

RC12

Wideband ARQ & IP Controller – 240 kbps



S4591 MELP 1200/2400

S4691 MARLIN – 48 kHz

S5066 Ed 4 WB-ARQ

PRODUCT OVERVIEW

Features and Benefits

- **STANAG 5066 Edition 4 Support**
 - STANAG 5066 Ed.4: Conformant to all mandatory Annexes
 - SIS interface: Supports 3rd-party STANAG 5066 clients, Eth. I/F
 - HF IP Client: Supports IPv4 over HF applications, Eth. I/F
 - COSS Client: Supports ACP-126 / 127 terminals, serial I/F
 - HF Operator Chat Client: Supports text messaging, Eth. I/F & serial I/F
 - CFTP & HMTTP Email: Supports SMTP email gateway, Eth. I/F
 - STANAG 5066 Ed.3: Compatibility mode supported
- **IP PEP:** Improved performance for IPv4 (Future, STANAG 5070 Ann. H-based)
- **COMSEC DTE Port:** Synchronous / Async serial I/F
- **REM Ctrl Port:** Interface to Trusted Filter, serial I/F
- **Data Rates:** 240 kbps MIL-STD 110D/STANAG 5069 (Block 4)
- **Data Rate Change:** Dynamically adapts to BLOS radio link variability
- **ALE Control:** Multi-channel, 2G, 3G & 4G ALE with ALM
- **Factory Presets:** Simplified configuration using pre-defined profiles
- **Operation:** Point-to-Point ARQ and Broadcast non-ARQ
- **Radio Silence:** Tx Inhibit support
- **Deployment:** Ship-Borne & Shore Station incl. Split-Site
- **Interoperability:** proven interoperability with other products, e.g. RC66, BFEM 66, 4KMA, OMAR HD, RIFAN, BRASS ICC/BRE1TA and BRE2TA.

STANAG 5066 Edition 4 ARQ Stack Function

The RC12 ARQ Server and IP Controller includes a standards-conformant STANAG 5066 Edition 4 Wideband Automatic Repeat Request (WB-ARQ) protocol stack for error-free data transfer over bandwidth constrained long-distance HF radio links. The unit's built-in HF IP Client natively supports IPv4 applications.

The RC12 is a 19" rack-mount unit intended for naval and governmental end users who employ HF radio technology for Extended Line-of-Sight (ELOS) and Beyond-Line-of-Sight (BLOS) maritime, strategic or trans-continental data communications.

The RC12's synchronous DTE interface supports all the MIL-STD-188-110D / STANAG 5069 data rates up to 240 kbps (Block 4) for interfacing directly to bulk encryption equipment.

The RC12 with its embedded STANAG 5066 Ed.4 WB-ARQ stack, together with the RapidM 48 kHz RM12 HF data modem, comprise the equipment necessary for applications like chat, email, message handling systems or IP traffic to run over long range HF radio links. By adding the RapidM RI12 IP-to-SYNC unit to the solution, split-site solutions can be deployed over large geographical areas.

STANAG 5066 Ed.4 addresses data operation using waveforms with bandwidths ranging from 3 to 48 kHz, with a maximum data rate of 240 kbps. The RC12 also supports Data Rate Change (DRC) and multi-frequency ALE control for improved operation over varying HF BLOS radio channels.

The Narrowband HF STANAG 5066 Ed.3 ARQ Stack, including the Wireless Token Ring Protocol (WTRP), is available as an operating mode in the RC12. This can be used for backward compatibility with existing fielded equipment supporting STANAG 5066 Ed.3 only.

The embedded STANAG 5066 HF Operator Chat, COSS and HF IP clients are always activated, ready to support applications such as text messaging, ACP127 and IP applications.

The RC12 will in near future also support a STANAG 5070 Annex H-based IP Performance Enhancing Proxy (PEP) that will improve the performance of UDP and TCP data over HF radio.

