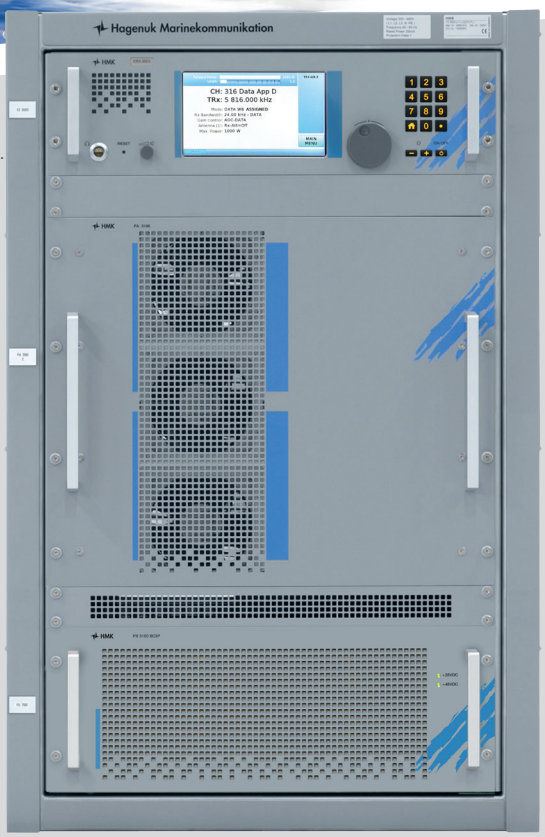
TRX 3100 M

1 kW HF Transceiver



TRX 3100 M standard version in 19" rack providing rack space for optional enhancements.

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The TRX 3100 M is a software-based HF transceiver rated at 1 kW PEP/average output power for tactical and strategic HF communication, providing 24 kHz wideband capability.

Form factor and technical design of this basic configuration allows easy replacement of existing TRX 3100 (of Series 3000), also in integrated systems.

FEATURES

Wide range	Full HF range, TX starting with 1.5 MHz, RX path also covering VLF Band
High speed @HF	Optimized 24 kHz system design allows data transfer, comparable to satellite communication
Heavy duty design	Capable for 24/7 transmission
Rugged design	Especially designed for harsh naval environments on vessels and submarines, providing enhanced co-site performance
Enhanced integrateability	Flexible interfaces, supporting seamless integration onboard
Full interoperability	Supporting wide range of STANAG and MIL-STD waveforms and modes
Modular system approach	This TRX 3100 M forms the basic unit for highly scalable modular HF system designs, a wide range of optional pre-integrated accessories is available supporting maritime needs
Fully software defined	Radio and accessories allow flexible adaptation to customer requirements, This transceiver can easily be configured to a transmitter (TX only), if required.
Frequency hopping	Designed for integration with external hopping controller to satisfy any customer ECCM requirements, e.g. acc. to NATO or any proprietary standard, like MAHRS or others

Hagenuk Marinekommunikation

A company of the ATLAS ELEKTRONIK Group

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TECHNICAL DATA

Frequency range	1.5 MHz – 30 MHz transmit, 10 kHz – 30 MHz receive
Frequency resolution	1 Hz
Frequency tuning	Via local keyboard or remote control
RF output power	1 kW ± 1 dB, PEP/average at 50 Ω
Reducing of output power in steps of	-3 dB, -6 dB, -10 dB, -20 dB
Adjustment of maximum power	In 0.1 dB steps down to -9.9 dB
Channel memory	1000
Frequency stability	< 1 x 10^{-8}
Frequency changing time	≤ 10 ms
Modes of operation	
Standard	AM (A3E), SSB (J3E USB/LSB), Data USB/ LSB/ISB, ISB (B8E), CW (A1A, A2A, H2A), FSK (F1B), AME (R3E, H3E, H3W), FM (F3E)

INTERNAL OPTIONS AND SCABILITY

Data communication *)	In conjunction with external MDM 3010 E, the radio supports basically narrowband legacy waveforms up to 19,200 bps and can easily be scaled to wideband waveforms via software up to comply MILSTD-188-110C, appendix D (up to 24 kHz)
2 Channel ISB	Acc. to MIL-STD-188-110C, appendix F
HF wideband capability, up to 24 kHz bandwidth	Acc. to STANAG 4203 Ed. 3 (prepared for Ed. 4); in conjunction with MDM 3010 E providing full support of MIL-STD-188-141D Appendix A (ALE 2G) Appendix C (ALE 3G); incl. STANAG 4538 Appendix G (ALE 4G (WALE), up to 24 kHz) The ALE features are scalable by software in MDM 3010 E modem controller
L11	Full radio support of Link 11, acc. to MIL-STD-188-203-1A, STANAG 5511 [1)]
L22	Full radio support of Link 22, acc. to STANAG 5522 [1)]
MSK(5030)	Full radio support of Multiple Shift Keying, acc. to STANAG 5030 [2)]
FH	Full radio support of ECCM acc. to MAHRS or other proprietary frequency hopping [3)]
LK	Full radio support of Link Y, proprietary Link-standards for non-NATO customers [4)]

