
  - autocrossing (when autonegotiation is switched on)
  - 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode
  - 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

  State on delivery: autonegotiation is activated with exception of the HIPER-Ring ports: 100 Mbit/s full duplex.
  The socket housings are electrically connected to the lower covering.
  Pin assignment of the RJ45 socket:
  - One line pair: pin 3 and pin 6
  - One line pair: pin 1 and pin 2
  - Remaining pins: not used.

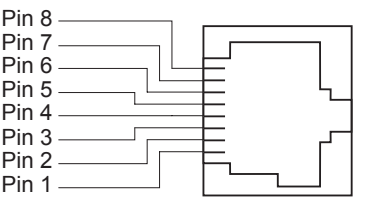


Fig. 4: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

10/100/1000 Mbit/s twisted pair connection

1000 Mbit/s twisted pair connection 1000 Mbit/s twisted pair ports (RJ45 sockets) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802-3, 2000 Edition 1000BASE-T standard. These ports support:

- autonegotiation
- autopolarity
- autocrossing (when autonegotiation is switched on)
- 1000 Mbit/s full duplex
- 100 Mbit/s half duplex, 100 Mbit/s full duplex,
- 10 Mbit/s half duplex, 10 Mbit/s full duplex.

State on delivery: autonegotiation.
The socket housing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

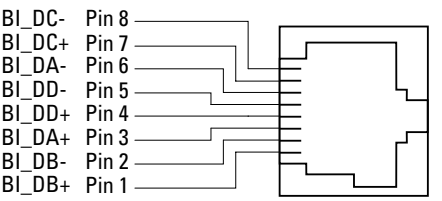


Fig. 5: Pin assignment of a 1000 Mbit/s twisted pair interface

100 Mbit/s F/O connection

100 Mbit/s F/O ports (SFP slot) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard. These ports support:

- full and half duplex mode

State on delivery: full duplex.

Note: Make sure, that you conncet LH ports only to LH ports, SM ports only to SM ports and MM ports only to MM ports.

1 Gbit/s F/O connection

1 Gbit/s F/O ports (DSC sockets) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-SX or 1000BASE-LX standard. These ports support:

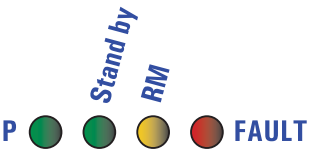
- autonegotiation.

Note: Make sure, that you conncet LH ports only to LH ports, SX ports only to SX ports and LX ports only to LX ports.

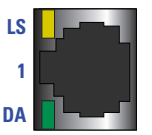
☐ Connect the data lines according to your requirements.

2.2 Displays

After applying the operating voltage, the software starts and initializes itself. The device then performs a selftest. Various LEDs light up in the process. The process lasts approximately 60 seconds.



Device status



Port status

Device status

These LED's provide information about conditions which affect the operation of the whole device.

P- Power (green LED)	Meaning
lit green	supply voltage is on
not lit	supply voltage is too low
FAULT – Error[)]	**Meaning**
lit red	a fault has occured [1)]
not lit	no fault has occured [1)]
RM - Redundancy Manager (green/yellow LED)	**Meaning**
lit green	RM function active, redundant port not active
lit yellow	RM function active, redundant port active
not lit	RM function not active
flashes green	Incorrect configuration of HIPER-Ring (e.g. ring not connected to ring port
Stand by	**Meaning**
lit green	Stand by opeartion active
not lit	Stand by operation not active

[1)] In order to display the error, you configure the setting of the signal contact in the network management program.

Port status

The green and yellow LEDs on the specific ports display port-related information. During the boot phase, the status of the boot procedure is displayed with these LEDs: .

