

XNode Plus



무선 개인 네트워크(WPAN) 및 저전력 광대역 네트워크(LPWAN) 기반 IoT 커넥티비티 응용 실습 장비

베이스 스테이션과 네트워크 서버가 통합된 고성능 엷지 서버와 모듈 타입 센서 노드 및 확장 모듈로 구성

엷지 서버는 AIoT 전용 운영체제인 Soda OS와 Pop 라이브러리를 통해 웹브라우저 환경에서 센서 노드 제어 및 인공지능 융합 프로그래밍 지원

엷지 서버는 mDNS/DNS-SD를 비롯해 SSH, SFTP, SMB/CIFS, MQTT, NX X Window 프로토콜 지원

센서 노드는 LoRa/Sigfox/Wi-Fi/Bluetooth(노드 A) 또는 Zigbee Pro/Bluetooth(노드 B) 중 선택 가능

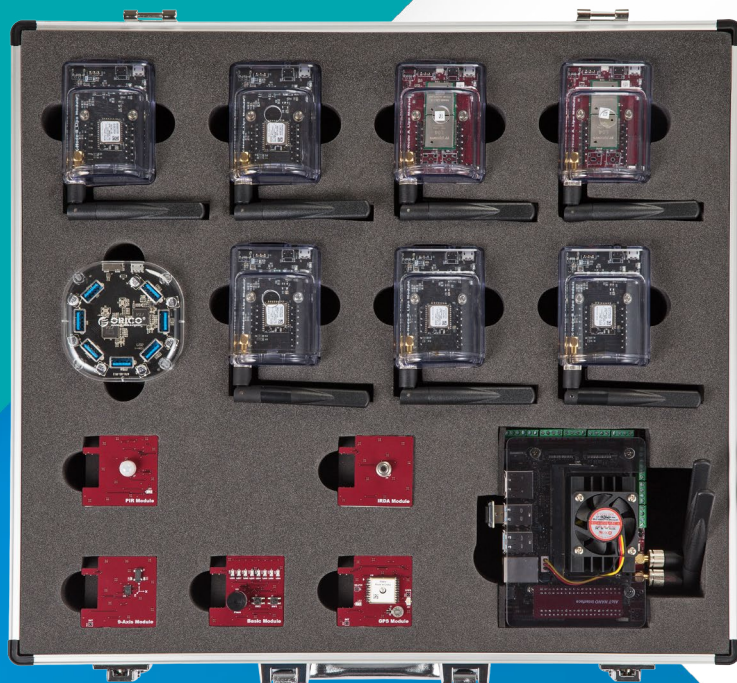
센서 노드는 독립적으로 운영할 수 있도록 2100mA 배터리와 인디케이터용 RGB LED 및 룩스 단위 빛 센서와 온습도 센서 기본 제공

센서 노드는 쉽고 간결하게 제어 프로그램을 작성할 수 있도록 인터프리터 방식의 파이썬3 지원

AIoT 전용 운영체제인 Soda OS와 Pop 라이브러리 지원

전문적인 응용 개발을 위해 Visual Studio Code 기반 통합개발환경 지원

파이썬 기반 엷지 서버 및 센서 노드용 학습 콘텐츠 제공



소프트웨어 사양

List		Specifications
Edge Server	Linux Kernel	aarch32 4.x 또는 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
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
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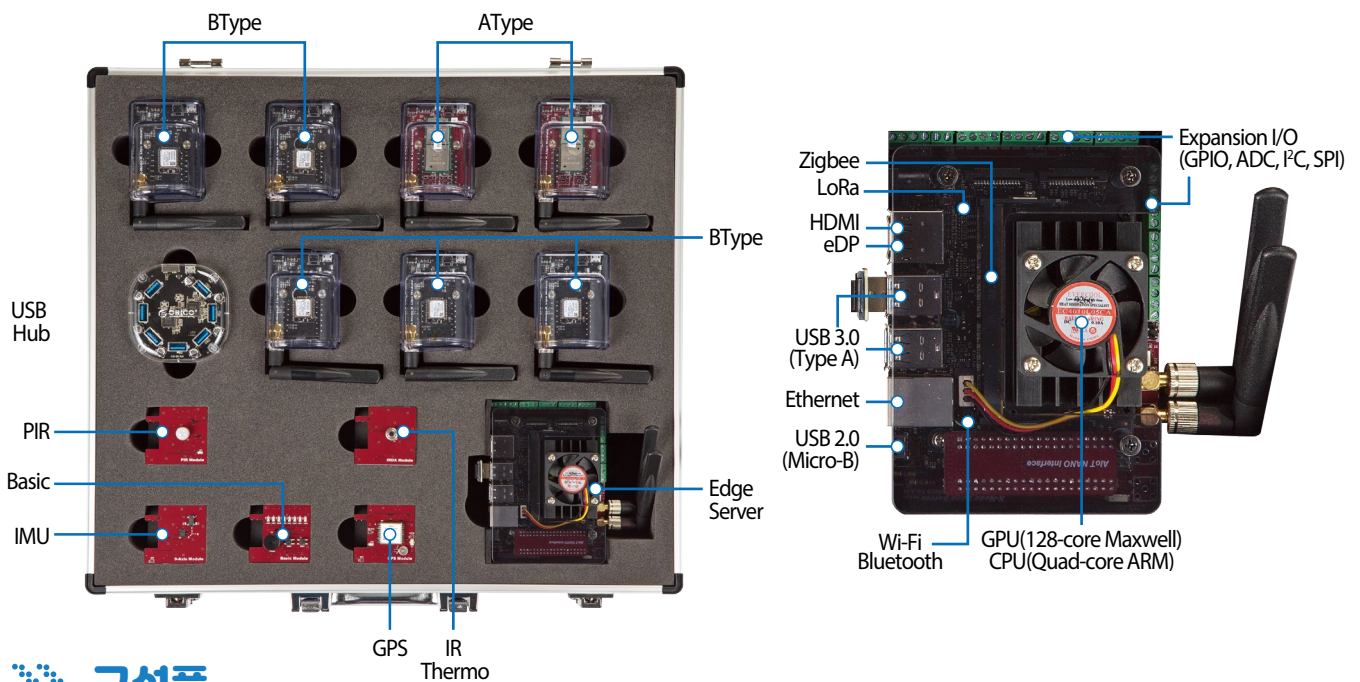
하드웨어 사양

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)
	Size: 46x44(mm)
Node A (2EA)	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)
	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)
Node A (2EA)	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
	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)

하드웨어 사양

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)

레이아웃



구성품

