Course: Digital Drift System

Module 1.3:

QuadPort 2 (without VHF pass-through)

& Repeater 2

RFI

TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – Highlights

The QuadPort v2 improves upon the v1 units

QUADPORT2 – with PoE

QUADPORT2 – without PoE

Features:

- More compact form factor
- Latest PoE standards – 802.3bt
- "Branch" device built in
- Power injection/take off points
- More flexible coax connector options
- Lower power consumption

Variants:

- A non-PoE version is available:
  - Lower power consumption
  - Lower Price

Notes:

- Factory programmed to use a 200 MHz bandplan
- Does not pass VHF voice radio signals

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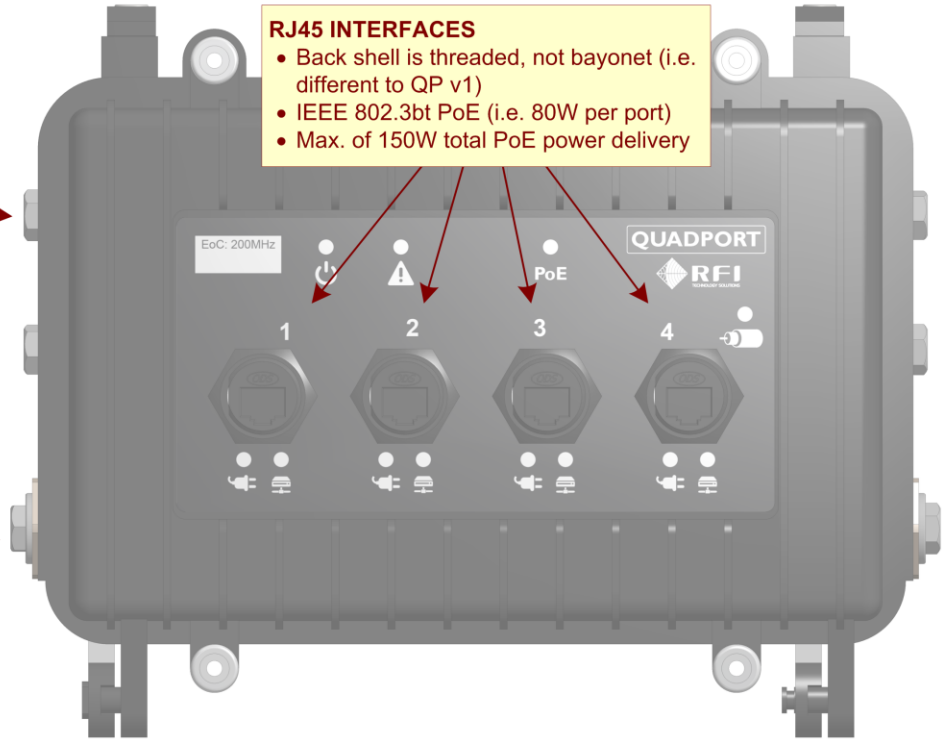
QuadPort 2 (without VHF pass-through) – External Connections

DC PORT
- Replace the blanking plug with an M20 cable gland
- Internal screw terminals that accept up to 4mm^2 stranded cables
- Can be use to inject or take off DC power

RJ45 INTERFACES
- Back shell is threaded, not bayonet (i.e. different to QP v1)
- IEEE 802.3bt PoE (i.e. 80W per port)
- Max. of 150W total PoE power delivery



COAX PORT
- From the factory: accepts a KS-pin
- Can be changed to an N-Type 50 Ohm Female using DDLFS-NF50-ADPTR
- Left port is disabled in “end-of-line” mode

COAX PORT
- From the factory: accepts a KS-pin
- Can be changed to an N-Type 50 Ohm Female using DDLFS-NF50-ADPTR

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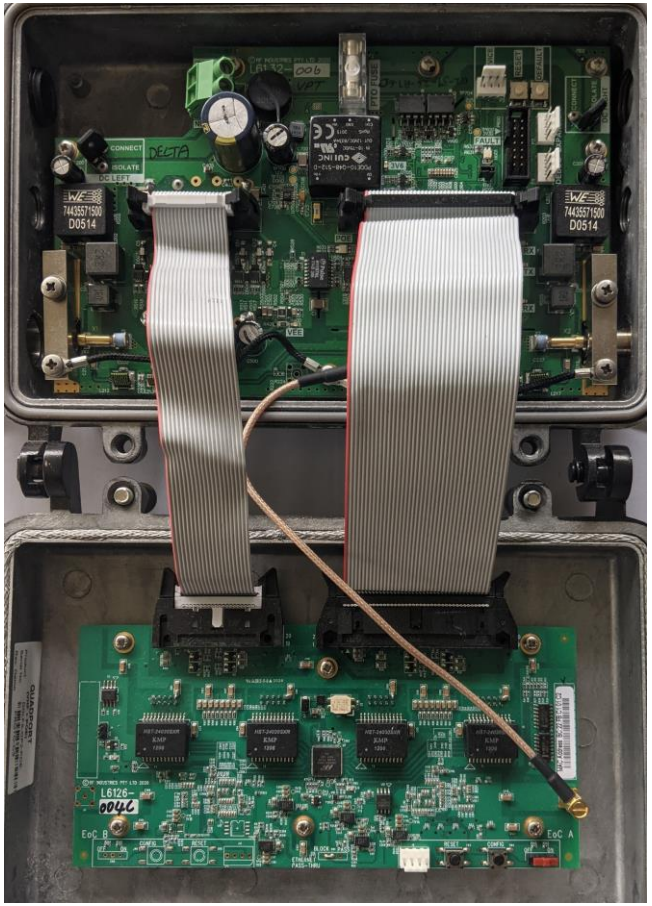
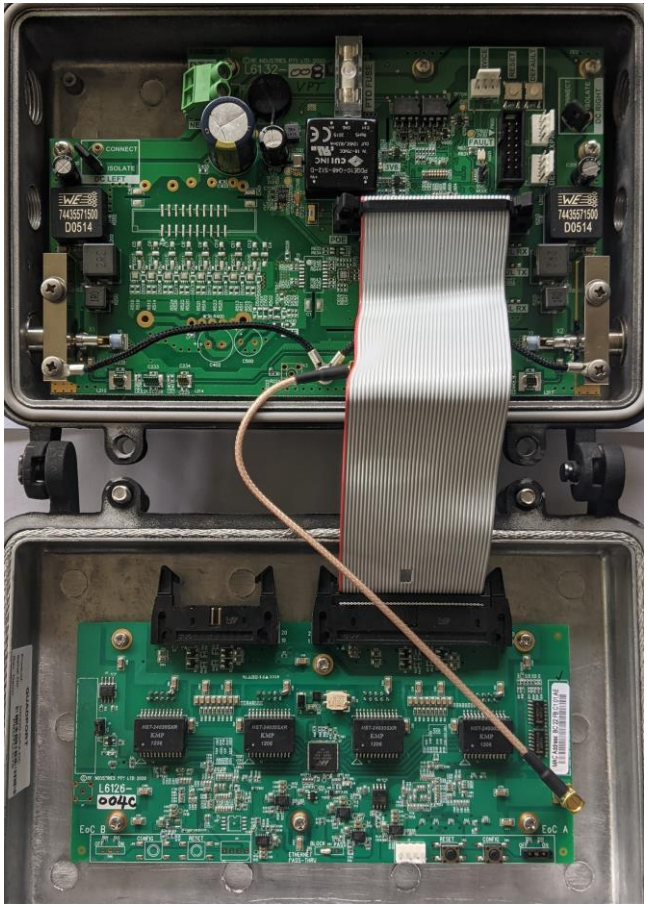
QuadPort 2 (without VHF pass-through) – Internals



QUADPORT2 – with PoE



QUADPORT2 – without PoE

Main Board

Networking Board

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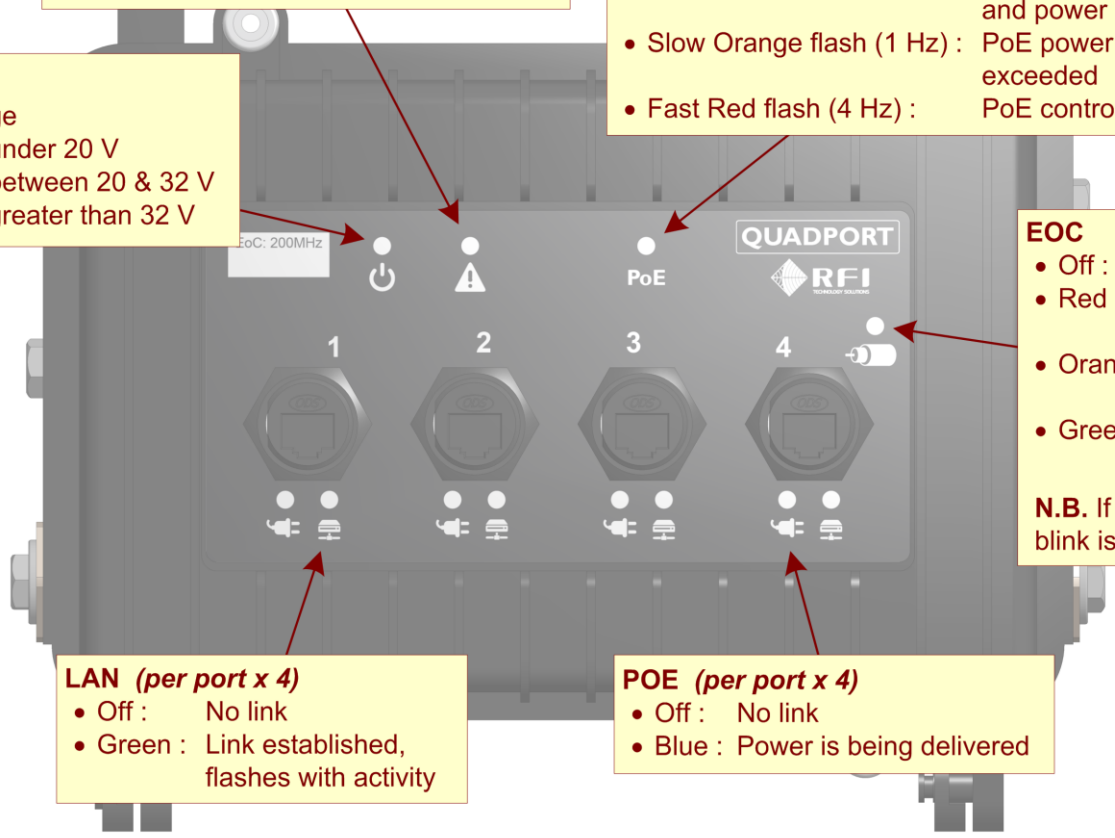
QuadPort 2 (without VHF pass-through) – External indicators



