



Broadcast Electronics

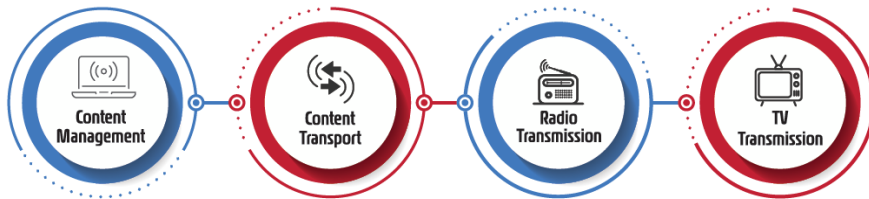


QUICK BLOCK Modular FM Transmitter System

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 technology areas:

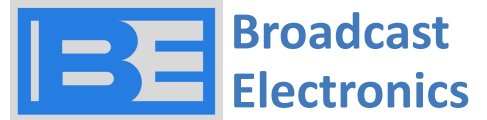


AudioVault is BE's award-winning suite of Content Management software enabling live and automated program creation and playout, news solutions and digital logging as well as data management.

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. BE ETX analog FM transmitters deliver compact, energy efficiency in a cost-effective package. The BE AM line of transmitters provides for 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.

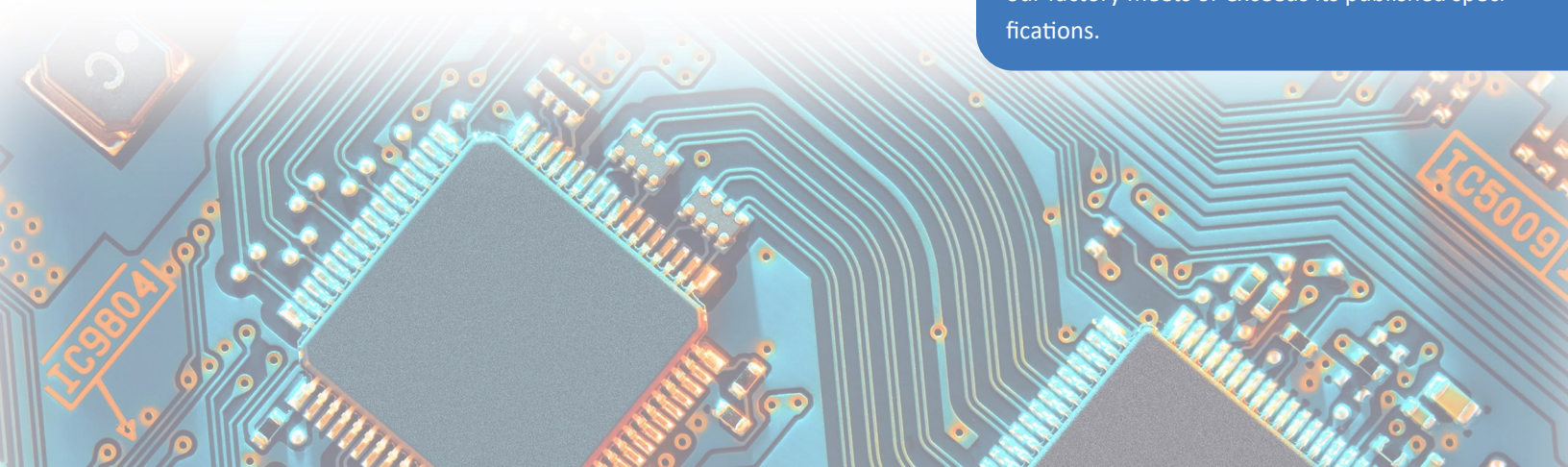
Broadcast Electronics, has been providing high-tech solutions for broadcasters for more than 65 years in over 170 countries. All of our products and services come from a heritage of creativity and innovation unmatched in the industry, focused on developing innovative solutions for customers problems.



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.

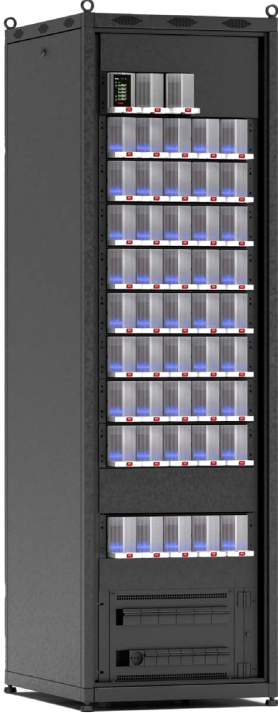
We take advantage of the best practices of automated production, adding human attention to detail to ensure every product that leaves our factory meets or exceeds its published specifications.



