Spansion shows two new ARM Cortex-M4-based micro-controllers: the FM4 S6E2DH series with a 2D integrated graphics display controller and the S6E2C-CxxF/MB9BF568F series with self-contained voice command control. The S6E2CCxxF/MB9BF568F series comes with a CAN port and offers over-the-air firmware update support via Wi-Fi. It features up to 2 MiB of Flash separated into two banks allowing firmware updates during device operation. The voice command control solution library features a speaker-independent voice control, built-in noise reduction, and multiple language support. A voice control-enabled starter kit is available along with the command programming software.

The FM4 S6E2DH series provides CAN FD as well as Micro-controller interfaces for connecting to NAND and NOR Flash and SDRAM. With these, it is an embedded processor for integrating displays in industrial, consumer, and home applications. The graphics display controller enables graphics processing and offloads the micro-controller CPU for other application functions. It comes with a low-level library for drawing and fast rendering of 2D shapes, in addition to several image processing features.

Infotainment platform
Android operating system
TES offers a range of platforms for infotainment. Aviator II is based on Texas Instrument’s Davinci/OMAP DM3730 processor and comes with an Android operating system. A power supply board according to automotive standards, including load dump and fuse protection, completes the package. Bluetooth and WiFi allow wireless data transfer with a variety of devices. To allow seamless integration into automotive environments, a CAN connection is provided. The video screen can be fed with the HDMI output installed.

Controller core
CAN FD for the automotive sector
Fraunhofer IPMS presents a CAN FD Controller Core for the automotive sector. The IPMS_CAN core implements functionality similar to the Philips SJA1000 working with its Pelican CAN mode extensions, providing error analysis, diagnosis, system maintenance, and optimization features. The core offers a CAN FD extension to increase net data throughput. It comprises data fields up to 64 bytes, extended CRC checksum, and a higher data rate for the payload.
in-CAN network, it is er control and built-
quad-core processor.
er with Intel Atom E3845
in-vehicle fanless comput-
The Nuvo-2510VTC is an
applications, such as
mobile NVR and mobile
APNR. The DC input can
be powered by 12-Vdc or
24-Vdc vehicle batteries.
The product provides two
PoE+ Gigabit Ethernet ports
and a USB 3.0 port for indus-
try cameras and IP cam-
eras. For mobile applications
which require data trans-
mission, it is possible to
install two 3G/4G mod-
ules with USIMs in its two
PCI Express (mPCIe) sock-
et.

All cards are supported by
the Ixxat Windows driver
packages (VCI) and the
real-time driver packages
(ECI for Linux, RTX, Intime,
QNX, VxWorks). Similarly,
the Ixxat APIs for CANopen
and J1939 support the
interfaces. For the analy-
sis of CAN and CAN FD
networks, HMS offers a
Windows-based analytical
tool with the Ixxat CAN
Analyser.

Bus nodes

The Unigate IC bus nodes
come in a 32-DIL housing and
have been designed for em-
bedded solutions for direct in-
tegration into terminal devic-
es. The modules comprise a
micro-controller, flash, RAM,
and a bus controller and han-
dle the complete communi-
cation on the bus side. They
are connected to the host pro-
cessor via a UART interface.
The company offers models
compatible, so that updates
of firmware can be done
with a CANopen Master or
configuration tool. The adap-
tion to different target hard-
wares is possible and also
a manufacturer specific pro-
code can be integrated.

Bootloader

The CANopen Bootloader
was developed to save mem-
ory resources. It supports the
necessary services and ob-
jects for a bootloader accord-
ing to CiA 302-2. 6 KIB to 8
KIB flash memory are suf-
ficient for the bootloader
and it is still fully CANopen

higher resolution for config-
uring bit timing than required
in the ISO specification.
In terms of bus interfaces,
all that users will need is a
driver that supports the ISO
standard.

