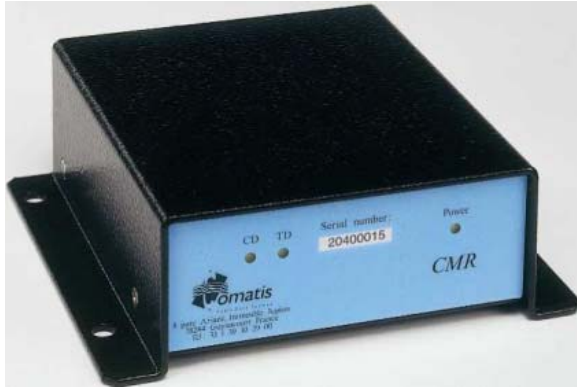


Multi protocols radio modem Platform of radio communication



- Compatibility with a great number of transceivers
- Several multiplexed ports of communication
- Channel access mode: TDMA or CSMA
- Applications with fast cycle time
- Energy saving management
- Multiple repetitions for extension of range

Radio modem CMR

Principal characteristics:

- Four addressable communication ports
- Modulation: FFSK, GMSK, FSK 4L
- Radio data rate : 1.2 to 80 Kb/s
- Command protocols: Hayes, MAP 27, TETRA...
- Digital and analogue inputs/outputs
- Power supply: 9 to 30 Vdc
- Compatible with Comatis radio networks CONDOR and SCORPION

Presentation:

CMR is industrial equipment of telecommunication which makes it possible to transmit data by radio using any radio transceiver (conventional PMR, MPT1327 radio mobile, microwave link...).

It offers a great number of communication ports and inputs/outputs, and has several types of modulations as well as powerful hardware resources, which make it compatible with various applications in multiple network contexts.

The data exchanges are ensured with precision and speed so that the CMR modem can be used in real time applications requiring permanent and constant communication.

Parameter settings and level tuning are entirely done by software to make easier the connection of CMR on the transceivers.

Modulations and data rates:

The CMR modem supports the old FFSK modulation as well as more recent numerical modulations: GMSK and 4 levels FSK (FSK4L).

According to the type of transceiver used, the target application and the available radio channel bandwidth, it is possible to obtain data rates on the air ranging between 1200 b/s and 80 kb/s.

The transmission can be done in half or full duplex.

Data protection:

The data can be transmitted with several levels of protection according to whether one wishes to improve the data rate or the consistency checks.

The first level offers best data rate on the radio channel and implements the detection and the elimination of errors based on the use of a cyclic redundancy code.

The higher levels use protocols of automatic error correction (FEC) and automatic acknowledgement and retries between modems (ARQ).

Addressing and routing:

It is possible to extend the radio electric ranges of the networks using the integrated procedures of routing and repetition of the modems.

These features make it possible to deploy "AD HOC" communication networks without infrastructure. The number of repetition is limited only by the acceptable delay of routing.

Network protocols:

CMR supports various protocols and of many features which make it possible to build radio networks with various architectures:

- Private point-to-point or point-to-multi points radio networks:

Modems CMR make it possible to deploy private networks radio in transparent mode or in addressing mode with different command sets for the selection of the called modem. The cover of these networks can be extended by the activation of functions of automatic repetition and routing of the data packets.

- MPT 1327 radio networks:

Trunk private land mobile radio systems which provide communication channels through a standard user access protocol MAP27. The data can be exchanged on the signalling or the traffic channels through individual or broadcast calls.

- SCORPION radio network:

Comatis radio network for telemetry applications. This network manages the energy saving by the dynamic allocation of appointments for communication with the telemetry stations and the routing of the data via radio repeaters located in high points. In order to accelerate times of collection for a great number of telemetry stations, a TDMA protocol is implemented during the communications.

Applications: Telemetry systems with very large radio cover, collection of remote sites without energy, rising announcement ...

- CONDOR radio network:

Comatis multi-cells radio network for mobile applications. This network supports large fleets of mobiles and offers particularly reduced cycle times for mobile location collection and several messaging with priority management.

Applications: Automatic Vehicle Location (AVL) systems, Real Time Passenger Information (RTPI) systems, real time supervision of ambulances or rescue vehicles ...