Quick Block - Transmitter System

The Quick Block is a new and innovative platform of reliable, efficient, and performance-leading FM transmitters from Broadcast Electronics. Quick Block 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.

General Description and Features



Broadcast Electronics Quick Block is an innovative technology platform using Plug and Play modular “blocks” that can be combined to create transmitters across a wide range of powers and broadcast standards. With the same modules, programmed and customized as needed, you can create Radio transmitters of different powers and types.

Quick Block is an EASY TO USE, PLUG & PLAY product that offers extensive benefits to users from a logistical, technological, maintenance, and operating cost perspective.

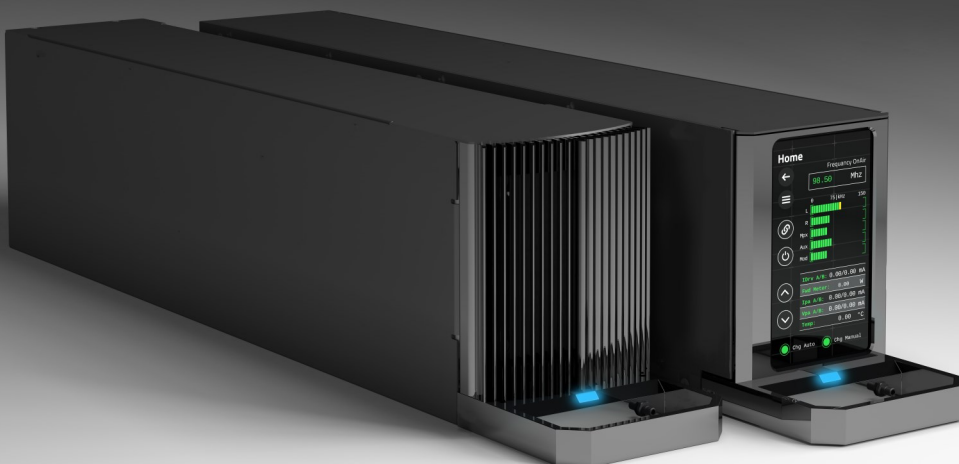
Quick Block has been designed for the maximum reliability and uptime, simplified and fast field repair, built-in redundancy, ease of stocking and replacing parts, and is designed with the flexibility to support continued technological updates over time.

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.

Quick Block’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.

Quick Block can support all analog and digital FM Radio standards such as Analog FM, HD Radio®, DRM+ and other emerging technologies.

It is not just a product, it is an innovative technological model, invented and patented by the Broadcast Electronics that enables new business models in an evolving global broadcast market.



Quick Block: The Power of Two

Every Quick Block system is made up of a combination of only two primary modules: the modulator and the amplifier.

These functional blocks can make up any system:

- Low, medium, and high-power transmitters
- Multiple transmitters in a single rack
- Active and passive redundant systems
- N+1 redundant systems

The Quick Block architecture is very versatile and ideal for applications across single Radio and TV stations or multi-station networks.

Quick Block is the ideal solution for networks of any size, thanks to the construction philosophy, parts are simple and cost-effective to stock, and maintenance time is drastically reduced.

It will no longer be necessary to carry out complex troubleshooting as all subsystems are modular and hot pluggable with integrated diagnostics so restoring a failed system to full power is quick and easy.

The Quick Block design philosophy will drastically reduce the stock of parts needed to maintain each transmission site. In addition, future upgrades, or system changes, as well as migrations to different standards will be simplified providing the lowest total cost of ownership.

Quick Block Driver/Exciter

- Multi-standard Modulator
- Redundant RF Driver
- Redundant Power Supply
- Built-In Control System
- Hot Plug slide-in connection
- Self-cooling
- Self-protection
- Communication Port
- RF Filters
- Color Touch Screen user interface



Quick Block Modulator

Quick Block FM Radio transmitters can be equipped with two modulator technologies: High-performance analog FM with precise low-noise PLL or software-defined direct-to-channel digital synthesis modulators capable of supporting analog and digital formats such as HD Radio or DRM+. Both modulators can be configured with a multilevel redundancy.



Modular Driver/Exciter

The Quick Block modulator is composed of a multi-level modular Hot Plug structure. Even on the single-driver version the modulator card can be replaced quickly by the front panel without the need of special tools or complex alignments.