Test tool

Vector supports the upcoming
ISO 11898-1: 2015 stan-
dard for CAN and CAN FD in
version 8.5 of its CANoe de-
velopment, simulation, and
test tool and CANalyzer
analysis tool. It provides a

The company offers models

Software library

Developing CAN FD devices

The CANopen Protocol
Stack is a software library
that features CiA 301 V 4.2.
The latest version supports
CAN FD. It is developed in
ANSI-C. CANopen-con-
form devices can be devel-
oped or extended with this
software. Its user interface
provides functions to evalu-
ate the received data and to

functions or for operating their
device directly in Codesys.

use the CANopen services in
the network. To connect the
stack to multiple CAN con-
trollers and CPU types, a
driver interface is used. Us-
ing this interface, the stack
can be adapted to CAN con-
trollers or CPU types. Also, it
is possible to substitute hard-
ware platforms. The stack is
configurable and scalable.

In-vehicle PC

Mobile applications

The Nuvo-2510VTC is an
in-vehicle fanless comput-
er with Intel Atom E3845
quad-core processor. Along
with ignition pow-
er control and built-
in CAN network, it is
ideal for light-weight mobile
embedded devices for indus-
trial purposes. Configu-
ration tools for the connect-
ion to serial bus systems
such as CAN/CANopen,
Profibus/Profinet or Ether-
cat are integrated into the
tool and the required proto-
col stacks are made avail-
able in form of libraries. The
user can create visualization
screens for testing their
program, for diagnostic pur-
poses or for operating their
device directly in Codesys.

The Codesys Development
System is used in applica-
tions worldwide to program
embedded devices. Codesys
contains different tex-
tual and graphical editors. The
code created in these
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Emtas
Hall 4/4-129

Emtas
Hall 4/4-129

Interface series

Expanded with PCI cards

The CAN-IB300/PCI and
CAN-IB400/PCI cards by
HMS allow users to con-
nect a computer to a CAN
network. They expand the
CAN-IB range, consisting of
PCle, PCle-Mini and PCle-
104 cards. Besides up to
four high-speed CAN chan-
nels, the low-speed CAN
standard is also supported.
Additionally, the products
can be equipped with up to
four LIN or K-Line interfaces.
The active CAN-IB400/PCI
has a 32-bit micro-control-
er. This en-ables handling and
filtering of the messages to
be sent and received on the
card.

Bus nodes

For industry protocols

The Unigate IC bus nodes
come in a 32-DIL housing and
and with a CANopen Master or

The latest version supports
CAN FD. It is developed in
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ate the received data and to

Emtas
Hall 4/4-129

for CANopen, Profibus, De-
vicenet, Modbus TCP, Profi-
net, Ethercat, Ethernet, Lon
Works, and Bacnet. Further-
more, models with an EIA-232
or EIA-485 interface are avail-
able for Modbus RTU and
Modbus ASCII.

Deutschmann
Hall 1/1-140

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Emtas
Hall 4/4-129

Expan
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Emtas
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Hall 1/1-140

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Test tool

Support for CAN FD

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Protocol stacks
CANopen and Devicenet

The company offers protocol stacks and drivers which allow the usage of different protocols as Profibus, Arconet, 3964R, ISDN stack, or USB port driver. For CAN applications they offer protocol stacks like CANopen and Devicenet. A set of CAN drivers support different controllers. For communication between microcontrollers Euros provides drivers and protocol stacks for SPI und I²C.

Embedded Office
Hall 4/4-350

Software
Analyzing serial bus systems

The CANexplorer 4 offers various functions for processing CAN data, e.g. classical text-based traces, graphs, bar graphs, LEDs, filters and triggers. It is also possible to use an integrated protocol abstraction for automatically interpreting data to CANopen and J1939. The CAN data is then available as pre-processed and ‘readable’ information. Further protocol stacks can be added with updates. All proprietary protocols and Raw CAN data can be processed with a manual symbol editor. This tool is used for defining symbols and translating the payload of a CAN frame into comprehensible values. Generating a test set-up can be carried out by connecting different functionals elements via ‘Drag & Drop’. This enables the software to display complex processes. Every test set-up is also displayed in a project-tree at the left side of the application window. The product obtains a multi-thread support for parallel usage next to other applications running on a PC and the visualization of various modules at the same time.

