



CST3000 TRANSMITTER SERIES

WHEN YOU NEED **LONG
DISTANCE CRITICAL WIRELESS
COMMUNICATION**

SAIT
A SECURITAS SOLUTION

**SMALLEST
1-10 KW
TRANSMITTERS
IN THE WORLD**



THE SAIT **CST3000** TRANSMITTER SERIES IS A
NEXT GENERATION COMPACT & MODULAR
STATE-OF-THE-ART TRANSMITTER DESIGNED
FOR RELIABLE "ROUND THE CLOCK" WIRELESS
OPERATIONS

DESCRIPTION

The CST3000 transmitter family is designed and manufactured by SAIT, in Belgium. It is a full solid-state, modular, multipurpose range of transmitters offering a high level of performance and a high degree of reliability for continuous transmission, 24 hours a day.

It is specially designed to be remotely controlled, through Ethernet connectivity, making it suitable for local or remote operation by human operators and computer systems.

The output power ranges from 1kW till 10kW PEP. The renewed, highly modular, design of the power stages provides a high level of redundancy.

The transmitters incorporate the most advanced technological improvements and comply fully with the latest international radio regulations.

The fully digital exciter allows virtually any modulation mode to be implemented in software, including protocols for high-speed data links used in ground-to-air or naval applications.

The frequency range extends from 0.2 MHz to 30 MHz, making it ideally suitable for beacon, NAVTEX or NAVDAT broadcasting and voice or data shore-to-ship, or ground-to-air communications.

The CST3001 transmitter is housed in a very compact 3u high 19-inch subrack.

Extensive BITE functions facilitate servicing and maintenance. The accessibility of all of the modules and printed circuit boards has been optimised to make maintenance as easy as possible. And, given that the transmitters are fully transistorised using the latest MOSFET technology, maintenance can be carried out in complete safety.

CST3001 ARCHITECTURE

The block diagram of the CST3001 1kW transmitter is presented in the below figure. The CST3001 transmitter consists of three main components.

1. DFS3000 exciter and control interface

The exciter and control interface module is a versatile digital frequency synthesizer, modulator and controller. It is based on Digital Signal Processor (DSP) and Direct Digital Synthesis (DDS) techniques. It synthesizes the required MF or HF carrier frequency, modulates this carrier frequency using one or two of the low frequency audio inputs or the internal modulation signal generator, and amplifies this modulated MF/HF carrier up to a suitable level for the power amplification chain of the CST3001.

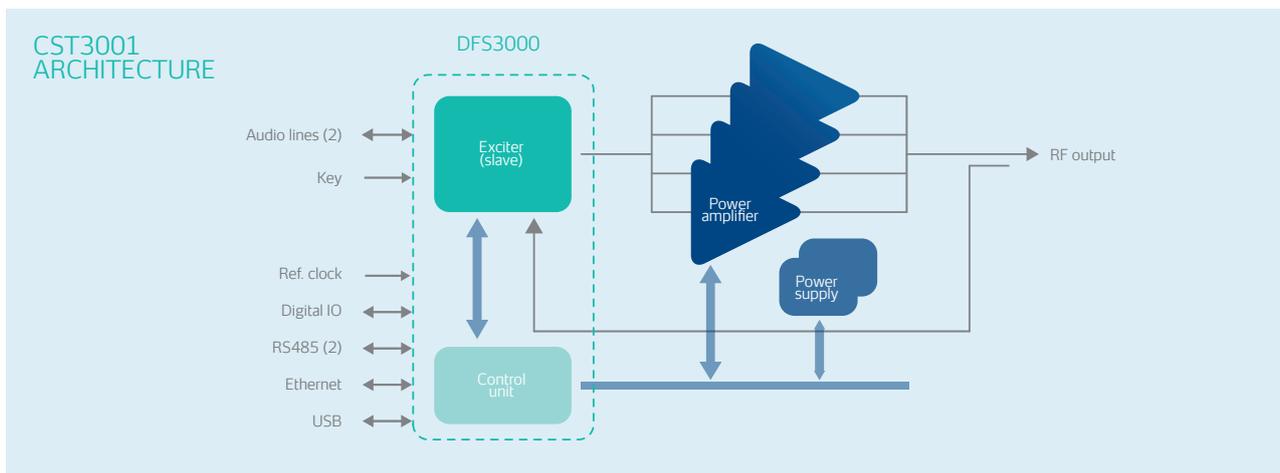
It generates the low-power modulated MF/HF carrier according to the configuration programmed by the operator (frequency, audio input signal, emission class, output power).

