

Innovator<sup>®</sup> LX

Low Power Solid State Transmitters





## The Innovator LX

Designed to provide broadcasters with a product that will meet their needs like no other solution on the market, this new low to medium power transmitter line uses our frequency agile exciter and the latest LDMOS devices for broadband operation across the entire UHF band. This allows users to minimize spare parts stock, which is especially important to group owners and networks, and also enables simple and inexpensive channel changes for users with channels out of the core or expected to be displaced in the future.

The very compact and completely modular design uses a chassis/backplane configuration with parallel amplifier and power supply modules which can be removed and replaced while the transmitter is on the air. Additionally, with many broadcasters choosing to begin digital operation at low power and moving to high power in the future, the Innovator LX series was designed to drive a high power transmitter with nearly 100% reuse, protecting your investment into the future.

Configurations are available in power levels from 10 watts to 6 kilowatts analog and up to 3 kilowatts digital.

## Exciter Chassis

The modular design of the Innovator LX allows it to be configured for analog or digital operation and as a transmitter, translator or booster by choosing the appropriate slide-in modules or rack-mount chassis.

### Analog Modulator

The analog modulator contains the circuitry to correct the input video and audio signals, which are then converted to a combined, modulated IF signal. In the modulator, a sync tip clamp restores the proper video DC level, and sync and white clipping limit video transient faults. The video signal is then modulated to IF and passed through a SAW filter for precise sideband filtering with minimal group delay error.

### Receiver

In analog and digital translator and booster configurations, Axcera's modular, frequency-agile receiver plugs directly into the LX exciter chassis. This advanced receiver can be tuned to accept an off-air RF input on any frequency in the operating band. The signal is then down-converted to IF with a low phase noise synthesized oscillator, ensuring excellent signal quality. The available "modulator option" includes both a modulator and a receiver, along with a switcher, which allows either input to be selected remotely for local program insertion or as a backup signal source.

### IF Processor

The visual and aural modulated IF signals are combined and applied to IF processing module. This stage provides outstanding amplitude linearity, incidental carrier phase modulation (ICPM), and frequency response signal pre-correction to yield an extremely linear transmitter output.

### Digital Modulator - ATSC

For ATSC operation, the analog modulator is replaced by Axcera's DM8 modulator. This ATSC compliant modulator accepts a SMPTE 310M input signal which is randomized and then forward error corrected (FEC) through Reed-Solomon encoding, data field interleaving, and trellis coding. Digital linear and non-linear correction is then applied, and the signal is modulated to the 8VSB IF.

### Digital Modulator - DVB

For DVB-T and DVB-H applications, the Innovator LX is available with Axcera's DVB1A-R COFDM modulator. Like the DM8, this unit offers digital linear and non-linear precorrection for a high quality output signal. Other available features include DVB-H and SFN modes, hierarchical modulation and more.

### Upconverter

The frequency agile upconverter accepts the IF and converts it to any UHF or VHF channel using a very low phase noise dual-conversion synthesized oscillator. The output channel is easily selected through the front panel of the controller for a truly frequency agile exciter/driver chassis.

### Driver Amplifier

The power amplifier module can be configured as a linear driver or as a final amplifier for a 100W analog/50W digital transmitter. As a linear driver, the amplifier module uses low level amplification feeding a low power class A amplifier configured to

drive an Innovator LX power amplifier chassis. This configuration is also offered as a 10W analog/5W digital transmitter. For the 100W analog/50W digital configuration, a dual transistor LDMOS amplifier provides excellent linearity, efficiency and reliability. An automatic gain control (AGC) loop ensures a stable signal level.

### Control and Monitoring

All transmitter control and monitoring functions are available at the exciter through front panel controls, LED status indicators and an informational LCD display. The Axcera-designed in-circuit programmable system controller provides a detailed look into the operation of the transmitter system through a soft-key interface. Parameters such as forward and reflected power, transistor currents, power supply voltages, module temperatures, system mode, and much more can be viewed directly from the front of the exciter.

## Power Amplifier Chassis

The Innovator LX power amplifier chassis provides parallel RF paths for excellent on-air reliability. The modular design allows each chassis to be configured with one, two or four amplifier sleds, depending upon output power requirements. Thanks to high-density heat sinks and efficient air-cooling, a fully populated chassis provides an amazing 1000W analog/500W ATSC/350W DVB output power. Multiple power amplifier chassis can be combined for power levels to 6000W analog/3000W ATSC/1850W DVB.

Reliability is enhanced with dual power supplies, each serving two amplifier modules. Additionally, dual module configurations can be fitted with a power supply dedicated to each module.

## Protection

To ensure that the Innovator LX will provide reliable service in challenging environments, a high degree of protection is provided in each amplifier chassis. Overdrive, VSWR and overtemperature protection are all included.

