

RTU513 Remote Terminal Unit DataSheet

Digital Output 16DOM10

Application

The binary output board 16DOM10 can be used for the potentially isolated output of up to 16 binary signals to the process. The assignment of an output to a number of processing functions can be freely undertaken within the scope of the configuration rules. The 16DOM10 can be used for the following types of signal:

- Object commands with 1 or 2 pole output without (1 out of n) check
- Object commands with 1.5 or 2 pole output with (1 out of n)-check
- Set-point messages
- General output messages



Characteristic

The binary output is made via relay contacts. Resistive loads of up to 60 W can be switched with output voltages between 24 and 60 VDC. The process relays to be switched have to be equipped with zero voltage diodes. The 16 outputs are combined into two groups. Each 8 outputs have a common return. The groups are potentially isolated from one another as well as from other logic.

The command output to the process equipment can be effected either directly or in conjunction with the board 16DOM10 command output monitoring. The board 16DOM10 covers the (1 out of n)-check of the output circuits. The 1.5 pole command output is only possible in combination with the board 16DOM10.

Two output relays of the board 16DOM10 are required for each command in the case of two-pole commands (e.g. k01 together with k11).

Characteristic

The number of object command outputs of a 16DOM10 board can be extended to 32 double commands by connecting in series a maximum of 4 command output modules 16DOM10. But the 16DOM10 module also can be used in series with the 16DOM10 as an isolating module with 16 interposing relays for fully potentially isolated command output. Another possibility for direct switching of process relays on electrical apparatus (isolators, circuit-breakers) with high switching capacity is given by using an additional booster relay connected to the command output monitoring board 16DOM10.

With the 1.5 pole command output, 1 output relay of the 16DOM10 switches the command to the interposing relay. The process voltage for the interposing relay is switched by the 16DOM10. The binary output board 16DOM10 can execute the following processing functions on the individual signal types:

- Control of the command output duration following instruction from the CMU.

Before and during command output the board 16DOM10 carries out several monitoring functions. These tests ensure correct output which can be still increased with the board 16DOM10:

- m out of n check of the output relays on the board 16DOM10
- monitoring of the output bit patterns by re-reading
- switching voltage monitoring before and during output
- command output duration monitoring

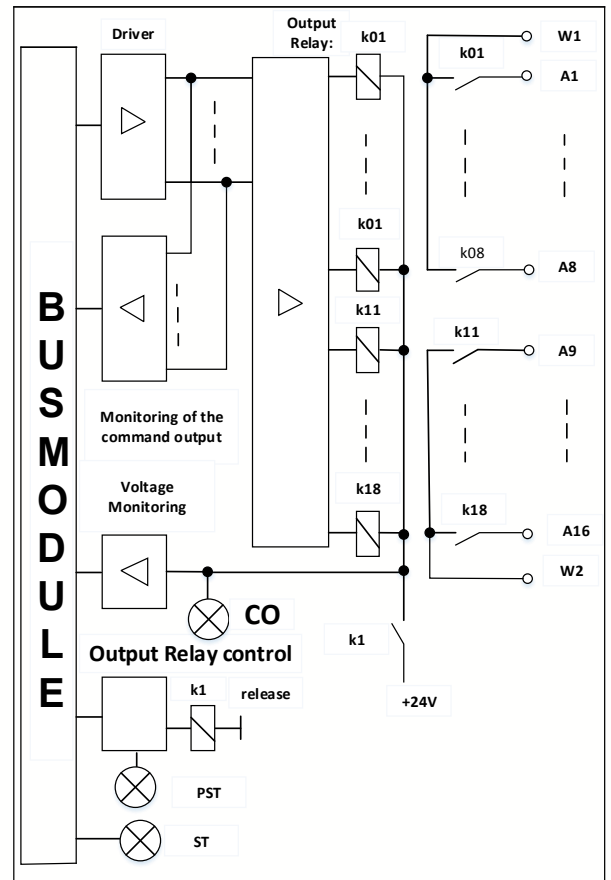


Fig. 1: Block diagram Binary Output Module 16DOM10

Characteristic

If a fault occurs during running of tests the command will be cancelled. The switching through of the output relays by the release relay k1 occurs only following successful testing.

A defective driver stage or a fault in the release relay k1 leads to complete inhibition of the 16DOM10 board.

