# **Course:** DD Leaky Feeder System **Module 3.2:** Active Devices





## Devices specific to DDLFS



#### LINEAMP + ETHERNET

Provides all the LineAmp features, plus Ethernet over Coax (EoC) and Layer 2 networking functionality. This enables:

- Data to be bridged onto and off the leaky feeder cable through the built-in RJ45 ports
- Digital re-generation of the EoC data signal, enabling high data speeds to be maintained as the network is extended.



#### QUADPORT 2 (with VHF pass-through)

- Can be spliced into the leaky feeder cable.
- Breaks out 4 x PoE++ ports.
- Takes the place of an Ethernet Coupler + QuadPort v1.
- Contains narrowband radios, enabling participation in the 2-way diagnostics system.



### LineAmp with Ethernet – External Connections



**TECHNOLOGY SOLUTIONS** 

#### LineAmp with Ethernet – Internals



## **Main Board**

Same as the base LineAmp, plus: Left EoC signal & right EoC signal are separated from the voice radio signals and are sent to the Networking Board

**Networking Board** 

Takes the place of the Display Board that is fitted in the base LineAmp



## LineAmp with Ethernet – External Indicators

The top row of indicators are for LineAmp functionality, and match those of the base LineAmp





### LineAmp with Ethernet – RF path





## LineAmp with Ethernet – Networking block diagram

Each LineAmp+Ethernet contains a 4-port Ethernet switch: 2 x GbE + 2 x EoC



## LineAmp with Ethernet – Networking board user interface





## LineAmp with Ethernet – 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 LineAmp with Ethernet. Each is independently configured:

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



## LineAmp with Ethernet – VLAN support



#### When the switch is combined:



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

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



## LineAmp with Ethernet – 24V passive PoE add-on

Simple, passive PoE devices can be supported – such as Ubiquiti Bullet & Microtik Metal





- Max. 20W power delivery across both RJ45 ports
- Available in two variants:
  - DD-24V-POE-INJ-Q24: accepts 9 -36 V line voltage
  - DD-24V-POE-INJ-Q48: accepts 18 75 V line voltage



## LineAmp with Ethernet – Deployment example





#### Do not place LAEs to suit endpoint network devices

- LineAmps (with or without Ethernet) should be located to optimise the voice radio
- LineAmp with Ethernet should be located to:
  - Connect to the backhaul network
  - Limit EoC domain size (aim for maximum of 5 x EoC devices per coax segment)
- Use QuadPort 2 devices when network outlets are required



## LineAmp with Ethernet – Deployment tips

Disable any EoC interfaces that are not being used

• This minimises the chance of network loops





Breaks out Power over Ethernet ports from the leaky feeder cable

## Extremely similar to the QuadPort 2 (without VHF pass-through):

• Refer to Module 1.3 for details. Only the differences are contained here.

## **Differences:**

- EoC bandplan = 100 MHz
- Frequencies above 120 MHz (i.e. VHF voice radio) are passed through
- Implements 2-way narrow band diagnostics over the VHF radio channels
- Fitted with cable glands to accept yellow leaky feeder cable



### QuadPort 2 (with VHF pass-through) – RF path

The VHF radio signal is passed through, and this QuadPort variant participates in the 2-way narrowband diagnostics









The device type can be identified by the fourth octet of the MAC address: XX:XX:**C#**:XX:XX

- C1 QuadPort
- C6 LineAmp + Ethernet (left-side)
- C7 LineAmp + Ethernet (right-side)

