OMRON

1
Features and System Configuration

2
Operating Procedure

DX Series

Condition Monitoring Package

User's Manual

N703-E1-01

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Introduction

Thank you for purchasing our DX-series Data Flow Controller.
This manual provides information about the Condition Monitoring Package included with the DX Series Data Flow Controller.
Please read this manual and make sure that you understand the functionality and performance of the product before you attempt to use it in a control system.

Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (electrical engineers or the equivalent).

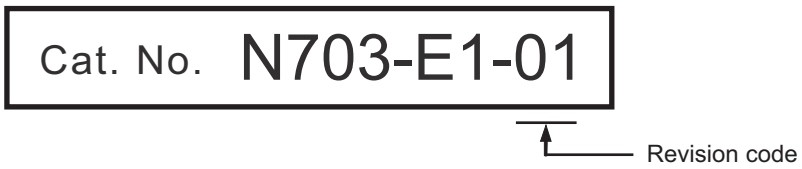
- Personnel in charge of designing and operating data utilization systems on a production site.
- Personnel in charge of designing and operating maintenance systems on a production site.

Guidance for Reading This Manual

For information on **Terms and Conditions Agreement**, **Precautions for Safe Use**, **Precautions for Correct Use**, and **Related Manuals**, refer to the *DX Series Data Flow Controller User's Manual (V241-E1)*.

Revision History

A manual revision code appears as a suffix to the catalog number on the front and back covers of the manual.



Revision code	Date	Revised content
01	October 2025	Original production

Sections in this Manual

CONTENTS

1

Features and System Configuration

This section describes the features and system configuration of the Condition Monitoring Package.

1-1 Capabilities of the Condition Monitoring Package

● Condition Monitoring Package

These packages enable data collection and visualization from condition monitoring devices.
Using programmatic communication, they support data visualization, threshold calculation, and alert configuration.
There are four types of Condition Monitoring Packages available.

Type	Content
Condition Monitoring Package (Variable Speed Motor)	Visualizes the condition of variable speed motors using the advanced motor condition monitoring device K7DD. The following measurement values are collected from condition monitoring devices. • RMS voltage value *1 • RMS current value • Peak current (+) • Total harmonic distortion (THD) • Active power *1 • Power factor *1 • Drive frequency All parameters are collected at a 10-second interval. For detailed measurement values, refer to the K7DD Power Line Data Generator User's Manual.
Condition Monitoring Package (Induction Motor, type Current)	Visualizes the current condition of induction motors using the motor condition monitoring device K6CM-CI2 (Comprehensive Current Diagnosis Type). The following measurement values are collected from condition monitoring devices. All parameters are collected at a 10-second interval. • Current • Deterioration Level 1 • Deterioration Level 2 Refer to the K6CM Motor Condition Monitoring Device User's Manual for details.
Condition Monitoring Package (Induction Motor, type Vibration)	Visualizes the vibration condition of induction motors using the motor condition monitoring device K6CM-VB (Vibration & Temperature Type). The following measurement values are collected from condition monitoring devices. All parameters are collected at a 10-second interval. • Acceleration • Velocity • Motor Temperature Refer to the K6CM Motor Condition Monitoring Device User's Manual for details.
Condition Monitoring Package (Temperature In Control Panels)	Visualizes the temperature inside control panels using the temperature condition monitoring device K6PM-TH. The following measurement values are collected. • Maximum temperature of 16 segments in thermal image from Sensor 1 • Maximum temperature of 16 segments in thermal image from Sensor 2 : • Maximum temperature of 16 segments in thermal image from Sensor 10 The data collection interval is 10 seconds per temperature sensor. Refer to the K6PM-TH Thermal Condition Monitoring Device User's Manual for details.

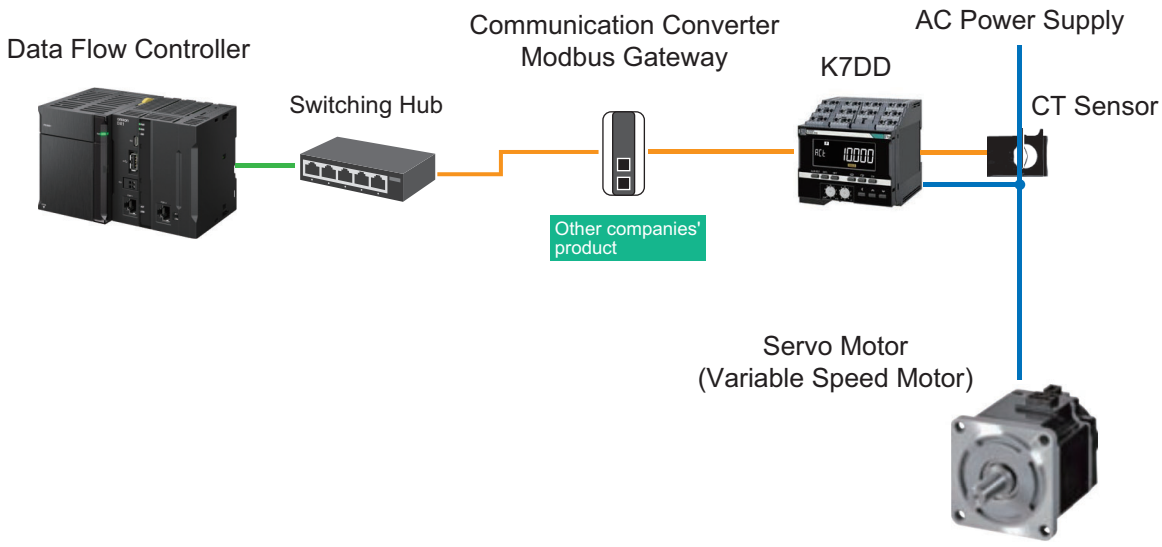
*1 If the K7DD is configured to acquire only current data, these items will not be displayed on the dashboard (status will be shown as "No Data or Not Configured").

1-2 Example System Configurations

Typical system configurations for each Condition Monitoring Package are shown below.

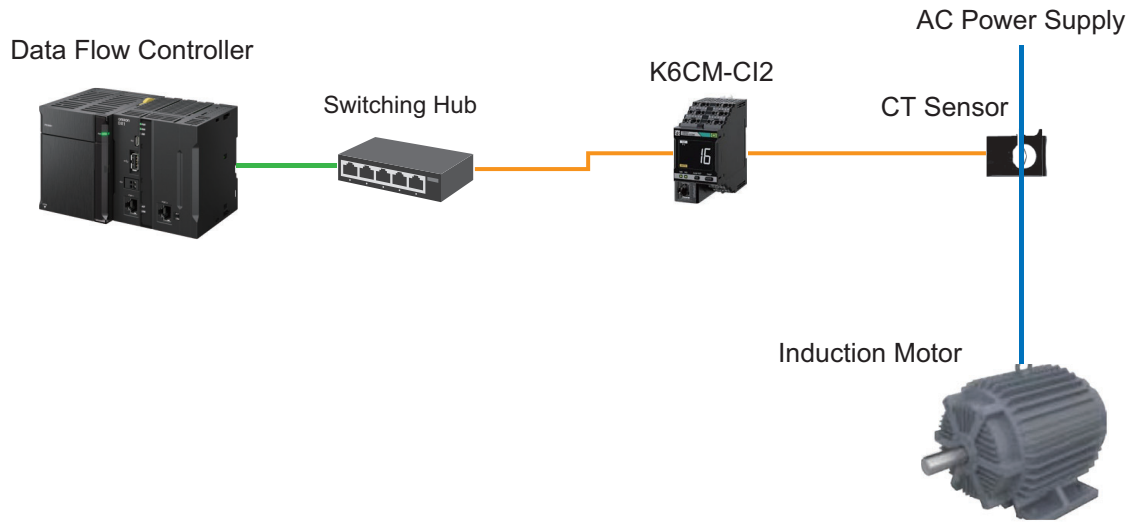
● Condition Monitoring Package (Variable Speed Motor)

