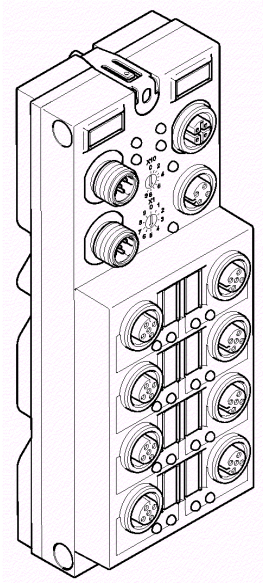
VersaMax IP Input Module

8 Point Input Module, Profibus
IC676PBI008

GFK-2292 *January 2004*

Module IC676PBI008 is used to accept digital input signals.



Features

- Connection to Profibus-DP using M12 connectors
- Baud rates up to 12 Mbaud autobaud
- Connection to digital sensors using M12 connectors
- Flexible voltage supply
- Diagnostic and status indicators
- Short-circuit and overload protection of sensor supply
- IP67 protection

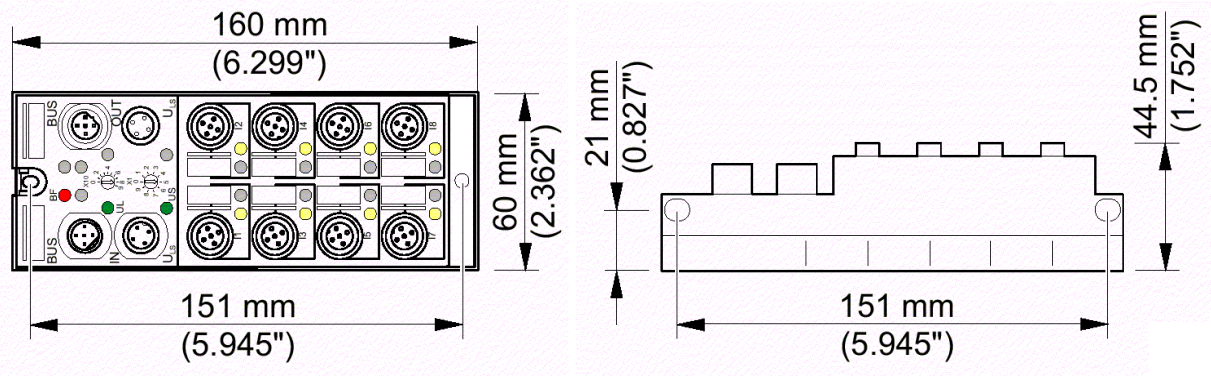
Module Specifications	
Housing dimensions (width x height x depth)	60mm x 160mm x 44.5mm (2.362in. x 6.299in. x 1.752in.)
Connection style	2-, 3-, and 4-wire
Operating temperature	-25°C to +60°C (-13°F to +131°F)
Storage temperature	-25°C to +85°C (-13°F to +185°F)
Operating/storage humidity	95%. Slight condensation is permitted occasionally on the outer housing, for short periods.
Degree of protection	IP67 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536

Module Power	
Nominal value	24VDC
Range	18VDC to 30VDC
Current consumption U_L at 24VDC	35mA typical, 100mA maximum
Current consumption U_S at 24VDC	4.5mA typical plus sensor current 700mA maximum

