

OMRON

Fleet Operations Workspace iQ

User's Manual

NOTE

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Introduction

Thank you for purchasing or choosing to evaluate Fleet Operations Workspace iQ (FLOW iQ). This manual is OMRON's original instructions describing the setup, operation, and use of FLOW iQ. This manual contains information that is necessary for safe and proper use of FLOW iQ. Please read this manual and make sure you understand the functionality and performance of FLOW iQ before attempting to use it in a controlled system. Keep this manual in a safe place where it will be available for reference during operation.

Overview

FLOW iQ is an analytical tool that tracks, stores and displays a fleet's operational status and performance using a graphical format. It provides current and historical data to plan and take preemptive actions for fleet optimization purposes.

The FLOW iQ application and associated database are included in the Fleet Operations Workspace Core package. This application runs on the Fleet Manager.

Requirements

FLOW iQ with Wireless Diagnostics requires the installation and proper operation of the following OMRON products:

- Fleet Manager
- Fleet Operations Workspace Core version 4.0 or higher
- SetNetGo 7.1.1 or higher
- MobilePlanner 8.0 or higher

Intended Audience

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

- Personnel in charge of planning Factory Automation systems.
- Personnel in charge of evaluating Factory Automation systems.
- Personnel in charge of introducing Factory Automation systems.
- Personnel in charge of designing Factory Automation systems.
- Personnel in charge of installing and maintaining Factory Automation systems.
- Personnel in charge of managing Factory Automation systems and facilities.

Applicable Products

This manual contains information for the proper use of FLOW iQ. FLOW iQ operates on the Fleet Manager with SetNetGo and MobilePlanner.

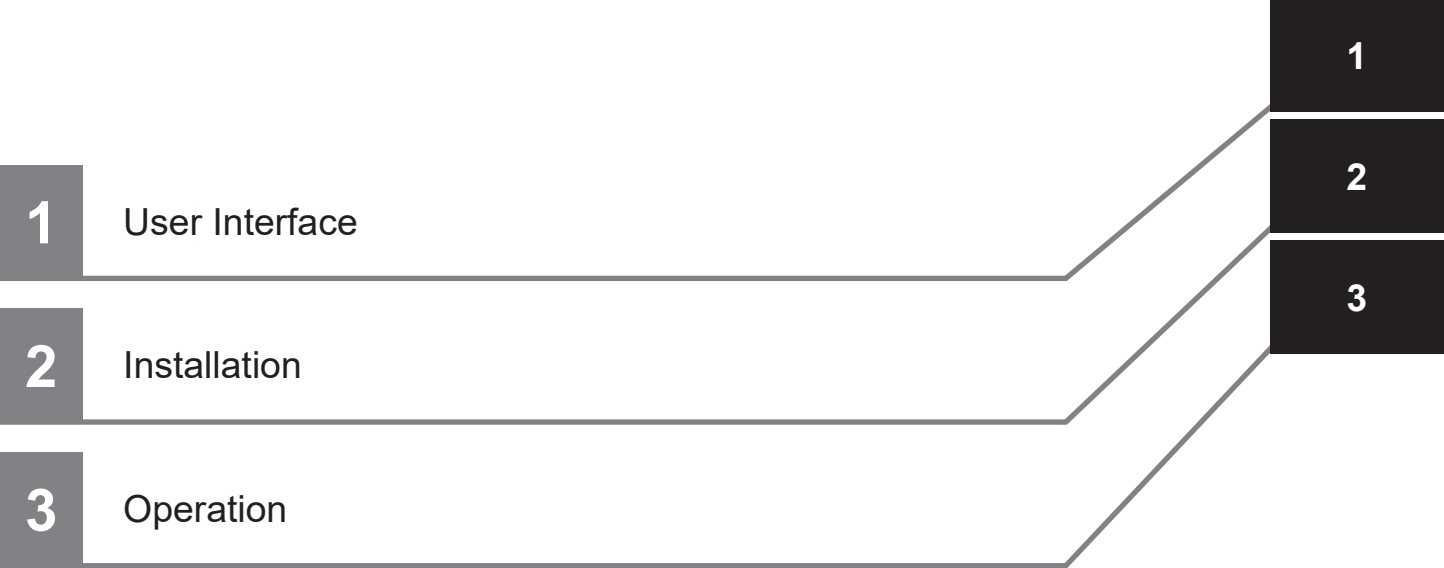
Notation

The following notation types are used in this document.

- [IP] is substituted for application-specific IP addresses.

- The terms AMR and robot are used interchangeably.

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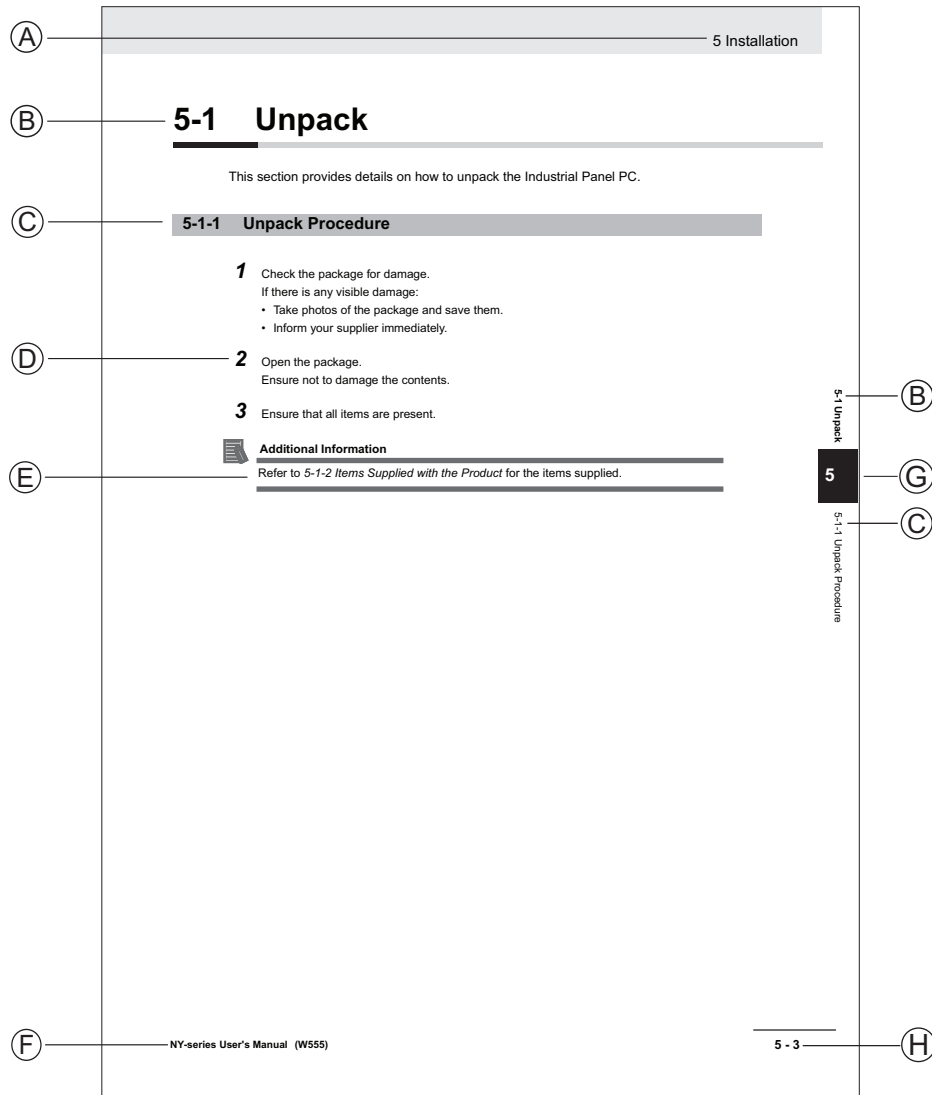
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Manual Information

This section provides information about the contents and structure of this manual.

Page Structure

The following page structure is used in this manual.



Note: This illustration is provided as a sample. It will not literally appear in this manual.

Item	Explanation	Item	Explanation
A	Level 1 heading	E	Special Information
B	Level 2 heading	F	Manual name
C	Level 3 heading	G	Page tab with the number of the main section
D	Step in a procedure	H	Page number

Special Information

Special information in this manual is classified as follows:



Precautions for Safe Use

Precautions on what to do and what not to do to ensure safe usage of the product.



Precautions for Correct Use

Precautions on what to do and what not to do to ensure proper operation and performance.



Additional Information

Additional information to read as required.

This information is provided to increase understanding or make operation easier.



Version Information

Information on differences in specifications and functionality between different versions.

Terms and Conditions Agreement

Warranty and Limitations of Liability

Warranty

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NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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- Omron Companies shall not be responsible for the operation of the user accessible operating system (e.g. Windows, Linux), or any consequence thereof.

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Safety Precautions

Definition of Precautionary Information

The following notation is used in this manual to provide precautions required to ensure safe usage of FLOW iQ. The safety precautions that are provided are extremely important to safety.

Always read and heed the information provided in all safety precautions.

The following notations are used.





 WARNING	<p>Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.</p>
 CAUTION	<p>Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or in property damage.</p>

Symbols

This section shows the safety symbols and alerts used in this manual.

In order to use FLOW iQ safely, the precautions listed in this manual are indicated by alert symbols.

The descriptions associated with these symbols must be followed, failure to follow all precautions and alerts may result in an unsafe installation or operation. The following symbols are used in this manual.

	<p>The circle and slash symbol indicates operations that you must not do. The specific operation is shown in the circle and explained in text. This example indicates prohibiting disassembly.</p>
	<p>The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a precaution for electric shock.</p>
	<p>The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a general precaution.</p>
	<p>The filled circle symbol indicates operations that you must do. The specific operation is shown in the circle and explained in text. This example shows a general precaution for something that you must do.</p>

Warning


WARNING

The Autonomous Mobile Robots (AMRs) monitored by FLOW iQ must be configured to operate with OMRON system operating software.



System and travel status parameters monitored by FLOW iQ are to be used for informational and planning purposes only and must not be used in safety-critical functions.



To maintain the security and reliability of the system, a robust cybersecurity defense program should be implemented, which may include some or all of the following:

Anti-virus protection

- Install the latest commercial-quality anti-virus software on the computer connected to the control system and keep the software and virus definitions up-to-date.
- Scan USB drives or other external storage devices before connecting them to control systems and equipment.

Security measures to prevent unauthorized network access

- Install physical controls so that only authorized personnel can access control systems and equipment.
- Reduce connections to control systems and equipment via networks to prevent access from untrusted devices.
- Install firewalls to block unused communications ports and limit communication between systems. Limit access between control systems and systems from the IT network.
- Control remote access and adopt multifactor authentication to devices with remote access to control systems and equipment.
- Set strong password policies and monitor for compliance frequently.

Data input and output protection

- Backup data and keep the data up-to-date periodically to prepare for data loss.
- Validate backups and retention policies to cope with unintentional modification of input/output data to control systems and equipment.
- Validate the scope of data protection regularly to accommodate changes.
- Check validity of backups by scheduling test restores to ensure successful recovery from incidents.
- Safety design, such as emergency shutdown and fail-soft operations in case of data tampering and incidents.



Additional recommendations

- When using an external network environment to connect to an unauthorized terminal such as a SCADA, HMI or to an unauthorized server may result in network security issues such as spoofing and tampering.
- You must take sufficient measures such as restricting access to the terminal, using a terminal equipped with a secure function, and locking the installation area by yourself.
- When constructing network infrastructure, communication failure may occur due to cable disconnection or the influence of unauthorized network equipment.
- Take adequate measures, such as restricting physical access to network devices, by means such as locking the installation area.
- When using devices equipped with an SD Memory Card, there is a security risk that a third party may acquire, alter, or replace the files and data in the removable media by removing or unmounting the media.
- Please take sufficient measures, such as restricting physical access to the Controller or taking appropriate management measures for removable media, by means of locking and controlling access to the installation area.
- Educate employees to help them identify phishing scams received via email on systems that will connect to the control network.

Cautions

 **CAUTION**

The administrator is responsible for the selection and training of personnel to properly install, operate, and maintain FLOW iQ and the systems that it interfaces with.



The installation of the FLOW iQ application software requires proper configuration with existing OMRON applications. Verify that you have the correct operating permissions before attempting to install and use FLOW iQ.



FLOW iQ is a monitoring program and does not control the fleet of AMRs or any individual AMR.



Precautions for Safe Use

This section identifies the proper precautions for the safe use of FLOW iQ.

Make sure to follow all the safety precautions that are necessary to ensure safe use of the product.

- Thoroughly read this manual and understand the installation, operation checks, and maintenance procedures before using the product.
- Only use this product within the specified conditions and installation methods.
- Always install software and equipment that is included in the product specifications. Not doing so may result in failure or malfunction.
- Comply with all the laws, regulations, and standards of the country/region where the product is used.

Precautions for Correct Use

This section identifies the proper precautions for the correct use of FLOW iQ. Observe the precautions described below to prevent operational failure, malfunctions, or undesirable effects on product performance or fleet historical data.

- The Fleet Manager and associated software must be operating and licensed to use FLOW iQ.
- The user interface representations in this document were captured with a specific browser and version. The appearance may vary slightly from what is shown in this manual.
- The **Reset** Button in the *Fleet Operations Workspace iQ* SetNetGo area is used to reset the application to its default state. Clicking the **Reset** Button removes all configurations, fleet history, and stored data. This resets the application to a default, unconnected state.
- If the Queuing Manager is disabled, FLOW iQ will function normally, but no activity will be provided in the Job History page.
- Data representation in the Robot Status area may not appear accurately after downgrading an existing system from FLOW iQ v3.0. Contact your local OMRON representative for more information.
- The Integration Toolkit should be running with a generated password to utilize all FLOW iQ functions.

Regulations and Standards

FLOW iQ is a software application that operates within the Fleet Operating Workspace CORE software, residing in the Fleet Manager. The application displays data from within the Fleet Operating Workspace CORE software and does not control or alter the performance of the systems.

Software Licenses and Copyrights

This product incorporates certain third party software.

Related Manuals

Use the following related manuals for reference.

Related Product Manuals

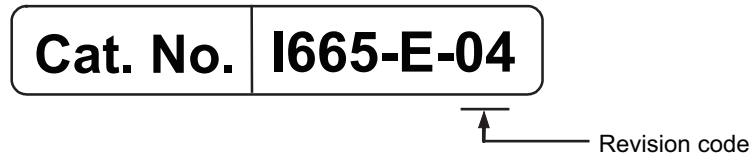
Manual Name	Description
EM2100 Installation Guide (Cat. No. I634)	Describes the installation of the Fleet Manager.
Fleet Operation Workspace Core Integration Toolkit User's Manual (Cat. No. I637)	Integration Toolkit is used to perform integration between the Fleet Manager and the end user's client application.
Fleet Operations Workspace Core User's Manual (Cat. No. I635)	Contains information that is necessary for installing and configuring an AMR fleet management and control system within a facility.
Fleet Simulator User's Manual (Cat. No. I649)	Describes the use of the Fleet Simulator.
HD-1500 Platform User's Manual (Cat. No. I645)	Describes the use of the HD-1500 Mobile Robot.
Mobile Robot LD Safety Guide (Cat. No. I616)	Describes the safety information for the LD mobile robots.
LD Platform Peripherals User's Guide (Cat. No. I613)	Describes the user of the LD Platform Peripheral equipment.
LD-60/90 Platform User's Manual (Cat. No. I611)	Describes the use of the LD Platform Mobile Robot.
LD-250 Platform User's Manual (Cat. No. I642)	Describes the use of the LD-250 Mobile Robot.
HD Mobile Robot Safety Manual (Cat. No. I647)	Describes the safety information for the HD-1500 mobile robots.

Glossary

Term	Definition
Access Point	Physical location of wireless device
AMR	Autonomous Mobile Robot
API	Application Programming Interface
BSSID	Basic Service Set Identifier; the MAC (Media Access Control) physical address of the access point
Fault	Event where there may be an operating error with an AMR
FLOW iQ	Abbreviated name for Fleet Operations Workspace iQ
Map	Graphic showing the particular boundaries and events for an AMR or AMR fleet
Ping	Communication time between the AMR and the Fleet Manager
Roam	An event, where the AMR switches to a different BSSID than the one currently connected to the network
SSID	The Service Set Identifier which is the name of wireless network

Revision History

On the front and back covers of the manual is a manual revision code, shown as a suffix to the catalog number.