LS (Link status, green LED)	Meaning
not lit	no valid connection
lit green	valid connection
flashes green (1 time per second)	port is switched to stand-by
flashes green (3 times per second)	port is disabled

DA (Data, yellow LED),	Meaning
not lit	no data reception at the specific port
flashes yellow	data reception at the specific port

2.3 Carrying out basic settings

IP addresses must be entered when the device is installed for the first time. The device provides 6 options for configuring the IP addresses:

- Entry via the V.24 connection.
- Entry by HiDiscovery protocol
- Configuration via BOOTP
- Configuration via DHCP
- Configuration via DHCP Option 82
- The AutoConfiguration Adapter

State of delivery

- IP address: The device looks for the IP address using DHCP
- Password for management:
  user, password: public (read only)
  admin, password: private (read and write)
- V.24 data rate: 9.600 baud
- Ring redundancy: on
  Ring ports on 100 Mbit/s full duplex or 1000 Mbit/s autonegotiation
- Ethernet ports: Link status is not evaluated (signal contact)
- Optical 100 Mbit/s ports: 100 Mbit/s full duplex
  All other ports: autonegotiation
- Redundancy manager switched off (DIP switch RM: OFF)
- Stand-by coupling off (DIP switch Stand-by: OFF)
  Port 4 = control port, port 3 = coupling port for red. ring coupling

USB interface

The USB socket offers an interface for the local connection of an Auto-Configuration Adapter ACA 21-USB. It is a device for saving/loading the configuration and for loading the software.

Pin number	Signal name
1	VCC
2	- Data
3	+ Data
4	Ground

V.24 interface (external management)

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with appropriate terminal emulation) or an AutoConfiguration Adapter ACA 11. This makes it possible to establish a connection to the Command Line Interface CLI and to the system monitor.

VT 100 terminal settings	
Speed	9.600 baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front cover of the device.
The V.24 interface is electrically connected to the supply voltage.

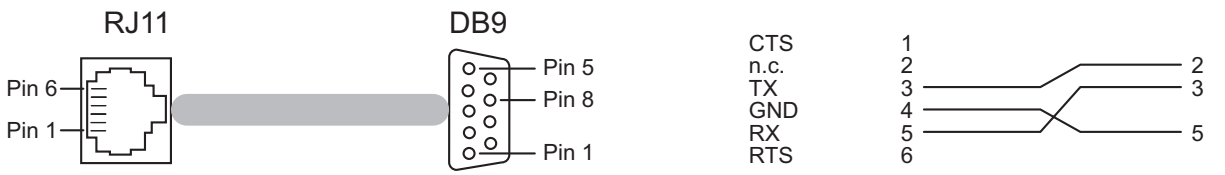


Fig. 6: Pin assignment of the V24 interface

Note: You will find the order number for the terminal cable, which is ordered separately, in the chapter “Technical data” on page 20.

You will find a detailed description of the configuration in the “Basic Configuration User Manual” on the CD-ROM.

2.4 Disassembling the CS30 interface card

The interface cards can be inserted into or removed from the basic device during network operation (hot swappable).

⚠ Observe the ESD guidelines and the safety instructions (see “ESD guidelines” on page 6 and “Safety instructions” on page 4) and the manufacturer’s instructions of your basic devices.

☐ Unscrew the four screws on the front panel of the CS30 interface card from the frame of the basic device (see figure below, step 1).
☐ Prize the black rocker lever from the locked into the unlocked position (see figure below, step 2):
  ☐ Press the white button being integrated in the lever and
  ☐ Simultaneously turn the lever by approx. 45° down
☐ Pull the CS30 interface card out of the housing of the basic device (see figure below, step 3).

Close the unused slot in the basic device with a blank panel.

