

Function Image™ FI-2.0 = 4FSK Modem Operation
Function Image™ FI-1.0 = GMSK Modem Operation

Features

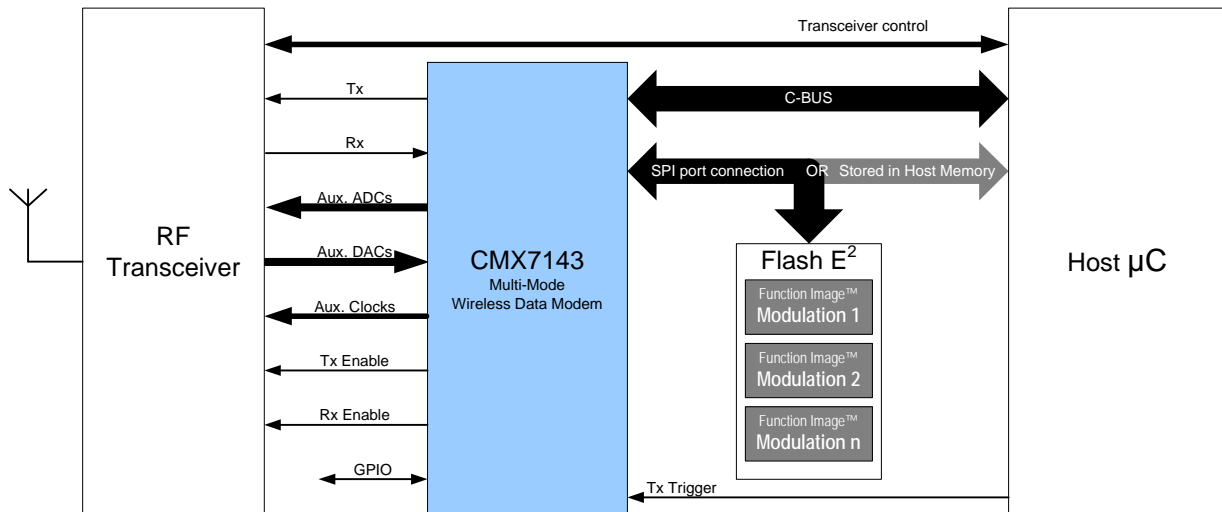
- Modulation scheme set by Function Image™
- Half-duplex operation
- 4.8kbps to 19.2kbps data rates
- Fast frame sync detection AFSD (Automatic Frame Sync Detection)
- Raw data mode
- Flexible packet data mode (frame sync, payload, CRC and FEC)
- 'Air compatible' mode (CMX909B/FX919B)
- Soft decision decoding option
- C-BUS serial interface to host micro
- RSSI processing
- Flexibility built on FirmASIC® technology

Features (Continued)

- 2 x auxiliary ADCs with 4 mux I/Ps
- 4 x auxiliary DACs
- 2 x auxiliary system clocks
- Flexible powersave modes
- Low power (3.0V to 3.6V) operation
- Small 48-pin LQFP and VQFN packages

Applications

- Wireless data modems
- Software defined modem systems
- Point-to-point telemetry systems
- M2M applications
- Traffic location systems
- General wireless telemetry



System Overview Diagram

Brief Description

The CMX7143 is a flexible half duplex, multi-mode wireless data modem IC configured by the Function Image™ (FI) that is uploaded to the device: GMSK modem operation with FI-1.0 and 4FSK modem operation with FI-2.0.

The device implements a comprehensive wireless data modem function. Raw data and packet data modes of operation are available; the packet mode being an enabler to achieve the lowest system operating power by minimising the host microcontroller interaction. Communication to a host is via a flexible serial bus (C-BUS). The device includes carrier sense function for LBT (Listen Before Transmit) applications and can automatically control the transmit hardware, including a RAMDAC feature for PA ramping.

