intdash Terminal System Operation Manual

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01 Introduction (Terminal System)

Important:
- This document is for general informational purposes only. Specifications in this document are subject to change without notice and are not guaranteed.
- Screenshots used in descriptions are examples. Some displays or procedures might differ depending on your environment and application version.

Note: Company names, service names, and product names mentioned in this document are generally registered trademarks or trademarks of their respective owners. Trademark symbols "™" and "®" are omitted in the text, figures, and tables.

Attention: This document has been translated using machine translation services and may contain inaccuracies and translation errors. Please also refer to the official version in Japanese.

This manual describes how to configure the Terminal System.

1.1 Terminal System overview

Terminal System is a computer that functions as an edge device for intdash. The software required to function as an edge device is pre-installed.

Terminal Systems are mainly installed and used in automobiles, heavy machinery, construction equipment, and agricultural machinery.

By connecting the Terminal System to the CAN bus of an automobile using the EDGEPLANT CAN-USB Interface, control and sensor signals can be acquired from the CAN bus and sent to the intdash server.

When the Terminal System is connected to a GPS device, camera, etc., data can also be acquired from these devices.

Data filtering and resampling can also be performed.

1.2 Hardware used as Terminal System

One of the following is used as the hardware for the Terminal System.

- aptpod EDGEPLANT T1
- NEXCOM VTC 1910-S

Important: Refer to accompanying documentation for safety precautions and specifications for the computer and peripheral equipment.

Note on connecting to the network

- To use wireless LAN, a designated wireless LAN adapter (Wi-Fi dongle) is required.
- To use a cellular network (LTE), a specified LTE module (with antenna) is required. EDGEPLANT T1 and VTC 1910-S are equipped with a SIM slot, but inserting a SIM card alone does not provide LTE communication.

1.3 Recommended environment for configuring the Terminal System

Terminal System settings are made from another PC connected to the network (hereafter referred to as "configuration PC").

Recommended configuration PCs are those that meet the following specifications.

- OS: Windows or macOS
- CPU: Intel 3rd generation Core i3 and above
- Memory: 4GB or more
- Web browser: Google Chrome (latest version)

See Terminal System Quick Start - Setup from the configuration PC (p. 8) for instructions on how to connect a configuration PC to the Terminal System and start configuration.

02 Startup and shutdown of Terminal System (power on/off)

Attention: The configuration of the power supply depends on the user's application and environment.

- Power source (car battery power, AC adapter, etc.)
- Starting method (started by manual switch or triggered by other devices such as car ignition)
- Power source for peripheral equipment (there may be restrictions on how peripheral equipment is powered)

This chapter describes the procedures for starting and shutting down the Terminal System and does not describe how to supply power for your specific purposes.

When using the Terminal System, please be sure to operate it in a safe manner according to your own configuration.

Important: Refer to the accompanying documentation for safety precautions and specifications for the computer and peripheral equipment.

2.1 Terminal System power supply terminal

The following terminals are available for Terminal System computers.

- IG: Start signal input (H: start, L: shutdown, Threshold: approx. 7 V)
- +: Constant power supply
- −: GND

The following are two examples of basic power supply methods (note that the position and order of the terminals may vary depending on the computer model).

If you wish to link to the vehicle's ignition (IG) signal or accessory (ACC) power supply, the configuration is as follows.

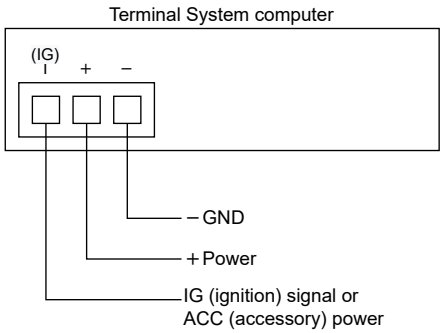


Fig. 1 Linked to IG signal or ACC power (peripheral devices are omitted)

If you wish to use manual switches to start and shut down the Terminal System, the configuration is as follows

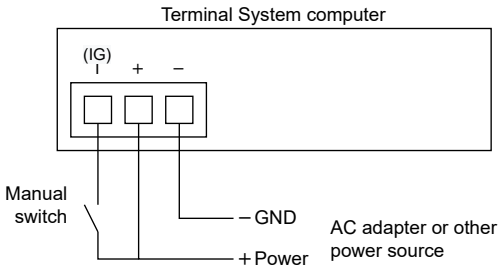


Fig. 2 Using a manual switch (peripheral devices are omitted)

2.2 Terminal System startup and shutdown procedures

Startup and shutdown are performed as follows.

Starting up the Terminal System

With power supplied to the + terminal of the Terminal System, set the IG terminal to a "H" state by an IG signal, ACC power, or switch operation. To prevent malfunction, the Terminal System is started up when the "H" state is maintained for 3 seconds.

Shutting down the Terminal System

Set the IG terminal to the "L" state. The shutdown process will take place and the computer's power LED will turn off completely when the process is complete. Once the power LED is completely off, it is safe to shut off the power supply to the + terminal.

Attention: Do not interrupt the power supply while the power LED is on or blinking.

Loss of power supply at unintended timing can cause the following problems:

- OS does not boot.
- Data is lost. The processed ratio of the measurement does not reach 100%.

Also note that depending on the shutdown process, it may take some time for the system to shut down completely.

Note that dark current is caused even when the Terminal System is shut down (refer to the documentation that came with your computer for the level of current). When the Terminal System is connected to an automobile battery, be aware of battery drain.

03 Terminal System Quick Start - Setup from the configuration PC

In this chapter, we will configure the most basic settings of the Terminal System. There are three main settings.

- Network settings
- Settings for connecting to the intdash server
- Settings for data acquisition from devices connected to the Terminal System

Once these settings are complete and you connect the required external device, you can start acquiring data.

Before starting the configuration, please have the following information ready.

- Information about the network to connect to the intdash server (eg. APN and authentication method when using cellular connection)
- URL of the intdash server (example: `https://example.intdash.jp`)
- Edge UUID (Edge account UUID assigned to this Terminal System, eg. `f90f2b42-66a5-4a57-8e99-468c36ebb6f2`)
- Client secret (The client secret of the edge account above. Example: `sEh9ZHPoKX8QYU...iBn5fneFM`)

3.1 Connect the Terminal System and the configuration PC with a LAN cable

To access the Terminal System from the configuration PC, connect the configuration PC and the Terminal System with a LAN cable.

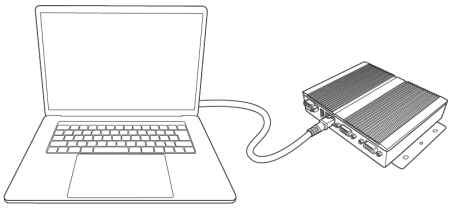


Fig. 3 Connect the configuration PC and the Terminal System

Note: In the figure above, the Terminal System and the configuration PC are directly connected, but you can also connect the Terminal System and the configuration PC to the same local network.

3.2 Open the Terminal System settings window in a web browser

Attention: In order to connect to the Terminal System, the configuration PC must have the following settings.

- Windows 10: IPv6 must be enabled.
- macOS: IPv6 setting must be set to "Link-local only".

1. In the address bar of the web browser on the configuration PC, type `http://<Terminal System computer name>.local/config/` (default setting is `http://terminal-system.local/config/`) and press Enter.
2. The authentication dialog opens. Enter the user name and password (default user name `user`, password `user`) to access the settings screen.

   Note:
   - The user name and password used here is the one for the Terminal System settings screen, which is different from the user name and password for intdash sign in.
   - See Change the password to access the settings screen ([Basic Auth]). (p. 47) for changing the password.

   The top screen (dashboard) of the Terminal System will be displayed.

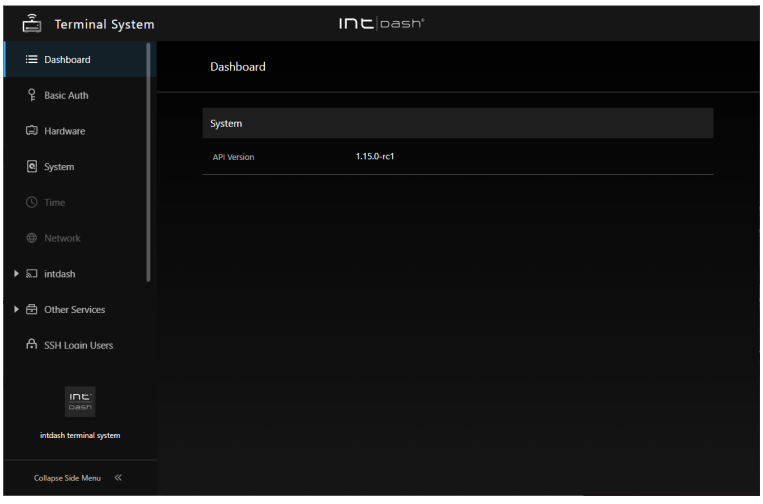


Fig. 4 Terminal System dashboard

3.3 Set up the network to send measurement data

Set up the network to send the measurement data to the intdash server.

As a typical example, this section describes a case in which the built-in LTE module is used to communicate over a cellular connection.

1. Open the [Network] menu.
2. Click [Create Network Setting] to create settings for your cellular connection.
   - Name: The name of the network setting. Enter any descriptive name.
   - Enabled: Turn on.
   - Type: Select [Cellular].

- NIC: Select the network interface for the built-in LTE module (usually only one is displayed).
- APN, Authentication Method, Username, Password: Enter the information that came with your mobile SIM card.
- MTU Automatically Configured: Turn on.
- Band Preset: Select the name of the antenna connected to the Terminal System.

3. Click [Create].
4. Operate the power switch to restart the Terminal System.

Note: See Connect to the network (p. 12) for more details on the settings.

3.4 Configure the destination (intdash server)

1. Select [intdash] menu > [Connection / Auth] and set the following.
   - intdash server URL
   - Edge UUID (UUID of the edge account assigned to this Terminal System)
   - Client secret (the client secret of the edge account above)

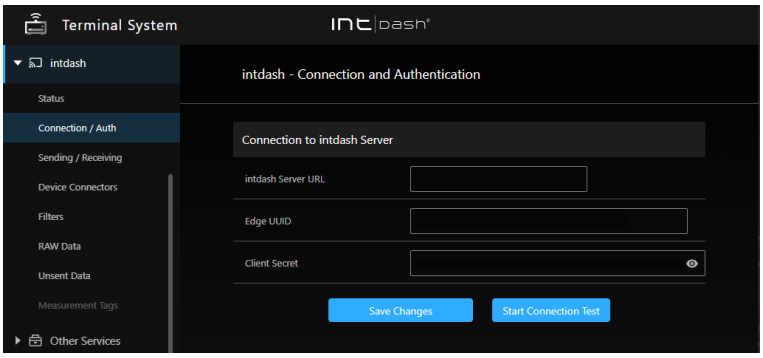


Fig. 5 Setting up authentication information

Note: For more information on how to set this up, see Configure settings for sending data to the server ([intdash] > [Sending / Receiving]) (p. 21).

2. Click [Save Changes].
3. Click [Start Connection Test], and then click [Test Connection].

   When the edge name is displayed, the connection is successful.

Note: You will see a message requesting you to restart the intdash service to reflect the settings, but restart it after configuring the device connector as described below.

3.5 Configure data acquisition

Configure device connectors to acquire data from devices connected to the Terminal System (CAN-USB Interface, GPS devices, cameras, etc.).

The Device Connector is a software that retrieves data from devices connected to the Terminal System.

1. Create the device connector settings required for data acquisition.

   In the [intdash] menu > [Device Connectors], click [Create Device Connector], set the channel, device type, and other items, and then click [Create].

   > **Note:** See Acquire data from devices (Device Connectors) (p. 26) for more details on the settings.

2. Restart the intdash service by clicking [Restart] in the [intdash] menu > [Status].

   intdash service is software that acts as the edge node of intdash. When the intdash service is started, the device connector is also started and data acquisition begins. If you are connected to the Internet, data transmission will also start.

This completes the settings for acquiring data from the CAN-USB Interface, GPS device, etc. and sending it to the intdash server.

The following sections describe each setting in detail.

04 Connect to the network

Proper configuration is required to connect Terminal System to the network.

4.1 Network type and priority

The Terminal System uses the network for two purposes:

- Sending measurement data (Terminal System accesses the intdash server.)
- Terminal System settings (The configuration PC accesses the terminal system.)

There are five types of networks available: The possible uses for each type are as follows (The ✓ mark indicates that it is available for use.).

Network type	Sending measurement data (Terminal System accesses the intdash server)	Terminal System settings (Configuration PC accesses the terminal system)
Ethernet	✓	✓
Wireless LAN - Client Mode	✓	✓
Wireless LAN - Access Point Mode	-	✓
Cellular	✓	-
Cellular - USB Device	✓	-

Attention:

- When using wireless LAN, connect the USB wireless LAN adapter specified by aptpod. Other USB wireless LAN adapters may not work properly.
- When using a cellular connection, connect the built-in LTE module or LTE adapter specified by aptpod. Otherwise, it may not work properly.
- When using a cellular network, depending on the SIM card, activation procedures may be required after purchase.
- Terminal System does not support SIM PIN.

Only one setting of the same type can be enabled (for example, two Ethernet settings cannot be enabled). Also, "Wireless LAN - Client Mode" and "Wireless LAN - Access Point Mode" cannot be enabled at the same time.

4.1.1 Network settings for sending measurement data (Terminal System accesses the intdash server)

Only one of the enabled settings with the highest priority will be used. The priority of the network type is as follows:

1. "Ethernet"
2. "Wireless LAN" (Client Mode or Access Point Mode)
3. "Cellular" or "Cellular - USB Device"

For example, if the "Ethernet" and "Wireless LAN - Client Mode" settings are enabled, the Ethernet connection will be tried first, and if the connection is not possible, the wireless LAN will be used.

4.1.2 Network settings during Terminal System setup (Configuration PC accesses the terminal system)

If Ethernet or wireless LAN (client mode or access point mode) is enabled, you can use either one.

For example, if both "Ethernet" and "Wireless LAN - Client Mode" are enabled, you can communicate via Ethernet or wireless LAN from the configuration PC. If you specify the Ethernet IP address of Terminal System on the configuration PC, you can access via Ethernet, and if you specify the IP address for wireless LAN, you can access via wireless LAN.

