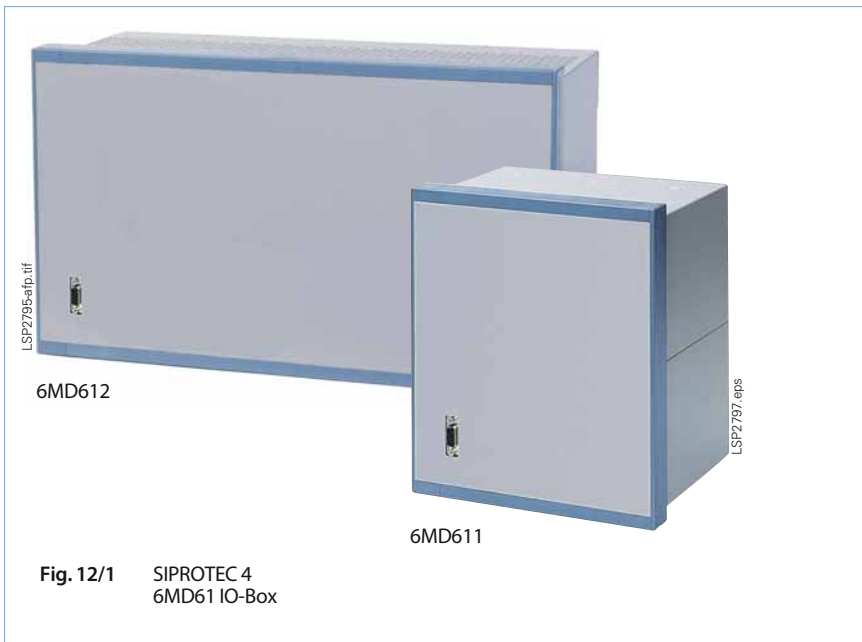


## SIPROTEC 4 6MD61 IO-Box



### Description

The SIPROTEC 4 IO-Box 6MD61 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 SIPROTEC4 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

