9   *Linking Remote Stations and Speaker Stations*

This chapter describes how to pair Remote and Speaker Stations to Main Stations. You can connect Remote and Speaker Stations on one of the Digital Intercom Lines, point-to-point to a Main Station Ethernet interface module (HLI-ET2) or over an IP network.

Pairing to a Main Station over an IP network requires an Ethernet interface module fitted to the extension bay of the Main Station (HLI-ET2).

Note: If you change the network topology between any two stations, you must reboot the stations.

Note: If the IP address on a Remote Station or Speaker Station changes, you must either reboot the Remote Station or disable and then re-enable the DHCP on the Remote Station.

Warning:. Digital intercom lines and the Ethernet connections are mutually exclusive on Remote and Speaker Stations. If both are connected it will be detected as a fault, communication over both ports will stop and both status LEDs will blink RED. This requires a reboot of the station using **Administration > Reset > Reboot**

Warning: When changing the connection from digital intercom line to Ethernet or vice-versa, you must disconnect one cable and then wait until the unit has detected a loss of connection before connecting the other cable. Otherwise, they will briefly be detected as both connected.

Warning: When changing the power connections to a Remote Station, a network storm error message may appear. If so, disconnect the power cable, and reboot the Remote Station.

9.1 Pairing scenarios

There are various topologies that you can create. Some of these are illustrated below.

9.1.1 Digital Intercom

Remote and Speaker Stations have Digital Intercom 3-pin XLR connectors (female and male) and can connect to Main Stations along with Beltpacks.

Note: A Remote or a Speaker Station draws current equivalent to three Beltpacks when the loudspeaker is in use. If the Remote or Speaker Station is locally powered using a power supply, it does not draw current from the digital intercom line.

1) Connect an XLR cable from a Main Station to the Remote or Speaker Station.

2) Power up the Main Station and verify that the Line 1 and Line 2 status LED are green on Main Station.

3) On a Remote Station you can verify that the Line status LED is steady green.