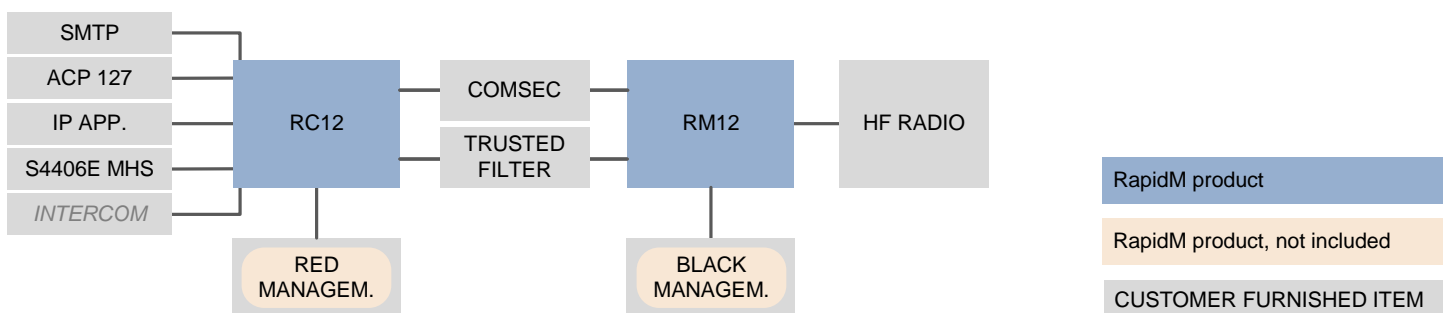


Figure 1: HF Circuit Architecture

Conformance To STANAG 5066 Edition 4

The RC12 conforms to all the mandatory requirements of the STANAG 5066 Ed.4 mandatory annexes (A, B, C, D, F and S), and also to a subset of the optional requirements of these annexes.

Annexes J, K and L address the Media Access Control (MAC) capabilities. The RC12 conforms to the requirements of Annexes J and K. The RC12 will be updated to include the STANAG 5066 Ed.4 Annex L in an upcoming release.

STANAG 5066 Ed.4 further introduces Annexes R and T specifying the Routing and TRANSEC Crypto Sublayers respectively as optional features. These annexes will be added to the RC12 in a later release.

Note: In Edition 4, the clients have been moved into their own separate annexes, and the STANAG 4406 Annex E and IP Clients have been updated. Some clients have been removed from the Ed.4 specification.

The table below provides a summary of the RC12's conformance to the STANAG 5066 Edition 4 standard.

* Future (Q2/2025)

Conformance with STANAG 5066 Edition 4					
ANNEX A	Subnetwork Interface Sublayer (SIS)	✓	ANNEX O	HF Operator Chat	✓
ANNEX B	Channel Access Sublayer (CAS)	✓	ANNEX P	ACP 127 & Character-Oriented Serial Stream	✓
ANNEX C	Data Transfer Sublayer (DTS)	✓	ANNEX Q	ACP 142. Supported via external MMHS Applications.	-
ANNEX D	Interface between DTS and Communications Equipment	✓	ANNEX R	Routing Sublayer	*
ANNEX F	SAP Assignment	✓	ANNEX S	SIS Access Protocol	✓
ANNEX J	REQs for Enhanced MAC Cap. in Multi-Node S5066 Networks	✓	ANNEX T	S5066 TRANSEC Crypto Sublayer using AES, and other Prot.	*
ANNEX K	High-Frequency Carrier-Sense Multiple-Access (CSMA) Prot.	✓	ANNEX U	IP Client (<i>excluding IPv6 support</i>)	✓
ANNEX L	High-Frequency Wireless Token-Ring-Protocol (WTRP) REQs	*	ANNEX V	Compressed File Transfer Protocol (CFTP)	✓
ANNEX N	Guidance on Address Management in S5066 Networks (Info)	✓	Note: The following Edition 3 annexes were not added to Edition 4: E, G, H, I, M.		