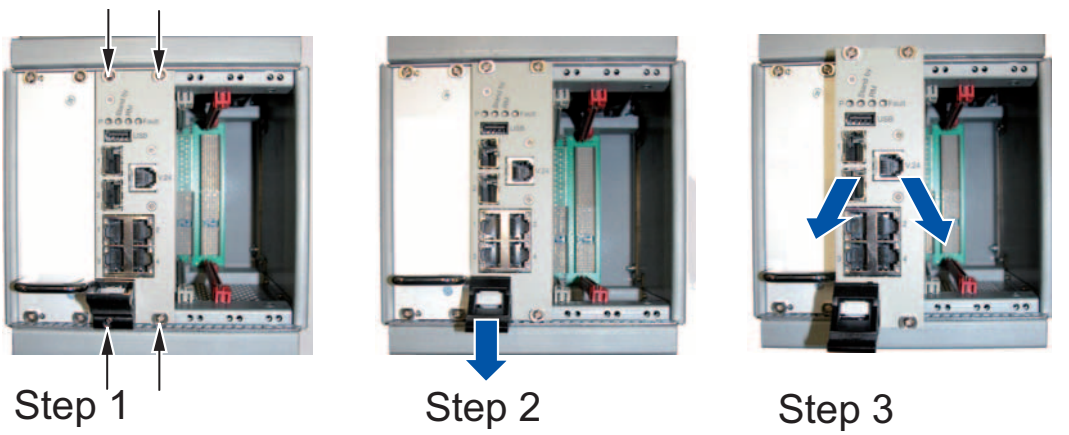


Fig. 7: Disassembling the CS30 interface card of the basic device

3 Technical data

General data

Dimensions W x H x D	CS30-0202	40 mm x 210 mm x 131 mm
Weight	CS30-0202	230 g
Voltage supply	Operating voltage	5 V DC via the backplane of the basic device
Overload current protection at input		non-changeable fuse
Surrounding	Storage temperature (surrounding air)	-40 °C to +85 °C
	Humidity	10% to 95% (non condensing)
	Atmospheric pressure	up to 2.000 m (795 hPa), higher altitudes on demand
Operating temperature	CS30-0202	-40 °C to +70 °C
	M - SFP - ... / ...	0 °C to +60 °C
	M - SFP - ... / ... EEC	-40 °C to +70 °C
	M-FAST SFP-.../...	0 °C to +60 °C
	M-FAST SFP-.../... EEC	-40 °C to +70 °C
Pollution degree		2
Protection types	Laser protection	Class 1 conforming to EN 60825-1 (2001)
	Protection types	IP 20

EMV and stability

EMV interference proof		
EN 61000-4-2	Discharge of static electricity	
	Contact discharge: test level 3	4 kV
	Air discharge: test level 3	8 KV
EN 61000-4-3	Electromagnetic fields	
	Test level 3 (80 - 2000 MHz)	10 V/m
EN 61000-4-4	Fast transients (burst), test level 3, x	
	- Power line	2 kV
	- Data line	1 kV
EN 61000-4-5	Surge voltage	
	- Power line, line/line: test level 2	0,5 kV
	- Power line, line/earth: test level 3	1 kV
	- Data line: test level 3	1 kV
EN 61000-4-6	Cable-based RF faults, test level 3	
	10 kHz - 150 kHz	3 V
	150 kHz - 80 MHz	10 V
EMV emitted immunity		
EN 55022	Class A	Yes
Stability		
Vibration	IEC 60068-2-6 Test FC, testing level in line with IEC 61131-2	Yes
Shock	IEC 60068-2-27 Test Ea, testing level in line with IEC 61131-2	Yes

Network size

Length of a twisted pair segment	
100 m approx.	cat5e cable with 1000BASE-TX

Table 1: TP port 10BASE-T / 100BASE-TX / 1000BASE-T

Product code M-FAST SFP-...		Wave length	Fiber	System attenuation	Example for F/O expansion	Fiber data
-MM/LC...	MM	1310 nm	50/125 µm	0-11 dB	0-5 km	1,0 dB/km, 800 MHz*km
-MM/LC...	MM	1310 nm	62,5/125 µm	0-8 dB	0-4 km	1,0 dB/km, 500 MHz*km
-SM/LC...	SM	1310 nm	9/125 µm	0-13 dB	0-25 km	0,4 dB/km; 3,5 ps/(nm*km)
-SM+/LC...	SM	1310 nm	9/125 µm	10-29 dB	25-65 km	0,4 dB/km; 3,5 ps/(nm*km)
-LH/LC	SM	1550 nm	9/125 µm	10-29 dB	40-104 km	0,25 dB/km; 19 ps/(nm*km)

Table 2: F/O port 100BASE-FX (SFP Fiberoptic Fast ETHERNET Transceiver)

