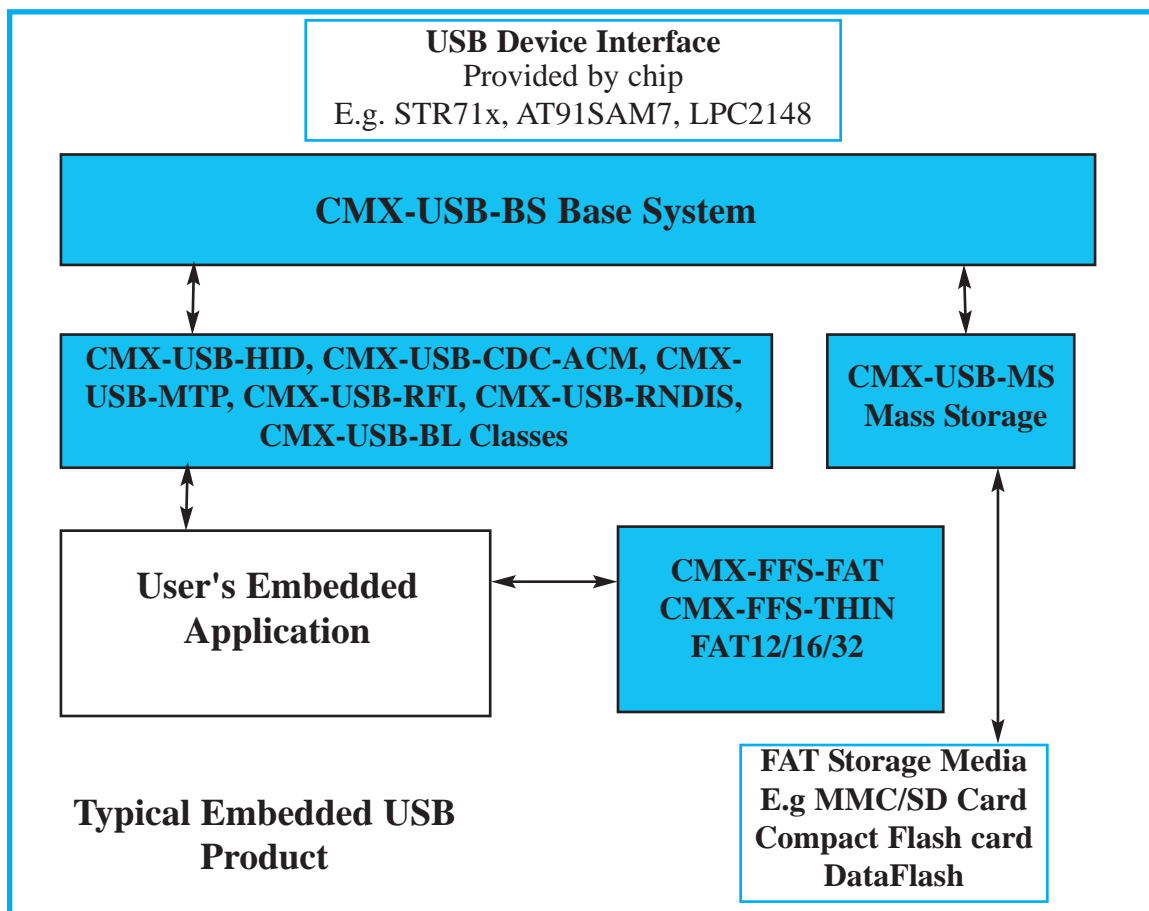# CMX-USB™

CMX-USB - Overview

CMX Systems is a well-known provider of Embedded Software Solutions. CMX-USB is targeted at systems which need USB device connectivity and the USB interface is provided to the End Point management level. CMX-USB provides an integrated suite of USB device functionality that also includes pre-built packages for several targets. Adding device USB connectivity just got easier for the embedded developer.

