Field Network Modules 61-UNIT Series

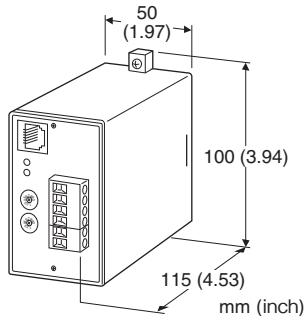
ANALOG I/O MODULE

(Multiplex Transmission System)

Functions & Features

• Interfacing analog I/O signals from/to Mini-M or Pico-M modules with Multiplex Transmission System

• Saving power and I/O wiring inside an instrumentation panel



MODEL: 61S–16[1]–[2][3]

ORDERING INFORMATION

• Code number: 61S-16[1]-[2][3]

Specify a code from below for each [1] through [3].
(e.g. 61S-161-K/Q)

• Specify the specification for option code /Q
(e.g. /C01)

NO. OF CHANNELS

16: 16 points

[1] I/O TYPE

1: Input

2: Output

[2] POWER INPUT

AC Power

K: 85 – 132 V AC

(Operational voltage range 85 – 132 V, 47 – 66 Hz)

DC Power

R: 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

(Specify power suffix code R (24 V DC) when the UNIT is to be combined with the M8BS2.)

[3] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

RELATED PRODUCTS

• Installation Base (model: M2BS2)

• Installation Base (model: M8BS2)

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection

SIN-NET, RUN contact output: Euro type connector terminal (applicable wire size: 0.2 to 2.5 mm^2, stripped length 7 mm)

I/O: Via Installation Base (model: MxBS2)

Power input: Via Installation Base (model: MxBS2)

Housing material: Flame-resistant resin (black)

Isolation: I/O to SIN-NET to RUN contact output to power

Power indicator: Red LED turns ON in normal conditions; OFF when the voltage level becomes low.

RUN indicator: Red LED turns ON when the selfdiagnosis proves normal, OFF in an abnormality.

■ RUN Contact Output: Contact opens at error

Rated load: 30 V DC @ 0.4 A (resistive load)

Maximum switching voltage: 125 V DC

Maximum switching power: 60 W

Minimum load: 10 mV DC @ 1 mA

Mechanical life: 5 x 10^7 cycles

Self-diagnosis

Communication: The receiver modules detect loss of communication and wire break.

CPU: Watch-dog timer

Memory: Sum check

Power voltage: Detects when the voltage supply to the CPU drops.

COMMUNICATION

Configuration: Multi-drop
Standard: Conforms to EIA RS-422
Communication: 2-wire, half-duplex
Transmission speed: 125 kbps
Control procedure: SDLC
Data encoding: NRZ
Protocol: SIN-NET (M-System's)
Error check: CRC
Transmission distance: 500 m
Transmission media: Twisted-pair cable CPEV-0.9 dia.
Station No.: Rotary switch
Terminator: Incorporated (remove jumper pin with those modules not located at the end of transmission line)

INPUT SPECIFICATIONS

■ Analog Input
Input range: 1 – 5 V DC
Input resistance: ≥ 1 MΩ
(Each input must be isolated by signal conditioners. Non-isolated modules such as M2BW and M8BW are not usable.)
A / D conversion
Moving averaging: 4 samples
Sampling rate: 160 ms

OUTPUT SPECIFICATIONS

■ Analog Output
Output range: 1 – 5 V DC
Load resistance: 20 kΩ minimum
(Output must be isolated with signal conditioners.
When the transmission line is open, the last value sampled before failure is held. Non-isolated modules such as M2BW and M8BW are not usable.)

INSTALLATION

Power consumption
•**AC**: Approx. 4 VA
•**DC**: Approx. 4 W (160 mA)
Operating temperature: -5 to +55°C (23 to 131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: Installation Base (model: MxBS2)
Weight: 250 g (0.55 lb)

PERFORMANCE in percentage of span

A/D conversion: ±0.1 %
D/A conversion: ±0.1 %
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Permissible power failure duration: ≤ 10 msec.
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute (I/O to SIN-NET to RUN contact output to power)

DESCRIPTIONS

■ RUN Contact Output (LED) Behaviors

• Input module

The LED for the Input Modules turns ON when the network is on-line.
When there is an abnormality in the network, the LED turns OFF.
The network is reconfigured after an abnormality.

• Output module

The LED for the Output Modules turns ON when the network is on-line and the module receives data from the corresponding Input Module.
When there is an abnormality in the network or there is no data receiving, the LED turns OFF.

■ Station Number (Address)

A) 1 input module and X output modules:
Match the address for input and output modules.

B) Computer interface:
Set address numbers to correspond with the computer as output module.

■ Transmission Time

Integrate all the transmission time for each process input module in the system.

• Analog input 16 points: 24 msec.

An analog module does not transmit all its signals in serial but does 1 point per each cycle. For example, when 1 contact input module (DLA1, 32 points) and 1 analog input module (16 points) are connected, 32-point contact signal and 1 point analog signal are transmitted in turn.
One cycle time is therefore calculated as:
32 points x 1.5 msec. + 24 msec. = 72 msec.
This method is beneficial for giving a priority to contact signals which vary rapidly.

