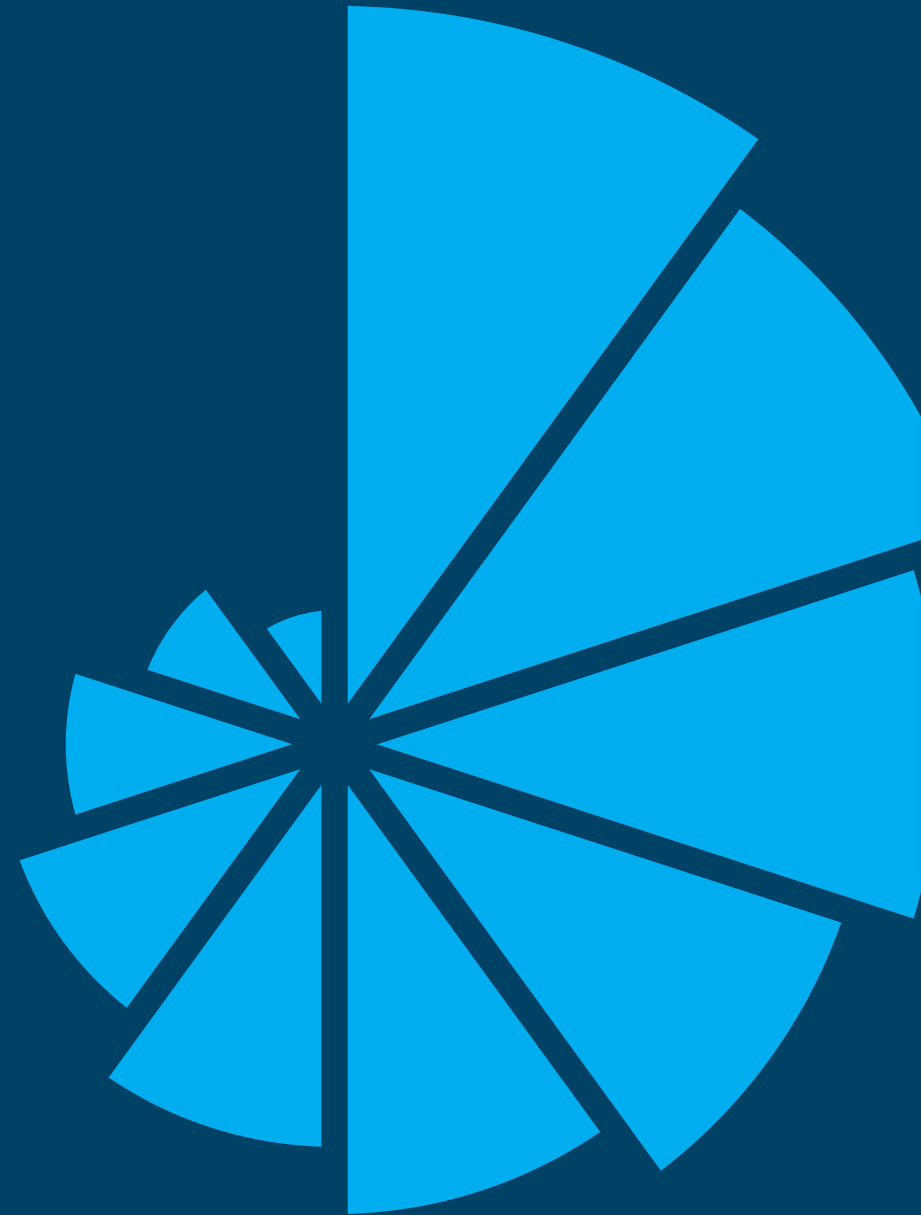


Elenos Group World Broadcast

WEBINAR:

*Indium High Efficiency FM Transmitters
from 150 Watts to 60kW*



Webinar Schedule

- Indium FM family introduction
- The million dollar question
- RF amplifier design innovations
- Efficiency innovations
- Power supply innovation
- Direct-to-channel FM digital exciter innovation
- Robustness innovation
- Remote control innovation and live demo
- Your questions



Remember, watching this webinar qualifies for ½ credit towards SBE certification under Category 1.