USB Device Interface
Provided by chip
E.g. STR71x, AT91SAM7, LPC2148

CMX-USB-BS Base System

CMX-USB-HID, CMX-USB-CDC-ACM, CMX-USB-MTP, CMX-USB-RFI, CMX-USB-RNDIS, CMX-USB-BL Classes

CMX-USB-MS Mass Storage

User's Embedded Application

CMX-FFS-FAT CMX-FFS-THIN FAT12/16/32

Typical Embedded USB Product

FAT Storage Media E.g MMC/SD Card Compact Flash card DataFlash

CMX-USB Base System - CMX-USB-BS handles all the basic setup and management of the USB system. The system assumes a USB Device Controller which handles all of USB up to the end point level. Also, part of the CMX-USB-BS system is the USB configuration including: Vendor ID, Product ID, End Point Type, End Point Addresses, Bulk, Interrupt, Control channels.

CMX-USB-MS Mass Storage - CMX-USB-MS storage allows you to connect standard PC compatible storage media attached to your embedded system like a standard pen-drive. The package includes the USB SCSI layer and also the low level drivers for attaching media to the device. Possible media you can attach include: Compact Flash cards, MMC/SD cards, HDDs, DataFlash and NAND flash. CMX provides tested drivers and reference schematics for all these media types.

CMX-USB-CDC-ACM - This Class driver provides a CDC class implementation for supporting standard comm ports. An API is provided which allows the comm port to be either virtual in your embedded application or connect it to a serial port on your embedded design. Provided is a sample application, which has an embedded command line terminal which can be accessed by the standard Windows terminal program (e.g. HyperTerm) through a Comm port over USB interface.

CMX-USB-MTP - This Class driver provides the Windows XP/Vista compliant Media Transfer Protocol (MTP) widely used in the design of portable media devices. This class driver option and Mass Storage alternative, appears as a standard drive to the host and can also be used with CMX-FFS file systems to provide synchronized device/ host file system access as well as API controlled file system access.

The CMX-USB-RFI - This Class driver is a Windows XP/Vista compatible alternative to Mass Storage and Media Transfer Protocol (MTP). CMX-USB-RFI provides improvements to Mass Storage including the ability to synchronize PC and embedded application access, and the ability to incorporate a file system with greater reliability than available with FAT. The CMX-USB-RFI device driver is provided at no charge with the purchase of the CMX-USB-RFI Windows Driver software.

CMX-USB-RNDIS - This Class driver is a USB virtual Ethernet driver with a simple API for easy integration with any TCP/IP stack or Ethernet driver interface. RNDIS Class allows the embedded target to appear as a standard network card to the host allowing access to the target from a directly connected PC or from devices sharing the same network.

File Systems

CMX also provides file system solutions for embedded systems. In particular the CMX-FFS-SAFE-FAT, CMX-FFS-FAT and CMX-FFS-THIN products are optimal solutions for running fully featured FAT file systems on Microcontrollers. The standard features include FAT12/16/32 and long filenames which make it as simple as possible to access standard flash devices both from your embedded application and through USB mass storage.

Integrated Packages

CMX offers complete pre-ported packages for several Microcontrollers. A complete tested project can be delivered including reference schematics which means that the developer gets an instant success in the project and can immediately focus on their core competences.

These packages work on various standard evaluation boards. Please contact CMX for more information about this.

CMX Systems, Inc.

