HF TRANSCEIVER
SENTRY-H 6120-BM

CODAN COMMUNICATIONS | DTC

KEY FEATURES

- Software Defined Radio
- 150 W power output (expandable to 500W/1kW)
- Wide range 10 V to 36 V DC input
- Rugged and waterproof MIL-STD-810G design
- Multiple control point flexibility
- Intuitive icon based colour display
- Multilingual user interface
- Embedded GPS
- IP/Ethernet/Wi-Fi/USB connectivity
- Exceptional RF performance
- 2nd generation digital voice (TWELP) with ECCM support
- Digital voice message call
- Up to 100 user defined Presets
- Supported standards:
  - MIL-STD-188-110A/B (STANAG 4539) Data (up to 19k2 bps)
  - MIL-STD-188-110D (Appendix C)
  - FED-STD-1045
  - MIL-STD-188-141D (Appendix A, Appendix C)
  - MIL-STD-188-141B ALE (JITC certification pending)
  - 3G ALE (STANAG 4538)
- AES-256/DES-56/CES-128 COMSEC
- ECCM - up to 25 hops/sec
- H-250 Accessories support
- Virtual Control Point (VCP) compatible
- Wide range of supported peripherals
- Worldwide Codan service an support

Codan's Sentry-H 6120-BM (type number 2310) delivers a rugged Software Defined Radio (SDR) solution for military organisations that demand uncompromised, secure long range voice and data communications. With 150W RF power, it has been specifically designed to deliver the smallest and lightest form factor for no-fuss integration into base and mobile platforms.

In close consultation with military customers, the 6120-BM has been optimised for ease-of-use and features an ergonomic smart handset with a daylight readable colour, high-resolution multi-language interface and a variety of other capabilities.

PROVEN SOFTWARE DEFINED ARCHITECTURE

Codan's 6120-BM uses the latest-generation high-performance Digital Signal Processor (DSP), Field-Programmable Gate Array (FPGA) and system on chip (SoC) technology.

Built upon a proven SDR platform with thousands of hours of operation in the field, the 6120-BM delivers market-leading performance and future upgradability through software updates that support evolving standards and ensure sustainability.

CONTROL POINT FLEXIBILITY

The 6120-BM is supported by the 2320 Smart Handset with Night Vision Goggle (NVG), 2340 Control Head and the 2330 Desk Console, providing ultimate flexibility for virtually any base or mobile platform application. Support for H-250 audio accessories is also provided via a dedicated interface. This presents the advantage of being able to conveniently locate the control point of choice for radio monitor and control while using a dedicated headset/handset or intercom system for voice communications.

IP/ETHERNET/USB CONNECTIVITY

The 6120-BM's IP based design enables the support of fully remote operation via dedicated cable or Ethernet when using the 2330 Desk Console. All Sentry-H control points have a USB port providing a convenient point for connecting the Codan TPS-M transceiver programming application. Alternatively, a conventional USB flash drive can be connected to the USB port for radio profiling, COMSEC key fill and firmware upgrades in the field.

INTUITIVE INTERFACE AND LOCALISED LANGUAGES

The Sentry control points have been designed with ruggedness, and ease of configuration and operation as primary objectives. The intuitive icon-based menu system and easy to read colour screen layout, common across all control points, is coupled with an ability to switch between multiple native languages (including data entry modes) ensures that you can focus more on your mission and less on complex radio operations and training.

Additional languages available upon request.

Operator access to radio configuration parameters can be easily locked down or made available, depending on your unique circumstances.

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ADVANCED ALE

The 6120-BM includes the latest generation STANAG 4538 3G ALE technology providing the tactical user with fast linking and data capabilities. Mission critical messages, including digital voice messages, are transferred securely by employing link protection and data encryption.Synchronised scanning provides more efficient use of existing bandwidth.

The 6120-BM is fully interoperable with military transceivers using JITC certified MIL-STD-188-141B ALE. You can initiate NET, GROUP, and WILDCARD selective calls, along with a number of advanced calls including phone, text message, GPS and status calls. Calls can be made ad-hoc or via fully pre-programmed entries in the contacts list.

