



RMCDE

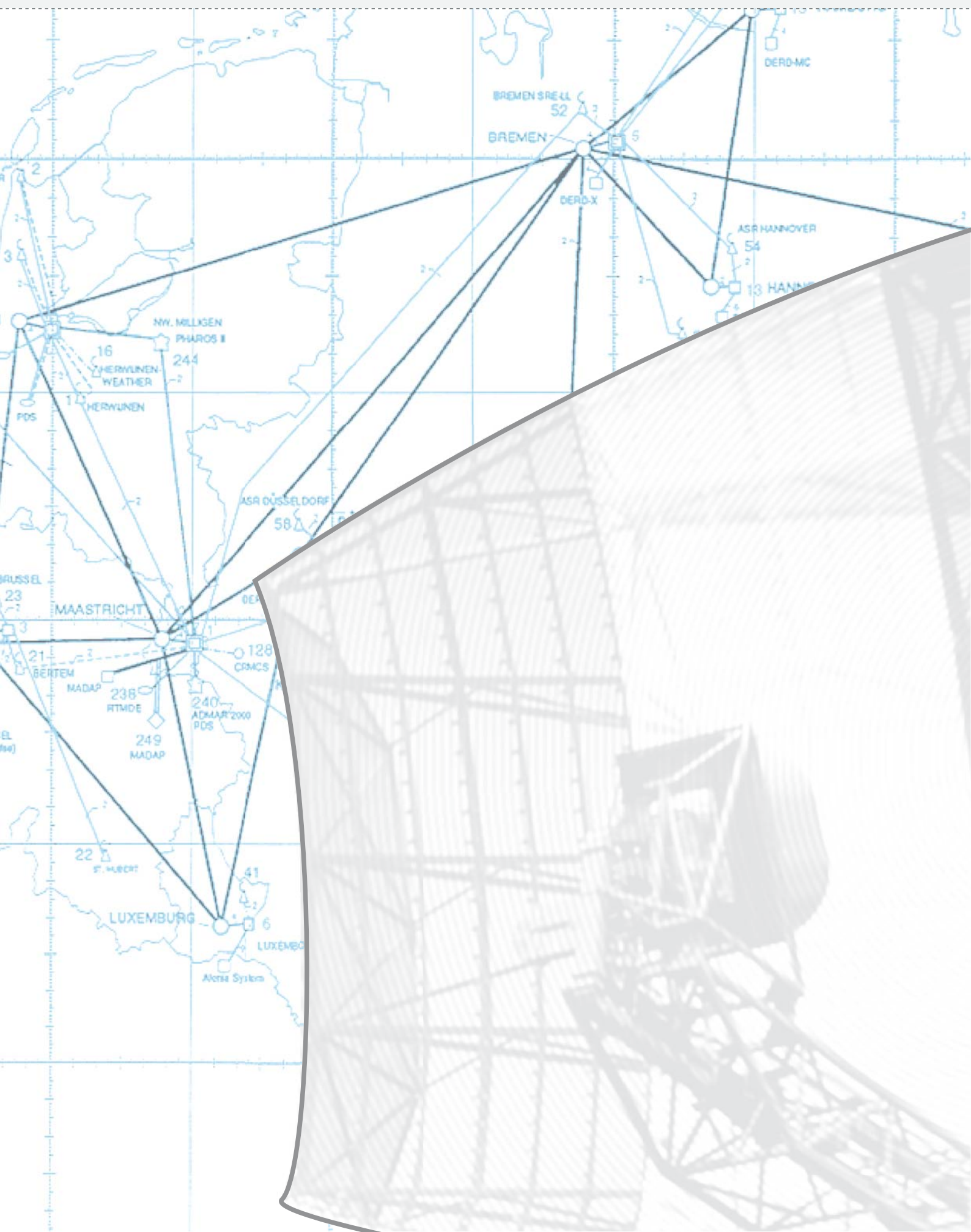
RADAR MESSAGE CONVERSION & DISTRIBUTION EQUIPMENT

HIGHLIGHTS

- Highly adaptable & expandable radar data communication processor due to modular design
- Supports wide range of supported formats & protocols
- Fault-tolerant hardware & software architecture
- Outstanding reliability & availability properties
- SNMP-based supervision & control
- Powerful set of radar data conversion, distribution & filtering features
- Native ASTERIX engine
- Integrated ADS-B server

COMSOFT

RMCD E — RADAR MESSAGE CONVERSION & DISTRIBUTION EQUIPMENT





The RMCDE is a highly versatile and technologically superior system for the exchange of surveillance data. Worldwide unique in its kind it represents a de facto standard for surveillance data communication.

