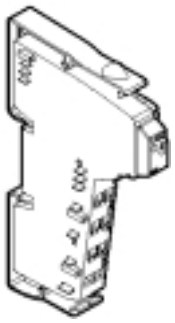
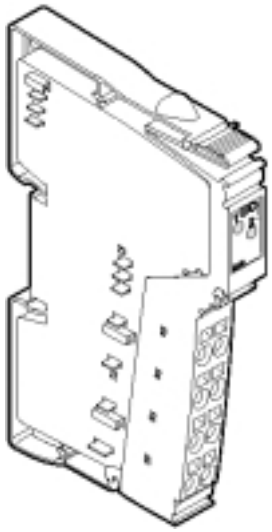


VersaPoint I/O Module

Output 24VDC Positive Logic 2.0A 2 Points
IC220MDL721

GFK-1903 *April 2001*

Module IC220MDL721 is used to output 24VDC digital signals.



Module with the I/O Terminal Strip plugged in

Module IC220MDL721 requires one (1) I/O Terminal Strip, IC220TBK082, ordered separately. See the ordering information below.

Features

- Connections for two 24V digital actuators
- Connection of 2-, 3-, and 4-wire actuators
- Nominal current of each output: 2A
- Total current of the module: 4A
- Short-circuit and overload protected outputs
- Diagnostic and status indicators

Ordering Information

IC220MDL721	Output 24VDC Positive Logic 2.0A, 2 Points
IC220TBK082	I/O Terminal Strip, Output. 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-, 3-, and 4-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

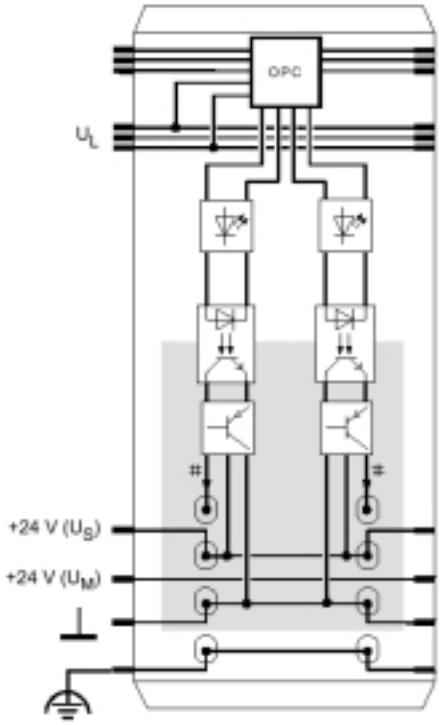
Power Consumption	
Communications power U_L	7.5V
Current consumption from the local bus U_L	35mA, maximum
Power consumption from the local bus	0.27W, maximum
Segment supply voltage U_S	24VDC (nominal value)
Nominal current consumption of U_S	4A (2 x 2A), maximum

VersaPoint I/O Module

Output 24VDC Positive Logic 2.0A 2 Points
IC220MDL721

GFK-1903 April 2001

Internal Circuit Diagram




Protocol chip (bus logic including voltage conditioning)


LED (status indicators)


Optocoupler

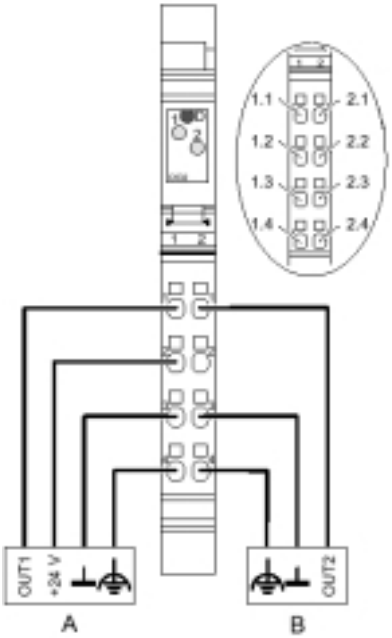

Digital output


Transisor


Isolated area

Connection Examples

The diagram below shows example connections for 3-wire (B) and 4-wire (A) actuators.



