Building Forward Together | **ADLINK**

Designed for
Infotainment, Industrial and Medical Solutions

Mini-ITX Embedded Boards

Intel® Platform
AMD® Platform

www.adlinktech.com
2016

Mini-ITX Embedded Boards:
Smaller form factor for today's compact systems

Industry trends indicate that users require a smaller and lower cost solution for their system requirements. Mini-ITX has a smaller board size and lower keep-out zones to enable a reduced chassis size for systems placed on the user's desk, mounted on a display, or installed in space-restrictive environments.
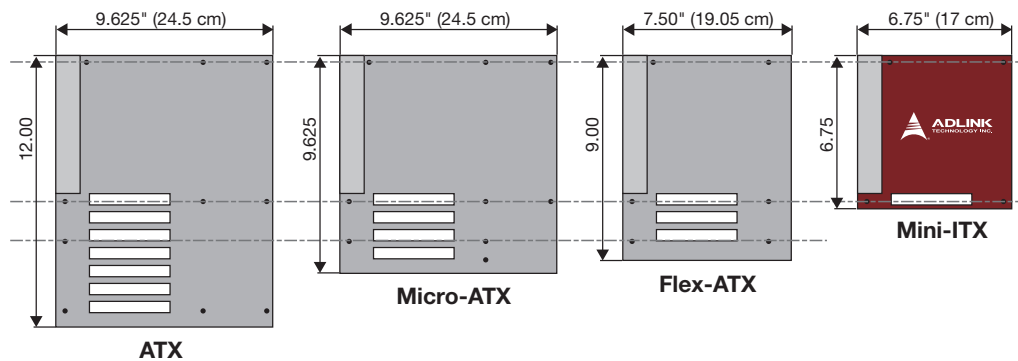
In addition to deployment in smaller chassis designed around the Mini-ITX form factor, these boards are compatible with ATX and microATX chassis without the need to retool the I/O shield. Mini-ITX embedded boards are ideal for applications in industrial automation, self-service kiosks, and other infotainment driven solutions.

Flexible, high speed and better connectivity

ADLINK Mini-ITX embedded boards support the latest Intel and AMD processors to deliver a high performance and space-saving platform for a wide array of embedded computing applications. Along with its compact footprint, this product line supports high processing speeds and high-bandwidth network connectivity with PCI Express®-based Gigabit Ethernet. Coupled with ample memory, diverse I/O, storage, and audio interfaces, ADLINK Mini-ITX embedded boards are suitable for multimedia, automation control, and gaming applications requiring a compact, easy-to deploy, and cost-effective mainboard.

Special I/O for vertical markets
• Vertical on-board USB2.0 port • Dual PCIe Expansion • Internal Audio Header • Internal Feature Header • TPM Header • SPI Header • Optional Socketed SPI BIOS

Easy Development and Maintenance
• BMC on-board • SEMA and SEMA Cloud support IoT deployment

Electro-mechanical compatibility within the AmITX-XX-G Mini-ITX family
• HDMI • Optional LVDS support • Multi DisplayPort • PCIe slot for external graphics

Others
• SATADOM support • Optional TPM on-board • ATX or 12VDC-only power input • Latch able connectors

Infotainment Applications

ADLINK Infotainment solutions are ideal for gaming and retail services including ATMs, floor plan guides, lottery & slot machines and supermarket self-service kiosks. ADLINK Mini-ITX embedded boards provide flexible connection possibilities for system integrators to link and manage multiple peripherals to meet application needs. Video lottery terminals and slot machines must sustain continuous operation, meaning hardware stability and ease of maintenance become essential. ADLINK's extensive experience and capabilities in hardware design and software development combined with our self-owned manufacturing base allows us to provide reliable products of superior quality for different solutions.

In the retail environment, multimedia digital signage that combines entertainment and information is one of the best ways to communicate with consumers. Intelligent display panels powered by ADLINK Mini-ITX embedded boards can be installed above checkout counters or in other suitable locations. Supermarket self-service kiosks are stand-alone terminals which integrate environment information, promotional products, membership management and other relevant data through interactive multimedia communication.

