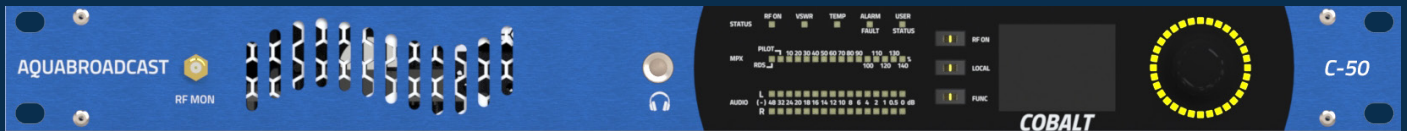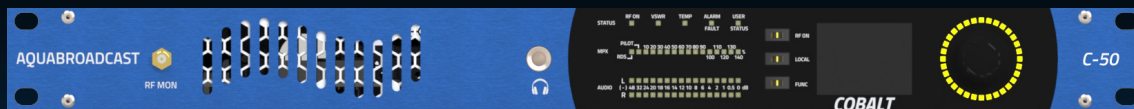# COBALT

C-50 Fully Featured FM Transmitter

Datasheet and Specifications

Our Innovation

The COBALT Series of Fully-featured FM Transmitters are our flagship Transmitter range. Comprising the best available technologies developed by our in-house Aqua Broadcast R&D team. Our innovative solutions are designed to be compact, efficient and use the very latest techniques and components.

Secure control and monitoring interface

COBALT Transmitters support HTTPS, enhancing security through encrypted communication between a user's browser and the accessed website. making it difficult for third parties to intercept and read the data being transferred, providing greater privacy and security to confidential information in the configuration and monitoring of your transmitter.

Already compatible with SNMPv1 and SNMPv2c, and SNMPv3 all COBALT products deliver improvements in performance, flexibility, and security

COBALT C-50

The COBALT C-50 is a 50W FM Broadcast Transmitter that is FCC part 73 LPFM and IC certified and has superior audio quality and sound clarity thanks to it's Direct to Channel Digital technology.

What sets it apart is its exceptional audio fidelity and crystal-clear sound, attributed to its innovative Direct to Channel Digital technology (DDS). Operating on a fully customized LINUX OS system, this low distortion modulator is a standard feature across all models within the COBALT family of FM Transmitters.

The inputs and outputs are versatile, encompassing Analog, AES/EBU, Digital MPX (AES192), ITU-R BS412.9 Limiter, Ethernet, USB, GPIO, GPS Sync with built-in SFN capabilities.

For added flexibility, an optional DC Input is available, allowing the COBALT C-50 to operate on a 48V DC power system, expanding the scope of off-grid power solutions.

What truly sets this transmitter apart in the radio market is its exceptional audio quality. It boasts a built-in 4-band Audio Processor with Bass enhancement, Pilot protection, Wide AGC, and an array of expertly crafted modern presets, ensuring that your broadcasts sound exceptional from the very beginning.

User-friendly -the modern design includes an ultra-clear RGB display that's easy to read. The intuitive joystick controls with haptic feedback and supplementary silicon buttons streamline the setup process, getting you on the air swiftly.

The COBALT C-50 offers advanced communication and automation capabilities, featuring an intuitive web interface and remote control via Ethernet (https). This means you can make adjustments or monitor the COBALT Transmitter from anywhere. Additionally, it offers full SNMP Version 3 management, enabling you to send emails, receive alerts, and monitor audio remotely, providing you with the assurance of full control from any location worldwide, using any device with a web browser.

Maintaining the COBALT C-50 is cost-effective and hassle-free, thanks to easy access to all components and software-controlled variable fan speed. It stands out with its superior AC efficiency, compact design, and reduced weight, resulting in low transportation costs and the lowest total cost of ownership in its class.

Standard Features

- ~ Direct to Digital Synthesized modulation
- ~ Linux OS
- ~ RGB Screen
- ~ 4 Band Audio Processing
- ~ Dynamic, UECP Compliant RDS Encoder
- ~ Digital MPX Encoder
- ~ MPX Power Limiter
- ~ GPS Sync
- ~ Ethernet Control and SNMP
- ~ FCC Part 73 Certified for LPFM, and IC Certification for Canada

Options Available

- ~ Dante® / AES67 Module
- ~ 5 Band Audio Processor
- ~ MicroMPX
- ~ Tuner / Re-Broadcast Module
- ~ 48V DC Power option

AQUABROADCAST

Linux O/S

All COBALT FM Transmitters run on a rock-solid LINUX Operating System that we have fully customized to exceed the demands of 24/365 Broadcasting. With enhanced Network Security, the COBALT is at the forefront of Technology.

RGB Screen

A clear RGB Display lets you either set up any COBALT Transmitter, and see parameters at a glance. Coupled with an intuitive menu system and Joystick providing Haptic feedback, it's so easy to control any COBALT Transmitter.

DDS Modulator

Our DDS (Direct to Digital Synthesis) modulation gives the COBALT an FM generated signal that is pure, and free of distortion or spurious artifacts.

4 Band Audio Processor

All COBALT FM Transmitters feature an on-board Audio Processor with 21 Presets. Sound great right out of the box or even use any external Audio Processor.

R·D·S
RDS Encoder

An RDS Encoder (UECP Compliant) is included as standard on all COBALT FM Transmitters. Either use it as a static RDS, or with external software like Magic RDS where you can manage and feed the entire RDS broadcast network from one place.

MPX POWER LIMITER
ITU Limiter

An ITU-R BS412.9 Limiter is included with all COBALT FM Transmitters, which defines the ultimate peak/average ratio of the program output. Required in many European countries, rest easy as it's included free of charge.

DIGITAL MPX
Digital MPX (AES192)

Digital MPX allows the FM multiplex signal including baseband audio, pilot, stereo sub, RDS and 67 kHz subcarriers to be processed and transmitted either directly at the transmitter site or from the studio through a broadband wired or wireless IP STL.

SFN Ready

On the rear are 1PPS and 10 MHz sync inputs letting you connect to any compatible GPS receiver, to allow for Single Frequency Network (SFN) operation of multiple COBALT Transmitters on the same frequency. The menu controls allow for several parameters to be set up the SFN fast and correctly.

HTTP/S Ethernet control

The included WEB interface with HTTP/S also provides Alarm and email communication of alerts and Alarms. Control and monitor COBALT from any web-enabled device from anywhere.

SNMP COMPATIBLE
Supports SNMP v1,v2c,v3

SNMP v1, v2c, v3 ready to provide users with easy and flexible real-time monitoring and remote-control options

OPTIONAL EXTRAS

* **Dante / AES67 option**

Add the Dante® / AES67 module and open a whole host of audio possibilities with other compatible products such as consoles and Processors.

μ MPX

MicroMPX

The MicroMPX lisence is an STL (studio-to-transmitter link) codec. It transports a full FM composite MPX signal, including pilot and RDS, at a bitrate of only 320 kbit/s. Using MicroMPX you can generate your signal completely in your studio and easily distribute it to all your transmitters. (You must already have the MicroMPX encoder to use this option.)

* **5-BAND**

5 band Audio Processor

Gain even more control with our 5 band Audio processor option. Fully adjustable, so you can create your own sound, or utilise the included presets or make and save your own presets.
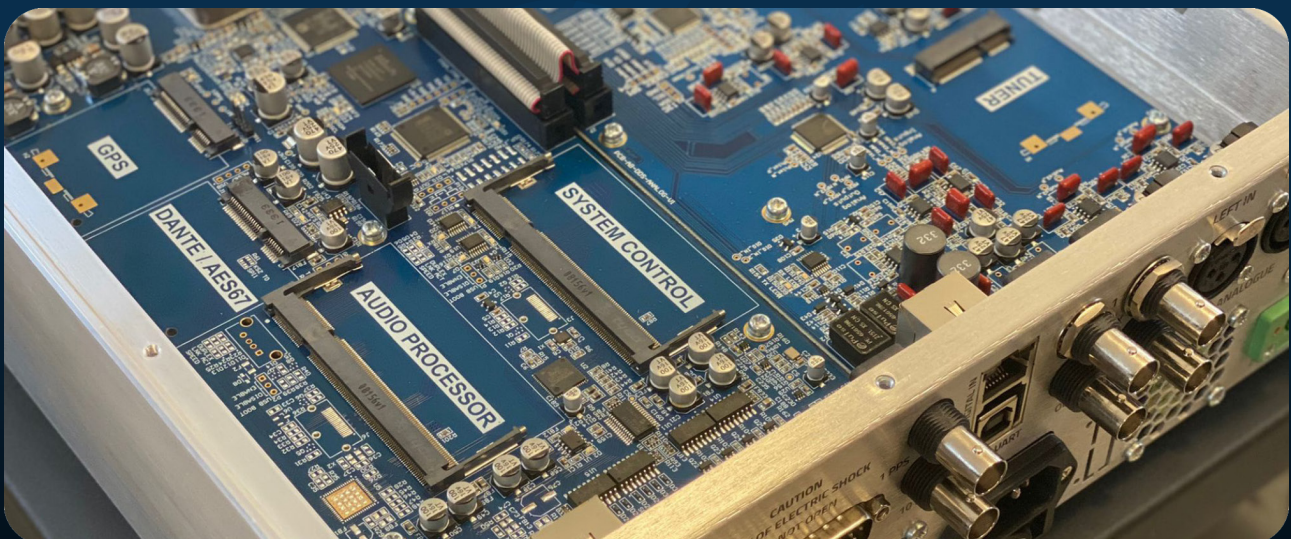
* **Tuner**

The optional Tuner is perfect for Re-Broadcast applications. The ultra senstive tuner with outstanding rejection performance, the best Translator combo available.

* **48V DC Power option**

24-48VDC operation in the C-10, C-30, C-50 and C-100 products allow for full FM operation.

* These are factory fitted options and must be specified when ordering

AQUABROADCAST

GENERAL

Output Power (W)	50
Range (W)	5-50
RF Output connector	N-Type (Female)
Input ACV @ 50/60Hz	100-240 (277 North America only)
Power Connector	IEC 13A filtered
Power consumption	~125W @ max power
AC-RF efficiency typ	~40%
Dimensions WxDxH (inch)	19 x 15 x 1RU (1.75")
Dimensions WxDxH (cm)	48.3 x 38 x 4.45
Weight	3.7kg / 8.14lb

MODULATOR

Transmitter type	Solid-state FM Stereo transmitter
Modulator	Direct-to-channel (DDS)
RF Output Frequency Range	VHF Band II, 87-108MHz
RF Frequency Steps	100kHz
Frequency Stability	±1 ppm or ±150Hz range with internal 10MHz clock reference
FM Modulation Range Capability	75kHz default, 100% modulation user adjustable up to 105kHz 140%, maximum 300kHz

RF

Power Stability	≤ ± 0.25dB
Asynchronous/AM noise	≤ -60dB
Synchronous AM s/n ratio	≤ -60dB
RF Harmonic and Spurious Suppression	Meets ETSI requirements
VSWR operation	Fully protected against gradual or sudden VSWR condition Proportional power reduction from VSWR 1.5:1

STEREO ENCODER

Performance	400Hz/1kHz test tones at modulation level ≤75kHz
Modes	Stereo, Mono L+R, Mono L, Mono R
Frequency response	20Hz-15kHz ±0.02dB
Pre-emphasis	0, 50 or 75μs
Pilot tone	19kHz, adjustable level 0-12%
Subcarriers suppression	≤ -70dB
Stereo Suppression	≥75dB AES/EBU input
Stereo SNR	≥70dB Analogue input
Stereo THD+N	≥80dB with 75us de-emphasis
Crosstalk	≥75dB without de-emphasis on both inputs <0.03% ≥70dB, between L+R and L-R due to channel matching, both inputs

