

# Digital Drift updates

v3.10 EoC firmware



**RFI**  
TECHNOLOGY SOLUTIONS



# Hardware compatibility

---

All Wave-2 Digital Drift devices can be upgraded to EoC firmware v3.10.

CoaxConfigurator v1.2.1 (or greater) must be used with devices running firmware v3.10.

## CCM220 based hardware:

- Portal: DD220-PO
- QuadPort1, Wave-2: DD220-QP-FM  
DD220-QP-GU
- Repeater1, Wave-2: DD220-RP

## CCM320 based hardware:

- LineAmp+Ethernet: DDLFS-LAE-V75
- QuadPort2: DDLFS-QP2-DC  
DDLFS-QP2-POE  
DD320-QP2-DC  
DD320-QP2-POE
- Repeater2: DD320-RP2-DC  
DD320-RP2-POE

**NOTE:** The part numbers listed above refer to the RFI branded Digital Drift product range.

Equivalent part numbers for the Strata branded DigitalBRIDGE product range are available on request.



# v3.10 feature matrix

Each feature has different applicability on each hardware platform.

	Portal (Wave-2)	Quadport1 (Wave-2)	Repeater1 (Wave-2)	LineAmp + Ethernet	QuadPort2	Repeater2	
1. VLAN support.	-	(A)	-	✓	✓	✓	Page 4
2. Default node role changes	-	-	-	✓	-	✓	Page 14
3. Avoidance of “through the air” feedback loops when operating on leaky feeder cable	(B)	(B)	(B)	✓	-	✓	Page 15
4. Discovery message pass-through	(C)	(C)	(C)	✓	✓	✓	Page 17
5. Cable length reporting	✓	✓	✓	✓	✓	✓	Page 18
6. Support for hardware fitted with 8MB flash.	-	-	-	✓	✓	✓	Page 19
7. Upstream bug fixes	✓	✓	✓	✓	✓	✓	Page 21
=> Applying the firmware update							Page 22

**NOTES:** (A) VLAN support is provided by the embedded managed switch in the DD220-QP-FM.

(B) Portal, QuadPort1 and Repeater1 devices are not operated on leaky coaxial cables.

(C) Discovery message pass-through has always been enabled on the CCM220 hardware.

# 1. VLAN support - Overview

---

v3.10 firmware adds VLAN support to LAE, QP2 & RP2 devices.

## Key points:

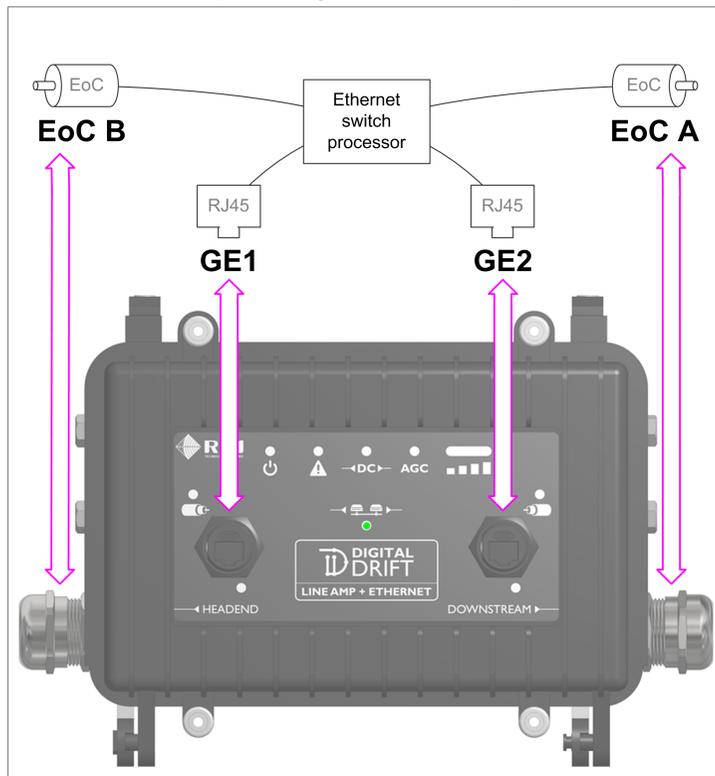
- **EoC ports:**
  - Always operate as VLAN Trunks
  - Always contain the “Management VLAN” (untagged)
- **RJ45 ports:**
  - Each port can operate as an Access port or a Trunk port
- **Management processors** (*for EoC\_A & EoC\_B*):
  - Reside on the “Management VLAN”
- **VLAN configuration:**
  - Is performed via the CoaxConfigurator (v1.2.1 or greater) by accessing the VLAN tab of the EoC\_A management processor

**Before demonstrating how to configure VLANs, it is useful to review the internal switching architecture of CCM320 based devices.**

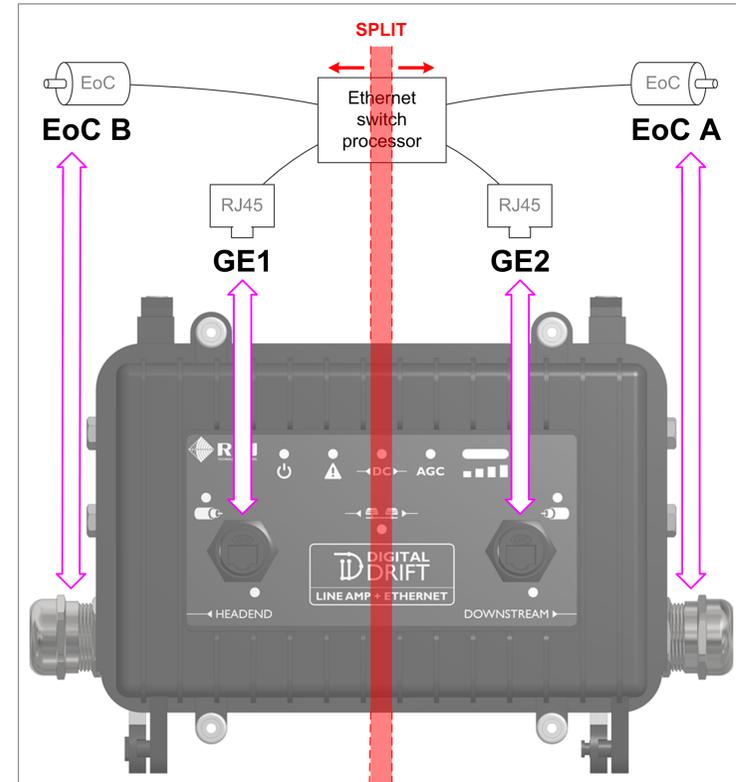
# LineAmp+Ethernet (LAE) – Internal switching architecture

The LineAmp+Ethernet has four Ethernet ports, which can operate as a single switch fabric, or as two independent 2-port switches.