■ Applicable models for use with 61S Input Module

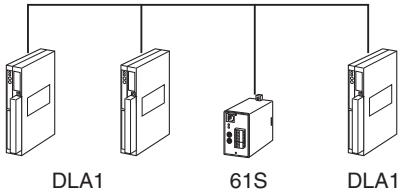
• 61S-162 (Ao 16 points)
• DLA1-xM1 (Ao 32 points; only the top 16 out of 32 are used)

■ **TRANSMISSION LINE CONFIGURATION**

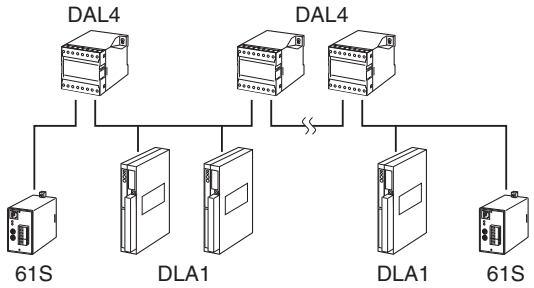
The multi-drop transmission line containing 22LA1, DLA1 and 61S modules should meet the following conditions. Contact M-System's sales office or representatives when designing.

A) 10 kilometers at maximum in total system.

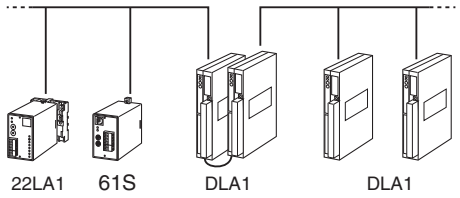
B) 61S modules plus DLA1 units: One multitransmission line containing a 60S module can consist of a maximum of 16 units within the total distance of 500 m.



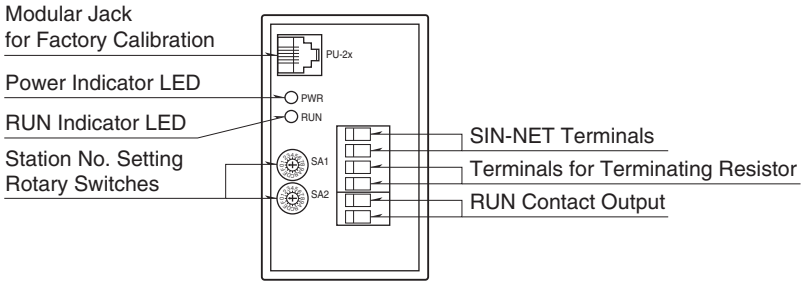
C) **61S modules plus DLA1 units plus Repeaters (model: DAL4):** DAL4 units can expand the total distance. (6 DAL4 units max.)



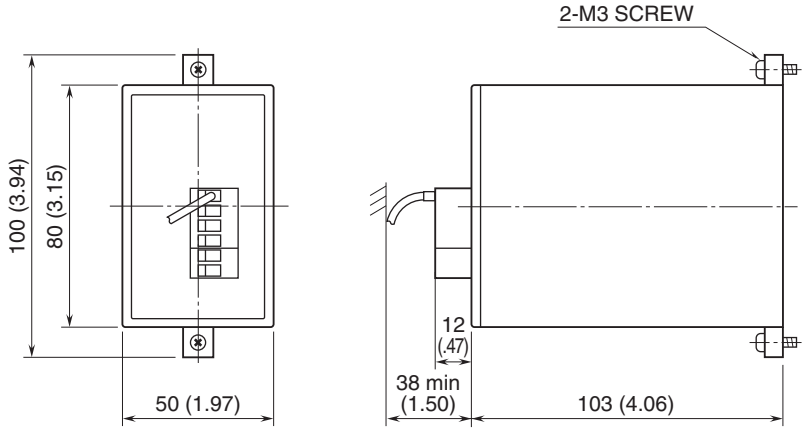
D) 61S modules plus 22LA1 modules plus DLA1 units: The total distance of a section consists of 61S and 22LA1 modules is less than 500 meters. They can be connected to DLA1 units via a DLA1-7 unit. (Eight DLA1-7 units max.)



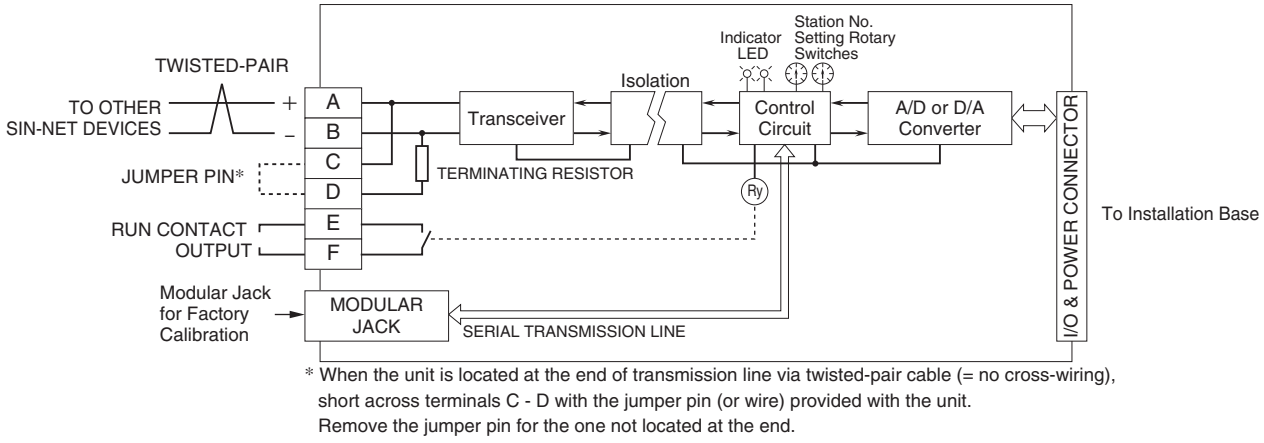
EXTERNAL VIEW



EXTERNAL DIMENSIONS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



* When the unit is located at the end of transmission line via twisted-pair cable (= no cross-wiring), short across terminals C - D with the jumper pin (or wire) provided with the unit. Remove the jumper pin for the one not located at the end.

⚠ Specifications are subject to change without notice.