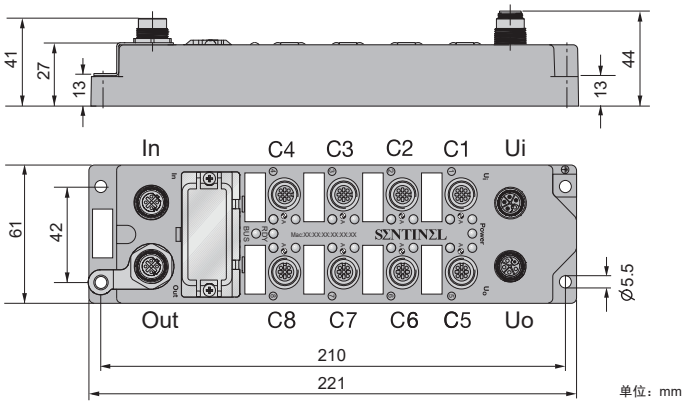
IO-Link modules for Modbus TCP

8 IO-Link Master Channels

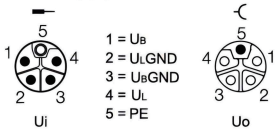
ELMT-8IOL-L001



- Modbus TCP IO-Link Master
- Integrated Ethernet Switch
- Support 100Base-TX
- 2 x M12, 4-pin, D-code, Ethernet Fieldbus connection
- 8 IO-Link Master Channels
- IO-Link V1.1
- IO-Link Master Port Type Class A
- IO-Link master port M12 A code
- Metal connector with high-strength plastic housing
- Impact and vibration resistance
- Fully potted module electronics
- Protection class IP67

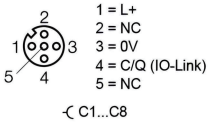
Model	ELMT-8IOL-L001
Supply voltage	24VDC ± 10%
Operating current	< 200mA
Supply current	Recommended >8A
IO-Link port parameters	
Number of ports	8 (C1...C8)
Connectivity inputs	M12, A-coded, Female
Common IO pins	Not supported. The second hole needs to be left empty.
Port supply current	The maximum is 2A, which is the current provided by the first hole to the device. The total of C1...C4 does not exceed 4A The total of C5...C8 does not exceed 4A
IO-Link parameters	
SIO model	Not Supported,The 4th hole cannot be used as a normal I/O.
IO-Link Pin definition	Pin 4 in IOL mode
IO-Link Port type	Class A, The second hole needs to be left empty.
IO-Link specification	V1.1
Frame type	Supports all specified frame types
Support Device	Maximum 32Bytes Input / 32Bytes Output
Transmission rate	4.8kbps(COM1) / 38.4kbps(COM2) / 230.4kbps(COM3)
Modbus-TCP	
Number of communication interface	2
Transmission standard	100Base-TX
Auto-negotiation	Supported
Auto-MDI/MDIX	Supported
Maximum transmission rate	100Mbit/s
Connector	M12, D-coded, Female
Default IP address segment	192.168.0.*
IP address setting function	support DHCP
Default subnet mask	255.255.255.0
Communication data format	Binary
Cycle time range	2ms-2000ms
Operating temperature	-20-55℃

Power Supply Connector L-coded

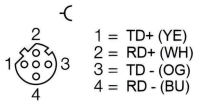


Note: UB is the module power supply, and UL is the load power supply
Note: UL is not used inside the module, so it is unnecessary to connect it.
Ui to Uo is directly connected

