

# ROScube-I Series

## Embedded Real-Time Robotic Controller with Intel® Xeon®/Core™ Processor

### Features

- x86-64 mainstream architecture for ROS 2 development
- Comprehensive I/O for connecting a wide range of devices
- Ruggedized, secure connectivity with locking USB ports
- External PCIe Gen3 expansion with ruggedized cassette
- Integrated both hard and soft real-time mechanism



### Introduction

ADLINK ROScube-I is a real-time ROS 2 enabled robotic controller based on Intel® Xeon® 9<sup>th</sup> Gen Intel® Core™ i7/i3 and 8<sup>th</sup> Gen Intel® Core™ i5 processors featuring exceptional I/O connectivity supporting a wide variety of sensors and actuators for unlimited robotic applications. Also supported are Intel® VPU and NVIDIA GPU cards for computation of AI algorithms and inference. The extension box allows for convenient functional and performance expansion. ROScube-I supports the full complement of resources developed with ADLINK Neuron SDK, a perfect platform for development of industrial use service robotic applications such as autonomous mobile robots (AMR) and autonomous mobile industrial robots (AMIR).

### Software Support

- Ubuntu 18.04 LTS
- ADLINK Neuron SDK
- ROS/ROS 2
- Intel® OpenVINO™

### Ordering Information

- **RQI-58 / RQI-58-E**  
Intel® Xeon® E-2276ME, DDR4 32G, 256G SSD / with expansion box
- **RQI-57 / RQI-57-E**  
Intel® Core™ i7-9850HE, DDR4 32G, 256GB SSD / with expansion box
- **RQI-55 / RQI-55-E**  
Intel® Core™ i5-8400H, DDR4 32G, 128GB SSD / with expansion box
- **RQI-53 / RQI-53-E**  
Intel® Core™ i3-9100HL, DDR4 16G, 64GB SSD / with expansion box

### Optional Accessories

- **DDR 4 SO-DIMM Storage**  
Dual channel non-ECC 2400 MHz DDR4 8 GB memory (P/N: 29-6B800-L430)  
Dual channel non-ECC 2400 MHz DDR4 16 GB memory (P/N: 29-6BC00-L430)
- **Wireless Module**  
Intel® Wireless-AC 9260 M.2 2230, Dual-Band 2x2 Wi-Fi + Bluetooth+ 5 kit (P/N: 91-95266-0010)
- **CAN bus Mini PCIe Module**  
Dual channel: FARO-FS900 (P/N: 92-97142-0010)
- **AC/DC Power adapter**  
220W AC/DC power adapter (P/N: 31-62149-0000)  
280W AC/DC power adapter (P/N: 91-95263-0010)

