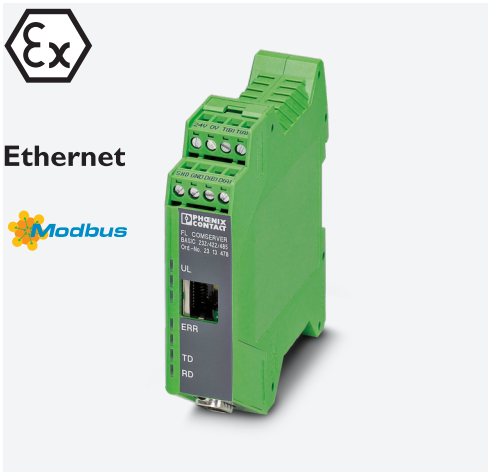
FL COMSERVER...

Serial RS-232/422/485 device server for industrial 10/100Base-T(X) networks



Data sheet
103827_en_15

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1 Description

The **FL COMSERVER** enables the integration of serial RS-232, RS-422, and RS-485 interfaces for machine and system access via an Ethernet network. This means that you can remotely maintain all controllers and control panels via the serial device server.

To connect serial Modbus/RTU/ASCII networks to a Modbus TCP network, you can use the FL COMSERVER UNI... as a Modbus gateway. For seamless integration, the device performs protocol-compliant conversions between the two Modbus protocols. The FL COMSERVER UNI... supports both serial and Ethernet-based Modbus clients and servers.

Features

- Mounting on a 35 mm DIN rail
- 10/100Base-T(X) auto negotiation
- Redundant power supply possible
- High-quality 3-way isolation
- Comprehensive diagnostic options
- Configuration via web-based management
- Password-protected configuration
- Software for virtual COM ports supplied as standard

Observe these notes

NOTE: device damage

The device is designed exclusively for operation with SELV/PELV from a class ES1 “electrical energy source” in accordance with EN/IEC 62368-1 and VDE 0868-1. The device may only be connected to devices that meet the requirements of class ES1 in accordance with EN/IEC 62368-1.

Make sure you always use the latest documentation.

It can be downloaded at: phoenixcontact.com/product/2313478

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3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
Second generation FL COMSERVER BASIC..., serial device server for converting a serial RS-232/422/485 interface to Ethernet, only supports TCP and UDP applications, incl. Com Port Redirector software and user documentation (PDF)	FL COMSERVER BASIC 232/422/485	2313478	1
Second generation FL COMSERVER UNI..., serial device server for converting a serial 232/422/485 interface to Ethernet, supports TCP, UDP, Modbus gateway, and PPP applications, incl. COM port redirector software and user documentation	FL COMSERVER UNI 232/422/485	2313452	1

Accessories	Type	Item no.	Pcs./Pkt.
RS-232 cable, 9-pos. D-SUB socket on 9-pos. D-SUB socket, 9-wire, 1:1	PSM-KA9SUB9/BB/2METER	2799474	1
Primary-switched power supply, QUINT POWER, screw connection, DIN rail mounting, supply of devices possible via the TBUS DIN rail connector, protective coating, input: single-phase, output: 24 V DC/2.5 A	QUINT4-SYS-PS/1AC/24DC/2.5/SC	2904614	1
DIN rail bus connector, color: green, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-22,5.., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting method: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts	ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm², solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter	FL CAT5 HEAVY	2744814	1
By the meter, Installation cable, Ethernet CAT5 (100 Mbps), shielded, PUR halogen-free, water blue RAL 5021, 4-wire (2x2xAWG26/7, SF/UTP), color single wire: white/orange-orange, white/green-green, cable length: Free entry (1.0 ... 1000.0 m)	FL CAT5 FLEX	2744830	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042, Ethernet	VS-08-RJ45-5-Q/IP20	1656725	1
Narrow Ethernet switch, five RJ45 ports with 10/100 Mbps on all ports, automatic data transmission speed detection, autocrossing function, and QoS	FL SWITCH 1005N	1085039	1