HMS-4X

Line 2

Line 1

HKB-2X
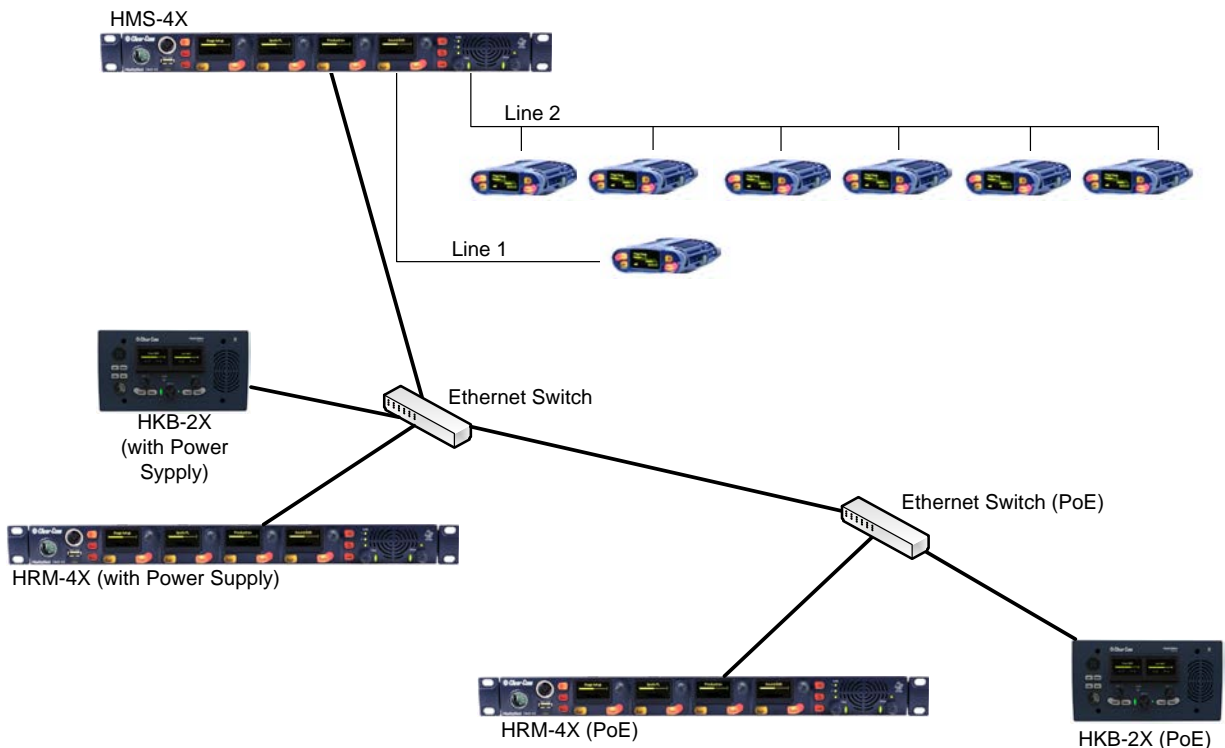
HKB-2X

HRM-4X
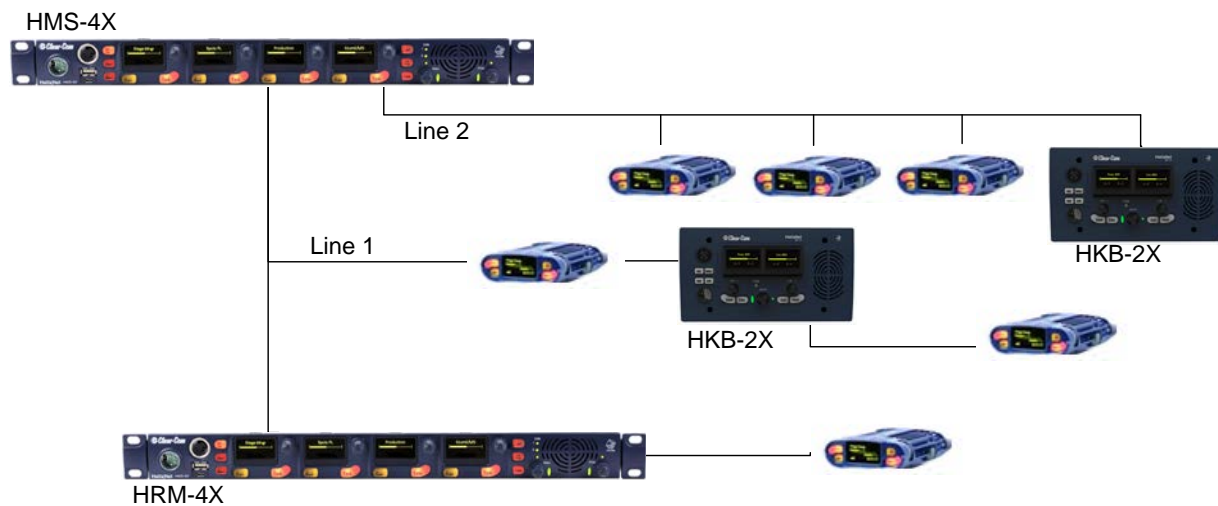
9.1.2   Ethernet point-to-point link

Remote and Speaker Stations have RJ45 Ethernet connectors and can connect to Main Stations over Ethernet.

1) Insert an HLI-ET2 Ethernet interface module in the Main Station. Use any of the three slots available.

   Note: Ensure that the Main Station is powered down before inserting modules.

2) Connect a regular Ethernet cable (for example, CAT5, CAT5e, CAT6, CAT6e) from one HLI-ET2 port on one station to the Remote or Speaker Station.

3) Connect an external AC/DC power adapter to the Remote or Speaker Station

4) Power up both Stations. Verify that the green LEDs on the HLI-ET2 port and on the Remote or Speaker Station are on.

5) Go to **Networking->Pair to Station->By Name** on the Remote or Speaker Station. You should see one entry indicating that the Remote or Speaker Station has properly detected the Main Station. Select this entry.