**Switch fabric combined**  
(1 x 4-port switch)



**Switch fabric split**  
(2 x 2-port switches)

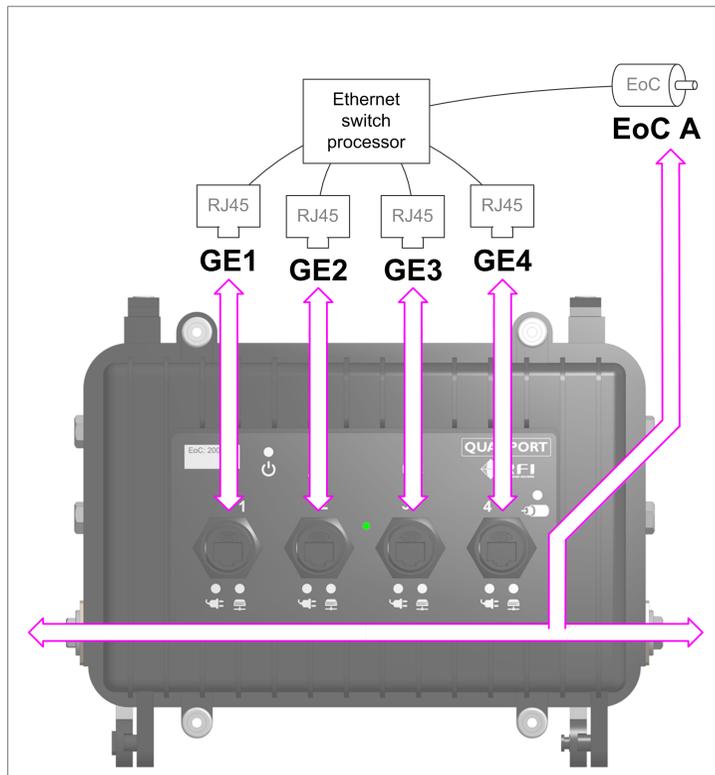


**NOTE:** When an LAE's switch fabric is "split", VLANs are disabled and the device operates as two independent 2-port unmanaged switches, transparent to VLANs.

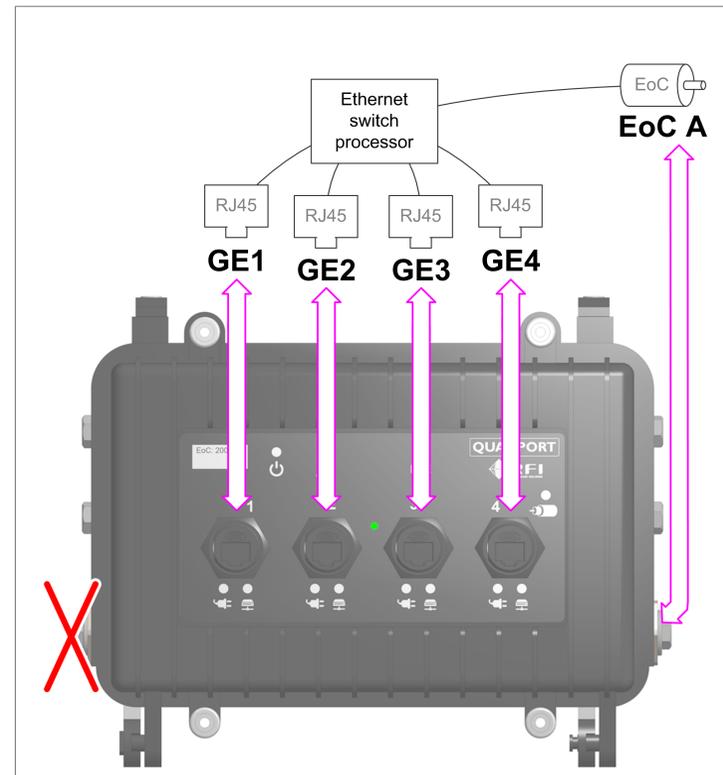
# QuadPort2 (QP2) – Internal switching architecture

The QuadPort2 has five Ethernet ports, which always operate as a single switch fabric. An internal slide switch selects whether the EoC port operates in "End of line" or "Pass-through" mode.

**EoC Pass-through mode**  
(1 x 5-port switch)



**EoC End of line mode**  
(1 x 5-port switch)

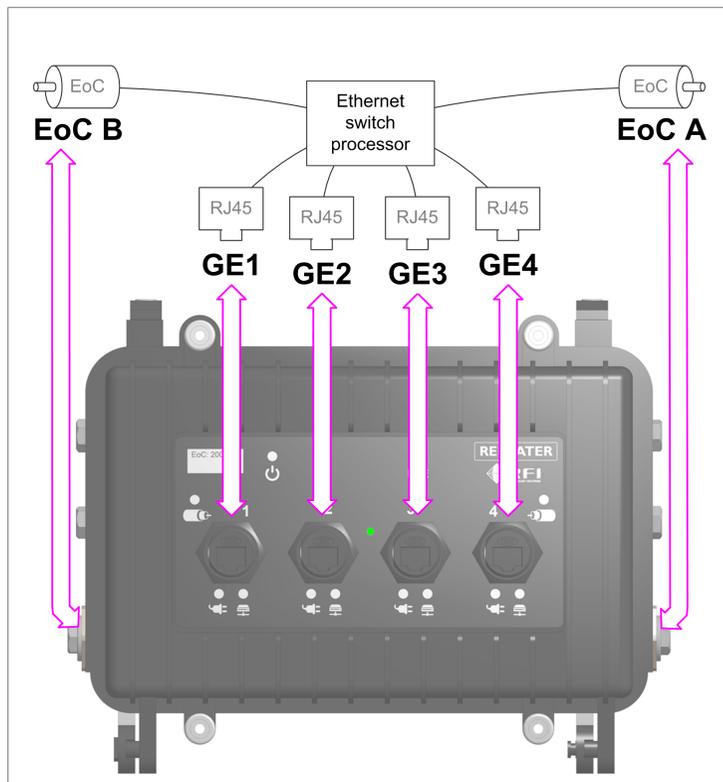


**NOTE:** DDLFS-QP2-V75 devices always operate the EoC port in "Pass-through" mode.

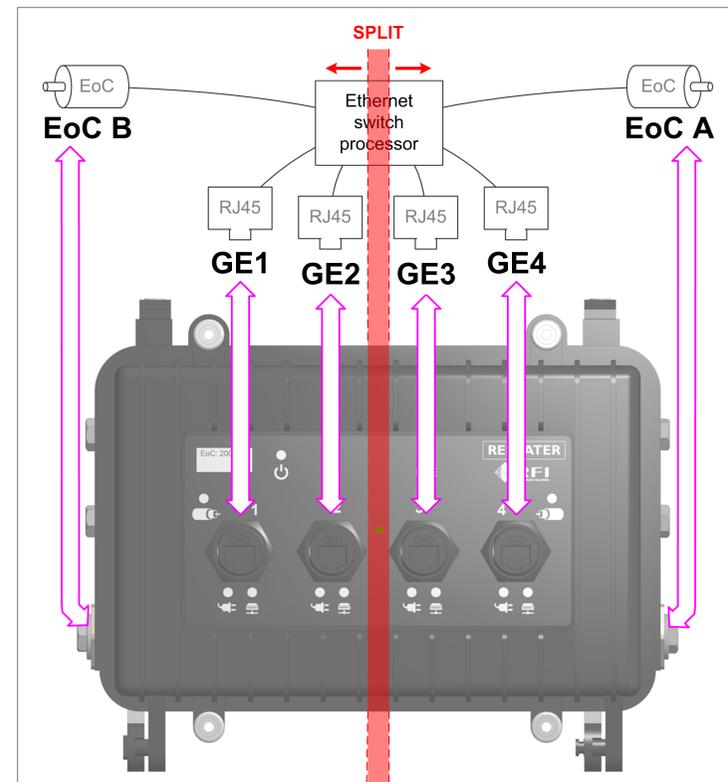
# Repeater2 (RP2) – Internal switching architecture

The Repeater2 has six Ethernet ports, which can operate as a single switch fabric, or as two independent 3-port switches.

