CML Microcircuits

COMMUNICATION SEMICONDUCTORS

# Product Selector

## Edition 10

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# CML Focus Products

## Products that are production-released and recommended for new designs

CML Microcircuits (CML) has, in over 40 years of operation, grown to be a world-leader in the design, development and support of low-power analogue, digital and mixed-signal semiconductors for telecommunications and control systems worldwide.

As an experienced designer and manufacturer of ultra low-power Application Specific Standard and Custom Product ICs for an ever-widening range of communications and control applications, CML builds a wealth of knowledge, experience and support into all of its products.

With a primary focus on all facets of wireless and wireline communications and control applications - from sub-audio through baseband to RF frequencies - CML offers a product portfolio that is second-to-none in the field.

Highly experienced in the design of IC products to operate to proprietary communications systems and protocols, CML's fast expanding custom design resource offers, in addition, unique paths to market for customer designs where a stock CML product does not suit. The newest member of this resource is our proprietary FirmASIC® technology, combining lowest overall cost, fastest time-to-market and lowest risk, with unsurpassed flexibility.

### Ultra Low Power Operation

CML's IC products consume significantly less power and provide more functionality than competing devices. This, of course, offers many 'power/battery-saving' advantages to radio, data and telecoms designs.

### High Integration

Permits many more individual functions on a single chip. The majority of CML products comprise multiple functions, all designed to serve not only the main application but also its peripheral and system activities.

As well as providing the main application functions, CML products generally offer the 'extra' analogue and digital functional and interfacing requirements not supplied by a DSP or host processor. This drastically reduces the requirement for extra ICs and their companion components, which in turn shrinks the overall PCB footprint requirement, thus allowing the design and production of a much smaller and lower-power end product.



For further information, please refer to the CML website (www.cmlmicro.com).

# Table Contents



## FirmASIC® Design Technology

FirmASIC® is a proprietary component technology from CML that reduces cost, time to market and development risk, with increased flexibility for the designer and the end application. FirmASIC® combines Analogue, Digital, Firmware and Memory technologies in a single silicon platform that can be focused to deliver the right feature mix, performance and price for a target application family.

## Infinite Applications

CML's wide-ranging product portfolio offers an expansive list of application possibilities for these versatile ICs.

Due to the ease of implementation, continuous flexibility and the on-going application and technical support available, a CML IC product is the ideal and time-saving solution to the majority of customers communications and/or control problems.

## Reliable Customer and Product Support

The CML network of over 100 distributor and representative companies worldwide, allied with its teams of application engineers, provides all CML customers with comprehensive local pre- and after-sales support.

From product inception, through the design, manufacture and qualification stages, CML is there providing unequalled technical and application support.

# RF (Radio Frequency) Products

CML's range of Radio Frequency (RF) products provides a selection of modular building blocks for implementation as part or all of the 'wireless front-end' of a wide range of constant and non-constant envelope modulation systems.

The new RF Building Block range is designed to provide flexible, high-performance ICs required for HF/VHF/UHF professional radios, wireless data terminals, wireless microphones and marine and avionics radio systems.

With an operating frequency ranging down to 20MHz and up to 1GHz, the RF products offer: a combination RF transceiver, a separate RF modulator and demodulator, and a Cartesian feedback loop transmitter for efficiency and transmitter PA linearisation.

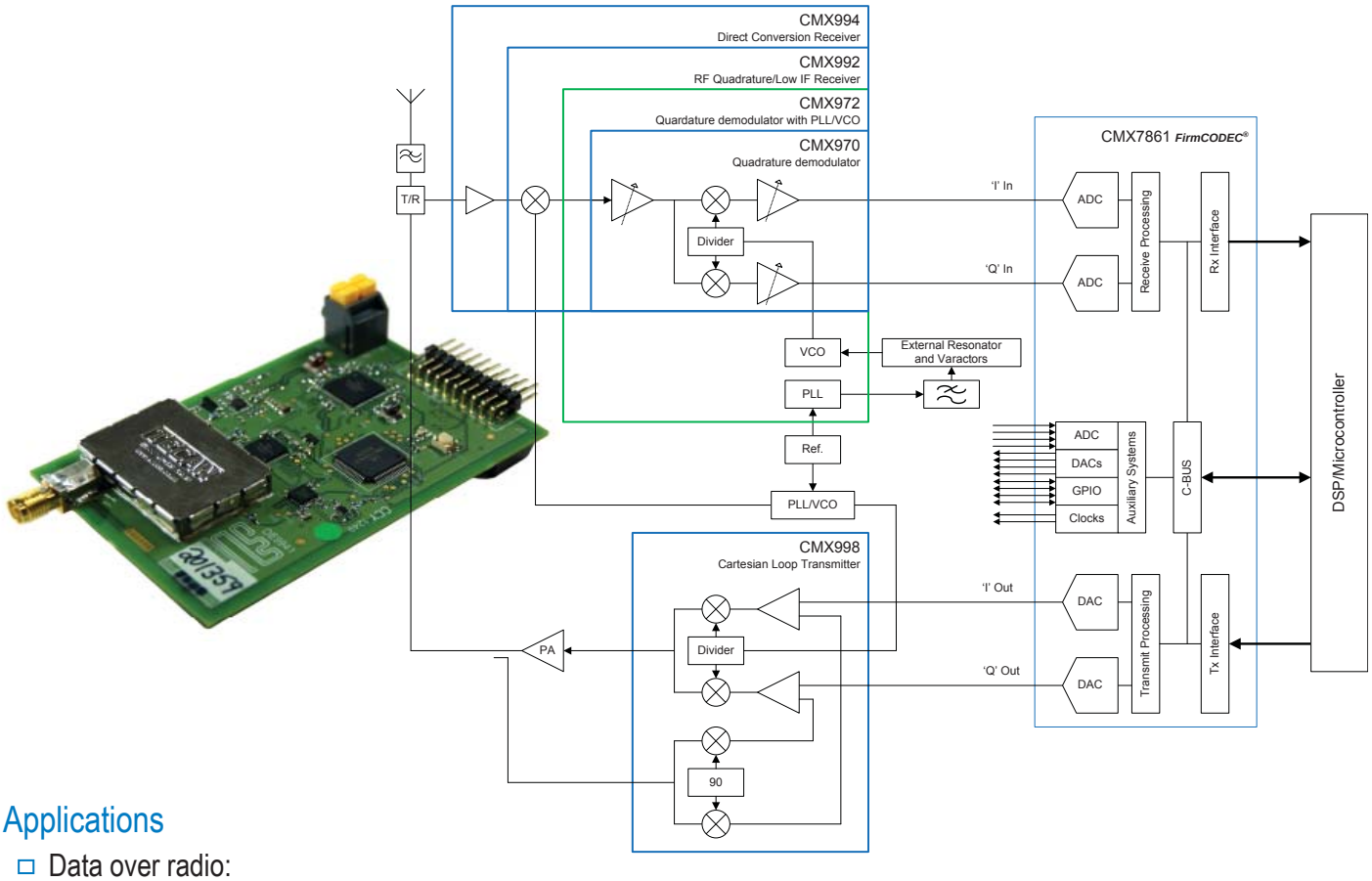
CML's RF devices are designed for use in a wide range of both narrowband and wideband applications, in the wireless data and digital PMR markets.

