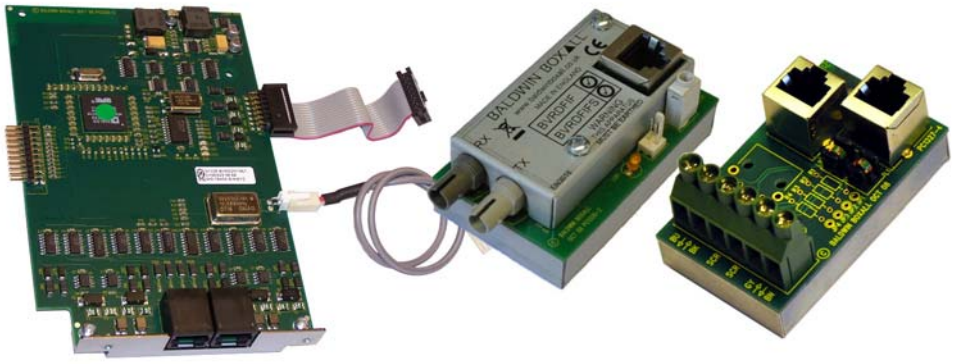
BALDWIN BOXALL
LEADING THE WAY TO SAFETY

BVRD Network

Installation Instructions



BVRDNET BVRDFIF / BVRDFIFS BVRDCIF

Manual name: BVRDNET

Issue: 4

ECR: 4424

Date of issue: Sept 2021

Wealden Industrial Estate
Farningham Road
Crowborough
East Sussex
TN6 2JR
UK

Telephone: +44 (0)1892 664422

Email: hello@baldwinboxall.co.uk

Website: http://www.baldwinboxall.co.uk

This equipment has been designed and manufactured to conform to both CE & UKCA requirements

Failure to use the equipment in the manner described in the product literature will invalidate the conformity.

A “Declaration of Conformity” statement and a “Declaration of Performance” is available on request.

Introduction

BVRD Network Installation

Commissioning

AMENDMENT RECORD

Change Note Number	Nature of Amendment	Date of Amendment
2990	Issue 2: Changes after LPCB approval	Sept 2016
3326	Issue 3: Updates to Fibre Optic Cable types	Oct 2017
4424	Issue 4: Added note for mutliple loops if >36 nodes & 2km max distance for OM2 & OM3 fibre	Sept 2021

PROPRIETARY NOTICE

Safety Information

Personnel who install, maintain or repair this equipment must read the safety information below before starting work.

Voltages in excess of 30 Volts RMS or 50 Volts DC are considered Hazardous and in certain circumstances can be lethal.

If Functional Testing, Maintenance, or Repair is to be completed with the Mains Power (and/or battery backup) connected then this should only be undertaken by personnel who are fully aware of the danger involved and who have taken adequate precautions and training.

This Manual contains Warnings, Cautions and Notes.

Warnings describe potential threats to health or life, e.g.

WARNING

Before attempting to remove this component, ensure the Mains Power Supply and Battery Backup have been disconnected.

Cautions describe potential threats to the equipment, e.g.

CAUTION

Notice must be taken of all cautions.
If a Caution is ignored the equipment may be damaged.

CAUTION: ELECTRO-STATIC SENSITIVE DEVICES

Observe the relevant precautions for the protection of Electro-static Sensitive Devices when handling this equipment.

Notes are statements that are useful to the user in the context of a particular section of the manual, e.g.

NOTE: Do not speak into the microphone until the "Speak Now" LED is illuminated.

Comments

Comments regarding the content of this manual are welcome and should be addressed to hello@baldwinboxall.co.uk.

1 Introduction

1.1 BVRDNET Network Overview

The BVRDNET is a factory fitted option for the BVRD2M & BVRD2M4 and enables upto 126 systems to be networked together.

The systems are fully monitored and connected in a loop configuration. The network will continue to function in the event of cabling damage at a single location.

The network can be either Copper, Multi Mode Fibre, Single Mode Fibre or a combination of both using the BVRDCIF, BVRDFIF and BVRDFIFS interface modules.

