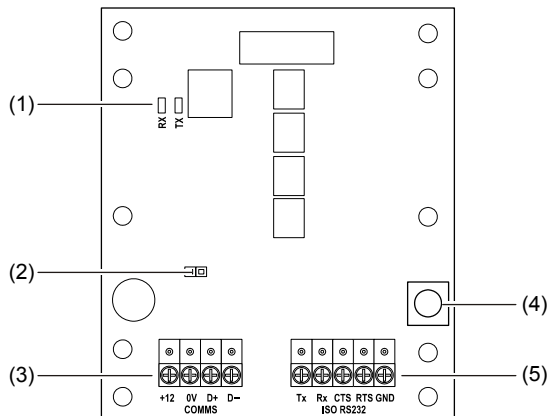


TS0894 Isolated RS-232 to RS-485 Interface Installation Sheet

Figure 1: TS0894 printed circuit board (PCB) details



- (1) Rx and Tx LEDs
- (2) RS-485 LAN termination pins
- (3) Power and RS-485 data terminals
- (4) Earth lug
- (5) Isolated RS-232 terminals

Description

TS0894 Isolated RS-232 to RS-485 Interface converts data from Challenger control panels between RS-232 and RS-485 levels for use with leased line modems and/or for distant or multi-drop control panels.

Product contents

Quantity	Item
1	TS0894 Isolated RS-232 to RS-485 Interface
3	2-way plug-on screw terminal
1	3-way plug-on screw terminal
4	M3x10 pan-head Phillips screw
4	PCB support stand off
1	Ring terminal
1	Installation Sheet

Inspect the package and contents for visible damage. If any components are damaged or missing, do not use the unit; contact the supplier immediately. If you need to return the unit, you must ship it in the original box.

Installation

When installing a Challenger panel, or any other parts of the system, you need to be aware of requirements for cabling and earthing, and plan accordingly.

Refer to the *Challenger V8 & V9 Installation and Quick Programming Manual*, REV 7.0 (or later) for our latest recommendations.

Notice! A qualified service person, complying with all applicable codes, should perform all required hardware installation.

The TS0894 Isolated RS-232 to RS-485 Interface may be used for a variety of applications (see “Applications” on page 2), and is typically installed in a Challenger enclosure.

The installation procedure will vary with the application.

RS-485 LAN termination

If required, place a jumper over the RS-485 LAN termination pins (see Figure 1 above, item 2).

If the TS0894 is the last device on the RS-485 LAN, the LAN termination should be ON. In a star wiring configuration, the RS-485 LAN may consist of a number of cable runs (branches). LAN termination should be set to ON only at the devices at the far ends of the two longest branches.

A star LAN that has multiple branches in excess of 100 m may need to use TS0893 Isolated RS-485 to RS-485 Interface modules to isolate the LAN segments that do not have LAN termination set to ON.

Power supply and RS-485

The functions of the power and comms terminals (Figure 1 above, item 3) are listed below.

+12	+12 VDC supply (LAN + or external power, if used)
0V	–12 VDC supply (LAN 0V and external power, if used)
D+	Positive data connection of the RS-485 LAN
D–	Negative data connection of the RS-485 LAN

We recommend that you use 2-pair twisted shielded data cable (such as Belden 8723) for the RS-485 LAN.

Use the +12 and 0V terminals to power the TS0894. Each TS0894 must be powered by an isolated 12 V source (panel AUX power, or TS0073 Power Supply, as appropriate).

Isolated RS-232

The functions of the Isolated RS-232 terminals (Figure 1 on page 1, item 5) are listed below.

Tx	RS-232 data transmit
Rx	RS-232 data receive
CTS	Clear to send
RTS	Request to send
GND	Isolated RS-232 ground

RS-232 communications to a management software computer or a modem serial port are made via a DB9 or a DB25 connector. Figure 2 lists the DB9 or DB25 pin numbers that corresponds with each function.

Figure 2: Serial DB9 and DB25 pin numbering

Function	Pin no.	
	DB9	DB25
TX	3	2
RX	2	3
CTS	8	5
RTS	7	4
CD	1	8
DTR	4	20
DSR	6	6
GND	5	7

LED indications

When connected and powered, LEDs (Figure 1 on page 1, item 1) indicate system status:

- **Tx** — indicates RS-232 data has been received and is resent as RS-485
- **Rx** — indicates RS-485 data has been received and is resent as RS-232

Applications

Typical applications include:

- Connecting a management software computer to a control panel over an extended distance, see “Connecting a computer to a control panel” below.
- Enabling the use of ‘multi-drop’ panel connections to a management software computer, see “Connecting a computer to multiple control panels” on page 3.
- Enabling panel to DGP communications via modem, see “Connecting to modems” on page 3.

