

CMX869 V.32bis Modem

INNOVATIONS
INV/Telecom/869/3 July 2004

A multi-standard modem IC for use in telephone-based information and data systems

www.cmlmicro.com

Remote Utility Meter Reading

Internet and Network Appliances

Industrial Control Systems

Feature and Pay Phones

Set-Top Boxes

Cash Terminals

Telephone Telemetry

Alarm and Security Systems

The CML Advantage

- Multi-standard QAM, DPSK and FSK Modem IC with multiple modes, data rates and automodem features
- Versatile telephone signalling functions provide end-to-end communication
- Very low-power (3.0 to 3.6 V) operation with powersave
- Ring detect / line reversal input
- Relay drive (hook-switch) output
- Low-overhead control and data via C-BUS serial interface
- Independent Rx and Tx USART functions
- Flexible line-driver and hybrid circuits on chip
- 2- or 4- wire operation
- Software driven input and output analogue level settings
- Compact 24-pin TSSOP, SOIC and DIL packaging

Protocols and Data Rates

Quadrature Amplitude Modulation (QAM)

- V.32bis, V.32, V.22bis
(14400, 12000, 9600, 7200, 4800, 2400, 1200 b/s)
Full-Duplex

Differential Phase Shift Keying (DPSK)

- V.22 - 1200/600 b/s

Frequency Shift Keying (FSK)

- V.23 - 1200/75, 1200/1200, 75, 1200 b/s
- Bell 202 - 1200/150, 1200/1200, 150, 1200 b/s
- V.21 or Bell 103 - 300/300 b/s

