

XNode Plus



IoT connectivity application training equipment based on wireless personal network (WPAN) and low-power wideband network (LPWAN)

Consists of high-performance edge server with integration of base station and network server, module type sensor node and expansion module

Edge server supports sensor node control and AI fusion programming in a web browser environment through the AIoT dedicated operating system Soda OS and Pop library

Edge server supports mDNS/DNS-SD, SSH, SFTP, SMB/CIFS, MQTT, and NX X Window protocols

Sensor node can be selected between LoRa/Sigfox/Wi-Fi/Bluetooth (Node A) or Zigbee Pro/Bluetooth (Node B)

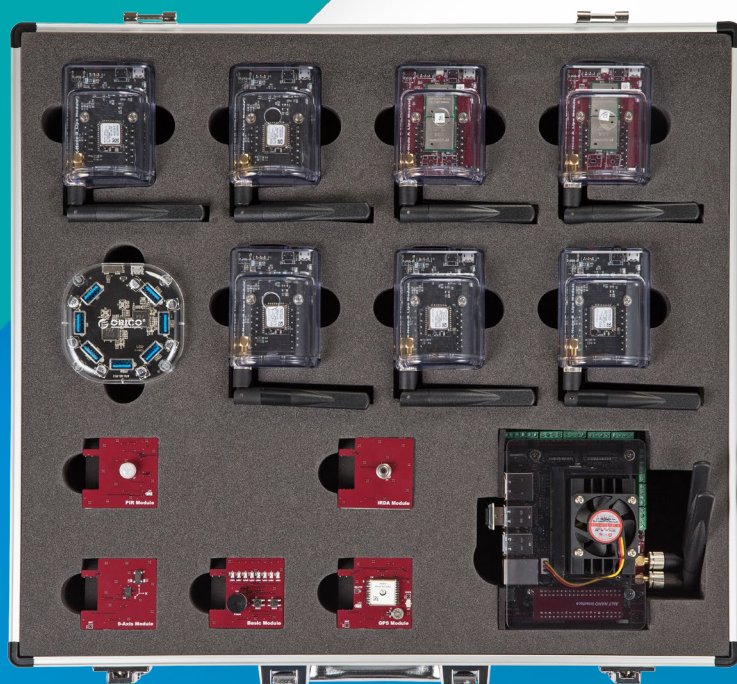
Provides 2100mA battery, RGB LED for indicator, light sensor based on lux unit and temperature/humidity sensor for independent operation of sensor node

Sensor node supports interpreter-style Python 3 so that control programs can be easily and concisely written

AIoT dedicated operating system Soda OS and Pop library

Visual Studio Code-based integrated development environment for professional application development

Provides training contents for Python-based edge server and sensor nodes



Software Specifications

List		Specifications
Edge Server	Linux Kernel	aarch32 4.x or aarch64 4.x
	Lightweight Desktop	X-Server, Openbox, lxdm, Tint2, blueman, network-manager, conky pcmanfm, lxterminal
	CLI	Zsh with Oh-My-Zsh, Tmux, Peco, powerlevel9k thema, Powerline fonts
	Tool Chain	GCC (c, c++), JDK, Node JS, Python3, Cling
	IDE	Visual Studio Code, NeoVim, Geany
	Soda OS	Connectivity
		SSH Server, Samba Server, Remove Desktop Server, mDNS(avahi) Bluez, MQTT Server(Mosquitto), Blynk Server
		Multimedia
		PulseAudio, sox (lame, oggenc), snowboy, Google Assistant OpenGL ES, OpenCV 4
		Data Science & AI
Pop Library		Numpy, Matplotlib, Pandas, Scipy, Seaborn Scikit-learn, TensorFlow, Keras, PyTorch, TorchVision, OpenAI Gym
	Jupyter Lab	Python3 and Cling support IPython Widgets Terminal support
	Multimedia Object	AudioPlay, AudioPlayList, AudioRecord, Tone, SoundMeter
	Voice Assistant Object	GAssistant, create_conversation_stream
Node A	AI Object	Linear Regression, Logistic Regression, Perceptron, ANN, DNN, CNN, DQN Pilot with AutoCar & SerBot
	MicroPython 3 (built in node)	
	Soda IDE	
	Configuration Software (compatible with Linux, OS X and Windows)	
Node B	Remote Terminal & Remote Desktop support	
	Pop Library	Output Object: RGB LED, Buzzer Input Object: Switch, PIR, Thermopile, 9Axis IMU, GPS
Node B	MicroPython 3 (built in node)	
	Soda IDE	
	Configuration Software (compatible with Linux, OS X and Windows)	
	Remote Terminal & Remote Desktop support	
Node B	Pop Library	Output Object: LED, Buzzer Input Object: Switch, PIR, Thermopile, 9Axis IMU, GPS

