



BROADCAST & SCIENCE EQUIPMENT

FM Transmitters

Science Amplifiers

Antennas

Site & Studio Equipment

Radio, Video and TV

Passive components

AXON 1 30W to 50W



AXON & NEURAL 30W to 1300W

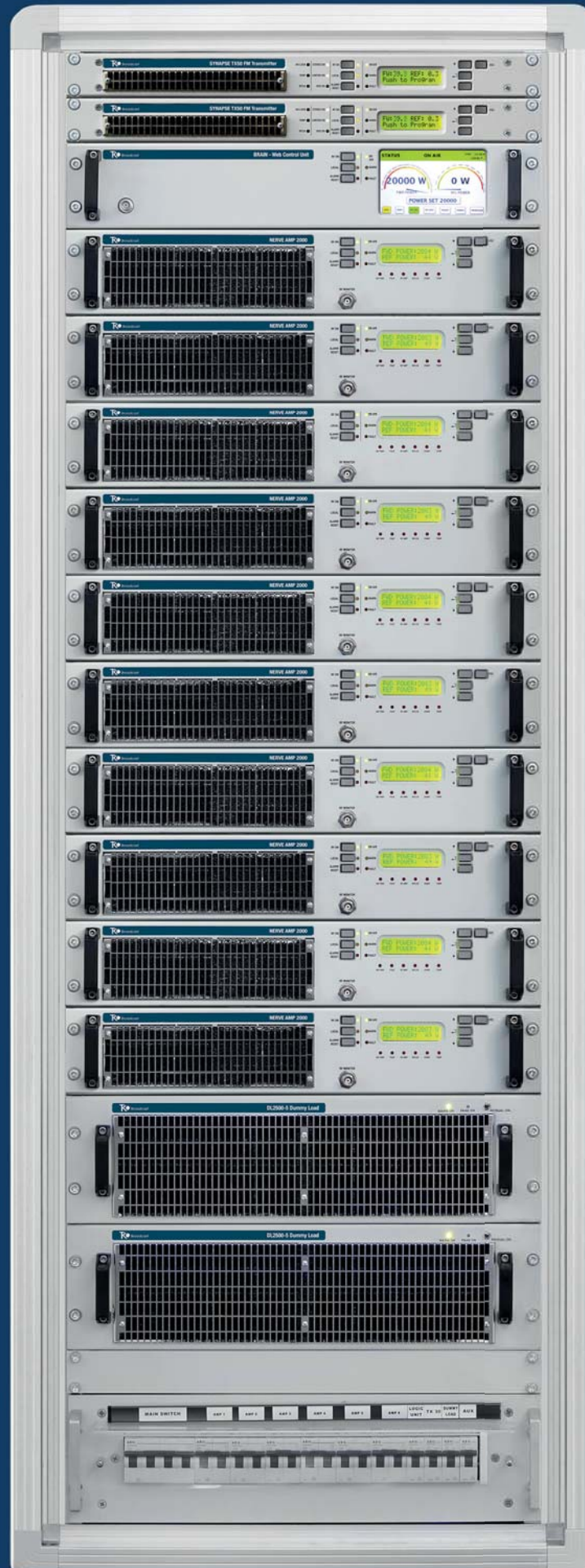


CORTEX 500W to 2500W



CORTEX

4kW to 100kW



AXON and CORTEX

World-class Performance FM TRANSMITTERS

Only option for High-End sound lovers with the need to broadcast from extreme weather environments

Ultimate solution from 30W to 100kW, AXON and CORTEX guarantees superior quality, reliability and professional features.

AXON and CORTEX are the TOP SELLER IN GOVERNMENTAL, PRIVATE NETWORKS, COMMERCIAL AND COMMUNITY RADIO STATIONS

Its unmatched features and outstanding technical characteristics makes it ideal for any FM broadcasting applications like:

- Community radios FM transmitter
- Commercial radios FM transmitter
- Religious radios FM transmitter
- Educational radios FM transmitter
- Other non-profit radio groups FM transmitter
- Big National Networks FM transmitter
- Public Radios FM transmitter
- Drive-in movies radios FM transmitter
- Theatres radios FM transmitter
- Stadiums radios FM transmitter
- Politic Radios FM Transmitter

AXON compact architecture and CORTEX modular architecture

AXON is a Low and Medium power FM Transmitter from 30W to 1.300W with Compact architecture: both, exciter and amplifier fit on the same case.

AXON is the Exciter of the CORTEX family

CORTEX is a Medium and High-Power FM Transmitter from 2kW to 100kW with Modular architecture: each component of the system is housed on a separate case: single or double Exciter, FM Amplifiers, Multiport splitters, Multiport combiner, Unbalanced power load, WEB control logic, Rack, Breakers, etc.