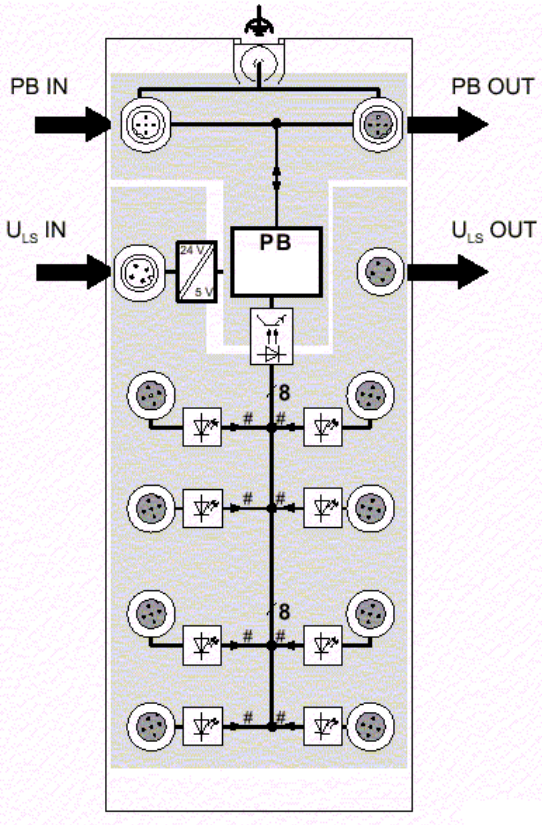
Ordering Information

IC676PBI008	8 Point Input Module, Profibus
IC676ACC001	VersaMax IP Point Labels, qty 50
IC676ACC002	Protective Caps. Male, for unused I/O connectors and/or outgoing bus and power connectors, qty 5
IC676ACC003	Protective Caps, Female, for unused incoming power connections, qty 5
IC676ACC004	Profibus Network Terminating Resistor
IC676ACC005	Profibus Network Tee

Module Dimensions

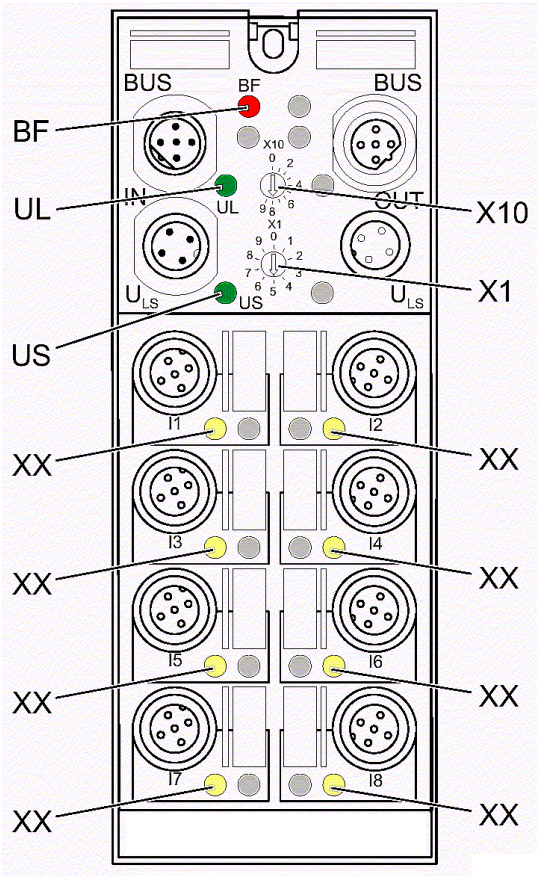


Internal Circuit Diagram



	Isolating transformer
	LED (status indicators)
	Optocoupler
	Digital input
	Isolated area

Module LEDs and Rotary Switches



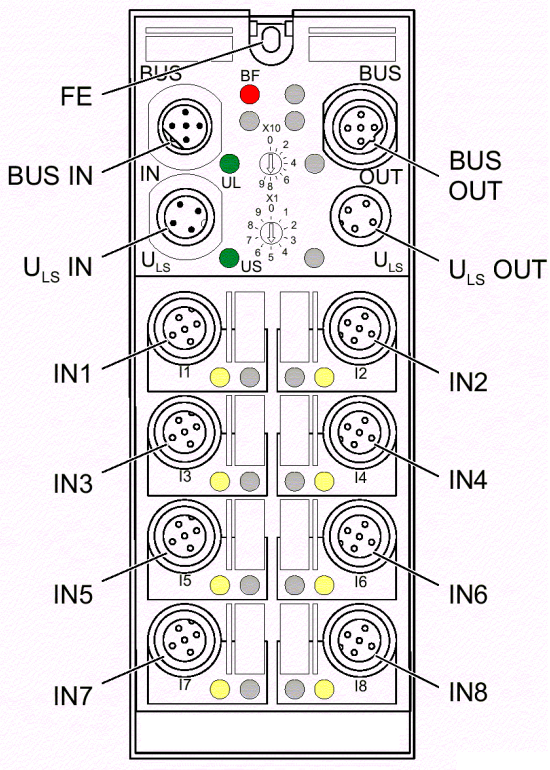
LEDs		
BF	*Red LED*	*Bus failure*
	ON	▪ No cyclic data transmission ▪ Profibus not connected; master not online ▪ Incorrect settings (configuration via master, station address) ▪ Synchronization or parameterization running ▪ Timeout expired
	OFF	▪ Module is addressed by Profibus and is in the "cyclic process data exchange" state. ▪ Missing module supply (in this state the UL LED also is off because of the missing 24V communications voltage.
UL	*Green LED*	*Communications power*
	ON	Communications power present
	OFF	Communications power not present
US	*Red/green LED*	*Voltage supply*
	ON (red)	Sensor voltage overload
	ON (green)	Voltage supply U_S greater than 18V
	OFF	Voltage supply is less than 18 volts
XX	Yellow LED	Input status indicator
	ON	Input active
	OFF	Input not active

Selecting the Station Address

The rotary switches are used to set up the two digits that represent the module's station address. Rotary switch X10 selects the first digit, and switch X1 selects the second digit.

