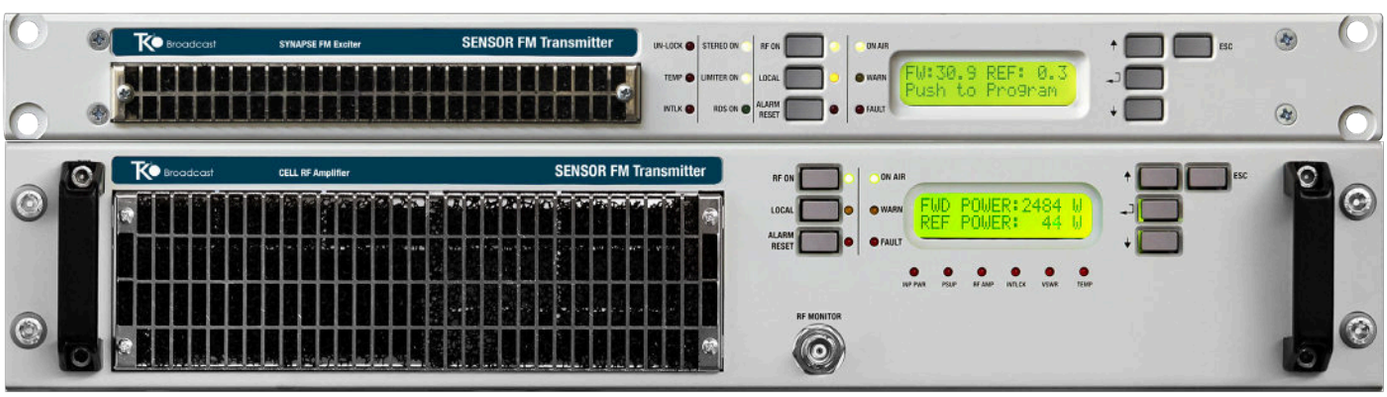
BROADCAST & SCIENCE EQUIPMENT

SENSOR 2000

2000W High Efficiency and Reliability FM Transmitter

DRM and IBOC Ready

SENSOR 2000


Broadcast
SYNAPSE FM Exciter
SENSOR FM Transmitter
UN-LOCK
STEREO ON
RF ON
ON AIR
TEMP
LIMITER ON
LOCAL
WARN
INTLK
RDS ON
ALARM RESET
FAULT
FW:30.9 REF: 0.3
Push to Program
ESC
Broadcast
CELL RF Amplifier
SENSOR FM Transmitter
RF ON
ON AIR
LOCAL
WARN
ALARM RESET
FAULT
FWD POWER:2484 W
REF POWER: 44 W
ESC
RF MONITOR

SENSOR Modular FM Transmitter
DRM and IBOC Ready
Output Power from 1000W to 5000W

SENSOR guarantees low energy consumption, reduced ownership costs, and easy maintenance.

HIGHLIGHTS

Enhance Your Broadcast with the SENSOR Modular High-Power FM Transmitter
Experience unmatched reliability, efficiency, and easy maintenance. DRM and IBOC ready.

For those who demand uncompromising sound quality and long-term reliability, **SENSOR** is the definitive solution. It combines exceptional durability, energy efficiency, and advanced connectivity, ensuring peak performance even in the harshest environmental conditions.

Its modular design simplifies maintenance by housing each component: Exciter and RF Amplifier in separate cabinets.
Sensor is composed by:

- Exciter SYNAPSE
- FM Amplifiers CELL

With **SENSOR**, you'll experience warm, clear, and smooth audio with low distortion, high signal-to-noise ratios, and excellent stereo separation giving your station a unique sound.
SENSOR takes care of FM modulation directly from your audio source, delivering up to 5000W of power with unmatched reliability.
Perfect for a wide range of FM applications, including community, commercial, religious, educational, large national networks, public, and political FM radio transmitters.

Main Key:

- Output Power from 1000W to 5000W
- Modular Architecture
- Double Drive option
- HD Radio and DRM ready
- Extreme Robustness and Reliability
- Remote Access via HTML5 Web, TCP/IP, SNMP, Email, and Telegram
- Unmatched Audio Fidelity and Versatile Audio Inputs
- Exceptional efficiency and low power consumption
- Unified Spare Parts Across SENSOR Series
- Easy maintenance and low-cost ownership

Highlights:

- High Signal-to-Noise Ratio Typically 85 dB, 65 dB stereo separation, ultra-low distortion of 0.03%.
- Versatile Audio Inputs: Supports MPX (Composite), Stereo, AES/EBU, Mono, and remotely programmable Dynamic RDS (remotely programmable). Includes optional automatic audio input backup and supports IP Streaming, Pen Drive, or Hard Disk for MP3 playback.
- Intelligent Soft Limiter: Maintains a maximum deviation of 75 kHz, ensuring high volume output without introducing distortion.
- Frequency Modulation Range: 87.5–108.0 MHz, options for Japan (JPN), Russia (OIRT 66–74 MHz), and other bands available.
- Efficiency: Achieves up to 88% RF and 75% overall efficiency, consistently maintained across all frequencies and power levels through intelligent control. Power consumption is further reduced thanks to the Energy-Saving Weekly Scheduler feature.
- Robust LDMOS 50 V with 6th Generation Planar Technology, offering VSWR tolerance greater than 65:1 at all phase angles, specifically designed for enhanced durability and ruggedness in FM and ISM applications.
- Spectral Purity: better than 84 dBc spurious and harmonics.
- Separate Components: Splitter, Combiner, Unbalanced Dummy Loads, Control Logic for easier maintenance.
- Passive Reserve Capability: A single CELL amplifier can serve as a backup.
- Double Exciter with Automatic Changeover Option
- Self-Protected Plug-In Power Supply: Wide voltage range (90–250 V) for enhanced reliability, includes AC mains filtering. Lightning and Overvoltage Protection, as well as Delayed Energization option.
- Optional Touch Screen BRAIN WEB Control Unit on the transmitter, along with an LCD and keyboard on the front panel of the RF amplifiers, providing user-friendly and fast control.
- Durable Construction: Features an aluminium body, tropicalized PCBs, and an air filter for dust protection. The air-ducted architecture protects internal electronic components from direct airflow, preventing failures due to air corrosion.
- RF Planar Architecture ensures maximum reproducibility and consistency in RF amplifier quality. The Copper Carrier enhances heat dissipation and simplifies maintenance.
- Broadband Output Filter: Optimal spectral purity without tuning.
- Standards Compliance: Meets ETSI, CCIR, FCC requirements.

SENSOR: Where Sound and Reliability Beat with the Same Heart

TECHNICHAL CHARACTERISTICS

COMPOSED BY

- Excitertype: Synapse
- RFAmplifier: CELL 2000

OUTPUT POWER WATTS

- Output Power: **2000W**
- Max Output Power: **2.200**
- FM+HD 20dBc Max: **1.900W**
- FM HD 14dBc Max: **1.380W**
- FM HD 10dBc Max: **1.200W**
- HD Only 20dBc Max: **780W**
- HD Only 14dBc Max: **660W**
- HD Only 10 dBc Max: **580W**
- OutputConnector: **7/16**

ELECTRICAL

- Overall Efficiency: 75%
- RF Efficiency: 88%
- Power Consumption: 2.667W
- AC Power Factor: 0.98
-
- AC MainsConfiguration 3 phase 380V: 4-wire WYE
- AC InputVoltage: 380V
- Total Line Amps: 4A
- AC Fuse Size: 6A
- Possible AC Conductor Size: AWG
- Possible AC ConductorSize: mm2
-
- AC Mains Configuration 3 phase 220: 3-wire closed delta or WYE plus safety ground
- AC Input Voltage: 220V
- Total Amps: 7A
- AC FuseSize: 10A
- Possible AC Conductor Size: AWG
- Possible AC Conductor Size: mm2

- AC Mains Config 1 phase: 2-wire plus safety ground

- AC Input Voltage: 220V
- Total Amps: 13A
- AC FuseSize: 18A
- Possible AC Conductor Size: AWG
- Possible AC Conductor Size: mm2

COOLING

- CoolingType: Forced Air
- CoolingAirVolumem3h: 283m3h
- HeatDissipationBTU: 2.222BTU
- Heat Dissipaiton: 667W
- AirConditioningLoad: 190W

MECHANICAL

- NumberOfCabinets: 2
- Cabinettype: 19U
- RackUnitsHeight: 3U
- Width: 484mm
- Depth: 624mm
- Height: 133.5mm
- Weight: 22 kg

PACKAGING

- PackageWidth: 780mm
- PackageDepth: 610mm
- PackageHeight: 330mm
- PackageWeight: 25 kg

ENVIRONMENTAL

- Altitude: 4.000m
- AmbientTempRange: -10 to 45°C de-rated 2° per each 300msl
- Humidity: 95% noncondensing