WCU

RF ON



ON AIR



WARNING



FAULT

TOTAL POWER

40000W

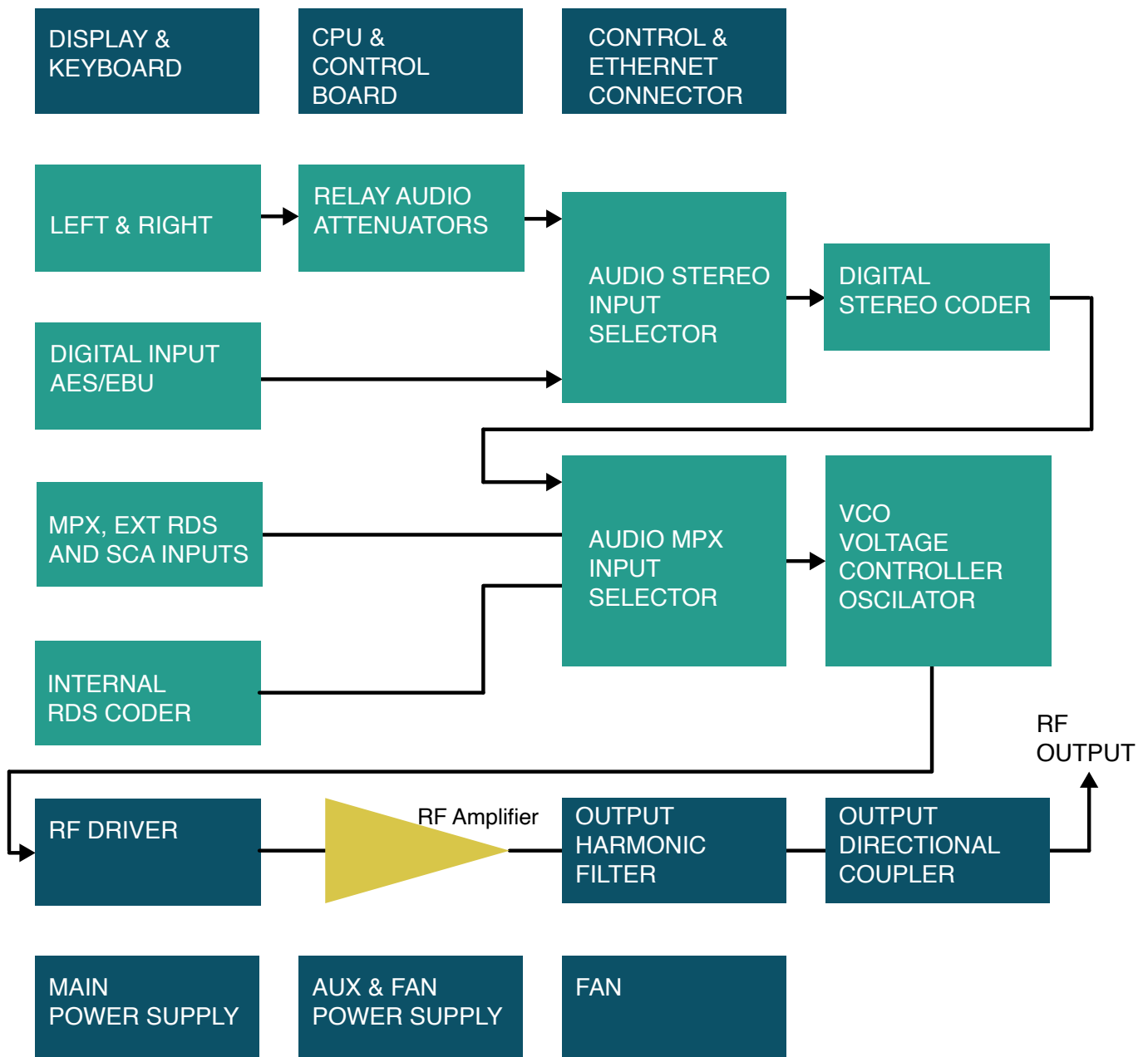
WCU

SYNAPSE - 30W FM Tr

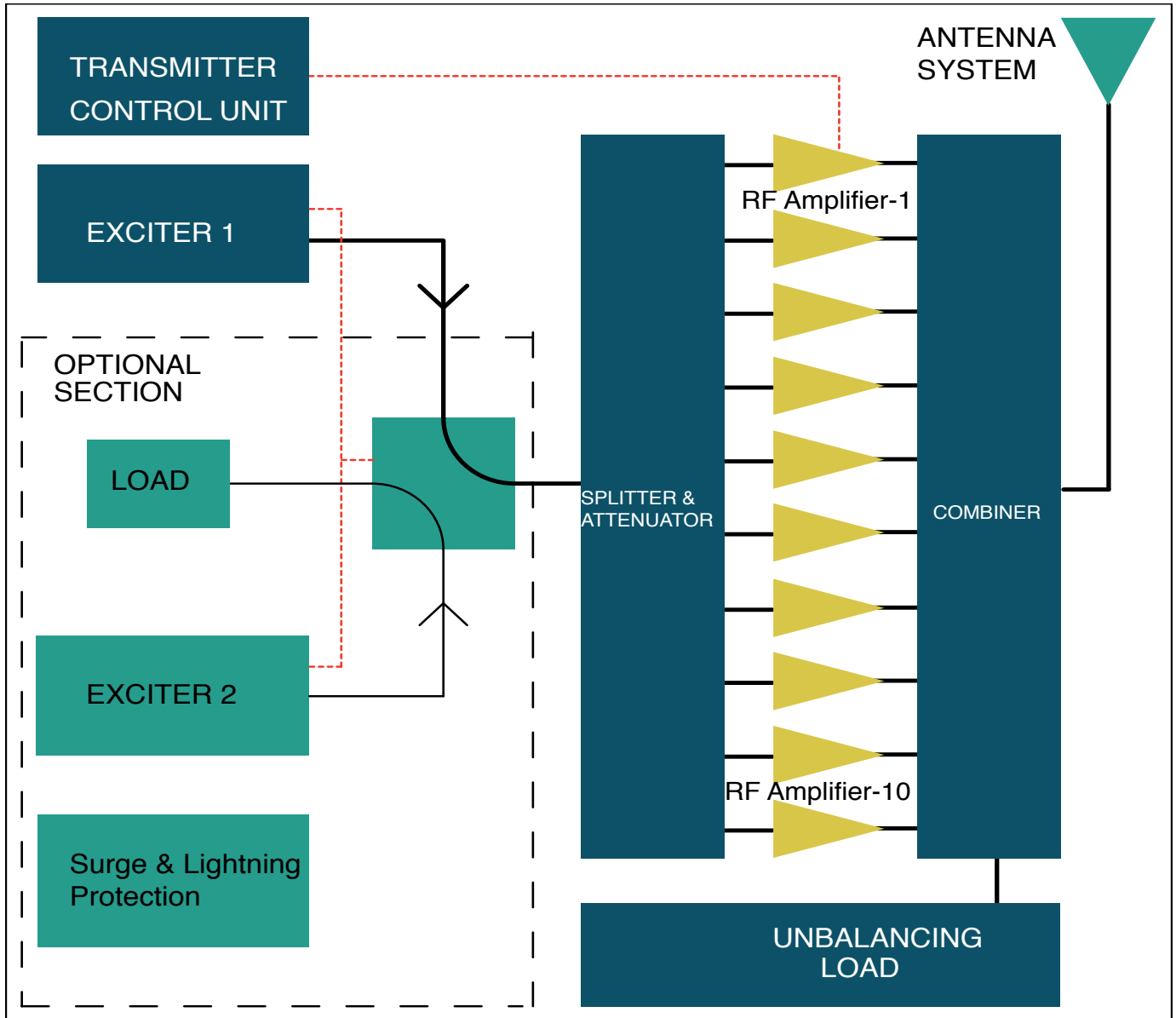
SYNAPSE - 30W FM T



AXON BLOCK DIAGRAM



CORTEX BLOCK DIAGRAM



AXON

Compact FM Transmitter

From 30W to 1.300W

The Sound Quality of the Music and its excellence audio fidelity are the most important feature of AXON, its features with warm softness audio, achieves a deep, clean and crystal sound, very low signal to noise, very low distortion and high stereo separation.

Audio inputs automatic backup: IP Streaming, Pen Drive or Hard disk MP3, MPX (Composite), Stereo, Digital AES/EBU or Mono

Intelligent Dynamic modulation Limiter keeps it always on right value

Dynamic RDS, remotely web programmable

WEB/SNMP remote control

Sharing all the reliability and robustness features of the CORTEX family, AXON takes care of CREATING the FM signal starting from the Audio signal. AXON is the cradle of FM signal modulation.

AXON is produced in a wide range of powers from 30W up to 1.300W, for this reason it is used indiscriminately as an Exciter for high power transmitters or alone as small or medium power radio transmitters.

His excellent audio quality highlights your sound and mood of your radio giving a measurable competitive advantage compared with any others brand of transmitters and gives you a big advantage over your competitors

- Very low S/N typical 85 dB, high stereo performance coder with typical 65 dB Stereo Separation and Ultra Low distortion 0,01% thanks to digital stereo coder.
- Exclusive Distortion-less Intelligent Soft Limiter keeps the maximum deviation in the 75kHz limits giving always the maximum possible volume without introducing of any kind of distortion.
- AES-EBU digital input
- Frequency Modulation from 87.5 MHz to 108.0 MHz. (JPN) JAPAN, Russian (OIRT 66 - 47 MHz) and more bands are options available
- Audio input and modulation selectable or in automatic change-over, MPX (Composite), Stereo, AES/EBU, Mono, AoIP (Audio over IP) or Pen Drive/HD MP3 play list.
- Dynamic RDS coder with TMC function, web remotely programmable
- HTML5 WEB TCP/IP and SNMP connectivity for remote Access.
- DDS option available
- N+1 Profiles connector provides 7 different memories selection. Memory settings are in the internal memory. Can be set by remote or in local.



AXON 30W to 1300W

CORTEX

Modular High-Power FM Transmitter

From 2/2,5kW to 100kW

CORTEX is the synthesis of robustness, easy maintenance, low energy consumption, Web Remote Control and a Big Sound.

CORTEX combine from 2 to 40 RF amplifiers to create a High-Power FM Broadcast Transmitter from 2/2,5kW to 100kW.

Designed for high-power requirements, it offers extreme high efficiency and makes it ideal for FM applications where the energy cost is crucial.

The 50-volt LDMOS technology delivers a dramatic increase in power density, lower operating costs and reduced cost of ownership over the life of the transmitter.

The modularity, the capability of grow in power (scalability) makes of CORTEX the most reliable and easy to maintenance FM Transmitter of the market.

Thanks to combine low power amplifiers CORTEX deliver the maximum level of output power in case of fault of one module amplifier.





