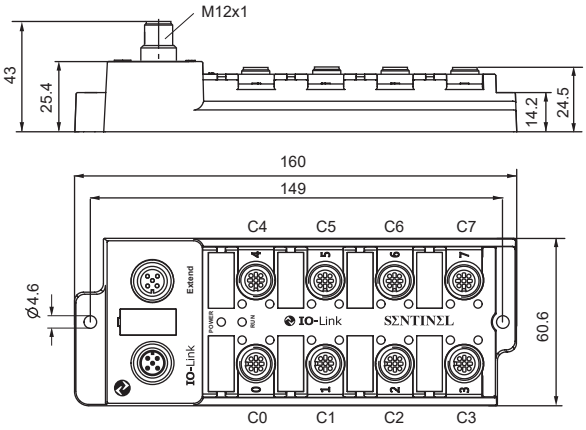
IO-Link Self-Adaption and extend I/O Module

SIOL-M12A-16SAP/EX(16xPNP Input or 16xPNP Output)

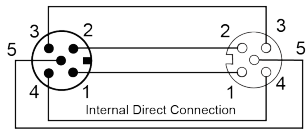
SIOL-M12A-16SAN/EX(16xNPN Input or 16xNPN Output)



- IO-Link IN/OUT Self-Adaption and extend device
- 16-channel digital input, M12, 5-pin
- 16-channel 0.2A digital output
- IO-Link V1.1
- IO-Link class A, M12, A-code
- Shared power supply for module and load
- Fiberglass housing
- Impact and vibration resistance
- Fully potted module electronics
- Protection class IP67

Model	SIOL-M12A-16SAP/EX SIOL-M12A-16SAN/EX
Supply voltage	24VDC ± 10%
Operating current	< 100mA
Working and load power supply	⩽4A (Ul Ub) Note: IO-Link Master provides power, Master parameters must be considered
Input	
Number of channels	16(C0-C7)
Connectivity type	M12, 5-pin
Input type	PNP or NPN(Depends on the model)
Input impedance	3K
Input rated current	7mA
Input delay	3ms
Switch threshold	2mA/4mA 7V/11V
Electrical isolation mode	Optocoupler isolation
Sensor power supply	Maximum 150mA C0...C3 Total current max 1.2 A C4...C7 Total current max 1.2 A The total C0-C7 current is limited to the maximum current of the Master port
Output	
Number of channels	16(C0-C7)
Output type	PNP or NPN(Depends on the model)
Output current	0.2A;Max.0.5A;(Total max current＜4A)
Output protection	Overload protection, overheating protection
Output protection reaction time	Approximately 20ms
Switching frequency	100HZ
Output voltage drop	0.6V
Electrical Isolation mode	Optocoupler isolation
IO-Link	
Process data	6 bytes input,4 bytes output
Vendor ID	1317 (0x0525)
Device ID	66148 (0x010264)

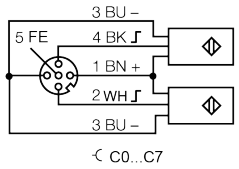
IO-Link M12 interface　　Extend M12 interface



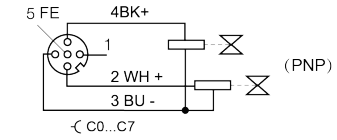
1 = +24VDC (U_b U_l)	1 = P1-1
2 = NC	2 = P2-2
3 = 0V (U_b U_l)	3 = P3-3
4 = C/Q(IO-Link)	4 = P4-4
5 = NC	5 = P5-5

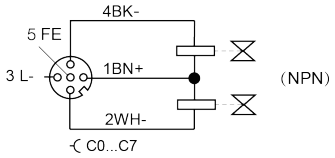
Note:P1-1 refers to the direct connection between Pin 1 on the left and Pin 1 on the right; the same applies to the others.

Digital input M12 interface



Digital output M12 interface





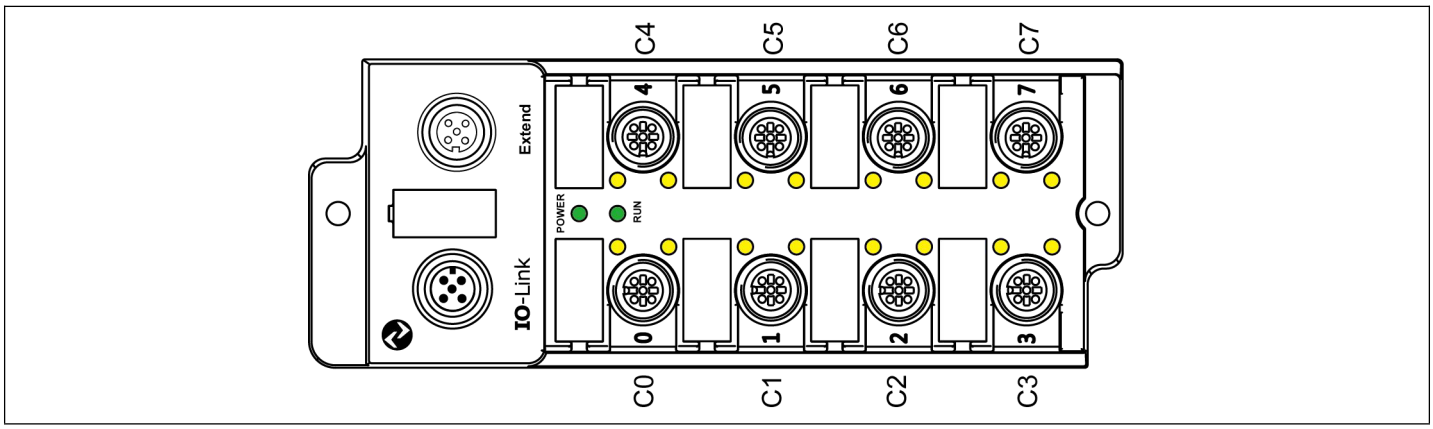
IO-Link Self-Adaption and extend I/O Module

