ENAiKOON

Gateway for IIoT Applications

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

M5-G1 Overview

The main application of IIoT gateways is receiving sensor data (e.g. temperatures, operating hours, humidity, etc.) from IIoT devices via short-range radio (BLE, LoRa, Wi-Fi) and forwarding them to the Internet via mobile radio, LoRaWAN or Ethernet.

This allows the use of inexpensive, battery-operated sensors whose batteries last for many years before needing to be replaced.

M5-G1 is a robust, IP67-certified, versatile IIoT device designed and manufactured in Germany.

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

With its two ESP32 processors, M5-G1 offers powerful computing power for a wide range of use cases.

Main features:

Versatile connectivity:

- Wireless:
  Wi-Fi, LoRa/LoRaWAN, BLE,
  Cellular (GPRS, NB-IoT, LTE Cat-M)
- Wired:
  Ethernet, CAN bus, RS232, RS485, 1-Wire, S0

Sensor and device compatibility:

- Connect to a wide range of third-party sensors, actuators, and smart devices

Location:

- Integrated GNSS receiver (GPS, Galileo, Beidou)

Built-in sensors:

- Temperature sensor
- Humidity sensor (requires suitable housing)
- Reed relay
- 3-axis accelerometer for motion detection and waking the device

Signaling & Alarming:

- Buzzer <80 dB
- 6 LEDs

Data processing:

- Direct cloud communication with
  - ginstr web
  - ENAiKOON inViu pro
- Gateway communication with LoRa/BLE sensors for extended range
- Large internal memory for data storage

Energy efficiency:

- Deep sleep mode with very low power consumption
  - <160 µA internal battery
  - <5 mA with 12 V external battery
- Supports Li-Ion batteries, LiPo batteries, Li-SOCI2 batteries

Environmental resistance :

- IP67 waterproof and dustproof

Security:

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

Adjustment:

- 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-G1 Device specification

18 connection terminals for cables:

VCC 6 ~ 36 VDC	RS485-B
GND	5V
S0 (counting 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 ESP32 Pico processor firmware

Radio modules:
- Wi-Fi 2.4 GHz: Integrated in the ESP32 WROOM processor
- BLE: Integrated in the ESP32 WROOM processor
- LoRa: SX1276 Ra-01H at 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:
  - Mobile communications
  - LoRa
  - Active GNSS

Ethernet port 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 pa)
- 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 individually switched on and off via software

Power consumption measurement:
- Allows you predicting the remaining battery life

Motion sensor:
- KXTJ3-1057

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

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

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 connectors:
For installing firmware and configuration file
- on ESP32 WROOM processor
- on 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
- About programming cable

Server integration:
- ginstr-web
- ENAiKOON inViu pro

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