Pike Tec
Hall 4/4-518

Panel PC
For Marine applications

The maritime field faces critical environmental challenges, making reliable and rugged systems essential. IEI provides maritime professionals with marine-grade computers and panel PCs that use technologies and designs which are suitable for applications on the dock, on an open deck, or in the control room or bridge. The fanless panel PC with 4th generation Intel Core i5 dual-core processor features two isolated CAN channels.

IEI Integration
Hall 2/2-311

Test tool
Possible CAN integration

Based on the requirements of testing procedures, especially while testing safety relevant systems, the company has designed the test tool TPT (Time Partition Testing). It gathers and presents steps of the testing process in an environment. The tool can test several software types on different levels of integration. Model-in-the-loop, software-in-the-loop or hardware-in-the-loop models can be tested. A CAN network, Matlab Simulink, C-Code, and Ascet can be integrated.

Sontheim
Hall 1/1-571

SICHERER, SCHNELLER, WIRTSCHAFTLICHER
Mehr Transparenz und Effektivität durch Protokollstacks.
WIR SEHEN UNS ... Halle 4 / Stand 143
Telecontroller

**For virtual plants**

The PFC200 controller is now also available as a telecontrol variant. It supports the telecontrol protocols IEC 60870-5-101, -103 and -104, IEC 61850 as well as IEC 61400-25, including Goose telegrams. The interfaces such as CAN, Profibus, EIA-232/EIA-458, and Dual-LAN make the product suitable for telecontrol tasks. However, the connection options for CAN and Profibus make the controller a gateway between the control system and CHP units or wind turbines. They have a temperature range from -20 °C to +60 °C.

Analyzing

**Probes from 3rd parties**

Trace Analyzer analyses the timing of actual traces obtained from 3rd party probes such as Vector CANAnalyzer, Lauterbach Trace32 or Gliwa T1. The tool supports Osek, Autosar, and Arinc 653 (IMA). Analysis and optimization of multi-core ECUs are supported, as well as functional safety considerations. The tool supports CAN, CAN-FD, Flexray, Arinc 664 (AFDX) and Ethernet. Analysis and optimization of gateways are supported. Scripting, remote access, import / export and report capabilities enable automated integration into customer workflows and with 3rd party tools.

Wago

Hall 1/1-560

USB/CAN interface

**For industrial PCs**

For applications with restricted space conditions EMS offers the USB/CAN interface CPC-USB/embedded which is a CAN interface for internal USB ports. Due to its size of 36 mm x 36 mm x 16 mm it is suitable for applications in embedded PCs. It is installed directly at a SUB-D9 case opening or a slot panel and wired with the included cable to a pin connector of an internal USB interface of the mainboard. The interface comes with a Cortex M3 microcontroller providing on-chip CAN and USB controllers. By combining the CPU with internal peripherals low latencies can be achieved. The interface is powered via USB, a separate supply for the CAN side is not needed.

Micro-controller

**Two CAN modules**

Atlantik Elektronik presents the portfolio of Nuvoton's ARM Cortex-M0/M4 derivatives with Ethernet, CAN, Smart Card Interfaces and USB for the implementation of industrial control systems. The MCUs by Nuvoton feature two CAN on-chip modules from Bosch. The CAN modules comply with ISO 11898-1:2003 supporting 11-bit and 29-bit identifiers.

