



Diversity Delay Kit For XPi 10esp Installations Application Guide

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1 Overview

This application guide is for supplemental information on HD receivers and their installation for use with the XPi 10esp Exporter. An HD radio kit has been created by BE which includes a basic receiver and rack mount for use in setting the Audio Diversity Delay in your HD system. Refer to the XPi 10esp Operation Manual or XPi 10esp Quick Installation Guide for set up information on Exporter after the installation of the HD receiver.

1.1 HD Radio Receivers

- To make use of the Automatic Diversity Delay setup and continuous delay correction features of the XPi 10esp, the HD receiver must have a Split FM/HD Mode of operation. This mode is also known as Split Analog/Digital Mode.
- Some HD Receivers and HD Car Radios have the FM/HD split mode, but very often, a hidden menu is required to navigate and enter the Split mode. And in many cases these HD radios and receivers will not remain in their Split mode on initial power up or a restart after a power failure. These receivers will still work fine for setting up an Exporter's diversity delay using the automatic feature, but you will need to switch the Export out of automatic when completed with the delay setup.
- If the HD receiver remains locked in the Split FM/HD mode and does not automatically revert to analog after a power failure, then the XPi 10esp Exporter can remain in Automatic mode to make full use of this great feature in the XPi 10esp.
- If the HD receiver reverts back to analog on power failure, a UPS or, battery power backup method can overcome the power reset of the receiver and then the Exporter can remain in automatic.

1.2 Receiver Location

- The receiver will need to be co-located with the XPi 10esp to cable into the Audio Delay Align RCA jacks on the rear of the XPi 10esp



Figure 1 – XPi 10 Exporter Rear View

- It is not a requirement to have the HD receiver located in the same equipment rack as the Exporter. However it should be close enough that the routing the audio cables between the two pieces of equipment do not attenuate the HD and Analog audio out of range of the AUDIO DELAY ALIGN input levels.
- When the Exporter is located at the transmitter site be sure the receiver is not overloaded with too high of an RF signal. Add attenuation between the receiver and its antenna or if the receiver is connected to a direct RF sample from the site's transmission line system. Reduce the signal so as not to exceed the radio's max input level specification of the radio or receiver.

2 Diversity Delay Receiver Kit Installation

This Application Guide is using the Inovonics INO-Mini Series of FM//HD Radio Monitor/Receivers such as models 639 & 632

2.1 Customer Supplied Material and Tools:

- Tywrap assortment for cable dress
- Wire Cutter
- Straight Blade Screw Driver, (small potentiometer adjustment)

- The following is required if the audio hook up cable needs to be extended and/or direct RF Sample is used for the Receiver Antenna Input:

- Wire Cutting , Stripping & Crimp Tools
- Audio and/or Coax Cable & Connectors
- Coaxial Attenuators for RF sample reduction
- Spectrum Analyzer for RF sample level measurement.

2.2 Supplied in BE 979-6105 Basic Kit with Inovonics HD Radio

- (1) 417-3291 Adapter, F Male to BNC Female
- (1) 849-6105 5 FT Cable Pair, Audio Link XLR to RCA
- (1) 849-6106 Antenna, FM Dipole with Male Type F
- (1) 949-0557 Cable, RG-142, 104 inches with BNC Male both ends.
- (1) IN-632-00 Inovonics model INO-Mini FM//HD Radio
- (1) IN-RK-00 Inovonics Rack Shelf Mounting Kit

2.3 Rack Installation of HD Radio/Receiver

1. Use the rack shelf mounting hardware and blank panels included in the kit to mount the INO-Mini series receiver.
2. If the receiver is installed in the same rack as the Exporter, use the the supplied 5FT audio cable pair to connect the Inovonics Left XLR output to the FM IN RCA jack on the XPi 10esp AUDIO DELAY ALIGN inputs. Connect the Right XLR output of the receiver to the HD IN on the XPi 10esp
3. If the receiver location requires a longer audio pair, then the supplied cable can be extended with a purchased RCA F to RCA-M cable pair or a custom cable made on site.
4. Connect the 12V DC "brick" style power supply to the receiver. The power supply can be mounted and cable dressed with Tywraps as shown in Figure 2



Figure 2 – Radio 12V DC Power Supply

5. Like many receivers, the Inovonics antenna input is Type F. In most installations, a simple antenna such as a folded dipole or whip antenna will work. The kit includes a dipole with cabled F connector ready to connect.
6. In all Exporter/Receiver combinations, the receiver needs to have an antenna signal strong enough to remain locked in HD so as to continuously provide the Split mode output signals.
7. After the receiver installation is completed and checked out, put the receiver into it's Split Mode operation.
8. Follow the instructions for setting up the diversity audio delay in the XPi 10esp manual to finish the setup.



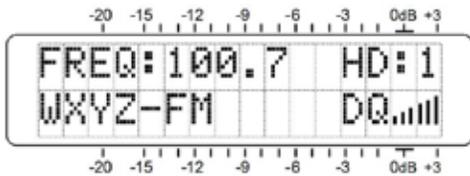
3 Inovonics model 632 and 639 Split Mode Operation.

Both of these models use a secondary submenu to put the receiver into split mode operation. Instructions are included in model 639 manual in their section on Hidden Menu settings. The model 632 has its split mode operation detailed on an Application Note available on the Inovonics web site. Both models have similar setup and the instructions have copied below for your convenience.

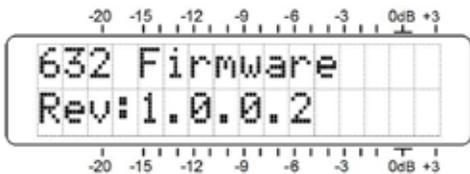
Note: The Inovonics Split Mode settings are not backed up in memory. Their instructions detail split mode operation as temporary for checking and setting up the diversity delay. As stated previously in Section 1 of this guide, these receivers will need to have a power backup method to keep them locked in the split mode operation.

3.1.1 Inovonics Sub-Menu Instructions

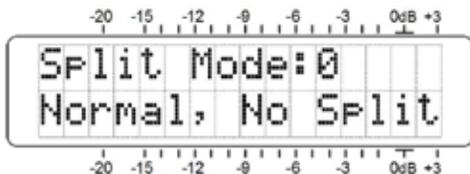
1. Set the 632 to receive the HD1 digital program as shown in the following screenshot.



2. Push and hold the <MENU> knob until the LDC display changes to the Firmware Revision screen. This requires holding the knob down for several seconds.



3. Once the Revision screen appears on the LDC display, release the knob, and then turn it clockwise three notches. This will bring up the Split Mode screen. Note that the default setting for this option is 0 (zero), meaning that the Split Mode is not activated.



4. Push the knob again. The 0 (zero) will begin blinking. Now turn the knob one notch clockwise to change the 0 to 1, as depicted here, and push the knob once again to lock-in this mode. At this point the HD Radio digital audio program will be heard in the right channel, and the analog FM signal in the left channel.

