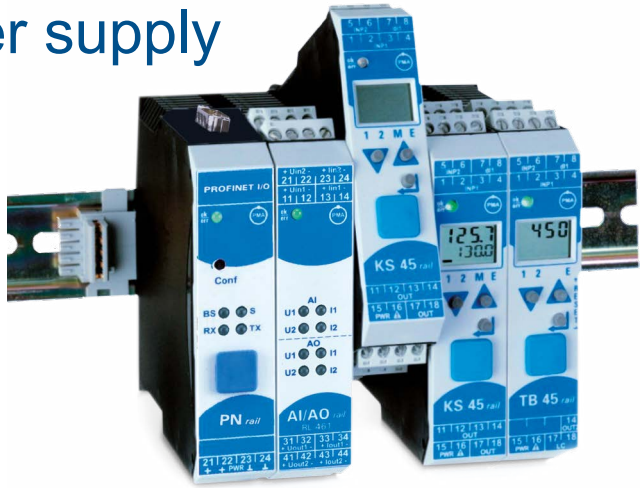
WEST Control Solutions

Datasheet

PMA Rail Line

Field bus couplers and power supply



Overview

The Rail Line system is designed to offer high accuracy data acquisition and independent control, monitoring and supervision in decentralised automation installations. The fieldbus couplers described in this document are communication gateways to the surrounding automation infrastructure. They can be used in combination with KS45, TB45, CI45, SG45 and all Rail Line I/O-extension modules

Key Features

- Fieldbus couplers to remote access a system of Rail Line modules
- Supported fieldbuses:
  - CANopen
  - PROFIBUS DP
  - MODBUS RTU
  - MODBUS/TCP
  - PROFINET IO
- Compact design, only 22.5 mm wide
- Clips onto top-hat DIN rail
- Plug-in screw terminals or spring-clamp connectors
- Direct communication between rail-mounted modules
- Central 24 VDC supply
- Function modules replaceable during operation (hot swap)
- Central configuration port for BlueControl®
- 2 data formats (integer & float)

Description

System Design

Rail-line consists of a bus coupler for„top hat“ rail mounting and the possibility to connect up to 62 I/O-modules.
The I/O modules are interconnected by means of quick-connect plugs.
One power supply module must be installed per 16 I/O modules.

Internal communication

An internal bus connects the I/O modules with the bus coupler module, where the statuses/values of the connected I/Os are continuously updated and stored. The stored data also contains information about the type and diagnostic results of the relevant I/O module. The scanning cycle depends on the type and number of installed modules and the bus load.

Data Acess

The process data that is to be transmitted
can be defined in the Engineering for every function module.
Up to 15 values can be read or written.
The data are always available in the bus coupler, thus ensuring fast responses to requests. Similarly, the fieldbus interface can be used to transfer the complete Engineering.

Interfaces and Engineering Tools

The fieldbus coupler as well as the connected function modules, can be configured with the BlueControl® software via the BluePort®interface

FIELDBUS COUPLER PROFIBUS-DP

General

PROFIBUS-DP slave interface to IEC 61158
Reading & writing of process data, parameters, and configuration data for DPV0.
A-cyclical DPV1 services for Master Classes 1 and 2
Connection via PROFIBUS Sub-D connector

Physical connection:	RS 485
Transmission speed:	9.6…1,200 kBit/s self-adapting
Address range:	1...99 via rotary switch
Number of units per bus	32

Cable lengths

Bit rate	max. length per segment
9.6 … 93.75 kbits/s	1,200 m
187.5 kbits/s	1,000 m
500 kbits/s	400 m
1.5 Mbits/s	200 m
3 …12 Mbits/s	100 m

Terminating resistor

external, fitted in connector

Cable

to IEC 61158, Type A.

Protocol

- PROFIBUS DPV1

GSD file

west-cs.co.uk/downloads

DPV1 functions

The extended PROFIBUS functions for DPV1 can be used for the standardized, non-cyclical transmission of parameters, etc. RLDP supports the following non-cyclical DPV1 services:

- a connection to the DP Class 1 Master (e.g. PLC):Read, Write, Alarm, Alarm_ Ack.
- two connections to the DP Class 2 Master (e.g. operating/engineering stations): Initiate, Abort, Read, Write

Upload/download of an Engineering via the PROFIBUS between BlueControl® and RLDP is possible via the DPV1 services (for PROFIBUS links supplied by Hilscher, e.g. CIF50-PB, CIF60-PB).