Your host:
Chuck Kelly
VP Market Development



Special Guest:
Antonello Giovannelli
Technical Director Emeritus



Special Guest:
Peter Conlon
Advisor to the CEO



The Indium Family of Solid State FM

- Scalable and flexible, available from 150W to 60kW
- Available with direct to channel digital exciter or analog
- Optimized for efficiency and robustness under real-world conditions
- Designed with 42 years of experience
- Monitor and control from anywhere with web interface



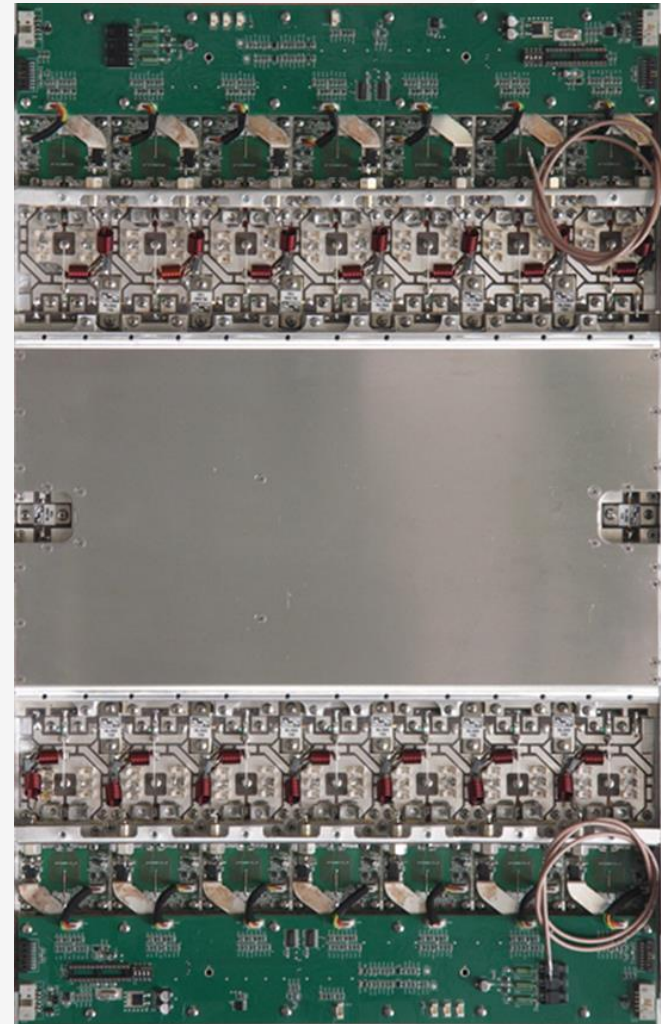
The Million Dollar Question



RF Innovation

Using stripline and microstrip design techniques results in:

- Clean design for easy troubleshooting and service
- Repeatability and precision in manufacturing
- Stable performance and reduced in-cabinet RFI
- Maximum efficiency



RF Innovation

Precision thermal modelling in the design of the cooling system provides:

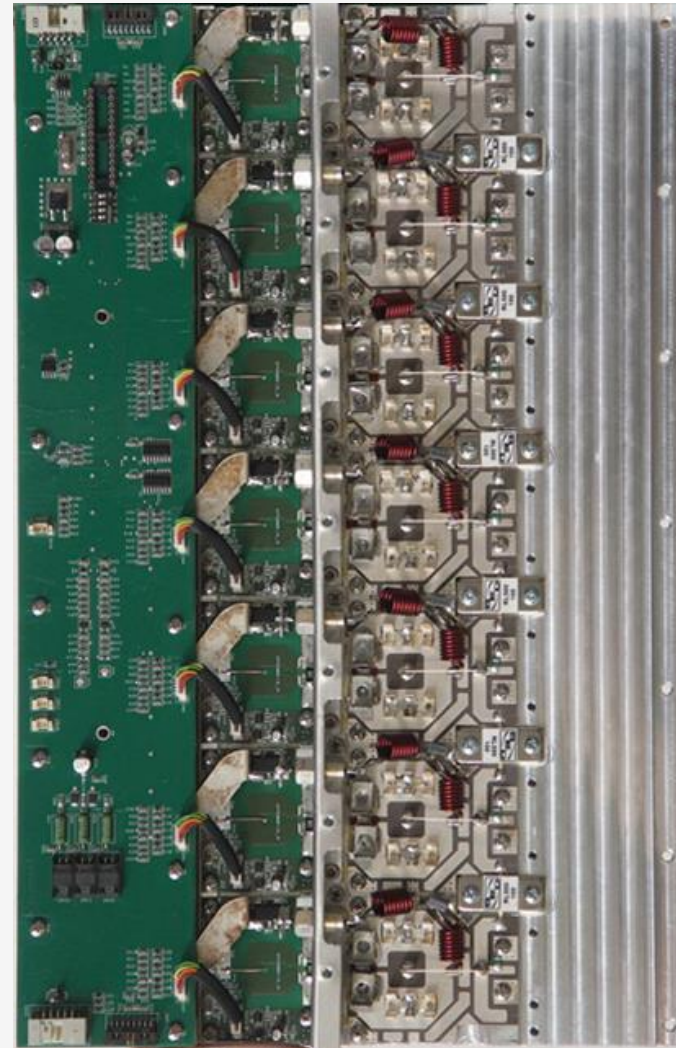
- Ideal component cooling with minimum heat sink size and weight
- Optimized fan speeds under all conditions for quiet, clean operation
- The ability to stay on the air under real-world conditions
- Longer PA device life due to reduced metal migration