System Configuration



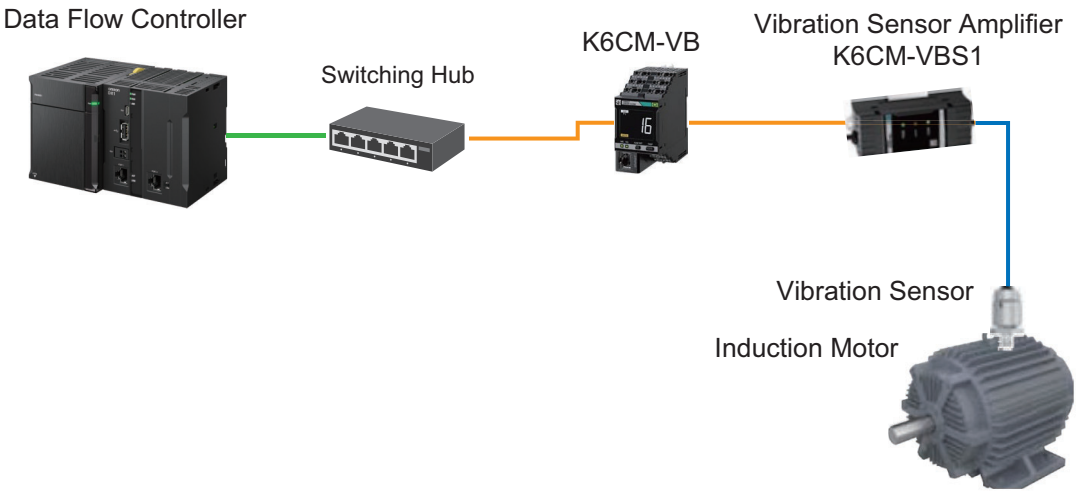
● Condition Monitoring Package (Induction Motor, type Current)

System Configuration



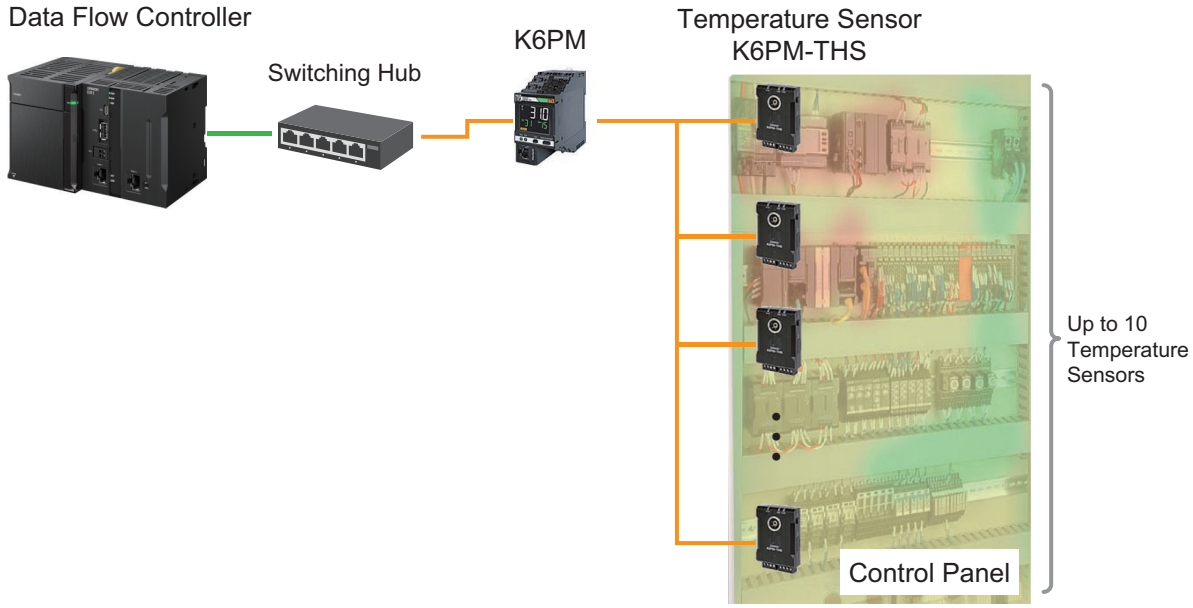
● Condition Monitoring Package (Induction Motor, type Vibration)

System Configuration



● Condition Monitoring Package (Temperature In Control Panels)

System Configuration



2

Operating Procedure

This section describes the operating procedure for the Condition Monitoring Package.

2-1 Overall Workflow

The following is the overall workflow for using the Condition Monitoring Package.
Refer to the manuals or instruction manuals of each device for wiring, installation, configuration, and software startup procedures.

Configure all devices on the same network

Wiring, installation, and configuration of measurement devices	Refer to the manuals or instruction manuals for the measurement devices in use. Use the Condition Monitoring Configuration Tool to configure K7DD, K6CM, and K6PM-TH.
Wiring, installation, and configuration of the Data Flow Controller	Refer to *3 Installation, Wiring, and Turning ON/OFF the Power Supply* in the *DX-series Data Flow Controller User's Manual*.

Launch the Dashboard Generator

Start the following web applications: • Dashboard Generator • SpeeDBee Synapse • Grafana	Refer to *4-1 Operating Procedure from the First Login to User Registration* in the *DX-series Data Flow Controller User's Manual*.
	Refer to *4-3 Procedure for Collecting and Visualizing Data Using Dashboard Packages* in the *DX-series Data Flow Controller User's Manual*.
Perform initial setup of the Dashboard Generator	Refer to *2-2 Basic Operations of the Dashboard Generator* in the *DX-series Dashboard Generator User's Manual*.

Configure the Condition Monitoring Package (SpeeDBee Synapse, Grafana)

Start the Condition Monitoring Package	Refer to *2-2-1 Configuration Procedure* on page 2-3.

Start Monitoring (Operation)

Configure threshold values	Refer to *2-3 Threshold Settings for Condition Monitoring Package* on page 2-14.

2-2 Starting the Condition Monitoring Package

For procedures from logging into the Dashboard Generator to applying settings to SpeeDBee Synapse and Grafana, refer to *Section 2-2 "Using the Dashboard Generator"* in the *DX Series Dashboard Generator User's Manual*.

2-2-1 Configuration Procedure

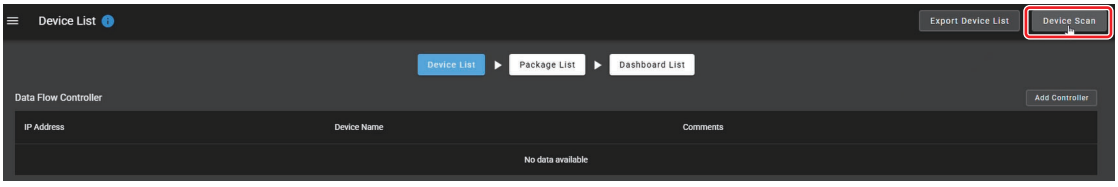
Follow the steps below.
This procedure assumes that the Dashboard Generator, Synapse, and Grafana are already integrated.

Configuration Steps	Details
Device List Screen Configuration	Perform a device scan to retrieve information about devices connected via the Condition Monitoring Package.
↓	
Package List Screen Configuration	Select the Condition Monitoring Package and specify the equipment identification information and the device to be used (e.g., K6CM-VBM) for dashboard registration. Register the dashboard based on the specified settings.
↓	
Dashboard List Screen Configuration (Synapse / Grafana)	Launch Synapse and start the Error Manager. Launch the Grafana dashboard (graph view).

