

Features

Performance for Industrial IoT Applications

- Intel Apollo Lake-I E3900 Processor (Dual or Quad core)
- Up to 8GB Soldered LPDDR4 System Memory
- Time Coordinated Computing
- Precision Time Measurement

Rugged Design for Demanding Environments

- -40°C to +85°C Operating Temperature Range
- PC/104 Small Form Factor
- Shock and Vibration Tested
- Wide Range Power Input (+9 - 36V DC)

Fast Graphics at High Resolutions

- Intel Low Power Gen9 Graphics Engine
- Multiple Displays Supported
- Full-HD and 3D Graphics Acceleration

Secure and Trusted Data

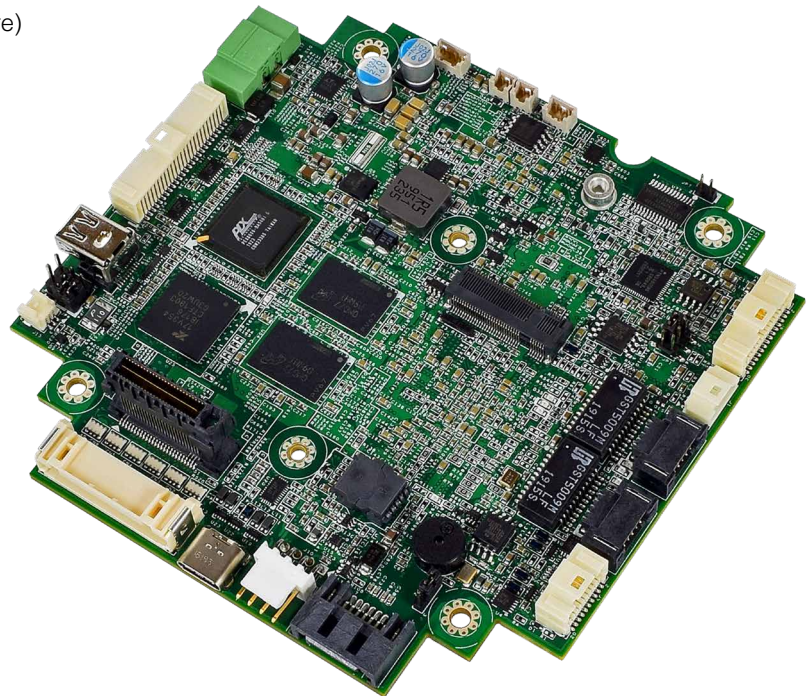
- TPM 2.0 Hardware Security Enabled
- Intel Security Engine
- Cryptographic Acceleration

Connectivity and I/O for Embedded Systems

- Dual Ethernet
- 1x USB 3.2 Gen 1 Type C and 8x USB 2.0
- 24x GPIO with Event Sense
- 4x Serial Ports, 1x Serial Console Port
- 1x I2C Bus

Expansion Options

- PCIe/104™ OneBank™
- M.2 Expansion Socket



Product Description

WinSystems' PX1-C441 single board computer (SBC) is a PC/104 form factor SBC with PCIe/104™ OneBank™ expansion featuring the latest generation Intel® Apollo Lake-I SOC processor. Its small size, rugged design and extended operational temperature make it a great fit for industrial IoT applications and embedded systems in the industrial control, transportation, Mil/COTS, and energy markets.

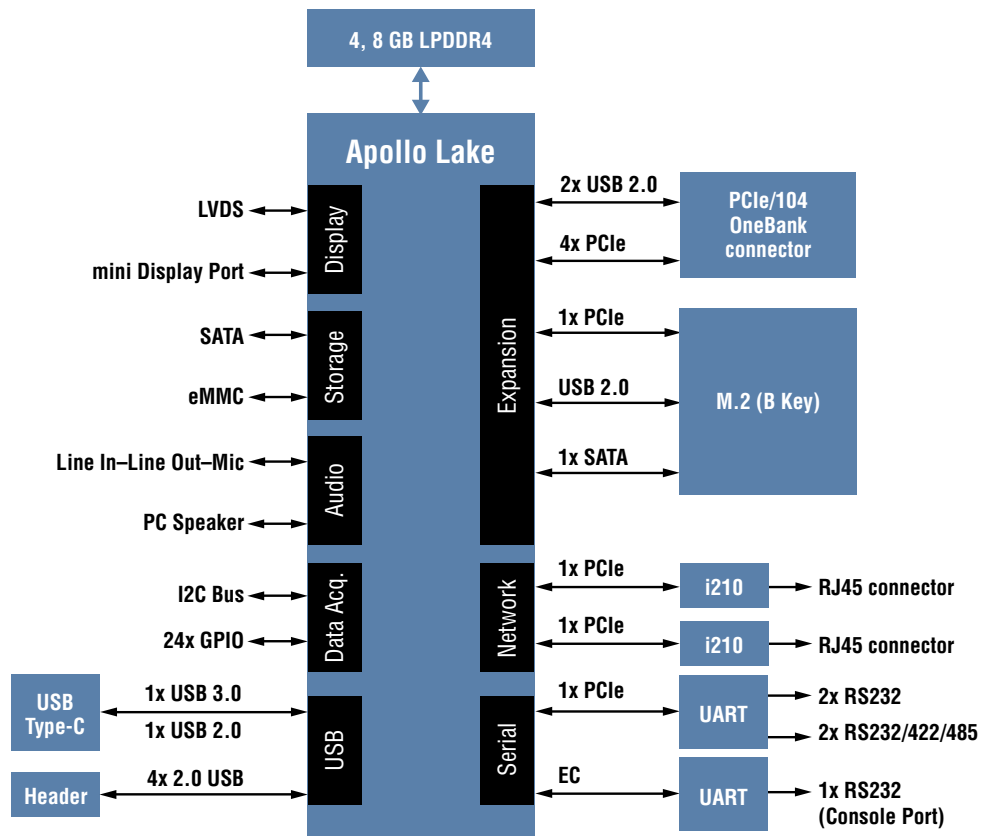
The WinSystems PX1-C441 single board computer features the Intel Atom Apollo Lake-I Dual core or Quad core System on Chip (SOC) for processing and graphics. It includes up to 8 GB of soldered down LPDDR4 system memory and a non-removable eMMC device for solid state storage of an operating system (OS) and applications. In addition, the board supports M.2 and SATA devices.