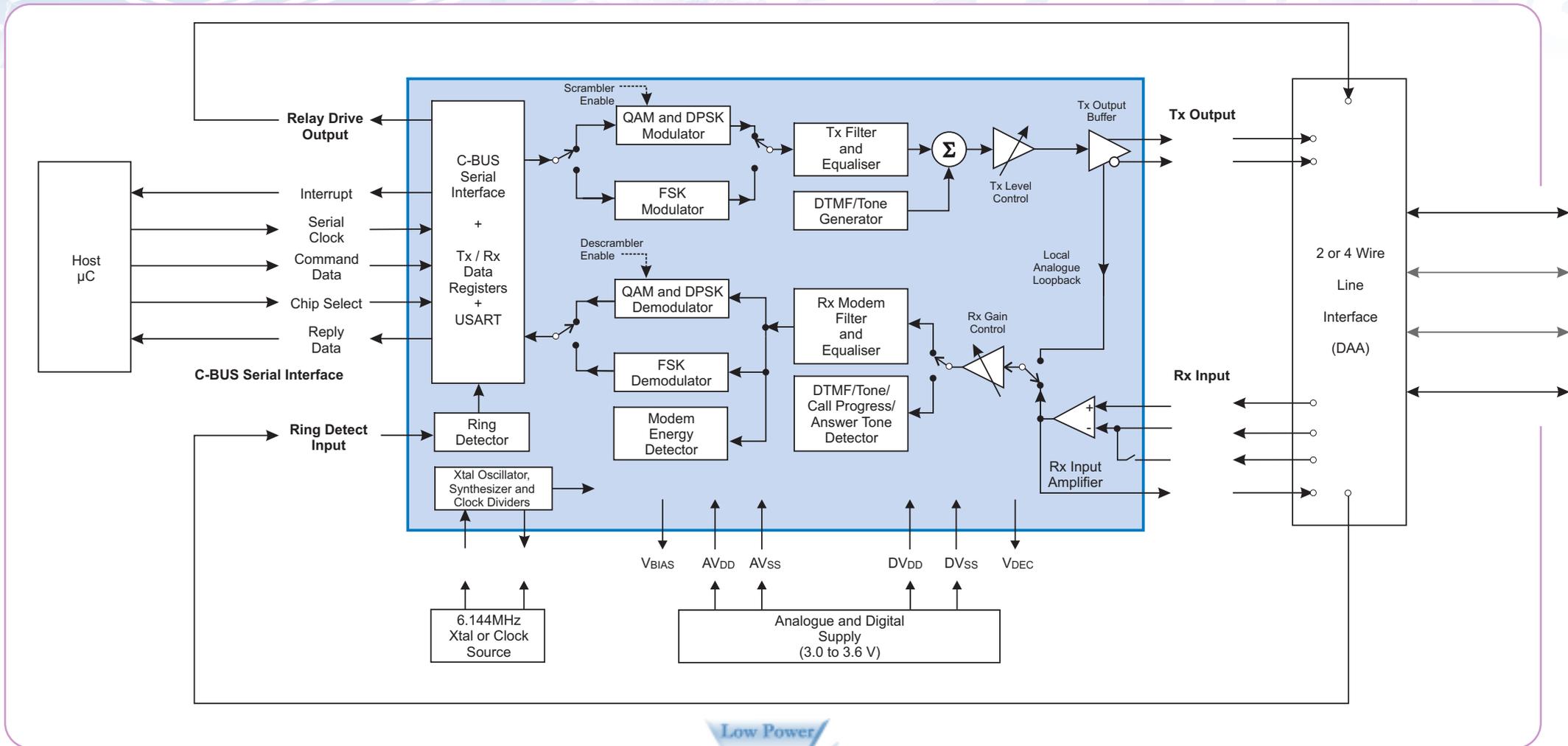
Automodem Facility

- Available to all QAM facilities



The CMX869

With a maximum 'speed' of 14,400b/s the **CMX869** will meet the requirements of most mid-range telephone data applications, especially those which have a need for speed but are governed by low-power limitations. This is a compact and versatile full-feature modem which offers QAM, DPSK and FSK modulation, QAM with multiple automodem data rates. This is combined with all the on-chip signalling functions required to set-up, negotiate and carry out data transfers over a 2 or 4 wire telephone system.



Tx and Rx Data Modes - Tx and Rx Modes can be independently disabled -

Modem

QAM
V.32bis, V.32, V.22bis

DPSK
V.22 1200 or 600 b/s

FSK
V.21 300b/s High or Low Band
Bell 103 300b/s High or Low Band
V.23 1200 or 75 b/s
Bell 202 1200 or 150 b/s



Low Power
3.0V

Signalling

Rx DTMF

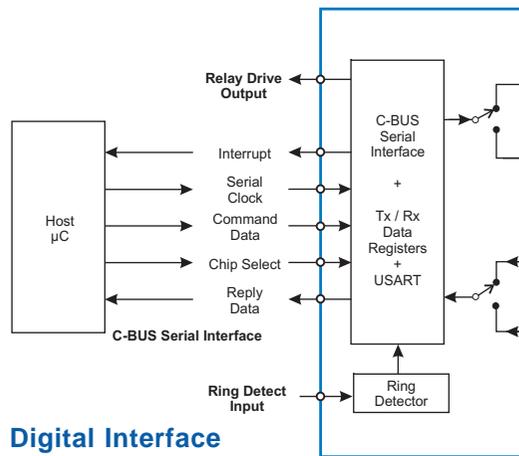
Call Progress 275Hz to 665Hz
Answer Tone 2100Hz / 2225Hz
Prog. Tone/Pair / 2130 + 2750 Hz
Ring Detect / Tone Decode / FSK Modem
- can be set for Type 1 (on-hook) CLI

Tx

DTMF

Single Tone Calling / Answer / Preset
User Programmed Tone / Pair
- frequencies and levels -
Guard Tone 550 / 1800 Hz in V.22bis mode

Interfacing



Communication with, and control of, the **CMX869** by the host μC is via the CML C-BUS serial data interface; a hardware/software interface compatible with most processor interfaces.

C-BUS is operational in both 'normal' and 'powersave' modes of this product.

To increase data transfer rates and minimise μC overheads, the CMX869 C-BUS can be set to operate in either 1 or 2 character mode.