FAULT
- Off : No fault
- Slow Orange flash (1 Hz) : Minor fault
- Fast Red flash (4 Hz) : Major fault

POE
- Off : PoE disabled
- Short Green blink : Searching for PoE devices
- Green solid : PoE device(s) found and power being delivered
- Slow Orange flash (1 Hz) : PoE power delivery limit exceeded
- Fast Red flash (4 Hz) : PoE controller fault

POWER
- Off : No voltage
- Red : Voltage under 20 V
- Orange : Voltage between 20 & 32 V
- Green : Voltage greater than 32 V

EOC
- Off : No link partner
- Red : Link established, throughput < 100 Mbps
- Orange : Link established, throughput is 100 to 200 Mbps
- Green : Link established, throughput > 200 Mbps

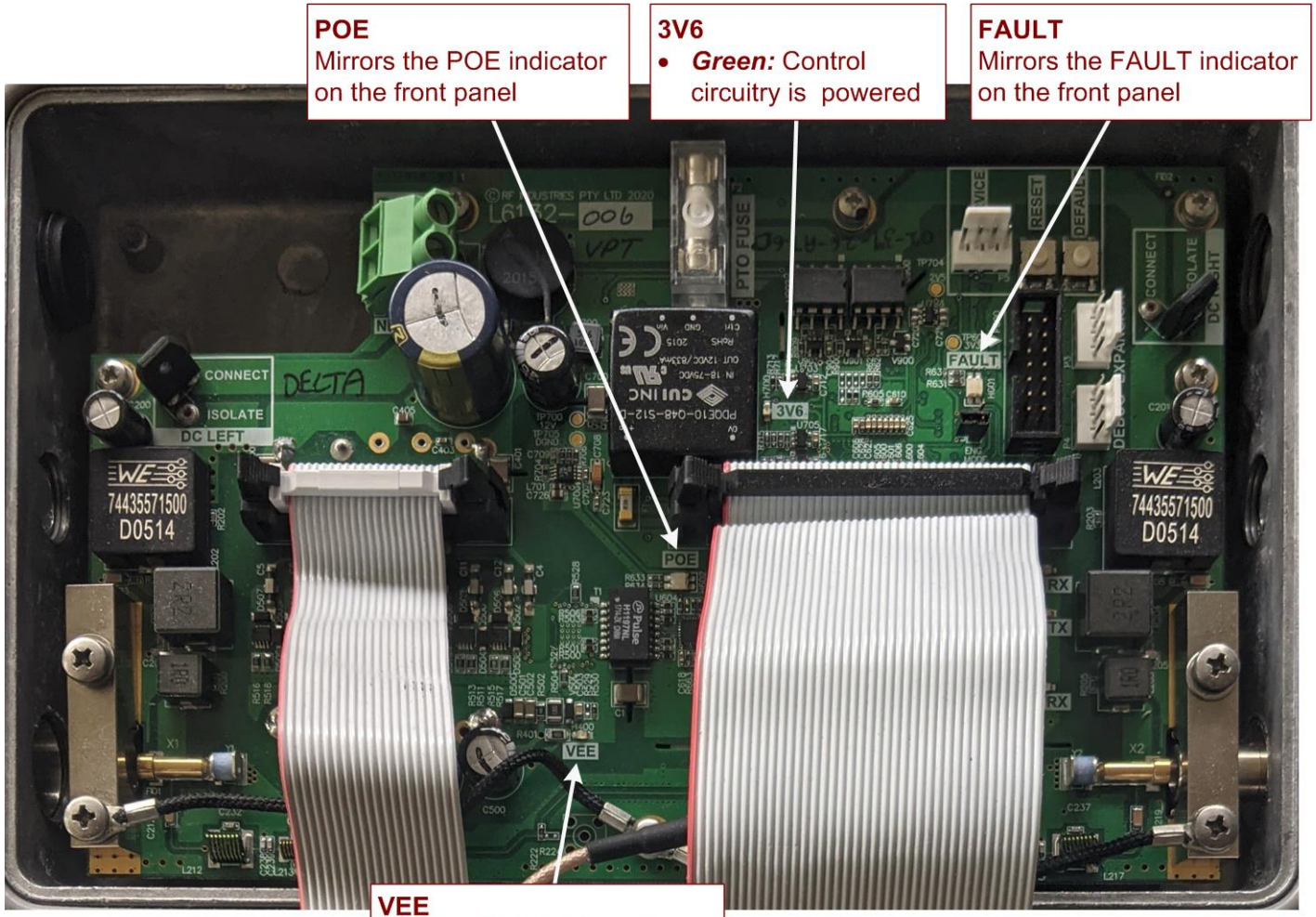
N.B. If EoC is disabled, a short Orange blink is displayed every 3s.

LAN *(per port x 4)*
- Off : No link
- Green : Link established, flashes with activity

POE *(per port x 4)*
- Off : No link
- Blue : Power is being delivered

RFI TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – Main board indicators



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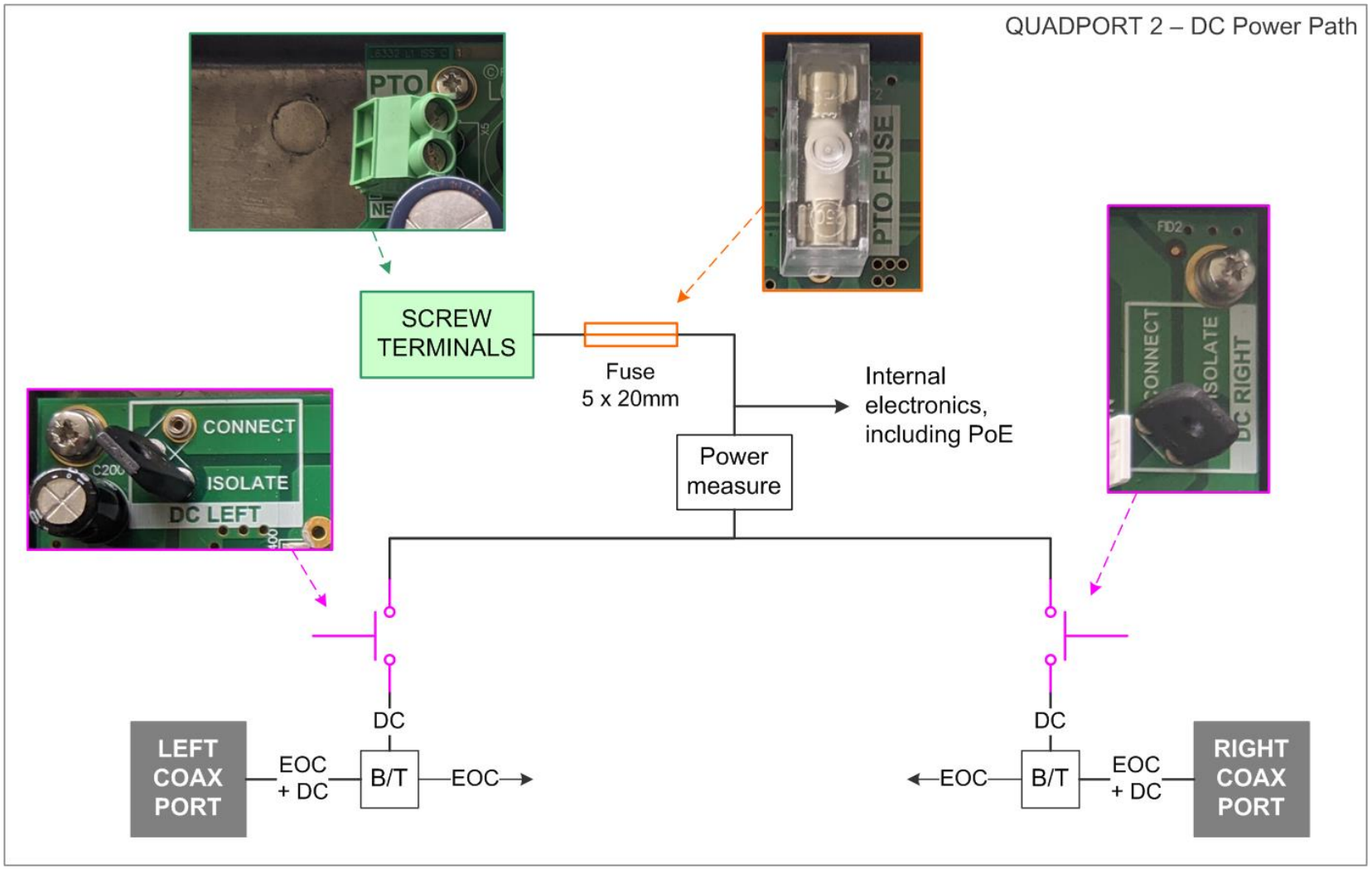
QuadPort 2 (without VHF pass-through) – DC power path



