tyco /Services/ **Fire & Safety**

F3200 PANEL-LINK UPGRADE
& INSTALLATION MANUAL
LT0198

F3200 PRODUCT MANUAL

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TABLE OF CONTENTS

AMENDMENTS

ISSUE	DATE	AMENDMENT	ECO
1.00	12/12/97	ORIGINAL	
1.01	04/02/98	CORRECT LINK SETTINGS, NETWORK PROGRAMMING	2742
1.10	22/01/01	ADD AS4428.1 INFORMATION	3041
1.20	3/6/03	F3200 V4.00 software & 1931-111 Issue B board	3362
1.30	12/2/09	F3200 Software V5.XX	3997
1.31	02/11/10	SF0222 removed from FP0795	4217
		RS485 Board Link Settings added	4156

1.   EQUIPMENT REQUIREMENTS

This document describes the upgrade procedure to add Panel-Link networking capability to an F3200 AS1603.4 or AS4428.1 panel. If the panel is also to be converted from AS1603.4 to full AS4428.1 compliance then refer also to LT0254 (AS1603.4 to AS4428.1 panel conversion). If the panel is currently fitted with AS1603.4 V2.XX software and is to be fitted with AS4428.1 V3.XX or V4.XX (or later) software but is keeping the AS1603.4 front panel and keyboard, then also refer to LT0264 (AS1603.4 to AS4428.1 software upgrade). LT0333 describes the procedure for upgrading to the latest AS4428 software.

If the panel or the software is being converted from AS1603.4 to AS4428.1, then that should be done first (as described in LT0254 or LT0264), after which, networking should be added as described in this document.

If the networking is Ring-based using I-Hubs, then also refer to the I-Hub user manual (LT0229).

1.1   F3200 PANELS WITH 1931-2-1 CONTROLLER & V1.XX SOFTWARE

To upgrade an older F3200 panel that has a 1931-2-1 controller board and V1.XX software, the controller board must be replaced with 1931-84-1 controller board. The RS485 Board is mounted by drilling holes for it in the cabinet.

The parts required are:

1 x FP0704 FP, F3200, NETWORK UPGRADE KIT, VX.XX
1 x PA0804 PCB ASSY, 1931-84-1, F3200 CNTRL/NETWORK/NDU, NO S/W

and if there are LED Display Boards in the panel

LM0092 LOOM, 1931-88, F3200 MKII CONTROLLER TO FIRST DISPLAY

The FP0704 kit includes F3200 AS1603.4 networking software and also includes LT0330 which details the link settings for the new controller board. The existing V1.XX database can be converted by the new software, so there is no need for database re-entry.

Full details of the FP0704 kit contents are shown in Table 1.1.

1.2   F3200 PANELS WITH AS1603.4 1931-84 CONTROLLER & V2.XX SOFTWARE

To add networking to an AS1603.4 F3200 panel that is already fitted with a 1931-84 controller and V2.XX software, a network upgrade kit is required:

FP0704 FP, F3200 NETWORK UPGRADE KIT, VX.XX

The FP0704 kit includes F3200 AS1603.4 networking software. The links on the controller board will not need changing. Table 1.1 shows the FP0704 kit contents.

Table 1.1
FP0704 Kit Contents

Part	Description	Qty	Use
HW0171	Hardware Spacer, 6.3mm 4NA06N	4	Space PA0773 board off cabinet
IC0358	IC SCC2692A44 DUART 44 Pin PLCC	1	Fit to U13 on Controller
LM0091	Loom FRC 10W Style C 500mm	1	Controller J7 to PA0773 J1
LT0198	Lit 1931-83 F3200 Network Upgrade Instructions	1	
LT0330	Lit, F3200 Controller Board, 1931-111, Link Settings	1	
NT0007	Nut Hex M3 ZP	8	4 x Mounting PA0773 in newer cabinets. 4 x Lock SC0044 in older cabinets.
PA0773	PCB Assy 1901-139-3 RS485 Comms Bd CMOS FRC Only	1	Mount on cabinet RHS
SC0044	Screw Machine PH Pozi M3 x 16 ZP	4	Mounting PA0773 in older cabinets
SF0230	Software F3200 Networked c/w Tandem V2.09 EPROM	1	U2 on Controller Board
SU0151	Sundry FRC Clamp Adhesive 1 inch	3	Tie down LM0091
WA0010	Washer Shakeproof M3 IT Lock ZP	8	Lock SC0044 in older cabinets
WA0026	Washer Crinkle Stainless Steel M3	4	Mounting PA0773

1.3   AS4428.1 F3200 PANEL

To add networking to an F3200 AS4428.1 panel, a network upgrade kit is required.

