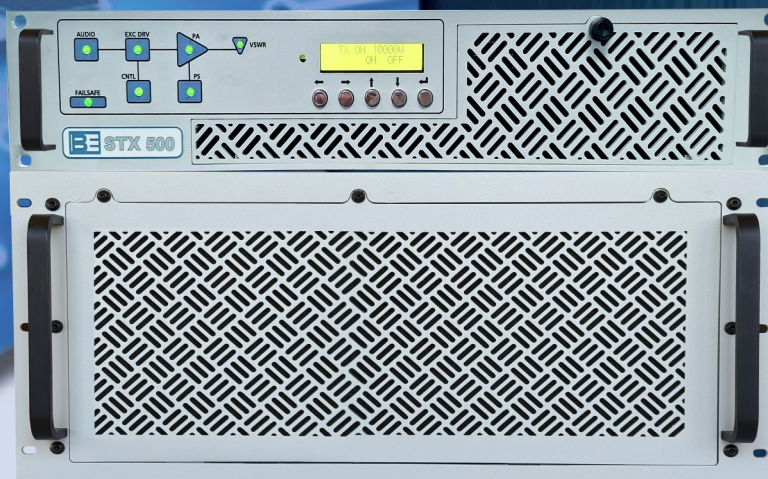




Broadcast Electronics

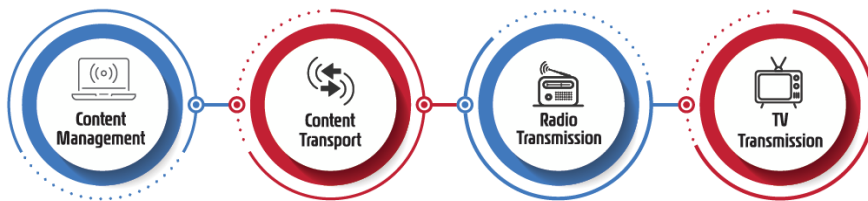


MTX Series Modular High Efficiency FM Transmitters

Overview

Broadcast Electronics has an over 67-year legacy of providing innovative technology to enable radio and TV broadcasters to deliver compelling content to their audiences and create revenue-generating business opportunities. Supporting global innovation and next-generation content delivery, Broadcast Electronics embodies a customer-first approach to the market from the company's headquarters in Quincy, Illinois in the United States.

Customer-focused solutions from Broadcast Electronics are built on four technological areas:

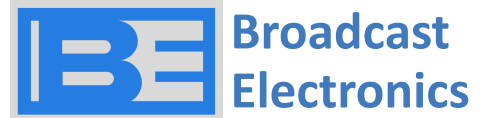


AudioVault is BE's award-winning suite of Content Management software enabling live and automated program creation and playout, news solutions, and digital logging as well as data management.

The Marti range enables content Transportation, powering audio contribution and distribution for point-to-point (STL) wireless connectivity.

Radio Transmission is the heart of Broadcast Electronics with multiple product lines to support AM and FM transmission. The BE STX line of HD Radio® ready FM transmitters provides superior sonic quality and low operating cost. The BE ETX analog FM transmitters deliver compact, efficiency in a redundancy-equipped package. The BE AMX line of transmitters provides rugged, reliable, energy-efficient peace of mind for your AM radio station.

Broadcast Electronics' complete line of **low and high-power TV transmitters** are designed around a software defined core exciter that can cover all the global analog and digital TV standards. With solutions covering UHF and VHF frequency bands and air-cooling configurations, BE can craft the right solution to meet your technical, budgetary, and operating requirements.



Broadcast Electronics is a global technology company dedicated to driving innovation in broadcast technology providing market leading solutions for software-based content management, Radio & Television transmission, and scientific applications of radio frequency devices.

Broadcast Electronics, has been providing high-tech solutions for broadcasters for more than 67 years in over 170 countries. All of our products and services come from a heritage of creativity and innovation unmatched in the industry, focused on developing innovative solutions for customers problems.



Every major innovation that shaped modern radio originated in Quincy, and it is here that BE products are designed, supported, and manufactured today.

Our facility in Quincy employs the latest instruments for research, new product design, prototype fabrication and testing.

We take advantage of the best practices of automated production, adding human attention to detail to ensure every product that leaves our factory meets or exceeds its published specifications.

