Dual-core micro-controller for embedded systems with two CAN ports

Texas Instruments (USA) has launched the Concerto micro-controller featuring C28x and ARM-Cortex-M3 cores. This chip is intended for embedded control and provides two CAN modules. Empowering developers to design greener, more connected applications, the chipmaker has implemented several peripherals on the 32-bit dual-core MCU. To make them easy to use, an intuitive software-infrastructure as well as application and connectivity libraries within in the Controlsuite software support the chips. The MCU series includes safety and security features and is code-compatible across the C2000 platform to enable scalability and code reuse in applications such as motor control, renewable energy, smart grid, digital power and electric vehicles.

“Greener” (more energy-efficient) applications require the performance of a real-time control MCU to execute complex algorithms needed for precise, efficient power conversion, which is the essence of efficient motor control, renewable energy and smart grid technologies. But to take that efficiency to new levels that can dramatically save energy, these applications must also be connected for remote data sharing, diagnostics, monitoring and control. TI’s dual-core chips enable developers to do both real-time control and connectivity within one microcontroller, eliminating the traditional need to choose between optimal performance and advanced connectivity.

According to the chipmaker, the C28x real-time control core with floating point and the Viterbi Complex Math Unit delivers thirteen times the performance over existing MCUs. The Cortex-M3 host-controller implements the peripherals such as two CAN modules, Ethernet and USB controller as well as multiple serial communication ports (four SSI, five UART, and two I2C). The chips are available in 150/75 MHz, 100/100 MHz or 60/60 MHz (C28x/Cortex-M3) versions.

The two DCAN modules with a dual clock source are compliant to ISO 11898-1 and support data-rates up to 1 Mbit/s. For communication on a CAN network, individual message objects can be configured. The 32 or 64 message objects and identifier masks are stored in the Message RAM. All functions concerning the handling of messages are implemented in the message handler. Those functions are acceptance filtering, the transfer of messages between the CAN Core and the Message RAM, the handling of transmission requests as well as the generation of interrupts or DMA requests. The register set of the DCAN can be accessed directly by the CPU via the module interface. These registers are used to control and configure the CAN Core and the Message Handler, and to access the Message RAM. The CAN implementations feature a programmable FIFO mode for the message objects.

The CAN modules provide parity checks to improve safety and security functionality. The on-chip 1-MiB flash-memory and the 132-KiB RAM provide error correction capability. There are also redundancy functions and lock protection implemented.

The MCUs come in a 144-pin QFP-package. Sampling has started already. The price per chip starts at 6.99 US-$ in quantities of 1,000 pieces.

The F28M35x Experiment Kit includes the F28M35x Controlcard and docking station to enable developers to begin evaluation and development. There are also online on-demand trainings for the Concerto MCU. Third-party software is also available.

The MCUs have been designed for industrial automation devices. The host controller core is used for communication tasks while the control core is handling the PWM for motion control. This allows implementing improved control algorithms, e.g., for multi-axis control. Another intended application is devices for solar farms: The host controller core manages and diagnoses the device; the control core processes the tracking algorithms or switches smartly between grid connection and battery system. In both mentioned application fields, CAN is an important communication technology. The two CAN ports support the separation of local extensions for complex devices and general-purpose communication to other devices. (hz) www.ti.com

Plug-in-boards with 8-bit MCU

Microchip (USA) has expanded its 8-bit CAN microcontroller family (PIC18F “K80”), and offers plug-in modules with this processor for the PIC18 Explorer Board. For CAN evaluation, the PICtail daughter board may be used in conjunction with Explorer development boards. The MCUs are available in 28-, 40-, 44-, and 64-pin packages. They feature an on-chip 12-bit analog-to-digital converter and a touch-sensing peripheral for advanced sensor applications. The MCUs are designed for automotive body control units, building automation including lift control, and industrial applications, which require CAN connectivity. (hz) www.microchip.com

www.microchip.com
You CAN get it…
Hardware & software for CAN bus applications…

PCAN-USB Pro
High-speed USB 2.0 interface with galvanic isolation for connecting up to 2 CAN and 2 LIN busses.

PCAN-GPRS Link
Development platform with CAN, GPS, and GPRS. Interpretation of OBD-II, FMS-, DTCO-, & CiA® 447.

PCAN-Repeater
Repeater for the galvanic isolation of 2 CAN bus segments, bus status display, switchable termination.

PCAN-Router Pro
Configurable four channel CAN router with data logger incl. configuration software.

PCAN-Explorer 5
The universal tool for developing and monitoring CAN networks.
- Extensive user interface improvements: File management via projects, configuration of all elements with the property editor, and window arrangement using tabs
- Simultaneous connections with multiple networks / CAN interfaces of the same hardware type
- Configurable symbolic message representation
- Data logging with tracers and the 4-channel Line Writer
- VBScript interface for the creation of macros
- Functionality upgrades with add-ins (e.g. J1939 Add-in)
- User interface language in English or German

PCAN-Diag 2
PCAN-Diag 2 is a handheld CAN bus diagnostics unit. The new model offers enhanced functionality:
- Clear CAN traffic representation in lists, configurable symbolic representation of received messages
- Transmission of individual CAN frames or CAN frame lists
- Built-in 2-channel oscilloscope for detailed analysis of the differential CAN signal or an optional external signal, triggering by CAN IDs or other events
- Bit rate detection, bus load and termination measurement
- Windows® software for easy device configuration and transmit list definition, upload via USB connection
- Storage of diagnostic results (CSV, BMP) on an internal 1 GB mass storage USB device

PCAN-ExpressCard
CAN interface for Express-Card slots. Available as 1-channel, 2-channel, and opto-isolated version.

PCAN-PCI Express
CAN interface for PCI Express slots. Available as 1-channel, 2-channel, and opto-isolated version.

PCAN-cPCI
CAN interface for cPCI slots. Available as 2-channel and 4-channel opto-isolated versions.