Features

Performance for Industrial IoT Edge Computing

- Intel Apollo Lake-I E3900 Processor (Dual or Quad core)
- Up to 8GB DDR3L ECC System Memory
- Up to 2.0GHZ Clock Rate
- Time-Coordinated Computing
- TPM Hardware Security Enabled
- 10+ Year Availability

Rugged Design for Demanding Environments

- -40°C to +85°C Operating Temperature Range
- 3.5" Small Form Factor
- Wide Range Power Input (10 - 50 V DC)

Graphics for Digital Signage

- Supports up to three Independent Displays
- 2x DisplayPort with 4K Resolution
- LVDS with backlight and touch control

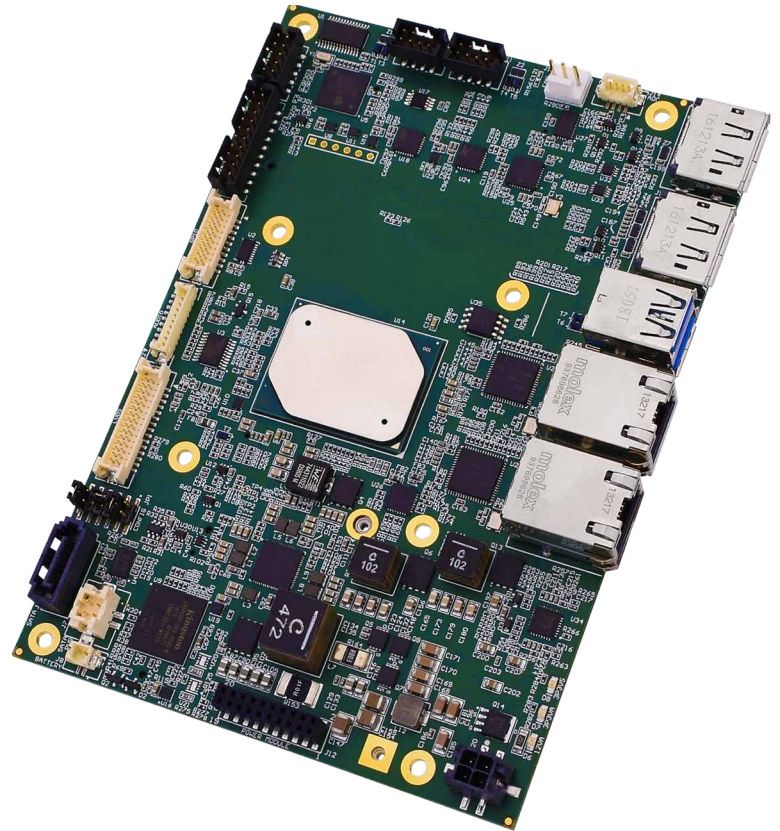### Connectivity and I/O for Embedded Data Acquisition

- 2x Gigabit Ethernet
- 2x USB 3.1 Gen 1 and 4x USB 2.0
- 8x General Purpose Input/Output (GPIO)
- 2x channel Analog-to-Digital (ADC)
- 3x Serial Ports
- HD Audio

Storage

- eMMC
- SATA with SATA Power
- mSATA

Expansion and Configuration Options for Semi-Custom Solutions

- Mini-PCI Express
- M.2 E-Key 2230 Form Factor
- WINSYSTEMS' Modular IO80 Expansion