Device List Screen - Device Scan

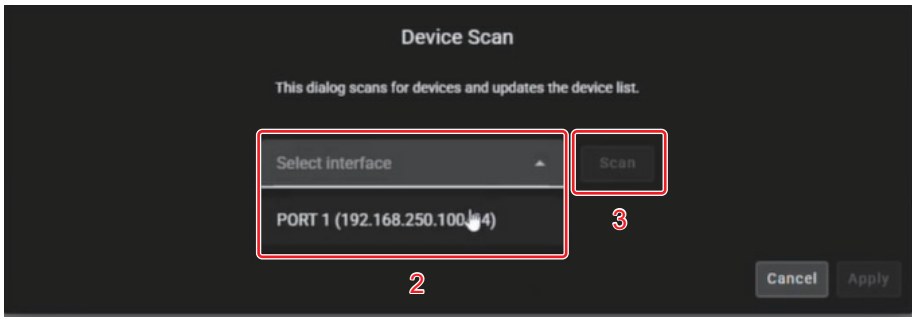
1 Click the **Device Scan** Button at the top right of the *Device List Screen*.

The *Device Scan Screen* will appear.

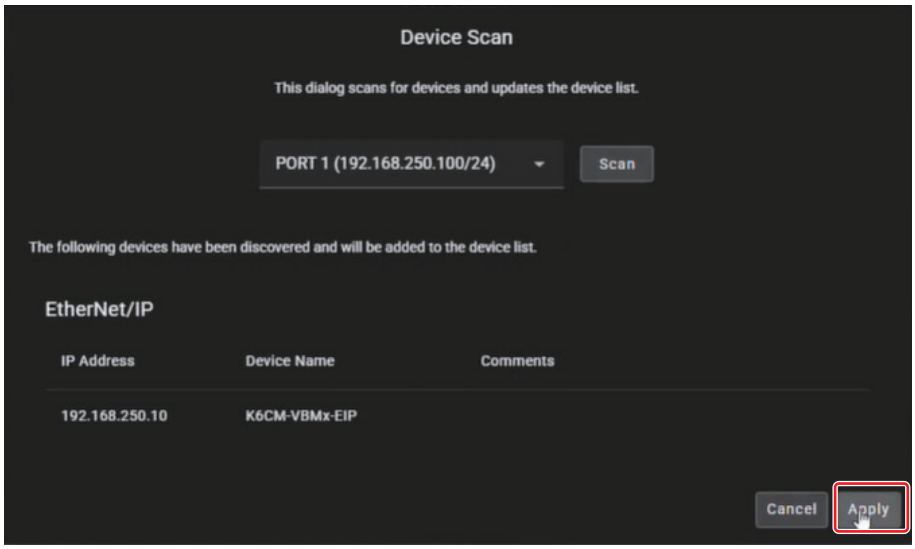


2 Select the interface from the dropdown menu.

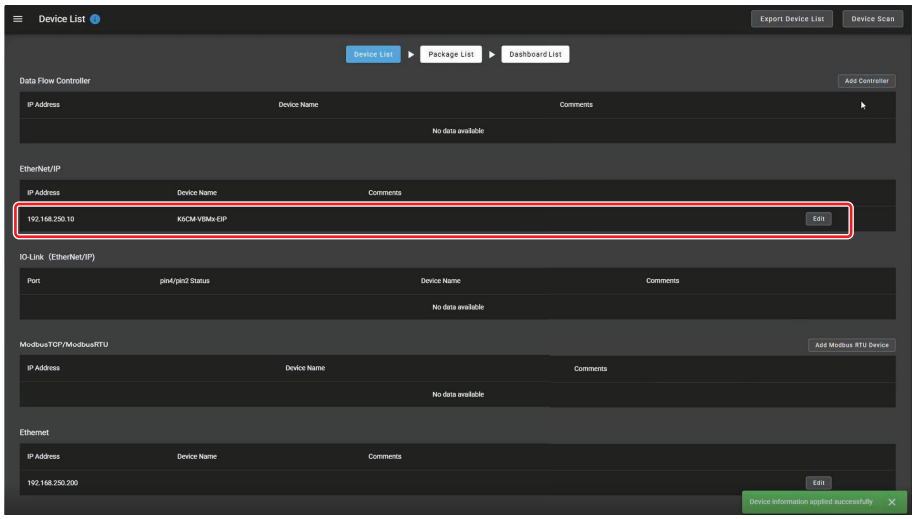
3 When the **Scan** Button becomes active, click it.



4 The scanned devices will be displayed. Click the **Apply** Button.

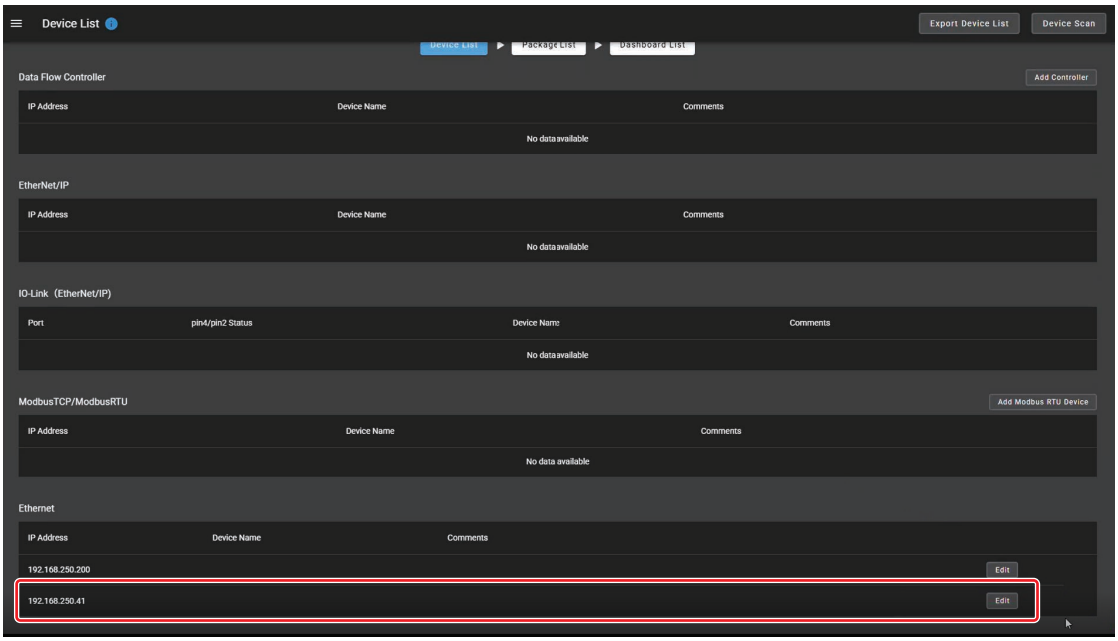


You will return to the *Device List Screen*. Confirm that the devices have been updated. In this example, **K6CM-VBMx-EIP** is added to **Ethernet/IP**.



For packages other than the Condition Monitoring Package (Variable Speed Motor), the device scan operation is complete.

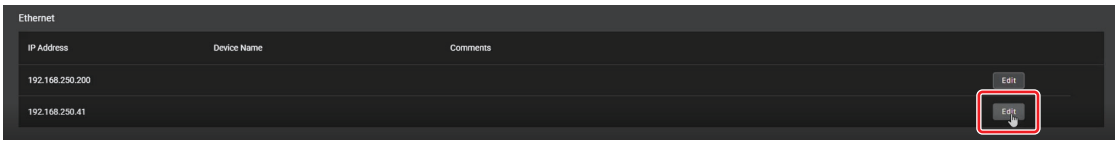
If using the Condition Monitoring Package (Variable Speed Motor), continue with the following steps. The scanned IP address of the communication converter will be displayed at the bottom under Ethernet.



At this stage, the communication converter and the K7DD used in the Condition Monitoring Package (Variable Speed Motor) have not yet been registered.
Proceed with the following steps to register the required information.

5 Click the **Edit** Button.

The *Edit Device Screen* will appear.