MTX FM Transmitter Series

The MTX builds on the high performing and reliable core exciter and control system from the award winning STX line, and brings new highly efficient amplifiers and power supplies to deliver a innovative platform of reliable, efficient, and performance-leading FM transmitters from Broadcast Electronics. MTX breaks the mold with high energy efficiency to lower operating costs, world-class audio performance, maximum reliability and uptime, simplified and fast field repair, built-in redundancy, and the flexibility to support continued technological updates over time.

The Best Audio Quality—Ultimate Reliability

Broadcast Electronics MTX is an innovative technology platform using plug-and-play modules that can be combined to create transmitters across a wide range of powers. MTX delivers a high-performance, cost-effective solution with models from 500 W to 40 kW and beyond. Leveraging the highly efficient and compact RF technology of the latest ruggedized LDMOS RF devices the MTX provides the efficiency, compactness, and reliability you have come to expect.

We didn't stop there, drawing from BE's decades of providing the best-sounding FM exciter on the market—the STX exciter—is at the heart of MTX with a digital direct-to-channel FM modulator and ultra-reliable highly efficient hot-pluggable power supplies to deliver the maintainability and robustness our customers have come to expect with the performance and reliability BE is known for.

MTX has been designed for maximum reliability and uptime, simplified and fast field repair, built-in redundancy, ease of stocking and replacing parts, and is designed with the flexibility to support continued technological updates over time.

Swapping out parts in the ultra-modular hot-pluggable system is very simple and does not require specialized technicians, just turn it on and set the frequency and power.

MTX's integrated web-enabled diagnostics allows for remote support to complement your technical team, and even deploy our resources to manage the technology if you want. – We simplify the management and field operations of your network.

Flexible options — software-enabled

BE knows that in the fast-paced and evolving world of broadcast radio, the adage—the only constant is change—holds. You need to invest in cost-effective tools for today but maintain the flexibility to expand your system when things change tomorrow—all without ripping things out and starting over. The MTX supports all analog and digital FM Radio standards such as Analog FM, HD Radio®, DRM+ and emerging technologies.

You bring the content; we will help you deliver it to your audience cost-effectively!

Put these powerful capabilities to work for you

- Models from 500 W to 44kW
- Ultra compact size and low weight
- Direct-to-channel digital modulator
- HD Radio & DRM+ operation
- Outstanding Audio performance
- High efficiency delivers up to 75% AC to RF Efficiency
- Hot-Pluggable / Front Access Power Supplies
- Hot-Pluggable / Front Access RF modules
- Seamless operations over a wide range of voltages and power stability
- Run at maximum power up to 1.5:1 VSWR w/proportional foldback
- IP Connectivity with HTML5 GUI for anytime, anywhere access
- Flexible alerts, monitor and control SNMP
- Comprehensive event log stores 5000 events—simplifies troubleshooting
- Built in RDS Encoder and digital Stereo Generator
- Optional Stereo Tool for powerful cost effective audio processing
- HLS Streaming input via Stereo Tool
- Optional Micro MPX for robust IP STL transport
- Removable front panel grill and washable filter for clean operation
- Multiple Program Inputs with silence sensor and auto failover
- Single Frequency Network capable with built-in Audio delay
- N+1 Capable, Main/Alternate Capable
- SNMP Level 3 Security and Control

Digital Modulator—The Heart of the Transmitter

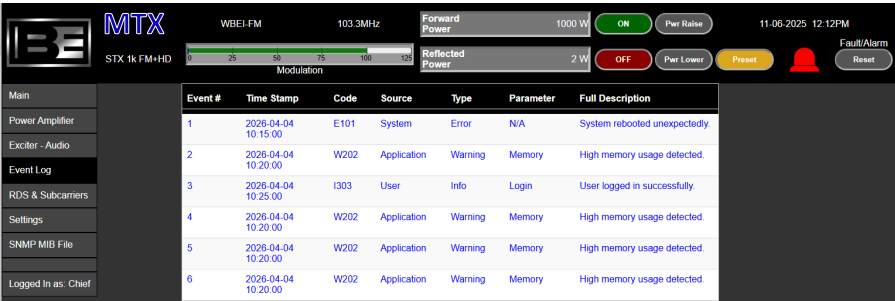
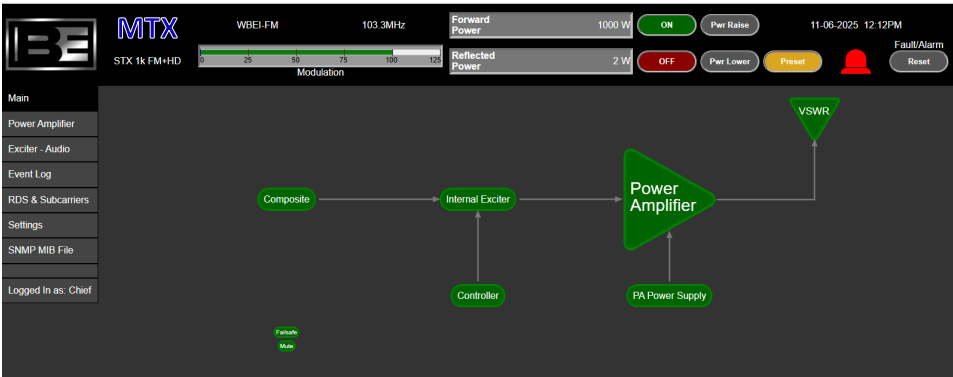
Building on BE’s long legacy of superior-sounding FM excitors, MTX continues the tradition with a state-of-the-art STX Digital Direct to Channel (DTC) modulator of unrivaled precision and sonic clarity inside every transmitter.