**EoC Pass-through mode**  
(1 x 6-port switch)



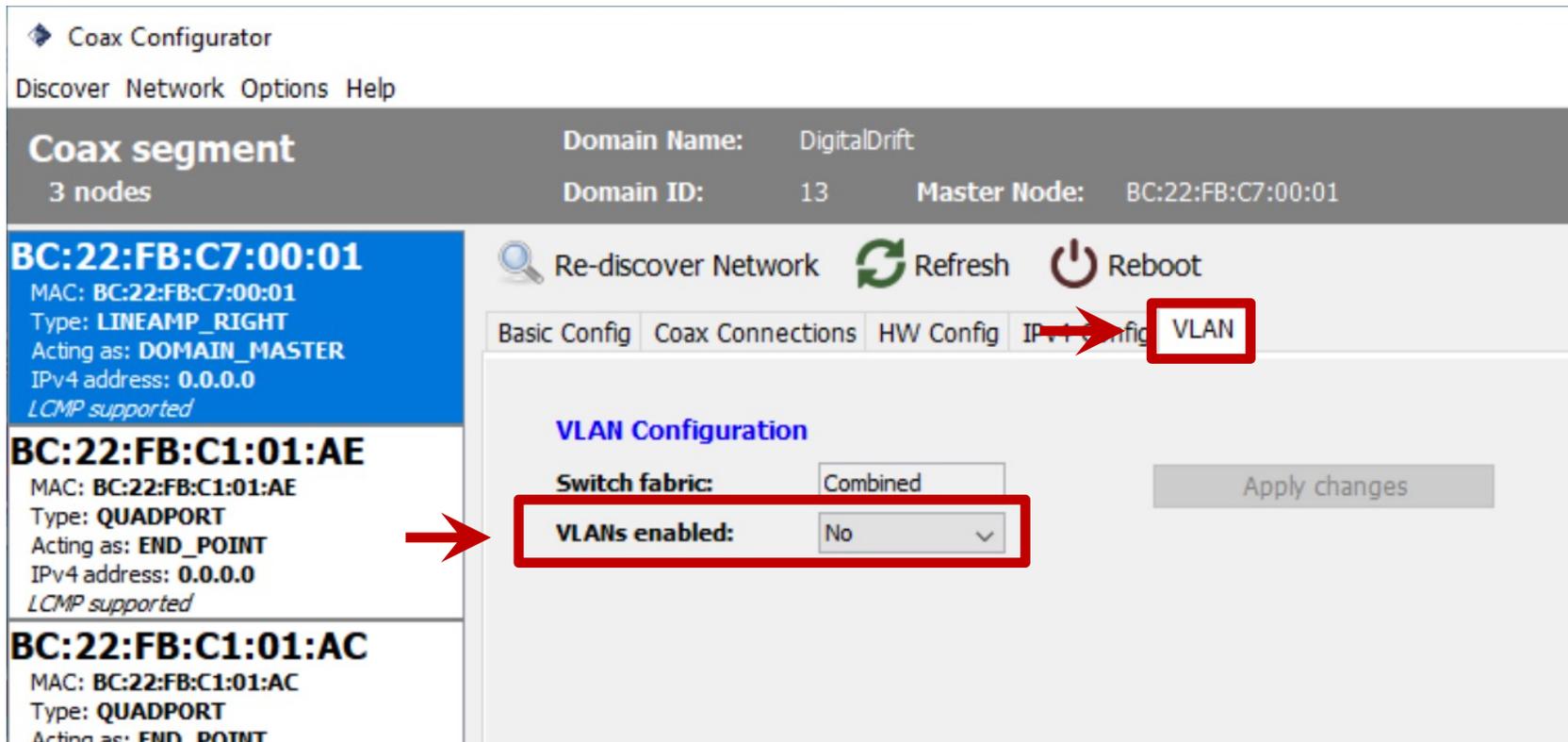
**EoC End of line mode**  
(2 x 3-port switches)



**NOTE:** When an RP2's switch fabric is "split", VLANs are disabled and the device operates as two independent 3-port unmanaged switches, transparent to VLANs.

# 1. VLAN support – Default configuration

VLANs are configured via the CoaxConfigurator, accessing the EoC\_A management processor. By default, VLANs are disabled.



The screenshot displays the Coax Configurator interface. On the left, a list of nodes is shown, including BC:22:FB:C7:00:01 (LINEAMP\_RIGHT, DOMAIN\_MASTER) and BC:22:FB:C1:01:AE (QUADPORT, END\_POINT). The main area shows the 'VLAN Configuration' page with the following settings:

- Switch fabric: Combined
- VLANs enabled: No

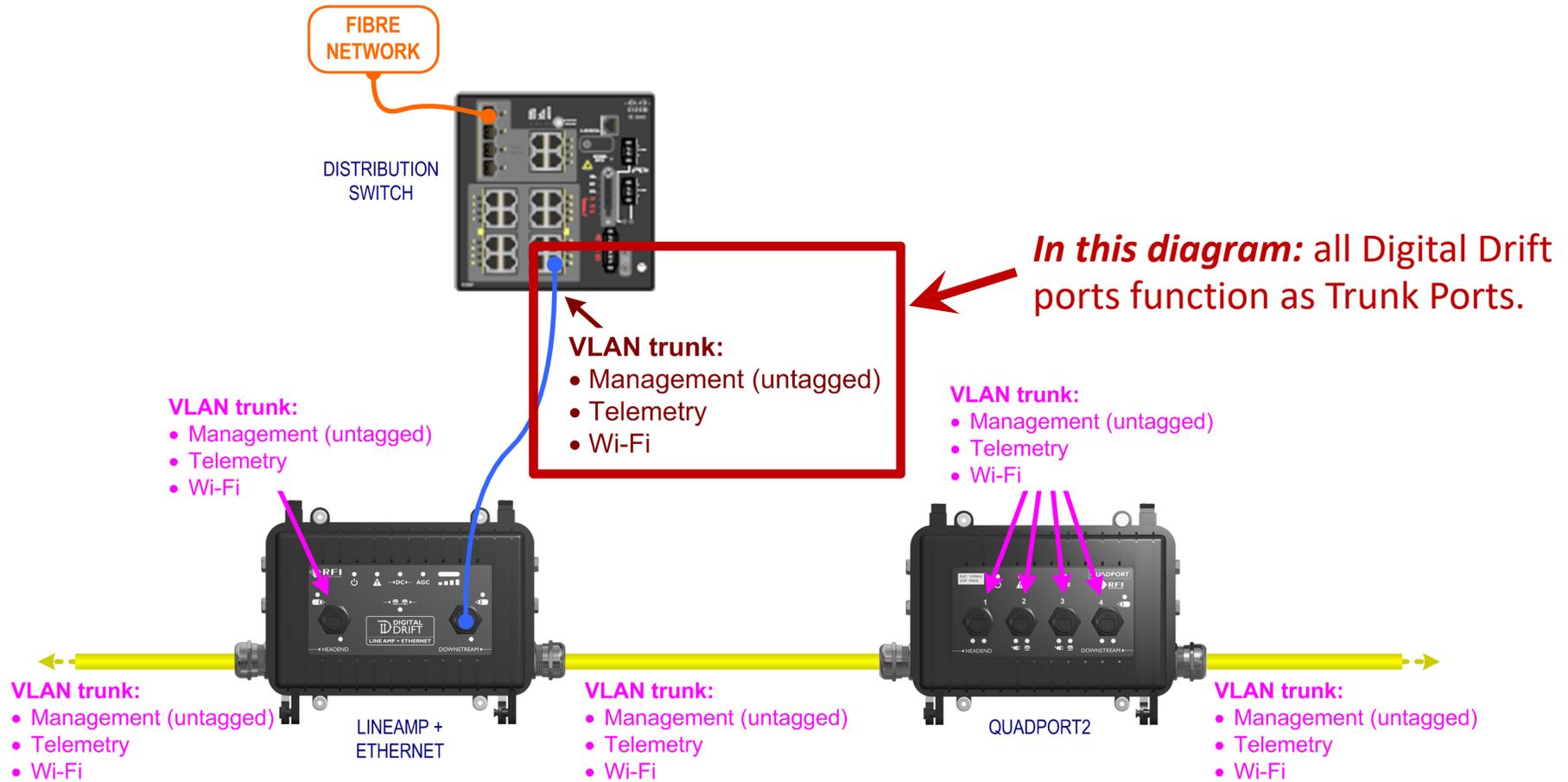
The 'VLANs enabled' dropdown is highlighted with a red box, and a red arrow points to it from the left. Another red box highlights the 'VLAN' tab in the navigation menu, with a red arrow pointing to it from the left.