Accessories	Type	Item no.	Pcs./Pkt.
FO converter with SC duplex fiber optic connection (1300 nm), for converting 10/100Base-T(X) to multi-mode fiberglass (50/125 µm). Auto negotiation and auto MDI(X) function. Comprehensive link diagnostics. DIN-rail mountable, 18 ... 30 V DC supply.	FL MC EF 1300 MM SC	2902853	1
Passive network isolator for electrical isolation in Ethernet networks. This protects Ethernet devices from potential differences of up to 4 kV. Can be used for transmission speeds of up to 100 Mbps. Possible to connect two RJ45 plugs.	FL ISOLATOR 100-RJ/RJ	2313931	1
Patch panel, RJ45 jack on Push-in terminal blocks, CAT5e, 10/100/1000 Mbps, DIN rail adapter, IP20, shield contacting with strain relief	PP-RJ-SCC	2703018	10
Second generation: Unmanaged Ethernet extender for point-to-point connections, line and ring structures, data rates up to 30 Mbps, distances of up to 20 km on in-house copper cables, diagnostics via USB and LEDs, 2 SHDSL ports, 1 LAN port	TC EXTENDER 2001 ETH-2S	2702409	1
Industrial SHDSL extender for serial RS-232/422/485 interfaces, point-to-point and line structures, serial data transmission up to 2000 kbps on in-house cables, diagnostics via USB and LEDs, two configurable alarm outputs	PSI-MODEM-SHDSL/SERIAL	2313669	1
Patch cable, CAT5, assembled, 0.5 m	FL CAT5 PATCH 0,5	2832263	1
Patch cable, CAT5, assembled, 5 m	FL CAT5 PATCH 5,0	2832580	1
Actuation tool, for ST terminal blocks, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip	SZF 1-0,6X3,5	1204517	10
Security element for FL patch cable	FL PATCH SAFE CLIP	2891246	20
D-SUB connector, 9-pos. socket, one 35° cable outlet, universal type for all systems, pin assignment: 1, 2, 3, 4, 5, 6, 7, 8, 9 to screw connection terminal block	SUBCON 9/F-SH	2761499	1
Connecting cable D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB.	CM-KBL-RS232/USB	2881078	1
Shield connection clamp for terminal points starting from 2.5 mm^2	ME-SAS	2853899	10
Surge protection in accordance with Class E_A ($CAT6_A$), for Gigabit Ethernet (up to 10 Gbps), token ring, FDDI/CDDI, ISDN, and DS1. Suitable for Power over Ethernet (PoE++ / 4PPoE) “Mode A” and “Mode B”. RJ45 attachment plug with separate grounding cable and ground connection snap-on foot for NS 35 DIN rails.	DT-LAN-CAT.6+	2881007	1
The FL DIN RA is installed in a standard, 19-inch rack (EIA-310-D, IEC 60297-3-100) to allow DIN rail mounted equipment to be rack mounted.	FL DIN RA	2891053	1

4 Technical data

Supply	
Supply voltage range	19.2 V AC/DC ... 28.8 V AC/DC (via pluggable COMBICON screw terminal block) 22.8 V DC ... 25.2 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal supply voltage	24 V AC/DC (via pluggable COMBICON screw terminal block)
	24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)
Typical current consumption	100 mA (24 V DC)
Electrical isolation	VCC // Ethernet // Serial
Test voltage data interface/power supply	1.5 kV_{rms} (50 Hz, 1 min.)
Tightening torque	0.5 Nm ... 0.6 Nm
Stripping length	7.00 mm
Conductor cross-section	
flexible	0.2 mm² ... 2.5 mm²
rigid	0.2 mm² ... 2.5 mm²

Functions	
Management	Web-based management, SNMP, emergency exit with Telnet and serial

Ethernet interface, 10/100Base-T(X) in accordance with IEEE 802.3	FL COMSERVER BASIC 232/422/485	FL COMSERVER UNI 232/422/485
Number of ports	1	1
Connection method	RJ45 jack, shielded	RJ45 jack, shielded
Serial transmission speed	10/100 Mbps, auto negotiation	10/100 Mbps, auto negotiation
Transmission length	≤ 100 m (shielded twisted pair)	≤ 100 m (shielded twisted pair)
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
Protocols supported	TCP/IP, UDP	TCP/IP, UDP, Modbus (TCP, RTU/ASCII), PPP
Auxiliary protocols	ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP, ICMP	ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP, ICMP
Status and diagnostic indicators	LEDs: UL (logic voltage), TD + RD (data activity serial), FD (full duplex), 100 (100 Mbps mode), Link (Ethernet), Activity (Ethernet), ERR (error)	LEDs: UL (logic voltage), TD + RD (data activity serial), FD (full duplex), 100 (100 Mbps mode), Link (Ethernet), Activity (Ethernet), ERR (error)

V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
Connection method	D-SUB 9 plug
Tightening torque	0.4 Nm
Data format/encoding	UART/NRZ: 7/8 Bit Data, 1/2 Bit Stopp, None/Even/Odd Parity
Serial transmission speed	0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4 kbps
Transmission length	15 m
Data flow control/protocols	Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Pin assignment	DTE/DCE switchover via web-based management

RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
Connection method	Plug-in/screw connection via COMBICON
Data format/encoding	UART/NRZ: 7/8 Bit Data, 1/2 Bit Stopp, None/Even/Odd Parity
Termination resistor	390 Ω - 180 Ω - 390 Ω configurable
Serial transmission speed	0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4; 500; 1000 kbps
Transmission length	≤ 1200 m
Data flow control/protocols	Automatic control

RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire	
Connection method	Plug-in/screw connection via COMBICON
Data format/encoding	UART/NRZ: 7/8 Bit Data, 1/2 Bit Stopp, None/Even/Odd Parity
Termination resistor	390 Ω - 180 Ω - 390 Ω configurable
Serial transmission speed	0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4; 500; 1000 kbps
Data flow control/protocols	Automatic control

General data	
Degree of protection	IP20
Mounting type	DIN rail mounting
Assembly note	The product can be snapped onto all 35 mm DIN rails in accordance with EN 60715.
Dimensions (W/H/D)	22.5 mm x 99 mm x 116 mm
Material	
Housing	PA 6.6-FR
Color	
Housing	green (6021)
Free fall in accordance with IEC 60068-2-32	1 m
Vibration resistance in accordance with EN 60068-2-6/ IEC 60068-2-6	5g, 10...150 Hz, 2.5 h, in XYZ direction
Shock in accordance with EN 60068-2-27/IEC 60068-2-27	15g, 11 ms period, half-sine shock pulse
Shock in accordance with EN 60068-2-27/IEC 60068-2-27	30g, 11 ms period, half-sine shock pulse
Noise emission according to	EN 61000-6-4
Noise immunity according to	EN 61000-6-2:2005
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Free from substances that could impair the application of coating	VDMA 24364:2018-05

MTTF (mean time to failure)	
SN 29500 standard, temperature 25°C, operating cycle 21%	2001 Years
SN 29500 standard, temperature 40°C, operating cycle 34.25%	870 Years
SN 29500 standard, temperature 40°C, operating cycle 100%	355 Years

Ambient conditions	
Ambient temperature	
Operation	-25 °C ... 60 °C
	-20 °C ... 60 °C (in acc. with UL)
Storage/transport	-25 °C ... 70 °C
Humidity	
Operation	10 % ... 95 % (non-condensing)
Storage/transport	5 % ... 95 % (non-condensing)
Altitude	≤ 5000 m (For restrictions, see the manufacturer's declaration for altitude operation)

Conformance/Approvals	2313478 FL COMSERVER BASIC 232/422/485
CE	CE-compliant
ATEX	Ex II 3 G Ex ec IIC T4 Gc PxCIF11ATEX2313478X Please follow the special installation instructions in the documentation!
UL, USA/Canada	508 Listed Class I, Div. 2, Groups A, B, C, D
UL, USA	Class I, Zone 2, AEx nA IIC T5
UL, Canada	Class I, Zone 2, Ex nA IIC T5 Gc X
KC approval for South Korea	KCC-REI-PCK-FL2313478
Corrosive gas test	ISA-S71.04-1985 G3 Harsh Group A
Standards/regulations	EN 50121-4

Conformance/Approvals	2313452 FL COMSERVER UNI 232/422/485
CE	CE-compliant
ATEX	Ex II 3 G Ex ec IIC T4 Gc PxCIF11ATEX2313478X Please follow the special installation instructions in the documentation!
UL, USA/Canada	508 Listed Class I, Div. 2, Groups A, B, C, D
UL, USA	Class I, Zone 2, AEx nA IIC T5
UL, Canada	Class I, Zone 2, Ex nA IIC T5 Gc X
KC approval for South Korea	MSIP-REI-PCK-2313452
Corrosive gas test	ISA-S71.04-1985 G3 Harsh Group A
Standards/regulations	EN 50121-4

Conformance with EMC Directive 2014/30/EU		
Immunity in accordance with EN 61000-6-2		
Electrostatic discharge	EN 61000-4-2	
	Contact discharge	± 6 kV
	Discharge in air	± 8 kV
	Comments	Criterion B
Electromagnetic HF field	EN 61000-4-3	
	Field intensity	10 V/m
	Comments	Criterion A
Fast transients (burst)	EN 61000-4-4	
	Input	2 kV (5 kHz)
	Signal	1 kV (5 kHz)
	Comments	Criterion A
Surge current loads (surge)	EN 61000-4-5	
	Input	2 kV
	Signal	1 kV
	Comments	Criterion B
Conducted interference	EN 61000-4-6	
	Voltage	10 V
	Comments	Criterion A

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

Emitted interference in acc. with EN 61000-6-4	
Interference emission	EN 55032

5 Safety regulations and installation notes

5.1 Intended use

The device allows easy integration of serial RS-232, RS-422 and RS-485 interfaces into industrial 10/100Base-T(X) networks.