Medical applications require highly accurate video imaging with low latency during surgical procedures, such as X-ray, ultrasound, and endoscopy. This market presents diverse opportunities for embedded designers, fueled by demand for real-time data processing and sharing, high definition imaging and graphics displays, and creative, compact solutions that enable healthcare anywhere. ADLINK expertly solves these medical design challenges, offering intelligent embedded platforms that help OEMs/ODMs innovate, reduce risk and accelerate time-to-market with solutions validated for high performance and complex regulatory requirements. For medical device developers and manufacturers, ADLINK is your complete supplier of Mini-ITX embedded boards that provide robust, fault-free connectivity, as well as the wide range of high-speed I/O required to support the broad and growing spectrum of imaging and diagnostics applications. Development time is reduced, and medical device manufacturers can focus on their core competencies in creating competitive, high performance healthcare applications.

	Retail	Medical	Gaming
Requirements	• Time to market • Processing performance	• High performance HD graphics • Multi DisplayPort/HDMI/ LVDS outputs	• Vertical on-board USB connector • Meet GLI criteria
Applications	• Kiosks (e.g. ATM, POS) • Vending machines • Digital signages	• Ultrasound • MRI • Point-of-care terminal • Patient bedside terminal	• Betting machines • Lottery terminals • Slot machines

# SEMA: Intelligent Middleware to Monitor and Control your Devices

SEMA Overview

Time-to-Market (TTM) and Total-Costs-of-Ownership (TCO) are key aspects to producing competitive products. To combine TTM and TCO in a reliable manner, a solid and reliable platform is fundamental. To assist in this endeavor, every ADLINK computer-on-module (COM), single board computer (SBC) and Mini-ITX product is equipped with a Board Management Controller (BMC) device supporting SEMA.

Initially designed for power sequencing tasks, the BMC has evolved to include many new and useful features throughout the years. Measuring system voltages and currents, controlling fan speed, accessing GPIOs and I2C bus are only a few examples of these new capabilities. Being compatible with the latest PICMG Embedded Application Programming Interface specification (EAPI) reduces your effort to port existing calls to SEMA to nearly zero!

On top of that SEMA provides an extended set of functions e.g. to show and control CPU Operation Mode, to read out HDD S.M.A.R.T. data or to read out a comprehensive set of system data.

Providing the interface from the hardware to the operating system is one of SEMA's most important functions. The BMC first collects all relevant information from the chipset and other sources. Using the I2C driver and the Extended EAPI the application layer fetches the data and presents it to the user. The application can be a local customer specific implementation or the SEMA Dashboard which can access the Extended EAPI also remotely and which shows the data in user friendly graphic interfaces, suitable for supervision and troubleshooting.
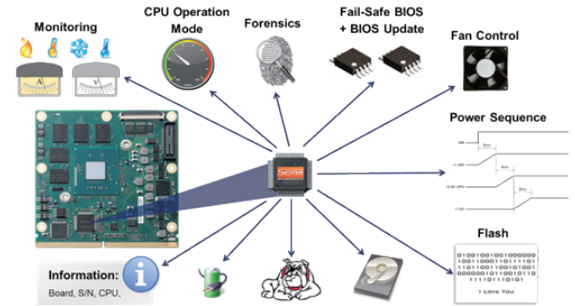
SEMA Features

At the heart of SEMA is the Board Management Controller (BMC) supporting SEMA functions. The SEMA Extended EAPI provides access to all functions then. And a web-based Dashboard allows to monitor remotely one or multiple devices / computer modules. So SEMA comprises:

- SEMA Board Management Controller HW and FW
- SEMA Extended EAPI Library

- SEMA Dashboard

Forensic information is available after system or module failures includes minimum and maximum temperature of the CPU and system, as well as HDD S.M.A.R.T information - all of which can be used to analyze system or module failure. SEMA is available for Linux and Windows operating systems and for various HW platforms.