MONO PERFORMANCE

Frequency response	20Hz - 15kHz ±0.02dB
Pre-emphasis	0, 50 or 75 μs
Mono SNR	≥100dB, with 75us de-emphasis
Mono THD+N	≤0.002% analogue input, ≤0.001% AES input, with 75us de-emphasis

ANALOGUE AUDIO PERFORMANCE

Frequency response	10Hz-53kHz ±0.03dB 53kHz-70kHz ±0.3dB
FM SNR	≥90dB, with 75us de-emphasis
THD+N	≤0.003% with 75us de-emphasis

DIGITAL

Frequency response	0-90kHz ±0.005dB
FM SNR	≥100dB, with 75us de-emphasis
THD+N	≤0.001% with 75us de-emphasis

AUDIO INPUTS

Analogue	2 x XLR female, 10kΩ impedance, level adjustable 0-24dBu
Digital	AES/EBU via RJ45 per StudioHUB+ Level adjustable -20-0dBFS, sampling rates 32-192kHz

AUDIO OUTPUT

Headphones Out	14" (6.3mm) female stereo socket software adjustable volume minimum load impedance 16Ω

WIDEBAND INPUTS

Analogue MPX	BNC, 10kΩ impedance, level adjustable 0-12dBu
Digital MPX	AES/EBU via RJ45 per StudioHUB+ level -20-0dBFS, sampling rate 192kHz left channel
Analogue RDS	BNC, 10kΩ impedance, level adjustable from 0.1-10Vpp

WIDEBAND OUTPUTS

Analogue MPX	BNC, 10Ω impedance, level adjustable 0-12dBu
Analogue Pilot	BNC, 10Ω impedance, level adjustable 0-12dBu

RDS GENERATOR

Type	Fully Dynamic RDS/RDS2/RBDS Generator
Protocols	ASCII commands, UECP protocol and X-Command Multi-port
Ports	UART over USB-B & Ethernet

WIDEBAND INPUTS

10MHz input	BNC, 50Ω terminated
1PPS input	BNC, 50Ω terminated
RF sample output	SMA, 50Ω, -30dBc
UART over USB	USB-B, system control
USB	USB 2 x USB-A, storage & FW upgrade
Ethernet	1 x RJ45
RS232	DB25 shared connector, system control
	GPIO DB25 shared connector, 8 x output & 8 x input, all optically isolated
Interlock/ External RF Off	DB25 shared connector,programmable logic/polarity
Analogue voltage output	DB25 shared connector, 4-channel 0-5V range

ENVIRONMENTAL

Altitude	15,000 ft / 4,420m AMSL
Temperature range	0 to +45°C working. -10 to +50°C storage
Humidity	95% @ 35°C, non-condensing

AQUABROADCAST

Aqua Broadcast was formed by a diverse and experienced team of people with extensive Broadcast and electronics experience. We love Broadcast just as much as you do, and we saw the need to do things differently to all our competitors.

With an international presence and offering multi-lingual staff, Aqua Broadcast has positioned itself as a dynamic and innovative company, driven by its passion for Broadcast and Studio products.

At our core are our customers. We focus on designing and building products for engineers and station owners who demand reliability, ease of use, with cutting-edge design and features. Listening to customer's ideas, feedback and success stories allows us to build products that are feature rich, reliable as well as easy to use.

Our strategically located offices worldwide mean you are never out of touch due to time zones. Sales and support are available round the clock. Whether it's a phone call, or email we are always with you every step of the way.

For details of your local dealer or Distributor, please refer to our website or contact us.

The purchaser will be responsible for all import taxes, customs, duties, freight costs and insurance.

Warranty Information

At Aqua Broadcast Ltd, we are devoted to building the highest quality products and the never-ending pursuit of providing a better experience to our customers.

Our warranty statements are a continued commitment to providing reliable solutions with our technologies. All Aqua Broadcast Ltd benefit from a 2 year Manufacturer's Warranty. Further information on the Warranty can be seen in each products user manual, or by contacting us.

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MADE IN UK

Specifications are subject to change without notice