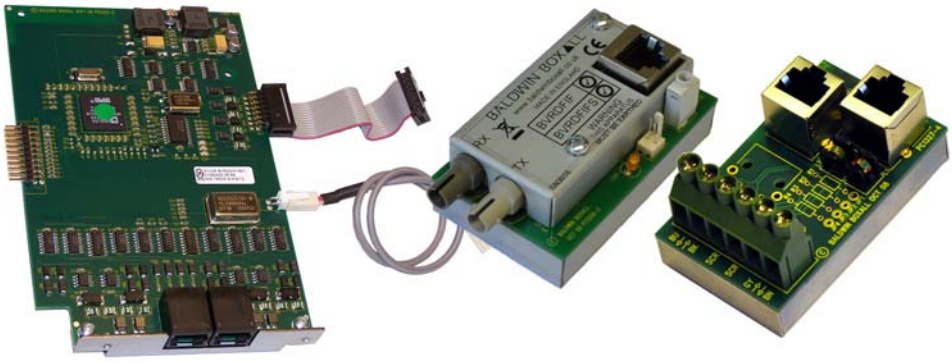
Two RS485 communication ports and upto 14 concurrent audio channels can be distributed around the network.

Typical maximum distances for copper connection are 300m for "slow speed" providing six concurrent audio channels and 200m for "fast speed" providing 14 concurrent audio channels.
The typical maximum distance for a multi-mode fibre connection is 3km and 4km for a single mode fibre connection.

NOTE: Multiple copper / fibre loops are required for systems that have greater than 36 nodes.

1.2 BVRDNET Components

Figure 1.1 — BVRDNET, BVRDFIF/S & BVRDCIF Modules



BVRDNET Module

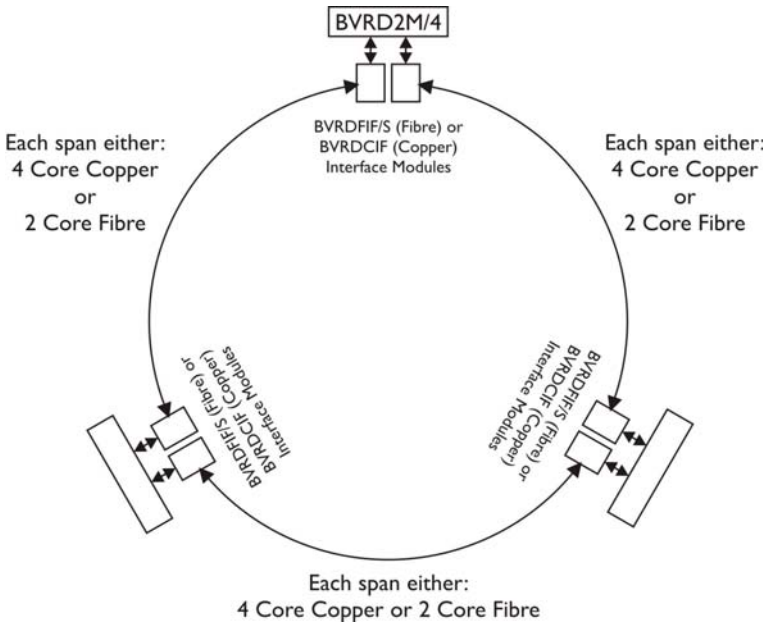
The BVRDNET is fitted inside the BVRD2M/4 and is a factory fit option only.

BVRDFIF/S (Fibre) & BVRDCIF (Copper) Interface

The BVRDCIF and BVRDFIF/S interface modules are DIN rail mounted and use standard RJ45 patch leads to connect to the BVRDNET module.