The product can be snapped onto all 35 mm DIN rails in accordance with EN 60715.

The DIN rail connector bridges the supply voltage. A joining station must not consist of more than 20 devices.

5.2 Installation notes

CAUTION:

Observe the following safety notes when using the device.

- The category 3 product is designed for installation in zone 2 potentially explosive areas. It satisfies the requirements of the following standards:
  - EN 60079-0, EN 60079-7
  - Comprehensive details are to be found in the EU Declaration of Conformity which is enclosed and also available on our website in the latest version.
- Installation, operation, and maintenance may only be carried out by qualified electricians. Follow the installation instructions as described.
- When installing and operating the device, the applicable regulations and safety directives (including national safety directives), as well as general technical regulations, must be observed. The safety-relevant data is listed in this document.
- Observe the specified conditions for use in potentially explosive areas! Also observe the requirements of EN 60079-14.
- The product must not be opened or modified apart from the configuration of the DIP switches. Do not repair the product yourself; replace it with an equivalent product. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from failure to comply.
- Do not subject the product to mechanical and/or thermal stress that exceeds the specified limits.
- The product must be stopped and immediately removed from the Ex area if it is damaged, has been subjected to an impermissible load, stored incorrectly, or if it malfunctions.
- The device is designed exclusively for operation with SELV/PELV from a Class ES1 “electrical energy source” in accordance with EN/IEC 62368-1 and VDE 0868-1. The device may only be connected to devices that meet the requirements of class ES1 in accordance with EN/IEC 62368-1.

5.3 Installation in Zone 2

WARNING: Explosion hazard when used in potentially explosive areas

Please make sure that the following notes and instructions are observed.

- Use in potentially explosive areas is not permitted in China.
- The device should be installed so that at least IP54 degree of protection is achieved in accordance with EN 60529. To this end, a suitable, approved housing that meets the requirements of EN 60079-7 should be used.
- Only devices that are designed for operation in Ex Zone 2 and the conditions at the installation location may be connected to the circuits in Zone 2.
- In potentially explosive areas, only open the product and connect and disconnect cables and plug-in connections (e.g., connector, SD card, DIN rail connector) when the power is disconnected.
- For safe operation, lockable plug-in connections (e.g., connector, SD card, DIN rail connector, etc.) must be fully inserted and have a functional interlock (e.g., locking clip, screw connection, etc.).
- Insert the interlock. Repair any damaged plug-in connections immediately.
- Only connect one cable per terminal point.
- Use the device in an environment that does not exceed pollution degree 2 in accordance with EN 60664-1.
- Use transient protection so that short-term surge voltages do not exceed 119 V.
- The switches of the device that can be accessed may only be actuated when the power supply to the device is disconnected.
- The product is not designed for use in potentially dust-explosive atmospheres.

5.4 UL note

WARNING: Explosion hazard when used in potentially explosive areas
Please make sure that the following notes and instructions are observed.

PROCESS CONTROL EQUIPMENT FOR HAZARDOUS LOCATIONS 31ZN

A) This equipment is suitable for use in Class I, Zone 2, AEx nA IIC T5; Class I, Zone 2, Ex nA IIC T5 Gc X and Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.
B) Conductor temperature rating must be 65°C or higher.
C) Product must be installed in Class I, Zone 2 certified and at least an IP54 enclosure.
D) Product must be used in no more than a degree of pollution 2 environment as defined by IEC 60664-1.
E) Provisions must be made to provide transient protection to the product so that voltage levels do not exceed 40 % of the rated voltage at the power supply terminals.
F) The product has to be installed in an enclosure with tool removable cover or door.

Ambient temperature: -20°C ... +60°C
24 V AC/DC <120 mA
Wire Range: 30-12 AWG
Torque: 5-7 (Lbs-Ins)

5.5 Security in the network

NOTE: Network security jeopardized by unauthorized access

Connecting devices to a network entails the danger of unauthorized access to the network.

Observe the following safety instructions!

- If possible, deactivate unused communication channels.
- Use secure passwords reflecting the complexity and service life recommended in the latest guidelines.
- Only allow authorized persons to access the device. Limit the number of authorized persons to the necessary minimum.
- Always install the latest firmware version. The firmware can be downloaded via the item (www.phoenixcontact.com/products).
- Observe the IT security requirements and the standards applicable to your application. Take the necessary protective measures. These may include, for example, virtual networks for remote maintenance access or a firewall.
- In security-critical applications, always use the device with an additional security appliance. Phoenix Contact offers security appliances in the mGuard product range. The mGuard routers connect various networks for the remote maintenance and protection of the local network and protect these networks against cyberattacks.
- You must take defense-in-depth strategies into consideration when planning networks.

