

Description

The SIPROTEC 6MD85 bay controller is a general-purpose control and automation device with protection function. It has been designed for utilization on all voltage levels, from distribution to transmission. As a part of the SIPROTEC 5 family, it allows the use of a large number of protection functions from the SIPROTEC library. The modular hardware permits action-related IOs to be integrated. Adapt the hardware exactly to your requirements and rely on future-oriented system solutions with high investment security and low operating costs.

| | |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Main function | Bay controller for medium voltage and high to extra-high voltage switchgear with integrated operation and extensive protection functions. Powerful automation, simple configuration with DIGSI 5 |
| Inputs and outputs | 5 predefined standard variants with 4 current transformers, 4 voltage transformers, 11 to 75 binary inputs, 9 to 41 binary outputs |
| Hardware flexibility | Flexibly adjustable and expandable I/O quantity structure within the scope of the SIPROTEC 5 modular system. For great requirements placed on the quantity structure, the device can be extended in the second row. For example, this permits an additional 240 binary inputs (and more) to be used with the IO230 (see chapter "Hardware") |
| Housing width | 1/3 × 19" to 2/1 × 19" |

Functions

DIGSI 5 permits all functions to be configured and combined as required.

- Integrated bay controller with versatile protection function from medium to extra-high voltage
- Control of switching devices
- Synchrocheck and switchgear interlocking protection
- Integrated electrical Ethernet RJ45 for DIGSI 5 and IEC 61850 (reporting and GOOSE)
- Up to 4 pluggable communication modules, usable for different and redundant protocols (IEC 61850, IEC 60870-5-103, IEC 60870-5-104, DNP3 (serial and TCP), Modbus TCP)
- Redundancy protocols PRP and HSR
- Arc protection
- Cyber security in accordance with NERC CIP and BDWE White-paper requirements
- Graphical logic editor to create powerful automation functions in the device
- Optional overcurrent protection for all voltage levels with 3-pole tripping
- Also used in switchgear with breaker-and-a-half configuration
- Selective protection of overhead lines and cables with single-ended and multi-ended feeders using protection communication
- Overcurrent protection also configurable as emergency function



[SIP5_GD_SS_W3, 1, --, --]

Figure 2.15/2 SIPROTEC 6MD85 bay controller (1/3 device with 1/6 expansion module with key switch operation panel)

- Secure serial protection data communication, also over great distances and all available physical media (fiber-optic cable, 2-wire connections and communication networks)
- Capturing operational measured variables and protection function measured values to evaluate the plant state, to support commissioning, and to analyze faults
- Synchrophasor measured values integrated with IEEE C37.118 protocol (PMU)
- Powerful fault recording (buffer for a max. record time of 80 s at 8 kHz or 320 s at 2 kHz)
- Auxiliary functions for simple tests and commissioning
- Flexibly adjustable I/O quantity structure within the scope of the SIPROTEC 5 modular system

Applications

The SIPROTEC 6MD85 bay controller is a general-purpose control and automation device with protection function on the basis of the SIPROTEC 5 system. The standard variants of the SIPROTEC 6MD85 are delivered with instrument transformers. Furthermore, protection-class current transformers are also possible in SIPROTEC 6MD85 so that protection functions can be used. Due to its high flexibility, it is suitable as selective protection equipment for overhead lines and cables with single-ended and multi-ended infeed with two ends when protection communication is used. The device supports all SIPROTEC 5 system properties. It enables future-oriented system solutions with high investment security and low operating costs.

Application example

Application templates are available in DIGSI for standard applications. They comprise all basic configurations and default settings.

The following application templates are available:

SIPROTEC 5 Devices and Fields of Application

Bay Controllers – SIPROTEC 6MD85

SIPROTEC 6MD85 standard

- Double-busbar feeder with switchgear interlocking.