FP0795 FP, F3200 AS4428 NETWORK UPGRADE KIT

This kit includes no software as V4.XX and V5.XX F3200 software already supports networking. These require a 1931-111 Issue B (or higher) controller board. Note, revisions 2 & 3 of the Issue B board require a wire link fitted if V4.XX (or later) software is to be used - this is described in Product Bulletin PBG0123A F3200 V4.00 software release. If the controller board revision is earlier than Issue B, then it is recommended it be replaced (use PA0909). Refer to LT0333 for detail of how to upgrade to the latest software.

LT0330 (included in FP0795), details the link settings for 1931-111 Issue B Controller according to the version of software fitted.

If the board is already fitted with F3200 V4.XX or later software, then the software does not need to be changed and networking can be enabled with programming, but upgrading to the latest F3200/NDU firmware may be desirable. This can be downloaded using FlashX.

Full details of the FP0795 kit contents are shown in Table 1.2.

Table 1.2
FP0795 Kit Contents

Part	Description	Qty	Use
HW0171	Hardware Spacer, 6.3mm 4NA06N	4	Space PA0773 board off cabinet
IC0358	IC SCC2692A44 DUART 44 Pin PLCC	1	Fit to U13 on Controller
LM0091	Loom FRC 10W Style C 500mm	1	Controller J7 to PA0773 J1
LT0198	Lit 1931-83 F3200 Network Upgrade Instructions	1	
LT0330	Lit, F3200 Controller Board, 1931-111, Link Settings	1	
NT0007	Nut Hex M3 ZP	8	4 x Mounting PA0773 in newer cabinets. 4 x Lock SC0044 in older cabinets.
PA0773	PCB Assy 1901-139-3 RS485 Comms Bd CMOS FRC Only	1	Mount on cabinet RHS
SC0044	Screw Machine PH Pozi M3 x 16 ZP	4	Mounting PA0773 in older cabinets
SU0151	Sundry FRC Clamp Adhesive 1 inch	3	Tie down LM0091
WA0010	Washer Shakeproof M3 IT Lock ZP	8	Lock SC0044 in older cabinets
WA0026	Washer Crinkle Stainless Steel M3	4	Mounting PA0773

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2.   UPGRADE PROCEDURE

When handling printed circuit boards and electronic components ensure that anti-static ESD precautions are taken.

When installing chips into sockets, ensure that the orientation is correct, that all pins go into the socket and that none are bent underneath.

2.1   F3200 PANELS WITH 1931-2-1 CONTROLLER & V1.XX SOFTWARE

1. Ensure that the current database is saved on disk.

2. Power the FIP down with the write protect link in the WRITE PROTECT position.

3. Remove the existing Controller Board and replace with the new PA0804. Reconnect the existing MAF flat ribbon cable to J4 on the Controller.

   If any LED Display Boards are fitted, a new FRC (LM0092) must be run from J13 on the Controller to the first LED Display Board.

4. Drill 4 x Φ3.5mm holes in the RHS of the cabinet using Figure 1 for the positions.

5. Feed the M3 x 16 screws into the cabinet from the outside and secure on the inside with shake-proof washers and nuts. Fit the plastic spacers onto the screws and mount the RS485 Board onto the screws using the stainless washers and nuts to hold it in place - the J3 screw terminal should be towards the bottom of the cabinet.

   Ensure that the RS485 Board Dip Switches are set as follows:
   A ON, B OFF, C ON, D ON

   Refer Section 2.4 for the RS485 Board link settings.

6. Connect the 10 way FRC from J7 NETWORK 1 on the Controller to J1 on the RS485 Board. Secure with the FRC cable holders supplied.