Attention: If no network settings are available (deleted or disabled), you will not be able to access the Terminal System settings screen. In that case, please contact the support desk.

4.1.3 Details of each network type

Ethernet

Connect the Ethernet cable to the Terminal System and connect it to an existing LAN such as a corporate LAN. This type is also used when connecting the Terminal System and the configuration PC on a one-to-one basis using an Ethernet cable.

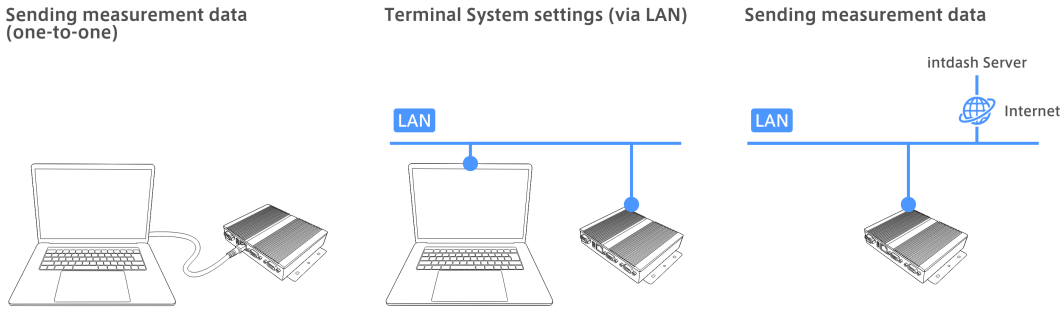


Fig. 6 Ethernet

The Ethernet cable can be attached and detached while using the Terminal System.

Wireless LAN - Client Mode

Connect the wireless LAN adapter to Terminal System. Connect to an existing wireless LAN, such as an in-house LAN, as a client.

WPA-PSK and WPA-PSK2 authentication methods are supported.

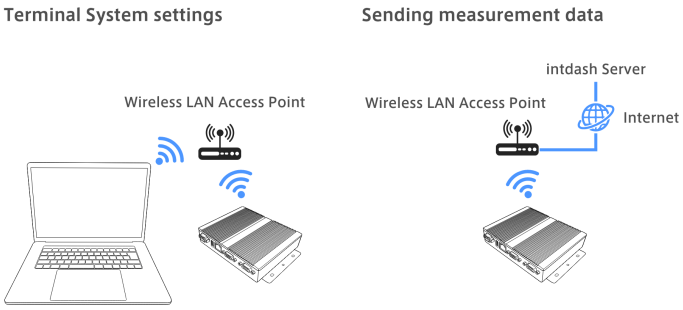


Fig. 7 Wireless LAN - Client Mode

Wireless LAN - Access Point Mode

Connect the wireless LAN adapter to the Terminal System to make the Terminal System itself a wireless LAN access point. This allows you to access the Terminal System settings screen from another PC.

It does not have the ability to redirect communications from other PCs to the Internet (no tethering capability).

WPA-PSK and WPA-PSK2 authentication methods are supported.

When using the EDGEPLANT T1 as the Terminal System computer, DHCP functionality is provided to the client. DHCP functionality is not provided when using VTC 1910-S.

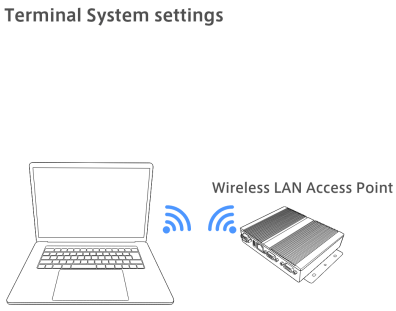


Fig. 8 Wireless LAN - Access Point Mode

Cellular

Use the LTE module built into the Terminal System to connect to the cellular network.

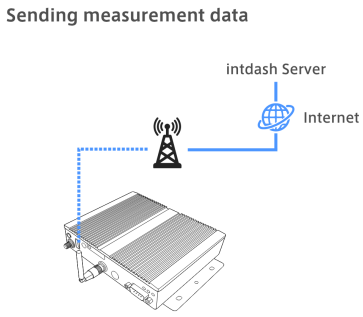


Fig. 9 Cellular

Attention:

- Do not insert or remove the SIM card while the Terminal System is turned on. Insert the SIM card before turning on the Terminal System.
- Insert the SIM card all the way in.
- RSSI (Received Signal Strength Indicator) is displayed on the details screen of the network settings.

Cellular - USB Device

Use a USB-connected LTE adapter to connect to the cellular network

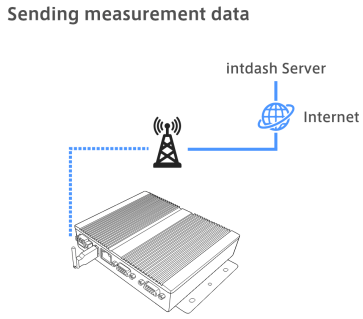


Fig. 10 Cellular - USB Device

Attention: When using "Cellular - USB Adapter", RSSI (Received Signal Strength Indicator) is not displayed on the detailed screen of network settings.

4.2 Create / change network settings

To create or change network settings, do the following:

Attention: When making settings for connections that use external devices such as wireless LAN adapters and LTE adapters, make settings with the required devices connected. If you try to set it when it is not connected, the setting will not be reflected normally and an error will occur.

1. If you want to create a new configuration, click [Create Network Setting]. If you want to change the existing network settings, click [Details].

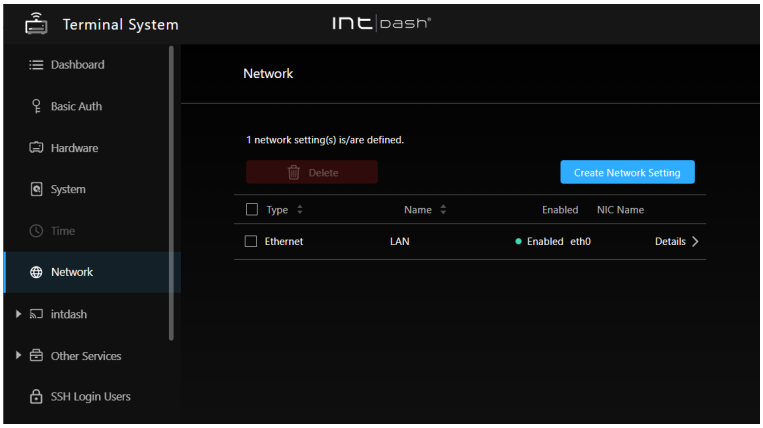


Fig. 11 Network settings

2. Enter the settings and click [Save Changes].

   See Network setting items (p. 16) for more information on the settings.

3. Operate the power switch to restart the Terminal System.

Note: While connected to the network, you can check the information such as the IP address by clicking [Details] in the network settings you are using.

4.3 Network setting items

The setting items are as follows.

4.3.1 Setting items common to all types

Name
Enter any descriptive name to distinguish the network settings.

Enabled
Enables / disables this network setting. Only one setting of the same type can be enabled.

See Network type and priority (p. 12) for network configuration priorities.

Attention: If no network settings are available (deleted or disabled), you will not be able to access the Terminal System settings screen. In that case, please contact the support desk.

Type
Select the type such as Ethernet or wireless LAN. The setting items are displayed according to the selected type.

NIC From the NICs (Network Interface Cards) recognized by the Terminal System, select the one used for this setting.

4.3.2 Setting items for Ethernet

DHCP

Set whether to use DHCP. If the network you are connecting to has DHCP, turn this on and the IP address of the Terminal System is automatically assigned.

> **Attention:** Be sure to turn this setting on when sending data to the intdash server. If you turn it off, you will not be able to send data.

If you want to use a fixed IP address when setting the Terminal System, turn this setting off and set the following static IP address.

Static IP Address, Subnet Mask of Static IP Address, Default Gateway of Static IP Address

If you turned off DHCP, enter the IP address, subnet mask, and default gateway to assign to the Terminal System.

4.3.3 Setting items for Wireless LAN (client mode)

SSID Enter the SSID of the existing wireless LAN to connect to.

Passphrase

Enter the passphrase of the wireless LAN to connect to.

> **Attention:** If you make a mistake in the SSID or passphrase, you will not be able to connect, but no error message will be displayed. Please enter the correct SSID and passphrase.

4.3.4 Setting items for Wireless LAN (access point mode)

SSID Set the SSID to be provided by the Terminal System access point. Use this SSID when connecting to the Terminal System access point from other PCs.

Passphrase

Set the passphrase (password) used when connecting to the Terminal System access point from another PC.

IP Address

Specifies the IP address assigned to the Terminal System itself. If not specified, the default value (192.168.0.100) is used.

Subnet Mask

Specify the subnet mask of the IP address of the Terminal System itself. If not specified, the default value (255.255.255.0) is used.

4.3.5 Setting items for Cellular

The APN, authentication method, username and password will vary depending on your cellular network. See the information that came with your SIM card.

APN Enter the access point name.

Authentication Method
Select the access point authentication method. If you don't know the authentication method, try "CHAP" first. If you cannot connect, then try "PAP".

Username
Enter the access point user name.

Password
Enter the access point password.

MTU Automatically Configured
Set whether to set the MTU (Max Transfer Unit) automatically. Normally turn it on.

MTU
If you turn off MTU auto-setting, you can set the MTU manually.

Band Preset
By selecting the antenna name, the appropriate band will be selected.

Band presets to choose from when using EDGEPLANT T1 as the Terminal System computer:

Band preset (antenna name)	LTE band	W-CDMA band
MA251.A.BI.001	B1, B3, B8, B18, B19, B39, B41	B1, B8, B19
TG.09.0113	B1, B3, B8, B18, B19, B39, B41	B1, B8, B19
TG.30.8113	B1, B3, B8, B18, B19, B21, B39, B41	B1, B8, B19
TG.35.8113	B1, B3, B8, B18, B19, B21, B39, B41	B1, B8, B19

Band presets to choose from when using VTC 1910-S or VTC 1010 as the Terminal System computer:

Band preset (antenna name)	LTE band
TG.09.0113	B1, B3, B8, B18, B19
GSA.8827.A.101111	B1, B3, B8, B18, B19, B21, B41
GA.130.201111	B1, B3, B8, B18, B19, B21, B41
TG.30.8113 (VTC 1910-S only)	B1, B3, B8, B18, B19, B21, B41

Other band presets (W-CDMA not available on VTC 1910-S or VTC 1010):

Band Preset	LTE band	W-CDMA band
docomo	B1, B3, B19, B21	B1, B6, B19
SoftBank	B1, B3, B8	B1, B8, B19
au	B1, B3, B18	
Default in Japan	B1, B3	B1
All bands	B1, B3, B5, B7, B8, B18, B19, B21, B38, B39, B40, B41	B1, B5, B6, B8, B19

4.3.6 Setting items for Cellular - USB

There are no settings specific to this type.

05 Measurement

In intdash, "measurement" is the process of acquiring and recording data from sensors and cameras. In the Terminal System, measurement is performed by the "intdash service". Measurements are started when the intdash service is started and terminated when it is stopped.

5.1 Check the status of the intdash service ([intdash] > [Status])

The [intdash] menu > [Status] shows the current status of the intdash service.

Service Status
Displays whether the intdash service is running or not.

Network Type
Displays the type of network currently in use (Ethernet, wireless LAN, etc.).

Auto-Start intdash Service
Sets whether the intdash service should be started automatically when the Terminal System is started. The measurement will start when the intdash service is started. See Make the measurement start automatically when the power is turned on ([intdash] > [Status]) (p. 23) for more information.

Resend Mode
If the intdash service is running in resend mode, "Running" is displayed. For more information on resend mode, see Modes of the intdash service (p. 20).

Size of Unsent Data
The size of the unsent data stored in the Terminal System.

Throughput for Resending
When resending is in progress, its throughput is displayed.

5.1.1 Modes of the intdash service

The intdash service has two modes: "normal mode" and "resend mode".

Normal mode
In normal mode, as soon as data is retrieved from the connected device, the data will be sent to the server according to the setting [intdash] > [Sending / Receiving].

To start the intdash service in normal mode, go to [Service Status] and click [Start] (or [Restart]). As soon as it starts, data acquisition and data transmission will begin.

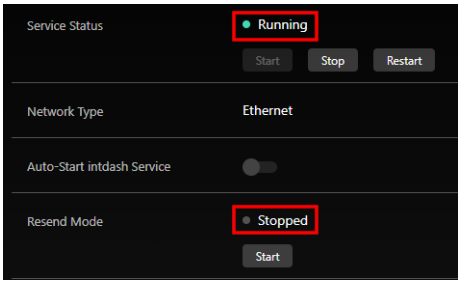


Fig. 12 intdash service running in normal mode (Resend mode is "Stopped")

Resend Mode
In resend mode, no measurement is performed. Only the stored data is sent to the server.

If you click [Start] in [Resend Mode], the intdash service will start in resend mode and will start sending unsent data. To stop the resend mode, click [Stop] under [Service Status].

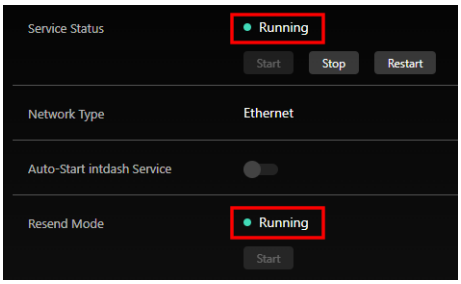


Fig. 13 intdash service running in resend mode (Resend mode is "Running")

5.2 Configure settings for sending data to the server ([intdash] > [Sending / Receiving])

There are two types of data transmission from the Terminal System to the intdash server: "real-time" and "resend".

- With real-time transmission, the acquired data is immediately sent to the server, and the real-time transmitted data is displayed when the Visual M2M Data Visualizer is set to LIVE mode.
- Resend is a process in which data that could not be sent in real time is automatically sent to the server at a specified interval (250 milliseconds by default).

Real-time transmission and resend are configured in [intdash] > [Sending / Receiving].

Attention: In intdash, "resend" refers to sending data to the server later that was attempted to be sent in real time but could not be sent.

