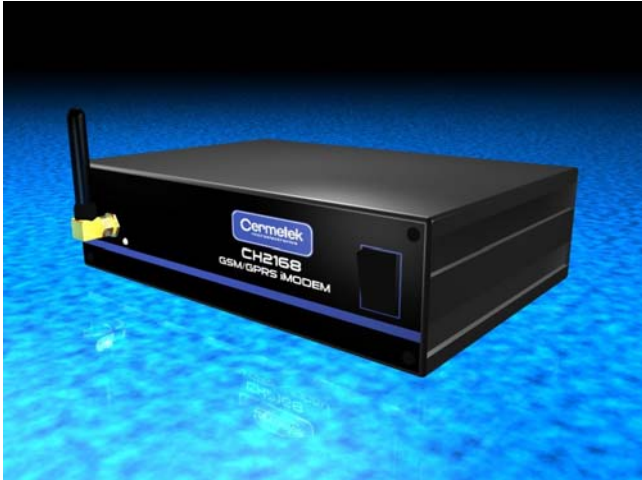


**Machine to Machine Data Transport Module**

The Cermetek CH2168 GPRS/Rf Data Transport Module provides transparent Machine to Machine (M2M) communications. The CH2168 is a versatile data transfer tool and Internet Appliance that enables the user to transfer E-Mail, run standard Internet applications, store E-Mail and other data, and implement custom Internet applications using I-Sockets. It is designed expressly for automated and embedded applications deployed in areas without access to standard PSTN telephone lines.

The CH2168 leverages commercial cellular infrastructure and uses the ubiquitous GPRS protocol to transfer data. Protocol operations are transparent to user applications. The CH2168 can communicate with remote systems whose only means of external access is via Analog Telephone Modems. Of course, the CH2168 can also communicate with conventional TCP/IP systems, such as Internet servers.

Data is exchanged between the host and CH2168 with the same API used by the other members of the iModem family and is conducted over a simple RS-232 serial interface. The CH2168 API meets the needs of user applications whose host CPUs have limited bandwidth, whose user requirements dictate that multiple iModem applications execute concurrently, and/or whose user applications demand multiple Internet connections.

**FEATURES**

- Transparent Internet operations with Domain Name Resolution (DNS), Send Email (SMTP), Retrieve Email (POP3), TCP/IP and UDP protocols. Authenticated SMTP supported.
- I-Sockets: Cermetek Sockets protocol having virtually the same functionality as BSD sockets.
- Send pre-stored email up to 500K bytes from static memory or up to 3M bytes from volatile memory.
- Send/Retrieve streaming email of unlimited length.
- Concurrent and multiple SMTP, POP3 and I-Sockets connections supported.
- Communication via V.24 (EIA 232-E), 5 volts serial interface at 19.2.kbps (default data rate).
- UL 60950 and CSA C22.2 950 (Third Edition) Listed, reference UL File E104957.
- FCC Part 15, 22 and 24 Conveyed.
- GCF Version 3.11 Approved.
- PTCRB Version 2.9.1 Approved.
- Single supply +6VDC to +9VDC operation.
- 60 day free trial GPRS network subscription with each CH2168.
- Low cost, shared GPRS subscriptions available.
- CH2168 operation does not divert CPU resources from host user applications.

- Data transmission speed is only limited by intrinsic GPRS limits and network conditions.
- Custom on-board CH2168 applications available. Contact Cermetek for details.

**USER FRIENDLY INTERFACE LAYER**

Cermetek's GPRS/Rf iModem utilizes a robust and user friendly API ~ application interface ~ tailored to offer high performance in environments with low bandwidth CPUs, in environments requiring concurrent application execution, or in environments requiring multiple and internet connections. The CH2168 operates using the same API as used in the CH2166/66A iModem products.

Data is transferred over a simple RS-232 serial interface. The API facilitates the implementation of a wide variety of IP applications and insulates the user from complex internet networking details. This API consists of various @<sup>®</sup> commands that look and feel like conventional modem AT commands.

With the @<sup>®</sup> commands, the user can perform all standard SMTP and POP3 email operations, including, sending, retrieving and deleting email messages; plus establish BSD style socket connections. The CH2168 also supports AT like binary data transfer. Command

results are conveyed via the iModem's V.24 (EIA 232-E) serial interface.

