Broadcast Electronics

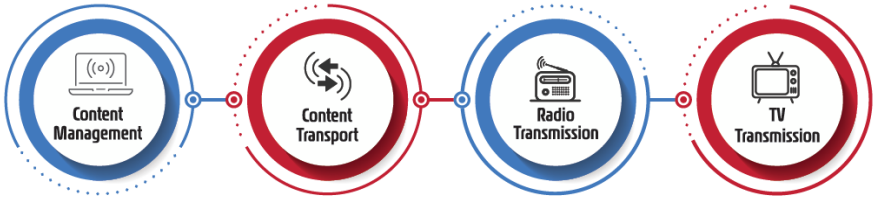
AM-A Series

AM Transmitters

Overview

Broadcast Electronics has an over 65-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 AM 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

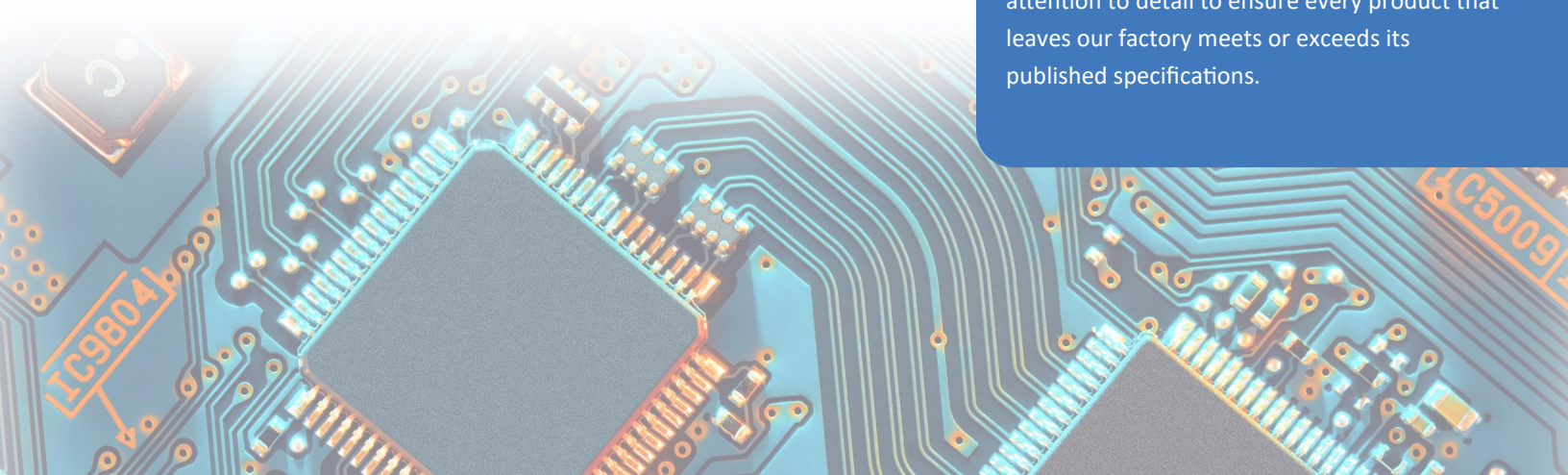
Broadcast Electronics is a global technology company dedicated to driving innovation in broadcast technology providing market leading solutions for software-based content management, Radio & Television transmission, and scientific applications of radio frequency devices.

Broadcast Electronics, has been providing high-tech solutions for broadcasters for more than 65 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.



BE AM Transmitter Series

The AM Series of solid state transmitters continues the legacy of reliable, efficient, and performance-leading solutions from Broadcast Electronics. The AM Series has been designed for high 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.

Excellent Audio Quality—Modular Reliability

Broadcast Electronics AM Series transmitters pack huge features into small packages, freeing up valuable floor space, lowering shipping costs, and placing them well ahead of the competition!

The AM Series transmitters produce superior audio quality for your listeners while maximizing reliability and redundancy, protecting your revenue stream from unexpected downtime.

The AM Series are the only transmitters on the market that incorporate multiple regulated power supplies, allowing you to achieve uncompromised redundancy for ultimate on-air reliability. Patented class E power modules save money and add to the bottom line, by achieving unequaled power economy to reduce your overall operational expenses.

