



## Model ICD102A

### Industrial DIN Rail Mount RS-422/485 Line Isolator/Repeater **CE**

#### Introduction

The ICD102A can be used to optically isolate one piece of RS-422/485 equipment from the rest of an RS-422/485 system, or one local group of RS-422/485 equipment from another. It can also be used as an RS-422/485 repeater. This allows the user to expand an existing RS-485 system to greater than the 32 node limitation in the RS-485 Standard. A typical setup using the ICD102A as an RS-485 repeater is shown in Figure 3.

All data lines as well as power and ground are isolated from one side of the ICD102A to the other. The ICD102A uses terminal blocks on each side of the device and supports Transmit Data (A) and (B), Receive Data (A) and (B), Signal Ground, and Protective Ground on the line side. Switch positions are the same for each side of the ICD102A e.g. switch position 3 on both switches is 9600 baud.

#### Connection

The ICD102A can operate in: two-wire half-duplex systems, four-wire half-duplex, or full-duplex systems (see Figures 1 and 2). The ICD102A can also operate as a four-wire to two-wire converter (Figure 2). By connecting one side of the ICD102A as a two-wire device and one side as a four-wire device, equipment meant for a point-to-point RS-422 interface can be connected directly to an RS-485 two-wire multi-drop system.

For the transient suppression of the ICD102A to work properly, the protective ground (PG) terminal must be tied to a good frame (chassis, green wire, or earth) ground.

#### RS-485 Operation

When no data is being transmitted through the ICD102A, the receivers are enabled on both sides of the device. As data is received on one side of the ICD102A, the opposite driver is enabled. When the ICD102A receives the falling edge of the last data bit, it waits one character time to disable the driver. This timeout period is factory preset for about one millisecond to accommodate a baud rate of 9,600 bits per second. The timeout period can be selected by dipswitch, accessible from outside the unit. The preset baud rate dipswitch settings available on the ICD102A should accommodate most systems. Alternative time-outs, can be achieved by turning the baud rate dipswitches OFF and placing a specific value through-hole resistor (R7 & R28) and/or through-hole capacitor (C8 & C12), on the board inside the unit near the switches. Through-hole resistor values for standard baud rate time out periods are given in Table 1. Setting non-standard baud rates may require a capacitor change. The ICD102A is factory set in two-wire mode (switch 7 & 8 are ON) at a 9600 baud rate, (switch 3 is ON), (up = ON).

#### Specifications

Isolation:	2,000 volts RMS for 1 minute optical isolation of data lines.
Surge Suppression:	6.5V working peak voltage, bi-directional over voltage suppressor 600W peak power dissipation 3,000 pF maximum capacitance
Data Rates:	Switch selectable for 2400 to 115.2K baud. For other baud rates up to 460.8K see Table 1.
Temperature Rating:	-40 to +80°C (-40 to +176°F)
Humidity Rating:	0 to 95% non-condensing
Power Requirements:	+10 to 30V (dissipates 800mW max)
Current Draw:	67mA @ 12VDC
Dimensions:	3.9L x 2.9W x 0.92H in (10.0 x 7.4 x 2.3 cm)

**Table 1. Baud Rate Selection**

	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	R7 & R28	Time (ms)
1200	OFF	OFF	OFF	OFF	OFF	OFF	820kΩ	9.02
2400	ON	OFF	OFF	OFF	OFF	OFF	Not Used	4.73
4800	OFF	ON	OFF	OFF	OFF	OFF	Not Used	2.20
9600	OFF	OFF	ON	OFF	OFF	OFF	Not Used	1.10
19200	OFF	OFF	OFF	ON	OFF	OFF	Not Used	.62
38400	OFF	OFF	OFF	OFF	ON	OFF	Not Used	.29
57600	OFF	OFF	OFF	OFF	OFF	ON	Not Used	.17
76800	ON	OFF	ON	ON	OFF	OFF	Not Used	.15
115200	ON	ON	ON	OFF	OFF	OFF	Not Used	.11
153600	OFF	OFF	OFF	OFF	OFF	OFF	6.2kΩ	.07
230400	OFF	OFF	OFF	OFF	OFF	OFF	4.3kΩ	.05
460800	OFF	OFF	OFF	OFF	OFF	OFF	2kΩ	.02

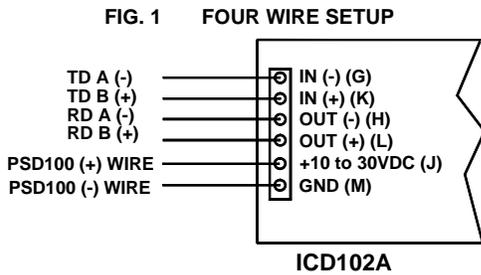
**Table 2: RS-422/485 Switch Settings**

	Position 7 TX Enable	Position 8 RX Enable
<b>RS-485 2-Wire Mode (half-duplex)</b>	ON	ON
<b>RS-485 4-Wire Mode (full-duplex)</b>	ON	OFF
<b>RS-422 Mode (full-duplex)</b>	OFF	OFF

