▼ VIGILANT

FP2024/2025 QE20 Fibre Network Kit Installation Instructions

1. General Description

This guide describes installation of the QE20 Fibre Network Kit, which is used alongside the FP2005 QE20 RS485 Network Module to provide a fibre-optic cable networking interface for a QE20 system. It can be used as a replacement for an existing fibre kit. The fibre network consists of two fibres (TX and RX) wired in a ring around all the QE20 panels. Two different fibre network kits are available to suit the different types of fibre generally used.

- FP2024   FP, QE20 FIBRE NETWORK KIT, SINGLE MODE
- FP2025   FP, QE20 FIBRE NETWORK KIT, MULTI MODE

Each kit consists of a metal bracket with these items mounted on it.

- A fibre switch to match the specific type of fibre optic cable being used.
- A PIB for networking of QE20 information and streaming of VoIP data.
- An Analogue Telephone Adaptor (ATA) for sending and receiving audio via VoIP.
- A VIF for interfacing the QE20 PA (speech) and WIP audio signals to the ATA.
- Looms for connection to the RS485 Network Module and PSU in the QE20.

These manuals should be referred to for specific details on configuring, diagnosing and servicing the components included in the Fibre Network Kit.

- LT0732 QE20 Fibre Networking User Manual
- LT0519 Panel-Link IP Bridge User Manual
- Cisco ATA 191 and ATA 192 Analog Telephone Adapter User Guide
- Cisco ATA 191 and ATA 192 Analog Telephone Adapter Administration
- Moxa Managed Ethernet Switch/Adaptor User's Manual
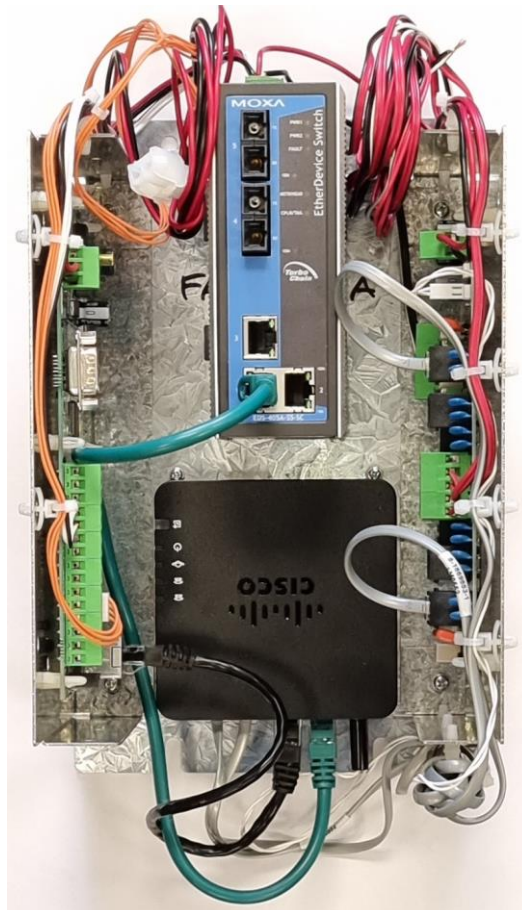- Moxa EDS-405A/408A Series Hardware Installation Guide

Figure 1 – FP2024/2025 QE20 Fibre Network Kit

2. Kit Contents

Each kit contains:

    1 x QE20 Fibre Network module – FP2024 Single mode or FP2025 Multi-mode
    4 x M4 x 10 Screws for mounting the module
    1 x LT0714, these instructions.

3. Mounting the Fibre Network Kit

The Fibre Network Kit is fitted to the QE20 mounting frame, occupying three of the 60mm positions as shown in Figure 2. It is usually mounted adjacent to the FP2005 RS485 Network Module it must be wired to. But the leads are long enough for it to be located in the frame above or below the RS485 Network Module – depending where on the frames the two modules are located and the cable route taken. Refer to LT0700 for details on mounting and wiring the RS485 Network Module.

The Fibre Network Kit is secured to the frame using four M6 x 10 screws. Loosely fit a screw to a bottom hole of the desired position, then slide the open slot at the bottom of the Fibre Network Kit under the screw head and then fit a top screw to hold the module. Fit and tighten all screws to secure the module into position.