The MTX features a digital exciter that can produce the best AES audio but is also capable of broadcasting in HD or DRM+. Flexible audio input options including Analog, AES composite AES 192 digital compose all with configurable automatic switch over to a back up source. MTX boasts plenty of inputs for SCA’s, RDS plus integrated digital stereo generator and an RDS generator. There is even built in switching to support dual excitors.

Advanced Monitor and Control Capability

MTX builds on the proven STX control architecture that has been updated with an new powerful yet simple-to-use browser-based HTML-5 graphical user interface for control and monitoring of the transmitter anywhere in the world. Responsive design ensures it is easy to read and use on a wide range of devices tailoring the display to best match your device—large PC monitor to a smart phone. Extensive TCP/IP network connectivity via integrated RJ-45 connection allows the transmitter to be securely connected to any IP network. Integrated multiuser multilevel password protection ensures only authorized operation on your network



MTX also supports a robust SNMPv3 – (Simple Network Management Protocol) interface for easy connection with a wide array of powerful software network manager systems and popular transmitter remote controls. The entire transmission system can be controlled and monitored using the standard published MIB protocols.

MTX provides a comprehensive event log that captures all transmitter-related activities, operations, and faults storing the 5000 most recent activities. This allows for detailed diagnostics and simplified routine maintenance.

Remote Monitor and Control interfaces supported include:

Popular parallel interface to panels and legacy remote-control systems

SNMP connectivity for alerts, monitoring, and control

Web GUI via ethernet network connection RJ-45 (10/100Base-T) with TCP/IP protocol

Amplifier Design Provides Robust and Efficient Operation

MTX employs the latest ruggedized LDMOS-power amplifier device technology coupled with innovative amplifier design to provide robust & efficient analog and HD Radio operation. All amplifiers and power supplies are designed for simple removal from the front panel for easy serviceability. The MTX controller constantly monitors the power supplies and RF amplifiers to automatically operate the system at the desired power, efficiency and reliability.

Redundant rugged amplifiers and low-loss combiners protect against lightning, antenna system shorts, and high VSWR to keep you on-air. These innovations reduce operating and maintenance costs, which provide a low total cost of ownership over the life of the transmitter - maximizing your investment.

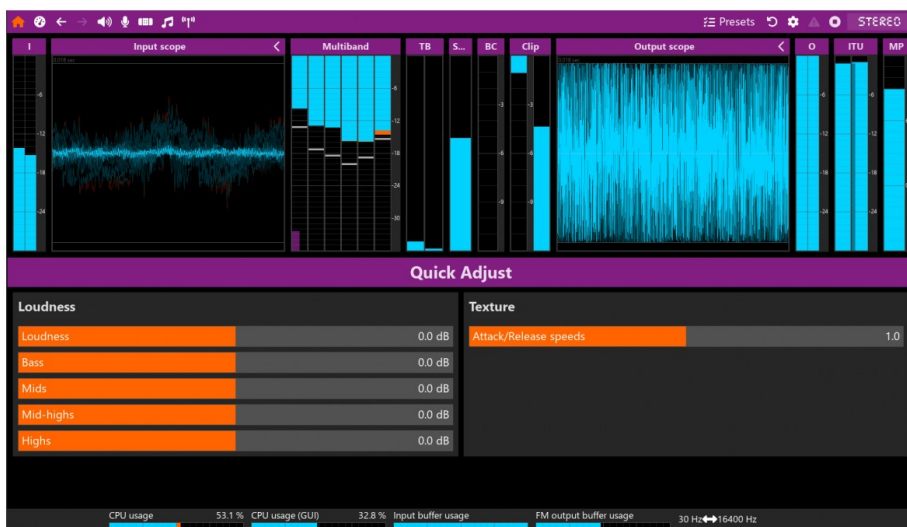
Audio Software Options

Stereo Tool—Powerful Audio Processing, Pleasing Price

Stereo Tool is a software-based audio processor which offers outstanding audio quality and comes with many unique features. It is used by over 3000 FM stations ranging from small local stations to 50 w to 100 kW stations and major nationwide networks.

