

## 2 Channels CAN Controller – USB 2.0

*Two Channels Multipurpose communications applications- Protocol Converter*

### Features

#### CAN Bus:

- High Speed CAN interface according to ISO 11898-2
- Time-stamped CAN messages
- Supports 11-bit (CAN 2.0A) and 29-bit (CAN 2.0B active) identifiers
- Bit rates" 10 to 1000 kbps
- Reliable error handling
- Low Power consumption
- NEMA Compliance
- Isolated CAN Channels

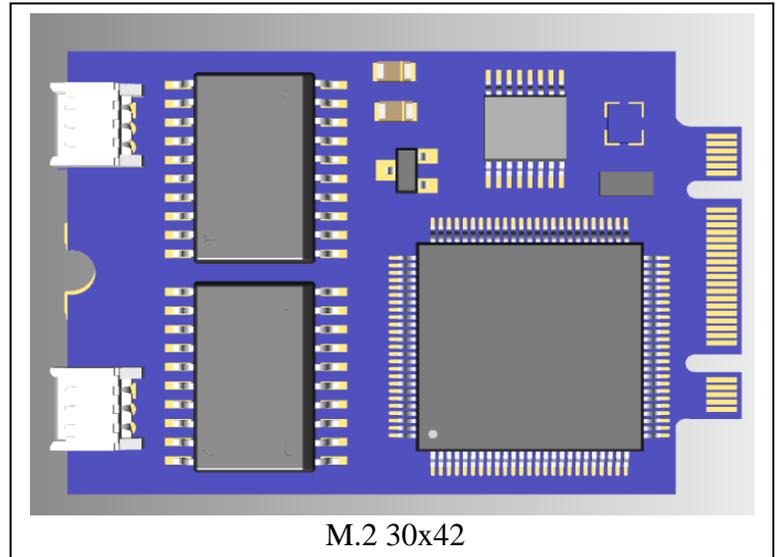
#### USB interface:

- Fully compliant with USB 2.0 spec.
- Supports Control, Bulk, Interrupt and Isochronous endpoints
- Endpoint Maximum packet size selection by software
- Supports DMA transfers with the DMA RAM of 16KB
  - USB host controller
- OHCI compliant
- Two downstream ports

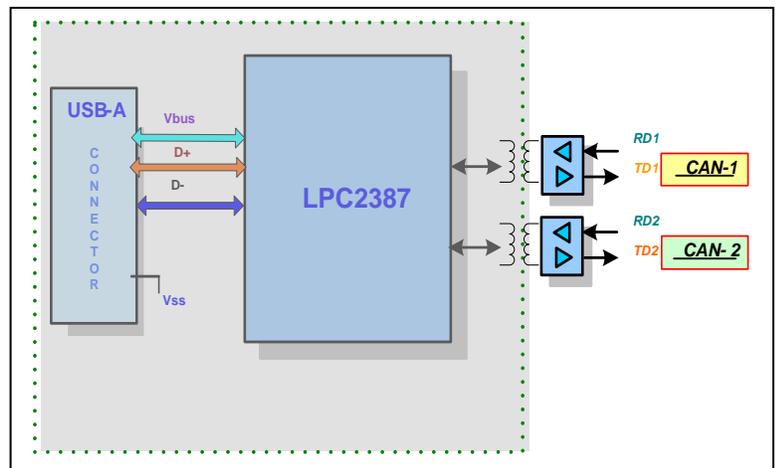
### Block Diagram and Operational Overview

The **M.2-CAN-2** board is engineered around the NXP LPC2387 microcontroller. This highly integrated 32 bits microcontroller based on the ARM7TDMI-S processor, has a very low power consumption and features 512 kB of on-chip high-speed flash memory. It incorporates several communications ports, specifically a USB full-speed Device/Host/OTG Controller with 4 kB of endpoint RAM, and two Controller Area Network (CAN) channels.

The device controller enables 12 Mbit/s data exchange with a USB host controller. It consists of a register interface, serial interface engine, endpoint buffer memory, and a DMA controller. The serial interface engine decodes the USB data stream and writes data to the appropriate endpoint buffer. The status of a completed USB transfer or error condition is indicated via status registers.



**Fig.1**



### Block Diagram

An interrupt is also generated if enabled. When enabled, the DMA controller transfers data between the endpoint buffer and the USB RAM.

The Controller Area Network (CAN) is a serial communications protocol that efficiently supports distributed real-time control with a very high level of security.

Its domain of application ranges from high-speed networks to low-cost multiplex wiring.

### **Applications:**

This board is optimally suited for communications gateway and protocol converters. This is a perfect solution for:

- Avionics equipment
- Avionic data communication systems
- Medical systems
- Industrial controls
- Others

### **Software Support:**

#### **LPC2387 Device Specifications:**

- Fully compliant with USB 2.0 Specification (full speed).
- Supports 32 physical (16 logical) endpoints with a 4 kB endpoint buffer RAM.
- Supports Control, Bulk, Interrupt and Isochronous endpoints.
- Scalable realization of endpoints at run time.
- Endpoint Maximum packet size selection (up to USB maximum specification) by software at run time.
- Supports SoftConnect and GoodLink features.
- While USB is in the Suspend mode, the LPC2387 can enter one of the reduced power modes and wake up on USB activity.
- Supports DMA transfers with the DMA RAM of 16 kB on all non-control endpoints.
- Allows dynamic switching between CPU-controlled and DMA modes.
- Double buffer implementation for Bulk and Isochronous endpoints.

- Two CAN controllers and buses.
- Data rates to 1 Mbit/s on each bus.
- 32-bit register and RAM access.
- Compatible with CAN specification 2.0B, ISO 11898-1.
- Global Acceptance Filter recognizes 11-bit and 29-bit receive identifiers for all CAN buses.
- Acceptance Filter can provide FullCAN-style automatic reception for selected Standard Identifiers.
- FullCAN messages can generate interrupts.

#### **Mechanical: Environmental:**

- Size – M.2 Module  
30 mm x 42 mm
- Power – T.B.D.
- Front panel I/O
- Vibration – 0.5G, 20-2000 Hz rand
- Shock – 20G, 11 msec, ½ sine
- Weight – tbd
- MTBF – >250,000 hours

#### **Operating Environment:**

- Operating temperature  
Commercial: 0 to +70 °C  
Optional: -40 °C to +85 °C
- Non-operating: -60 °C to +120 °C
- Humidity – 5 to 90% (non-cond)
- Altitude – 0 to 10,000 feet

#### **Ordering Information:**

**Part number: M.2 –CAN-2:** CAN Bus and USB interface on M.2 22x60

**Part number: M.2 –CAN-2I:** Same as above with -40 to +85 C M.2 22x60

**Part number: M.2 –CAN-2ICC:** Same -40 to +85 C Conformal Coated

#### **Optional Accessories**

**Part number: CBL-Mini-CAN-12** CAN Cable, 12 Inch Micro to DB9