

>> MSN8100-H

The performance characteristics described are pertinent to any one channel to the extent described, all channels being mutually independent.

General

Frequency Range:

Rx 10kHz to 30MHz in 1Hz steps
Tx 1.5MHz to 30MHz in 1Hz steps

Tuning time:

< 5ms to within 20Hz

Frequency accuracy:

3 parts in 10^{-7} (0°C to 35°C)

External Frequency input:

1, 5, or 10 MHz

Modes of Operation:

CW	A1A, A1B
MCW	A2A, A2B
AM	H3E
FAX	F1G, F3C
FSK	F1A, F1B, J2B
USB/LSB	H2A, H2B, J2A, J2B, J3E, R2A, R2B, R3E
ISB	B7B, B8E, B9W
STANAG	4197, 4198, 4203, 4285, 4415, 4481, 4529, 4539, 5031, 5511 & 5522 compatible

The SDR is configurable to support both half duplex and full duplex operation (in data modes using a combination of two channels)

Equipment Status and BITE:

Indicator display for equipment operability
Interrogatory BITE with detection to module level

Channel store:

1024 pre-sets per channel. Parameters stored in non-volatile memory include frequency, mode, AGC characteristics, filter selection, BFO/RIT and transmitter power

Exciter

In-band noise:

-50dBc in a 3kHz bandwidth

Wideband noise:

The noise level is <-165dbc (1Hz) for all frequencies removed by more than 5% from the tuned frequency (with PPS)

Carrier suppression:

>60dB

Unwanted sideband suppression:

>60dB

Spurious emissions:

Better than -80dB at all frequencies removed by more than 5% from the tuned frequency (with PPS)

Receiver

Sensitivity:

LSB, USB, ISB; a signal of -113dBm (1mV emf) in a 3 kHz bandwidth gives a (S+N)/N of 10dB.

A high sensitivity position is provided with PPS

AGC:

<3dB change in output for input signals (AM) between -107dBm and +13dBm
Attack time <10ms (USB/LSB/ISB)
Decay time 25ms; fast, medium, slow compatible with all modes, fully compliant with L11

Bandwidth selection:

0.16kHz, 0.3kHz, 1kHz, 1.24kHz, 2.3kHz, 2.4kHz, 2.75kHz, 3kHz and 6kHz

BFO/RIT:

BFO Tunable ± 4 kHz in 1Hz steps (Centred)
RIT Tunable ± 4 kHz in 1Hz steps (USB, LSB & ISB)

In-band intermodulation products:

In SSB and in ISB modes, for two 224mV emf carriers, resulting in audio outputs at 1100Hz and 1700Hz, all inter-modulation products and harmonics are 50dB or more below each tone over 1.5 to 30MHz

Out of band intermodulation products:

Between 1.5 and 30 MHz, for two equal signals removed from the tuned frequency by 5% and 10%, the 3rd order intercept point is +55dBm (with PPS)

Cross modulation:

A30% modulated unwanted AM signal (400Hz), removed by at least 20kHz from a wanted signal of -53dBm can have a level up to +5dBm before

3% cross modulation occurs (with PPS)

Blocking:

A-53dBm wanted signal is not compressed by more than 1dB by an interfering carrier of +8dB removed by not less than 20kHz from the tune frequency over 1.5 to 30MHz (with PPS)

IF rejection:

The rejection of all IF frequencies is >80dB below the wanted signal from 1.5 to 30MHz

Image rejection:

The rejection of all image frequencies is >100dB below the wanted signal

Spurious rejection:

At frequencies more than 20kHz from the tuned frequency; at least 80dB and >105dB, at frequencies >5% (with PPS)

Internally generated spurious:

Fewer than fifty 3kHz channels above -121dBm referred to the input. No channels have spurious responses above -112dBm

Mute and De-sense:

When PTT is operated, receiver output is muted

Scan mode:

Channel scan between designated channels with selected dwell time on each channel (0.1s to 12.7s).

Interface

Receiver Antenna input:

Impedance; 50 Ohms nominal, no damage is caused by input signals of up to 100V emf from a 50 Ohm source. The level of any radiated frequency component does not exceed -87dBm

AF Outputs:

Two line outputs for each channel, level adjustable from -20dBm to +10dBm into 600 Ohms balanced. User facility to switch the lines to either sideband

AF Inputs:

One line input for each sideband, level adjustable from -20dBm to +10dBm into 600 Ohms balanced. User facility to switch the lines to either sideband

Tape recorder:

Open collector gate

Exciter RF Output:

Load impedance 50 Ohms; output 17dBm ± 1 dB

PA Interface:

RS-422 serial control

Precision Time and Frequency Standard:

To STANAG 4430

Transmission Signalling:

Ready; Busy and PTT; all at 0V when activated

Local Audio:

One input and output at 0dBm/600 Ohms

Data Input/Output:

RS-422 with handshaking

Remote/Local Control:

i) RS-232 serial point to point
ii) 10/100 Base T Ethernet (main control port)

Power Supply:

85-132 and 170-264 VAC autoranging, 47-63 Hz

Power Consumption:

350 VAmx; four channel configuration

Physical Characteristics

Temperature range:

MIL-STD-810F. Methods 501.4 and 502.4
Operating: -6°C to 49°C
Storage: -33°C to +71°C

Humidity:

MIL-STD-810F Method 507.4

Vibration:

MIL-STD-167-1 (ships) Type 1

Shock:

MIL-STD-810F Method 516.5
15g, 18ms

EMC/EMI:

MIL-STD-461E

MTBF:

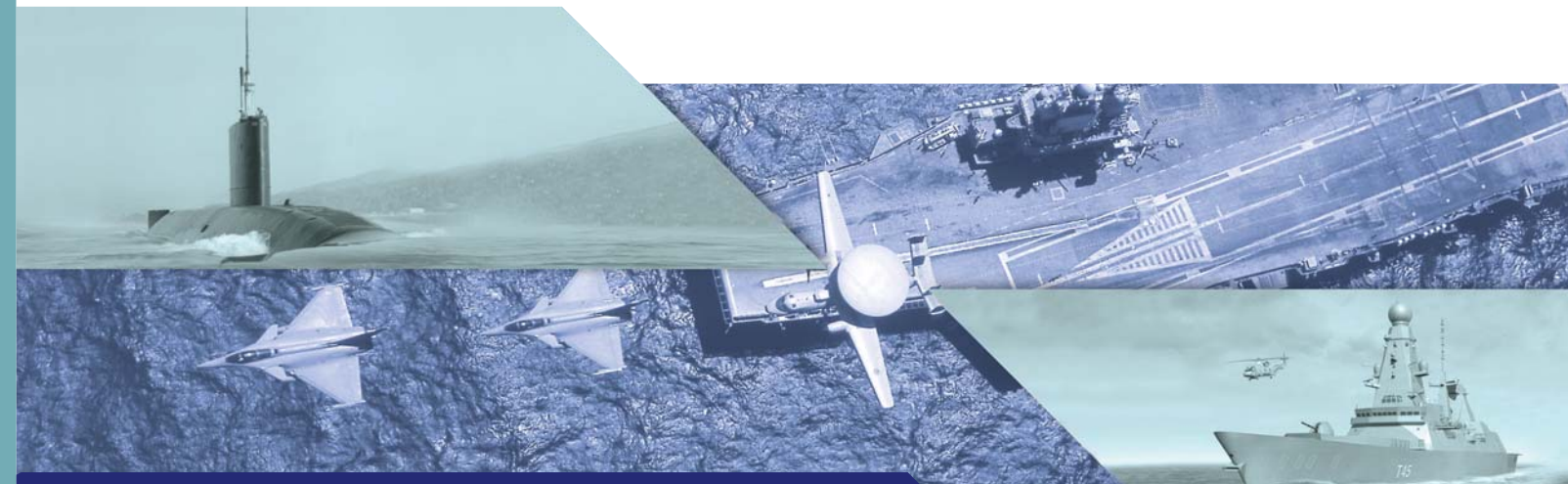
MIL-HDBK-217F at 25°C NS > 4000 hours

Size:

178H (4U) x 483W x 495D mm (ex. handles)

Weight:

17kg max depending on configuration



MSN8100-H

HF Software Defined Radio (SDR)



- Multi-channel, multi-mode operation
- Outstanding radio performance
- Embedded modem supports current and future waveforms and services
- High data rate and networking waveforms enabling
- Naval Intranet over HF
- Open, menu-driven Human Interface
- Software configurable ready for in-service upgrade
- Standard interfaces support legacy integration
- Supports cross service interoperability
- Networked via Ethernet and SNMP
- A future-proof procurement

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The Thales HF Naval SDR has been designed as the primary component of an end-to-end radio system benefiting from the attributes of a versatile programmable and configurable multi-channel exciter-receiver. All the features necessary to support the application and use of advanced digital waveforms specified for the achievement of high performance communications in the HF spectrum are incorporated in this single unit. As with all Thales radio products particular attention is given to providing optimal performance in terms of sensitivity, inter-modulation, reciprocal mixing and wide band noise to ensure satisfactory operation in a severe co-site environment. Such versatility enables its use within retained legacy systems as well as for the design of more modern future proofed multi-tasking systems. Part of Thales's family of HF Naval products, SDR sets the standard for maritime communications.

A capable, future-proof communications platform for deployment in fleet wide applications aboard all types of surface ships from patrol craft to aircraft carriers and submarines.

The HF Naval ADR is part of a range of SDR products servicing the whole defence theatre. These products share a common development environment and maintain a common hardware inventory. The benefit to any user is that of a fully sustainable product designed to meet the planned opera



The HF SDR as a complete transceiver can operate independently or within a totally integrated end-to-end naval communications system offering voice, data, messaging and e-mail services. Based on open systems architecture principles the design provides a fully supported software environment enabling ready adaptation or enhancement as operational needs change. It can evolve to meet the changing needs of the naval communications community and the demands of future warship design.

STANDARDS

The HF SDR is compliant to and compatible with the following functional and performance standards;

STANAG 4197*
STANAG 4198*
STANAG 4203
STANAG 4285
STANAG 4529
STANAG 4538 (RF Reqs.)
STANAG 4539 Annex B
STANAG 5066 V1*
STANAG 5511* edn. 3
MIL STD 188 110A/B
MIL STD 188 141A/B (Annex A/C)
STANAG 4415
STANAG 4481 edn.1 (Annex B/C)
STANAG 5031 edn.1
STANAG 5522* Annex 2
Where marked (*) modem and/or control functions provided externally.

CONFIGURATIONS

The basic product can be configured for one to four channel operation, each channel being designated as a transceiver, receive or transmit channel as an operational selection. When complemented by a Series 8000 range of power amplifiers, any one channel has a full transceiver capability. The HF SDR is also complemented by a pre/post selector unit for enhanced cosite performance. Control of the HF-SDR can be exercised from a networked workstation or locally through a tablet PC or the LCT 8100. The control application provides quick access menus allowing the operator to select basic operating functions whilst privileged menus allow the supervisor/maintainer to set configuration parameters of all radio channels. Other control options are available.

FLEXIBILITY

The equipment, as supplied, has a suite of functional waveforms with the inherent capability for the addition or exchange of other waveforms solely by software. A software update is initiated from a Local Control Terminal (LCT) via the Ethernet port. It benefits from a modular construction