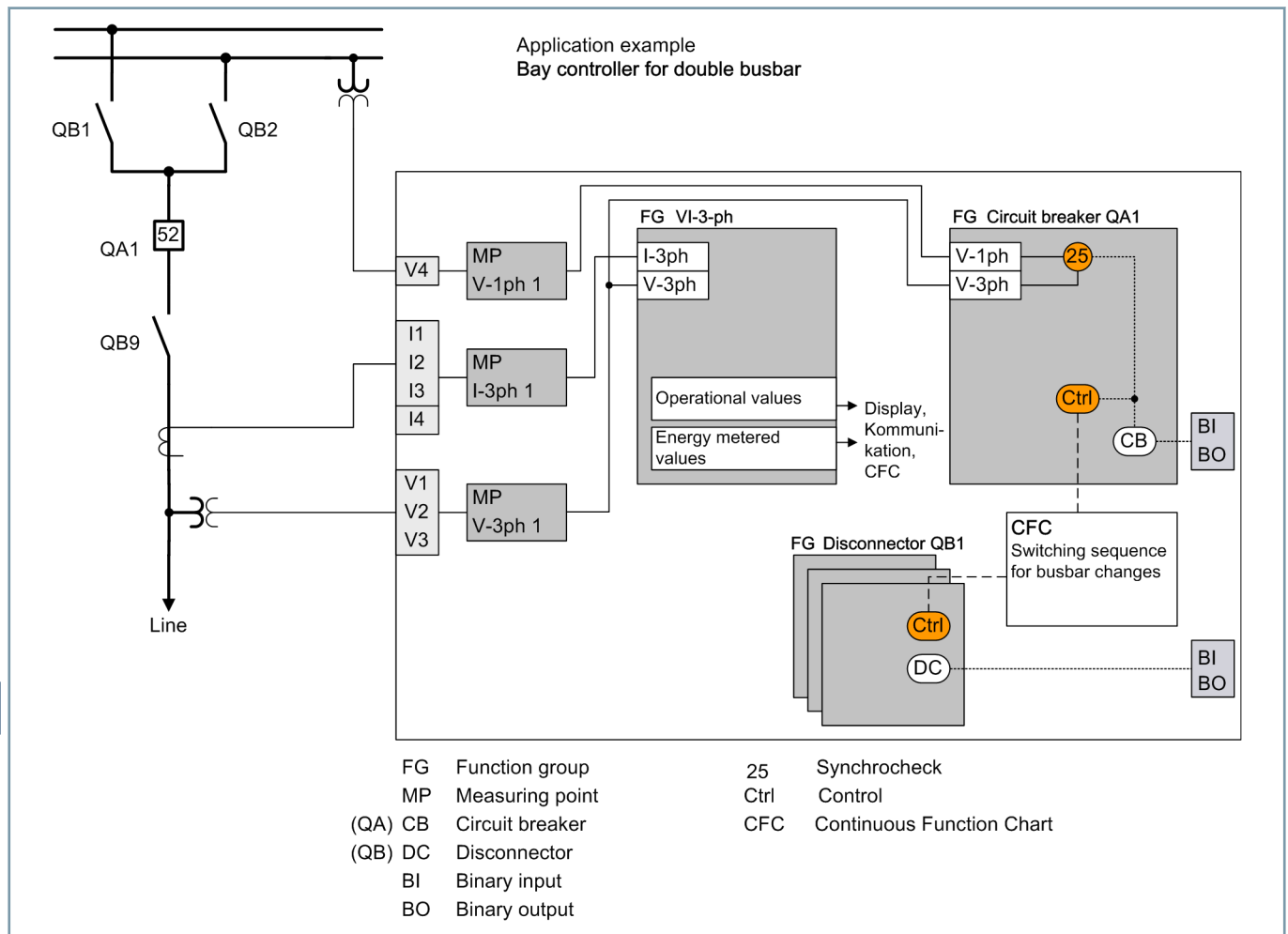
SIPROTEC 6MD85 extended control

- Additionally to 6MD85 standard, this includes the CFC blocks for switching sequences and arithmetic
- Switching sequence for automatic busbar transfer preconfigured (started by function key).