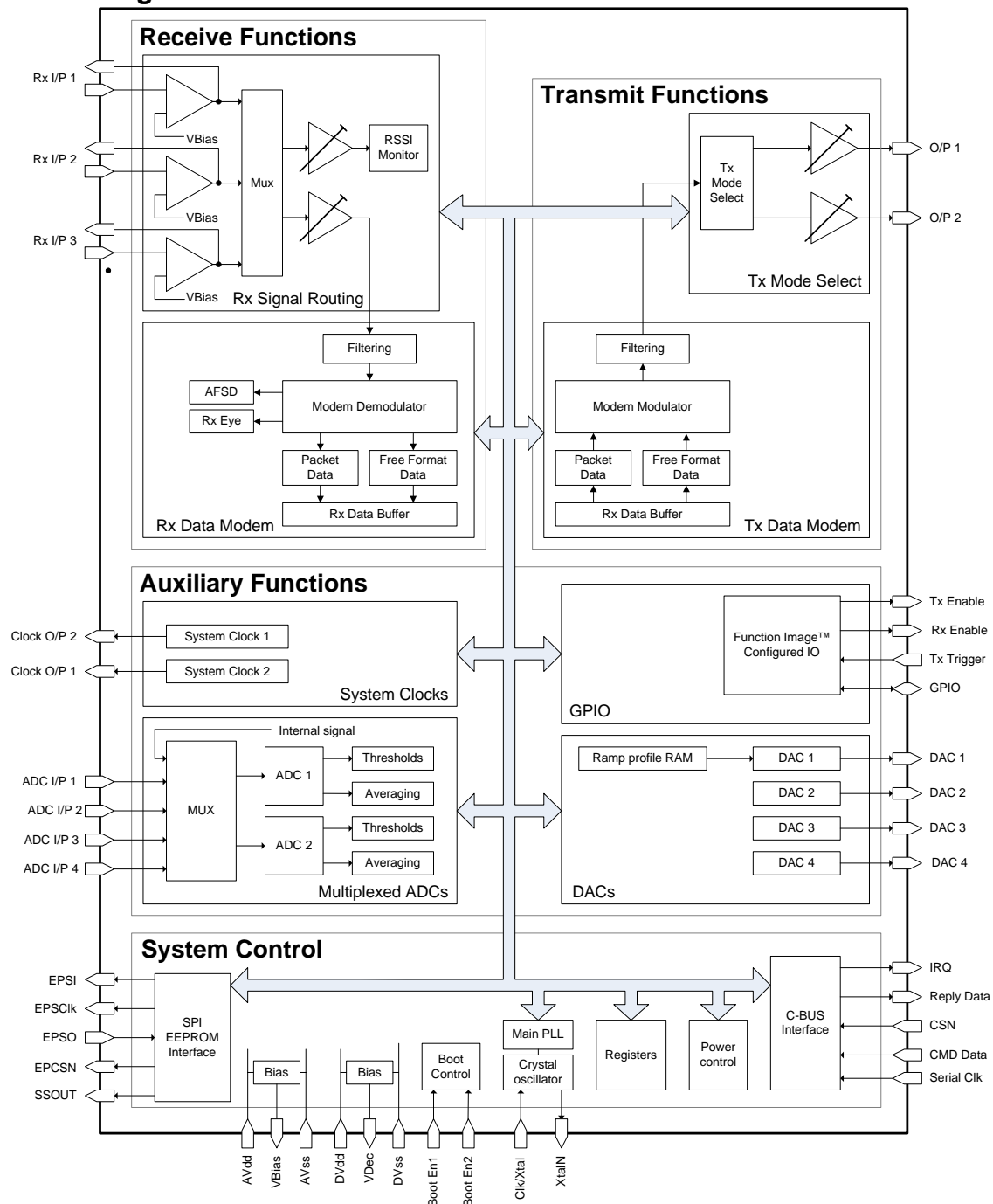
Other features include two Auxiliary ADCs with four selectable inputs and four auxiliary DAC interfaces (with an optional RAMDAC on the first DAC output, to facilitate transmitter power ramping). The device has flexible powersaving modes and RSSI processing and is available in both LQFP and VQFN packages.