SEMA Cloud: The End-to-End IoT Application Enablement Platform


Downtime of devices or systems is not acceptable in today's industries. To help customers to analyze their systems and take counter measures for preventive maintenance, ADLINK has developed a tool which is able to monitor and collect system performance and status information from the hardware in a timely, flexible and precise manner: the Smart Embedded Management Agent (SEMA). By combining SEMA intelligent middleware with cloud connectivity, ADLINK takes remote management technology a step further than previous generations. By employing full connectivity, from edge to cloud to end application, SEMA-enabled embedded devices can connect to the cloud without additional design requirements. Pushing data to the cloud enables operators to verify, monitor and control system performance from a single, central location – improving reliability and reducing management costs.

- Manage and control all devices with one click
- Avoid system downtime by predictive maintenance

- Integration of operational device data to business processes
- Reducing the Total Cost of Ownership

ADLINK´s Global Cloud Server Infrastructure

The SEMA Cloud Gateway offers the ability of a device to interwork with the Cloud Server. The SEMA Cloud Gateway provides an Operation Rule Processor and a local data base, so it is possible to execute rules and analysis of data and to take action locally on device already before data is transferred to the cloud. If the devices lose the connection to the cloud, it will recognize the lost connection and will store all data until the connection is reestablished.

The contact of the devices for transmitting data can be planned. At pre-defined times the device establishes a connection to the cloud and sends or receives data. That is possible for 2G/3G/4G connections. ADLINK´s Cloud agent is running on the most popular embedded OSes. It is available for Windows, Linux and Android in 32/64Bit and it is usable on x86 and ARM architectures.
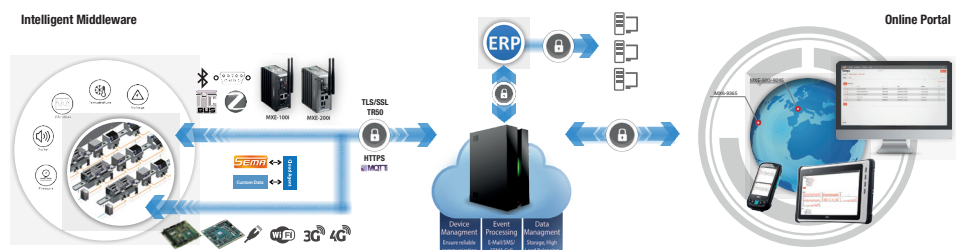
The Architecture of SEMA Cloud Use Case: IoT Intelligent Vending Machine

Vending machines have been in use by retailers for many years as self-serve solutions to sell beverages, snacks, and tickets to consumers. In recent years, vending machines have proliferated both in numbers and diversity. They can be found in many public locations as well as private facilities, selling different types of goods and services. They are also becoming more and more intelligent, supporting better user interfaces and offering more selection.

Situation

- High cost of maintenance and support (software updates, troubleshooting and repairs)
- Revenue loss when a vending machine goes out of order

These challenges can be met with an Internet of Things (IoT) solution enabled through two-way communication between vending machines and a cloud server. In the machine-to-cloud direction, hardware status information and business data are periodically sent to the cloud server. Hardware status information is processed in real-time for health assessment and failure detection. Data is stored in a database for further analysis and modeling. In the cloud-to-machine direction, commands and data can be sent to manage, control, and configure the vending machines. This includes performing remote diagnostics as well as pushing software updates to all devices as required.
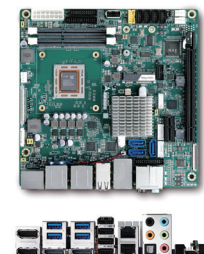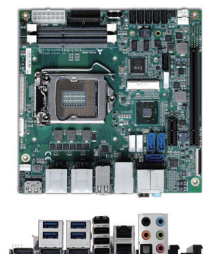
Solution Architecture