SIOL-M12A-16SAP/EX(16xPNP Input or 16xPNP Output)

SIOL-M12A-16SAN/EX(16xNPN Input or 16xNPN Output)

Number of ports	2
IO-Link specification	V1.1
IO-Link port type	Class A
Frame type	TYPE_2_V
Transmission rate	COM3 230.4 kbit/s
Minimum cycle time	3200us
ISDU	Supported
Block parameter operation	Not support
Data storage (DS)	Supported
Data storage lock	Supported Note: This function is supported for compatibility, but the device will not perform this operation.
Operating temperature	-20-55℃

User Manual



LED state

Power	Green LED lights: ON: The module power supply is normal OFF: The module power supply is disconnected	
Run	Yellow LED lights: ON: First-level IO-Link communication is normal OFF: The IO-Link communication is not established	Green LED lights: ON: Both the first-level and the extended IO-Link communication are normal
C0...C7	Yellow LED lights: ON: Input/Output active OFF: Input/Output inactive	

Process data/Input data

Note: BYTE 0,1 correspond to the first level (self-adaptation), while BYTE 2,3,4,5 correspond to the second level (extended).

BYTE	BYTE0								BYTE1							
BIT	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
DATA (Input)	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

Note:The C * P * represents the *th pin of the C * port； for example： The C2P4 represents pin 4 of the C2 port；

BYTE	BYTE2								BYTE3							
BIT	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
DATA (Input)	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0

BYTE	BYTE4								BYTE5							
BIT	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
DATA (Input)	-	-	-	-	-	-	Extended IO-LINK Error Status 0: No error occurrences 1: Error occurrences detected	Extended IO-LINK Current Status 0: Communication interrupted 1: Communication normal	Extended IO-LINK Port Error Count							

User Manual

Process data/Output data

Note: BYTE 0,1 correspond to the first level (self-adaptation), while BYTE 2,3 correspond to the second level (extended).

BYTE	BYTE0								BYTE1							
BIT	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
DATA (Output)	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

Note:The C * P * represents the *th pin of the C * port； for example： The C2P4 represents pin 4 of the C2 port；

BYTE	BYTE2								BYTE3							
BIT	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
DATA (Output)	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0

Working Mechanism:

This module is a self-adaptive module. The input and output functions require no configuration. Simply complete the hardware connection for the input and output, and then operate the corresponding input or output points directly. For example, when the module is used as an input, after connecting the input signal to the hardware, you can directly operate the corresponding input point. In this case, avoid operating the output point corresponding to this input point. When the module is used as an output, if an output point is set, the corresponding input point will also receive a signal. This input point can be used as a feedback signal for the output.

The module connected to the extended port is also an IO-Link substation module. Its process data occupies 2 bytes for input and 2 bytes for output. Therefore, the process data of the IO-Link substation module connected to this extended port must remain within 2 bytes for input and 2 bytes for output. Otherwise, any bytes beyond this limit cannot be used.

Direct Parameter

Direct parameters are uesd to identify the device. Direct parameters are operated by index 0. The Subindex 0 represents operating the entire index; Subindex 1 represents address 0; Subindex 16 represents address 0x0F.

Index	Address	Parameter name	Length	Authority	Description
0	0x07 7	Vendor ID(High)	1Byte	Read	0x05 5
0	0x08 8	Vendor ID(Low)	1Byte	Read	0x25 37
0	0x09 9	Device ID(High)	1Byte	Read	0x01 1
0	0x0A 10	Device ID(Median)	1Byte	Read	0x02 2
0	0x0B 11	Device ID(Low)	1Byte	Read	0x64 100

Parameter data/Request data/ISDU indexed service data unit

Index	Subindex	Parameter name	Length	Authority	Description
0x02 2	0	System command	1Byte	Write	0x80 128 Reset device 0x82 130 Restore factory settings
0x10 16	0	Manufacturer name	8Byte	Read	Sentinel
0x11 17	0	Manufacturer description	41Byte	Read	Sentinel Industrial Ethernet manufacturer
0x12 18	0	Device name	14Byte	Read	SIOL-M12x-16SAx/EX
0x13 19	0	Device ID	7Byte	Read	6614801
0x14 20	0	Device description	34Byte	Read	I/O Module 16 IN/OUT and extend
0x15 21	0	Serial-Number	9Byte	Read	661480101
0x16 22	0	Hardware version	8Byte	Read	HW-V0.01
0x17 23	0	Software release	8Byte	Read	FW-V0.01
0x18 24	0	ApplicationSpecific Tag	Maximum 32Byte	Read Write	This item is defined in the IODD file, Included in the DataStorage(DS)
0x19 25	0	Function Tag	Maximum 32Byte	Read Write	This item is not defined in the IODD file, It can be set directly through Index.
0x1A 26	0	Local Tag	Maximum 32Byte	Read Write	This item is not defined in the IODD file, It can be set directly through Index.
0x24 36	0	Device state	1Byte	Read	0: The equipment operating normally; 1: Need to maintain; 2: Running incorrect environment or parameters; 3: Device abeyance; 4: Device failed to run;