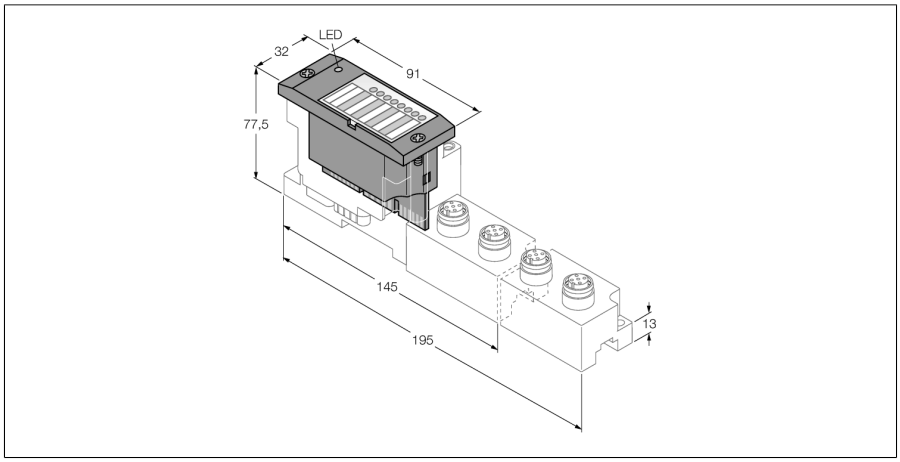
BL67 electronic module
Connection of SSI Encoders
BL67-1SSI



- Independent of the fieldbus and connection technology used
- Protection class IP67
- LEDs indicate status and diagnostic
- Electronics galvanically separated from the field level via optocouplers
- Connection of SSI encoder
- Transmission rate, max. 1Mbps

Functional principle

BL67 electronic modules are plugged on the purely passive base modules which in turn are connected to the field devices. The separation of connection level and electronics simplifies maintenance considerably. Flexibility is enhanced because the user can choose between base modules with different connection technologies.

The electronic modules are completely independent of the higher level fieldbus through the use of gateways.

Type	BL67-1SSI
ID	6827191
Number of channels	1
Supply voltage	24 VDC
Nominal voltage V_i	24 VDC
Nominal current from field supply	≤ 50 mA
Nominal current from module bus	≤ 50 mA
Max. sensor supply I_{sens}	500 mA not short-circuit proof
Power dissipation, typical	≤ 1 W
Transmission signals	CL, D
Connection type	4-wire full duplex (clock output/signal input)
Transmission rate	62.5 kbps up to 1 Mbps
Parameters	transmission rate, diagnostics, data format (binary-/GRAY-coded), data frame bits (1-32), number of invalid bits (LSB: 0-15, MSB 0-7)
Cable length	30 m
Electrical isolation	isolation of electronics and field level via optocouplers
Output connectivity	M12, M23
Number of diagnostics bytes	1
Number of parameter bytes	4
Number of input bytes	8
Number of output bytes	8

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Dimensions (W x L x H)	32 x 91 x 59 mm
Approvals	CE, cULus
Ambient temperature	-40…+70 °C
Storage temperature	-40…+85 °C
Relative humidity	5…95 % (internal), level RH-2, no condensation (when stored at 45 °C)
Vibration test	Acc. to EN 61131
- up to 5 g (at 10 to 150 Hz)	for mounting on DIN rail no drilling according to EN 60715, with end bracket
- up to 20 g (at 10 up to 150 Hz)	for mounting on base plate or machinery Therefore every second module has to be mounted with two screws each.
Shock test	Acc. to IEC 60068-2-27
Drop and topple	acc. to IEC 68-2-31 and free fall to IEC 68-2-32
Electromagnetic compatibility	Acc. to EN 61131-2
Protection class	IP67
Tightening torque fixing screw	0.9…1.2 Nm