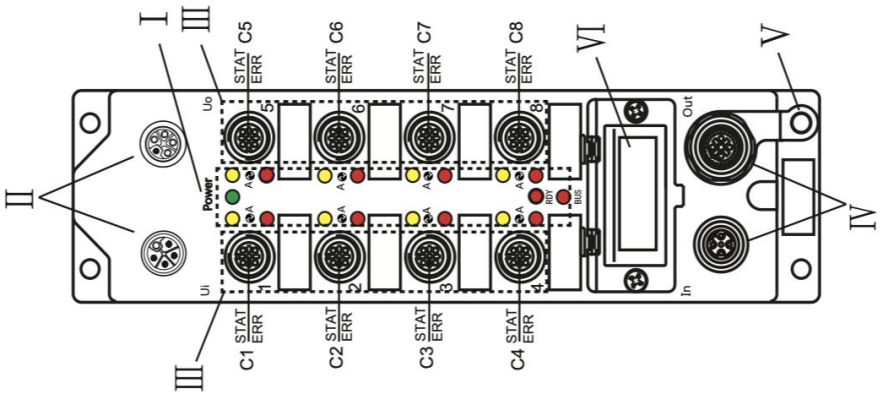
IO-Link Port Connector M12



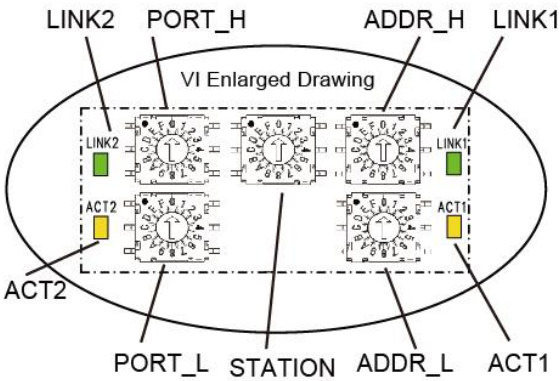
Bus Connector M12



User Manual



Area Code	Project	Description	
I	Module LEDS	LED name	Detail
		Power	Green LED lights: ON: The module power supply (U_b) OFF: The module power supply is disconnected
		BUS	Green LED lights: ON: Modbus-TCP Communication is normal Red LED lights: ON: Modbus-TCP Communication interruption; Flashing: In DHCP mode, waiting for IP assignment
		RDY	Red LED lights: ON: IO-Link There is an error in the port, which is inconsistent with the configuration;
		STAT	Yellow LED lights: The IO-Link communication status of the port (C1-C8) ON: The IO-Link communication is normal; OFF: The IO-Link communication is not established;
		ERR	Red LED lights: Working state of the port ON: The port is working abnormally; please check the IO-Link cable or the IO-Link port settings in the dial code OFF: There is no abnormality in this port; IO-Link is communicating normally or this port is closed or disabled during the dial switch.
II	Power Supply	U_i (left): Power supply input, L-coded, 5-pin, male U_o (right): Power supply output, L-coded, 5-pin, female	
III	IO-Link PORT	1. M12 A-coded, 5-pin, female; Pin 4 is IO-Link, Dose not support SIO, i.e., Standard I/O mode; Pin 2 is empty, no external signals can be connected; 2. In the figure, which port does C* represent; The STAT represents the communication status indicator lamp; The ERR represents the working status indicator lamp; For example:C1 STAT/ERR represents that the port is PORT1, The LED above the right of the port is STAT and the LED below is ERR; For detailed information on the indicator lights, please refer to Area Code Ⅰ; 3. Totally is 8 IO-Link port class A, every port is independent lamp for START&ERR. External power supply is required for class B device; Note: Please close the port in the profinet configuration when not used, try not let the module have a red light;	
IV	BUS	In (left): Modbus-TCP Bus in, M12 D-Code, 5-pin, female Out (right): Modbus-TCP Bus out, M12 D-Code, 5-pin, female	
V	PE	Ground	



<table>
<tr><td rowspan="5">VI</td><td rowspan="4">Network Status LEDS</td><td>LINK2</td><td>Bus in Green LED lights:
ON: The communication rate of this port is 100M;
OFF: The communication rate of this port is not 100M;</td></tr>
<tr><td>ACT2</td><td>Bus in Yellow LED lights:
ON: This establishes a physical connection;
OFF: No connection; Flashing: There is data exchange;</td></tr>
<tr><td>LINK1</td><td>Bus out Green LED lights:
ON: The communication rate of this port is 100M;
OFF: The communication rate of this port is not 100M;</td></tr>
<tr><td>ACT1</td><td>Bus in Green LED lights:
ON: This establishes a physical connection;
OFF: No connection; Flashing: There is data exchange;</td></tr>
<tr><td>IP Address Settings</td><td colspan="2">ADDR_H is the high bit of the hexadecimal address; ADDR_L is the low bit of the hexadecimal address; the corresponding functions of different dial codes are as follows:

<table><tr><td>0xFF</td><td>DHCP mode, waiting for IP allocation after power on</td></tr><tr><td>0x00</td><td>Run according to the last DHCP assigned IP address</td></tr><tr><td>0x01 - 0xFE</td><td>Set the 4th digit of the IP address. The first 3 digits of the network segment are assigned by DHCP.</td></tr></table>
For example: ADDR_H is A, ADDR_L is 9, then ADDR is 0xA9, and the IP address is: *.*.*.169;
Note: After the code is changed, it will take effect after power is turned on again</td></tr>
<tr><td>IO-Link Port vacant</td><td colspan="2">Rotary code PORT_H, PORT_L: 0x00: open and close the IO-Link port according to the "configuration data"; non-0x00: open and close the IO-Link port according to the "dial code" (as shown below)