Revision code	Date	Revised content
01	May 2021	Initial publication
02	March 2022	Updates for FLOW v2.2
03	December 2022	Updates for FLOW v3.0
04	October 2023	Updates for FLOW v4.0

1

User Interface

This section provides information about the FLOW iQ user interface.

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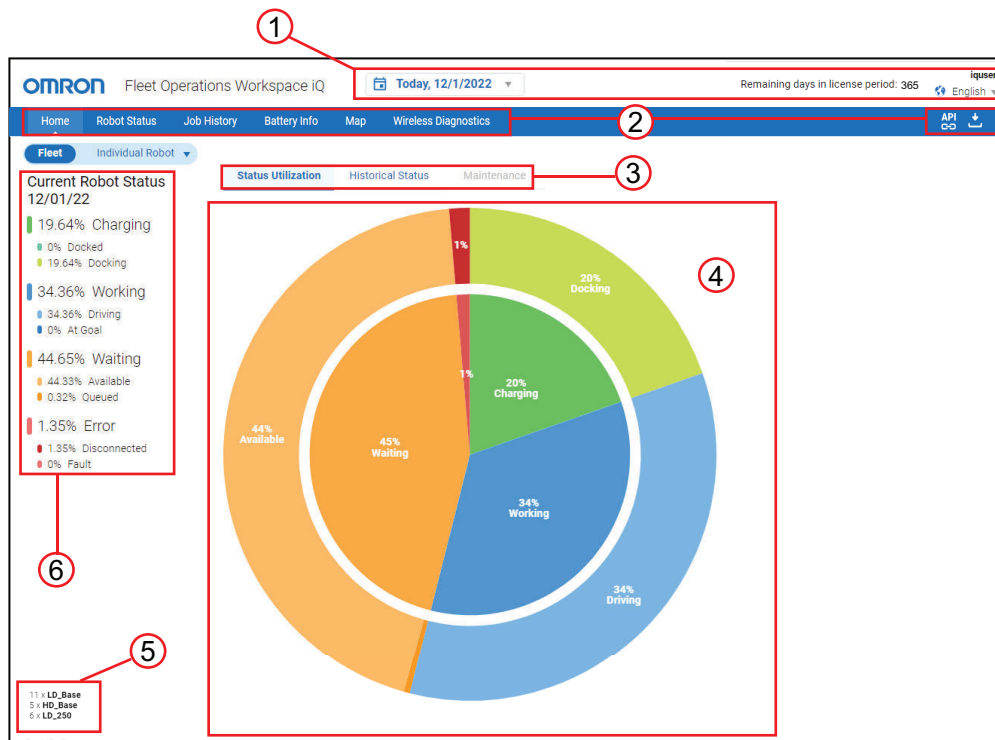
1-1 Interface Structure

The FLOW iQ interface shows the operational information and status of an AMR or AMR fleet, using a combination of graphs, data tables and notifications. The views and presented data are controlled with the Title Bar, Menu Bar and selectable Additional Information within the pages.



Precautions for Correct Use

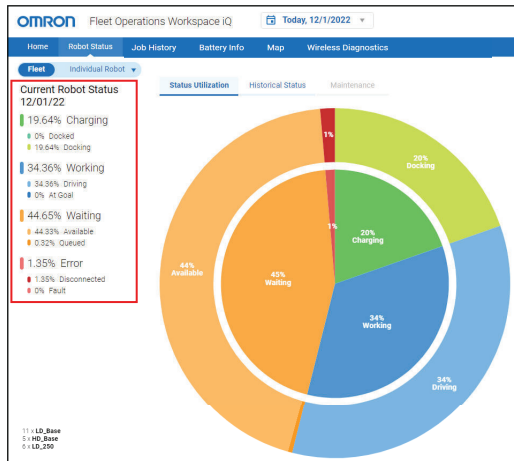
The user interface representations in this document were captured with a specific browser and browser version. The appearance may vary slightly from what is shown in this manual, depending upon the browser that is used.



Item	Name	Description
1	Title Bar	Date/Time setting, License Status, User ID, Language Selection.
2	Menu Bar	Menu functions, API details, Download function.
3	Additional Information	Select for additional information shown in the Information Area.
4	Information Area	Graph or table showing AMR or fleet status.
5	AMR Identification	Number and model of the AMRs in the fleet.
6	Side Bar	Current details of the Information Area data.

1-2 Side Bar

The *Robot Status* Side Bar provides the cumulative status within the current one-hour operating interval for the data displayed in the Information Area. The Side Bar for *Job History* and *Battery Info* displays non-cumulative data at 10 second intervals. Side Bar data displays when either fleet or an individual AMR is selected in Robot Status. The *Robot Status* Side Bar is shown in the following figure.



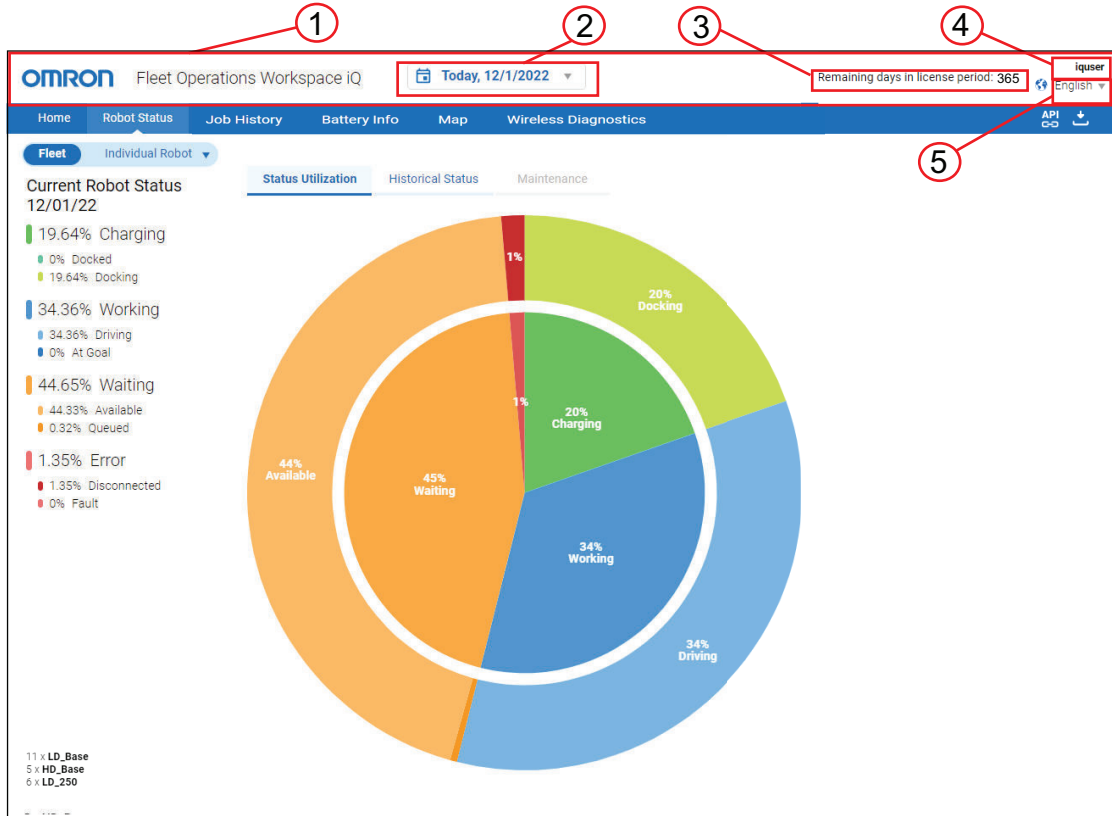
1-3 Information Area

FLOW iQ provides both fleet and AMR operational data in both graphical and tabular format. The primary region of the browser that displays this data is the Information Area, shown in the following figure. The Information Area data is cumulative for the selected Date/Time interval. Refer to *Section 3 Operation* on page 3-1 for more information.



1-4 Title Bar

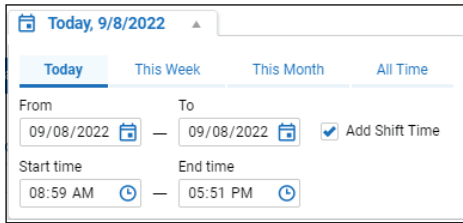
The Title Bar provides the following information.



Item	Description
1	Title Bar
2	Date and Time Selection Refer to 1-4-1 Date/Time on page 1-5 for more information.
3	Remaining days for license Refer to 1-4-4 License on page 1-6 for more information.
4	User Refer to 1-4-3 User on page 1-6 for more information.
5	Language Selection Refer to 1-4-2 Language on page 1-6 for more information.

1-4-1 Date/Time

The Date/Time shows the current day and time on the *Home* page. The Date/Time selection is editable when *Robot Status*, *Job History*, *Battery Info* or *Map* are selected. The options can be for a fixed time interval, such as a week or month, or another user specified interval. The Date/Time selection is a drop-down that may display differently in different browsers. Refer to 3-2-1 *Date/Time Settings* on page 3-3 for more information.



The screenshot shows a date and time selection interface. At the top, it displays "Today, 9/8/2022" with a calendar icon and a dropdown arrow. Below this are four tabs: "Today", "This Week", "This Month", and "All Time". The "Today" tab is selected. Underneath, there are two rows of input fields. The first row is labeled "From" and "To", with the date "09/08/2022" in each field, a minus sign between them, and a calendar icon. To the right of the "To" field is a checked checkbox labeled "Add Shift Time". The second row is labeled "Start time" and "End time", with "08:59 AM" and "05:51 PM" respectively, and a clock icon next to each.

1-4-2 Language

English is the default language for FLOW iQ. The information and graphs can display in 10 languages:

- German
- English
- Spanish
- French
- Italian
- Japanese
- Korean
- Polish

- Traditional Chinese
- Simplified Chinese

Change to a language other than English by left-clicking the arrow under the User name, and making the selection.

1-4-3 User

The name of the logged on user is fixed as *iquser* and is displayed at the top-right corner of the Title Bar.

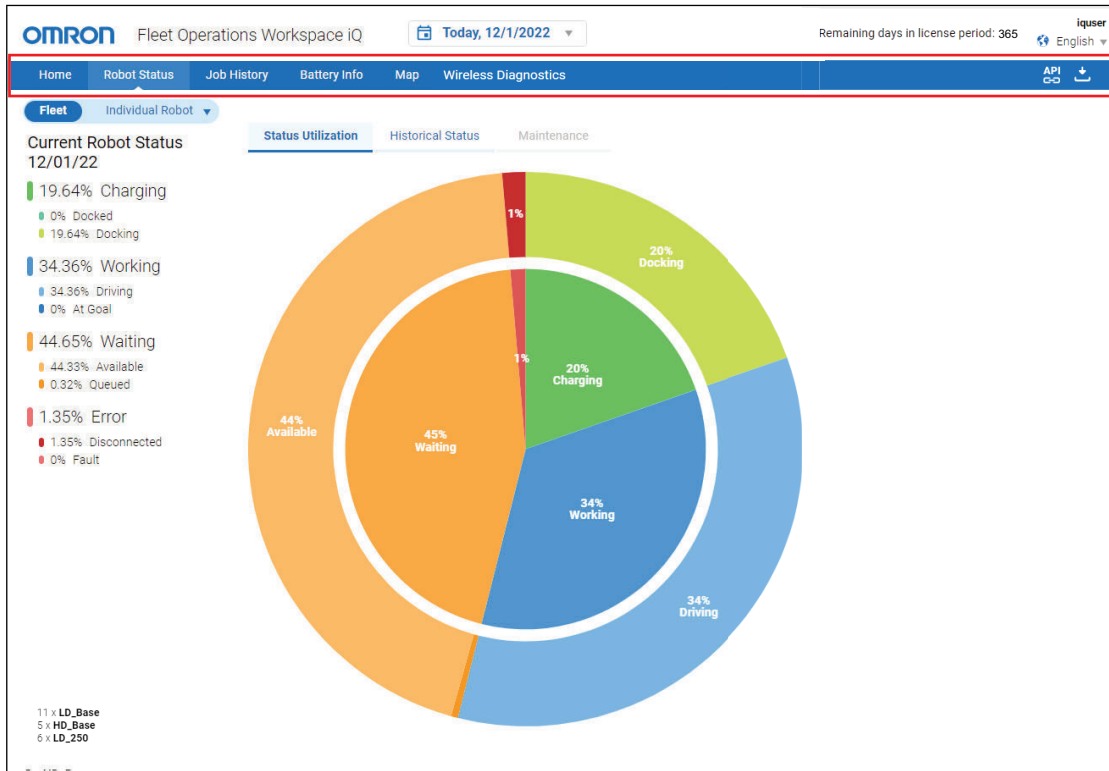
1-4-4 License

The Title Bar displays the available FLOW iQ license period.



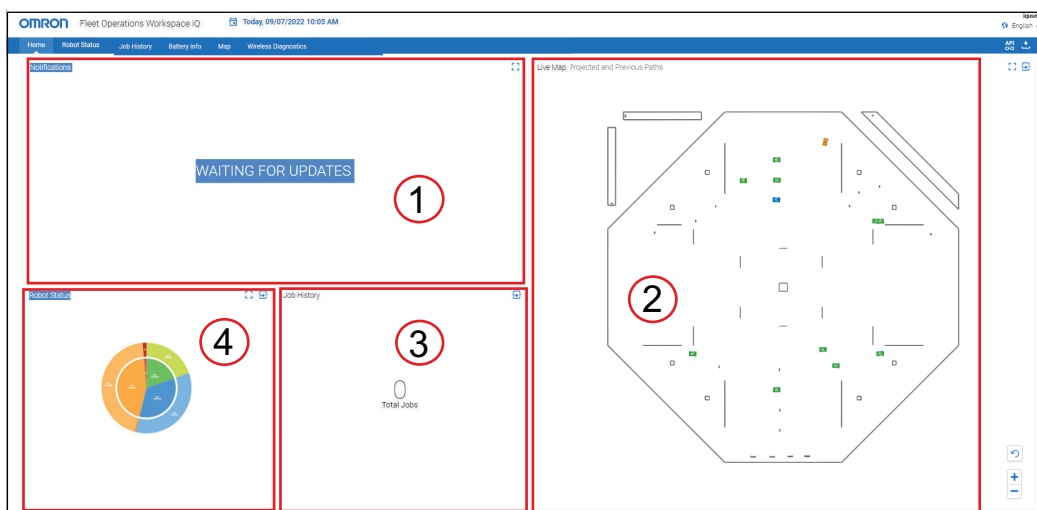
1-5 Menu Bar

The Menu Bar is the primary navigation feature in FLOW IQ. The Menu Bar has six selectable navigation items in addition to the API and Download functions.



1-5-1 Home

When FLOW iQ starts, the *Home* option of the Menu displays a current view of the fleet operation. Refer to 3-3 *Home Functions* on page 3-9 and 3-1 *Accessing FLOW iQ* on page 3-2 for more information.

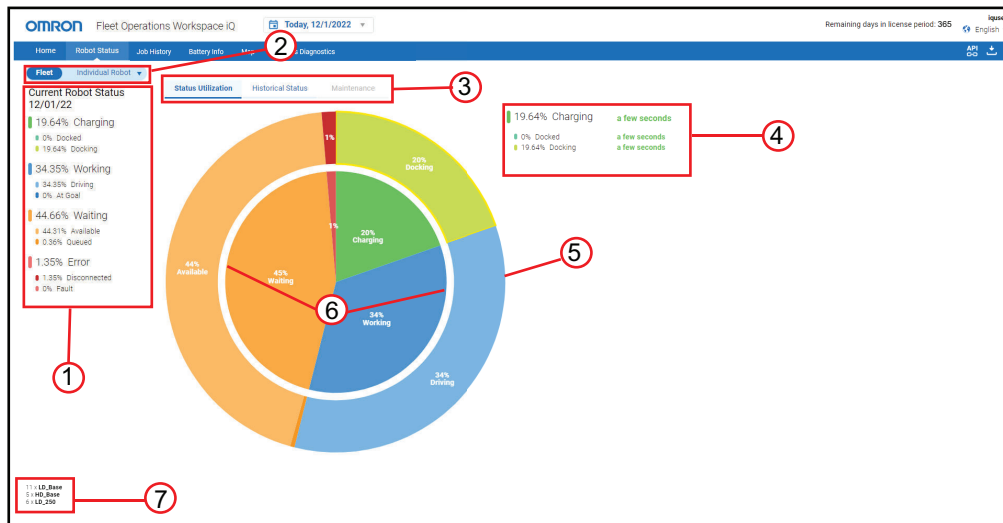


Item	Name	Description
1	Notifications	Completed jobs or errors and faults.