RADIOELECTRICS CHARACTERISTICS

- Frequency Range: 87.5 ÷ 108.00 MHz, Programmable in 10 KHz steps
- Range of adjustment from 100 to maximum power.
- On request 66 ÷ 74 MHz (OIRT), 76 ÷ 90 MHz (JPN) Bands.
- Frequency Stability: better than ±50Hz from -10 to +50°C
- Modulation capability max deviation: +/-150kHz.
- Frequency Control: Synthesizer μprocessor control.
- Output Impedance: 50 ohm.
- Display: forward/reflection power and modulation indicator
- Type of Modulation: Direct frequency modulation of carrier frequency. F3E Stereo with Subcarrier and Mono.
- Lock in Time: Typ. 4 second.
- Off Lock Attenuation: ≥ -80 dBc.
- Modulation Mode: Mono, Stereo, Multiplex, SCA, RDS, Aux.
- Pre-emphasis: Flat(0)/50/75 μs selectable from front panel.
- Asynchronous AM S/N Ratio: -70 dB below reference carrier. 100% AM modulation @ 400 Hz, without FM modulation.
- Synchronous AM S/N Ratio: -60 dB below reference carrier. 100% AM modulation@ 400 Hz with FM modulation ±75 KHz @ 400 Hz.
- RF Harmonics: Exceeds ETSI/EBU/CCIR/FCC requirements. better than 84 dbc
- RF Spurious: Exceeds ETSI/EBU/CCIR/FCC requirements. better than 84 dbc
- Output power on/off and adjustable from front panel and remotely.
- Overall Efficiency: 75%
- Monitor RF: -60 dBc, BNC connector
- VSWR: 1.5:1 Maximum with automatic fold-back at higher VSWR
-

MONAURAL OPERATION

- Audio Input Impedance: 600 ohm balanced, 15 Kohms unbalanced.
- Audio Input Level: -6 to +12 dBm. (Other range on request)
- Input Connector: XLR female.
- Audio Frequency Response: ±0.15 dB, 30 Hz to 15 KHz.
- Total Harmonic Distortion + Noise: 0.03% @ 400 Hz
- Intermodulation Distortion: 0.03%, 1 KHz/1.3 KHz, 1:1 ratio
- Transient Intermodulation Distortion: 0.03%, 2.96KHz square wave and 14 KHz sine wave.
- FM S/N Ratio: -89 dB RMS detector, -85 dB below ±75 KHz deviation, 50 μs de-emphasis, weighted.

MULTIPLEX OPERATION

- Composite Input Impedance: 5 Kohm unbalanced.
- Composite Input Level: 3.5Vp-p for ±75KHz deviation.
- Input Connector: BNC female.

- Composite Amplitude Response: < ±0.15dB, 30Hz to 60kHz; < ±0.25dB above 60kHz
- Total Harmonic Distortion + Noise: 0.03% @ 400 Hz
- Intermodulation Distortion: 0.03%, 1 KHz/1.3 KHz, 1:1 ratio
- Transient Intermodulation Distortion: 0.03%, 2.96 KHz square wave and 14 KHz sine wave.
- FM S/N Ratio: -89 dB RMS detector, -85 dB below ±75 KHz deviation, 50 μs de-emphasis, weighted.

STEREO OPERATION

- Audio Input Impedance: 600 ohm balanced, 15 Kohm unbalanced.
- Audio Input Level: -12 to +12 dBm.
- Input Connector: XLR female.
- Audio Frequency Response: ±015 dB from 30 Hz to 15 KHz.
- Total Harmonic Distortion + Noise: 0,03% @ 400 Hz
- Intermodulation Distortion: 0,02%, 60Hz /7kHz 4:1 ratio +4dBu
- Transient Intermodulation Distortion: 0.03%, 2.96 KHz square wave and 14 KHz sine wave.
- FM S/N Ratio: -85 dB RMS detector, -82 dB below ±75 KHz deviation, 50 μs de-emphasis, weighted.
- Stereo Separation: 30÷80 Hz ≥ -53 dB, 80Hz÷15 KHz ≥ -65 dB (Typ. 70 dB).
- Crosstalk attenuation: Main to Sub -55 dB 30 Hz to 15 KHz
- 38 KHz Suppression: ≥ -70 dB (typ. -85 dB).
- Pilot Frequency: 19 KHz ± 1 Hz
- Phase Pilot: ± 2° adjustable
- Output Pilot: 1 Vpp., BNC female
- Audio Filter Attenuation: ≥ -55 dB @ 19 KHz, > -45 dB 20 KHz to 100 KHz.
- Modes: Stereo, Mono L+R, Mono L, Mono R.

AES/EBU OPERATION

- Input Level: -10dBfs to 0dBfs
- Input Connector: XLR female, optical TOS-LINK.
- Input Impedance: 110 ohm.
- Data Format: S/PDF,AES/EBU, IEC958, EIAJCP340/1201.
- D/A Converter: 24 bit.
- Sampling Frequency: from 32 to 96 KHz with automatic selection
- Stereo separation (crosstalk): ≥50dB,100Hz to 5kHz
- Amplitude response: ≤ ± 0.1dB, from 30Hz to 15kHz
- FM S/N Ratio: -85 dB below ±75 KHz deviation, 50 μs de-emphasis, weighted.

SCA, RDS, AUX OPERATION

- Input Connector: BNC female
- Input Impedance: 3 Kohm.
- Input Level: -3 to +6 dBm.
- Frequency Response: ±0.2 dB, 40 KHz to100 KHz.
- Input Connector: BNC female. Most SCA, RDS, AUX, performance parameters are determined primarily by the generator used.

AUXILIARY CONNECTIONS

- N°2 RS485: Serial Interface connector RJ45 back panel.
- Telemetry Interface: connector DB25F back panel.

ENVIRONMENTAL

- Operating temperature: -10°C to +50°C.
- Max Operating Altitude: 4000 mt.
- Relative Humidity Range: 0 to 95% non condensing.
- Protection against Lightening, Dust and Corrosion

OPTIONS AVAILABLE

Wide range of options available reduces the need of any additional equipment:

- High performances Stereo Encoder
- Digital AES/EBU
- Dynamic RDS Encoder with TMC Function
- AOIP Audio Over IP
- WEB TCP/IP and SNMP connectivity for remote Access
- Japanese (JPN), Russian (OIRT) and more bands are options available.
- Parallel Remote Control Connector Interface

MODULAR ARCHITECTURE

Advantages of Modular Architecture:

Sometimes, the RF amplifier and exciter are integrated into a single enclosure, which complicates maintenance.

The **SENSOR** modular system overcomes these challenges by making each component independent and self-sufficient, greatly simplifying troubleshooting and fault resolution.

Another key advantage is that both, the FM Exciter and the RF Amplifier, are designed to operate independently and, each of them, includes all necessary components such as power supply, fans, control logic, output filter, and protections. Testing or repairing it, whether on-site or in the lab, requires only a dummy load and an standard power cord, without the need for special tools.

SYNAPSE COMPACT LOW POWER FM TRANSMITTER

SYNAPSE embodies:

- Extreme robustness and reliability
- Exceptional energy efficiency for lower consumption
- Remote access via HTML5 WEB, TCP/IP, SNMP, Mail, and Telegram
- Easy maintenance with minimal costs
- Versatile audio inputs, including STEREO, MPX Composite, AES/EBU digital, or MONO
- Unmatched audio fidelity