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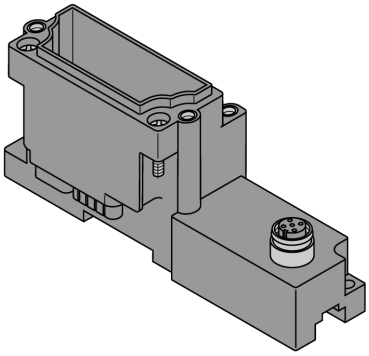
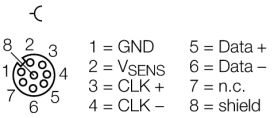
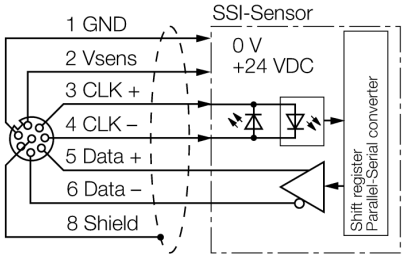
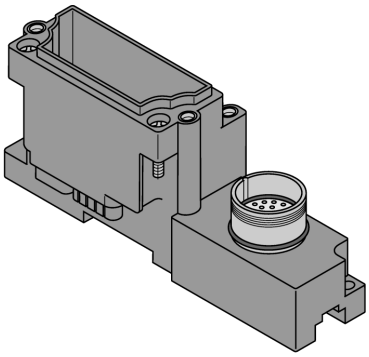
Compatible base modules

Dimension drawing	Type	Pin configuration
	**BL67-B-1M12-8** 6827193 1 x M12, 8-pole, female **Comments** Matching connection cable (for example): BS8181-0 Ident no. 6901004 For connection of SSI sensors paired, shielded sensor cable is recommended.	Pin Assignment  1 = GND 2 = V_{SENS} 3 = CLK + 4 = CLK – 5 = Data + 6 = Data – 7 = n.c. 8 = shield Wiring Diagram 
	**BL67-B-1M23** 6827213 1 x M23, 12-pole, female **Comments** Wiring diagram see above. matching connection cable (for example): FW-M23ST12Q-G-LT-ME-XX-10 Ident no. 6604070	Pin Assignment 1 = GND 2 = V_{SENS} 3 = CLK + 4 = CLK – 5 = Data + 6 = Data – 7 = n.c. 8 = shield 9 = n.c. 10 = n.c. 11 = n.c. 12 = n.c.

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LED display

LED	Color	Status	Meaning
D		OFF	No error message or diagnostics active.
	RED	ON	Failure of module bus communication. Check if more than 2 adjacent electronic modules are pulled. Relevant modules are located between gateway and this module.
	RED	FLASHING (0.5 Hz)	Upcoming module diagnostics
UP		OFF	No upward movement
	GREEN	ON	Upward movement
DN		OFF	No downward movement
	GREEN	ON	Downward movement

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Data mapping

DATA	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	n	STS STOP	x	x	ERR PARA	STS UFLW	STS OFLW	ERR SSI	SSI DIAG
	n+1	STS UP	STS DN	REL CMP2	FLAG CMP2	STS CMP2	REL CMP1	FLAG CMP1	STS CMP1
	n+2	REG WR ACEPT	REG WR AKN	x	x	SSI STS3	SSI STS2	SSI STS1	SSI STS0
	n+3	REG RD ABORT	x	REG RD ADR (MSB to LSB)					
	n+4	Data byte 0							
	n+5	Data byte 1							
	n+6	Data byte 2							
	n+7	Data byte 3							
Output	m	STOP	x	x	x	x	x	x	x
	m+1	x	x	x	CLR CMP2	EN CMP2	x	CLR CMP1	EN CMP1
	m+2	REG WR	x	REG WR ADR					
	m+3	x	x	REG RD ADR					
	m+4	Data byte 0							
	m+5	Data byte 1							
	m+6	Data byte 2							
	m+7	Data byte 3							

n = Offset of input data; depending on extension of station and the corresponding fieldbus.
m = Offset of output data; depending on extension of station and the corresponding fieldbus.

With PROFIBUS, PROFINET and CANopen, the I/O data of this module is localized
within the process data of the whole station via the hardware configuration tool of the fieldbus master.
With DeviceNet™, EtherNet/IP™ and Modbus TCP a detailed mapping table can be created
with the TURCK configuration tool I/O-ASSISTANT.

Note:
A software function module is available for simple handling of the synchronous serial interface (abbreviated SSI). This function module is available for the CoDeSys programmable BL67 gateway.

The actual sequence of the data of the SSI modules in the process data of the higher-level control system may vary from that shown here. The sequence in Profibus systems is generally the reverse (byte 0 complies with byte 7 etc.).

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