FL COM SERVER RS232/FL COM SERVER RS485 Serial V.24 (RS-232)/RS-485 Device Server for 10/100BASE-T(X)

1. Short Description

Ethernet has achieved a high level of acceptance in industrial applications. However, automation equipment is not always network compatible. A solution is available in the form of the new FL COM SERVER serial device server. It enables serial V.24 (RS-232) and RS-485 interfaces to be easily integrated into industrial 10/100BASE-T(X) networks.

This means you can do the following anywhere in the world:
- Request the system state
- Transmit visualization data
- Initiate a program or firmware download
- Carry out remote monitoring

With the aid of virtual COM ports, existing application software that only supports serial communication can be redirected to the network card of a Windows PC using the COM port redirector software, which is available free of charge.

Easy Configuration and Diagnostics

Configuration and diagnostics can be carried out without the need for additional software via standard web browsers using web-based management. The menu structures are clearly organized by topic to enable intuitive configuration and the web pages are adapted dynamically to the desired applications. If, however, configuration and diagnostics are to be implemented directly using a process visualization, the relevant SNMP objects are available for integration in OPC databases.

Performance for Industrial Requirements

For safe and continuous operation under harsh industrial conditions, the FL COM SERVER provides high-quality 3-way electrical isolation (VCC//V.24 (RS-232), RS-485//Ethernet) and the 24 V voltage supply can be supplied redundantly as an option. The high electromagnetic compatibility of the devices ensures a high level of availability.

In addition to the hardware, the software also meets the specific industrial requirements. The device therefore supports the 3964R protocol as well as the various Modbus protocols and status messages via SNMP objects.

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The **FL COM SERVER...** has been specially developed for industrial applications in the control cabinet. It offers the following features:
- Mounting on an EN DIN rail
- Width of just 22.5 mm
- 10/100BASE-T(X) auto negotiation
- 24 V AC/DC ±20% voltage supply
- Redundant voltage supply as an option
- High-quality 3-way isolation (VCC//V.24 (RS-232), RS-485//Ethernet)
- Comprehensive diagnostic indicators
- Configuration using web-based management
- Support of all popular network protocols
- Password-protected configuration
- PPP protocol with CHAP (128-bit password encryption)
- Modbus TCP supported
- COM redirector software supplied as standard

2. Applications

Thanks to a wide range of integrated functions, the device can be used in various ways for different applications. Web-based management provides user-friendly support during configuration. The main applications are explained below.

Point-to-Point/Tunnel

A common application is the simple point-to-point connection of two serial devices via an existing network. For this cabling, the data is tunneled through the network using two FL COM SERVER devices and any limitations with regard to range, e.g., 15 m, maximum for V.24 (RS-232), are eliminated.

**Point-to-point connection**

Figure 01
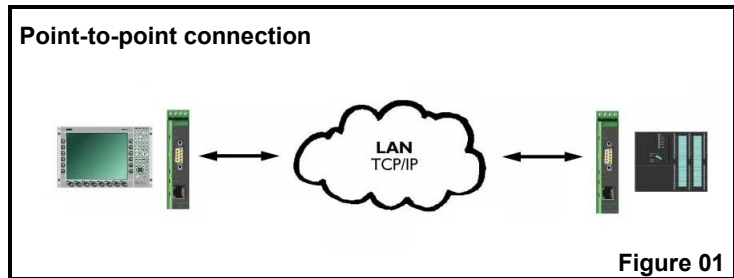
Client Server Operation

If, however, the serial data of an application software program is available in the network, only one FL COM SERVER is installed at the serial device. The FL COM SERVER can then provide the data as a client or server and transmit in TCP/IP or UDP. Sockets are programmed for this, which can then access the data.

