BE10A

Entry-Level Box PC for Industrial Applications
Industrial Stand-Alone Device

- » *Compact low-power solution for IoT and automation applications*
- » *TI Sitara ARM Cortex-A15 AM57x8 single or dual core*
- » *Built-in quad core PRU and DSP core*
- » *1 mSATA slot, 1 microSD card slot for storage*
- » *1 PCI Express Mini Card slot with 1 microSIM slot for WLAN, GSM (2G), UMTS (3G), LTE (4G), GPS or GLONASS functionality*
- » *Gb and Fast Ethernet, USB (2.0 and 3.0), RS232, RS485/422, CAN, binary I/O, audio, DVI-D*
- » *DIN rail, wall or 19" rack mounting*
- » *Input voltage 24 V DC nom. (8 to 60 V DC range)*
- » *0 to +60°C operating temperature*
- » *Fanless and maintenance-free operation*

The BE10A is an entry-level box PC designed for a wide range of embedded computing applications. It features the latest AM57x8 Sitara ARM Cortex-A15 processors from Texas Instruments supporting 2 GB of DDR3 memory with ECC.

The BE10A meets the intense processing and communications needs of modern embedded applications and maintains low power consumption (approx. 10 W) at an ambient temperature of 60°C. Easy expansion options are available in the form of PCI Express Mini Card for wireless functionality, mSATA and microSD card.

Wide Range of Applications

In PC-based industrial automation the BE10A presents a perfect open platform for development of flexible and task specific software applications, e.g. in process automation and robotics control.

In more complex automation architectures, in renewable energy substations or on board public transportation vehicles the BE10A is integrated between low-level devices (sensors) and remote servers or the cloud. It provides data acquisition and data processing solutions and acts as a gateway.

The BE10A is able to further extend the gateway applications into two-way full IoT interfaces. In these applications it is possible to control the field devices remotely and send updates from central server locations. In HMI applications, e.g. ticketing machines, the BE10A is capable of interfacing a touch screen and several peripheral devices.

Fieldbus Protocols

The Programmable-Realtime Unit (PRU) is a unique feature of TI Sitara processors which enables the BE10A to support several industrial communication protocols (EtherCAT, EtherNet/IP, POWERLINK, PROFINET, SERCOS) on up to four Fast Ethernet ports. Traditionally, these protocols have been implemented with additional hardware such as an FPGA but with BE10A the fieldbus protocols are enabled by a simple firmware update. The required firmware and update tools are available from Texas Instruments.

Compact, Maintenance-Free Solution and Flexible Installation

The BE10A only needs a compact, small-footprint housing without fans, making it maintenance-free. It can easily be integrated into existing system environments.

Data Sheet

CPU	■ The following CPU types are available:
	□ TI Sitara ARM Cortex-A15, AM5718, 1.5 GHz, single core, no ECC
	□ TI Sitara ARM Cortex-A15, AM5728, 1.5 GHz, dual core, no ECC
	□ TI Sitara ARM Cortex-A15, AM5738, 1.5 GHz, dual core, ECC

Memory	■ System Memory
	□ Soldered DDR3 with or without ECC
	□ 1 GB, or
	□ 2 GB

Mass Storage	■ The following mass storage devices can be assembled:
	□ One microSD card
	□ One mSATA disk

Graphics	■ Integrated in processor
	■ 1080p HD video acceleration
	■ Dual 3D graphics and single 2D graphics
	■ Maximum resolution: 1920 x 1200p
	■ Via one DVI interface

Front Interfaces	■ Video
	□ One DVI-D single link interface
	□ HDMI 1.4a, HDCP 1.4 and DVI 1.0 support
	■ USB
	□ One Series A connector, USB 3.0
	□ Three Series A connectors, USB 2.0
	■ Ethernet
	□ One RJ45 connector, 1000BASE-T
	□ Four RJ45 connectors, 100BASE-T
	□ Two link and activity LEDs per channel
	■ Antenna connections
	□ Three antenna connector cutouts, linked to PCI Express Mini Card, for various types (SMA, reverse SMA, QMA, FME...)
	■ Legacy serial I/O
	□ Four RS232 interfaces on 9-pin D-Sub connectors
	□ Seven RS422/485 interfaces, full duplex on 9-pin D-Sub connectors
	□ One RS422 interface on 9-pin D-Sub connector
	■ CAN Bus
	□ Two 9-pin D-Sub connectors
	■ Binary I/O
	□ Eight binary inputs (8 to 60 V DC, 10 mA per channel, 1 kHz max.)
	□ Four binary outputs (open-drain, 300 mA sink current per channel)
	■ Additional status LEDs
	□ One for power status
	□ Three user LEDs
	■ Power supply
	■ Audio
	□ One Line Out on binary I/O connector

Technical Data

In-System Interfaces

- mSATA
  - One mSATA slot, SATA Revision 2.x (3 Gbit/s)
- PCI Express Mini Card
  - One slot, for mobile service, wireless communication, positioning or real-time Ethernet functions such as
  - GLONASS and GPS PCI Express MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components
  - WLAN PCI Express MiniCard DNXA-116, -40 to +85°C screened, storage temperature -40° to +85°C
  - MC7304 PCI Express MiniCard, full-size on USB: LTE, DC-HSPA+, HSPA+, HSDPA, HSUPA, WCDMA, GSM, GPRS, EDGE, and GNSS, -40 to +85°C
  - One microSIM card slot
  - PCI Express and USB interface

Supervision and Control

- Real-time clock with supercapacitor backup
  - Data retention of supercapacitor: 7 days

Electrical Specifications

- Isolation voltage: 1500 VDC between Ethernet interfaces and shield
- Supply voltages
  - 24 V nominal input voltage
- Power consumption
  - 15 W max. (estimated), with PCI Express Mini card and mSATA module

Mechanical Specifications

- Dimensions: Height 133 mm (3U) x Width 142 mm (28 HP) x Depth 33 mm
- Weight: less than 1 kg

Environmental Specifications

- International Protection Rating:
  - IP20 (IEC 60529)
  - Other IP protection classes possible on request
- Temperature range (operation)
  - 0°C to +60°C (screened)
  - Fanless operation
- Temperature range (storage): -40°C to +85°C
- Humidity: EN 60068-2-30, EN 50155
- Altitude: -300 m to +3000 m
- Shock: EN 50125-3, class: 3 m from track
- Vibration: EN 50125-3, class: 3 m from track
- Conformal coating of internal components; optional

Safety

- Flammability
  - UL 94V-0
- Electrical Safety
  - EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013
  - EN 62368-1:2014

EMC Conformity

- EN 50121-4:2015
- EN 50121-5:2015
- EN 61000-6-4:2011
- EN 61000-6-2:2005
- EN 55022:2010
- EN 55024:2010

Software Support

- Linux
- For more information on supported operating system versions and drivers see Software.

Technical Data

MeN

BIOS

- U-Boot Universal Boot Loader

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