General Specifications

Model ML2 RS232C/RS485 Converter

GS 77J04L02-01E

General

This plug-in type RS-232C/RS-485 dual directional (half duplex) converter has two ports of RS-232C and RS-485. Between these two ports, isolation, level conversion and active control of driver are performed. This converter is mainly used to connect RS-232C of personal computer with the instruments equipped with RS-485.

Main Features and Functions

• Two modes (Auto and Manual) for Active control of RS-485 driver can be selected with the DIP switch. Auto: When start bit is detected on RS-232C

side, the converter makes RS-485 driver active.

- Manual: Active control of RS-485 driver depends on RS (Request to Send) of outer set instrument connected with RS-232C.
- For RS-485, 2-wire or 4-wire can be selected by DIP switch. And for 2-wire, On/Off of Echo back function can be selected by DIP switch. (For 4-wire, be sure to set Echo back function at Off.)
- RS-485 line is internally equipped with 220Ω terminating resistor. With or without the resistor can be selected with the DIP switch.
- A corresponding communication speed can be changed to eight stages and selected with the rotary switch.

(38400, 19200, 9600, 4800, 2400, 1200, 600, 300 bps)

Model and Suffix Codes

	<u>ML2</u> -
Model	
Power supply	

6: 85 to 264 V AC/DC

7: 12 to 36 V DC (Operating range: 12 to 48V DC)

Items to be Specified when Ordering

• Model and Suffix Codes: e.g. ML2-6



Communication Specifications

RS-232C Specifications

Interface: Conforms to RS-232C Transmit mode: Half duplex communication Synchronizing mode: Start-stop synchronizing mode Applicable transmit speed (bps): 38400, 19200, 9600, 4800, 2400, 1200, 600, 300

CS (CTS) signal: Turned off when data is detected on RS-485 side.

If no data is detected, CS (Clear to Send) signal is turned on again after elapsed time of 10 bits. However, if data of RS-232C is detected during elapsed time of 10 bits, CS (Clear to Send) signal is turned on immediately.

Rotary Switch No.	Transmit speed (bps)	Timer (ms)
0	300	33.3
1	600	16.7
2	1200	8.33
3	2400	4.17
4	4800	2.08
5	9600	1.04
6	19200	0.52
7	38400	0.26

Connector type: D-sub 9-pin (male) Recommended cable: Straight cable Terminal to connect: SD (TXD), RD (RXD), RS (RTS) CS (CTS), DR (DSR), CD (DCD), ER (DTR), SG (GND) Signal polarity: Start bit +12 V Stop bit -12 V Terminating resistor: None Transmit distance: Maximum 15 m



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RS-485 Specifications

Interface: Conforms to RS-485 Transmit mode: Half duplex communication Synchronizing mode: Start-stop synchronizing mode Applicable transmit speed (bps): 38400, 19200, 9600, 4800, 2400, 1200, 600, 300

Active control of driver:

- Auto: When start bit is detected on RS-232C side, the converter makes RS-485 driver active and transmits data received from RS-232C to RS-485. If no data is detected, the converter returns the driver to passive after elapsed time of 10 bits.
- Manual: Active control of RS-485 driver depends on RS (Request to Send) of outer set instrument connected with RS-232C.

When RS (Request to Send) is turned on, the converter makes RS-485 driver active and transmits data received from RS-232C to RS-485. When RS (Request to Send) is turned off, the converter returns the driver to passive.

Connection method: 8-pin terminal board (M3.5 screw terminal)

Recommended cable: 0.9 mm² or thicker of multicore twisted pair cable with a shield

Terminal to connect:

- 4-wire: RDA(-)/RDB(+)/SDA(-)/SDB(+)/SG 2-wire: A(-)/B(+)/SG
- Signal polarity:

4-wire

- 4-wire
 Start bit:
 SDB(+) is minus side against SDA(-) RDB(+) is minus side against RDA(-)

 Stop bit:
 SDB(+) is plus side against SDA(-) RDB(+) is plus side against RDA(-)

 2-wire
 Start bit:

 Start bit:
 B(+) is minus side against A(-)

 Stop bit:
 B(+) is plus side against A(-)

 Terminating resistor:
 220Ω (with/without resistor is
- selectable)
- Transmit distance: Maximum 1.2 km

Standard Performance

Insulation resistance: 100 M Ω minimum at 500 V DC between RS-232C, RS-485, power supply and grounding terminals mutually

Withstanding voltage: 2000 V AC for one minute between RS-232C, RS-485, power supply and grounding terminals mutually

Operating temperature range: 0 to 50°C

- Operating humidity range: 5 to 90% RH (no condensation)
- Power supply rated voltage: 100 to 240 V AC_, 50/ 60 Hz or 15 to 30 V DC_...
- Power supply input voltage: 100 to 240 V AC_→ (-15%, +10%), 50/60 Hz or 15 to 30 V DC_→ (±20%)

Power consumption:

- 2.6 W at 24 V DC; 2.5 W at 110 V DC;
 - 5.0 VA at 100 V AC; 6.8 VA at 200 V AC

Switch Setting

No.	Setting	OFF	ON
1	2-wire/4-wire	4-wire	2-wire
3	Driver active	Auto	Manual
4	Terminating resistor	Without	With
5	Echo back	OFF	ON
6	Fixed to OFF	OFF	-

Switch setting when shipment from factory

- 2-wire/4-wire select switch: ON (2-wire)
- Terminating resistor select switch: ON
- Driver active switch: OFF (Auto)
- Echo back switch: OFF (echo back Off)
- Rotary switch: No.5 (for 9600 bps)

LED Display

- RDY: Lit in green while the power is turned on SD/RD: Lit in green when data is received in RXD
- of RS-232C side DRIVER ACTIVE: Lit in green while the driver is
- active

Mounting and Appearance

Material: Case body; ABS resin (black), UL94 V-0 Socket; Modified polyphenylene oxide, including glass fiber (black), UL94 V-1

Mounting method: Wall or DIN rail mounting More than 5 mm interval is required for side-by-side close mounting.

Connection method:

RS-232C D-sub 9-pin (male)

RS-485 M3.5 screw tarminal

External dimensions: 86.5 (H)×51 (W)×127.9 (D) mm (including a socket)

Weight: Approx. 250 g (including 60g of socket)

Accessories

Spacer: One (used for DIN rail mounting) Tag number labels: One sheet

System Configuration

• 4-wire



Terminal Assignments

F_F			
	1	SDA (-)	
	2	SDB (+)	
	3	SDA (-) / A (-)	RS-485
	4	SDB (+) / B (+)	
	5	SG	
	6	GND	
	7	L+	SUPPLY
	8	N-	

Block Diagrams



For 2-wire: Turn on the SW1-1 and SW1-2 to short-circuit, then connect cables to the terminals 3, 4, and 5. For 4-wire: Turn off the SW-1-1 and SW1-2 to open circuit, then connect cables to the terminals 1, 2, 3, 4, and 5.



• 2-wire



External Dimensions

(51)



• The information covered in this document is subject to change without notice for reasons of improvements in quality and/or performance.