CORTEX 2kW to 1000kW





HIGHLIGHTS

- Analogue and Digital Ready for HD Radio and DRM
- CORTEX is built by CELL 2500 FM and Pulse Amplifier
- CELL amplifier, equipped to work in stand-alone, allows easy maintenance on site
- Low level power input to the CELL Amplifiers modules
- Hot plug-in power supply standard market available for Instant replacement, easy maintenance, without off-air.
- The power supply is self-protected, and grants more reliability thanks its wide voltage range.
- Modular Architecture with very light amplifier modules (less than 17kg/34lbs each) provides Maximum Redundancy in Ultra compact size 2U for each amplifier module
- Fully RF and power supply redundant
- A single CELL Amplifier can be put on air as back-up of a bigger transmitter.
- Multiport Combiner and Splitter
- All system parts are assembled on separate components: splitter, combiner, unbalanced dummy loads, control logic.
- Solid State LDMOS technology up to 80% High Efficiency constant at any power level
- Total spectral purity: better than -90 dBc spurious and harmonics. I grant highest RF signal quality.
- Double exciter with automatic change over (option)
- Delayed energized of the system and overvoltage surge protection (option)
- Energy Saving Weekly scheduler output power derating for energy consumption optimization management.
- N+1 and Backups systems
- Web control logic Touch Screen BRAIN Control Unit
- Friendly User Interface with LCD front panel display, Direct Keys and LEDs indicator. It shows transmitter status and allows smart browsing with ENTER and ESC Keys.
- Remote control by TCP/IP: WEB + SNMP of all signal parameters
- Parallel Remote-Control Connectors
- Made in aluminium, Air filter and PCB boards tropicalized
- Aluminium air ducted.
- Copper Carrier on active power components such as LDMOS or unbalanced loads resistors
- Easy maintenance
- High Reliability and robustness
- High precision Mechanical construction
- Uninterrupted service thanks to free failure design intelligent software protections
- Protection against Lightning, Dust and Corrosion
- Full- range power supply: 180-260 vac mains voltage
- Designed to be rough itself. All components that determine the reliability are over-dimensioned.

ned. The Heatsink, LDMOS, Fans, Unbalanced load resistors and Power supply.

- Sturdy and careful packaging ensures a safe journey to your destination.
- Top seller in Governmental, Private Networks, Commercial and Community radio stations
- Compliant with all the standard: ETSI – CCIR – FCC. Meets all the most rigorous electro-magnetic quality standards

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CORTEX architecture

The transmitter with modular architecture is composed by:

- Stand alone Low Power Exciter
- High Efficiency Solid State FM Amplifiers CELL 2500
- Multiport splitters
- Multiport combiner
- Unbalanced power load 2 to 10 inputs
- FM single or double exciter.
- WEB control logic.
- Rack.
- Breakers
- External power supply for Dummy Load

CELL 2500 FM and Pulse Amplifier is the core of CORTEX

It represents the base of all configurations.

It was **obsessively optimized** for best results, in this way, big broadcast systems benefit and share this optimization.

The CELL RF Amplifier has 2kW or 2,5kW output power.

Thanks, of the size, 2 HE it fits up to 10 in a standard 19-inch rack.

In the CELL Amplifier was **Maximized**:

- Efficiency
- Reliability
- Electro-magnetic performance
- Protections
-

And minimizes:

- weight
- power consumption
- heat produced on the site

CELL amplifier, equipped to work in stand-alone allows easy maintenance on site

A key to make easy the maintenance is to have the possibility to test and repair the amplifier module in laboratory or in the site without special tools required.

It's necessary to remark than in most modular systems from other manufacturers, the RF module contains only the amplification part.

When it is pulled out, it has no power supply, no fans, no logic, no output filter. It is impossible to repair under these conditions. The repair can only be carried out in the manufacturer factory by specialized technicians.

The conditions to make easier the maintenance is:

- 1) To be possible test and repair the amplifier module on site or in laboratory.
- 2) It doesn't need any special tools.

The CELL amplifier is equipped with: power supply, fans, control logic, output filter and protections. All the parts needed to work in stand-alone.

To make the maintenance on it only and external exciter, a dummy load and energy cord with standard plug are needed. No special tools or connectors are needed

CELL Amplifier low level power input

The CELL amplifier has an input pre-driver. The power necessary to drive it less than 1 W.

Inside the amplifier there is a 10 dB attenuator.

This feature allows to drive big power transmitters with a small 30W Exciter, moreover allows to install and attenuator/isolator on the input of the Splitter.

The benefits of this configuration are:

- All the family CORTEX uses the same exciter model
- The input attenuator, together with the pre-amplifier grants always an optimum load to the exciter.
- Never the exciter stops by VSWR coming back from the amplifiers

In fact, the exciter is not driving direct the input of the LDMOS but is driving a perfect resistor load.



CELL 500W to 2500W

Multiport Splitter

The Multiport splitter is used to divide the input power into the outputs. It can have between 2 and 10 outputs.

In the input of the splitter is present a 50 Ohm attenuator/isolator. This shows a constant and adapted load to the exciter.

This is crucial to grants the redundancy of the system: without it, in case of fault in the splitter, a cable or the input of an amplifier, it produce and VSWR alarm on the exciter. A fault in only one component stops the complete transmitter!

- Revolutionary modular splitter broken the port number limits.
- Isolator/Attenuator on the input
- Ultra Compact Design.
- Non Hierarchy Arbitrary odd and even port number.



Over dimensioned unbalance dummy loads

The Dummy Load for the unbalancing power is of fundamental importance for the system.

The Cortex Dummy Load is modular and can have from 1 to 10 inputs each of 6000W.

The maximum power that can derive from each output of the combiner to the load is 1300W.

The maximum power that can arrive depends on how many modules are not delivering power.

The total power that must be able to dissipate is represented by a curve that increases when the first modules are turned off and falls when there are few modules left.

In a 10kw transmitter with 4 x 2,500W, when the first module is missing, 1300 W arrive, if you turn off the second, 2600 W arrives, if you turn off a third one, 1300 W arrives, with all the modules off, 0 W arrives, so it is a curve of this type: 0, 1300, 2600, 1300, 0

In practice, the imbalance load is never used, but when needed it must absolutely work perfectly and be able to handle all the power that comes from the combiner to one or more inputs.

If the load is not dimensioned correctly, it breaks due to excess power and heat.

The broken load reflects the power, which it is unable to handle, to the functioning modules.

The functioning modules see reflected power and fatally stop due to VSWR alarm.

Hence, the quality of the load compromises the redundancy and reliability of the entire system.

Some manufacturers to prevent this phenomenon, in case of fault of one or more modules, implement a power derating of the modules still working.

This produces a loss of output power in the chain, since a part of the power is lost due to faulty modules, in addition, the ones that remain, operate at reduced power.

This is how in derating systems, the output power suffers from a double loss, the loss of the broken module and the derating of the functioning modules.

For this reason it is necessary to inquire, before purchasing a transmitter, if derating is used in the event of a fault in the modules. In this case it means that the load is not dimensioned correctly.