**NOTE:** When VLANs are disabled, the device is transparent to VLANs, meaning that it will pass tagged and untagged frames between all of the switch's Ethernet ports.



# 1. VLAN support – Behaviour when VLANs are disabled

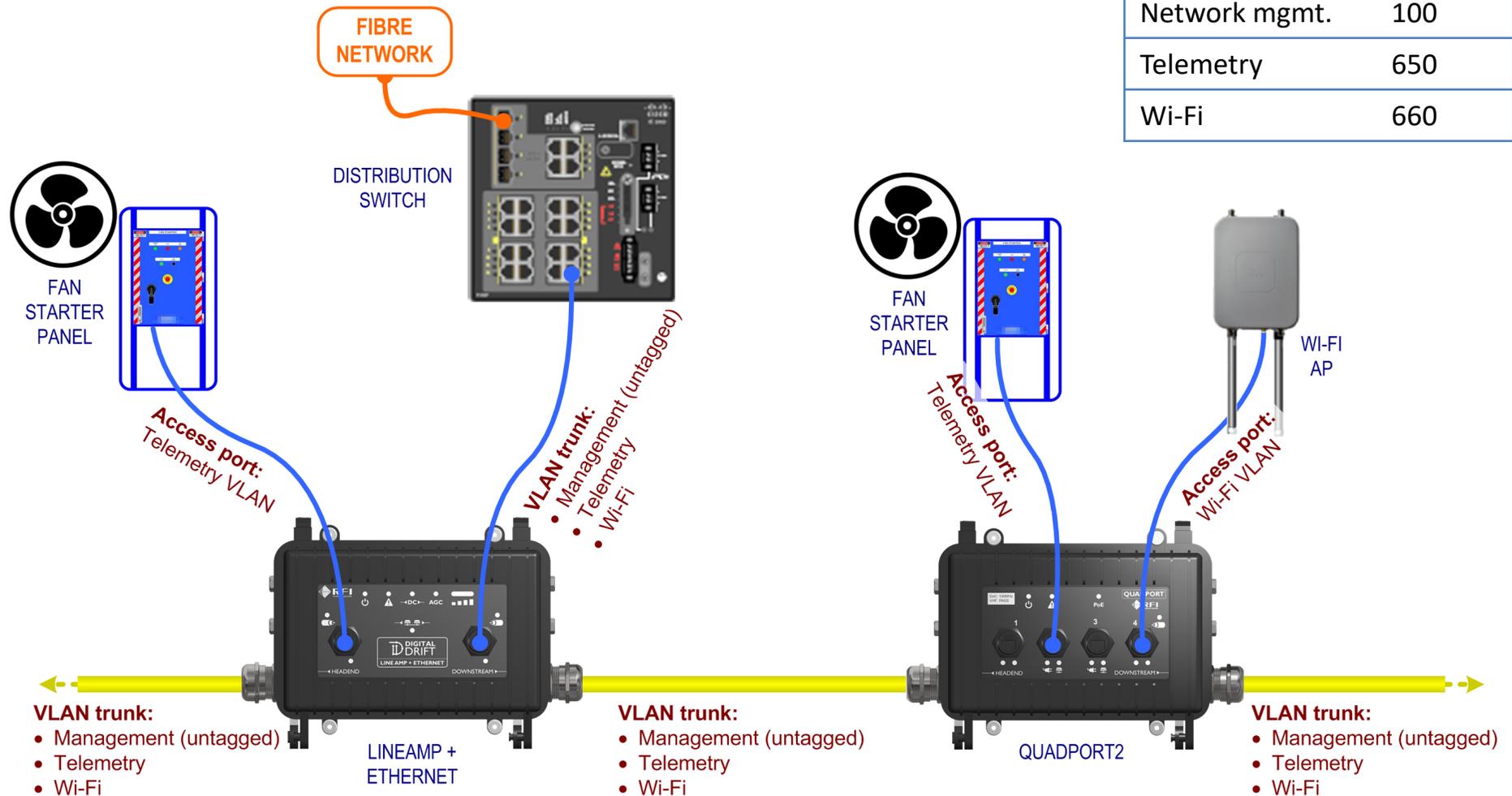
If the uplink is a Trunk port for a set of VLANs, all downstream Digital Drift ports also act as Trunk ports for that set of VLANs.



# 1. VLAN support – Example scenario

The desired state is illustrated below.

VLAN name	VLAN id
Network mgmt.	100
Telemetry	650
Wi-Fi	660



# 1. VLAN support – Example scenario - LAE configuration

**Coax Configurator**  
Discover Network Options Help

**Coax segment**  
3 nodes

Domain Name: DigitalDrift  
Domain ID: 13 Master Node: BC:22:FB:C7:00:01

**BC:22:FB:C7:00:01**  
MAC: BC:22:FB:C7:00:01  
Type: LINEAMP\_RIGHT  
Acting as: DOMAIN\_MASTER  
IPv4 address: 0.0.0.0  
LCMP supported

**BC:22:FB:C1:01:AE**  
MAC: BC:22:FB:C1:01:AE  
Type: QUADPORT  
[Click here to get info](#)

**BC:22:FB:C1:01:AC**  
MAC: BC:22:FB:C1:01:AC  
Type: QUADPORT  
[Click here to get info](#)

Re-discover Network Refresh Reboot

Basic Config Coax Connections HW Config IPv4 Config **VLAN**

**VLAN Configuration**

Switch fabric: Combined

VLANs enabled: Yes

Allowed VLANs: 100, 650, 660

Management VLAN: 100

**EoC ports:** VLAN mode: Trunk  
Native VLAN: 100  
Tagged VLANs: 650, 660

**GE1 port:** VLAN mode: Access  
VLAN: 650

**GE2 port:** VLAN mode: Trunk  
Native VLAN: 100  
Tagged VLANs: 650, 660

Ingress mode: Secure

Ingress mode: Secure

Ingress mode: Secure

**Enable VLANs**

All VLANs permitted through this device must be listed here

Places the EoC management processors (A & B) on VLAN 100

Ensures VLANs 650 & 660 are carried over the coax. backbone

Configures GE1 as an Access port on VLAN 650 (Telemetry)

Configures GE2 as a Trunk port containing all VLANs (Cisco uplink)

# 1. VLAN support – Example scenario - QP2 configuration

**Coax Configurator**  
Discover Network Options Help

**Coax segment**  
3 nodes

Domain Name: DigitalDrift  
Domain ID: 13 Master Node: BC:22:FB:C7:00:01

**BC:22:FB:C7:00:01**  
MAC: BC:22:FB:C7:00:01  
Type: LINEAMP\_RIGHT  
Acting as: DOMAIN\_MASTER  
IPv4 address: 0.0.0.0  
LCMP supported

**BC:22:FB:C1:01:AE**  
MAC: BC:22:FB:C1:01:AE  
Type: QUADPORT  
Acting as: END\_POINT  
IPv4 address: 0.0.0.0  
LCMP supported

**BC:22:FB:C1:01:AC**  
MAC: BC:22:FB:C1:01:AC  
Type: QUADPORT  
Acting as: END\_POINT  
IPv4 address: 0.0.0.0  
LCMP supported

Re-discover Network Refresh Reboot

Basic Config Coax Connections HW Config IPv4 Config **VLAN**

**VLAN Configuration**

Switch fabric: Combined

VLANs enabled: Yes

Allowed VLANs: 100, 650, 660

Management VLAN: 100

**EoC ports:** VLAN mode: Trunk Native VLAN: 100 Tagged VLANs: 650, 660

**GE1 port:** VLAN mode: Access VLAN: 100

**GE2 port:** VLAN mode: Access VLAN: 650

**GE3 port:** VLAN mode: Access VLAN: 100

**GE4 port:** VLAN mode: Access VLAN: 660

Enable VLANs

All VLANs permitted through this device must be listed here

Places the EoC management processor (A) on VLAN 100

Ensures VLANs 650 & 660 are carried over the coax. backbone

Configures GE2 as an Access port on VLAN 650 (Telemetry)