Product Description

WINSYSTEMS' SBC35-427 is a small form factor single board computer (SBC) featuring the latest generation Intel Apollo Lake-I SOC processor. Its small size, low power, rugged design, and extended operational temperature make it a great fit for rugged embedded systems in the industrial control, transportation, energy, and industrial IoT markets.
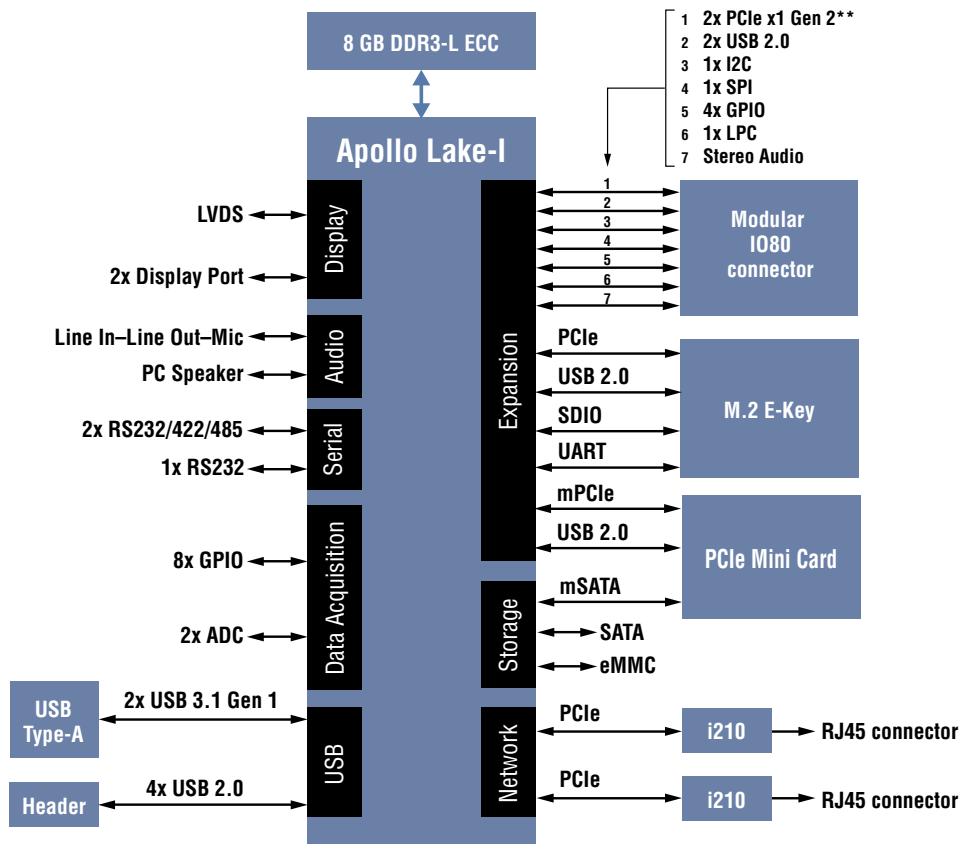
This full-featured SBC supports three independent video displays (two DisplayPort and LVDS video), dual Ethernet, two USB 3.1 Gen 1 ports, four USB 2.0 ports, eight general purpose I/O (GPIO) lines, two channels Analog-to-Digital Converter (ADC), stereo audio, and a watchdog timer.

The WINSYSTEMS SBC35-427 single board computer features a Dual or Quad-Core processor and up to 8GB of socketed SODIMM DDR3L ECC SDRAM. The SBC includes an mSATA socket and optional soldered down eMMC device for solid state storage of operating systems (OS) and applications. Additionally, the board supports an external SATA device.