| Rx | Product Description | RF/IF Range MHz | I/Q BW MHz | Input IP3 dBm | Noise Figure dB | Gain dB (V/V) | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|---|
| CMX970 | RF/IF Quadrature Demodulator | 20 - 300 | 10 | -15 | 10 | 56 | 3.0 - 3.6 | 15 | 16-pin VQFN | Very low power, gain controls and flexible LO driver |
| CMX972 | RF/IF Quadrature Demodulator with PLL | 20 - 300 | 10 | -15 | 10 | 56 | 3.0 - 3.6 | 24 | 32-pin VQFN | Very low gain controls, flexible LO, synthesiser with VCO amp |
| CMX992 | RF/IF Quadrature Receiver with IF PLL | 100 - 1000 | 1.4 | 11 | 15 | 61 | 3.0 - 3.6 | 52 | 48-pin VQFN | Dual superhet I/Q architecture, IF filter mux, VGA, flexible LO divider, IF synthesiser with VCO amp |
| CMX994 | Direct Conversion Receiver | 50 - 940 | 1.6 | 11 | 5 | 63 | 3.0 - 3.6 | 56 | 40-pin VQFN | Very high IIP2 for true-zero IF direct conversion reciever use, low power, complete LNA to zero-IF reciever path, IF filter, gain controls, flexible LO divider for Tx and Rx synthesiser with VCO amp |

| Tx | Product Description | RF/IF Range MHz | I/Q BW MHz | Output IP3 dBm | Noise Floor dBm/ Hz | Output Power dBm | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|---|
| CMX971 | RF Quadrature Modulator | 20 - 1000 | 25 | 11 | -150 | 0 (PEP) | 3.0 - 3.6 | 61 | 16-pin VQFN | Very low power, excellent untrimmed performance, flexible LO divider |
| CMX993 | RF Quadrature Modulator | 30 - 1000 | 10 | 25 | -155 | 3 (PEP) | 3.0 - 3.6 | 95 | 16-pin VQFN | Amplifiers for analogue scaling and filtering, output gain control, flexible LO divider |
| CMX993W | RF Quadrature Modulator | 30 - 1000 | 50 | 25 | -155 | 3 (PEP) | 3.0 - 3.6 | 96 | 16-pin VQFN | Amplifiers for analogue scaling and filtering, output gain control, flexible LO divider |
| CMX998 | Cartesian Feedback Loop Transmitter | 30 - 1000 | 100 | - | -148 | 3 (PEP) | 3.0 - 3.6 | 135 | 64-pin VQFN | I/Q modulator-based subsystem greatly linearises external RF PA |

# RF (Radio Frequency) Products

| Tx/Rx | Product Description | RF/IF Range MHz | I/Q BW MHz | IP3 dBm | Noise | | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|---|
| | Tx | | | Output | Floor dBm/Hz | Output Power dBm | | | | |
| | Rx | | | Input | Figure | Gain | | | | |
| CMX973 | Low Power RF Qudrature Transceiver | | | | | | | | | |
| | Tx | 20 - 1000 | 25 | 11 | -150 | 0 (PEP) | 3.0 - 3.6 | 61 | 32-pin VQFN | Very low power, small size, excellent performance, flexible LO divider, synthesiser with VCO amp |
| | Rx | 20 - 300 | 10 | -15 | 10 | 56dB (V/V) | | 15 | | |
| CMX991 | RF Quadrature Transceiver | | | | | | | | | |
| | Tx | 100 - 1000 | 1 | - | -142 | -10 | 3.0 - 3.6 | 82 | 48-pin VQFN | Small size dual superhet Rx, two-stage Tx shares Rx IF. flexible LO divider, IF synth with VCO amp |
| | Rx | 100 - 1000 | 1.4 | 11 | 15 | 43dB (V/V) | | 52 | | |




## Applications

- Data over radio:
  MSK, FSK, GMSK, QPSK, QAM
- Wideband modulation systems up to 50MHz
- Linear and non-linear modulation schemes
- Wireless telemetry
- Marine AIS systems
- Software Defined Radio (SDR)
- Satellite terminals
- Digital TV - CATV mod.
- Wi-Max implementations
- Analogue, digital and multimode radio:
  TETRA, APCO, dPMR, DMR, PDT

# Analogue Two-way Radio Products

CML's two-way radio products address both the full baseband and individual communication requirements of analogue military, PMR/LMR, trunked and leisure radio systems.

The analogue two-way radio product features include:

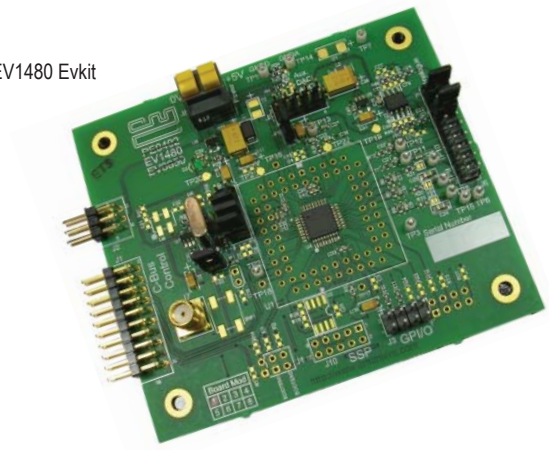
- Baseband functions: audio processing, data, CTCSS, DCS, Selcall, XTCSS, single-tone operations and DTMF
- Voiceband processing offering flexible functions such as: signal filtering, companding, scrambling, pre and de-emphasis and the digital control of all signal paths and levels
- In-band signalling in the form of DTMF, Selcall and general single, dual and multi-tone operations
- Sub-audio signalling (CTCSS and DCS), sub-audio signalling functions that operate alongside voiceband operations.
- Data functions are available on-chip, in both raw and packet formats, to enable data-over-radio (telemetry) and/or control signalling
- RF support features such as system clocks, RF synthesisers and auxiliary ADCs and DACs.
- Control of the majority of CML's IC products via a serial bus (C-BUS)

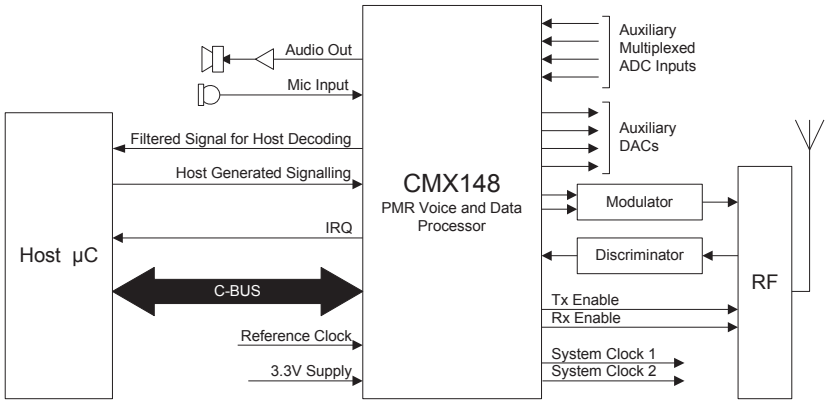
| | Product Description | Radio Systems | Audio Processing | Data | Signalling | Aux Functions | Supply Voltage V | Typ. Current mA | Package Type |
|---|---|---|---|---|---|---|---|---|---|
| CMX7031<br>CMX7041 | Two-way Radio Processor | Professional TWR<br>PMR<br>Marine VHF<br>Amateur AX.25 | AGC<br>Filtering<br>Companding<br>Scrambler<br>Pre/De-emphasis<br>Limiter | FFSK/<br>MSK<br>4FSK<br>C4FM<br>AX.25 | CTCSS<br>DCS<br>DTMF<br>Selcall<br>XTCSS<br>Programmable Tones | ADCs, DACs,<br>RAMDAC,<br>GPIO, Systems<br>Clocks | 3.0 - 3.6 | 7.8 | 48-pin VQFN/<br>LQFP<br><br>64-pin<br>VQFN/LQFP |
| CMX148 | PMR Audio and Data Processor | PMR446<br>FRS<br>MURS<br>GMRS<br>Leisure Radio | Filtering<br>Scrambler<br>Pre/De-emphasis<br>Limiter | FFSK/<br>MSK | DTMF | ADCs,<br>DACs,<br>RAMDAC,<br>GPIO,<br>System Clocks | 3.0 - 3.6 | 9.8 | 48-pin<br>VQFN/LQFP |
| CMX138A | Audio Scrambler and Sub-audio Signalling Processor | PMR446<br>FRS<br>MURS<br>GMRS<br>Leisure Radio | Filtering<br>Compander<br>Scrambler<br>Pre/De-emphasis<br>Voice Scrambler | - | CTCSS<br>DCS<br>Programmable Tones | ADC, DAC,<br>RAMDAC,<br>GPIO,<br>System Clocks | 3.0 - 3.6 | 10.2 | 28-pin SOIC<br>TSSOP |
| CMX881 | Baseband Processor for PMR and Trunked Radio | PMR<br>Trunked Radio | Filtering<br>Compander<br>Voice Scrambler<br>Pre/De-emphasis<br>Limiter | FFSK/<br>MSK | CTCSS<br>DCS<br>DTMF<br>Selcall<br>XTCSS<br>Programmable Tones | ADC | 2.7 - 5.5 | 5.5 | 28-pin<br>SSOP<br>TSSOP |

