Broadcast Electronics

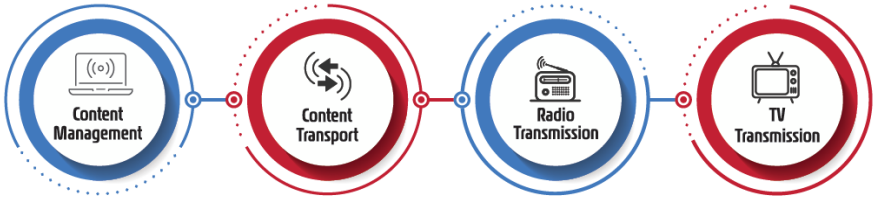
TTX Series Digital Television

Software Defined Exciter

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

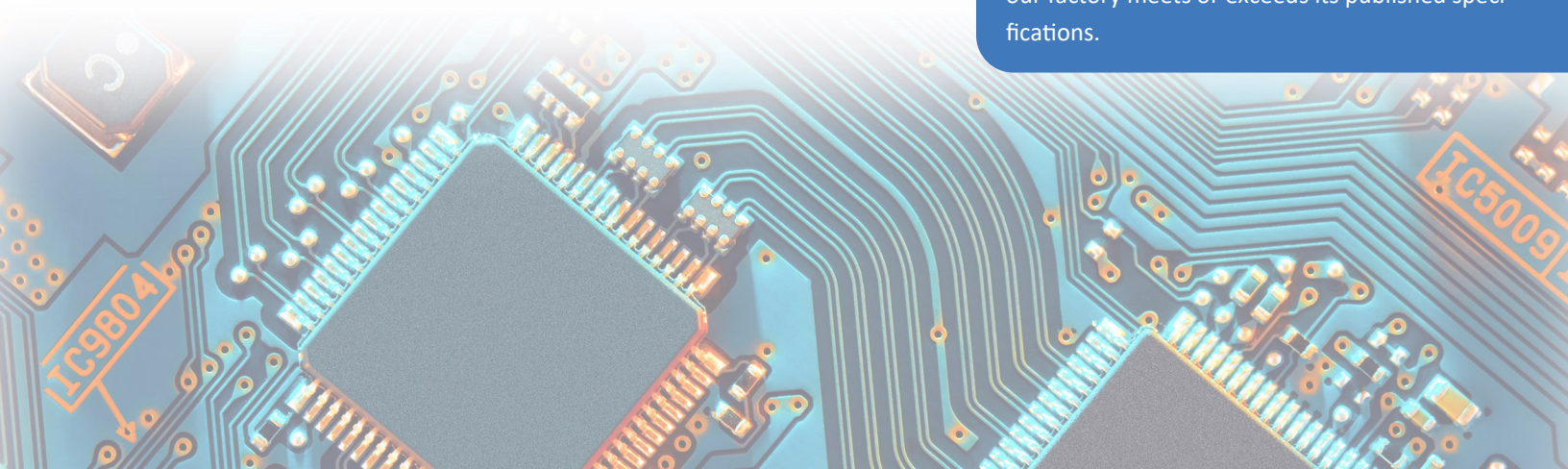
Broadcast Electronics is a global technology company dedicated to driving innovation in broadcast technology providing market leading solutions for software-based content management, Radio & Television transmission, and scientific applications of radio frequency devices.

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.



TTX Compact Transmitter Series

The TTX is the latest in a long timeline of reliable, efficient, and performance-leading TV transmitters from Broadcast Electronics. TTX has been designed for high energy efficiency to lower operating costs, world-class digital performance, maximum reliability and uptime, simplified and fast field repair, built-in redundancy, and the flexibility to support continued technological updates over time.

Combining the best of both world

Broadcast Electronics TTX series combines the best characteristics from the BE Alpan family and the BE ETX line of transmitters to deliver a high-performance, cost-effective solution. Drawing from BE's legacy of software defined exciters, we incorporated a digital direct-to-channel software defined modulator incorporating adaptive pre correction and rugged construction to deliver the maintainability and robustness our customers expect with a new level of performance and reliability at an exceptional price.