Note: Examples in this document are based on Challenger V8 panel and TS0091 Computer & Printer Interface fitted to the TS0816 PCB. Challenger V9 panels require the use of a TS0892 V9 Isolated Serial Interface fitted to the TS0816P PCB.

Connecting a computer to a control panel

A pair of TS0894 modules can be used to connect the serial port on a management software computer to the serial port on

a TS0091 Computer & Printer Interface fitted to the control TS0816 PCB (Figure 3 below).

Figure 3: Connection to distant computer

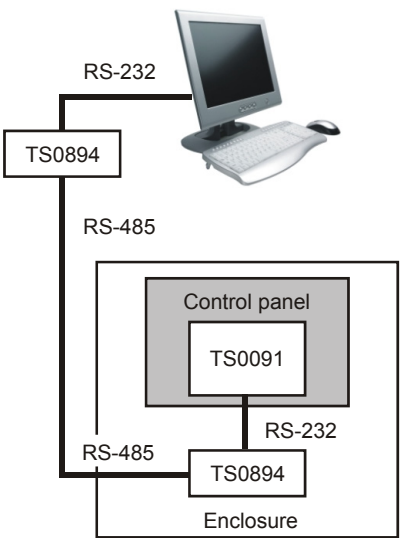
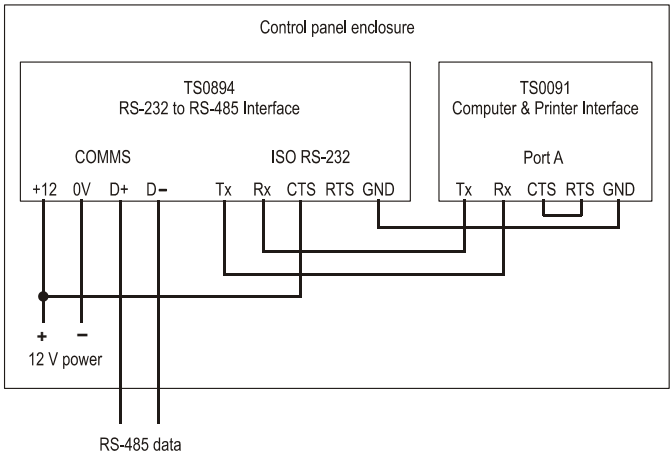


Figure 4 below shows the connections between the TS0894 module and the TS0091 module.

Figure 4: Converting panel’s RS-232 to RS-485



A second TS0894 module is required to convert RS-485 data to RS-232 for the computer’s serial port. The connections from the second TS0894 module to the management software computer depend on whether the computer is a Forcefield server or a Windows computer running TITAN or Security Commander management software:

- See Figure 5 on page 3 for Forcefield connection details.
- See Figure 6 on page 3 for TITAN or Security Commander connection details.

Figure 5: Terminals used for a Forcefield server's serial port

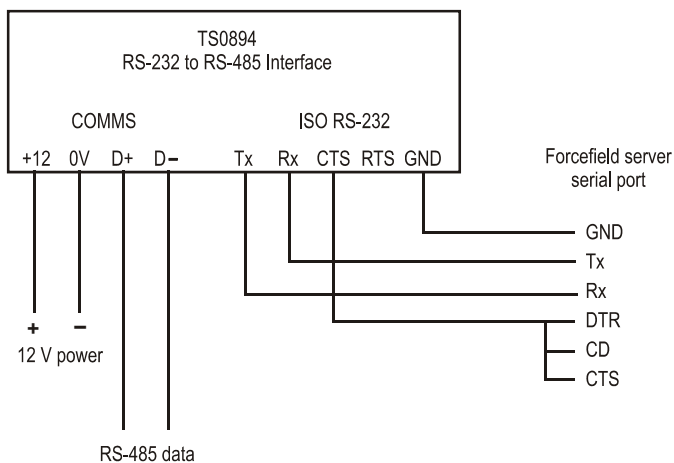
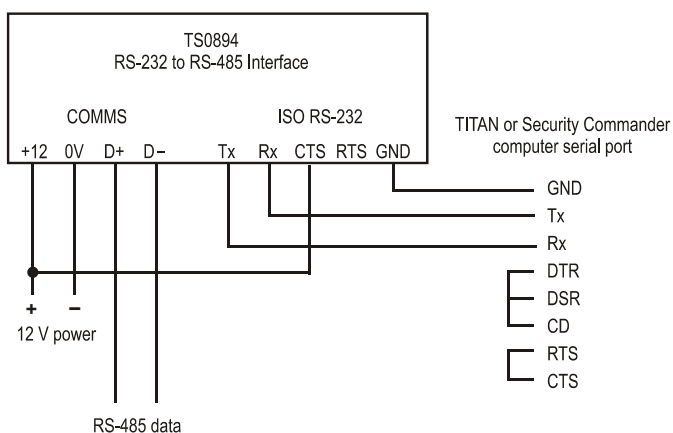