Shown below is the end-to-end architecture of the Vending Machine Management and Analytics solution based on hardware, software, and cloud technologies from ADLINK. In this solution, new and/or legacy vending machines are connected to the internet via broadband or wireless connection. Data from vending machines are then aggregated and stored on the cloud. From there, the data can be accessed via web-based dashboard, or retrieved by external applications for analytics purposes. Commands and data can also be sent from the cloud to remotely manage and control the vending machines.
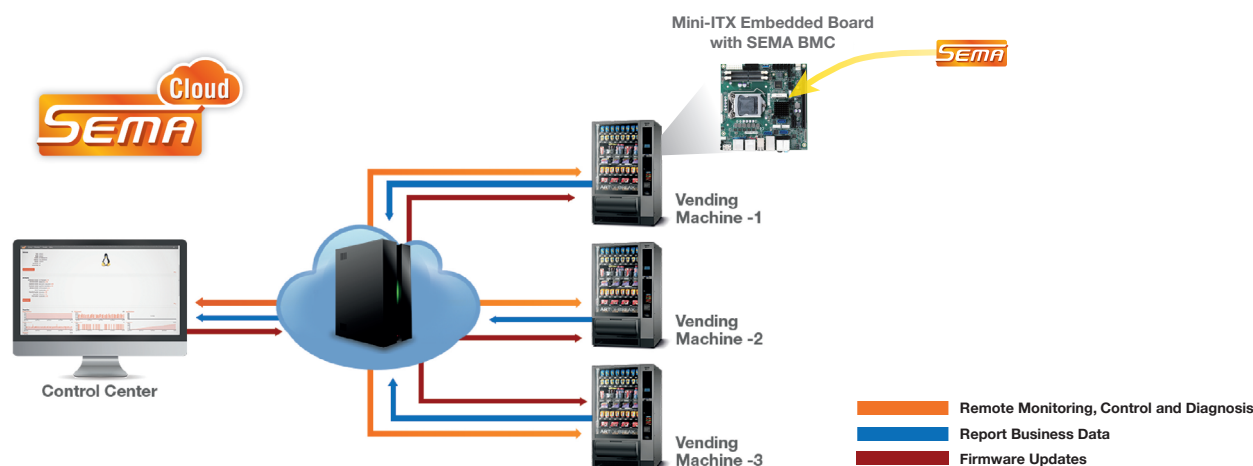
The key Mini-ITX Embedded Board of the solutions are:

- Intelligent vending machines based on an ADLINK Mini-ITX embedded board solution, collecting device data and supporting remote management, control and configuration.
- ADLINK IoT Gateways, aggregating data from multiple vending machines and connecting securely to the cloud.
- ADLINK SEMA Cloud solution, enabling edge-to-cloud integration and supporting cloud-based management of vending machines and real-time monitoring of machine data.
- ADLINK SEMA Cloud API, exporting device data and control points for use by external applications.
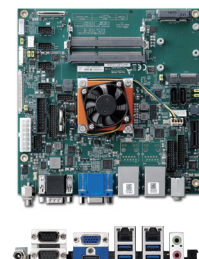
High Performance Mini-ITX Embedded Boards