Driver/Exciter 1+1 Redundant

The Quick Block 1+1 system uses a double line of independent boards; a modulator and a pre-driver amplifier with an automatic switch that guarantees transmission even with a “second fault level”.

Quick Block Amplifier

The Quick Block amplifier module is a complete hot-plug amplifier system complete with a high-efficiency RF amplifier, single phase 220-240V AC input power supply, cooling system, and integrated control unit.

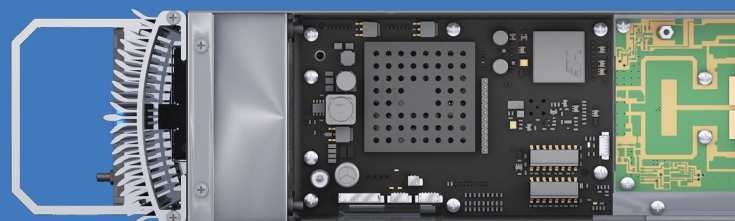
Quick Block features the latest LDMOS high-power high-efficiency RF devices, which when coupled with the Digital Adaptive Pre-correction delivers excellent performance and low operating costs for low and high-power systems.

All Quick Block modules are broadband for the intended band of service, simplifying spare parts stocking and facilitating quick frequency changes.

The powerful software-defined exciter option allows for support of multiple modulation types and standards all with a simple click of a mouse to seamlessly migrate from an analog to a digital.

Each Quick Block module includes:

- RF Amplifier
- Power Supply
- Power Measurement
- Built-In Control
- Hot Plug Slide-in connection
- Self-cooling
- Self-protection
- Communication Port
- RF Low Pass Filter
- Rapid Diagnostic Indications (LED multicolor, multi-function)



Advanced Monitor and Control Capability

Quick Block Transmitter System Remote Monitor and Control Features

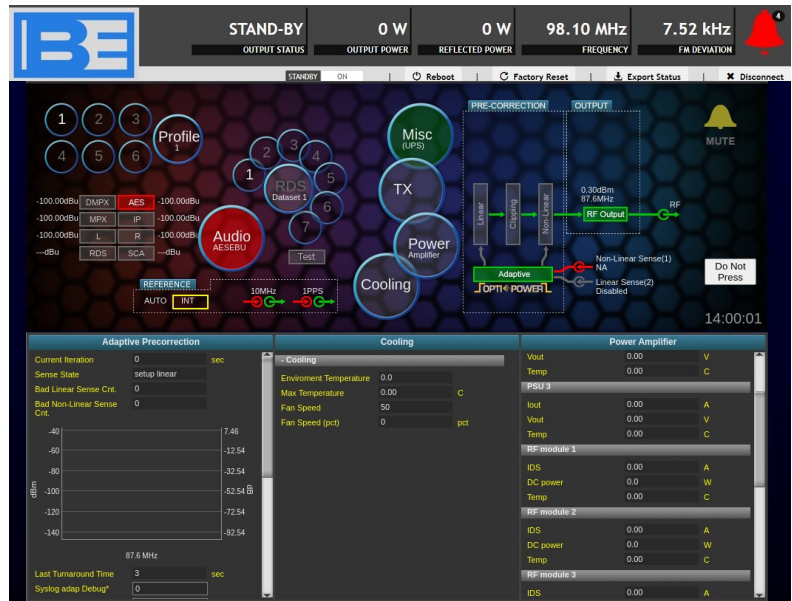
Every Quick Block includes a powerful yet simple-to-use browser-based HTML-5 graphical user interface for control and monitoring of the transmitter anywhere in the world. Extensive TCP/IP network connectivity via integrated RJ-45 connection allows the transmitter to be securely connected to any IP network. The optional 3g/4g model provides for simple connectivity in even the most remote places. Integrated multiuser multilevel password protection ensures only authorized operation on your network.

Quick Block also supports a robust SNMP V3 – (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.

Quick Block 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
- Automated Alarms and notifications via Email or SMS text
- SNMP connectivity for alerts, monitoring, and control
- Web GUI via ethernet network connection RJ-45 (10/100Base-T) with TCP/IP protocol



System Architecture

The Quick Block architecture can be configured to meet the requirements of any Radio broadcast standard, as well as new technologies as they evolve. Its flexibility and scalability are ideal to meet different system designs and requirements such as low-power, high-power, or N+1 systems.