CMX Embedded Software Products are shipped royalty free, with full 'C' source code, 6 months technical support and software updates.
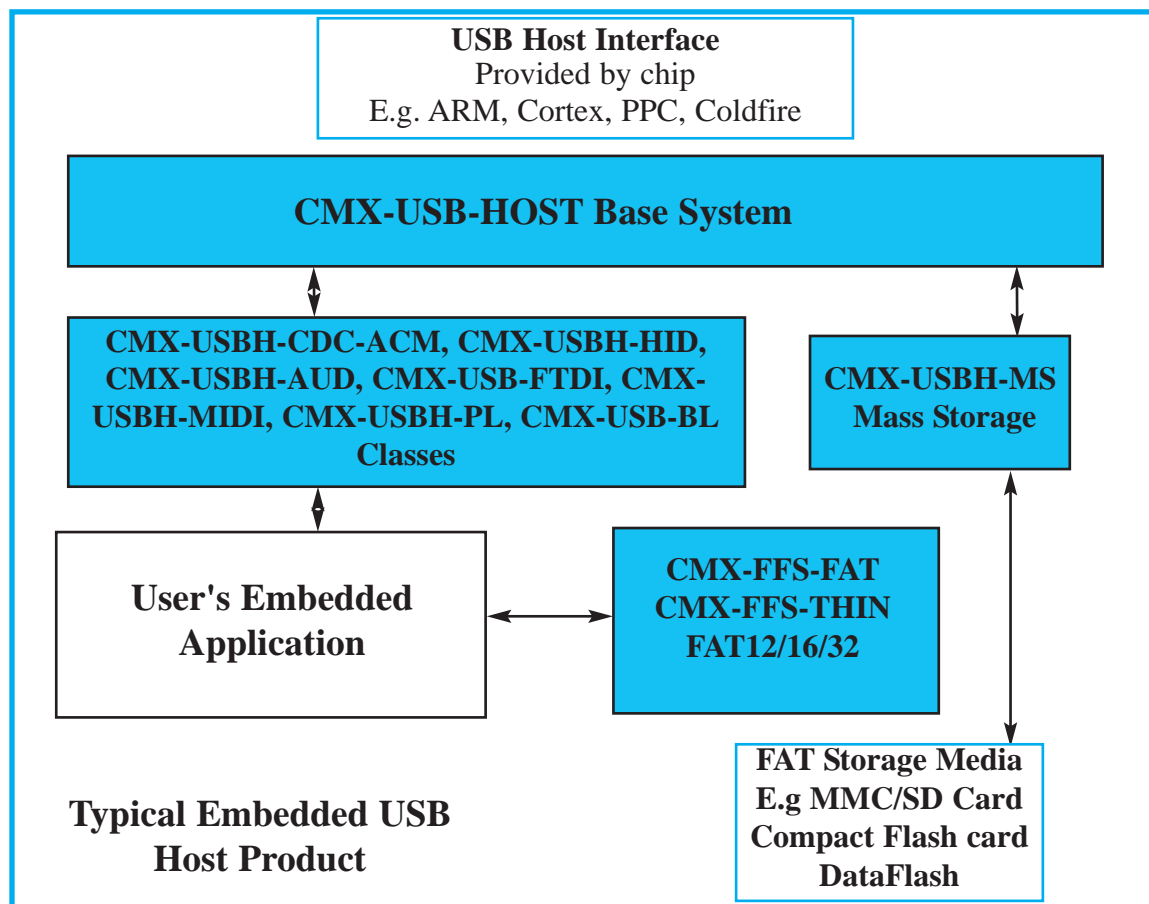
Contact Comsol for a current list of supported processors.

CMX-USB Host™

CMX-USB Host - Overview

CMX Systems is a well-known provider of Embedded Software Solutions. CMX-USB-Host is targeted at systems which need USB Host connectivity and the USB interface is provided to the End Point management level. CMX-USB Host Software provides an integrated suite of USB Host functionality that also includes pre-built packages for several targets. Adding USB Host connectivity just got easier for the embedded developer.

USB Host Interface
Provided by chip
E.g. ARM, Cortex, PPC, Coldfire

CMX-USB-HOST Base System

CMX-USBH-CDC-ACM, CMX-USBH-HID, CMX-USBH-AUD, CMX-USB-FTDI, CMX-USBH-MIDI, CMX-USBH-PL, CMX-USB-BL Classes

CMX-USBH-MS Mass Storage

User's Embedded Application

CMX-FFS-FAT CMX-FFS-THIN FAT12/16/32

Typical Embedded USB Host Product

FAT Storage Media E.g MMC/SD Card Compact Flash card DataFlash

CMX-USB-Host Base System

CMX-USB-Host (OHCI or EHCI or Non-Standard) is designed both for microcontrollers with integrated USB host controllers and for external USB host controllers. Designed as a small footprint, efficient driver - it works seamlessly with any host controller. The CMX-USB-Host package is fully compatible with CMX's Host Class drivers for Mass Storage, CDC, HID, Audio, FTDI, MIDI and Printer. CMX-USB-Host Mass Storage is fully compatible with CMX-FFS-FAT.

