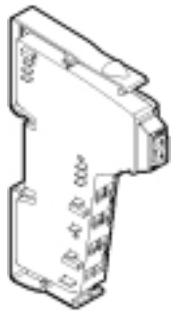
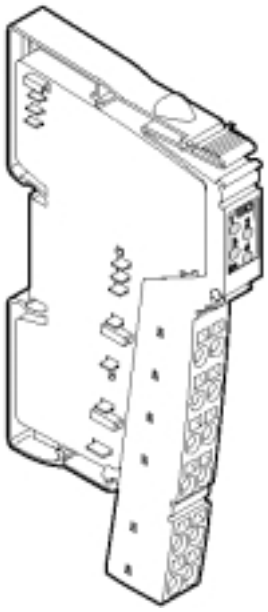


VersaPoint I/O Module

Input 24VDC Positive Logic 4 Points
IC220MDL642

GFK-1902 *April 2001*

Module IC220MDL642 is used to accept 24VDC digital input signals.



Module with the I/O Terminal Strip plugged in

Module IC220MDL642 requires one (1) I/O Terminal Strip, IC220TBK122, ordered separately. See the ordering information below.

Features

- Four digital sensors can be connected
- Connection of 2- and 3-wire sensors
- Maximum permissible load current per sensor: 250mA.
- Maximum permissible load current from the terminal: 1.0A.
- Diagnostic and status indicators

Ordering Information

IC220MDL642	Input 24VDC Positive Logic, 4 Points
IC220TBK122	I/O Terminal Strip, Input. 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

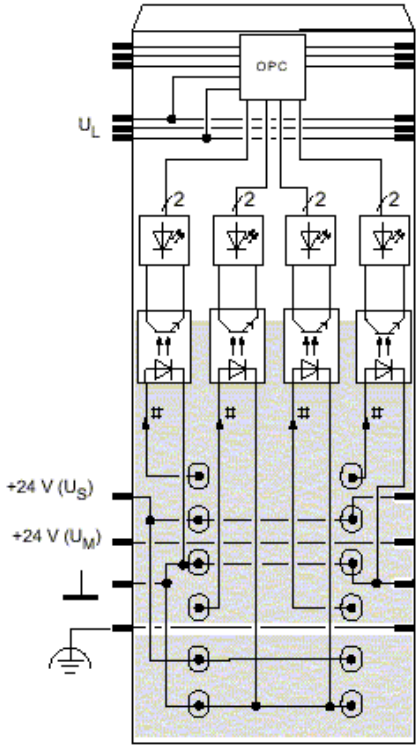
Power Consumption	
Communications power U_L	7.5V
Current consumption from the local bus U_L	40mA, maximum
Power consumption from the local bus	0.3W, maximum
Segment supply voltage U_S	24VDC (nominal value)
Nominal current consumption of U_S	1.0A, maximum

VersaPoint I/O Module

Input 24VDC Positive Logic 4 Points
IC220MDL642

GFK-1902 April 2001

Internal Circuit Diagram



Protocol chip (bus logic including voltage conditioning)

LED (status indicators)

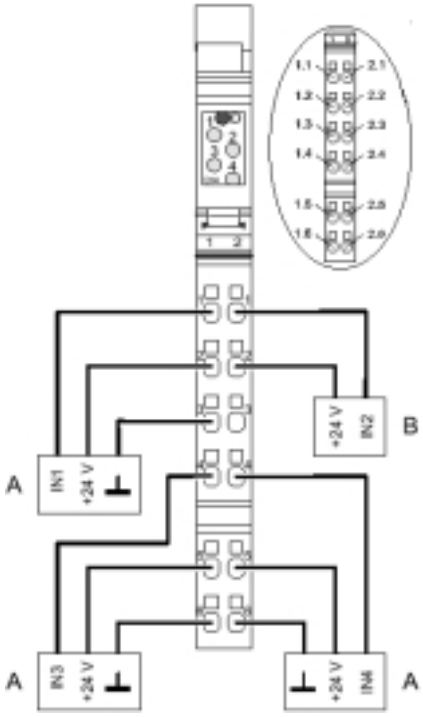
Optocoupler

Digital input

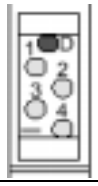
Isolated area

Connection Examples

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



Terminals		Assignment
1.1	**2.1**	Signal input (IN)
1.2	**2.2**	Segment voltage US for 2- and 3-wire termination
1.3	**2.3**	Ground contact (GND) for 3-wire termination
1.4	**2.4**	Signal inputs (IN3, IN4)
1.5	**2.5**	Segment voltage US for 2- and 3-wire termination
1.6	**2.6**	Ground contact (GND) for 3-wire termination



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

Program Data

ID code	BE hex (190 decimal)
Length code	41 hex
Input address area	4 bits
Output address area	0 bits
Parameter channel (PCP)	0 bits
Register length (bus)	4 bits
Error Messages	None

Input Specifications

Discrete Inputs	
Number	4
Input design	According to EN 61131-2, Type 1
Definition of switching thresholds Maximum low level voltage Minimum high level voltage	 ULmax < 5V UHmin > 15V
Common potentials	Segment supply, ground
Nominal input voltage U_{IN}	24VDC
Permissible range	-30V < UIN < +30VDC
Nominal input current U_{IN}	3mA, minimum
Delay time	None
Permissible cable length to the sensor	30m (98.4ft.) (to ensure conformance with EMC directive 89/336/EEC)
Use of AC sensors	AC sensors in the voltage range < UIN are limited in application (corresponding to the input design).

Characteristic Curve: Current Depending on the Input Voltage and the Ambient Temperature T_U			
Supply voltage	**Input current**	**Input current according to t >= 20s**	
		At TU = 25°C (77°F)	**At TU = 55°C (131°F)**
18V	3.0mA	2.9mA	2.5mA
24V	3.9mA	3.8mA	3.5mA
30V	4.5mA	4.2mA	3.0mA
The current is reduced depending on the ambient temperature TU and the number of inputs that are switched on (module internal temperature).			

Module Electrical Specifications

Power Dissipation	
Formula to calculate the power dissipation of the electronics $P_{tot} = 0{,}24\ W + \sum_{n=0}^{4} [\ U_{INn} \times 0{,}003\ A]$ With P tot Total power dissipation of the module n Index of the number of set inputs n = 0 to 4 U INn Input voltage of the input n	
Power dissipation of the housing PHOU	0.6 W max. (within the permissible operating temperature)

Concurrent Channel Derating	
Derating	None

Safety Devices	
Overload in segment circuit	No
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 module and the discrete input module using 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.	
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.