

Fig. 12/1 SIPROTEC 4 6MD61 IO-Box

Description

The SIPROTEC 4 6MD61 IO-Box enables in a simple, easy way to enhance the number of binary inputs and outputs in the switchgear. It can be used directly in the bay together with other SIPROTEC 4 units and also together with SICAM PAS to serve as a central process connection.

The IO-Box is based on the SIPROTEC 6MD63 and 6MD66 series, so it can be easily integrated in systems with other SIPROTEC 4 units.

The IO-Box supports a wide range of demand for additional binary inputs (BI) and binary outputs (BO), starting from 20 BI+10 BO and going up to 80 BI+53 BO. All important standard communication protocols are supported.

With IEC 61850-GOOSE communication, a direct information interchange with other SIPROTEC units is possible. For simplification and cost reduction, the IO-Box is available only without automation (CFC), without keypad and without display.

Function overview

Application

- Extension of number of inputs and outputs of bay controller
- Extension of number of inputs and outputs of protection unit
- Central process connection for SICAM PAS

Features

- Standard SIPROTEC hardware for easy configuration with DIGSI
- Full EMC compliance like all other SIPROTEC devices
- Housing can be used for surface mounting or flush mounting (units are always delivered with two mounting rails for surface mounting. These rails can be dismantled for flush mounting)
- Three types with different amount of inputs and outputs available

Monitoring functions

- Operational measured values (only 6MD612)
- Energy metering values (only 6MD612)
- Time metering of operating hours
- Self supervision of relay

Communication interfaces

- IEC 61850 Ethernet
- IEC 60870-5-103 protocol
- PROFIBUS-FMS
- PROFIBUS-DP
- Service interface for DIGSI 4 (modem)
- Front interface for DIGSI4
- Time synchronization via IRIG B / DCF77

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Application

Application

The following figures show the most important applications of the SIPROTEC IO-Box 6MD61.

The configuration shown in Fig. 12/2 allows direct GOOSE communication between the SIPROTEC 4 units (6MD66, 7SJ63) and the IO-Boxes, independent of the substation controller. Of course, this configuration is also possible without substation controller. The IO-Box is used as additional digital inputs and measurements (measurements only with 6MD612), and serves as an additional command output.

The communication between IO-Box and the substation controller is established by using the IEC 61850 standard protocol.

Fig. 12/3 shows a configuration in which the IO-Box is used as a central process connection in the cubicle of the substation controller. For example, cubicle signaling lamps or a signaling horn are controlled by the command relays of the IO-Box.

Fig. 12/4 shows the communication for substations with no Ethernet protocol used. In this case, all communication lines go directly to the substation controller. If information from the IO-Box is used for switchgear interlocking, the interlocking logic must be part of the substation controller.