Configures GE4 as an Access port on VLAN 660 (Wi-Fi)

## 2. Default node role changes

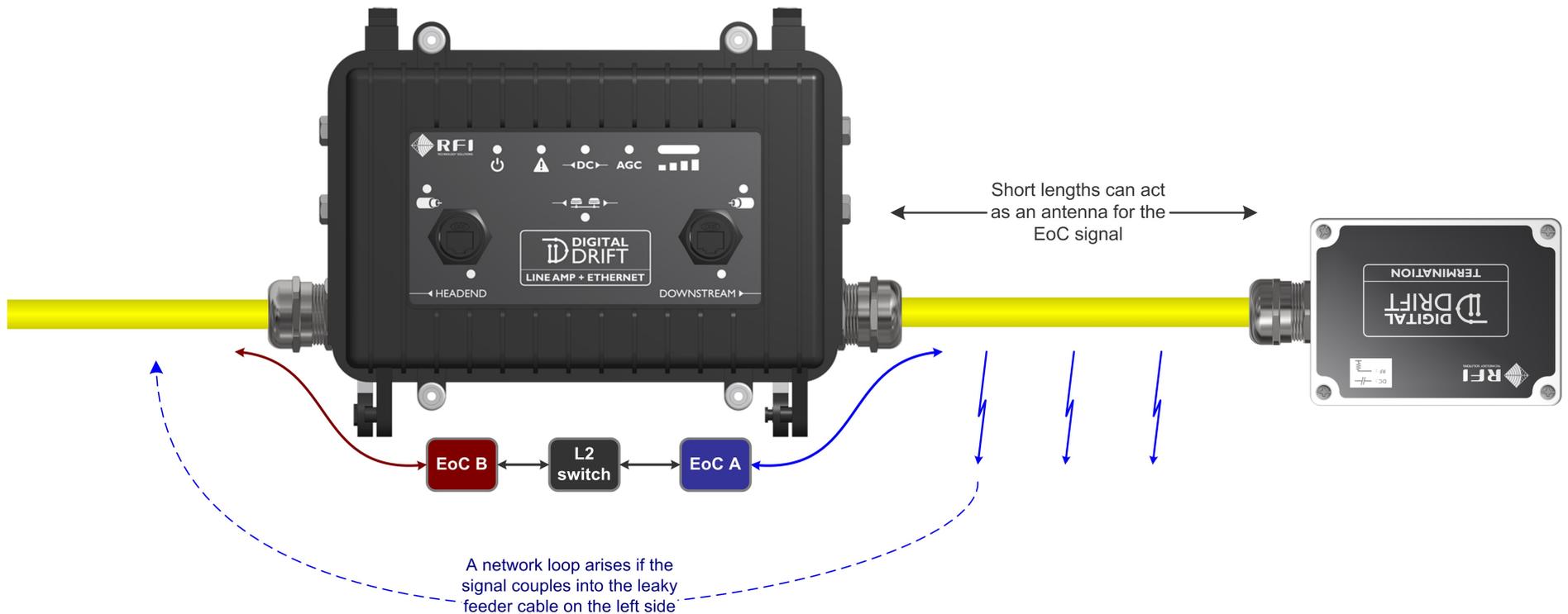
When v3.10 firmware is applied, the node role of LineAmp+Ethernet and Repeater2 devices will be changed to a new default value.

Platform	Hardware	Interface	FW < v3.10	FW >= v3.10
CCM220	Portal	-	Automatic	Automatic
	QuadPort1	-	Endpoint	Endpoint
	Repeater1	LEFT	Automatic	Automatic
		RIGHT	Automatic	Automatic
CCM320	<b>LineAmp+Ethernet</b>	LEFT ( <i>ccm320b</i> )	Automatic	<b>Endpoint</b>
		RIGHT ( <i>ccm320a</i> )	Automatic	<b>Domain Master</b>
	QuadPort2	( <i>ccm320a</i> )	Endpoint	Endpoint
	<b>Repeater2</b>	LEFT ( <i>ccm320b</i> )	Automatic	<b>Endpoint</b>
		RIGHT ( <i>ccm320a</i> )	Automatic	<b>Domain Master</b>

**NOTE:** If a node role other than the default value is required, it can be changed by using the CoaxConfigurator after the upgrade. However, a factory reset will always revert back to the values in the table above.

### 3. Avoidance of “through the air” feedback loops - Background

When LineAmp+Ethernet and Repeater2 devices are operated on leaky coaxial cable (LCX), there are situations where the LCX acts as an antenna, which causes the left and right side EoC interfaces to link up with each other.



### 3. Avoidance of “through the air” feedback loops - Solution

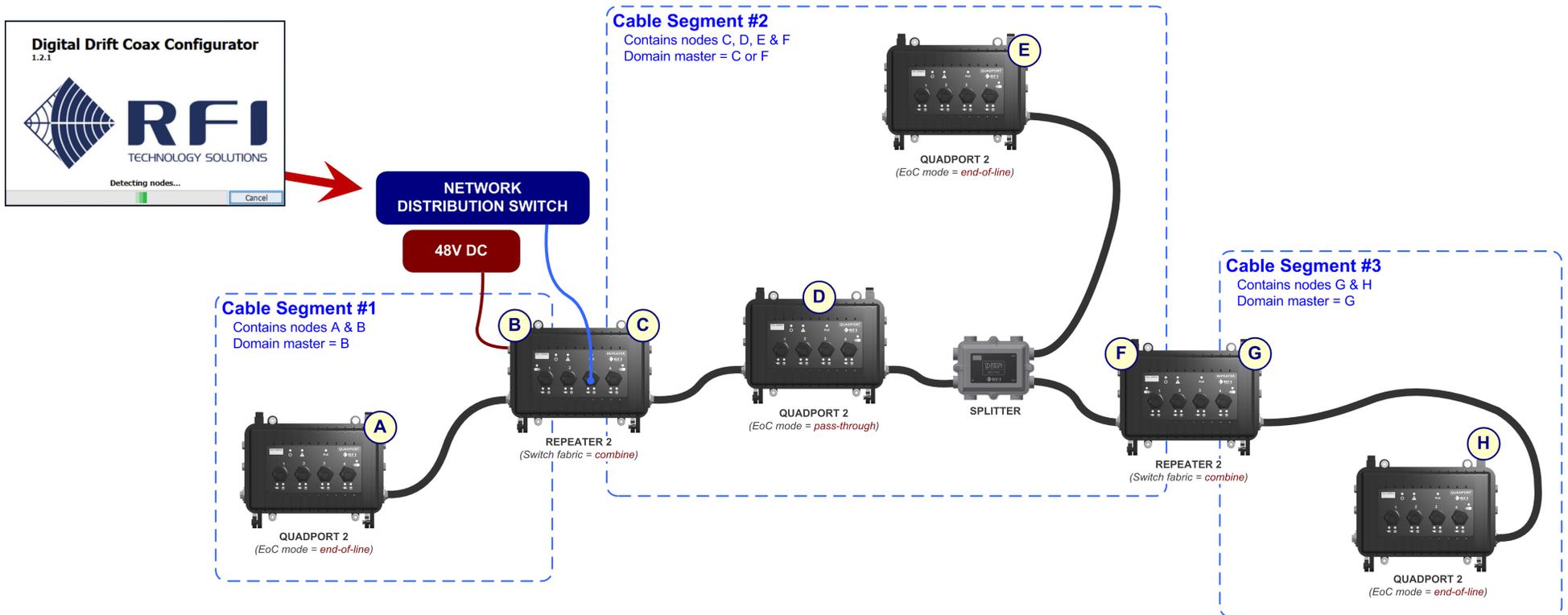
v3.10 firmware reduces the EoC signal’s default TX power & lowers the RX AGC ceiling on LineAmp+Ethernet and Repeater2 devices.