RF Innovation

Class F PA design improves efficiency and reliability:

- The latest LDMOS devices for maximum efficiency
- Reduces the footprint of the amplifier
- Reduces the heat to be dissipated, keeping the devices cool, resulting in long life



RF Innovation

Precision design and carefully milled combiners offer:

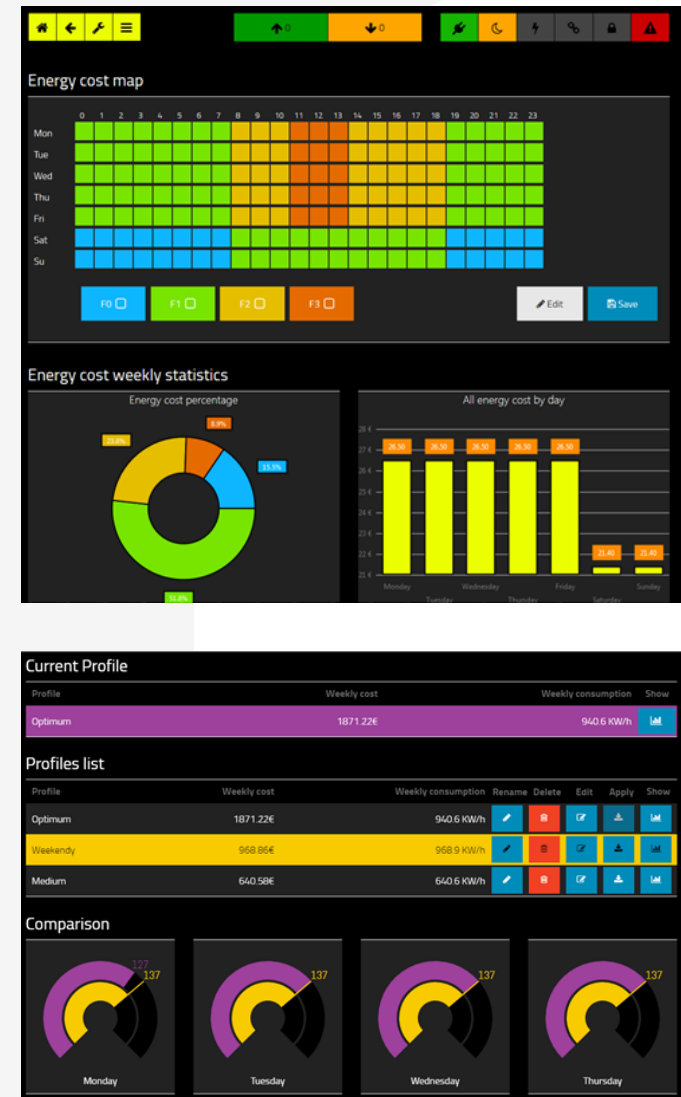
- Repeatable performance
- Protection against physical or electronic shocks
- Reduced losses for improved efficiency



Reduction of Energy Costs

The Indium family includes a unique power level scheduler:

- Allows the automatic reduction of power at specific hours and days
- Based on listenership coverage needs and variable power company daypart costs
- Calculates savings automatically allowing intelligent business decisions to be made
- Amount of power reduction may be limited by government regulations



Power Supply Design

Most other manufacturers use an off-the-shelf power supply:

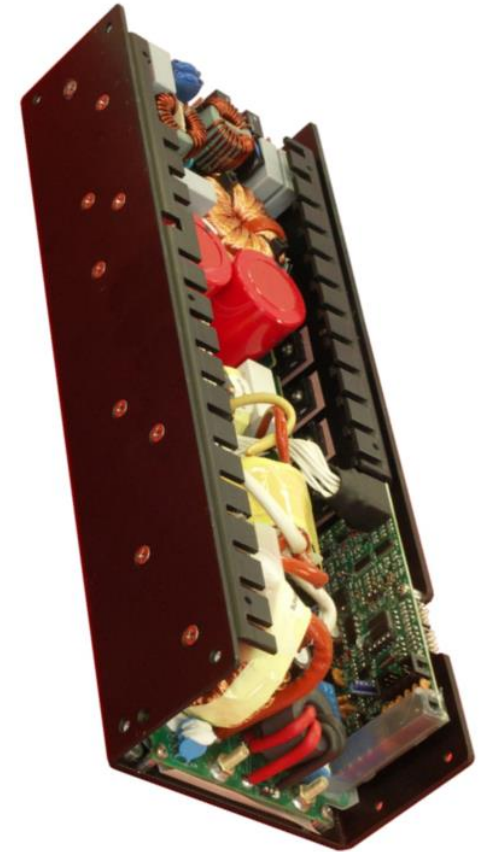
- These are often designed for computer clean room environments
- They are sealed and not user-repairable
- Schematic diagrams are not available
- The replacement of an inexpensive component requires the replacement of the entire unit.



Power Supply Innovation

Elenos designed its own power supplies:

- Designed for real-world transmitter room environments (less-than-perfect AC and harsh physical conditions)
- Optimized for the specific physical design of the transmitter
- Allows dynamic voltage control by the transmitter
- User serviceable!



Power Supply Innovation

The Indium remote control can monitor:

- Output current
- Output voltage
- Mains voltage
- Input overvoltage
- Temperatures
- Data communication errors
- Internal failures
- Each supply addressable

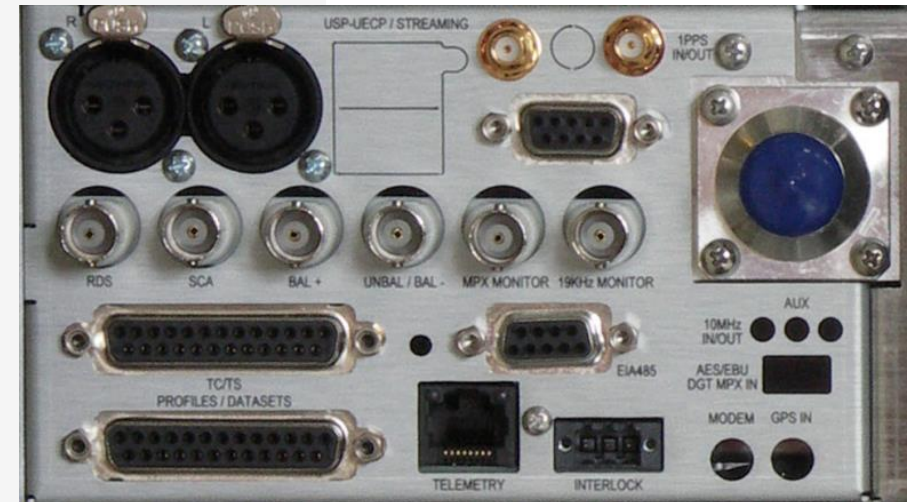
* Depending on model



Direct-to-Channel Digital Exciter

A fully digital exciter that offers:

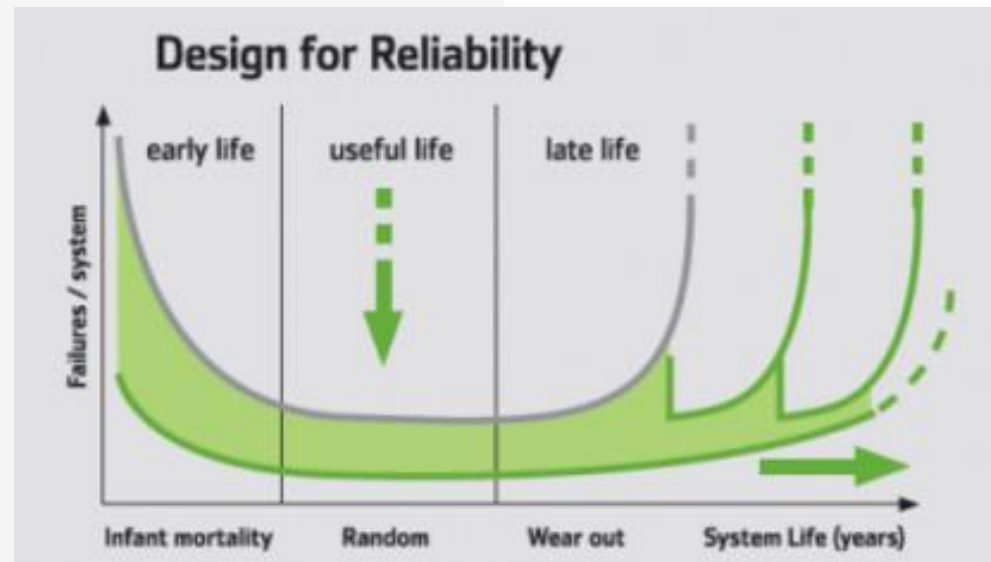
- Truly transparent, industry leading audio performance
- A wide variety of auto switching inputs, balanced analog L+R, AES/EBU, analog MPX, and MPX over AES
- SFN capability with 10MHz and 1pps inputs
- Shoutcast / Icecast streaming inputs



Designed for Long Life and Robustness

All the fancy features and outstanding performance are worthless if the transmitter is unreliable, so how does Elenos assure the reliability and long life of its products?

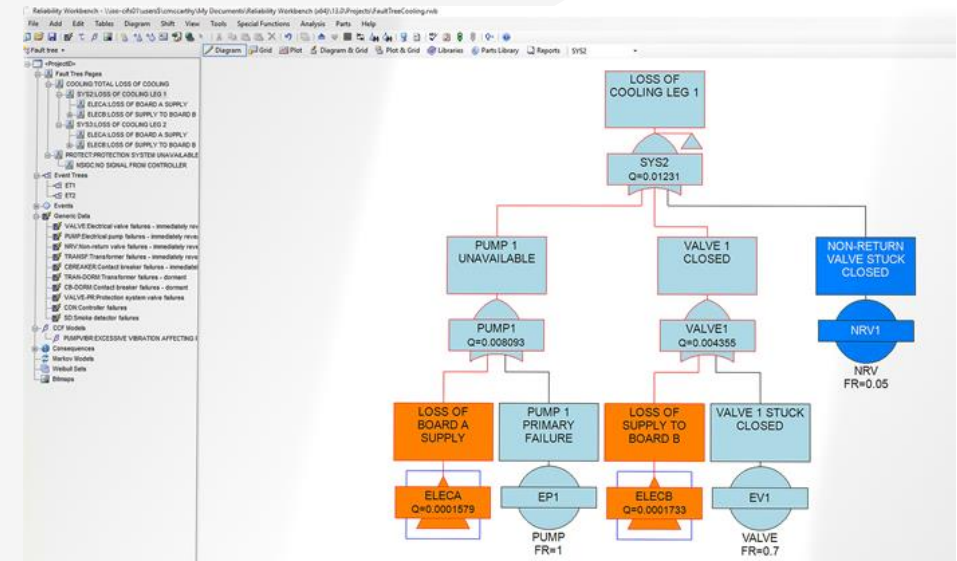
- Design headroom – assuring that every component is well within the maximum limits both by extensive design modelling and testing
- Adherence to tough industry standards for MTBF calculation
- Thermal camera measurement
- External MTBF evaluation consultant used
- MTBF design target: 30 to 60 years



