ANALOG I/O MODULE (Modbus; RS-485)	MODEL	**61M**

BEFORE USE ....

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Analog I/O module ....(1)
Terminating resistor (110 Ω, 0.25 W).................................(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE

• Locate the power input rating marked on the product and confirm its operational range as indicated below:
　　85 – 132V AC rating: 85 – 132V, 47 – 66 Hz, approx. 4VA
　　24V DC rating: 24V ±10%, approx. 4W, approx. 160mA

■ GENERAL PRECAUTIONS

• Before you remove the unit or mount it, turn off the power supply, input signal and output signal for safety.

■ ENVIRONMENT

• Indoor use.
• When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
• Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
• Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

• Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
• Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
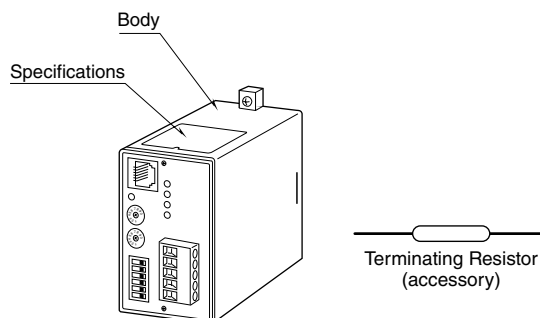
■ AND ....

• The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.
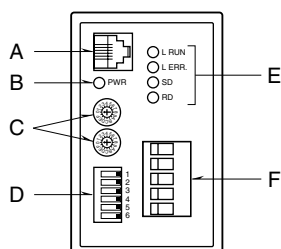
INSTALLATION

Use the Installation Base (model: MxBS2).
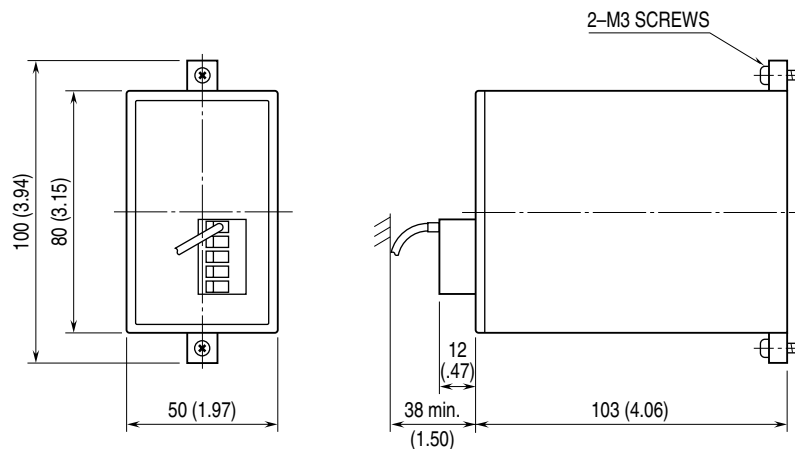
COMPONENT IDENTIFICATION

Body

Specifications

Terminating Resistor
(accessory)

■ FRONT PANEL CONFIGURATION

		NAME	FUNCTIONS			
A		Modular jack for factory calibration	Used only for factory calibration.			
B		Power indicator LED	green LED, ON when power is supplied.			
C		Node address setting	Selectable within 01 – F7. (factory set to: 00)			
D		Transmission setting	Baud rate	SW	BAUD RATE (bps)			

				SW	38.4 k	19.2 k	9600	4800
			Baud rate	1	ON	OFF	ON	OFF
				2	ON	ON	OFF	OFF
				3	OFF	OFF	OFF	OFF
				SW	PARITY			
				SW	NONE	ODD	EVEN	N/A
			Parity	4	ON	OFF	ON	OFF
				5	ON	ON	OFF	OFF
				SW	DATA			
			Data	SW	RTU (Binary)		ASCII	
				6	ON		OFF	

		NAME	MARKING (color)	FUNCTIONS
E		Status indicator LED	L RUN (red)	ON for 10 sec. when the modules receives data.
			L ERR. (red)	ON at errors in parity, framing, overrun, CRC, LRC
			SD (red)	ON when transmitting
			RD (red)	ON when receiving
F		Euro type connector terminal for Modbus	For wiring to Modbus	

TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

■ EXTERNAL DIMENSIONS unit: mm (inch)

2–M3 SCREWS

100 (3.94)
80 (3.15)
50 (1.97)

12 (.47)
38 min. (1.50)
103 (4.06)