# Anaologue Two-way Radio Products

| | Product Description | Radio Systems | Audio Processing | Data | Signalling | Aux Functions | Supply Voltage V | Typ. Current mA | Package Type |
|---|---|---|---|---|---|---|---|---|---|
| CMX882 | Baseband Processor with GPS Data Signalling | PMR446<br>FRS<br>MURS<br>GMRS<br>Leisure Radio | Filtering<br>Compander<br>Scrambler<br>Pre/De-emphasis<br>Limiter | FFSK/MSK | CTCSS, DCS | ADC | 2.7 - 5.5 | 5.5 | 28-pin TSSOP |
| CMX883 | Baseband Processor | PMR446<br>FRS<br>MURS<br>GMRS<br>Leisure Radio | Filtering<br>Compander<br>Scrambler<br>Pre/De-emphasis<br>Limiter | - | CTCSS, DCS | ADC | 2.7 - 5.5 | 5.5 | 28-pin TSSOP |
| CMX838 | Family Radio Processor | FRS<br>GMRS<br>PMR446 | Filtering<br>Pre/De-emphasis<br>Limiter | - | CTCSS | RF Synthesiser | 2.7 - 5.5 | 13 | 28-pin TSSOP |
| CMX823 | Programmable Paging Tone Decoder | Tone Paging | - | - | Selcall | - | 2.7 - 5.5 | 1 | 16-pin SSOP |

EV1480 Evkit






## Applications

- General Two-way Radio
- Analogue PMR/LMR
- Trunked Radio
- FRS, GMRS, MURS and PMR446 Leisure Radio
- Wireless Data Comms
- Fixed and Rolling Code Voice Scramblers
- Status and Alarm Systems
- Portable and Mobile Radios
- On-site Repeaters
- Community Base Stations
- Marine VHF Radio
- Aviation Radio
- Amateur Radio
- National Weather Radio Systems
- Paging Systems
- Tone Squelch Systems
- Tone Signalling
- Door Access and Gate Entry

# Digital PMR/LMR Products

CML offers a wide range of voice, signalling and data processing ICs for digital communications systems, integrating baseband processing and systems - specific Air Interface.

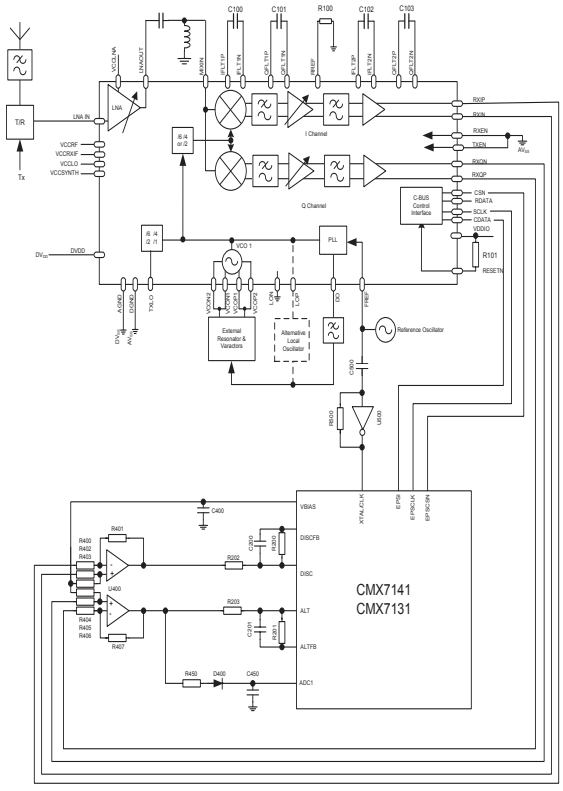
Features include: vocoder support, layer 1 and layer 2 of system Air Interface data coding, data modems, plus auxiliary functions supporting the overall radio design. Solutions are available for both FDMA and TDMA based PMR/LMR systems.

## FDMA systems

dPMR446, dPMR mode 1/2/3, NXDN, ARIB-STD T98 and ARIB-STD T102

| | Product Description | FDMA Systems | TDMA Systems | LD or I/Q Interface | Embedded Functions | Supply Voltage V | Typ. Current mA | Package Type |
|---|---|---|---|---|---|---|---|---|
| CMX7861 | FirmCODEC™ Programmable Basedband Interface for DSP/Microcontroller | Universal | Universal | I/Q | Audioband Codec<br>Channel Filters<br>AUX ADCs, DACs, RAMDAC,<br>GPIO and System Clocks | 3.0 - 3.6 | 3 | 64-pin LQFP<br>64-pin VQFN |
| CMX7131<br>CMX7141 | Multi-standard Digital PMR Processor | dPMR446<br>dPMR™ Mode 1/2/3<br>ARIB STD-T98<br>DCR/ARIB STD-T102<br>NXDN™<br>AnaloguePMR | - | LD or I/Q | AIr Interface Protcols: Physical and Data Link Layers<br>Audioband Codec<br>AUX ADCs/DACs, RAMDAC,<br>4FSK, GPIO and System Clocks | 3.0 - 3.6 | 4.4 | 64-pin LQFP<br>64-pin VQFN |
| CMX8341 | Dual Mode Analogue/Digital PMR Processor | dPMR446<br>Analogue PMR | - | LD | Air InterfaceProtocol, Physical and Data Link Layers<br>AUX ADCs/DACs, RAMDAC,<br>GPIO and System Clocks<br>Embedded RALCWI 2400bps Vocoder and 4FSK Modem. | 3.0 - 3.6 | 4.4 | 100-pin LQFP |