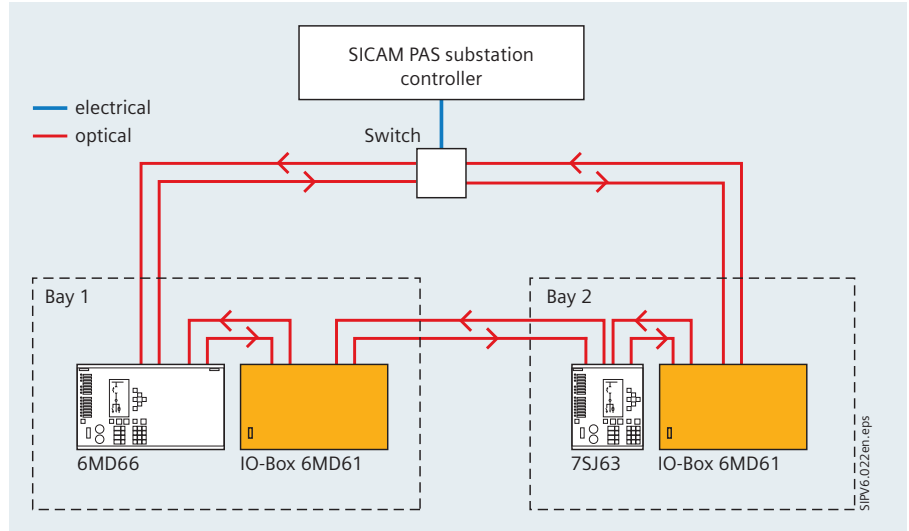


Fig. 12/2 Configuration with IO-Box in IEC 61850 substation

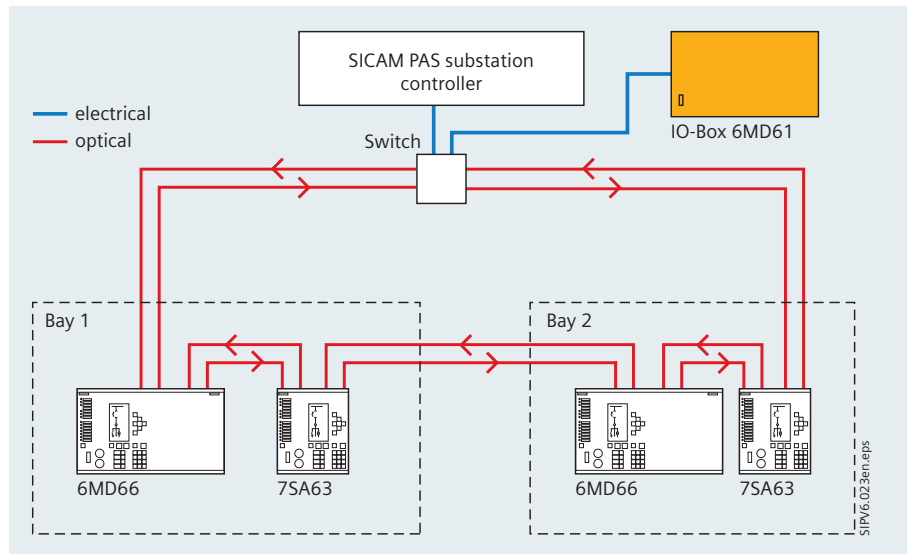


Fig. 12/3 IO-Box as central input/output for SICAM PAS substation controller

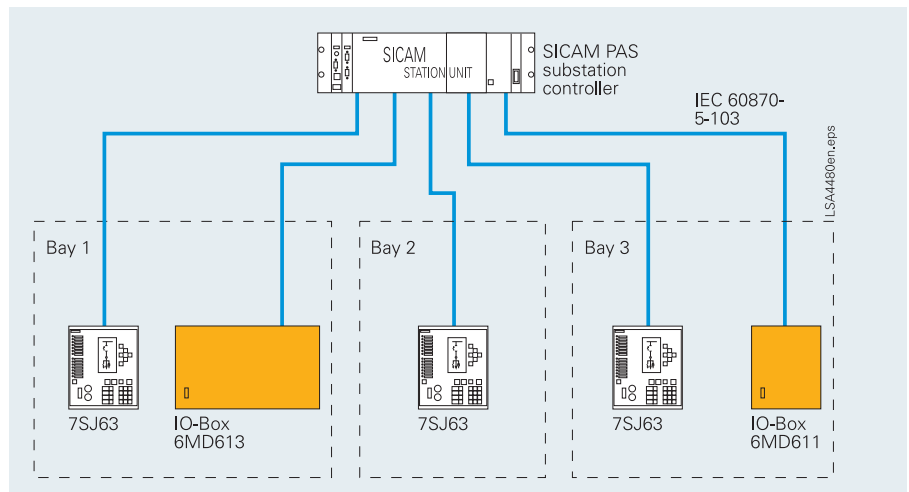


Fig. 12/4 Direct connection of IO-Boxes and protection relays to substation controller via standard protocol