7. Fit the supplied controller software to U2. For a 1931-84 or 1931-111 Issue A board, the link settings are as follows:

Lk1	Not Fitted		Lk8	1-2 (LHS)
Lk3	Not Fitted		Lk11	Not Fitted
Lk4	1-2 (E2/RAM)		Lk12	Not Fitted
Lk5	Not Fitted		Lk13	2-3 (A17)
Lk6	2-3 (E2)			

   For the 1931-111 Issue B board, refer to LT0330 for link setting detail.
   Fit Lk7 to the DATABASE WRITE position, fit SW1 link (E2 INIT), and power up the panel. Re-initialise the database by following the prompts on the display.

8.   Enter programming mode using the default password and load the previously saved database.

     The panel will indicate that there is an "EEPROM DATABASE VERSION ERROR" - press ACK as instructed. The panel will recognise that the database is an old version and will ask if you wish it to be converted. Press ACK to convert the database.

     When complete, move Lk7 to the WRITE PROTECT position and wait for the panel to automatically re-start.

9.   Once the panel has re-started, enter programming mode (using the access code for the old database). The converted database should be saved to disk.

10. Refer to Section 3 of this document for network parameter setting detail.

2.2   F3200 WITH 1931-84-1 AS1603.4 CONTROLLER & V2.XX SOFTWARE

1.   Ensure the database is saved to disk.

2.   Ensure LK7 is in the WRITE PROTECT position and powerdown the panel.

3.   Fit the 44 pin IC to the Controller in U13. Note that the bevelled corner must be aligned with the bevel on the socket, and the IC must be pushed firmly into the socket.

4.   Remove the existing software EPROM from U2 on the Controller and fit the new network software.

5.   Fit the plastic spacers onto the 4 threaded studs on the RHS of the cabinet and fit the RS485 onto the studs. Position the J3 screw terminals towards the bottom of the cabinet and secure the board with crinkle washers and nuts.

     Ensure that the RS485 Board Dip Switches are set as follows:
     A ON, B OFF, C ON, D ON

     Refer Section 2.4 for the RS485 board link settings.

6.   Run the 10 way FRC from J7 Network 1 on the Controller to J1 on the RS485 Board, and secure the cable with FRC cable holders supplied.

7.   Power the panel up and check that a database checksum error does not occur. If necessary, reload the database from disk. Refer to Section 3 of this document for network parameter setting detail.

2.3   F3200 WITH AS4428.1 1931-111 CONTROLLER BOARD

If the controller board is 1931-111 Issue B or later, then V4.XX or later software can be used, and will most likely be already fitted. Note, revisions 2 & 3 of the Issue B board require a wire link fitted if V4.XX (or later) software is to be used - this is described in Product Bulletin PBG0123A. For Issue B onwards of the 1931-111 controller board, the link settings must be set according to the software fitted, as shown in LT0330.

If the Controller is 1931-111 Issue A it is recommended it be replaced (use PA0909) and fit the latest F3200 software.

1.   Ensure the database is saved to disk.

2.   Ensure LK7 is in the WRITE PROTECT position and powerdown the panel.

3.   Fit the 44 pin IC to the Controller in U13. Note that the bevelled corner must be aligned with the bevel on the socket, and the IC must be pushed firmly into the socket.

4.   Fit the plastic spacers onto the 4 threaded studs on the RHS of the cabinet and fit the RS485 onto the studs. Position the J3 screw terminals towards the bottom of the cabinet and secure the board with crinkle washers and nuts.

        Ensure that the RS485 Board Dip Switches are set as follows:
   A ON, B OFF, C ON, D ON

        Refer Section 2.4 for the RS485 board link settings.

5.   Run the 10 way FRC from J7 Network 1 on the Controller to J1 on the RS485 Board, and secure the cable with FRC cable holders supplied.

6.   Power the panel up and check that a database checksum error does not occur. If necessary, reload the database from disk. Refer to Section 3 of this document for network parameter setting detail.

2.4   PA0773 RS485 BOARD LINK SETTINGS

With Rev 6 onwards of the PA0773 RS485 board there are two links included to select the power source.