DISPLAY AND OPERATION

Indicator LEDs

OK / Err. (3-colour):	device status
BS (yellow):	fieldbus status
BF (red):	faulty parameter or configuration telegram
S (yellow):	system bus status
D (yellow):	diagnosis

Address selector

2 rotary coding switches	0...99

Fig.: 1: Dimensions RL DP

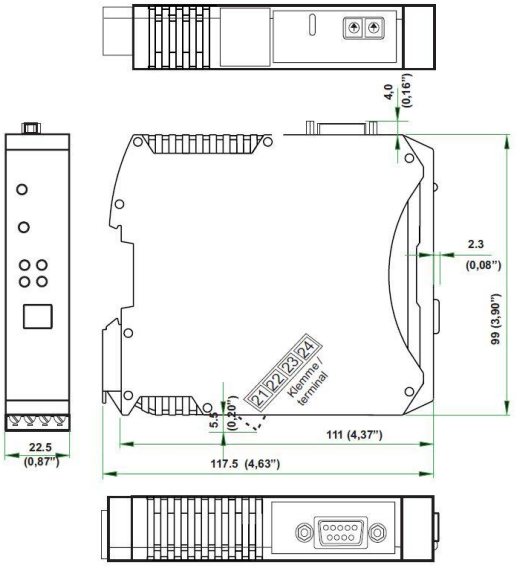


Fig.: 2: communicative possibilities

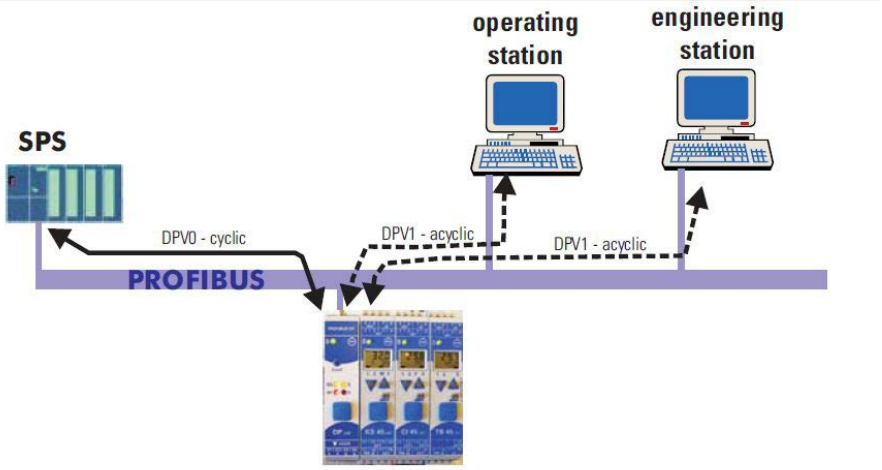
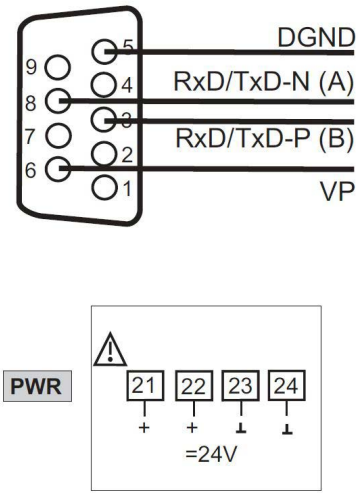


Fig.: 3 : Buscoupler PROFIBUS DP

Fig.: 4: Connection buscoupler



ETHERNET MODBUS/TCP

Ethernet interface with TCP/IP protocol, Reading & writing of process data, parameters, and configuration data via application protocol MODBUS/TCP. Connection via RJ45-connector

Network connection

Ethernet RJ45 femal connector 10/100BaseT to IEEE802.3

Transmission speed

10 / 100 MBit/s

Cable

Copper conductors, twisted pair, 4 wires Type Cat5

Permissible cable lengths

Ethernet segment length: 100 m (with Cat5 cables)