Client server operation

Figure 02
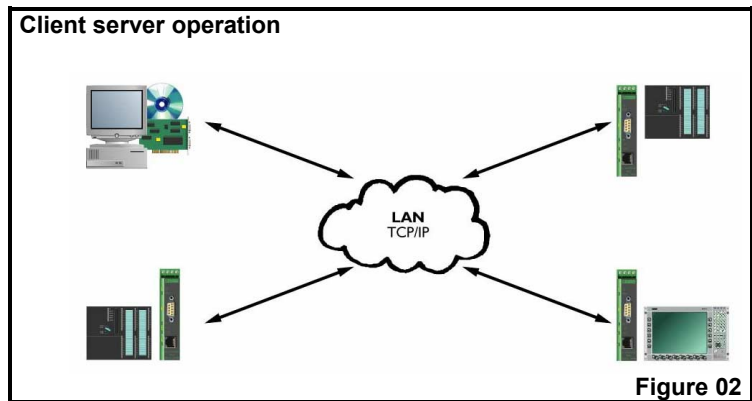
Redirector/Virtual COM Ports

Often the existing application software does not support Ethernet communication. However, due to increasing developments in network technology, local connections, e.g., on programming interfaces, are often implemented via the existing PC network card and the connected network. A solution is available in the form of the COM port redirector software, which is supplied as standard. It creates virtual COM ports on the PC, which are used by the existing application software. There is no need to modify the application software, which means that connections can be easily established to the programming interfaces with all the advantages of networking.

Redirector/virtual COM ports

Figure 03
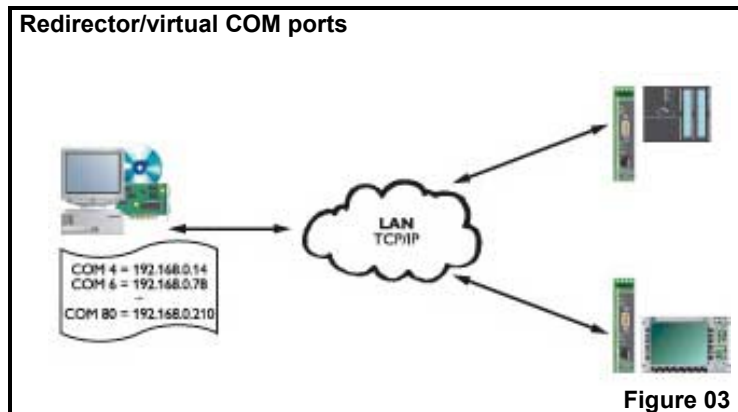
FL COM SERVER…
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Modbus Gateway/Multi-Drop Networks

Conventional RS-485 multi-drop networks can also be extended and replaced with modern network technology using the FL COM SERVER.
Modbus is the most widely known example of this technology. The FL COM SERVER supports both the Modbus ASCII and RTU protocols as well as the Ethernet-based Modbus TCP protocol. The comprehensive gateway function enables use on Modbus masters and slaves, and thus the integration of all serial Modbus devices in Modbus TCP networks.

Other multi-drop networks can either be addressed using simple broadcast addressing to all network devices or with the aid of intelligent mechanisms for specific addressing. The required target address is read directly from the serial data flow and used for addressing.

Multi-drop networks

Figure 04
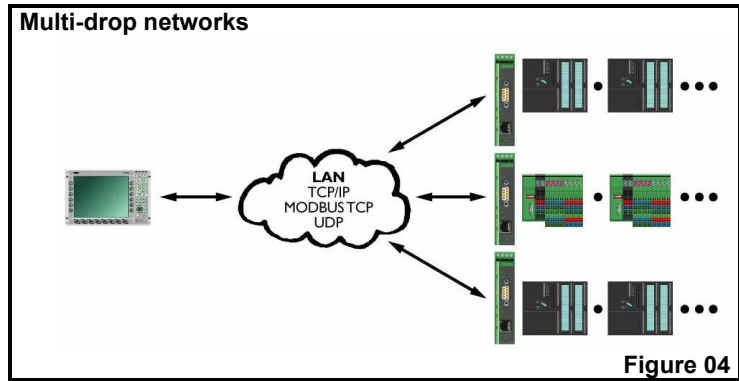
Remote Access in Remote Networks

