3.5.4 PROFINET - EPM-S140

The bus coupler module represents the interface between the process level (I/O level) and the higher-level fieldbus. The control signals on the process level are transmitted by the I/O compound modules via the internal backplane bus.

Features

- PROFINET I/O-Device according to IEC 61158
- Up to 64 I/O compound modules can be connected to a PROFINET bus coupler module
- Integrated power supply unit for the internal voltage supply and the voltage supply of the connected I/O compound modules
  - Power supply unit supplied via an external DC voltage source
- Integrated 2-port switch
  - Ethernet connection via 2 RJ45 sockets (P1, P2)
  - Auto negotiation (negotiating the transmission parameters)
  - Auto crossover (transmit and receive path are automatically crossed if required)
- Setting of the PROFINET address via coding switch
- LEDs for status display

Overview

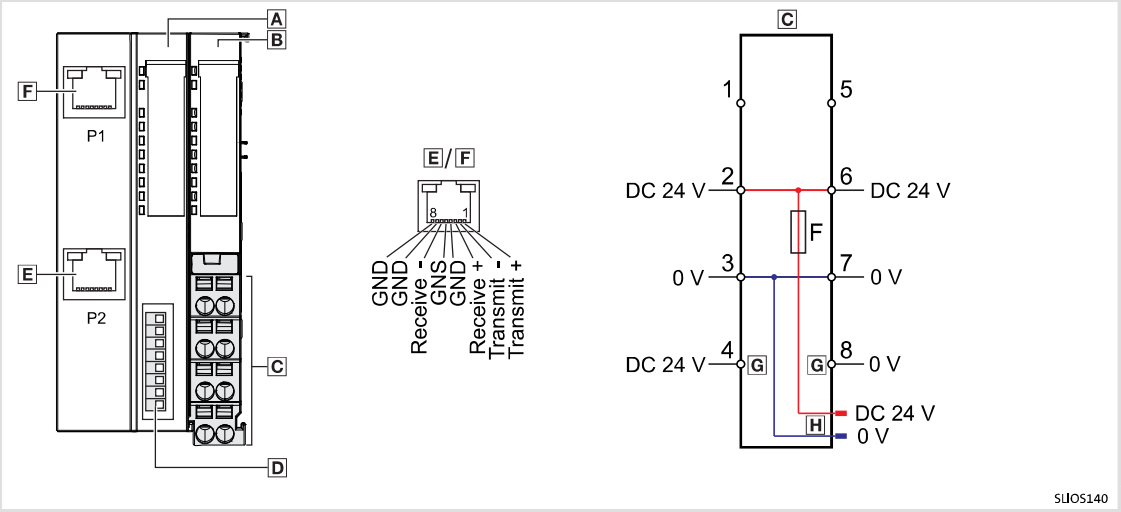
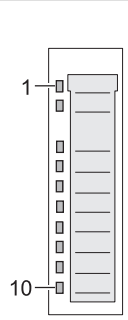


Fig. 3-12 Elements and circuit diagram of voltage supply

- A Displays for station and fieldbus status
- B Displays for electronics and I/O supply status
- C Terminals for the voltage supply
- D Coding switch for setting the PROFINET address
- E RJ45 socket for connection to the fieldbus (P1)
- F RJ45 socket for connection to the fieldbus (P2)
- G Electronic supply
- H I/O supply

Status displays

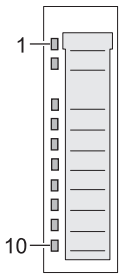
Fieldbus status LEDs A

View	Pos.	Designation	Colour	Explanation
	1	PWR	Green	On: bus coupler is supplied with voltage
	2	SF	Red	On: System error; error at PROFINET or at backplane bus
	3	BS	Green	Bus error; error in PROFINET communication
	4	MT	Yellow	Maintenance: PROFINET maintenance request
	5	LINK1	Green	Physical connection to PROFINET (P1)
	6	ACT1	Green	Communication via PROFINET (P1)
	7	LINK2	Green	Physical connection to PROFINET (P2)
	8	ACT2	Green	Communication via PROFINET (P2)
	9	-	-	Not assigned
	10			