Protocol

TCP/IP protocol
MODBUS/TCP - Server via port 502 Connectable to 4 Clients at the same time
max. 16 connections

DISPLAY AND OPERATION

Indicator LEDs

ok/err: (3-colour)	device status
BS (yellow):	fieldbus status
S (yellow):	system bus status
RX (yellow):	Ethernet data receiving
TX (yellow):	Ethernet data transmission

Address selection

by means of Engineering Tool BlueControl® or BOOTP protocol

Fig. 5: Dimensions RL ETH

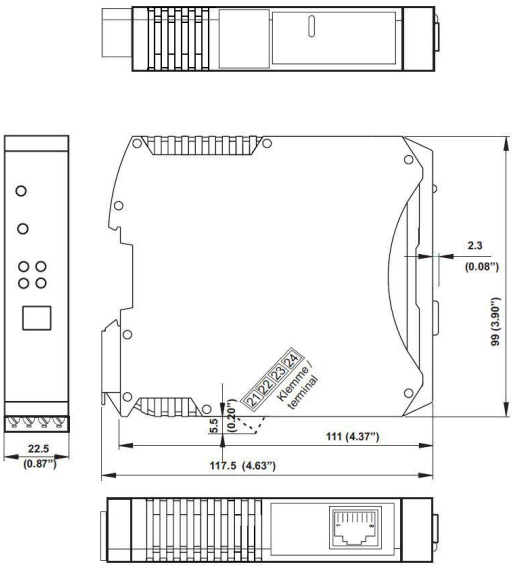
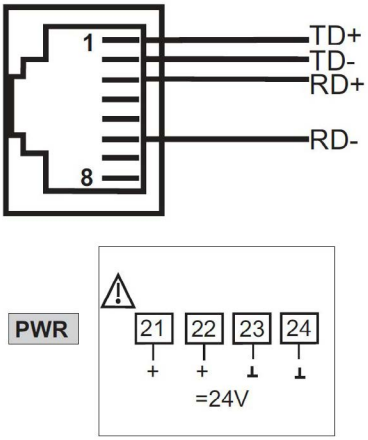


Fig. 6 Bus coupler Ethernet

Fig. 7: Connections RL ETH



GENERAL TECHNICAL DATA

POWER SUPPLY

24 VDC supply

Voltage: 19,2...30 VDC
Power consumption of bus coupler: max. 4 W
Power for module energization: max. 5 A
Supply only with safe low voltages (SELV)
Protected against reversed polarity and overvoltage
Behaviour with power failure
System configuration: Permanent storage in EEPROM

BLUEPORT® FRONT INTERFACE

Connection to the module front via a PC adapter (see 'Accessories').

The BlueControl® software enables

- The fieldbus coupler and
- The connected modules

to be configured, parameters set, and operated.

SYSTEM BUS INTERFACE

Internal bus for connecting modules via the system interface.
Connection via bus connector fitted in the top-hat rail.

ENVIRONMENTAL CONDITIONS

Protection class

Module front: IP 20
Housing: IP 20
Terminals: IP 20

Permissible temperatures

Operation: -10...55 °C
Storage: -25...60 °C
Transport: -25...85°C

Humidity

KUF to DIN 40 040
75% yearly average, no condensation

Shock and vibration

Vibration test Fc (DIN EN 60068-2-6)
Loading: 5 g
Duration: 2 h in every axis

Shock test Ea (DIN EN 60068-2-27)

Shock: 25 g
Duration: 11 ms

Electromagnetic compatibility

Complies with EN 61 326-1 for continuous, unattended operation.
Emissions:

- within the limits for Class A devices.

Immunity:
complies with the test requirements for devices used in industrial areas.