1.3 Simple Network Schematic

Figure 1.2 — Illustration of a BVRDNET Network

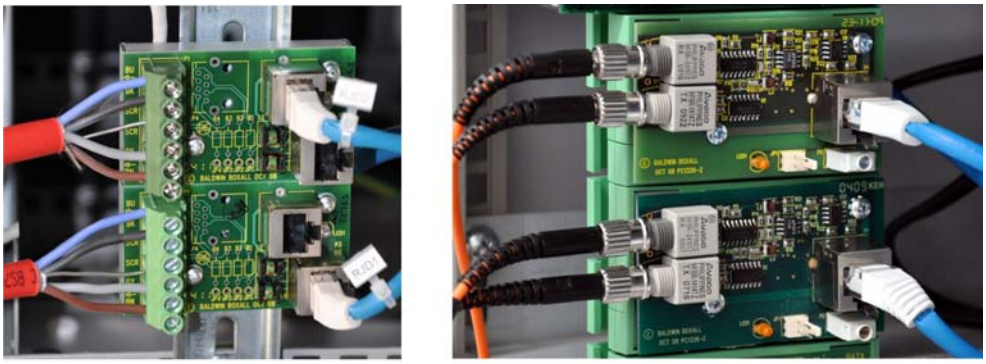


2 BVRD Network Installation

2.1 BVRDCIF & BVRDFIF/S Modules

The BVRDCIF and BVRDFIF/S Interface modules are both DIN Rail mounted and connect to the BVRD2M/4 using standard RJ45 patch leads. BVRDFIF/S modules require a Wurth 742-71221 cable ferrite installing so that the cable passes through the ferrite 2 times. The ferrite should be located as close to the BVRDFIF/S as possible.

Figure 2.1 — Typical BVRDCIF & BVRDFIF/S modules



BVRDCIF BVRDFIF/S

Both interface modules include an LED that will flash to show valid network communications.

2.2 BVRDCIF (COPPER) NETWORK

2.2.1 Cable Requirements

The BVRDCIF module enables connection to a copper network.

The copper network is a pair of Tx and a pair of Rx conductors (minimum 4 core screened cable required). The maximum length of cable between units is dependant on the speed selected and the cable type in use.

Enhanced Fire Rated Four Core Cable should be used, with a *cross sectional area* of either >1mm^2 (untwisted) or 0.5mm^2 (twisted). Baldwin Boxall recommend using 1.5mm^2 cable.

The typical maximum length of cable between units is as follows:
"Slow" speed (six concurrent audio channels) - 300 metres
"Fast" speed (fourteen concurrent audio channels) - 200 metres

2.2.2 Cable Connections to BVRDCIF

The conductor connections are colour coded on the BVRDCIF module to enable correct connection.

It is important that the pairs are wired diagonally opposite within the cable as shown in Figure 2.2.