The system is cornerstone of the European RADNET (Radar Data Network) and substantial key to its success.

The RMCDE is a flexible radar communication front-end processor, capable of connecting on one side to almost all types of radars and on the other side to a broad variety of different radar processing equipment.



A rich set of conversion functions, the support of all kinds of communication interfaces, as well as the networking and filter capabilities of the RMCDE make it a supreme solution for a wide range of ATC environments.

The open and modular architecture of the RMCDE hardware and software, as well as its broad conformity to international standards guarantee utmost scalability and adaptability.

Today more than 100 installations of the RMCDE in over 50 air traffic control centres are operational. The equipment was worldwide the first to implement the ASTERIX (All-purpose Structured EUROCONTROL Radar Information Exchange) standard and today represents the most mature ASTERIX engine on the market.

FUNCTIONAL FEATURES

DISTRIBUTION

- 1: N distribution of plot and track data from arbitrary sources to any number of sinks regardless of location
- Real-time transport with minimum end-to-end delays (< 50 msec)
- Enhanced reliability on various architectural levels
- Wide range of supported LAN/WAN interface types and protocols
- Flow control on application level with priority-based load reduction
- Network functionality including intelligent routing and WAN multicast techniques
- Automatic adaptation to failures of network nodes and links

CONVERSION

- Sensor and track data conversion between any of a large number of civil and military formats
- Speed conversion and adaptation of line characteristics (V.11/V.24, LAN/WAN, etc.)
- Support of most standardized ASTERIX categories and user application profiles (UAP)
- Country-specific ASTERIX application support
- Open architecture for future extensions of the ASTERIX standard
- Conformance to latest international standards

ARCHITECTURE

- Redundant hardware units (operational and hot standby)
- Manual and automatic switching modes
- Board system with scalable hardware architecture in terms of board type and number
- Operator Subsystem for configuration and system monitoring
- LINUX-based working position with fully graphical HMI with OSF/Motif user interface
- HMI with OSF/Motif user interface
- Native ASTERIX engine (all internal processing based on ASTERIX)

FLANKING FUNCTIONS

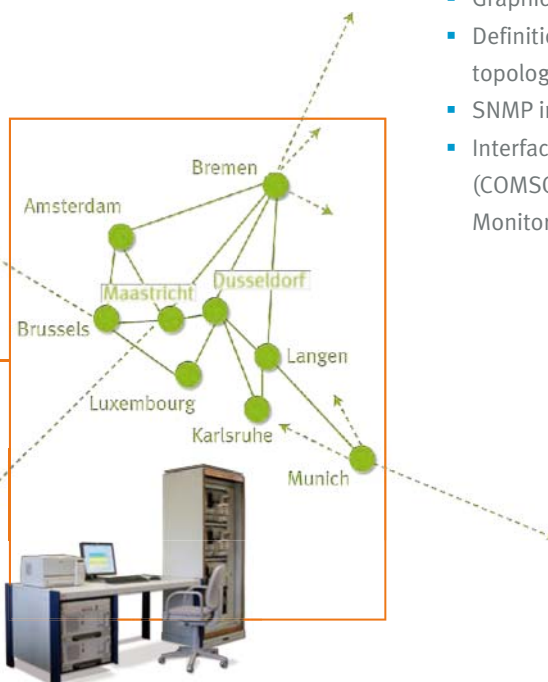
- Flexible user configuration management
- Software update support
- Access control
- File transfer, printing, internal mail function

TIME SYNCHRONIZATION

- Precise time stamping based on UTC (GPS, DCF 77, internal clock/crystal backup, NTP)
- Time conversion between relative (TIS) and absolute time