DE9944 Demo Kit



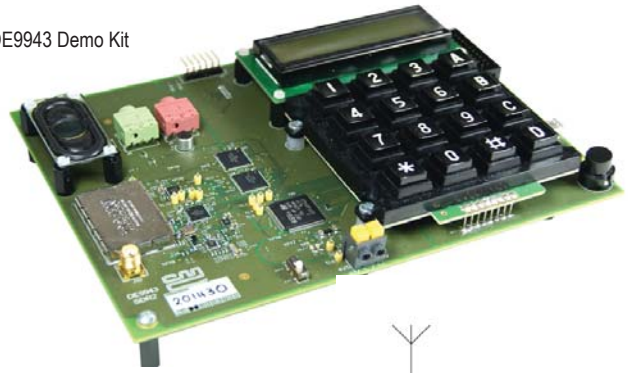
# Digital PMR/LMR Products

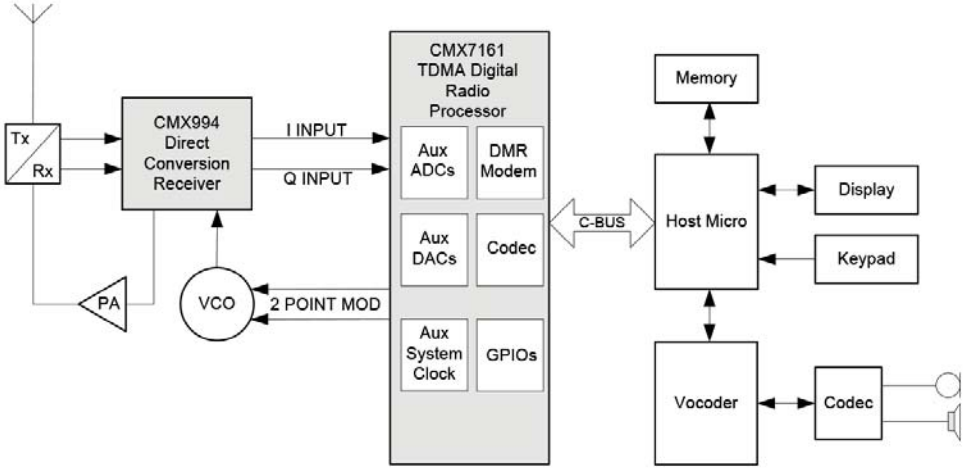
## TDMA systems

TETRA, DMR, APCO P25, PDT

| | Product Description | FDMA Systems | TDMA Systems | LD or I/Q Interface | Embedded Functions | Supply Voltage V | Typ. Current mA | Package Type |
|---|---|---|---|---|---|---|---|---|
| CMX7861 | FirmCODEC™ Programmable Basedband Interface for DSP/Microcontroller | Universal | Universal | I/Q | Audioband Codec<br>Channel Filters<br>AUX ADCs, DACs, RAMDAC,<br>GPIO and System Clocks | 3.0 - 3.6 | 3 | 64-pin LQFP<br>64-pin VQFN |
| CMX981 | Advanced Digital Radio Baseband Processor | - | TETRA<br>APCO P25 | I/Q | Channel Filters<br>Audioband Codec<br>AUX ADCs/DACs, RAMDAC,<br>GPIO and Speaker Amp | 2.25 - 2.75<br>(3.6 Tol I/O) | - | 64-pin VQFN |
| CMX7161 | TDMA Digital Radio Processor | - | DMR | I/Q | Audioband Codec<br>Channel Filters<br>AUX ADCs, DACs, RAMDAC,<br>GPIO and System Clocks<br>DMR Modem | 3.0 - 3.6 | - | 64-pin LQFP<br>64-pin VQFN |

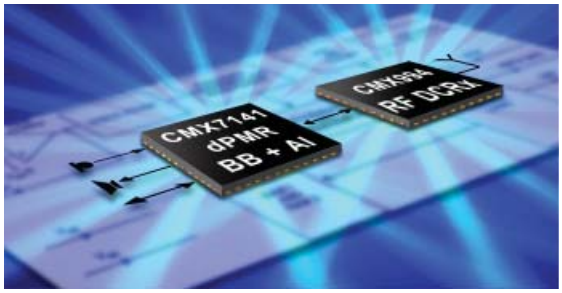
DE9943 Demo Kit






## Applications

- FDMA Systems
  - dPMR446, dPMR mode 1
  - NXDN,
  - ARIB STD-T102
  - ARIB STD-T98
  - DCR
- TDMA systems
  - TETRA, APCO P25
  - DMR, PDT
  - RCR-39
- Digital WLL
- Satcoms Terminals
- Aviation Systems
- Mixed-mode Analogue/Digital Radios
- Military Communications



# Wireless Data Products

CML's wireless data products address a wide range of communications and control applications, offering operation to custom, freeformat and packet data systems.

Most common data-transfer protocols are catered for at a range of speeds from 1.2kbps to 200kbps, utilising: FSK, FFSK, GMSK, 2/4FSK and QAM modulation schemes.

The advent of CML's FirmASIC® technology has enabled the availability of the Multi-Mode Packet Data Modem offering configurable GMSK/GFSK, 2/4FSK, FFSK/MSK and QAM modulation schemes by the up-loading the appropriate Function Image™ file.

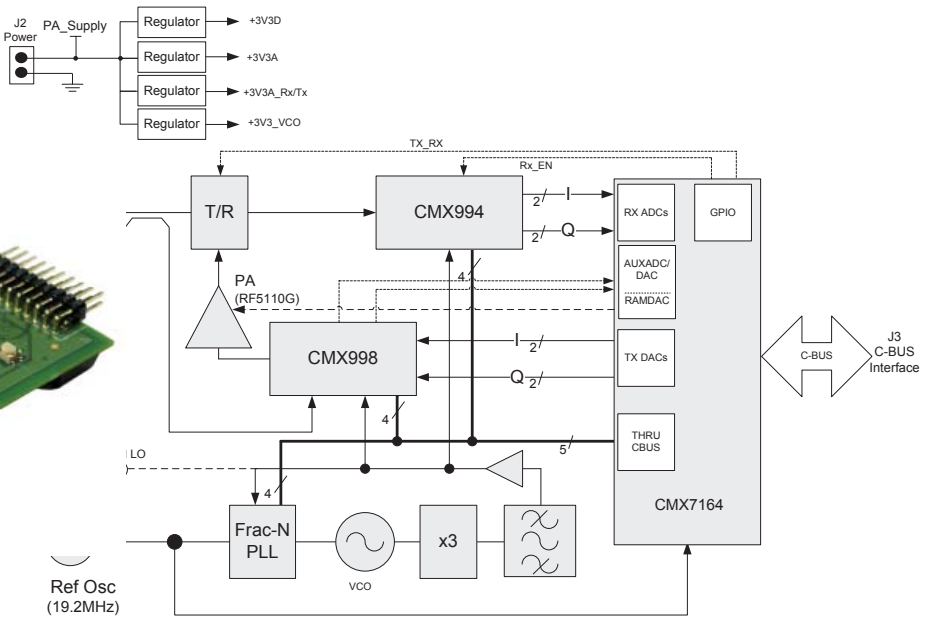
The CMX7164 multi-mode (GMSK, 2/4FSK and QAM) Packet Data Modem and CMX7163 QAM Packet Data Modem are complemented by CML's range of RF products, enabling highly-integrated wirelss data modems to be implemented.

| | Product Description | Modulation Schemes | Data Range kbps | Supply Voltage V | Typ. Current mA | Package Type | Auxiliary Features | Key Benefits |
|---|---|---|---|---|---|---|---|---|
| CMX7164 | Multi-mode (I/Q) Wireless Data Modem | GMSK/GFSK<br>2/4 FSK<br>4/16/64 QAM | GMSK <=19.2<br>4 FSK <=20<br>QAM <96 | 3.0 - 3.6 | Rx 17.9<br>Tx 12.7 | 64-pin VQFN<br>LQFP | ADCs, DACs<br>System Clocks<br>GPIO<br>RAMDAC | Multi-mode packet data modem for I/Q based systems |
| CMX7163 | QAM (I/Q) Wireless Data Modem | 4/16/64 QAM | QAM <=96 | 3.0 - 3.6 | Rx 18.7<br>Tx 15.5 | 64-pin VQFN<br>LQFP | ADCs, DACs<br>System Clocks<br>GPIO<br>RAMDAC | High speed QAM packet data modem for I/Q based systems |
| CMX7143 | Multi-mode Wireless Data Modem | FFSK/MSK<br>GMSK/GFSK<br>4FSK | FFSK <=2.4<br>GMSK <=19.2<br>4FSK <=20 | 3.0 - 3.6 | Rx 11.7<br>Tx 15.7 | 48-pin VQFN<br>LQFP | ADCs, DACs<br>System Clocks<br>GPIO<br>RAMDAC | Multi-mode packet data modem for RF LD systems |