The 6120-BM certified waveforms allow for integration and interoperability with agencies using disparate radio networks and systems.

LQA RAPID

Codan's proprietary enhancement to ALE waveforms provides improved performance through monitoring channel conditions over a 24 hour period. This ensures that users can rapidly establish communications on the best channel for the time of day, without the need to initiate updates to the LQA information prior to calling, thus increasing network availability and performance.

PRESET SUPPORT

Tactical communications users often require an ability to quickly switch between different radio configurations to communicate with different units or in different ways without re-programming the equipment. Until recently, Codan supported this requirement via Secure Interoperability on a Channel level as well as the Select Active HF Network features. The new Presets feature further improves Sentry-H family capabilities. A Preset is a predefined set of configurations and settings, which includes:

- A fixed channel/frequency or a scanning mode with a group of active HF networks

- Digital Voice state, rate and active waveform

- Encryptor and secure key index

- Hopping state and hopping plan index

- Transmit power as well as values for up to 32 transceiver settings.

The Preset capability allows an operator to quickly switch between different modes/operational scenarios to communicate with different parties or re-configure the equipment on a fly for different missions, ensuring that radio assets remain flexible to meet your mission needs.

GPS SUPPORT

The 6120-BM has embedded GPS receivers in the RF Unit and 2320 Handset with GPS, GLONASS and BEIDOU navigation systems supported. The RF Unit has a connection point for an external remote GPS antenna if needed.

Position data display format is user selectable and includes UTM, UPS and MGRS formats. Your distance and bearing from a remote HF station or waypoint can be displayed graphically via the handset user interface.

OVER THE AIR WAYPOINTS

The user interface facilitates straightforward sharing of waypoints over the air with other users. The message call mechanism provides an intuitive method to select, include and transmit multiple waypoints from the waypoint list. Upon receiving a message call containing waypoints, the waypoints can be saved to the waypoint list, and also used for immediate distance & bearing plots. This feature greatly simplifies the process of sharing and tracking geo-location information amongst a group of radio users.

HIGH POWER FOR BASE AND MOBILE CONFIGURATIONS

The 6120-BM is the military industry's first base and mobile radio system that delivers 150 W of RF power without the added cost, weight and complexity of an external amplifier. It has an in-built power amplifier that provides full-duty cycle performance across the complete HF band for all supported modes. Designed for maximum efficiency and a wide range of DC input voltages, the 6120-BM is the HF radio of choice for vehicle and other battery based systems.

The rugged RF unit is made out of a high-grade metal cast chassis and meets or exceeds MIL-STD-810G so you can be confident it will get the job done no matter where you operate.

DIGITAL VOICE

Codan's second generation digital voice technology utilises MELPe (Mixed-Excitation Linear Predictive enhanced) or TWELP (Tri-Wave Excited Linear Prediction) including latest addition of 300 bit/s and 480 bit/s vocoder rates to provide a major improvement in High Frequency (HF) voice communications. A fully digital mode, coupled with highly optimised vocoder technology, provides clarity and connectivity when traditional methods fail. Compatible with AES-256 encryption, DES-56 encryption and Frequency Hopping options.

An optional open protocol version of Digital Voice is also available to enable interoperability between Codan and other vendor radios.

DATA WAVEFORMS

The 6120-BM is hardware ready for data mode and is delivered with the Codan 2400 bit/s robust data modem as standard. This data waveform is supported with the Codan Chat application providing peer-to-peer text chat, email, and file transfer with a simple GUI that supports multiple languages.

The optional STANAG 3G ALE provides fast linking and data capability, when combined with Sprint Chat/Net application, that is capable of exceeding the performance experienced with traditional MIL-STD-188-110 2G data. Codan 3G ALE supports all call types including digital voice message calls and SMS text (via Sprint Net stations).

The 6120-BM may be software upgraded to full MIL-STD/STANAG data capability with data rates up to 19k2 bps (with ISB) using the Codan RC50-C HF email application.