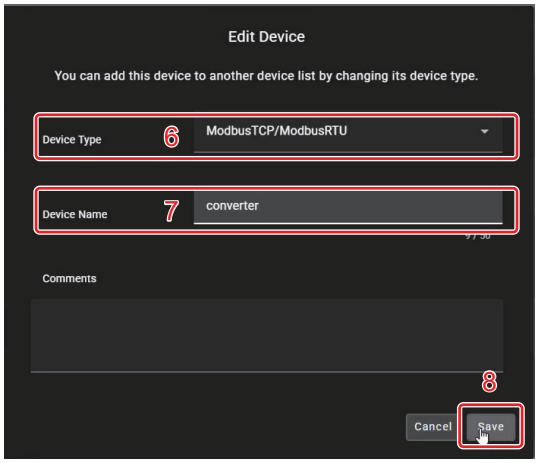
6 From the **Device Type** dropdown menu, select **ModbusTCP/ModbusRTU**.

7 Enter a desired name in the **Device Name** field.

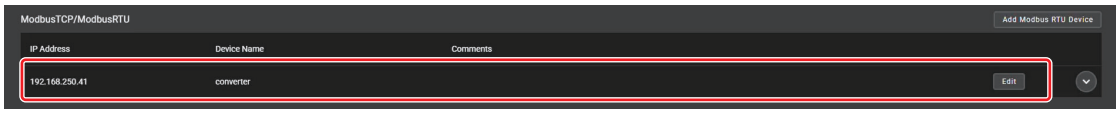
Example: converter

8 Click the **Save** Button.

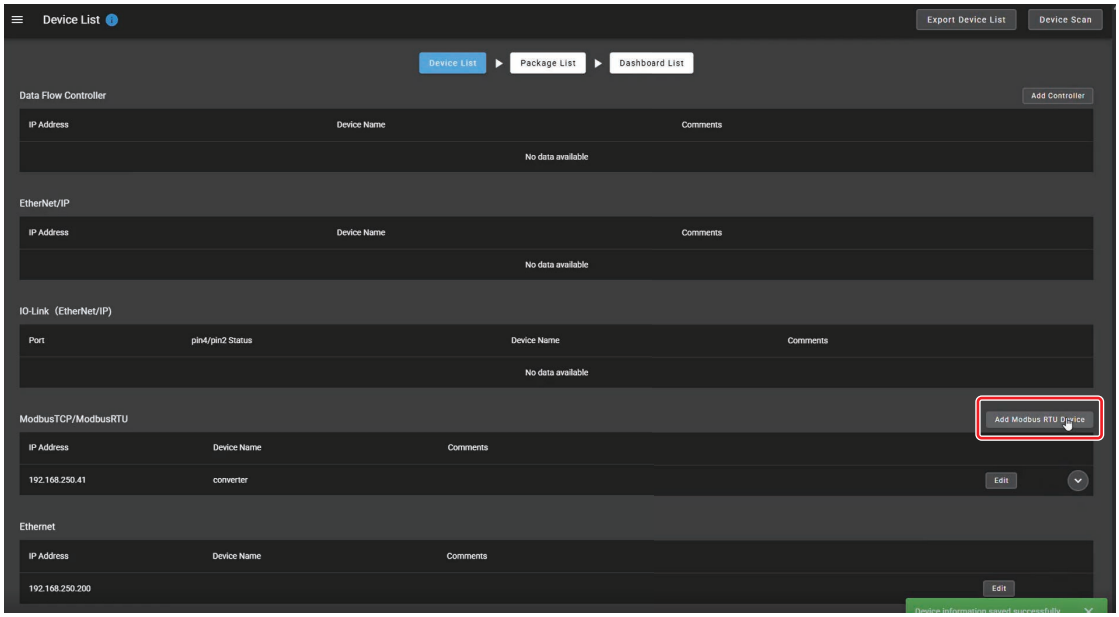
You will return to the *Device List Screen*.



The previously scanned IP address and **converter** will now appear under the **ModbusTCP/ModbusRTU** field.



9 Click the **Add Modbus RTU Device** Button.
The *Add Modbus RTU Device Screen* will appear.

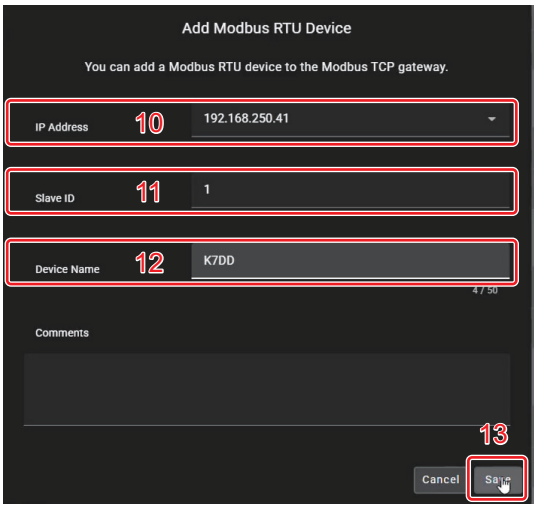


10 From the **IP Address** dropdown menu, select the IP address you added.

11 In the **Slave ID** field, select the communication number of the connected K7DD.

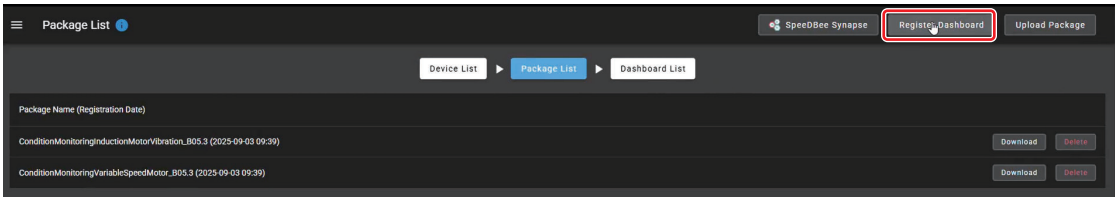
12 Enter a desired name in the **Device Name** field.
Example: K7DD

13 Click the **Save** Button.



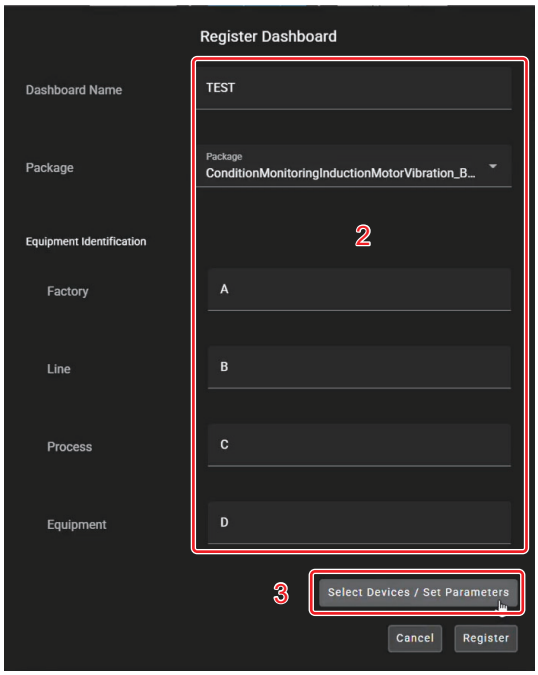
Package List Screen - Dashboard Registration

1 Click the **Register Dashboard** Button at the top right of the *Package List Screen*.
The *Register Dashboard Screen* will appear.



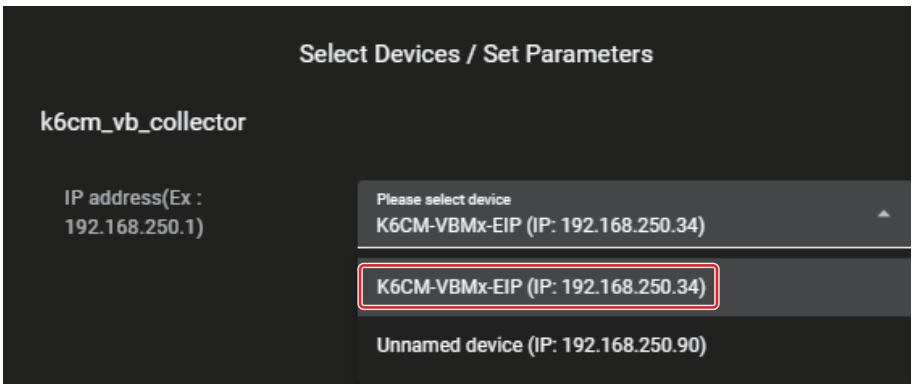
2 Configure the information on the *Register Dashboard Screen*.