# Wireless Data Products

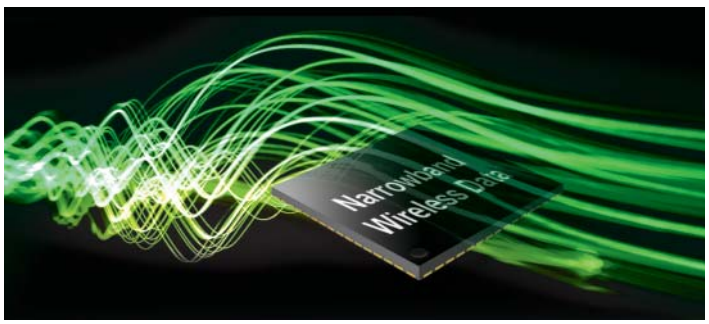
| | Product Description | Modulation Schemes | Data Range kbps | Supply Voltage V | Typ. Current mA | Package Type | Auxiliary Features | Key Benefits |
|---|---|---|---|---|---|---|---|---|
| CMX969 | RD-LAP, MDC4800 Motient/ARDIS Packet Data Modem | 4FSK FSK | RD-LAP = 19.2 MDC =4.8 | 2.7 - 5.5 | 4 | 24-pin TSSOP | - | RD-LAP, MDC2800, Motient/ARDIS conformance |
| CMX909B | GMSK Packet Data Modem | GMSK | 38.4 | 2.7- 5.5 | 3 | 24-pin TSSOP SSOP | - | General purpose GMSK packet data modem |
| FX919B MX919B | 4FSK Packet Data Modem | 4FSK | 19.2 | 3.0 - 5.5 | 4 | 24-pin SOIC | - | General purpose 4FSK packet data modem |
| FX929B | 4FSK RD-LAP Packet Data Modem | 4FSK | 19.2 | 3.0 - 5.5 | 4 | 24-pin SOIC | - | RD-LAP conformance |
| CMX589A | Full-dulpex GMSK Modem | GMSK/GFSK | <= 200 | 3.0 - 5.5 | 4 | 16-pin SOIC TSSOP | - | General purpose high speed GMSK modem data-pump |
| CMX469A | 1200/2400/4800 Baud FFSK/MSK Modem | FFSK/MSK | 1200 2400 4800 | 3.0 - 5.5 | 4.5 | 20-pin SOIC 24-pin TSSOP | - | General purpose audio-band FFSK modem data-pump |

DE9941 Demo Kit




## Applications

- Narrowband Radio Systems
- Data Over Radio
- Radio-paging
- Wireless Telemetry
- Machine-to-Machine (M2M)
- Wireless Control Systems
- Wireless Monitoring
- SCADA Implementations
- Traffic (Vehicle) Location
- Differential GPS
- ISM Bands
- Software Defined Radio (SDR)



# Digital Voice Products

CML's DuraTALK® family of digital voice products comprises a range of flexible technologies supporting voice-data generation, coding, transcoding and decoding functions for digital communication systems, as well as many other in-band audio applications where there is a need for storage and playback.

The DuraTALK® family currently consists of the following technologies:

- TWELP™: Crystal clear digital voice for professional radio
- RALCWI™: CML's low bit-rate Vocoder
- Transcoding: On-chip multi-transcoding/conversion of data formats
- CVSD and ADM: Flexible error tolerant encoders/decoders

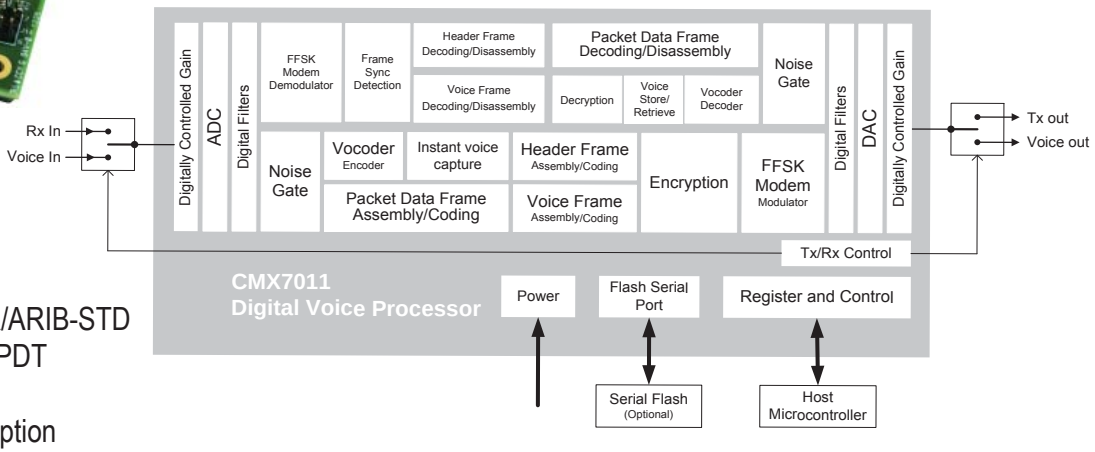
The flexible, low power, highly integrated TWELP™, RALCWI™, Transcoder and CVSD ICs are suited to wireless and wireline voice applications such as voice scramblers, alarm systems, military field applications and professional or leisure digital two-way radios.

| | Product Description | Voice-data Scheme | Voice-band Codec | Supply Voltage V | Typ. Current mA | Package Type | Additional Features | Key Benefits |
|---|---|---|---|---|---|---|---|---|
| CMX7011 | Digital Voice Encryption/ACE Processor | RALCWI™ | Yes | 3.0 - 3.6 | 30 | 48-pin VQFN<br>48-pin LQFP | I/O Filters<br>Packet data<br>Voice Storage Encryption | Complete voice encryption system including Air Interface protocol |
| CMX7262 | Professional Radio 2400bps Vocoder | TWELP™ | Yes | 3.0 - 3.6 | 23 | 64-pin VQFN | I/O Filters | High performance low-bit rate Vocoder |
| CMX7261 | Digital Voice Multi-transcoder | ADM<br>CVSD<br>PCM<br>G.729A<br>G.711 | Yes | 3.0 - 3.6 | 52 | 64-pin VQFN | I/O Filters | Performs as a group of audio codecs |

# Digital Voice Products

| | Product Description | Modulation Schemes | Data Range kbps | Supply Voltage V | Typ. Current mA | Package Type | Auxiliary Features | Key Benefits |
|---|---|---|---|---|---|---|---|---|
| CMX608<br>CMX618<br>CMX638 | Low-cost 2400bps Vocoder | RALCWI™ | Yes<br>(Not CMX608) | 3.0 - 3.6 | 20 | 48-pin VQFN<br>48-pin LQFP | I/O Filters | Low-cost 2400bps Vocoder with robust FEC.<br>CMX638 offer duplex operation |
| CMX649 | Adaptive Delta Modulation (ADM) Codec | ADM<br>PCM<br>CVSD | Yes | 2.7 - 5.5 | 2.9 | 20-pin TSSOP<br>SOIC | I/O Filters | General purpose error tolerant voice coding scheme |
| CMX639 | CVSD Voice Codec | CVSD | Yes | 3.0 - 5.5 | 1.9 | 16-pin SOIC<br>24-pin TSSOP | I/O Filters | General purpose error tolerant voice coding scheme |
| FX609<br>MX609 | CVSD CODEC | CVSD | Yes | 4.5 - 5.5 | 3.5 | 24-pin PLCC<br>SOIC | I/O Filters | General purpose error tolerant voice coding scheme |
| FX619 | 'Eurocom' Codec | CVSD | Yes | 4.5 - 5.5 | 4.5 | 24-pin PLCC<br>SOIC | I/O Filters | CVSD Codec conforming to the 'Eurocom' standard |
| MX629 | 'Military' Delta Modulation Codec | CVSD | Yes | 4.5 - 5.5 | 5.5 | 24-pin PLCC | I/O Filters | CVSD Codec conforming to MIL-STD 188-113 |

PE0101-7011 Evkit




## Applications

- Digital FDMA Radios: dPMR/ARIB-STD
- Digital TDMA Radios: DMR/PDT
- Voice-over IP (VoIP)
- Voice Scrambling and Encryption
- Digital Wireless Local Loop
- Military Communications
- Satcom Terminals
- Terrestrial Flight Telephone Systems
- Cordless Telephones
- Alarm Systems
- Voice Store and Forward
- Voice Annunciators
- Voice Store and Retrieval
- Call Center Call Logging
- Delay Lines

DuraTALK®

# Marine Comms Products

CML offers an increasing range of voice and data communication ICs in the support of marine safety equipments.

AIS has become the essential navigation/safety equipment onboard leisure sailing yachts/motor cruisers, through to commercial vessels (fishing, cargo and passenger ships).