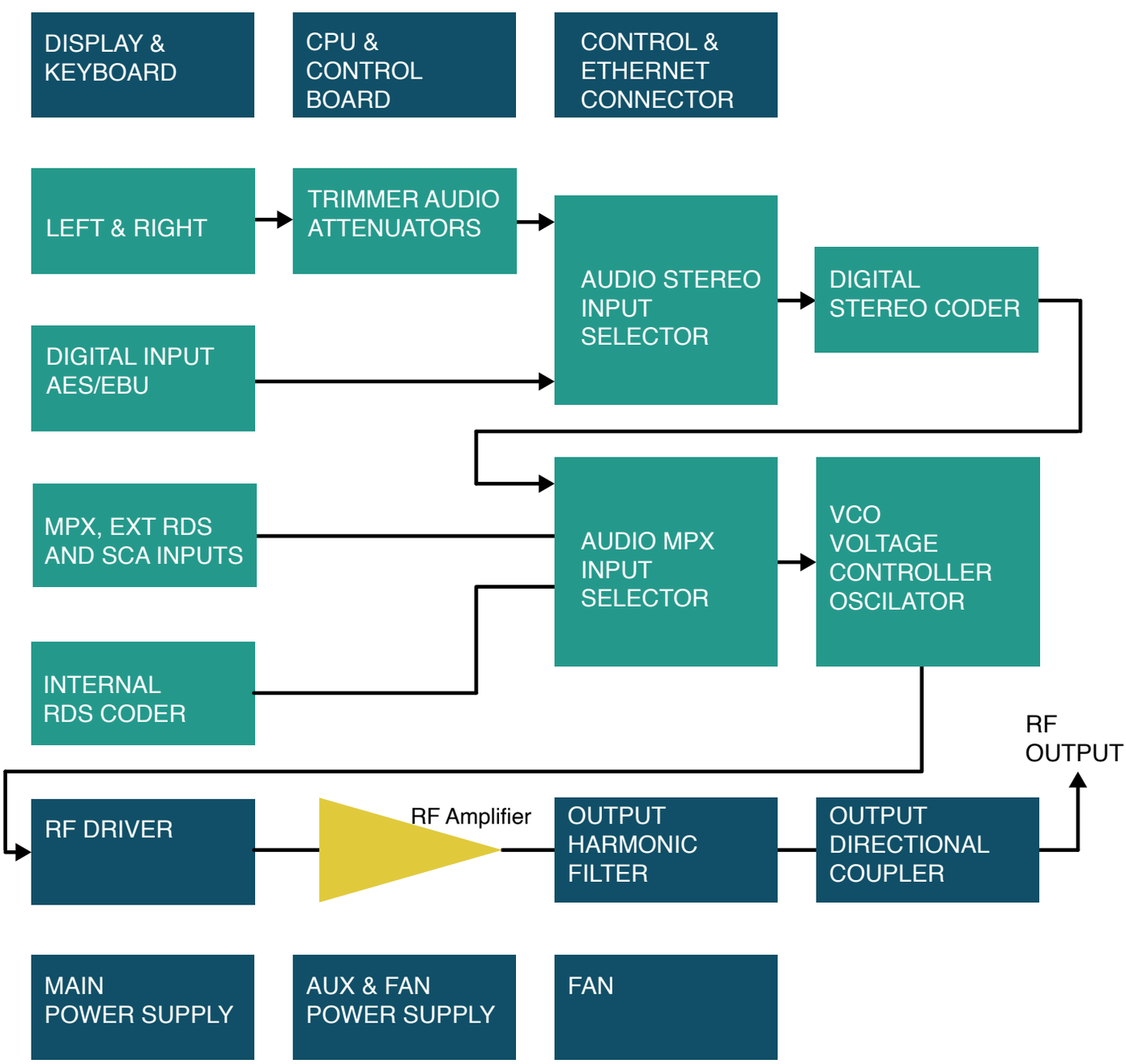
SYNAPSE FRONT VIEW



SYNAPSE BACK VIEW



SYNAPSE 30 BLOCK DIAGRAM



CELL RF Amplifier: The Core of SENSOR

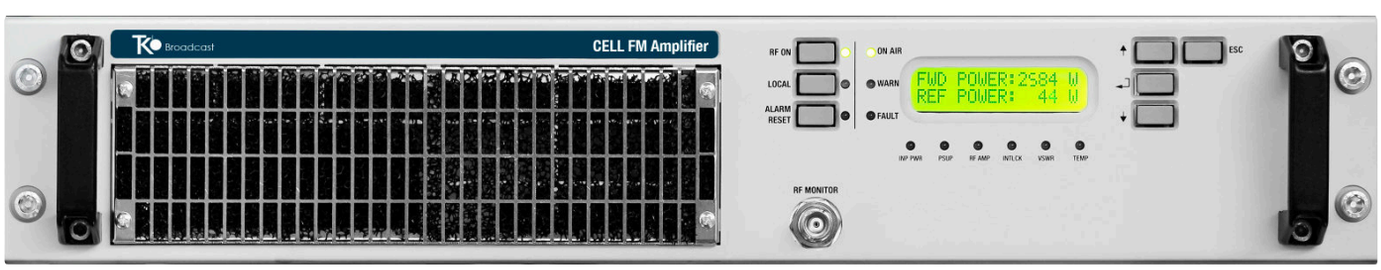
The **FM Amplifier** is the foundation of all **SENSOR** configuration. It has been optimized to enhance the performance of large broadcast systems, allowing them to benefit from shared optimizations. Features with Low-Level RF Power Input thanks a pre-driver requiring less than 1 W of power, allowing to drive high-power transmitters using a small 30 W exciter. It also supports the installation of an attenuator/isolator on the splitter's input, providing added flexibility and protection.

Benefits:

- Optimal Load to the Exciter: The input attenuator and pre-amplifier provide an optimum load to the exciter.
- Prevents Exciter Shutdown: Avoids VSWR feedback from the amplifiers.
- Isolated Exciter Input: The exciter drives a resistive load rather than directly driving the LDMOS input.

Note: In configurations with only one RF amplifier, a 10 dB input attenuator is installed.

CELL FRONT VIEW



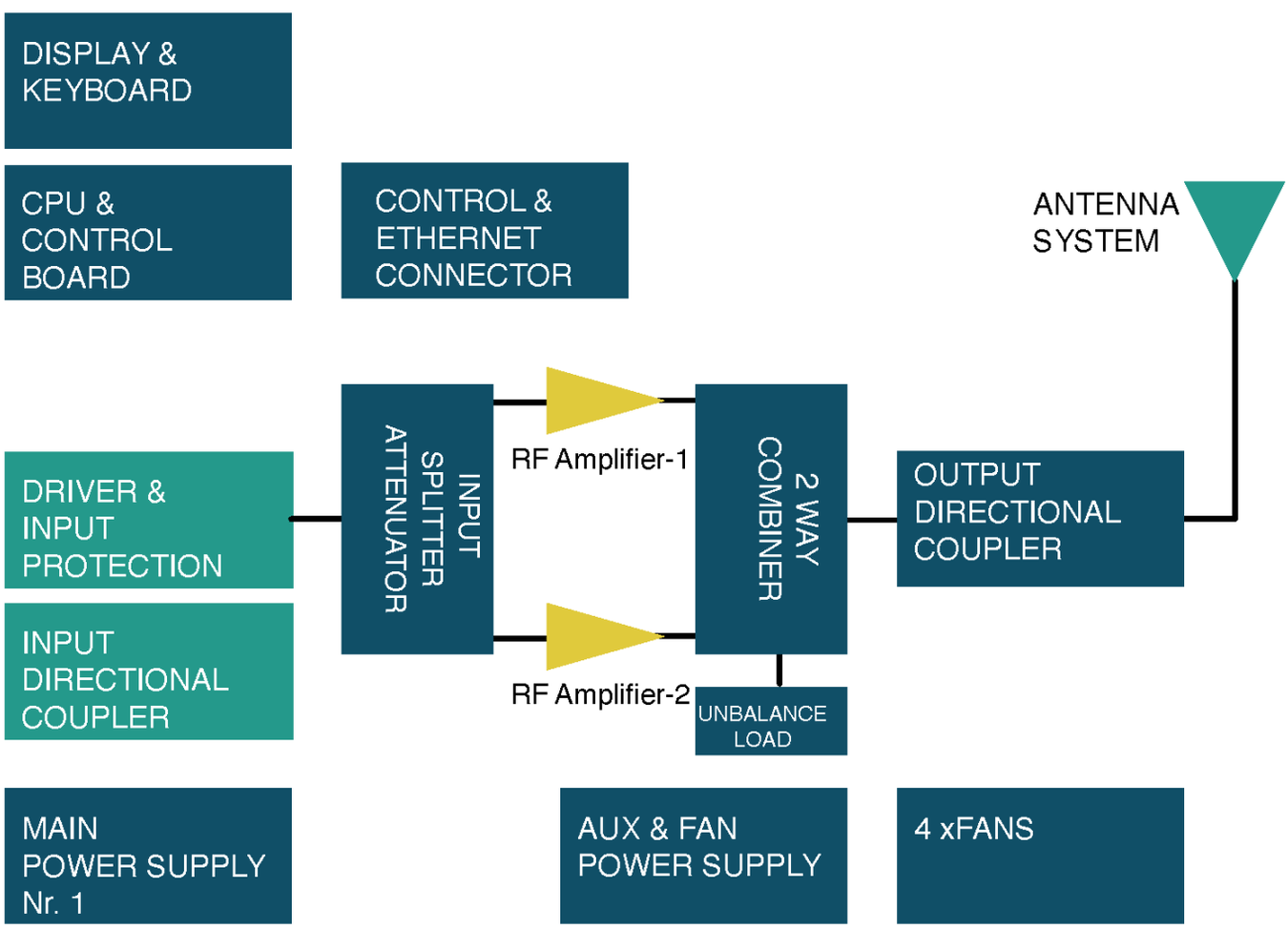
CELL BACK VIEW



Key Features of the RF Amplifier include:

- Compact Dimensions
- Stand-Alone Operation
- Low Input Power Requirement
- Hot Plug-In Power Supply: Available on the online market.
- Safe Removal: Can be safely removed without interrupting the transmission.

CELL 2000 BLOCK DIAGRAM



FEATURES

User Interface

Provides immediate control and visualization of the transmitter's status.

Features:

- Direct Access to Main Commands: Smart navigation keys with ESC function.
- Status Indicators: LEDs provide immediate recognition of operational conditions.
- Intuitive Navigation: Easily browse all parameters.