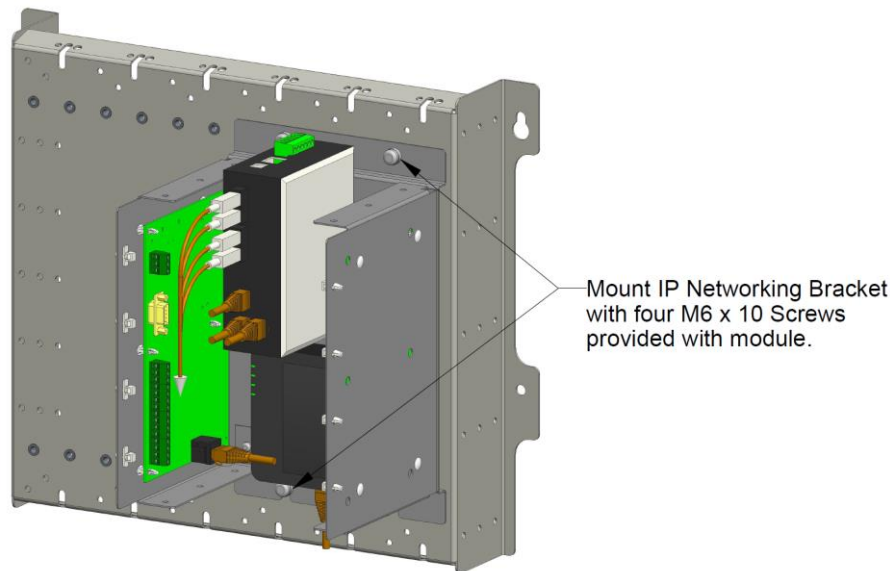Mount IP Networking Bracket with four M6 x 10 Screws provided with module.

Figure 2 – QE20 Fibre Network Kit Mounting

4. Replacing an Existing Kit

When replacing an existing Fibre Kit it will be necessary to transfer the configuration from the PIB, ATA and fibre switch in the old Fibre Kit to the corresponding items in the new kit. Ideally, the configurations will have been stored safely elsewhere, so they can be downloaded to the new kit. Otherwise, the configuration may need to be extracted from the existing item, if that part is working sufficiently.

Refer to the specific PIB, ATA and fibre switch manuals for details on configuring, saving and extracting the configurations.

Identify and label the existing cable connections to/from the Fibre Kit.

Power down the QE20 Panel.

Unplug the 3 looms that connect the Fibre Kit to the RS485 Network Module.

Unplug the power lead to the Fibre Kit.

Unplug the fibre optic cable from the Switch in the Fibre Kit.

Remove the top mounting screws and loosen the lower mounting screws.

Lift the module clear of the frame.

Set the links and address switch on the VIF and the links on the PIB of the new Fibre Kit to match the settings of the removed one.

Position the new module onto the frame with the mounting slots under the lower screws.

Fit the top mounting screws and tighten all screws.

Reconnect the 3 looms from the Fibre Kit to the RS485 Network Module – VIF 4-way audio cable to VIF PA/WIP J11, PIB cable to TTL SERIAL J3 and VIF QEComms cable to QE COMMS J5.

Plug in the power lead to the Fibre Kit.

Plug the two fibre optic cables into the Switch in the Fibre Kit.

Power up.

Download or program the required configurations for the PIB, ATA and fibre switch.

Check the operation of the QE20 and, in particular, the network operation as per Section 8.

4. Adding a Fibre Network Kit

When adding a Fibre Network Kit to a QE20, the networking functionality will need to be entered into the QE20 site configuration using QE20Config. The other QE20 panels on the network may also need their site configuration updated to include the new QE20 panel. A QE20 RS485 Network Module will also need to be fitted, unless there is one in the QE20 already.

The PIB, ATA and fibre switch will need configuring to provide the required network operation. Refer to the LT0732 QE20 Fibre Networking User Manual for design and configuration of the fibre network, and to the specific PIB, ATA and Switch manuals for details on configuring and saving the configurations in these units.

As part of the design process the optical loss on each segment of the fibre network will need to be calculated to make sure it does not exceed that of the fibre switches.