With more flexibility than ever before, BE's AM Series transmitters also give you the ability to operate at 5 user-defined power levels. One transmitter can handle all your power needs, providing the most cost-efficient transmitter in its class. The AM Series transmitters can operate efficiently at both high and lower power levels, maintaining unparalleled performance to accommodate all your day and nighttime power needs.

Put these powerful capabilities to work for you

- Models from 500 W to 10 kW
- Compact size and low weight
- Operates at 5 user-defined power levels
- HD Radio & DRM+ operation
- Outstanding Audio performance
- High efficiency—delivers over 80% AC to RF Efficiency
- Hot-Pluggable / Front Access RF modules
- Front panel modulation metering eliminates the need to purchase an outboard modulation monitor
- Electronically regulated power supplies avoid the need to purchase an external voltage regulator
- Output tuning network compensates for daily variations of antenna loads and even serves as an output coupler for an emergency antenna
- Seamless operations over a wide range of voltages and power stability
- Low noise super cooling system
- Run at maximum power up to 1.5:1 VSWR w/proportional foldback
- IP Connectivity with HTML5 GUI for anytime, anywhere access
- Comprehensive event log stores 500 events—simplifies troubleshooting
- Optional AM Stereo Generator

RF Amplifier Module—The Heart of the Transmitter

At the heart of every BE AM Series transmitter is the integrated RF amplifier/ modulator module. The AM Series employs patented class E power amplifier technology coupled with innovative modulator design to provide robust & efficient analog, HD Radio and DRM operation. The AM Series 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.

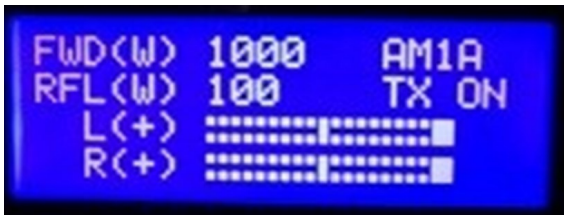
Simple On-Air Serviceability

All Broadcast Electronics AM Series transmitters are skillfully designed to provide easy on-air servicing and maintenance. The front panel removable design allows for any needed repair or replacement to be performed whenever it is convenient, by simple removal and replacement with a new or repaired module. Ventilation is provided by redundant brushless ball bearing fans mounted on the rear door with cooling airflow channels across all modules and power supplies for maximum heat removal, further ensuring cool operation and long term reliability.

Regulated Power Supplies—a BE Exclusive

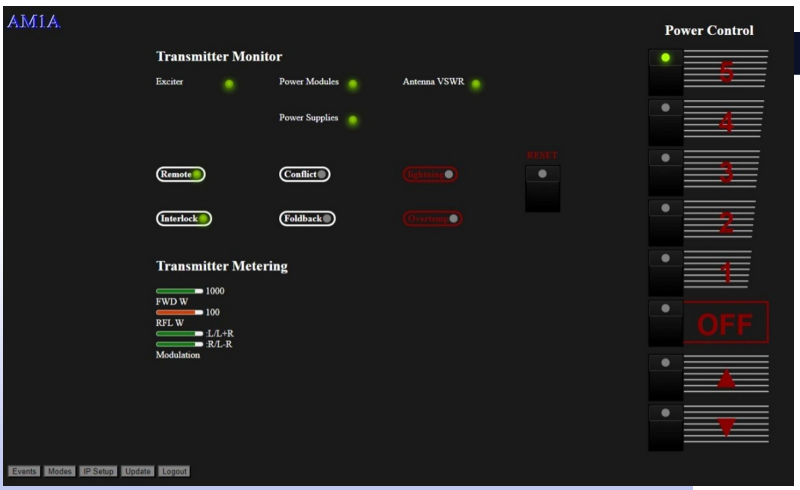
Only Broadcast Electronics AM Series transmitters use independently regulated power supplies to power the Amplifier and Modulator functions in each transmitter. By using a regulated power supply only BE is able to provide great sounding audio at lower power levels, such as nighttime or critical hours when your station is required to reduce power. We will adjust the power supply—prior to the amplifier and modulator—to operate at very low power yet still delivering the best audio performance possible. Other designs use simple unregulated supplies and make audio performance impairing adjustments to the modulators to operate at reduce power.