Dialing into remote networks that are otherwise difficult to access (e.g., wind parks) can now be easily ensured via a modem connection (long-distance data transmission) in combination with the FL COM SERVER.
The COM SERVER supports the PPP protocol with CHAP authentication (Challenge Authentication Protocol). Unauthorized access to the network is prevented by 128-bit password encryption.
This makes remote monitoring and remote diagnostics of spatially separated network devices as easy as private dialing to the Internet.
In addition, a Bluetooth access point can be implemented by combining the new PSI WL BLUETOOTH converter with the FL COM SERVER. This enables wireless integration of serial devices in an Ethernet network with a range of up to 150 m.
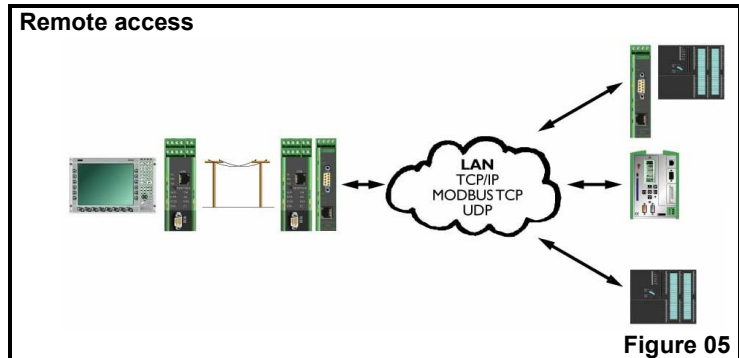
Remote access

Figure 05

FL COM SERVER…
Serial V.24 (RS-232)/RS-485 Device Server for 10/100BASE-T(X)

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FL COM SERVER RS…   c**RU**us
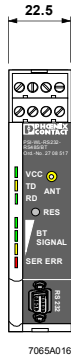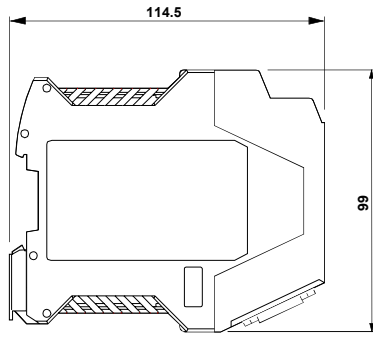
3. Ordering Data		Type	Order No.	Pcs. Pkt.
V. 24 (RS-232) COM server, for converting a serial V.24 (RS-232) interface to Ethernet including CD-ROM with drivers, COM redirector software, additional software, and application documentation (PDF)		**FL COM SERVER RS232**	**27 44 490**	1
RS-485 COM server, for converting a serial RS-485 interface to Ethernet including CD-ROM with drivers, COM redirector software, additional software, and application documentation (PDF)		**FL COM SERVER RS485**	**27 08 740**	1
Accessories				
V.24 (RS-232) cable, 9-pos. female connector to 9-pos. female connector, completely assigned 1:1	0.5 meters	**PSM-KA 9SUB9/BB/0,5METER**	**27 08 52 0**	1
V.24 (RS-232) cable, 9-pos. female connector to 9-pos. female connector, completely assigned 1:1	2.0 meters	**PSM-KA 9SUB9/BB/2METER**	**27 99 47 4**	1
Zero modem gender changer, 9-pos. female connector to 9.pos. male connector, crossed data and control cables		**PSM-AD-D 9/SB/NULLMODEM**	**27 08 75 3**	1
9-pos. D-SUB male connector for self-assembly of V.24 (RS-232) cables, with one cable feed, all D-SUB connections correspond 1:1 to screw terminal blocks	Female connector Male connector	**SUBCON 9/F-SH** **SUBCON 9/M-SH**	**27 61 49 9** **27 61 50 9**	1 1
9-pos. D-SUB bus connector for self-assembly of RS-485 cables, with two cable feeds, D-SUB connections 1, 2, 3, 5, 6, 8 correspond to two screw terminal blocks each	Female connector Male connector	**SUBCON PLUS F1** **SUBCON PLUS M1**	**27 44 26 7** **27 61 82 6**	1 1
System power supply, primary switched, 24 V DC, 1.5 A, DIN rail-mountable, wide range input	85 - 264 V AC (at 45 - 65 Hz)	**MINI-SYS-PS-100-240AC/24DC/1.5**	**28 66 98 3**	1
DIN rail bus connector (optional) For connection of the system power supply	2 required	**ME 17,5 TBUS 1,5/5-ST-3,81 GN**	**27 09 56 1**	10
For connection of the COM server	1 required	**ME 22,5 TBUS 1,5/5-ST-3,81 GN**	**27 07 43 7**	10