Description	Order No.	Order code
6MD61 IO-Box	6MD61	-0AA0-
20 binary inputs, 6 command relays, 4 (2) power relays, 1 live status contact (similar to 6MD634) in ½ 19" housing	1	
33 binary inputs, 14 command relays, 8 (4) power relays, 1 live status contact, 2 x 20 mA, 3 x V, 4 x I, (similar to 6MD636) in ½ 19" housing	2	
80 binary inputs, 53 command relays, 1 live status contact in ½ 19" housing	3	
Current transformer: rated current I_n		
No analog measured variables	0	
1 A ²⁾	1	
5 A ²⁾	5	
Rated auxiliary voltage (power supply, indication voltage)		
24 to 48 V DC, threshold binary input 19 V	2	
60 V DC, threshold binary input 19 V ²⁾	3	
110 V DC, threshold binary input 88 V ²⁾	4	
220 to 250 V DC, 115 to 230 V AC, threshold binary input 176 V for input No. 8-80 for 6MD613 (C-I/O 4), otherwise threshold 88 V ²⁾	5	
Unit version		
Surface-mounting case, without HMI, mounting in low voltage compartment, screw-type terminals (direct wiring / ring lugs), also usable as flush-mounting case		F
Region-specific default settings/function versions and language settings		
Region DE, 50 Hz, language: German, changeable		A
Region World, 50/60 Hz, language: English (GB), changeable		B
Region US, 60 Hz, ANSI, language: English (US), changeable		C
Region FR, language: French, changeable		D
Region World, language: Spanish, changeable		E
System interface (on rear of unit, port B)		
No system port	0	
IEC 60870-5-103 protocol, electrical RS232	1	
IEC 60870-5-103 protocol, electrical RS485	2	
IEC 60870-5-103 protocol, optical 820 nm, ST connector	3	
PROFIBUS-FMS Slave, electrical RS485	4	
PROFIBUS-FMS Slave, fiber, double ring, ST connector	6	
PROFIBUS DP Slave, electrical RS485	9	L O A
PROFIBUS-DP Slave, 820 nm fiber, double ring, ST connectors	9	L O B
IEC 61850, 100 BaseT (100 Mbit Ethernet electric, double, RJ45 connector)	9	L O R
IEC 61850, 100 Mbit Ethernet, fiber optic, double, LC connectors	9	L O S
Function interface (on rear of unit, port C)		
No function port	0	
DIGSI 4, RS232	1	
DIGSI 4, RS485	2	
DIGSI 4, 820 nm fiber, ST connector	3	

1) Only for position 6 = 2

2) Thresholds can be changed (jumper) for each binary input between 19 V and 88 V, for 6MD613 BI No. 8-80 also to 176 V.

