

DESIGO™ I/O modules

Switching modules

PTM1.2Q250 TM1.2Q250-M

for AC 24...250 V, with or without manual switching, double modules

Signal converters for connection to P-bus, with two independent on/off control outputs (binary control outputs) and potential-free changeover contacts.

Two versions:

- without manual switch
- with manual switch

Use

The two switching modules are used to:

- switch different types of units and loads, such as
 - power contactors
 - relays and semiconductor relays
 - motors
 - burners (control loop)
 - chillers and heat pumps (control loop)
 - solenoid valves
 - indicating units (optical or audible)
- drive actuators, e.g. air damper or valve actuators, to their fully open or fully closed positions

On applications where manual interventions are required, e.g. auxiliary operation, or to carry out service work, the switching module with the manual switches is used.

Functions

- Conversion of on/off signals delivered by the automation station via the P-bus to on/off commands for the plant.
- Indication of switching statuses of the control outputs:
 - lamp OFF: contact across terminals Q11-Q12 or Q21-Q22 closed
 - lamp ON: contact across terminals Q11-Q14 or Q21-Q24 closed (steady light)
 - The relays drop out (contact across terminals Q11-Q12, Q21-Q22 closed) when
 - the automation station is at fault
 - there is no correct P-bus telegram within 4 seconds
- Positions of manual switches:
 - AUTO: automatic operation, the switching status of the contacts is determined by the automation station
 - OFF: contact across terminals Q11-Q12, Q21-Q22 closed (relays dropped out)
 - ON: contact across terminals Q11-Q14, Q21-Q24 closed (relays picked up)
- Functions with manual control:
 - the positions of the manual switches can be identified (sensed) by the automation station
 - with the PTM1.2Q250-M module, manual control is also operational without the automation station when AC 24 V operating voltage is present at the I/O bar

Type summary

	Switching module without manual switches	PTM1.2Q250
	Switching module with manual switches	PTM1.2Q250-M
Delivery	Base and electronic module are supplied together but in separate boxes that are attached to one another.	
Accessories	For general accessories that are used in connection with the I/O modules, refer to data sheet N8105. Such accessories must be ordered separately.	

Equipment combinations

Automation stations	Basically, the I/O modules can be connected to any automation station with P-bus if the automation station supports the I/O functions on the software side. Refer to document Z8102, "I/O module system".
Field units	Any units of the Siemens product ranges can be connected if their signals are compatible with the module's inputs and outputs. It is also possible to use products of other manufacture if their signals are compatible and if they satisfy the relevant safety requirements.

Technical design

	<p>The signal flow between the automation station and the I/O module takes place via the process bus (P-bus) at an access cycle of 0.5 seconds.</p> <p>The relays' switching status is determined by the automation station.</p>
Notes	<p>The whole functionality of the I/O module comprises the module itself (hardware) and handling of the signals in the automation station (software). For a full understanding of the scope module functions, the relevant process sequences and possible choices available when configuring the user program must be taken into consideration.</p> <p>For the technical features common to all I/O modules, refer to document Z8102, "I/O module system".</p>

Modular unit with plastic casing, consisting of terminal base and electronic module which are plugged onto the I/O bar. The signals and voltages are picked up from contacts on the I/O bar.

The connecting terminals of the I/O modules arranged on the I/O bar are used in place of the block terminals for the external wiring usually installed in the control panel. They comply with the relevant standards and regulations and provide the test terminal function. Also, they can be fitted with plant-specific labels.

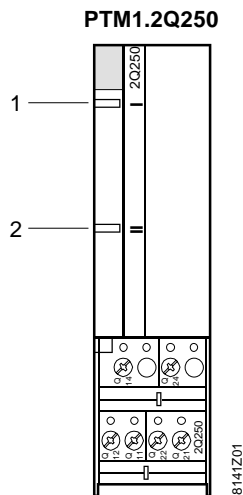
Transparent module front for insertion of the plant-specific module labels. The specifically prepared and perforated labels are marked with the help of the engineering tool for the building automation and control system. The space for the address plug, the signal lamps and, in the case of the PTM1.2Q250-M module, the slide switches for manual control, are also on the front of the module.

All I/O modules use the same accessories, which are shown on data sheet N8105.

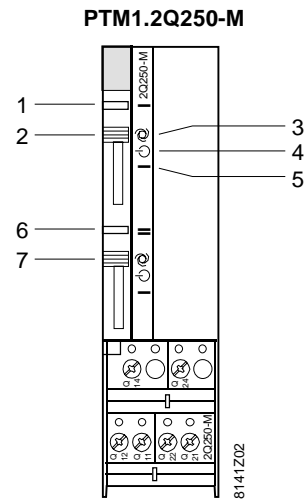
Note

For a more detailed description of the module's mechanical design, refer to document Z8102, "I/O module system".