### 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.

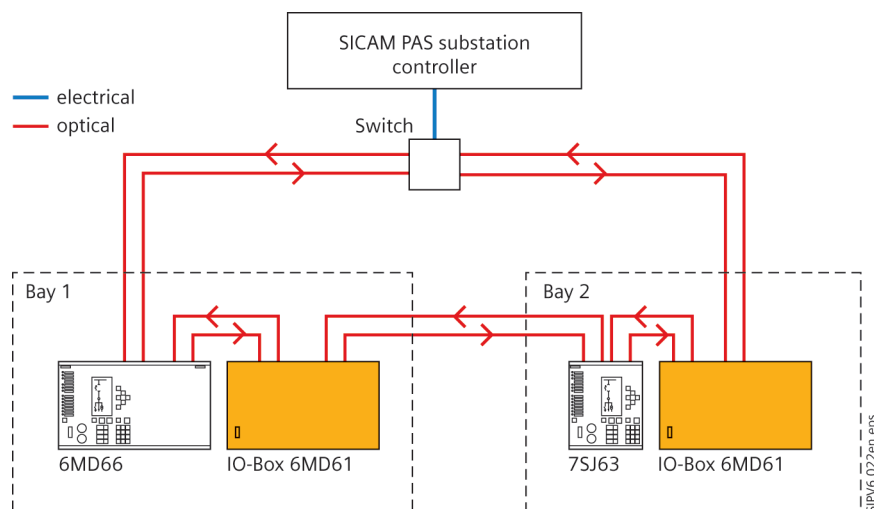


Fig. 12/2 Configuration with IO-Box in IEC 61850 substation

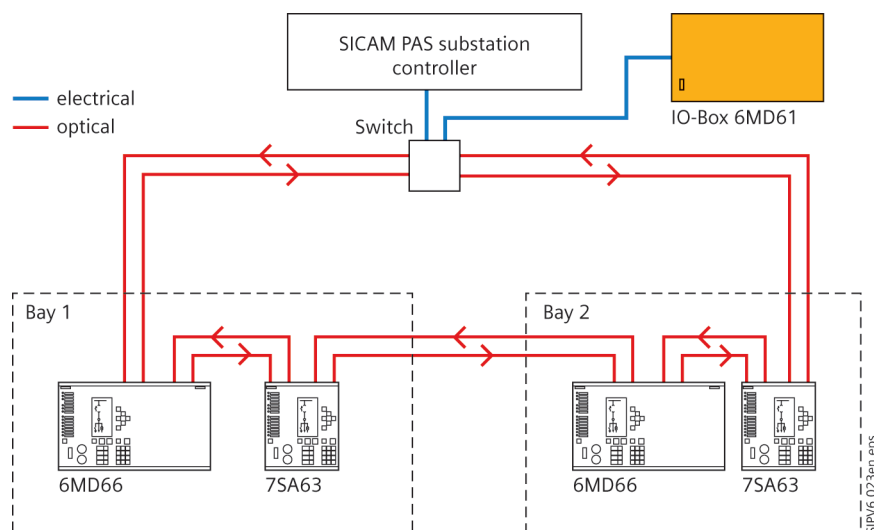


Fig. 12/3 IO-Box as central input/output for SICAM PAS substation controller

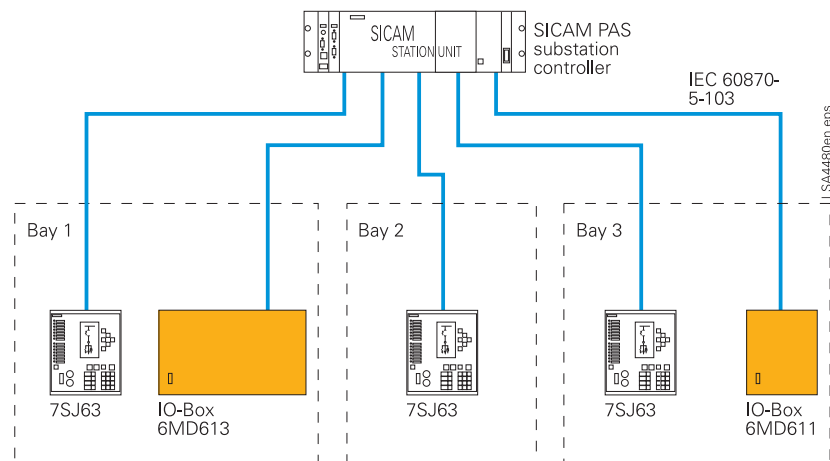


Fig. 12/4 Direct connection of IO-Boxes and protection relays to substation controller via standard protocol

## Selection and ordering data

Description	Order No.	Order code
<b>6MD61 IO-Box</b>	<b>6MD61</b> □□ – □□□□ – 0AA0 □□□	
20 binary inputs, 6 command relays, 4 (2) power relays, 1 live status contact (similar to 6MD634) in 1/2 19" housing	1	
33 binary inputs, 14 command relays, 8 (4) power relays, 1 live status contact, 2 x 20mA, 3 x V, 4 x I, (similar to 6MD636) in 1/1 19" housing	2	
80 binary inputs, 53 command relays, 1 live status contact in 1/1 19" housing	3	
<b>Current transformer: rated current <math>I_n</math></b>		
no analog measuring	0	
1 A <sup>1)</sup>	1	
5 A <sup>1)</sup>	5	
<b>Rated auxiliary voltage (power supply, indication voltage)</b>		
24 to 48 V DC, threshold binary input 19 V	2	
60 V DC, threshold binary input 19 V <sup>2)</sup>	3	
110 V DC, threshold binary input 88 V <sup>2)</sup>	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 <sup>2)</sup>	5	
<b>Unit design</b>		
Surface mounting case, without HMI, mounting in low voltage compartment, screw-type terminals (direct wiring / ring lugs), also usable as flush mounting case	F	
<b>Region-specific default settings/function and language presets</b>		
Region DE, 50 Hz, language German (changeable)	A	
Region World, 50/60Hz, language English (GB) (changeable)	B	
Region USA (ANSI), 60 Hz, language English (US) (changeable)	C	
Region FR, language French (changeable)	D	
Region World, 50/60Hz, language Spanish (changeable)	E	
<b>System interface (on rear of unit, port B)</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
<b>Function interface (on rear of unit, port C)</b>		
no function port	0	
DIGSI 4, RS232	1	
DIGSI 4, RS485	2	
DIGSI 4, 820nm 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.