COMSEC

A range of COMSEC options are available with the 6120-BM, from CES-128 grade voice encryption through to full AES-256 encryption of digital voice, STANAG/MIL-STD data and STANAG 4538/3G ALE. The AES-256 encryption supports 256 by 256 bit keys with additional layers of protection possible by incorporating unique radio identifiers. 6120-BM has an option of a non export-controlled DES-56 encryption for digital voice and data with up to 256 secure keys.

All voice encryption options can be activated by a single hotkey, and are fully integrated with core radio functions like Selcall and ALE calling to ensure simplicity of operation. The Secure Interop feature enables configuration of the 6120-BM to automatically enable encryption on specified networks /channels.

Codan Key Management is used to generate the key files, and Codan Key Fill software or a USB flash drive may be used to load the keys to the radio.

ECCM (FREQUENCY HOPPING)

The 6120-BM can be enabled with frequency hopping capability providing tactical networks with additional capability to prevent malicious jamming and signal interception. The user can select between up to 31 user programmable hop plans, each comprising a hop name, rate, bandwidth and encryption key.

Additional information security can be achieved with the use of one time session PIN's, and also combining frequency hopping with CES-128 voice encryption.

Frequency hopping is now compatible with Digital Voice and 2G MIL/STANAG data waveforms to further extend ECCM capabilities. Available Digital Voice vocoder rates and 2G data rates are dependant on selected hopping rate, ISB data is not supported in frequency hopping mode.

WARRANTY, SERVICE AND SUPPORT

Codan provides proven product reliability and performance, backed up by our standard three year warranty. The ability to independently sustain your equipment, complimented by field upgradable unique option codes, enables you to truly utilise SDR technology should your mission change features can easily be enabled.

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SOFTWARE APPLICATIONS

- TPS-M Radio Programming Software
- RC50-C HF Email (for STANAG/MIL modem)
- Codan Chat HF (for robust ARQ modem)
- Key Management Software
- Key Fill Software
- RTS tracking software
- SprintChat and SprintNet
- Virtual Control Point (VCP)
- Software Developers Kit (SDK)

TRANSCEIVER BASED OPTIONS

- Standard digital bundle
- Advanced digital bundle
- Open protocol digital voice
- 3G ALE (STANAG 4538)
- DES-56 voice and data encryption
- CES-128 voice encryption
- ECCM (frequency hopping)
- Foreign language user interface
- Free tune transmit
- Independent Sideband (ISB)
- 1.5MHz Tx

ACCESSORIES

- 2320 Handset
- 2340 Control Head
- 2330 Desk Console
- Tactical base antenna and mast solutions
- Mobile / base antenna tuners
- Mobile Shock Mounts
- General mounting accessories
- H-250 audio accessories, remote speaker
- 3320 AC power supply
- Morse key
- Crosspatch
- 500 W / 1kW high power amplifiers
- External GPS antennas

SPECIFICATIONS

GENERAL

Frequency range	**Transmit:** 1.6 to 30 MHz (optional: 1.5 to 30MHz) **Receive:** 250 kHz to 30 MHz
Power output	150 W PEP ±1 dB (two-tone or voice), user-programmable in 1 W steps (low/medium/high)
Channels	Up to 1000 entries
Contacts	Up to 500 entries
HF networks	Up to 20 networks (simultaneous scanning)
Presets	Up to 100 user defined presets
Input voltage range	13.8 V DC nominal, negative earth **Functional range:** 10.8 V to 35.2 V DC
Supply current	**Transmit:** output power 150 W, two-tone 11 A to 20 A CW or average speech 8 A for battery life calculations **Receive:** no signal < 0.6 A typical, 0.9 A maximum
Frequency stability	±0.3 ppm from – 20°C to +60°C
GPS	RFU - external antenna, 2320 Handset - embedded receiver/antenna (GPS, GLONASS and Beidou)
Programming	TPS-M- Radio Programming Software, USB memory device
Language support	English, Spanish, Russian, French, Arabic, Dari, Pashto, Portuguese and Polish
Compliance	CE, FCC Part 90, AS/NZS 4770, AS/NZS 4355, IC RSS-125

