

Hardware-based Echo Cancellation Module (HWEC)

Application Notes

Xorcom has designed a hardware echo canceller module for its award-winning Astribank telephony interfaces and Asterisk-based IP-PBX appliances. The module provides a high level of echo cancellation and voice enhancement while reducing load on the CPU, as compared to OSLEC, the software-based echo cancellation solution provided in the standard Asterisk framework.

Before you configure a system that includes the Xorcom hardware-based echo cancellation module you should be aware of a few design limitations:

1. HWEC is not supported in the XR1000 models.
2. For certain telephony module combinations not all port types will be able to use the HWEC.

Possible Scenarios

Case 1

When the chassis includes both a digital module (E1/T1 or BRI) **and** one or more FXO modules, the HWEC **will not work** for the FXO modules.

Recommendation:

- If using HWEC for the FXO channels **is not crucial** then software echo cancellation should be configured for those specific channels in the DAHDI configuration.
- If using HWEC **is crucial**, a separate Astribank should be used for the FXO module(s) and HWEC. Keeping the digital modules and the FXO modules in different chassis will allow the HWEC to function for all these ports.

Case 2

If the chassis includes one or more FXO modules and one or more FXS modules, and the unit is **not** the DAHDI synchronization master, the HWEC **will not work** on the FXS modules. Xorcom drivers automatically determine, per configuration, which unit should be the Sync Master. All other devices are synchronized to the Sync Master. The synchronization algorithm chooses a Sync Master according to the following priority:

1. E1/T1 connection
2. BRI connection
3. Astribank/Xorcom IP-PBX that has at least one FXO module
4. Astribank/Xorcom IP-PBX with FXS module

Examples of HWEC Behavior

The examples below demonstrate the HWEC behavior in various scenarios:

Example 1: E1/T1 Chassis + FXS+FXO Chassis

The configuration consists of an E1/T1 chassis and an FXS+FXO chassis. The Sync Master role will be given to the E1/T1 device and the FXS+FXO chassis will work as a Sync Slave. In this case the HWEC **will not handle** the FXS ports of the FXS+FXO chassis.

Example 2: E1/T1 Chassis + FXO Chassis

For a configuration of one E1/T1 chassis and one FXO-only chassis, the HWEC **will handle** all ports on both chassis.

Example 3: FXO Chassis + FXS+FXO Chassis

The configuration consists of a chassis with one or more FXO modules and another chassis with FXS and FXO modules. If the first chassis is defined as the Sync Master, then the FXS ports on the second chassis **will not be handled** by the HWEC.

Example 4: FXS+FXO Chassis + FXO Chassis

This is the same configuration as in the previous example, except that the chassis with the FXS and FXO modules is defined as the Sync Master. In this case, the HWEC **will handle** all ports on both chassis.

Example 5: FXO Chassis + FXO Chassis

For a configuration with two FXO-only chassis, the HWEC **will handle** all ports on both chassis.

Recommendations

- When HWEC is required for all ports (including FXS), make sure the units are configured homogeneously (all analog units are populated with either FXS or FXO modules, i.e., not mixed).
- If there is a chassis containing both FXS and FXO modules, make sure this chassis is the Sync Master by using the XPP_SYNC parameter in the /etc/daohdi/init.conf file (refer to DAHDI documentation for instructions). *Note: This is possible only when there is no digital – E1/T1 or BRI – equipment in the configuration.*
- If there is a chassis containing both FXS and FXO modules and it is not possible to define it as the Sync Master, software echo cancellation should be defined for the FXS ports that are not supported.

Licensing

The Xorcom licensing mechanism automatically detects configurations that have unsupported ports and does not charge the HWEC license fee for these specific ports.