Operating states and faults are displayed by light emitting diodes on the front panel of the 16DOM10:

- **ST**: Common malfunction information of the board
- **PST**: Command output fault condition display when the monitoring system responds
- **CO**: Command output display during output time

The board microcontroller is responsible for interactive communication with the PKS RTU513 system bus. All configuration characteristics and processing parameters are downloaded from the communication unit via the RTU system bus. No parameter setting and adjustment is required on the board. The board is equipped with both a serial and a parallel interface to the PKS RTU513 system bus.

During initialization and operation the board carries out a number of tests. If a fault occurs it is reported to the communication unit. All fault conditions impairing the function of the board are displayed as common fault signal with a light emitting diode (ST) on the front panel. A failure of the board is detected by the communication unit.

Signaling

The board monitors and checks its functionality as well as the dialog via the peripheral bus. Detected errors are indicated and/or transmitted by the board:

- by the red LED "ST" on the front plate
- by the red LED "PST" on the front plate
- by diagnostic messages

Signaling

The **LED"ST"** indicates board errors or peripheral bus errors. The "ST"-LED indicates:

- Board runs initialization procedure
- Board is doing a cold- or warm start
- board has detected a memory error (RAM or EPROM)
- Micro controller faulty
- no dialog via the peripheral bus for at least 2 minutes. The board is not polled by the PBP of CMU.

The **LED"PST"** indicates an error at command output:

- 24 V DC for the output relays failed during command output
- Time out PBP during active output. Any active output is stopped (switched off).

At least one output relay is switched on. The **LED"CO"** is direct connected to the 24 V DC. "CO" is ON for the time an output is active (pulse or persistent).

Setting

There are no settings required and possible on the 16DOM10.

WMS10	SMS10			Signal Identification	
	Sub-connector			Identification	Meaning
1			z32	A 01	binary output 01
2		b32		A 02	binary output 02
3	d32			A 03	binary output 03
4			z30	A 04	binary output 04
5		b30		A 05	binary output 05
6	d30			A 06	binary output 06
7			z28	A 07	binary output 07
8		b28		A 08	binary output 08
9	d28			A 09	binary output 09
10			z26	A 10	binary output 10
11		b26		A 11	binary output 11
12	d26			A 12	binary output 12
13			z24	A 13	binary output 13
14		b24		A 14	binary output 14
15	d24			A 15	binary output 15
16			z22	A 16	binary output 16
17	A			A	Cable shield
18		b22		W01	common return output 1 to 8
19	d22			W02	common return output 9 to 16

The pin configuration of SMS10 Subrack corresponds to the pin configuration of the board connector