CML's AIS products include all the necessary signalling functionality, including the GMSK modem, DSC modem and embedded AIS protocol. AIS Class A, AIS Class B, AIS Rx only applications, AIS-SART, MOB/PLB and marine VHF voice communications are all supported.

A VHF marine radio is an essential piece of equipment in both coastal and deep-water operations.

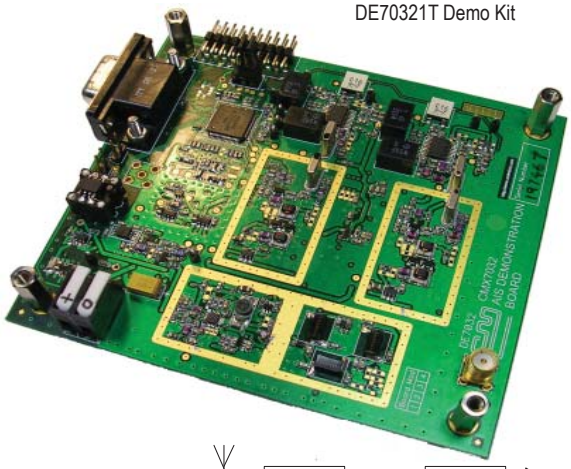
CML provides complete world voice signalling and data solutions supporting voice communication, DSC, ATIS, DTMF, NWR WAT and SAME.

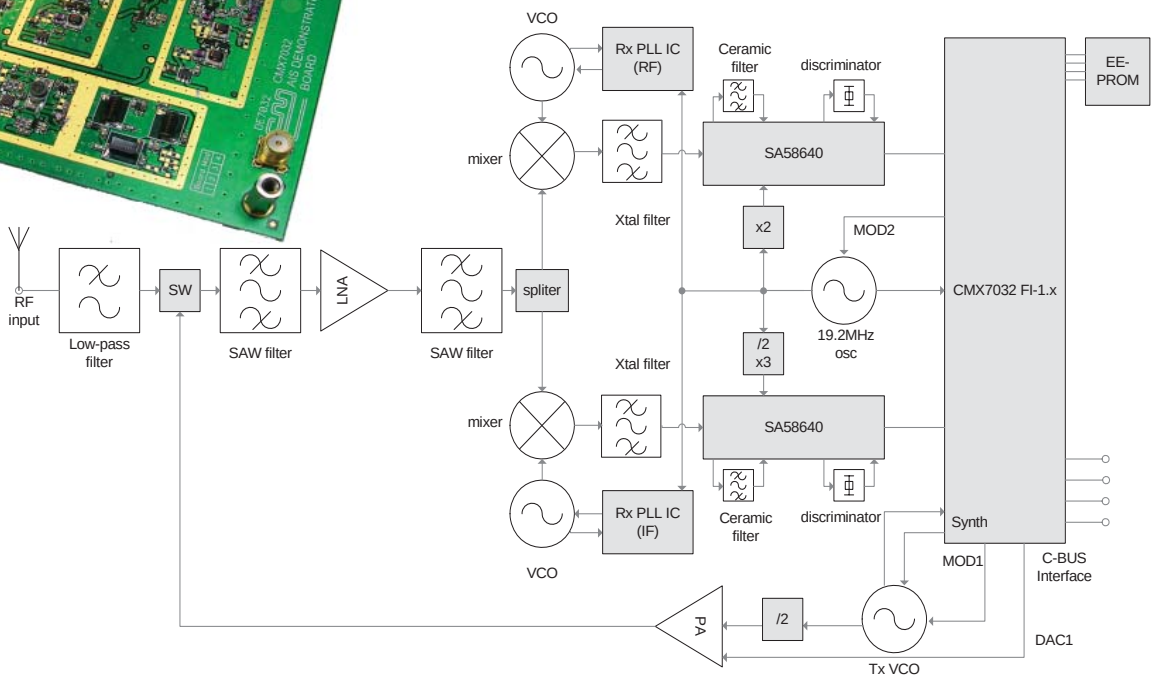
| | Product Description | AIS | Modem | Voice | Auxiliary Functions | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|
| CMX885 | Marine VHF Processor | - | DSC | Yes | ADCs<br>DACs<br>RAMDAC<br>System Clks | 3.0 - 3.6 | 8mA | 48-pin VQFN<br>48-pin LQFP | Low cost Marine VHF voice and DSC processing<br><br>Includes ADCs, DACs, RAMDAC and system clocks |
| CMX7045 | AIS-SART Processor | SART<br>PLB<br>MOB | GMSK<br>DSC | - | ADCs<br>DACs<br>RAMDAC<br>System Clks | 3.0 - 3.6 | 20mA | 48-pin VQFN<br>48-pin LQFP | Embedded AIS-SART Air-Interface |
| CMX7042 | AIS Baseband Processor | Class B<br>Dual Rx | GMSK<br>DSC | - | ADCs<br>DACs<br>RAMDAC<br>System Clks | 3.0 - 3.6 | 20mA | 48-pin VQFN<br>48-pin LQFP | Function Images support:<br>AIS Class B<br>Dual AIS Rx |

# Marine Comms Products

| | Product Description | AIS | Modem | Voice | Auxilary Functions | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|
| CMX7032 | AIS Baseband Processor with RF Synthesisers | Class B Dual Rx | GMSK DSC | - | ADCs DACs RAMDAC System Clks | 3.0 - 3.6 | 20mA | 64-pin VQFN 64-pin LQFP | CMX7042 + RF synthesisers |
| CMX910 | AIS Class A Baseband Processor | Class A | GMSK DSC | - | ADCs DACs | 3.0 - 3.6 | 35mA | 64-pin VQFN | Complete AIS Class A processor |

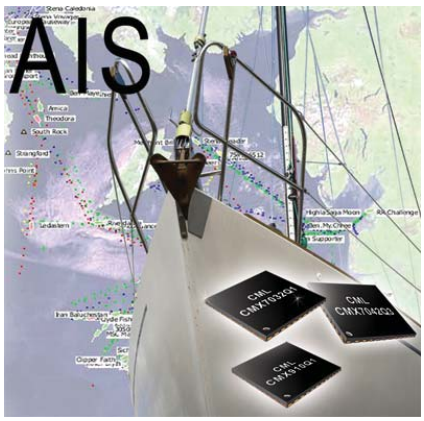
DE70321T Demo Kit






## Applications

- Automatic Identification System (AIS)
- AIS Class A transponder
- AIS Class B transponder
- AIS-SART (Search and Rescue Transmitter)
- Man overboard systems (MOB)
- Personal Location Beacon (PLB)
- Aids to Navigation (ATON)
- Marine VHF Radio
- Automatic Transmission Identification System (ATIS)
- Asset tracking
- Coastal security



# Wireline Telecom - Modems Products

CML's Low Power Wireline Modem products are employed worldwide in all types of communication applications.

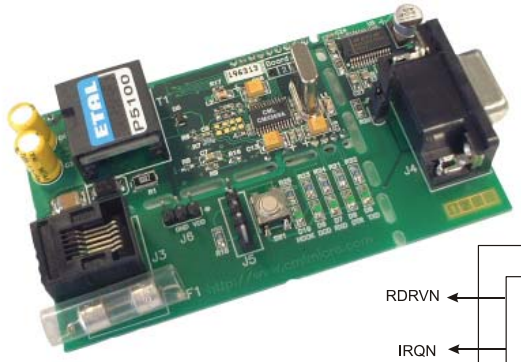
CML's highly integrated ICs demand very little power or µC assistance, a factor that often means that the products can be line powered.

The wireline data IC range covers most relevant ITu-T V recommendations and compatible Bellcore data specifications. These single chip wireline data products offer a full suite of wireline signalling functions to cater for complete system operations from line and call set-up right through to the completed data transaction.