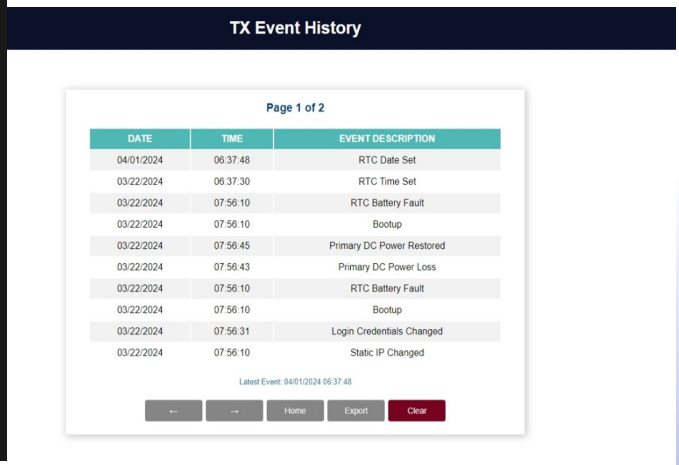
New Advanced Monitor and Control Capability



New to the BE AM Series is a updated LCD display and powerful yet simple-to-use browser-based HTML-5 graphical user interface for control and monitoring of the transmitter anywhere in the world. Extensive TCP/IP network connectivity via integrated RJ-45 connection allows the transmitter to be securely connected to any IP network. The new controller also provides a comprehensive event log that captures all transmitter-related activities, operations, and faults storing the 500 most recent activities. This allows for detailed diagnostics and simplified routine maintenance.

The updated control functionality and web GUI can be added to existing BE AM Seriese Transmitters with a simple to install upgrade kit and front panel.





BE AM Transmitters

AM 500A

AM 1A

AM 2.5A

AM 5A

AM 6A

AM 10A

BE AM: Rock Solid Reliability and Great Sounding Audio

The Broadcast Electronics AM family of AM 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.

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

BE AM 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 AM transmitters achieve high levels of overall electrical , while also providing extremely high operational performance under extreme environmental conditions (high external temperatures, poorly adjusted antenna, fluctuations in the power source).

HD Radio DRM

All BE AM Series 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 or DRM broadcasts.

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

Specifications

	AM 500A	AM 1A	AM 2.5E	AM 5E	AM 6A	AM 10A
RF SPECIFICATIONS						
Range (Output Power)	5 W to 500 W	5 W to 1.1 kW	12 W to 2.5 kW	25 W to 5 kW	25 W to 6.6 kW	50 W to 10.8 kW
Accuracy (Output Power)	2% full scale	2% full scale	1% full scale	1% full scale	1% full scale	1% full scale
Efficiency	65% or better, 500 W carrier into 50 Ohm load	65% or better, 1 kW carrier into 50 Ohm load	82% or better, 2.5 kW carrier into 50 Ohm load	82% or better, 5 kW carrier into 50 Ohm load	82% or better, 2.5 kW carrier into 50 Ohm load	82% or better, 10 kW carrier into 50 Ohm load
VSWR	Nominal 1.3:1 at full carrier power; will operate into higher VSWR with automatic power reduction, open and short circuit protected	Nominal 1.3:1 at full carrier power; will operate into higher VSWR with automatic power reduction, open and short circuit protected	Nominal 1.5:1 at full carrier power; will operate into higher VSWR with automatic power reduction, open and short circuit protected	Nominal 1.5:1 at full carrier power; will operate into higher VSWR with automatic power reduction, open and short circuit protected	Nominal 1.5:1 at full carrier power; will operate into higher VSWR with automatic power reduction, open and short circuit protected	Nominal 1.4:1 at full carrier power; will operate into higher VSWR with automatic power reduction, open and short circuit protected
AUDIO SPECIFICATIONS						
Amplitude Response (Stereo w/Optional Card)	+/- 0.5 dB, 20 Hz to 10 kHz					
THD + Noise (Stereo with Optional Card)	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power					
S/N Radio (Stereo with Optional Stereo Card)	>55 dB below a reference level equivalent to 100% negative modulation of either left or right channel in a 22 Hz to 30 kHz bandwidth, unweighted	>65 dB below a reference level equivalent to 100% negative modulation of either left or right channel in a 22 Hz to 30 kHz bandwidth, unweighted	>55 dB below a reference level equivalent to 100% negative modulation of either left or right channel in a 22 Hz to 30 kHz bandwidth, unweighted	>55 dB below a reference level equivalent to 100% negative modulation of either left or right channel in a 22 Hz to 30 kHz bandwidth, unweighted	>55 dB below a reference level equivalent to 100% negative modulation of either left or right channel in a 22 Hz to 30 kHz bandwidth, unweighted	>55 dB below a reference level equivalent to 100% negative modulation of either left or right channel in a 22 Hz to 30 kHz bandwidth, unweighted
Separation (Stereo with Optional Card)	-30 dB or better, 50 Hz ro 10 kHz, at 50% single channel modulation into a 50 Ohm resistive load, at rated power					
Amplitude Response (Mono)	+/- 0.5 dB, 20 Hz to 10 kHz at 90% negative modulation (linear phase mode), +0.1 dB -3, 20 Hz to 10 kHz at 90% negative modulation, standard					
THD + Noise (Mono)	<1.2%, 20 Hz to 10 kHz at rated power	<0.8%, 20 Hz to 10 kHz at rated power	<0.8%, 20 Hz to 10 kHz at rated power	<0.8%, 20 Hz to 10 kHz at rated power	<0.8%, 20 Hz to 10 kHz at rated power	<0.8%, 20 Hz to 10 kHz at rated power