This full-featured SBC has onboard I/O and supports simultaneous DisplayPort and LVDS video. It provides dual Gigabit Ethernet interfaces, eight USB 2.0 channels, one SuperSpeed USB 3.2 Gen 1 channel, four serial ports and one serial console port, 24 general purpose I/O (GPIO) lines, one I2C bus, stereo audio, and a watchdog timer.

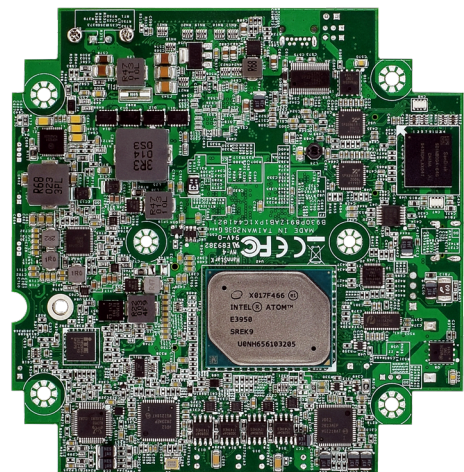
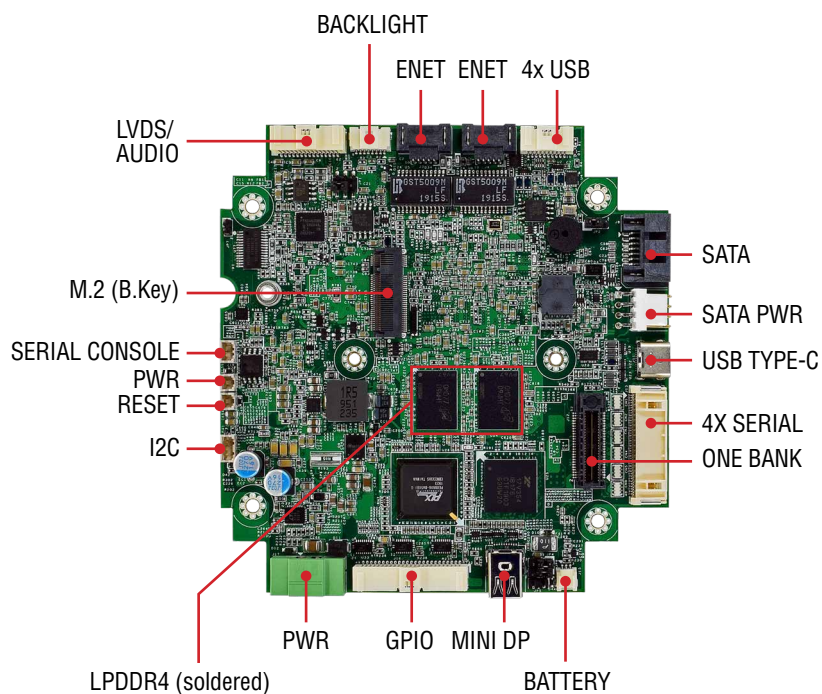
Additionally, the board has an M.2 socket and a PCIe/104 OneBank connector that provides four PCIe and two USB 2.0 I/O expansion channels.

The PX1-C441 supports Linux, Windows® 10 desktop, Windows® 10 IoT, and other x86-compatible real-time operating systems. Drivers are available from the WinSystems website.