The Profibus master addresses the module by means of this station address. The address must be a number from 1 to 99. A new address is only accepted when the module is powered up.

Module Connectors

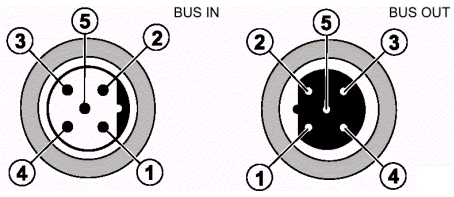


Connector	Function
FE	Functional earth ground
BUS IN	Profibus In
BUS OUT	Profibus Out
U_{LS} IN	Voltage supply in
U_{LS} OUT	Voltage supply out for additional modules
IN1 TO IN8	Inputs 1 to 8

Connection Guidelines

- ***Meet Noise Immunity Requirements***. Connect FE using a mounting screw, or (when mounting the module on the side or on a non-conductive surface), using a cable connection to the FE connection point.
- ***Ensure IP67 Protection.*** Cover the unused sockets with protective caps (IC676ACC002 and ACC003).
- ***Avoid Damage to the Electronics.*** Supply the sensors with the apropriate voltage U_S at the connection points.
- ***Avoid Polarity Reversal of the supply voltages U_L and U_S.***
- ***Connect the sensors to the correct points as shown on the next page.***

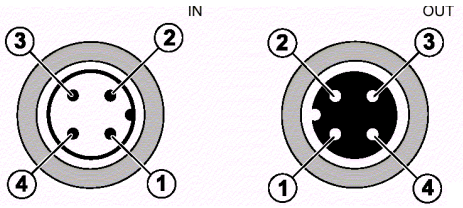
Profibus Pin Assignments



The thread is used for shielding.

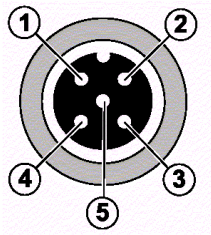
Pin	In	Out
1	VP	VP
2	RxD/TxD-N (A)	RxD/TxD-N (A)
3	DGND	DGND
4	RxD/TxD-P (B)	RxD/TxD-P (B)
5	Shield	Shield

Pin Assignment of the Voltage Supply



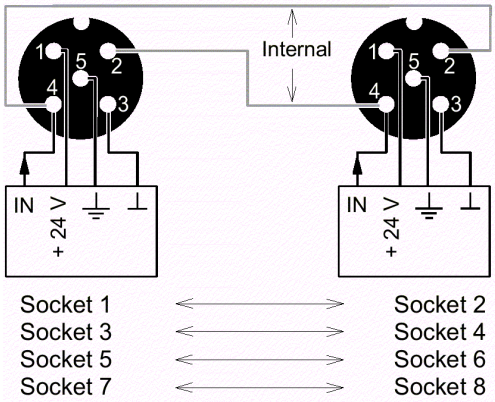
Pin	In	Out
1	U_L +24V	U_L +24V
2	U_S GND	U_S GND
3	U_L GND	U_L GND
4	U_S +24V	U_S +24V

Pin Assignment of the Inputs



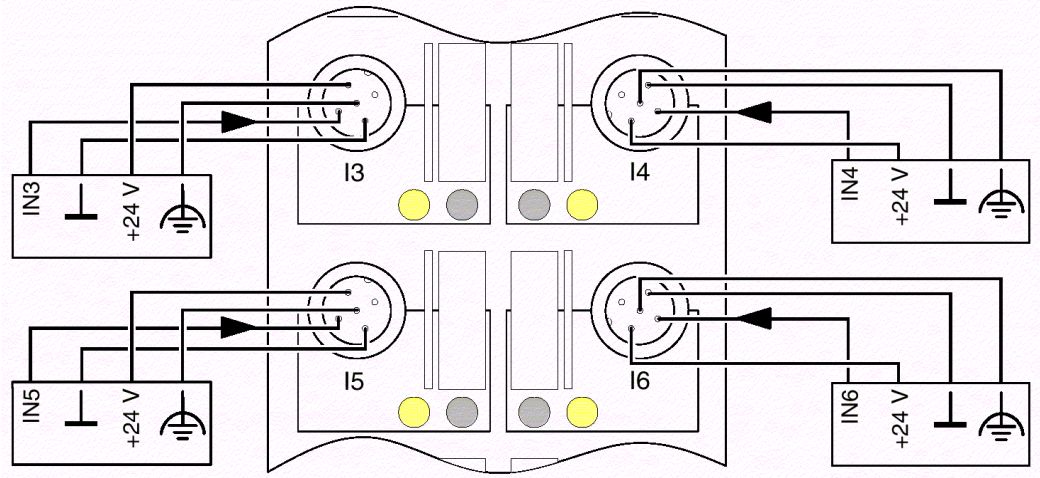
1	US +24V
2	See input socket assignments below
3	GND
4	Input
5	FE