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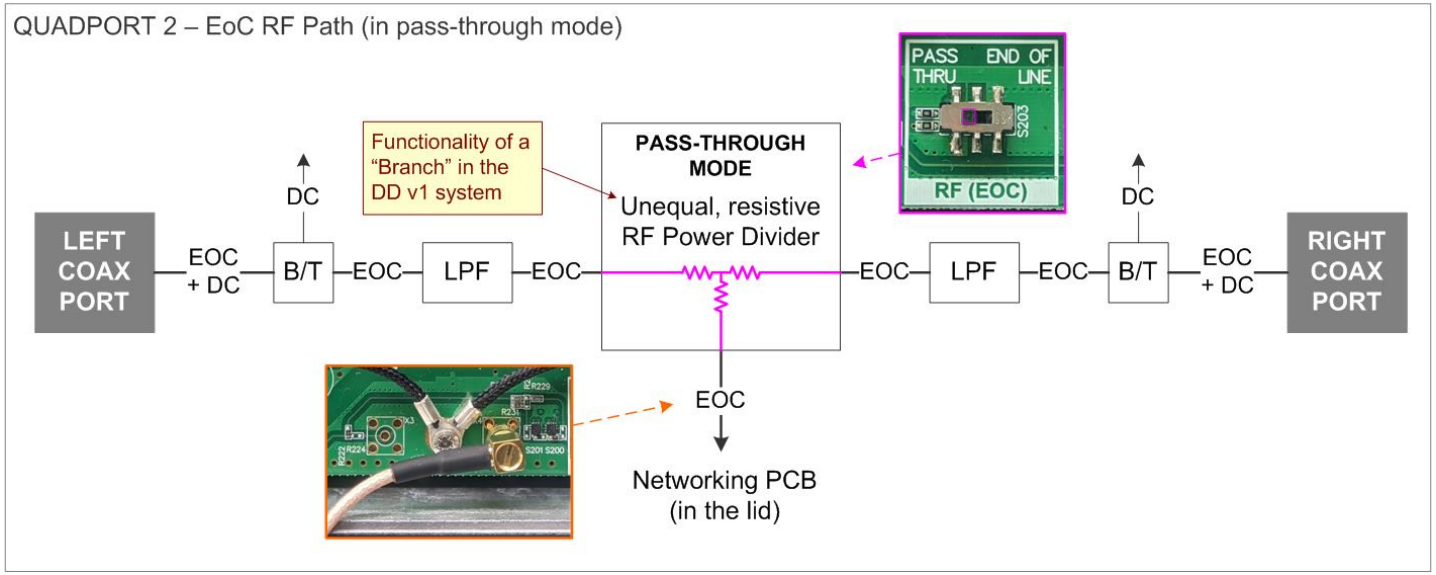
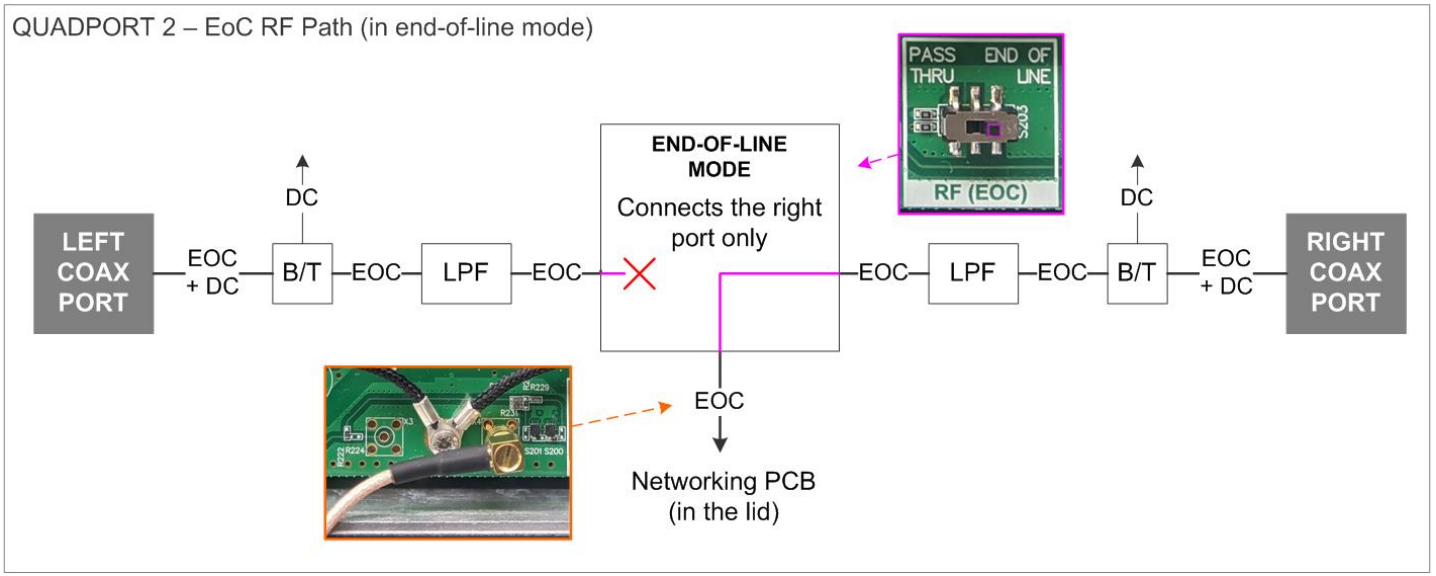
QuadPort 2 (without VHF pass-through) – EoC RF path





RFI TECHNOLOGY SOLUTIONS

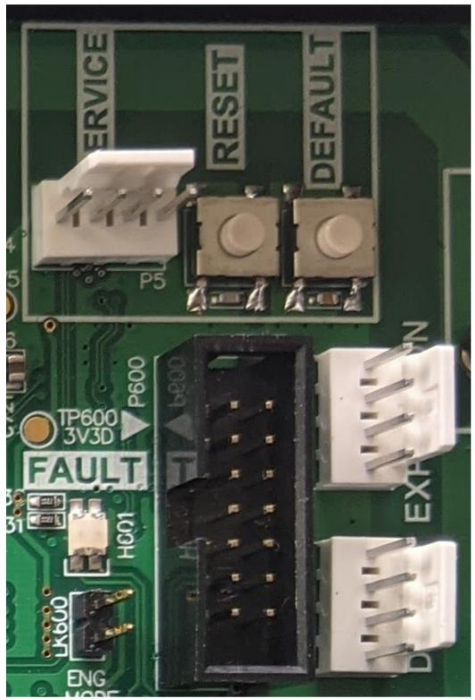
QuadPort 2 (without VHF pass-through) – Main board configuration

QUADPORT 2 – Main board configuration controls

SERVICE
Serial port (TTL level) used to configure the Main Board parameters:
- PoE port enablement
- PoE power delivery limits
- Power LED colour thresholds

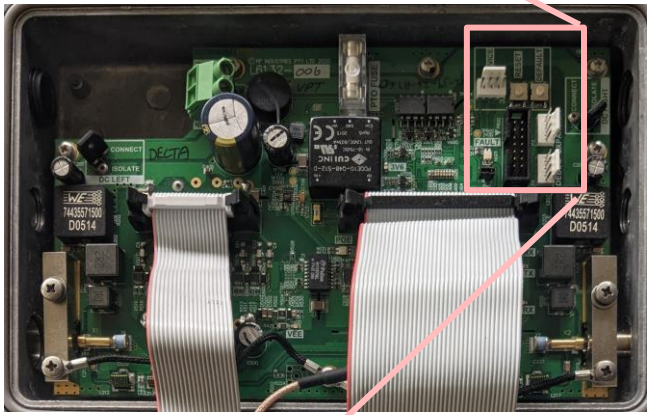
RESET
Power cycle the Main Board

DEFAULT
Hold for 10s to reset the Main Board to factory defaults



EXPANSION
Serial port (TTL level) for connecting either:
- Commtrac module
- Bluetooth module