Complete FM processing including AGC, compression, equalization, limiting, clipping, high performance stereo generator, composite clipping and much more. Complete details at StereoTool.com

Stereo Tool on your STX 1k transmitter simplifies the workflow allowing you to take full advantage of the great sounding STX exciter technology for a competitive edge in your market. Complete control with presets, and expert level adjustment all via the HTML5 browsers interface with security. Stereo Tool can even accept HLS streaming input to simplify your distribution.



Micro MPX—simplifies transporting audio over standard IP networks

MicroMPX is our STL (studio-to-transmitter link) codec. It transports a full FM composite MPX signal, including pilot and RDS, at bitrates from 320 kbit/s, with perfect peak control. Using MicroMPX you can generate your signal completely in your studio and easily distribute it to all your transmitters

MicroMPX is a codec that is specifically designed for FM. It doesn't cause typical lossy codec artifacts (pre/post ringing, watery sound), and perfectly maintains peak control, even when using composite clipping. This eliminates the need to have an expensive high end audio processor or stereo/RDS generator at the transmitter site.

MicroMPX has built-in error correction for connection drops, and supports dual paths (you can send the same data over multiple connections, as long as any of them arrive the audio keeps playing). If everything fails, there's a built-in backup audio player.

You can originate your distribution with Micro MPX by simply using the software based encoder at your studio, or you can directly output MicroMPX from many popular audio processors as well as Stereo Tools used at your studio.

SFN: GPS synchronization: Identical MicroMPX receivers that are fed by the same encoder in a Single Frequency Network (SFN) with multiple transmitters that are broadcasting at the same frequency with overlapping reception areas and use GPS synchronization of the decoders and STX 1k transmitters to delivery audio synchronized to within less than 1 μ s.

MTX Transmitters

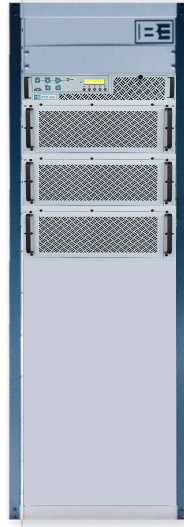
MTX 5



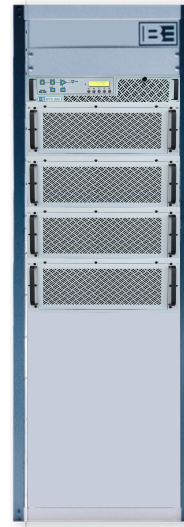
MTX 10



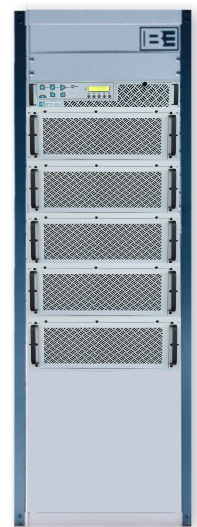
MTX 20



MTX 30



MTX 40



MTX Rock Solid Reliability and Great Sounding Audio Scalable to 40kW and beyond

The Broadcast Electronics MTX family of FM transmitters has been intelligently designed to offer the perfect combination of audio quality, reliability, redundancy, serviceability, and efficiency in a compact design. Each transmitter is crafted with superior attention to detail and features the highest quality components.

MTX Power amplifier modules and hot-pluggable power supplies are all easily accessible saving time on service and maintenance with every part and assembly.

MTX transmitters represent the most advanced technology in terms of electrical efficiency, compactness, reduced weight, ease of use, and remote monitoring. They have been designed to guarantee maximum performance and operation while lowering operational costs through energy saving technology.

The Broadcast Electronics MTX High Power transmitters achieve levels of overall electrical efficiency unseen in the market today, while also providing extremely high operational performance under extreme environmental conditions (high external temperatures, poorly adjusted antenna, fluctuations in the power source).