Links on VIF

The two links on the VIF, Lk1 and Lk2, need to be left open for normal operation. Make sure a jumper is not fitted, or is on one pin only.

Links on PIB

The two links on the PIB, J13 DHCP Server, J10 Serial Diag, should be left open for normal operation. Make sure a jumper is not fitted or is on one pin only. Note a jumper should be left on one pin of J13 DHCP Server of the PIB so that it is easy to enable the DHCP server to assign an IP address to a laptop if it is connected to the fibre network.

Mount the Fibre Kit as detailed in Section 3 and connect the internal wiring as per Section 5.

Connect the fibre ring as per Section 6.

Power up and check the fibre network operation as per Section 8.

5. Internal Wiring

The QE20 Fibre Network Kit requires:

- 24V DC power to be supplied. Connect the 24V DC loom of the Fibre kit to 24V DC from a 27A PSE via a LM0665 3-way splitter loom.
- The 4-way loom carrying PA & WIP audio to the VIF to be plugged into J11 VIF PA/WIP on the RS485 Network Module.
- The 2-way loom from the VIF QECOMMS terminals to be plugged into J5 QECOMMS+- on the RS485 Network Module.
- The 10-way header loom from the PIB to be plugged into J3 TTL SERIAL on the RS485 Network Module.

Drawing 1922-197 Sheet 2 included in this guide details the wiring connections between the Fibre Network Kit and the RS485 Network Module, and the internal wiring of the Fibre Network Kit.