Brief Description (Continued)

The CMX7143 utilizes CML's proprietary *FirmASIC*[®] component technology. On-chip sub-systems are configured by a Function Image[™]: this is a data file that is uploaded during device initialisation which defines the device's function and feature set. The Function Image[™] can be loaded automatically from an external EEPROM or host μ Controller over the built-in C-BUS serial interface. The device's functions and features may be enhanced by subsequent Function Image[™] releases, facilitating in-the-field upgrades.

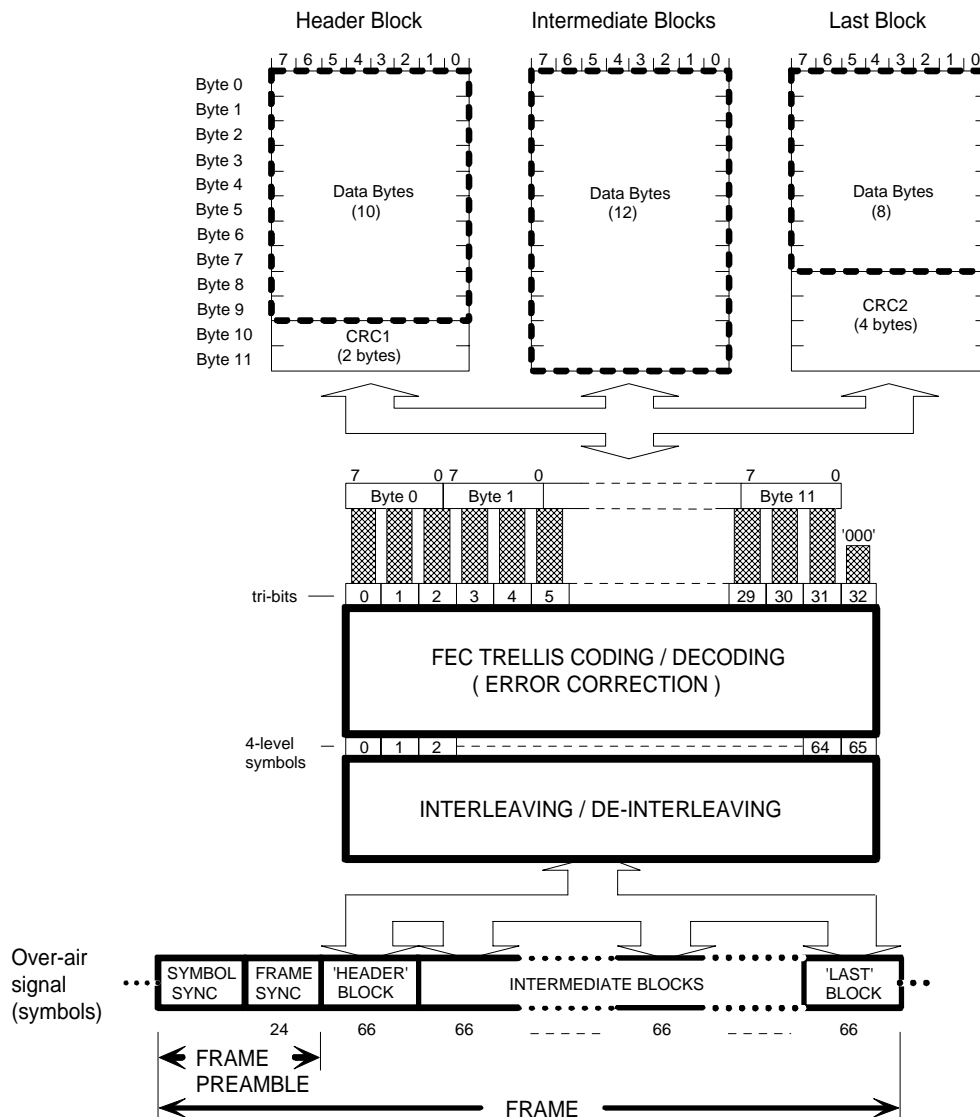
One or more modulation schemes as Function Images can be held in either an EEPROM attached to the device or in the host microcontroller's Flash memory. On power-up one of the stored FIs can be loaded into the CMX7143 to set its operating modulation scheme. During operation, should a different modulation scheme be required, the operating FI can be replaced with the appropriate new FI.