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Connection diagram

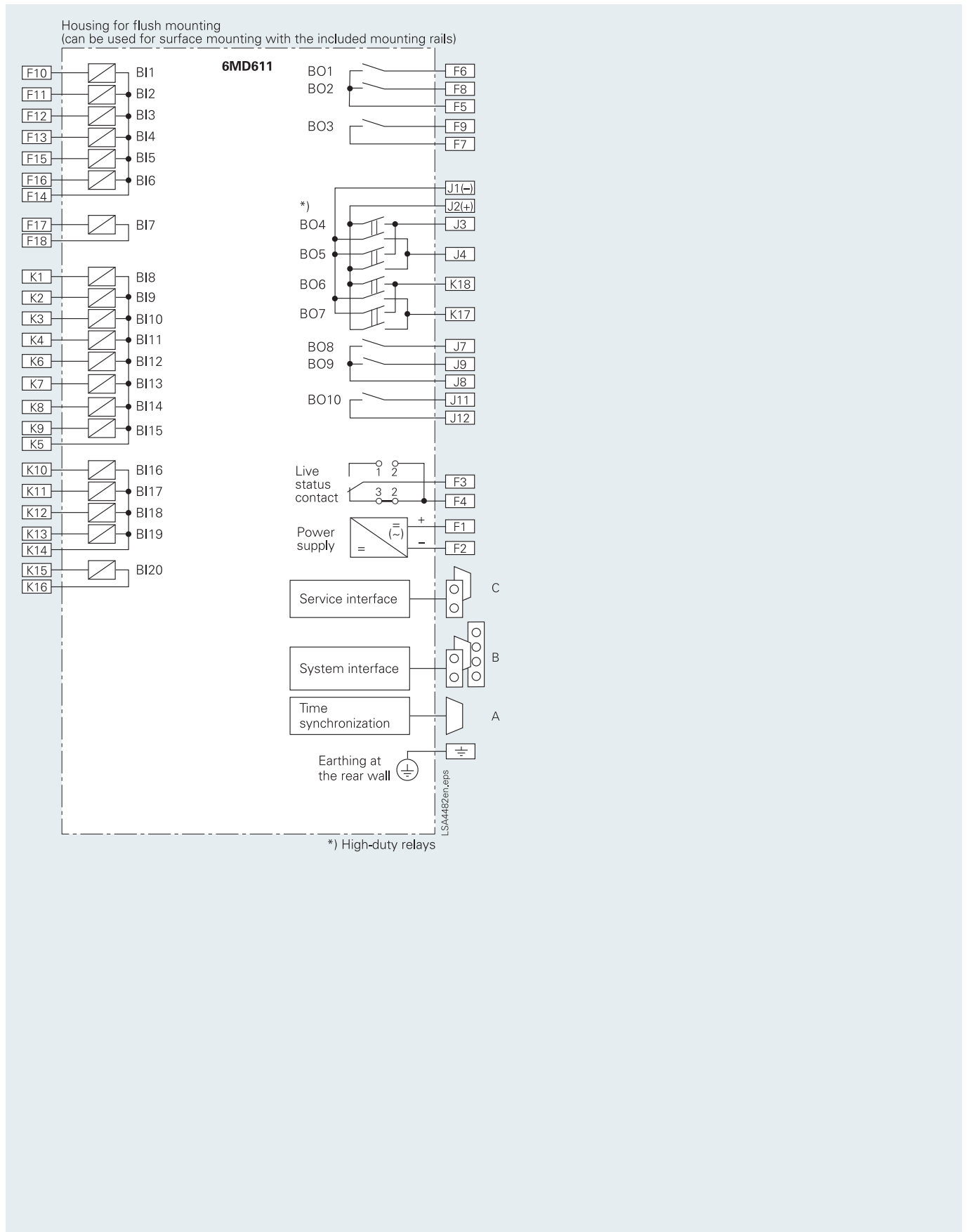


Fig. 12/5 Connection diagram

