

## Multiplex Transmission System

### REPEATER

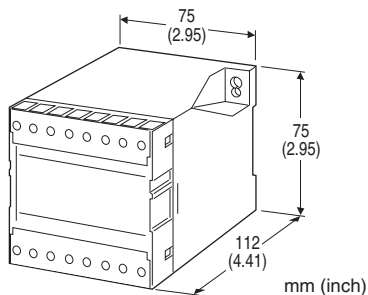
(SIN-NET, M-Bus use)

#### Functions & Features

- Extending No. of field devices and transmission distance for DLA1, DLA2
- Branching
- Transmission media conversion (twisted-pair from/to fiber optics)
- Repeater circuit incorporated in each port

#### Typical Applications

- Exceeding 1 kilometer (3280 ft) distance with DLA1 or DLA2
- Using more than 16 DLA1 or DLA2 units



## MODEL: DAL4-[1]-[2]

### ORDERING INFORMATION

- Code number: DAL4-[1]-[2]
- Specify a code from below for each of [1] and [2].  
(e.g. DAL4-1-M2)

#### [1] CABLE & PORT TYPE

- 1: Twisted-pair cable, 3 ports
- 2: Fiber optics (PCF), 2 ports + Twisted-pair cable, 1 port
- 5: Fiber optics (GI-850 nm), 1 port + Twisted-pair cable, 1 port
- 7: Fiber optics (GI-850 nm), 1 port + Twisted-pair cable, 1 port

#### [2] POWER INPUT

AC Power

**M2:** 100 - 240 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)

DC Power

**R:** 24 V DC

(Operational voltage range 24 V  $\pm$ 10 %, ripple 10 %p-p max.)

### RELATED PRODUCTS

- Standard multi-transmission unit (model: DLA1)
- Remote I/O unit (model: DLA2)
- Multi-transmission module (model: 22LA1)
- SIN-NET interface module (model: D3-NS1)
- Telemetry interface module (model: D3-NS2)
- Remote I/O interface module (model: D3-NS3)
- Lightning surge protector (model: MDP-DM3)

### APPLICABLE NETWORK

SIN-NET, M-Bus

### GENERAL SPECIFICATIONS

**Construction:** Stand-alone; terminal access at the front

**Connection**

**Twisted-pair cable & power input:** M3.5 screw terminals (torque 0.8 N·m)

**Optical fiber:** Connector

**Screw terminal:** Nickel-plated steel

**Housing material:** Flame-resistant resin (black)

**Isolation:** PORT-A to PORT-B to PORT-C to power to FG

### COMMUNICATION

#### ■ TWISTED-PAIR CABLE

**Cable:** CPEV-0.9 dia.

**Transmission Distance:** 1 kilometer max. with 16 field units; 2 kilometers max. between two DAL4

#### ■ FIBER OPTICS CABLE

- PCF

**Transmission distance:** 1 kilometer max.

**Link:** JIS F07 connector

**Applicable fiber HC-20/07 (SUMITOMO):**

Core/clad dia. 200/230  $\mu$ m

Max. loss 11 dB<sup>-1</sup>

- GI-850 nm (DAL4-5)

**Transmission distance:** 2.5 kilometers max.

**Connector:** JIS F01 connector

**Applicable fiber:**

Core/clad dia. 50/125  $\mu$ m

Max. loss 7 dB<sup>-1</sup>

- GI-850 nm (DAL4-7)

**Transmission distance:** 4 kilometers max.

**Connector:** JIS F01 connector

**Applicable fiber:**

Core/clad dia. 50/125  $\mu$ m

Max. loss 12 dB<sup>-1</sup>

\*1. Total of connection and transmission loss.

## INSTALLATION

### Power consumption

- AC: Approx. 11 VA
- DC: Approx. 250 mA

**Operating temperature:** -5 to +55°C (23 to 131°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Mounting:** Surface or DIN rail