Specifications

	AM 500A	AM 1A	AM 2.5E	AM 5E	AM 6A	AM 10A
MECHANICAL/PHYSICAL						
Size (Unpacked)	ECU: 19" W x 14.4" D x 10.5" H (48.0 x 36.6 x 26.7 cm) Output Network: 19" W x 27.1" D x 14" H (48.3 x 68.8 x 35.6 cm)	ECU: 19: W x 14.4" D x 10.5" H (48 x 36.6 x 26.7 cm) Output Network: 19" W x 27.1" D x 14" H (48.3 x 68.8 x 35.6 cm)	24.82" W x 31.55" D x 71.32" H (63.0 x 80.1 x 181.2 cm)	24.82" W x 31.55" D x 71.32" H (63.0 x 80.1 x 181.2 cm)	27.3" W x 37.0" D x 73.5" H (69.3 x 94.0 x 186.7 cm)	27.3" W x 37.0" D x 73.5" H (69.3 x 94.0 x 186.7 cm)
Weight (Unpacked)	90.6 lbs (41.1 kg)	90.6 lbs (41.1 kg)	410 lbs (186 kg)	525 lbs (238 kg)	442 lbs (200 kg)	635 lbs (288 kg)
Airflow (Outlet Size)	ECU: 9.5" x 14" (24.1 x 35.6 cm) Output Network: 6.5" x 4.0" (16.5 x 10.2 cm)	ECU: 9.5" x 14" (24.1 x 35.6 cm) Output Network: 6.5" x 4.0" (16.5 x 10.2 cm)	9.86" x 15.18" (0.25m x 0.38m)	9.86" x 15.18" (0.25 x 0.38m)	15.69" x 24.38" (39.85 x 61.93 cm)	15.69" x 24.38" (39.85 x 61.93 cm)
RF Output Connector	Type N Female	Type N Female	Clamp and lug	Clamp and lug	Clamp and lug	1 5/8" EIA Flange
ELECTRICAL						
AC Input Voltage	96-252 VAC, 50/60HZ, single phase				196-252 VAC Delta/Wye or 339-437 WAC Wye, 50/60 Hz, three phases; 196-252 VAC, 50/60Hz, single phase	
Disconnect Size	20 A	20 A	40 A	60 A	175A three-phase, 125A single phase	150A three-phase, 225A single phase
AC Wire Size	#12 AWG, THHN	#12 AWG, THHN	#8 AWG, THHN	#6 AWG, THHN	#4 AWG THHN, three phase; #1 AWG THHN, single phase	2/0 AWG THHN, three phase; #250MCM AWG THHN, single phase
Current Draw	9.5 A max	18 A max	35 A max	58 A max	52 A max three phase, 90 A max phase	100A max 3-phase, 150A max phase
Power Consumption (125% sinusoidal mod)	1.25 kW at 500 Watt carrier	2.05 kW at 1 kW carrier	6.05 kW 2500 Watts carrier	10 kW at 5 kW carrier	13.2 kW at 6.6 kW carrier	23 kW at 10.8 kW carrier
Cooling Air Requirements	250 CFM (7.08 M3/min)	250 CFM (7.08 M3/min)	500 CFM (14.16 M3/min)	500 CFM (14.16 M3/min)	720 CFM (20.4 M3/min)	1200 CFM (34.0 M3/min)
Heat Dissipation (at 125% audio tone modulation)	600 Watts maximum for 500W RF output a	850 Watts maximum for 1.1 kW RF output	1650 Watts maximum for 2.5 kW RF output	450 Watts maximum for 5 kW RF output	4200 Watts maximum for 6.6 kW RF output	6000 Watts maximum for 10.8 kW RF output at 125%
BTU (at 125% audio tone modulation)	2,000 BTU/H for 500 W RF Output	2,900 BTU/H for 1.1 kW RF Output	5,500 BTU/H for kW RF Output	10,800 BTU/H for 5 kW RF Output	14.360 BTU/H for 6.6 kW RF Output	20,525 BTU/H for 10.8 kW RF Output
Power Factor	>0.75 at full load	>0.75 at full load	>0.85 at full load	>0.85 at full load	>0.75 at full load	>0.75 at full load