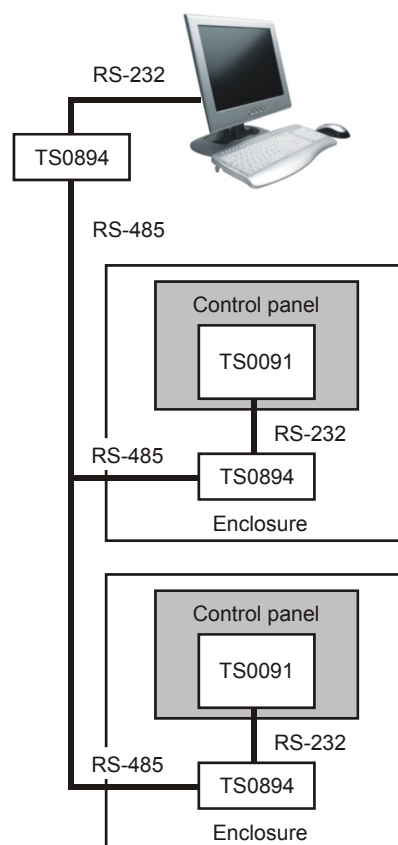
Figure 6: Terminals used for a Windows computer's serial port



Connecting a computer to multiple control panels

The management software computer's RS-232 serial port may be used to connect up to six control panels via multi-drop (Figure 7 below).

Figure 7: Connection to multiple control panels



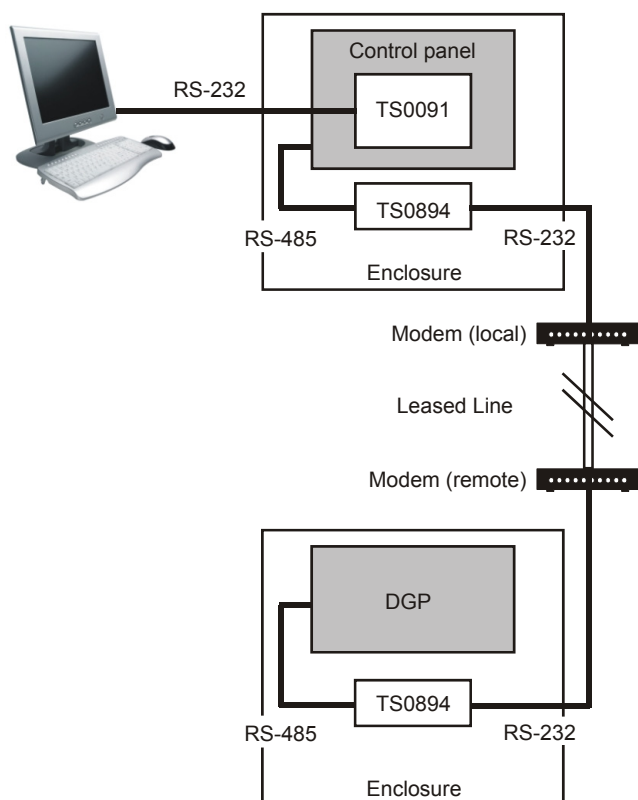
Connecting to modems

TS0894 may be used to enable communications over a leased line via local and remote modems (see Figure 8 on page 4). Prior to using the modems, you must perform the following actions:

- Initialise the modem by connecting it to a computer and running a VT100 terminal session (such as Windows HyperTerminal).
- Configure the modem by setting its switches.

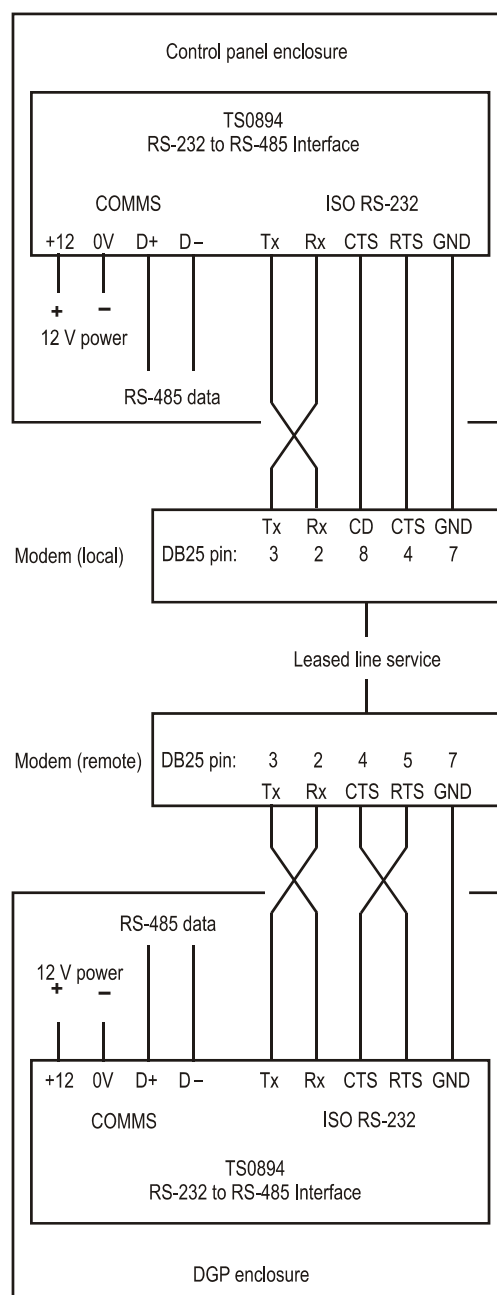
Refer to "Modem use" on page 4 for details.