Block Diagram



Function Image™ FI-2.0 - 4FSK Modem Overview

- Configurable data rates up to 19.2kbps
- Packet data definition as defined within the FX/MX919B datasheet
 - Symbol Sync
 - Flexible frame structure, header, intermediate and last blocks can all be: 6bytes, 9bytes or 12bytes
 - Frame Sync
 - Default FX/MX919B
 - User programmable
 - Header block
 - CRC coding/decoding
 - Intermediate blocks
 - Last blocks
 - CRC coding/decoding
 - FEC Trellis coding/decoding
 - Interleaving/de-interleaving
- Frame construction/destruction utilising a data buffer



Frame Sync:

-1 +1 -1 +1 -1 +3 -3 +3 -3 -1 +1 -3 +3 +3 -1 +1 -3 -3 +1 +3 -1 -3 +1 +3

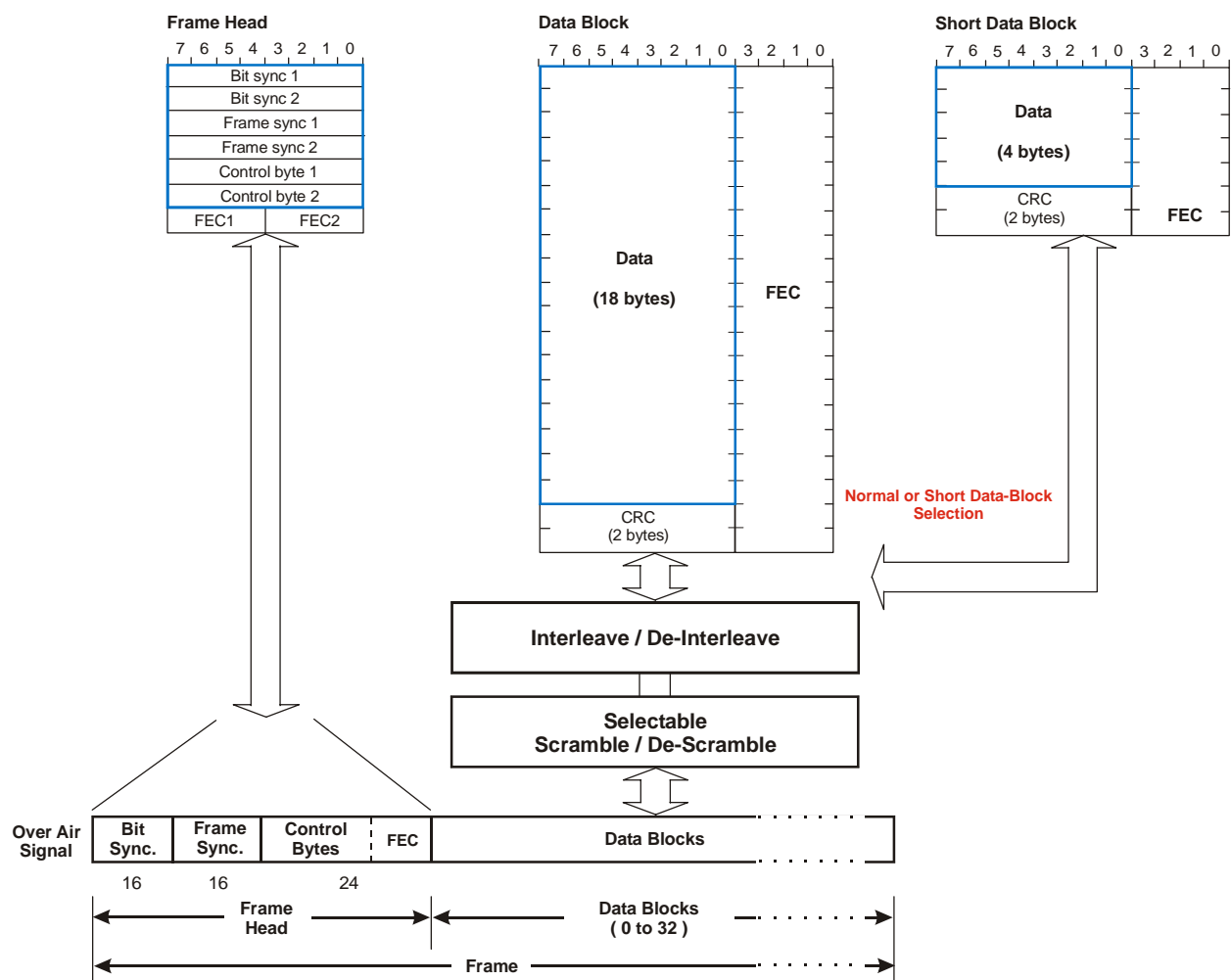
sent first

last

Symbol Sync : at least 24 symbols of '..+3 +3 -3 -3 ...' sequence

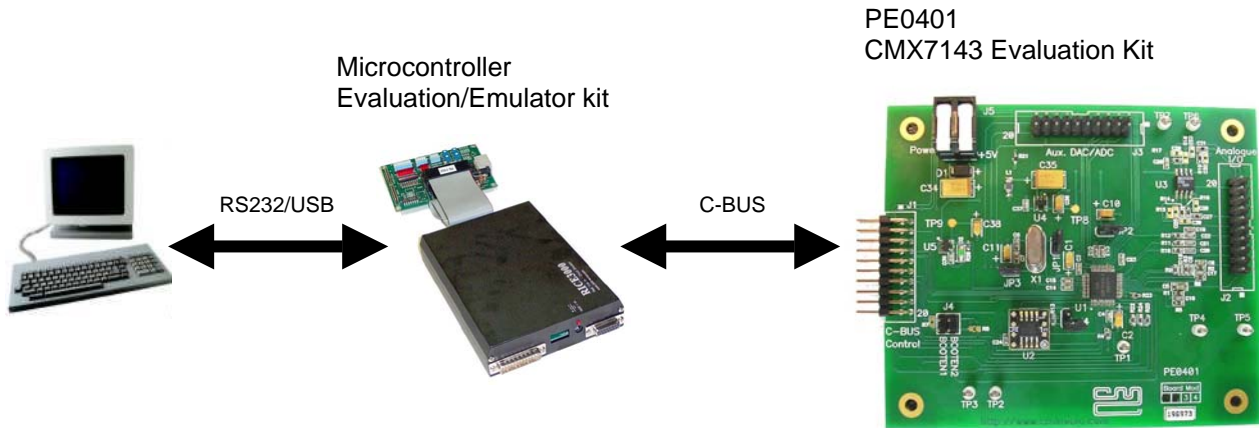
Function Image™ FI-1.0 - GMSK Modem Overview

- Configurable data rates up to 19.2kbps
- Viterbi decoding algorithm
- Packet data definition as defined within the CMX909B datasheet
 - Programmable BT = 0.25, 0.27, 0.3 and 0.5
 - Frame sync words
 - Frame header
 - Data block
 - Data block size
 - CRC and FEC coding and decoding
 - Interleaving/de-interleaving
 - Scrambling/de-scrambling
 - Including Mobitex R14N short block frames
 - Flexible frame structure Head and Data block
 - Complete frame construction/destruction utilising a data buffer



Product Support

- PE0401 is the evaluation card for the CMX7143
- Specific Function Images can be downloaded into the PE0401 for complete evaluation of the CMX7143 device
- Microcontroller evaluation/emulator kit is required with a suitable program to control the PE0401 C-BUS port



Products

CMX7143Q3 – 48 pin VQFN package
CMX7143L4 – 48 pin LQFP package
PE0401 – Evaluation kit

CML website www.cmlmicro.com

Product overview
Product preview document
Datasheet

CML technical portal (My CML)

Complete datasheet + product user manual
Function Image™ data files
Evaluation kit support
Application notes
FAQs



www.cmlmicro.com

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