Product Name	AmITX-SL-G	AmITX-HL-G	AmITX-BE-G
CPU	6th Gen. Intel® Core™ i7-6700/6700TE i5-6500/-6500TE i3-6100/6100TE Intel® Pentium® G4400/G4400TE Intel® Celeron® G3900/G3900TE	4th Gen. Intel® Core™ i7-4700S/4770TE/4790S i5-4570S/4570TE/4590S i3-4330/4330TE/4360/4350T Intel® Pentium® G3420/G3320TE Intel® Celeron® G1820/G1820TE	AMD® R series RX-427BB/425BB/225FB
Chipset	Q170 and H110	PQ87 and H81	AMD A77E
Memory	Up to 32 GB non-ECC Dual Channel DDR4 at 2133/1866 MHz	Up to 16 GB non-ECC Dual Channel DDR3/DDRL3 at 1600/1333 MHz	Up to 16 GB non-ECC Dual Channel DDRL3 at 1600/1333 MHz
Integrated Graphics	Intel® Gen 9 graphics 3 DisplayPort, LVDS co-lay with eDP (opt.)	3 DispayPort, LVDS (opt.)	AMD® Radeon HD 9000 4 DisplayPort, LVDS (opt.)
SATA	3x SATA 6 Gb/s	Q87: 3x SATA 6 Gb/s H81: 1x SATA 3 Gb/s and 2x SATA 6Gb/s	3x SATA 6.0 Gb/s
LAN	1x Intel® i219LM, GbE 1x Intel® i211AT, GbE	1x Intel® i218LM, GbE 1x Intel® i211AT, GbE	2x Intel® i211AT, GbE
Serial Port	1x RS-232/422/485 3x RS-232		
USB	Q170: 7x USB 3.0, 4x USB 2.0 H110: 4x USB 3.0, 7x USB 2.0	Q87: 4x USB 3.0, 9x USB 2.0 H81: 2x USB 3.0, 11x USB 2.0	4x USB 3.0 9x USB 2.0
Expansion Slots	1x PCIe x16, 1x PCIe x1 1x full size Mini PCIe + USB or mSATA 1x half size Mini PCIe+USB 1x SPI header for external BIOS	1x PCIe x16, 1x PCIe x1 1x full size Mini PCIe + USB or mSATA 1x half size Mini PCIe + USB 1x SPI header for external BIOS	1x PCIe x16, 1x PCIe x1 1x full size Mini PCIe + USB or mSATA 1x half size Mini PCIe + USB 1x SPI header for external BIOS
SEMA Support	Yes		
Power Supply	12V ±5% / 5Vsb ±5% (ATX), 12V ±5% (AT) Onboard headers for fan and SATA power		
Operating Temperature	0˚C to +60˚C		
Size	170 mm x 170 mm (L x W)		
OS support	Win10/Win 8.1/7, WES 7, Linux, VxWorks	WES 7/8 Linux, VxWorks	Windows 7/8, WES 7/8, Linux

Note: All specifications are subject to change without further notice.

Lower Power Consumption Mini-ITX Embedded Boards

Product Name	AmITX-AL-I	AmITX-BW-I	AmITX-BT-I
CPU	Future Intel® Processor	Intel® Pentium® N3710 Intel® Celeron® N3160/N3060/N3010	Intel® Atom™ E3800 series SoC Intel® Celeron® N2930/J1900
Memory	Up to 16 GB non-ECC Dual Channel DDR3L at 1867/1600 MHz	Up to 8GB non-ECC Dual Channel DDR3L at 1600/1333 MHz	Up to 8 GB non-ECC Dual Channel DDRL3 at 1333/1066 MHz
SATA	2x SATA 6 Gb/s	2x SATA 6 Gb/s	2x SATA 3 Gb/s
LAN	2x Intel® i211AT, GbE		
Serial port	2x RS-232/422/485 4x RS-232	2x RS-232/422/485 4x RS-232	3x RS-232/422/485 3x RS-232
USB	4x USB 1.1/2.0/3.0 4x USB 1.1/2.0		
Integrated Graphics	1x HDMI, 2 DisplayPort, LVDS, eDP (opt.)	1x HDMI, 2 DisplayPort, LVDS, eDP (opt.)	VGA, HDMI, LVDS
Expansion slots	1x PCIe x1, 1x Mini-PCIe, 1x mSATA 1x SPI header for external BIOS	1x PCIe x1, 1x Mini-PCIe, 1x mSATA 1x SPI header for external BIOS	1x PCIe x1, 1x Mini-PCIe, 1x mSATA 1x SPI header for external BIOS
SEMA Support	Yes		
Power Supply	12V ±5% Supports ATX/AT mode Onboard headers for fan and SATA power	12V ±5% Supports ATX/AT mode Onboard headers for fan and SATA power	Std: 12V ±5% / 5Vsb ±5% (ATX), 12V ±5% (AT) Supports ATX/AT mode Onboard headers for fan and SATA power
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.)	0˚C to +60˚C	0°C to 60°C -40°C to + 85°C (opt.)
Form Factor & Compatibility	170 mm x 170 mm (L x W)		
OS support	Win 10/7, WES7, Win 10 IOT Enterprise Linux, VxWorks	Windows 7/8, WES 7, Linux, VxWorks	Windows 7/8, Linux, VxWorks

Notes:
- Optional TPM support for special bill of materials
- Optional -40°C to +85°C support: Standard product with 100% ETT screening available for selected CPU SKUs and std. 12V power supply only
- All specifications are subject to change without further notice.

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