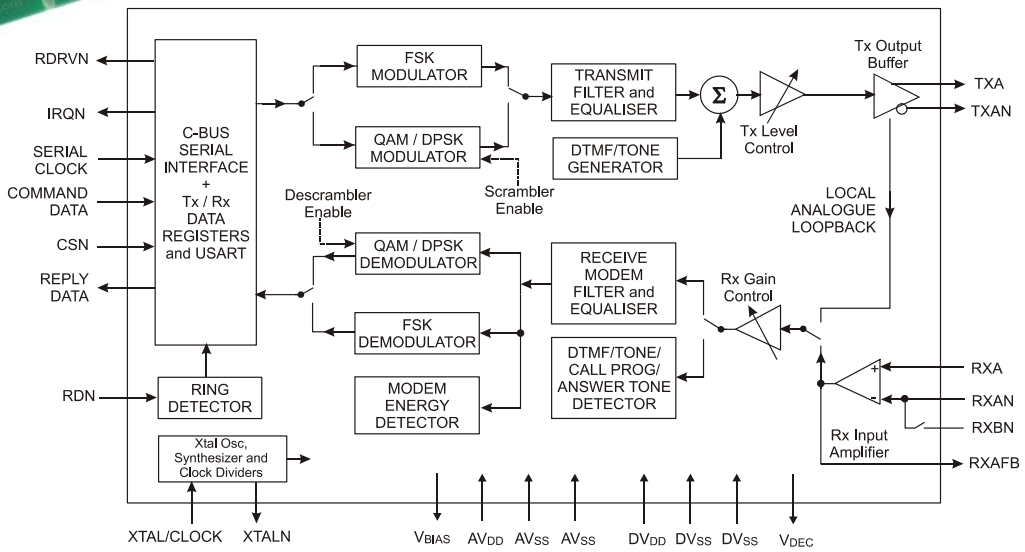
| | Product Description | V.32 | V.22 | V.23 | V.21 | Bell 202 | Bell 103 | DTMF | CLI | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CMX869B | V.32 bis Modem | Y bis | Y bis | Y | Y | Y | Y | Y | Y | 3.0 - 3.6 | 8.6 | 24-pin SOIC TSSOP | Ring Detect USART Hybrid support Line equalisation |
| CMX868A | V.22 bis Modem | - | Y bis | Y | Y | Y | Y | Y | Y | 2.7 - 5.5 | 3.0 | 24-pin SOIC SSOP | Ring Detect USART Hybrid support Line equalisation |
| CMX867A | V.22 Modem | - | Y | Y | Y | Y | Y | Y | Y | 2.7 - 5.5 | 3.0 | 24-pin SOIC TSSOP | Ring Detect USART Hybrid support Line equalisation |
| CMX866 | V.22 Modem with AT Commands | - | Y | Y | Y | Y | Y | Y | Y | 2.7 - 5.5 | 5 | 28-pin SSOP | Ring Detect USART Hybrid support Line equalisation |
| CMX865A | DTMF/FSK Combo | - | - | Y | Y | Y | Y | Y | Y | 3.0 - 3.6 | 4.0 | 16-pin SOIC TSSOP | Hybrid support and Audio codec access |

# Wireline Telecom - Modems Products

| | Product Description | V.32 | V.22 | V.23 | V.21 | Bell 202 | Bell 103 | DTMF | CLI | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CMX860 | Telephone Signalling Transceiver | - | - | Y | - | Y | - | Y | Y | 2.7 - 5.5 | 3 | 28-pin SOIC | Hybrid support |
| CMX850 | Communications Controller With Embedded 8051 | - | Y | Y | Y | Y | Y | Y | Y | 3.0 - 3.6 | 6.8 | 100-pin LQFP | Line reversal detect<br>Off-hook detect<br>Watch-dog timer<br>UART<br>AUX ADC<br>PWM outputs<br>Embedded 8051 |
| FX604<br>MX604 | V.23 Compatible Modem | - | - | Y | - | - | - | - | - | 3.0 - 5.5 | 1.0 | 16-pin SOIC | PABX applications |
| FX614<br>MX614 | Bell 202 Compatible modem | - | - | - | - | Y | - | - | - | 3.0 - 5.5 | 1.0 | 16-pin SOIC | Ideally suited to WLL, FWT, CWT, HART applications |



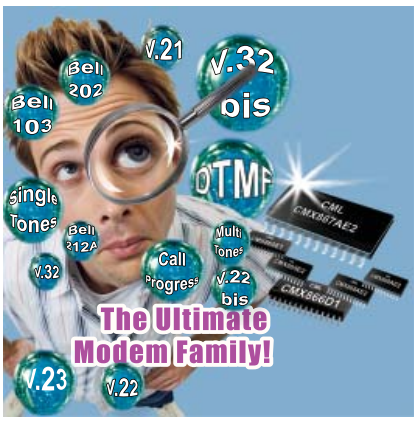

DE8691 Demo Kit




CMX869B

## Applications

- Low power wireline modems
- Wireline telemetry
- Pair-gain systems
- Public Switched Telephone Network (PSTN)
- Least cost routers
- Internet appliances
- Remote meter reading
- Set-top boxes
- Subscriber pulse metering
- Wireless Local Loop (WLL)
- Banking/billing systems



# Wireline Telecom - Telephony Products

CML's wireline telephony products cover all aspects of a telephone system's operating requirements in the analogue, digital and mixed signal fields and are employed worldwide in all types of communication applications.
CML's highly integrated ICs perform the majority of telecoms voice, signalling and data functions whilst demanding very little power or µC assistance, a factor that often means that the product can be line powered.

Analogue, digital and mixed-mode (POTS-to-ISDN) products are also available singularly, or in multi-feature combinations.

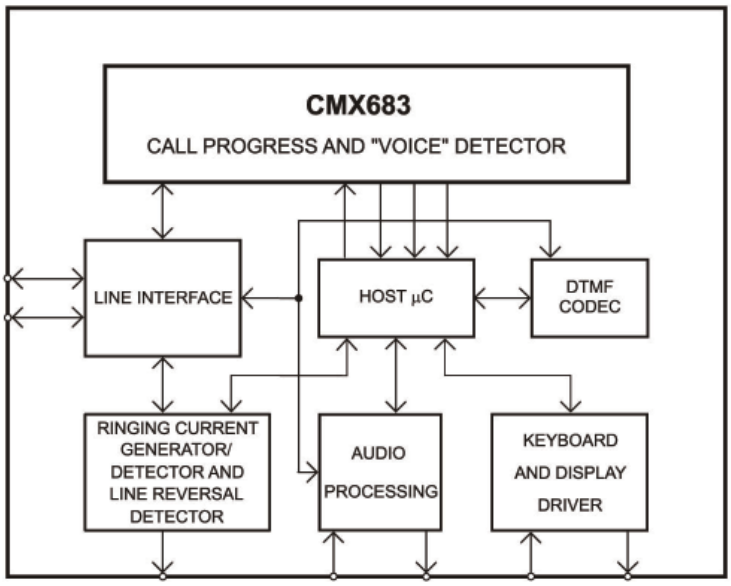
The telephony range of IC products covers all of the voice and signalling requirements of a modern day telephone system.