6. Field Wiring

Connect the two fibre pairs going each way round the ring to ports 4 & 5 on the Fibre switch (unless the switch is configured for Ethernet on one or both legs). Refer to drawing 2001-2 Sheet 606 included later in this guide.
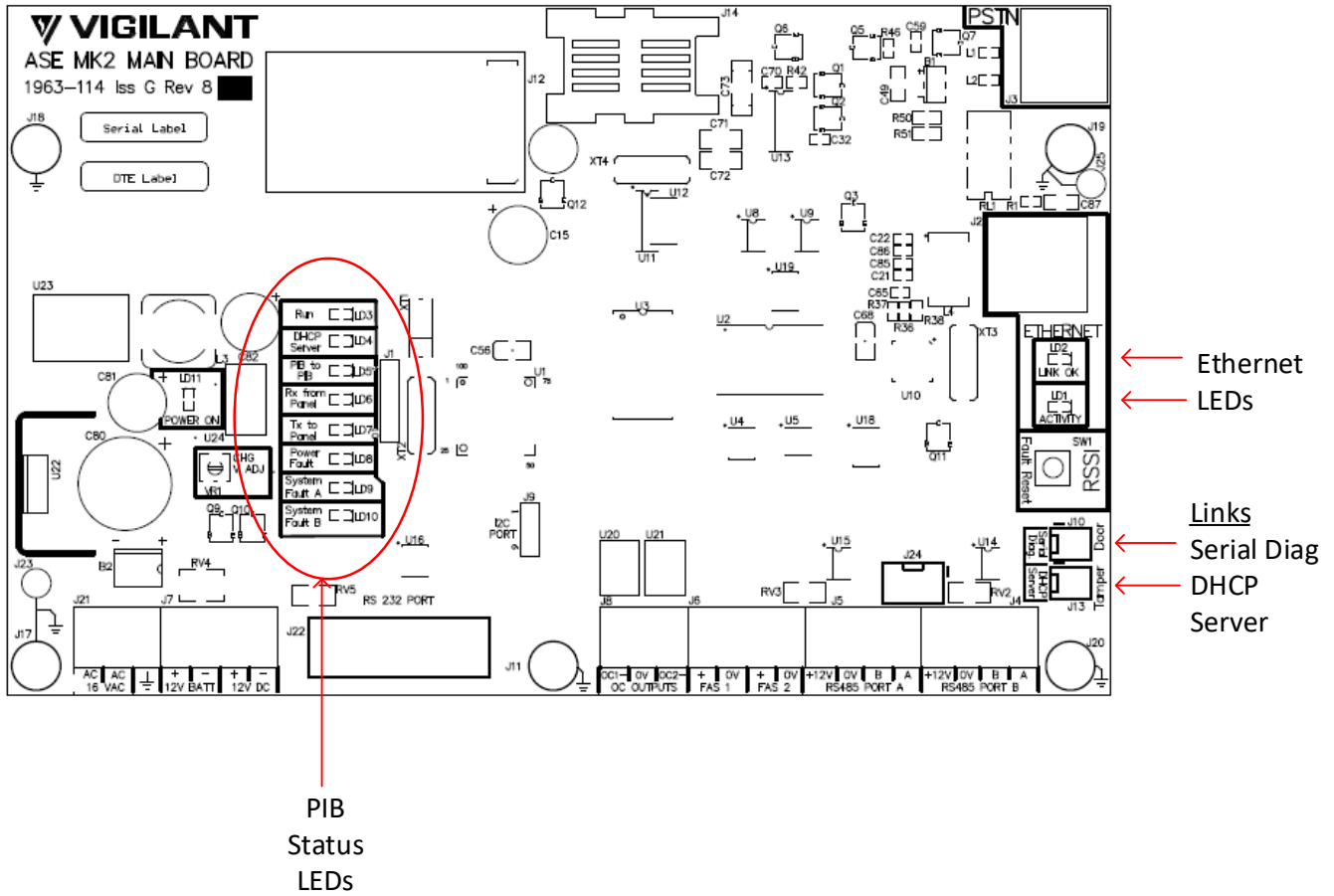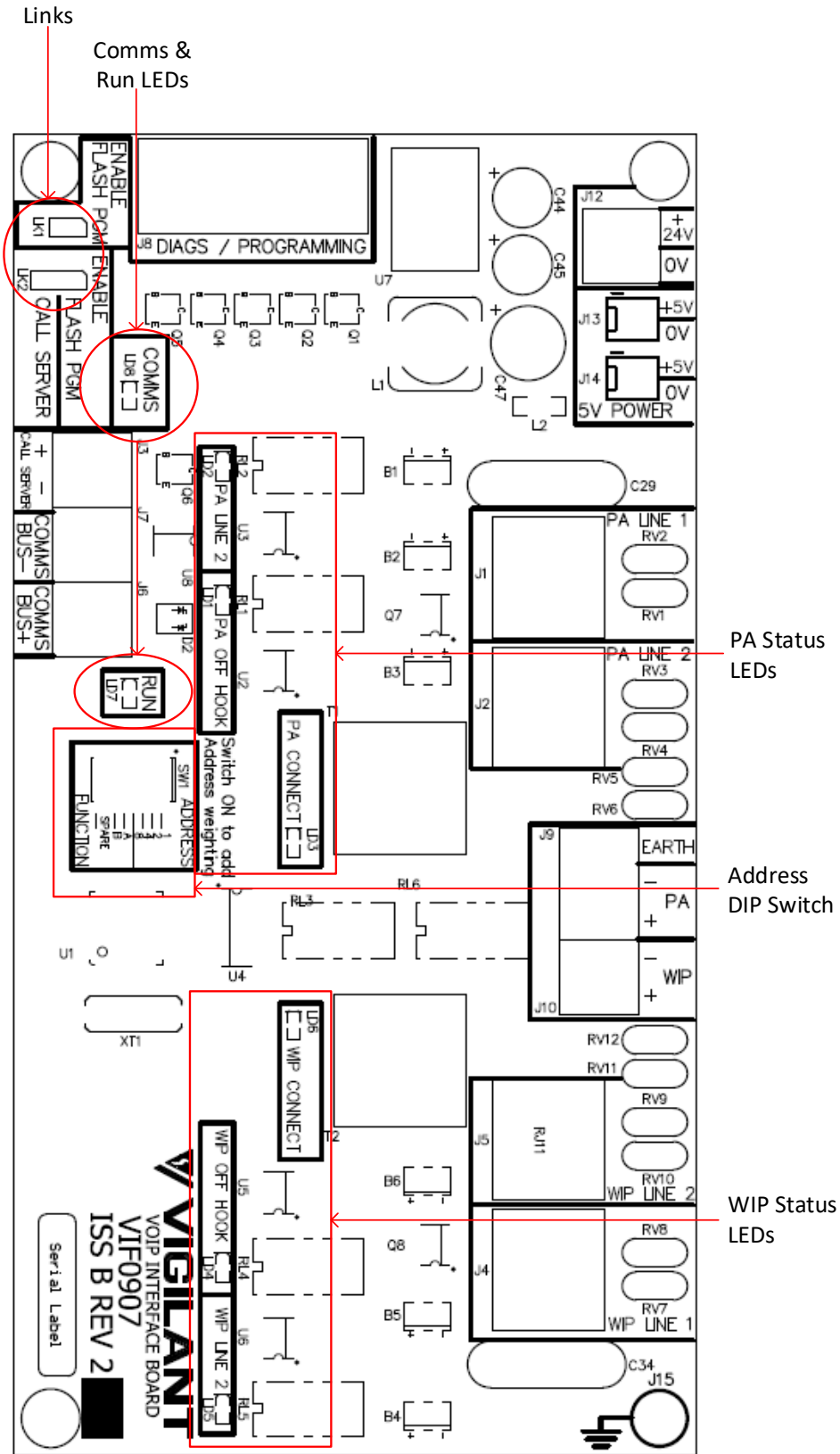
Figure 3 –PIB Link and LED locations

