EQIO

VPX-6820

PRODUCT MANUAL

Intel 6th-Gen VPX System Controller

Intel Core i7-6820EQ



Measurement and control, made easy.

Easy · Quick · Input · Output

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01 OVERVIEW

Intel 6th-Gen VPX System Controller

VPX system controller · Industrial automation · Unit unit vision · Edge computing · VPX · Intel

VPX-6820 uses Intel Core i7-6820EQ and CM236 chip group, supports soldered DDR4 memory, provides front rear I/O display, network, storage and PCIe I/O, used for industrial automation and field data processing.
Front panel settings HDMI, USB and Gigabit Ethernet, rear part connect VGA, LVDS, composite serial and storage interfaces, facilitates assign operation and backplane routing. Onboard mSATA and PCIe expansion can combination acquisition and communications function, suited to modular measurement and control host. Facilitates chassis installation.



Product appearance reference; shipped units may differ.

Key features

- Core i7-6820EQ and CM236
- Up to 32GB soldered DDR4
- Front rear I/O dual Gigabit Ethernet
- HDMI, VGA and LVDS display
- SATA3.0, mSATA and PCIe3.0

02 FUNCTIONS

Functions and engineering value

4-core eight threads compute basic

I7-6820EQ and CM236 consists of x86 compute platform, up to 32GB soldered DDR4 application and data cache provides resources. AMI UEFI responsible for boot, Windows or Linux system required match board driver; actual continuous processing capability should per cooling and load verification, not up to turbo replace board-level performance.

Operation connect and backplane routing

Front I/O HDMI, USB3.0 and Gigabit Ethernet suited to local operation and equipment attach, rear I/O VGA, LVDS, serial and network used for chassis internal connect. Composite serial supports multi type electrical standard but per actual mode used, display channel parallel combination and rear I/O definition required system design in confirm.

High-speed expansion and data storage

2-ch PCIe3.0 x8 provides function expansion connect, 2-ch rear I/O SATA3.0 and onboard mSATA I/O facilitates arrangement system and data media. Modular chassis design when at the same time consider backplane channel, expansion equipment power consumption and storage installation, I/O resources not represent has peripheral equipment already fully fitted.

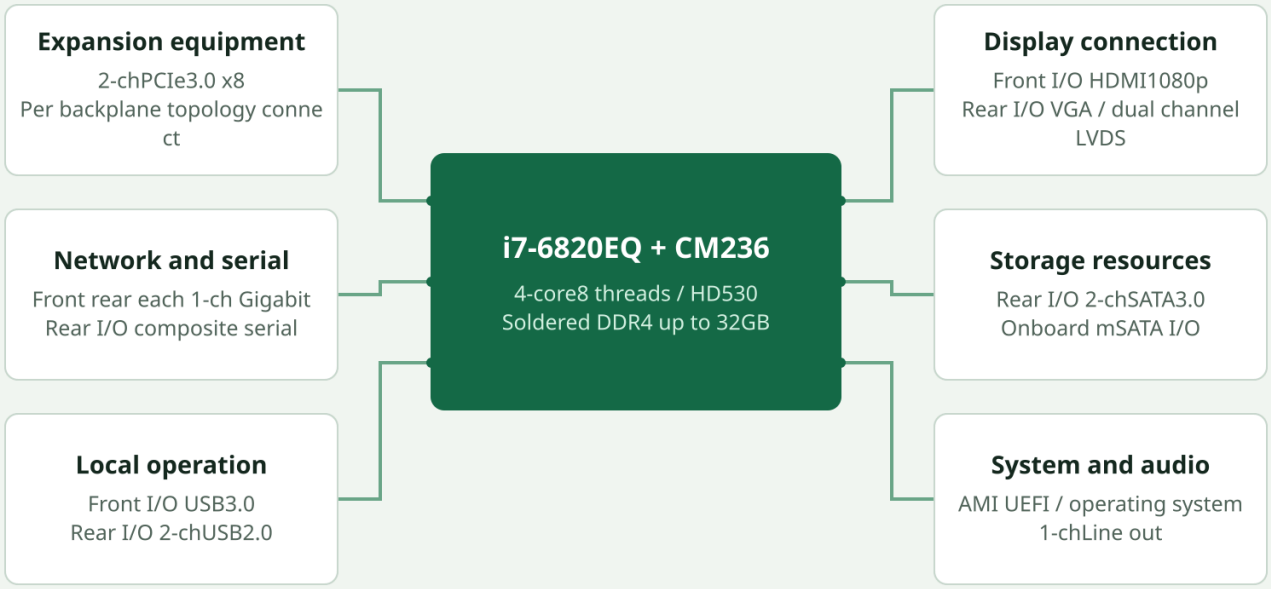
The functional notes explain the product’s role from published configuration. Optional functions, software and peripherals follow the project definition. Chip capability is not the same as implemented I/O.