Item	Name	Description
2	Live Map	Fleet operating area containing live information.
3	Job History	Summary of job activity.
4	Robot Status	Graph of AMR fleet operating activity.

1-5-2 Robot Status

Robot Status shows the performance and maintenance state of a fleet or individual AMR. The Information Area contains a dual level, pie chart graph that shows the status for a time interval selected with the Date/Time values. Refer to 3-4 *Robot Status* on page 3-10 for more information.



Item	Name	Description
1	Side Bar	Robot Status, current hour's status. Four major areas of interest: Charging, Working, Waiting and Error.
2	Fleet/AMR Selection	Enables data selection of the AMR fleet or an individual AMR.
3	Status Selection	Three options display the cumulative status as: a pie chart, bar graph or maintenance record (for individual robots) during the selected time interval.
4	Status Detail	Displays the details of the selected status from the pie chart.
5	Substatus	Provides cumulative substatus information about docking, docked, driving, at-goal, available, queued, disconnected, emergency stop, and fault states. This area provides additional details for the main status area.
6	Main Status	Provides cumulative status information about charging, working, waiting, and error states.
7	AMR Identification	Number and model of fleet AMRs.

The *Historical Status* displays the same *Status Utilization* data, but as a line graph for the selected time interval.

The *Maintenance* Tab shows the operating records and software versions for a selected AMR.

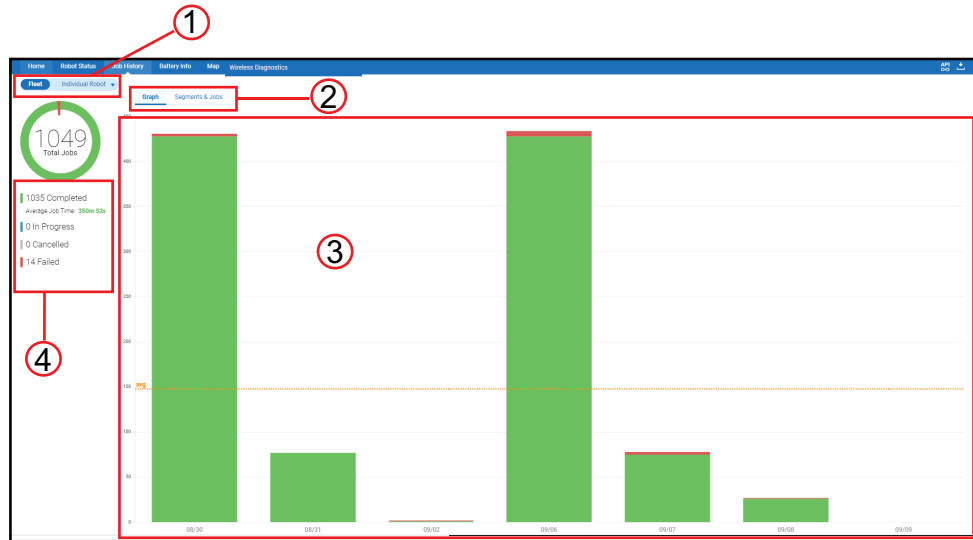
1-5-3 Job History

Job History shows the work performance of a fleet or individual AMR. The Information Area bar graph shows the job results, for the selected time interval.

The bars of the graph show the cumulative job activity for the time interval identified along the bottom of the graph. The colors correspond to the job status shown on the Side Bar.

- Green: Completed
- Blue: In-progress
- Gray: Canceled jobs
- Red: Failed jobs.

Refer to 3-5 *Job History* on page 3-12 for more information.



Item	Name	Description
1	Fleet/AMR Selection	Enables selection of the AMR fleet or an individual AMR.
2	Graph/Segments & Jobs	Selector for the type of data presented, chart or tabular.
3	Information Area	Graph or table presentation in this section.
4	Side Bar	Cumulative status of the jobs over the defined time interval.

The *Segments & Jobs* Tab for the *Fleet* shows the data in a table format with three areas of interest: *Most Used Segments*, *Most Failed Jobs*, and *Most Failed Robots*.

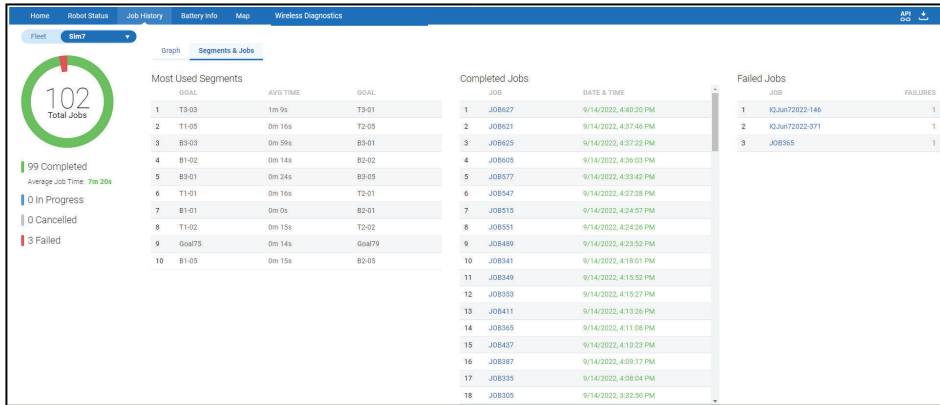
The screenshot shows the 'Segments & Jobs' tab for a fleet. On the left, there is a 'Side Bar' with a circular gauge showing '972 Total Jobs' and job statistics: 958 Completed, 0 In Progress, 0 Cancelled, and 14 Failed. The main area contains three tables:

Most Used Segments			
	SEGAL	AJVS TIME	ROAL
1	T1-02	0m 18s	T2-02
2	T3-02	0m 48s	T3-04
3	T1-05	0m 18s	T2-05
4	T1-01	0m 18s	T2-01
5	B1-01	0m 0s	B2-01
6	T3-04	0m 43s	T3-02
7	T3-01	0m 51s	T3-05
8	T3-03	1m 9s	T3-01
9	T1-03	0m 1s	T2-03
10	T3-05	1m 31s	T3-01

Most Failed Jobs		
	JOB	FAIL
1	JOB401	585
2	JOB66	45
3	IQJun72022-17	1
4	IQJun72022-371	1
5	IQJun72022-999	1
6	IQJun72022-997	1
7	IQJun72022-403	1
8	IQJun72022-146	1
9	JOB42	1
10	JOB365	1

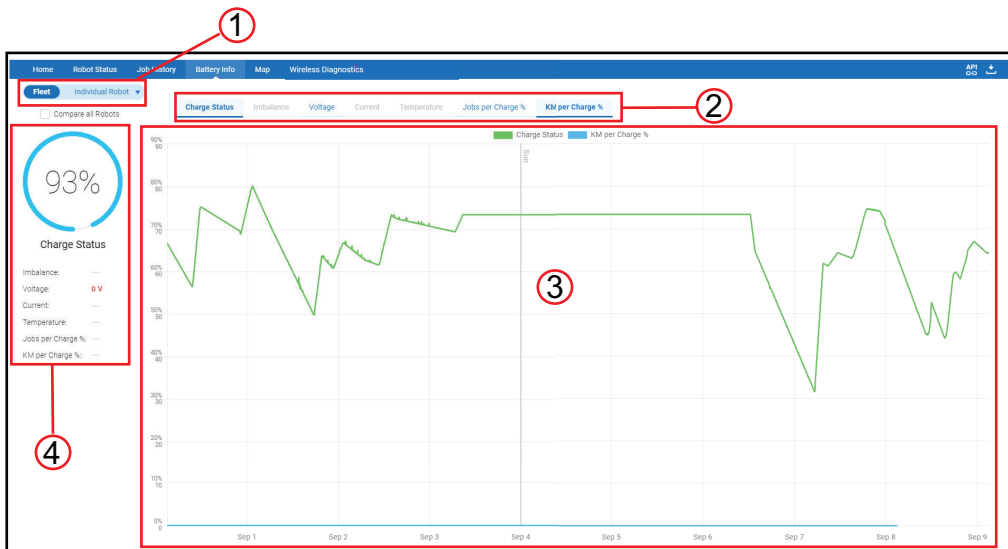
Most Failed Robots			
	ROBOT	FAIL	
1	Sim19	585	
2	Sim14	45	
3	Sim13	3	
4	Sim7	3	
5	Sim8	2	
6	Sim10	2	
7	Sim11	1	

The *Segments & Jobs* Tab for an individual AMR shows the data in a table format with three areas of interest: *Most Used Segments*, *Completed Jobs*, and *Failed Jobs*.



1-5-4 Battery Info

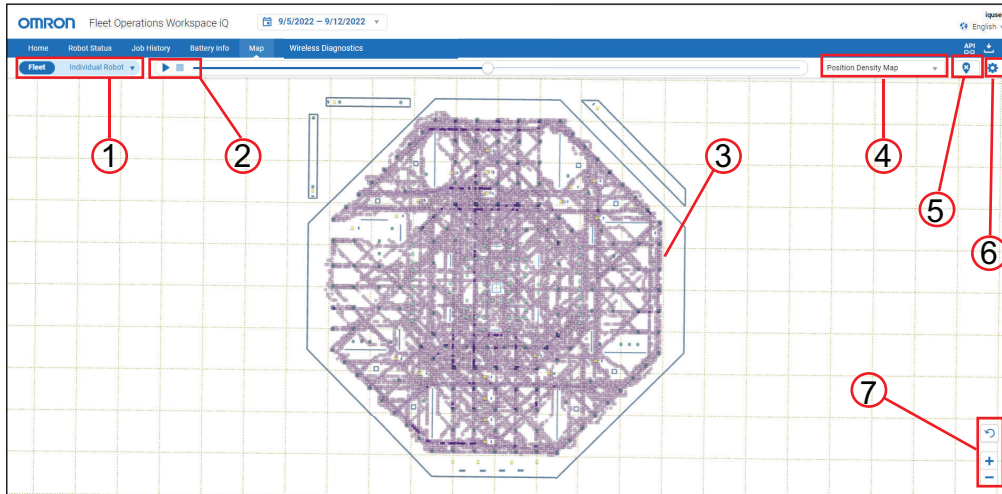
Battery Info shows the battery and power performance of a fleet or individual AMR. The Information Area line graph shows the cumulative battery and AMR performance, for the selected time interval. Refer to 3-6 *Battery Info* on page 3-14 for more information.



Item	Name	Description
1	Fleet/AMR Selection	Enables selection of the AMR fleet or an individual AMR.
2	Performance Details	Selectable tabs that display the performance of AMR and battery parameters graphically.
3	Information Area	Shows cumulative, battery power or performance over a selected time interval.
4	Side Bar	Current status of the Battery Performance Details in both numeric and qualitative values (if known) are shown.

1-5-5 Map

The *Map* is a graphical representation of the operating area for the AMR fleet. Limiting boundaries and obstacles are shown with the cumulative paths of the operating AMRs. Refer to 3-7 *Map* on page 3-15 for more information.



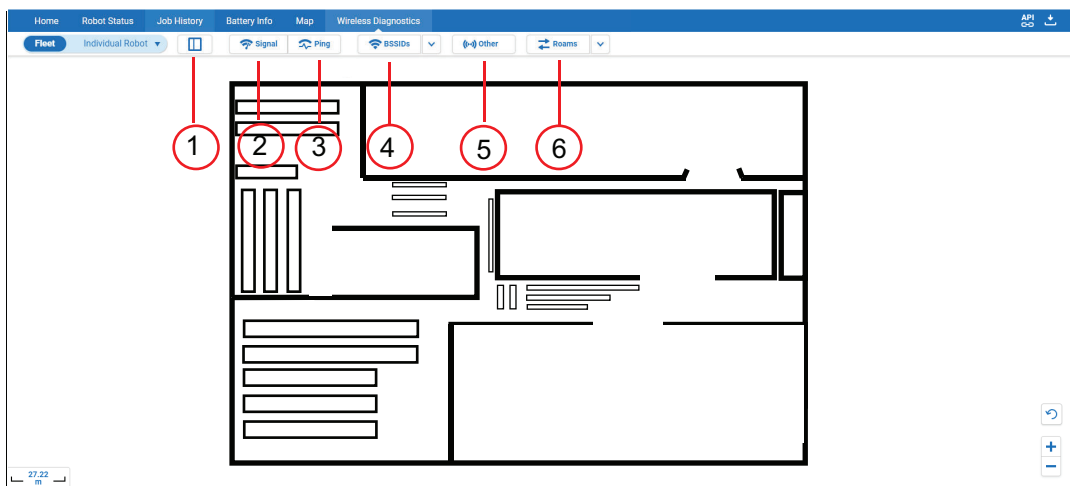
Item	Name	Description
1	Fleet/AMR selection	Enables selection of the AMR fleet or an individual AMR.
2	Time Progression	Displays cumulative operation for the defined time interval.
3	Information Area	The physical and operating boundary for AMRs.
4	Map Selection	Displays specific maps from a selection of four options.
5	Fault Selection	Toggle to identify selectable faults and selected AMR categories.
6	Map Settings	Optional selections to display data.
7	Display Controls	Zoom, view and reset controls for the map view.

The Map Selection drop-down has four data display options:

- *Position Density Map*: Displays frequency an AMR passed through a grid location.
- *Localization Map*: Shows the cumulative localization score reported by the AMR.
- *Wireless Quality Map*: Displays the Wireless signal strength for the AMR travel points.
- *Floor Map*: Displays the boundary of fleet operations and obstacles.

1-5-6 Wireless Diagnostics

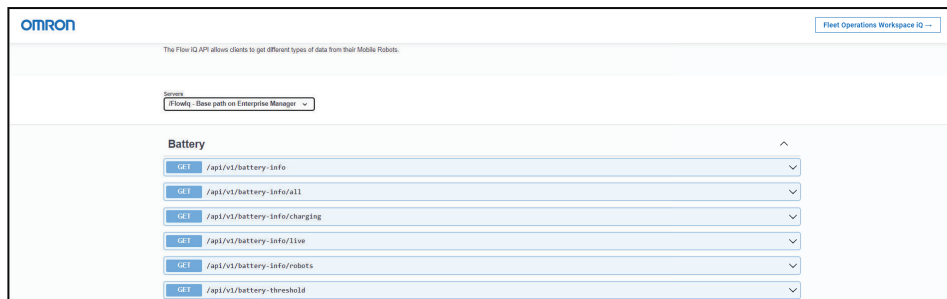
Flow 4.0 is expanded to include a more detailed analysis of an AMR Fleet's wireless status to improve wireless performance. Wireless Diagnostics shows the AMRs interactions with access points, roaming, signal strength, and channel interference. Refer to 3-8 *Wireless Diagnostics* on page 3-17 for more information.




Item	Name	Description
1	Show/Hide panel	Opens side panel for an overview of all connected and detected but not connected networks.
2	Signal	Shows the signal level in dbm for map.
3	Ping	Displays time interval between the AMRs and Fleet Manager.
4	BSSIDs	Identifies a physical access point locations where AMRs have the ability to connect.
5	Other	Displays additional networks that are not connected to the selected AMR.
6	Roams	Identifies BSSID switching regions.

1-5-7 API and Download

The FLOW iQ API shows the current operating API parameters. Refer to *3-9-1 API Operation* on page 3-22 for more information.



The **Download** Icon () saves the Information Area in either of three formats: pdf, png or jpg. Refer to *3-9-2 Download* on page 3-24 for more information.



Installation

This section provides information about the installation of FLOW iQ.

2-1	Installation Steps	2-2
2-2	Version Conflicts	2-4
2-3	Restore Default Settings	2-5
2-4	Licensing	2-7
2-4-1	License Details	2-7
2-4-2	License Installation	2-7

2-1 Installation Steps

FLOW iQ is included in FLOW Core v2.2 and above. Use the following procedure if FLOW iQ is not included in your version of FLOW Core or when FLOW iQ needs to be upgraded.