For use with F3200, NDU, PTM, etc, the host provides +5V via the 10-way FRC, so both LK6 and LK7 need to be fitted. Do NOT connect +24V or +5V to J6 as well!

320

39   65

147

Drill 4 x
ϕ3.5mm
holes
in
RHS

RHS of Cabinet

Door   Wall
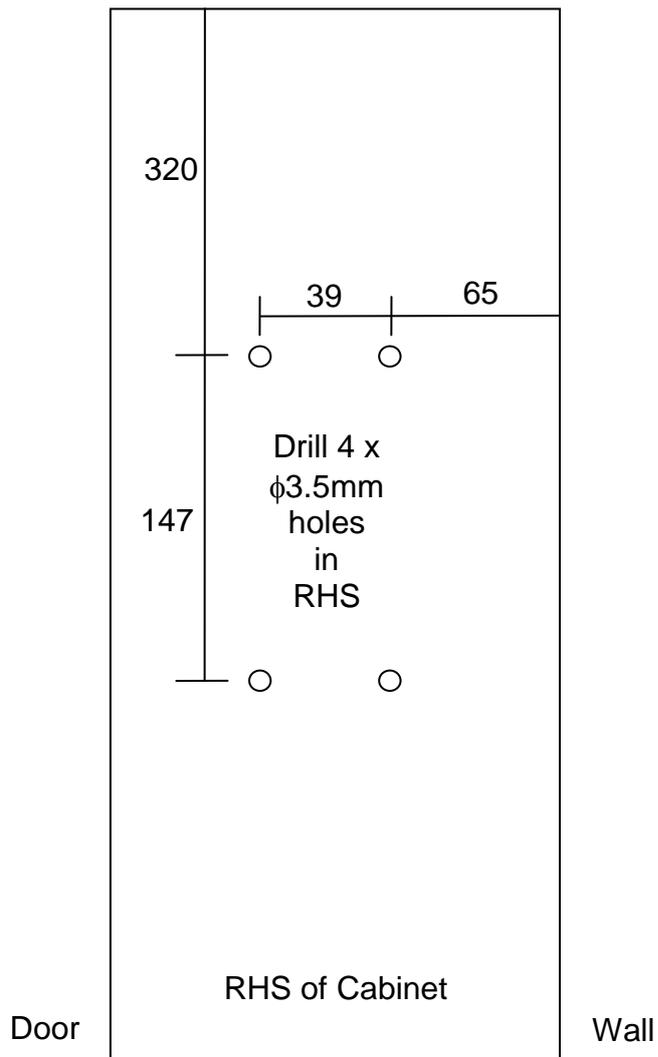
FIGURE 1
DRILLING DETAIL FOR FULL SIZE CABINET

3.   PROGRAMMING CHANGES FOR NETWORKING

Network programming is detailed in the F3200 Installation & Programming Manual (LT0122) for AS1603.4 systems, and in LT0256 for AS4428.1 systems.

The default values should be sufficient for most systems, but some specific programming is required.

With V4.00 software or later, there is a specific parameter that must be set to enabled, to have network operation enabled. This parameter is found under the CONFIG menu option from the main network programming menu. Refer to LT0256 for the programming options. Software versions prior to V4.00 do not have this "network operation enabled" parameter.

Each network panel is programmed with a unique identification number, its SID number. During programming, the FIP will most likely generate network faults. This is to be expected, as it is likely that the FIP is not connected to the network and thus to other panels it needs information from. Some of the network software functions are operational even when processing is stopped in program mode.

These faults will be cleared automatically at the completion of programming. Any network faults occurring after this will most likely be true network faults, e.g. not all FIPs are on the network, or as a result of incorrect programming, e.g. incorrect panel link integrity settings.