CMX-USBH-CDC-ACM - This Class driver enables the designer to provide a virtual USB serial port on the embedded target which acts as a standard serial port and can be accessed using simple, serial API functions. CMX-USBH-CDC-ACM is optimized to use minimal RAM and ROM and requires just the control channel endpoint and a single interrupt endpoint.

CMX-USBH-HID - This Class driver enables the designer to provide support for Human Interface Devices such as a mouse, keyboard or joystick.

CMX-USBH-MS Mass Storage - This Class driver allows any flash drive to plug into the host system and to be read by the hosts file system. The system allows the host to access the drive using the minimum possible RAM and ROM requirements. It can be used with both an integrated USB host controller or with an external USB host controller. CMX-USBH-MS uses just the control channel endpoint and two bulk endpoints. CMX-USBH-MS is fully compatible with CMX-FFS-FAT and CMX-FFS-THIN Flash File System product.

CMX-USBH-AUD - This Audio Class driver supplies a wide range of audio functions for embedded USB Hosts supporting USB speakers and / microphones. Supporting both TYPE I (PCM/PCM8) and TYPE II (MPEG) stream formats, CMX-USBH-AUD provides sample rate adjustment for the audio device rate, volume and mute control, graphic equalizer, loudness, bass boost, input terminal (IT) of streaming type for playback, and output terminal (OT) for recording. Processing features provided include; up/down mix, Dolby Prologic, 3D stereo extender, reverb, chorus, compression and processing unit extension. CMX-USBH-AUD also includes a mixer unit, line in or microphone selection and AF Version 1 (full speed).

CMX-USBH-FTDI - This Class driver is available for embedded designs which include FTDI USB to Serial converter devices.

The CMX-USBH-MIDI - Implements the Musical Instrument Digital Interface protocol when required for USB Host applications.

The CMX-USBH-PL - The Print Class driver enabling USB Hosts to interface with PLC5 format compliant printers.

Integrated Packages

CMX offers complete pre-ported packages for several Microcontrollers with integrated USB HOST and external USB Host controllers. A complete tested project can be delivered including reference schematics which means that the developer gets an instant success in the project and can immediately focus on their core competences.
These packages work on various standard evaluation boards. Please contact CMX for more information about this.

CMX Systems, Inc.

CMX Embedded Software Products are shipped royalty free, with full 'C' source code, 6 months technical support and software updates.

Contact Comsol for a current list of supported processors.

Bootloaders

CMX offers a variety of Bootloaders all of which are installed as fixed boot stubs in the target processor. Based on the developers' trigger mechanism, the bootloader will check for a new code image. If available, the bootloader will program the image into the device. Specific Bootloader variants include:

CMX-USB-BL - Used to configure a bootloader that loads a new code image from a host (PC) application over a USB connection.

CMX-USBH-BL - A standalone boot stub that can read a new code image from any USB pen drive, and use it to update your target device's firmware safely.

CMX-FAT-BL - Checks an attached SD card (or other similar media) for a new code image and if available, programs the image into the device.

Window Drivers

CMX-USB-RFI - This windows driver is a Windows XP/Vista compatible alternative to Mass Storage and Media Transfer Protocol (MTP). CMX-USB-RFI provides improvements to Mass Storage including the ability to synchronize PC and embedded application access, and the ability to incorporate a file system with greater reliability than available with FAT. The CMX-USB-RFI device driver is provided at no charge with the purchase of the CMX-USB-RFI Windows Driver software.

Integrated Packages

CMX offers complete pre-ported packages for several Microcontrollers. A complete tested project can be delivered including reference schematics which means that the developer gets an instant success in the project and can immediately focus on their core competences.

These packages work on various standard evaluation boards. Please contact CMX for more information about this.

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