## Specifications

Model Name	RQI-58 RQI-58-E	RQI-57 RQI-57-E	RQI-55 RQI-55-E	RQI-53 RQI-53-E
<b>System Core</b>				
Processor	Intel® Xeon® E-2276ME 45W	Intel® Core™ i7-9850HE 45W	Intel® Core™ i5-8400H 45W	Intel® Core™ i3-9100HL 25W
Core	6	6	4	4
Base Freq.	2.8GHz	2.7GHz	2.5GHz	1.6GHz
MAX Turbo Freq.	4.5GHz	4.4GHz	4.2GHz	2.9GHz
Chipset	Mobile Intel® CM246 Chipset			
Memory	2x DDR4 16GB 2400MHz, dual SO-DIMMs, up to 32GB	2x DDR4 16GB 2400MHz, dual SO-DIMMs, up to 32GB	2x DDR4 16GB 2400MHz, dual SO-DIMMs, up to 32GB	2x DDR4 8GB 2400MHz, dual SO-DIMMs, up to 16GB
Display	2x DP++ and 1x HDMI			
<b>Front Panel I/O Interface</b>				
Ethernet	<b>4x GbE:</b> 3x Intel® i211AT + 1x Intel® i219LM with iAMT support, IEEE 1588 and 802.1AS			
Series Port	COM 1/2: RS-232/422/485			
USB	2x USB 3.1 Gen1 Type A with lockable connectors 4x USB 3.1 Gen 1 Type A 4x USB 2.0 Type A			
Multi-I/Os on DB 50 connector (Support real time OS)	Two channel I <sup>2</sup> C <b>8x Digital Input:</b> VIH: 2 to 5.25V, VIL: 0 to 0.8V <b>8x Digital Output:</b> VOH: 2.4 to 5V, VOL: 0 to 0.5V, Current: 24mA/per channel <b>Optional (Default do not install the module on the system):</b> <b>Dual Channel:</b> FARO-FS900, PEAK IPEH-003049* <b>Single Channel:</b> PEAK IPEH-003048* <b>*: This module supports real time OS</b>			
<b>Internal I/O Interfaces</b>				
Mini PCIe	2x full size (one for CAN, one for Wi-Fi or LTE)			
M.2	1x Socket 1, Key A and A+E key, 2230 for Wi-Fi			
USIM	1x Socket			
TPM	TPM 2.0			
<b>LED indicator</b>				
Watchdog	1 x Watchdog LED			
Diagnostics	1 x Diag-Alert LED (indicates if no physical storage is connected or memory is installed)			
Storage	1x Storage activity LED			
User Defined	5x user defined LEDs (Green: U2-U5, Red: U1)			
<b>Storage Devices</b>				
M.2 B key or B+M Key	256GB mSATA SSD		128GB mSATA SSD	64GB mSATA SSD
<b>Expansion Box*</b>				
Expansion Slots	1x PCIe Gen3 x 16 1x PCIe Gen3 x 4 *: Only for -E model			
<b>Power Requirements</b>				
DC Power Input	9-32V (±5% tolerance, reverse polarity protection)			
Power consumption	16.7-4.7A (w/o expansion box) 20-12.5A (w/ expansion box)			
AC/DC Power Adapter	<b>Optional:</b> 160W, 220W or 280W AC/DC power adapter, see order information			
Power Switch	1x power ON/OFF button			
System Reset	Hardware reset button			
EXT Power Header	1x Extend the power on/off button for robot system			
<b>Mechanical</b>				
Dimensions	<b>w/o expansion box:</b> 210(W) x 240(D) x 86(H) mm (8.267 x 9.449 x 3.385 inches) <b>w/ expansion box:</b> 210(W) x 240(D) x 165(H) mm (8.267 x 9.449 x 6.496 inches)			
Weight	3.6kg w/o expansion box 4.6kg w/ expansion box			
Mounting	Wall mount kit			

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Model Name	RQI-58 RQI-58-E	RQI-57 RQI-57-E	RQI-55 RQI-55-E	RQI-53 RQI-53-E
<b>Environmental</b>				
Operating Temperature	-20~70°C(-4°F~140°F w/ 1x SODIMM) -20~60°C(-4°F~140°F, w/ 2x SODIMM) *Default: 2x DDR4 memory			
Operating Humidity	~95% @40°C (non-condensing)			
Storage Temperature	-40~85°C(-40°F~185°F)			
Vibration	<b>IEC 60068-2-6:</b> 1G, 5-500Hz, 3 axes <b>IEC 60068-2-64:</b> Operating 5Grms, 5-500 Hz, 3 axes w/ M.2 SSD			
Shock	<b>MIL-STD-202G Method 213B, Table 213-I Condition A</b> Operating: 100G, half sine 11ms duration w/ M.2 SSD			
EMI	CE & FCC Class B with validated AC/DC adapter (EN61000-6-4/-2)			
EMS	<b>IEC 61000-4-2</b> (ESD, contact: ±8kV, air: ±15kV) <b>IEC 61000-4-3</b> (RS, 10V/m from 80-1000MHz, 3V/m from 1400-2000MHz, 1V/m from 2000-2700MHz, 1kHz sine wave, 80% AM) <b>IEC 61000-4-4</b> (EFT, ±2kV at 5KHz on power port, ±1kV at 5KHz on signal port) <b>IEC 61000-4-5</b> (Surge, ±2kV line to earth CM on power port, ±1kV line to earth CM on signal port) <b>IEC 61000-4-6</b> (CS, 10Vrms with 1kHz sine wave, 80% AM from 0.15MHz-80MHz) <b>IEC 61000-4-8</b> (power-frequency magnetic fields) <b>IEC 61000-4-11</b> (voltage DIPS & voltage interruptions)			
Safety	UL, cUL, CB			
<b>Software</b>				
SDK	ADLINK Neuron SDK			
Environment	Ubuntu 18.04 LTS			
Middleware	ROS/ROS 2 Intel® OpenVINO™			