Designed for Long Life and Robustness

Ultra-high reliability must be designed-in from the beginning, and requires extensive design tools and analysis. Verified by external MTBF consultant. The “Isograph Reliability Workbench” is used which provides:

- Fault tree analysis
- FMECA/FMEDA/FMEA analysis
- RBD analysis
- Failure rate prediction
- Markov analysis
- Weibull analysis



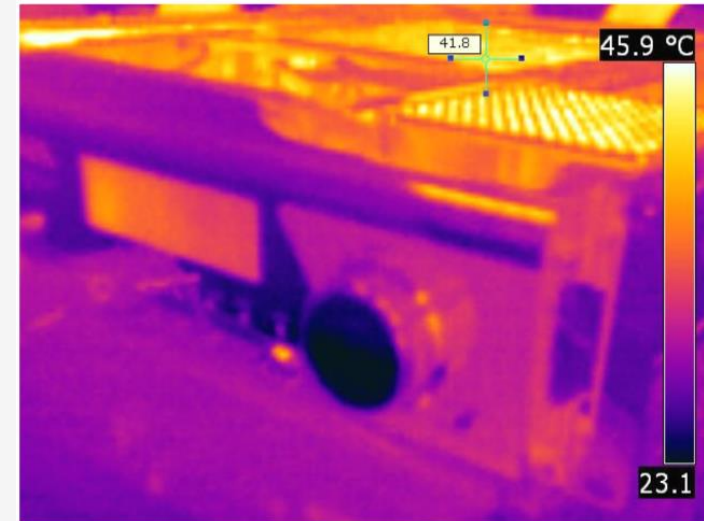
Failure Rates.rwb-repx (read only)

Failure Rates						
RWB V13.0						
<ProjectID>						
Part number	Reference ID	Category	Failure rate	N	N x failure rate	Contribution (%)
0805 COG	C3-C5	MIL-CR	0.006496	3	0.01949	1.967
0805 COG	C1, C20-32	MIL-CR	0.006496	14	0.09095	1.367
1		MIL-BK	0.9935	1	0.9935	6.846
11		MIL-BK	5.441	1	5.441	37.49
12		MIL-BK	8.077	1	8.077	55.66
121		MIL-BK	6.692	1	6.692	82.85
122		MIL-BK	1.385	1	1.385	17.15
19982B	C2	MIL-CR	0.01335	1	0.01335	0.2006
2164	RAM1-16	MIL-MM	0.03576	16	0.5722	8.601
2164	DISPLAY RAMS 1-24	MIL-MM	0.03258	24	0.782	57.6
28086F	C3	MIL-CR	0.01589	1	0.01589	0.2389
2N4403	T1-4	MIL-LB	0.004355	4	0.01742	1.283
2N4403	T1-7	MIL-LB	0.004355	7	0.03049	0.4583
4017A	IC1-5	MIL-DI	0.04266	5	0.2133	3.926
4017A	IC1-4	MIL-DI	0.04266	4	0.1706	2.565
4610X101-40338G	RN1	MIL-RS	0.005945	1	0.005945	0.4379

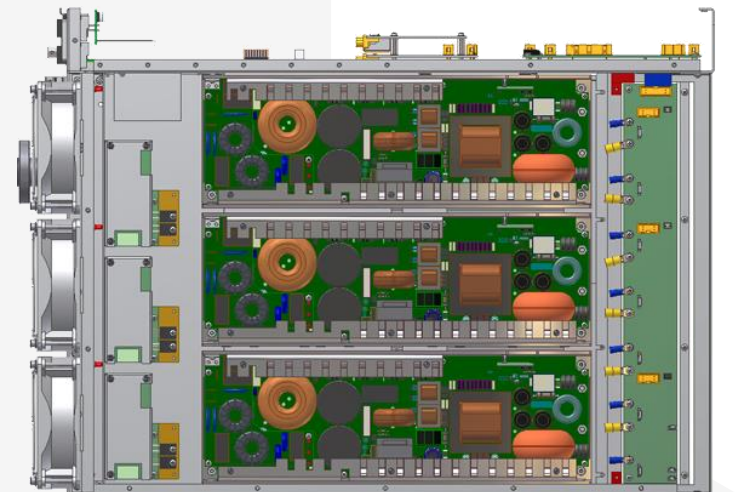


Designed for Long Life and Robustness

Thermal imaging cameras are used to isolate and correct hotspots before the first units are sold



Careful evaluation of thermal cycling stress which has been shown to be responsible for many long-term failures



The Elenos LifeExtender – A Safety Net

The real world is a harsh place.