Reliability and Robustness: Engineered for Durability

To ensure exceptional reliability and performance, all components of **SENSOR** are over-dimensioned to handle rigorous conditions.

Design and Construction:

- Air Filter: Provides high protection, easily cleanable or replaceable.
- Aluminium Construction: Balances minimal weight with maximum durability.
- Tropicalized PCB Boards and Wiring: Specialized coating safeguards against extreme conditions.

Component Over-Dimensioning:

- Heatsinks and Fans: Handle excessive heat and ensure adequate cooling.
- Dummy Loads and LDMOS RF Amplifiers: Exceed operational requirements and tolerate high VSWR.
- Power Supply: Provides 30% more power than required.

Integrated Protections:

- AC Mains Filtering
- Lightning Protection
- Overvoltage Spike Protection

Mechanical Construction

- Compact Design: Robust 3U aluminium rack mount.
- Optimized Airflow: Channels air through aluminium ducts, enhancing cooling efficiency.
- Efficient Heat Management: Dedicated heatsinks for all heat-producing components.
- Enhanced Durability: Protects electronic components from thermal stress.
- Heavy-Duty Fasteners: Simplifies maintenance with durable 5 mm screws.
- Aluminium Construction: Combines low weight with exceptional strength.

High Efficiency for Low Power Consumption

- Advanced 6th-generation LDMOS Technology: High efficiency and tolerance to VSWR up to 65:1, ensuring superior reliability and reduced energy consumption
- Intelligent Efficiency Algorithm: Controls power supply voltage and bias, maintaining optimal efficiency at any frequency and power level.

Plug-In Power Supply

Self-Protected Plug-In Power Supply: Wide voltage range (90–250 V) for enhanced reliability, includes AC mains filtering. Lightning and Overvoltage Protection, as well as Delayed Energization option.





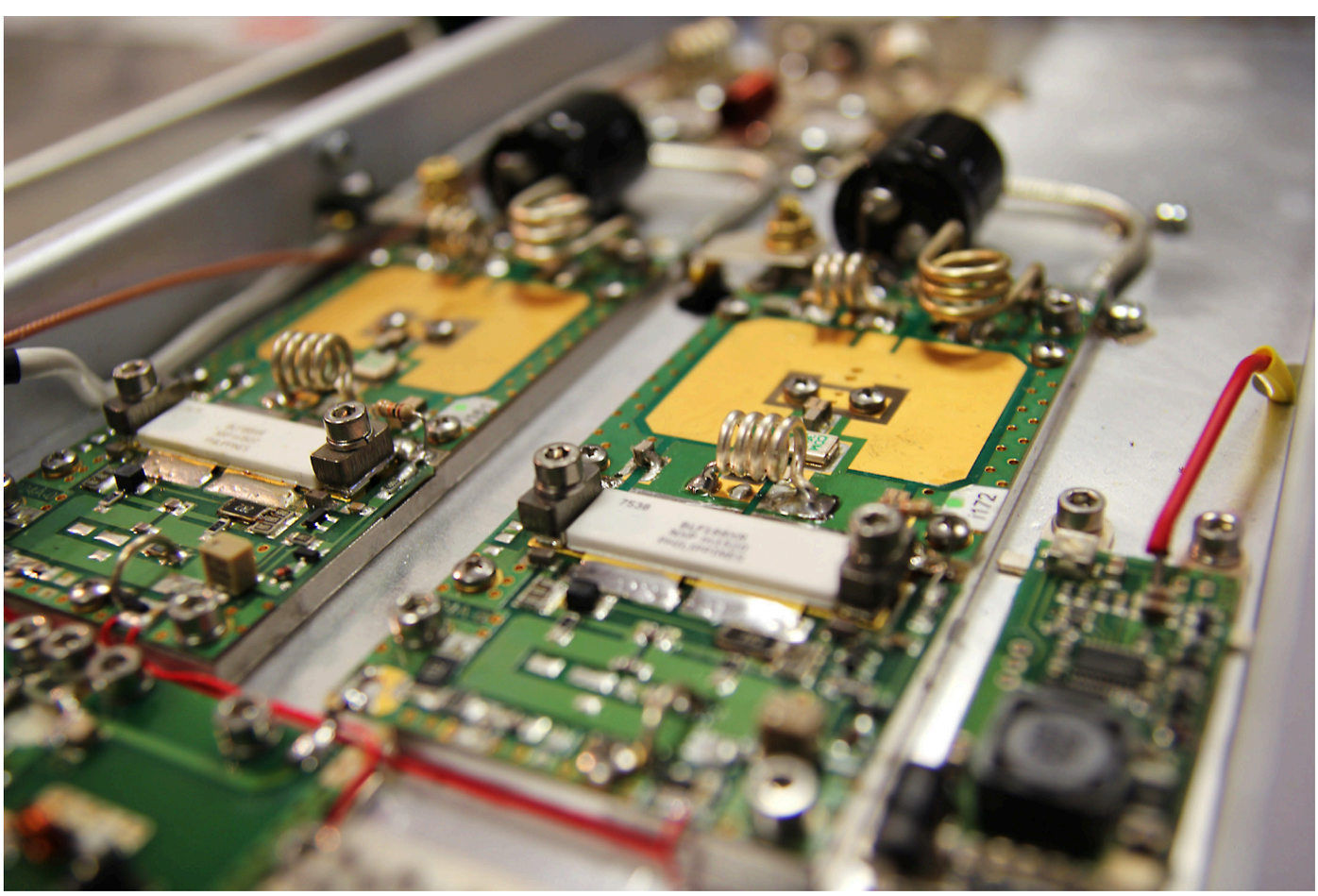






RF Planar Architecture

Ensures maximum reproducibility and consistency in RF amplifier quality. The Copper Carrier enhances heat dissipation and simplifies maintenance.



Protections

Transmitter Integrated Protection:

Safeguards against internal anomalies like VSWR issues, excessive temperature, or component malfunctions.

Site Protection Against Environmental Factors:

Shields against external factors like lightning or power supply fluctuations.

Transmitter Integrated Protections

SENSOR incorporates:

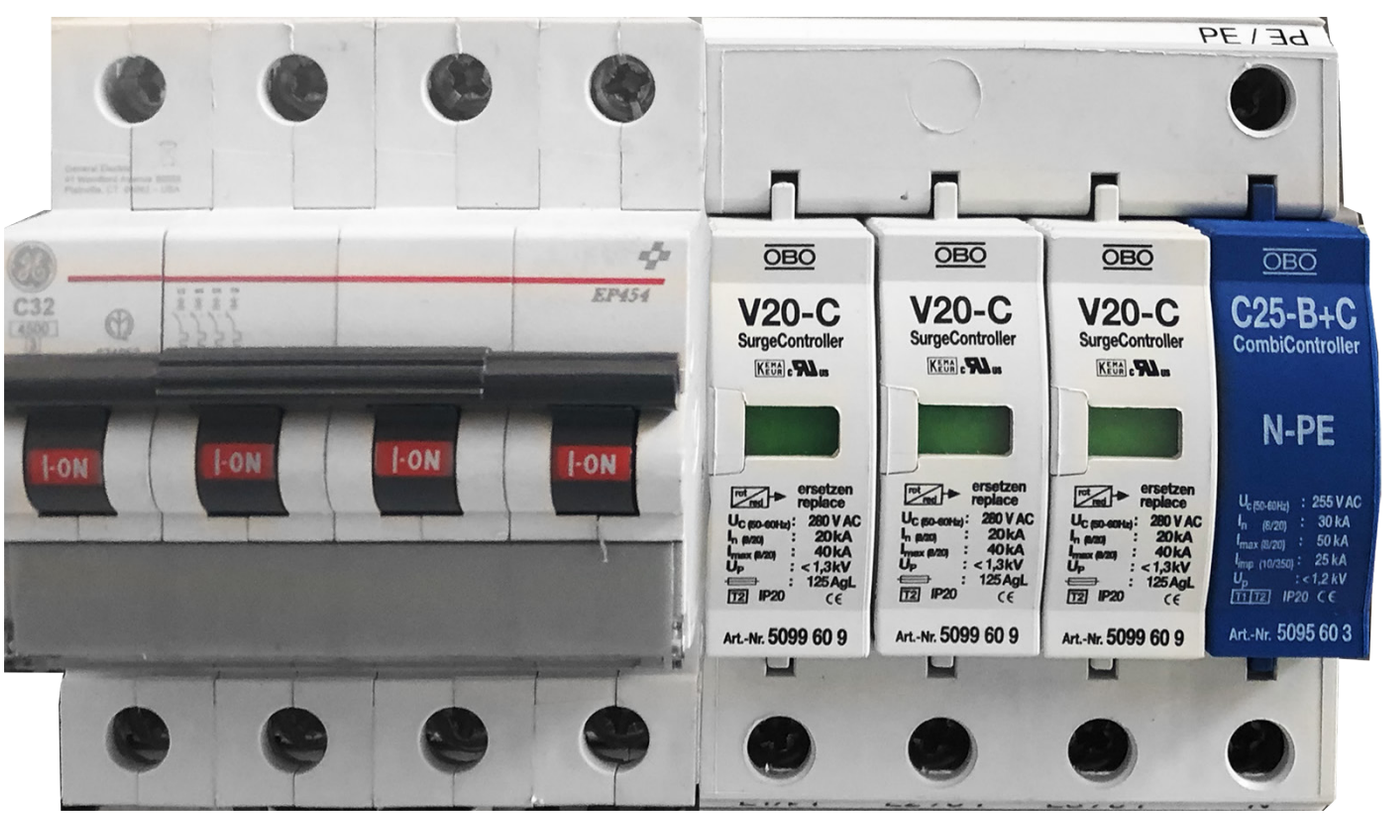
- Fast Hardware Protection: Immediate response within nanoseconds for critical scenarios.
- Soft Software Protection: Reduces output power without interrupting the broadcast under less severe conditions.