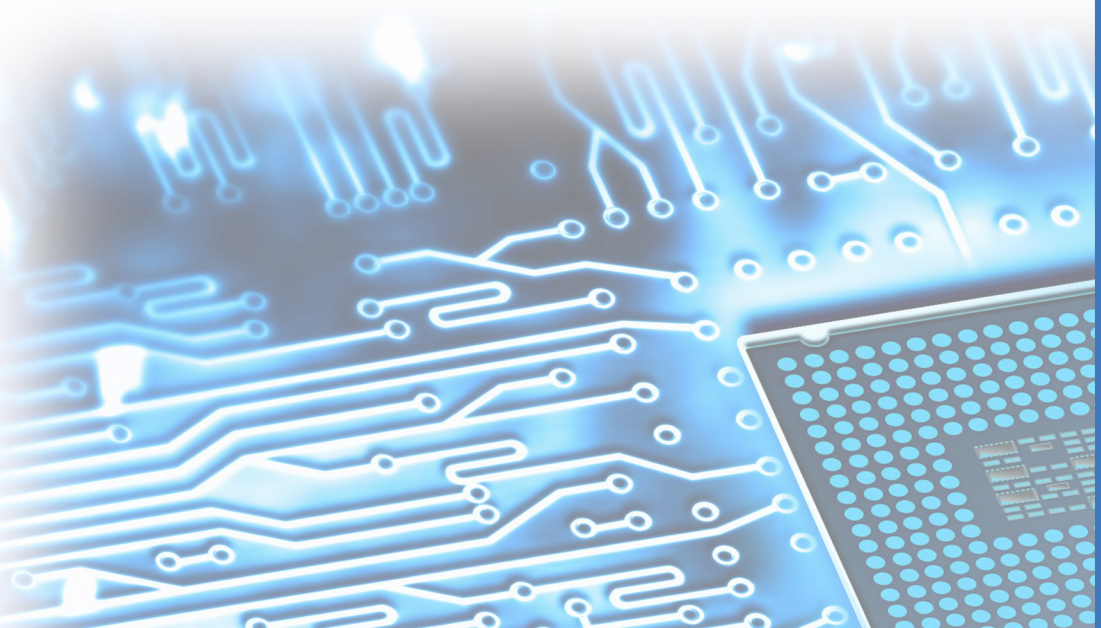
TTX's simple yet powerful front panel LCD screen, navigation buttons and bright LED indicators allow easy review, setup, and diagnostics. The RJ-45 port allows you to connect to the intuitive and powerful GUI and SNMP from anywhere in the world. The programable parallel GPI/O interface provides connectivity to a traditional remote-control system.

Flexible options — software enabled

BE knows that in the fast-paced and evolving world of broadcasting, the old 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 software defined modulator with dualcast allows you to switch modulations by simply clicking a button. The TTX comes standard with extensive capabilities to address almost all situations, but also we offer a wide selection of cost-effective options to protect your original investment and extend the usability of the transmitter to deliver your content to your audience.

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



Put these powerful capabilities to work for you

- **Software Defined Mult standard Multimode modulator allow dualcast operation (analog and digital mult standard)**
- **Advanced Adaptive Correction**
- **Linear and non-linear precorrection**
- **Optimized correction for all amplifier types**
- **Frequency Agile – Band I, III, IV and V**
- **Supports all widely used TV standards**
- **Upgradeable to emerging digital standards**
- **T.S. over IP able to receive MPEG Transport Streams**
- **Seamless operations over a wide range of voltages and power stability**
- **IP Connectivity with HTML5 GUI for anytime, anywhere access**
- **Flexible alerts, monitor and control with SMTP email, SNMP, and SMS**
- **Comprehensive event log stores 5000 events—simplifies troubleshooting**
- **Ultra compact size and low weight**

Software Defined Modulator—The Heart of the Transmitter

The TTX Software Defined Multistandard Multimode modulator allow dualcast operation (analog and digital multistandard DVB-T/H; DVB-T2; ISDB-T/Tb; ATSC; other on request) and can be supplied with wide choice of input interfaces, linear and non-linear precorrection with option for adaptive.

Advanced Monitor and Control Capability

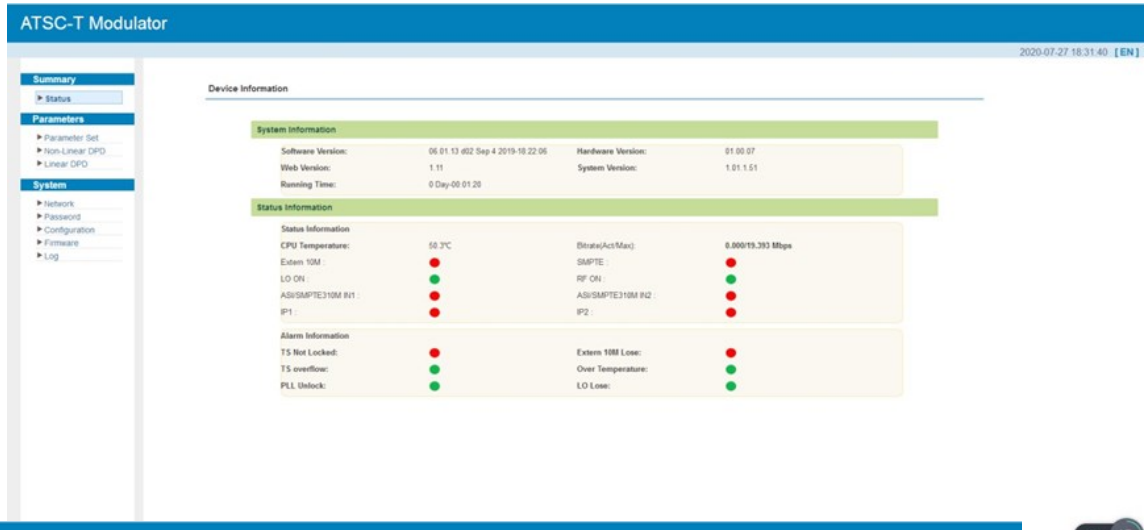
Every TTX includes a powerful yet simple-to-use browser-based HTML-5 graphical user interface for control and monitoring of the transmitter anywhere in the world. Extensive TCP/IP network connectivity via integrated RJ-45 connection allows the transmitter to be securely connected to any IP network.