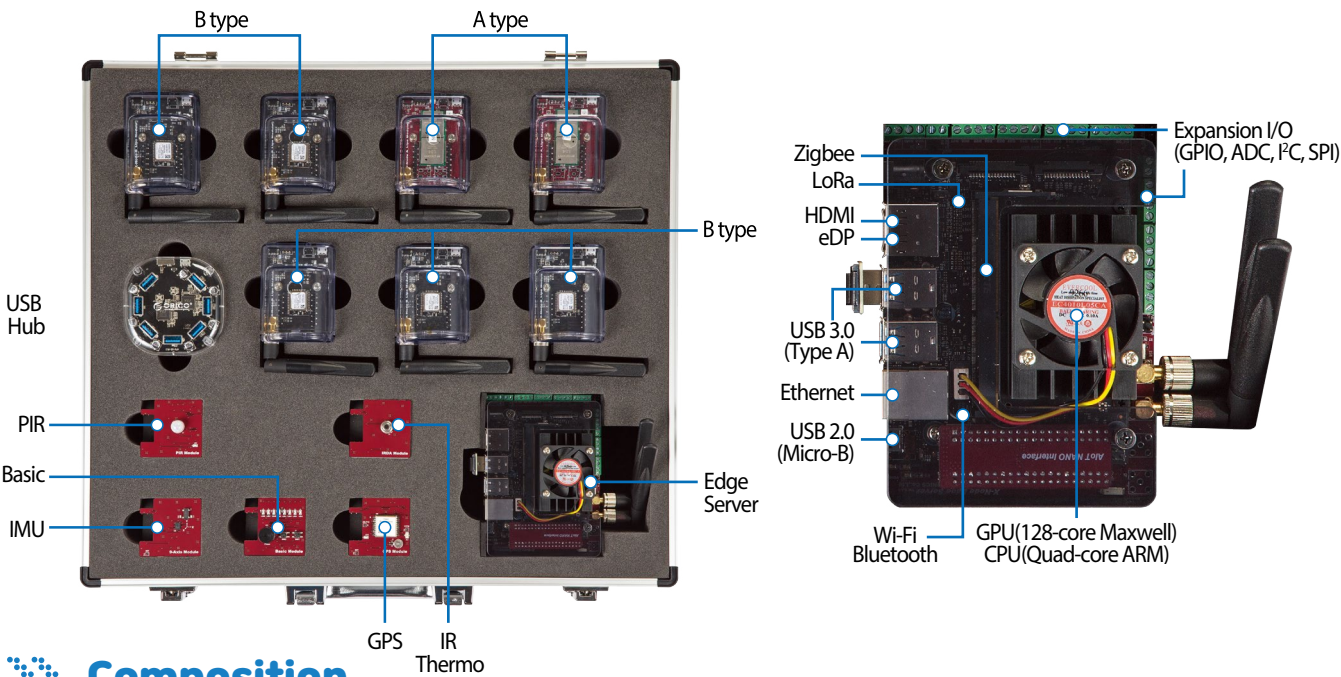
Hardware Specifications

List	Specifications
Edge Server	CPU: Quad-core ARM A57 @ 1.43 GHz
	GPU: Maxwell Core 128EA
	Memory: 4GB 64-bit LPDDR4 25.6 GB/s
	Storage: microSD (64GB)
	Video Encoder: 4K@30 4x 1080p@30 9x 720p@30 (H.264/H.265)
	Video Decoder: 4K@60 2x 4K@30 8x 1080p@30 18x 720p@30 (H.264/H.265)
Expansion Module	Camera: MIPI CSI-2 DPHY lanes
	Connectivity
	Dual Band Wireless WiFi 2GHz/5GHz Band, 867Mbps, 802.11ac
	Bluetooth 4.2
	Gigabit Ethernet
	Display: HDMI and display port
	USB: 4x USB 3.0, USB 2.0 Micro-B
	Basic
	Input Device: Tact Switch x 2EA(GPIO)
	output device: LED 8EA(I ² C)
	Actuator: Passive Buzzer(GPIO)
Node A (2EA)	Size: 46x44(mm)
	IMU
	Acceleration ranges: 2g/±4g/±8g/±16g
	Gyroscope ranges: ±125°/s to ±2000°/s
	Magnetic field range: ±1300uT(x-,y-axis), ±2500uT(z-axis)
	Interface: I ² C
	Size: 46x44(mm)
	PIR
	Sensing Range: 110°
	Spectral Response: 5 ~ 14 um
	I/O Interface: Digital Out
	Size: 46x44(mm)
Node A (2EA)	IR Thermo
	Measurement resolution: 0.02°C
	Measure range: -40°C ~ +125°C
	Interface: I ² C
	Size: 46x44(mm)
	GPS
	Sensitivity: -165dBm
	Update Rate: up to 10Hz
	AGPS Support for Fast TTFF
	Consumption current(@3.3V)
	Acquisition: 25mA Typ
	Tracking: 20mA Typ
Node A (2EA)	Size: 46x44(mm)
	RAM: 4MB
	Flash Memory: 8MB
	Interface: UART, SPI, I ² C, I ² S, ADC, PWM, GPIO
	Indicator: RGB LED
	Wi-Fi
	802.11b/g/n
	Data Rate: 1Mbps to 72Mbps