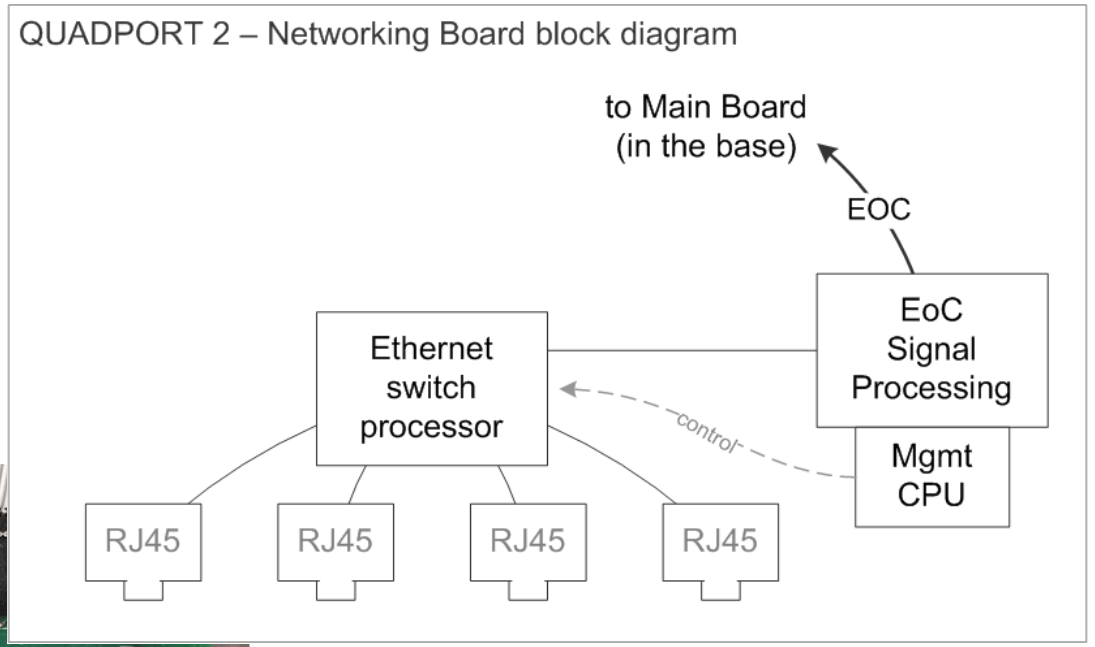
DEBUG
Serial port (TTL level) for developer debugging

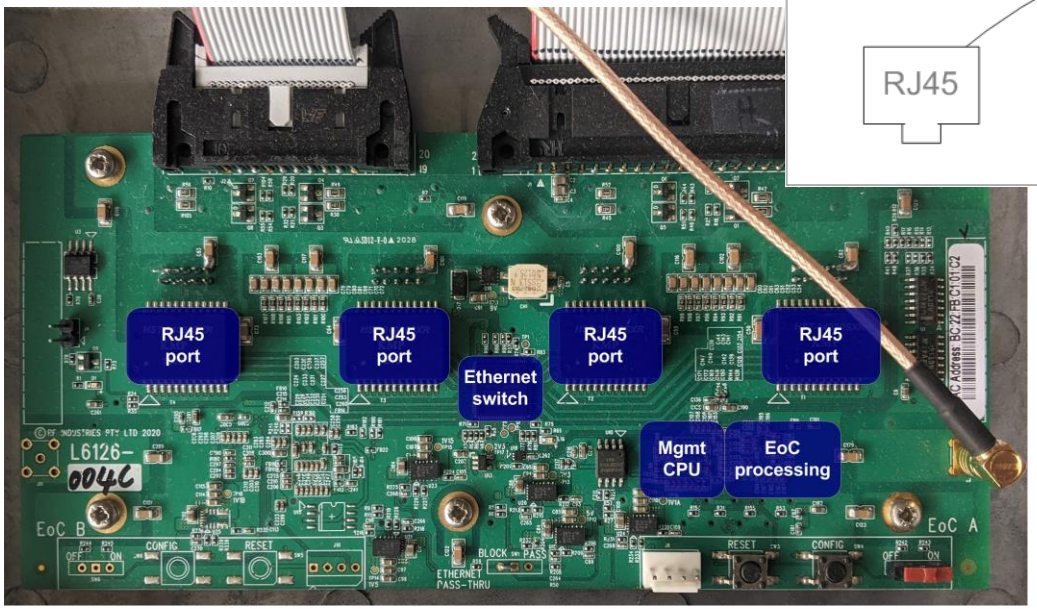


RFI TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – Networking board block diagram

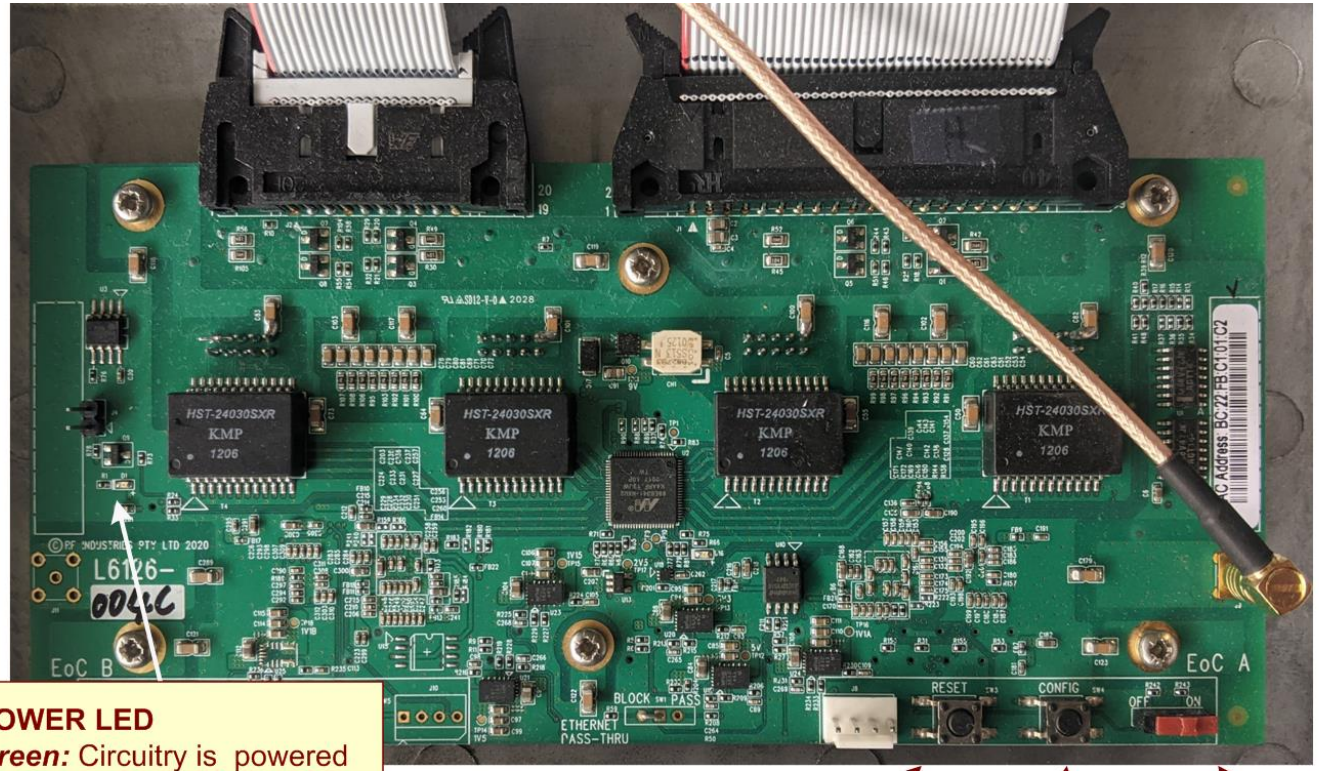
Each QuadPort v2 contains a 5-port Ethernet switch: 4 x GbE + 1 x EoC





RFI TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – Networking board user interface



POWER LED
Green: Circuitry is powered

RESET
Power cycle the Networking Board

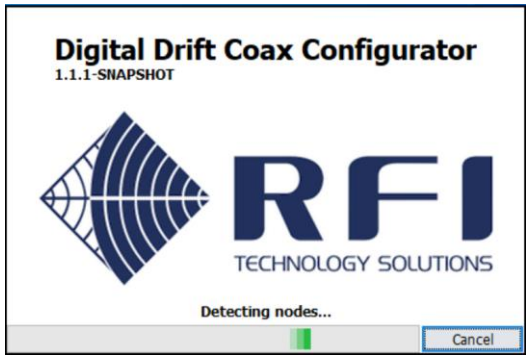
CONFIG
- Hold for 10s to reset settings to factory default
- Hold while booting up to enter boot loader mode

EOC ENABLE
Can be used to disable the EoC interface

RFI TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – Networking board configuration

Networking configuration is performed over Ethernet using the Config Tool (see Module 1.4)



Configurable items:

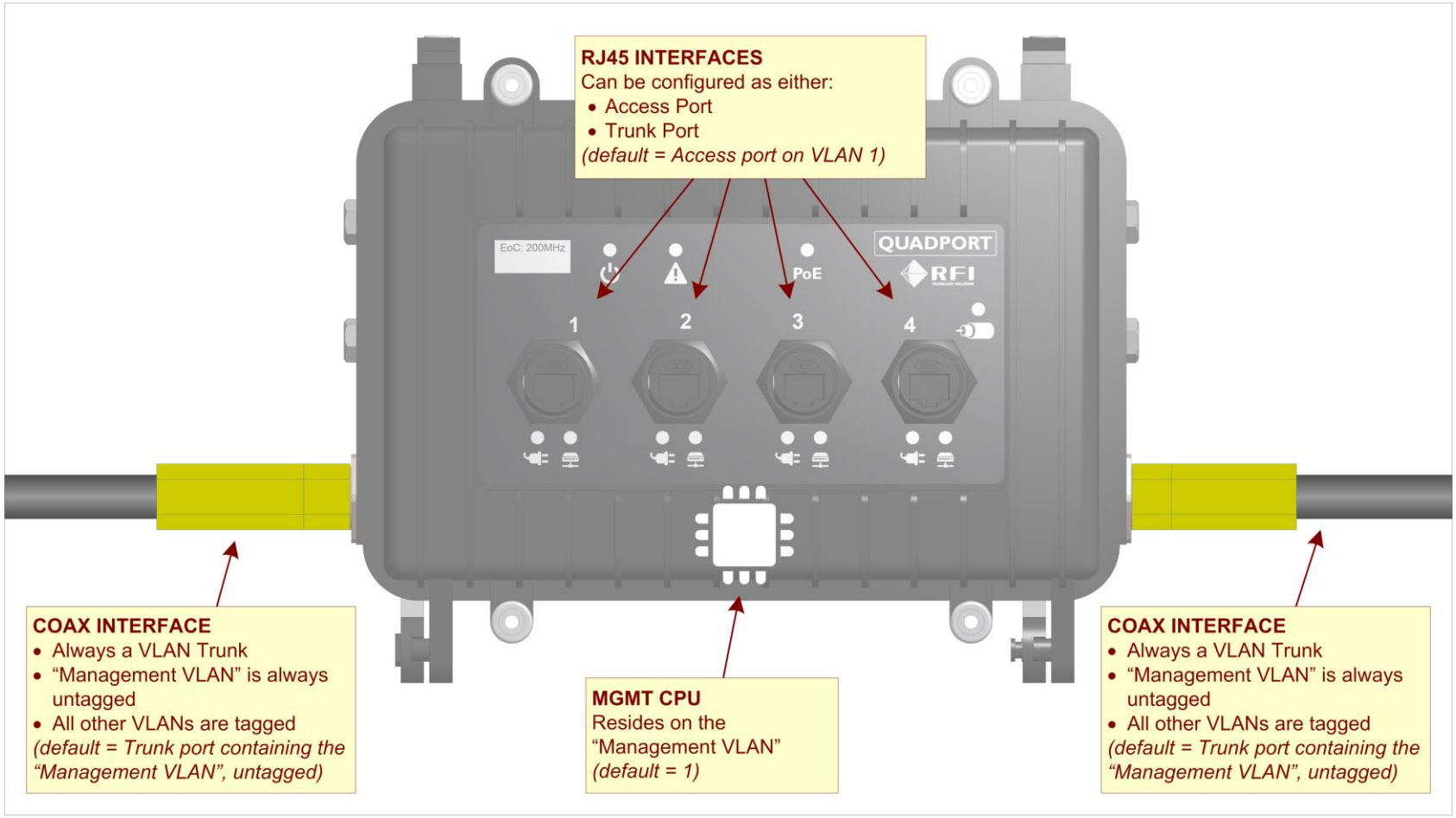
- Device name
- IP addressing details
- VLAN enablement
- VLAN port allocations

NOTE: There is no SNMP or CLI support

RFI TECHNOLOGY SOLUTIONS

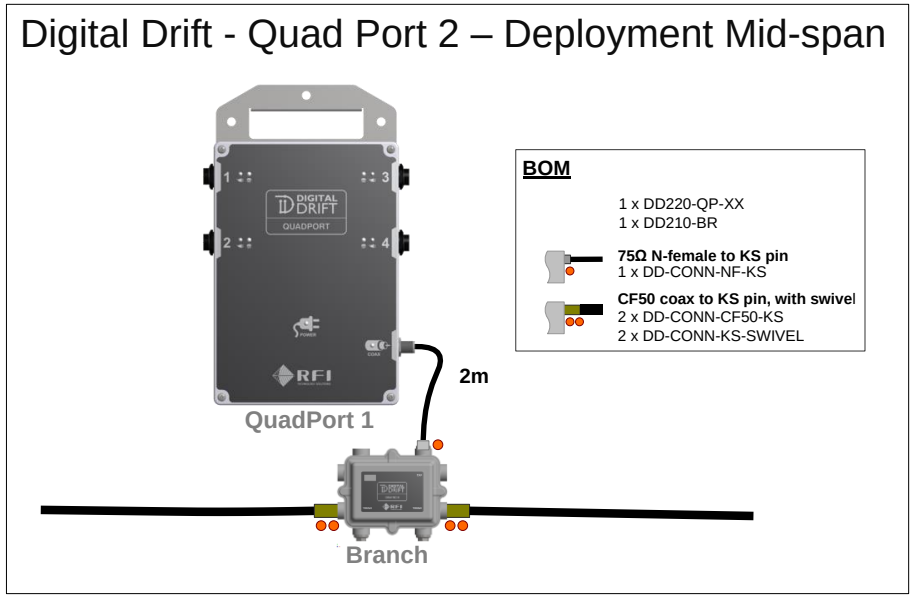
QuadPort 2 (without VHF pass-through) – VLAN support

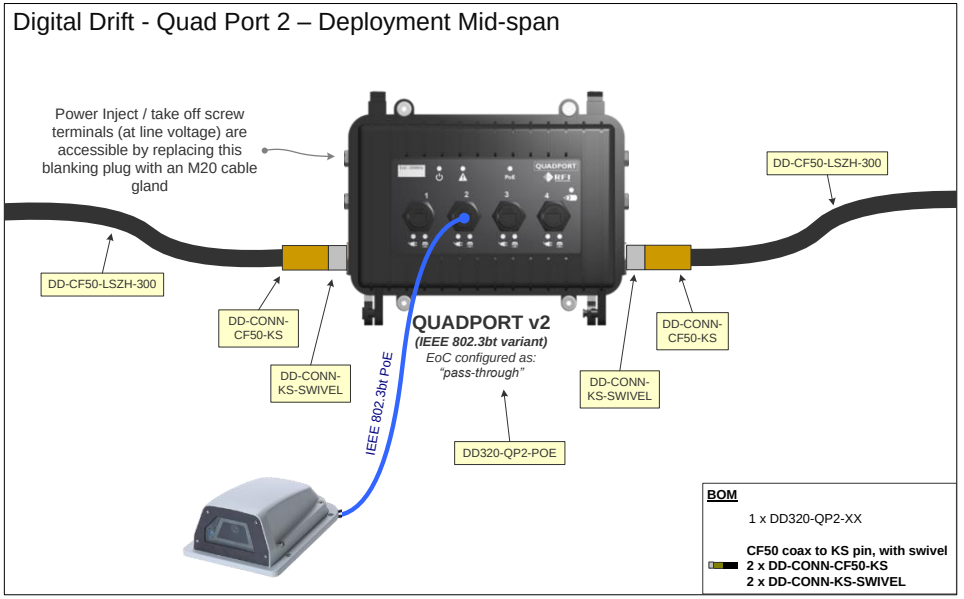
When 802.1Q VLANs are enabled:



RFI TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – Mid-span example

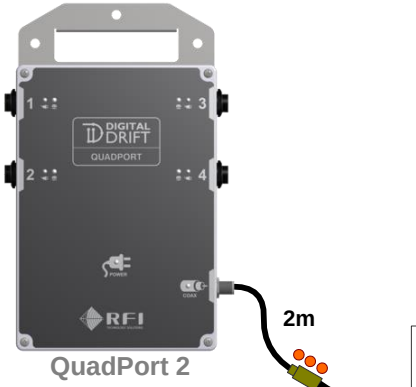




RFI TECHNOLOGY SOLUTIONS

QuadPort 2 (without VHF pass-through) – End of line example

Digital Drift - Quad Port 1 – Deployment End of Line

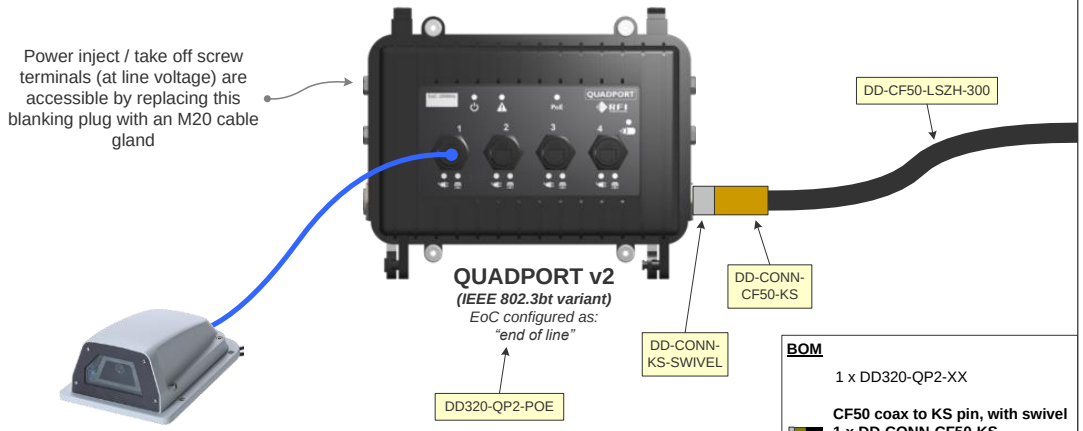


BOM

1 x DD220-QP-XX

CF50 coax to 75Ω N-female
1 x DD-CONN-CF50-KS,
1 x DD-CONN-KS-BARREL,
1 x DD-CONN-NF-KS

Digital Drift - Quad Port 2 – Deployment End of line



BOM

1 x DD320-QP2-XX

CF50 coax to KS pin, with swivel
1 x DD-CONN-CF50-KS
1 x DD-CONN-KS-SWIVEL

RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Highlights

The Repeater version 2 replaces the Repeater v1 and Portal v1:

Features:

- More compact form factor
- 4 x RJ45 ports with optional PoE – 802.3bt power delivery
- 2 x EoC interfaces – one for the left cable and one for the right cable
- Power injection/take off points
- More flexible coax connector options
- Ability to “split” or “combine” the ethernet switching fabric

- Non-PoE version available
  - Lower power consumption
  - Lower Price
- Factory programmed to use 200 MHz band plan

RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Features in common with QuadPort 2

The following aspects of the Repeater 2 are the same as for the QuadPort 2 *(without VHF pass-through)*:

- External Connections
- Main Board – LEDs
- Main Board – Configuration
- DC Power Path
- PoE port functionality

Repeater 2 – Internals

Interface board

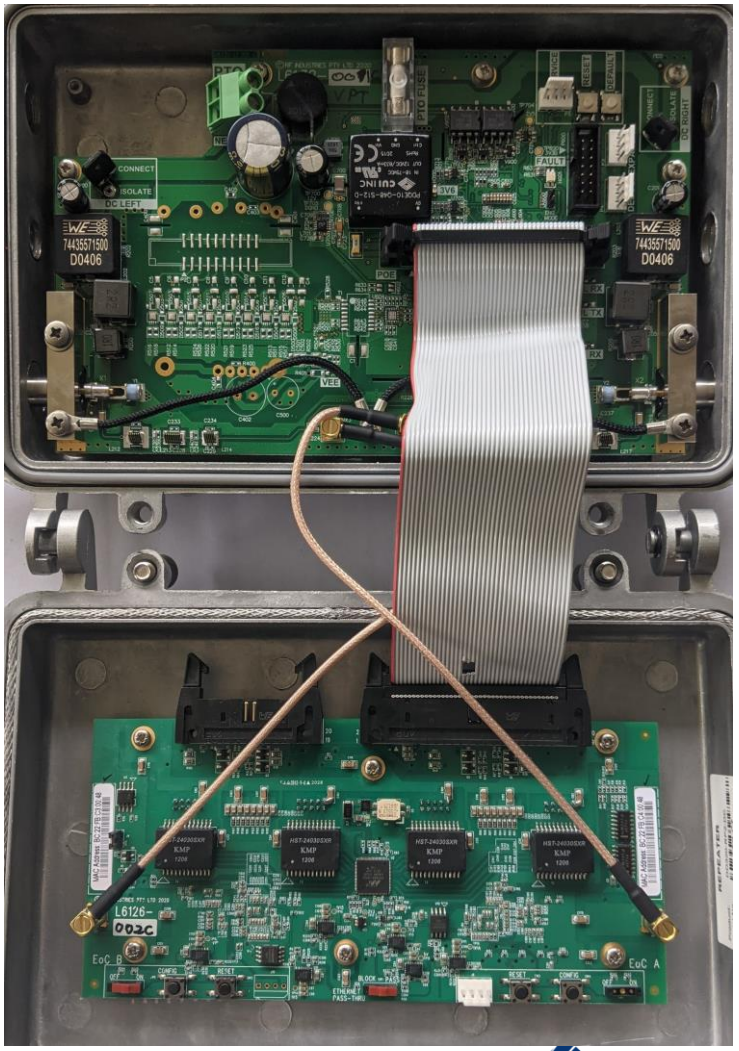
As per QP2, but:

- It directly exposes the 'left' and 'right' coax interfaces

EoC Board

As per QP2, but:

- Has an extra EoC interface
- Has the ability to 'split' or 'combine' the Ethernet switch



RFI TECHNOLOGY SOLUTIONS

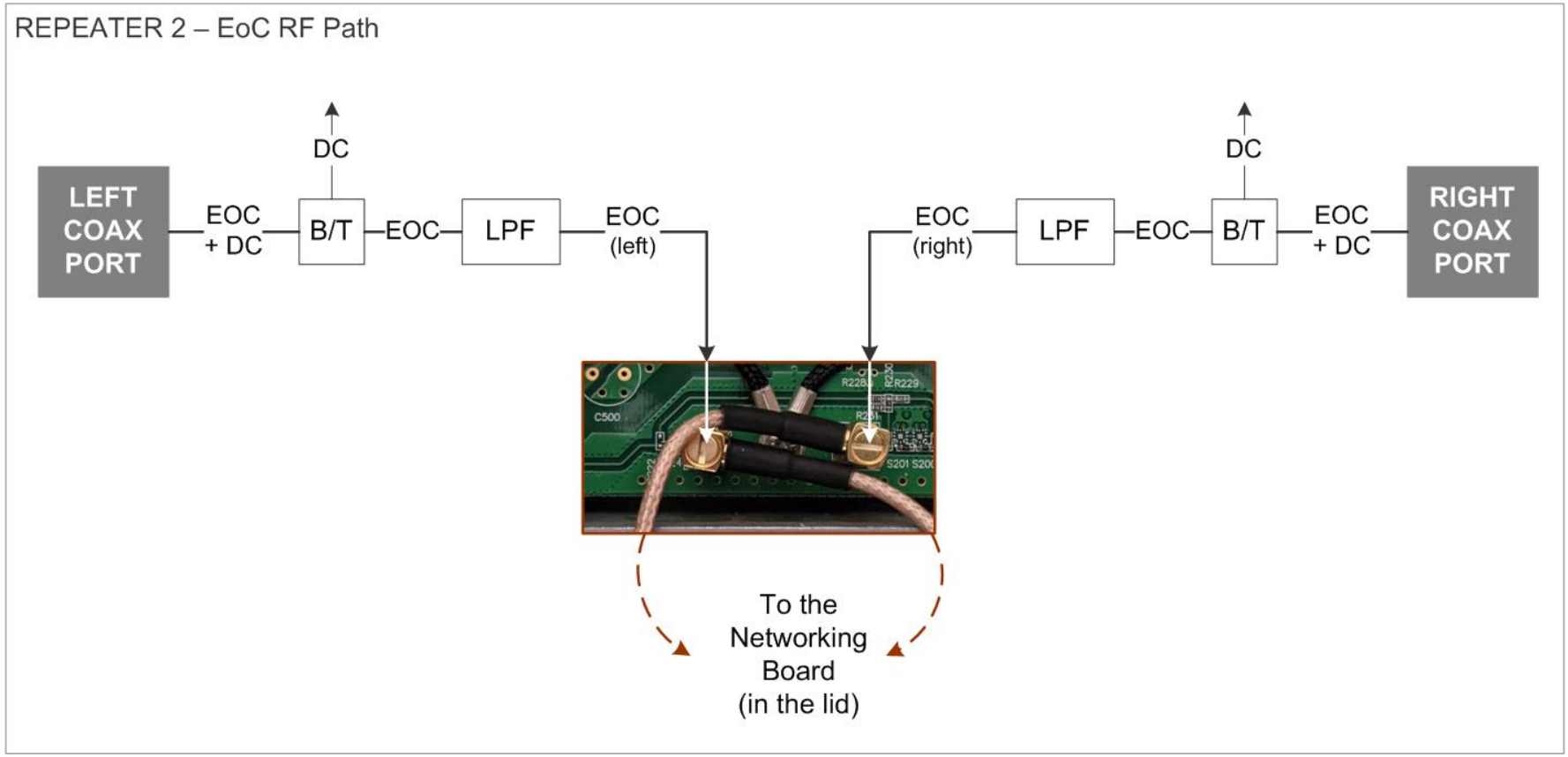
Repeater 2 – External indicators

As per the QuadPort 2, but:

- Has an extra EoC indicator for the left-side EoC interface

RFI TECHNOLOGY SOLUTIONS

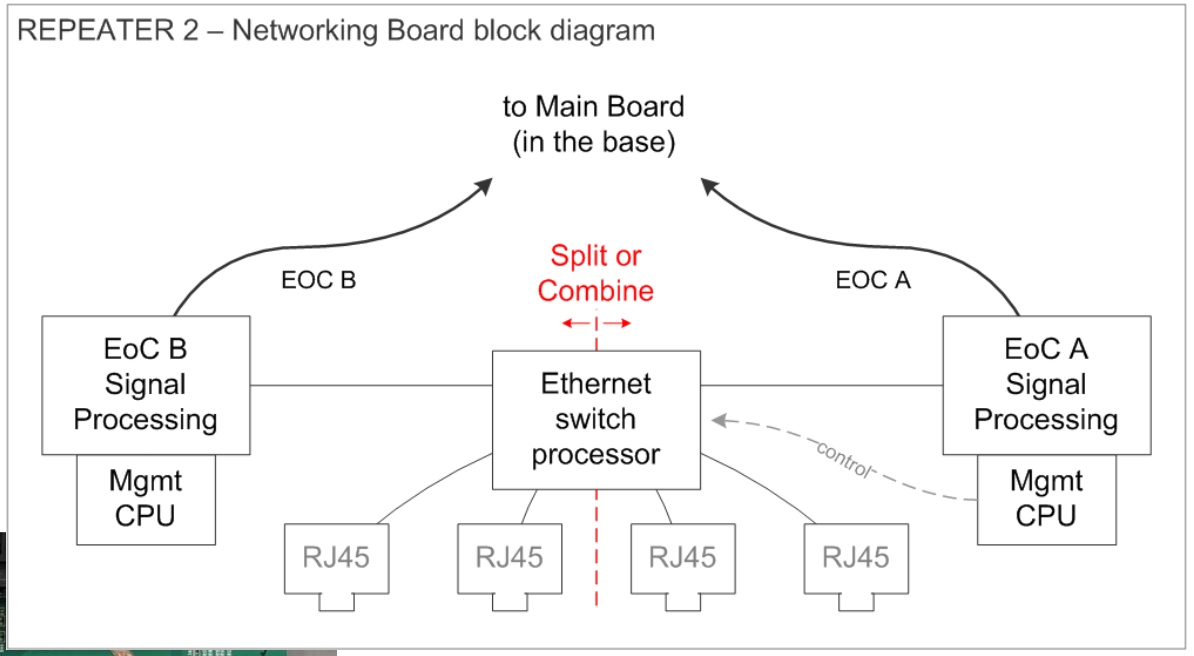
Repeater 2 – EoC RF path

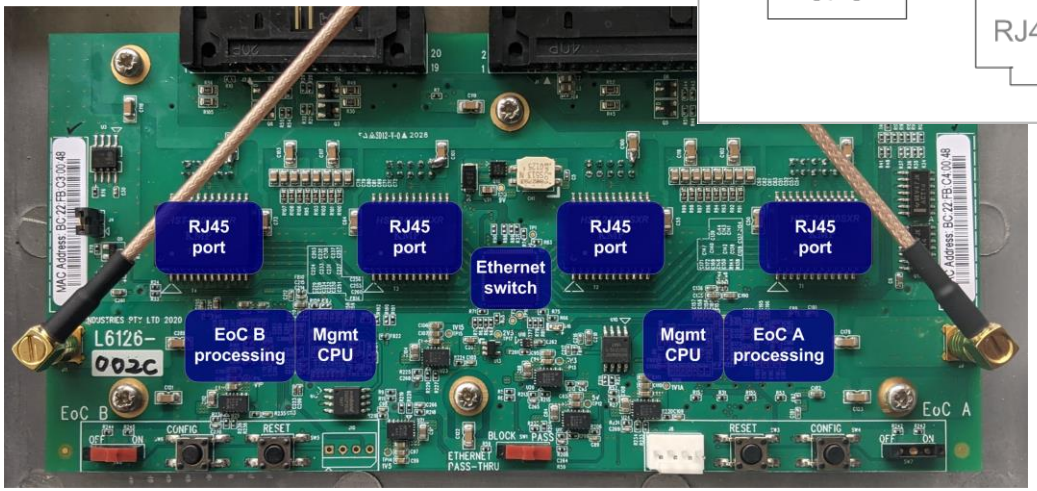


RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Networking board block diagram

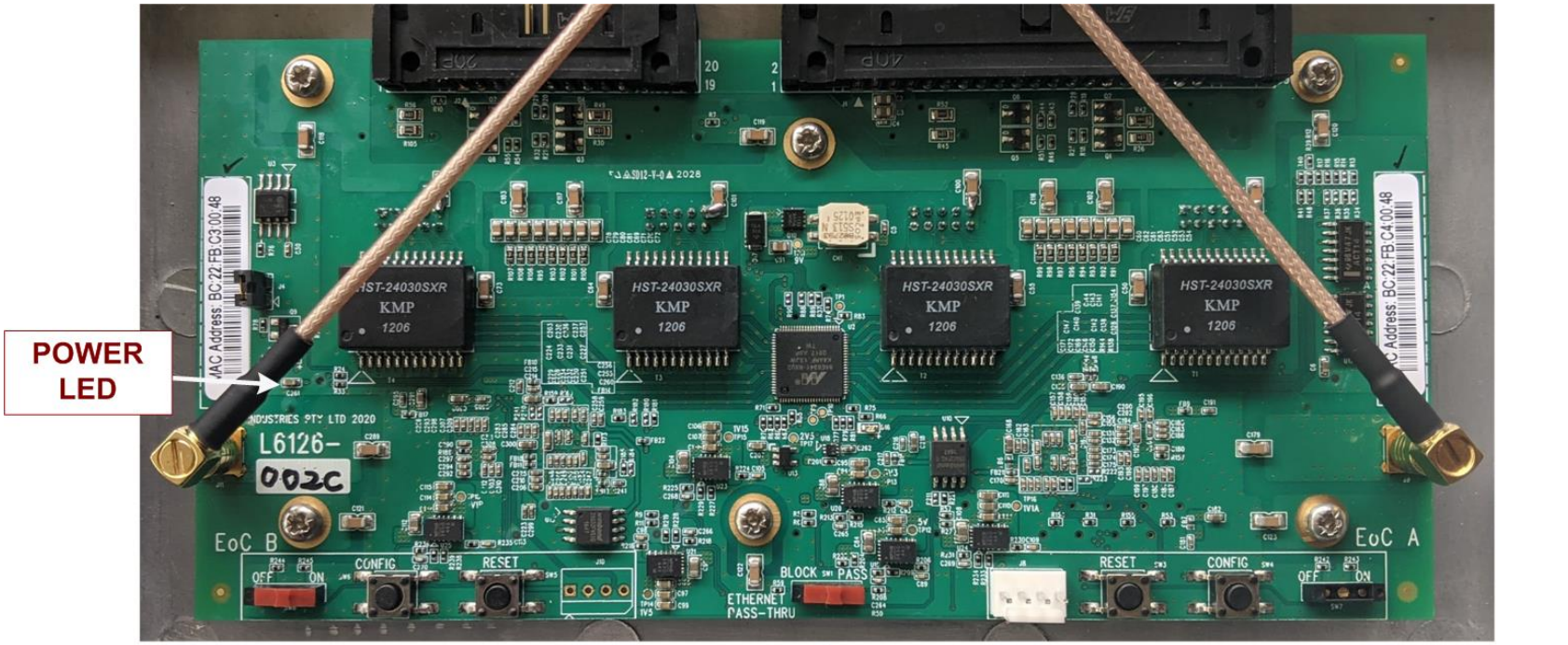
Each Repeater v2 contains a 6-port Ethernet switch: 4 x GbE + 2 x EoC





RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Networking board user interface



SPLIT ⇦ ⇨ COMBINE

ENABLE | CONFIG | RESET

EoC B processor
(left-side coax)

SWITCH SPLIT / COMBINE
Controls whether the Ethernet switch fabric operates as:

- 1 x 6-port switch
- 2 x 3-port switches (left / right)

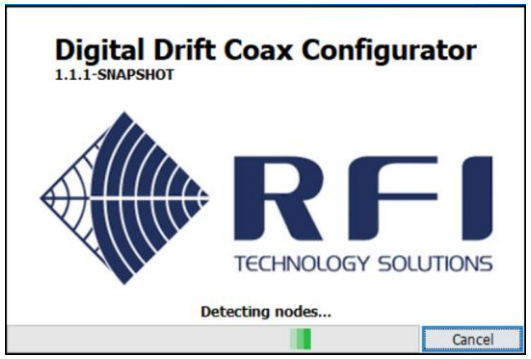
RESET | CONFIG | ENABLE

EoC A processor
(right-side coax)

RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Networking board configuration

Networking configuration is performed over Ethernet using the Config Tool (see Module 1.4)



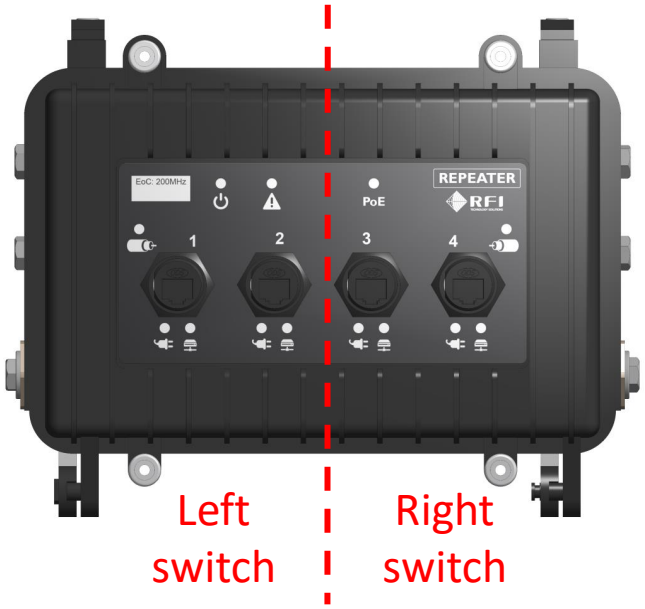
There are two EoC management processors in each Repeater. Each is independently configured:

- EoC A (Right-side coax)
  - Also controls the switch processor (VLANs)
- EoC B (Left-side coax)

RFI TECHNOLOGY SOLUTIONS

Repeater 2 – VLAN support

When the switch is split:



- VLANs are disabled
- Operates as two independent 3-port unmanaged switches. Each containing:
  - 2 x RJ45 GbE ports
  - 1 x EoC port