Once network programming is complete, other programming can be done to use the networking features, namely

a)   Network Logic Variables
        A network panel can send output logic states to other panels and can use the logic states received from other panels.

b)   FFCIF (FF) Control
        The FFCIF (FF) at the panel can receive alarms from the other panels on the network. Programming of Remote Acknowledge can be set to allow events in the local FFCIF (FF) to be cleared by an operator at another FIP on the network.

c)   MAF and Totals
        A network panel transmits on a regular basis the number of off-normal conditions it has, and its MAF status. An F3200 FIP can be programmed to collect and combine the totals and/or the MAF status, for display on the LCD or control of local brigade relays, respectively.

d)   Network SID Programming
        An F3200 panel can be configured for whether it sends and receives commands to particular SIDs, logs events for particular SIDs, and uses MAF status of particular SIDs.

e)   Event Transmission
        Transmission of all events onto the network can be enabled or disabled. Also
        selects whether events sent onto the network include text information for the
        source of the event. Some receivers of the event, e.g. colour graphics, can
        supply the text, but others, e.g. network printers may need the text to be able
        to print it out.

f)   Status Transfer
        The transmission of zone status onto the network can be enabled or disabled.
        Currently the only network device which uses this status data is the PMB.

h)   Network Time Mastering
        A network panel can be configured as a Network Time Master. Changing the
        time and date at the Network Time Master result in time/date commands
        being sent to all other FIPs on the network. Network Time Masters also send
        out automatic time/date updates daily at 11:30pm, and when Daylight Saving
        adjustments are made, to synchronise all the FIP clocks on the network.

i)   Network Bells or Network External Bell/Warning System
        AS1603.4 panels can be programmed so that operation of the bells at one
        panel can trigger the bells to operate at other panels on the network and for
        silencing of the bells to work across the network.

        AS4428 panels can be programmed so that the External Bell and/or the
        Warning System can be operated and silenced across the network.

4.   NETWORK CABLING REQUIREMENTS

All network cabling must conform to the requirements of AS 1670.1. In general, a network of F3200 FIPs can be considered to be a Class 2 distributed system.

The cabling requirements specified below assume that each of the F3200s panels to be networked has more than 10 zones or 250 devices.

In addition to the requirements of AS1670.1 the following requirements must be met.

4.1   CABLE REQUIREMENTS

Cables must be a single twisted pair, preferably shielded, and have a conductor to conductor capacitance of not more than 180pf/metre, and a characteristic impedance of not less than 100 ohms.

AS1670.1 Clause 8.17 specifies the requirements for wiring of the fire alarm system in general. Clauses 3.3.4 and 3.3.7 specify the functional and mechanical protection requirements for cables used in a network.
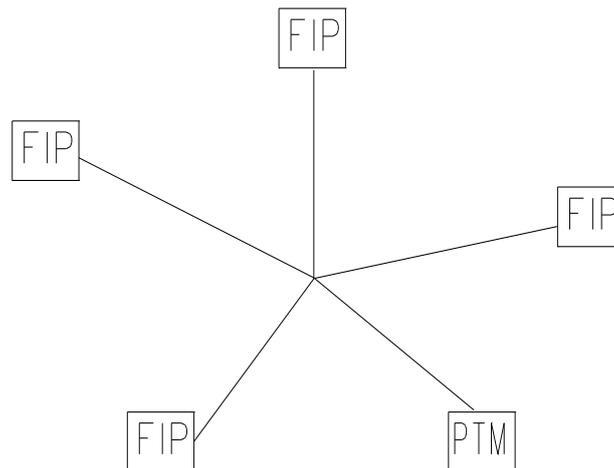
It is the installer's responsibility to assess the appropriate cabling arrangement and protection required to meet the standard.