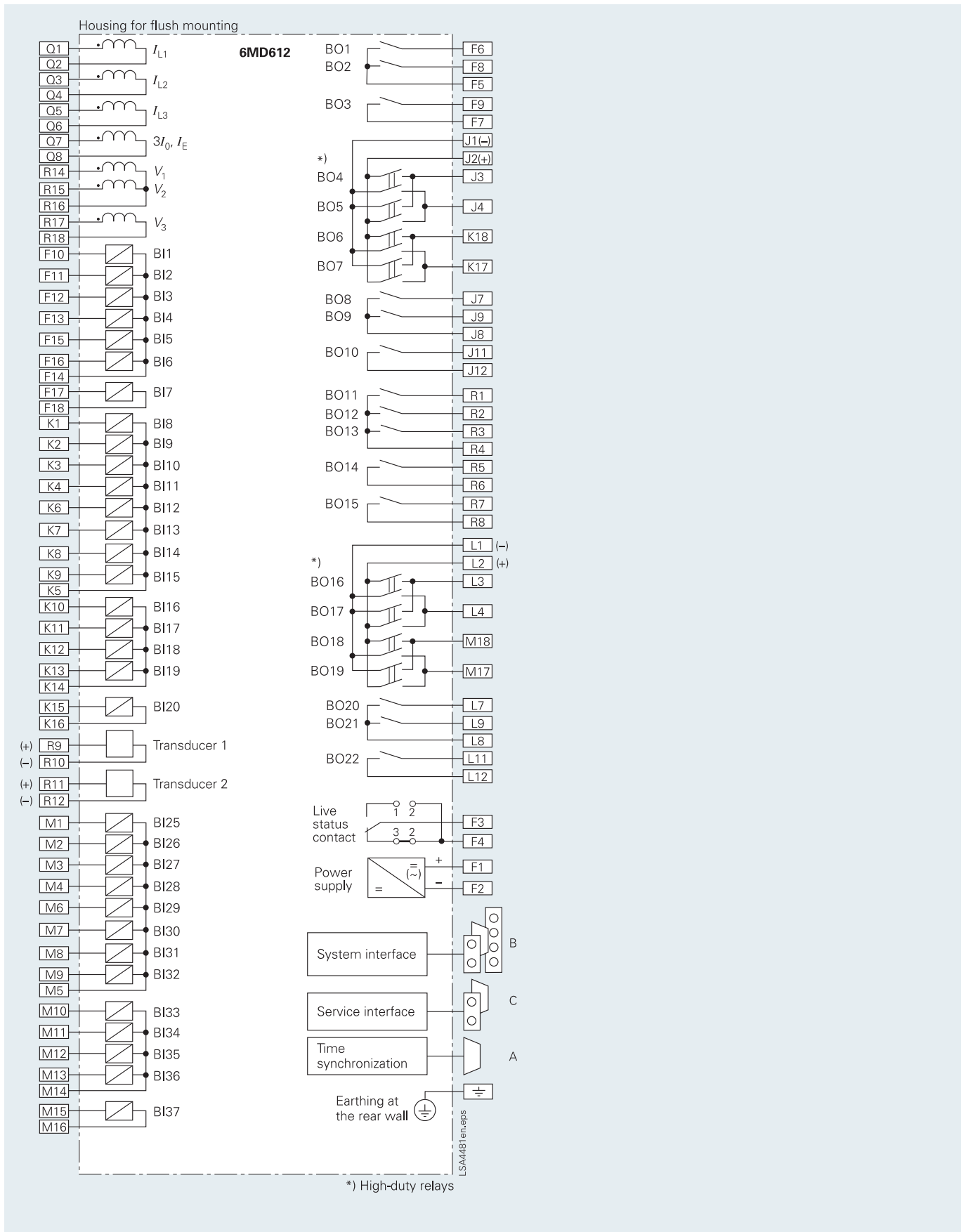


Fig. 12/6 Connection diagram

Connection diagram

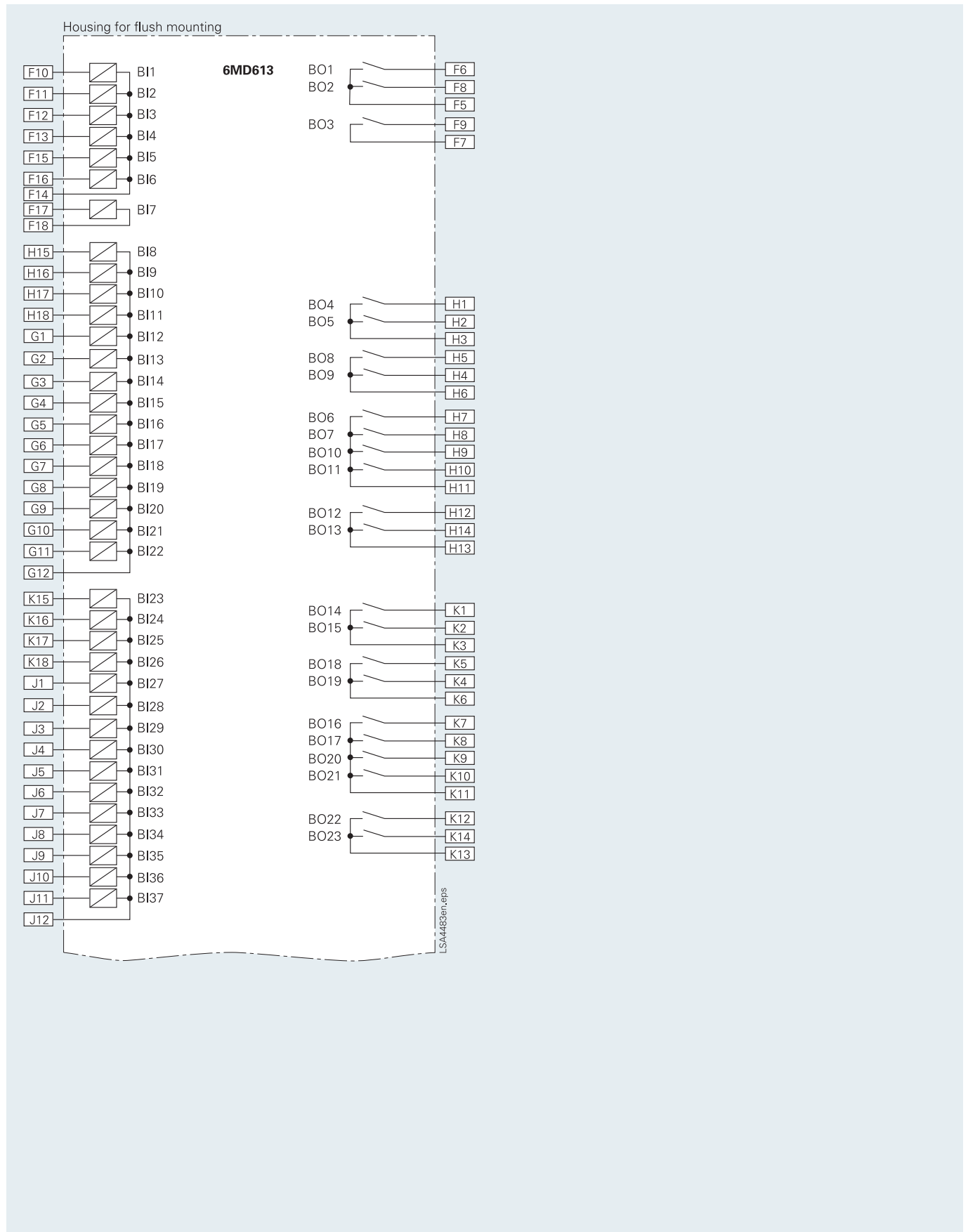