Front views



- 1 Signal lamp for switching output I
- 2 Signal lamp for switching output II



- 1 Signal lamp for switching output I
- 2 AUTOMATIC/MANUAL switch
- 3 Switch position AUTOMATIC
- 4 Switch position MANUAL: OFF
- 5 Switch position MANUAL: ON
- 6 Signal lamp for switching output II
- 7 AUTOMATIC/MANUAL switch for switching output II (the other elements are the same as those of switching output I)

Engineering notes



The document Z8102, "I/O module system", contains system-related engineering know-how. It should be studied before reading the following sections while paying special attention to the information relating to safety.

Correct use

Within the overall system, these I/O modules must always be used on applications as described in document Z8102, "I/O module system". The module-specific characteristics and features given in the brief description on the front page and in the chapters "Use", "Engineering notes" and "Technical data" of the present sheet must also be taken into consideration.



The sections of this chapter identified by a warning triangle contain additional requirements and restrictions relevant to safety. They must be observed to ensure the safety of persons and objects.



Caution

- To protect the I/O components, the breaking voltage routed via the I/O module must be fused with **10 A max.**
- Both switching outputs of these modules accept **only mains voltage or only extra-low voltage**. A mixture of both is not permitted!
- Different phases at the two outputs are permitted.
- The module's manual switch function must not be used for safety shutdown.

Switching frequency

On applications requiring great switching frequencies, the life of the relay contacts must be taken into account. For details, refer to "Technical data".

Fitting notes

Please refer to document M8102, "I/O modules and P-bus".

Instructions for fitting the I/O module on mounting rails and on the I/O bar are printed on the packing.

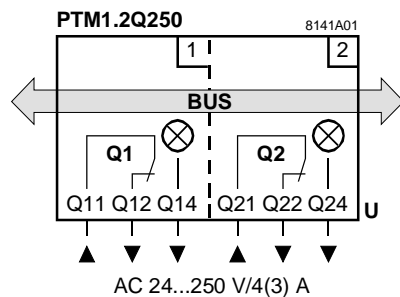
Commissioning notes

Please refer to document Z8102, "I/O module system".

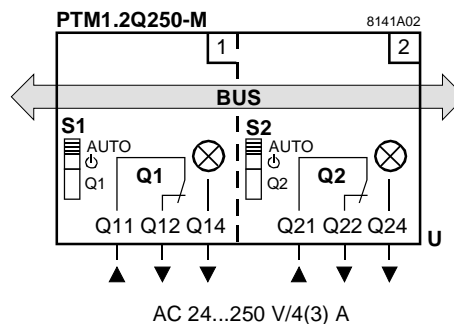
Technical data

Power supply	Operating voltage ¹⁾	AC 24 V ± 20 %
	Safety extra low voltage "SELV" or protection by extra-low voltage "PELV" as per	HD 384
	Frequency ¹⁾	50 Hz or 60 Hz
	Power consumption ¹⁾	2 VA
	I/O module power supply via P-bus	DC 24 V (against G0)
	Load units	2 (12.5 mA each)
Switching outputs	Number of switching outputs (change-over contacts)	2
	External fusing of mains line	
	Fuse, slow	max. 10 A
	Circuit-breaker (c.b.)	max. 13 A
	Tripping characteristics (c.b.)	B, C, D as per EN 60898
	Contact data	
	Switching voltage	max. AC/DC 250 V min. AC 24 V min. DC 5 V
	AC current load	max. 4 A (res.), 3 A (ind.) min. 5 mA at AC 250 V min. 20 mA at AC 24 V
	DC current load	max. 4 A at DC 24 V (res.) max. 0.5 A at DC 24 V L/R = 20 ms max. 0.1 A at DC 250 V (res.) min. 0.1 A at DC 5V
	Switch-on current	max. 10 A (1 s)
	Lifetime of relay contacts at AC 250 V	guide values
	at 0.1 A (res.)	2 x 10 ⁷ operations
	at 0.5 A (res.)	2 x 10 ⁶ operations
at 4 A (res.)	1 x 10 ⁵ operations	
Red. faktor for ind. loads (cos phi = 0.6)	0.85	
Insulation strenght	Between relay outputs and system electronics (reinforced insulation)	AC 3750 V, as per EN 60 730-1
	Between adjacent relay contacts (basic insulation)	AC 1250 V, as per EN 60730-1
	Permissible line lengths	1000 m
CE conformance	In compliance with the directives of the European Union	
	Electromagnetic compatibility	89/336/EEC
	Low voltage directive	73/23/EEC
	1) Applies only to PTM1.2Q250-M	
Note	For technical data common to all I/O modules, refer to document Z8102, "I/O module system", and for dimensions refer to document M8102, "I/O modules and P-bus".	

PTM1.2Q250 switching module
without manual switch



PTM1.2Q250-M switching module
with manual switch



- U** **Switching modules**
- Q1, Q2** Switching relays
- S1, S2** Manual switches
- BUS** I/O bar with P-bus
- Q11, Q21 Relay inputs
- Q12, Q22 N.C. contacts
- Q14, Q24 N.O. contacts