Figure 2.2 — Diagonally Opposite Pairs within Cable

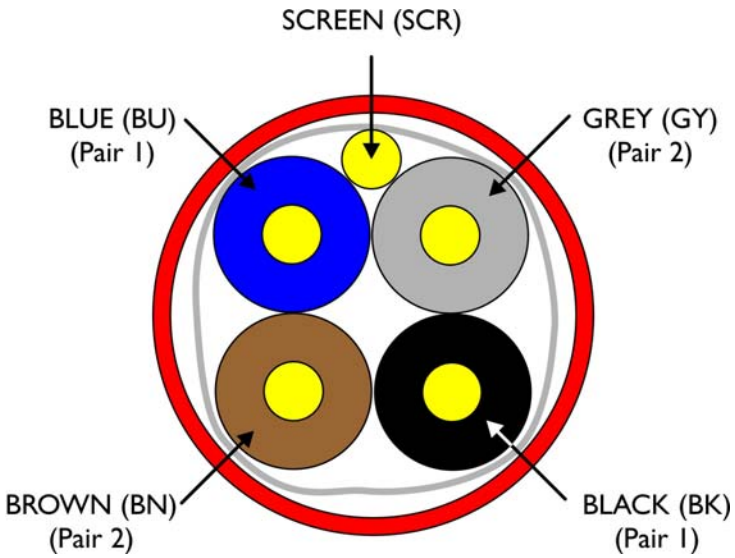
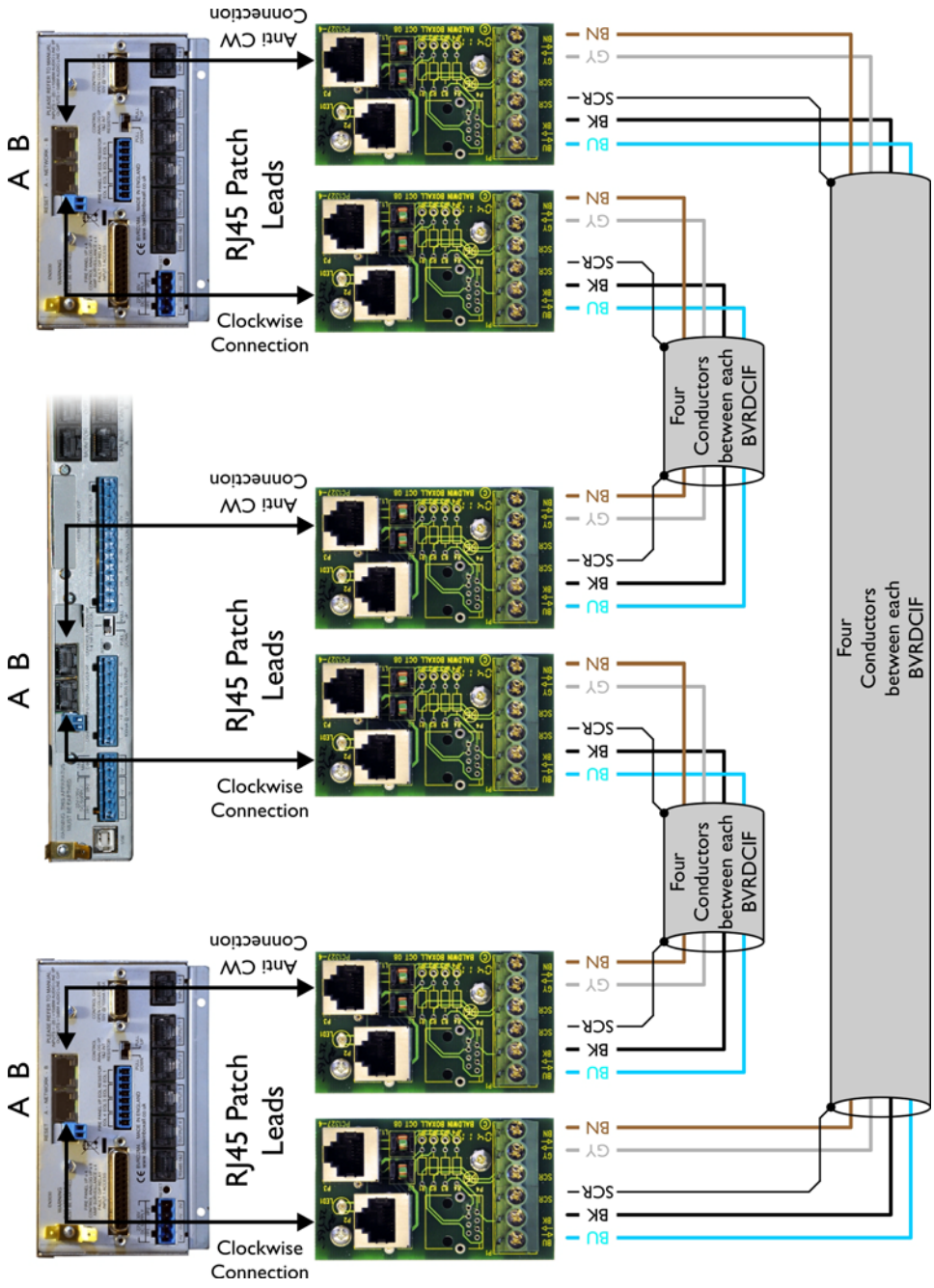


Figure 2.3 — Typical Connection Details for BVRDCIF Copper Network



For each BVRD2M/4 there are two BVRDCIF modules. The RJ45 connections should be connected as shown in Figure 2.3, with one RJ45 in the “Lower” (P3) socket and the other RJ45 in the “Upper” (P2) socket of the BVRDCIF modules.