Platform	Hardware	Interface	FW < v3.10		FW >= v3.10	
			TX gain	RX equalizer	TX gain	RX equaliser
CCM220	Portal	-	Normal	Off	Normal	Off
	QuadPort1	-	Normal	Off	Normal	Off
	Repeater1	LEFT	Normal	Off	Normal	Off
		RIGHT	Normal	Off	Normal	Off
CCM320	<b>LineAmp + Ethernet</b>	LEFT ( <i>ccm320b</i> )	Normal	Off	<b>-4 dB</b>	<b>On</b>
		RIGHT ( <i>ccm320a</i> )	Normal	Off	<b>-4 dB</b>	<b>On</b>
	QuadPort2	( <i>ccm320a</i> )	Normal	Off	Normal	Off
	<b>Repeater2</b>	LEFT ( <i>ccm320b</i> )	Normal	Off	<b>-4 dB</b>	<b>On</b>
		RIGHT ( <i>ccm320a</i> )	Normal	Off	<b>-4 dB</b>	<b>On</b>

**NOTE:** If TX and RX values other than the defaults are required, they can be changed by using the CoaxConfigurator after the upgrade. However, a factory reset will always revert back to the values in the table above.

## 4. Discovery message pass-through

Remote coax. segments can now be interrogated by the CoaxConfigurator without needing to physically connect to an RJ45 port on that coax. segment.



### FW < v3.10:

Coax segments headed by Nodes B & C will be found by the CoaxConfigurator.

### FW >= v3.10:

Coax segments headed by Nodes B, C & G will be found by the CoaxConfigurator.

# 5. Cable length reporting

The Coax Connections tab for nodes with a role of Domain Master displays the cable length to the other devices on that coax. segment.

Discover Network Options Help

**Coax segment**  
3 nodes

Domain Name: DigitalDrift  
Domain ID: 13 Master Node: BC:22:FB:C7:00:AC

BC:22:FB:C7:00:AC  
MAC: BC:22:FB:C7:00:AC  
Acting as: **DOMAIN\_MASTER**

Re-discover Network Refresh Reboot

Basic Config **Coax Connections** W Config IPv4 Config VLAN Ethernet SNR & PSD IPv6 Config Notches QoS Config Multicast & Filtering Bridge Sync

**Coax PHY**  
TX gain: -4 dB RX equaliser: On  
Update & Reboot

**Coax connections**  
Device ID: 1 Node Type: DOMAIN\_MASTER  
Domain Name: DigitalDrift  
Domain ID (DOD): 13 Profile: COAX 100MHz

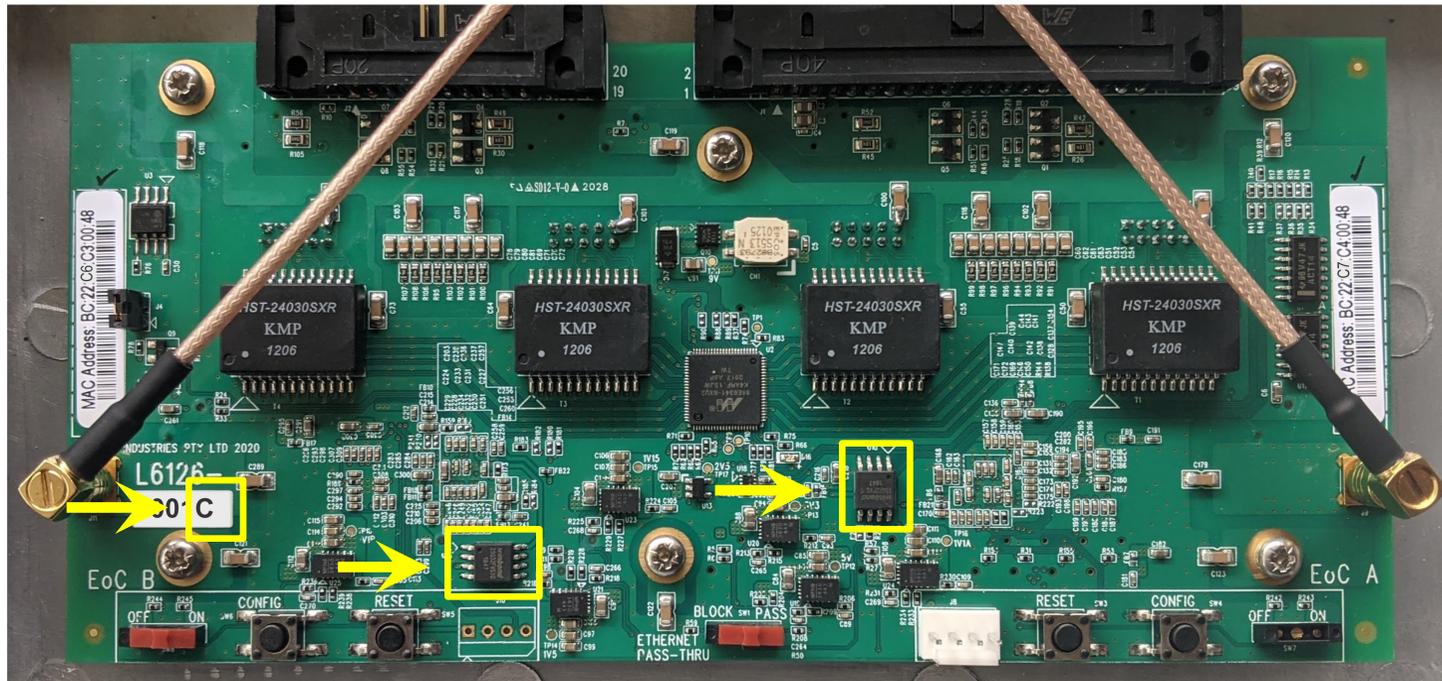
Rx Throughput and Errors are calculated every time that you press Refresh.

Device ID	MAC Address	TX PHY	RX PHY	RX Throughput	RX Errors	Cable length
3	BC:22:FB:C1:02:88	742 Mbps	545 Mbps	-	-	149 m
2	BC:22:FB:C6:00:A9	768 Mbps	712 Mbps	-	-	309 m

## 6. Support for hardware fitted with 8MB flash

CCM320 based hardware manufactured after July 2022 may be fitted with 8MB flash chips. Firmware prior to v3.10 only supports 4MB flash chips.

