

# ROScube Pico NPN series

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

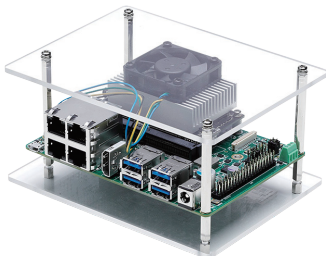
## Features

- 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**  
256GB, Transcend TS256GMTE452T (P/N: 29-46N00-6100)
- **Wireless module**  
Intel® Wireless-AC 9260 M.2 2230, Dual-Band 2x2 Wi-Fi + Bluetooth+ 5 kit (P/N: 91-95266-0010)  
\* WiFi backport driver is on the desktop.
- **90W, Adapter, 19V/4.74A, DC Jack (P/N:31-62137-0000)**  
(board version comes with 60W adapter by default)

## Software Support

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

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## Specifications

Model Name	NPN-1 (Board)	NPN-1B (BOX)	NPN-2 (Board)	NPN-2B (BOX)
<b>System-on-module (SOM)</b>				
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		Power Modes (S/W controllable by user): 2-core @ 1.5GHz, 10W 4-core @ 1.2GHz, 10W 2-core @ 1.9GHz, 15W 4-core @ 1.4GHz, 15W 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	
<b>Front Panel I/O Interface</b>				
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			
<b>Internal I/O Interfaces</b>				
MRAA 40-pin header	2x I <sup>2</sup> 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 Key E for Wi-Fi module 1x M.2 2242 Key M for 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 (board only)	Power (green) Standby (blue) SD Card (green) NVMe Module (amber)			
Power management pin	1x power button, 1x system reset, 1x force recovery, 1x power-on LED (for extending the function to robots)			
RTC	CR2032 3V Li VARTA battery			
<b>Side Panel I/O Interfaces</b>				
DB-37 connector	2x UART, 2x I <sup>2</sup> C, 1x SPI, 1x CANbus, 5x GPIO, 1x extended power on/off, 1x extended SYS reset, 1x extended force recovery			
Audio IN/OUT	1x 3.5mm stereo line-out jack			
<b>Sensor</b>				
IMU	1x BMI160 (3-axis gyroscope, 3-axis accelerometer)			
<b>Power Requirements</b>				
Power Buttons	1x power on/off button, 1x reset button			
DC input	8-20 VDC (+/- 10%)			
AC/DC Power adapter	90W, Adapter, 19V/4.74A, DC Jack (optional, see ordering information)			

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## Mechanical

Dimensions (WxDxH)	Board: 123.5 x 90 mm (4.86 x 3.54 in.)	Box: 140 x 110 x 63.3 mm (5.5 x 4.33 x 2.49 in.)	Board: 123.5 x 90 mm (4.86 x 3.54 in.)	Box: 140 x 110 x 63.3 mm (5.5 x 4.33 x 2.49 in.)
Weight	319 g	1035 g	339 g	1035 g
Mounting	Wall mount kit (with BOX version only)			

## Environmental

Operating Temperature (with 0.6m/s airflow)	-20°C to 45°C	-20°C to 50°C	-20°C to 60°C	-20°C to 50°C
Operating Humidity	Approx. 95% @40°C (non-condensing)			
Storage Temperature	-40 to 85°C (-40°F to 185°F)			
EMI	CE & FCC Class A 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			