Product code M-SFP-...		Wave length	Fiber	System attenuation	Example for F/O expansion	Fiber data
-SX/LC...	MM	850 nm	50/125 µm	0-7,5 dB	0-550 m	3,0 dB/km, 400 MHz*km
-LX/LC...	MM	1310 nm [1)]	50/125 µm	0-11 dB	0-550 m	1,0 dB/km, 800 MHz*km
-SX/LC...	MM	850 nm	62,5/125 µm	0-7,5 dB	0-275 m	3,2 dB/km, 200 MHz*km
-LX/LC...	MM	1310 nm [1)]	62,5/125 µm	0-11 dB	0-550 m	1,0 dB/km, 500 MHz*km
-LX/LC...	SM	1310 nm	9/125 µm	0-11 dB	0-20 km	0,4 dB/km; 3,5 ps/(nm*km)
-LH/LC...	LH	1550 nm	9/125 µm	6-22 dB	24-72 km	0,25 dB/km; 19 ps/(nm*km)
-LH+/LC	LH	1550 nm	9/125 µm	15-32 dB	60-120 km	0,25 dB/km; 19 ps/(nm*km)

Table 3: F/O port 1000BASE-FX (SFP Fiberoptic Gigabit ETHERNET Transceiver)

MM = multimode
SM = singlemode
LH = singlemode longhaul

[1)] with F/O adapter in line with IEEE 802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)

Power consumption/power output

Name	Power consumption	Power output
CS30-0202	6,0 W [1)]	20,5 Btu (IT)/h

[1)] The power consumption of the SFP tTransceivers is included in this number.

Scope of delivery

Device	Scope of delivery
CS30-0202	CS30-0202 device description and operating instructions CD-ROM

Order number

Product name	Order number
CS30-0202	943 941-001

Accessories

Name	Order no.
Manual Basics Industrial ETHERNET and TCP/IP	280 720-834
AutoConfiguration Adapter ACA 11	943 751-001
AutoConfiguration Adapter ACA 21-USB	943 271-001
Terminal access cable	943 301-001
Netzwork management software HiVision	943 471-100
OPC server software HiOPC	943 055-001
Gigabit ETHERNET SFP transceiver:	
M - SFP - SX / LC	943 014-001
M - SFP - SX / LC EEC	943 896-001
M - SFP - LX / LC	943 015-001
M - SFP - LX / LC EEC	943 897-001
M - SFP - LH / LC	943 042-001
M - SFP - LH / LC EEC	943 898-001
M - SFP - LH+ / LC	943 049-001
Fast ETHERNET SFP Transceiver:	
M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001

Based specifications and standards

EN 61000-6-2:2001	Generic standards – Immunity for industrial environments
EN 55022:1998 + A1 2000 + A2-2003	Information technology equipment – Radio disturbance characteristics
IEC/EN 60950-1:2001	Safety of Information Technology Equipment (ITE)
EN 61131-2:2003	Programmable Controllers

Table 4: List of based specifications and standards
Certified devices are marked with a certification identifier.

RFC 768	UDP	RFC 1769	SNTP
RFC 783	TFTP	RFC 1907	MIB2
RFC 791	IP	RFC 1945	HTTP/1.0
RFC 792	ICMP	RFC 2131	DHCP
RFC 793	TCP	RFC 2132	DHCP-Options
RFC 826	ARP	RFC 2236	IGMPv2
RFC 951	BOOTP	RFC 2239	MAU-MIB
RFC 1112	IGMPv1	RFC 3411	SNMP Framework
RFC 1157	SNMPv1	RFC 3412	SNMP MPD
RFC 1155	SMIv1	RFC 3413	SNMP Applications
RFC 1213	MIB2	RFC 3414	SNMP USM
RFC 1493	Dot1d	RFC 3415	SNMP VACM
RFC 1542	BOOTP-Extensions	RFC 2613	SMON
RFC 1757	RMON	RFC 2674	Dot1p/Q

Table 5: List of RFCs

IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1 Q	Tagging
IEEE 802.1 Q-1998	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.1 w.2001	Rapid Reconfiguration
IEEE 802.3-2002	Ethernet

Table 6: List of IEEE standards

Notes

4 Further support

Technical questions and training courses

In the event of technical queries, please talk to the Hirschmann contract partner responsible for looking after your account or directly to the Hirschmann office. You can find the addresses of our contract partners on the Internet:
http://www.hirschmann-ac.com

Our support line is also at your disposal:

- Tel. +49(1805) 14-1538
- Fax +49(7127) 14-1551

Answers to Frequently Asked Questions can be found on the Hirschmann internet site www.hirschmann-ac.com/faq

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