**4MB flash variant**  
Hardware revision = **C**  
Flash chip(s) **unlabelled**

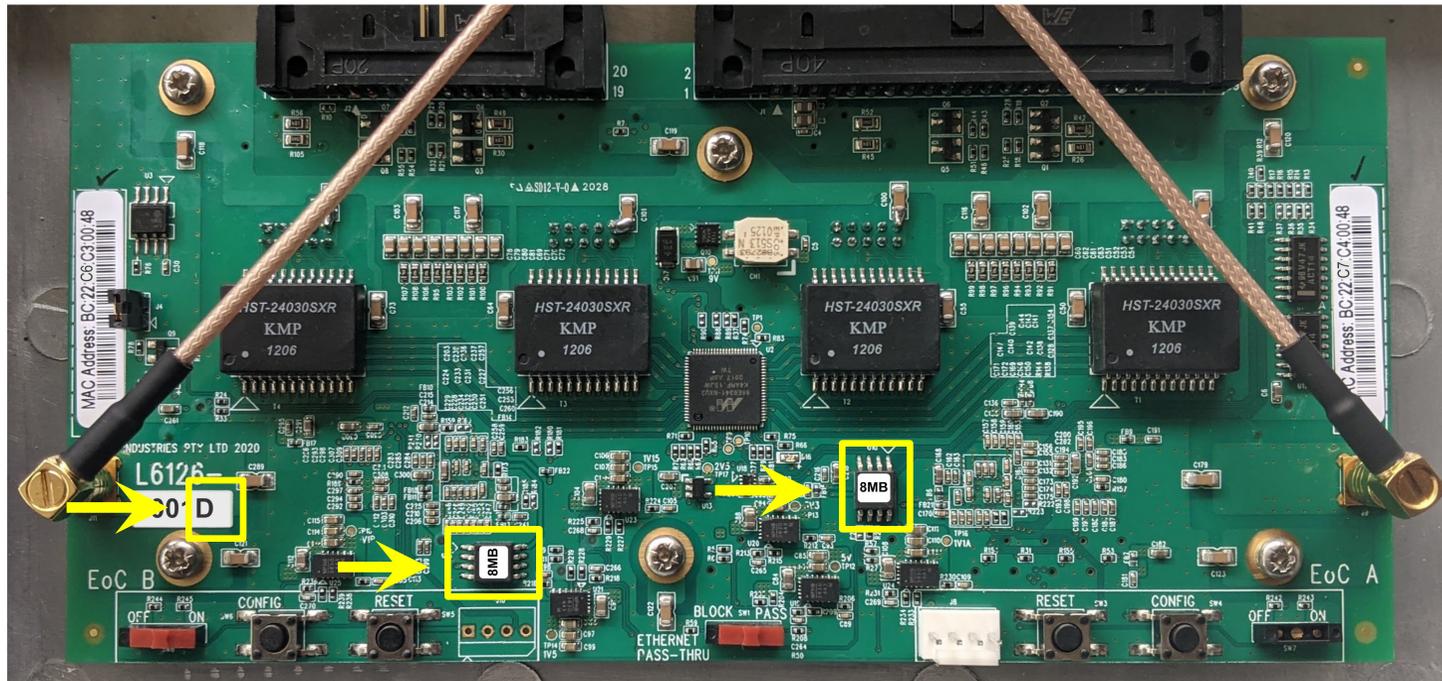


## 6. Support for hardware fitted with 8MB flash

**8MB** flash variant

Hardware revision = **D**

Flash chip(s) **labelled as 8MB**



## 7. Upstream bug fixes

---

The v3.10 release incorporates improvements in the EoC software stack since 2020.

### **Critical updates:**

- **Layer 2 switching module improvements:**
  - Faster updating of the distributed L2 switch tables as mobile devices move between EoC nodes.
- **TCP/IP stack bug fixes**
  - Updated to the TCP/IP stack's 2022 release.
  - Resolved device resets in packet overload scenario.

# Applying the firmware update – Current state

Use the CoaxConfigurator (v1.2.1) to determine the hardware platform and current firmware version.

The screenshot displays the Coax Configurator interface. On the left, a list of nodes is shown, with the first node selected: **BC:22:FB:C7:00:01**, MAC: BC:22:FB:C7:00:01, Type: LINEAMP\_RIGHT, Acting as: DOMAIN\_MASTER, IPv4 address: 0.0.0.0, and LCMP supported. Below it are two QUADPORT nodes: **BC:22:FB:C1:01:AC** and **BC:22:FB:C1:01:AE**.

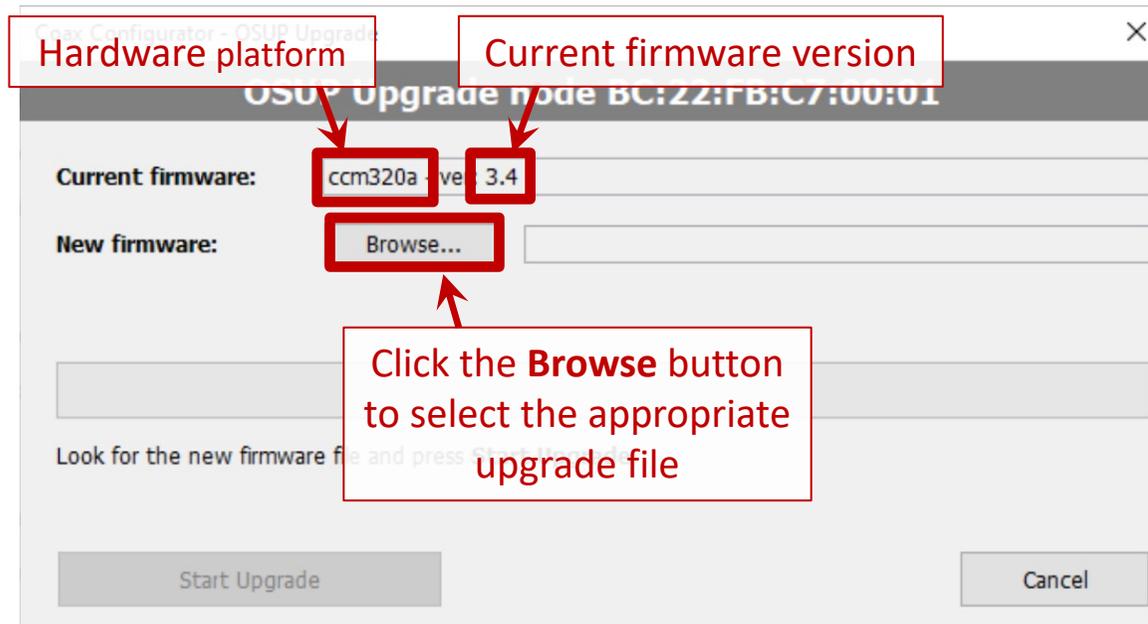
The main configuration area is titled "Node basic configuration" and includes fields for Node Name, Node Role (Always DOMAIN\_MASTER), Domain Name (DigitalDrift), and Discovery pass-through (Enabled). The "Firmware" field shows "ccm320a" and "ve 3.4". A red box highlights the "Upgrade" button next to the firmware version. A red callout box points to this button with the text: "Click the Upgrade button to select an upgrade file".

Other red callout boxes highlight the hardware platform and firmware version: "Hardware platform" points to "ccm320a" and "Firmware version" points to "3.4".

Navigation tabs at the top include "Basic Config" (highlighted with a red box), "Coax Connections", "HW Config", and "IPv4 Config". Action buttons include "Re-discover Network", "Refresh", and "Reboot".

# Applying the firmware update – Upgrade file selection

Select the upgrade file based on the hardware platform and flash size.



Hardware platform	Flash size	Upgrade file
ccm220	-	ccm220_p2mp_upgrade@3.10.bin
ccm320a	4MB	ccm320a_4MB_p2mp_upgrade@3.10.bin
	8MB	ccm320a_8MB_p2mp_upgrade@3.10.bin
ccm320b	4MB	ccm320b_4MB_p2mp_upgrade@3.10.bin
	8MB	ccm320b_8MB_p2mp_upgrade@3.10.bin