Setting Item	Description
Dashboard Name	Enter a desired name. It will be displayed in Synapse and Grafana. Example: TEST
Package	Select **Condition Monitoring Package (Induction Motor, type Vibration)**.
Equipment Identification	Optional input fields. Includes factory name, line name, process name, and equipment name.



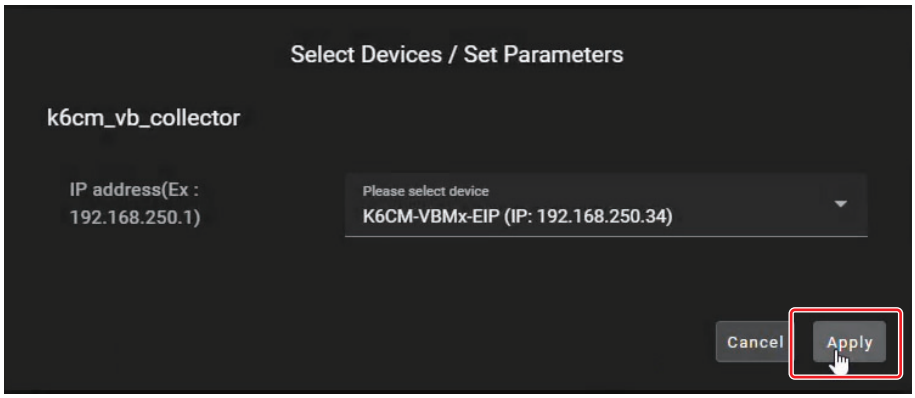
3 When the **Select Devices / Set Parameters** Button becomes active, click it.
The *Select Devices / Set Parameters Screen* will appear.

4 From the **IP Address** dropdown menu, select **K6CM-VBMx-EIP (IP:192.168.250.xx)**.



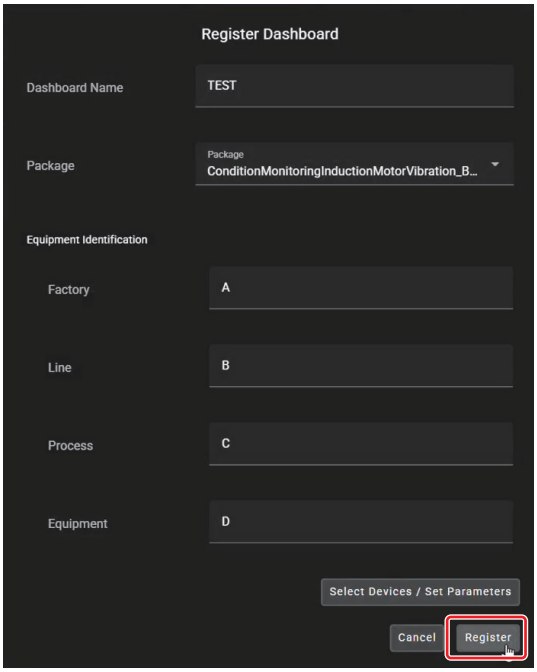
5 Click the **Apply** Button.

You will return to the *Register Dashboard Screen*.



6 Click the **Register** Button.

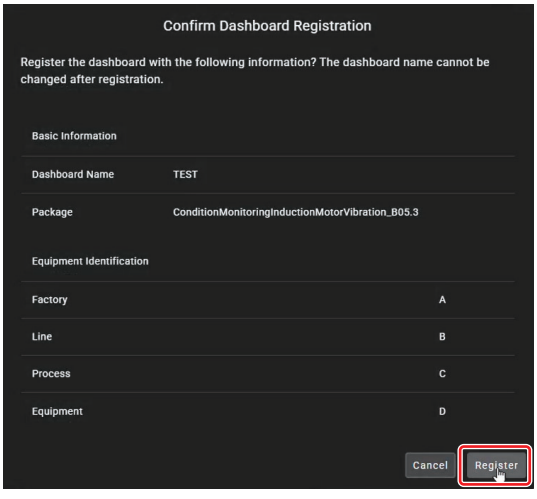
The Confirm *Dashboard Registration Screen* will appear.



7 Click the **Register** Button.

Dashboard registration takes approximately 30 seconds.

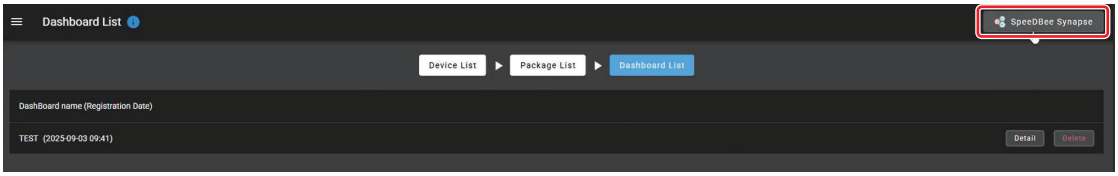
Once registration is complete, the system will transition to the *Dashboard List Screen*.



Dashboard List Screen - Launching Synapse

1 Click the **SpeeDBee Synapse** Button at the top right of the *Dashboard List Screen*.

The *SpeeDBee Synapse Screen* will appear.



2 A panel has been added with a custom dashboard name (e.g., TEST).
Click **DETAIL** on the corresponding panel.

The screen will transition to the *Synapse Connection Screen*.

3 Click the **Start** Button.

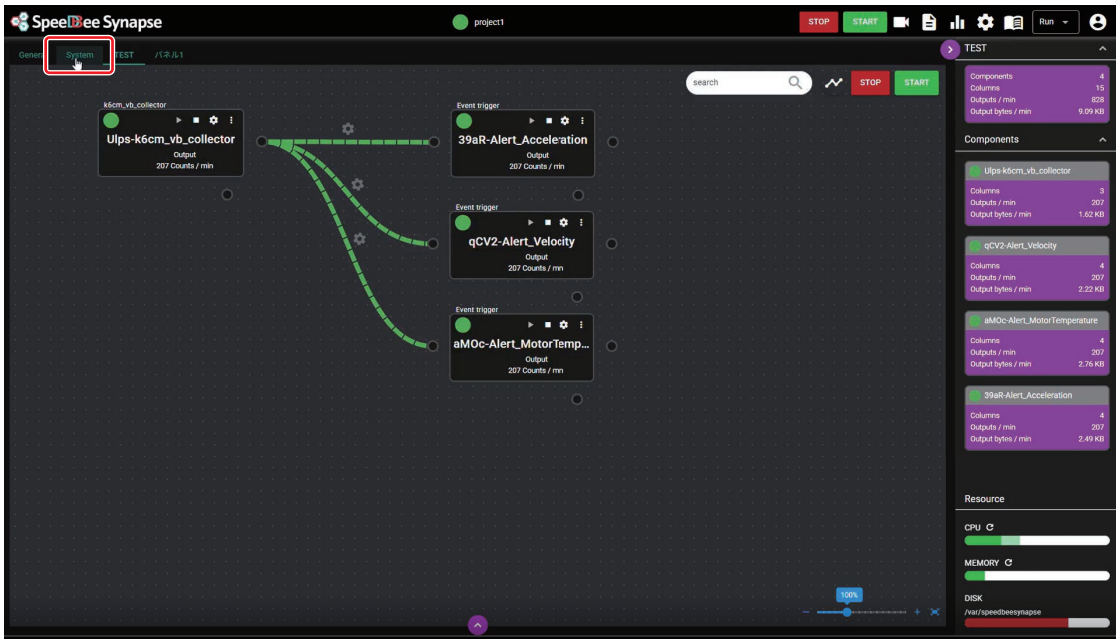
A component showing flow links between each component will be displayed.