Protection Features:

- Environmental Over-Temperature Protection
- Cooling System Failure Detection
- Amplifier Breakdown Monitoring
- Over and Under AC Voltage Protection
- RF Coaxial Output Open or Short Circuit Protection

Site Protections: Overvoltage Protection and Delayed Energization (Optional)

Offers optional protection systems, including delayed energization and surge protectors, to guard against power interruptions and overvoltage.



N+1 and Backup Systems

- Versatile Standby Options: Supports various configurations.
- Streamlined Control: No additional control units required.
- N+1 Profiles Connector: Provides seven memory settings.
- Comprehensive Remote-Control Interface: Includes dry contact relay outputs and opto-isolated inputs.

Standards Compliance

- Rigorous Standards Adherence: Fully compliant with ETSI, CCIR, and FCC regulations.

Final Testing and Burn-In

- Final Test and Burn-In: Ensures maximum reliability through meticulous design and extensive testing.
- Rigorous Quality Assurance: Guarantees flawless operation by scrutinizing every detail.



Packaging

Designed with optimized size and weight for secure packaging, ensuring protection against shock and vibration during transport.

Shock and vibration during the transport can compromise the result of an installation.

Optimizing the CELL Amplifier dimension and weight allows a small and smart package small weight and dimensions help to meet the most demanding transport conditions for: Hermetic temperature control vibration and Shock Isolation handling light packs aid the health of the operators.



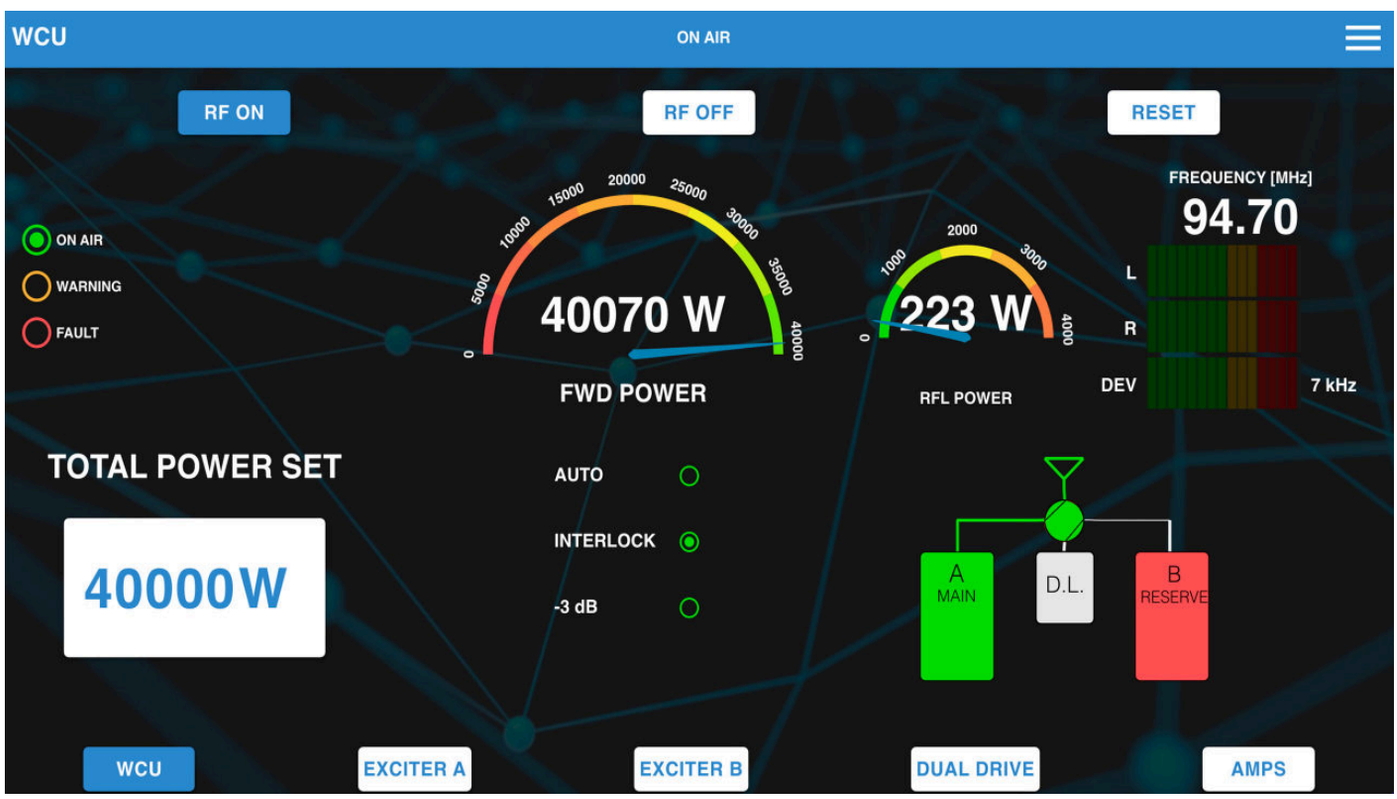
REMOTE CONTROL
TCP/IP: Web and SNMP Access

Combining intuitive local control with advanced remote capabilities, this system ensures comprehensive supervision of all transmitter operations. It provides operators with unmatched control and diagnostic precision, guaranteeing optimal performance and swift fault resolution.

SENSOR features the most advanced web remote control on the market.

User Interface:

- Direct Internet Connection: No external boxes needed.
- Comprehensive Web Control: Adjust all main parameters remotely.
- Universal Graphics Interface: Compatible with PCs, smartphones, and tablets.
- Email Alerts and Reports: Programmable notifications for alarms or status reports.
- Web Log File: Stores up to 64,000 events, exportable in .txt format.
- Remote Upgradability and Secure Access
- SNMP v2c Support
- Telegram Remote control
- Advanced Diagnostics: Over 100 parameters monitored, including current, voltage, and temperatures.