Additional measures for protection against unauthorized network access can be found in the “INDUSTRIAL SECURITY” application note. The application note can be downloaded via the item (www.phoenixcontact.com/products).
German: AH DE INDUSTRIAL SECURITY, 107913
English: AH EN INDUSTRIAL SECURITY, 107913

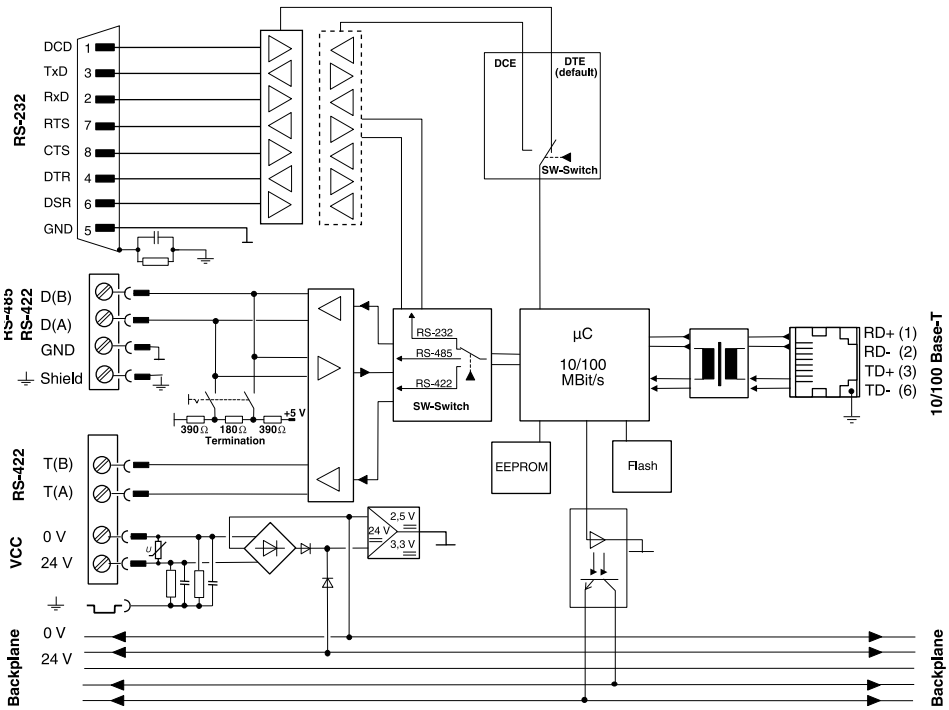
If a security vulnerability exists for products, solutions, or services from Phoenix Contact, it will be published on the PSIRT (Product Security Incident Response Team) website:
www.phoenixcontact.com/psirt

6 Product description

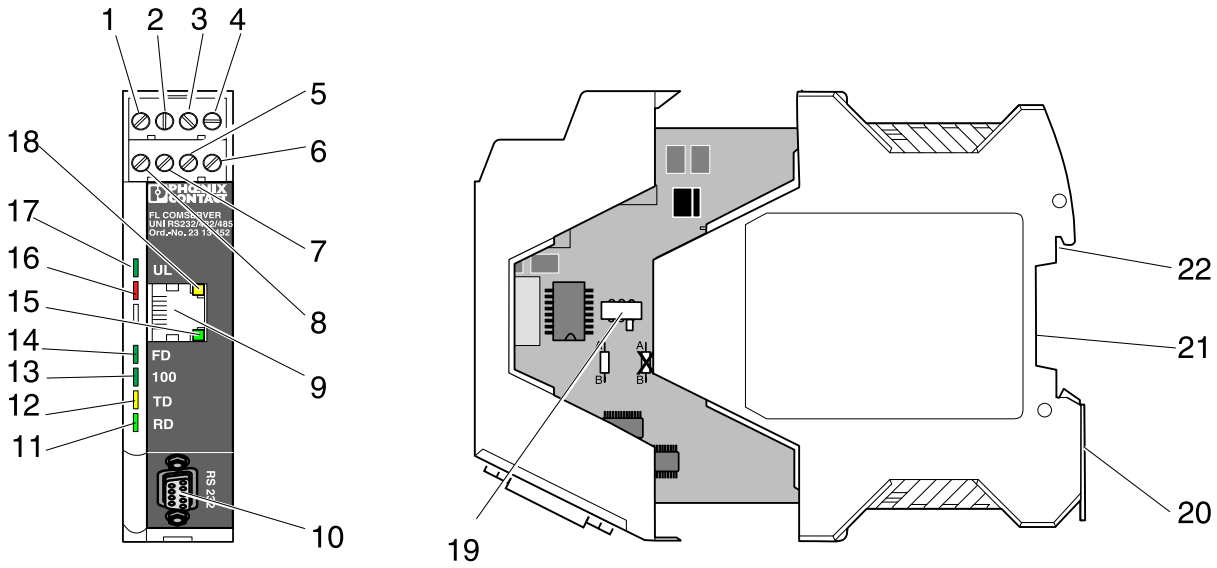
Product designation	Item No.	Protocol	
		TCP/UDP	Modbus gateway/PPP
FL COMSERVER UNI 232/422/485	2313452	✓	✓
FL COMSERVER BASIC 232/422/485	2313478	✓	