4. Technical Data

Function	Serial device server
Configuration and management	- With a standard web browser and HTTP protocol - With FL SWT Factory Manager software - With SNMP objects - Local with terminal program via V.24 (RS-232)/RS-485 (emergency access)
Supported web browsers	- Remote via Ethernet and Telnet (emergency access)
	Netscape Communicator Version 4.5 or later, or Internet Explorer Version 4.01 or later

LED diagnostic indicators	
Power supply	
V.24 (RS-232)/RS-485 data	
V.24 (RS-232)/RS-485 error	- Green (UL), steady light during operation
Ethernet data	- Yellow (RD), dynamic for received V.24 (RS-232)/RS-485 data
Ethernet link	- Red (ERR)
Full duplex Ethernet	- Yellow (ACT), dynamic for transmit/receive data
100 Mbps Ethernet	- Green (LNK), with received link signals
Ethernet collision	- Green (FD), full duplex mode
	- Green (100), 100 Mbps transmission speed
	- Yellow (COL), dynamic with every collision

Supply	
Supply voltage 1	24 V AC/DC +/-20%, via plug-in COMBICON screw terminal block
Frequency	DC or 50 - 60 Hz
Supply voltage 2, alternative or redundant	24 V DC ±5% via backplane bus contact and system power supply

Serial Interface	V.24 (RS-232) according to ITU-T V.28, EIA/TIA-232, 66 259-1 and RS-485 according to EIA/TIA-485, DIN 66259-4
Connection	9-pos. D-SUB male connector
Device type	DCE
Data format/encoding	Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length

Data flow control	V.24 (RS-232)	Software handshake, Xon/Xoff or hardware handshake RTS/CTS
	RS-485	Automatic control

Serial transmission speed	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 187500 bps, can be set via WBM
Protocols	Transparent protocol, including 3964R protocol

Ethernet Interface (TP)	According to IEEE 802.3
Connection	RJ45, 8-pos., shielded
Shield	DC coupled on DIN rail
Transmission speed	10/100 Mbps, auto negotiation
Protocols	TCP/IP, UDP, Modbus TCP, TFTP, HTTP, PPP with CHAP authentication (128-bit password encryption)
Secondary protocols	ARP, DHCP, BOOTP, SNMP-V1, RIP, RARP

5. General Data

CE conformance	EMC Directive 89/336/EEC
Approvals	c**RU**us
	c(UL)us Cl.1, Div.2, Grp. A-D, Temp Code T4A
Ambient operating temperature range during operation	0°C to +55°C
Housing - Material - Dimensions (H x W x D in mm)	With 5-pos. bus contact and ground contact ABS-V0, green 99 x 22.5 x 114.5
Weight of device	150 g
Functional earth ground	Functional earth ground to EN DIN rail integrated in housing
Vibration resistance	5g according to DIN EN 60068-2-6, 1.5 h each in x, y, and z direction