Also, when data that has been excluded from real-time transmission by a filter is later sent to the server, we call it "resend". In this case, since the data was originally excluded from real-time transmission, it is not "re"send in the strict sense of the word, but is included in "resend" for convenience.

5.2.1 Combination of real-time sending and resending

The following four combinations of real-time sending and resending are possible.

Real-time sending enabled and resending enabled

The data is sent to the server in real time. Even if the network is temporarily disconnected for a period of time, all data will eventually be stored on the server through automatic retransmission.

Real-time sending enabled and resending disabled

The data is sent to the server in real time. Since there is no automatic resend, if the network is temporarily disconnected, the data for that time range will not be sent to the server but will be stored in the Terminal System. After the measurement is finished, you can send the unsent data to the server using the resend mode.

Real-time sending disabled and resending enabled

Real-time data transmission is not performed. Data is sent at specified intervals by automatic "resend".

Real-time sending disabled and resending disabled

Neither real-time transmission nor resend will be performed. As resend is disabled, the unsent data will remain stored in the Terminal System. By using the resend mode after the measurement, all data can be saved to the server.

Note: Send unsent data to the server later
There are two ways to send the stored unsent data to the server.

- Turn on resend mode
- Send to the server via the configuration PC

For more information, see Transmit stored data (p. 40).
Note that if you restart the intdash service with [Resending] turned on, a new measurement will be started and at the same time, the transmission of unsent data begins.

Attention:

- The data will be deleted from the Terminal System once it has been saved to the server.
- When the unsent data accumulates in the Terminal System and there is no more free space in the storage, the measurement becomes impossible.

5.2.2 Configure settings for real-time transmission.

For "Real-time sending," configure the following settings.

Enabled

Turns on the transmission method to be used. See Combination of real-time sending and resending (p. 21) for combinations of transmission methods (default: on).

Sending Interval

Set the interval at which data is sent. If the server cannot keep up with the receiving process and errors occur frequently, increase this value (default: 5 ms).

After configuring the settings, click [Save changes].

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart. If you click [Restart] in the [intdash] menu > [Status], the intdash service will be started with the new settings and the measurement will begin.

5.2.3 Configure resend

For "Resending," configure the following settings.

Enabled

Turn on the transmission method you want to use. See Combination of real-time sending and resending (p. 21) for combinations of transmission methods. (default: on)

Send timing

Sets the conditions for resending.

- Always (default): Always resend, regardless of the communication environment.
- Use this option if you are using a built-in LTE module and want to send only some of the data in real time by filtering, and send the rest of the data later via wireless or wired LAN.

Sending Interval

Set the interval at which data is sent (default: 250 ms). If the server cannot keep up with the receiving process and errors occur frequently, increase this value. Also, set the interval to a smaller value when you want to accelerate resending where there is enough network

bandwidth (e.g. when using resend mode).

After configuring the settings, click [Save changes].

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart. If you click [Restart] in the [intdash] menu > [Status], the intdash service will be started with the new settings and the measurement will begin.

5.3 Manually start/stop the measurement ([intdash] > [Status])

To start/stop the intdash service manually on the Terminal System settings screen, do the following.

1. In the [intdash] menu > [Status], under [Service Status], click [Start].

   This will start the measurement and start sending/receiving data to/from the intdash server according to the setting [intdash] > [Sending / Receiving].

2. To manually end the measurement, click [Stop].

Note: In the factory default settings, [Auto-Start intdash Service] is turned on in the [intdash] menu > [Status], so when you power on the Terminal System, it will automatically start acquiring data and start sending/receiving data to/from the intdash server.

5.4 Make the measurement start automatically when the power is turned on ([intdash] > [Status])

If you turn on [Auto-Start intdash Service] in the [intdash] menu > [Status], the measurement will start automatically when the Terminal System starts, and data will be sent to and from the intdash server according to the settings in the [intdash] menu > [Sending / Receiving].

Turning on this setting will allow you to start and end the measurement simply by starting and shutting down the Terminal System.

By default, [Auto-Start intdash Service] is turned on.

06 Set up a connection to the server

To configure the information needed to connect to the intdash server, do the following

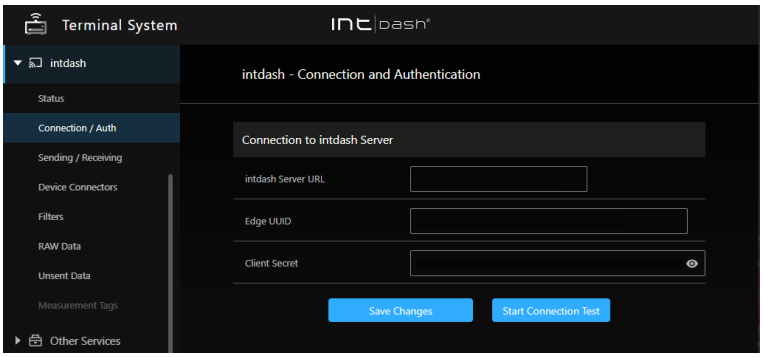


Fig. 14 [intdash] menu > [Connection / Auth]

1. Open the [intdash] menu > [Connection / Auth] and enter the following information.

   intdash Server URL

   Enter the URL of the intdash server that this edge will use.

   Please note that depending on your environment, the URL used by the Terminal System may differ from the URL used by the web applications.

   In the case of an intdash environment run by aptpod, the Terminal System usually connects to `<example>.intdash.jp`, and the web applications connects to `<example>.vm2m.jp` (where `<example>` is the same name).

   Edge UUID

   This is the UUID to identify this edge; create an edge account in the intdash My Page application and enter that UUID here.

   (example: `f90f2b42-66a5-4a57-8e99-468c36ebb6f2`)

   Client Secret

   Enter the client secret for authentication that you issued in intdash My Page for this edge.

   (example: `sEh9ZHPoKX8QYU...iBn5fneFM`)

   Attention:

   - Previous versions of Terminal System used edge tokens instead of client secrets for authentication. A Terminal System that continues to use an edge token will display the edge token in the Connection and Authentication screen. However, you will not be able to set up a new edge token; if you want to set up new credentials for the Terminal System, use a client secret.
   - If you set a new client secret with unsent data still in the Terminal System, the data will not be able to be sent to the server. Please send or delete all unsent data before setting a new client secret. See Transmit stored data (p. 40) for information on how to send unsent data to the server.

2. Click [Save Changes].
3. Click [Start Connection Test] to test the connection.

> **Note:** Test the connection after saving the changes.

The settings will take effect after the intdash service is restarted. Click [Restart] in the [intdash] menu > [Status] to start the intdash service with the new settings and start the measurement.

07 Acquire data from devices (Device Connectors)

The Device Connector is software that receives data from devices connected to the Terminal System (CAN-USB Interface, cameras, GPS devices, etc.).

The device connector must be configured for each device to be used.

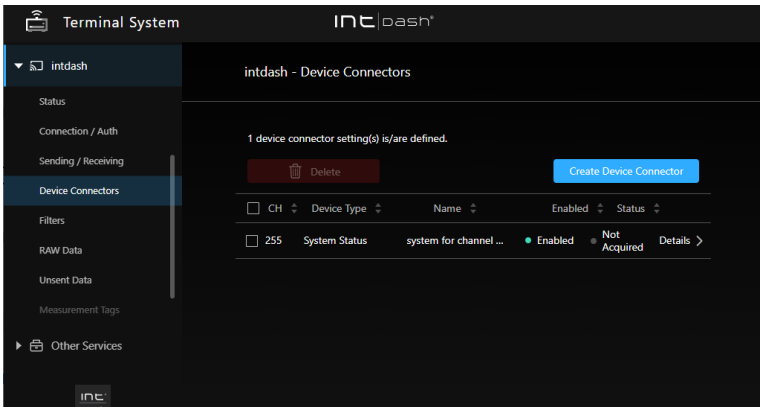


Fig. 15 [intdash] menu > [Device Connectors].

7.1 Create/modify new device connector settings

Attention: To create device connector settings, the Terminal System must already have recognized the device. With the device connected, power on the Terminal System.

To create device connector settings, go to the [intdash] menu > [Device Connectors] and click [Create Device Connector]. To change the settings of an existing device connector, click [Details].

In the device connector settings, configure the following.

CH A channel number used for data identification; the Terminal System does not allow multiple device connectors to be created with the same channel number.

Device Type
Select the device type. For more information about device types, see Available device types and configuration items (p. 27). (You cannot change the device type of an existing device connector setting.)

Name
You can give the device connector an arbitrary name.

Enabled
Turn on the device connector you want to use.

Status
The status of the device connector is displayed.

- Connected: Device connector is working properly.
- Not Acquired/No Data/Disconnected: The connection to the device has not been established. Check the connection to the device and the cable. If the device itself has a status indicator (e.g. LED), check if the status indicator is normal.
- Error: Check the contents of the error message and try to resolve the error. If the problem persists, please contact our support desk.

After configuring the settings, click [Save Changes].

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart. If you click [Restart] in the [intdash] menu > [Status], the intdash service will be started with the new settings and the measurement will begin.

7.2 Available device types and configuration items

The available device types and configuration items are as follows.

- ANALOG-USB Interface (p. 27)
- Audio (p. 28)
- Audio (Onboard) (p. 29)
- CAN Transceiver (p. 29)
- CAN-USB Interface (p. 29)
- Custom (p. 30)
- GPS (p. 30)
- H.264 (p. 30)
- H.264 for GStreamer (p. 31)
- H.264 for BRIO x4 (Logitech BRIO Webcam x4) (p. 32)
- H.264 for C920 (for Logitech C920 webcam) (p. 32)
- H.264 for See3CAM_CU30 (for e-con Systems See3CAM_CU30 camera) (p. 33)
- H.264 for EP1-VM01A (for aptpod EDGEPLANT EP1-VM01A camera) (p. 34)
- H.264 for EP1-VM01A x4 (aptpod EDGEPLANT EP1-VM01A camera x4) (p. 34)
- MJPEG (p. 35)
- MJPEG for EP1-VM01A (for aptpod EDGEPLANT EP1-VM01A camera) (p. 35)
- PCAN-USB FD (for PEAK-System PCAN-USB FD) (p. 36)
- System Status (p. 36)

Note: If you want to use your own device connector, select the device type [Custom]. For information on how to develop device connectors, see the intdash Edge Agent Developer Guide for details on how to develop device connectors.

7.2.1 ANALOG-USB Interface

This is the device connector for using the EDGEPLANT ANALOG-USB Interface EP1-AG08A made by aptpod.

Analog Input Sampling Frequency
: Specify the sampling frequency (common to all ports of ANALOG-USB Interface).

Analog Input Ch (number) Enabled
: Enables/Disables each analog input port of ANALOG-USB Interface.

Analog Input Ch (number) Voltage
: Specify the range of input voltage for each analog input port of ANALOG-USB Interface.

Analog Output Enabled
: Turn on if you want to use the analog output port of ANALOG-USB Interface.

Analog Output Waveform
: Select a signal waveform to output from the analog output port of ANALOG-USB Interface (0: pseudo-random signal, 1: sine wave, 2: triangle wave, 3: square wave, 16: fixed signal).

Analog Output Voltage
Specify the voltage of the signal to be output from the analog output port of ANALOG-USB Interface.

Analog Output Frequency
Specify the frequency of the signal waveform to be output from the analog output port of ANALOG-USB Interface.

Timestamp Mode
Sets how the timestamp is given to the received data.

- `device`: Timestamps are given using the clock of the ANALOG-USB Interface. It is more accurate than `host` timestamps.
- `host`: Timestamps are given using the clock of the Terminal System computer.

If you want to synchronize multiple aptpod USB interfaces using a sync cable, select `device` in each device connector setting.

However, if you select `device` here, there may be a time difference between the aptpod USB interface and other devices. This is because devices other than aptpod USB interface use the clock of the Terminal System computer (equivalent to `host`).

If time synchronization between aptpod USB interfaces and other devices is important, select `host` for the aptpod USB interface to use the clock of the Terminal System computer.

Device Path
Select the device path of the connected ANALOG-USB Interface. Multiple device connectors cannot use the same device path.

7.2.2 Audio

This is the device connector used to acquire audio data.

Format
Select the audio data format (S16LE: signed 16 bit little-endian, S32LE: signed 32 bit little-endian, F32LE: floating-point little-endian).

Sampling Frequency
Enter a numerical value. (Unit: Hz)

Number of Channels
Enter the number of channels.

Device Path
Select the device path of the connected ANALOG-USB Interface. Multiple device connectors cannot use the same device path.

Mic Jack Audio Element
If you use the computer's microphone jack, enter the name of the device element that indicates the status (plugged or unplugged) of the microphone jack.

- When using the VTC 1910-S as a Terminal System computer: `Mic Jack`.
- When using the EDGEPLANT T1 as your Terminal System computer: `y Jack-state`.

Interface
Enter the type of audio control device.

- When using the VTC 1910-S as a Terminal System computer: `CARD`
- When using the EDGEPLANT T1 as your Terminal System computer: `MIXER`

Command
Enter a GStreamer command. Set up the appropriate pipeline for the audio input you are using, and make sure that the audio data is output from the GStreamer's standard output.

The following variables can be used in the command to refer to other setting values.

Variables	Values
$_DEVICE	Full path set in [Device Path].
$_FORMAT	The value set for [Format].
$_RATE	The value set for [Sampling Frequency].
$_CHANNELS	The value set for [Number of Channels].

Command example when using the VTC 1910-S as the Terminal System computer:

```
gst-launch-1.0 -q alsasrc device=$_DEVICE ! audioconvert ! audio/x-raw,format=$_FORMAT,rate=$_RATE,
↪channels=$_CHANNELS ! fdsink fd=1
```

Command example when using the EDGEPLANT T1 as the Terminal System computer:

```
gst-launch-1.0 -q alsasrc device=hw:1 ! audioconvert ! audio/x-raw,format=$_FORMAT,rate=$_RATE,channels=
↪$_CHANNELS ! fdsink fd=1
```

7.2.3 Audio (Onboard)

Device connector to get the audio input from the onboard audio of the Terminal System.

Format
Select the audio data format (S16LE: signed 16 bit little-endian, S32LE: signed 32 bit little-endian, F32LE: floating-point little-endian).

7.2.4 CAN Transceiver

This is a device connector to use aptpod's CAN Transceiver (former product). (This option is not shown if you are using the EDGEPLANT T1.)

Baud Rate
Select the baud rate for CAN communication.

Device Path
Select the device path of the connected CAN Transceiver. Multiple device connectors cannot use the same device path.

7.2.5 CAN-USB Interface

This is a device connector for the following CAN-USB interface products from aptpod.

- CAN USB Interface AP-CT2A
- EDGEPLANT CAN-USB Interface EP1-CH02A

Baud Rate
Select the baud rate for CAN communication.

Device Path
Select the device path for the connected EDGEPLANT CAN-USB Interface EP1-CH02A. Multiple device connectors cannot use the same device path.

ACK Set whether or not ACK is sent from the CAN-USB Interface to the CAN bus (0: with ACK, 1: without ACK).

Timestamp Mode
Sets how the timestamp is given to the received data.

- `device`: Timestamps are given using the clock of the CAN-USB Interface. It is more accurate than `host` timestamps.
- `host`: Timestamps are given using the clock of the Terminal System computer.

If you want to synchronize multiple aptpod USB interfaces using a sync cable, select `device` in each device connector setting.

However, if you select `device` here, there may be a time difference between the aptpod USB interface and other devices. This is because devices other than aptpod USB interface use the clock of the Terminal System computer (equivalent to `host`).

If time synchronization between aptpod USB interfaces and other devices is important, select `host` for the aptpod USB interface to use the clock of the Terminal System computer.

7.2.6 Custom

If you want to use your own device connector, use Custom.

Options

Set the device connector settings as key/value pairs. The contents of the settings vary depending on the device connector.

Select the appropriate Type when entering the value; if you select boolean, object, or array, the value must be entered in JSON notation.

7.2.7 GPS

Device Connector that acquires various NMEA sentences from GPS devices. In the normal configuration, latitude, longitude and direction (RMC sentences) are obtained approximately every 200ms.

There are no unique setting items for GSP devices.

7.2.8 H.264

Device connector for acquiring H.264 video from the camera.

Resolution

Select the resolution of the video to be acquired.

Frame Rate

Select the frame rate of the video.

Device Path

Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you have multiple cameras and frequently reconnect cameras, the `/dev/videoX` format allows you to use any camera attached to `/dev/videoX`, regardless of its individual number.

However, if an incompatible camera is recognized as `/dev/videoX`, data cannot be acquired correctly.

Encoding Delay Correction
Enter the offset (camera processing time) for the timestamp. For example, if processing in the camera takes 100 milliseconds, specify "100". This will add timestamps of 100 milliseconds earlier to the camera data.

7.2.9 H.264 for GStreamer

This is a device connector to convert the RAW data output from the camera to H.264 with GStreamer and acquire it.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate of the video.

Device Path
Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

Encoding Delay Correction
Enter the offset (camera processing time) for the timestamp. For example, if processing in the camera takes 100 milliseconds, specify "100". This will add timestamps of 100 milliseconds earlier to the camera data.

Command
Enter a GStreamer command. Set up an appropriate pipeline appropriate for the input, so that H.264 data is output from the GStreamer's standard output.

The following variables can be used in the command to refer to other setting values.

Variables	Values
`$_PATH`	Full path set in [Device Path].
`$_FPS`	The value set for [Frame Rate].
`$_WIDTH`	The width value of the resolution specified in [Resolution].
`$_HEIGHT`	The height value of the resolution specified in [Resolution].

Command example when using the VTC 1910-S as the Terminal System computer:

```
gst-launch-1.0 -q v4l2src device=$_PATH ! image/jpeg,width=$_WIDTH,height=$_HEIGHT,framerate=$_FPS/1 !␣
↪queue ! vaapijpegdec ! queue ! vaapipostproc ! queue ! vaapih264enc rate-control=2 bitrate=3072 max-
↪bframes=0 keyframe-period=150 ! fdsink fd=1
```

Command example when using the EDGEPLANT T1 as the Terminal System computer:

```
gst-launch-1.0 -q v4l2src device=$_PATH ! image/jpeg,width=$_WIDTH,height=$_HEIGHT,framerate=$_FPS/1 !␣
↪jpegdec ! omxh264enc iframeinterval=$_KEYPERIOD bitrate=3000000 insert-sps-pps=true insert-vui=true !␣
↪video/x-h264,stream-format=byte-stream ! queue ! h264parse ! queue ! fdsink fd=1
```

7.2.10 H.264 for BRIO x4 (Logitech BRIO Webcam x4)

This is a device connector for acquiring video from four Logitech BRIO webcams as a single video in a 2x2 tiled configuration.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

Bitrate
Select the bit rate.

Device Path
Select the device path of the connected camera as the source for the upper left, upper right, lower left, and lower right videos, respectively. Multiple device connectors cannot use the same device path.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

7.2.11 H.264 for C920 (for Logitech C920 webcam)

Device connector for acquiring H.264 video from Logitech C920 webcam.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

> **Note:** When using the C920, 30fps cannot be selected. (Because the frame rate may drop from 30 fps to 15 fps due to the automatic exposure adjustment function.)

Bitrate
Select the bit rate.

Device Path
Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

7.2.12 H.264 for See3CAM_CU30 (for e-con Systems See3CAM_CU30 camera)

Device connector to acquire H.264 video from e-con Systems See3CAM_CU30 camera.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

Bitrate
Select the bit rate.

Device Path
Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

7.2.13 H.264 for EP1-VM01A (for aptpod EDGEPLANT EP1-VM01A camera)

Device connector to acquire H.264 video from the EDGEPLANT EP1-VM01A camera from aptpod.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

Bitrate
Select the bit rate.

Device Path
Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

7.2.14 H.264 for EP1-VM01A x4 (aptpod EDGEPLANT EP1-VM01A camera x4)

This is a device connector for acquiring video from four aptpod EDGEPLANT EP1-VM01A cameras as a single video in a 2x2 tiled configuration.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

Bitrate
Select the bit rate.

Device Path
Select the device path of the connected camera as the source for the upper left, upper right, lower left, and lower right videos, respectively. Multiple device connectors cannot use the same device path.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

7.2.15 MJPEG

Device connector for acquiring MJPEG video from a camera.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

Device Path
Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device connector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

Encoding Delay Correction
Enter the offset (camera processing time) for the timestamp. For example, if processing in the camera takes 100 milliseconds, specify "100". This will add timestamps of 100 milliseconds earlier to the camera data.

7.2.16 MJPEG for EP1-VM01A (for aptpod EDGEPLANT EP1-VM01A camera)

Device connector to acquire MJPEG video from aptpod EDGEPLANT EP1-VM01A camera.

Resolution
Select the resolution of the video to be acquired.

Frame Rate
Select the frame rate.

Device Path
Select the camera by specifying the device path. You cannot set the same device path for multiple device connectors.

There are two types of device paths:

- A format that includes the camera model number and individual number, such as `/dev/example_camera-name_serial-number` (only cameras compatible with this Device Connector are displayed).
- Format `/dev/videoX` (X is a number. Cameras that are incompatible with this device con-

nector will also be displayed.)

Either format can be used, but if you want to continue using a specific individual camera, we recommend a format that includes the individual number.

If you frequently reconnect a camera with a different individual number, you can specify it in the format `/dev/videoX` so that it can be used regardless of the individual number. However, in this case, if a camera that is not suitable for this device connector is recognized as `/dev/videoX`, it will not be able to acquire data correctly.

7.2.17 PCAN-USB FD (for PEAK-System PCAN-USB FD)

This is the device connector for acquiring CAN data using PEAK-System PCAN-USB FD.

Baud Rate
Select the baud rate for the arbitration phase.

Data Baud Rate
Select the baud rate for the data phase.

Device Path
The path of the devices recognized by the Terminal System will be displayed. Select the device you want to use. Multiple device connectors cannot use the same device path.

ACK Set whether or not ACK is sent from the CAN-USB Interface to the CAN bus (0: with ACK, 1: without ACK).

ISO CAN FD
Set whether to use ISO CAN FD or not (0: disabled, 1: enabled); select 1 to use ISO compliant CAN FD, or 0 to use non-ISO CAN-FD.

7.2.18 System Status

System Status is a special device connector that retrieves information about the Terminal System itself and sends it to the intdash server, rather than data from the connected devices. It can be used to get the status of the Terminal System itself and to check the communication between the Terminal System and the intdash server.

There are no special settings for System Status.

When shipped from the factory, this device connector is set to channel 255. Normally, there is no need to change this setting.

The data obtained by the System Status device connector is as follows

Data type	Data ID	Content
String	s00	System information
String	s20	Network information
String	s50	Status of the Edge Agent (agent software that sends and receives data to and from the intdash server)

08 Filtering/sampling

By filtering the data retrieved from the device, only some of the data can be sent to the intdash server. This reduces the amount of data to be sent.

There are two types of filters: "ID Filter" and "Sampling". In the following, ID filters and sampling are collectively referred to as filters.

A filter can be set to apply only to real-time transmissions or to apply to all transmissions. This allows only the data points that pass the filter to be sent in real time, and the rest to be sent later by resend process.

Note: Real-time data is the data that is displayed when the Visual M2M Data Visualizer is set to LIVE mode.

Filters are used, for example, as follows

- If an "ID filter that allows only data with CAN ID 0x10" is applied only to real-time transmission
  - For real-time transmission, only data points with a CAN ID of 0x10 are allowed and will be sent to the server in real-time. All other data points are blocked and will be sent to the resend process.
  - Since no filter is applied to the resend process, the remaining data points (with CAN IDs other than 0x10) will be sent to the server in the resend process.
- If an "ID filter that allows only data with CAN ID 0x10" is applied to both real-time transmission and resend
  - For real-time transmission, only data points with a CAN ID of 0x10 are allowed and will be sent to the server in real-time. All other data points are blocked and will be sent to the resend process.
  - Data points with a CAN ID other than 0x10 are blocked also in the resend process. As a result, those data will not be sent to the server.

Attention: The filters available depend on the device type.

- ID filters can only be used with CAN data[*1].
- Sampling can only be used with CAN data[*1], GPS, and MJPEG data.

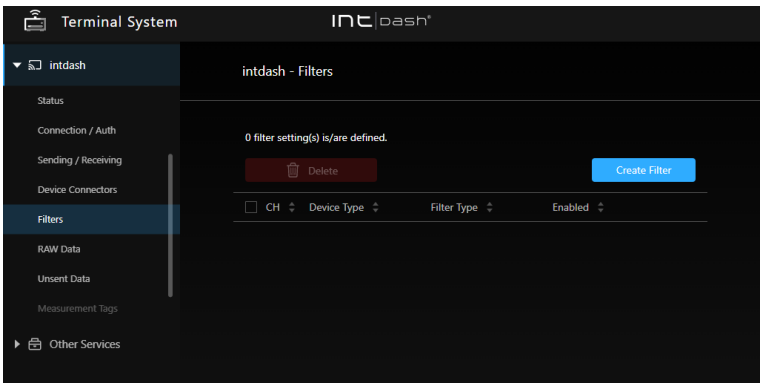


Fig. 16 [intdash] > [Filters] menu

[*1] Device types that can use ID filters are CAN Transceiver, USB-CAN Interface, CANopen, PCAN-USB FD, and Socket CAN.

8.1 Filter Type

There are two types of filters. When a filter is set, only allowed data (that could pass the filter) will be sent to the server.

ID Filter

The ID filter is a filter that determines whether to allow or block each data point according to its ID.

There are two types of ID filters: the "allow list" type and the "block list" type.

An allow-list type ID filter permits only data points with the specified ID, and blocks other data points.

A block list type ID filter blocks data points with a specified ID and allows other data points.

Sampling

Sampling is the function of extracting data at regular intervals.

When sampling is set, one data point for each data ID will be selected at each sampling interval.

In each sampling interval, the data points are processed as follows.

- The first data point of the data ID is allowed.
- The second and subsequent data points with the same data ID are blocked.
- If there is no distinction by data ID, as in MJPEG, then only the first data point is allowed.

The following figure shows how three types of CAN data (ID 1, 2, and 3) with different frequencies are extracted on the channel where sampling is set (CH 1). In each sampling interval, the first data point with ID 1 is allowed. Similarly, the first data point with ID 2 and the first data point with ID 3 are allowed and sent to the server.

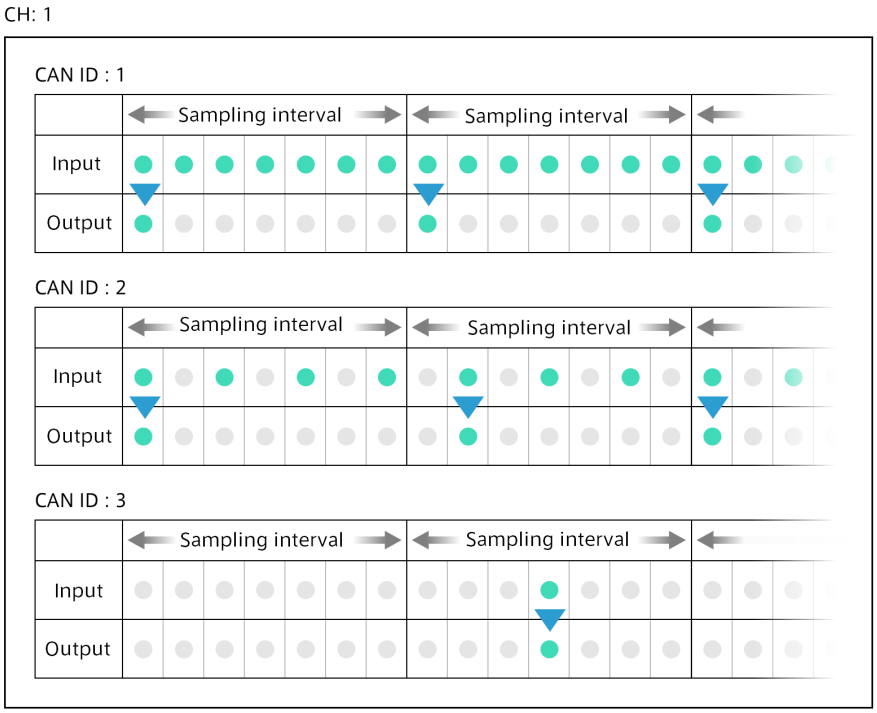


Fig. 17 Example of sampling CAN data that occurs at different frequencies on channel 1

8.2 Create/modify new filter settings (including sampling)

To create/configure a new filter, do the following

1. Under [intdash] > [Filters], click [Create Filter]. Or, if you want to change the settings of an existing filter, click [Details].
2. Set the following.

   CH
   Specify the channels to which the filter is applied. If [Apply to All Channels] is checked, the filter will be applied to all channels of the specified device type.

   Device Type
   Specify the device type to which the filter will be applied. (You cannot change the device type of an existing filter.)

   Filter Type
   Specify the filter type. For more information about filter types, see Filter Type (p. 38).

   Enabled
   When turned on, the filter will be applied.

   Target
   Specify where to apply the filter.

   - If the target of the filter is set to realtime, the data blocked by the filter will not be sent in realtime, but will be sent to the server via resend process and stored on the server.
   - If the filter is applied to both realtime and resending, data blocked by the filter will not be sent to the server because it will not be sent in realtime and there will be no automatic resending process.

   Filtering Method (only for ID filter)
   Select either the allow list or the block list.

   An allow-list type ID filter allows only data with a specified ID and sends those data to the server.

   A block list type ID filter blocks only data with a specified ID, and allows other data to be sent to the server.

   ID List (only for ID filter)
   Enter CAN IDs in decimal notation. You can specify up to 100 IDs separated by commas.

   Sampling Interval (only for sampling)
   Specify the sampling interval in milliseconds (1 to 99999).

3. Click [Create] or [Save Changes].

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart. If you click [Restart] in the [intdash] menu > [Status], the intdash service will be started with the new settings and the measurement will begin.

09 Transmit stored data

Data that could not be sent in real time due to network instability, or data that was blocked by filters and not sent in real time, is stored in the Terminal System as "unsent data".

When resend is turned on in [intdash] menu > [Sending / Receiving], unsent data is sent in parallel while real-time data is being sent. If a large amount of unsent data accumulates, it may take some time before all data is sent.

If you have turned off the resend process in [intdash] menu > [Sending / Receiving], the unsent data will not be resent automatically.

To transmit stored data efficiently, you can use the resend mode or download the data to a configuration PC.

9.1 Send only unsent data (resend mode)

In resend mode, no new data will be acquired, only the stored data waiting for resend will be transmitted. The resend mode is performed according to the "Resending" settings in [intdash] > [Sending / Receiving]. See Configure settings for sending data to the server ([intdash] > [Sending / Receiving]) (p. 21) for details on the settings.

Attention: Clicking Resend Mode [Start] will restart the intdash service in resend mode, which will stop the running measurement.

To use the resend mode, go to [intdash] > [Status] and click Resend Mode [Start].

The decrease in unsent data indicates that resending is in progress.

After the resend is complete, please shut down the Terminal System. Alternatively, restart the intdash service and the next measurement will start in normal mode.

9.2 Resend the data to the server via the configuration PC ([intdash]> [Unsent Data])

The data waiting for retransmission stored in the Terminal System can be downloaded to the configuration PC.

Data downloaded to the configuration PC can be uploaded to the intdash server using the dedicated application "intdash-edge-uploader".

This makes it possible to upload data later via an internal LAN, etc., even when all data cannot be uploaded at the time of measurement (e.g., when network bandwidth is limited).

Note: Please contact us for information on how to get the intdash-edge-uploader.

9.2.1 Uploading unsent data with intdash-edge-uploader (Windows)

To download the data to the configuration PC and upload it to the intdash server, do the following.

> **Note:** To perform the following steps, you will need intdash-edge-uploader.exe, a dedicated CLI application for Windows.

1. In the [intdash] menu > [Unsent Data], click [Download].

   All the data stored in the Terminal System awaiting resend will be downloaded as a single zip file.

2. Start a command prompt on the configuration PC.
3. (Only if your Internet connection is available through a proxy server) Execute the following command to set the proxy server information in the command prompt.

   ```
   set HTTP_PROXY=http://[<user>:<pass>@]<ProxyAddress>[:<port>]
   set HTTPS_PROXY=http://[<user>:<pass>@]<ProxyAddress>[:<port>]
   ```

   - `<user>` : User name to access the proxy server (optional).
   - `<pass>` : Password for accessing the proxy server (optional).
   - `<ProxyAddress>` : IP address or name of the proxy server (FQDN).
   - `<port>` : Port number of the proxy server (optional).

   Example: If your proxy server is `http://proxy.net` with port 8080:

   ```
   set HTTP_PROXY=http://proxy.net:8080
   set HTTPS_PROXY=http://proxy.net:8080
   ```

4. Type the following command to run `intdash-edge-uploader.exe`. The `^` (caret) is entered to escape newlines.

   ```
   C:\Users\UserName\> <path_to_intdash-edge-uploader> ^
   -s <ServerAddress> -e <EdgeUUID> -t <APIToken> ^
   <measurement_data>
   ```

   - `<path_to_intdash-edge-uploader>`: Path to the executable `intdash-edge-uploader.exe`.
   - `<ServerAddress>`: intdash server name.
   - `<EdgeUUID>`: The UUID of the edge which retrieved the data (the edge UUID assigned to the Terminal System).
   - `<APIToken>`: The user's API token (not the edge's client secret).
   - `<measurement_data>`: Full path of the downloaded unsent data (zip file).

   The following is an example of an actual command.

   ```
   C:\Users\UserName\> C:Users\UserName\Desktop\intdash-edge-uploader\Win64\intdash-edge-uploader.exe ^
   -s example.intdash.jp ^
   -e 01234567-0123-0123-0123-0123456789abcdef ^
   -t abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUV ^
   C:\Users\UserName\Desktop\000000001_1563766531.000000000
   ```

   > **Note:** Drag and drop the file icon to the command prompt to enter the path of the file. It is convenient to use this function when specifying the executable file or the measurement data.

5. The intdash server's name and edge UUID will be displayed, make sure they are correct.

```
Upload settings:
- Server : example.intdash.jp
- Edge UUID : 01234567-0123-0123-0123-0123456789abcdef
```

6. When the transmission starts, the progress will be displayed as shown below.

```
Processing...
2/100% (232/239)
```

> **Note:** The numbers in brackets on the right side of the percentage are "Remaining unsent data/total unsent data".

When the transmission is complete, a list of transmitted measurements will be displayed and you will be returned to the original prompt.

7. Exit the command prompt.

9.2.2 Uploading unsent data with intdash-edge-uploader (macOS)

To download the data to the configuration PC and upload it to the intdash server, do the following.

> **Note:** To perform the following steps, you will need intdash-edge-uploader, a dedicated CLI application for Mac.

1. In the [intdash] menu > [Unsent Data], click [Download].

   All the data stored in the Terminal System awaiting resend will be downloaded as a single zip file.

2. Start a terminal on the configuration PC.
3. (Only if your Internet connection is available through a proxy server) Execute the following command to set the proxy server information in the command prompt.

```
export HTTP_PROXY=http://[<user>:<pass>@]<ProxyAddress>[:<port>]
export HTTPS_PROXY=http://[<user>:<pass>@]<ProxyAddress>[:<port>]
```

   - `<user>` : User name to access the proxy server (optional).
   - `<pass>` : Password for accessing the proxy server (optional).
   - `<ProxyAddress>` : IP address or name of the proxy server (FQDN).
   - `<port>` : Port number of the proxy server (optional).

   Example: If your proxy server is `http://proxy.net` with port 8080:

```
export HTTP_PROXY=http://proxy.net:8080
export HTTPS_PROXY=http://proxy.net:8080
```

4. Type the following command to run intdash-edge-uploader. The `\` (backslash) is entered to escape a newline.

```
UserName$ <path_to_UploaderForMac> \
-s <ServerAddress> -e <EdgeUUID> -t <APIToken> \
<measurement_data>
```

   - `<path_to_intdash-edge-uploader>`: Path to the executable intdash-edge-uploader.
   - `<ServerAddress>`: intdash server name.
   - `<EdgeUUID>`: The UUID of the edge which retrieved the data (the edge UUID assigned to the Terminal System).

- <APIToken>: The user's API token (not the edge's client secret).
- <measurement_data>: Path of the downloaded unsent data (zip file).

The following is an example of an actual command.

```
UserName$ /Users/UserName/Desktop/intdash-edge-uploader/Darwin/intdash-edge-uploader \
-s example.intdash.jp \
-e 01234567-0123-0123-0123-0123456789abcdef \
-t abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUV \
/Users/UserName/Downloads/000000001_1563766531.000000000
```

Note: Drag and drop the file icon to the terminal and the path to the file will be entered. It is useful to use this function when specifying the executable file or the measurement data.

5. The intdash server's name and edge UUID will be displayed, make sure they are correct.

```
Upload settings:
- Server : example.intdash.jp
- Edge UUID : 01234567-0123-0123-0123-0123456789abcdef
```

6. When the transmission starts, the progress will be displayed as shown below.

```
Processing...
2/100% (232/239)
```

Note: The numbers in brackets on the right side of the percentage are "Remaining unsent data/total unsent data".

When the transmission is complete, a list of transmitted measurements will be displayed and you will be returned to the original prompt.

7. Exit the terminal.

10 Check the event log

Events such as errors and warnings that occur in the Terminal System can be checked in [Events].

The event log may be needed for troubleshooting.

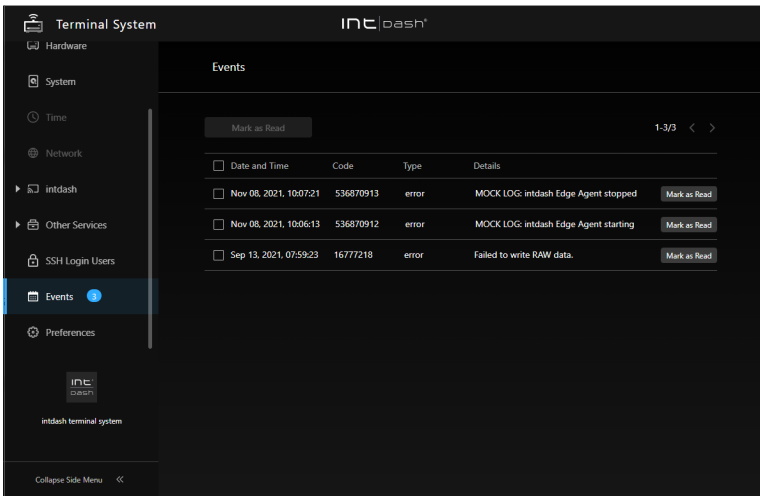


Fig. 18 [Events] menu

The number next to the [Events] menu indicates the number of unread events.

if you select events and click [Mark as Read], the event will be removed from the screen. Events that have been removed from the screen cannot be displayed again.

11 Other settings and operations

11.1 Set the display language and time zone for the settings screen ([Preferences]).

You can change the language of the Terminal System settings screen and the time zone used for the display.

1. Open the [Preferences] menu.
2. Select your language and time zone.

Attention: This setting is saved in the web browser of the configuration PC. Therefore, if you use another web browser, you need to set it again.

11.2 Confirm/change the name of the Terminal System ([System]).

You can confirm/change the name of the Terminal System. This name is used when accessing the Terminal System from the configuration PC.

1. Open the [System] menu.
2. The name of the computer in this Terminal System will be displayed in the [Device Name] field.

   If you want to change it, enter a new name and click [Save Changes].

Use `http://<Terminal System computer name>.local/config/` to access the Terminal System settings screen from the configuration PC.

11.3 Update Terminal System software ([System])

You can update the Terminal System software using one of the following methods.

Online automatic update
: Terminal System automatically downloads software update files from a dedicated repository via the Internet. By setting in advance, the update can be executed at the specified timing. (Get update files automatically via the internet (p. 46))

Update using a file
: The user uploads a software update file to the Terminal System from the configuration PC. The Terminal System does not need to be connected to the internet. (Update using a file (p. 46))

Attention: Please note the following points when updating the software.

- When the software update is started, the measurement will stop.
- Do not turn off the Terminal System while updating software.
- When updating the software of peripheral devices using this function, connect the required peripheral devices in advance.
- Do not remove peripherals while updating software.

11.3.1 Get update files automatically via the internet

You can use the online automatic update function to obtain the update file via the Internet.

> **Note:** [Update Sources] must be set for online automatic update. Usually this is already set up, but if you are unsure which repository to specify, please contact us.
> To make a new setting, enter the ID (any descriptive name, alphanumericals only) and URL, and click [Add].

When [Update Sources] is set, Terminal System accesses the repository via the Internet about 5 minutes after the power is turned on and downloads new update files, if any.

When a new update file is downloaded, you will see the message "A software update is available." in the [System]> [System Information] > [Version].

You can apply the update immediately by clicking [Update Now].

To apply the update at a fixed timing, set as follows.

1. Open the [System] menu.
2. In [Online Automatic Update] > [Update Settings], set when to apply the updates.

   If you turn on [Update Regularly], the Terminal System will be updated if it is turned on at the specified time.

   > **Attention:** If the measurement is being performed at the time specified in [Update Regularly], the measurement will be stopped and the update will be performed. When the update is complete, the measurement will resume automatically.

3. Depending on the content of the update, the message "Reboot the Terminal System." will be displayed. In that case, operate the power switch to restart the Terminal System.

11.3.2 Update using a file

1. Receive an update file from aptpod and copy it to the configuration PC.
2. Access the Terminal System setting screen from the configuration PC.
3. Under [System]> [Update Using File], click [Browse] and specify the update file.

   The update file will be uploaded to the Terminal System and the update will begin.
4. Depending on the content of the update, the message "Reboot the Terminal System." will be displayed. In that case, operate the power switch to restart the Terminal System.

11.4 Check system information such as CPU usage and storage usage ([Hardware]).

1. Open the [Hardware] menu.
2. [Status] shows information such as CPU usage and storage usage.

The serial number may be required when you contact us.

11.5 Change the password to access the settings screen ([Basic Auth]).

You can change the password used to access the setting screen.

1. Open the [Basic Auth] menu.
2. Enter your new password and click [Save changes].

Note: What you can change here is the password for accessing the setting screen from the configuration PC. It is not the password to sign in to the intdash server.

11.6 Configure settings for saving RAW data ([intdash]>[RAW Data]).

The data acquired from devices before applying filters is saved in the Terminal System as backup data (RAW data). The location where the RAW data is saved can be changed.

Attention:

- RAW data is data that the Terminal System has internally for backup, and is not used in normal use cases.
- RAW data is different from "unsent data". For more information about unsent data, see Send only unsent data (resend mode) (p. 40).
- RAW data is saved in a dedicated format.
- RAW data cannot be downloaded from the Terminal System settings screen.

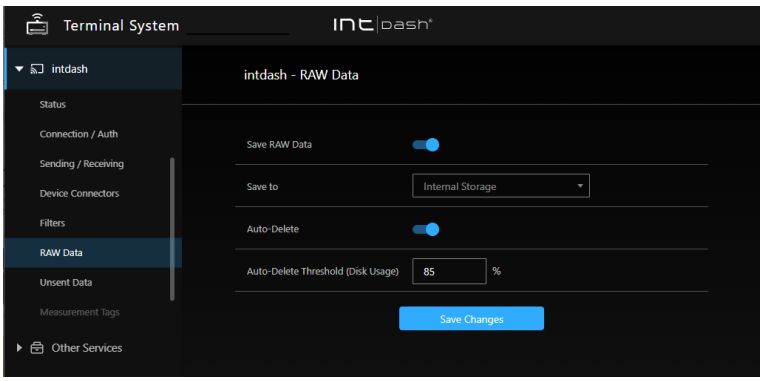


Fig. 19 [intdash] menu > [RAW Data]

11.6.1 Change the settings for RAW data

Settings for RAW data can be made in the [intdash] menu > [RAW Data].

Save RAW Data
When turned on, RAW data will be saved in the Terminal System.

Save to
Select a destination to save the RAW data.

Attention: If you remove the USB or SD card that has been selected as the destination for RAW data, the RAW data will not be saved.

Internal Storage
Save RAW data to the internal storage of the Terminal System.

USB
Save RAW data to USB storage. In order to save RAW data to USB storage, the following must be met

- Only one USB storage device must be connected to the Terminal System.
- USB storage must be formatted as FAT or FAT32.

The first partition of the USB storage will be used to store the RAW data.

SD Card
Save RAW data to SD card. In order to save RAW data to SD card, the following must be met.

- The Terminal System computer must have an SD card slot.
- Only one SD card must be connected to the Terminal System.
- The SD card must be formatted in FAT or FAT32.

The first partition of the SD card will be used to store the RAW data.

Auto-Delete
Each time you make a measurement, RAW data is accumulated, which reduces the available disk space. By enabling automatic deletion, you can avoid the disk from filling up.

When Auto-Delete is enabled, the oldest RAW data will be automatically deleted when the disk usage exceeds the [Auto-Delete Threshold (Disk Usage)].

Auto-Delete Threshold (Disk Usage)
If [Auto-Delete] is enabled, RAW data will be automatically deleted when the usage of the RAW data partition exceeds this value.

After configuring the settings, click [Save Changes].

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart. If you click [Restart] in the [intdash] menu > [Status], the intdash service will be started with the new settings and the measurement will begin.

11.7 Directly edit the configuration file

You can view and directly edit configuration files stored in the Terminal System.

⚠ **Warning:** If incorrect settings are applied by directly editing the configuration file, the system may not work properly. Use only if you fully understand the impact of the configuration changes.

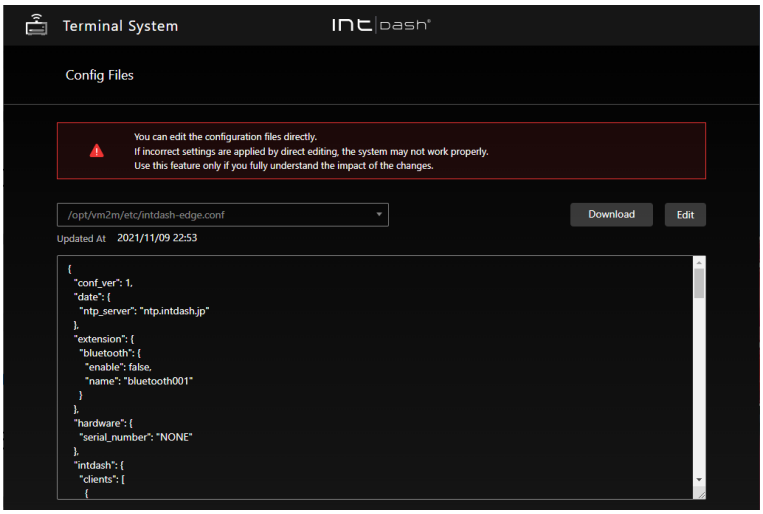


Fig. 20 Edit the configuration file

1. Access `http://<Terminal System name>.local/config/config-files/` with a web browser.

   Note: This function setting cannot be accessed from the menu in the screen; you must enter the URL to access it.

2. Select the file you want to edit and click [Edit].

   Click [Download] to download the configuration file to the PC.

3. When you are done editing, click Save.

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart. If you click [Restart] in the [intdash] menu > [Status], the intdash service will be started with the new settings and the measurement will begin.

11.8 Get remote support

Remote support means that a support staff member can remotely log in to your Terminal System via the Internet to perform maintenance.

During remote support, the support staff accesses your Terminal System using SSH (Secure Shell) via a managed relay server. As long as the security of the relay server is functioning, no third party from outside can log in to your Terminal System.

To use this feature, both the customer and the support staff must be prepared in advance.

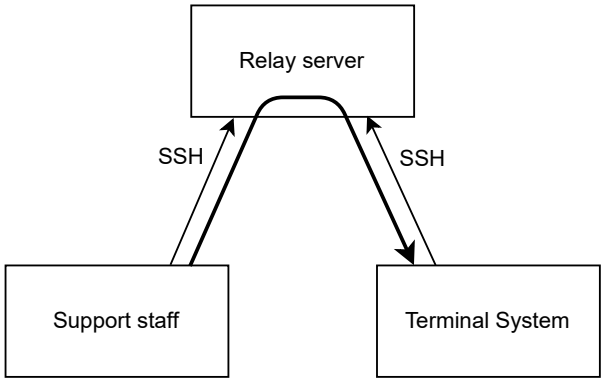


Fig. 21 Remote support

11.8.1 Prepare to get remote support.

In order to be able to receive remote support, please let your support representative know that you need remote support. You should receive the following from your support representative

- SSH login user name (login name of the support staff)
- Public key of the SSH login user above
- Relay server name (FQDN)
- Listening Port on Server

Using this information, configure the Terminal System as follows.

1. Open [SSH Login Users].

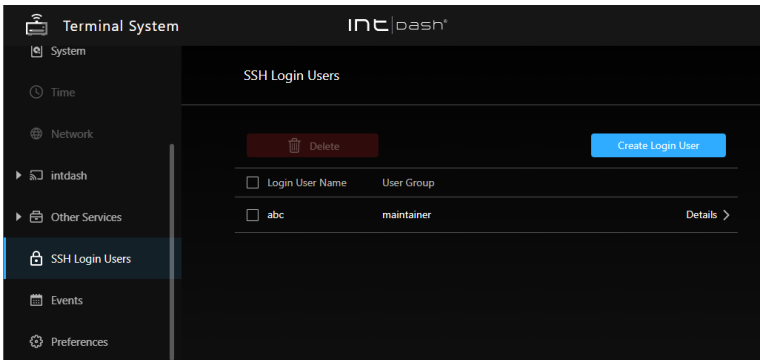


Fig. 22 SSH Login Users

2. Click [Create Login User], enter the SSH login user name you received from your support representative, and click [Create].
3. Enter the public key you received from your support representative, and click [Save Changes].
4. Go to [Other Services] menu > [Remote Support] and click [Create Settings].

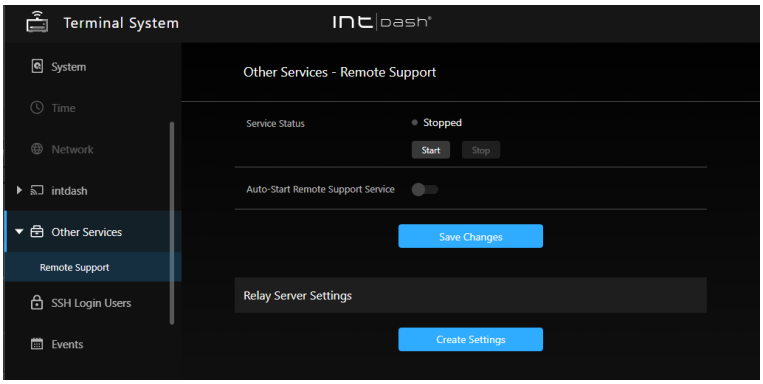


Fig. 23 Remote support

> **Note:** You can only create one setting. If you already have a setting, you can delete it by clicking [Delete Settings].

5. Enter the name (FQDN) and the listening port number of the relay server, and click [Create].
6. When the public key is issued, copy it and send it to the support staff by e-mail or other means.

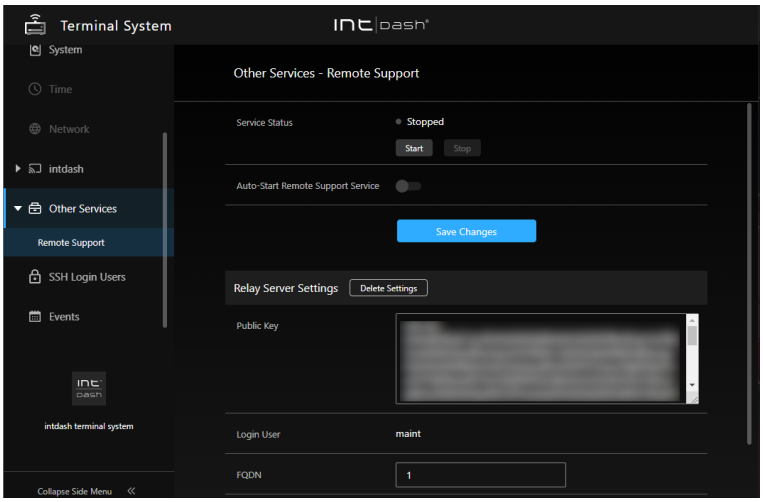


Fig. 24 Issuing a public key

The support staff will set this public key on the relay server. This will allow the Terminal System to connect to the relay server.

After configuring the settings, click [Save Changes].

If a message appears at the top of the screen requesting a restart, the settings will take effect after the restart.

11.8.2 Receive remote support

To get remote support, start the remote support service as follows.

Note: Please arrange the date and time for remote support between you and the support staff in advance. Start the remote support function according to the agreed upon support time.

1. Make sure that the Terminal System is connected to the Internet.
2. In the [Other Services] menu > [Remote Support], click [Start] to start the remote support function.

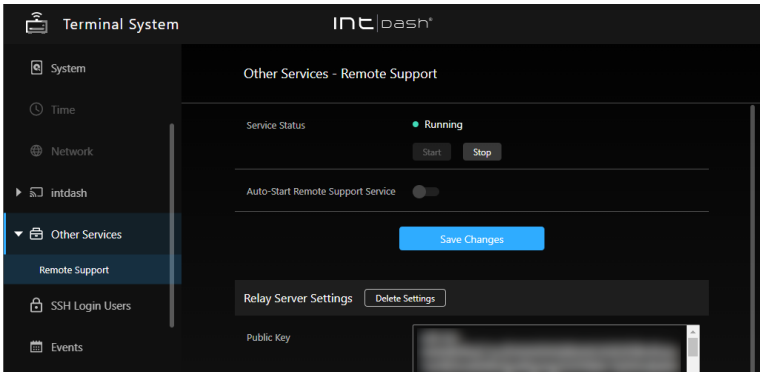


Fig. 25 Activate the remote support function

3. Our support staff will remotely log in to your Terminal System via the Internet to perform maintenance.

When the remote support is finished, go to the [Other Services] menu > [Remote Support]and click [Stop] to stop the remote support function.

Note: When [Auto-Start Remote Support Service] is turned on, the remote support function will be automatically started when the Terminal System starts. Normally, you do not need to turn on this function.

12 Troubleshooting / Frequently asked questions

I cannot connect to the network via wireless LAN (client mode).

- Make sure that MAC address filtering is not performed on the access point.
- Make sure that the frequency range and standards supported by the access point match those of the USB wireless LAN adapter.

I cannot access the Terminal System settings screen from my configuration PC.

Check the connection between the Terminal System and the configuration PC.

- If the Terminal System is connected to the PC with a LAN cable, check that the LAN cable is connected correctly, e.g., by using the LEDs on the LAN port.
- If your web browser has proxy settings enabled, please disable them.
- If the configuration PC is Windows, make sure IPv6 is enabled. If the configuration PC is macOS, make sure that the IPv6 setting is "Link-local only".

I forgot the password to access the Terminal System settings screen.

Please contact our support desk.

The status of the device connector is set to "Not Acquired" or "Disconnected" and no data can be obtained.

- Check the connections and cables between the Terminal System and the device.
- If the device connected to the Terminal System has an indicator, check that it is lighting/blinking properly.

The status of the device connector is "Error" and no data can be acquired.

Please check the contents of the error message and contact our support desk.

13 Contact us

If you have any questions or inconveniences, please contact us using the contact information below.

aptpod, Inc.

- Email address (customer support) VM2M-support@aptpod.co.jp
- Website https://www.aptpod.co.jp/en/

14 Appendix: Display Software for Terminal System

By connecting a display device with the dedicated software to the intdash Terminal System (hereinafter referred to as Terminal), you can display the Terminal status and perform simple operations.

14.1 How to use

14.1.1 Operating environment

This software has been confirmed to work in the following environments. Please note that it may not be displayed or operated normally in environments other than these.

Terminal on which this software operates

- M5Stack

Terminal to connect to

- aptpod EDGEPLANT T1
- NEXCOM VTC 1910-S
- NEXCOM VTC 1010

> **Attention: When using the Terminal System settings application at the same time**
>
> If the settings are changed using the Terminal settings application rather than the display device, the display device display will not be updated. Reboot the display device (unplug and plug the USB cable) if you have changed the settings.

14.1.2 Operation

Once communication with the Terminal is established, the buttons on the display device can be operated. Follow the icons at the bottom of the screen and press the hard button on the display device.

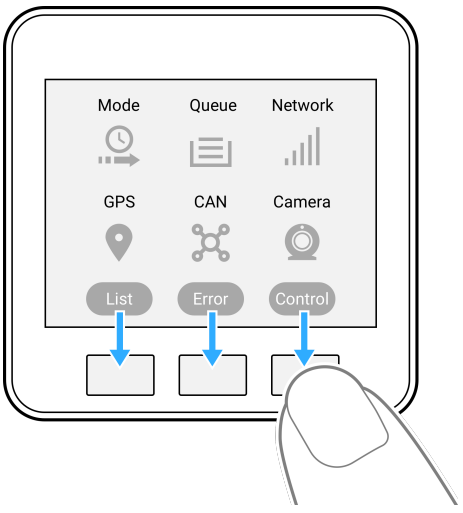


Fig. 26 Operation

Note: About button notation in the manual
In this manual, when button operation is required, it is indicated by a screen icon such as Control . In this case, press the hard button below the icon.

14.1.3 Beeps

A beep sounds when a button is operated or an error occurs. You can change the beep volume with Control screen (p. 71).

The specifications of the beep sound are explained below.

Beep (normal)

A high-pitched beep is played during normal operation as follows

- When the button is pressed
- At the start of communication with Terminal
- When the initial communication with the Terminal is completed
- Resending / Resending is completed

Beep (error)

A low-pitched beep is played when the following problems occur.

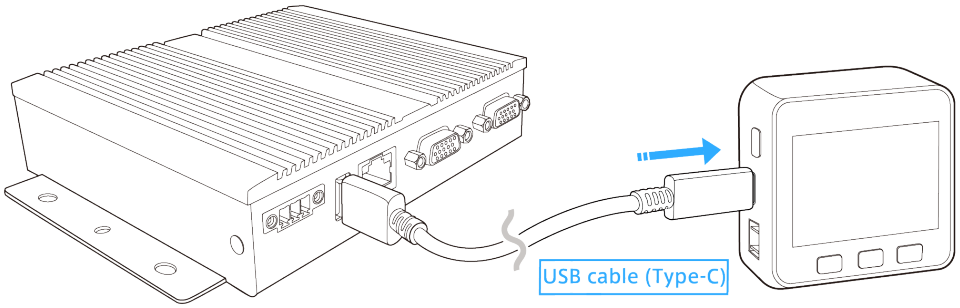
- Communication process with Terminal times out
- Failed to get the status of the Terminal
- Cannot connect to base station with built-in LTE module
- Cannot get IP address while using built-in LTE module
- Terminal System is configured to use the built-in LTE module or a USB-connected LTE adapter, but some other method (e.g., Ethernet) is being used
- Unable to acquire GPS signal
- Unable to connect to server
- Error in connection with server
- Device connector not connected
- Error in connection of device connector
- No data received from camera

14.2 Setup

To use the display device with this software installed, it is necessary to connect to the Terminal with a USB cable and turn on the power of the Terminal.

14.2.1 Connect the display device and Terminal

Connect the display device to Terminal with a USB cable (Type-C).



Attention: Connecting multiple display devices

Do not connect multiple display devices to one Terminal.

14.2.2 Startup

When Terminal starts, the display device starts in conjunction with the power supply from USB.

Note: If the startup screen is not displayed

If the display device does not start, try the following methods.

- Press the reset button (red button) on your display device
- Plug and unplug the USB cable of your display device
- Restart the Terminal

Note: About the startup screen

When Terminal detects a display device, the display device will show the startup screen multiple times. This behavior is normal.

After the display device starts up, it waits for the start of communication with the Terminal.

When communication with the Terminal is started, [Loading Data…] is displayed.

When the initial communication is completed, the Main screen is displayed.

14.2.3 Timeout display

If communication with Terminal System cannot be initiated within 60 seconds after the display device is started, "Connection Timeout" is displayed.

If communication with Terminal is interrupted for 10 seconds after the initial communication is completed, [Connection Lost] will be displayed.

Note: If "Connection Lost" occurs
Unplug and re-plug the USB cable from the display device; Terminal will attempt to restore communication.

14.2.4 Shutdown

When the power of Terminal is turned off by detecting ignition off etc., the display device will also be shut down.

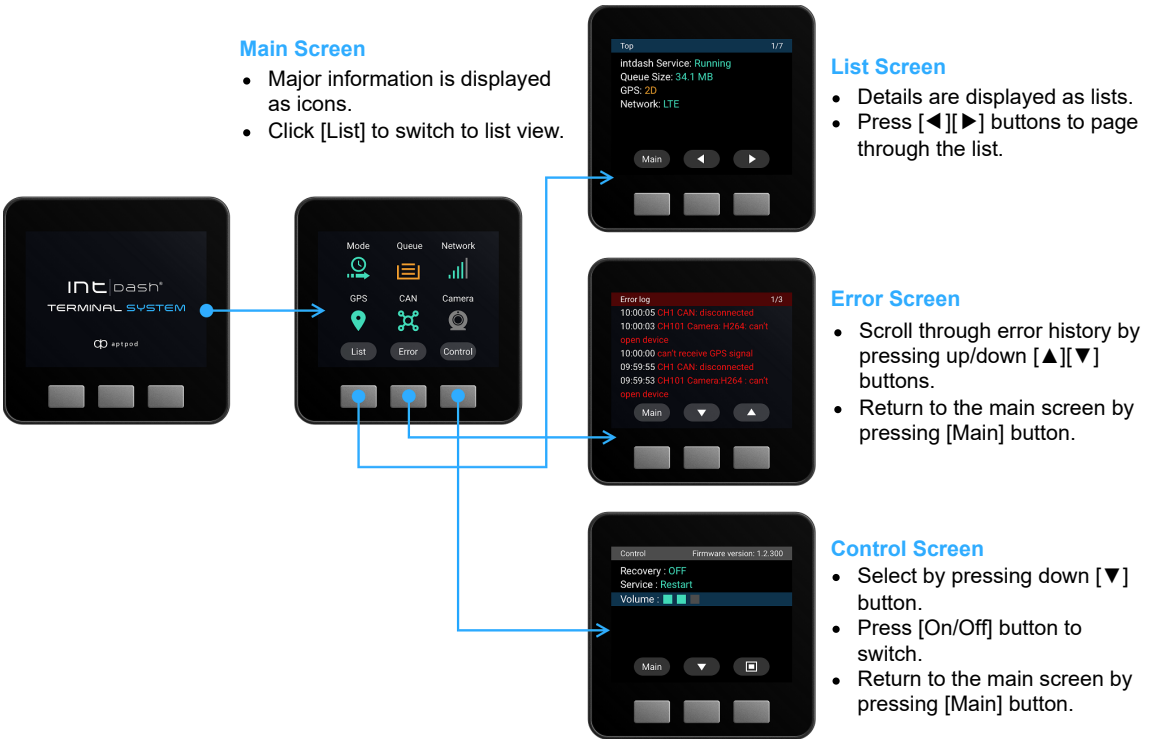
The behavior when the power is turned off is as follows

1. When the shutdown process starts in the Terminal, communication with the display device is stopped. "Connection Lost" is displayed on the display device.
2. When the Terminal is turned off, the display device is also turned off.

Note: How to stop the display device alone
It is not possible to turn off only the display device while it is connected to Terminal. If you want to stop only the display device, unplug the USB cable of the display device.

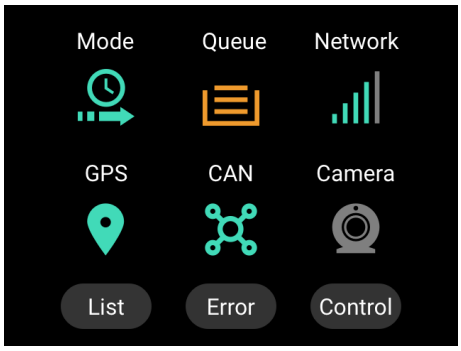
14.3 Screen

The following functions can be set with this software.



14.3.1 Main screen

Displays the operating status of Terminal and measurement devices as icons.



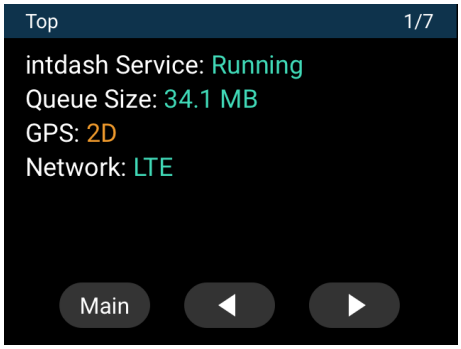
Main screen functions

- Status is displayed.
- You can go to the details pages.

See Main screen (p. 62) for details.

14.3.2 List screen

The detailed operating status of the intdash Service is displayed in text.



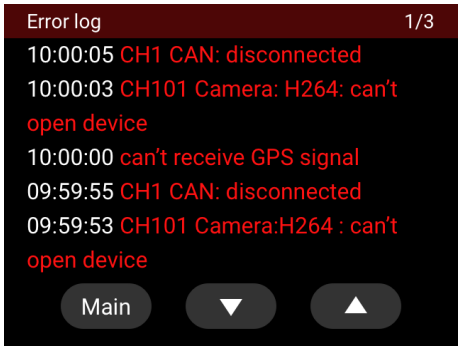
List screen functions

- Displays the measurement status, data size waiting for resending, etc.
- Displays the network connection status
- Displays the status of the connection to the intdash server
- Displays the operating status of measuring devices (Device Connectors)
- Hardware information such as CPU usage

See List screen (p. 66) for more details.

14.3.3 Error screen

Error messages are displayed.



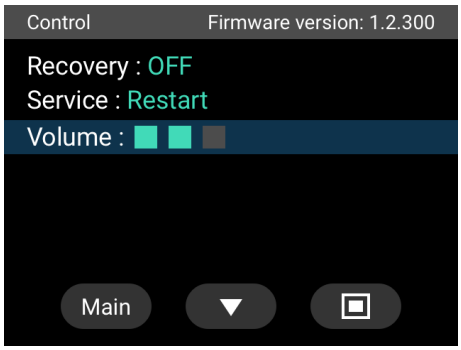
Error screen functions

- Displays error messages

See Error screen (p. 71) for more information.

14.3.4 Control screen

You can start resend mode, set beep volume, etc.



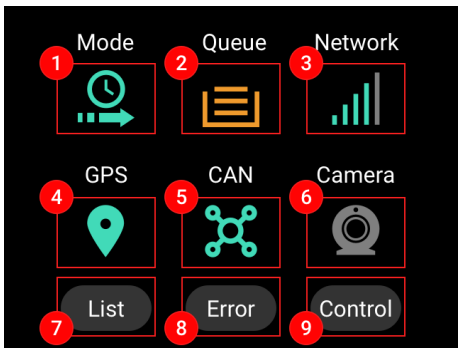
Control screen functions

- Resend mode can be started.
- Restart intdash Service
- Beep volume setting for display device

See Control screen (p. 71) for more information.

14.4 Main screen

You can check the overall operating status of the intdash Terminal System , such as the operating mode of the intdash Service, network, and data logging status, with the icons.



Display	Description
1 [Mode] icon	Indicates the status of the intdash Service
2 [Queue] icon	Indicates the size of data waiting for retransmission to the intdash server
3 [Network] icon	Indicates network status
4 [GPS] icon	Indicates GPS reception status
5 [CAN] Icon	Indicates CAN data reception status
6 [Camera] Icon	Indicates the data reception status of the camera device
7 [List] button	Go to the List screen
8 [Error] button	Go to the Error screen
9 [Control] button	Go to the Control screen

14.4.1 Icons

This section describes the icons that appear on the Main screen.

Mode

The status of the intdash Service is displayed.

Icon	Description
	Measurement process in operation
	Measurement process stopped
	Resend mode in operation
	Resend mode stopped

Note: Blinking resend mode icon
The resend mode icon blinks when all data has been sent in resend mode.

Queue

Displays the size of the data waiting to be retransmitted by the intdash Service.

Icon	Data size waiting to be resent
	0 byte
	1 MB or less
	1 MB or more
	1 GB or more

Network

The network connection status of intdash Service is displayed.

Icon	Description
	Cellular connection
	Ethernet
	Wireless LAN

Note: Icon when the built-in LTE module is used
When a cellular connection with a built-in LTE module is used, the RSSI values are displayed by the number of antennas.

Note: Icon when a USB-connected LTE adapter is used
If a USB-connected LTE adapter is used, one of the following will be displayed; RSSI values are not visible.

(green): USB-connected LTE adapter is used

(gray): Other network interface is used; USB-connected LTE adapter is not used

GPS

The acquisition status of the GPS device connected to Terminal is displayed.

Icon	Description
	Stopped / Disabled
	Connected (3D)
	Connected (2D)
	Signal cannot be acquired

- 3D is the state in which signals from 4 or more satellites are acquired
- 3D is the state in which signals from 3 satellites are acquired

CAN

The connection status of the CAN transceiver connected to the Terminal is displayed.

Icon	Description
	Stopped / Disabled
	Connected (data is being received)
	Connected (data not received)
	Not connected / error

Camera

The status of the Camera connected to the Terminal is displayed.

Icon	Description
	Stopped / Disabled
	Connected (data is being received)
	Connected (data not received)
	Not connected / error

Note: Icon display when using multiple devices
When multiple channels are used for CAN or Camera, if there is even one channel in each device type that is not in the connected (normal) status, the icon will show either no data received (orange) or no connection/error (red).
(e.g.) If one of the three CAN transceivers is not connected, **Not connected (red)** will be displayed.

14.4.2 Button display

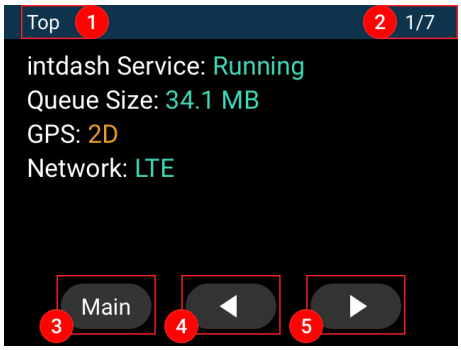
This section describes the buttons that appear on the Main screen.

Button	Description
List	Go to the List screen where you can see the detailed operating status, etc. of the intdash Service. See List screen (p. 66) for details.
Error	Go to the Error screen where simple error messages of the intdash Service are displayed. See Error screen (p. 71) for details.
Control	Go to the Control screen where you can start resend mode and set beep volume and other settings. See Control screen (p. 71) for details.

14.5 List screen

Displays detailed operating status and other information about the intdash Service. The List screen consists of multiple pages.

- Displays the measurement status, data size waiting for resending, etc.
- Displays the network connection status
- Displays the status of the connection to the intdash server
- Displays the operating status of measuring devices (Device Connectors)
- Hardware information such as CPU usage

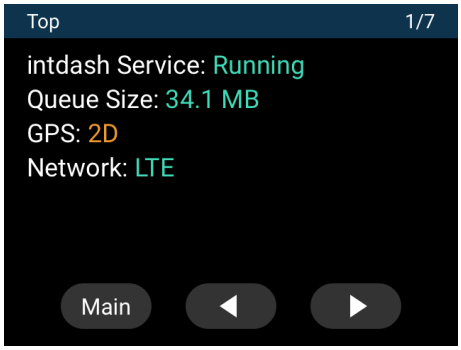


Number	Description
1	Page title
2	Current page / total number of pages
3	Return to Main screen
4	Return to previous page
5	Go to the next page

The following pages are displayed.

- Top (p. 66)
- Network (p. 67)
- intdash Clients (p. 68)
- Logger (Device Connector) (p. 68)
- Hardware Info (p. 70)

14.5.1 Top

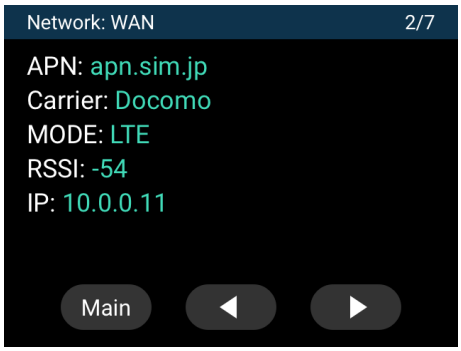


Name	Description
intdash Service	Operating status of intdash Service
Queue Size	Data size waiting to be resent
GPS	GPS acquisition status
Network	Network status of intdash Service

14.5.2 Network

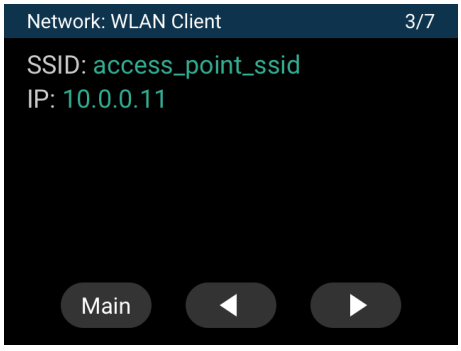
Displays the network status of the intdash Service. Each page is displayed only when the setting is enabled on the Terminal.

WAN



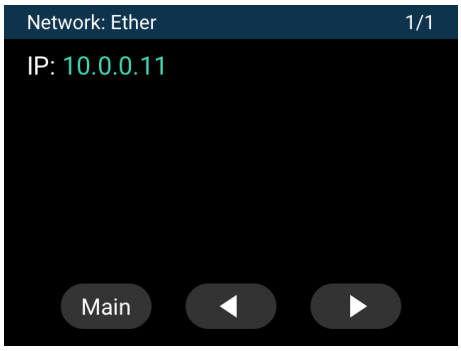
Name	Description
APN (only when using the built-in LTE module)	APN of the connection destination
Carrier (only when using the built-in LTE module)	Name of the carrier being connected
MODE	When the built-in LTE module is used, "LTE" or "WCDMA" is displayed depending on the communication method; when a USB-connected LTE adapter is used, "USB CDC" is displayed.
RSSI (only when using the built-in LTE module)	RSSI value
IP	IP address (when connected to a network)

WLAN Client



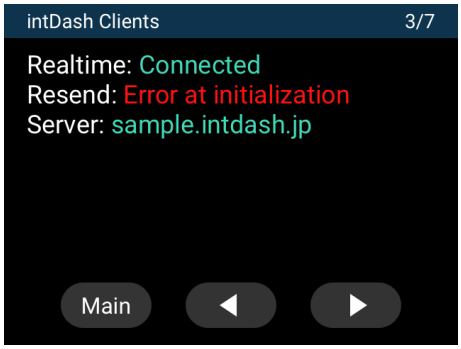
Name	Description
SSID	SSID of access point
IP	IP address (when connected to a network)

Ether



Name	Description
IP	IP address (when connected to a network)

14.5.3 intdash Clients

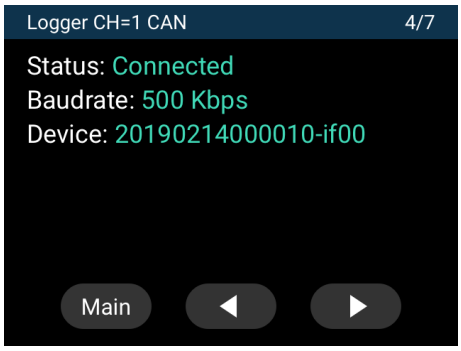


Name	Description	Notes
Realtime	Real-time transmission connection status	Displayed only when set
Resend	Connection status of resending	Displayed only when set
Bulk	Bulk transmission connection status	Displayed only when set
Server	Address of the intdash server	

14.5.4 Logger (Device Connector)

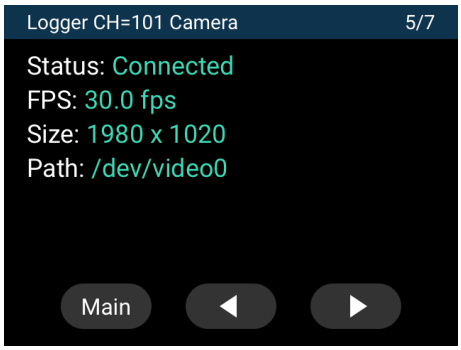
The status and settings of the intdash device connectors are displayed. A page is displayed for each device connector.

CAN



Name	Description	Notes
CH=	Channel	Appears at the top of the page
Status	Transceiver connection status	
Baud rate	CAN bus baud rate	
Device	Serial number and I/F of the connected CAN-USB Interface	

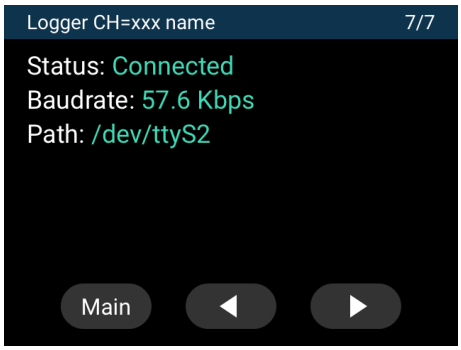
Camera



Name	Description	Notes
CH=	Channel	Appears at the top of the page
Status	Camera device connection status	
FPS	FPS value	
Size	Screen size	
Path	Device file name of the connected device	

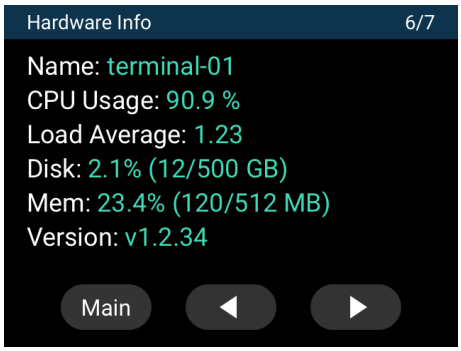
Other Device Connectors

Other Device Connectors (neither CAN nor camera) have the following display.



Name	Description	Notes
CH=	Channel	Appears at the top of the page
Status	Device Connector connection status	
Baud rate	Baud rate	
Path	Device file name of the connected device	

14.5.5 Hardware Info

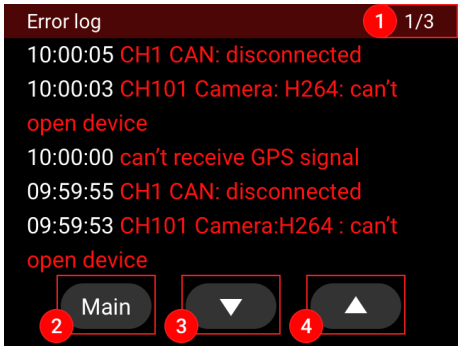


Name	Description
Name	Machine name of Terminal
CPU Usage	CPU usage
Load Average	Load average
Disk	Terminal disk usage
Mem	Terminal memory usage
Version	Software version of intdash Terminal System

Note: How to access terminal settings
You can access the terminal settings by the machine name displayed in Name.
Example `http://<machine_name>.local/`

14.6 Error screen

The Error screen displays simple error messages about the intdash service.



Number	Description	Notes
1	Current page / total number of pages	Page number 1 is the latest.
2	Return to Main screen	
3	Go to older page	
4	Go to newer page	

14.6.1 Error message display

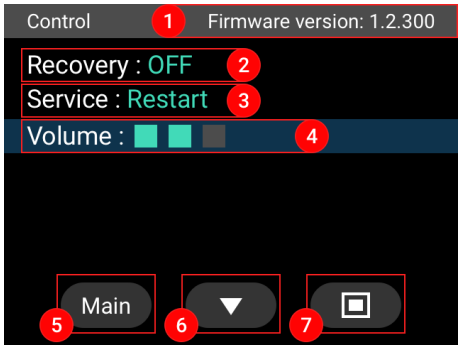
- The latest error message is displayed at the top.
- Error messages are displayed in chronological descending order.
- Timestamp is displayed in JST (UTC+9).
- Error messages disappear when you turn off the display device.

Note: Change timestamps
The time zone of the time stamp can be changed. Please contact us for details.

14.7 Control screen

The following settings can be made on the Control screen.

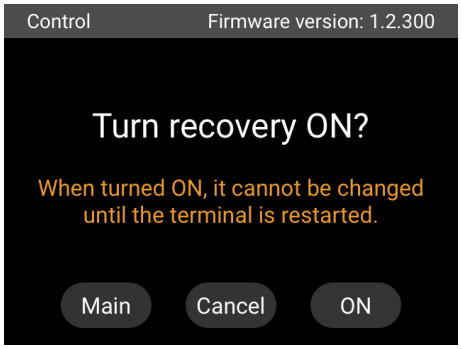
- Start resend mode
- Restart the intdash Service
- Set volume



Num-ber	Description
1	Firmware version
2	Resend mode (Resend mode can be started. (p. 72))
3	Restart the intdash Service (Restart intdash Service (p. 73))
4	Beep volume when a button is pressed or an error occurs (Beep volume setting (p. 73))
5	Return to Main screen
6	Move the cursor
7	Perform the function selected with the cursor

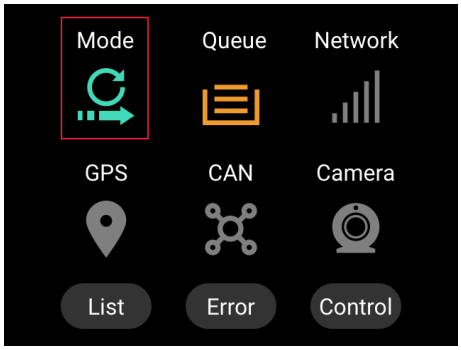
14.7.1 Resend mode can be started.

Select [Recovery : ON]. A confirmation screen will appear.



Press ON to start the resend mode.

When started in resend mode, the Main screen displays (Resend mode in operation).



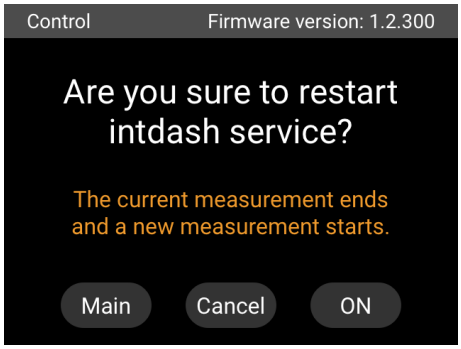
- During retransmission, a short beep sounds periodically.
- When resending is complete, you will hear a long beep at regular intervals and the Mode icon on the Main screen will flash.

Attention: Precautions when starting resend mode

- When you start the resend mode, the running measurement will stop.
- Resend mode does not end until the Terminal is turned off and on again or the intdash Service is restarted (Restart intdash Service (p. 73)).
- To perform the measurement again, restart the intdash Service or turn off the Terminal and then turn it on again (Restart intdash Service (p. 73)).

14.7.2 Restart intdash Service

Select [Service: Restart]. A confirmation screen will appear.

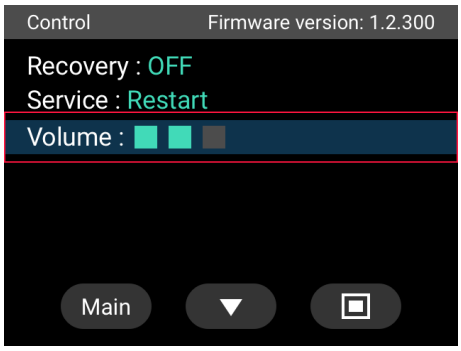


Press ON to restart the intdash Service.

Attention: Precautions when restarting intdash Service

- Restarting the intdash Service will terminate the running measurement (or running re-transmission).
- Terminal will not restart in resend mode. If you want to switch to resend mode, run Re-send mode can be started. (p. 72).

14.7.3 Beep volume setting



Press the select button ⊡ to set the beep volume. The beep volume can be selected from 4 levels (OFF/1/2/3).

14.8 Frequently asked questions about the display device software

The following is a summary of the most frequently asked questions.

14.8.1 Q: The beeping does not stop.

If an error is detected, a beep sound will notify the user. The reasons for the beep are as follows.

- Not connected to the network
- Cannot connect properly to the measurement device
- No data coming from the measuring device
- Others

See Beep (error) (p. 56) for the conditions under which the beep occurs.

The problem is indicated in the message displayed on the error screen (Error screen (p. 71)).

14.8.2 Q: Nothing appears on the screen.

See If the startup screen is not displayed (p. 57).