Tabel.1: Subrack terminal connection: 16DOM10

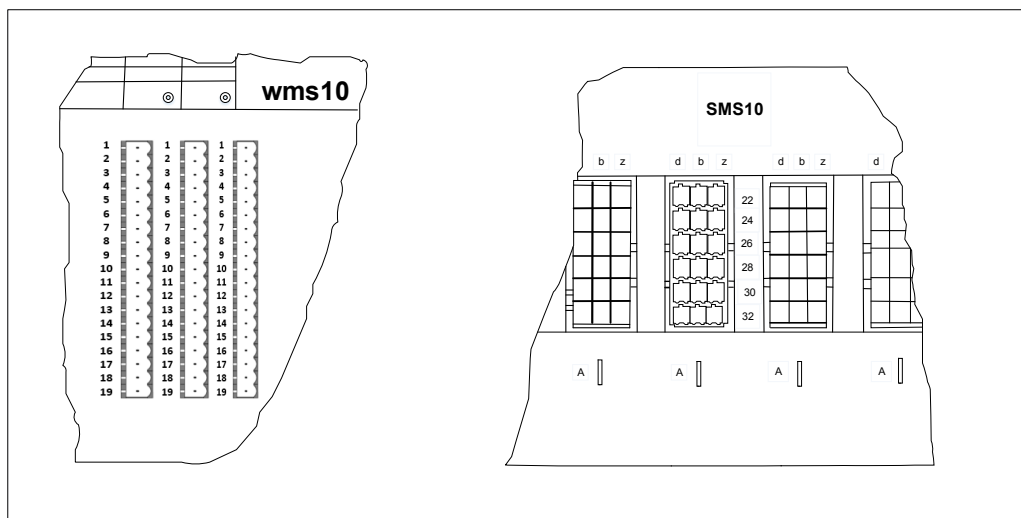


Fig. 2: Placement of signal terminal connectors on subracks

Setting

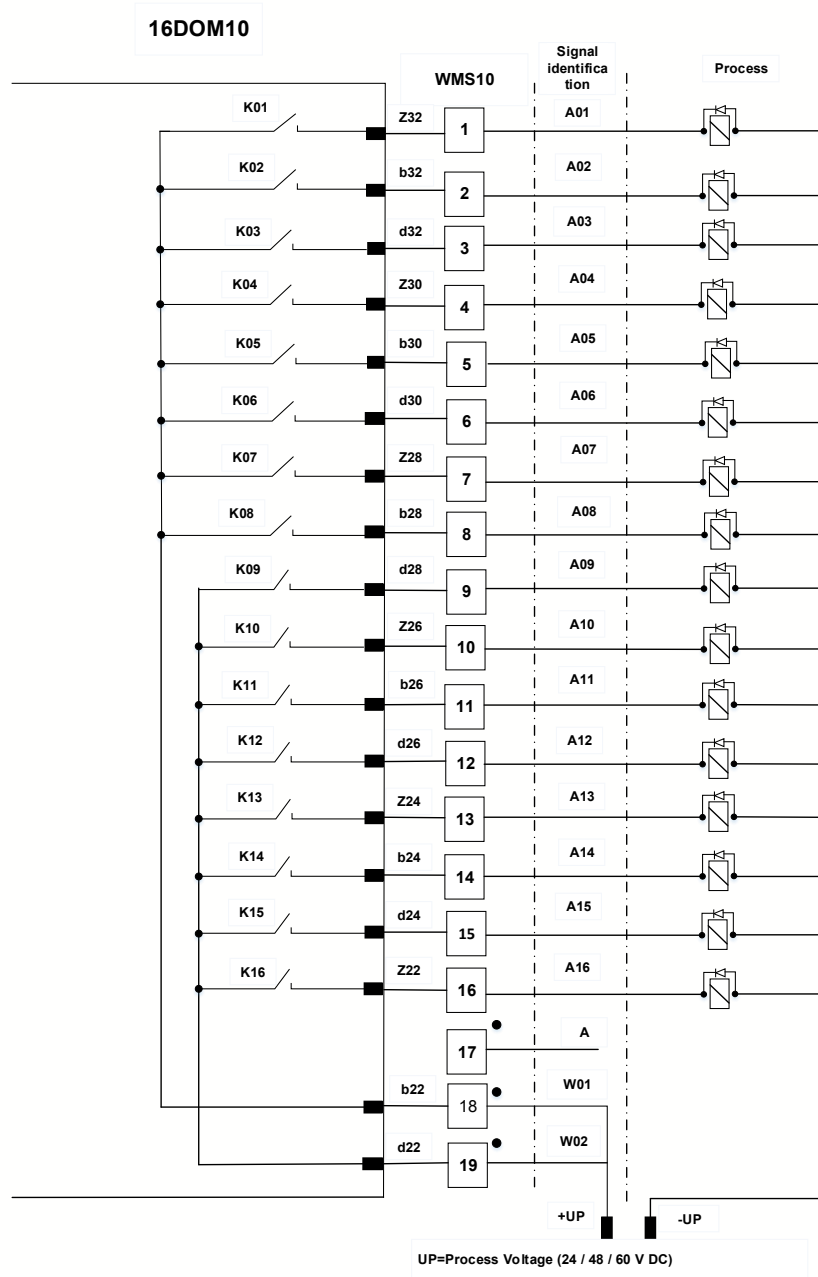


Fig. 3: Binary output 1 pole same process voltage circuit on both halves.