	Transmit power: Up to +16dBm
	Receiver Sensitivity: -93 to -71 dBm
	Bluetooth
	Bluetooth 4.2 BR/EDR BLE
	Range: 30M
Node A (2EA)	Data Rate: 1Mbps
	Sensitivity: -97dBm
	Output Power: 12dBm
	LoRa
	Frequency: 900MHz
	Range: 10km
	Data Rate: 300kbps
	Sensitivity: -148dBm
	Output Power: 20dBm
	Sigfox
	Frequency: 900MHz
	Range: 10km
	Data Rate: 100bps
	Output Power: 20dBm
Node A (2EA)	Light Sensor
	Illuminance: 1 ~ 65535(lx)
	Interface: I ² C
	HUMIDITY & TEMPERATURE Sensor
	Humidity Resolution: 12bit(0.04%RH), 8bit(0.7%RH)
	Humidity Accuracy: +-3%RH
	Temperature Resolution: 14bit(0.01C), 12bit(0.04C)
	Temperature Accuracy: +-4°C
	Interface: I ² C
	Power
	Micro USB B type(+5V)
	Expansion Connector (+5V)
	Li-Po Type 3.7V/2100mAh (1EA)

Hardware Specifications

List	Specifications
Node B (5EA)	RAM: 128KB
	Flash Memory: 1MB
	Interface: UART, SPI, I ² C, ADC, PWM, GPIO
	Indicator: LED
	ZigBee 3.0 Frequency: 2.4GHz Range: Max 3200m (outdoor), Max 90m(indoor) Data rate: 250kbps Sensitivity: -103dBm Output Power: 19dBm Receiver Sensitivity: -100 dBm Bluetooth support
	Light Sensor Illuminance: 1 ~ 65535(lx) Interface: I²C
HUMIDITY & TEMPERATURE Sensor	Humidity Resolution: 12bit(0.04%RH), 8bit(0.7%RH)
	Humidity Accuracy: +-3%RH Temperature Resolution: 14bit(0.01C), 12bit(0.04C) Temperature Accuracy: +-4°C Interface: I ² C
Power	Micro USB B type(+5V) Expansion Connector (+5V) Li-Po Type 3.7V/2100mAh (1EA)

Layout



Composition