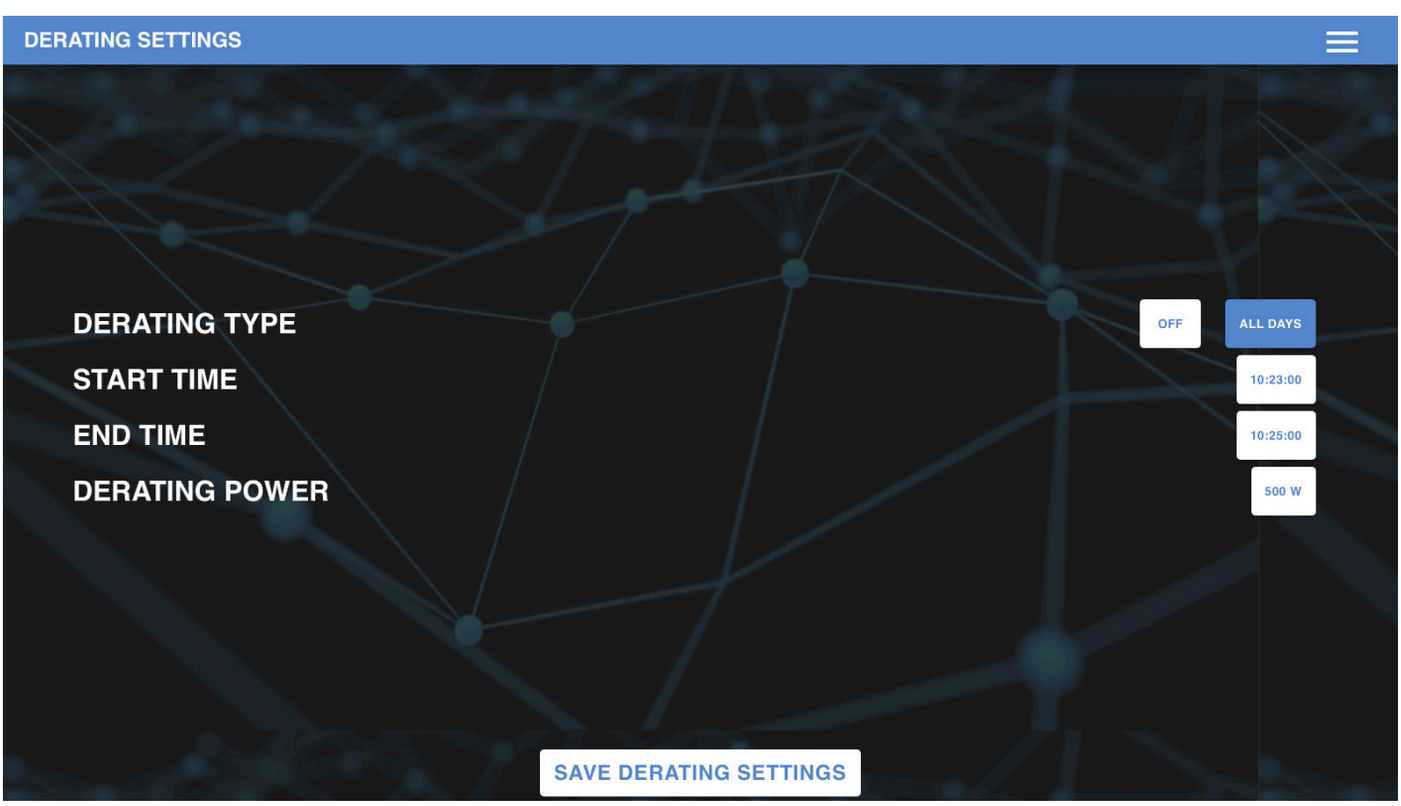
RF Modules working parameters

This page provides a detailed, row-by-row display of the operational status and working parameters of RF amplifier modules, enabling operators to monitor their performance and health in real-time.



Energy-Saving Scheduler for Power Derating

- Weekly Scheduler: Optimizes energy consumption with configurable events.
- Flexible Scheduling: Multiple events per day, tailored for each day of the week.



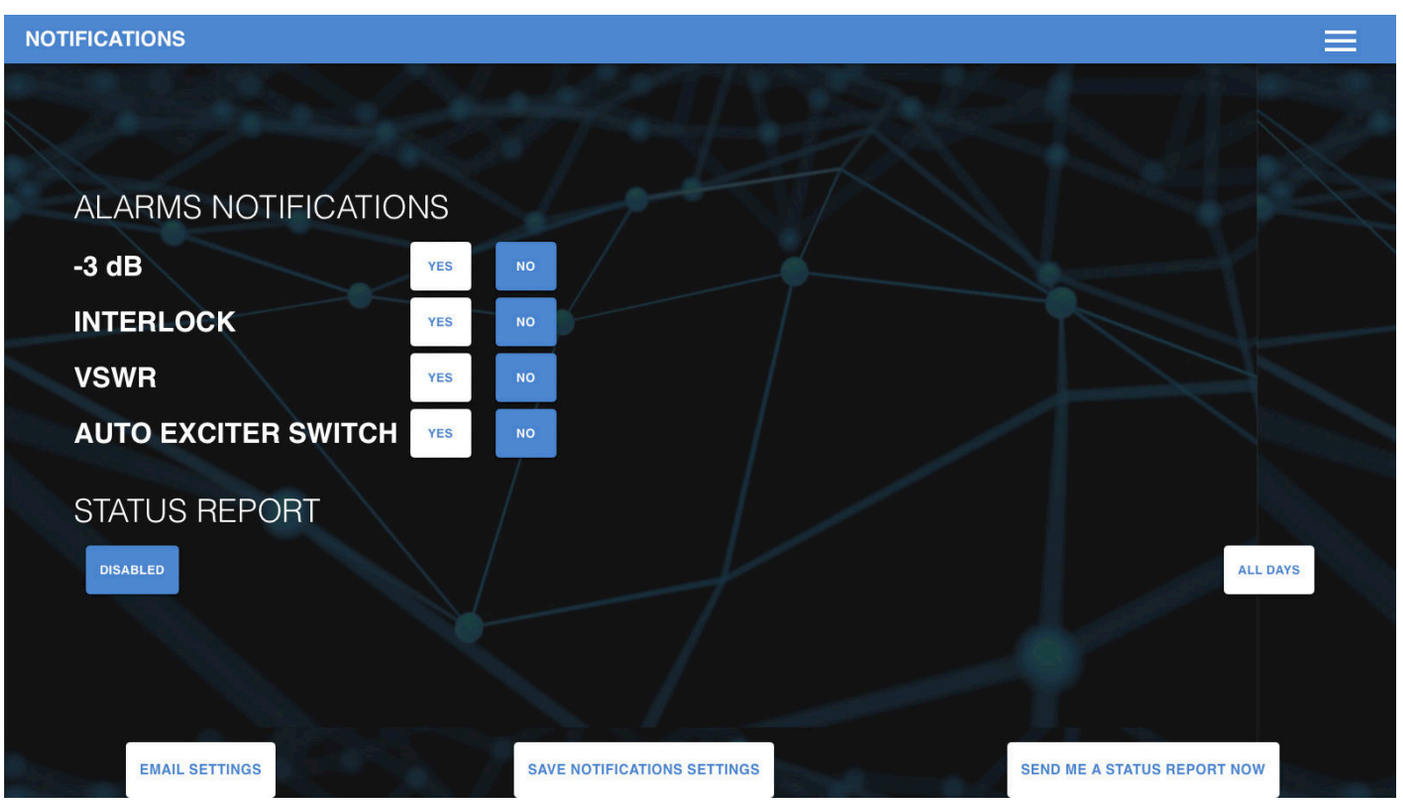
EMAIL and TELEGRAM Notifications

The remote control delivers real-time updates on the FM transmitter's status and alarms via e-mail and Telegram, enhancing management efficiency and minimizing downtime. Notifications can be customized to focus on specific status changes, with options for immediate alerts and periodic updates at set intervals.

Key Features:

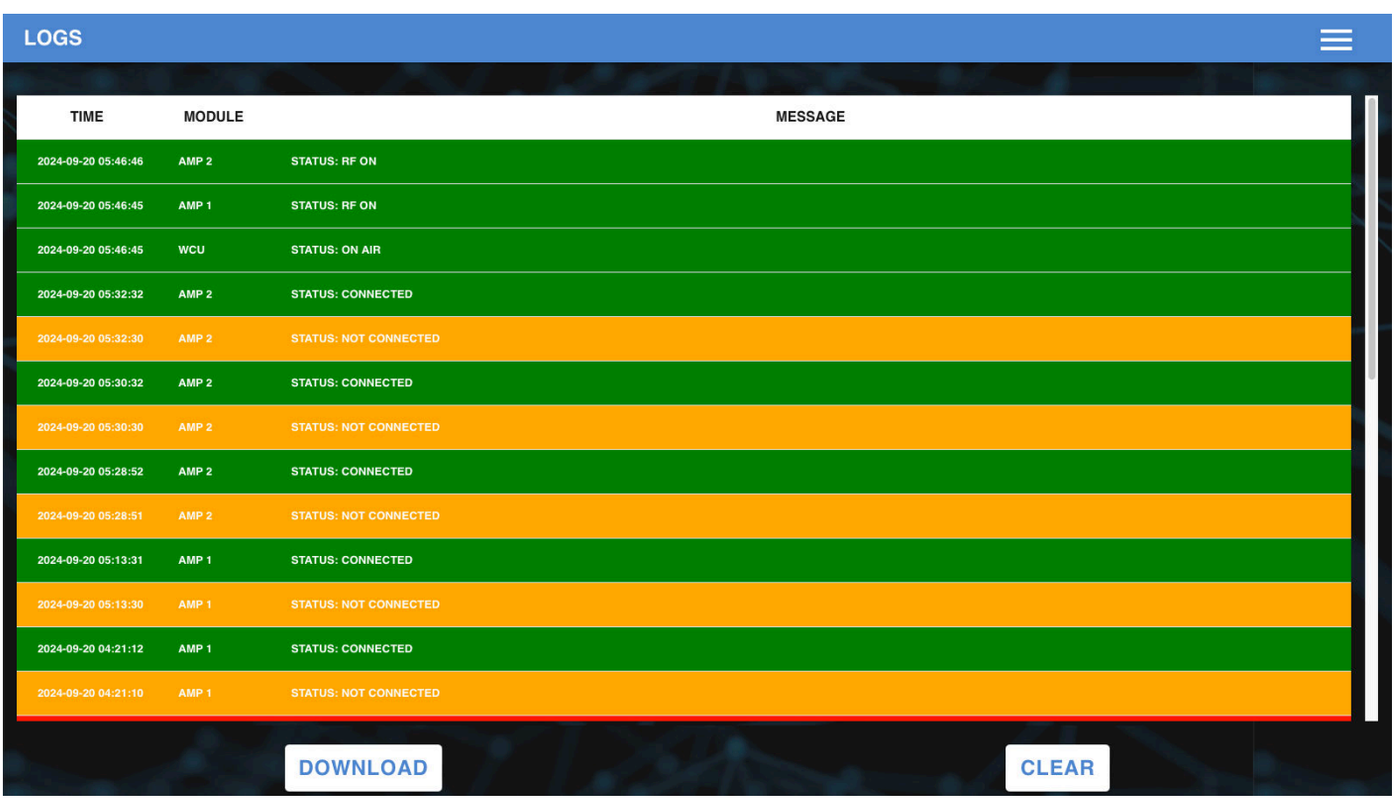
- Status Updates: Detailed notifications on operational parameters, including ON/OFF states, working frequency, audio modulation levels, and key metrics like power and temperature.
- Alarm Alerts: Instant notifications for faults or anomalies, such as low output power, VSWR issues, or exciter auto-switch events.
- Customizable Notifications: Flexible configuration to select which events trigger alerts.
- 24/7 Monitoring: Continuous operation ensures timely response to issues anytime.