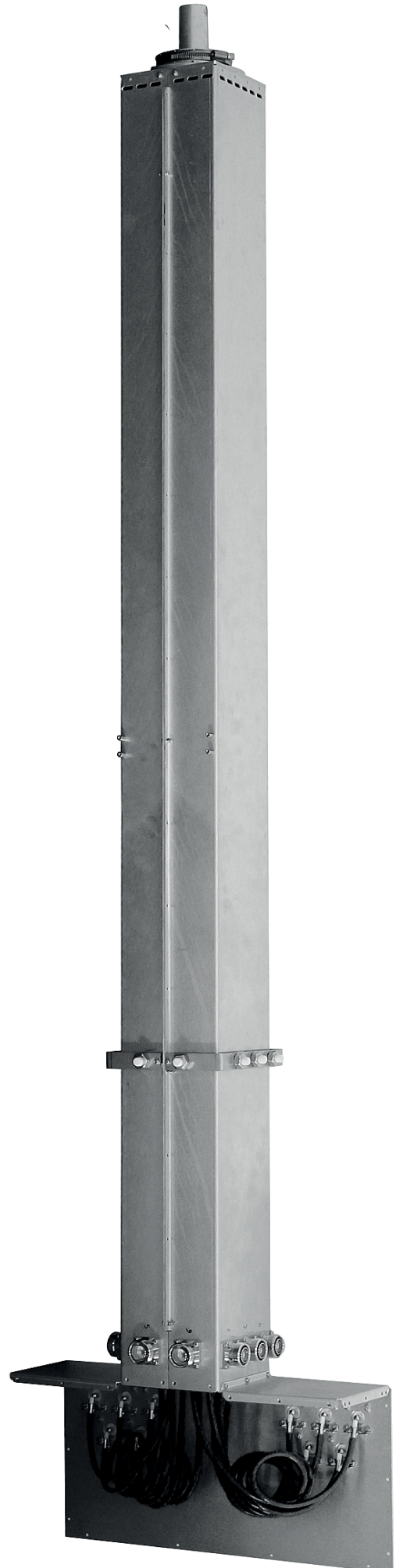
In the Cortex, each load can withstand 4 times the maximum power it can get.

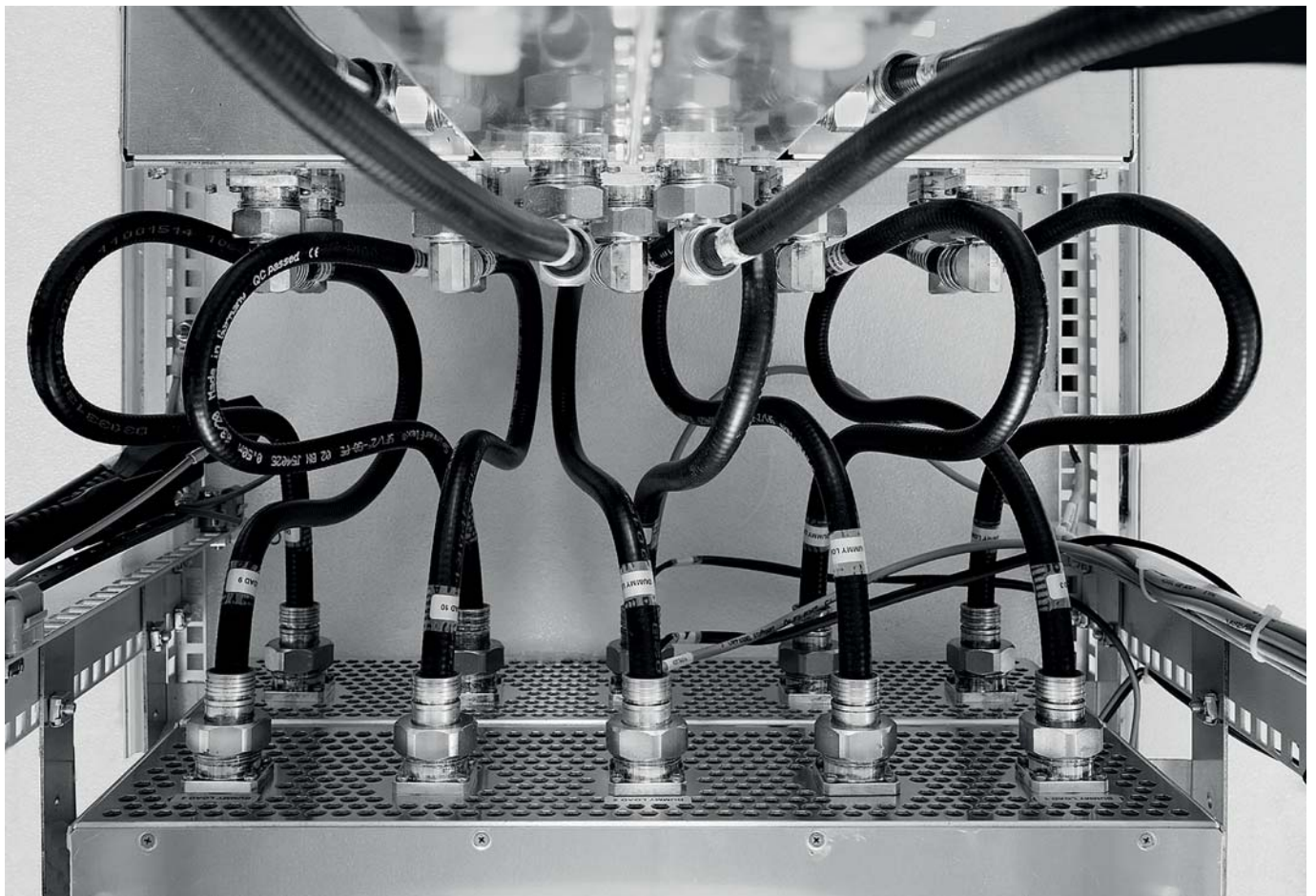
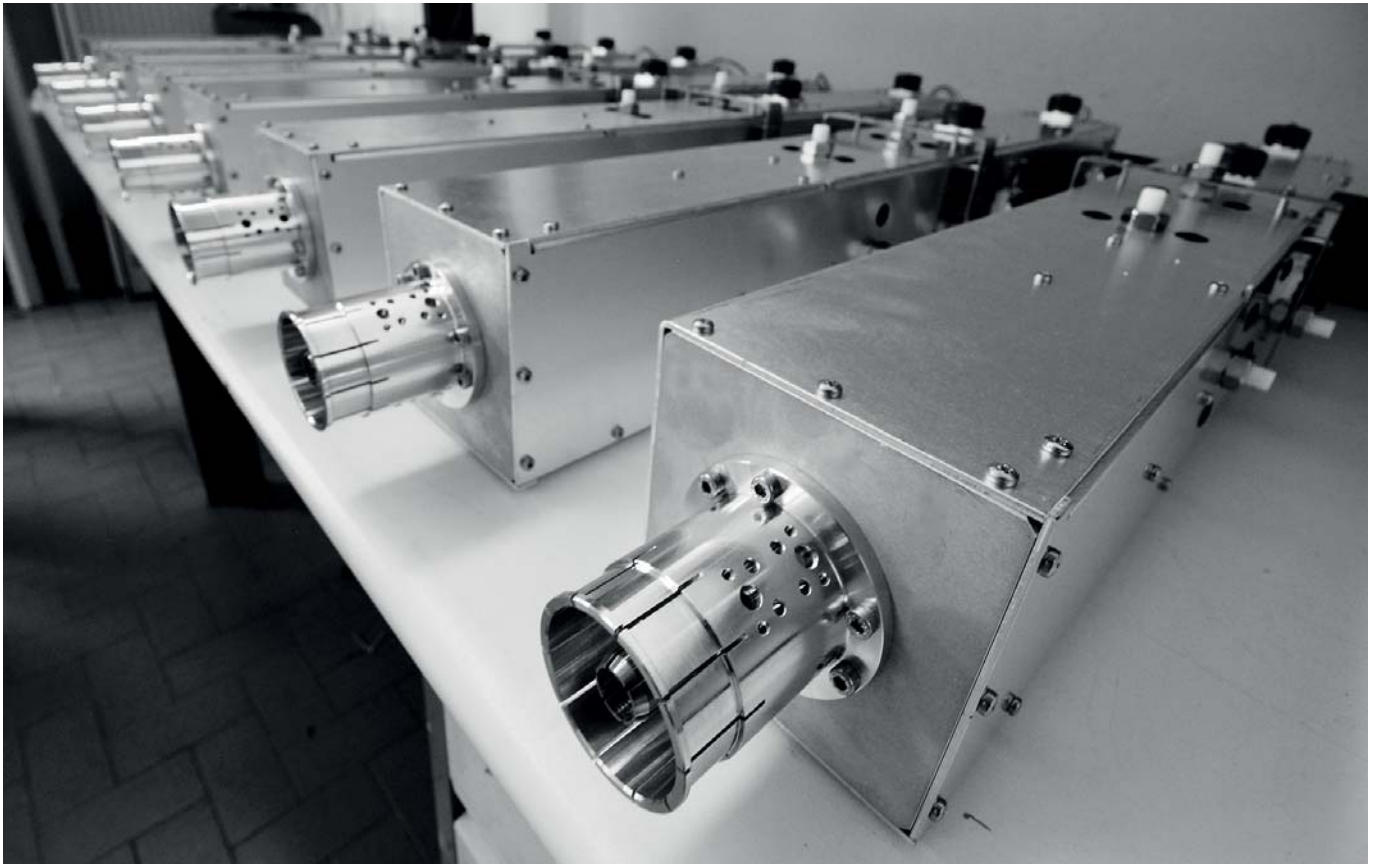
In the extreme case of the 100kW transmitter, there are a total of 4 loads, each with 5 input ports each of 6000W for a total of 120,000W!