BE MTX transmitters are designed with digital radio in mind, supporting both HD Radio and DRM+ operation. We provide the flexibility of changing transmission between analog only mode and analog+ HD, all digital or even DRM broadcasts.

Digital Ready – just add an external HD Radio or DRM signal generator when you are ready to make the change.



Specifications

	MTX 5	MTX 10	MTX 20	MTX 30	MTX 40
Range (Output Power)	500 to 5,500	1,000 to 11,000	2,000 to 22,000	3,000 to 33,000	4,000 to 44,000
Modulation Standards	Analog FM HD Radio DRM	Analog FM HD Radio DRM	Analog FM HD Radio DRM	Analog FM HD Radio DRM	Analog FM HD Radio DRM
# of Power Supplies	2	4	8	12	16
Power Factor	.99	.99	.99	.99	.99
# of Power Amplifiers	2	4	8	12	16
Efficiency	Up to 74% typical AC to RF	Up to 74% typical AC to RF	Up to 74% typical AC to RF	Up to 74% typical AC to RF	Up to 74% typical AC to RF
Output Connector	1-5/8" EIA unflanged	3-1/8" EIA unflanged	3-1/8" EIA unflanged	3-1/8" EIA unflanged	3-1/8" EIA unflanged
Analog Input	2x XLR female (Balanced impedance 600Ω/10KΩ selectable)	2x XLR female (Balanced impedance 600Ω/10KΩ selectable)	2x XLR female (Balanced impedance 600Ω/10KΩ selectable)	2x XLR female (Balanced impedance 600Ω/10KΩ selectable)	2x XLR female (Balanced impedance 600Ω/10KΩ selectable)
AES	XLR female (Balanced impedance 600Ω/10KΩ selectable)	XLR female (Balanced impedance 600Ω/10KΩ selectable)	XLR female (Balanced impedance 600Ω/10KΩ selectable)	XLR female (Balanced impedance 600Ω/10KΩ selectable)	XLR female (Balanced impedance 600Ω/10KΩ selectable)
MPX/SCA/RDS input	2x BNC female (Unbalanced impedance 50Ω/10KΩ selectable)	2x BNC female (Unbalanced impedance 50Ω/10KΩ selectable)	2x BNC female (Unbalanced impedance 50Ω/10KΩ selectable)	2x BNC female (Unbalanced impedance 50Ω/10KΩ selectable)	2x BNC female (Unbalanced impedance 50Ω/10KΩ selectable)
Operating Temperature	-10°C to +50°C 95% non- condensing	-10°C to +50°C 95% non- condensing	-10°C to +50°C 95% non- condensing	-10°C to +50°C 95% non- condensing	-10°C to +50°C 95% non- condensing
Maximum operating altitude (ft / m)	10,000 / 3,000	1,0000 / 3,000	10,000 / 3,000	10,000 / 3,000	10,000 / 3,000
AC Input Voltage (47-63Hz)	1-Ph 175-265 V or 3-Ph 175-265 V / 303-459 V	1-Ph 175-265 V or 3-Ph 175-265 V / 303-459 V	1-Ph 175-265 V or 3-Ph 175-265 V / 303-459 V	1-Ph 175-265 V or 3-Ph 175-265 V / 303-459 V	1-Ph 175-265 V or 3-Ph 175-265 V / 303-459 V
Dimensions (W x H x D, inches / cm)	19 x 6 RU (10.5) x 26 inches 48 x 26.7 x 66 cm	19 x 6 RU (10.5) x 26 inches 48 x 26.7 x 66 cm	22.5 x 64 x 33 inches 58 x 163 x 84 cm	22.5 x 64 x 33 inches 58 x 163 x 84 cm	22.5 x 64 x 33 inches 58 x 163 x 84 cm
Weight (LBS / Kgs)	68 / 31	85 / 39	350 / 158	450 / 205	650 / 295