This feature provides a reliable and adaptable solution for monitoring and maintaining transmitter performance.



LOG file

Here’s a refined version of your text with redundancies eliminated and improved readability:
A detailed log file records all transmitter status changes with precise date and time stamps. Events such as ON/OFF state transitions, operational frequency adjustments, audio modulation presence, connection status with RF modules and the exciter, and any component faults are documented. This log preserves the transmitter’s history to facilitate accurate monitoring of its operation and streamline troubleshooting in case of component failure.



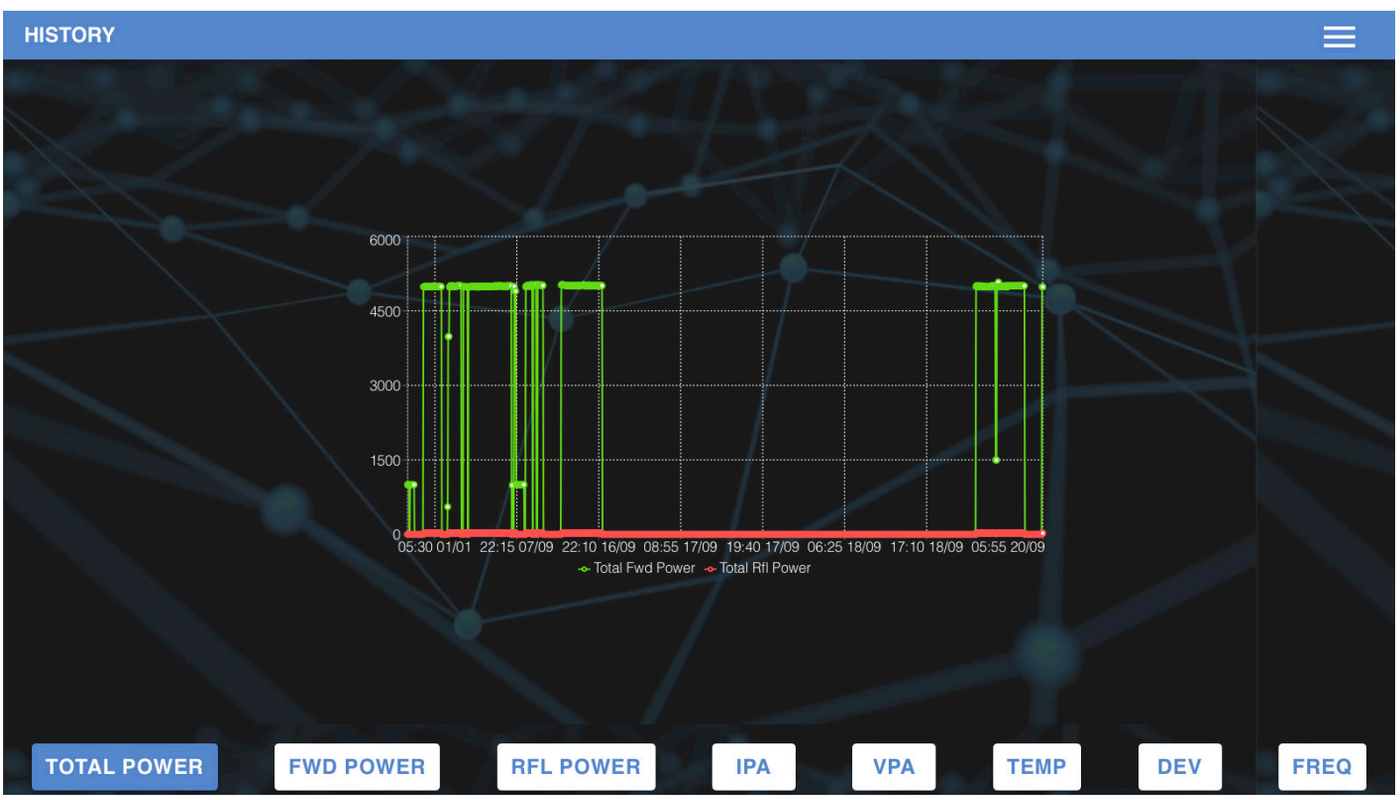
History Chart

TEKO transmitters offer a unique supervision feature that tracks working parameters over the past month using a first-in, first-out chart. This enables maintenance engineers to monitor real-time conditions and compare them with historical data.

This functionality is especially valuable for diagnosing faults at the hosting site by helping to identify potential causes. For example, a change in working temperature may indicate a cooling system issue, while the audio modulation graph can reveal STL link problems.

The monitored parameters include:

- Forward Power
- Reflected Power
- Voltage of each RF amplifier
- Current of each RF amplifier
- Temperature of each amplifier
- Audio Modulation
- Working Frequency



Dynamic RDS OPTION

Fully dynamic FM broadcast RDS encoder with independent communication port
Control interface based on ASCII commands and UECP protocol
Text features include dynamic PS, parsing, scrolling, tagging, fixed messages, scheduling and HTTP reading
Excellent compatibility with broadcast automation systems
Control software includes powerful Windows GUI application
Supports control from external PHP/ASP scripts
Easy and fast set-up
Excellent spectral purity, direct digital RDS signal synthesis; compliant with EN 50067 / EN 62106
Two switchable program sets (with optional DSN and PSN setting)
Internal real-time clock incl. backup battery
No special 19 kHz input needed - pilot tone internally recovered from MPX signal using digital PLL

RDS services directly supported by the unit

PI	Program Identification
PS	Program Service
PTY	Program Type
TP	Traffic Program
TA	Traffic Announcemen
AF	Alternative Frequencies
PTYN	Program Type Name
DI	Decoder Identification
EON	Enhanced Other Networks information
RT	Radiotext
RT+	Radiotext Plus
M/S	Music/Speech
CT	Clock-Time and Date
PIN	Program-Item Number
ECC	Extended Country Code
LIC	Language Identification Code
TMC	Traffic Message Channel
UDG	User Defined Groups

DYNAMIC RDS OPTION

User Instruction

PS - Program service name
This is the label of the program service consisting of not more than eight alphanumeric characters, which is displayed by RDS receivers in order to inform the listener what program service is being broadcast by the station to which the receiver is tuned.

RT - Radiotext
This refers to text transmissions, primarily addressed to consumer home receivers, which would be equipped with suitable display facilities. The text can be up to 64 characters long. Some receivers do not support the Radiotext service.
An additional feature of the Radiotext is the Text A/B flag. Two cases occur: If the receiver detects a change in the flag, then the whole radiotext display should be cleared and the newly received radiotext message segments should be written into the display. If the receiver detects no change in the flag, then the received text segments or characters should be written into the existing displayed message and those segments or characters for which no update is received should be left unchanged. For static RT (i.e. RT is not updated and shows only a general information like studio's phone number), the A/B flag has no meaning.

RT+ on iPodClick here for summarization of national character coding issues

RT+ - Radiotext Plus
The RT+ is designed to let the listener take additional benefit from the Radiotext service by enabling receivers to offer direct access to specific elements of Radiotext. Typically the RT+ feature supports song artist and song title elements. These elements anyway carried in the Radiotext, are identified by their class code, length and location within the Radiotext. The receiver must be equipped with the RT+ function (also called "tagging") to take advantage of this feature.

Click here for information about how to send RT+ tagging with our RDS encoders

AF - Alternative frequencies list
The list of alternative frequencies gives information on the various transmitters broadcasting the same program in the same or adjacent reception areas. This facility is particularly useful in the case of car and portable radios.
When the PI code indicates local coverage-area, i.e. only one frequency is used, AF list may contain this frequency.

PI - Program identification
This information consists of a code enabling the receiver to distinguish between countries, areas in which the same program is transmitted, and the identification of the program itself. The code is not intended for direct display and is assigned to each individual radio program, to enable it to be distinguished from all other programs. One important application of this information would be to enable the receiver to search automatically for an alternative frequency in case of bad reception of

the program to which the receiver is tuned; the criteria for the change-over to the new frequency would be the presence of a better signal having the same PI code.
The PI code consists of four characters. The first two characters have special meaning, second two are used to clearly identify different stations.
The first character identifies country. The second character identifies program type in terms of area coverage:
0 - Local (Local program transmitted via a single transmitter only during the whole transmitting time.)
1 - International (The same program is also transmitted in other countries.)
2 - National (The same program is transmitted throughout the country.)
3 - Supra-regional (The same program is transmitted throughout a large part of the country.)
4 to F - Regional (The program is available only in one location or region over one or more frequencies, and there exists no definition of its frontiers.)