Shock test
          Operation
          Storage
	According to IEC 60068-2-27
	15 g, 11 ms, half-sine shock pulse
	30g, 11 ms, half-sine shock pulse

Free fall	According to IEC 60068-2-32, 1 m
Degree of protection	IP20
3-way electrical isolation	Supply//Ethernet (TP)//V.24 (RS-232), RS-485
Test voltage	1.5 kV AC, 50 Hz, 1 min. between all ground levels according to EN 50178 and EN 61131-2
Chloroform test	Free from substances that would hinder coating with paint or varnish according to central standard P-VW-3.10.757 650 of VW, Audi, and Seat

CE
CE Conformance With EMC Directive 89/336/EEC

EMC (Electromagnetic Compatibility)
Immunity to Interference According to EN 61000-6-2

• Electrostatic discharge (ESD)	EN 61000-4-2
• Electromagnetic HF field: Amplitude modulation: Pulse modulation:	EN 61000-4-3
• Fast transients (burst) Signal: Supply:	EN 61000-4-4
• Surge current loads (surge) Signal: Supply:	EN 61000-4-5
• Conducted interference	EN 61000-4-6
Noise emission	EN 55022

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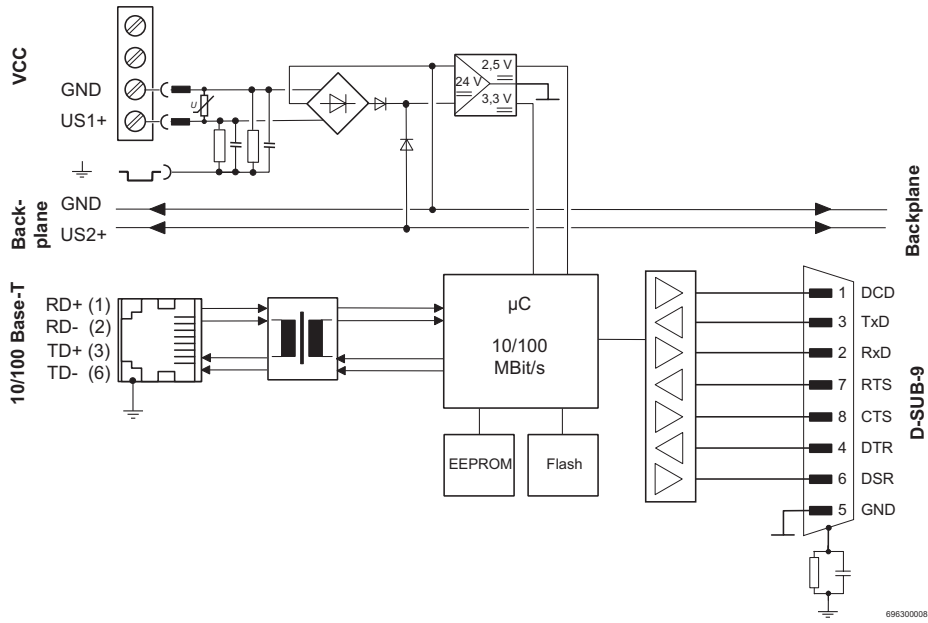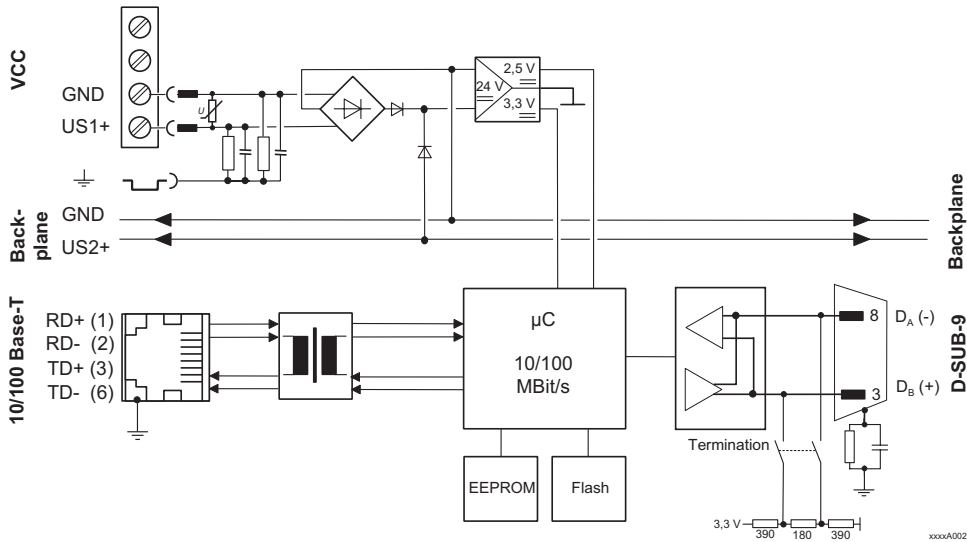
6. Block Diagram