NOTE: The "Tx" and "Rx" pairs are swapped between the two RJ45 sockets (P2 and P3) on the BVRDCIF. This enables all Site Network Cables to be terminated on the BVRDCIF modules using the same colour scheme to enable quick and easy connection.

2.3 BVRDFIF (Fibre) Network

2.3.1 Fibre Optic Cable Requirements

Multimode fibre: OM1 (62.5/125), OM2 (50/125) and OM3 (50/125).

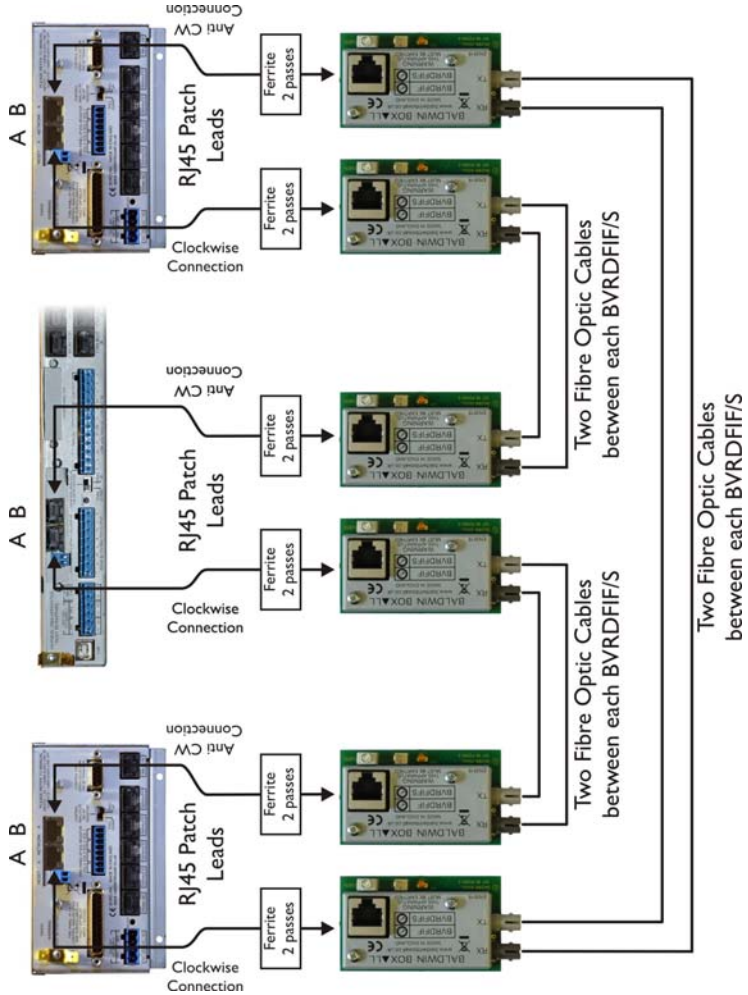
Single mode fibre: OS1 (9/125) and OS2 (9/125).

Fibre optic cable with ST Transmit and Receive connections should be used.
Two cables (Tx and Rx) connect between each BVRDFIF.

The typical maximum distance between units for a fibre network is 2km at slow or fast speed (multi mode) and 4km (single mode).

2.3.2 Connection Details

Figure 2.4 — Typical Connection Details for BVRDFIF Fibre Network



3 Commissioning

The BVRDNET network has been designed to enable simple commissioning. The network can be connected one "span" at a time to minimise fault finding. There is no power distributed around the network and fault finding can be performed with units switched on.

3.1 Copper Network (using BVRDCIF modules)

3.1.1 "Local" Network connection

Before connecting the site wiring to the BVRDCIF ensure there are no shorts between the site wiring conductors, and ensure there are no shorts to earth.