The board has expansion capabilities via a M.2 connector E-Key 2230, Mini-PCIe socket (with mSATA support) and WINSYSTEMS' Modular IO80 interface.
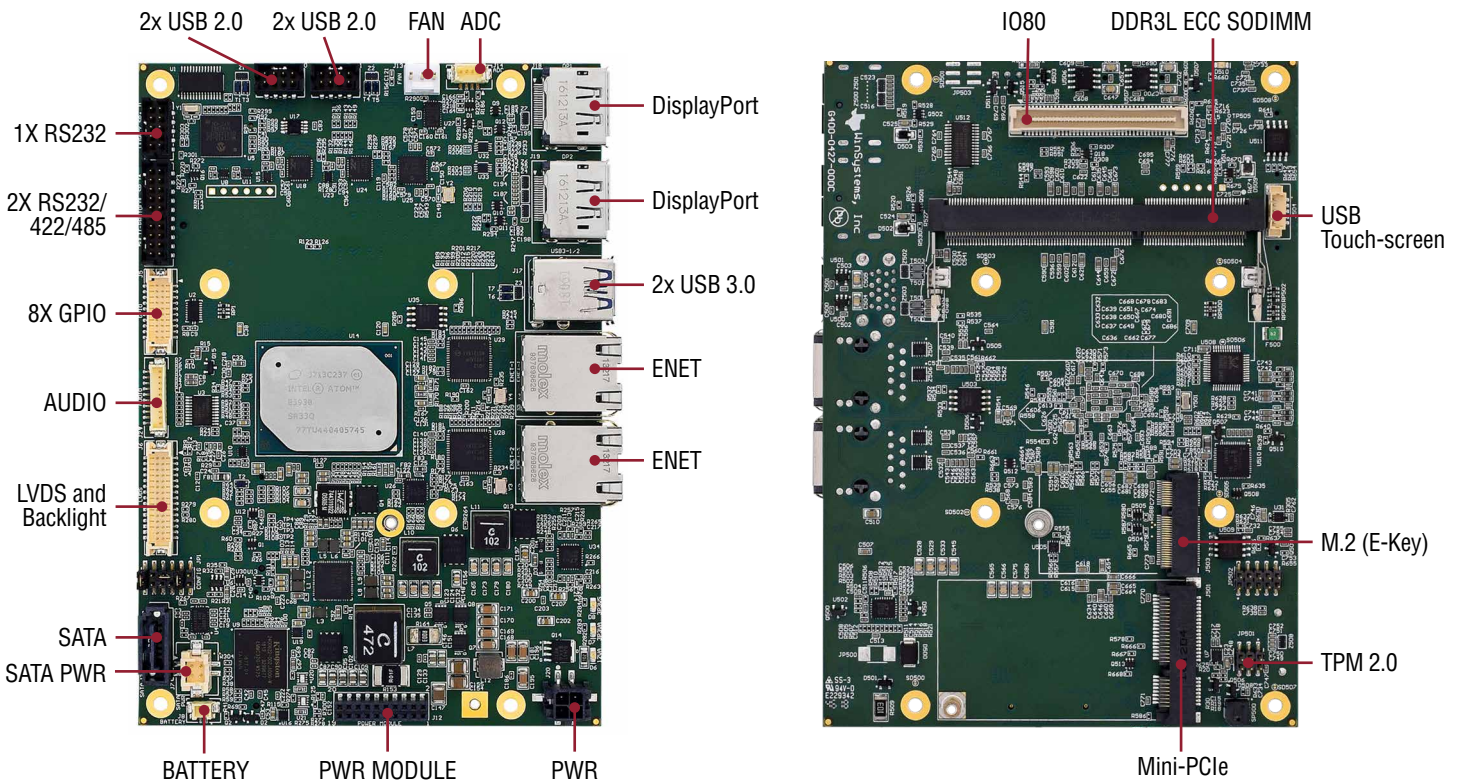
The SBC35-427 supports Linux, Windows® 10, DOS, and other x86-compatible real-time operating systems. Drivers are available from the WINSYSTEMS website.

SBC35-427

Block Diagram

8 GB DDR3-L ECC

Apollo Lake-I

1 2x PCIe x1 Gen 2**
2 2x USB 2.0
3 1x I2C
4 1x SPI
5 4x GPIO
6 1x LPC
7 Stereo Audio

Display
- LVDS
- 2x Display Port

Audio
- Line In–Line Out–Mic
- PC Speaker

Serial
- 2x RS232/422/485
- 1x RS232

Data Acquisition
- 8x GPIO
- 2x ADC

USB
- USB Type-A — 2x USB 3.1 Gen 1
- Header — 4x USB 2.0

Expansion
- 1 2 3 4 5 6 7 — Modular IO80 connector
- PCIe
- USB 2.0
- SDIO
- UART — M.2 E-Key
- mPCIe
- USB 2.0 — PCIe Mini Card

Storage
- mSATA
- SATA
- eMMC

Network
- PCIe — i210 — RJ45 connector
- PCIe — i210 — RJ45 connector

*One PCIe x1 lane is software switchable to 1x USB 3.1 Gen 1

Connectors

Left board:
- 2x USB 2.0
- 2x USB 2.0
- FAN
- ADC
- 1X RS232
- 2X RS232/422/485
- 8X GPIO
- AUDIO
- LVDS and Backlight
- SATA
- SATA PWR
- BATTERY
- PWR MODULE
- PWR
- DisplayPort
- DisplayPort
- 2x USB 3.0
- ENET
- ENET

