



## Main Features

- Support EZ Mesh and Wi-Fi client router operation mode
- Selectable 2.4GHz/5GHz, 2x2 MIMO
- Support serial to Ethernet, serial to Wi-Fi and Ethernet to Wi-Fi
- Support Modbus/RTU to Modbus/TCP
- Built-in offline port buffer with 20MB of storage
- High immunity to Surge, ESD & EFT protection
- Support serial data log
- Wide operation temperature from -40°C~70°C
- Cloud ready: MQTT/AWS/Azure

## Product Overview

NIO 51 brings the wireless connectivity from serial devices or Ethernet devices perfectly to Wi-Fi mesh backbone in smart factories. Thanks for the Wi-Fi mesh technology, every device connecting to NIO 51 can easily keep multiple Wi-Fi connecting paths to either IWF 310 EZ Mesh backbone or neighbor NIO51 devices to communicate with the control center even the devices are in moving status such as AGV application in factories.

NIO 51 provides flexible conversion between Modbus RTU to Modbus TCP protocols as well as serial to Ethernet/Wi-Fi interfaces within one box. It's also equipped with high immunity to EMC high level protection in Surge, ESD and EFT, wide operation temperature and redundant power so people do not need to concern about impact from harsh environment. Optional mPCIe port can be used as 3G/LTE WAN connection in the mobility applications or the environments where no Wi-Fi coverage is possible.

NIO 51 fills the communication gap between legacy edge nodes to the control center, enabling field data to be harnessed for manufacturing process optimization, asset management, and preventive maintenance.

## Specifications

### Wi-Fi Radio

- IEEE802.11a/b/g/n, 2x2 MIMO

### Serial Interface

- RS232/422/485 with isolation
  - Data bits: 8
  - Stop bits: 1
  - Parity: none, even, odd
  - Baud rate: 300bps~921.6Kbps

### Ethernet Interface

- 10/100Mbps

### Power Requirements

- Input voltage: 12~48VDC, 2-pin removable terminal block
- Input current: 1.67A@12VDC

### LED Indicator

- 1 x Power/status
- 1 x Serial status
- 3 x RSSI indicator
- 1 x Wi-Fi 2.4/5GHz indicator
- 1 x Link/Act indicator
- 1 x Extension module

### Factory Default/Reset Button

- Press reset button 10 seconds for factory default

### Connector Type

- DC input: Phoenix contact terminal block
- Ethernet: RJ-45 connector
- Serial signal: DB9