■ CONNECTION DIAGRAM

Terminator
*
To Other Modbus Devices

| DA |
| DB |
| DG |
| SLD |
| FG |

I/O & POWER CONNECTOR

To Installation Base

Modular Jack for Factory Calibration → MODULAR JACK
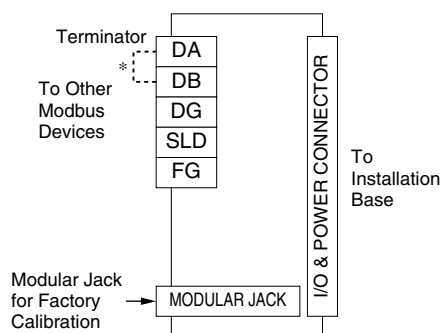
*Attach the terminating resistor when the module is at the termination of a transmission line.
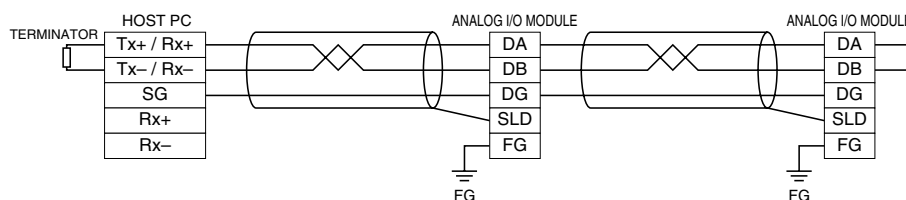
WIRING INSTRUCTIONS

■ EURO TYPE CONNECTOR TERMINAL (Modbus)

Applicable wire size: 0.2 to 2.5 mm^2 (AWG24 to 12)
Stripped length: 7 mm

COMMUNICATION CABLE CONNECTIONS

TERMINATOR

HOST PC

| Tx+ / Rx+ |
| Tx− / Rx− |
| SG |
| Rx+ |
| Rx− |

ANALOG I/O MODULE

| DA |
| DB |
| DG |
| SLD |
| FG |

FG

ANALOG I/O MODULE

| DA |
| DB |
| DG |
| SLD |
| FG |

FG

MODBUS FUNCTION CODES & SUPPORTED CODES

■ **Data and Control Functions**

CODE	NAME		
01	Read Coil Status	X	Digital output from the slave
02	Read Input Status	X	Status of digital inputs to the slave
03	Read Holding Registers	X	General purpose register within the slave
04	Read Input Registers	X	Collected data from the field by the slave
05	Force Single Coil	X	Digital output from the slave
06	Preset Single Registers	X	General purpose register within the slave
07	Read Exception Status		
08	Diagnostics	X	
09	Program 484		
10	Poll 484		
11	Fetch Comm. Event Counter		Fetch a status word and an event counter
12	Fetch Comm. Event Log		A status word, an event counter, a message count and a field of event bytes
13	Program Controller		
14	Poll Controller		
15	Force Multiple Coils	X	Digital output from the slave
16	Preset Multiple Registers	X	General purpose register within the slave
17	Report Slave ID		Slave type / 'RUN' status
18	Program 884/M84		
19	Reset Comm. Link		
20	Read General Reference		
21	Write General Reference		
22	Mask Write 4X Register		
23	Read/Write 4X Register		
24	Read FIFO Queue		

■ **Exception Codes**

CODE	NAME		
01	Illegal Function	X	Function code is not allowable for the slave
02	Illegal Data Address	X	Address is not available within the slave
03	Illegal Data Value	X	Data is not valid for the function
04	Slave Device Failure		
05	Acknowledge		
06	Slave Device Busy		
07	Negative Acknowledge		
08	Memory Parity Error		

■ **Diagnostic Subfunctions**

CODE	NAME		
00	Return Query Data	X	Loop back test
01	Restart Comm. Option	X	Reset the slave and clear all counters
02	Return Diagnostic Register	X	Contents of the diagnostic data (2 bytes)
03	Change ASCII Input Delimiter	X	Delimiter character of ASCII message
04	Force Listen Only Mode	X	Force the slave into Listen Only Mode

MODBUS I/O ASSIGNMENTS

	ADDRESS	61M TYPE		DATA TYPE	DATA
		1	2		
Coil (0X)	1 – 16	X			Averaging SW *
	17 – 32	X			Sampling rate SW **
Inputs (1X)	1 – 16	X	X		Analog channel status (active channel)
	17 – 32	X	X		Analog status (out of range)
Input Registers (3X)	1 – 16	X		I	Analog input
	17 – 48	X		F	Analog input
Holding Registers (4X)	1 – 16		X	I	Analog output
	17 – 48		X	F	Analog output
	49 – 80	X	X	F	Full scale
	81 – 112	X	X	F	Zero scale

■**61M Type**

1: Analog input
2: Analog output

■**Data Type**

F: Floating
I : Int 0 – 10000 (0 – 100%)

* Averaging SW
1: 4 samples
2: 2 samples
3: None

** Sampling rate SW
17: 400 millisec.
18: 240 millisec.
19: 160 millisec.

LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protectors for protection against induced lightning surges. Please contact M-System to choose appropriate models.