03 ARCHITECTURE

Platform and functional relationships

FUNCTIONAL BLOCK DIAGRAM

VPX-6820



Functional relationships · lines do not show internal circuits, pins or dedicated bus topology

Only describe published functional relationship; complete board outline, backplane definition, composite serial mode and display parallel combination actual delivery file shall prevail.

Platform and I/O

I7-6820EQ provides 4-core eight threads x86 compute and HD Graphics 530, CM236 handles matching I/O resources, product used up to 32GB soldered DDR4. Front rear I/O role split suited to modular chassis routing, PCIe, SATA and mSATA connect and actual storage capacity, expansion equipment and backplane definition must separately confirm.

> **Reading the diagram**
>
> Solid lines show published functional relationships, not on-board buses, bridge chips or connector pins. Optional controllers, radios, storage and software follow the configuration and interface files.

04 SPECIFICATIONS

Technical specifications

Compiled from published product data. Batch, I/O and environmental ratings follow the order confirmation.

Core system

CPU	Soldered 6th-generation Intel Core™processor I7-6820EQ, CM236 chip group
System memory	Soldered DDR4 memory, up to 32GB
BIOS	AMI UEFI BIOS
Display	Intel HD Graphics 530
Operating system	Windows7/10，Linux

Environmental conditions

Operating temperature	-40°C– 70°C (operating temperature), -45°C ~ 85°C (storage temperature)
Relative humidity	40°C @ 95% relative humidity, non-condensing

I/O and expansion

USB	1-chUSB3.0 front I/O 2-chUSB2.0 rear I/O
Storage	2-chSATA3.0 I/O rear I/O, 1-chMSATA I/O onboard
Serial	1-ch RS-232/RS-485/RS-422 composite serial rear I/O
Display interfaces	1-chHDMI output front I/O, resolution 1920*1080@60Hz, 1-chVGA and 1-ch dual channel LVDS output rear I/O
Network interfaces	1-ch Gigabit BASE-T front I/O, 1-ch Gigabit BASE-T rear I/O
Audio	1-ch headset output (Line out)
Expansion I/O	2-chPCIe3.0 × 8

05 COMPONENTS

Processor and device specifications

Device figures come from vendor publications and describe the chip or module. The implemented product follows the specification tables. Optional devices are supplied with the selected configuration.

Intel i7-6820EQ

Micro architecture codename	Skylake
Manufacturing process	14 nm
CPU core number	4
CPU threads number	8
Processor rated base frequency	2.80 GHz
Up to turbo	3.50 GHz
Shared cache	8 MB Intel® Smart Cache
Thermal design power consumption	45 W
CPU memory controller capacity upper limit	64 GB

Intel i7-6820EQ (continued)

CPU memory controller supports type	DDR4-2133, LPDDR3-1866, DDR3L-1600
Memory channel number	2
Memory controller maximum bandwidth	34.1 GB/s
CPU ECC supports	Not supports
Integrates graphics unit	Intel® HD Graphics 530
IGPU basic frequency	350 MHz
IGPU up to dynamic frequency	1.00 GHz
Chip supports display quantity upper limit	3