Once started, the flow links will turn yellow.

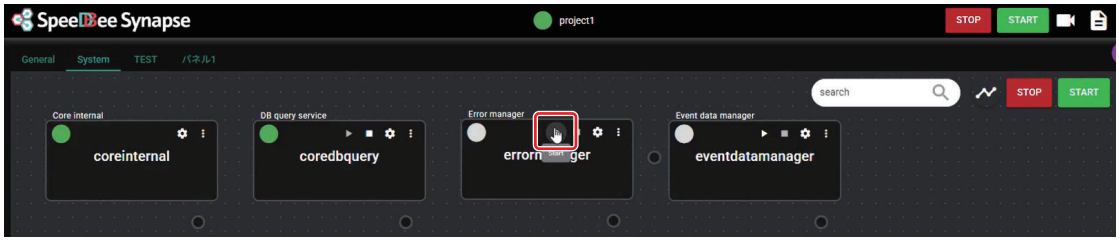
After a short time, the flow links will turn green.

4 Click the *System Tab* at the top left (for Error Manager configuration).

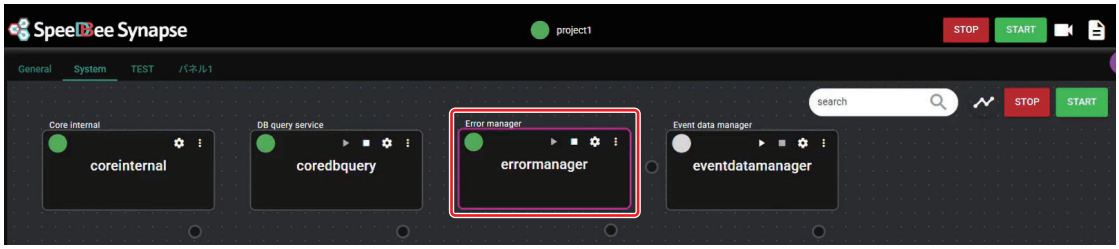
The *System Panel* will appear.



5 Click the ▶ (**Launch**) Button on the *Error Manager Component*.



The Error Manager will start.

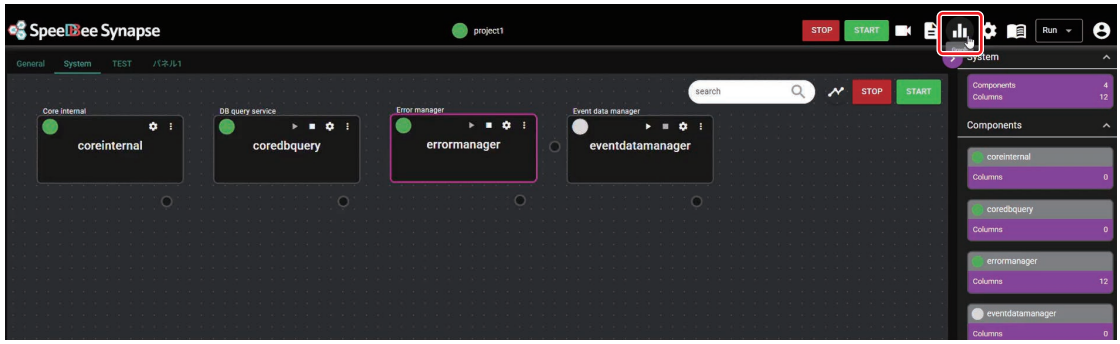


Note: Error Manager is required for Grafana to retrieve data from Synapse.

Dashboard List Screen - Launching Grafana

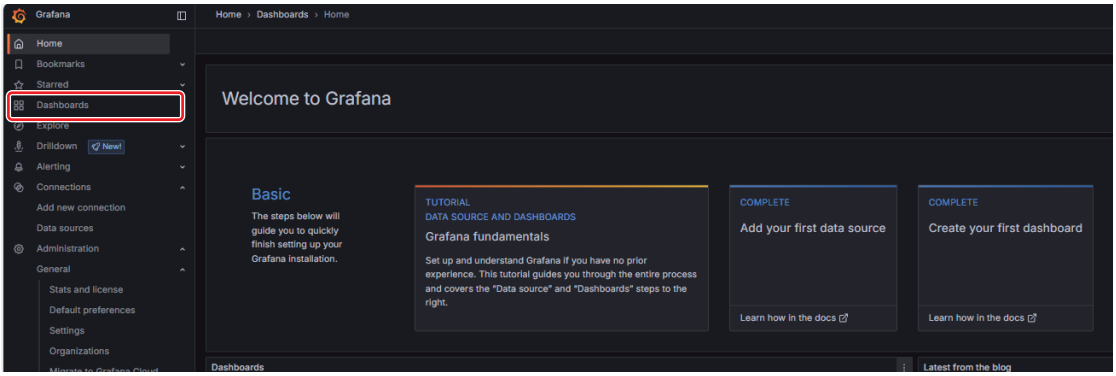
1 Click the graph icon in the upper-right corner of the *Synapse Screen*.

The *Grafana Screen* will appear.



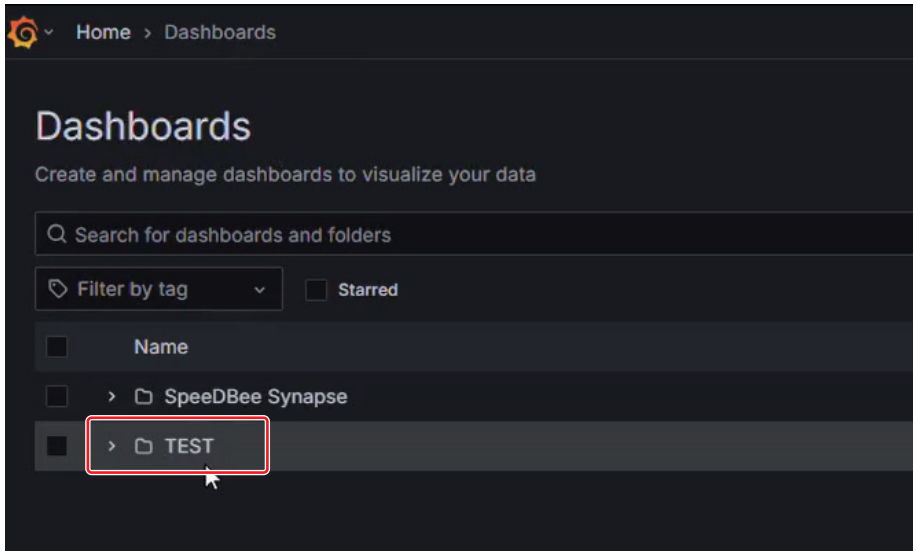
2 Click **Dashboards**.

The screen switches.



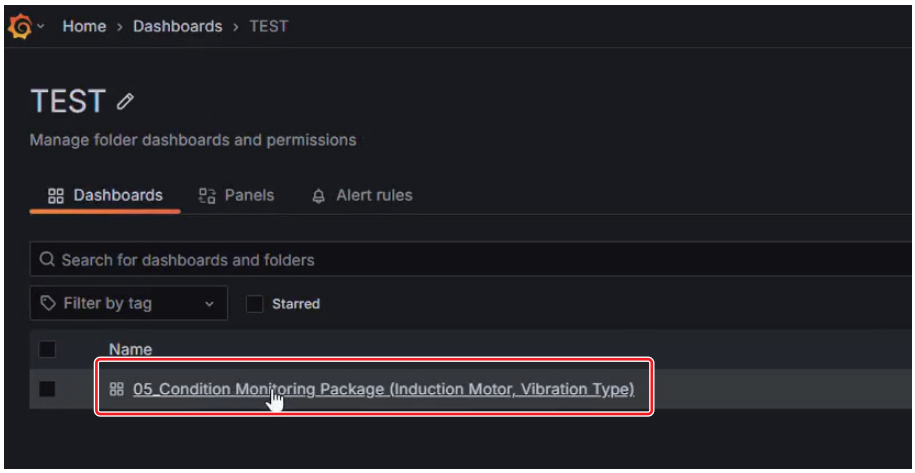
3 Click any dashboard name that has been added.

Example: TEST

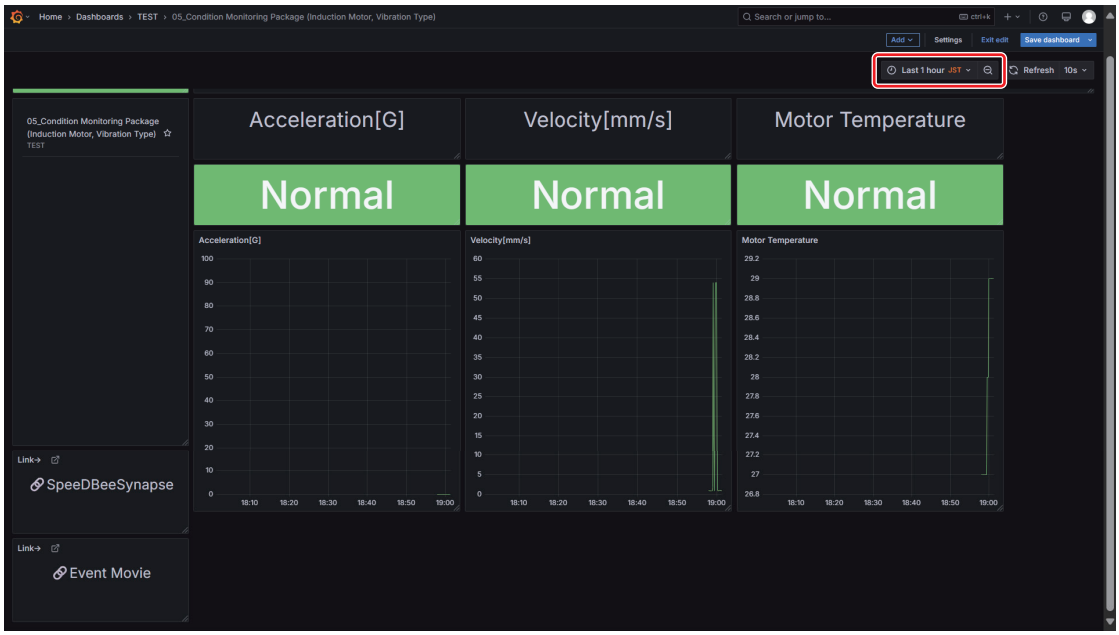


4 Click **Condition Monitoring Package (Induction Motor, Vibration Type)**.

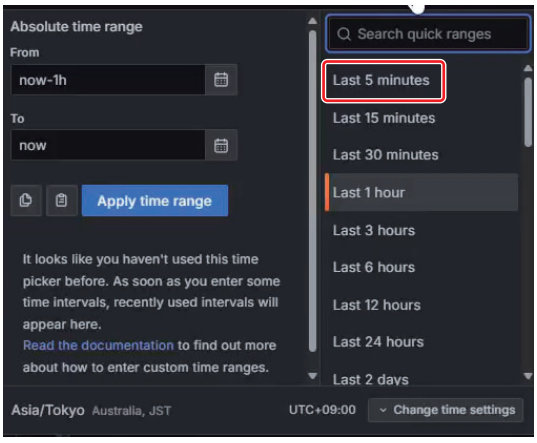
The screen switches.



5 The KPI is displayed as a graph. To change the time range on the horizontal axis, use the dropdown menu labeled **Last 1 hour JST**.

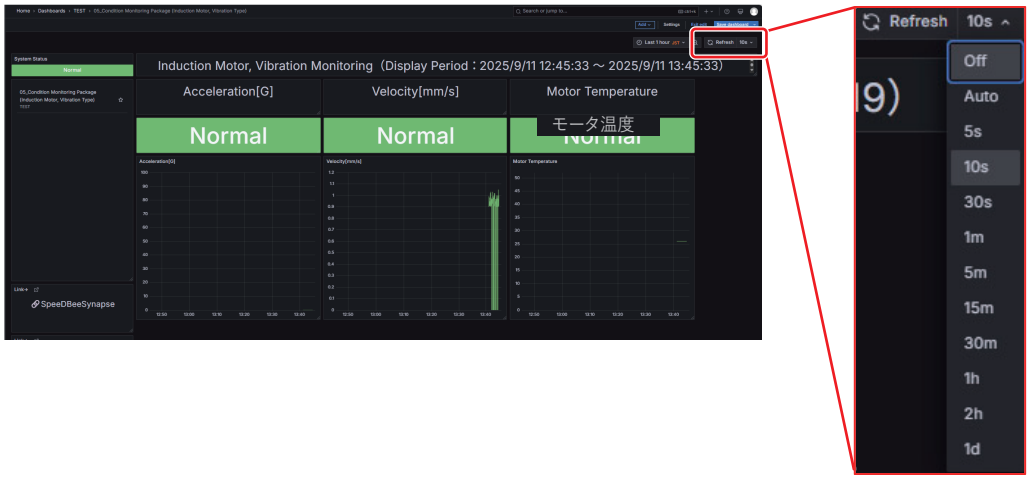


In this example, **Last 5 minutes** is selected.



Note:
The vertical axis (values) of the graph automatically adjusts its scale based on the range of acquired data.

6 To adjust the data refresh frequency, click **Refresh** Button at the top right.
Select the desired interval from the dropdown menu.



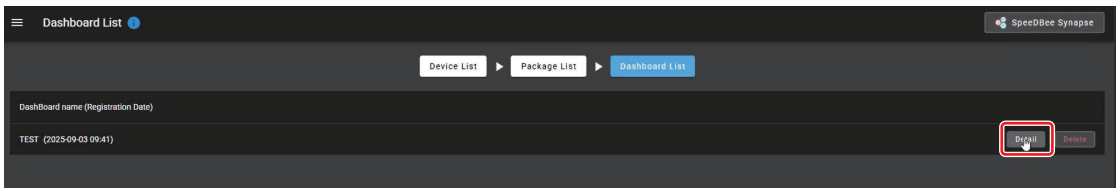
2-3 Threshold Settings for Condition Monitoring Package

Based on the configuration in *2-2 Starting the Condition Monitoring Package*, data (KPIs) can be acquired from the condition monitoring device.
To operate monitoring effectively, it is necessary to set threshold values for these KPIs, determine **Normal** or **Abnormal** status, and visualize the results.
This section outlines the procedure for configuring threshold values.
Thresholds configured through this procedure are stored in Synapse and Grafana within the Data Flow Controller.
The Data Flow Controller evaluates the collected data from the condition monitoring device against the configured thresholds to determine whether the status is normal or abnormal.
Although the condition monitoring device itself can also store threshold values, the Data Flow Controller cannot retrieve and apply those values directly.
Additionally, while the device allows for two thresholds (Warning and Abnormal), this package supports configuration of only one threshold.

As an example, this section explains the procedure using the Condition Monitoring Package (Induction Motor, type Vibration).

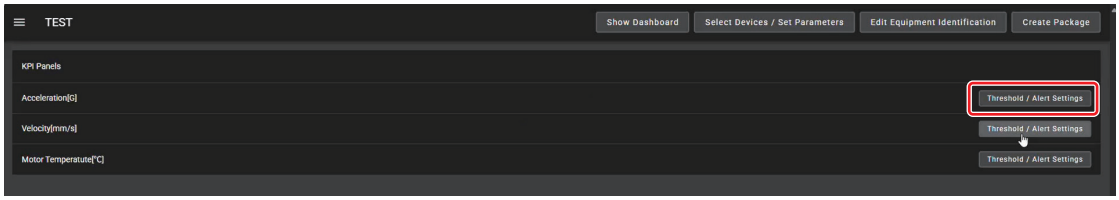
Configuration Procedure

1 Click the **Detail** button for the dashboard name displayed on the *Dashboard List Screen*.
The *KPI Panels Screen* will appear.