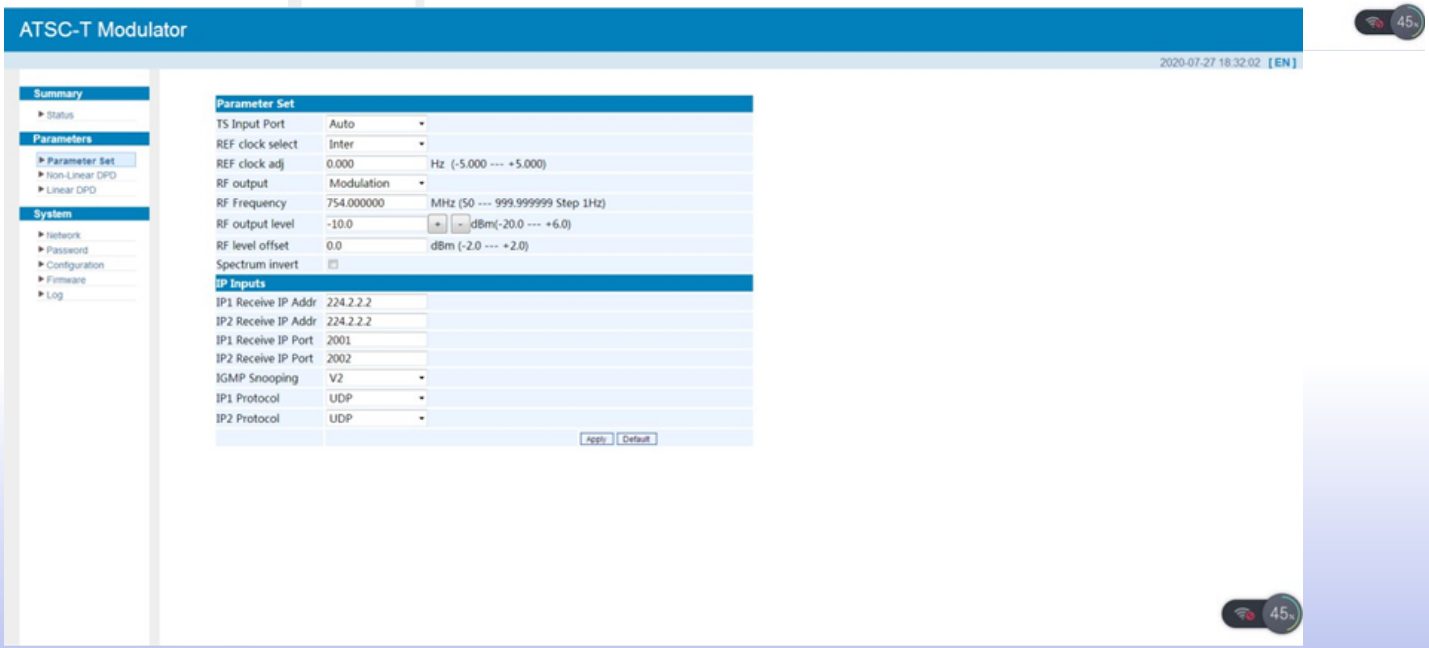
TTX also supports a robust SNMP – (Simple Network Management Protocol) interface for easy connection with a wide array of powerful software network manager systems and popular transmitter remote controls. The entire transmission system can be controlled and monitored using the standard published MIB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

TTX 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.