<table><tr><td>Rotary Code</td><td colspan="4">PORT_H</td><td colspan="4">PORT_L</td></tr><tr><td>Port</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table>
For example: PORT_H: 0x02; PORT_L: 0x05; the corresponding binary is: 0010 0101 represents: open ports C1, C3, C6, and close other ports;
Note: After the code is changed, it will take effect after power is turned on again</td></tr>
</table>

IO-Link Port Byte Mapping

<table>
<tr><th colspan="4">1.IO-Link Configuration Data (Occupy 133 Word), Support function code F04 (read input register)</th></tr>
<tr><th>Modbus
Reference Number</th><th>Modbus
Data Address</th><th>IO-Link BYTE</th><th>Description</th></tr>
<tr><td rowspan="2">30001</td><td rowspan="2">0</td><td>Byte0</td><td>8 bits represent the current IO-Link status of 8 ports:
1 is normal communication, 0 is no communication
<table><tr><td>Bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Port</td><td>C8</td><td>C7</td><td>C6</td><td>C5</td><td>C4</td><td>C3</td><td>C2</td><td>C1</td></tr></table></td></tr>
<tr><td>Byte1</td><td>8 bits represent IO-Link disconnection records of 8 ports:
1 means disconnection, 0 means no disconnection
<table><tr><td>Bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Port</td><td>C8</td><td>C7</td><td>C6</td><td>C5</td><td>C4</td><td>C3</td><td>C2</td><td>C1</td></tr></table></td></tr>
<tr><td rowspan="2">30002</td><td rowspan="2">1</td><td>Byte2</td><td>C1 Port disconnection times</td></tr>
<tr><td>Byte3</td><td>C2 Port disconnection times</td></tr>
<tr><td rowspan="2">30003</td><td rowspan="2">2</td><td>Byte4</td><td>C3 Port disconnection times</td></tr>
<tr><td>Byte5</td><td>C4 Port disconnection times</td></tr>
<tr><td rowspan="2">30004</td><td rowspan="2">3</td><td>Byte6</td><td>C5 Port disconnection times</td></tr>
<tr><td>Byte7</td><td>C6 Port disconnection times</td></tr>
<tr><td rowspan="2">30005</td><td rowspan="2">4</td><td>Byte8</td><td>C7 Port disconnection times</td></tr>
<tr><td>Byte9</td><td>C8 Port disconnection times</td></tr>
<tr><td>30006-30021</td><td>5-20</td><td>Byte10-Byte41</td><td>C1 Port process input data (32Byte)</td></tr>
<tr><td>30022-30037</td><td>21-36</td><td>Byte42-Byte73</td><td>C2 Port process input data (32Byte)</td></tr>
<tr><td>30038-30053</td><td>37-52</td><td>Byte74-Byte105</td><td>C3 Port process input data (32Byte)</td></tr>
<tr><td>30054-30069</td><td>53-68</td><td>Byte106-Byte137</td><td>C4 Port process input data (32Byte)</td></tr>
<tr><td>30070-30085</td><td>69-84</td><td>Byte138-Byte169</td><td>C5 Port process input data (32Byte)</td></tr>
<tr><td>30086-30101</td><td>85-100</td><td>Byte170-Byte201</td><td>C6 Port process input data (32Byte)</td></tr>
<tr><td>30102-30117</td><td>101-116</td><td>Byte202-Byte233</td><td>C7 Port process input data (32Byte)</td></tr>
<tr><td>30118-30133</td><td>117-132</td><td>Byte234-Byte265</td><td>C8 Port process input data (32Byte)</td></tr>
</table>

2.IO-Link Process Data Output (Occupy 128 Word), Support function codes F03 (read holding register), F16 (write holding register), F23 (read and write holding register)			
Modbus Reference Number	Modbus Data Address	IO-Link BYTE	Description
40001-40016	0-15	Byte10-Byte31	C1 Port process output data (32Byte)
40017-40032	16-31	Byte32-Byte63	C2 Port process output data (32Byte)
40033-40048	32-47	Byte64-Byte95	C3 Port process output data (32Byte)
40049-40064	48-63	Byte96-Byte127	C4 Port process output data (32Byte)
40065-40080	64-79	Byte128-Byte159	C5 Port process output data (32Byte)
40081-40096	80-95	Byte160-Byte191	C6 Port process output data (32Byte)
40097-40112	96-111	Byte192-Byte223	C7 Port process output data (32Byte)
40113-40128	112-127	Byte224-Byte255	C8 Port process output data (32Byte)

Correspondence between words and bytes:																
Default byte order	IO-Link data byte 0 BYTE 0 high byte								IO-Link data byte 1 BYTE 1 low byte							
Word (bit)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0