Figure 8: Connection over leased line using modems



The connections required depend on whether the modem is used in a local or remote role. See Figure 9 below for connection details.

Figure 9: Terminals used for modem connection



Modem use

This section describes the use of Netcomm SmartModem SM5695, or equivalent. Modems used with TS0894 must support leased line mode. This section is only a guide — refer to your modem's documentation for specific details.

TS0894 may be used to enable communications over a leased line via local and remote modems. Prior to using the modems, you must perform the following actions:

- Initialise the modem by connecting it to a computer and running a VT100 terminal session (such as Windows HyperTerminal).
- Configure the modem by setting its switches.

To initialise a modem:

1. Connect the modem to a computer serial port.
2. Apply power to the modem.
3. Open a VT100 terminal session.
4. Configure the terminal session using the connection parameters 4800 baud, 8 bits, 1 stop bit, no parity.
5. Enter the required AT commands (see below).

AT commands are so named because each command is prefixed by AT and executed by pressing ENTER. Multiple commands may be strung together (e.g. AT&L1&L2), but different modems permit different lengths of command strings.

The AT commands differ slightly between the local modem and the remote modem. The following command strings have been tested by Interlogix. Refer to Table 1 for an explanation of the specific AT commands used.

Use the following commands for the **local** modem:

- AT&F0B10N1\Q0
- AT&L1&L2
- ATR4
- AT+MS=9,0,4800,4800
- ATQ1&W

Use the following commands for the **remote** modem:

- AT&F0B10N1\Q0
- AT&L1&L3
- ATR4
- AT+MS=9,0,4800,4800
- ATQ1&W

Table 1: AT commands for Netcomm SmartModem SM5695

Command	Purpose
&F0	Defaults the modem.
B10	Sets the modem to V.32 at 4800bps.
R4	Sets terminal speed to 4800 bps.
&C1	DCD follows modem on-line.
&L1	Sets modem into leased line mode.
&L2	Auto leased line Originate mode
&L3	Auto leased line Answer mode
\N1	Direct data connection (variable speed mode).
\Q0	Disables flow control.
\Q1	Disables modem messages. There will be no response (modem messages) sent to the terminal after this command.
+MS	Select Modulation 9 is mode 9 (V.32 9600 or 4800) 0 is automode disabled, i.e., fixed modulation) 4800 is the minimum bps rate 4800 is the maximum bps rate
&W	Saves the settings.

Configuring modems

Set the switches of the local and remote modems according to Table 2.

Table 2: Modem switch settings

Switch	Local modem	Remote modem
DIP switch 3 (auto answer disable)	ON	OFF
DIP switch 4 (dumb mode)	ON	ON
DIP switch 6 (originate/answer)	ON (originate)	OFF (answer)
Talk/Data switch	IN (data)	IN (data)

Specifications

Voltage	10.5 to 13.8 VDC
Typical operating current	100 mA @ 13.8 V
Dimensions	80 × 90 mm (Tecom B+ size PCB)
Operating environment	
Operating temperature	0 to 50°C
Relative humidity	0 to 95% noncondensing

Note: Units should only be used in a clean environment and not in humid air.

Regulatory information

Manufacturer	UTC Fire & Security Australia Pty Ltd Level 1, 271–273 Wellington Road, Mulgrave, VIC, 3170, Australia
Year of manufacture	The first two digits of the product serial number (located on the product identification label) are the year of manufacture.
Compliance	 N4131

NOTICE! This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Disclaimer

The customer is responsible for testing and determining the suitability of this product for specific applications. In no event is UTC Fire & Security Pty Ltd (trading as Interlogix) responsible or liable for any damages incurred by the buyer or any third party arising from its use, or their inability to use the product.

Contact information

For contact information, see www.utcfs.com.au.