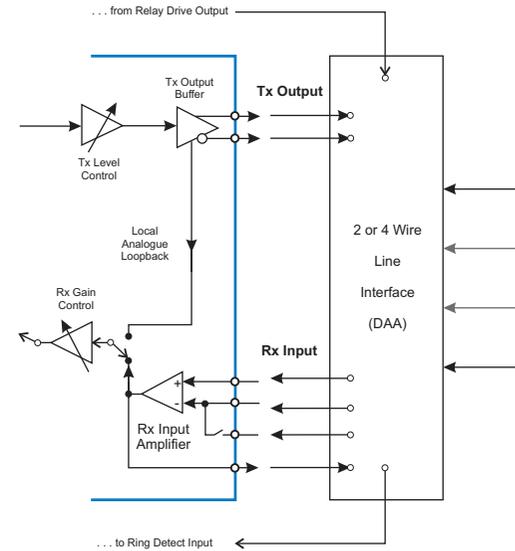
On-chip programmable **Tx and Rx USARTs** are available for use with asynchronous data and to allow unformatted synchronous data to be received or transmitted as 8/16-bit words.

Digital Interface

Rx and Tx USART

Can be programmed for all modem modes

- Synchronous data
- Start - Stop characters



The **CMX869** is compatible with either a 2-wire or 4-wire telephone installation providing additionally, a ringing signal detector input and a relay drive output.

The Ring Detector circuitry is operational in both 'normal' and 'powersave' modes.

Tx output levels and the Rx input gain can be adjusted on chip with an additional Rx input gain setting for Type 1 Caller Line ID.

The Relay Drive output is available to provide a software-controlled 'hook switch' function.

Analogue Interface

Local Analogue Loopback

- An overall on-chip test mode from Tx 'Data' In to Rx Signal Out
- Enables the software developer to test and debug prototype programmes

Telephone Telemetry - Remote Utility Meter Reading - Alarm and Security - Industrial Control - Electronic Cash - Feature and Pay Phones - Internet Appliances - Cable TV Set-Top Boxes



Data Operations

Data Scrambling/Descrambling

- Automatic scrambling and descrambling handshake functions provided for V.32bis, V.32, V.22bis and V.22 operating modes in accordance with current ITU specifications

Tx Filter and Equaliser

- Tx filter limits the modulator output out-of-band signal energy to well within acceptable limits
- The appropriate equalisation for the selected operating mode is determined and implemented automatically

V.32bis/V.32/V.22bis/V.22 Automodem Operation

- Automatic response to 'Retrain' and 'Rate Re-negotiation' requests from distant modems
- 'Start Automodem' commands available for calling and answer modes
- 'Initiate Retrain' and 'Initiate Rate Re-negotiation' commands available
- A separate Status Register reports progress

Other Recent CML Wireline Telecom IC Products

- **CMX683** Call Progress and Voice Audio Detector
- **CMX850** Communications Controller
- **CMX866** V.22bis Modem with AT Command Set
- **CMX867** V.22 Modem
- **CMX868** V.22bis Modem
- **CMX878** V.22bis Modem *plus* DAA

IC Evaluation and Demonstration Products

- **EV8500** for CMX850
- **DE8661** for CMX866 with 'Socket Modem' and DAA
- **DE8681** for CMX868 with 'Socket Modem' and DAA
- **DE8781 and DE8782** for CMX878

Member Companies



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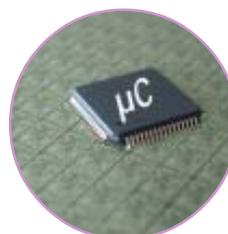
Frequency Stability

- All timing, data rates, digital operations and signalling frequencies are sourced from a stable 6.144MHz on-chip oscillator employing a single Xtal or clock-pulse input



Power Requirements

- Separate digital and analogue supplies
- 3.0 to 3.6 Volt range
- Operating (3.3V) = 4.5mA
- Powersave and Reset Functions



µC / C-BUS Control and Data Interface

- Serial control, data and program command interface
- **Serial Clock:** Max data rate = 5MHz
- **Command Data:** Command, control and information data to the device
- **Reply Data:** Status and information data from the device
- Selectable 1 or 2 character mode reduces µC overhead and decreases C-BUS transfer time

Packages	-40° to +85°C
CMX869D2	24-pin plastic SOIC
CMX869E2	24-pin plastic TSSOP
CMX869P4	24-pin plastic DIL

Information

www.cmlmicro.com/products/wtelecom/CMX869.htm