## Connection diagram

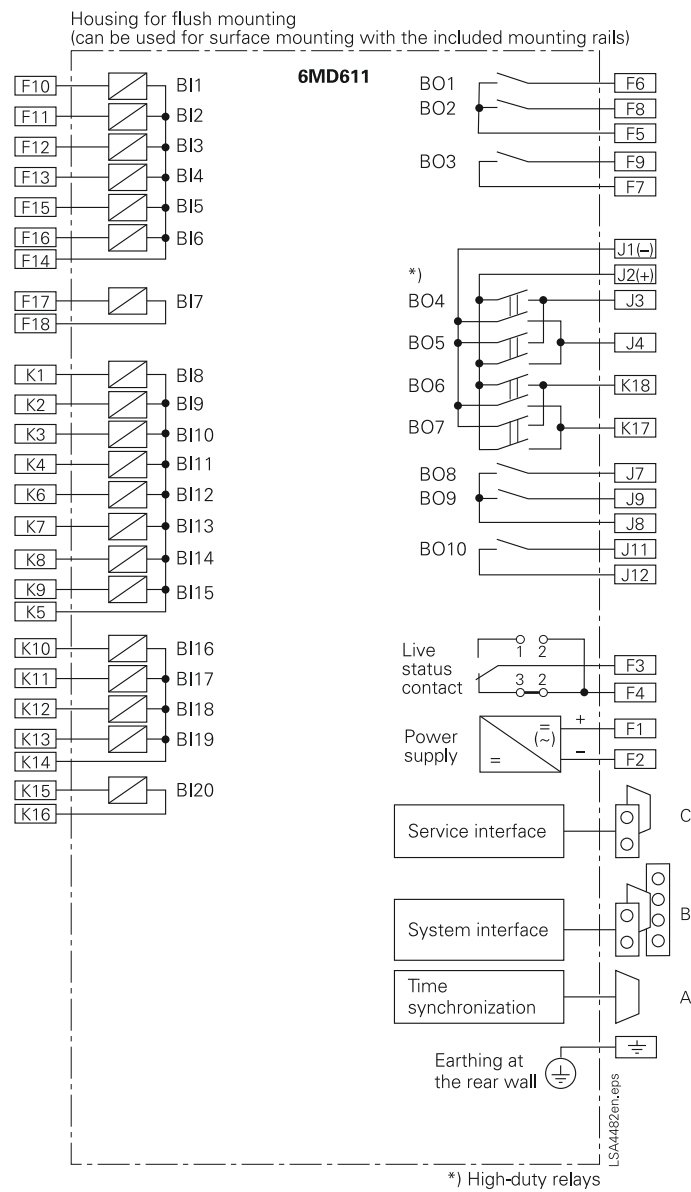


Fig. 12/5 Connection diagram