Figure 4 – VIF Address Switch, Link and LED locations

7. LED Indications

Details of the LED indicators on the various modules in the Fibre Network Kit are contained in their respective manuals. Some key ones are:

- **Moxa Fibre Switch** PWR1 is on when power is applied (PWR2 is usually off as it is not connected). If Fault is on (red) this indicates the loop is broken or the switch is failed. MSTR/HEAD is on if the switch is configured as the master of the ring and flashing if the ring is broken or the switch has become a master due to a break in the ring. CPLR/TAIL is on when the switch is coupling data around the ring due to a break in the ring. Assuming the two fibre ports 4 and 5 are the ring ports, Port 4 and 5 100M should be on and flash when data is transmitted around the ring. There are also combined Link / Activity LEDs for each Ethernet port. These will be on if a connection is present and flash as data is transmitted on the port.

- **PIB** LD3 RUN flashes on/off every second when the PIB is operating. LD6 RX and LD7 TX flash when the PIB communicates with the RS485 Network Module. LD5 PIB to PIB flashes when data is transmitted to or received from another PIB on the QE20 network. LD9 SYSTEM FAULT A is on yellow if any PIB on the network has a fault condition. LD1 Activity (flashes with data Tx/Rx) and LD2 Link OK (on steady) indicate the status of the Ethernet connection to the switch.

- **VIF** LD7 RUN flashes On/Off ~2 times per second when the VIF is operating. LD8 QE90 Comms flashes approximately every 2 seconds in response to QEComms messages being received from the RS485 Network Module. LD1 – LD3 indicate the state of PA calls on the fibre network and LD4 – LD6 indicate the state of WIP calls. Refer to LT0732 for details on these LED indications and how they show the stages of VoIP calls on fibre networking.

- **ATA** Power is on steady green when the ATA is powered up, has an IP address and is ready to be used. Flashing indicates a problem with the ATA. Network (globe symbol) is on green when connected to the switch and flashes when data is sent by the ATA. Phone 1 and Phone 2 are off when PA and WIP are idle. They slow flash green while a call is being set up or is in progress. If they fast-flash green there is a problem with registration or a factory-reset has been performed. The Problem Report Tool LED may be on or flashing red / amber / green. It is meaningless in the QE20 application.

8. Power On & Testing

Some suggested steps for the initial power up and testing of the QE20 Fibre Network Kit.

- Power up the QE20 with its site configuration installed.

- Make sure the PIB, VIF, ATA and Fibre switch are configured for their required operation.

- Check for any fault conditions and resolve these. Check the LED indications on the PIB, ATA, VIF and fibre switch are as expected.

- Make a live Speech announcement from the front panel microphone to a zone that is on a remote node on the fibre network and confirm that the speech can be heard from the loudspeakers in the remote zone. If the local QE20 only receives speech announcements from remote QE20s, then make the speech announcement at one of the remote QE20s and check it is heard at the loudspeakers on this QE20.