**Weight:** 300 g (0.66 lb)

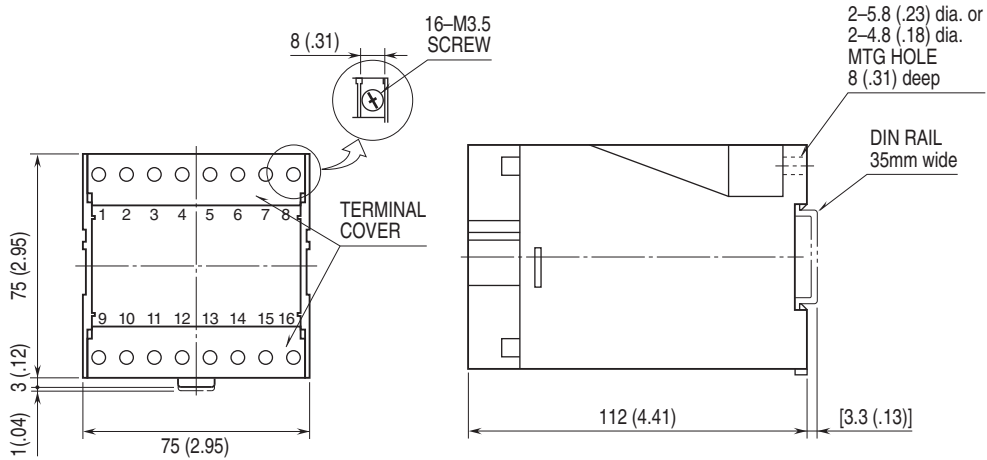
## PERFORMANCE

**Insulation resistance:**  $\geq 100 \text{ M}\Omega$  with 500 V DC

**Dielectric strength:** 1500 V AC @ 1 minute  
(PORT-A to PORT-B to PORT-C to power to FG)

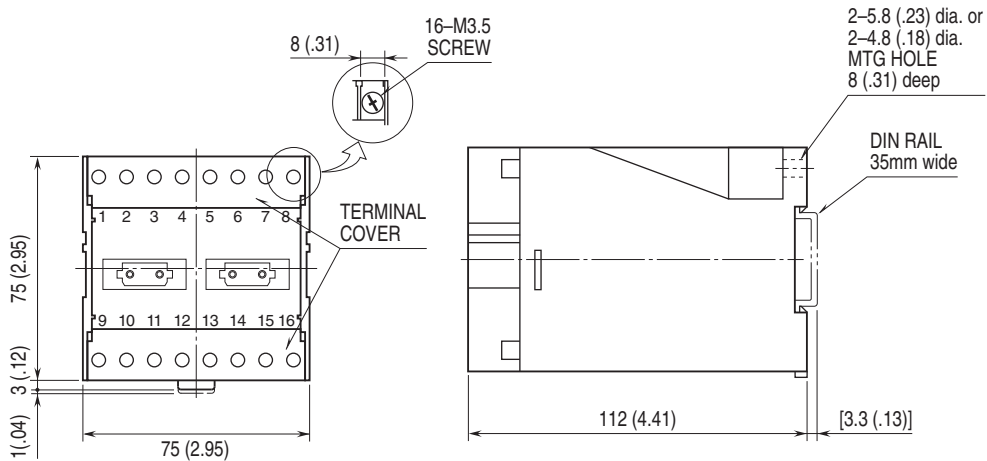
## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

### ■DAL4-1



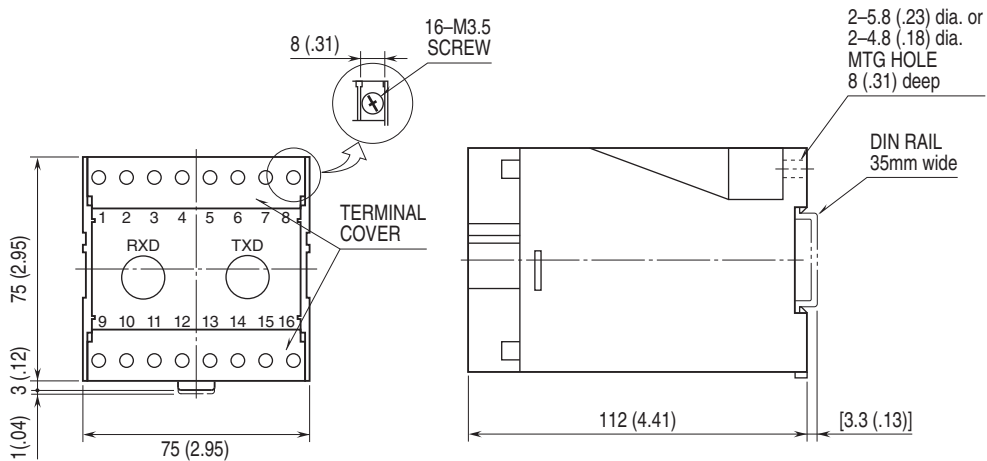
•When mounting, no extra space is needed between units.

### ■DAL4-2



•When mounting, no extra space is needed between units.

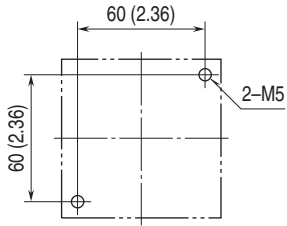
### ■DAL4-5, 7



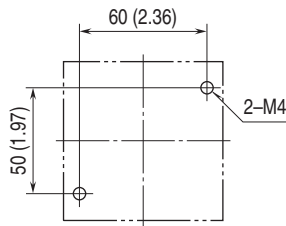
•When mounting, no extra space is needed between units.