From Rx/Tx DTMF, calling-line ID and call progress functions through-to voice recognition in both the digital and analogue domains, these products also offer on-chip line/phone interfacing.

| | Product Description | Digitally Controlled Amplifiers | Data | Signalling | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|
| MX019 | Digitally Controlled Quad Amp Array | 4 | - | - | 4.5 - 5.5 | 1.5 | 16-pin SOIC | General purpose digitally controlled quad amplifier array |
| FX029 MX029 | Digitally Controlled Amplifier Array | 2 | - | - | 4.5 - 5.5 | 3 | 16-pin SOIC | General purpose digitally controlled dual amplifier array |
| CMX673 | Call Progress Tone Detector | - | - | Single Call Progress Dual Tone Detectors | 2.7 - 5.5 | 0.5 | 16-pin SOIC 20-pin TSSOP | Universal call progress detector |
| CMX683 | Call Progress Tone Detector Plus Voice Detector | - | - | Single Call Progress Dual Tone Detector | 2.7 - 5.5 | 0.6 | 16-pin SOIC TSSOP | Call progress detector with voice detection |
| CMX602B | Calling Line Identifier Plus Call Waiting | - | V.23 Demodulation | CLI Decoder CIDCW Decoder | 2.7 - 5.5 | 0.5 | 16-pin SOIC TSSOP | Featurephone applications |

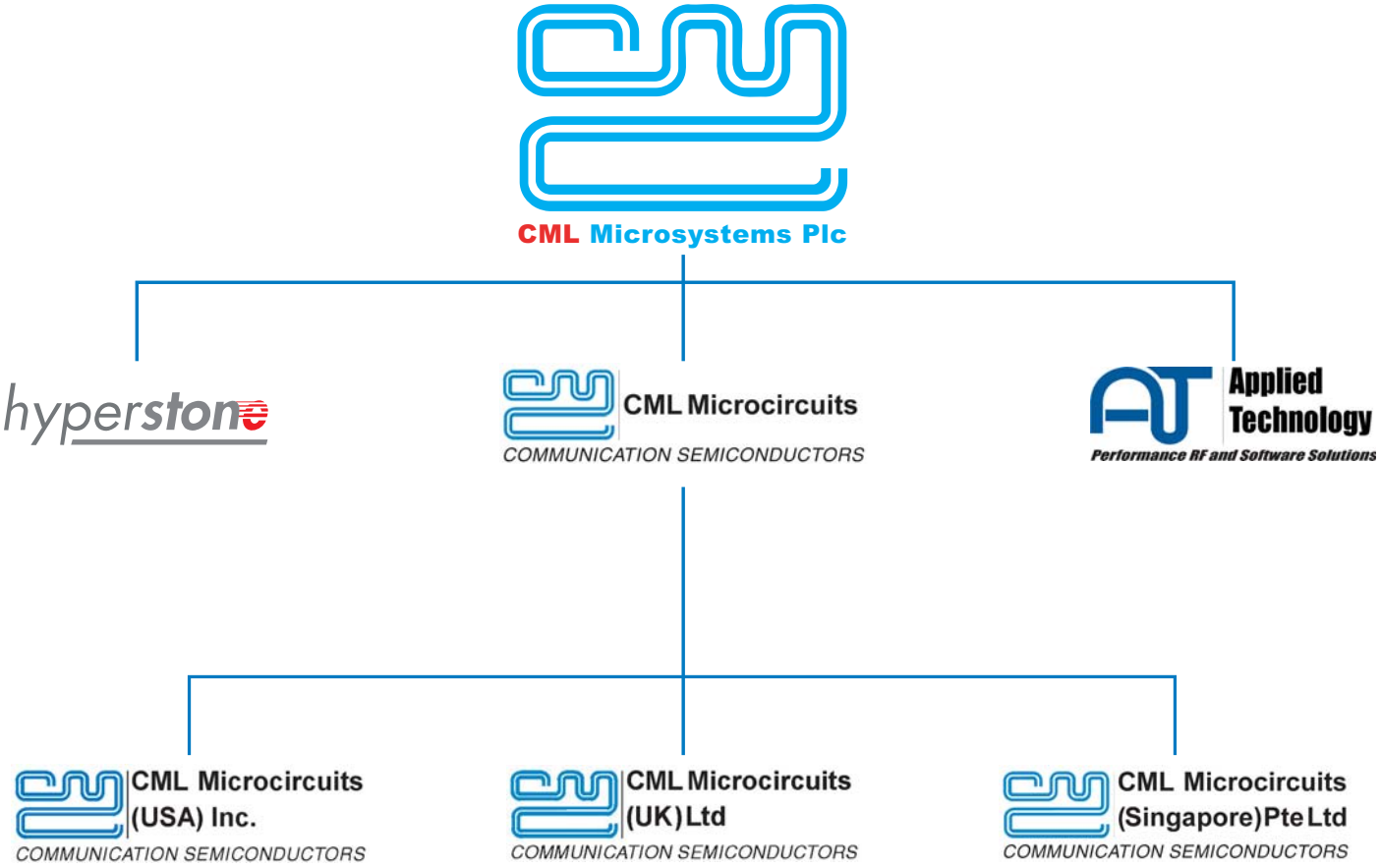
# Wireline Telecom - Telephony Products

| | Product Description | Digitally Controlled Amplifiers | Data | Signalling | Supply Voltage V | Typ. Current mA | Package Type | Key Benefits |
|---|---|---|---|---|---|---|---|---|
| CMX612 | Calling Line ID Plus Tone Decode for VMW | - | V.23/Bell 202 Demodulation | CLI Decoder<br>CIDCW Decoder<br>VMWI Decoder | 2.7 - 5.5 | 0.5 | 20-pin TSSOP | Featurephone applications |
| CMX631A | SPM Detector | - | - | SPM Detector (12kHz/16kHz) | 2.7 - 5.5 | 0.8 | 16-pin SOIC<br>PDIP<br>24-pin SSOP | Payphone applications |
| CMX641A | Dual SPM Detector Plus Payphone Security | - | - | Dual SPM Detector (12kHz/16kHz) | 2.7 - 5.5 | 1.2 | 24-pin SOIC | PABX applications |
| CMX605 | Digital-to-Analogue (POTS) Signalling Interface with DTMF Encoder Decoder | - | FSK V.23/Bell 202 | DTMF<br>SPM Generation<br>Ringing Signals<br>Flexible Tones<br>Fax/Answer Originate | 2.7 - 5.5 | 1.6 | 16-pin PLCC | Ideally suited to WLL, FWT, CWT applications |




## Applications

- Low power wireline
- Modems and wireline telemetry
- Telephones, Featurephones
- Payphones and PABX
- Calling line ID (CLI)
- Public Switched Telephone Network (PSTN)
- Integrated System Digital Network (ISDN)
- Least cost routers
- Pair-gain systems
- Internet appliances
- Set-top boxes
- Remote meter reading
- Subscriber pulse metering
- Wireless Local Loop (WLL)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# Custom ASIC Design Resources

CML Microcircuits offers a complete 'turnkey' service for the design and supply of custom ASIC solutions. Supporting all stages of ASIC development, from concept through design, layout, prototype-testing and the supply of production tested devices.

Through CML, customers gain access to leading-edge technologies and a design team with extensive expertise specialising in: Analogue, Digital, Mixed-Signal, Memory and RF integrated circuit design.

Technologies available encompass state-of-the-art processes and geometries, including: CMOS, BiCMOS, BiPOLAR and SiGe.

Extensive custom cell libraries are available comprising: logic, analogue/mixed-signal, digital; including memory, µController, RISC/DSP and IP cores.

FirmASIC® is a CML proprietary technology that has been successfully deployed in a wide range of standard and custom product offerings. Key benefits of this technology include: fast time-to-market, low cost, low risk, small footprint and unsurpassed flexibility.

A growing family of approved and stable FirmASIC® hardware plaforms is available, each providing a different mix of fixed and re-definable functions.

The whole essence of FirmASIC® is delivering a product with the right feature mix, performance and cost for a specific target application, in the shortest possible time.


For more information on CML's Design Resource please speak to your local CML contact or enquire on-line via the home page of our website: www.cmlmicro.com.

# Embedded Products

As part of CML's extensive wireline portfolio, CML features the CMX850 Communications Controller IC.
This extremely compact and low-power modem/µController integration satisfies all of the communications, control, data and signalling requirements of any wireline end-product using on-line communications.

Hyperstone, a fabless semiconductor company and a member of the CML Plc Group, offers a wide range of microprocessor and microcontroller products based on unified RISC/DSP architechture.

Hyperstone Inc, based in the USA, represents the full range of Hyperstone products in North and South America, providing distribution and product engineering support.


Focus Products

- E2 RISC/DSP Microcontroller
- hyNet XS and S Communication Controllers
- F4 and S6 Flash Memory Controllers
- Integrated Development Tools Available

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