- Call a WIP at a remote QE20 and check the WIP answers and bi-directional voice conversation is possible. If this QE20 doesn't make WIP calls, then pick up a WIP attached to this panel and check the call is answered at a remote QE20 and voice conversation is possible.
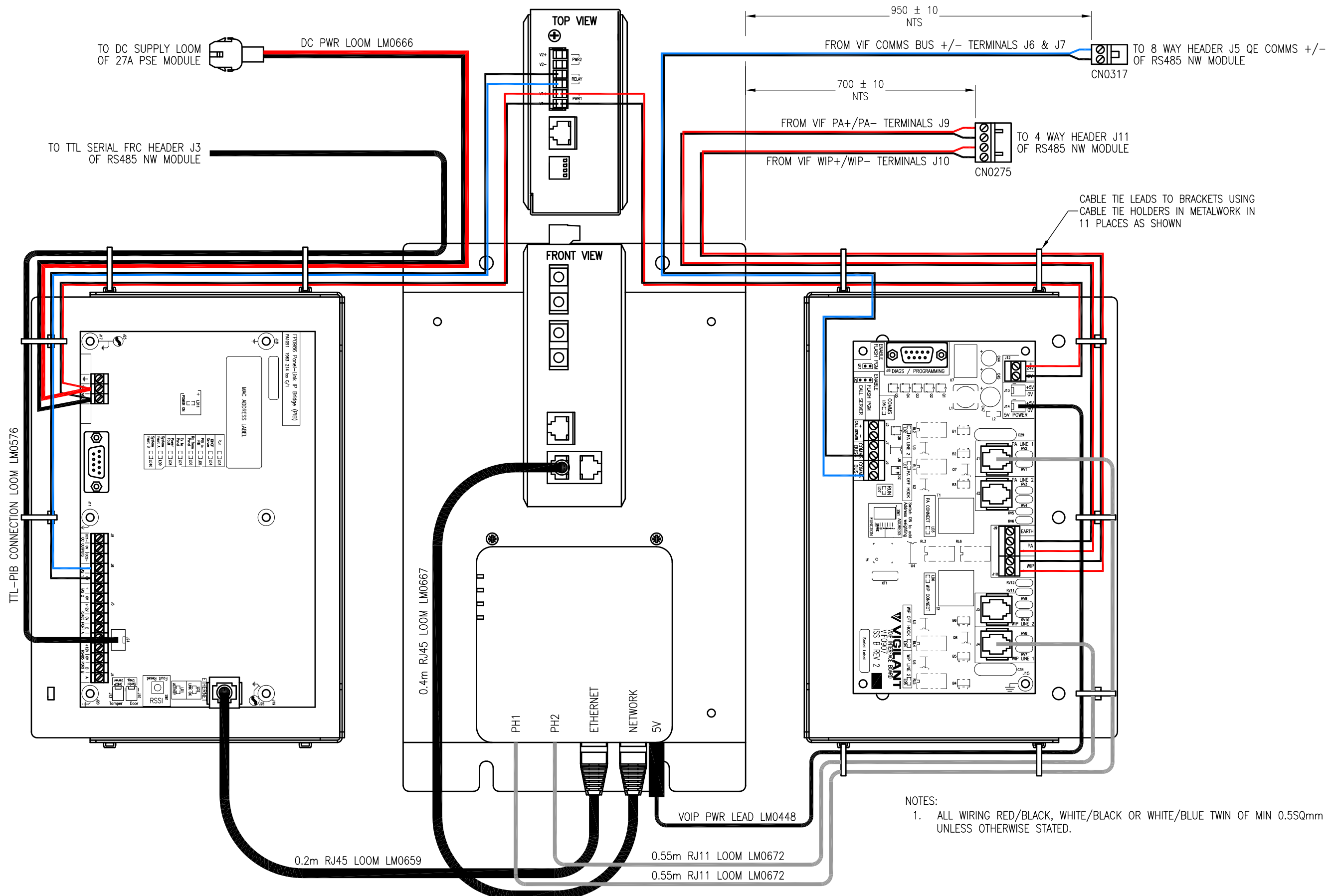
9. Fibre Network Kit Specifications

Power Requirements	18V – 32Vdc, 520mA typ @ 24V
Operating Temperature Range	-5°C to +45°C 10% to 93% RH non-condensing
FP2024 – Fibre type	9/125um single-mode fibre, SC connectors, two fibres
FP2024 – Optical link budget	29 dB, approx. 40 km
FP2025 – Fibre type	50/125um or 62.5/125um multi-mode fibre, SC connectors, two fibres
FP2025 – Optical link budget	12 dB, approx. 4km
Ethernet	10/100BaseT RJ45
Remote Audio Connections	Total of 31 remote nodes across Speech and WIP connections