Atlantik Elektronik

Hall 5/5-410

Stamp Module

**For CAN FD to USB**

For the implementation of a CAN connection in own circuits, Peak-System introduces the stamp module PCAN-Chip USB at the Embedded World 2015 in Nuremberg, Germany. The communication with the CAN FD channel is done via the module's USB 2.0 interface. The actual used physical CAN transmission is determined by the transceiver to be implemented by the developer. The stamp module has side lengths of 25 mm by 20 mm and is suitable for automatic insertion due to the single-sided component placement and the half-whole edge contacts. The separately available board PCAN-USB Chip Eval with example circuits provides an environment for testing purposes.

Peak-System

Hall 1/1-606

Creating apps

With the Andox users have the possibility to port and run their own apps. Control applications with display configurations have been implemented. The panel display works under the Android and Linux operating systems. Apps can be created with the free Android Studio IDE Developer Tool so the user can put their idea into real applications and work with it immediately. The unit comes with a

Freescale i.MX6 ARM processor. The product features CAN, USB, HDMI, EIA-232/485, GPIOs, two µSD Card Slots and a 8 VDC to 28 VDC wide range input.

EMTrust

Hall 1/1-558

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EMTrust

Hall 1/1-558
All you CAN plug

**CAN-PCIe/402**
- up to 4 high performance PCI Express CAN interfaces
- DMA busmaster
- Powered by esd Advanced CAN Core (esd-ACC)
- MSI (Message Signaled Interrupt) support
- Electrically isolated
- Provides high resolution hardware timestamp

**CAN-USB/400**
- 2 high performance CAN-USB interfaces
- Powered by esd Advanced CAN Core (esd-ACC)
- USB 2.0 with high speed data rates of 480 Mbit/s
- Electrically isolated
- Provides high resolution hardware timestamp
- Error injection for advanced diagnostic
- IRB 8 timecode as option

**CAN-PCI/400**
- up to 4 high performance CAN interfaces
- Powered by esd Advanced CAN Core (esd-ACC)
- Electrically isolated
- Provides high resolution hardware timestamp
- Error injection for advanced diagnostic

**CAN-PCI104/200**
- PC104-CAN interface
- One or two CAN interfaces for PC104 bus

**EtherCAN/2**
- 10/100 Baset ETHERNET-CAN Gateway
- Electrically isolated
- Configuration and Diagnostics by webbrowser

**CAN-USB/2**
- CAN-USB interface
- Intelligent CAN interface with ARM 7
- USB 2.0 with high speed data rates of 480 Mbit/s
- Electrically isolated
- Provides high resolution hardware timestamp

**Gateways**
- EtherCAT-CAN
- PROFINET-CANopen
- PROFBUS-CANopen
- PROFBUS-DeviceNet
- EtherNet/S7-CAN

**Operating Systems**
esd supports the real-time multitasking operating systems
VxWorks, QNX, RTX, RTOS-32 and others as well as Linux and Windows 32/64Bit systems

**CAN Tools**
- CANideal: Display and recording of CAN message frames
- CANplot: Display of online/offline CAN data
- CANrepro: Replay of pre-recorded CAN message frames
- CANscript: Python scripting tool to handle CAN messages
- COBview: Analysis and diagnostics of CANopen nodes

*The tools are free of charge on the driver CD or can be downloaded at [www.esd.eu](http://www.esd.eu)*
Oscilloscope

**CAN FD: Analysis solution**

The RTO and RTE digital oscilloscopes come with a high definition mode, which increases the vertical resolution to up to 16 bits – a 256-fold improvement over the 8-bit resolution available in standard mode. An addition to the RTM oscilloscope family offers a history and segmented memory option, which expands the maximum memory depth to 460 mega-samples per channel.

The API offers a two-channel, 16-bit sigma delta (ΣΔ) analog-to-digital converter (ADC) for measurement of battery voltage and current, as well as a third 16-bit ΣΔ ADC for temperature monitoring using the integrated sensor and redundant measurement plausibility checks to support functional safety. The product’s input battery voltage measurement capability supports up to 52 V directly to the device as well as higher voltage battery configurations when used with external voltage dividers. It enables operation in low-power mode for a majority of the time.