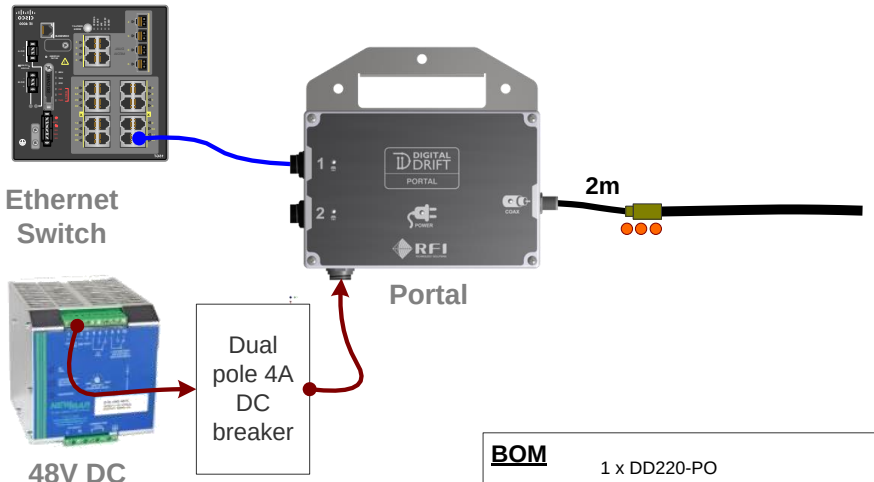
When the switch is combined:

- VLANs are supported
- Features are as per the QuadPort 2

RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Launch point example

Digital Drift – Portal v1 1 – Deployment Launch point

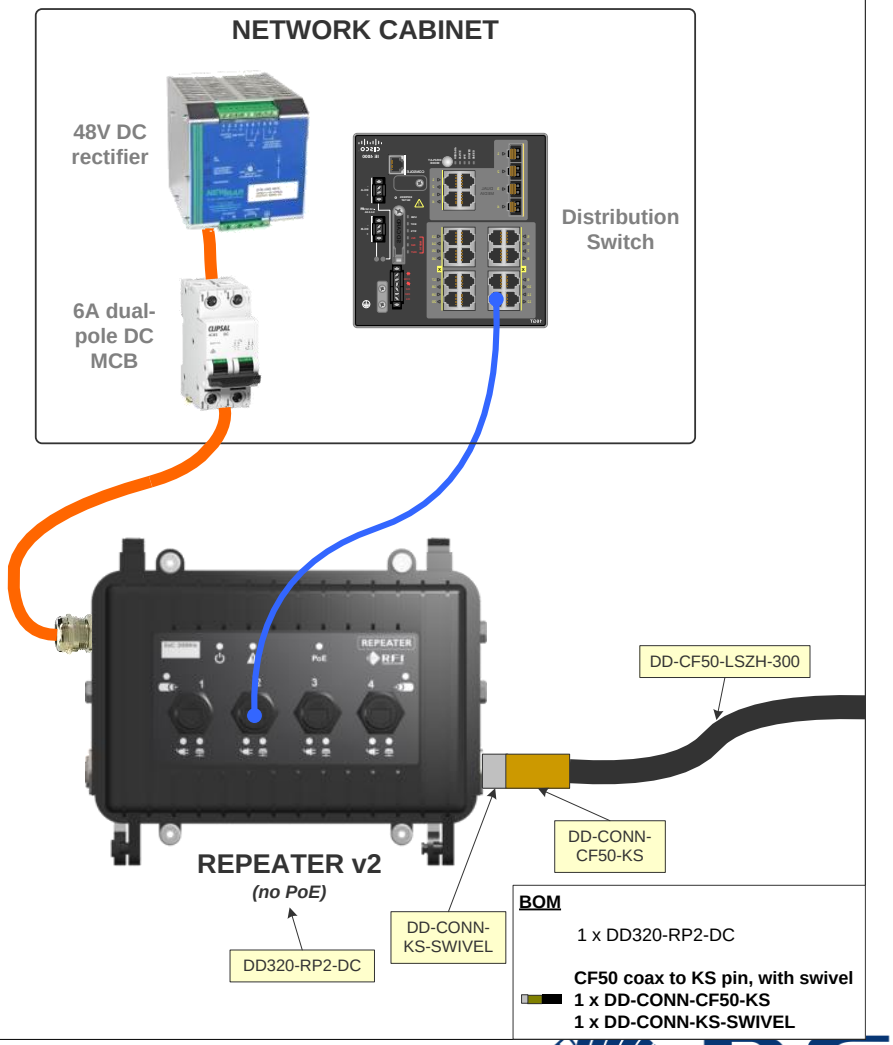


BOM

1 x DD220-PO

CF50 coax to 75Ω N-female
1 x DD-CONN-CF50-KS,
1 x DD-CONN-KS-BARREL,
1 x DD-CONN-NF-KS

Digital Drift – Repeater 2 – Deployment Launch point



BOM

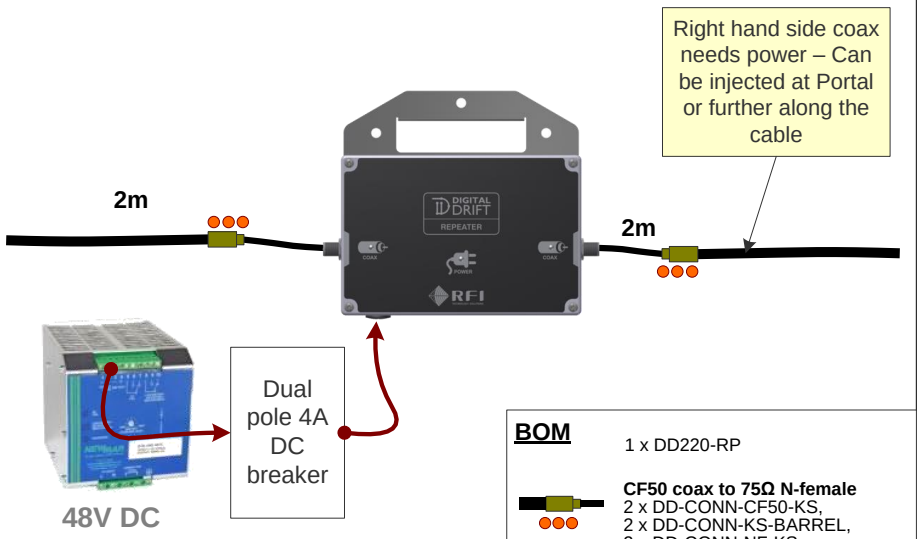
1 x DD320-RP2-DC

CF50 coax to KS pin, with swivel
1 x DD-CONN-CF50-KS
1 x DD-CONN-KS-SWIVEL

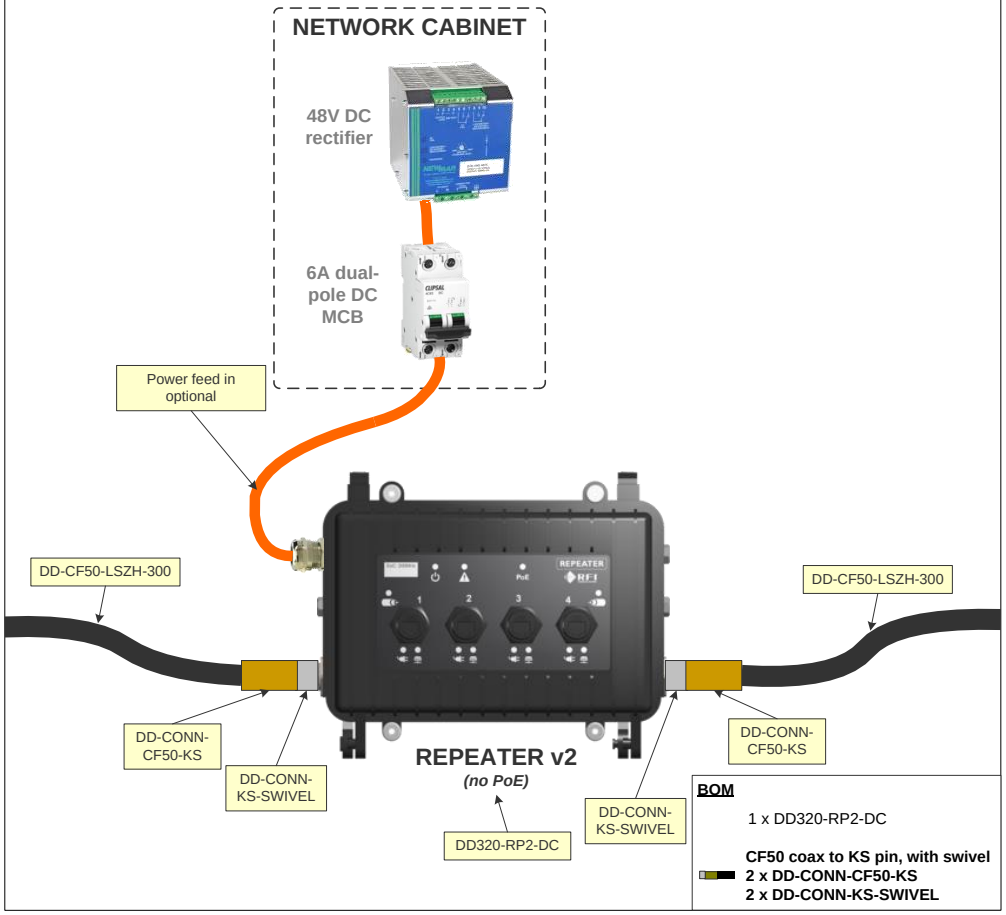
RFI TECHNOLOGY SOLUTIONS

Repeater 2 – Network extension example

Digital Drift – Repeater v1 – Deployment Network Extension



Digital Drift – Repeater v2 – Deployment Network Extension



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Digital Drift – QP2 / RP2 - MAC address conventions

The device type can be identified by the fourth octet of the MAC address:

XX:XX:XX:**C#**:XX:XX

- C1 - QuadPort
- C3 - Repeater (left-side)
- C4 - Repeater (right-side)