Block Diagram



Connectors



Technical Specifications

PROCESSOR	Intel Atom Apollo Lake-I x5 E3930 Dual Core, up to 1.8 GHz	Intel Atom Apollo Lake-I x5 E3940 Quad Core, up to 1.8 GHz	Intel Atom Apollo Lake-I x7 E3950 Quad Core, up to 2.0 GHz
MEMORY	<ul style="list-style-type: none"> Up to 8GB of soldered down LPDDR4 system memory (RAM) 		
STORAGE	<ul style="list-style-type: none"> eMMC Solid State Disk supporting up to 64 GB of Flash (Optional - MOQ required) M.2 SSD support with 22mm x 42mm B-Key Socket SATA Connector 		
DISPLAY	<ul style="list-style-type: none"> Dual, simultaneous video output support <ul style="list-style-type: none"> DisplayPort LVDS 		
NETWORK INTERFACE	<ul style="list-style-type: none"> Two 1000 Mbps using the Intel i210 LAN controller <ul style="list-style-type: none"> Supports Wake on LAN on both channels Status & Activity LEDs for both Ethernet controllers 		
ONBOARD I/O	<ul style="list-style-type: none"> Eight USB 2.0 with overcurrent protection <ul style="list-style-type: none"> Four USB 2.0 available on USB header Two USB 2.0 available on PCIe/104 OneBank One USB 2.0 available on USB Type-C One USB 2.0 available on M.2 One USB 3.2 Gen 1 port with overcurrent protection available on the USB Type-C connector Four 16C550-compatible, serial channels with speeds up to 30 Mbps in RS-422/485 modes <ul style="list-style-type: none"> Two capable of RS-232 operation Two capable of RS-232/422/485 operation One RS232 serial console port 24 lines of general purpose digital I/O (user selectable input/output supported voltages: 1.8/2.5/3.3/5V) Stereo audio output One I2C Bus One SATA 3.0 channel Speaker output for beep tones Real-time Clock (RTC) with optional battery back up Watchdog timer adjustable from 1 second to 255 minutes 		
EXPANSION BUS	<ul style="list-style-type: none"> PCIe/104 OneBank connector with four PCIe channels and two USB 2.0 channels M.2 connector with one USB 2.0 port, one SATA channel, and one PCIe channel 		
POWER	Input: +9 - 36V DC Typical: 9W Sleep: 3W Max: 16W	Input: +9 - 36V DC Typical: 9W Sleep: 3W Max: 17W	Input: +9 - 36V DC Typical: 9W Sleep: 3W Max: 23W
SOFTWARE	<ul style="list-style-type: none"> UEFI compliant BIOS in SPI Flash Device Compatible with Linux, Windows 10 Enterprise, Windows 10 IoT Core, and other x86 operating systems 		
ENVIRONMENTAL	<ul style="list-style-type: none"> Operational from -40°C to +85°C¹ (¹Requires airflow) RoHS compliant 		
MECHANICAL	Dimensions - 4.55 x 4.39 inches (115.6 x 111.6 mm) Weight - 4.2 oz (120 gm) without heatsink PC Board thickness 0.078 inches	Dimensions - 4.55 x 4.39 inches (115.6 x 111.6 mm) Weight - 4.2 oz (120 gm) without heatsink PC Board thickness 0.078 inches	Dimensions - 4.55 x 4.39 inches (115.6 x 111.6 mm) Weight - 4.2 oz (120 gm) without heatsink PC Board thickness 0.078 inches

Order Information

SBC PART NUMBER	PX1-C441-3930-m-e-0 Intel E3930 x5 Dual core 1.8 GHz m = 1/2/4/8 GB system memory (RAM) e = 4/8/16/32/64	PX1-C441-3940-m-e-0 Intel E3940 x5 Quad core 1.8 GHz m = 1/2/4/8 GB system memory (RAM) e = 4/8/16/32/64	PX1-C441-3950-m-e-0 Intel E3950 x7 Quad core 2.0GHz m = 1/2/4/8 GB system memory (RAM) e = 4/8/16/32/64
CABLES	<ul style="list-style-type: none"> CBL-SET-441-2 cable and accessories set includes: <ul style="list-style-type: none"> USB Adapter ADP-IO-USB-002 (Adapter to 4x USB 2.0 Type A connectors) USB CBL-USB4-002-12 (Cable to USB Adapter, 12") Ethernet (2) CBL-ENET1-302-12 (ENET cable with two connectors, 12") Serial CBL-SER4-002-12 (Cable to four DB9 connectors, 12") Battery BAT-LTC-E-36-16-2 (External 3.6 V, 1650 mAH battery) Additional Cables <ul style="list-style-type: none"> CBL-DIO24-002-12 Digital I/O – 50-pin IDC Female, 12 CBL-DIO24-001-12 Digital I/O – Molex Pico-Clasp, 12 CBL-SATA-701-20 SATA – Data (Latching), 20 CBL-PWR-117-12 Power cable to SATA drive CBL-LVDSAB-009-18 LVDS/backlight with analog audio 		
OPTIONAL BATTERY	<ul style="list-style-type: none"> BAT-LTC-E-36-16-2 (External 3.6 V, 1650 mAH) BAT-LTC-E-36-27-2 (External 3.6 V, 2700 mAH) 		

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 PCIe/104 and M.2 interfaces. Our Application Engineers are available to guide you through product selection and customized options.