PWR	SF	BS	MT	LINK1	ACT1	LINK2	ACT2	Status
Green	Red	Green	Yellow	Green	Green	Green	Green	
On	-	-	-	-	-	-	-	The PROFINET bus coupler is supplied with voltage.
On	Off	0.5 Hz	-	[On]	-	[On]	-	It is not possible to establish a connection with the PROFINET I/O controller. A connection to the switch, however, exists (no AR is active) LNK1 or LNK2 is on.
On	Off	On	-	Off	Off	Off	Off	There is no physical connection to the Ethernet. LNK1 and LNK2 are off.
On	-	Off	-	[On]	Pulse	[On]	Pulse	A connection to a PROFINET I/O controller has been established (at least one AR is active) LNK1 or LNK2 is on.
On	On	-	-	-	-	-	-	• A diagnostic message not yet acknowledged is available. • Error at the backplane bus (e.g. module defective, bus disturbed). • Error at firmware update (only visible for a short time, afterwards restart).
On	2 Hz	On	-	On	-	On	-	IP address error • No valid IP address has been assigned. • The assigned IP address already exists in the system.
On	-	1 Hz	1 Hz	-	-	-	-	A firmware update is currently being executed. Here, BS and MT are blinking alternately.
On	-	-	-	2 Hz	-	2 Hz	-	Identification via DCP. Depending on the connection, LINK1 or LINK2 is blinking for 3 seconds with 2 Hz.
On	On	-	On	-	-	-	-	Maintenance request (Maintenance demanded/requested) • After the coupler has been parameterised, no sync frame has been received. • Jitter is outside the limits (renewed synchronisation). • Switch has rejected 10 frames (network overloaded). • Error at the system SLIO bus (version error).

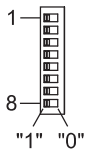
"-": Not relevant; "x Hz": Blinking with x Hz; "[an]": Option; "Puls": Pulsating

Module status LEDs A

View	Pos.	Designation	Colour	Explanation
	1	PWR IO	Green	On: I/O supply okay
	2	PF IO	Red	On: Fuse for I/O supply is defective
	3	PWR	Green	On: Electronic supply okay
	4	PF	Red	On: Fuse for electronic supply defective
	5	-	-	Not assigned
	6			
	7			
	8			
	9			
	10			

Control elements

Coding switch PROFINET address D

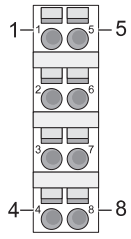
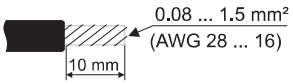
View	Pos.	Valency	Example	
			Switching status	Node address
	1	-	-	No function
	2	1	1	Profinet name: "EPM-S140-xxx" with xxx = decimal value of position 2 ... 8; for example: 19_{dec} → xxx = 19
	3	2	1	
	4	4	0	
	5	8	0	
	6	16	1	
	7	32	0	
	8	64	0	

Important switch positions

Pos.	Status	Behaviour at restart
2 ... 8	0	Profinet-compliant (IEC 61158-6-10, IEC 61784-2) ● IP address./subnet mask comes from flash memory. ● Profinet name comes from flash memory.
2 ... 8	[1 ... 127]	● IP address./subnet mask comes from flash memory. ● Profinet name: EPM-S140-xxx (with xxx = decimal value of position 2...8): Profinet name with I/O controller cannot be changed.

Terminals

Module terminals, spring terminals C

View	Designation	Explanation	Terminal data
 SLIO002	1	Not assigned	
	2	I/O supply +24 V DC	
	3	I/O supply 0 V	
	4	Electronic supply +24 V DC	
	5	Not assigned	
	6	I/O supply +24 V DC	
	7	I/O supply 0 V	
	8	Electronic supply 0 V	

Note!

- Terminals 2 and 6 as well as 3 and 7 are bridged internally. Please note that the **max. permissible bridge current is 5 A**.
- Both the I/O supply and the electronic supply are protected against overload internally by a fuse. When the fuses have been tripped, the main supply of the bus coupler (EPM-S700) must be replaced (📖 776).

PROFINET, RJ45 socket D

View	Pin	Assignment	Explanation
 SLIO065	1	Transmit +	Transmitted data plus
	2	Transmit -	Transmitted data minus
	3	Receive +	Received data plus
	4	GND	Ground
	5	GND	Ground
	6	Receive -	Received data minus
	7	GND	Ground
	8	GND	Ground

Technical data

Rated data EPM-S140	
Electrical data	
Supply voltage	
Nominal value	DC 24 V
Permissible range	DC 20.4 ... 28.8 V
Current consumption	
Nominal value	0.95 A
In idle state	0.095 A
Starting current	3.9 A
I^2t	0.14 A^2s
Current output, max.	
At the backplane bus	3 A
Load supply	7 A (if no UL conformity is required: max. 10 A)
Polarity reversal protection	Yes
Power loss	3 W

Rated data EPM-S140	
Status, alarm, diagnostics	
Status display	Yes
Alarms	Yes, parameterisable
Process alarm	Yes, parameterisable
Diagnostic alarm	Yes, parameterisable
Diagnostic function	Yes, parameterisable
Diagnostic information can be read out	Possible
Supply voltage display	Green LED
Maintenance display	Yellow LED
Group error display	Red LED
Channel error display	None
System limits	
Mounting racks, max.	
Modules per mounting rack	64
communication	
Fieldbus	PROFINET-IO
Physics	Ethernet 100 Mbits
Connection	2 x RJ45
Electrical isolation	Yes
Transmission speed	100 Mbps
Address range	
Inputs, max.	512 bytes
Outputs, max.	512 bytes