RF Specifications	
Transmitter Type	Solid State VHF FM transmitter for analog FM: 87.5 MHz to 108 MHz; 10 kHz increments
Output Power	1,000 W to ~ 44,000 W 50 ohms
Efficiency	Up to 74% typical AC to RF
Modulation Type	Direct-to-channel digitally generated FM (no analog up-conversion)
Modulation Capabilities	Standard: ± 75 kHz peak deviation – Max: ± 300 kHz peak deviation
Spurious and Harmonic	Compliant with ETSI and FCC specification—85dB or better; low pass filter standard
Asynchronous AM S/N Ratio	Better than -65dB (-75dB Typical) referenced to average peak-to-peak carrier amplitude. 75uSec de-emphasis)
Synchronous AM S/N Ratio	Better than 60dB referenced to average peak-to-peak carrier amplitude. 75kHz deviation @400Hz
VSWR	Normal operation up to 1.5:1 Integrated Proportional Fold-back and Fast Protection
Regulatory	FCC; IC; CE; BETS-6; IEC 215 Safety
Audio Specifications	
Audio Inputs	AES, L&R analog, composite, SCA/ RBDS/RDS external generator input, SCA audio inputs (2)
Amplitude Response	Composite/ AES: ± 0.03 dB, 30 Hz to 53 kHz; ± 0.1 dB, 53kHz to 100kHz Analog L&R: ± 0.25 , 30Hz to 53kHz
Total Harmonic Distortion + Noise	Composite: 0.005% or less @400Hz, 10-22kHz bandwidth, 75uSec deemphasis. AES/ Analog L/R Stereo: -0.01 typical @ 400 Hz, 10-22kHz bandwidth 75uSec deemphasis
Composite Intermodulation Distortion	0.13% SMPTE (60/7000 Hz, 1:1 ratio), DIM-B: 0.008% (14kHz)
S/N Ratio	AES: 95dB typical below 100% modulation @ 400Hz-22kHz bandwidth, A-weighted filter 100dB typical below 100% modulation @ 400Hz, 10Hz-22kHz bandwidth, CCIR-468 filter Analog: 93dB typical below 100% modulation @ 400Hz, 10Hz-22kHz bandwidth, A-weighted filter 98dB typical below 100% modulation @ 400Hz, 10Hz-22kHz bandwidth, CCIR-468 filter Stereo: 80dB or better below 100% modulation @ 400Hz, unweighted
Stereo Separation	AES: -74dB below 100% modulation @400Hz. Analog L/R: -70dB, 30Hz to 15kHz
IMD Distortion	SMPTE: 0.01% or less (60/7000Hz; 1:1 ratio) DIM-B: 0.005% typical (14 Hz)

Service and Support

We know that having the right support behind a product is every bit as important as the features and capabilities it delivers. At Broadcast Electronics we are committed to provide you with not only great products and software, but a dedicated team of service experts to help you keep your station running smoothly for years to come.

Training

Broadcast Electronics has long provided training programs for our products to educate and prepare users to operate and maintain them in the most effective possible manner. Training is offered for all styles of transmitters and Audio Vault systems, featuring a mix of instruction with hands-on operation and troubleshooting. Training programs can be crafted to meet your local needs, offered in our facility, at your location, or online. Many of our programs can provide SBE ongoing educational credits.

Warranty

You can rest assured that Broadcast Electronics stands behind its products and services to provide complete satisfaction.

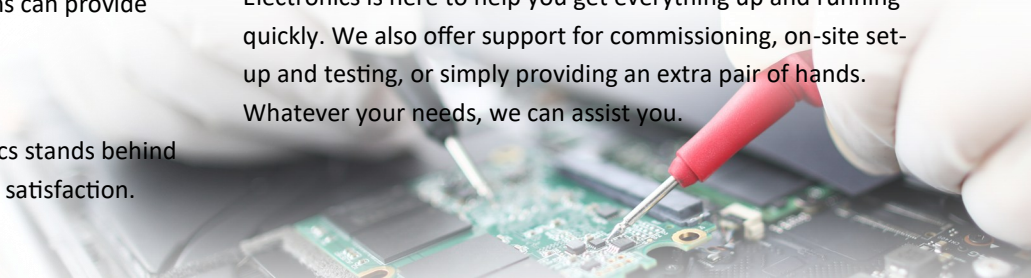
Our products offer a standard set of warranty services that exceed others in the industry.

Repair Service

As a leader in providing innovative products and solutions to broadcasters around the globe, Broadcast Electronics understands the need for long life and years of trouble-free service. You can feel secure that if disaster strikes and your products need service, we offer complete repair and refurbishment service to get you back on the air delivering your high-quality programming quickly.

On-Site Service and Installation

Whether you need assistance troubleshooting an existing transmitter or Audio Vault system or require a complete installation of a new one, the global service team at Broadcast Electronics is here to help you get everything up and running quickly. We also offer support for commissioning, on-site set-up and testing, or simply providing an extra pair of hands. Whatever your needs, we can assist you.





Broadcast Electronics

Telephone (217) 224-9600
4100 North 24th Street
Quincy, Illinois 62305-3606 U.S.A.
www.bdcast.com