Right board:
- IO80
- DDR3L ECC SODIMM
- USB Touch-screen
- M.2 (E-Key)
- TPM 2.0
- Mini-PCIe

SBC35-427

Technical Specifications

PROCESSOR	Intel Atom x5-E3930 Processor Dual-Core, up to 1.8 GHz (base frequency 1.3 GHz)	Intel Atom x5-E3940 Processor Quad-Core, up to 1.8 GHz (base frequency 1.6 GHz)	Intel Atom x7-E3950 Processor Quad-Core, up to 2.0 GHz (base frequency 1.6 GHz)
MEMORY	• SODIMM DDR3L ECC (up to 8GB)		
STORAGE	• eMMC • SATA Connector • mSATA		

DISPLAY	• Three independent video outputs
	  – LVDS with digital backlight and touch control
	  – 2x DisplayPort up to Ultra 4K Resolution (Front Panel I/O)		

NETWORK INTERFACE	• 2x Gigabit Ethernet ports (Front Panel I/O)		
ONBOARD I/O	• 1x Legacy RS232 Interface (8-wire) • 2x Multi-Protocol Serial Ports (4-wire) • 2x USB 3.0 ports (Front Panel I/O) • 4x USB 2.0 ports • 8x lines of general purpose digital I/O • 2x channels Analog-to-Digital (ADC) (10-bit resolution) • HD Audio Interface (Line Out, Line In, Mic In) • Speaker output for beep tones • Real-time Clock (RTC) with optional battery back up • Watchdog timer		
EXPANSION BUS	• 1x Mini-PCIe card • 1x M.2 connector (E-Key) • WinSystems Modular IO80 Interface		
POWER	Wide Input: +10 to 50 VDC		
SOFTWARE	• Compatible with Linux, Windows10, and other x86 operating systems		
ENVIRONMENTAL	• Operational from -40°C to +85°C (-40 to +185°F)[1] • RoHS compliant [1] Requires airflow and high temperature grade DRAM		
MECHANICAL	Dimensions - 5.75 in x 4.00 in (3.5" SBC) (146mm x 102mm) Weight - 8.0 oz (225 gm) with heat spreader PC Board thickness 0.078 inches	Dimensions - 5.75 in x 4.00 in (3.5" SBC) (146mm x 102mm) Weight - 8.0 oz (225 gm) with heat spreader PC Board thickness 0.078 inches	Dimensions - 5.75 in x 4.00 in (3.5" SBC) (146mm x 102mm) Weight - 8.0 oz (225 gm) with heat spreader PC Board thickness 0.078 inches

Order Information

SBC PART NUMBER	**SBC35-427-3930-M-T** 39xx = CPU (3930, 3940, 3950) M = EMMC (0, 16, 32, 64, 128, 256 GB) T = Thermal option (1 = heat spreader, 2 = heat spreader + heatsink, 3 = heat spreader + heatsink + fan)
RAM	DDR3L PC3-12800 SDRAM SODIMM 204-PIN WITH ECC • SODIMM204-3-128-4E (4GB Extended Temp) • SODIMM204-3-128-8E (8GB Extended Temp) • SODIMM204-3-128-4H (4GB HighTemp) • SODIMM204-3-128-8H (8GB HighTemp) • SODIMM204-3-128-4A (4GB Automotive Temp) • SODIMM204-3-128-8A (8GB Automotive Temp)
CABLES AND ACCESSORIES	• CBL-LVDSB-021-20 LVDS and Backlight to AUO panel • CBL-AUDIO-001-20 AUDIO • CBL-DIO8-101-12 DIO • CBL-SER2-202-12 COM (R232/422/485) • CBL-SER1-202-12 COM (Legacy RS232) • CBL-USB2-006-12 USB • CBL-USB1-202-12 TOUCH Controller • CBL-PWR-124-12 SATA Power • CBL-PWR-125-20 Power • CBL-ADC-001-12 ADC

Expansion and Customization Options

WINSYSTEMS provides additional cables, expansion cards, power supplies, and solid state drives to complete your embedded computing solution including data acquisition, communications, location, and other features via Mini-PCIe, M.2, and IO80 interfaces. Our Application Engineers are available to guide you through product selection and customized options.

Contact an Application Engineer or visit our website for more information.

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