## OVERVIEW OF THE CH2168

As with all Internet enabled devices, the CH2168 requires internet, GPRS/RF and ISP configuration parameters. Configuration parameters may be specified at the time of command execution or derived from profiles stored on the CH2168.

Configurable internet attributes include:

- Internet and DNS Server addresses.
- SMTP and POP3 Authentication.
- TCP/IP Network and Protocol Parameters.
- User configurable Application and Link profiles.

Configurable cell network attributes include:

- GPRS APNs (Multiple APNs, but only one can be active at a time).
- GPRS transparency and authentication (Nontransparent networks require PDN authentication).
- GPRS QOS parameters.
- GPRS configuration and PLMN specific parameters.

## BASIC INTERNET APPLIANCE OPERATION

**Command Architecture.** Profiles make it possible to access the contents of associated Application and Link profiles by referencing only a single profile name. Parameters specified as part of a command have precedence over those specified in a profile. Command results, diagnostics, and error notifications are conveyed to the user via the serial port.

**Send and Retrieve Email.** The CH2168 has the ability to send and retrieve email of unlimited length. Once a streaming email transmission session is set up, the user just sends data to the CH2168 ~ one line at a time ~ for as long as desired.

Email messages may include files from either static or dynamic RAM memory, and/or attached ASCII files, at the user's discretion.

**Data Transfer.** Data is conveyed as a TCP or UDP payload via GPRS/RF protocols between the GPRS/IMODEM and an Internet system via of a gateway. The data appears as standard TCP or UDP data to Internet systems.

## HARDWARE DESCRIPTION

Each CH2168 iModem contains all the hardware and firmware needed for internet and GPRS connectivity and functionality.

**Storage Memory** A total of 500K bytes of Flash RAM or static memory are available for permanent storage of files on the CH2168. THE CH2168 also includes 3M bytes of volatile memory or dynamic RAM available for temporary file storage on the CH2168.

**iModem Hardware Configuration** The CH2168 iModem consists of a Motorola Coldfire  $\mu$ P controller with associated internal logic, RS-232 Serial Port, Integral GPRS/RF hardware/firmware, SIM holder, 8 Mbytes of RAM (3MB available for user data and custom software), 2 Mbytes of Flash RAM (500KB available for user data) and an RF antenna connector.

**Required External Connections** The CH2168 iModem requires an external RF antenna. An ITU-T V.24 serial interface cable is required for connection to the host processor/application serial port. A +6V DC supply (provided) is required for power.



CH2168 Front Panel



CH2168 Back Panel

**GRPS/RF Characteristics** The CH2168 GPRS/RF modem is specified as follows:

Quad Band GPRS: Compatible with US and European Networks.

Radio Frequency: 850/900/1800/1900 MHZ

Sensitivity: -106 dB (Typical)

Transmit Power: Class 4 (2W @850/900 MHZ), Class 1 (1W @1800/1900 MHZ)

**GRPS/RF Packet Data** The CH2168 GPRS/RF modem processes/supplies the following packet data:

Mode: Class B, Multislot 10

Coding Scheme: CS1-CS4

Packet Channel: PBCCH/PCCCH

**GSM Functionality** The CH2168 GPRS/RF modem is compatible with the following SMS systems:  
GSM SMS: MO/MT (Incoming SMS calls accepted.)

**Approvals** The CH2168 GPRS/RF iModem has the following approvals and Certifications:

FCC: Part 15, 22, & 24

GCF: Version 3.11

PTCRB: Version 2.9.1

Industry Canada and CE Mark

UL 60950 and CSA C22.2 950 (Third Edition) listed and Industry Canada CS-03 approvable.

**Physical Dimensions** The CH2168 is supplied in an extruded aluminum case measuring approximately 5.25" x 3.15" x 1.37" in size. The ON/OFF power switch, external antenna jack and power connector are all accessible from the exterior of the case.

SIM holder is accessible from the interior only.

Cermetek reserves the right to make changes in specifications at any time and without notice. The information furnished by Cermetek in this publication is believed to be accurate and reliable. However, Cermetek assumes no responsibility for its use, or for any infringements of patents or other rights of third parties resulting from its use. No license is granted under any patents or patent rights of Cermetek.

Cermetek provides the user with a FCC (USA) and IC (Canada) Approved or Approvable device. However, Cermetek does not have influence over nor knowledge of the specific user application environment. Therefore, for FCC and IC Approved or Approvable devices, the user assumes all risk for maintaining compliance to registration.

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