6.1 Basic circuit diagram

Figure 1 Basic circuit diagram



6.2 Function elements



1	24 V	Supply voltage
2	0 V	Supply voltage
3	T(A) RS-422 connection, transmit, negative	
4	T(B) RS-422 connection, transmit, positive	
5	D(A) RS-422/485 connection, receive, negative	
6	D(B) RS-422/485 connection, receive, positive	
7	GND	
8	Shield, same potential as FE	
9	RJ45, Ethernet interface (TP port)	
10	D-SUB 9-pos. (pin) RS-232 interface	
11 ... 18	LEDs	See the following table
19	Slide switch for RS-422/485 termination network	
20	Universal snap-on foot for EN DIN rails	
21	Bus connector for redundant supply voltage (concealed)	
22	FG functional ground contact (concealed)	

Diagnostic and status indicators			
No.	**Name**	**Color**	**Description**
Serial interface			
11	RD	Green	Device receives serial data.
12	TD	Yellow	Device transmits serial data.
Ethernet interface (TP port)			
13	100	Green	On: 100 Mbps data transmission
14	FD	Green	On: data transmission in full duplex mode
15		Green	On: data transmission, dynamic Off: no link, line interrupt, interface not used, or end device switched off
18		Yellow	Activity, flashes during data transmission at the Ethernet port
General			
16		Red	On: firmware error
			Flashing: faulty Ethernet configuration (IP address conflict, no DHCP response)
			Flashing synchronously with the RD/TD LED: faulty serial interface parameters
17	UL	Green	On: normal operation Flashing: start system and software

7 Serial interfaces

Observe the different interface configuration when changing a device from FL COM SERVER RS... to FL COMSERVER...232/422/485.

– When connecting the device, make sure the signal assignment of the interfaces is correct.

7.1 RS-232 interface

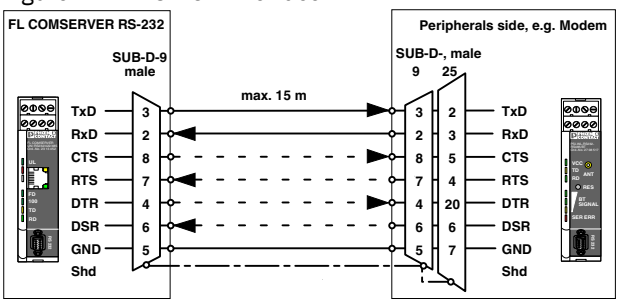
The RS-232 interface can be switched via web-based management between:

– DTE (Data Terminal Equipment)

– DCE (Data Communication Equipment)

In the delivery state (DTE), the interface behaves like a PC.

Figure 2 RS-232 interface



FL COMSERVER...		End device	
D-SUB 9 (DTE, default)	**Direction**	**D-SUB 9 (DCE)**	**D-SUB 9 (DTE)**
1	DCD ←	1	4
2	RxD ←	2	3
3	TxD →	3	2
4	DTR →	4	1, 6
5	GND	5	5
6	DSR ←	6	4
7	RTS →	7	8
8	CTS ←	8	7
9	RI ←	9	-

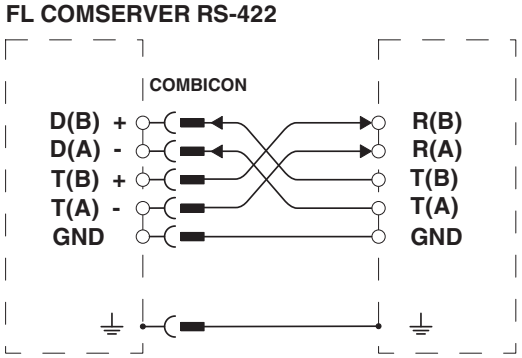
7.2 RS-422 interface

In RS-422 operating mode, a point-to-point connection can be established.