**Development platform**

**For MCU software applications**

The Universal Debug Engine (UDE) is a development platform to develop, test and maintain microcontroller software applications. Together with the Universal Access Device (UAD) it supports various MCU cores and provides built-in multi core debugging. Access to a variety of ARM derivatives is provided through the UAD2 or the UAD2pro. Features of these devices include high-speed CAN with up to 1 Mbit/s, a high-speed USB 2.0 host interface, and a fast JTAG debugger for ARM MCUs (1 MiB/s). They support serial and CAN monitors, and CANopen diagnosis.

The UDE automation interface is based on Microsoft Windows Component Object Model (COM). Different modules of the debug engine can be used from within the UDE or called by scripts from external applications.

**Middleware components**

**Offering a range**

The company offers a range of Ecos Pro compatible middleware components. The middleware enables integration into the user’s software platform. It allows engineering teams to concentrate on core application development rather than being diverted into more generic system level development. The following middleware is available directly from the company: Ecos Pro-CAN (Controller Area Network device API and drivers), CANopen (CiA standards based CAN protocol stack for industrial automation), Yaffs (Nand flash file system), Ecos Pro-MMFS (streaming multimedia file system), Ecos Pro-Secure Shell (SSH-2 compatible Secure Shell daemon), Ecos Pro-Psim (Graphics user interface middleware), HCC USB (USB host, device and OTG stacks), CEE-J (Embedded Java virtual machine), and OS Changer (Porting aid to help migrate existing applications to Ecos Pro).

**CAN interface**

**Direct integration**

The CANpro USB Embedded interface card offers easy integration of a CAN interface to a PC-internal USB connector. The interface card does not require a power supply or housing. It makes use of the USB 2.0 highspeed standard and therefore offers a high data throughput and short reaction times of 100 μs to 500 μs. The card provides an API, supporting both CAN and CANopen protocols. The API offers different operating modes with regard to the handling of individual CAN messages. In addition, a .NET API is available. The CANpro USB Embedded is also suitable for use in combination with standard software tools such as telegram analyzers or configurators.

**Battery sensor**

**AEC-Q100 qualified**

The MM921J638 is an AEC-Q100 qualified battery sensor which combines three measurement channels, a 16/32-bit MCU, and a CAN protocol module in a single package. The sensor measures key battery parameters for monitoring state of health (SOH), state of charge (SOC) and state of function (SOF) for early failure prediction. A four-cell front end architecture supports 12-V lead acid batteries as well as emerging battery applications, such as 14-V stacked cell Li-Ion, junction boxes, and 24-V truck batteries. The analog front-end includes a two-channel, 16-bit sigma delta (ΣΔ) analog-to-digital converter (ADC) for measurement of battery voltage and current, as well as a third 16-bit ΣΔ ADC for temperature monitoring using the integrated sensor and redundant measurement plausibility checks to support functional safety. The product’s input battery voltage measurement capability supports up to 52 V directly to the device as well as higher voltage battery configurations when used with external voltage dividers. It enables operation in low-power mode for a majority of the time.

**CAN controller IP**

**Now supporting CAN FD**

Bosch presents its C_CAN-FD8 protocol controller IP module for MCU integration. The CAN IP module, compatible to the C_CAN, is now supporting CAN FD mode. It can be realized as a stand-alone device, as part of an ASIC or as a FPGA (Altera or Xilinx).