SYSTEM & NETWORK MANAGEMENT

- Fine-grained diagnostics on interface, protocol and application level
- Accurate online delay time measurements
- Graphical status visualization
- Definition of nodes, network topology and connections
- SNMP interface
- Interface to COMSOFT's CRMCS (COMSOFT Radar Network Monitoring and Control System)

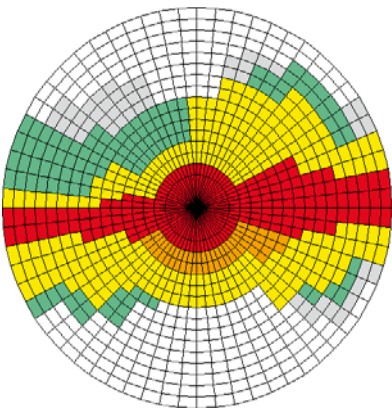


References of RMCDE locations with zoom on European RADNET

TECHNICAL DATA

FILTERING

- Manual and automatic input of user-defined filtertables for plots and tracks
- Height band filtering
- Geographical filtering
- Message type filtering
- Weather filtering
- Intelligent filter evaluation and optimization strategies
- Integrated ADS-B server functionality



Interfaces

Up to 104 serial interfaces (V.24 or V.11)
10/100 Mbit/s Ethernet, FDDI (DAS)

Formats

ASTERIX (various categories), RDIF, EUROCONTROL, CD2, CAA, Aircat, RDE, various military formats, further formats in preparation

Protocols

HDLC LAP-B, HDLC Frame Level, X 25, OSI/TP4, TPD, CLNP, LLC1, ES-IS, UDP/IP, TCP/IP, SNMP V.1, SNMP V.2, various proprietary protocols

Time Services

NTP, DCF 77, GPS, crystal backup

Availability

Computed availability: 99,999986%

Maintainability

MTTR (Mean Time To Repair): 15 min

Delay (internal)

< 50 msec per plot at high data load

Throughput

> 10.000 plots/sec

Hardware

Rack-mounted multiprocessor board system
Server-based operator subsystem

Software

Realtime operating system for core communication units
HMI based on LINUX and OSF/Motif

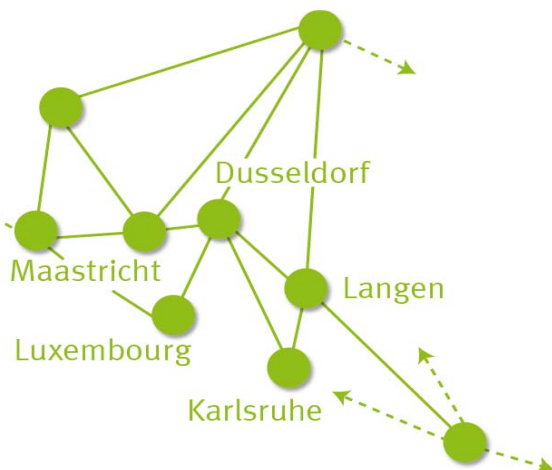
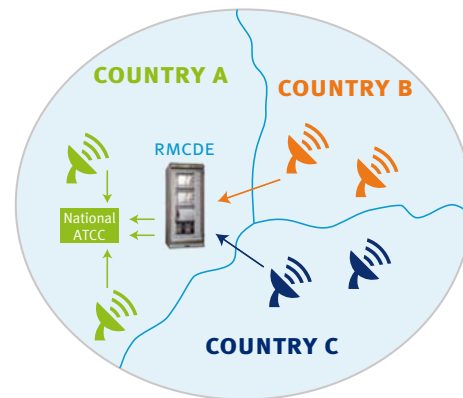


RMCDE USAGE

The RMCDE is a versatile system that can be scaled and configured in a large number of ways. As a result, the variety of scenarios, for which it can be employed, is extensive. Often an evolutionary use can be observed. The RMCDE is first applied to support national modernization programmes, later the equipment helps the country to connect to neighbouring states for surveillance data exchange, and finally the same physical equipment is integrated into a wide-spanning, flexible radar data network.