Terminals	Assignment
1.1, 2.1	Signal output (OUT1, OUT2)
1.2, 2.2	Segment voltage U_S for 4-wire termination Measuring point for the supply voltage
1.3, 2.3	Ground contact (GND) for 2-, 3-, and 4-wire-termination
1.4, 2.4	FE (functional earth ground) connection for 3- and 4-wire-termination

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

Program Data

ID code	BD hex (189 decimal)
Length code	2 hex
Output address area	2 bits
Input address area	0 bits
Parameter channel (PCP)	0 bits
Register length (bus)	2 bits

Output Specifications

Discrete Outputs	
Number	2
Nominal output voltage U_{OUT}	24VDC
Differential voltage for I_{nom}	≤ 1V
Nominal current I_{nom} per channel	2A
Tolerance of the nominal current	+10%
Total current	4A
Protection	Short circuit, overload
Nominal load	
Ohmic	12Ω / 48W
Lamp	48W
Inductive	48VA (1.2H, 50Ω)
Signal delay: OFF to ON	
Ohmic nominal load	200µs, typical
Lamp nominal load	200ms (with switching frequencies up to 8Hz; above this frequency the lamp load responds like an ohmic load), typical
Inductive nominal load	Approximately 250 ms (1.2H, 12Ω)
Signal delay: ON to OFF	
Ohmic nominal load	Approximately 200µs
Lamp nominal load	Approximately 200µs
Inductive nominal load	Approximately 250 ms (1.2H, 12Ω)
Switching frequency with:	
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 (1.2H, 12Ω), maximum
Overload response	Auto restart
Response after inductive overload	Output can be damaged

Discrete Outputs (continued)	
Reverse voltage endurance against short pulses	Yes
Strength against permanently applied reverse voltages	Up to 2A DC
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.
Limitation of the demagnetization voltage induced on circuit interruption	Approximately -0.7 V
Maximum inductive breaking energy/channel	1500 W (pulse 8/20 ms)
Protective circuit	Free-wheeling diode per channel

Output Characteristic When Switched On (Typical)	
Output current (A)	*Differential output voltage (V)*
0	0
0.2	0.02
0.4	0.04
0.6	0.06
0.8	0.08
1.0	0.10
1.2	0.12
1.4	0.14
1.6	0.16
1.8	0.18
2.0	0.20
2.2	0.22

Power Dissipation

Formula to calculate the power dissipation of the electronics

$$P_{tot} = 0.18\ W + \sum_{n=0}^{2} (200\ mW + I_{Ln}^2 \times 0.1\ \Omega)$$

With

P_{tot}	Total power dissipation of the terminal
n	Index of the number of set outputs n = 0 to 2
I_{Ln}	Load current of the output n

Power dissipation of the housing depending on the ambient temperature

$$P_{HOU} = 2.4\ W \qquad -25°C < T_U \leq -5°C$$

$$P_{HOU} = 2.4\ W - \frac{T_U - (-5°C)}{37.5\ K/W} \qquad -5°C < T_U \leq +55°C$$

With

P_{OU}	Permissible power dissipation of the housing, maximum
T_U	Ambient temperature

Concurrent Channel Derating		
Ambient temperature TA	*Maximum load current at 100% simultaneity*	*Maximum load current at 50% simultaneity*
55°C (131°F)	1A	2A
At an ambient temperature of 55°C (131°F) and 100% simultaneity, a load current of 1A per channel is permissible. If only one channel is used (50% simultaneity), a load current of 2A can be tapped. If both channels are used you must define the permissible working point according to the above formulas. You can find an example in the User Manual.		

Safety Devices	
Overload/short circuit in segment circuit	Electronic
Surge voltage	Protective circuits of the power terminal
Polarity reversal	Protective circuits of the power terminal

Electrical Isolation
To provide electrical isolation between the logic level and the I/O area it is necessary to supply the bus terminal 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.)

Common potentials	
24V main power, 24V segment voltage, and GND have the same potential. FE (functional earth ground) is a separate potential area.	
Separate system potentials consisting of bus module/power terminal and I/O module	
Test distance	*Test voltage*
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.

Error Messages	
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 under these conditions.
Operating voltage out of range	None