The controller enables the configuration and supervision of the transmitter. It has Ethernet and serial interfaces, presenting a standard control and monitoring interface to a local or remote controller, or to the station automated operation and control system.

A standard PC or tablet running the built-in SAIT CST3000 web application provides the local or remote convivial GUI to the transmitter. The control interface allows the operator to operate, configure and monitor the status and diagnose the transmitter.

2. Power amplifier

The power amplification chain of the SAIT CST3001 transmitter amplifies the output signal from the exciter up to a maximum level of 1 kW PEP. It is based on the combination of four identical and independent power amplifiers.



Each power amplifier module delivers a nominal output power of 250 W. The combining of the four amplifier modules is carried out in the backplane of the transmitter rack. The architecture of the CST3001 amplification chain provides an inherent functional redundancy of the transmitter: in case of failure of one of the amplifier modules, the transmitter still operates but with a reduced output power.

3. Power supply

The CST3001 transmitter has an integrated dual redundant adaptive power supply for optimal power efficiency.

The CST3001 transmitter is made of only three different types of replaceable units: the exciter and controller board, the 250W power amplifier module and the power supply module. These components can easily be accessed from the rack front and swapped without any tool. This allows a quick and easy maintenance, based on three LRU modules.

CST300X - HIGH POWER ARCHITECTURE

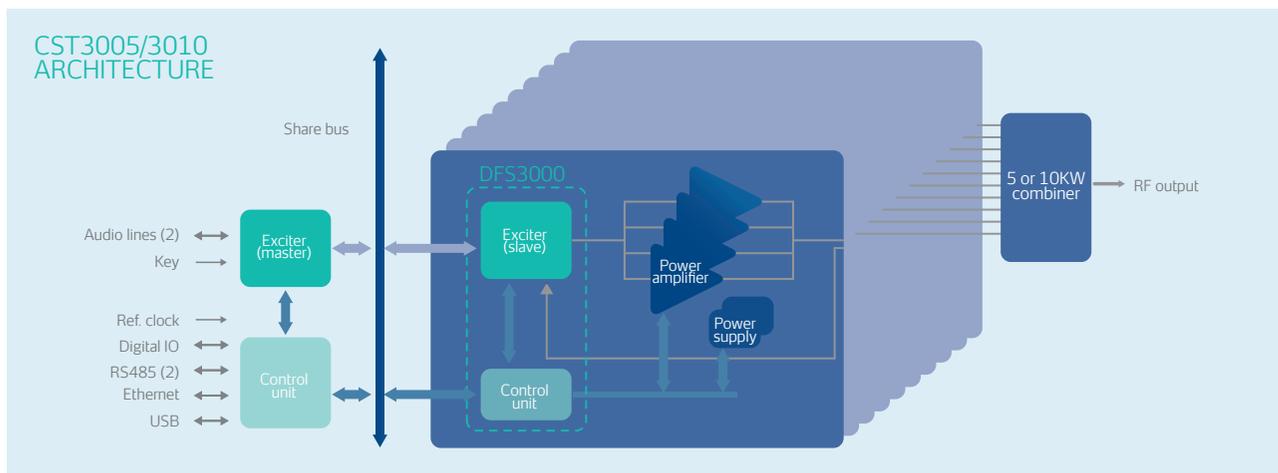
Our modular CST3000 transmitter family makes it possible to build practically any kind of transmitter. Currently SAIT has already a 5KW (CST3005) and 10KW (CST3010) models available. In this matter multiple 1KW CST3001 subracks are combined to form 5KW (CST3005) or 10KW (CST3010) transmitters.

The CST3005 5KW consists of five 1KW subracks (CST3001) and one 5:1 combiner and the CST3010 10KW of ten 1KW subracks (CST3001) and one 10:1 combiner. All 1KW subracks are identical and communicate with each other and with the combiner over a dedicated high-speed digital communication bus, called "share bus".

Various signals transit over the share bus such as baseband data (light blue arrows, basically processed audio samples), control and monitoring data as well as a synchronization clock and fast-data corresponding to events (blue arrows).