4.2   NETWORK TOPOLOGY

There are a number of ways to connect panels together on a network. Vigilant recommends that a "bus" arrangement be used on panel-link, i.e.
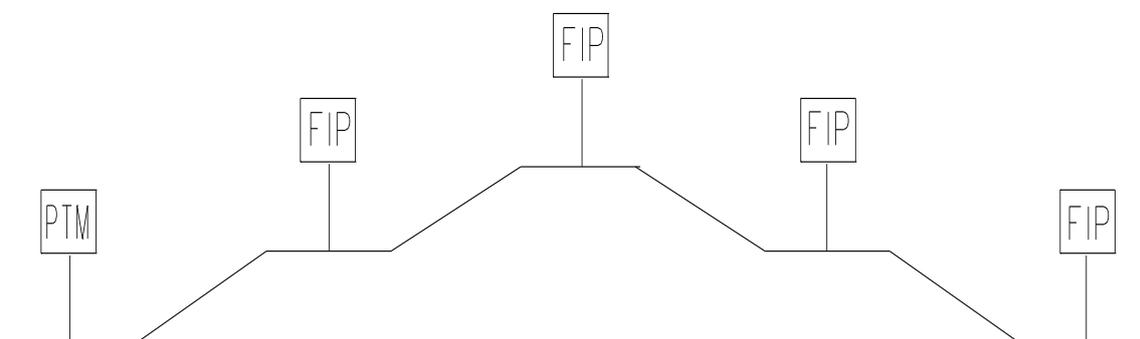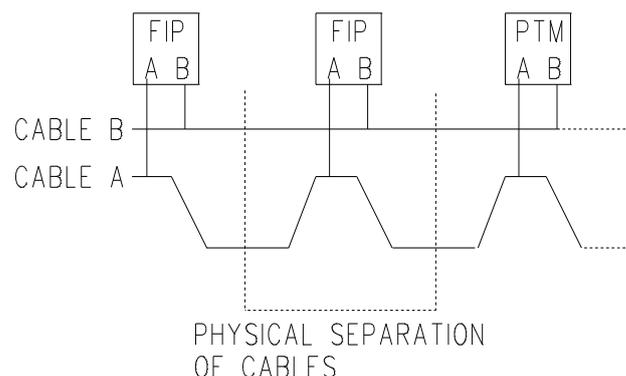
As an alternative, a star arrangement can be used.

In all cases, the sum of all cable lengths should not exceed 1200m.

Duplicated Cables

AS1670.1 requires that duplicated cable paths be used when the FIP has more than 10 zones or 250 devices. For Panel-link, this requirement can only be met by the duplicated cable arrangement shown below.
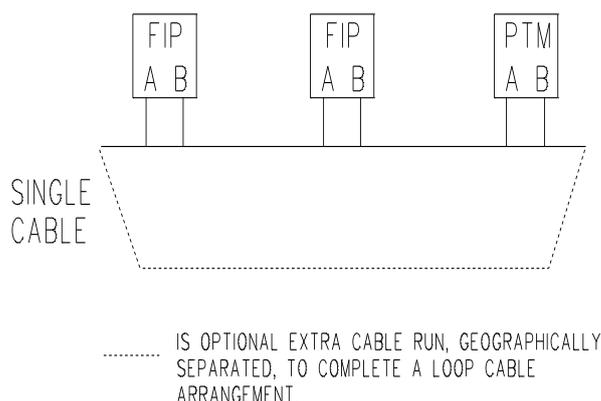

This arrangement provides better protection against short and open circuits, as a short or open on one cable does not affect the other cable.

Physical separation of the cable paths between the FIPs reduces the likelihood of a mishap affecting both cable runs. (Refer AS1670.1 Clause 3.3.7).

If a fault occurs on a single cable, the FIPs annunciate this, but alarms can still be transmitted using the other cable.

Single Cable - Bus & Loop

In situations where compliance with AS1670.1 is not required, the FIPs could also be connected to a single cable as shown below.


```
        ┌─────┐      ┌─────┐      ┌─────┐
        │ FIP │      │ FIP │      │ PTM │
        │ A B │      │ A B │      │ A B │
        └─────┘      └─────┘      └─────┘
```

SINGLE
CABLE

.... IS OPTIONAL EXTRA CABLE RUN, GEOGRAPHICALLY
          SEPARATED, TO COMPLETE A LOOP CABLE
          ARRANGEMENT.

This simple bus arrangement does not meet AS1670.1, as the presence of a single fault (short or open circuit) can prevent transmission of alarms.

The loop arrangement provides extra protection against a single open circuit. If the loop is broken in one place, all devices are still able to communicate. Alarms can still be sent in the presence of a single open circuit. A second open circuit will signal fault. But a short circuit will signal fault and prevent transmission of alarm information.

WARNING   The single cable options must not be used in situations where AS1670.1 requirements must be met.