When connecting the I/O device, use a common shielded twisted pair bus line. Fit this bus line with a termination network on both I/O devices.

This operating mode supports full duplex transmission.

Figure 3 RS-422 interface



FL COMSERVER...		End device
RS-422 4-wire	**Direction**	**RS-422 4-wire**
T(A)-	→	RX-
D(A)-	←	TX-
GND		
D(B)+	←	TX+
T(B)+	→	RX+

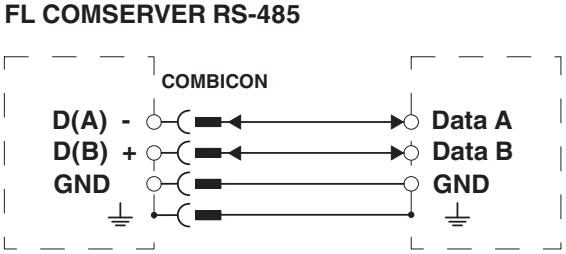
7.3 RS-485 interface

You have to disconnect the 9-pos. D-SUB connector from the data cable when changing a device from FL COM SERVER RS... to FL COMSERVER ... 232/422/485.

– Connect the single-core wires of the data cable to the COMBICON plug-in screw terminal block.
– Make sure the signal assignment is correct.

In RS-485 mode, an RS-485 network with several I/O devices can be created. Use a twisted pair bus cable to connect the I/O devices. Fit this bus cable with a termination network at the two furthest points of the RS-485 network.

Figure 4 RS-485 interface



FL COMSERVER...		End device
RS-485 2-wire	**Direction**	**RS-485 2-wire**
D(A)-	↔	RX/TX-
GND		
D(B)+	↔	RX/TX+

7.4 Termination

The FL COMSERVER can be operated on a 2-wire or 4-wire bus line as required. For correct operation of the bus system, termination networks are required for the RS-422/ RS-485 bus connection.

The device is equipped with a switchable termination network upon delivery.

RS-422

In the case of a point-to-point connection, you must activate the termination network on both devices.

RS-485

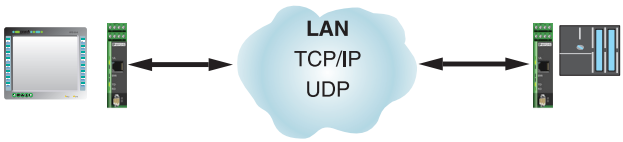
In the case of multipoint connections, you must activate the termination network on the first and last bus device of the line.

8 Application examples

8.1 Point-to-point, permanent line replacement

A common application is the point-to-point connection of two serial devices via an existing network. For this cable replacement, the data is tunneled through the network using two FL COMSERVERs. Any limits on range (e.g., the maximum of 15 m imposed by RS-232) are overridden.

Figure 5 Point-to-point connection



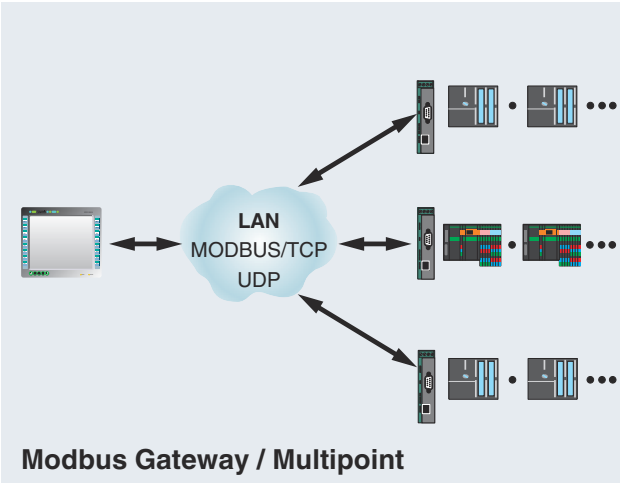
8.2 Modbus gateway, multidrop networks

You can even extend or replace conventional RS-485 multidrop networks with modern network technology using the FL COMSERVER.

Modbus is the best-known example of this technology. The FL COMSERVER supports the serial Modbus/ASCII and RTU protocols as well as the Ethernet-based Modbus/TCP protocol. The full-fledged gateway function enables the use with Modbus clients and servers, and therefore the integration of any number of serial Modbus devices into Modbus/TCP networks.