Input Socket Assignments



Two input signals can be connected to each input socket. If both inputs of the same socket are used. the other socket of the pair (1/2, 3/4, 5/6, 7/8) must not be used.

Connection Examples



Program Data

ID number	066B hex
Input address area	8 bits

Process Input Data Format

The 8-Point Input Module provides 8 bits of process data. Connection points are assigned to these 8 bits as shown below:

Bit Number	7	6	5	4	3	2	1	0
Input	8	7	6	5	4	3	2	1

Module Diagnostic Data

The module also provides 12 bytes of diagnostic data to the master, in the format shown below. Of this data, bytes 0 through 6 are Profibus standard data. Bytes 7 through 12 are specific to this module.

If a diagnostic event occurs, the module generates a telegram containing the diagnostic data to the master. The module can read the current diagnostic data at any time.

Byte Number	Bit 7	Bit 6	Bit 5	Bit 4	Bit 2	Bit 2	Bit 1	Bit 0	Diagnostic Data
Byte 0	X	X	X	X	X	X	X	X	Station Status 1
Byte 1	X	X	X	X	X	X	X	X	Station Status 2
Byte 2	X	X	X	X	X	X	X	X	Station Status 3
Byte 3	X	X	X	X	X	X	X	X	Master address diagnostics
Byte 4	0	0	0	0	0	1	1	0	High ID Number
Byte 5	0	1	1	0	1	0	1	1	Low ID Number
Byte 6	0	0	0	0	0	1	1	1	Diagnostic header
Byte 7	M.7	M.6	M.5	M.4	M.3	M.2	M.1	M.0	Module Diagnostics
Byte 8	0	0	0	0	0	0	0	0	Reserved
Byte 9	0	0	0	0	0	0	0	0	Reserved
Byte 10	0	0	0	0	0	0	0	0	Reserved
Byte 11	0	0	0	0	0	0	0	0	Reserved
Byte 12	X	X	0	0	0	0	0	0	Reserved

Byte 7, Format of the Module Diagnostics Data

Bit Number	Used For	Comment
M.0 - M.2	Reserved	0
M.3	Status of the US Sensor Supply	1 if the Sensor Supply is less than 18V
M.4 - M.5	Reserved	0
M.6	Status of the UL Module Supply	1 if the Module Supply is less than 18V
M.7	Overload Status of the US Sensor Supply	1 if the Sensor supply is overloaded

Technical Data

Discrete Inputs	
Number	8
Nominal input voltage U_{IN}	24VDC
Permissible range	-30V < U_{IN} < +30VDC
Nominal input current U_{IN}	5mA
Characteristic curve of the current	Linear in the range 1V < U_{IN} < 30 V
Delay time	On: 3.1ms typical Off: 4.1ms typical
Permissible cable length to the sensor	100m (328.08ft))

Input Characteristic Curve	
Input voltage (V)	*Typical input current (mA)*
-30 < U_{IN} < 0.7	0
3	0.5
6	1.0
9	1.6
12	2.3
15	3.0
18	3.8
21	4.5
24	5.2
27	6.0
30	6.7

Sensor Supply	
Minimum sensor voltage	U_S - 1V
Nominal current per channel	75mA
Nominal current per module	600mA
Overload Protection	Electronic per module
Short-circuit protection	Electronic per module

Error Messages	
Short circuit of sensor supply	Yes. If an error is triggered by an overload or short circuit of the sensor supply, the module switches off the sensor supply of the channels and reports a peripheral fault to the master.
Overload of sensor supply	Yes. If the sensor supply US falls below 18V, the module reports a peripheral fault to he master.

Profibus Interface	
Baud Rate, incoming and outgoing	12 Mbaud maximum. For transmission rates above 3 Mbaud, T-pieces with integrated series inductance must be used.
Shield connection, incoming and outgoing	Direct to FE