10. End User Licence Agreement, Privacy and Licensed Software

Please refer to the following web page for the Johnson Controls End User Licence Agreement (EULA), Open Source Software (OSS) licences and Privacy information related to this product - www.johnsoncontrols.com/techterms

TOP VIEW

TO DC SUPPLY LOOM
OF 27A PSE MODULE

DC PWR LOOM LM0666

950 ± 10
NTS

FROM VIF COMMS BUS +/- TERMINALS J6 & J7

TO 8 WAY HEADER J5 QE COMMS +/-
OF RS485 NW MODULE

CN0317

700 ± 10
NTS

FROM VIF PA+/PA- TERMINALS J9

TO 4 WAY HEADER J11
OF RS485 NW MODULE

TO TTL SERIAL FRC HEADER J3
OF RS485 NW MODULE

FROM VIF WIP+/WIP- TERMINALS J10

CN0275

CABLE TIE LEADS TO BRACKETS USING
CABLE TIE HOLDERS IN METALWORK IN
11 PLACES AS SHOWN

V2+
V2-
PWR2
RELAY
PWR1

FRONT VIEW

FP0986 Panel-Link IP Bridge (PIB)
PA1091 1963-74 Iss 6/1

MAC ADDRESS LABEL

TTL-PIB CONNECTION LOOM LM0576

POWER ON

RSSI

Tamper Door

Fault Reset

VIGILANT
VIF0907
ISS B REV 2

FLASH
ENABLE
DIAGS / PROGRAMMING

FLASH PGM
CALL SERVER

5V POWER

LINE 1
RX2

LINE 2
RX3

EARTH
PA
WIP

WIP OFF HOOK
WIP LINE 1

PA OFF HOOK
PA LINE 1

0.4m RJ45 LOOM LM0667

PH1 PH2 ETHERNET NETWORK 5V

VOIP PWR LEAD LM0448

0.2m RJ45 LOOM LM0659

0.55m RJ11 LOOM LM0672

0.55m RJ11 LOOM LM0672

NOTES:
1.   ALL WIRING RED/BLACK, WHITE/BLACK OR WHITE/BLUE TWIN OF MIN 0.5SQmm
     UNLESS OTHERWISE STATED.

3rd ANGLE
PROJECTION

UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE:
1 DECIMAL PLACE ±0.5, 2 DECIMAL PLACES ±0.3, 3 DECIMAL PLACES ±0.1

