

**Unique Micro Design**

**Model 153  
Isolated Interface Converter  
RS232 to RS422 / RS485  
User Manual**

Document Reference : DOC-M153-UM

UMD Part Number : 6-0153-993-5

Issue : 5

02/02/98

*Technologists and suppliers to  
professional systems integrators*

### Revision History

Date	Issue	Comments
20/06/95	1	First Issue
01/03/96	2	Explanation for using RS485 expanded and H1 jumper information changed, Status Indicator LED's section added
12/09/96	3	Fixed UMD ProtoLink example. Added terminating pack explanation.
07/10/96	4	Added modular RJ-45 termination recommendation for UMD ProtoLink Networking
2/02/98	5	Fixed UMD ProtoLink example. P10 H3 Jumper corrected

## 1. Introduction

This manual provides basic information about connecting to the Unique Micro Design Model 153 RS232 to RS422 / RS485 isolated interface converter.

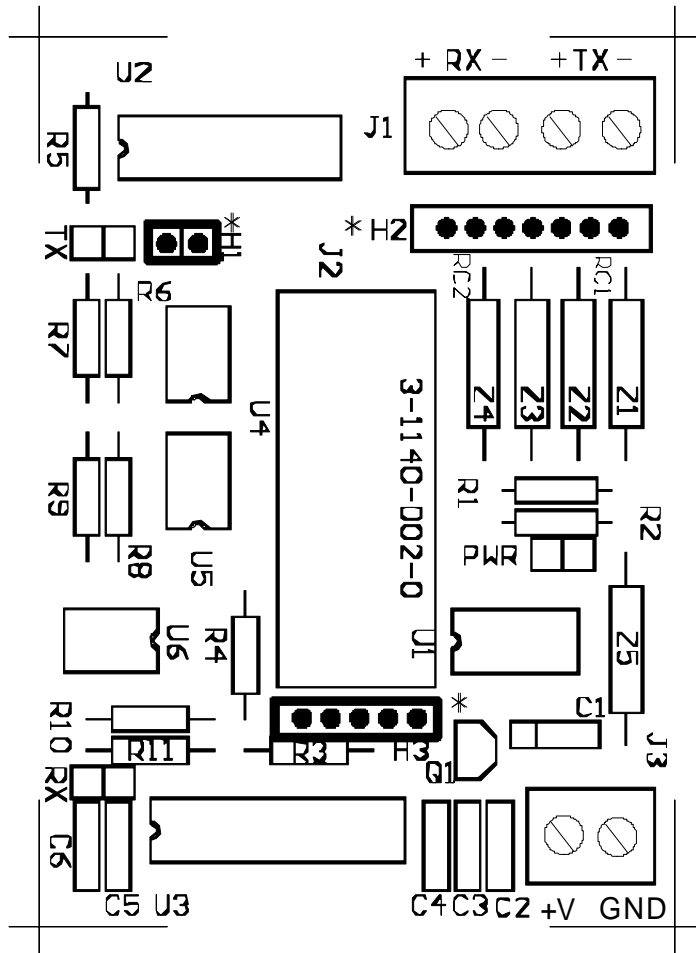
The Model 153 is an electrically isolated bidirectional interface converter for RS232 to RS422 / RS485 signals. It is ideally suited for driving serial data over long distances, especially where differing ground potentials may occur between connected nodes or where protection from electrical interference is required.

When used in RS485 multidrop mode ( master - slave ), the transmitter is enabled by asserting either the Data Terminal Ready ( DTR ) or Request to Send ( RTS ) lines on the RS232 interface ( jumper selectable ).

The Model 153 can be powered using either regulated 5 volts DC input from the RS232 DB9 connector, or unregulated 7 - 9 volts DC input through terminals on the circuit board.

The M153 circuit board is designed to mount on Standard Pattern Flush Mounting GPO wall plates for convenience in industrial situations.

## 2. Jumper Settings



Component Side view of M153

## 2.1. Power Source

Power can be supplied to the M153 from either a regulated 5V dc power source input on pin 7 of the J2, RS232 DB9 connector, or from an unregulated 7 - 9 volt input on the J3 terminal.



H3

H3 jumper set for power sourced from J3



H3

H3 jumper set for power sourced from pin 7 on J2

**Note:** when the H3 jumper is set for power sourced from pin 7 on J2, J2 should be connected with care to standard RS232 ports. The RS232 interface has been designed to connect directly to UMD standard DB9 serial ports which have 5 volts available on

## 2.2. Transmitter Control

Jumper H1 disables control transmitter enable. With H1 installed, the transmitter is always enabled (RS422 mode). With H1 removed, transmitter enable is controlled via the selected RS232 handshake input (RS485 mode), see section 2.3.



H1 jumper not installed, transmitter enable controlled via RS232 handshake.

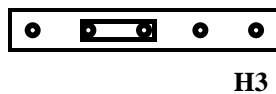


H1 jumper installed, transmitter always on.

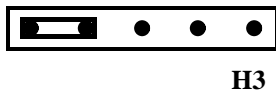
### 2.3. Transmitter enable control

**Note:** This is only effective when the H1 jumper is not installed.

When the H1 jumper is installed, the transmitter enable is controlled by either pin 7 (RTS) on the J2 RS232 interface, or pin 4 (DTR). In both cases, pin 8 (CTS) on J2 indicates the state of the transmitter enable line.



H3 jumper set for Transmitter controlled by RTS ( pin 7, J2 )



H3 jumper set for Transmitter controlled by DTR ( pin 4, J2 )

### 3. Connector Details.

#### 3.1. J2, RS232 Connector.

J2 mounted on the solder side of the circuit board is the RS232 DCE interface. This interface uses RS232 +/- 9 volt levels. Regulated 5 volt power can optionally input on J2

Pin	I/O	Description
1	-	
2	o/p	RxD (data out)
3	i/p	TxD (data in)
4	i/p	DTR or Transmitter Enable
5	-	Ground
6	-	internally connected to pin 8
7	i/p	RTS or Transmitter Enable or +5 Volts input
8	o/p	CTS
9	-	

RS232 DCE Serial Interface  
DB9 socket

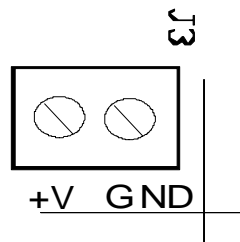


Front view DB9 socket

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### 3.2. J3, Unregulated Power input Terminals

Unregulated power 7 - 9 volts can be connected to J3. The GND pin can also be used to connect the local EARTH to the M153.



J3 the unregulated power supply terminals located near the corner of the circuit board.

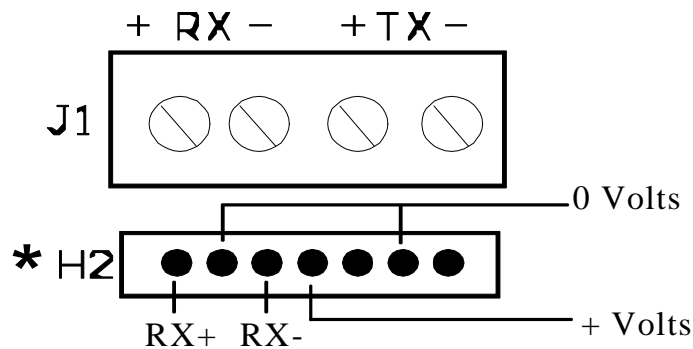


### 3.3. J1, RS422 / 485 Terminals

Typically twisted pair wires are connected to the transmitter and receiver inputs. Connections can be made for full duplex data transmission or half duplex data transmission.

A terminating pack may sometimes be needed to condition the line as determined by cable type, length and other factors. Consult your system integrator for further details.

The terminating pack has four legs, marked RX+, 0, RX- and +V. If used, the terminating pack must be placed in the H2 connector with the correct orientation as shown below.



J1 terminals.