## MOUNTING REQUIREMENTS unit: mm [inch]

### ■ M5 SCREWS

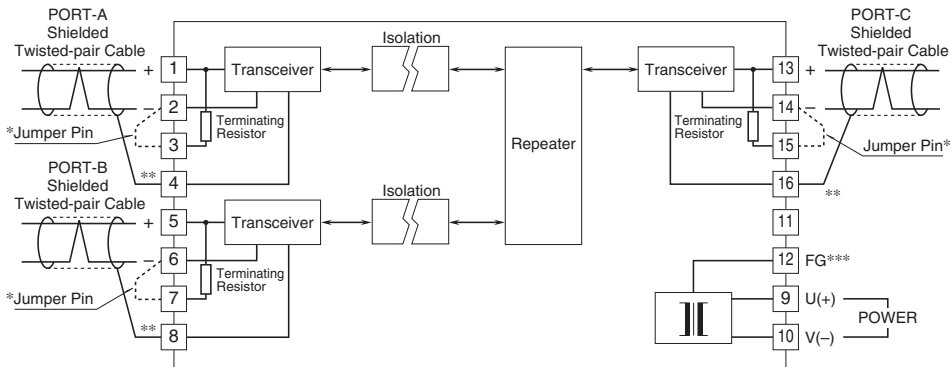


### ■ M4 SCREWS

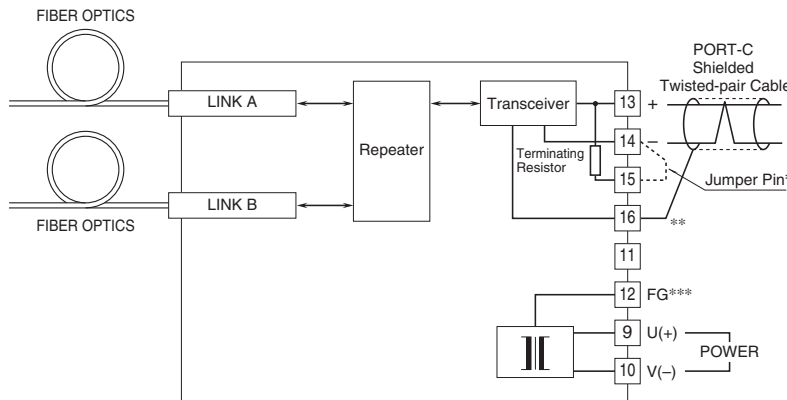


## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

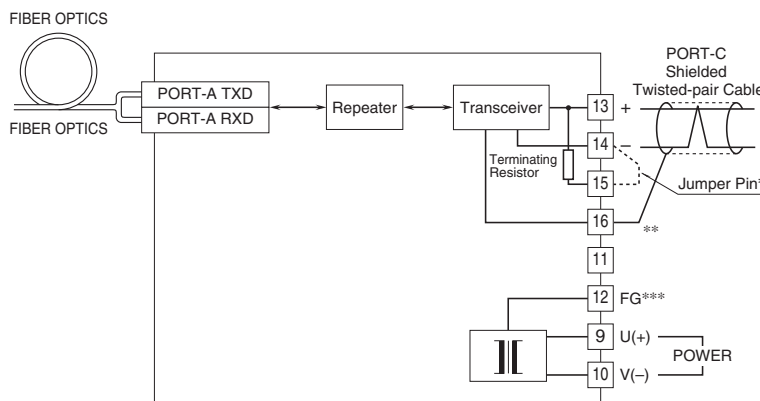
### ■ DAL4-1



### ■ DAL4-2



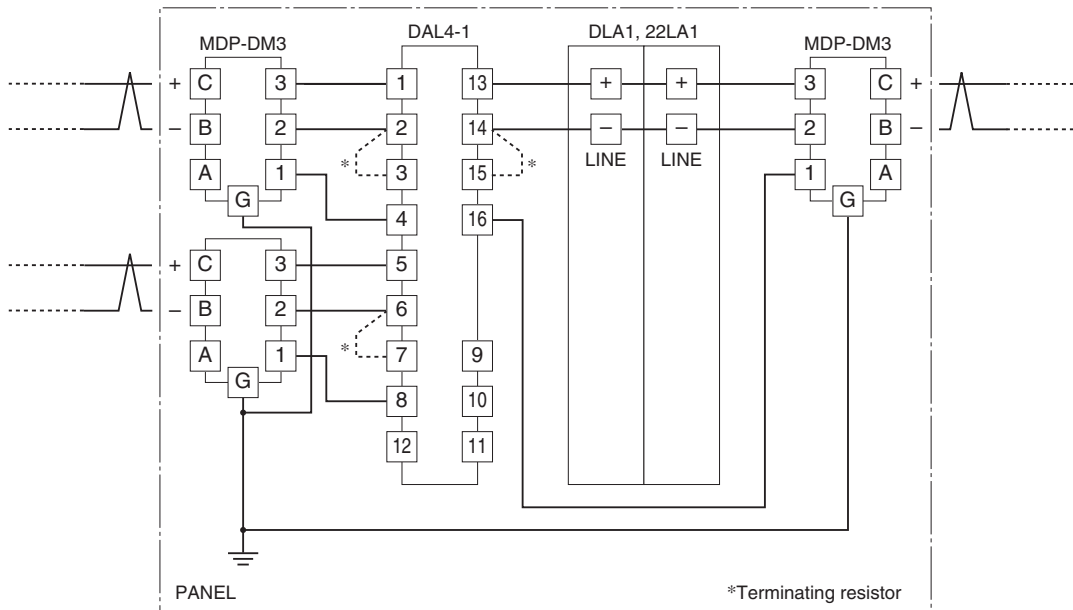
### ■ DAL4-5, 7



- \* When the unit is located at the end of transmission line via twisted-pair cable (= no cross-wiring), short across these terminals. Do not short them for the one not located at the end.
- \*\* When the DAL4 is to be connected with the 22LA1 or DLA1 multi transmission devices, do not connect the shield wire to the SG (4, 8 or 16) but to the FG at the instrumentation panel.
- \*\*\* Grounding the FG improves noise immunity of the power and transmission lines, and is a recommended practice when the DAL4 is installed where a noise is present.

## LIGHTNING SURGE PROTECTION

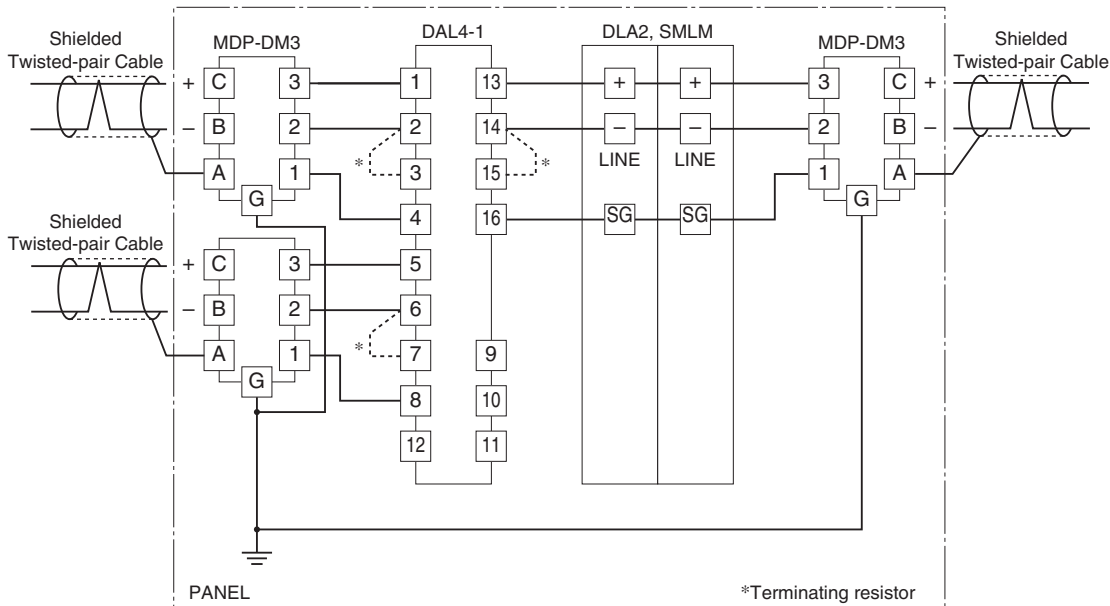
### ■ MULTIPLEX TRANSMISSION



#### Notes

- Be sure to use lightning surge protectors (model: MDP-DM3) on twisted-pair cables.
- Be sure to connect the terminal No. 1 of the MDP-DM3 with SG terminal of the DAL4.
- For connecting model DLA1 or 22LA1 with the DAL4 in the same panel, install them between the MDP-DM3 and the DAL4.  
Be sure to connect the terminal No. 1 of the MDP-DM3 with SG terminal of the DAL4.
- Lightning surge protectors for power supply line are recommended for complete protection.

### ■ M-BUS



#### Notes

- Be sure to use lightning surge protectors (model: MDP-DM3) on twisted-pair cables.
- Be sure to connect the terminal No. 1 of the MDP-DM3 with SG terminal of the DAL4.
- For connecting model DLA2 or SMLM with the DAL4 in the same panel, install them between the MDP-DM3 and the DAL4.  
Be sure to connect the terminal No. 1 of the MDP-DM3 with SG terminal of the DAL4.
- Lightning surge protectors for power supply line are recommended for complete protection.



Specifications are subject to change without notice.