

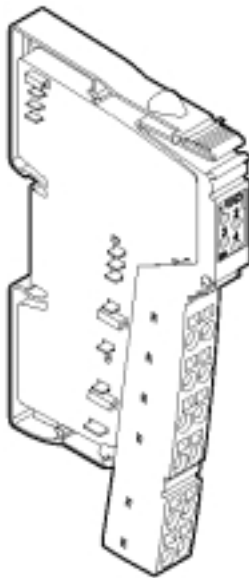
## VersaPoint I/O Module

**Output 24VDC Positive Logic 0.5A 4 Points  
IC220MDL752**

GFK-1904

April 2001

Module IC220MDL752 is used to output 24VDC digital signals.



### Module with the I/O Terminal Strip plugged in

Module IC220MDL752 requires one (1) I/O Terminal Strip, IC220TBK123, ordered separately. See the ordering information below.

### Features

- Connections for four digital actuators
- Connection of 2- and 3-wire actuators
- Nominal current per output: 0.5A
- Total current of the module: 2A
- Short-circuit and overload protected outputs
- Diagnostic and status indicators

### Ordering Information

IC220MDL752      Output 24VDC Positive Logic  
0.5A, 4 Points

IC220TBK123      I/O Terminal Strip. Quantity 10

### Module Specifications

Housing dimensions (width x height x depth)	12.2mm x 120mm x 71.5mm (0.480in. x 4.724in. x 2.795in.)
Connection style	2- and 3-wire
Operating temperature	-25°C to +55°C (-13°F to +131°F)
Storage temperature	-25°C to +85°C (-13°F to +185°F)
Operating humidity	75% on average, 85% occasionally. Appropriate measures against increased humidity (>85%) must be taken.
Storage humidity	75% on average, 85% occasionally.
Degree of protection	IP 20 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536

### Power Consumption

Communications power UL	7.5V
Current consumption from the local bus UL	44mA, maximum
Power consumption from the local bus	0.33W, maximum
Segment supply voltage U <sub>S</sub>	24VDC (nominal value)
Nominal current consumption of U <sub>S</sub>	2A (4 x 0.5A), maximum

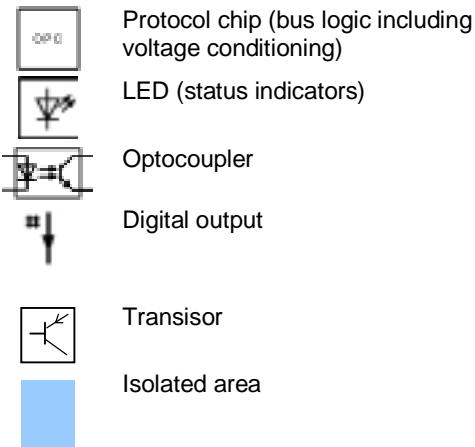
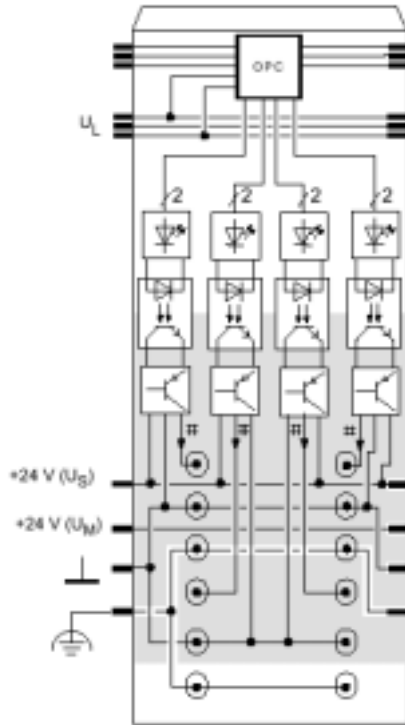
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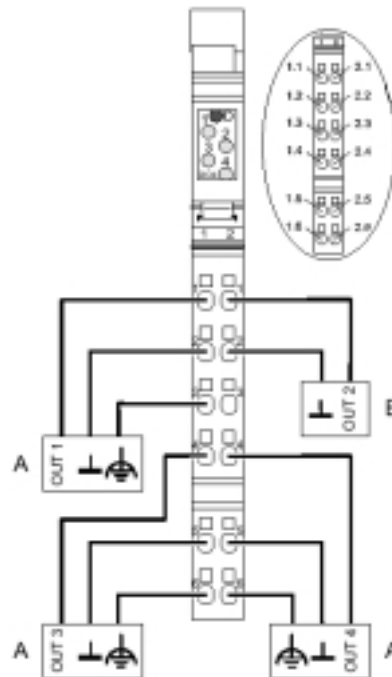
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### Internal Circuit Diagram




### Connection Examples

The diagram below shows example connections for 2-wire (B) and 3-wire (A) actuators.



Terminals		Assignment
1.1	2.1	Signal output (OUT 1, OUT 2)
1.2	2.2	Ground contact (GND) for 2- and 3-wire termination
1.3	2.3	FE connection for 3-wire termination
1.4	2.4	Signal outputs (OUT3, OUT4)
1.5	2.5	Ground contact (GND) for 2- and 3-wire termination
1.6	2.6	FE (functional earth ground) connection for 3-wire termination

	LED	Color	Meaning
	D	Green	Bus diagnostics
1, 2, 3, 4	Yellow	Status indication of the outputs	

**Program Data**

ID code	BD hex (189 decimal )
Length code	41 hex
Output address area	4 bits
Input address area	0 bits
Parameter channel (PCP)	0 bits
Register length (bus)	4 bits