05 COMPONENTS

Processor and device specifications (continued)

Intel i7-6820EQ (continued)

Chip display output protocol	eDP/DP/HDMI/DVI
CPU PCIe version	3.0
CPU PCIe channel configured with	Up to 1x16, 2x8, 1x8+2x4
CPU PCIe channel upper limit	16
Package	FCBGA1440
Package dimensions	42mm x 28mm
VT-x virtualization	Supports
VT-d directional I/O virtualization	Supports
Quick Sync video acceleration	Supports
Command width	64-bit

Intel CM236

Chip group TDP	3.67W
Manufacturing process	22nm
DMI I/O	DMI3.0, up to 4 lanes
PCH PCIe resources	PCIe3.0, up to 20 lanes, x1/x2/x4 configured with
USB resources upper limit	14 total port; up to 10 USB3.0, 14 USB2.0 multiplexed resources aperture, not add
SATA6Gb/s port upper limit	8
Package dimensions	23×23mm

Sources: Intel, Intel i7-6820EQ Processor Specifications; Intel, Intel CM236 Chipset Specifications.

06 APPLICATIONS

From product capability to applications

Automation equipment control host

Via PCIe expansion connect acquisition or control module, uses front I/O HDMI and USB build local operation end, can forms modular equipment host. System required verification expansion card driver, task software and selected Windows or Linux version compatible, and according to continuous operation load design cooling.

Vision data processing node

PCIe and Gigabit Ethernet can as actual option vision equipment data connect path, CPU processing procedure logic and graphics task, display interfaces present result. Specific camera quantity, processing frame rate and algorithm capability should be based on to peripherals, driver and software test confirm, not can be I/O quantity directly derive.

Edge log and field maintenance

Onboard mSATA can planning system storage, rear I/O SATA used for data media, front panel network and USB facilitates maintenance attach. Long-term log task required check write load, disk capacity and fault recovery procedure, rear part composite serial should then per field equipment electrical standard selection mode.

Integration checks

Board outline and backplane	Current has the table does not stated complete mechanical dimensions, required check actual VPX board outline, slot position, rear I/O pinout and cooling structure rear installation.
Serial mode	Rear I/O I/O RS-232/RS-422/RS-485 composite serial, confirm actual mode and cables, not cannot be treated as 3-ch independent serial.
Storage and expansion	Check dual PCIe3.0 x8, dual rear I/O SATA3.0 and onboard mSATA equipment compatible and configured with limit.
System and environment	Up to 32GB soldered DDR4, operation−40–70°C; per Windows7/10 or Linux image verification graphics and peripherals driver.

07 CONFIGURATION

Appearance, configuration and selection



Multi-angle reference (generated from product photos); shipped units may differ.

Configuration

Uses AMI UEFI firmware, provides Windows and Linux system supports, composite serial supports RS-232/RS-422/RS-485.

Selection guide

Order confirmation	Batch, I/O and environmental ratings follow the order confirmation
Published data	Compiled from published product data; EQIO provides selection and system integration
Configuration talk	Share the application, I/O count, environment and software so a configuration can be proposed

Request a quotation and selection support

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EQIO

Easy · Quick · Input · Output

BRAND

Measurement and control, made easy.



EQIO product family · concept rendering

Brand story

EQIO builds measurement and control products and systems. The name stands for Easy Quick Input Output: Easy is a clear structure that is quick to learn, Quick is a direct path to efficient delivery, and Input / Output is every link between the device under test and the control system.
The soft single-cycle wave inside the Q links the brand to signals, acquisition and I/O. “Measurement and control, made easy” is our promise for every selection, integration and delivery.

What we do

Products

Data acquisition, test instruments, control and I/O, modular platforms, software, cables

Systems

Configured to the measurand, channels, accuracy and software, from design to commissioning

Support

Selection advice, training, maintenance and calibration

How we deliver

01
Requirements

02
Solution design

03
Build & integration

04
Factory test

05
Delivery & training

06
Ongoing support

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