6) Go to **Station Settings->Keyset Assign** and assign channels to any keyset.
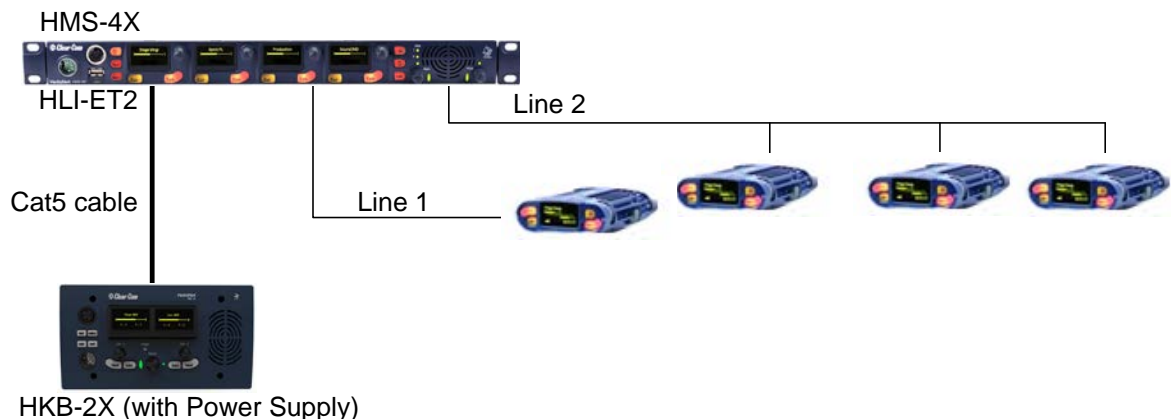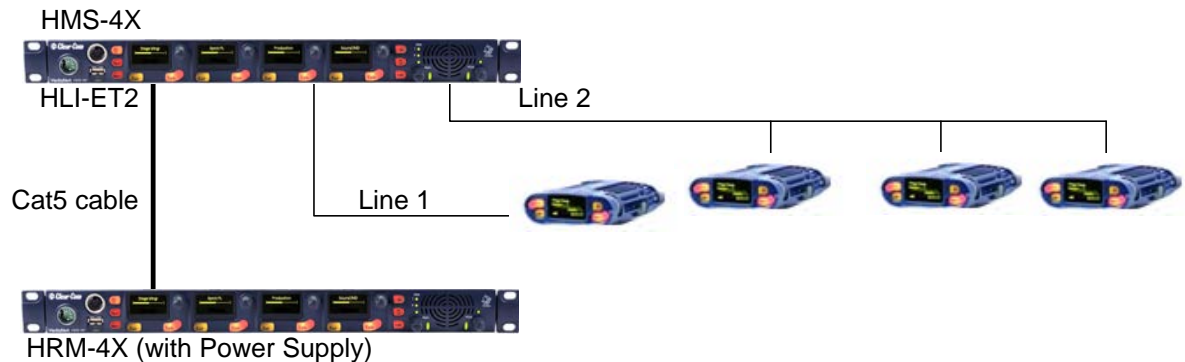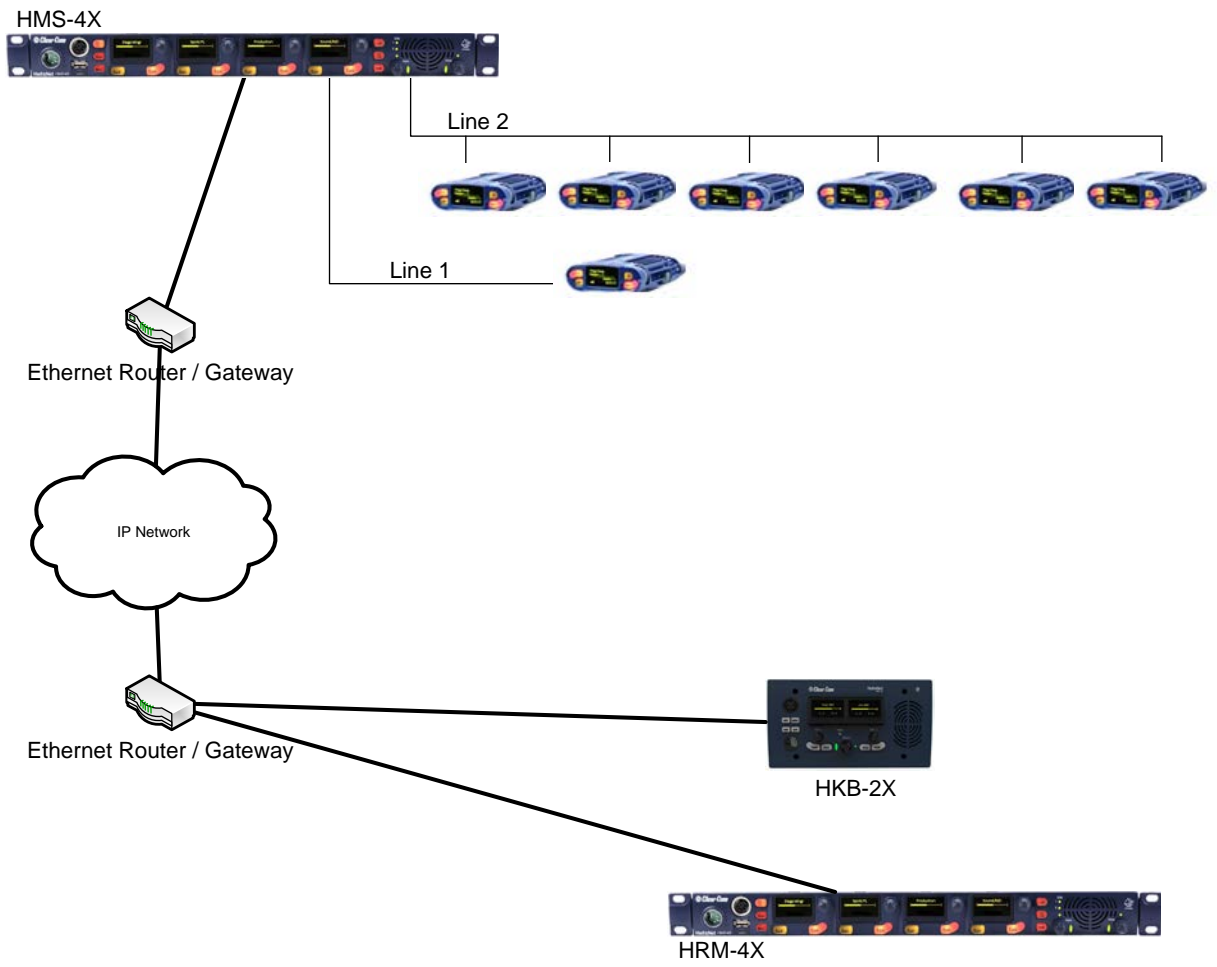
9.1.3   Local IP Network