Communication ports:

Modem CMR has 4 synchronous/asynchronous communication ports with several electrical interfaces (RS232, RS485, RS422 or TTL), and a CAN port.

Each port can operate in transparent or addressing mode. In the case of use of the addressing mode, CMR manages the multiplexing and de-multiplexing of the data.

The data rates on the communication ports range between 1200b/s and 115 kb/s.

It is possible to install different protocols of dialog on each port.

Subset of the available protocols:

- Hayes : emulation of the behaviour of a standard PSTN modem
- Map27 : protocol to command a MPT1327 radio mobile
- ModBus : master-slave communication protocol for industrial devices such as sensors and instruments
- NMEA/RTCM-104 : dialog with a standard GPS receiver
- GSM : protocol to command a GSM terminal (*)
- PEI : protocol to command a TETRA terminal (*)
- Specific command sets of the SCORPION and CONDOR networks

()If necessary, CMR can control a PSTN modem or a GSM or TETRA terminal, to backup a primary communication channel over a private radio system.*

Digital and analogue IO:

CMR has 7 logical outputs, 7 logical inputs and 3 analogue inputs which can be used to supervise external equipment.

It is possible to implement simple automatisms. These inputs/outputs can be operated in recopy between sites, or read/write mode using a command set.

Energy saving management:

The CMR modem manages several modes of energy saving based over periods of deactivation and automatic waking according to various criteria.

The management of appointments is done using a real time clock which causes the waking of the attached radio transceiver and possibly of a telemetry station connected to CMR. The waking time of a modem can be configured dynamically and remotely from another modem or a central station.

Technical specifications:

Main characteristics	
CMR OEM board	PC104 mechanical format
Size and weight (case version)	160 x 110 x 32mm, 150gr
Power supply	8 to 30Vdc
Current / 12Vdc	80mA / 14mA (power-saving mode) / 10µA (stand-by)
Temperature Range	-20°C, +60°C
CPU	
µController	RISC 32bits, clock 20MHz, 20 MIPS
RAM	30 KB + 512 KB (option)
FLASH	512 KO + 2 MB (option)
Communication ports	
Serial port 1	RS232 (TD/RD/DTR/DSR/RTS/CTS/DCD), asynchronous (300~115200 b/s, 7~8 bits, 1~2 stops, with or without parity) or synchronous (up to 2 Mb/s, clock out)
Serial port 2	RS232 or TTL (TD/RD), asynchronous (300~38400 b/s, 7~8 bits, 1~2 stops, with or without parity)
Serial port 3	TTL (TD/RD), asynchronous (300~38400 b/s, 7~8 bits, 1~2 stops, with or without parity)
Serial port 4	RS232 (TD/RD/DTR/CTS/DCD) or RS422/RS485, asynchronous (300~115200 b/s, 7~8 bits, 1~2 stops, with or without parity) or synchronous (up to 2 Mb/s, clock in)
CAN port (option)	compatible with CAN2.0B specification, up to 1 Mb/s
Inputs - outputs	
7 digital outputs	Open drain
7 digital inputs	0-5V (maximum 30V), ESD protection
3 analogue inputs	0~5V, 10bits
Modem	
Types of modulation	FFSK (1200 to 4800 b/s), GMSK (4800 to 38400 b/s) or FSK4L (up to 80 Kb/s)
Data protection	Error detection (CRC16) and/or correction (FEC), automatic acknowledgement and retries (ARQ)
Conformity to standards	FFSK: BIIS1200, IETS300230, 1382 GMSK/FSK4L: ETS300113

Non contractual information

Remote parameter setting and maintenance:

CMR can be configured through a local port or remotely by radio. Its firmware is stored in a FLASH memory and can be upgraded easily. A simple and ergonomic tool, named "CMR modem utility", is proposed gracefully to facilitate all the maintenance operations.

Level tunings:

All the parameter settings including the level tunings of the modem input and output are done by software. This prevents dispersions in the performances of the radio modems and simplifies the interfacing on various types of radio transceivers. The Comatis company has built sets of parameters for the most frequently used transceivers.