Backwards-interoperability with Edition 3

The RC12 supports networks consisting of a mixture of STANAG 5066 Ed.3 and Ed.4 nodes. As part of the RC12 address configuration, it can be specified on a per-node-basis whether a node is Ed.3 or Ed.4 capable.

Only when the RC12 is configured for Ed.4 will it be able to communicate with nodes being Ed.3 or Ed.4 capable. If not specified in the address configuration, the Ed.4 capability of the remote node can be determined as part of the link request.

If a remote node is only Ed.3 capable, then all following STANAG 5066 data exchanges with that node will conform to STANAG 5066 Ed.3. Alternatively, if a remote node is indeed Ed.4 capable, then all following STANAG 5066 data exchanges will make use of the Ed.4 functionality.

When the RC12 is run in the STANAG 5066 Ed.3 mode, it will only be able to communicate using Ed.3 features. The RC12 complies with the STANAG 5066 Ed.3 Annex L (WTRP), which is not interoperable with the STANAG 5066 Ed.4 Annex L.

The table below provides a summary of the RC12's conformance to the STANAG 5066 Ed.3 annexes that are removed from Ed.4.

Conformance with STANAG 5066 Ed.3 Annexes Removed from Ed.4					
ANNEX E	HF Modem Remote Control Interface (RM Proprietary I/F)	N/A	ANNEX I	Messages and Procedures for Frequency Change	✓
ANNEX G	Use of Waveforms at Data Rates Above 2400 bps	✓	ANNEX M	ATDMA Prot using S5066 DTS Layer Messaging (Empty)	N/A
ANNEX H	Implementation Guide and Notes (Information Only)	N/A	Note: This is not a complete conformance-to-standard table for STANAG 5066 Ed.3.		

Embedded STANAG 5066 Clients

By default, the STANAG 5066 compliant IP Client, COSS Client and Chat Client are activated for use. The RC12 further offers an optional Email Gateway function, which enables the use of the embedded STANAG 5066 Ed.4 CFTP Client, Ed.3 HMTTP Client, and an SMTP component for

legacy Email operation. This is required for BFEM 66 & OMAR HD interoperability, as an example. The Email Gateway functionality is subject to applying the software activation key, CE (S5066 Email Gateway).

Additional STANAG 5066 Ed.3 Annex F Clients Support					
ANNEX F.5	STANAG 5066 HF Mail Transfer Protocol (HMTTP) Client	✓	ANNEX F.16	RAW SIS Socket Server	✓
Embedded Email Gateway – SMTP, RFC 2821					
SMTP	Embedded SMTP Client (RFC 2821)	✓	Note: This is not a complete list of the supported STANAG 5066 Clients. STANAG 5066 Ed.4 retained most of the clients specified in Ed.3 Annex F.		

Binding of STANAG 5066 Clients

The RC12's embedded STANAG 5066 Ed.4 WB-ARQ stack support simultaneous binding from multiple clients. Clients connect to the Subnet Interface Sublayer (SIS), each using an unique Service Access Point (SAP). Each SAP is identified by its SAP Identifier (SAP ID), which is a number in the range 0-15; hence a maximum of 16 clients can be supported simultaneously.

The RC12's embedded clients use the following SAP IDs internally:

COSS: ID 1; HMTTP: ID 3; CHAT: ID 5; IP Client: ID 9 and CFTP: ID 12


An external Military Message Handling System (MMHS) based on NATO standard STANAG 4406 Annex E typically binds to SAP ID 2. Similarly, an external Military Email System (MEMS) based on Allied Communication Publication standard ACP-142 typically binds to SAP ID 7.

RC12 Ordering Information (STANAG 5066 Focus)

RC12 Ordering Information	Stock Number	Description
RC12 Hardware, S5066 ARQ and IP Controller (CD)	RME-C2-RA-CDV06	SDC: RC12 CD (S5066WB ARQ IP 240 kbps) V06
Software Option: Email G/way (SMTP) (CE)	C12-SW-O-CE-V06	SW MDL-CE (S5066 Email G/way, SMTP) V06

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