Application example with switching sequence

Figure 2.15/3 shows a simple application example with a 6MD85 on a double busbar. The circuit-breaker function group

contains the synchrocheck. The disconnectors are also controlled by one function group each. Operational measured values and energy measured values are calculated in the function group VI_3-phase, and are available for output on the display, transmission to the station automation system and processing in the CFC. A switching sequence stored in the CFC which is triggered via a function key causes an automatic busbar transfer.



[dw_6MD8-Bsp-Application-1, 1, en_US]

Figure 2.15/3 Application example: Bay controller 6MD85 for double busbar with switching sequence for busbar transfer

SIPROTEC 5 Devices and Fields of Application

Bay Controllers – SIPROTEC 6MD85

Functions, application templates

| ANSI | Functions | Abbr. | Available | Template | | |
|------------------------|----------------------------------------------------------------------------------|------------------|-----------|----------|---|----|
| | | | | 1 | 2 | 3 |
| | Protection functions for 3-pole tripping | 3-pole | ■ | ■ | ■ | ■ |
| | Hardware quantity structure expandable | I/O | ■ | ■ | ■ | ■ |
| 25 | Synchrocheck, synchronizing function | Sync | ■ | | | |
| 27 | Undervoltage protection: "3-phase" or "universal Vx" | V< | ■ | | | |
| 32, 37 | Power protection active/reactive power | P<>, Q<> | ■ | | | |
| 38 | Temperature Supervision | θ> | ■ | | | |
| 46 | Negative sequence overcurrent protection | I2> | ■ | | | |
| 49 | Thermal overload protection | θ, I²t | ■ | | | |
| 50/51 TD | Overcurrent protection, phases | I> | ■ | | | |
| 50N/ 51N TD | Overcurrent protection, ground | IN> | ■ | | | |
| 50HS | High speed instantaneous overcurrent protection | I>>> | ■ | | | |
| | Instantaneous tripping at switch onto fault | SOTF | ■ | | | |
| 51V | Voltage dependent overcurrent protection | t=f(I,V) | ■ | | | |
| 59 | Overvoltage protection: "3-phase" or "pos.seq. V1" or "universal Vx" | V> | ■ | | | |
| 74TC | Trip circuit supervision | TCS | ■ | | | |
| 81 | Frequency protection: "f>" or "f<" or "df/dt" | f>, <, df/dt>, < | ■ | | | |
| 86 | Lockout | | ■ | | | |
| 90V | Automatic voltage control for 2 winding transformer | | ■ | | | |
| 90V | Automatic voltage control for 3 winding transformer | | ■ | | | |
| 90V | Automatic voltage control for grid coupling transformer | | ■ | | | |
| PMU | Synchrophasor measurement (1 PMU can be used for max. 8 voltages and 8 currents) | PMU | ■ | | | |
| AFD | Arc-protection (only with plug-in module ARC-CD-3FO) | | ■ | | | |
| | Measured values, standard | | ■ | ■ | | ■ |
| | Measured values, extended: Min, Max, Avg | | ■ | | | ■ |
| | Switching statistic counters | | ■ | ■ | | ■ |
| | Circuit breaker wear monitoring | ΣIx, I²t, 2P | ■ | | | |
| | CFC (Standard, Control) | | ■ | ■ | | ■ |
| | CFC arithmetic | | ■ | | | |
| | Switching sequences function | | ■ | | | ■ |
| | Inrush current detection | | ■ | | | |
| | External trip initiation | | ■ | | | |
| | Control | | ■ | ■ | | ■ |
| | Fault recording of analog and binary signals | | ■ | ■ | | ■ |
| | Monitoring and supervision | | ■ | ■ | | ■ |
| | Protection interface, serial | | ■ | | | |
| | Circuit Breaker | | ■ | ■ | | ■ |
| | Disconnecter | | ■ | ■ | | ■ |
| Function-points class: | | | | 0 | 0 | 20 |

2.15

Table 2.15/2 SIPROTEC 6MD85 - Functions and application templates

- 1 Standard
- 2 Not Configured
- 3 Extended Control