## Connection diagram

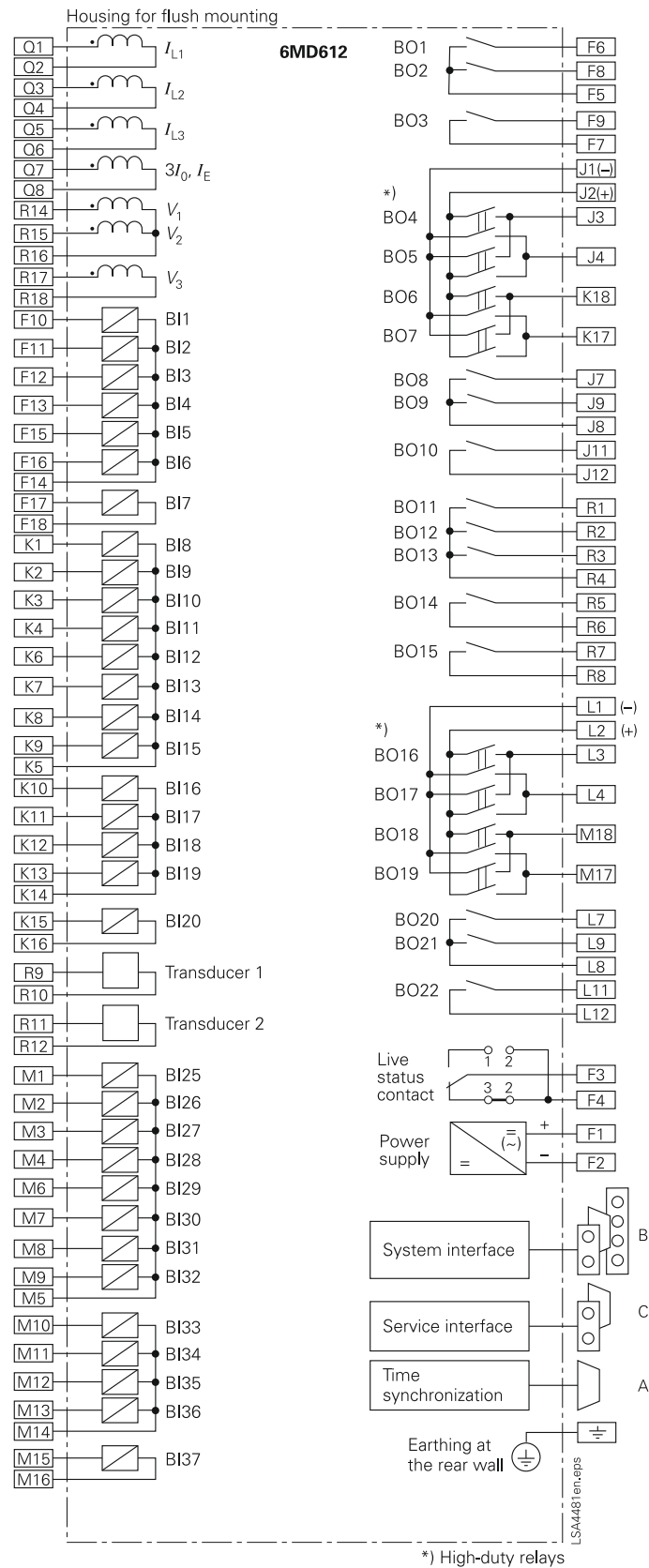
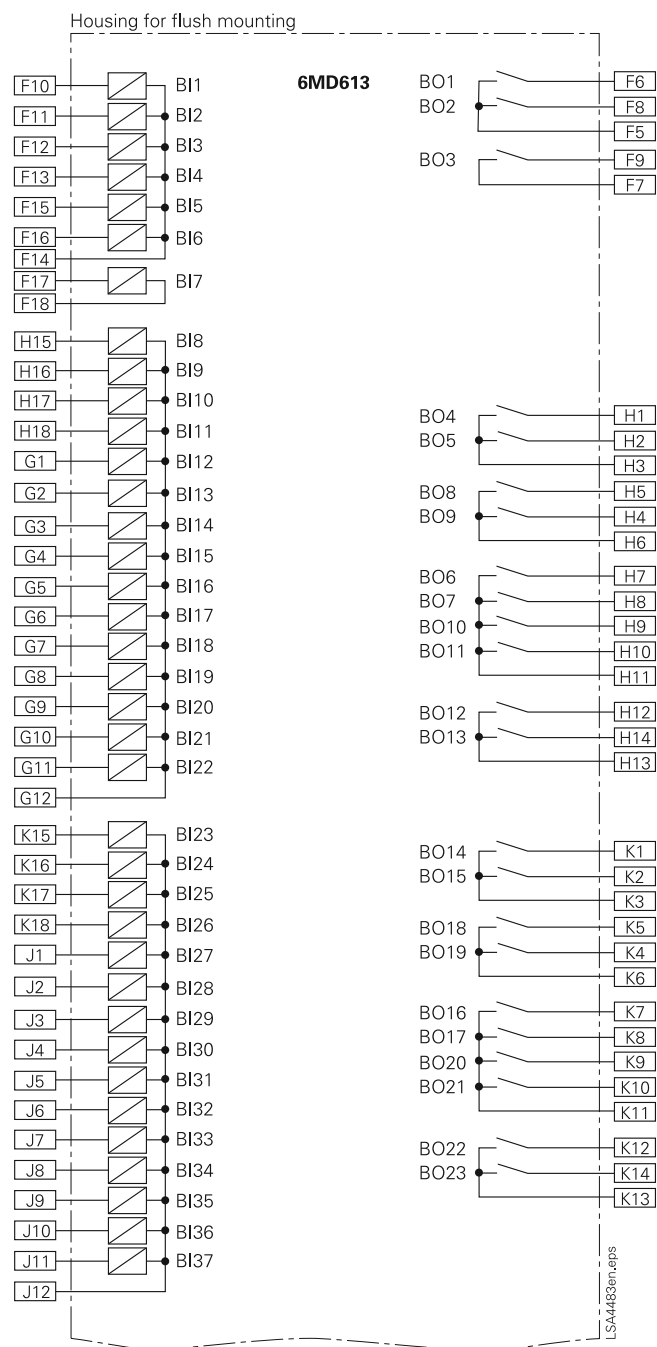