# Applying the firmware update – Start the upgrade

Coax Configurator - OSUP Upgrade

**OSUP Upgrade node BC:22:10:00:00:00:00**

**Current firmware:** ccm320a - ver: 3.4

**New firmware:** Browse... ccm320a\_4MB\_p2mp\_upgrade@3.10.bin

Look for the new firmware file and press **Start Upgrade**

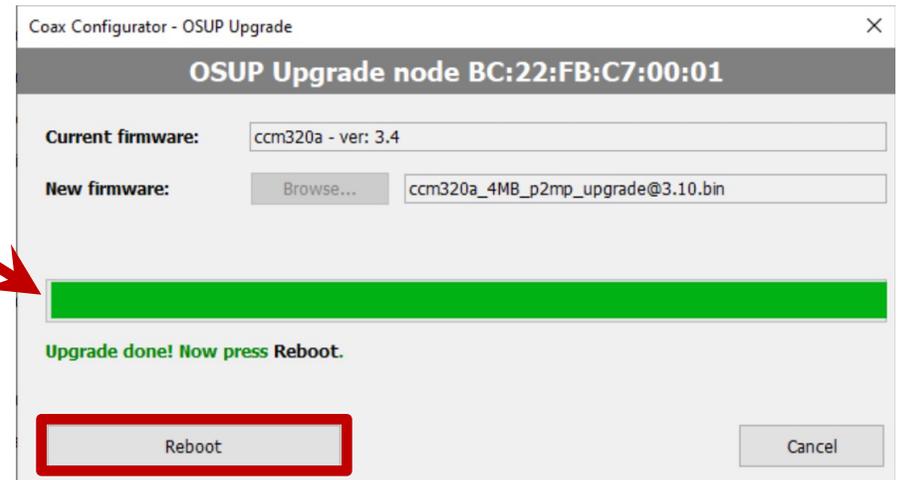
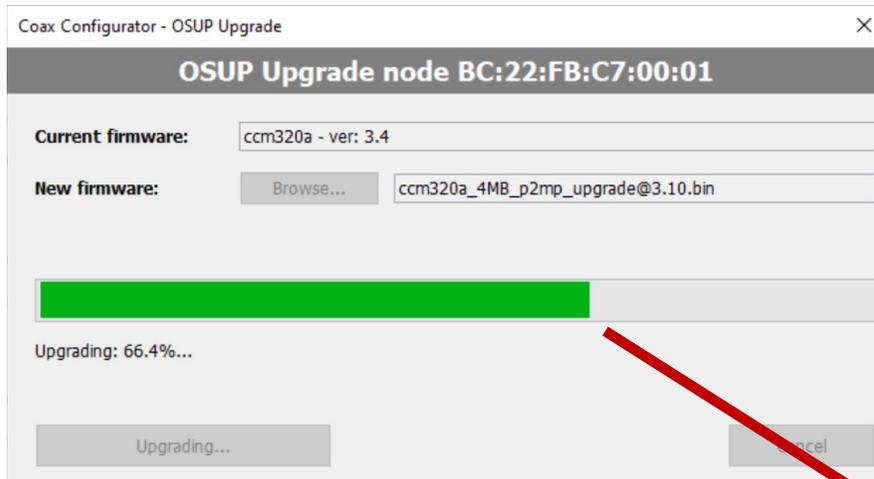
Start Upgrade Cancel

Upgrade file selected

Click the **Start Upgrade** button to commence the upgrade

# Applying the firmware update – Wait for the upgrade

If a compatible upgrade file was selected, the upgrade will commence. Wait until the percentage bar reaches 100% and the Reboot button is displayed.



Click the **Reboot** button once the upgrade is done

# Applying the firmware update – Successful completion

After a successful update, the new firmware version will be displayed.

Coax Configurator

Discover Network Options Help

**Coax segment**  
3 nodes

Domain Name: DigitalDrift  
Domain ID: 13 Master Node: BC:22:FB:C7:00:01

**BC:22:FB:C7:00:01**  
MAC: BC:22:FB:C7:00:01  
Type: LINEAMP\_RIGHT  
Acting as: DOMAIN\_MASTER  
IPv4 address: 0.0.0.0  
LCMP supported

**BC:22:FB:C1:01:AE**  
MAC: BC:22:FB:C1:01:AE  
Type: QUADPORT  
[Click here to get info](#)

**BC:22:FB:C1:01:AC**  
MAC: BC:22:FB:C1:01:AC  
Type: QUADPORT  
[Click here to get info](#)

Re-discover Network Refresh Reboot

Basic Config Coax Connections HW Config IPv4 Config VLAN

**Node basic configuration**

Node Name:  Apply

Node Role: Always DOMAIN\_MASTER Change

Domain Name: DigitalDrift Apply

Discovery pass-through: Enabled

Device Type: LineAmp (Right)

Coax status: COAX 100MHz - Connected 7.9 Mbps

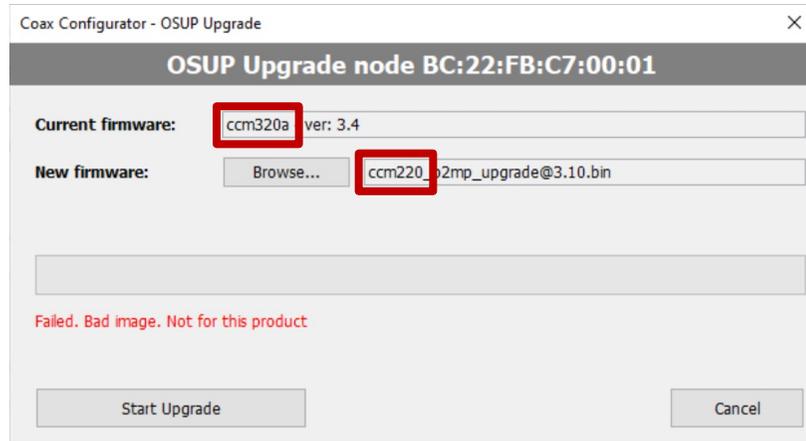
Firmware: **ccm320a\_4MB\_p2mp - ver: 3.10**

Factory Profile Id: 81

# Applying the firmware update – Troubleshooting

There are two possible causes of the error message: **Bad image. Not for this product**

## Cause #1: Wrong hardware platform:

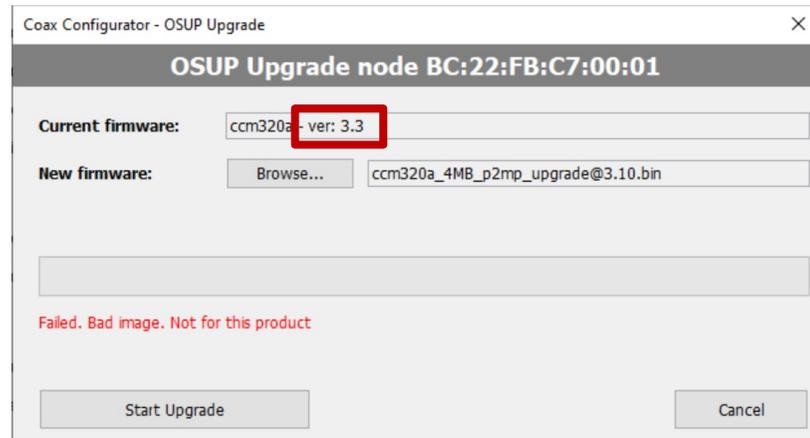


The screenshot shows the 'Coax Configurator - OSUP Upgrade' dialog box for node BC:22:FB:C7:00:01. The 'Current firmware' field contains 'ccm320a ver: 3.4'. The 'New firmware' field contains 'ccm220\_p2mp\_upgrade@3.10.bin'. A red error message at the bottom reads 'Failed. Bad image. Not for this product'. The 'Start Upgrade' and 'Cancel' buttons are visible at the bottom.

## Solution:

Try again with the upgrade file that matches the device's hardware platform.

## Cause #2: Current firmware version is 3.3:



The screenshot shows the 'Coax Configurator - OSUP Upgrade' dialog box for node BC:22:FB:C7:00:01. The 'Current firmware' field contains 'ccm320a ver: 3.3'. The 'New firmware' field contains 'ccm320a\_4MB\_p2mp\_upgrade@3.10.bin'. A red error message at the bottom reads 'Failed. Bad image. Not for this product'. The 'Start Upgrade' and 'Cancel' buttons are visible at the bottom.

## Solution:

Apply a Raw Upgrade, using the CoaxConfigurator in “factory” mode.

Contact RFI Technical Support for more details on how to do this.