ENAiKOON

Beacon scanner for asset management applications

Short range: BLE / LoRa
Long range: Wi-Fi / LoRaWAN / Cellular / Ethernet

M5-B1 Overview

The main application of beacon scanners is receiving, aggregating, and forwarding so-called PINGs from beacons.

Typical applications include fully automatic, permanent inventory on construction sites, in supermarkets, or checking the contents of containers.

Beacons are small, very inexpensive devices that transmit a globally unique ID via radio at regular intervals, so-called PINGs.

ENAiKOON offers various beacons for different applications.

Mostly BLE beacons (so-called iBeacons or Airtags) or LoRa Beacons are used.

BLE beacons typically have a radio range of up to 100 meters, LoRa beacons up to 1000 meters in free field.

M5-B1 is a robust, IP67 certified IIoT device that is developed and manufactured in Germany.

The device can be mounted stationary as well as in vehicles, construction machines or containers.

With its two ESP32 processors, M5-G1 offers strong computing power for a variety of applications.

Key features:

Versatile connectivity:

- Wireless:
  Wi-Fi, LoRa/LoRaWAN, BLE,
  Cellular (GPRS, NB-IoT, LTE Cat-M)
- Wired:
  Ethernet

Sensor and device compatibility:

- Connection to a wide range of beacons from ENAiKOON and third-party providers

Localization:

- Integrated GNSS receiver (GPS, Galileo, Beidou)

Built-in sensors:

- Temperature sensor
- Humidity sensor (requires suitable housing)
- Reed relay
- 3-axis acceleration sensor for motion detection and device wake-up

Signaling & Alarming:

- Buzzer <80 dB
- 6 LEDs

Data processing:

- Direct cloud communication with
  - ginstr web
  - ENAiKOON inViu pro
- Large internal memory for data storage

Energy efficiency:

- Deep sleep mode with very low power consumption
  - <160 µA internal battery
  - <5 mA at 12 V external battery
- Supports Li-ION batteries, LiPo batteries, LiSOCI2 batteries

Environmental resistance:

- IP67 waterproof and dustproof

Security:

- Encrypted data transmission with SSL/HTTPS for increased security
- Compliance with European data protection regulations

Adaptation:

- Programmable with any Arduino IDE, e.g. PlatformIO
- Customizable firmware for specific requirements

Advantages:

- "Made in Germany":
- Quality, reliability and German support
- Strong performance and versatility
- Enhanced security and data protection
- Easy integration and customization
- Ideal for indoor and outdoor use

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M5-B1 Device specification

18 connection terminals for cables:

VCC 6 ~ 36 VDC	RS485-B
GND	5V
S0 (count input)	1Wire
CAN-H	DigIn/DigOut 4
CAN-L	DigIn/DigOut 3
RS232-R	DigIn/DigOut 2
RS232-T	DigIn/DigOut 1
DOUT5	Dry contact input 3.3V
RS485-A	Dry contact input 3.3V

DigIn/DigOut 1-4 configuration options:
- Digital input
- Digital output
- Interrupt input
- PWM output
- Analog input

2 processors:
- ESP32-WROOM (Arduino-compatible)
- ESP32-Pico

Memory:
- RAM: 520 KB + 520 KB
- Flash: 16 MB + 4 MB
- 6 MB for the firmware of the ESP32-WROOM processor
- 10 MB for data (approx. 10,000 sensor readings)
- 4 MB for the firmware of the ESP32-Pico processor

Radio modules:
- Wi-Fi 2.4 GHz: Integrated in the ESP32-WROOM processor
- BLE: Integrated in the ESP32-WROOM processor
- LoRa: SX1276 Ra-01H with 868 MHz
- LoRaWAN support: v1.0.2 and v1.0.3
- GSM / GNSS:
  - SIMCOM SIM7000G, Nano-SIM
  - GPRS, NB-IoT, LTE Cat-M

Antenna connections:
- Internal antennas for all radio modules
- IPEX / SMA connector for external antennas:
  - Cellular
  - LoRa
  - Active GNSS

Ethernet connection with PoE support

Connections on the board:
- Backup battery
- RTC battery
- SuperCap
- 5V Vin (max. 5.5V)

GNSS (Positioning):
- GPS
- Galileo
- BeiDou

Real-time clock:
- PCF8563
- Long-term stable (max. 5 minutes deviation p.a.)
- Separate button cell backup battery

Built-in sensors:
- Temperature
- Humidity
- Reed relay
- 3-axis G-sensor

Temperature sensor:
- SHT41
- Temperature range: -40 °C ~ +80 °C
- Accuracy: up to 0.1 °C

Humidity sensor:
- SHT41
- Relative humidity accuracy: up to +- 1.0 %RH
- Operating range: 0 ~ 100 %RH

Buzzer with <80 dB

6 LEDs:
- Programmable
- LEDs can be switched on and off individually

Ultra-low power mode:
- Maximum power consumption: 160 µA at 3.6 V
- All relevant components can be switched on and off individually via software

Power consumption measurement:
- Enables prediction of remaining battery life

Motion sensor:
- KXTJ3-1057

Watchdog:
- Automatic restart of the device in case of software problems

Power supply:
- 6 ~ 36 VDC, 220V AC via power supply

Battery:
- Li-ion battery
  - 650 mAh
  - Rechargeable above 0 °C
- Support for
  - rechargeable Li-Ion batteries
  - rechargeable LiPo batteries
  - Non-rechargeable Li-SOCI2 batteries

Connection cable:
- For power supply
- 1.5 meters

Programming cable connections:

For installing firmware and configuration file
- on the ESP32-WROOM processor
- on the ESP32-Pico processor

Firmware and configuration can also be loaded onto the board over-the-air (OTA)

Operating temperature:
- -40 °C ~ +80 °C

Housing:
- IP67 waterproof, semi-transparent
- 130 x 80 x 35 mm
- Wall mounting possible

Programmable with any Arduino IDE:
- e.g. PlatformIO

Firmware update:
- Over-the-Air (Wi-Fi, Cellular), Ethernet
- Via programming cable

Server integration:
- ginstr-web
- ENAiKOON inViu pro

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