### 3.4. Status Indicators

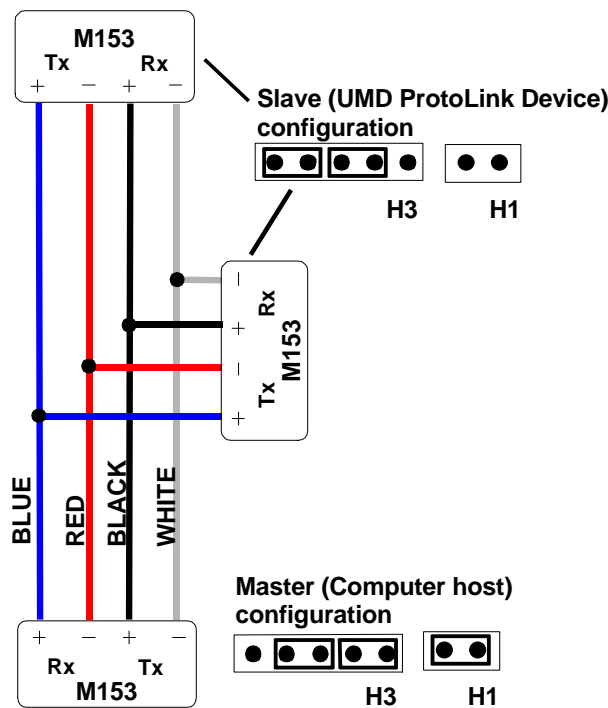
There are three LED indicators mounted on the component side of the printed circuit board. The red LED (PWR) is “on” when power is available at the isolated RS485 driver. The green LED (TX) flashes when data is transmitted to the RS485 output and the yellow LED (RX) flashes when data is transmitted to the RS232 output.

## 4. M153 Connection Examples.

### 4.1. UMD ProtoLink Network /Full Duplex RS485 multidrop

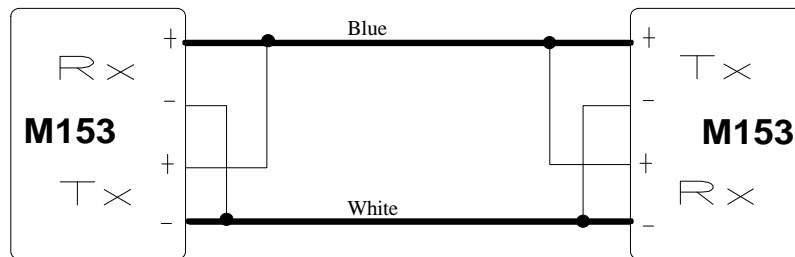
In the example of a UMD ProtoLink Network configuration the master converter is setup with its transmitter always enabled.

The ProtoLink Device at each slave node controls the transmitter enable. The ProtoLink Communication protocol ensures that only one slave at a time transmits, preventing data corruption if two slaves transmit at the same time.



### 4.2. Half Duplex

In this example, only one end can transmit at a time. Transmit enable control is required at both ends.



### 4.3. Full Duplex

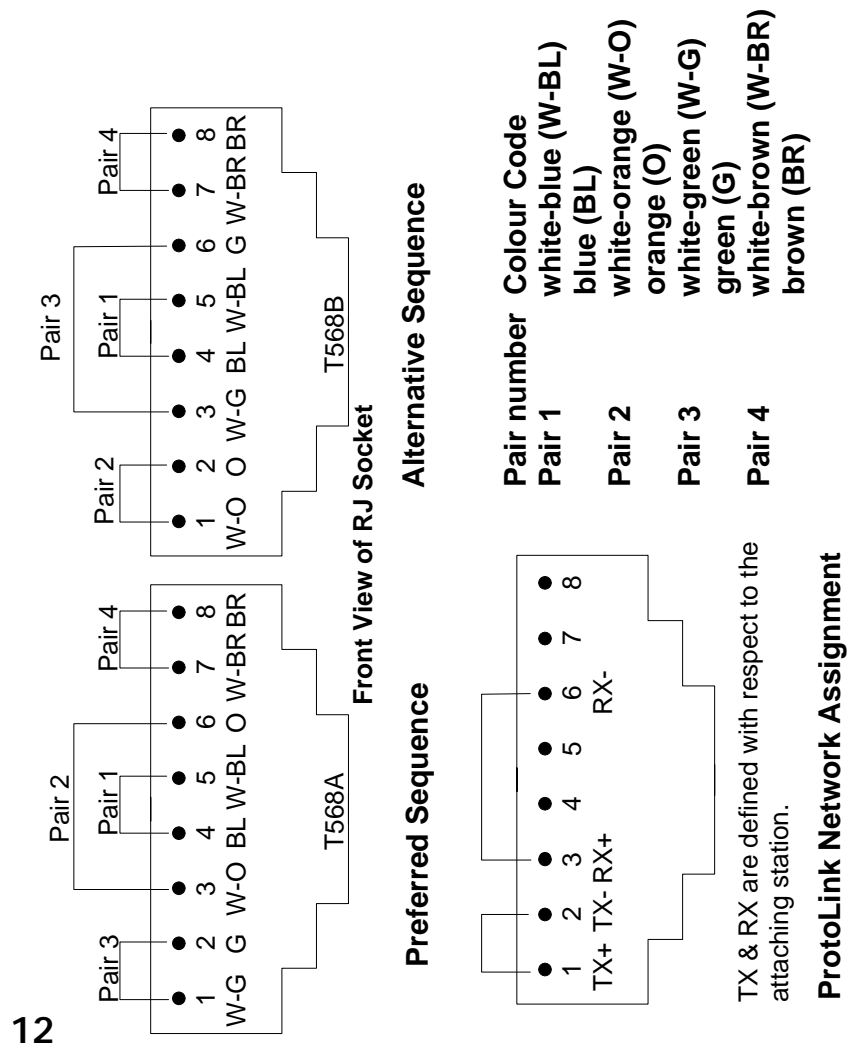
In this example, both units can simultaneously transmit and receive, both transmitter enable settings are enabled.



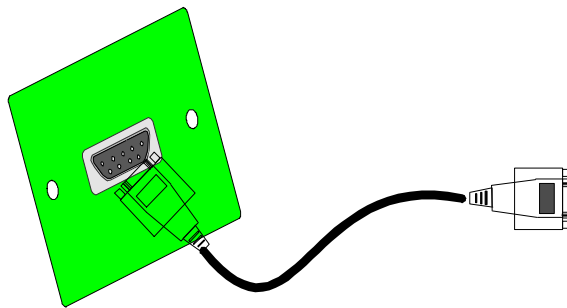
### 4.4. Terminating RJ connectors for ProtoLink Networking

This section provides a guideline for terminating modular RJ connectors for a UMD ProtoLink Network.

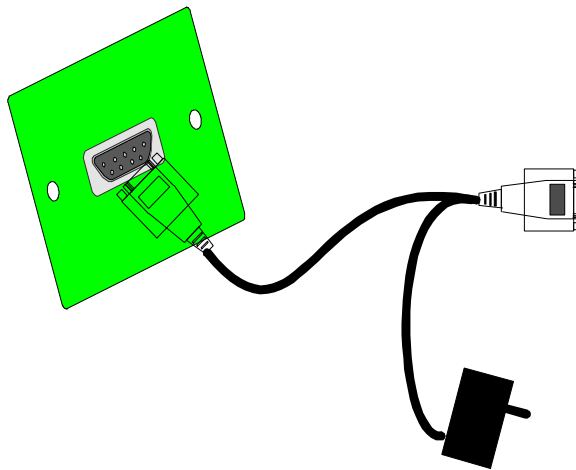
Australian Standard AS3080-1982 defines cabling of commercial premises for information technology purposes. This standard assigns pins/pairs to local



## 5. Connecting to a PC or UMD ProtoLink Device



Use UMD CA109 cable to connect to a UMD ProtoLink Device, which provides the power for the M153.



Using UMD CA6149 cable to connect to a PC. Power for the M153 is provided by the plug pack.

## 5. Specifications.

<b>Physical</b>	Dimensions	50 x 70 x 20 mm ( loaded circuit board )
<b>Power</b>	Input Voltage	5 Volts DC regulated on DB9 connector
		7 - 9 Volts DC unregulated on screw terminals
	Input Current	60 ma
<b>Communication Ports</b>	RS232	DB9 Socket ( DCE )
	Transmission Speed	38,400 baud maximum
	RS422 / 485	Screw Terminal, 4 way
<b>Indicators</b>	LED	Power, transmit data and receive data

## 6. Ordering information and Accessories

Part Number	Model No.	Description
9-0153-100-3	K153-100	Model 153 Standard Pattern Flush Mounting GPO Stainless Steel wall plate Kit.
9-0153-200-9	K153-200	Model 153 loaded circuit board Kit
		<b>Accessories</b>
3-1140-100-0	M153	Model 153 loaded circuit board ( only )
4-0041-100-1		Stainless Steel Standard Pattern Flush Mounting wall plate 115 x 73 mm with 84 mm mounting centres
1-6004-104-2	PPI6D1000	Plug Pack 6 Volt 1 amp
2-5109-020-4	CA109-2	Cable DB9 plug to DB9 socket 2 meters
2-6149-020-2	CA6149-2	Cable M153 to DB9 serial port with plug pack
2-6150-020-2	CA6150-2	Cable M153 to DB25 serial port with plug pack
		<b>Documentation</b>
6-0153-992-7	DOC-M153-PD	Product Description
6-0153-993-5	DOC-M153-UM	User Manual ( this document )



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