OPERATING MANUAL

FOR

RS232 □ RS422/RS485

MODEL LD-15U

INTRODUCTION

Milestone model LD-15U is a RS232 to RS422/RS485 converter is designed for high-speed data transmission between computer system and or peripherals over long distance under high noise conditions. They provide dual line interface per signal.

APPLICATIONS

Application for these converters can be for factory automation, programmable logic controllers, attendance recording systems, Barcode Readers, remote data transmission, remote terminals, EPABX etc.

SPECIFICATIONS

Input	RS232 - TxD, RxD, DSR (for control), GND (D9 Female connector)
Output	RS422/RS485 – Tx+, Tx-, Rx+, Rx- (D9 Male Connector). Each signal is protected by spike suppressor, fuse and has opto-isolation.
Selection Switch	**1**. Rear side has **2-way 'SELECT' switch** for selecting 2-Wire or 4-Wire mode in RS422/RS485 application. **2**. **(Optional)** Rear side has **3-way 'SELECT' switch** for selecting AUTO Mode (No Handshake Signal), DSR+ Mode (+12V Control) and DSR- Model (-12V Control) for controlling data flow.
Max. Distance	1.2Kms. @ 19,200 bps
Output Cable	Shielded twisted pair cable-90 ohms/km
Transient Protection	2500 V Peak
Front Panel Indications	Power, Rx, Tx and DSR (for Control)
Power Supply	Mains Input-230V, 50 Hz
Power	Max. 20 VA Built-In Power Supply.
Size	117mm x 105mm x 55mm

INSTALLATION INSTRUCTIONS

Switch Settings

1. **2-WAY SELECT SWITCH:** Select 2-wire (half duplex) or 4-wire (full duplex) mode on 2-way switch on the back panel.
2. **3-WAY CONTROL SWITCH (Optional):**
   A. Position 1 - Auto - No Handshake Control
   B. Position 2 - DSR + (+12V) to enables RS485 output
   C. Position 3 - DSR - (–12V) to enables RS485 output

TABLE I: RS 232 Port – D9 Female Connector

Pin No.	Signal Name	In/Out
2	Tx	Output
3	Rx	Input
4	DSR	Input
5	Signal Ground	-

TABLE II: Output port-D9 Male connector

Line Driver Port	Signal – 4 Wire (RS422)	Signal – 2 Wire (RS485)
3	-Rx	
4	+Rx	
5	+Tx	+Tx/+Rx
6	-Tx	-Tx/-Rx
7	GND.	GND.
1	Frame Ground	Frame Ground

LED Indication:

A. Power - Power to the Unit
B. TD - Tx Data on RS422/RS485
C. RD - Rx Data on RS422/RS485
D. DSR - Transmit Control

TABLE III: RS 232 Cable

Computer End			RS232 Port	
Pin No. (D-25) Female	**Pin No. (D-9) Female**	**Signal**	**Pin No. (D-9) Male**	**Signal**
3	2	Rx	2	Tx
2	3	Tx	3	Rx
6	6	DSR	6	DTR
7	5	GND	5	Sig.Gnd
20	4	DTR	4	DSR
4, 5	7, 8	RTS.CTS	8	RTS

The above connections are for Standard PC COM Port. Please verify these connections for any other system or terminal before making the cable.

LONG DISTANCE CABLE LAYING

Long distance cable between two RS422/RS485 interfaces must be a twisted pair shielded cable. The pair should be used for each signal type + and – signal. This gives high common mode noise rejection. While laying the cable, care should be taken not to lay this cable parallel to power line cables. The cable resistance should not be more than 90 ohms/1000 meters. The cable should be run through conduit pipe for physical protection.

TERMINATING RESISTOR

Terminating Resistor of value 180 Ohms is required for 2-wire RS-485 configuration at each end between + and – output of the RS-485 port.
In multidrop configuration, terminating resistor should be connected on LD-15U RS-485 Port as well as on the last remote device port in the chain.

TABLE IV: OUTPUT CABLE – 4 Wire

D9 Male	Pin No.	Instrument
-Rx	3	-Tx
+Rx	4	+Tx
+Tx	5	+Rx
-Tx	6	-Rx

TABLE V: OUTPUT CABLE – 2 Wire

D9 Male	Pin No.	Instrument
+Tx/+Rx	5	+Tx/+Rx
-Tx/-Rx	6	-Tx-Rx

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