

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)

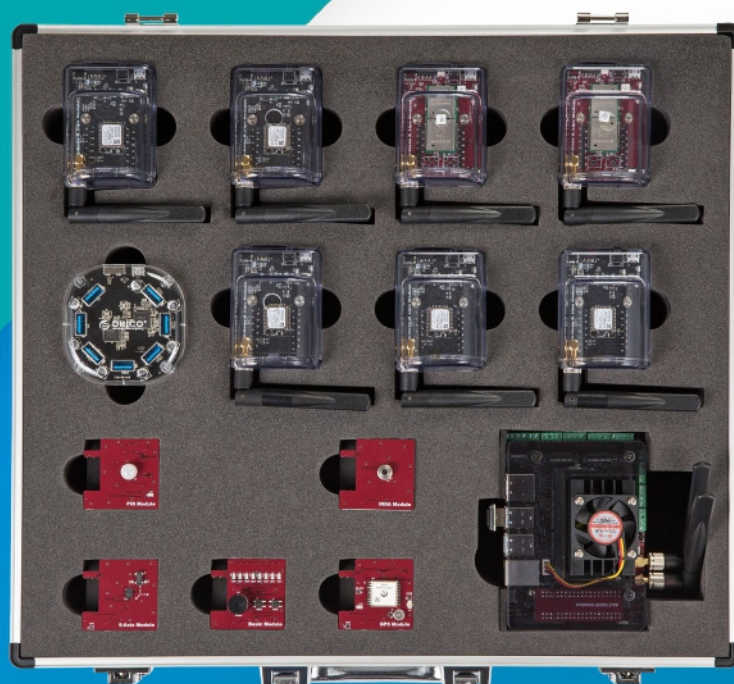
Provides 2100mA battery, RGB LED for indicator, light sensor based on lux unit and temperature/humidity sensor for independent operation of sensor node

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, Remote 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 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
Pop Library	Voice Assistant Object GAssistant, create_conversation_stream
	AI Object Linear Regression, Logistic Regression, Perceptron, ANN, DNN, CNN, DQN Pilot with AutoCar & SerBot
Node A	MicroPython 3 (built in node)
	Soda IDE
	Configuration Software (compatible with Linux, OS X and Windows)
	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
Pop Library	Output Object: LED, Buzzer Input Object: Switch, PIR, Thermopile, 9Axis IMU, GPS

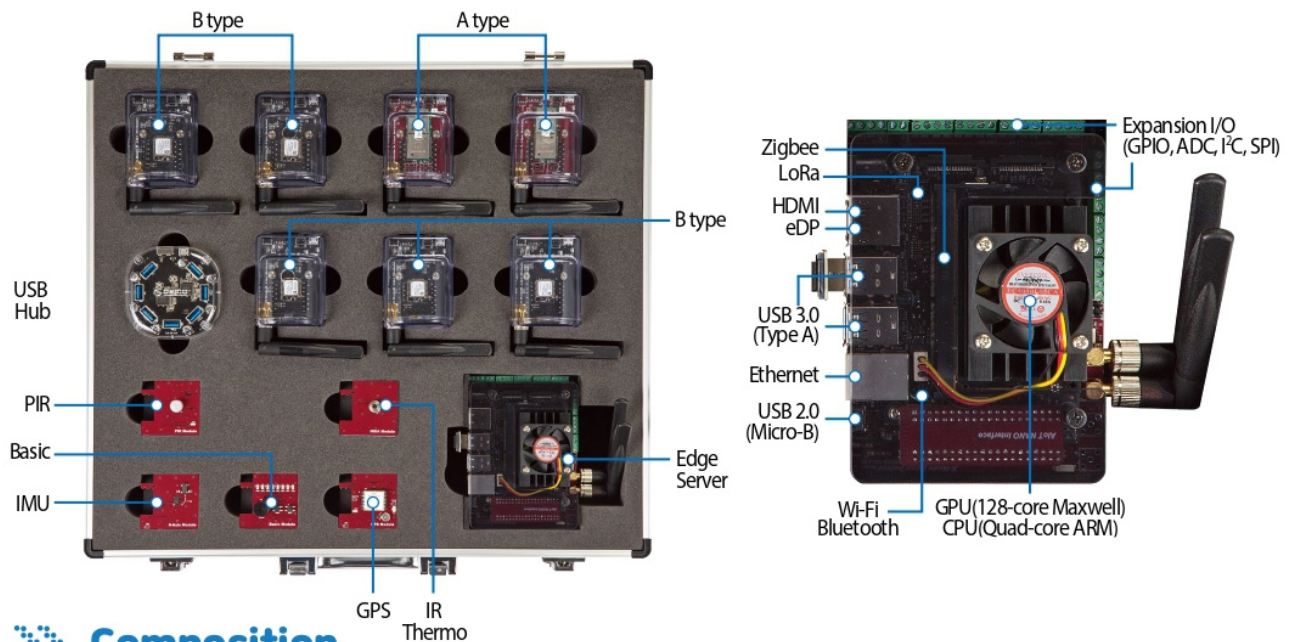
Hardware Specifications

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)
Edge Server	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)
	Camera: MIPI CSI-2 DPHY lanes
	Connectivity: Dual Band Wireless WiFi 2GHz/5GHz Band, 867Mbps, 802.11ac Bluetooth 4.2 Gigabit Ethernet
Expansion Module	Display: HDMI and display port
	USB: 4x USB 3.0, USB 2.0 Micro-B
	Basic: Input Device: Tact Switch x2EA(GPIO) output device: LED 8EA(I ² C) Actuator: Passive Buzzer(GPIO) 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)
Expansion Module	PIR: Sensing Range: 110° Spectral Response: 5 ~ 14 um I/O Interface: Digital Out Size: 46x44(mm)
	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 Size: 46x44(mm)
	RAM: 4MB Flash Memory: 8MB Interface: UART, SPI, I ² C, I ² S, ADC, PWM, GPIO Indicator: RGB LED
Node A (2EA)	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 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
	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: 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)	

Layout



Composition