Connect the site wiring to the BVRDCIF, ensuring the connections match the screen printed colour codes.
If the site cabling does not match the colour codes then **note the relevant connection details**.

Ensure the "Local" BVRD2M/4 is switched on and the network is enabled in configuration.

Connect the “Local” BVRD2M/4 to the BVRDCIF, using either the P2 or P3 RJ45 connection, and **note which is being used**.

NOTE: The LED on the BVRDCIF will not flash until the network is connected and receiving data.

3.1.2 “Remote” Network connection

Go to the “Remote” unit.

Connect the site wiring to the “Remote” BVRDCIF, ensuring the connections match the screen printed colour codes (or is consistent with the connection details of the “Local” unit if the site cables do not match the screen printed colour codes).

Ensure the “Remote” BVRD2M/4 is switched on and the network is enabled in configuration.

Connect the BVRD2M/4 to the OTHER RJ45 connector on the BVRDCIF i.e. if P2 was used for the “Local” unit, connect the “Remote” unit to P3.

Refer to Figure 2.3 for connection details.

The LEDs on the BVRDCIF modules should now flash regularly to indicate data is being received.

If the LEDs do not flash then refer to “Fault Finding” on page 10.

3.2 FIBRE NETWORK (USING BVRDFIF/S MODULES)

3.2.1 "Local" Network Connection

Identify each of the Fibre Cables to be used (using a visible light source if necessary).

Connect the Fibre Cables to the ST connectors on the BVRDFIF/S module (refer to Figure 2.4 on page 6 for connection details).

Ensure the "Local" BVRD2M/4 is switched on and the network is enabled in configuration.

Connect the RJ45 patch lead to the BVRDFIF/S module.

NOTE: The LED on the BVRDFIF/S will not flash until the network is connected and receiving data.

3.2.2 "Remote" Network connection

Go to the "Remote" unit.

Ensure the "Remote" BVRD2M/4 is switched on and the network is enabled in configuration.

Connect the BVRD2M/4 to the RJ45 connector on the BVRDFIF/S module.

Connect the Fibre cables to the ST connectors.

The LEDs on the BVRDFIF/S modules should now flash regularly to indicate data is being received.

NOTE: If the LED on the BVRDFIF/S module does not flash then swap the Fibre Cable connections. It is likely the TX and RX are swapped.

If the LEDs still do not flash then refer to "Fault Finding" on page 10.

3.3 Fault Finding

3.3.1 BVRDCIF & BVRDFIF/S LED Indicators

The flashing LEDs on the BVRDCIF and BVRDFIF/S modules indicate valid reception of data and when the network is connected correctly will flash regularly at approximately 1Hz. The LEDs do not indicate the quality of transmission.

3.3.2 Common (Copper and Fibre) Network Fault Finding

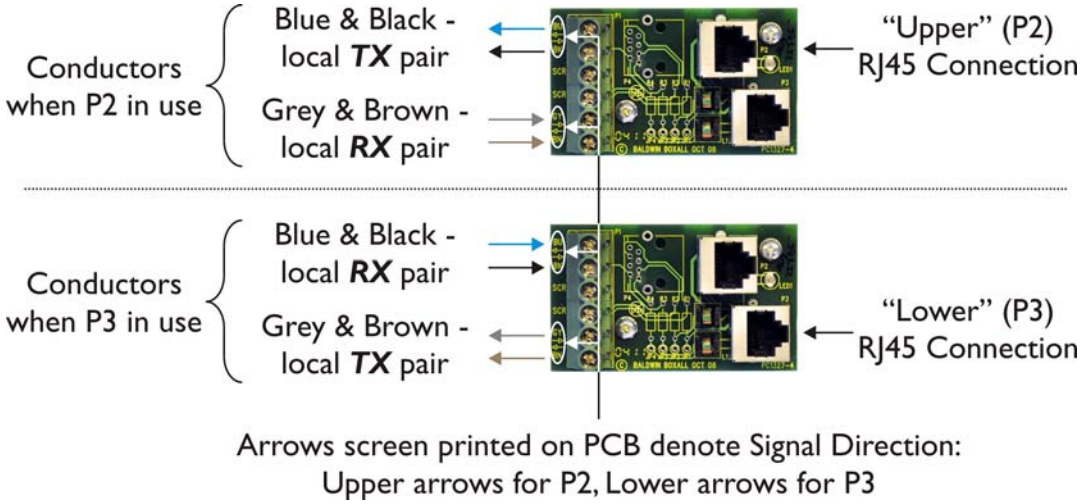
- Ensure both the Local & Remote units are set to the same Network Speed (either 6 or 14 channels).
- Ensure the correct cables are connected between the Remote unit and the Local Unit.
- Ensure the TX cable from the "remote" unit is connected to the "local" RX, and the "local" TX is connected to the "remote" RX.
- It is possible to check the Local Hardware by connecting both the Interface units to each other, forcing the local unit to "talk" to itself. This allows the operator to ensure the local settings are correct.