FEATURES & BENEFITS

- Output power up to 10 kW PEP
- MF and HF coverage, from 190KHz to 30MHz
- DSP-based exciter
- Fast channel switching
- Local and/or remote PC-based control (IP connectivity)
- Full solid-state design
- Easy component accessibility
- Continuous duty cycle operation
- Linear RF amplifier for outstanding performance
- Easy maintenance (BITE facilities)
- User-friendly Graphical Operator Interface
- Interactive status indication
- Automatic power limitation to support any VSWR
- External ATU (Antenna Tuning Unit) and ASU (Antenna Switching Unit) control capability
- Robust and resistant to extreme environmental conditions
- Inherent power amplifier - power supply redundancy
- NAVDAT Compliant
- Supporting multiple modulation formats including NAVTEX, DSC, and high-speed data protocols
- Built-in SELCAL facility for air traffic control
- Modular and highly reliable
- Extremely compact
- Very high power efficiency thanks to adaptive power supply
- Voice over IP: Eurocae 137 Part 1
- Integrated Voice & Data recording



SPECIFICATIONS

GENERAL

Power supply	230 VAC, 50-60 Hz
Power consumption CST3001	2.5 kVA max.; 2 kVA typical; PF 98%
Power consumption CST3005	13 kVA max; PF 98%
Power consumption CST3010	25 kVA max
Cooling	Forced air (integrated fans)
Operating temperature	-20 - 50°C
Humidity	5 - 95 % non-condensing
EMC	Conforms to CE regulations

FREQUENCY SYNTHESIS

Frequency range	190 KHz - 30 MHz 1.6 - 30 MHz (CST3010)
Tuning resolution	< 1 Hz
Frequency ageing	< 5 10 ⁻³ /day
Exciter technology	DSP with Direct Digital Synthesis
Modulation type	CW, AM, SSB, ISB
Class of emission	Any combination of modulation type, carrier level and input source(s)
Audio bandwidth (-3 dB)	300 - 3050 Hz (configurable)
Audio inputs	2 input lines with key
Audio level	-20 to +10 dBm
Audio input impedance	600 Ω balanced

OUTPUT RF POWER

Full output power	1 kW PEP (CST3001) 5 kW PEP (CST3005) 10 kW PEP (CST3010)
Duty cycle	Continuous (100%)
Reduced output power level	4 programmable levels
Impedance	50 Ω unbalanced
VSWR	< 1.5:1 at full power > 1.5:1 at reduced pwr
Harmonics and spurious	< -60 dB/PEP
Intermodulation products	< -50 dB/PEP
Hum and noise	< -60 dB/PEP
Wideband noise	< -120 dBc/Hz
Carrier suppression (SSB mode)	< -50 dB/PEP
Unwanted sideband suppression	< -60 dB/PEP
Protection	Open circuit, short circuit, excessive VSWR

REMOTE CONTROL

User interface	PC - based
Features	Programming of radio channels, audio input source, class of emission, power reduction, transmitter state Monitoring of transmitter state, direct and reflected output power, temperature and voltage levels, alarms and alarm history
Nb of channels in memory	> 200
Channel switching time	< 100 ms
Connection	Ethernet (10 BaseT)
Protocol	Websocket, SNMP

PHYSICAL

Dimensions (HxWxD)	133 x 483 x 550 mm (CST3001) 1200 x 600 x 800 mm (CST3005) 2200 x 600 x 800 mm (CST3010)
Weight	25 kg (CST3001) 150 kg (CST3005) 300 kg (CST3010)

IF YOU NEED HIGH POWER, LONG DISTANCE WIRELESS COMMUNICATION, YOU CHOOSE SAIT

The new SAIT CST3000 series has been developed by taking into account customer's feedback in the maritime, defense and aviation business. The most important unique selling points are:

- Low power consumption (50% less heat generated)
- Small (10 x smaller than previous generation)
- Fast (frequency change < 1 sec)
- Easy to use graphical machine interface
- Easy maintenance
- Integrated voice over IP system
- Software driven, supporting current voice and data applications in the different market segments but also future developments
- Modular: from 1 KW to 10 KW
- Robust
- STANAG and IMO Compliant
- Reduced radiated emissions

MORE INFO?

Contact your SAIT Account Manager or surf to www.sait.be


 SAIT
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