IMPORTANT NOTE

It is essential that all FIPs, NDUs or any other devices connected to the network are all wired the same way, i.e. using duplicated cable or single cable.

Single and duplicated cable connections cannot be mixed on the same Panel-Link network.

Digital Hubs

Digital Hubs can be used in some applications to extend the length of a network, or to interface to alternative communication media, e.g. fibre optics. Contact Tyco Safety Products technical support for advice regarding the use of hubs for your particular application.
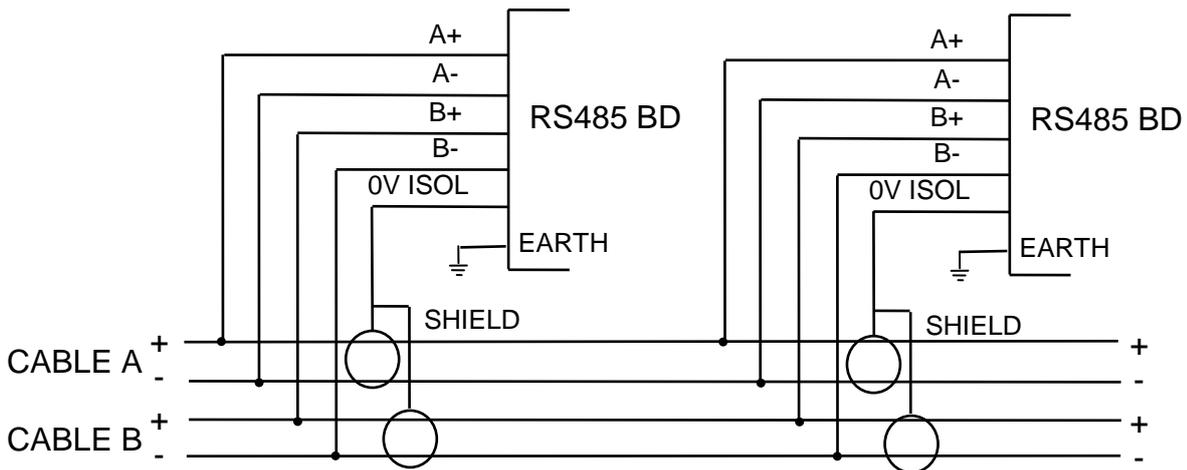
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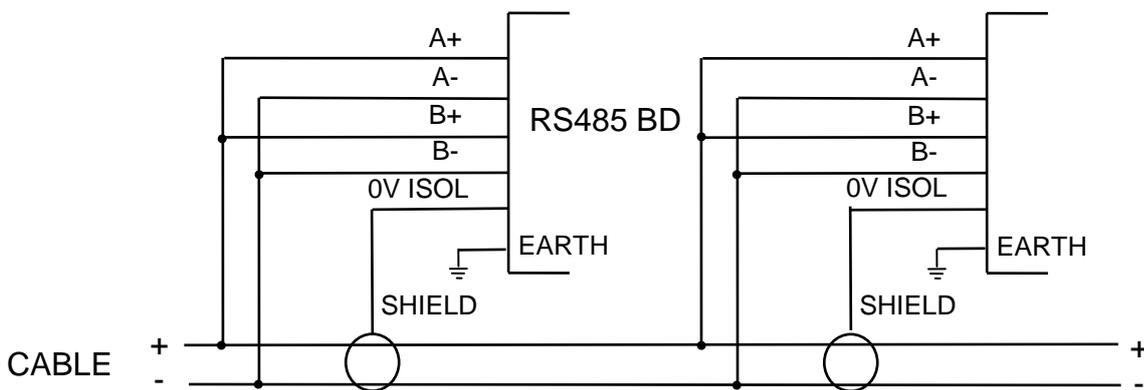## 5.   CONNECTION OF CABLES TO RS485 BOARD

5.1   SHIELDED CABLES

With shielded cable the shield should be a continuous circuit, connecting to 0V ISOL at each panel. It may be directly earthed, but this should only occur at one panel, otherwise multiple earth connections may cause problems.