3.3.3 Copper Network (BVRDCIF) Specific

- Ensure the site cable connections are correct (or consistent if they do not match the screen printed colour codes) on both the local and remote BVRDCIF modules.
- Check the site cabling has continuity and no shorts to ground etc.
- Ensure the maximum cable lengths are less than:
  300m when using 6 channels,
  200m when using 14 channels.

- Ensure that on each span both RJ45 connectors are used - P2 on one end and P3 on the other end.

Figure 3.1 — BVRDCIF Copper Conductors



3.3.4 Fibre Network (BVRDFIF/S) Specific

Ensure the correct fibres are in use (using visible Light Source if required).

Ensure the fibre optic link is less than 3km long (multi mode) and 4km long (single mode).

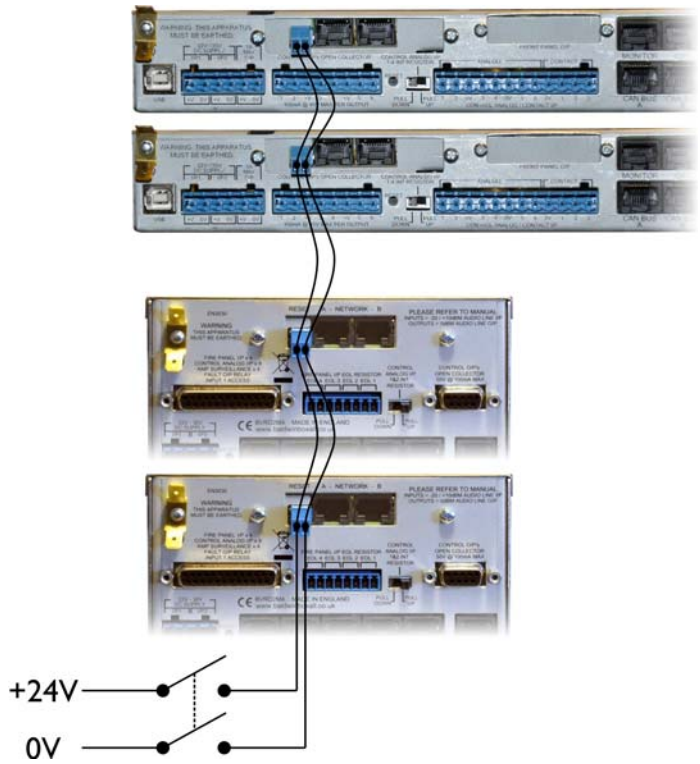
3.4 System Wide Reset Control

The BVRD Network Card includes a facility to remotely reset the local router.

During Commissioning it is occasionally necessary to reset routers to clear stored routes, and this can be difficult when physical access to the equipment racks is limited.

It is possible to connect each reset seperately for individual routers, or all routers on the network can have these reset connections connected together to enable a system wide reset.

Figure 3.2 — Typical Connections for System Wide Reset



Warning

The switch shown in Figure 3.1 must be either a momentary "Flip-top" or keyswitch to prevent accidental or inadvertant use.

Using this reset will temporarily prevent the system from operating correctly.