Specifications

RF Specifications	
Impedance	50 Ohm
Range (Frequency)	522 kHz to 1705 kHz, supplied on one frequency (synthesized), as ordered; accommodates 9 kHz or 10 kHz channel spacing
Stability	+/- 3ppm, 0° to 50° C
RF Harmonies Suppression	Meets or exceeds FCC, DOC, & CCIR requirements, when preceded by external NRSC-1 compatible audio low pass filter(s)
Type (Modulation)	Pulse width modulation of L+R envelope with optional integrated C-QUAM AM stereo, an RN input connector (BNC) is also provided for an external RF or stereo exciter
Capabilities (Modulation)	>145% peak positive capability at rated nominal output power into 50 Ohm load
Carrier Shift (Modulation)	<1% at 95% negative modulation at 1 kHz
Regulatory	FCC; IC; CE; BETS-6; IEC 215 Safety
Audio Specifications	
Modes	Stereo (with optional stereo card), Mono L+R, Mono L, Mono R
Connector Type	3 position terminal block (2 sets of 3 for Stereo with optional card)
Input Level	10 dBm, +/- dB, L+R (or mono) to produce 100% L+R envelope modulation, other input levels accommodated by internal resistor selection
Impedance	600 Ohm; inputs are balanced, transformerless, and resistive with passive RFI filtering; other impedances can be accommodated
Squarewave Overshoot	1% or less at 400 Hz, 50% single channel modulation with high-frequency boost disabled
Squarewave Tilt	1% or less at 40 Hz, 1.5% or less at 20 Hz, measured with 90% negative modulation
Incidental Phase Modulation	Less than 2° (0.035 radians) average, or 30 dB (typical 40 dB) below equivalent 100% L-R C-QUAM modulation 50 Hz to 10 kHz, at rated power, measured with an audio input level which generates 95% negative L+R envelope modulation at 1 kHz (9.5 dBm)
Intermod Distortion	1.2% or less 1:1 ratio, 1.7% or less 4:1 ratio. 60/7000 hz SMPTE standards with 85% modulation rated power
S/N Radio	>65 dB below a reference level equivalent to 100% negative modulation in a 22 Hz to 30 kHz bandwidth, unweighted
Environmental	
Temperature	0° to 50° C
Altitude	10,000 ft (3,048 M) at 60 Hz; 7,500 ft (2,286 M) at 50 Hz
Humidity	0% to 95% (non-condensing)

MDCL+: Lower Energy Costs for AM Radio

Broadcast Electronics know that every broadcaster needs to carefully manage costs, and energy consumption is a big topic on everyone's mind. MDCL, or Modulation-Dependent Carrier Level, is a technology that allows AM radio stations to reduce their electricity consumption by dynamically adjusting the stations carrier power based on the audio content, saving energy without significantly impacting audio quality.