Fig. 12/7 Connection diagram, part 1; continued on the following page

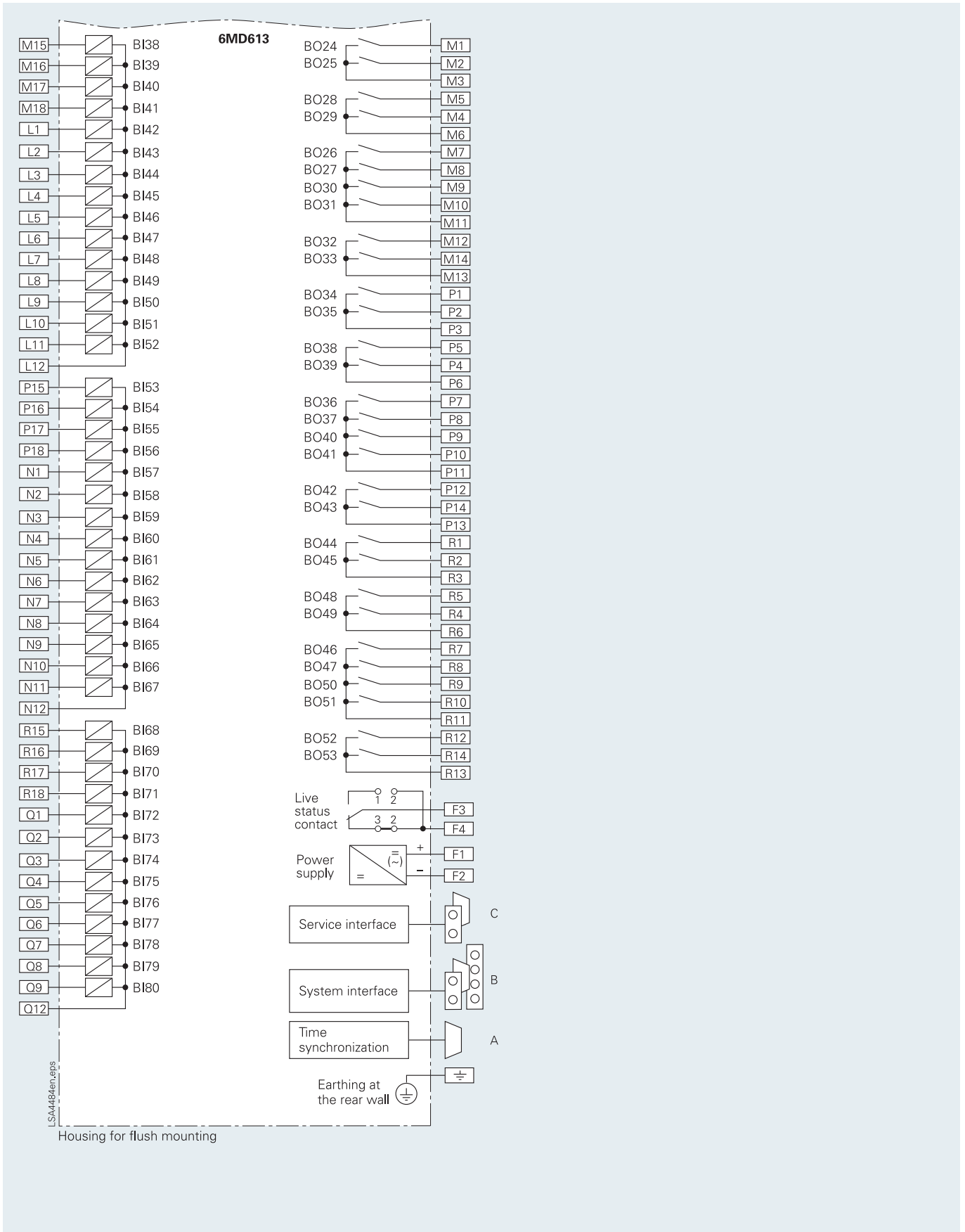


Fig. 12/8 Connection diagram part 2