GALVANIC ISOLATION

Supply voltage, fieldbus, and logic circuits are isolated from each other.
Insulation voltage: 500 VDC

GENERAL

Housing front

Material: Polyamide PA 6.6
Flammability class: V0 (UL 94)

Connecting terminals

Material: Polyamide PA
Flammability class:
V0 (UL 94) for screw terminals
V0 (UL 94) for bus connectors

System bus connectors

Insertions under load: max. 5

Electrical safety

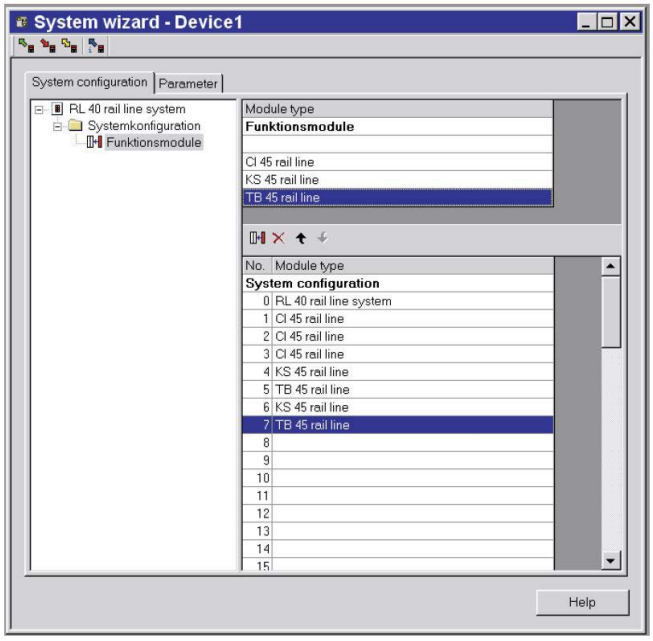
Complies with EN 61 010-1:Over-voltage category II
Contamination degree 2
Protection class II

Electrical connections

Plug-in connector strips with choice of terminal type:

- Screw terminals or spring-clamp terminals, both for lead cross- sections from 0.2 to 2.5 mm².

Fig.: 8: System assistant



Mounting

Clip-on rail mounting (35 mm top-hat rail to EN 50 022).
Locked by means of metal catch in housing base.
Stacked mounting possible.
Mounting position: vertical

Weight:

0.16kg

Standard accessories

– Operating instructions
– Bus connector for fitting into top-hat rail
– Connection for power supply: screw terminal connector

CERTIFICATIONS

- CE (standard)
- cULus-certification (Type 1, indoor use) File: E 208286

ACCESSORIES

POWER SUPPLY MODULE

Applications

- Supplementary supply of additional modules
- Distribution in different installation levels
- Provision of separated potential levels

Note:
- No stacked mounting with other system modules permitted (fieldbus coupler, other supply modules)
- Bus connection has to be realized locally by means of plugs for bus connection (see accessories)

Number of modules per supply module: 16 *
Connection: direct, via system bus in the top-hat rail

BLUECONTROL® (ENGINEERING TOOL)

PC software package for system con- figuration, parameter setting, and operating (commissioning) the fieldbus coupler.
Central Engineering Tool for configuring, parameter setting, and operating the connected function modules.

Software requirements:

Windows operating system

Hardware requirements:

A special PC adapter (see 'Additional Accessories') is required for connecting to the device.
Updates and demo software from:
www.west-cs.co.uk

ORDERING INFORMATION

System components	
Fieldbus coupler CANopen	RL40-111-00000-U00
Fieldbus coupler PROFIBUS DP	RL40-112-00000-U00
Fieldbus coupler MODBUS RTU	RL40-113-00000-U00
Fieldbus coupler MODBUS TCP	RL40-114-00000-U00
Fieldbus coupler Profinet IO	RL40-115-00000-U00
Power supply module	RL40-119-00000-U00

ACCESSORIES

Description		Order-No.
Connector-set screw terminal	4 pcs.	9407-998-07101
Connector-set spring-clamp terminal	4 pcs.	9407-998-07111
Top-hat rail bus-connector	1 pcs.	9407-998-07121
Plug for bus connection, inverted, connections at left, horizontal cable entry	1 pcs.	9407-998-07131
Plug for bus connection, connections at right, vertical cable entry	1pcs	9407-998-07141

ADDITIONAL ACCESSORIES

Description		
PC adapter for the BluePort® front interface		9407-998-00001
USB serial adaptor (USB to RS 232)		9407-998-00081
Converter RS 232 to RS 422/485	galv. isolated	ADAM-4520-D
BlueControl® Mini		www.west-cs.co.uk
BlueControl® with Basic license rail line		9407-999-12001
BlueControl® with Expert license rail line		9407-999-12011

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