Simple Upgrade for New & Existing Transmitters

MDCL+ employs Modulation Dependent Carrier Level algorithms and **can save most AM radio stations 50% or more of their electricity costs.** A typical 10kW AM station operating 24 hours a day with an average electricity cost of 20 cents per Kilowatt/hour, the savings can be more than $12,000 every year. Some locations (including Alaska and Hawaii) will have considerably higher power rates resulting in up to four times greater energy and cost savings.

The AM carrier uses 66% of the transmitter power yet delivers no useful information!

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

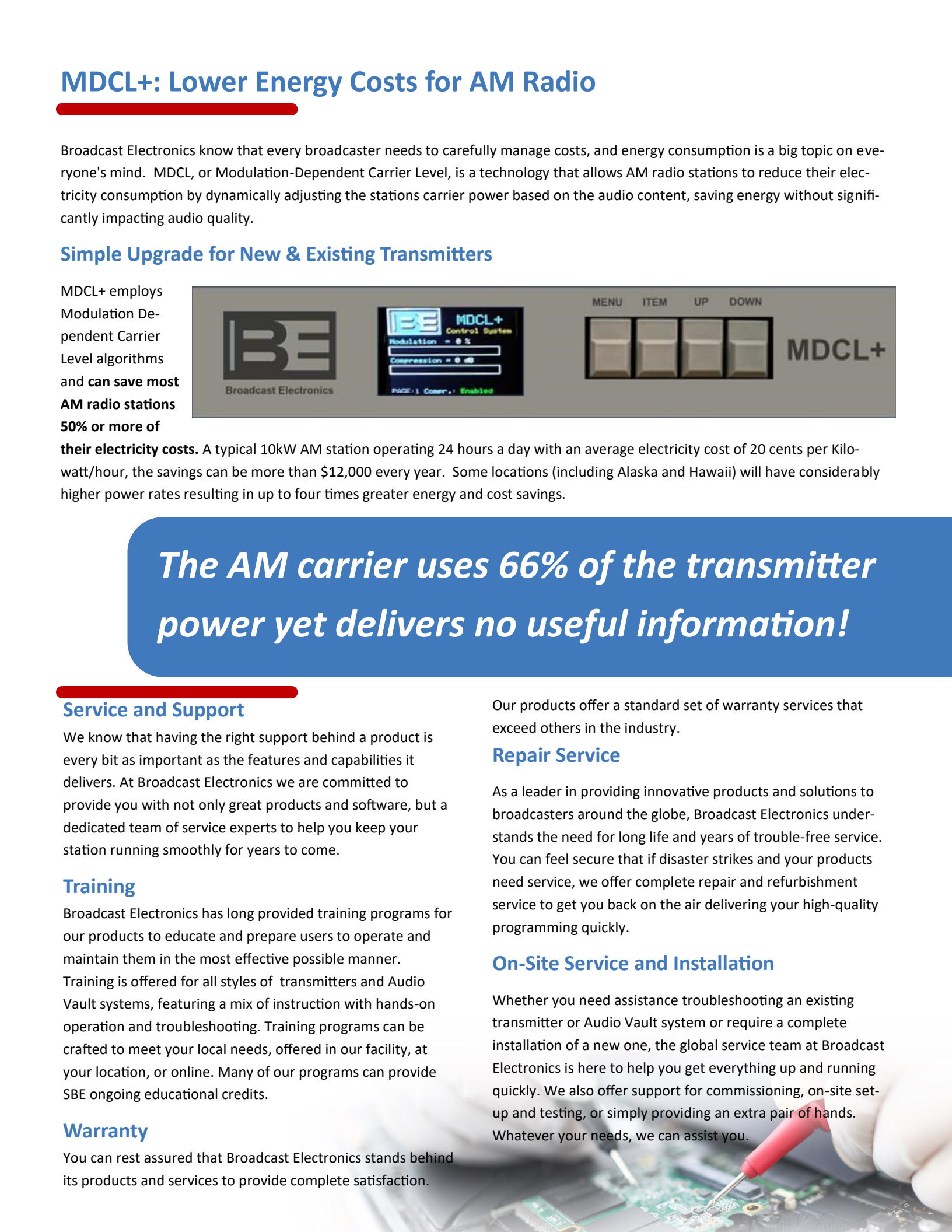
You can rest assured that Broadcast Electronics stands behind its products and services to provide complete satisfaction. Our products offer a standard set of warranty services that exceed others in the industry.

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.



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