You can directly address other multidrop networks using simple broadcast addressing sent out to all network devices or using intelligent mechanisms. The required destination address is read directly from the serial data stream and used for addressing.

Figure 6 Modbus gateway

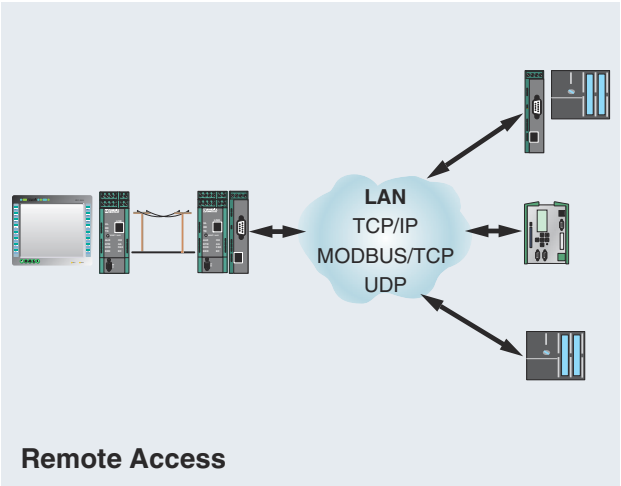


8.3 Access to remote networks

Dialing into remote networks that are otherwise difficult to access (e.g., wind farms) can now be easily achieved via a modem connection (dial-up) in combination with the FL COMSERVER.

For this reason, the FL COMSERVER supports the PPP protocol with CHAP authentication (Challenge Handshake Authentication Protocol). 128-bit password encryption protects the network from unauthorized access.

Figure 7 Access to remote networks

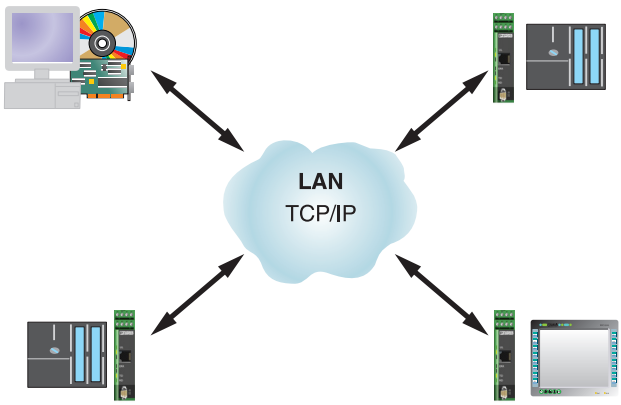


8.4 Client/server mode

If, however, the serial data of an application software program is to be available in the network, only one FL COMSERVER is installed at the serial device.

In its function as a client or server, the FL COMSERVER can then make the data available and transmit it in TCP/IP or UDP. The sockets of the application software can therefore directly access the serial data in the field.

Figure 8 Client-server mode



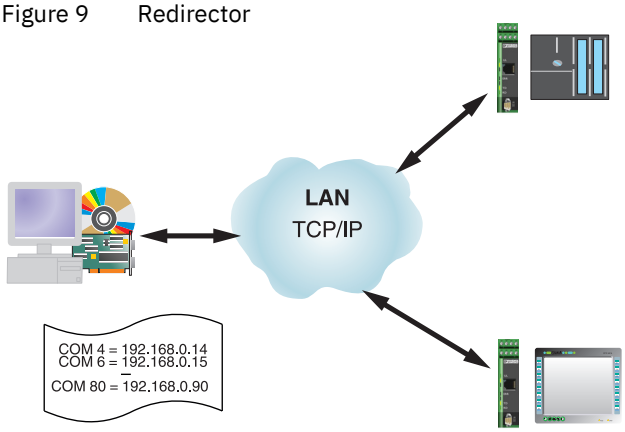
8.5 Redirector, virtual COM ports

In many cases, the existing application software does not support Ethernet communication. However, in the face of increasing networking, local connections, e.g., to programming interfaces, should often be established via the PC's existing network card and the connected network.

The COM port redirector software provides the solution. It creates virtual COM ports on the PC that can be used by the existing application software. You do not need to change the application software. This means you can easily establish connections to programming interfaces while retaining all the advantages of networking.

The COM port redirector software can be downloaded at www.phoenixcontact.com/product/2313478.

Figure 9 Redirector



Redirector software	Number of virtual ports	Operating system
FL COM Port Redirector	≤16 (version 1.50 or later)	Windows® XP and above, 32-/64-bit
CPR Manager as of firmware version E2.20	≤ 254	Windows® XP, 2003 Server, Vista 7, 2008 Server, 32-/64-bit