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL	–	KJS	RC	MH	DC	23-11-22

QE20
FIBRE NETWORK KIT
WIRING DIAGRAM

DRAWING No: 2001-2   SHEET 605 of N

A2 | ISS/REV   A | PART No: SEE TABLE

OTHER PANELS
OR JOINED

PORT 5

PORT 4

MOXA
FIBRE SWITCH

PORT 5

PORT 4

MOXA
FIBRE SWITCH

PORT 5

PORT 4

MOXA
FIBRE SWITCH
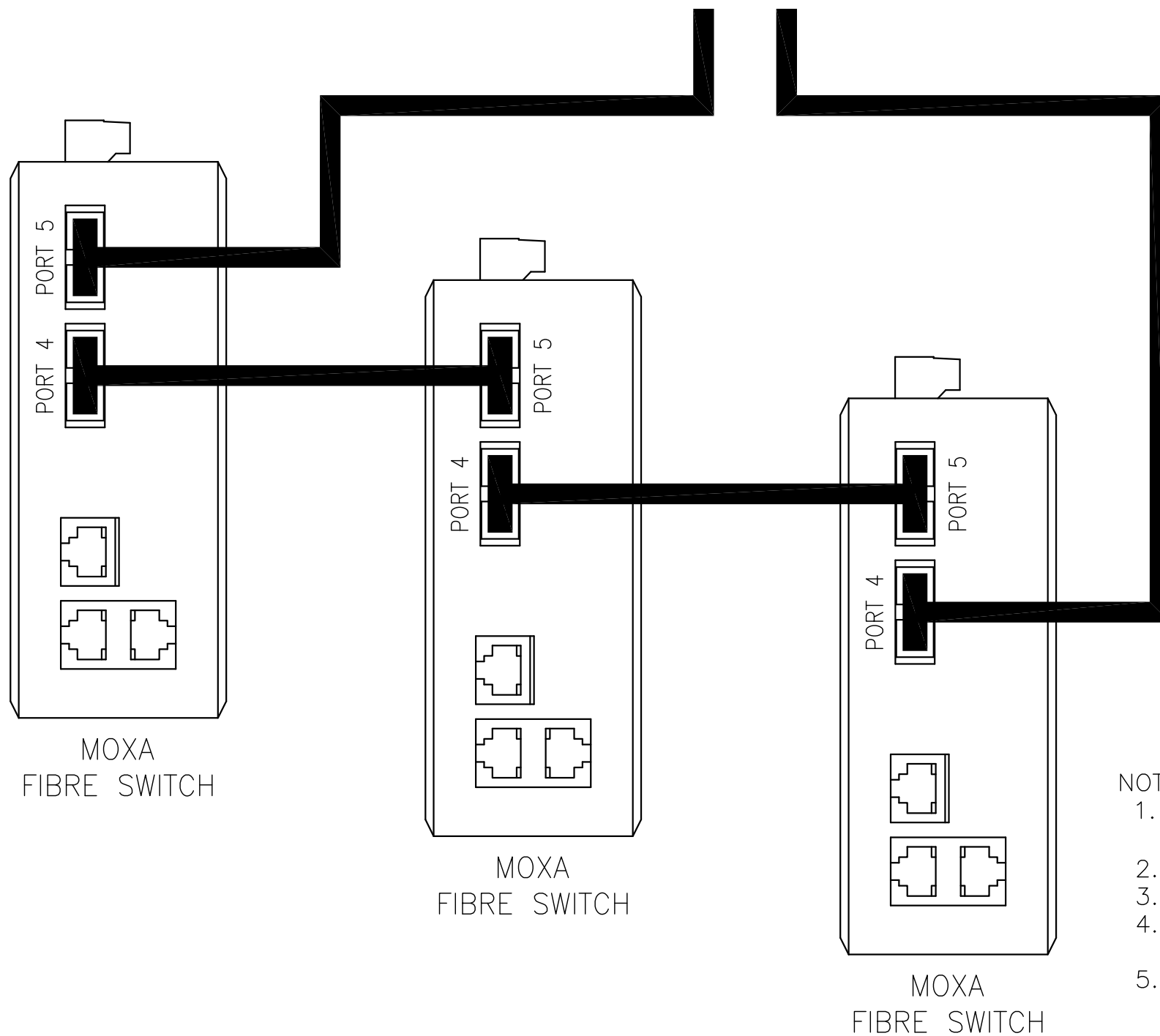
NOTES:
1. USE FP2024 QE20 FIBRE NETWORK KIT FOR SINGLE MODE FIBRE. USE FP2025 FIBRE NETWORK KIT FOR MULTI−MODE FIBRE.
2. USE SC CONNECTORS ON THE FIBRE PAIR (TX & RX).
3. CONNECT FIBRES IN A RING. IN TO PORT 4 AND OUT OF PORT 5.
4. CHECK OPTICAL LOSS ON EACH SEGMENT DOES NOT EXCEED SINGLE MODE = 29dB, MULTI−MODE = 12 dB.
5. INSTALL FIBRES OBSERVING MINIMUM BEND RADIUS AND TO AVOID PINCHING, BENDING OR FLEXING OF THE FIBRE.

UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ±0.5, 2 DECIMAL PLACES ±0.3, 3 DECIMAL PLACES ±0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
A	ORIGINAL.	−	KJS	RC	MH	DC	30−4−20

JOHNSON CONTROLS
17 MARY MULLER DRIVE
P.O. BOX 19545
CHRISTCHURCH, PH: +64 3 3895096
NEW ZEALAND. FAX:+64 3 3895938

QE20 FIBRE NETWORKING
FIBRE RING
WIRING DIAGRAM

DRAWING No: 2001-2   SHEET 606 of N

A3 | ISS/REV | A | PART No: