

OpenBlocks IoT Family Azure IoT Edge Set-up Guide



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Chapter 1 General

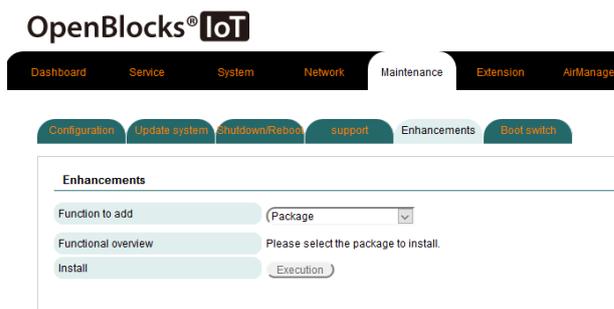
This manual describes how to use Azure IoT Edge1 that can be installed in the OpenBlocks IoT Family, including web user interface (hereinafter referred to as "WEB UI").

As of the time of preparing this document, Azure IoT Edge is in public preview. Specifications are subject to change at the time of general availability.

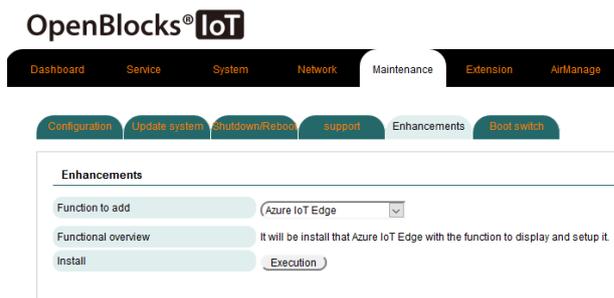
Chapter 2 Azure IoT Edge setup

2-1. Installing Azure IoT Edge, including WEB UI

At the time of shipment from our factory, Docker, Azure IoT Edge module and WEB UI for Azure IoT Edge are not installed in this product. To install WEB UI and Azure IoT Edge, using the **[Maintenance]-[Enhancements]** tab.



When choosing the **[Maintenance]** tab of WEB UI and clicking on the **[Enhancements]** tab, it is possible to choose a package for extensions.



From the pull-down menu showing a list of packages to be installed, choose "Azure IoT Edge."

Press the Execution button to install the program.

After completing installation, the unit will require rebooting to make the installation effective. Choose the Shutdown/Reboot tab from the Maintenance tab to reboot the unit.

If Docker has not been installed when installing Azure IoT Edge, install this program in a similar manner. While installing Docker, certain drivers will be compiled, which takes

additional time. A button to check the installation status will appear. Press this button to check on the progress of installation.

Please note that Azure IoT Edge uses Docker internally. To check the status of containers, etc. to be used by Azure IoT Edge, please also consider using the WEB UI (Docker) function.

In addition, data between the host machine (OpenBlocks IoT series) and sensors or other devices can be transmitted to Azure IoT Edge. In this case, please consider using the IoT data control function.

2-2. [Preparations in advance] IoT Hub setup

Before using Azure IoT Edge, it is necessary to create an IoT Hub and to register IoT Edge devices in advance.

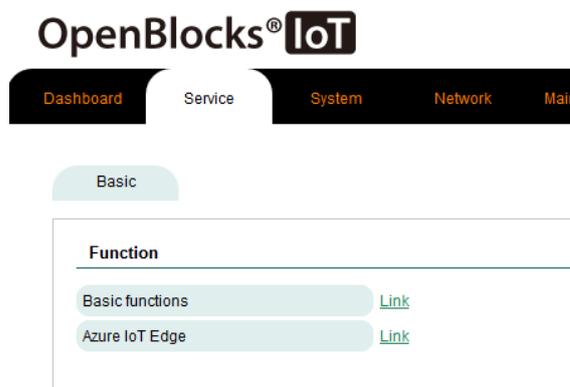
For these procedures, please refer to "Create an IoT Hub" and "Register an IoT Device" at the URL below and carry them out.

<https://docs.microsoft.com/ja-jp/azure/iot-edge/tutorial-simulate-device-linux>

Make a note of the connection string of each registered IoT Edge device (primary or secondary key).

2-3 Azure IoT Edge setup from WEB UI

When the Azure IoT Edge package has been installed, Azure IoT Edge will be displayed in the **[Service]-[Basic]** tab.



Choose the Service tab and click on the **Azure IoT Edge** link in the **[Basic]** tab. The root tab will be switched to display the **[Dashboard]**, **[Basic]** and **[Azure IoT Edge]** tabs for service.

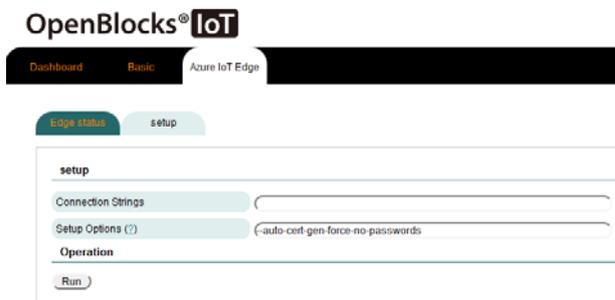
*Links and root tabs for service that appear in the **[Service]-[Basic]** tab may differ, depending on the packages installed using the **[Maintenance]-[Enhancements]** tab.

2-4. Azure IoT Edge setup

To perform operations, etc. from this chapter and below, setup described in Chapter 2-2 "[Preparation in advance] IoT Hub setup" must be completed in advance.

If not completed, perform first.

Choose the **[Azure IoT Edge]-[Setup]** tab, and use the connection string taken note of in the IoT Hub setup to set up Azure IoT Edge.



Setup

Connection string:

Enter the string to use for connecting to IoT hub. Check this information on the IoT Hub page of Azure Portal.

Setup Options:

Normally, it is not necessary to change this item.

Setup or change of this item should be performed only by those familiar with ioedgectl commands.

After making the necessary entries, press the Run button.

Normally, after completing this process, the screen will move to the Edge status tab.

If setup has already been completed, this item will not be displayed. To display this again, it is necessary to initialize the setup.

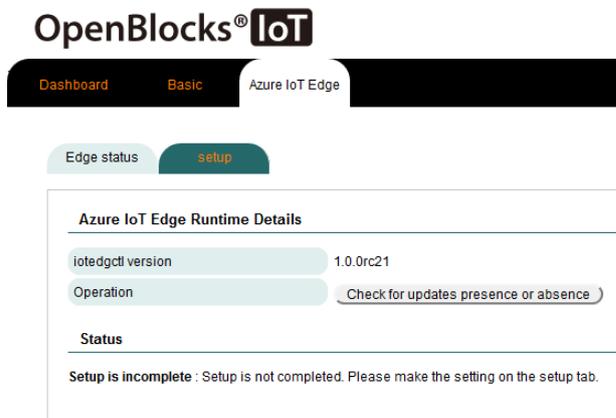
2-5 Azure IoT Edge operation

In the **[Azure IoT Edge]-[Edge status]** tab, it is possible to carry out the following actions:

- Update and update check of Azure IoT Edge runtime
- Control Azure IoT Edge to start up/stop
- Initialization of Azure IoT Edge setup

At the time of initial activation, containers to be used by Azure IoT Edge will be downloaded. If IoT Edge modules created by the user (such as Azure Machine Learning and Azure Functions) also are to be downloaded, perform login setup of the Azure container registry to be discussed later in advance.

- If setup has not been completed



Azure IoT Edge runtime details

iotedgectl version:

Displays the version of Azure IoT Edge runtime

Operation: :

Checks the update status or update Azure IoT Edge runtime

To use this function, an Internet connection is required.

*The update function will be displayed only if an update is available after checking.

Status

The status of Azure IoT Edge will be displayed. The following status conditions will be displayed.

Depending on actual status, corresponding buttons for operation may be displayed.

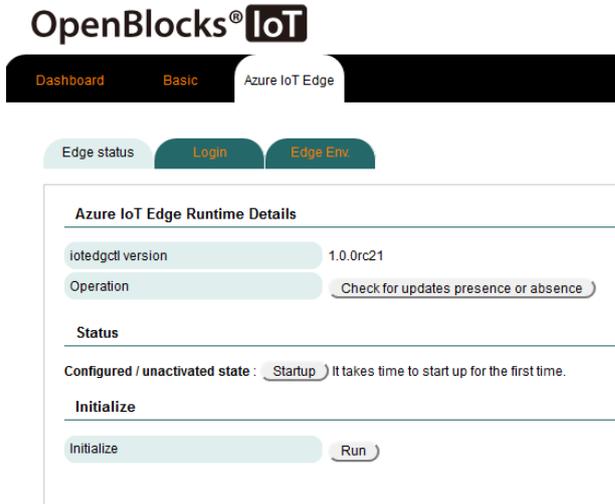
• **Activated**

Azure IoT Edge containers are activated.

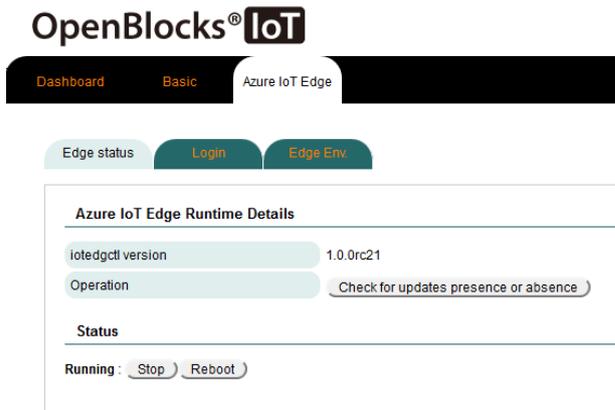
• **Inactivated**

Azure IoT Edge containers are un-activated.

- If setup is completed but Azure IoT Edge is not activated



- If Azure IoT Edge is in operation



- **Configured/Unactivated state**

Azure IoT Edge setup has been completed, but initial activation has not been performed.

At the time of initial activation, data for operation will be downloaded from the IoT Hub. For this reason, the unit must be connected to the Internet.

- **Setup not completed**

Azure IoT Edge setup has not been performed. Follow the instructions in the previous section to perform the setup.

- **Unknown**

The status condition is unknown to WEB UI. Use the command line to check the status.

Initialize

Initialize:

Press the "Run" button to initialize Azure IoT setup (runtime setup and containers used by Azure IoT Edge).

This will be displayed when the setup is completed and Azure IoT Edge is not activated.

● If Azure IoT Edge is not activated

OpenBlocks® IoT

The screenshot shows the OpenBlocks IoT dashboard with the 'Azure IoT Edge' tab selected. The dashboard has a dark header with 'Dashboard', 'Basic', and 'Azure IoT Edge' tabs. Below the header, there are three buttons: 'Edge status', 'Login', and 'Edge Env'. The main content area is titled 'Azure IoT Edge Runtime Details' and contains the following information:

Azure IoT Edge Runtime Details	
iotedgectl version	1.0.0rc21
Operation	Check for updates presence or absence
Status	
Stopped :	Startup
Initialize	
Initialize	Run

When containers are downloaded and launched at the time of initial startup, Azure IoT Edge sets its reboot policy to "Always."

*Downloading, etc. will be performed if any change in configuration is made on the IoT Hub side other than the initial activation.

For this reason, in conjunction with the rebooting of Docker Daemon and rebooting of the host machine (OpenBlocks), it will always be activated.

2-6 Azure container registry login setup

If Azure Machine Learning, Azure Functions, etc. are used as IoT Edge modules, service containers corresponding to Azure container registry will be deployed.

*Regarding how to create and deploy containers, refer to the following page:
<https://docs.microsoft.com/ja-jp/azure/iot-edge/tutorial-deploy-machine-learning>

If a container is downloaded from Azure container registry using Azure IoT Edge runtime, it is necessary to set up login information.

It is possible to set up Azure container registry login information for Azure IoT Edge runtime using the **[Azure IoT Edge]-[Login]** tab.

●When login information has not been set up

The screenshot shows the OpenBlocks IoT dashboard with the 'Azure IoT Edge' tab selected. The 'Login' sub-tab is active. The 'Add Registry (?)' section contains three input fields: 'Login server', 'Username', and 'Password' (with a 'Display entered password' toggle). Below these is a 'Login' button. The 'Registry List' section below shows the message 'Registry server to log in is not specified.'

Add registry

Login server:

Enter the login server for Azure container registry.

Username:

Set up username to be used for logging onto the login server.

Password:

Set up password information to be used for logging onto the login server.

After making entries, press the Login button to save the login information in Azure IoT Edge runtime.

Note that as no actual login process is performed, be sure to enter the correct login information. If login information is incorrect, downloading of the target container will fail. For this reason, please check the log of Azure IoT Edge management container (container name: edgeAgent).

● When login information has been set up

The screenshot shows the OpenBlocks IoT dashboard. At the top, there is a navigation bar with 'Dashboard', 'Basic', and 'Azure IoT Edge'. Below this, there are tabs for 'Edge status', 'Login', and 'Edge Pro'. The main content area is divided into two sections. The first section is titled 'Add Registry (?)' and contains three input fields: 'Login server', 'Username', and 'Password' (with a 'Display entered password' checkbox). Below these fields is an 'Operation' section with a 'Login' button. The second section is titled 'Registry List' and contains a table with the following data:

#	Registry server	Operation
1	habecontainerreg.azurecr.io	Log out

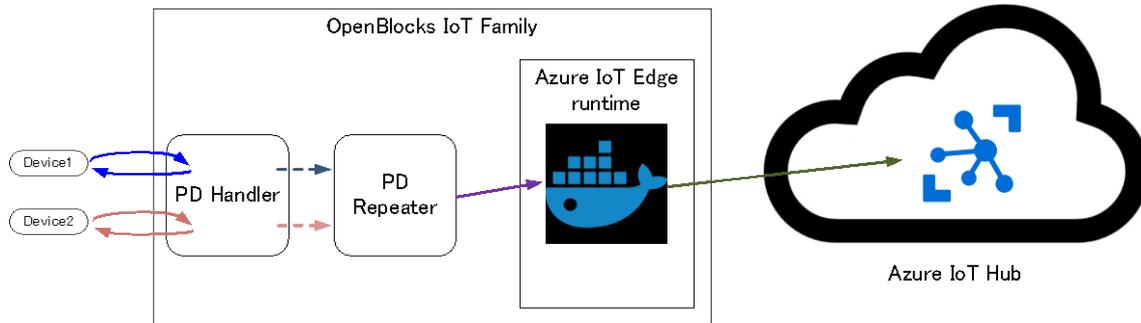
Registry List

Shows a list of registries registered.

Regarding unnecessary registry information, it is possible to delete login information by using the Logout button.

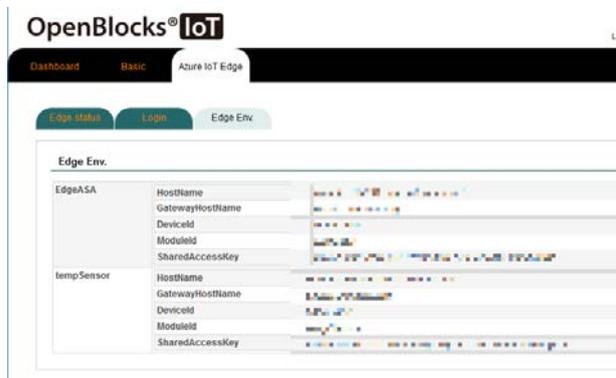
2-7. Environment variables of Azure IoT Edge module

As shown in the figure below, in conjunction with the IoT data control function, it is possible to send data and perform a filtering process to Azure IoT Hub via a container downloaded by Azure IoT Edge runtime.



When device data is sent to an IoT Edge module via the IoT data control function, environment variables that the IoT Edge module has must be used.

Such environment variables can be checked using the **[Azure IoT Edge]-[Edge Env.]** tab.



Edge Env.

Refers to container information downloaded after activation and shows environment variables for Azure IoT Edge.

Please note that the information used by the IoT data control function is module ID (Item name: ModuleId). Enter this information in the relevant tab in the IoT data control function.

Chapter 3 Others

3-1. Conjunction with Docker for WEB UI

With this function, total control of Azure IoT edge is possible, but no individual container control is available. If the filtering function in added IoT Edge modules or Azure IoT Edge is used, excessive memory may be consumed, affecting the host machine (OpenBlocks).

If installing Docker for WEB UI, it is possible to check the resource status or set up the control function by installing Docker for WEB UI. We recommend considering this option.

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