SURVEILLANCE DATA EXCHANGE

The RMCDE enables surveillance data exchange within and between countries. By means of its powerful set of conversion functions it permits any kind of radar data to be used by any kind of user at any location. This is why many countries have in the past, chosen the RMCDE as the base element of their national radar communication infrastructure.

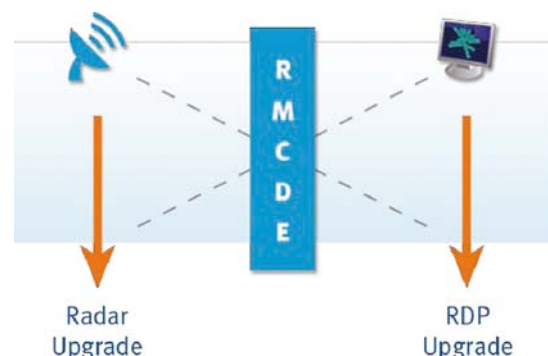


NETWORK SOLUTIONS

As successfully demonstrated with the European RADNETs, the RMCDE enables the build-up of powerful national or multinational radar communication networks. Centres no longer have to separately connect to all sensors but immediately obtain total radar coverage, regardless of their geographical location or the location of the radar stations. RMCDE supports X.25 and TCP/IP based network infrastructures.

MIGRATION SUPPORT

The RMCDE allows the use of old sensors with new radar processing equipment and vice versa. This provides investment security and helps a country or a centre to decouple the modernization of radar stations from the modernization of RDP, allowing a smooth and step by step transition to new technology.





SUPERIOR TECHNOLOGY

The RMCDE is based on the latest international standards and uses forefront hardware and software technology. It represents a solid base and a strategic element of a country's future in ATC.

COST SAVINGS

The sharing of radar data via the RMCDE has proven a decisive cost saving factor, evading investments in new sensors, as well as helping to significantly reduce PTT line costs by using a radar data network.

SAFETY

The sharing of radar data increases coverage and adds to accuracy and reliability of surveillance. In addition, an RMCDE networked solution provides contingency options enabling the mutual backup of whole centres.

INVESTMENT SECURITY

The easy extensibility of the RMCDE with respect to new protocols and formats, as well as its flexible use within a wide range of application scenarios guarantee a maximum cost-effectiveness of the equipment for a long period of time.

RELATED PRODUCTS

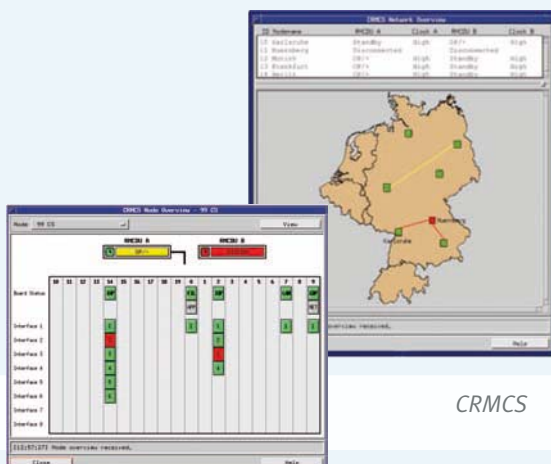
CRMCS (COMSOFT Radar Network Monitoring & Control System) is a comprehensive and user-friendly network management system for RMCDE-based radar networks.

ADR (All-purpose Data Stream Replicator) is a downscaled version of the RMCDE acting as flexible radar communication fallback systems. Both are available on COTS PCs.

RMD (Radar Monitoring Display) provides special features for technical monitoring. The system is available separately or integrated into the RMCDE environment.

RRR (Radar Recording & Replay System) is a forefront recording and replay system, compliant with ICAO and EUROCONTROL specifications. In conjunction with the RMCDE a synchronized recording "out of the wall" of all critical ATC data is possible.

RAPS-3 (Recording, Analysis, Playback & Simulation System for Surveillance Data) from COMSOFT is a portable PC solution with a wide range of powerful functions for technical monitoring and integration testing. RAPS-3 is the only EUROCONTROL qualified ASTERIX Test and Reference Tool. It serves for conformance testing of the latest ASTERIX standards including Mode S and ADS-B.



CRMCS



RAPS-3



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