1) Insert an HLI-ET2 Ethernet interface module into the Main Station. Use any of the three slots available.

   Note: Ensure that the Main Station is powered down before inserting modules.

2) Connect a regular Ethernet cable (for example, CAT5, CAT5e, CAT6, CAT6e) from one HLI-ET2 port to an Ethernet Switch and connect Remote or Speaker Stations to Ethernet Switch as well.

3) Connect an external AC/DC power adapter to the Remote or Speaker Station or connect them on a Power over Ethernet (PoE) port on the Ethernet Switch.

4) Power up all Stations. Verify that the green LED on the HLI-ET2 port and on the Remote or Speaker Station is on.

5) Go to **Networking->Link to Station->By Name** on each Remote and Speaker Station. You should see one entry indicating that the Remote or Speaker Station has properly detected the Main Station. Select this entry.

6) Go to **Station Settings->Keyset Assign** and assign channels to any keyset.

HMS-4X

Line 2

Line 1

HKB-2X
(with Power
Sypply)

HRM-4X (with Power Supply)

Ethernet Switch

Ethernet Switch (PoE)

HRM-4X (PoE)

HKB-2X (PoE)

Clear-Com

9.1.4 Remote IP Network

Remote and Speaker Stations can connect to a Main Station that is not within the same network Broadcast Domain.

1) Insert an HLI-ET2 Ethernet interface module in the Main Station. Use any of the three slots available.

   Note: Ensure that the Main Station is powered down before inserting modules.

2) Connect a regular Ethernet cable (for example, CAT5, CAT5e, CAT6, CAT6e) from one HLI-ET2 port to a Router/Gateway. Make sure you know the Gateway IP address for that first subnet.

3) Connect Remote or Speaker Stations to a Router/Gateway. Make sure you know the Gateway IP address for that second subnet.

4) Connect an external AC/DC power adapter to the Remote or Speaker Station or connect them on a Power over Ethernet (PoE) port on the Ethernet Switch.

5) Power up all Stations. Verify that the green LED on the HLI-ET2 port and on the Remote or Speaker Station is on.

6) On the Main Station, go to **Networking->Preferences->IP Address** and note the IP address of the Main Station. Make sure that **Networking->Preferences->Gateway** and **Networking->Preferences->Netmask** match that of your subnet.

7) On each Remote and Speaker Station make sure that all **Networking->Preferences** match that of your subnet.