Interfaces		
I/O Audio	600 Ω balanced, 0 dBm adjustable	
Remote control	Serial data RS232, 422, 485 LAN 10/100/1000 BASE-T Ethernet	
Input for external frequency standard	10 MHz, 0 dBm ±10 dB, 50 Ω	
Frontpanel socket	Microphone PTT (0V = transmit) Interface for software updates/ upgrades in field [5)]	
Comprehensive built-in test (BITE)		
Suppression of unwanted sideband	> 60 dB/PEP	
Carrier suppression	J3E, ISB, Link 11: H3E, H3W: R3E:	> 60 dB/PEP 4.5 dB to 6 dB / PEP 18 dB ± 2 dB / PEP
Suppression of intermodulation products 3. order	> 36 dB / PEP (two-tone signal with power amp.)	
Harmonics suppression	> 60 dB / PEP	
Noise suppression (inband)	80 dBc / Hz	
Noise suppression	Δf = >100 Hz: >75 dBc / Hz Δf = >100 kHz: >145 dBc / Hz	
Power supply		
PS 3100 BC3P	440 VAC 3 phase with 60 Hz (acc. to EN (acc. to STANAG 1008 Ed. 9 and MIL-STD-1399 section 300A)	

[1)] with external DTS / SPC, [2)] with external MSK demodulator, MSK 3003 E (pls refer to separate HMK brochure), [3)] with external FH controller, integration service may become necessary for new hopping controllers, [4)] requires Link controller equipment from dedicated OEMs, other proprietary LINK systems can be integrated upon request, [5)] requires separate FillGun service tool

GENERAL DATA

Environmental specifications	
Temperature	
Operation	-15 °C to +55 °C, acc. to MIL-STD-810H, method 502.7 procedure II, method 501.7 procedure II
Non-operation / storage	-30 °C to +70 °C, acc. to MIL-STD-810H, method 502.7 procedure I, method 501.7 procedure I
Humidity	
Damp heat	40 °C, 95 % RH, acc.to MIL-STD-810H, method 507.6 procedure II – aggravated cycle
Shock	
Functional shock	30 g / 20 ms; half sine, 3 shocks per main axis (pos./neg.), acc. to MIL-STD-810H, method 516.8 procedure I – functional shock
Vibration	
General vibration	Acc. to MIL-STD-810H, method 514.8 procedure I – general vibration a ii (category 21 – watercraft – marine vehicles, Fig. 514.8D-11)
Environmental vibration	Acc. to MIL-STD-810H, method 528.1 type I – environmental vibration (sections 5.1.2.4.2 exploratory vibration test, 5.1.2.4.3 variable frequency test, 5.1.2.4.6 endurance test)
Pressure	
Low pressure (altitude)	Ati 4.572 m (15.000 ft), acc. to MIL-STD-810H, method 500.6, procedure I (storage / air transport)
EMC	Acc. to MIL-STD-461 H, procedure CE101, CE 102, CS 101, CS 114, CS 115, CS 116, RE 101, RE 102, RS 101, RS 103
	Acc. to DIN EN 60945:2003-07, chapters 9.2, 9.3 and 10.3 to 10.9

Dimensions	
Height	937 mm (19U including standard rack)
Depth	673 mm (incl. handles)
Width	586 mm (including side covers, for taking units of 19" industrial standard size)
Weight	Approx. 163 kg incl. rack
Packaging dimensions (incl. rack in wooden box)	
Height	Approx. 1150 mm
Depth	Approx. 790 mm
Width	Approx. 840 mm
Weight	Approx. 240 kg

EXTERNAL OPTIONS AND ACCESSORIES

MDM 3010 E	External HF data modem, ALE and frequency hopping controller (for further details, please refer to separate brochure)
ARQ 3010 E	External IP network Over-The-Air (OTA) controller, e.g. to comply STANAG 5066 (for further details, please refer to separate brochure)
MSK 3003 M	External MSK controller (for further details, please refer to separate brochure)
AK 3003	FillGun service tool for installation, SW maintenance and field updates/ upgrades
Handset	HMK Mat.-No. 3028.386
Headset	HMK Mat.-No. 3026.917
ATU 3100 HVST	Automatic antenna tuner unit (ATU), with silent tuning capability, 1000 W, for vessel applications (please refer to separate brochure)

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EXTERNAL OPTIONS AND ACCESSORIES

The following Series 3003 M equipment and accessories can be used in conjunction with the TRX 3100 M basic unit:

MDM 3010 E, software defined HF and UHF WB Modem & ALE controller

ARQ 3010 E, HF / UHF OTA network controller

ATU 3100 HVST, antenna tuning unit for whip antennas on vessels

Handset, Headset

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