**Output Specifications**

<b>Discrete Outputs</b>	
Number	4
Nominal output voltage $U_{OUT}$	24VDC
Differential voltage for $I_{nom}$	$\leq 1V$
Nominal current $I_{nom}$ per channel	0.5A
Tolerance of the nominal current	+10%
Total current	2A
Protection	Short circuit; overload. All four channels are thermally coupled, i.e. an error in one channel can affect the other channels.
<b>Nominal load</b>	
Ohmic	48 $\Omega$ / 12W
Lamp	12W
Inductive	12VA (1.2H, 50 $\Omega$ )
<b>Signal delay upon: OFF to ON</b>	
Ohmic nominal load	100 $\mu$ s, typical
Lamp nominal load	100ms (with switching frequencies up to 8Hz; above this frequency the lamp load responds like an ohmic load), typical
Inductive nominal load	100ms (1.2H, 50 $\Omega$ ), typical
<b>Signal delay: ON to OFF</b>	
Ohmic nominal load	1 ms, typical
Lamp nominal load	1 ms, typical
Inductive nominal load	50 ms (1.2H, 50 $\Omega$ ), typical
<b>Switching frequency with:</b>	
Ohmic nominal load	300Hz, maximum. This switching frequency is limited by the selected data rate, the number of bus devices, the bus structure, the software, and the control or computer system used.
Lamp nominal load	300Hz, maximum. This switching frequency is limited by the selected data rate, the number of bus devices, the bus structure, the software, and the control or computer system used.
Inductive nominal load	0.5Hz maximum (1.2H, 50 $\Omega$ )

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<b>Discrete Outputs (continued)</b>	
Overload response	Auto restart
Response time with ohmic overload (12Ω)	Approximately 3 s
Restart frequency with ohmic overload	Approximately 250Hz
Restart frequency with lamp overload	Approximately 250Hz
Inductive overload response	Output can be damaged
Response time after short circuit	Approximately 850ms
Strength against permanently applied reverse voltages	Up to 2A DC
Strength against permanently applied surge voltage	No
Validity of output data after connection of 24V power supply (power up)	5ms, typical
Response upon power down	The output follows the power supply without delay.
Protective circuit type	Integrated 45V Zener diode in output chip
Overcurrent shutdown	At 0.7A, minimum
Output current when switched off	300μA, maximum
Output voltage when switched off	2V, maximum
Output current with ground connection interrupted	25mA, maximum
Switching power with ground connection interrupted	100mW at 1 κΩ load resistance, typical
Inrush current with lamp load	1.5A for 20ms, maximum

<b>Output Characteristic When Switched On (Typical)</b>	
Output current (A)	Differential output voltage (V)
0	0
0.1	0.04
0.2	0.08
0.3	0.12
0.4	0.16
0.5	0.20

<b>Power Dissipation</b>	
<i>Formula to calculate the power dissipation of the electronics</i>	
$P_{EL} = 0.19 \text{ W} + \sum_{n=1}^4 (0.10 \text{ W} + I_{Ln}^2 \times 0.4 \Omega)$	
With	
P tot	Typical power dissipation of the module
n	Index of the number of set outputs n = 1 to 4
I Ln	Load current of the output n
Power dissipation of the housing PHOU	0.6W max. (within the permissible operating temperature)

<b>Concurrent Channel Derating</b>			
<i>Ambient temperature TA</i>	<i>Maximum load current at 100% simultaneity</i>	<i>Maximum load current at 75% simultaneity</i>	<i>Maximum load current at 50% simultaneity</i>
≤ 35°C (95°F)	0.5A	0.5A	0.5A
≤ 45°C (113°F)	0.375A	0.5A	0.5A
≤ 55°C (131°F)	0.25A	0.33A	0.5A

With 100% simultaneity, a load current of 0.5A for each channel is permissible up to 35°C (95°F) (ambient temperature range), a load current of 0.375 A between 35°C and 45°C (95°F and 113°F), and a load current of 0.25A up to 55°C. (131°F).

If a maximum of two channels are operated in the permissible ambient temperature range (50% simultaneity), a load current of 0.5A can be tapped.

If all four channels are used you must define the permissible working point according to the above formula. An example can be found in the System Manual.

<b>Safety Devices</b>	
Overload/short circuit in segment circuit	Electronic; with 4-channel driver
Surge voltage	Protective circuits of the power terminal; Protection up to 33VDC
Polarity reversal of power supply	Protective circuits of the power terminal; It is necessary to protect the power supply. The power supply unit should be able to supply 4 times (400%) the nominal current of the fuse.
Reverse voltage	Protection up to 2A DC

<b>Electrical Isolation</b>
To provide electrical isolation between the logic level and the I/O area it is necessary to supply the bus module and the digital output module using the bus module or a power terminal from separate power supply units. Interconnection of the 24V power supplies is not allowed. (For detailed information, refer to the user manual.)

<b>Common potentials</b>	
24V main power, 24V segment voltage, and GND have the same potential. FE (functional earth ground) is a separate potential area.	
<b>Separate system potentials consisting of bus module/power terminal and I/O module</b>	
<i>Test distance</i>	<i>Test voltage</i>
5V supply incoming remote bus / 7.5V supply (bus logic)	500VAC, 50Hz, 1 min.
5V supply outgoing remote bus / 7.5V supply (bus logic)	500VAC, 50Hz, 1 min.
7.5V supply (bus logic) / 24V supply (I/O)	500VAC, 50Hz, 1 min.
24V supply (I/O) / functional earth ground	500VAC, 50Hz, 1 min.

<b>Error Messages</b>	
Short circuit/overload of an output	An error message is generated when an output is shorted and switched on. Also, the diagnostic LED (D) flashes on the module at 2Hz (medium) under these conditions.
Operating voltage out of range	None