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SPECIFICATIONS

RF

Modes	Single Sideband USB, LSB (J3E), AM (H3E), CW (J2A), AFSK (J2B), FSK (F1B), ISB (B7D or B2B), Software Defined
Duty cycle	100% voice and data
Receiver specifications	**Sensitivity:** SSB: -125 dBm (0.12 uV) for 10dB SINAD **Selectivity:** >65 dB at -1 kHz at -1 kHz +4 kHz SCF (USB)
Transmitter specifications	**Spurious and harmonic suppression:** >65 dB below PEP **Intermodulation products:** >31 dB below PEP

WAVEFORMS

Automatic Link Establishment (ALE)	MIL-STD-188-141D (Appendix A, Appendix C); FED-STD-1045; JITC Certified MIL-STD-188-141B; STANAG 4538 3G ALE
Data	MIL-STD-188-110D (Appendix C); MIL-STD-188-110A/B (STANAG 4539) data capability with data rates up to 19k2 bps
Selcall	CCIR 493-4 proprietary and open standard
Digital Voice	TWELP 2400 bit/s, 1200 bit/s, 600 bit/s, 480 bit/s, 300 bit/s MELPe (STANAG 4591) 2400 bit/s, 1200 bit/s
Digital voice (open protocol)	TWELP (600/700/1200/2400 bit/s) Note: Actual vocoder rate combinations are dependent on other Export/Non-export controlled capabilities that may also be enabled
Encryption	AES-256 digital voice and data (256 keys, direct entry and programmable via Codan KMS/KFS & USB flash drive) DES-56 digital voice and data (256 keys direct entry via UI) CES-128 voice (97 x 16-digit keys, direct entry and programmable via Codan KMS/KFS & USB flash drive, 4-digit session PIN)
ECCM	6, 12, 25 hops per second (hps) **Max Data Rate:** 6hps (2400bps) 12hps (1200bps) 25hps (600bps) **DV Vocoder Rates (TWELP only):** 6hps and 12hps (1200bps, 600bps, 480bps, 300bps) 25hps (600bps, 480bps)

ELECTRICAL AND MECHANICAL

Size	**RFU:** 220 mm x 66.5 mm x 190 mm **2320 Handset:** 67 mm x 210 mm x 72.5 mm **2330 Console:** 228 x 190 x 79 mm **2340 Control Head:** 46 x 218 x 102 mm
Weight	**RFU:** 2.82 kg **2320 Handset:** 280 g (no cable) **2330 Console:** 1.1 kg **2340 Control Head:** 0.77 kg
Interfaces	**RFU:** ATU control, GP Interface, Control Point interface (includes TCP/IP Ethernet), DC input, Fan control, H-250 Audio (powered), GPS antenna, Antenna. **2320 Handset:** USB **2330 Desk Console:** USB, GP Interface, Ethernet, DC input, Headset, Morse Key **2340 Control Head:** USB, Transceiver control, Speaker, Microphone

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Temperature range	Operational at –30 to +60°C; 95% RH maximum, non-condensing (–40 to +70°C reduced performance)
Environmental standards	**2310 RFU & 2320 Handset:** MIL-STD-810G (Immersion, Shock, Drop, Vibration, Humidity, Blowing Dust, Salt Fog, Fungus, Contamination, Altitude) Ingress: IP67 1m / 60 minutes **2340 Control Head:** MIL-STD-810H (Shock, Vibration, Salt Fog) Ingress: IP54 **2330 Desk Console:** MIL-STD-810G (Shock, Vibration, Altitude)
MTBF	141,000 hours
MTTR	<10 minutes

PRODUCT TYPE NUMBER

Product type numbers	RF Unit: 2310, Smart Handset: 2320, Desk Console: 2330, Control Head: 2340

Values noted are typical. Equipment descriptions and specifications subject to change without notice or obligation.

Sentry-H 6120-BM radio's Export Commodity Classification (ECCN) under the Export Administration Regulations (EAR) is 3A611.a. Certain features may require an ITAR approval when exporting from the United States.

2320 Handset shown

2340 Control Head shown

2330 Desk Console shown

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