### Wi-Fi Operating Mode

- EZ Mesh
- Client router

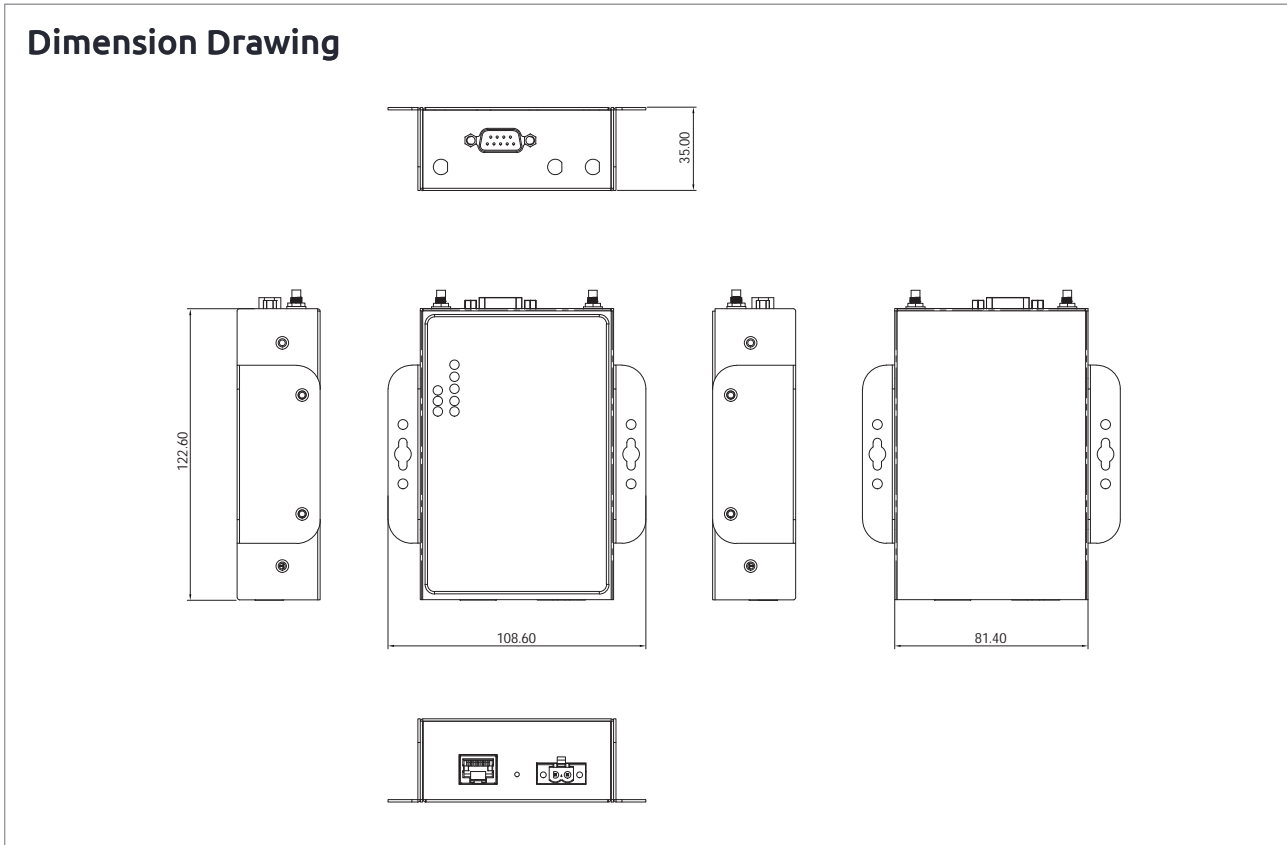
### Wi-Fi Security (Client Mode)

- WEP (64/128)
- WPA/WPA2 mixed
- WPA2-personal (PSK+CCMP/AES), WPA2-enterprise

### Protocol

- Modbus TCP
- Modbus RTU
- Transparent mode for serial to Wi-Fi/Ethernet

## Dimension Drawing



### Serial Port Characteristics

- Flow control: XON/XOFF, RTS/CTS
- Serial data log: 64KB
- Offline port buffering: 20MB
- Min. concurrent TCP client number: 10

### Software Watchdog

#### Dimension

- 81.4 x 122.6 x 35 (W x D x H) (mm)

#### Weight

- 450g

#### Mounting

- Wall mounting
- DIN mounting

#### Construction

- SGCC chassis with fanless design

#### Certification

- EMI: FCC, CE Class A
- RF
  - FCC: Part 15C
  - CE: EN300328, EN301893
- Safety
  - EN 62368-1

#### EMC

- EN301 489-1/17, FCC Part 15 subpart B, EN55032/55024
- IEC61000-4-2: level 4
- IEC61000-4-4: level 4
- IEC61000-4-5 Surge: level 3

#### Environment

- Operating temp: -40°C~70°C
- Storage temp: -40°C~85°C
- Relative humidity: operating 5%~95%, non-condensing
- RoHS compliant
- Vibration
  - Random: 2Grms@5~500Hz, IEC60068-2-64
  - Sinusoidal: 2Grms@5~500Hz, IEC60068-2-6
- Shock: 50G, half sine, 11ms, IEC60068-27

## Ordering Information

- **NIO 51 (P/N: 10T00005101X0)**  
Industrial Mesh Wi-Fi Serial/Ethernet device gateway