ECC - Extended Country Code
It helps the receiver to recognise the country in cooperation with the PI code. The first most significant bits of the PI code carry the RDS country code. The four bit coding structure only permits the definition of 15 different codes, 1 to F (hex). Since there are much more countries to be identified, some countries have to share the same code which does not permit unique identification. The ECC byte determines the country unambigouesly.

Click here to find ECC and first PI digit for your country!

PTY - Program type
This is an identification number to be transmitted with each program item and which is intended to specify the current Program type within 31 possibilities. This code could be used for search tuning. The code will, moreover, enable suitable receivers and recorders to be pre-set to respond only to program items of the desired type. The last number, i.e. 31, is reserved for an alarm identification which is intended to switch on the audio signal when a receiver is operated in a waiting reception mode.

TA - Traffic announcement identification
This is an on/off switching signal to indicate when a traffic announcement is on air. The signal could be used in receivers to:
a) switch automatically from any audio mode to the traffic announcement;
b) switch on the traffic announcement automatically when the receiver is in a waiting reception mode and the audio signal is muted;
c) switch from a program to another one carrying a traffic announcement.
After the end of the traffic announcement the initial operating mode will be restored.

TP - Traffic program identification
This is a flag to indicate that the tuned program carries traffic announcements. The TP flag must only be set on programs which dynamically switch on the TA identification during traffic announcements. The signal shall be taken into account during automatic search tuning, so I recommend to

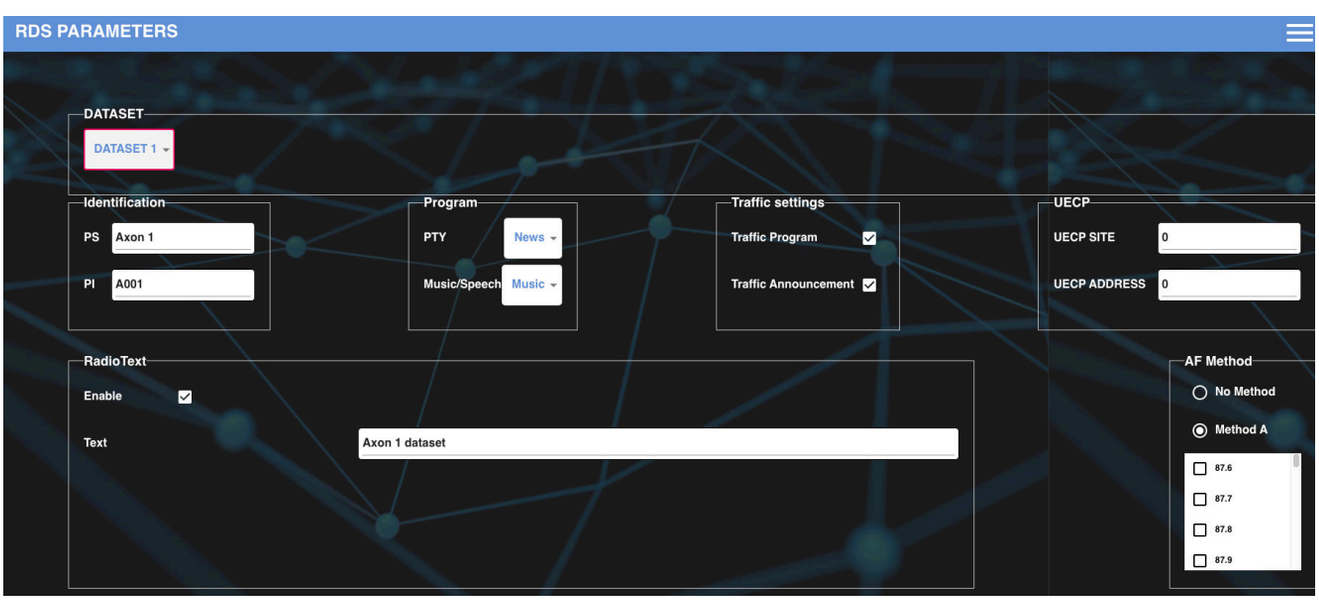
turn this flag on even though you don’t transmit any traffic announcements.

DI - Decoder identification
Indicates which possible operating mode is appropriate for use with the broadcast audio. Many receivers ignore this service completely. For others, only the Stereo and Dynamic PTY flags have a sense. Set the Dynamic PTY if your PTY changes dynamically in dependence on actual program content. Flags Artificial head and Compressed are archaic and should be kept cleared unless you have a real reason for their use.

M/S - Music/speech switch
This is a two-state signal to provide information on whether music or speech is being broadcast. The signal would permit receivers to be equipped with two separate volume controls, one for music and one for speech, so that the listener could adjust the balance between them to suit his individual listening habits.

CT - Clock-Time and Date
Time and date codes should use Coordinated Universal Time and Modified Julian Day. The listener, however, will not use this information directly and the conversion to local time and date will be made in the receiver’s circuitry. CT is used as time stamp by various RDS applications and thus it must be accurate.

EON - Enhanced Other Networks information
This feature can be used to update the information stored in a receiver about program services



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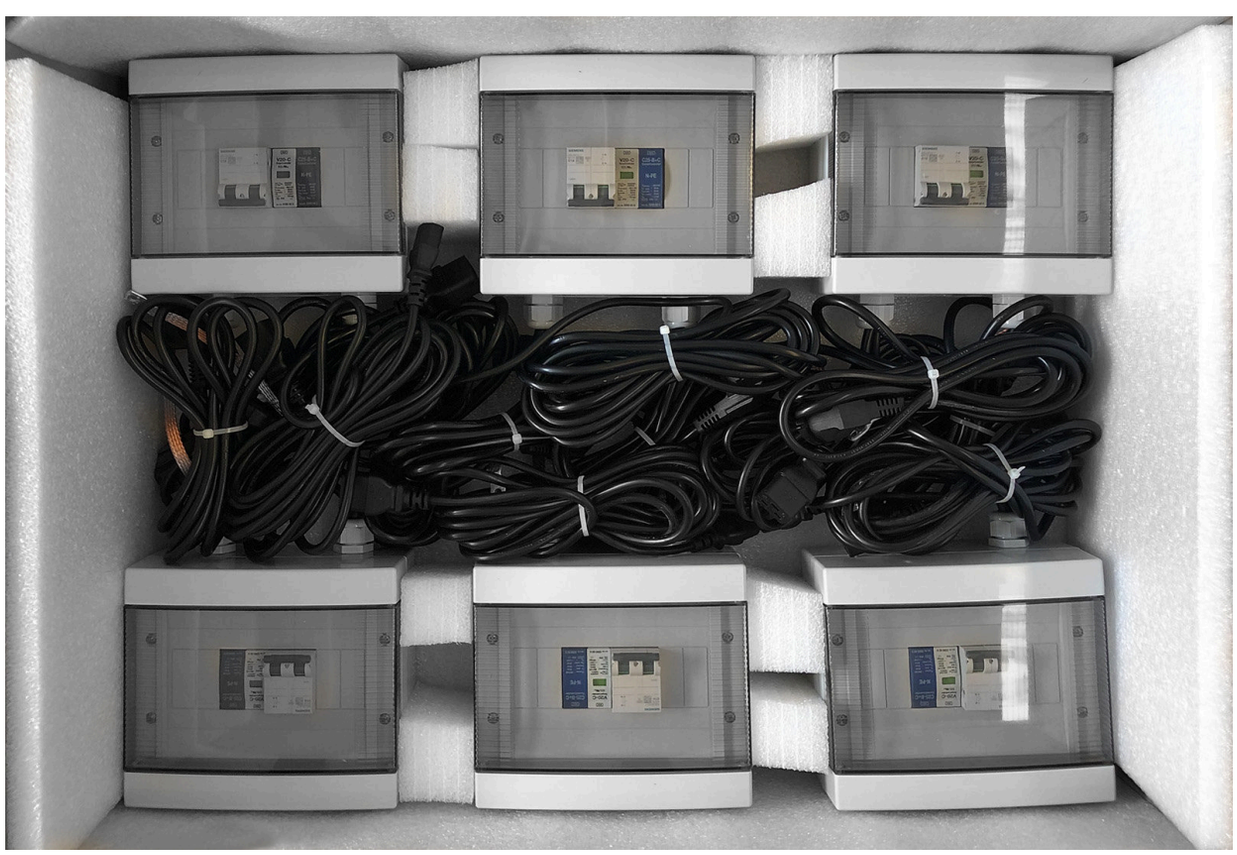
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ITALIA
Phone: +39 051 660 0608
email: info@tekobroadcast.com
www.tekobroadcast.com