Upgrading FLOW Core can impact AMR operations and functionality. Refer to the *Fleet Operations Workspace Core User's Manual (Cat. No. I635)* or contact your local OMRON representative for more information.

CAUTION

- The installation of the FLOW iQ application software requires proper configuration with existing OMRON applications. Verify that you have the correct operating permissions before attempting to install and use FLOW iQ
- The administrator is responsible for the selection and training of personnel to properly install, operate, and maintain FLOW iQ and the systems that it interfaces with.



Precautions for Safe Use

Only use this product within the specified conditions and installation methods.

- Always install software and equipment that is included in the product specifications. Not doing so may result in failure or malfunction.
- Comply with all the laws, regulations, and standards of the country/region where the product is used.



Precautions for Correct Use

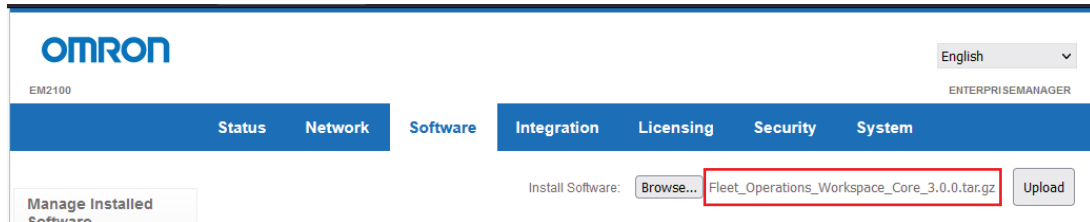
The Integration Toolkit should be running with a generated password to utilize all FLOW iQ functions.

- 1 Open a browser and enter the Fleet Manager IP in the address field to access SetNetGo.

- 2 Access the **Software** area in SetNetGo and then select **Manage Installed Software**.

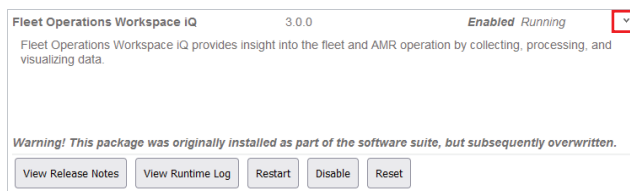
3 Click the **Browse** Button, navigate to the `Fleet_Operations_Workspace_Core_X.X.X.tar.gz` file, and select it (X.X.X represents the version of the FLOW Core package).

4 Click the **Open** Button and then confirm that the correct file is displayed in SetNetGo.

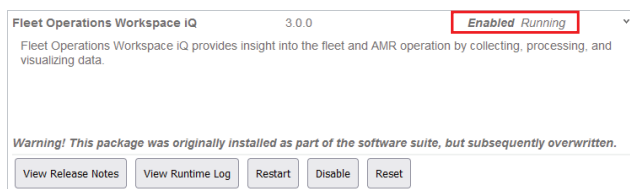


5 Click the **Upload** Button to begin the FLOW Core installation process.

6 After the installation process is complete, expand the Fleet Operations Workspace iQ item in the *Manage Installed Software* area.



7 Confirm that the FLOW iQ application is running.



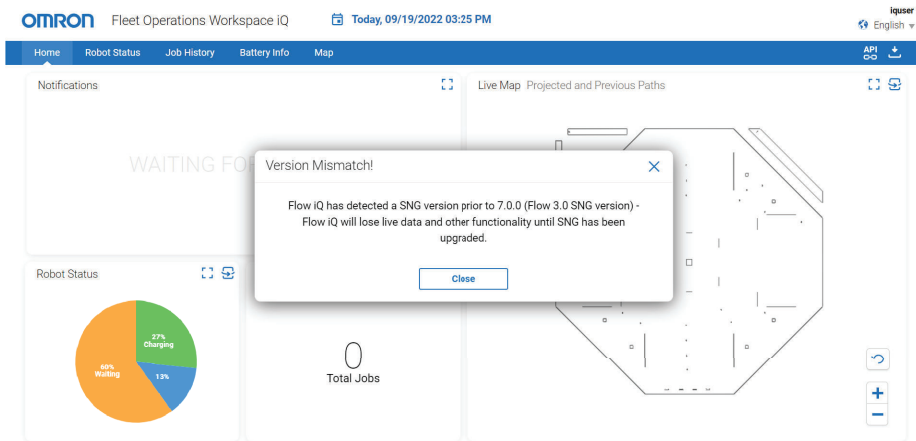
If FLOW iQ is not running, click the **Restart** Button in the *Fleet Operations Workspace iQ* area. Correct FLOW iQ operation is dependent on the Integration Toolkit.


If FLOW iQ is not running after restarting, check the status of the Integration Toolkit. If the Integration Toolkit is not running, click the **Restart** Button. After the Integration Toolkit has restarted and is running, click the **Restart** Button in the *Fleet Operations Workspace iQ* area again.

8 A new password must be generated for FLOW iQ. The Integration Toolkit password must be generated prior to attempting to generate the FLOW iQ password. If the Integration Toolkit password has not been generated, access the *SetNetGo > Security > Integration Toolkit* area and click the **Generate New Password** Button before generating a password for FLOW iQ. To generate a new password for FLOW iQ, click the **Generate New Password** Button in *SetNetGo > Security > FLOW iQ* and save this system generated password. The installation process is complete after the new password is generated.

2-2 Version Conflicts

An error message will be displayed when starting FLOW iQ if there is a version conflict.



When the pop-up is closed the  icon displays on the top right of FLOW iQ. To use the Wireless Diagnostic feature, the Flow4.0 package must be uploaded to each AMR in the fleet. Refer to *Requirements* on page 1 or contact your local OMRON representative for more information about version conflicts.

2-3 Restore Default Settings

The following procedure describes how to restore FLOW iQ to factory default settings.



Precautions for Correct Use

The **Reset** Button in the Fleet Operations Workspace iQ SetNetGo area is used to reset the application to its default state. Clicking the **Reset** Button removes all configurations, fleet history, and stored data. This resets the application to a default, unconnected state.

- 1 Open a browser and enter the Fleet Manager IP in the address field to access SetNetGo.

The screenshot shows the OMRON SetNetGo web interface. The top navigation bar includes Status, Network, Software, Integration, Licensing, Security, and System. The 'Software' tab is selected. The main content area displays system information for a device (EM2100). A small image of the device is shown on the left. On the right, the following status is displayed:

Mode of Operation:	Standalone Fleet Manager
Maintenance Ethernet:	Disconnected
Management Interface:	Connected
Management Interface IP:	10.151.26.180
Fleet IP:	10.151.26.181
System Uptime:	22 hours 47 min

Buttons for 'Download debug info' and 'Refresh' are visible in the top right. The footer contains the text: 'SETNETGO-ENTERPRISEMANAGER-5.4.1-MASTER-F536D86' and 'COPYRIGHT 2005-2020 OMRON ROBOTICS AND SAFETY TECHNOLOGIES, INC.'

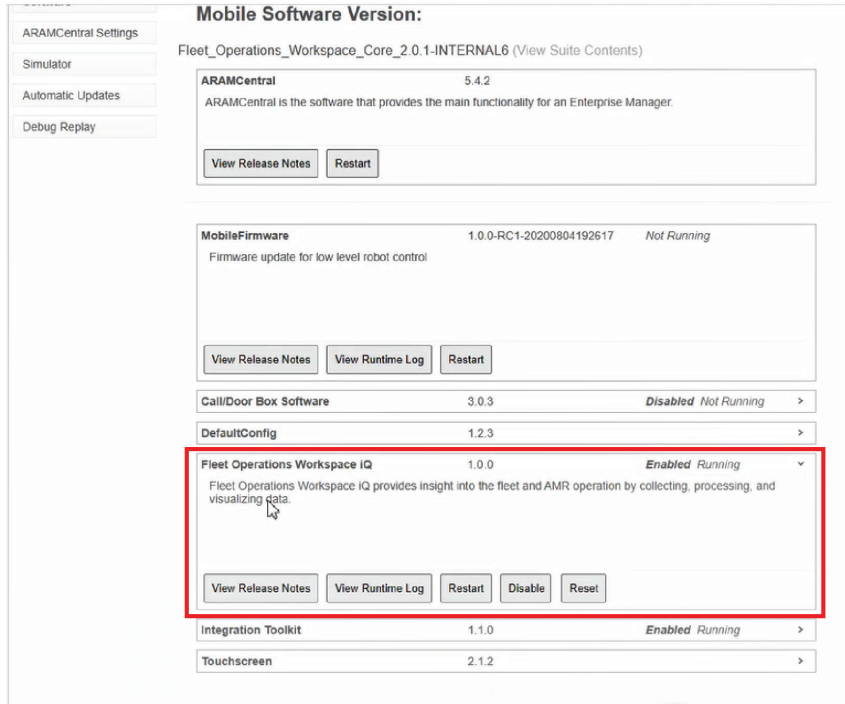
- 2 Access the **Software** area as shown below.

The screenshot shows the OMRON SetNetGo web interface with the 'Software' tab selected in the navigation bar. The page displays software management options. At the top, there is an 'Install Software' section with a 'Choose File' button and 'No file chosen' text, and an 'Upload' button. Below this, the 'Mobile Software Version:' section is shown, listing the following software and their versions:

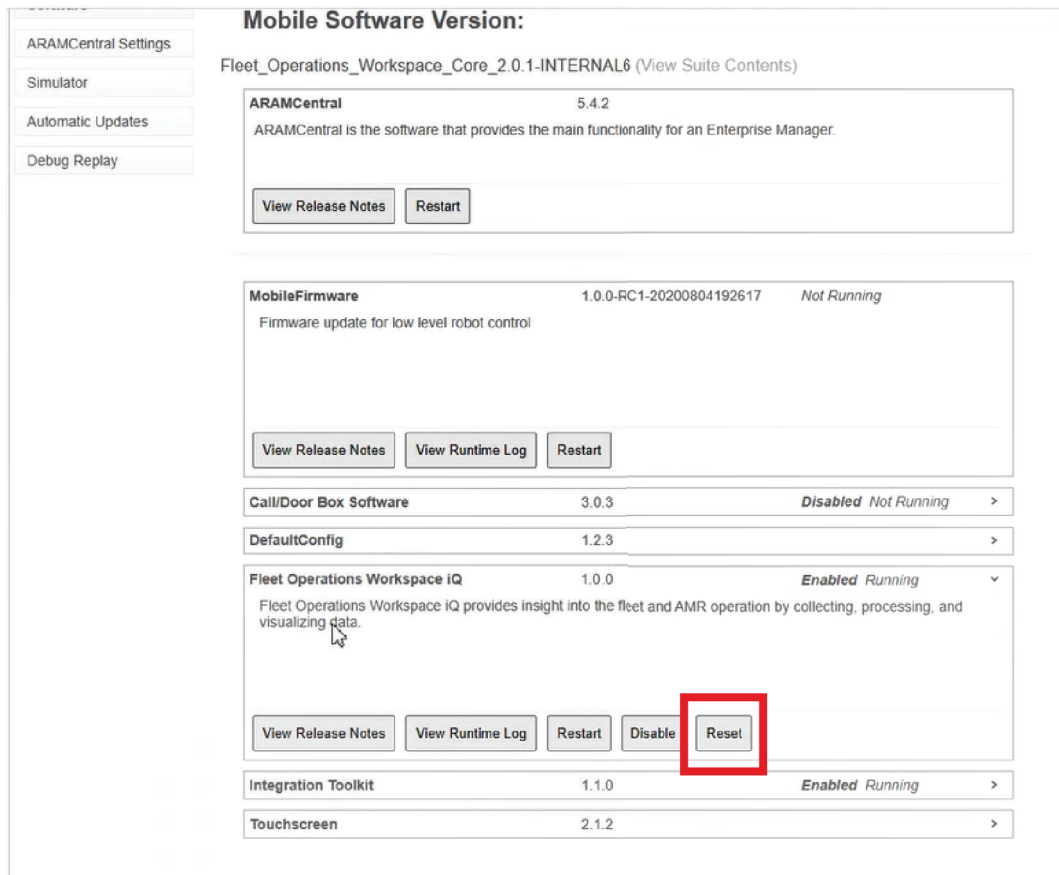
Mobile Software Version:	Fleet_Operations_Workspace_Core_2.0.1
ARAMCentral	5.4.2
ARAMCentral is the software that provides the main functionality for an Enterprise Manager.	
MobileFirmware	1.0.0-RC1-20200804192617 <i>Not Running</i>
Firmware update for low level robot control	
Call/Door Box Software	3.0.3 <i>Disabled Not Running</i>
DefaultConfig	1.2.3

Buttons for 'View Release Notes' and 'Restart' are provided for each software entry.

- 3 In the *Manage Installed Software* area, expand the Fleet Operations Workspace iQ area as shown below.



- 4 Click the **Reset** Button in the *Fleet Operations Workspace iQ* area.



After clicking the **Reset** Button, this procedure is complete, resetting both FLOW iQ and the database.

2-4 Licensing

FLOW iQ software access requires a valid, time-based license unless the Fleet Manager is in Fleet Simulator mode. If the license expires, access to the FLOW iQ software is prohibited but FLOW iQ continues to record data.

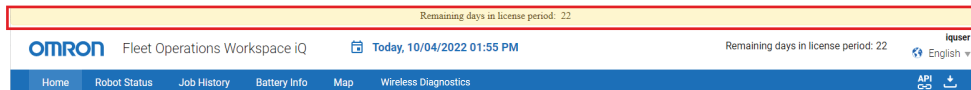
For versions of FLOW iQ after v2.0, FLOW iQ licenses must be purchased.

2-4-1 License Details

The Title Bar displays the remaining time for the FLOW iQ license once it is properly activated. This information displays on the right-side of the Title Bar.



When the license is at or under the 30 day remaining limit, a warning displays above the Title Bar, showing the remaining days for the license.



Contact your Omron representative for license information when this warning is displayed.



Precautions for Correct Use

The Fleet Manager and associated software must be operating and licensed to use FLOW iQ.

2-4-2 License Installation

The FLOW iQ license installation is accomplished using SetNetGo. The procedure is similar to other FLOW license installations. Refer to the *Fleet Operations Workspace Core User's Manual (Cat. No. I635)* for more information.

If FLOW iQ was not licensed and functional prior to the installation, it should be manually restarted to immediately activate a new license. If FLOW iQ is not restarted, it will automatically activate within 24 hours.

3

Operation

This section provides information about FLOW iQ operation.

3-1	Accessing FLOW iQ	3-2
3-2	Common Operations	3-3
3-2-1	Date/Time Settings	3-3
3-2-2	Map View Controls	3-4
3-3	Home Functions	3-9
3-4	Robot Status	3-10
3-4-1	Fleet Status	3-10
3-4-2	Individual Robot Status	3-11
3-5	Job History	3-12
3-5-1	Job History Graph	3-12
3-5-2	Job History Segments & Jobs	3-12
3-6	Battery Info	3-14
3-6-1	Battery Info Graphs	3-14
3-7	Map	3-15
3-7-1	Position Density Map	3-15
3-7-2	Localization Map	3-15
3-7-3	Wireless Quality Map	3-16
3-7-4	Floor Map	3-16
3-8	Wireless Diagnostics	3-17
3-8-1	Signal	3-17
3-8-2	Ping	3-18
3-8-3	BSSID.....	3-18
3-8-4	Other	3-19
3-8-5	Roams	3-20
3-9	API and Download	3-22
3-9-1	API Operation	3-22
3-9-2	Download	3-24

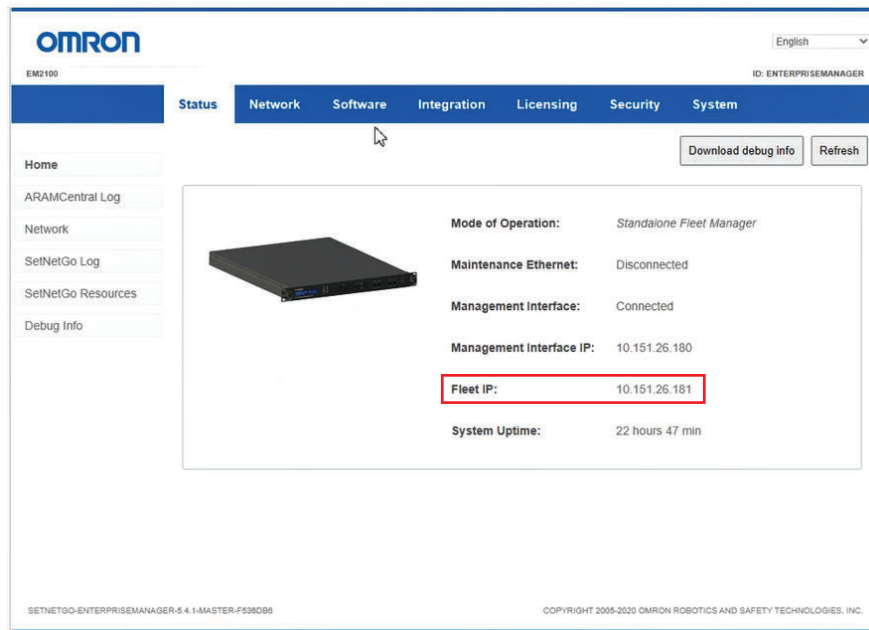
3-1 Accessing FLOW iQ

The FLOW iQ interface can be accessed with a web browser using the following URL.

https://[IP]/FlowIq

IP represents the SetNetGo Fleet IP address found in the area shown below.