V.24 (RS-232)

Figure 06

RS-485
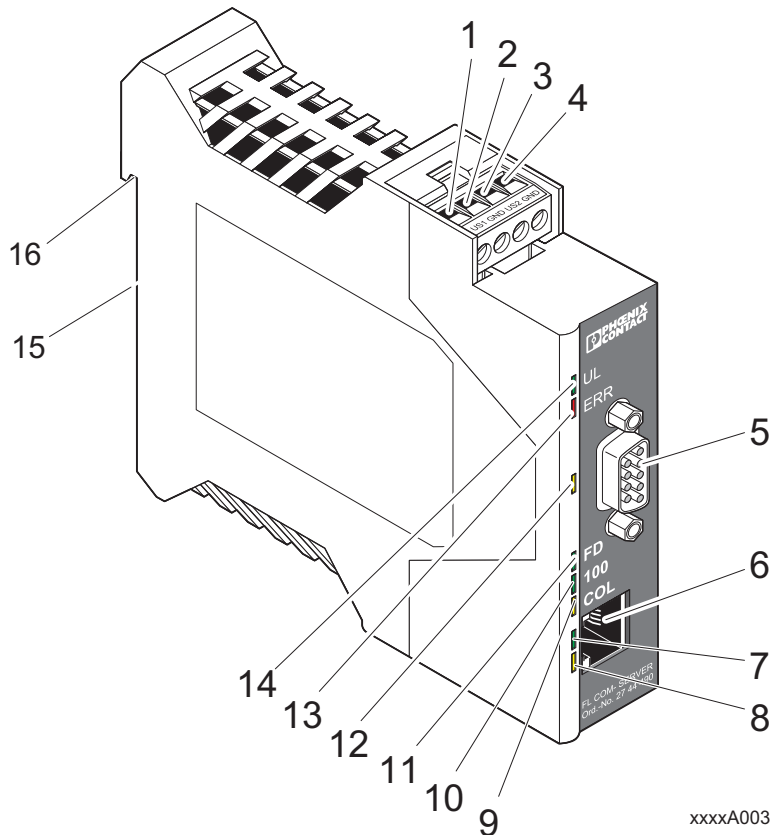

Figure 07

7. Function Elements

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Figure 08

1. 24 V AC/DC ±20%, plug-in screw terminal block
2. 0 V
3. Not used
4. Not used
5. V.24 (RS-232) or RS-485 connection, 9-pos. D-SUB male connector
6. Ethernet connection, RJ45
7. Green LED, LINK status TP port
8. Yellow LED, data transmission TP port, dynamic
9. Yellow LED, data collision TP port
10. Green LED, 100 Mbps transmission speed TP port
11. Green LED, full duplex data transmission TP port
12. Yellow LED, V.24 (RS-232)/RS-485 receive data, dynamic
13. Red LED, error display
14. Green LED, supply voltage
15. Bus connector for redundant power supply (covered)
16. Functional earth contact (covered)