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Ethernet/CAN Gateway

EtherCAN CI-ARM9/RMD
CAN/Ethernet Gateway
embedded Linux Kernel 3.10.0
ARM9 CPU / 454MHz
2GByte EMMC Flash
128 MByte RAM

HMI panel PC
Two CAN interfaces

The BS04 is a HMI panel PC with a 10.4-inch LCD. It is IP65-rated and comes with a range of interfaces including: two CAN, two CFAST, three USB (one of them on the front), two Ethernet, two EIA-422/EIA-485, and one SDHS. Its operating temperature is from -50 °C to +60 °C and its shock/vibration 10g/1g. The product features

PCI express board
Up to 4 CAN interfaces

The CAN-PCIe402 is a single lane PCIe board with Altera FPGA for one, two, or four CAN interfaces. It supports MSI (Message Signaled Interrupts) and features a selectable CAN termination on board. Additionally it provides drivers and higher layer protocols for Windows, Linux, VxWorks, QNX, RTX, RTX64 and others. CANopen, J1939 and Arinc 825 protocols are available.

Protocol stack
CANopen FD add-on

Micro Control introduces their add-on CANopen FD. The source code written in ANSI-C is an extension to the CANopen slave protocol stack and requires an ISO CAN FD controller to be used in the system. The add-on is introduced as a supplement to the CANopen FD standard (CANopen version 5.0) of CAN in Automation.

To serve the needs of the modular structure of the CANopen protocol stacks, the CAN driver CANpie has been extended to include an ISO CAN FD controller option. This way, future exchanges of microcontrollers can be facilitated as only the CAN driver will have to be exchanged. The protocol stack will remain unchanged. The introduction of CANopen FD will not affect the existing license scheme: customers receive a site-related company license without any additional royalties, including a 12-months technical support.

Tools
Configuring and simulating

The CANopen Configuration Manager allows the dynamic configuration of a CANopen network. This tool handles the error-prone PDO mapping and shows the results on a graphic image. The youCAN simulates a CANopen network. This brings the user’s laboratory environment for troubleshooting and verification as close to a real network as it can be.

CAN Products for your Needs

Successfully applied in
• Machine automation
• Building automation
• Transportation systems
• Telecommunication systems

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CAN FD Interfaces for High-Speed USB

**PCAN-USB FD**

- Single Channel CAN FD Interface
- Adapter for High-speed USB 2.0
- Time stamp resolution 1 µs
- CAN bus connection via D-Sub, 9-pin
- Complies with CAN specifications 2.0 A/B and FD CAN FD support for ISO and Non-ISO standard switchable (with firmware update coming in Q1-2015)
- CAN FD bit rates for the data field up to 12 Mbit/s
- CAN bit rates from 40 kbit/s up to 1 Mbit/s
- Measurement of the bus load including error and overload frames on the physical bus
- Induced error generation for incoming and outgoing messages
- Switcheable CAN termination and 5-Volt supply
- Galvanic isolation up to 500 V
- Extended operating temperature range from -40 to 85 °C

**Scope of Supply for all CAN FD Interfaces**
- CAN FD interface drivers for Windows 8.1, 7, Vista and Linux (32/64 bit)
- PCAN-View: Software for monitoring CAN and CAN FD busses for Windows (32/64 bit)
- PCAN-Basic: API for developing applications with CAN and CAN FD connection for Windows (32/64 bit)

**PCAN-USB Pro FD**

- Dual Channel CAN FD & LIN Interface
- Adapter for High-speed USB 2.0
- Time stamp resolution 1 µs
- Transmitting and receiving of CAN FD and LIN messages using two D-Sub connections
- Complies with CAN specifications 2.0 A/B and FD CAN FD support for ISO and Non-ISO standard switchable (with firmware update coming in Q1-2015)
- CAN FD bit rates for the data field up to 12 Mbit/s
- CAN bit rates from 40 kbit/s up to 1 Mbit/s
- Measurement of the bus load including error and overload frames on the physical bus
- Induced error generation for incoming and outgoing messages
- Switcheable CAN termination and 5-Volt supply
- Galvanic isolation up to 500 V
- Extended operating temperature range from -40 to 85 °C

**LIN operation properties ...**
- Bit rates from 1 kbit/s up to 20 kbit/s
- Both LIN channels (common ground) are optodecoupled against USB and CAN FD
- Can be used as a LIN master or slave (1 ms master task resolution)

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