

ROScube Pico NPN series

NVIDIA® Jetson Xavier™ SOM-based platform for rapid development of ROS and AI applications

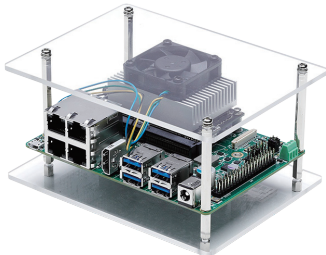
Features

- Low power consumption (15W) and excellent per-watt performance
- Compact, SODIMM-based design
- Comprehensive I/O for broad compatibility
- Affordable solution for rapid development and deployment
- Reliable, lockable USB connectors



Introduction

The ROScube Pico Series is an integrated development board powered by an NVIDIA® Jetson Xavier™ NX and Nano system-on-module (SOM) platform designed for rapid development and deployment of ROS and AI applications. The straightforward design allows users to quickly get started on development using open-source ROS libraries and packages. In addition to NVIDIA JetPack SDK, the ROScube Pico NX/Nano supports the full complement of resources provided by ADLINK's Neuron SDK, Neuron IDE, and Neuron Library. The ROScube Pico NX/Nano is especially suited for robotic applications that demand cost-effective deployment without compromising AI computing capability.



Ordering Information

- **NPN-1**
ROScube Pico with NVIDIA Nano SODIMM module
- **NPN-1B**
ROScube Pico with NVIDIA Nano SODIMM module, IP40 BOX version
- **NPN-2**
ROScube Pico with NVIDIA NX SODIMM module
- **NPN-2B**
ROScube Pico with NVIDIA NX SODIMM module, IP40 BOX version

Optional Accessories

- **M.2 M Key 2242 NVMe SSD**
- **Wireless module**
Intel® Wireless-AC 9260 M.2 2230, Dual-Band 2x2 Wi-Fi + Bluetooth+ 5 kit (P/N: 91-95266-0010)
- **90W, Adapter, 19V/4.74A, DC Jack (P/N:31-62137-0000)**

* Need to install WIFI backport driver, please check installation script in UM.

Software Support

- **Ubuntu 18.04 L4T**
- **Neuron SDK, Neuron IDE, Neuron Library**
- **NVIDIA Jetson SDK**

ROScube Pico NPN series



Specifications

Model Name	NPN-1 (Board)	NPN-1B (BOX)	NPN-2 (Board)	NPN-2B (BOX)
System-on-module (SOM)				
NVIDIA Module	NVIDIA Jetson Nano Module		NVIDIA Jetson Xavier NX Module	
CPU	Quad-core ARM Cortex-A57 MPCore processor		6-core NVIDIA Carmel ARM v8.2 64-bit CPU 6MB L2 + 4MB L3	
CPU Max Frequency	1.43GHz		2-core @ 1.5GHz/4-core @ 1.2GH, 10W 2-core @ 1.9GHz/4/6-core @ 1.4GHz, 15W	
GPU	NVIDIA Maxwell architecture with 128 NVIDIA CUDA® cores		384-core NVIDIA Volta GPU with 48 Tensor Cores	
GPU Max Frequency	921MHz		800MHz @10W/1100MHz @ 15W	
Memory	4GB 64-bit LPDDR4 @ 1600MHz 25.6GB/s		8GB 128 bit LPDDR4x @ 1600MHz 51.2GB/s	
Storage	16GB eMMC 5.1 on NV module			
AI performance	N/A		14 TOPS @10W/21 TOPS @15W	
Front Panel I/O Interface				
Display	1x HDMI 2.0			
Ethernet	4x Gigabit Ethernet ports			
USB 3.1 Gen1	4x USB 3.1 Gen1 Type-A ports (2x with lockable connectors)			
Micro-USB	1x Micro-USB port for OTG/debugging and recovery			
Internal I/O Interfaces				
MRAA 40-pin header	2x I ² C, 7x GPIO, 1x SPI, 1x UART, 10x PWM (board only)			
micro SD	1x micro SD slot (Board level with 1x 32GB micro SD card as default)			
M.2 slot	1x M.2 E Key for Wi-Fi module 1x M.2 B+M Key for 2242 NVMe SSD			
CANbus	1x 3-pin header (only on NPN-2 SKU and board level)			
FAN	1x 4-pin-wafer for FAN control (only on board level)			
LEDs	1x green for NVIDIA module power on 1x green for SD-card power on 1x blue for sleep mode (board only)			
Power management pin	1x PWR_BTN, 1x SYS_RST, 1x Force recovery, 1x power-on LED (for extending the function to robots)			
RTC	CR2032 3V Li VARTA			
Side Panel I/O Interfaces				
DB-37 connector	2x UART, 2x I ² C, 1x SPI, 1x CANbus, 5x PWM, 1x extended power on/off, 1x extended SYS reset, 1x extended force recovery			
Audio IN/OUT	1x 3.5mm stereo line-out jack			
Sensor				
IMU	1x BMI160 (3-axis gyroscope, 3-axis accelerometer)			
Power Requirements				
Power Buttons	1x power on/off button, 1x reset button			
DC input	DC 8–20V range (+/- 10%)			
AC/DC Power adapter	90W, Adapter, 19V/4.74A, DC Jack (optional, see ordering information)			
Mechanical				
Dimensions (WxDxH)	Board Level: 123.5 (W) x 90 (D) mm (4.86 x 3.54 in) BOX level: 140 (W) x 110 (D) x 63.3 (H) mm (5.5 x 4.33 x 2.49 in)			
Weight	BOX: Under 1040g			
Mounting	Wall mount kit (with BOX version only)			

ROScube Pico NPN series

Environmental	
Operating Temperature	-20°C to 50°C (-4°F to 122°F) with 0.6m/s airflow -20°C to 65°C (-4°F to 149°F with 1.2GHz CPU) with 0.6m/s airflow
Operating Humidity	Approx. 95% @40°C (non-condensing)
Storage Temperature	-40 to 85°C (-40°F to 185°F)
EMI	CE & FCC Class B with validated AC/DC adapter (EN61000-6-4/-2)
EMS	IEC 61000-4-2 (ESD, contact: ±8kV, air: ±15kV) IEC 61000-4-3 (RS, 10V/m from 80-1000MHz, 3V/m from 1400-2000MHz, 1V/m from 2000-2700MHz, 1kHz sine wave, 80% AM) IEC 61000-4-4 (EFT, ±2kV at 5KHz on power port, ±1kV at 5KHz on signal port) IEC 61000-4-5 (Surge, ±2kV line to earth CM on power port, ±1kV line to earth CM on signal port) IEC 61000-4-6 (CS, 10Vrms with 1kHz sine wave, 80% AM from 0.15MHz-80MHz) IEC 61000-4-8 (power-frequency magnetic fields) IEC 61000-4-11 (voltage DIPS & voltage interruptions)
Vibration	IEC60068-2-6: 3G, 10-500Hz, 3 axes total, non-operational IEC60068-2-64: 1Grms, 10-500Hz, 1 hour/axis, operational
Shock	IEC-60068-2-27 Operating 50G, half sine 11ms duration
Safety	62368 LVD
Software	
Environment	Ubuntu 18.04 L4T (Support from 32.4.3)
Middleware	ROS/ROS 2, Neuron Library DDS with shared memory DDS with extra QoS
Platform	ADLINK Neuron SDK