The elements that compose the multiple configurations are the “fundamental QB modules” as follow:

- The “QB Amplifier” modules have a generic use defined only by their application frequency.
- The “QB Driver/CCU” modules have multiple applications even if dedicated to various modulation platforms such as both analog and digital and cover all of today’s modulation standards.
- The Hot Plug chassis, this frame is a mechanical and logic unit that defines the Quick Block application. Its interfaces are the connection to the outside world, and it combines the elements of the Quick Block Amplifier and Quick Block Driver/CCU to define the final product application. The dimensions of this frame are a standard wide of 19 rack mount and a height of 3 RU.
- Hot Plug Cabinet is a standard 19” rack that contains the Hot Plug chassis and constitutes the application for high-power systems.

Quick Block Compact Transmitters

This line is made up of a single Hot Plug chassis. It is equipped with a minimum of one Quick Block Driver/Exciter module and between one and four Quick Block Amplifier modules. Here are some examples of products in a single Chassis configuration:

QB Control & Modulator

RF Amplifier up to 4 QB Modules



Compact Transmitter
3 RU



Quick Block High Power Transmitters



Dual Exciters

Central Control Unit (CCU) with color screen

Up to 10 QB-5 Chassis 50 modules

Optional Mains Distribution

Specifications

	QB 1	QB 2	QB 3	QB 4	QB 10	QB 15
Analog Power	1,100 W	2,400 W	3,700 W	5,000 W	11,250 W	18,000 W
HD Power	-20 .736 kW -14 .491 kW -10 .347 kW	-20 1.6 kW -14 1.1 kW -10 .75 kW	-20 2.45 kW -14 1.65kW -10 1.16 kW	-20 3.35kW -14 2.23 kW -10 1.57 kW	-20 8.4 kW -14 5.6 kW -10 3.9kW	-20 12.5 kW -14 8.4 kW -10 5.9 kW
Accuracy (Output Power)	2% full scale	2% full scale	2% full scale	2% full scale	1% full scale	1% full scale
Efficiency	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%
Output Connector	7-16 DIN female; EIA 7/8" flange on request	7-16 DIN female; EIA 7/8" flange on request	7-16 DIN female; EIA 7/8" flange on request	7-16 DIN female; EIA 7/8" flange on request	EIA 1-5/8" flange	EIA 3-1/8" flange
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)	2x XLR female (Balanced; impedance 600Ω/10KΩ selectable)
THD + Noise (Stereo)	<2% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power
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)	2x BNC female (Unbalanced; impedance 50Ω/10KΩ selectable)
AES-3 & AES 192	Optional	Optional	Optional	Optional	Included	Included
Operating Temperature	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing
Maximum operating altitude (ft / m)	10000 / 3000	10000 / 3000	10000 / 3000	10000 / 3000	10000 / 3000	10000 / 3000
AC Input Voltage	200-264Vac, 47 to 63Hz single phase	200-264Vac, 47 to 63Hz single phase	200-264Vac, 47 to 63Hz single phase	200-264Vac, 47 to 63Hz single phase 400Vac three phase star conn. (with power neutral) and 230Vac three phase delta conn. (without power neutral)		
Dimensions (W x H x D, inches / cm)	19 x 3 RU x 28.75 inches 48 x 13 x 73 cm	19 x 3 RU x 28.75 inches 48 x 13 x 73 cm	19 x 3 RU x 28.75 inches 48 x 13 x 73 cm	19 x 3 RU x 28.75 inches 48 x 13 x 73 cm	19 x 11 RU x 34 inches 48 x 49 x 87 cm	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm
Weight (LBS / Kgs)	50 / 23	61 / 28	71 / 32	82 / 38	330 / 150	450 / 201

All specifications contained in this document may be changed without prior notice