The Username is "iquser". Use the password that was generated in SetNetGo (refer to *2-1 Installation Steps* on page 2-2 for more information).



The screenshot displays the OMRON FLOW iQ web interface. The top navigation bar includes tabs for Status, Network, Software, Integration, Licensing, Security, and System. The 'Network' tab is selected. The main content area shows system status information for a device (EM2100). A red box highlights the 'Fleet IP' field, which is set to 10.151.26.181. Other status information includes Mode of Operation (Standalone Fleet Manager), Maintenance Ethernet (Disconnected), Management Interface (Connected), Management Interface IP (10.151.26.180), and System Uptime (22 hours 47 min).

Mode of Operation:	Standalone Fleet Manager
Maintenance Ethernet:	Disconnected
Management Interface:	Connected
Management Interface IP:	10.151.26.180
Fleet IP:	10.151.26.181
System Uptime:	22 hours 47 min



Precautions for Correct Use

The Integration Toolkit should be running with a generated password to utilize all FLOW iQ functions.

3-2 Common Operations

This section provides information to use operations common to all functions of FLOW iQ.

WARNING

- System and travel status parameters monitored by FLOW iQ are to be used for informational and planning purposes only and must not be used in safety-critical functions.
- The Autonomous Mobile Robots (AMRs) monitored by FLOW iQ must be configured to operate with OMRON system operating software.



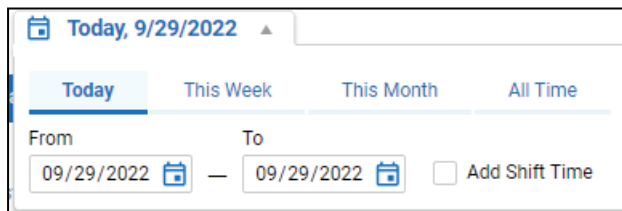
3-2-1 Date/Time Settings

Change the time interval for the FLOW iQ displayed data using the following procedures.

Calendar Settings

Use the following procedure to define a time interval for review.

- 1 Select any Menu item other than *Home*.
- 2 Left-click the arrow next to the Date/Time on the Title Bar to display the drop-down calendar and time interval.



- 3 Select a time interval from the fixed options of *Today*, *This Week*, *This Month*, or *All Time*.
- 4 Set a specific time interval by left-clicking the *From* and *To* calendars and selection a day from each to set the interval.
- 5 Left-click in the FLOW iQ application to close the calendar and view the results of the set interval.

The selected range shows in the Date/Time part of the Title Bar. The FLOW iQ display updates, showing the AMR or fleet activity within that selected interval. The update applies to all the Menu options until it is changed.

Shift Settings

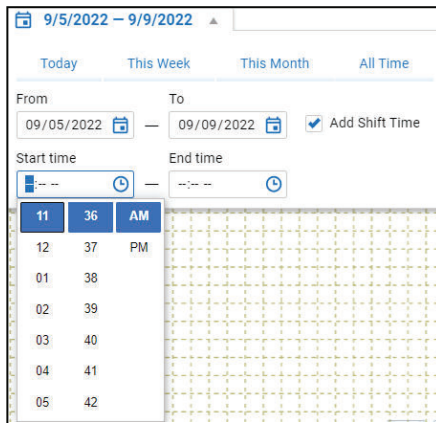
Use the following procedure to define a specific shift to display.



Additional Information

The entire day will be displayed if Shift Settings are not set.

- 1 Select any Menu item other than *Home*.
- 2 Left-click the arrow next to the Date/Time on the Title Bar to display the drop-down calendar and time interval.
- 3 Select a time interval from the fixed options, or manually set the interval from the calendar.
- 4 Click the **Check box** next to *Add Shift Time*, opening the shift selection.



- 5 Left-click the **Start Time** and **End Time** drop-downs and select the start and end shift hours. The update applies to all the Menu options until it is changed.

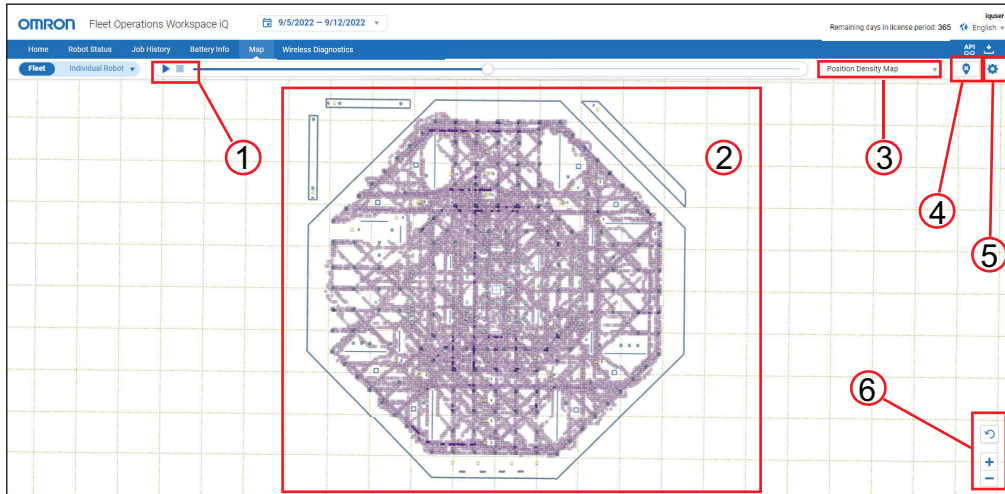
3-2-2 Map View Controls

Maps have common view controls, allowing users to display the graphic to obtain the maximum information from each map.

CAUTION

FLOW iQ is a monitoring program and does not control the fleet of AMRs or any individual AMR.







Item	Name	Description
1	Time Progression	Displays AMR or fleet status for the defined time interval using the Start and Pause buttons.
2	Information Area	Physical and operating boundary for AMRs. Displays path of an AMR or the AMR fleet, as selected.
3	Map Selection	Displays specific map from a selection of four options, to view the selection options for the same time interval. Refer to <i>Map Selection</i> on page 3-5 for more information.
4	Fault Selection	Toggle to identify selectable faults and selected AMR categories for each map. Refer to <i>Fault Selection</i> on page 3-5 for more information.
5	Map Settings	Optional selections to display data: Grid, Legend, Goals, Smooth Data, Dimensions. Refer to <i>Map Settings</i> on page 3-6 for more information.
6	Display Controls	Zoom and reset controls of map view. Refer to <i>Display Controls</i> on page 3-7 for more information.

Map Selection

FLOW iQ has four maps that are displayed from the Map Selection. When **Map** is selected from the Menu, the Fleet Position Density map opens as the default. Confirm the Date/Time for the data review, and whether a single AMR or the fleet map will be displayed. The same Date/Time and AMR/fleet values apply to all selected maps.

Click the Map Selection drop-down to select a different map from the four available options. The Time Progression slider starts by clicking the arrow (). Pause the Time Progression by clicking the rectangle ().




Additional Information

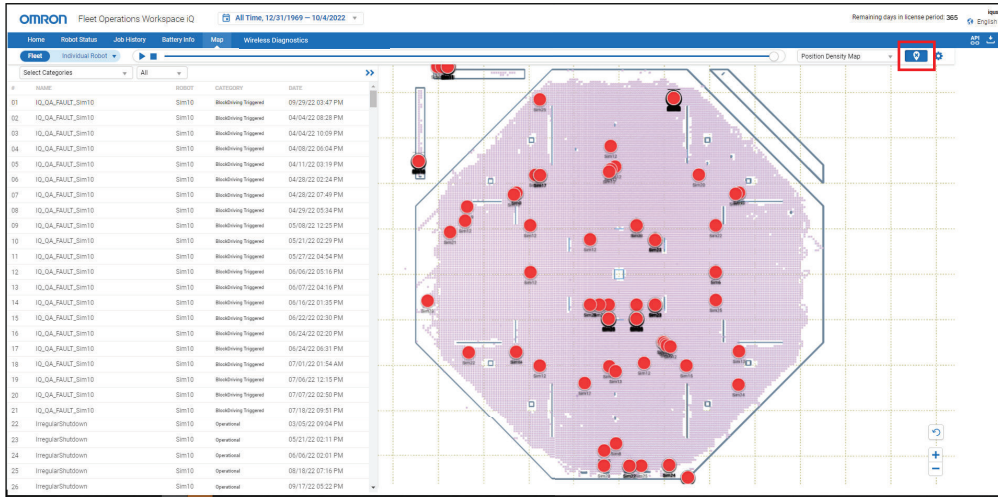
The Time Progression will automatically run every time a map is selected.

Fault Selection

The FLOW iQ Fault Selection shows the fault location on the map and opens a table listing the details for each fault .


To use the Fault Selection, open any map and click the **Fault Icon** (). The Fault Table opens next to the map. The table shows all the faults for the selected time interval.

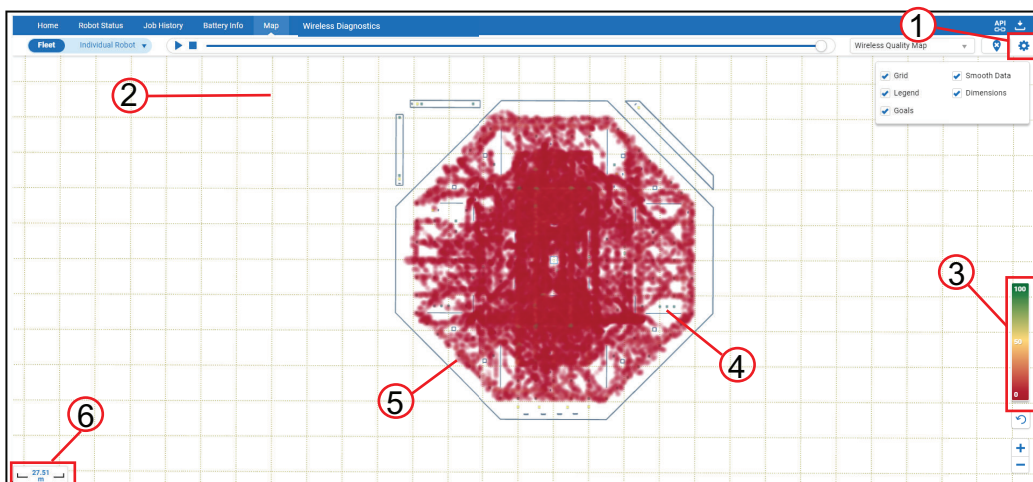
Use the *Select Categories* drop-down to select and display only specific faults in the table. Click the *All* drop-down to select between *Active*, *Inactive* and *All* AMRs.



When the *Fault Icon* is selected in one map, any other map that is opened also shows the faults and table. Click a fault in the table to highlight the location on the map. Click any mapped fault location to view the details in the table.

Map Settings

FLOW iQ maps have five settings. To use the settings, select any map and click the **Settings Icon** (). The drop-down has five labeled check boxes for the settings. When selected, the map shows that setting option, and they persist for every map. Select or deselect the settings as needed to view specific map data.

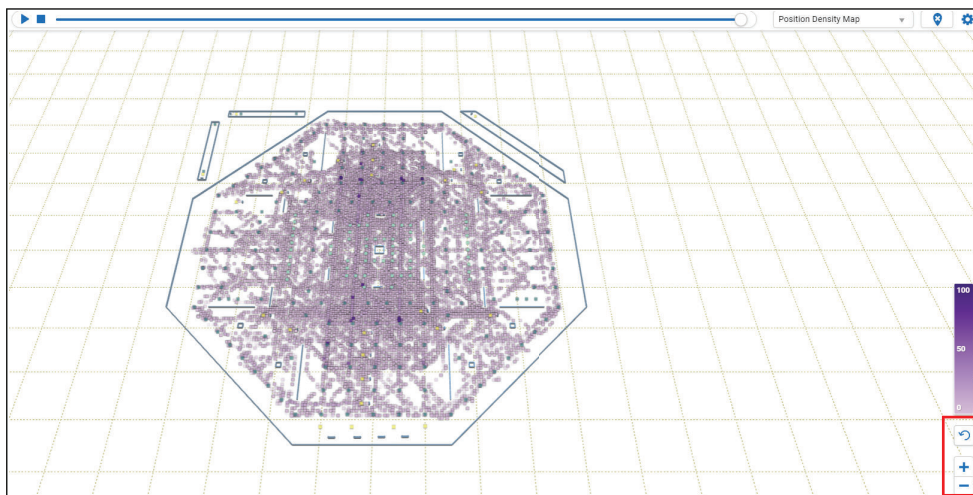



Item	Setting	Description
1	Settings	Opens map display settings.
2	Grid	Displays a grid matrix in the map Information Area.

Item	Setting	Description
3	Legend	The Legend color bar correlates to the relative frequency of an event. The values are normalized between 0 and 100. 100 is relative to the maximum frequency of all values, not a frequency of 100.
4	Goals	Goals are preset within the map area. Goals are most visible in the Floor Map. Refer to <i>Fleet Operations Workspace Core User's Manual (Cat. No. I635)</i> for more information.
5	Smooth Data	Averages the data points for less defined data paths.
6	Dimensions	Shows a reference dimension for use with the map.

Display Controls

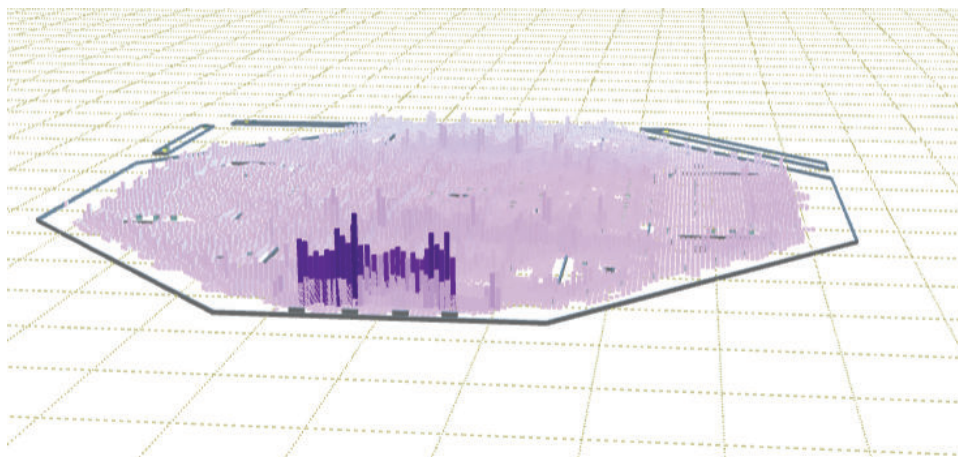
The FLOW iQ maps have display controls to improve viewing and understanding of the fleet or AMR data. The map controls are on the lower right-side of the map.




Use the magnification controls () to increase or reduce the map size. The map view can also be magnified by clicking the cursor over any map area and rolling the mouse wheel.

The map can also be rotated while holding the Control (Ctrl) key and left mouse button while moving the mouse. Hold the Ctrl key, left-click and hold the mouse button to rotate the map, to tilt the map at an angle.