Connection for Duplicated Cables
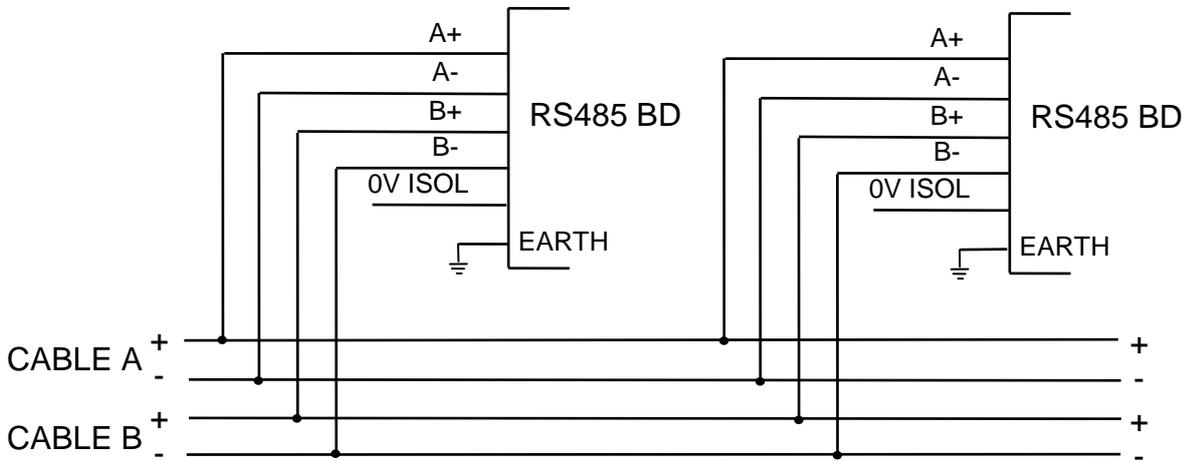
Connection for a Single Cable

Note that all throughout the network:

A+ connects to A+   B+ connects to B+
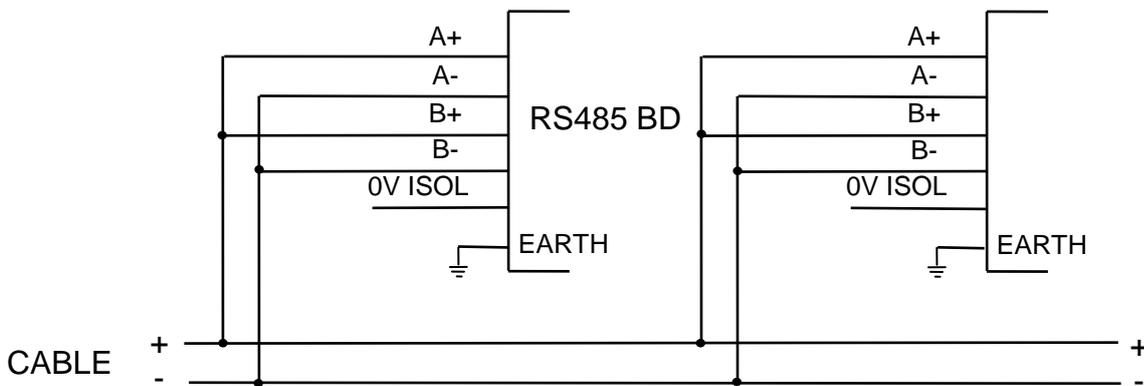A- connects to A-   B- connects to B-

5.2 UNSHIELDED CABLES

Connection for Duplicated Cables

Connection for a Single Cable

Note that all throughout the network:

A+ connects to A+   B+ connects to B+
A- connects to A-   B- connects to B-

Earth connections should be provided at each RS485 board, even with unshielded cable. The standard mounting of the RS485 Board on metal screws, with crinkle washers and nuts on all 4 positions, provides adequate earthing.

5.3 NOTES

1)   All FIPs, NDUs, PTMs, etc, must be wired to the network the same way, i.e.

        (a)   all with duplicated cables, or
        (b)   all with a single cable.

        Mixing duplicated cables with single cables (even for simple PTM printers) is not permissible. Random network faults may result if, for example, a PTM is connected using only one cable pair of a duplicated cable network.

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