8) On each Remote and Speaker Station go to **Networking->Link to Station->By Address** and enter the IP address of the Main Station.

9) Go to **Station Settings->Keyset Assign** and assign channels to any keyset.

HMS-4X

Line 2

Line 1

Ethernet Router / Gateway

IP Network

Ethernet Router / Gateway

HKB-2X

HRM-4X

9.1.5   Mixed Pairs

Here is one example of how all the previous pairings could be mixed with Main Station Linking.
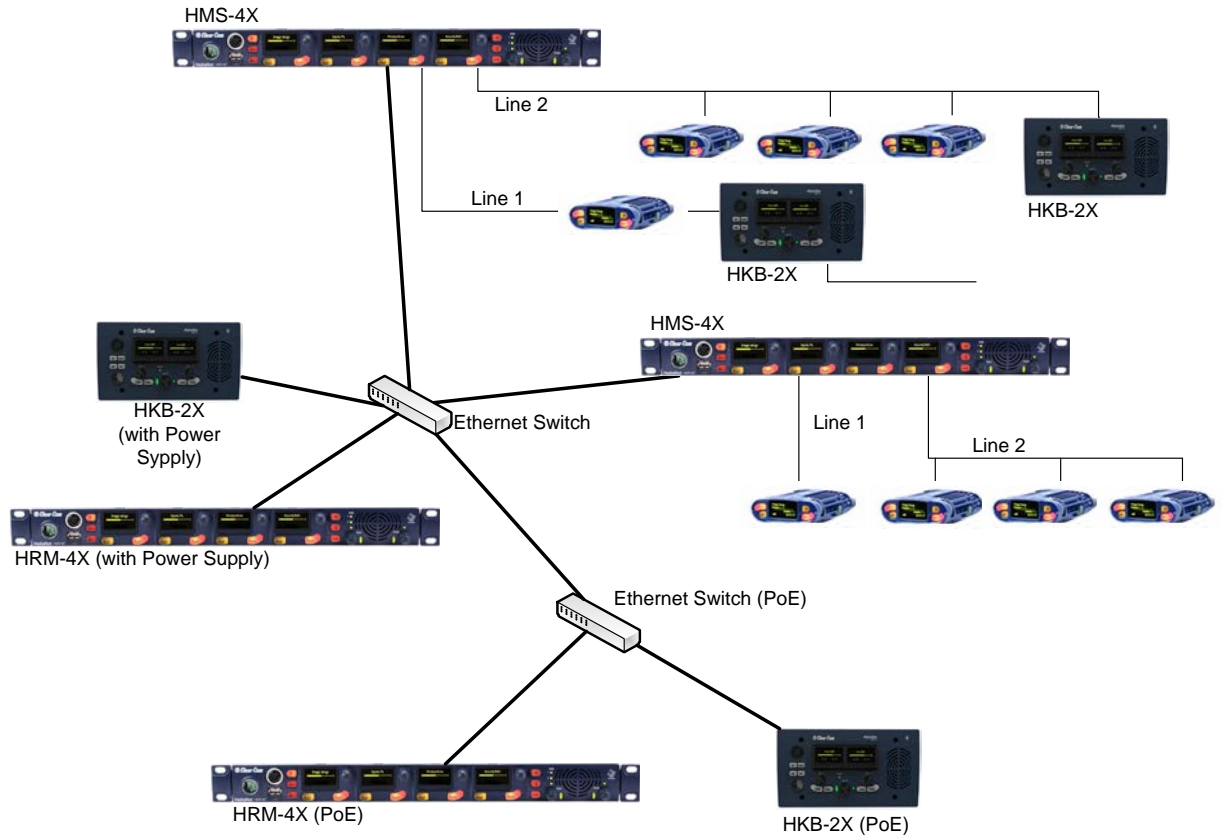
9.2   Networking Specifications

Specification	Value
Latency on Powerline	40-80ms (depends on the distance and the number of Devices (HBP, HRM, HKB) on the line. More distance or more Devices means more latency)
Latency over IP Network	30ms + Network Latency
Bandwidth used	HRM-4X: 600 kbps to the Main Station, 2.5 Mbps from the Main Station. HKB-2X: 300 kbps to the Main Station, 1.5 Mbps from the Main Station.
IPv4	UDP Port 6001 (Digital Intercom) TCP Port 6001 (Digital Intercom) UDP Port 5353 (mDNS)