When the map is angled, the relative bar height shows the value or frequency in that particular grid, as shown in the following figure.

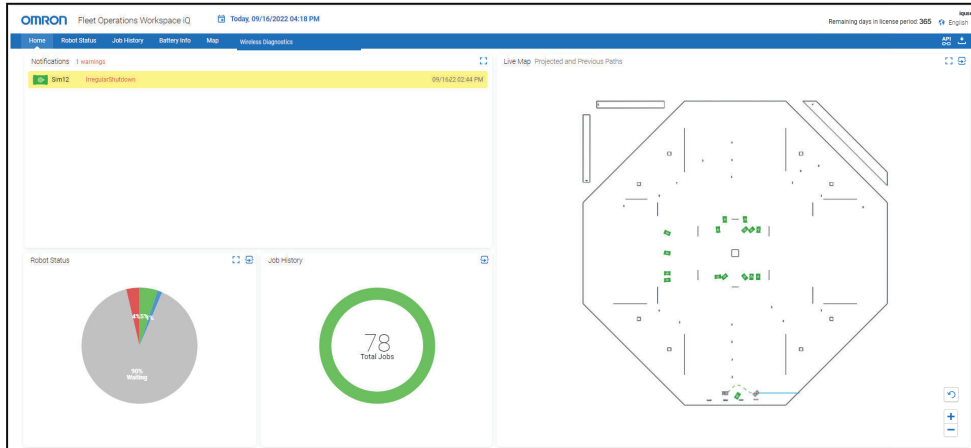


Click the **Reset Icon** () to return the map to a default magnification and orientation.



3-3 Home Functions


This section describes the use of the Home page.

The Home page has four sections showing the current status of the fleet: *Notifications*, *Robot Status*, *Job History* and the *Live Map*.



The *Notifications* view provides a limited, single line statement for job completion and errors or faults with operating AMRs. Click on a notification and the robot that completed this job or fault will be highlighted on the *Live Map*.

Expand *Notifications*, *Live Map*, and *Robot Status* by clicking the **Expand** icon () and reduce them by clicking the **Reduce** icon ().

Click the **Selection** icon () on the *Live Map*, *Job History*, or *Robot Status* to open the different views of each section.

The *Live Map* selected views are: *Robots Only*, *Previous Paths (green)*, *Projected Paths (blue)*, and *Projected and Previous Paths*. The *Job History* views are the Current jobs and the Side Bar data. *Robot Status* views are the current Information Graphic and the Side Bar data for the fleet.

3-4 Robot Status

This section describes how to access and view *Robot Status* information.



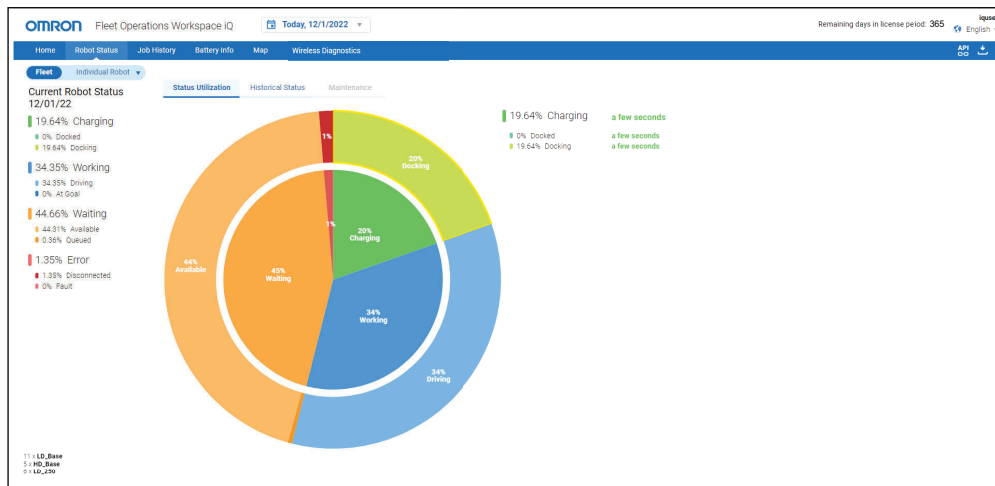
Precautions for Correct Use

Data representation in the Robot Status area may not appear accurately after downgrading an existing system from FLOW iQ v3.0. Contact your local OMRON representative for more information.

3-4-1 Fleet Status

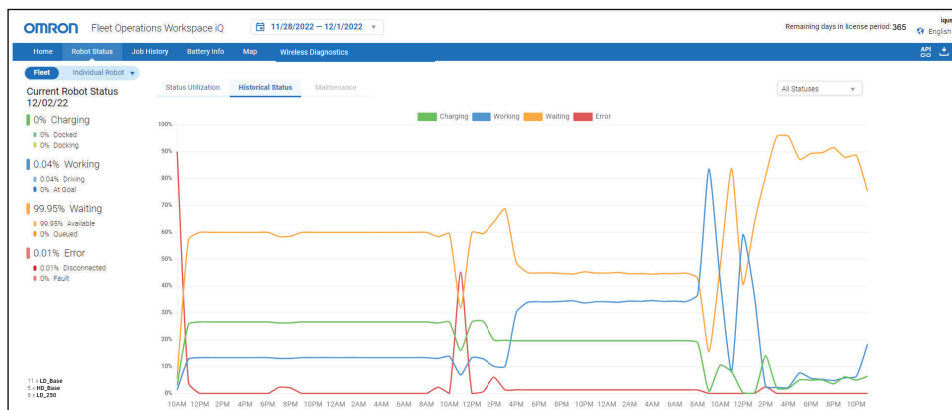
The following information applies to both the Fleet Status and Robot Status options.

When Robot Status is selected from the Menu, the application opens to the *Status Utilization* view of the fleet. Refer to *1-5-2 Robot Status* on page 1-8 for more information. Accept the default time, or change it to a specific interval. Refer to *3-2-1 Date/Time Settings* on page 3-3 for more information.



Hover the cursor over a specific area of the pie chart to view a pop-up with the exact values. Left-click a segment of the chart to display the Status Detail of that segment.

Click the **Historical Status** option to view the data in a line graph format for the time interval. The default graph shows four options: *Charging*, *Working*, *Waiting*, *Error*.



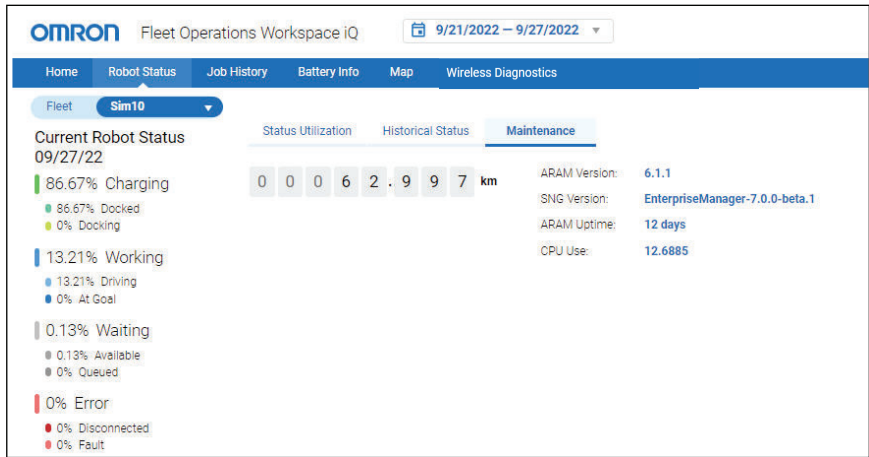
Click the **All Statuses** Drop-down and select a specific view from the four options: *Compare Charging*, *Compare Working*, *Compare Waiting*, and *Compare Failed*. Hover the cursor over a line and a pop-up opens, showing the status at that particular time.

The *Maintenance* Tab is inactive for a Fleet Status selection, and is activated after making the *Individual Robot* selection.

3-4-2 Individual Robot Status

The Side Bar, Information Area, Status Utilization and Historical Status options with Individual Robot status all function the same as with the Fleet status selection.

Click the **Individual** Drop-down to select the AMR of interest. Click the **Maintenance** Tab to view the data for the selected AMR. Refer to 3-2 *Common Operations* on page 3-3 for information about the display and operating controls.



3-5 Job History

This section describes how to access and view Job History information.

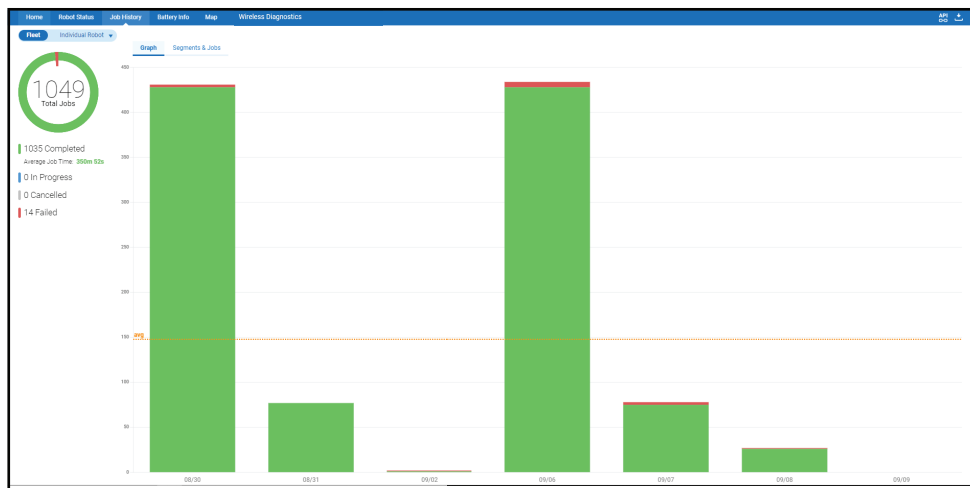


Precautions for Correct Use

If the Queuing Manager is disabled, FLOW iQ will function normally, but no activity will be provided in the Job History page.

3-5-1 Job History Graph

View the job performance over time by clicking **Job History** from the Menu. The page opens to the default *Fleet* view, and shows the performance as colored bar graphs. Accept the default, current date or click the **Date/Time** Drop-down to select the desired time interval. Refer to 3-2-1 *Date/Time Settings* on page 3-3 for more information.



Hover the cursor over a point on any bar to open a pop-up, identifying the status, number of effected jobs and the date. Click **Individual Robot** and select an AMR, to view the same time interval graph for that single AMR.

3-5-2 Job History Segments & Jobs

View Job History, *Segments & Jobs* by clicking **Job History**, and then click the **Segments & Jobs** Tab. The page opens showing the same data as the Job History graph, but in table format.

Most Used Segments				Most Failed Jobs			Most Failed Robots		
	GOAL	AVG TIME	GOAL	JOB	FAIL	ROBOT	FAIL		
1	T1-02	0m 18s	T2-02	1	JOB401	585	1	Sim19	586
2	T3-02	0m 48s	T3-04	2	JOB66	45	2	Sim14	45
3	T1-05	0m 18s	T2-05	3	IQJun72022-17	1	3	Sim13	3
4	T1-01	0m 18s	T2-01	4	IQJun72022-371	1	4	Sim7	3
5	B1-01	0m 0s	B2-01	5	IQJun72022-399	1	5	Sim8	2
6	T3-04	0m 43s	T3-02	6	IQJun72022-397	1	6	Sim10	2
7	T3-01	0m 51s	T3-05	7	IQJun72022-403	1	7	Sim11	1
8	T3-03	1m 9s	T3-01	8	IQJun72022-146	1			
9	T1-03	0m 1s	T2-03	9	JOB42	1			
10	T3-05	1m 11s	T3-01	10	JOB665	1			

The Side Bar shows the current status of the jobs performed during the defined time frame. Hover the cursor over any line in the *Most Used Segment* column to view the details pop-up. Click a blue Job Number in the *Completed Jobs* column to open the details for that job.

JOB621 JOB621-63223a7a

Status: **Completed** Start Charge: **74.93%**

Start Time: **9/14/2022, 4:32:58 PM** End Charge: **74%**

Robot: Sim7

Click the *Robot* name in the pop-up to view the *Most Failed Jobs* pop-up for that AMR.

Sim7

Status: **Charging::Docked** Robot Job History

Battery:

102 Total Jobs

99 Completed Average Job Time: 7m 20s

0 In Progress

0 Cancelled

3 Failed

JOB	FAIL
1 IQJun72022-146	1
2 IQJun72022-371	1
3 JOB365	1

Click the **Robot Job History** Button to view the job history for that AMR for the selected time interval. Click the *Robot* name in the *Most Failed Robots* column to view the *Most Failed Jobs* pop-up for that AMR. Then, click the **Robot Job History** Button to open the job history for that AMR. Click the **Individual** option and select an AMR, to open its Jobs & Segments view.

Home Robot Status Job History Battery Info Map Wireless Diagnostics

Fleet Sim7

Graph Segments & Jobs

102 Total Jobs

99 Completed Average Job Time: 7m 20s

0 In Progress

0 Cancelled

3 Failed

GOAL	AVG TIME	GOAL
1 T3-03	1m 9s	T3-01
2 T1-05	0m 16s	T2-05
3 B3-03	0m 59s	B3-01
4 B1-02	0m 14s	B2-02
5 B3-01	0m 24s	B3-05
6 T1-01	0m 16s	T2-01
7 B1-01	0m 0s	B2-01
8 T1-02	0m 15s	T2-02
9 G0a75	0m 14s	G0a79
10 B1-05	0m 15s	B3-05

JOB	DATE & TIME
1 JOB627	9/14/2022, 4:40:20 PM
2 JOB621	9/14/2022, 4:37:46 PM
3 JOB625	9/14/2022, 4:37:22 PM
4 JOB605	9/14/2022, 4:36:03 PM
5 JOB577	9/14/2022, 4:33:42 PM
6 JOB547	9/14/2022, 4:27:28 PM
7 JOB515	9/14/2022, 4:24:57 PM
8 JOB551	9/14/2022, 4:24:26 PM
9 JOB489	9/14/2022, 4:23:52 PM
10 JOB341	9/14/2022, 4:19:01 PM
11 JOB349	9/14/2022, 4:15:52 PM
12 JOB353	9/14/2022, 4:15:27 PM
13 JOB411	9/14/2022, 4:13:25 PM
14 JOB365	9/14/2022, 4:11:08 PM
15 JOB437	9/14/2022, 4:10:23 PM
16 JOB387	9/14/2022, 4:09:17 PM
17 JOB335	9/14/2022, 4:08:04 PM
18 JOB305	9/14/2022, 3:32:50 PM

JOB	FAILURES
1 IQJun72022-146	1
2 IQJun72022-371	1
3 JOB365	1

Hover the cursor over any line in the *Most Used Segment* column to view the details in a pop-up for the selected segment.

Click a blue Job Number in the *Completed Jobs* column to open the details for that job.

JOB621 JOB621-63223a7a

Status: **Completed** Start Charge: **74.93%**

Start Time: **9/14/2022, 4:32:58 PM** End Charge: **74%**

Robot: Sim7

Click a blue Job Number in the *Most Failed Jobs* column to open the details for that job.

JOB621 JOB621-63223a7a

Status: **Completed** Start Charge: **74.93%**

Start Time: **9/14/2022, 4:32:58 PM** End Charge: **74%**

Robot: Sim7

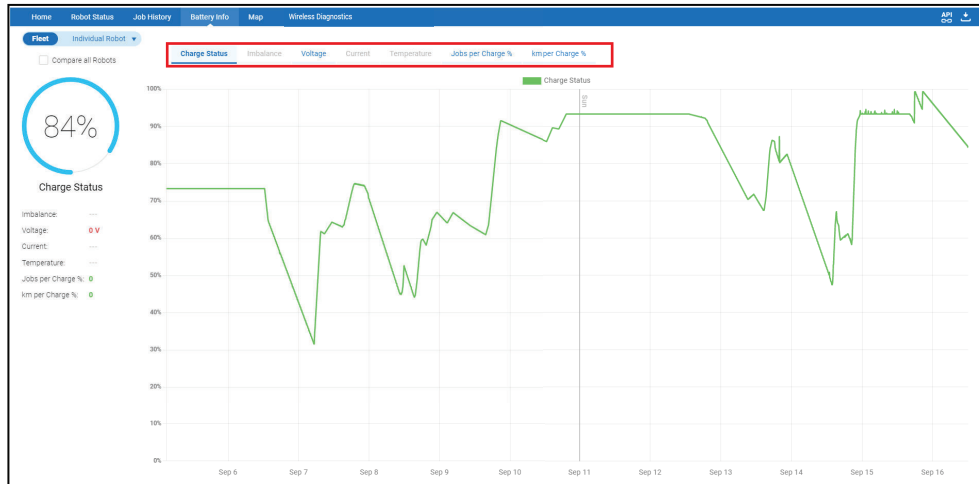
3-6 Battery Info

This section describes how to access and use the battery information.