- Extreme AC voltage fluctuations and surges
- Both high and low temperatures
- High dust and dirt environments

LifeExtender monitors and controls every aspect of transmitter operation from temperatures, voltages and currents, to fan speeds and reflected power and takes action to protect the transmitter and keep you on the air

The logo for lifeXtender, featuring the word "life" in a grey sans-serif font, followed by "Xtender" in a blue sans-serif font. The "X" is stylized with a blue outline. A registered trademark symbol (®) is located to the left of the "life" text.

Remote Control – More Than Just a Pretty Screen

Lets face it, nobody lives at the transmitter site anymore, so effective and accessible remote control is essential:

- Works through the Web (no flash)
- Supports advanced SNMP
- You can even communicate via SMS (optional 3G/4G modem)
- Displays hundreds of parameters
- Logs an unlimited number of events
- Sends alerts
- Let's see it live!



At Broadcast Electronics, We've Got Your Back

We know how important it is to be able to get help when you need it - 24 x 7 x 365

- All Elenos products sold in the Americas are supported by trained, knowledgeable technicians at Broadcast Electronics
- Spare parts stocks are maintained at BE.
- ¡Nosotros hablamos español!
- Check out our webinar next Tuesday, November 5th (one hour earlier than today) with Andy Berry, head of BE customer service

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phone: +1 217.224.9617

email: rfservice@bdcast.com

Repair Center & Parts

phone: +1 217.224.9617

email: repair@bdcast.com

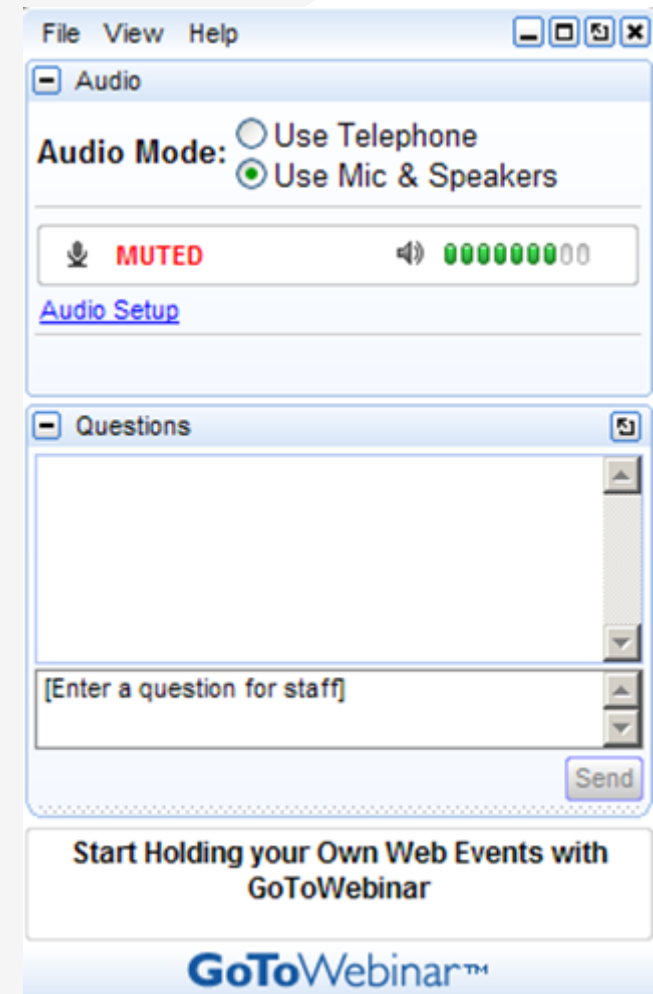
email: parts@bdcast.com



It's Time for Your Questions

Look for the Questions tab on the GoToWebinar interface

- Enter your question
- We'll answer live or, if time doesn't permit, we'll answer you after the webinar via email
- Thanks for your questions and feedback - they help us keep these webinars relevant.



Thank You

We know how valuable your time is, and we are honored that you chose to spend time with us.

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