Multiport Combiner

- Revolutionary modular combiner broken the port
- Ultra Compact Design.
- Low power to high power direct stepping.
- Low loss.
- Non Hierarchy Arbitrary odd and even port numk
- Ground referred balancing loads.
- Extremely high isolation value: more than 26dB.
- Up to 10 input way for 30 kW Output Power.
- Ultra-wideband, exceeds more stringent specific
- Phase stable.
- Best in class low loss performance: less than 0.1
- More than 12 dB of additive harmonic filtering.
- Low Cost vs Power ratio





Modular Architecture advantages

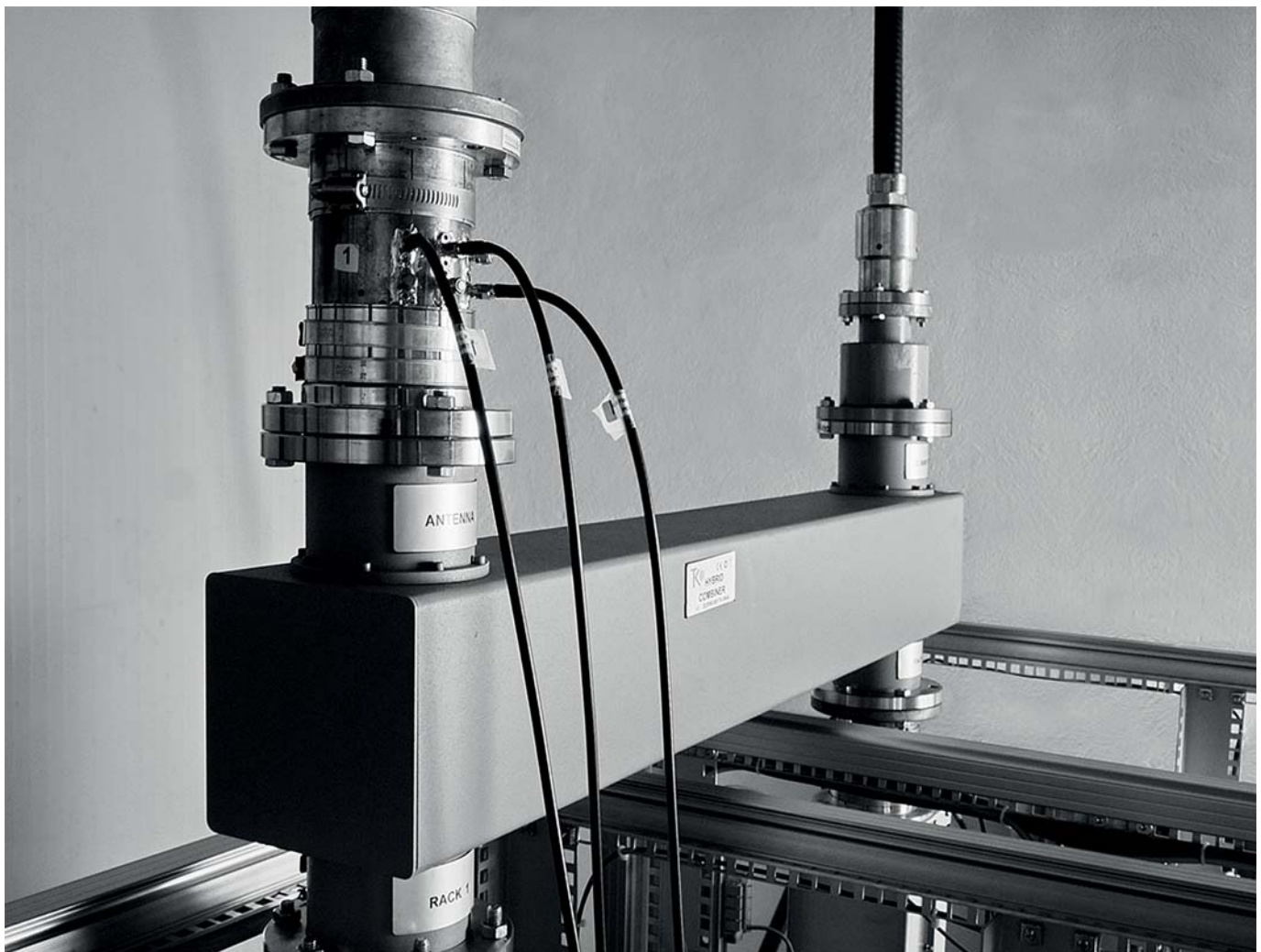
- High Reliability
- Active Reserve
- Redundant
- Low Power Combined Architecture.
- Maximum level of output power in case of fault of one module amplifier
- Combines 2 to 10 CELL RF amplifiers to create High Power FM Broadcast Transmitters.
- GPU Grow Power Upgrade feature (Power scalability).
- Hot Plug-in Power Supply
- Up to 75% Overall Efficiency

Combining more amplifiers to reach power up to 100kW

In the same way CELL 2500 is the smallest brick of the CORTEX 25kW/10, this CORTEX 25kW/10 is the smallest brick of the higher power systems.

In fact, to reach higher power two or more CORTEX 25/10 are combined to reach powers up to 100kW or more.

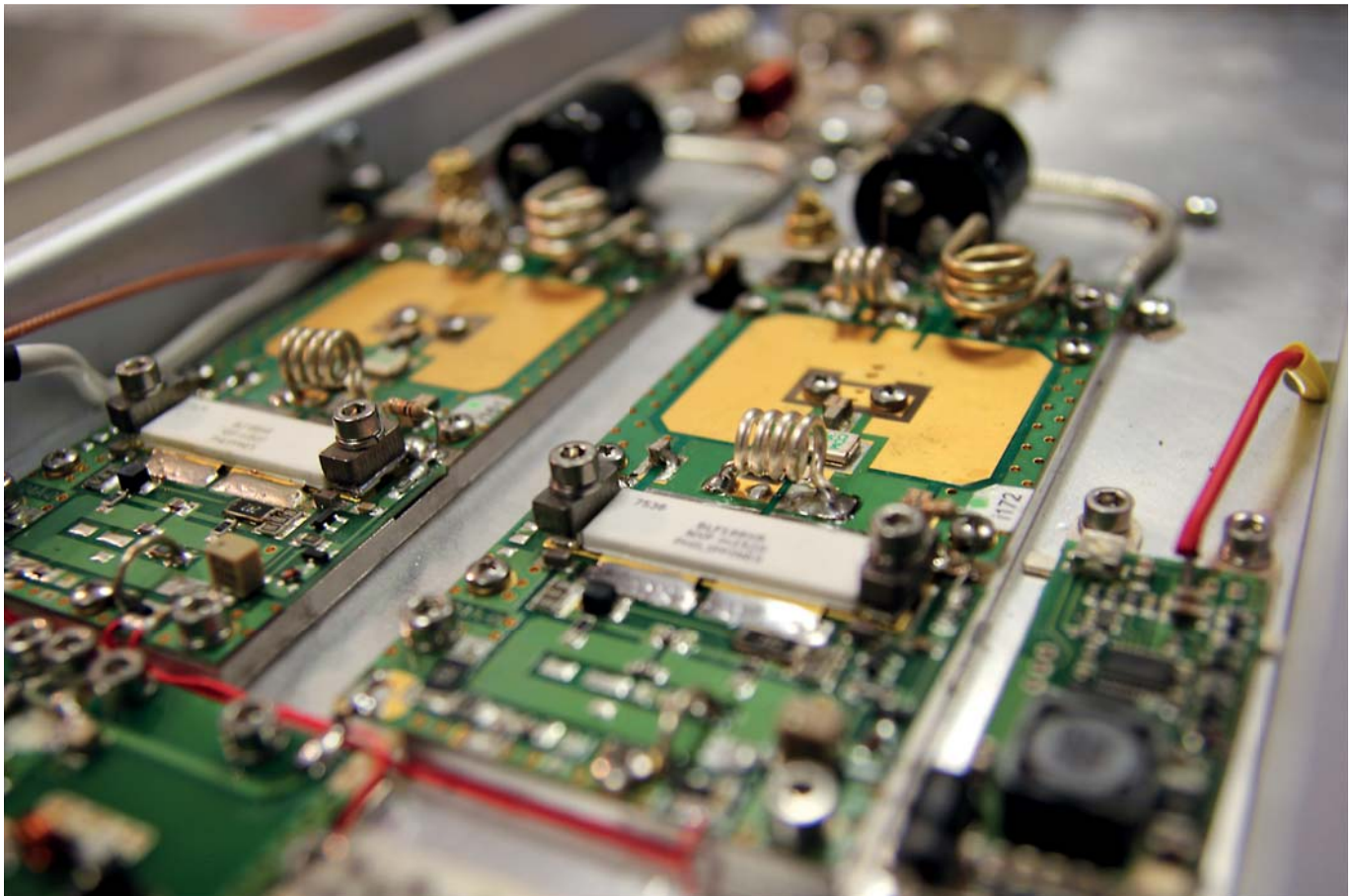
The most standard high power transmitter on the market is 50kW/20, this transmitter is composed by: 2 x 25kW RF Amplifiers, 1 x 3dB Hybrid coupler, 1 x 15kW Dummy Load, 1 x Dual Driver Exciter, 1 x Web Control Logic





RF and Radio-electrical and Electrical Characteristics

- High Efficiency LDMOS 50V 6th generation Planar Technology
- VSWR > 65:1 @ all Phase Angles, designed for enhanced ruggedness ISM applications and plasma generators.
- Total spectral purity: > -100 DBC SPURIOUS, > - 84 DBC HARMONICS, > - 84 DBC HARMONICS
- CELL RF Amplifier has 2,5kW output power in 2 HE occupancy.
- Natural outclass green technologies up to 88% RF efficiency and up to 79% overall efficiency
- EFFICIENCY is maintaining constant at any frequency and at any power level thanks to an intelligent algorithm that controls the Voltage Power Amplifier and the Bias
- Planar architecture
- The output filter broad band keeps optimum performances on spectral purity without need of tuning.
- Integrated AC Mains filtering.
- Integrated lightning protection
- Full Range, 90V to 250V Power Supply.



Double exciter with automatic change over (option)

The CORTEX FM transmitter optionally mounts a double exciter system.

In a redundant modular system, all components are multiple and work in parallel. This means that the malfunction of one of them cannot permanently stop the transmission. The only component that is not in parallel but in series with the rest of the system is the exciter. For this reason, the exciter is the system's only bottleneck.

The double exciter of the CORTEX starts working automatically when it detects the malfunction of the exciter in the air. It automatically switches the failed exciter to the dummy load and connects the spare exciter in its place.

The artificial load, always connected to the reserve exciter, allows the technician to test the exciter on site, without having to disconnect it from the transmitter and possibly repair it on site.



User Interface:

LCD front panel display, Direct Access Keys command and LEDs indicators allows immediate control and visualization of the overall status of the transmitter.

Quick and easy navigation through menus create a User Interface friendly, simple and intuitive together an immediate learning, full control and measurements of all working parameter: Output Power, Frequency (from 87.5 to 108 MHz), SCAs, Stereo/Mono/MPX, Dynamic Limiter etc.

- Direct access to main commands and smart navigation keys with esc command
- Overall status showing by leds allows immediate recognition of the operational conditions of the transmitter
- Smart browsing of all the transmitter parameters
- Touch screen brain control unit: the control unit have the specific function to supervise the transmitter, even in case of failure of it (or turned off) manual control of the transmitter guarantee perfect operation.



Touch Screen BRAIN Control Unit

The control unit have the specific function to supervise the transmitter, even in case of failure of it (or turned off) manual control of the transmitter guarantee perfect operation.



Energy Saving with High Efficiency and Scheduler Power Derating

- AXON and CORTEX use Solid State RF power devices, 6th generation LD-MOS. They are High Efficiency and VSWR 65:1 tolerant. This characteristic provides high reliability and low energy consumption.
- An intelligent algorithm maintains the high Efficiency constant at any power.
- This algorithm controls the Voltage of the Power Supply and the Bias.
- Thanks to this, the efficiency is very high at any frequency and at any output rate power.
- Weekly scheduler output power derating for energy consumption optimization management.
- It's possible to scheduler each day of the week with several events for day

DERATING SETTINGS

DERATING TYPE

DAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

SUNDAY

START

END

POWER

W

W

W

W

W

W

W

OFF

ALL DAYS

DAY BY DAY

DELETE TASK

SAVE DERATING SETTINGS

Remote Control by TCP/IP: WEB + SNMP of all parameters

AXON and CORTEX has the most advanced WEB remote control of the market

- Direct internet connection: CORTEX have direct connection to internet without the help of any external box or accessories.
- Extremely detailed web control with all main parameters fully controllable and adjustable, available. .
- It's has a graphics interface. Runs on any kind of devices: any PC browser, smartphones IOS or Android and tablets
- All this devices works without proprietary tools or Apps. Not need to install any specific software.
- An unique characteristic of the WEB remote control is: it sent email in case of alarms or warnings.
- It's possible program when to send info mails. The info mail are send Daily or weekly. This mails reporting the full status of all working parameters of the transmitter.
- Web log file: Up to 64000 events stored in the web board. It can save the log file in the PC in common text format (.txt)
- Remotely upgradable
- Remote control by TCP/IP: WEB + SNMP of all signal parameter
- MIRROR Network Mirror System Web log file: Up to 64000 events stored in the web board. The log file is saved in the PC in common text format (.txt)
- Full Local or Remote control by login username and password.
- Host Logic and tele-measurement (TM, TC & TA).
- Display of forward/reflection power value and reflection high alarm.
- SNMP v2c with Traps and Informs
- Extremely detailed web control with all main parameters fully controllable and adjustable, available without proprietary tools.
- Remote deep diagnostic capability: handle huge quantity of information to perform remote deep diagnosis.
- Measurements of more than 100 operational parameters including current, voltage and temperatures of each power supply and each RF module
- It safety handle huge quantity of information to perform remote deep diagnosis
- N+1 Profiles connector: provides 7 different memories selection. Memory settings are located in the internal memory and can be selected remotely and locally.
- Parallel Remote-Control Connector Interface with dry contact relay outputs and opto-isolated inputs with the following signals available: on/off, local/remote, alarm status, RF higher than a pre-set threshold, reset of alarms.



AMPLIFIERS

MODULE	CONNECTED	REMOTE	ON/OFF	FAULT	FWD	RFL	PWR SET	PWR IN	IPA	VPA	TEMP
AMP 1	●	●	●	●	300 W	0 W	300 W	640 mW	16 A	19 V	15 °C
AMP 2	●	●	●	●	300 W	0 W	300 W	619 mW	16 A	18 V	15 °C
AMP 3	●	●	●	●	301 W	0 W	301 W	568 mW	17 A	18 V	15 °C
AMP 4	●	●	●	●	300 W	0 W	300 W	594 mW	18 A	18 V	17 °C
AMP 5	●	●	●	●	301 W	4 W	301 W	635 mW	17 A	18 V	16 °C
AMP 6	●	●	●	●	300 W	7 W	300 W	670 mW	18 A	18 V	17 °C
AMP 7	●	●	●	●	301 W	0 W	301 W	574 mW	16 A	19 V	15 °C
AMP 8	●	●	●	●	300 W	3 W	300 W	604 mW	16 A	18 V	16 °C
AMP 9	●	●	●	●	300 W	0 W	300 W	609 mW	17 A	17 V	15 °C
AMP 10	●	●	●	●	301 W	4 W	301 W	619 mW	16 A	18 V	14 °C

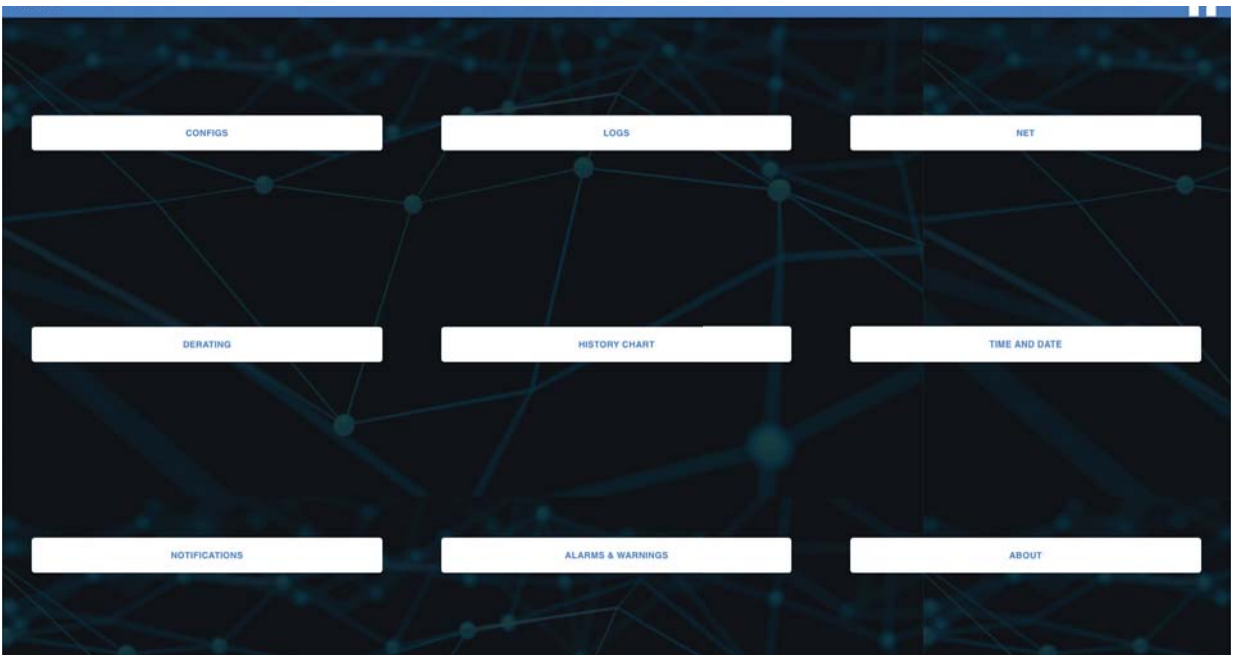
PREV NEXT

WCU EXCITER A EXCITER B DUAL DRIVE AMPS



TIME	MODULE	MESSAGE
2020-05-07 19:42:20	WCU	ALARM STOP: 3dB
2020-05-07 19:42:19	AMP 3	STATUS: RF ON
2020-05-07 19:42:19	WCU	STATUS: ON AIR
2020-05-07 19:42:18	AMP 1	STATUS: RF ON
2020-05-07 19:42:18	AMP 2	STATUS: RF ON
2020-05-07 19:42:13	WCU	ALARM START: 3dB
2020-05-07 19:42:13	WCU	STATUS: RF ON
2020-05-07 19:42:11	WCU	COMMAND: SET COMBINER ON AIR
2020-05-07 19:41:41	WCU	COMMAND: SET COMBINER TO REMOTE MODE
2020-05-07 18:06:57	WCU	STATUS: OFF AIR
2020-05-07 18:06:56	AMP 2	STATUS: RF OFF
2020-05-07 18:06:56	AMP 3	STATUS: RF OFF
2020-05-07 18:06:55	AMP 1	STATUS: RF OFF
2020-05-07 18:06:48	WCU	STATUS: ON AIR
2020-05-07 18:06:46	WCU	STATUS: OFF AIR
2020-05-07 18:06:46	WCU	STATUS: RF OFF

DOWNLOAD CLEAR



Dynamic RDS OPTION: Web Programmable. Specialty design to work as back-up in N+1 Systems

- Designed to work in N+1 Systems, puts automatically on air the RDS program of the fault transmitter
- Fully dynamic FM broadcast RDS encoder with independent communication port
- Control interface based on ASCII commands and UECP SPB-490 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
- Six 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
- RS232 port to select the data set or initialize any service

The screenshot displays the 'RDS PARAMETERS' web interface. At the top, there is a blue header with the title 'RDS PARAMETERS' and navigation icons (a hamburger menu and a home icon). The main content area has a dark blue background with a network-like pattern. It is divided into several sections:

- DATASET:** A dropdown menu showing 'DATASET 1'.
- Identification:** Fields for 'PS' (Axon 1) and 'PI' (A001).
- Program:** Fields for 'PTY' (News) and 'Music/Speech' (Music).
- Traffic settings:** Checkboxes for 'Traffic Program' and 'Traffic Announcement', both of which are checked.
- UECP:** Fields for 'UECP SITE' (0) and 'UECP ADDRESS' (0).
- RadioText:** An 'Enable' checkbox (checked) and a 'Text' field containing 'Axon 1 dataset'.
- AF Method:** Radio buttons for 'No Method' and 'Method A' (selected). Below 'Method A' is a list of frequency options: 87.6, 87.7, 87.8, and 87.9, each with an unchecked checkbox.

At the bottom center, there is a 'SAVE PARAMETERS' button.

Maintenance highlights

Shock and vibration during the transport process 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.

- All the WIRED LINE shares the same spare parts
- COPPER CARRIER: all components that need heat dissipation such as LDMOS or unbalanced power resistors are mounted on a copper carrier to improve heat dissipation and greatly facilitate maintenance, in fact in cases where LDMOS is mounted directly on the heat sink, it causes high heat sink dissipation and it becomes almost impossible to heat the weld.
- HOT PLUG-IN POWER SUPPLY STANDARD MARKET AVAILABLE for Instant replacement, easy maintenance, without off-air. The power supply plug-in modules can be safely removed from the front panel without interrupting the transmission.
- MODULARITY with very light amplifier modules (less than 17kg/34lbs each)
- Maximum redundancy
- Ultra-compact size 2u for each amplifier module
- Air protection: all the internal components are designed to avoid the direct contact with the air, mainly the air coming in from the fans, this avoids all the failures produced by the air corrosion.
- Fully RF and power supply redundant
- Modularity with very light amplifier modules (less than 17kg/34lbs each)
- A single cell amplifier can be put on air as back-up of a bigger transmitter.
-

HOT PLUG-IN POWER SUPPLY



Delayed energized of the system and overvoltage surge protection

Prevents against peaks and high variation voltages, typical events after mains power blackout
The CORTEX family is equipped with protection systems against interruptions, micro-interruptions, overvoltage and mains discharges integrated in the standard configuration of the transmitter.

In particular conditions with extreme problems of bad electricity, sometimes, it is decided to strengthen these protections with an external protection system.

Extreme protection, it has all the functions to allow total protection of the transmitter even in cases of

Protections

There are two kinds of protection: Fast Hardware Protection and Soft Software Protections

In some conditions, like a short-circuit on the antenna or coaxial cable, the protection must be hardware and act in few nanoseconds. In fact, the software in this case is not fast enough to grant the protection of the equipment.

When the fault condition is soft, like the increase of VSWR caused by snow or humidity, a software protection can be use.

On the CORTEX series of FM Transmitter are implemented both: Fast Hardware Protections and Soft Software Protections.

The software protection reduces the output power without on-air interruption, keeping the RF devices always within the safe operating parameter.

The transmitter is protected in case of:

- Environmental over-temperature
- Cooling failure
- Amplifier breakdown
- Over and Under Voltage DC
- Over and Under Voltage AC
- RF and Power Supply Temperature
- RF Coaxial Output Open or Short Circuit Able of a long working time on Short/Open loads at all phase angles without any damage.
- Load mismatching, antenna short/open circuit.
- Delayed energized of the system after Mains Power Blackout prevents against peaks and high variation voltages typical of this event.
- Each module is equipped with a logic controller that allows full control by a local operator.
- Capability of a long working time on Short/Open loads at all phase angles without any damage.

Beyond the Hardware or Software protection, the transmitter is designed to be rough itself, to keep it functioning perfectly even in the worst case of operating conditions.

To achieve this, the important components of the transmitter are over-dimensioned or with hardware protected:

- 6th generation LD-MOS High Efficiency and VSWR 65:1.
- Over-dimensioned switching power supply with PFC (Power Factor Corrector)
- Over-dimensioned Heat Sinks and Fans
- Integrated AC Mains filtering
- Integrated lightning protection
- Integrated overvoltage spikes on the mains protection.

Reliability and robustness designed to be rough itself

Over

dimensioned all the components that determine the reliability: heatsinks, fans, dummy loads, LD-MOS, power supply

- Air filter: it gives high protection to the internal components, mounted on the front panel and easy to clean or replace.
- Totally made in aluminium: for minimum weight and maximum robustness.
- The PCB boards and the wiring are fully tropicalized by a specific coating for electronic assembly.
- These precautions guarantee a long life in extreme environmental conditions, preventing damage due to corrosion and erosion, protecting the components from the inclemency of the tropical climate. Defend from humidity, salt and pollution.
- • Over-dimensioned heatsinks.
- • Over-dimensioned fans.
- • Unbalanced dummy loads are twice the quantity needed
- • LDMOS RF amplifiers are 30% more powerful than the needed. They are 65:1 VSWR tolerant
- • Power supply deliver 30% more of power than the quantity used by the equipment at full rated power.
- • Integrated AC Mains filtering
- • Integrated lightning protection
- • Integrated overvoltage spikes on the mains protection
-

Final test and Burn-in

To get maximum reliability from a transmitter there are no shortcuts: good design, good component quality, and many, really many hours of work and time spent on final test and burn-in.

The final test, together with the “burn-in” are the only key to making a transmitter work well. It is a “sine qua non” condition.

Our engineers are obsessed with taking the final test for as long as possible, checking every detail, not neglecting a single parameter. When the transmitter has given the “pass” it must be perfect.



Mechanical construction

- The equipment is housed into a compact rack 2 Unit Aluminium cabinet
- Exclusive design of the air flow inside the transmitter guide the air into aluminium ducts avoiding contact with the electronic components
- Every component that produces heat is mounted on a heat sink
- Air passes exclusively into the aluminium heat sink avoiding contact with the electronic components.
- All the cover screws are 5mm diameter. Typically, 3mm are used but after open the cover just one time some of them are always broken. A big effort was made to develop mechanics with big screws and great advantage on facility to manipulate the transmitter when needed to open or close the covers making easy the maintenance.
- The mechanics parts of the transmitter are all made in aluminium. It provides low weight and robustness.

N+1 and Backups systems

- Conventional standby systems such as: exciter standby, (n+1) Transmitter standby, passive standby and active output stage standby can be implemented.
- No additional control units are needed for the exciter standby and the active amplifier standby.

Compliant with all the standard: ETSI – CCIR - FCC.

CORTEX meets all the most rigorous electromagnetic quality standards

CORTEX MODULAR

based on 2000W CELL Amplifier

Model	Description
CORTEX 1/1	1000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.1 CELL 1000 Amplifier
CORTEX 2/1	2000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.1 CELL 2000 Amplifier
CORTEX 4/2	4000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.2 CELL 2000 Amplifier
CORTEX 6/3	6000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.3 CELL 2000 Amplifier
CORTEX 8/4	8000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.4 CELL 2000 Amplifier
CORTEX 10/5	10000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.5 CELL 2000 Amplifier
CORTEX 12/6	12000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.6 CELL 2000 Amplifier
CORTEX 14/7	14000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.7 CELL 2000 Amplifier
CORTEX 16/8	16000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.8 CELL 2000 Amplifier
CORTEX 20/10	20000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.10 CELL 2000 Amplifier
CORTEX 24/12	24000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.12 CELL 2000 Amplifier
CORTEX 28/14	28000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.14 CELL 2000 Amplifier
CORTEX 32/16	32000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.16 CELL 2000 Amplifier
CORTEX 36/18	36000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.18 CELL 2000 Amplifier
CORTEX 40/20	40000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.20 CELL 2000 Amplifier
CORTEX 52/26	52000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.26 CELL 2000 Amplifier
CORTEX 60/30	60000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.30 CELL 2000 Amplifier
CORTEX 72/36	72000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.36 CELL 2000 Amplifier
CORTEX 80/40	80000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.40 CELL 2000 Amplifier

CORTEX MODULAR

based on 2500W CELL Amplifier

CORTEX 1,3/1	1300W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.1 CELL 1300 Amplifier
CORTEX 2,5/1	2500W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.1 CELL 2500 Amplifier
CORTEX 5/2	5000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.2 CELL 2500 Amplifier
CORTEX 7,5/3	7500W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.3 CELL 2500 Amplifier
CORTEX 10/4	10000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.4 CELL 2500 Amplifier
CORTEX 12,5/5	12500W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.5 CELL 2500 Amplifier
CORTEX 15/6	15000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.6 CELL 2500 Amplifier
CORTEX 17,5/7	17500W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.7 CELL 2500 Amplifier
CORTEX 20/8	20000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.8 CELL 2500 Amplifier
CORTEX 25/10	25000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.10 CELL 2500 Amplifier
CORTEX 30/12	30000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.12 CELL 2500 Amplifier
CORTEX 35/14	35000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.14 CELL 2500 Amplifier
CORTEX 40/16	40000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.16 CELL 2500 Amplifier
CORTEX 45/18	45000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.18 CELL 2500 Amplifier
CORTEX 50/20	50000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.20 CELL 2500 Amplifier
CORTEX 60/24	60000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.24 CELL 2500 Amplifier
CORTEX 70/28	70000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.28 CELL 2500 Amplifier
CORTEX 80/32	80000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.32 CELL 2000 Amplifier
CORTEX 100/40	100000W modular high efficiency, Redundant Active Reserve, FM Transmitter composed by: AXON 30 Exciter, Nr.40 CELL 2000 Amplifier

Packing

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.



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