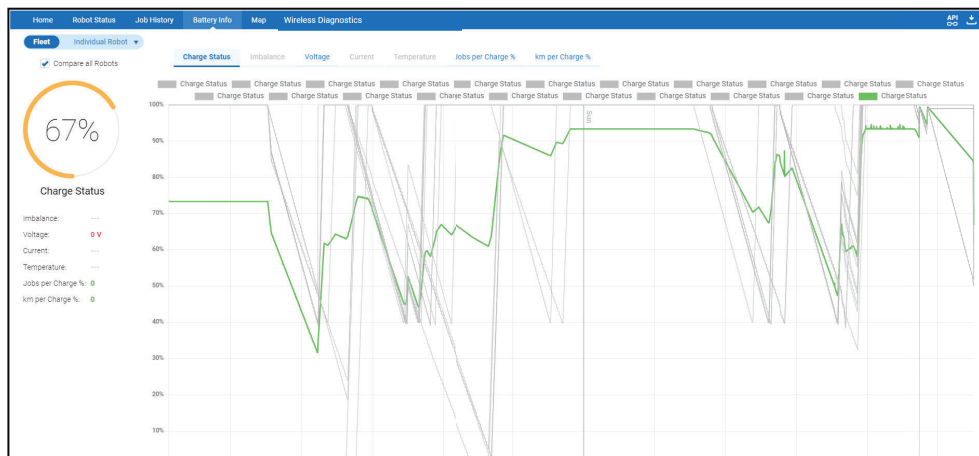
3-6-1 Battery Info Graphs

To view the AMR and fleet battery status click **Battery Info** on the Menu.

The *Battery Info* opens with the default, *Fleet* line graph with 6 battery parameters.



Click the **Compare All Robots** Check Box to view the graphs for all operating AMRs. The Fleet status shows as the green line graph.



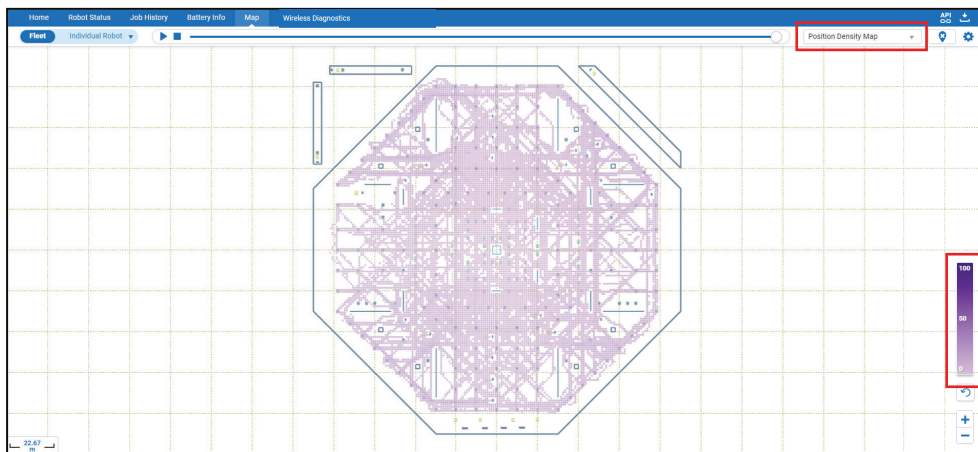
To view the battery status for an individual AMR, click the **Individual Robot** selection. Click any of the Performance Details above the graph to view that battery parameter. Refer to *1-5-4 Battery Info* on page 1-10 for more information.

3-7 Map

The following sections explain how to use maps to view the fleet or AMR operating conditions, using the different map types.

3-7-1 Position Density Map

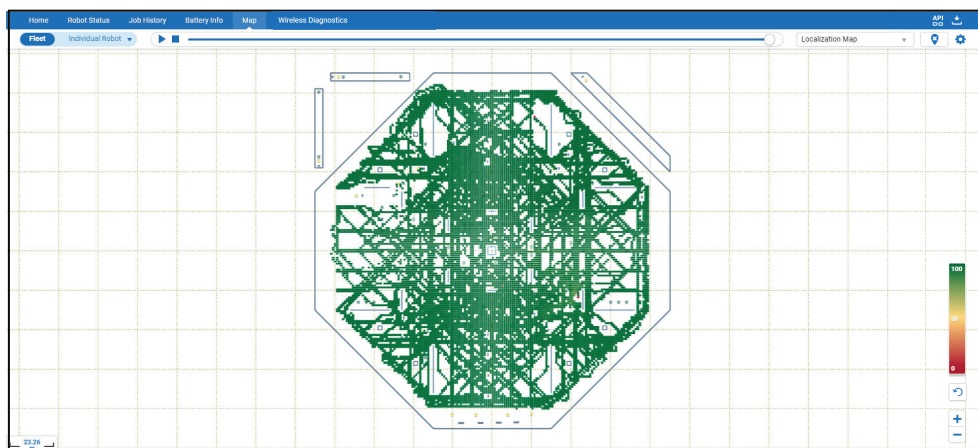
The *Position Density* map displays the traffic patterns within the operating area of the AMR or fleet. The color intensity increases with the frequency at which an AMR enters and exits a map grid cell. The *Fleet, Position Density Map* is the default view when **Map** is selected. The displayed color is based on the normalized, legend color scale. Click the **Map Selection** Drop-down to open the other available maps. Refer to 3-2-2 *Map View Controls* on page 3-4 for specific legend and map selection information.



3-7-2 Localization Map

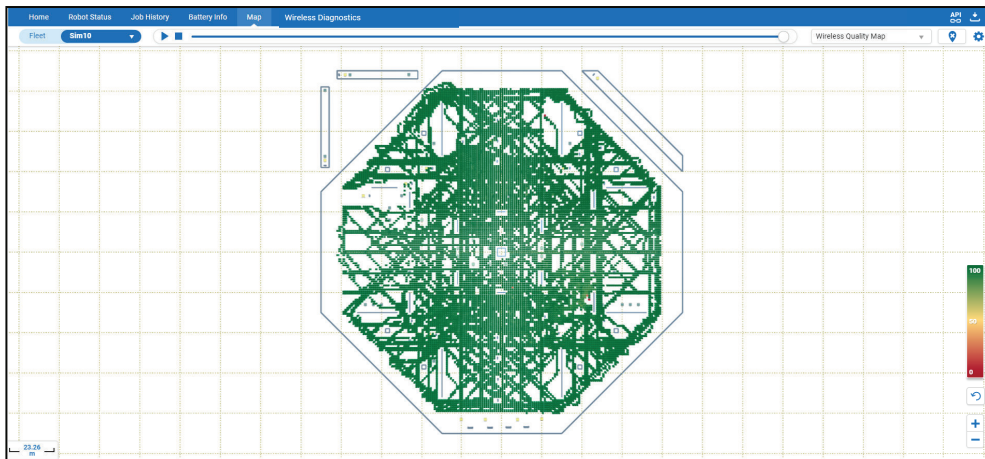
The *Localization Map* shows the average value of the AMR's localization score within a grid cell for the operating area of the AMR or fleet. The localization score is a number ranging from 0 to 100, where higher values represent better accuracy of the cumulative localization score reported by the AMR. If this value drops below 60 it may be necessary to re-localize the AMR. The localization information is generated and collected from all operating AMRs.

Click the **Map Selection** Drop-down and select **Localization Map** to view that status.



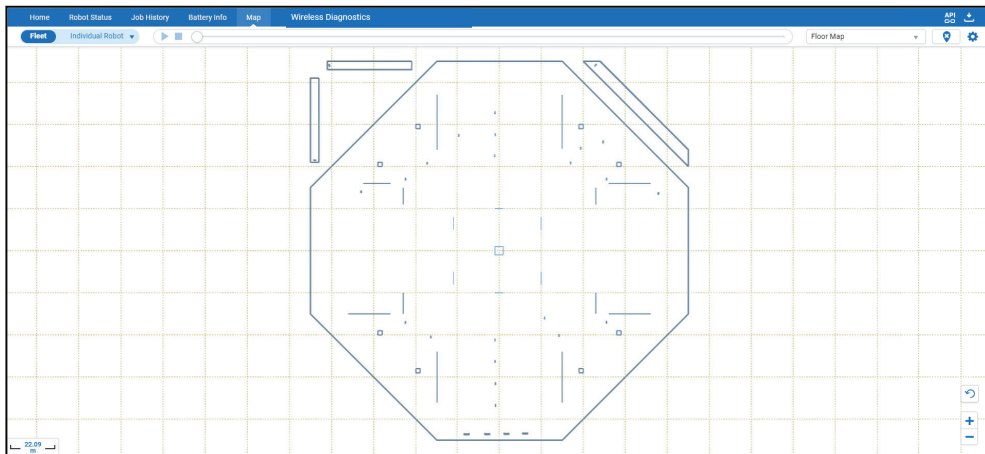
3-7-3 Wireless Quality Map

The *Wireless Quality Map* shows the wireless communication strength within each grid cell for the operating area of the AMR fleet. Use the wireless quality information to maintain or optimize the wireless coverage in the fleet operating areas. Wireless Quality data is reported from each AMR with a relative strength number ranging from 0 to 100. A higher value represents a stronger wireless quality. Refer to *3-2-2 Map View Controls* on page 3-4 for information about the display and operating controls. Click the **Map Selection** Drop-down and select **Wireless Quality Map** to view that status.



3-7-4 Floor Map

The *Floor Map* displays the operating area of the AMR or fleet. This includes the boundaries and obstacles. Click the **Map Selection** Drop-down and select **Floor Map** to view and confirm the configuration of all goals, boundaries and obstacles within the area.



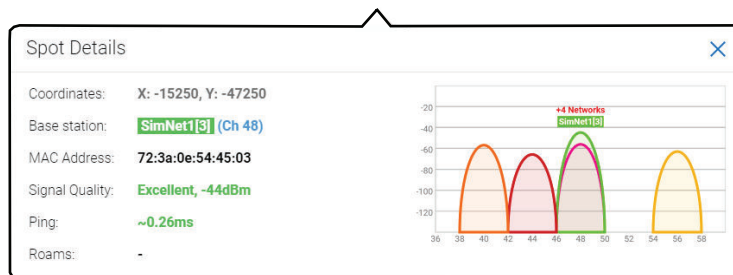
Additional Information

Individual Robot and Fleet views of the Floor Map are identical. Refer to *3-2 Common Operations* on page 3-3 for information about the display and operating controls.

3-8 Wireless Diagnostics

The Wireless Diagnostics area is used to analyze wireless network performance and functionality. *Wireless Diagnostics* uses BSSIDs. BSSIDs are MAC addresses for the access point hardware. A FLOW iQ *BSSID* is the human readable alias, created from a name and number, that is system created, to identify the MAC address network access point.

Wireless Diagnostics collects data and displays it as *Spot Details* when the point is clicked in the Signal, Ping, BSSIDs, and Roams maps. Spot Details shows the fleet signal level, not an individual AMR, even when the *Individual Robot* is selected.

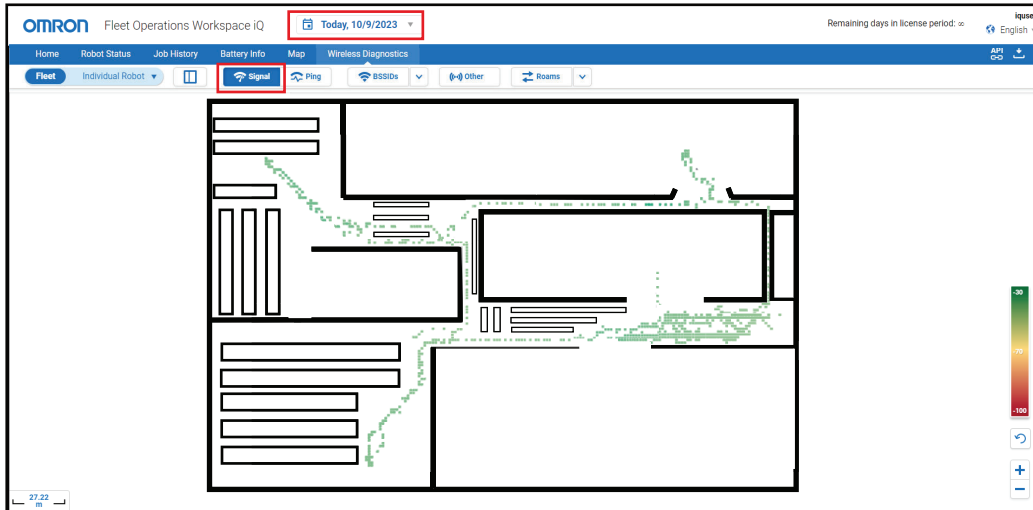


Values	Description
Coordinates	X and Y coordinates of that map point
Base Station	Wireless access point and channel
MAC Address	Device MAC address alias generated from the SSID and a number, used for system identification
Signal Quality	Quantitative and numeric value (dBm) of signal at that point, when available
Ping	Ping time, if available
Roams	BSSID connection switch, at that access point.

The scan graph on the right side of the Spot Details identifies the connected base station channel in green, if available. This graph shows the closest channels that may overlap or interfere with the connected channel (base station).

3-8-1 Signal

The Signal area provides information about the wireless signal level received by AMRs in the fleet. Click the **Signal** Button to show the AMR travel points on the map, colored to correspond to the Legend color bar on the right side of the map. Use the Calendar to select the day or time interval for the signal analysis. Refer to 3-2-1 *Date/Time Settings* on page 3-3 for more information.



Click a colored AMR travel point in the map to view the **Spot Details** at that point. Refer to *3-8 Wireless Diagnostics* on page 3-17 for more information.

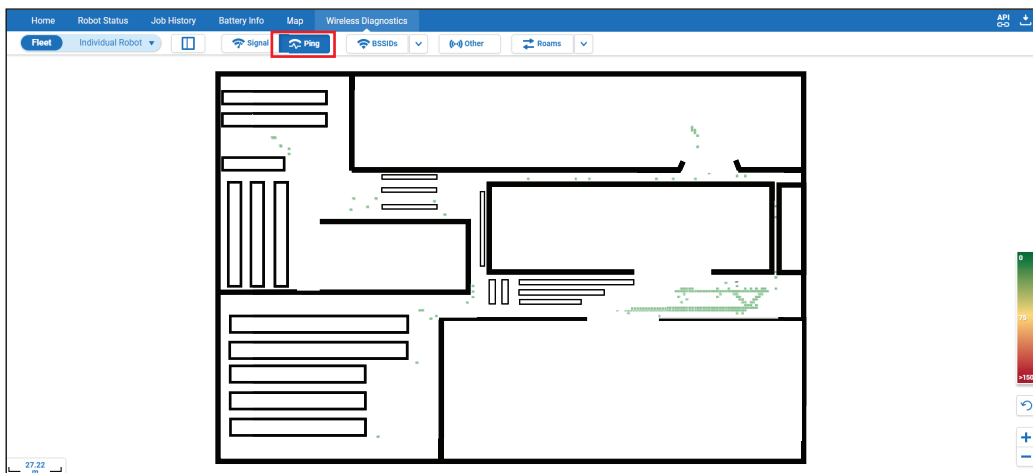


Additional Information

The signal strength in this map is shown in dBm while the information presented in the Wireless Quality Map is shown as a relative value. Refer to *3-7-3 Wireless Quality Map* on page 3-16 for more information.

3-8-2 Ping

The time for a packet to transmit from the AMR to the Fleet Manager and back to the AMR is the Ping. Click the **Ping** Button to display the locations where AMRs pinged the Fleet Manager. The locations show as colored travel points. The color of each travel point corresponds to the speed legend on the right side of the map.