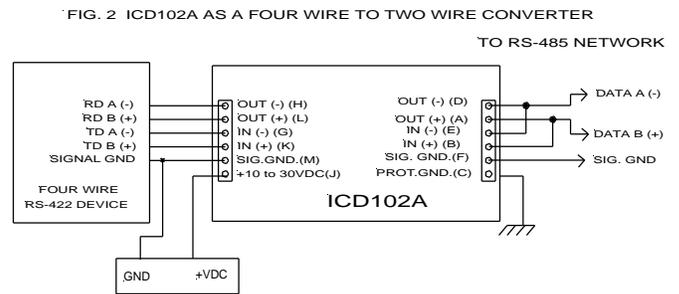
**LEDs**

The red LEDs indicate when data is transferred to the RS-485 driver. The LED with the arrow pointing to the J2 terminals, A – F, is LED DS2. It indicates that data is being transmitted out of J2. The LED with the arrow pointing to the J1 terminals, G – M, is LED DS1. This LED indicates data is being transmitted out of J1.

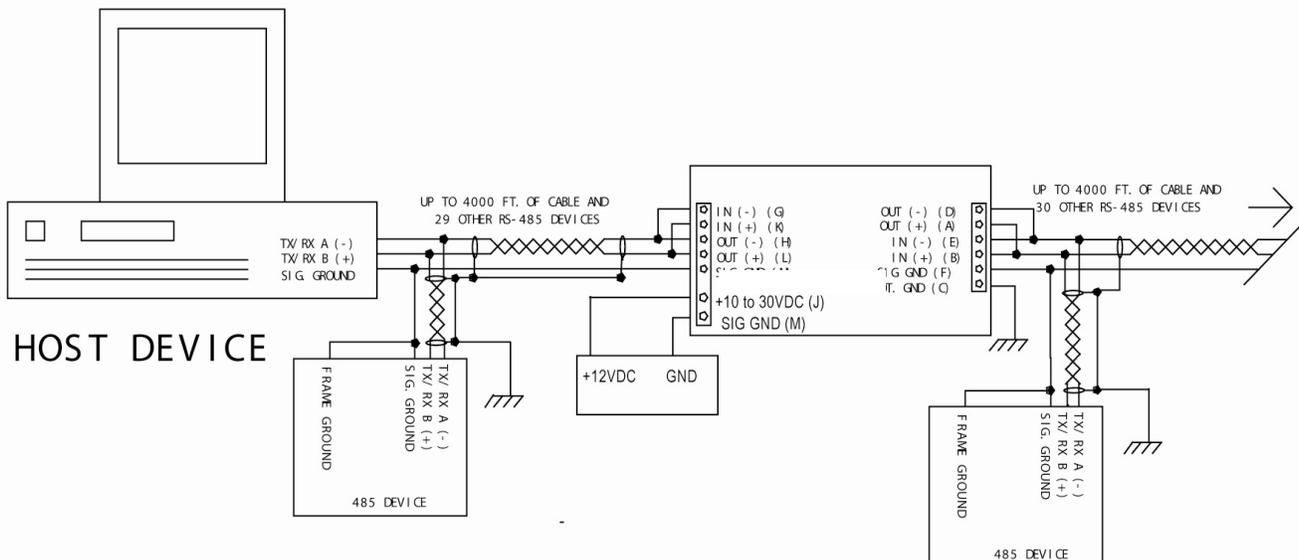
**Figure 1. Four-wire Set-up**



**Figure 2. ICD102A as a Four-wire to Two-wire Converter**



**Figure 3. ICD102A as a Two-wire RS-485 Repeater**



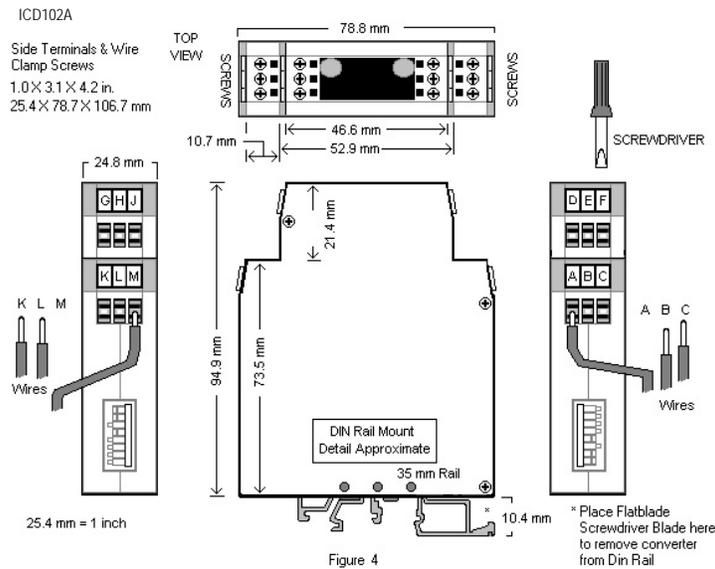
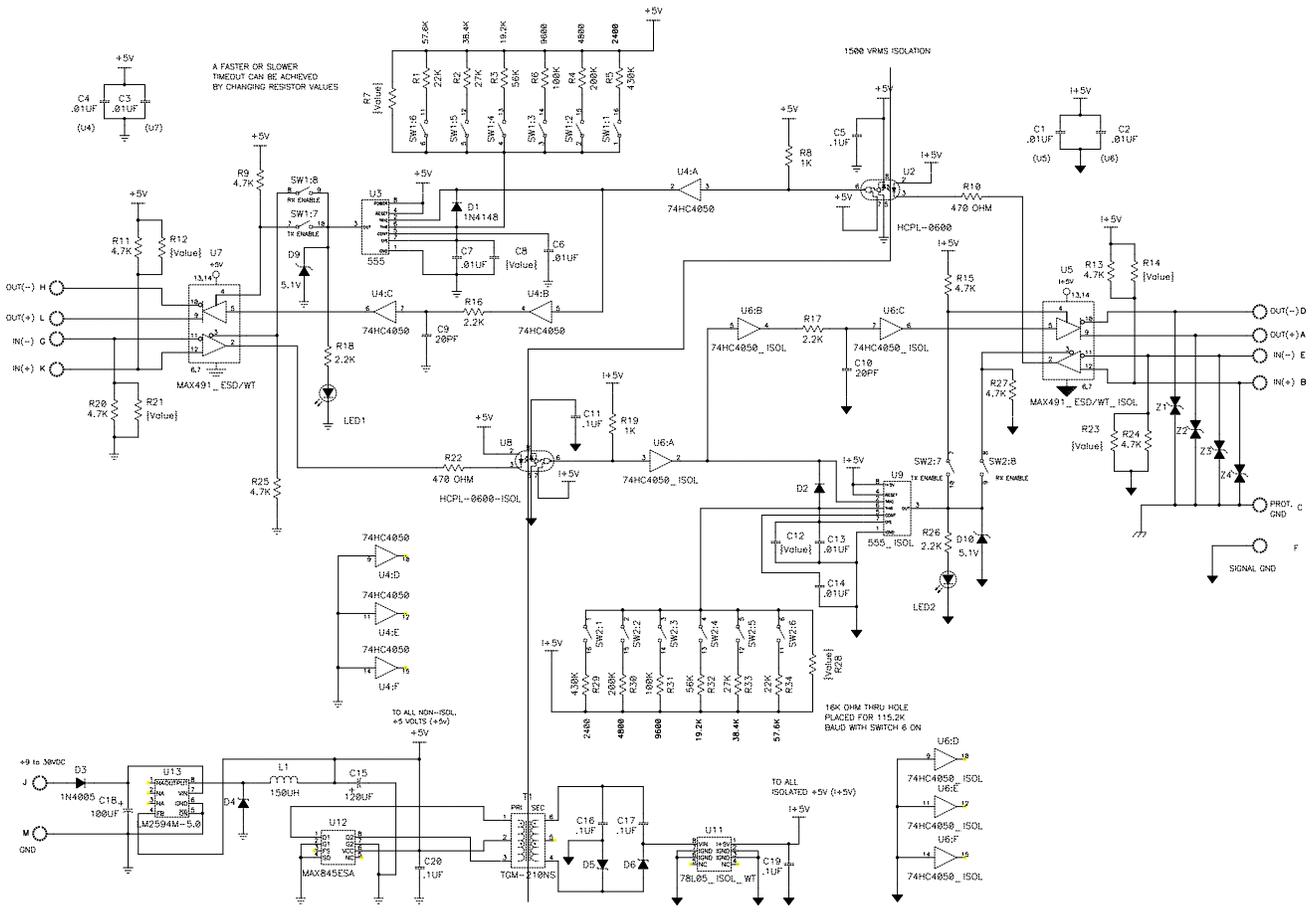


Figure 4



Model Number:	ICD102A
Description:	DIN Mount RS-422/485 Opt. Isolated Repeater
Type:	Light industrial ITE equipment
Application of Council Directive:	89/336/EEC
Standards:	EN 55022 EN 61000-6-1 EN 61000 (-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11)



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