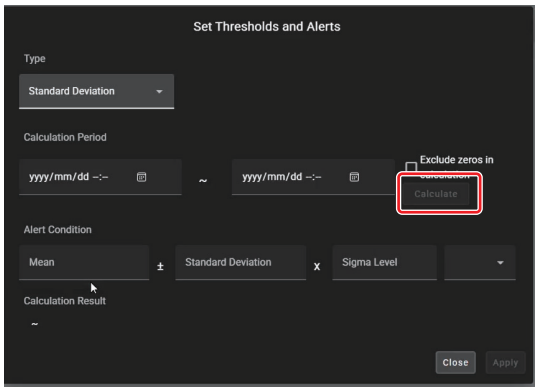


2 Click the **Threshold / Alert Settings** Button for the KPI.
In this example, the Speed [mm/s] is configured.

Continue with the following steps to set thresholds for each KPI.
The *Set Threshold and Alerts Screen* will appear.



3 Configure the information on the *Set Threshold and Alerts Screen*.

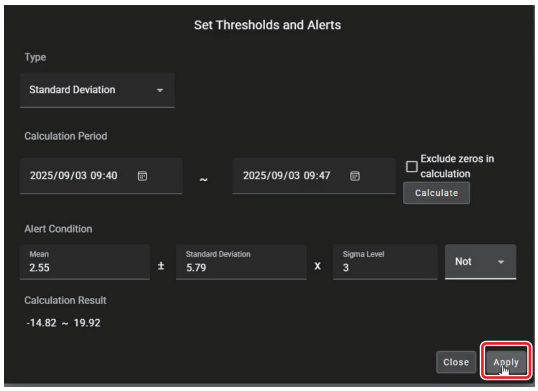


After setting the calculation period, the **Calculate** Button becomes active. Click it to proceed.

Configuration Item	Selected Item
Type	Standard Deviation, Absolute Value, Range Specification, Maximum Value, Average Ratio, Standard Deviation, and Not Set
Calculation Period	Specify the data range. Time can be set down to seconds.
Alert Condition	Alert conditions are displayed. Values can be adjusted.
Calculation Result	The calculated threshold value is displayed.

Example Setting: *Standard Deviation*

4 Click the **Apply** Button.



Precautions for Correct Use

■ Threshold/Alert Configuration: Calculation Period Settings

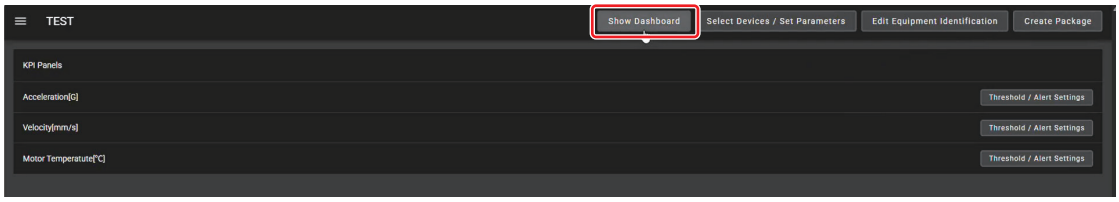
A custom calculation period can be configured.
By default, with a memory retention period of 600 seconds, the data used for threshold calculations is limited to the most recent 10 minutes.
If the configured calculation period is shorter than 10 minutes, thresholds will be calculated based on that shorter duration.
To set a longer calculation period, the data retention period must be modified.
Refer to section *2-6 Setting the Data Range Handled by the Dashboard* in the *DX Series Dashboard Generator User's Manual* for instructions.

■ Data Storage Location

When the Data Flow Controller is powered off, data is cleared under the default configuration (USB port disabled).
To retain previously collected data, enable the USB port and use a USB memory device.
Refer to section *2-5 Changing the Data Storage Location* in the *DX Series Dashboard Generator User's Manual* for configuration steps.

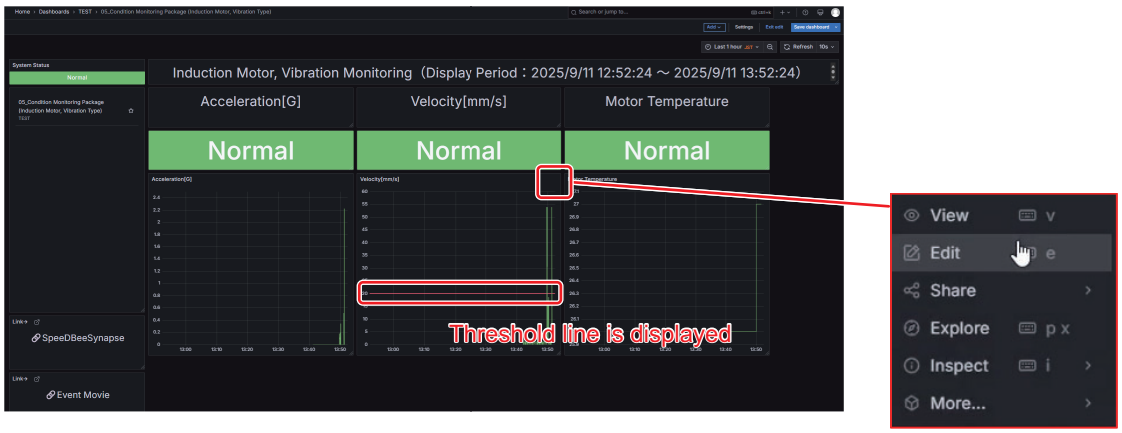
5 Click the **Show Dashboard** Button.

The *Grafana Screen* will appear.

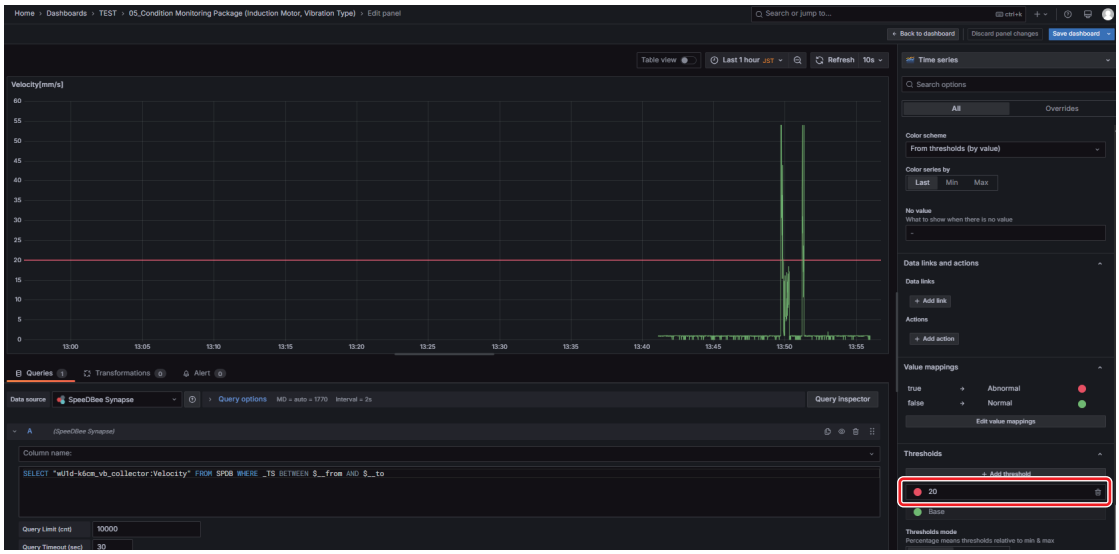


6 Hover over the **Menu** Button at the top right of the graph panel and click **Edit**.

Verify that the threshold has been applied.



7 Confirm that the threshold value is displayed in the right-hand section.



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Note: Specifications are subject to change.