More than just VSWR cutback, Axcera's Intelligent VSWR Protection™ (IVP) actually recognizes the cause of VSWR and reacts appropriately in order to protect the entire transmission system while ensuring minimal loss of signal coverage. This unique feature determines whether the high VSWR is caused by a catastrophic problem like a transmission line arc, or if it is a temporary problem such as antenna icing. In the catastrophic case a typical transmitter may continue to produce power, resulting in expensive antenna, transmission line or RF system repairs. But with Axcera's IVP, the system will quickly remove drive to the final amplifier, avoiding further damage to the system components. For a temporary VSWR condition like antenna icing, the system will remain on the air at a reduced power level until the VSWR returns to a normal level, ensuring minimal coverage loss during the VSWR condition.

AGC around the system ensures that the transmitter output remains stable. An output bandpass and trap filter is included to provide superior out of band rejection. This RF network also adds lightning protection through the DC short circuit of the band pass filter.

## Dual-Use™ Functionality

With Axcera's exclusive Dual-Use option, the Innovator LX is configured with both the Axcera DM8 ATSC (or DMC-R DVB) modulator and our analog modulator card, along with an integral switcher. This allows the input to be switched between analog and digital operation at the touch of a button, both locally and by remote control. As a backup transmitter, Dual-Use allows a single Innovator LX broadband transmitter to simultaneously back up both a main analog and a main digital transmitter, eliminating the need for separate analog and digital standby transmitters. For low power broadcasters approaching the digital transition, Dual-Use allows the Innovator LX to "flash-cut" between analog and digital operation on demand, at the touch of a button. With Dual-Use, the Innovator LX can even be switched between digital and analog operation during the programming day, offering LPTV broadcasters the potential to maintain both digital and analog audiences throughout the digital transition.

## Features & Benefits

### Agile Exciter & Broadband LDMOS Amplifier Modules

The frequency agile exciter and broadband solid state amplifier modules cover the entire UHF band, minimizing spare parts stock and simplifying channel changes.

### Parallel Amplifiers and Power Supplies

Power levels of 500W analog/250W ATSC/175W DVB and higher available with parallel amplifier modules and power supplies for excellent reliability

### Axcera ATSC Digital Modulator

For DTV operation, our fully ATSC compliant 8VSB modulator is designed and manufactured by Axcera. Utilizing programmable digital equalization, this modulator provides linear and non-linear precorrection, providing excellent SNR performance.

### Axcera DVB-T/H Digital Modulator

For DVB-T and DVB-H applications, Axcera's DVB1A-R COFDM modulator offers digital linear and non-linear precorrection for a high quality output signal. Other available features include DVB-H SFN modes, hierarchical modulation and more.

### ±1kHz Frequency Stability Standard

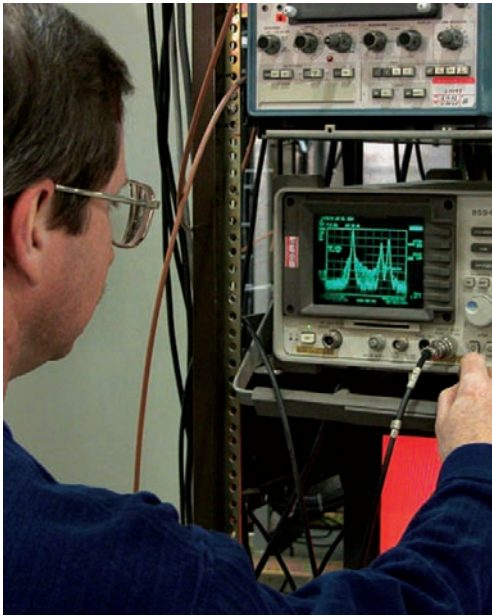
No options are necessary for operation with a channel offset, and the exciter can be locked to a precision source for precise frequency applications.

### Protection Circuitry

We have built a high degree of protection into all of our transmitters and exciter systems. Features such as Intelligent VSWR Protection™ and overtemperature and overdrive circuits protect the system from undesirable conditions. Additionally, RF shielded circuit enclosures help our products to operate free of interference even in high RF environments.

### Remote Control Capability

Each Innovator LX includes an easily accessible interface designed to work with standard remote control systems.



## Manufacturing & Support

All Innovator LX series transmitters are completely designed, built and factory tested in the USA by Axcera under strict ISO9001:2000 control. This ensures the highest quality manufacturing practices and provides parts and service availability in a very timely fashion, keeping you on the air.

All Axcera broadcast products come with unlimited customer telephone support - 24 hours/day, 7 days/week. Since our facilities are located just south of Pittsburgh, Pennsylvania, we are able to offer quick turnaround on most replacement modules and timely shipping from the Pittsburgh International Airport.

Like all Axcera transmitters, these units are designed using no Axcera proprietary parts. Whenever possible, all components carry their original manufacturer's part number, allowing users to purchase components either from Axcera or directly from the OEM vendor. This offers the security that you will always receive a fair price on replacement components throughout the life of the transmitter.

Axcera's service and support organization is widely regarded as the most reliable in the industry, and in over 25 years in business, Axcera has never discontinued support of any of its product lines.



[www.axcera.com](http://www.axcera.com)

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