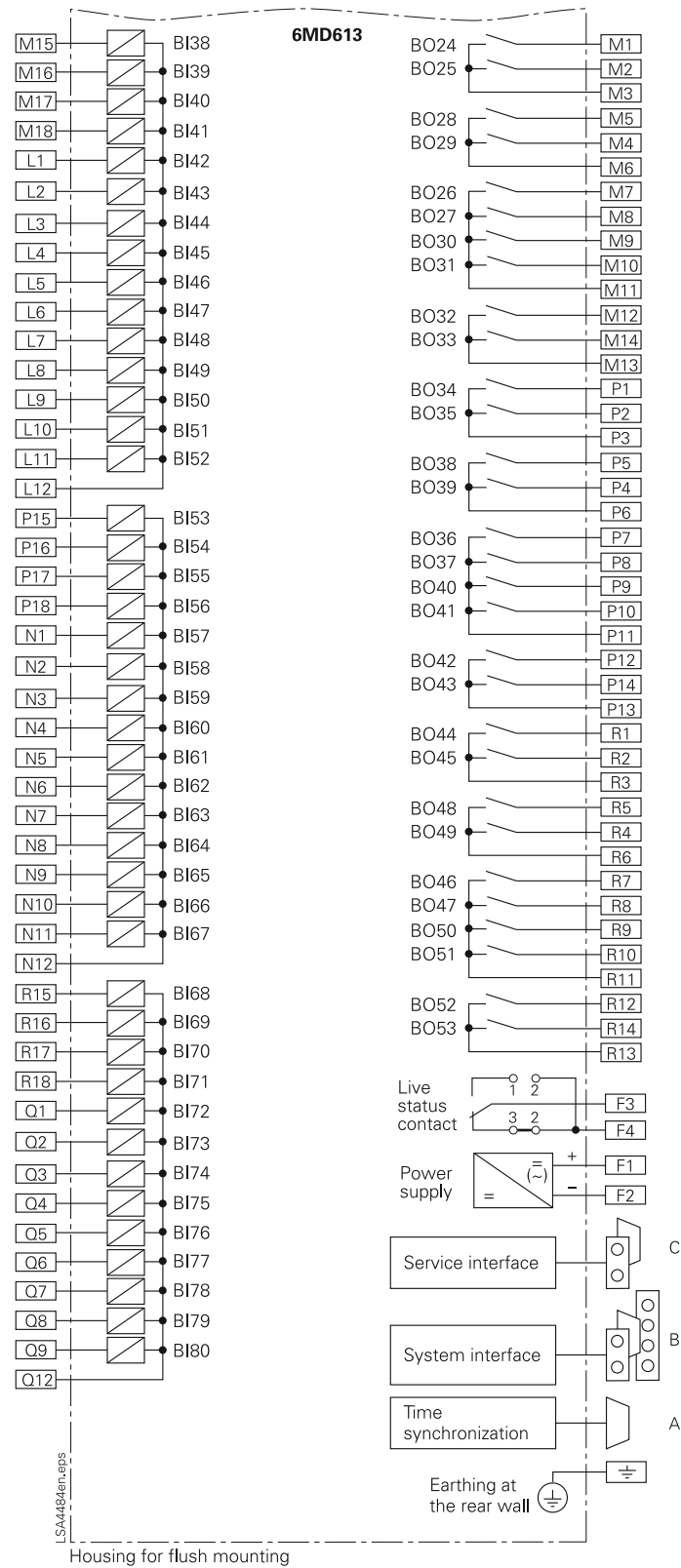
Fig. 12/6 Connection diagram

## Connection diagram



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

## Connection diagram



**Fig. 12/8** Connection diagram  
part 2