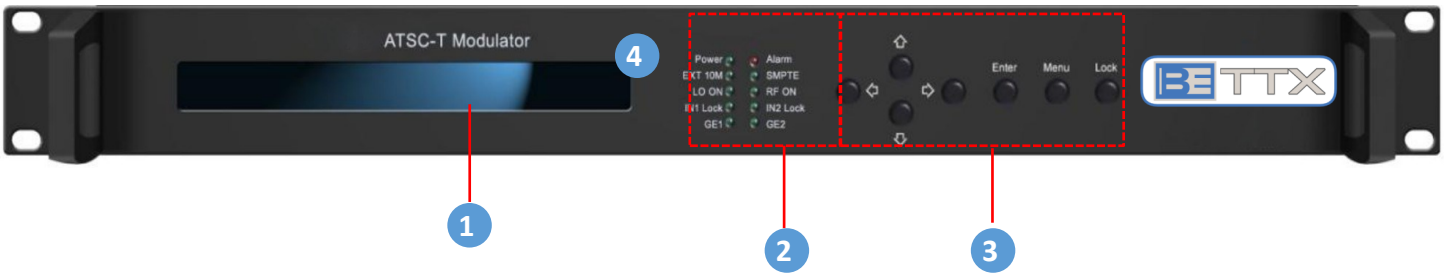
Remote Monitor and Control interfaces supported include:

- Popular parallel interface to panels and legacy re-mote-control systems
- Automated Alarms and notifications via Email
- SNMP connectivity for alerts, monitoring, and control
- Web GUI via ethernet network connection RJ-45 (10/100Base-T) with TCP/IP protocol

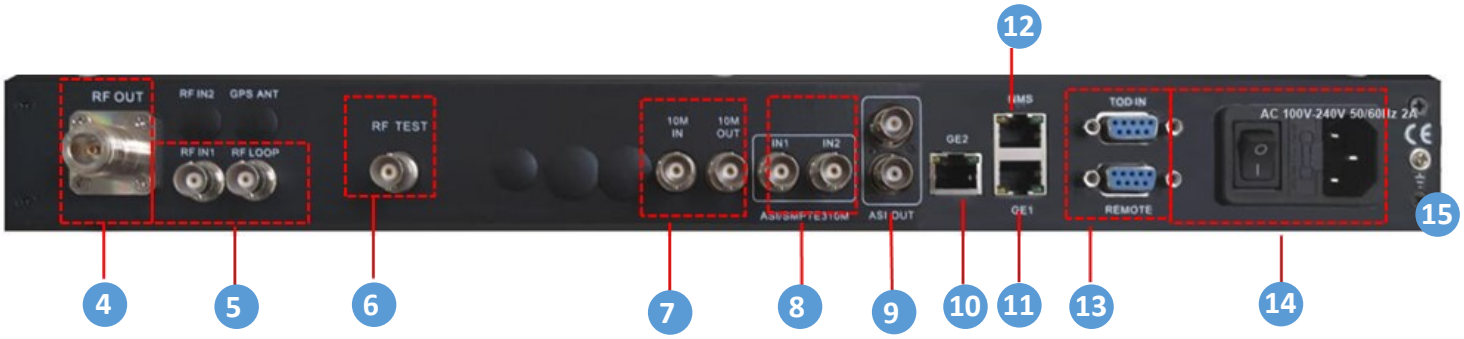




TTX Exciter Front & Rear Panel



1. Graphic LCD display
2. LED indicators: green (ON), yellow (warning), red (alarm)
3. Function keys and menu selectors



4. RF output connector (N female)
5. RF In and loop out port (for digital pre-distortion function)
6. RF Test port
7. 10Mhz reference clock input and loop out port
8. 2 ASI/SMPTE input ports
9. 2ASI Loop out port
10. IP Input #1
11. IP Input #2
12. Network Management System Port
13. DB9 connector for RS232 & Remote Control—GPIO
14. AC power supply input and fuse
15. Ground screw

Specifications	
Input	2 channels ASI input, hot backup, BNC interface Self-adapted 2 ASI/SMPTE 310M input
	Dual IP input ports, one for hot backup , over UDP/RTP, Unicast/Multicast, GE ports
	1 channel 10MHz reference clock input
Modulation	Standard: ATSC A/53, Constellation: 8VSB, FEC: RS(208 188)+Trellis, Bandwidth: 6MHz
RF Output Connection	N Type, 50Ω impedance
Frequency Range	50~860Mhz,1hz stepping
MER – Output Level	-20dbm~6dbm,0.1db stepping
Shoulder Level	60dB
MER	≥ 40db
Non-linear digital pre correction	over 10db ACPR improvement (normally)
Linear digital pre correction	over 10db non-flatness adjustment(normally)
Dimensions (W x D x H, inches / cm)	19” x 18” x 1.75” (1 RU) (482mm×455mm×44.5mm)
Weight (LBS / Kgs)	13.25 lb (6.0kg)
AC Input Voltage	90-264Vac, 47 to 63Hz single phase
Power Consumption	25W

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. Our programs provide SBE 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 programing 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 a 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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