Setting

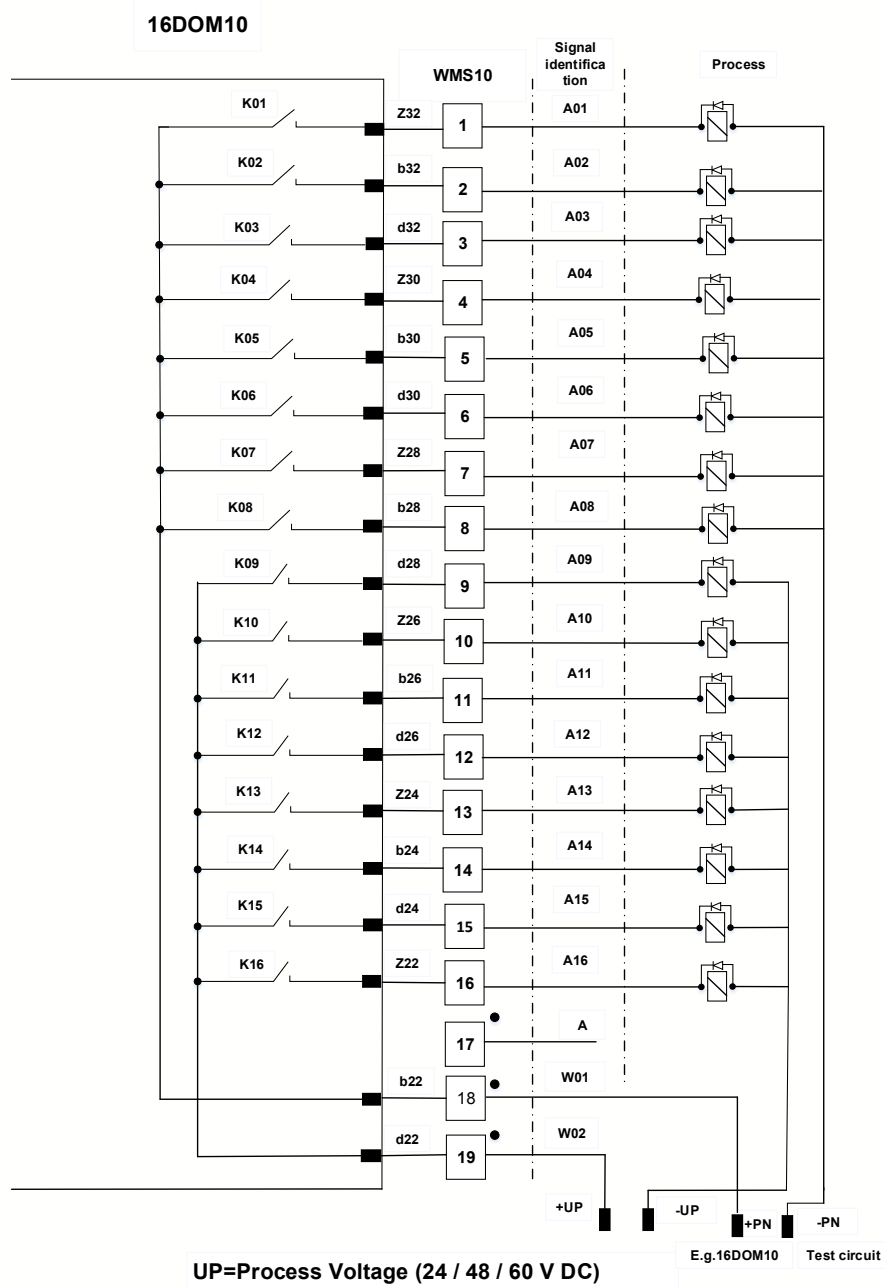
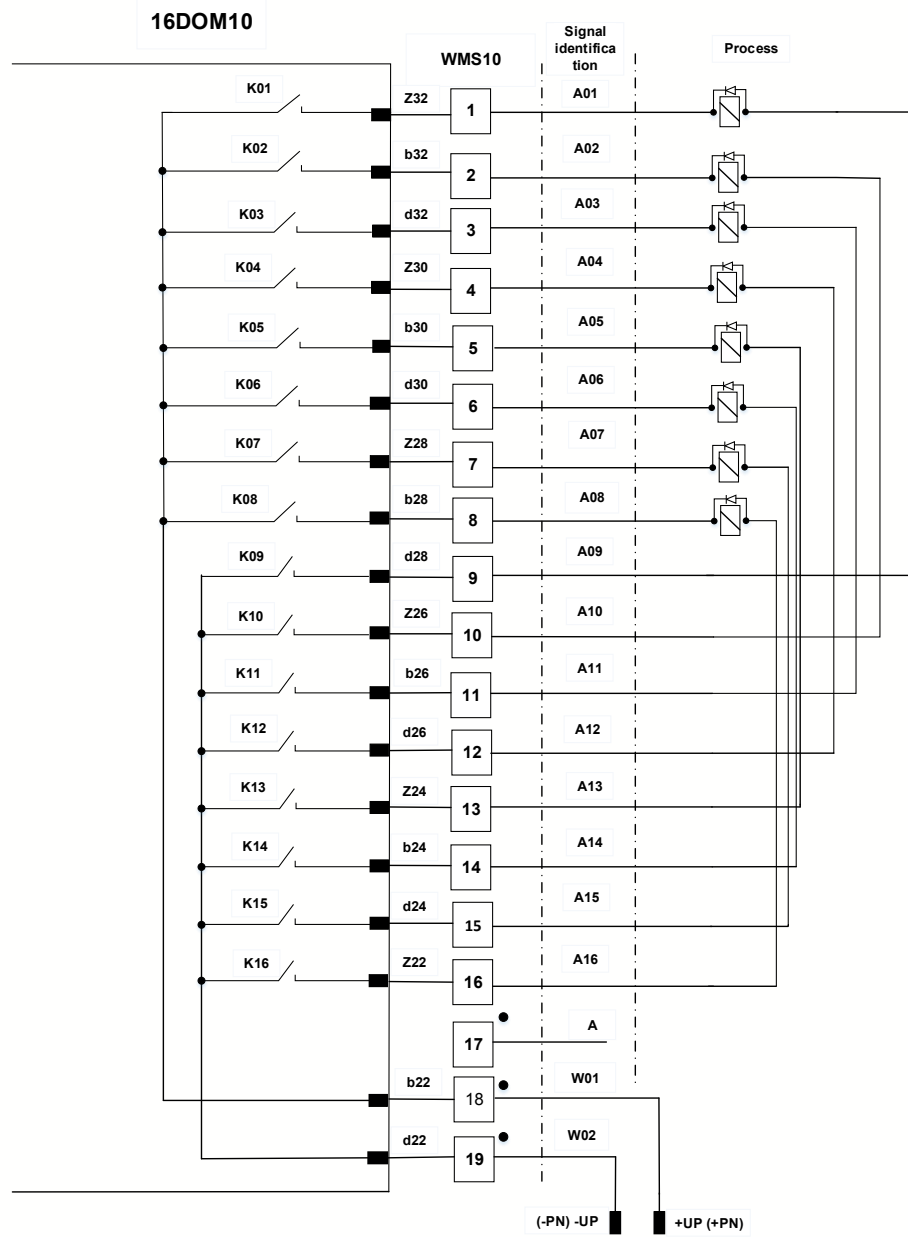