Specifications

	QB 20	QB 25	QB 30	QB 35	QB 40	QB 50
Analog Power	25,000 W	31,000 W	37,000 W	43,000 W	50,000 W	62,000 W
HD Power	-20 16.7 kW -14 11.2kW -10 7.9 kW	-20 20.9 kW -14 13.9 kW -10 9.9 kW	-20 25.1 kW -14 16.7 kW -10 11.8 kW	-20 29.3 kW -14 19.5 kW -10 13.8 kW	-20 33.5 kW -14 22.3 kW -10 15.7 kW	-20 42.0 kW -14 28.1 kW -10 19.8 kW
Accuracy (Output Power)	2% full scale	2% full scale	2% full scale	2% full scale	1% full scale	1% full scale
Efficiency	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%	Up to 76% Typical always > 72%
Output Connector	EIA 3-1/8" flange	EIA 3-1/8" flange	EIA 3-1/8" flange	EIA 3-1/8" flange	EIA 3-1/8" flange	EIA 4-1/2" flange
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)	2x XLR female (Balanced; impedance 600Ω/10KΩ selectable)
THD + Noise (Stereo)	<2% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power	<1.5% at 50% single channel modulation, 50 Hz to 10 kHz at rated power
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)	2x BNC female (Unbalanced; impedance 50Ω/10KΩ selectable)
AES-3 & AES 192	Included	Included	Included	Included	Included	Included
Operating Temperature	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing	-5°C to +50°C 95% non-condensing
Maximum operating altitude (ft / m)	10000 / 3000	10000 / 3000	10000 / 3000	10000 / 3000	10000 / 3000	10000 / 3000
AC Input Voltage	200-264Vac, 47 to 63Hz single phase 400Vac three phase star conn. (with power neutral) and 230Vac three phase delta conn. (without power neutral)					
Dimensions (W x H x D, inches / cm)	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm	40 RU Cabinet 24 x 78 x 43 inches 61 x 198 x 109 cm
Weight (LBS / Kgs)	771 / 350	850 / 385	980 / 445	1030 / 467	1083 / 491	1187 / 583

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RF Specifications	
Transmitter Type	Solid State VHF FM transmitter for analog FM, FM+ HD Radio and HD Radio Only
Output Power	500 W to ~ 62,000W
Efficiency	Up to 76% typical AC to RF
Modulation Type	Direct-to-channel digitally generated FM (no analog up-conversion) or PLL
Modulation Capabilities	Standard: ± 75 kHz peak deviation – Max: ± 200 kHz peak deviation
Modulation Modes	FM Analog, FM+HD Radio at -10dB, 14dB, and -20dB injection levels, and HD-only
Spurious and Harmonic	Compliant with ETSI and FCC specification—85dB or better; low pass filter standard
Asynchronous AM S/N Ratio	Better than -65dB (-70dB Typical) referenced to average peak-to-peak carrier amplitude. 75uSec de-emphasis)
Synchronous AM S/N Ratio	> 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
Audio Specifications	
Audio Inputs	AES, L&R analog, composite, SCA/ RBDS/RDS external generator input, SCA audio inputs (2)
Amplitude Response	Composite/ AES: +/-0.03dB, 30 Hz to 53 kHz; +/- -0.1dB, 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	Composite: 85dB below 100% modulation @400 Hz. AES/ Analog L&R Stereo: 80dB below 100% modulation @400Hz. Analog L/R: -70dB, 30Hz to 15kHz
Stereo Separation	AES: -74dB below 100% modulation @400Hz. Analog L/R: -70dB, 30Hz to 15kHz

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

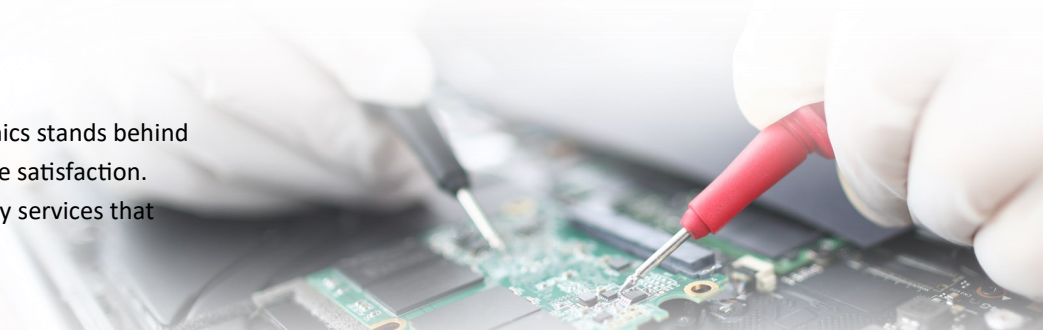
You can rest assured that Broadcast Electronics stands behind its products and services to provide complete satisfaction. Our products offer a standard set of warranty services that exceed others in the industry.

Repair Service

As a leader in providing innovative products and solutions to broadcasters around the globe, Broadcast Electronics understands the needs 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

Regardless if you simply need some additional help troubleshooting an existing transmitter or Audio Vault system, or a complete installation of a new one, let the global service team at Broadcast Electronics help you get things up and going quickly. If you just need commissioning, on site set up and test, or an extra pair of hands, we can help with that too.





Broadcast Electronics

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