



Network Controller

Wireless network adaptor
for i3 Micro Module

Oct. 2023



1. Overview

In many industrial applications, there is a need to prevent anomalies in machinery and equipment to minimize downtime.

Productivity and efficiency can be improved by predicting problems, rather than reacting only after breakdowns have occurred.

TDK i3 Micro Module - Ultracompact, battery-powered wireless multi-sensor module - was designed to facilitate this type of predictive maintenance in any kind of industrial applications.

It achieves vibration sensing at almost any desired location without physical constraints such as wiring. This accelerates the prediction of anomalies in machinery and equipment, enabling an ideal implementation of Condition based Monitoring (CbM).

Monitoring through real-time visualized empirical equipment data instead of relying on manpower and scheduled maintenance, understanding the health of machinery and equipment to help extend uptime, and minimizing downtime by preventing unexpected failures - all contribute to establishing an ideal predictive maintenance system.

2. Key features

- Edge AI enabled anomaly detection
- Embedded algorithm for vibration monitoring
- Sensors: accelerometer, temperature
- Wireless connectivity: BLE and mesh network
- USB interface
- Replaceable battery
- PC software for data collection, AI training, and visualization

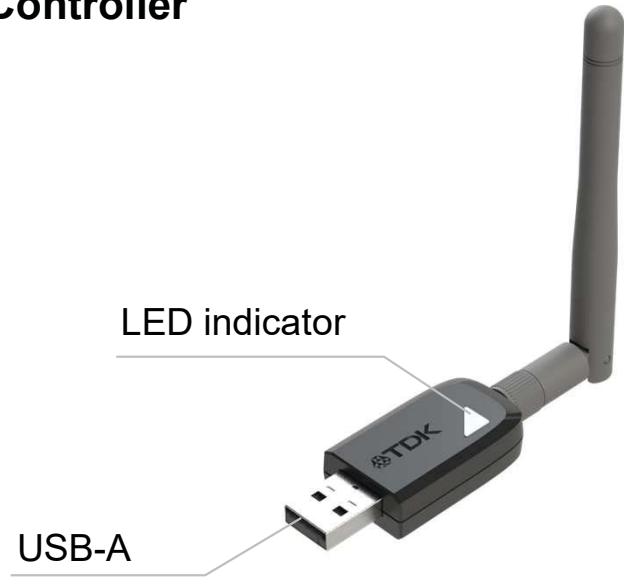
3. Main applications

- Factory automation
- Robotics
- HVAC equipment and filter monitoring



4. Target specifications

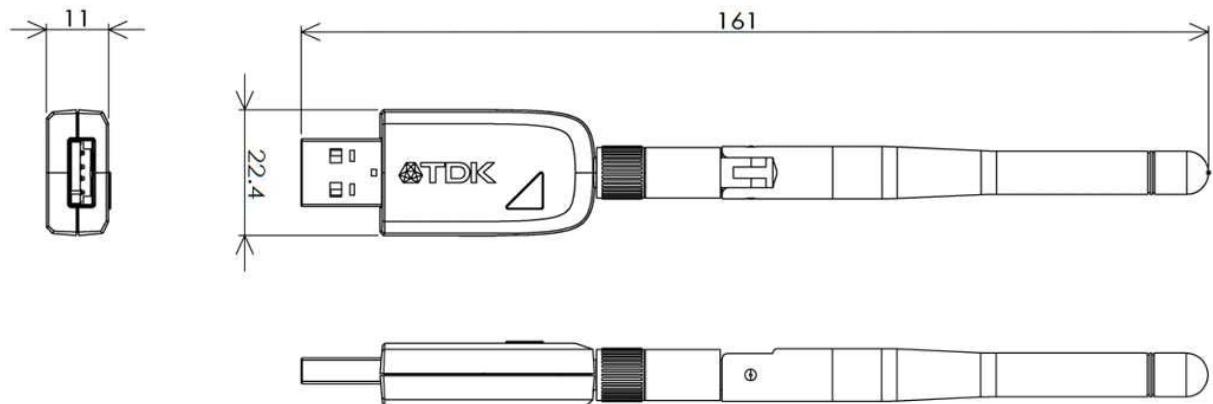
- **Network Controller**



Item	Specification
Communication interface	
Wireless	Mesh / Bluetooth low energy
Wired	USB
Communication range (Line of sight)	
Mesh	< 40m (Network Controller <-> Sensor)
Bluetooth low energy	< 10m (Network Controller <-> Sensor)
Supported number of sensors	
Mesh	100
Bluetooth low energy	1
Operating condition	
Power Supply	USB
Operating Temperature	-10 to 60degC
Mechanical specifications	
Dimension	38 x 22.4 x 11 (Exclude connector and antenna)
Ingress protection	N/A

5. Outline dimension

- **Network Controller**



6. Software



CbM Studio

CbM Studio is a PC software that can be used with the i3 Micro Module and provides the following features to make it easy to start implementing Condition based Monitoring.

- Sensor configuration
- Recording streaming data for AI training
- Feature analysis of streaming data
- Training of AI model
- Deployment of trained AI model
- Collecting & exporting sensor data
- Visualizing received sensor data
- Visualizing mesh network status

• System requirements

Item	Requirement
OS	Windows 10, 64bit
RAM	16GB
Hardware	USB 2.0 port

• Supported function

Sensor interface	Recording raw data	Deployment of trained AI model	AI inference operation
USB	✓	✓	✓
Mesh			✓
Bluetooth low energy	✓	✓	✓

7. Safety precautions

IMPORTANT SAFETY INFORMATION

To assure the correct use of the product basic safety measures should always be followed including the warnings and cautions listed in this instruction manual.

■ Warning

*Warning: Improper use may result in death or serious injury.

- Please stop using this product immediately, if there is strange smell or smoke from the unit.
- Keep the unit out of the reach of young children.
- Do not subject the unit to extreme temperatures, humidity, moisture, or direct sunlight. Internal condensation due to severe change in temperature may cause malfunction.

■ Caution

*Caution: Improper use may result in minor or moderate injury to the user or damage to the equipment.

- Do not use the unit in the field of strong electromagnetic waves and static electricity.

■ Precautions for Correct Use

- Do not disassemble or modify the unit.
- Do not subject the unit to strong shocks, drop it, step on it.
- Do not immerse the unit or any of the components in water. The unit is not waterproof. Do not wash it or touch it with wet hands. Be careful that water does not get into the unit.
- Depending on the surrounding environment and the mounting position, the performance may vary.
 - (1) Do not subject the unit to extreme temperatures, humidity, moisture, or direct sunlight.
 - (2) Do not use the unit where it will be exposed to dew condensation.
 - (3) Do not subject the unit to extreme water droplets, oil or chemical materials.
 - (4) Do not use the unit where it will be exposed to flammable gas or corrosive vapors.
 - (5) Do not use the unit where it will be exposed to extreme dust, saline matter or iron powder.

- This Product operates in the unlicensed ISM band at 2.4 GHz. In case this Product is used around the other wireless devices including microwave and wireless LAN, which operate same frequency band of this Product, there is a possibility that interference occurs between this Product and such other devices.
- If such interference occurs, please stop the operation of other devices or relocate this Product before using this Product or do not use this Product around the other wireless devices.
- Application examples provided in this document are just for reference. In actual applications, confirm its functions, limitations and safety before using this Product.

8. FCC Notes and Cautions

■ Product Name : Network Controller
■ Model Name : Network Controller
■ FCC ID : 2ADLX-NC0110013M

■ FCC Note

- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

■ FCC Caution

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

■ RF Exposure Compliance

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines as this equipment has very low levels of RF energy.

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