Fig. 4: Binary output 1 pole. Different process voltage sources on k 01-k 08 and k 09-k

Setting



UP=Process Voltage (24 / 48 / 60 V DC) or 16DOM test circuit

Fig. 5: Binary output 2 pole. Either direct or by 1 out of n check

Technical Data

In addition to the PKS RTU 513 general technical data, the following applies:

Output Circuit

Outputs	16, relay contacts single pole, 2 groups of 8
Potential isolation	yes, group-wise, from one another and against power supply

Power Supply

Supply	5v/120 mA 24v/±10 mA per relay
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Mechanical Layout

Printed circuit board	3HE, Euro card format (160 x 100)
Front panel	4R, 1 Slot (20 mm)
weight	approx. 0.2 kg

Test Voltage

AC Test Voltage EN 61000-4-16 IEC 60870-2-1 (class VW3)	2,5 kV, 50 Hz, VDE 804 safety electrical isolation
Impulse Voltage with stand test IEC 60255-5 IEC 60870-2-1 (class VW 3)	5 kV (1,2 / 50 µs)

Connection Type

Connector	Indirect, 48 pole Type F DIN 41612
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Environmental conditions

Temperature	-10 ... 65 °C
Relative humidity	5 ... 95 % (non condensing)

Electromagnetic Compatibility

Electrical fast transient test:	1 kV IEC 801-4 (class 2)
High frequency disturbance test:	2.5 kV (1MHz) IEC 255-4 (class III)

Relay Characteristics in Connection with 16DOM10

max. switching voltage	60 V DC
max. switching capacity resistive load:	60 W
inductive load at L/R = 30 ms:	40 VA (at 60 VDC)
Continuous current of a relay group: (8 with common return)	max. 2 A
Continuos current: (pulse command and 16DOM10 board with booster relay)	± 2 A (for command duration ± 25 sec.)