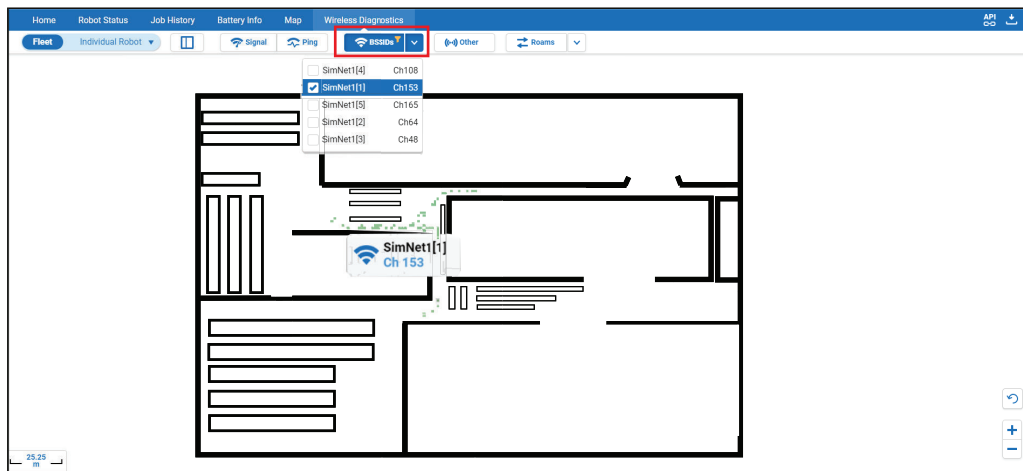


Click a specific travel point where a ping occurred, to display the Spot Details for the ping. Refer to *3-8 Wireless Diagnostics* on page 3-17 for more information.

3-8-3 BSSID


Click the **BSSIDs** Button to show all the operating access points for the map. Select an access point to display the Spot Details. Refer to *3-8 Wireless Diagnostics* on page 3-17 for more information.

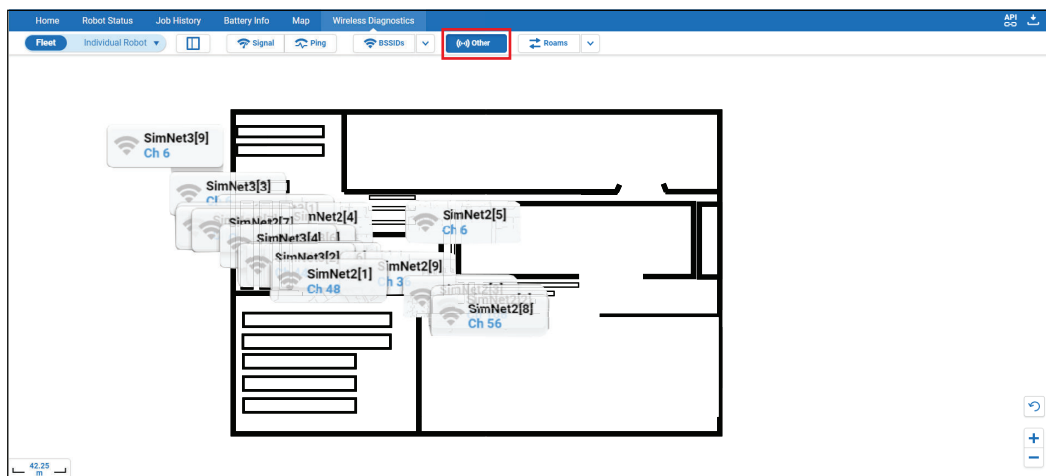
Click the arrow next to the BSSIDs Button to display and filter the available wireless access points. The one or more active filter access points show in the map. When a filter is selected, a small yellow icon also appears in the BSSIDs button.



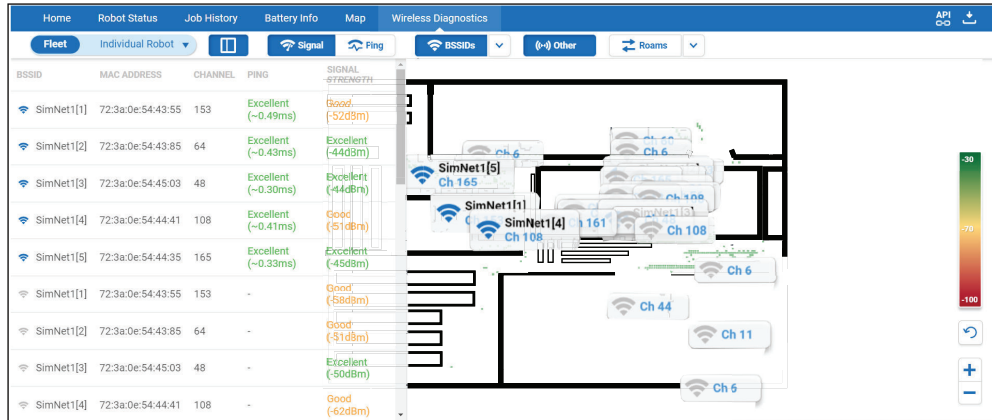
Double click any shown access point to open a pop-up with the details for that point. Refer to 3-8 *Wireless Diagnostics* on page 3-17 for more information.

3-8-4 Other

Click the **Other** Button to display all wireless networks and BSSIDs broadcasting in the operating area. Networks that are detected but not connected to the Fleet Manager show with the antenna symbol as gray,  Ch 6.

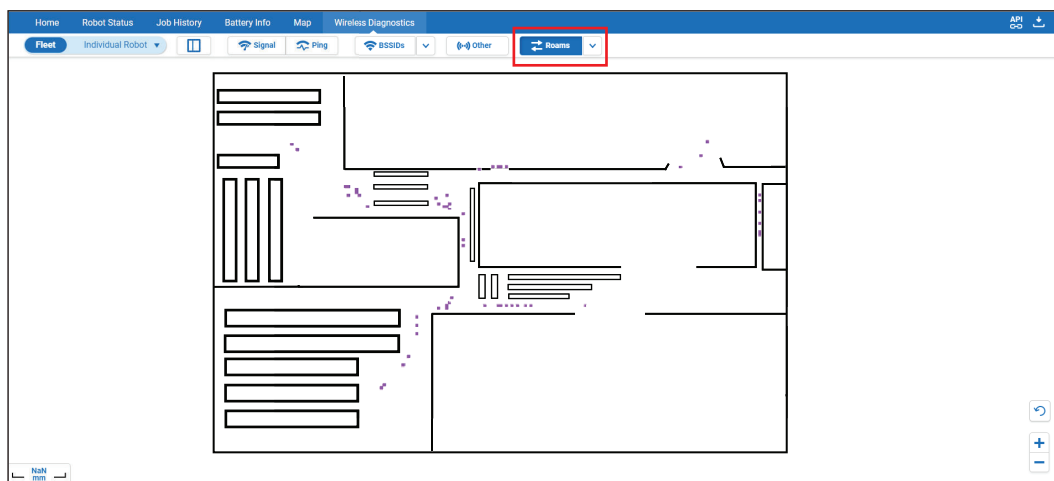


Click the **Show/Hide** Button to display a list of both connected and unconnected networks. Select a list item to display that access point in the map. Close the side panel by clicking the **Show/Hide** Button.



3-8-5 Roams

When an AMR moves through a facility it connects to different access points based on signal strength and channel availability. These connecting events are called *Roams* and display the map locations where AMR connections change from one BSSID to another BSSID. Click the **Roams** Button and all the access points on the map where roaming occurs show in a purple color.

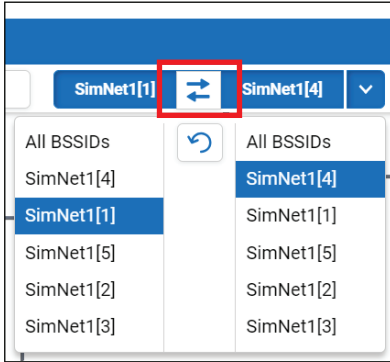


Click any roaming point to view the roam details in a pop-up. Refer to *3-8 Wireless Diagnostics* on page 3-17 for more information.

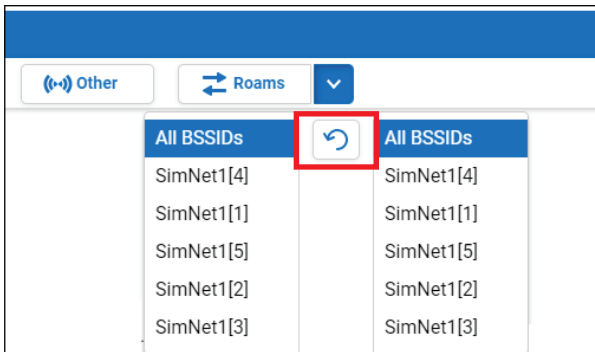
Click the Roams drop-down arrow to open the filter option. Select the BSSID alias from each column to display the travel points where AMRs changed connection to access points. Click the double arrow



separating the selected Roams options to show the travel points where AMRs are moving towards an access point. Click the arrow again to show the travel points where AMRs move away from an access point. Click it to be a double arrow, showing all access point movement.

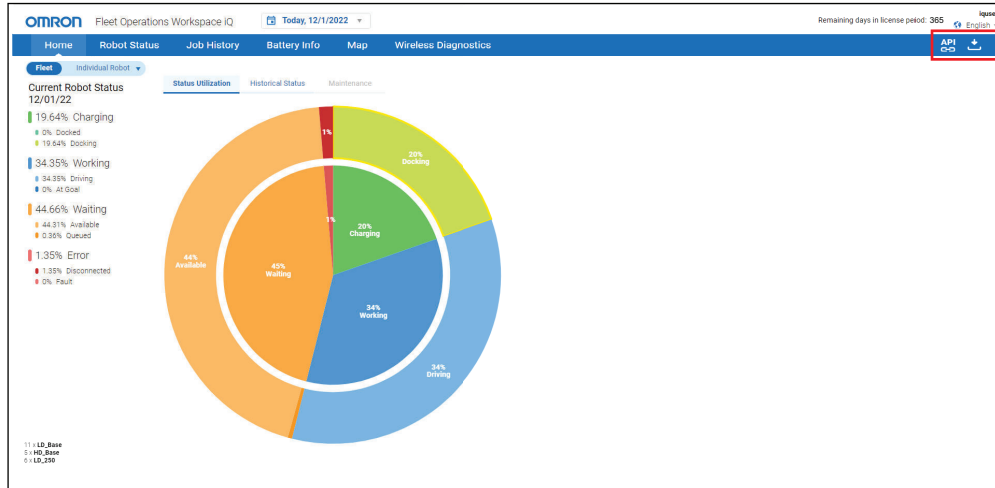


Click the circular arrow in the middle of the drop down to return to the default roaming filter. All Roams will show as purple travel points.




3-9 API and Download

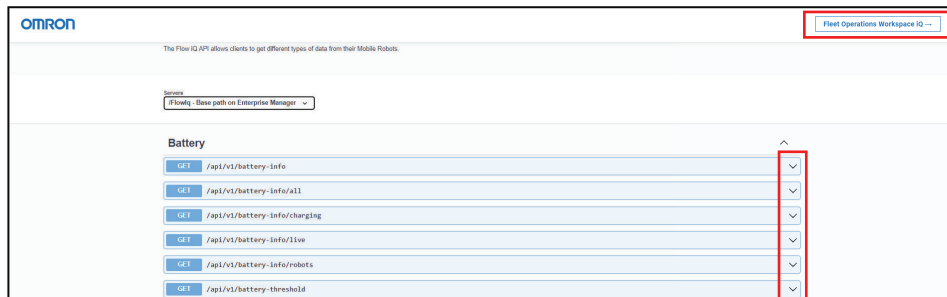
The following sections show how to use the FLOW iQ API and Download functions.



3-9-1 API Operation

Use the following procedures to view and understand the FLOW iQ API.

Click the **API** icon () to open the API documentation page. The page contains the supported HTTP methods, endpoint descriptions and usage examples.



Click the right-side arrow to learn how use or try an endpoint.

Battery

GET /api/v1/battery-info

Returns JSON response with the battery information of the selected robot(s) within the date range. These information includes the battery voltage, distance per state of charge, and timestamps.

Parameters Try it out

Name	Description
start_date * required string (query)	The desired start date to get battery information from the selected robot(s) <input type="text" value="2021-07-20"/>
end_date string (query)	The desired end date to get battery information from the selected robot(s) Default value : start_date <input type="text" value="2021-10-21"/>
SRC string (query)	The desired robot(s) from which to get battery information (leave blank to select all robot's) Default value : Empty string <input type="text" value="Sim143"/>
start_time string (query)	The desired shift start time to get battery information from the selected robot(s) Default value : 00:00:00 <input type="text" value="10:00:00"/>
end_time string (query)	The desired shift end time to get battery information from the selected robot(s) Default value : 23:59:59 <input type="text" value="18:00:00"/>
date_format string (query)	Optional custom date format following Datetime Format Codes Default value : %Y-%m-%d <input type="text" value="%Y-%m-%d"/>

Click the **Try it out** Button to enable the function and enter the values into the respective boxes in the *Description* column. Then click the **Execute** Button and view the *Responses*.

Returns JSON response with the list of robot(s) within the date range. If the date range is empty, the default date range is since Jan 1, 1970 until now.

Parameters

Name	Description
start_date string (every)	The desired start date to get the list of robot(s) 2022-09-20
end_date string (every)	The desired end date to get the list of robot(s) 2022-10-21
date_format string (every)	Optional custom date format following Datetime Format Codes %Y-%m-%d

Responses

curl -X 'GET' \
 'https://10.151.26.181/Flow/api/v1/battery-info/robots?start_date=2022-09-20&end_date=2022-10-21&date_format=%Y-%m-%d' \
 -H 'accept: application/json'

Request URL
https://10.151.26.181/Flow/api/v1/battery-info/robots?start_date=2022-09-20&end_date=2022-10-21&date_format=%Y-%m-%d

Server response

Code Details

200

```

{
  "robots": [
    "S1a10",
    "S1a11",
    "S1a12",
    "S1a13",
    "S1a14",
    "S1a15",
    "S1a16",
    "S1a17",
    "S1a18",
    "S1a19",
    "S1a20",
    "S1a21",
    "S1a22",
    "S1a23",
    "S1a24"
  ]
}

```

Response headers

```

content-length: 296
content-type: application/json
date: Tue, 25 Oct 2022 14:56:32 GMT
server: lighttpd/1.4.59
strict-transport-security: max-age=3072000; includeSubDomains; preload
x-content-type-options: nosniff
x-frame-options: DENY

```

Cancel (highlighted in red)

Download (highlighted in red)


Click the **Download** Button to save the json.

Return to the main API page by clicking the **Cancel** Button.

Return to the FLOW iQ Main Page by clicking the **Flow Operations Workspace iQ** Button.

3-9-2 Download

Use the following procedures to download FLOW iQ graphics.

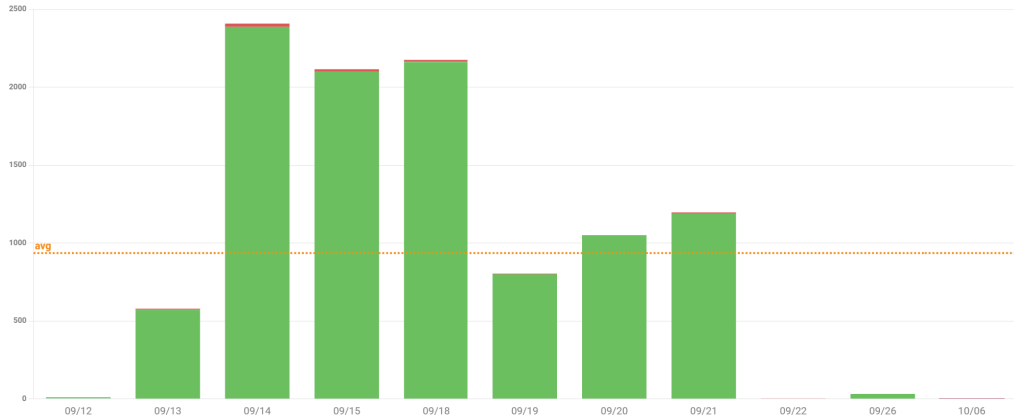
- 1 For any view, click the **Download** Icon () to open the Download panel.

PDF PNG JPG

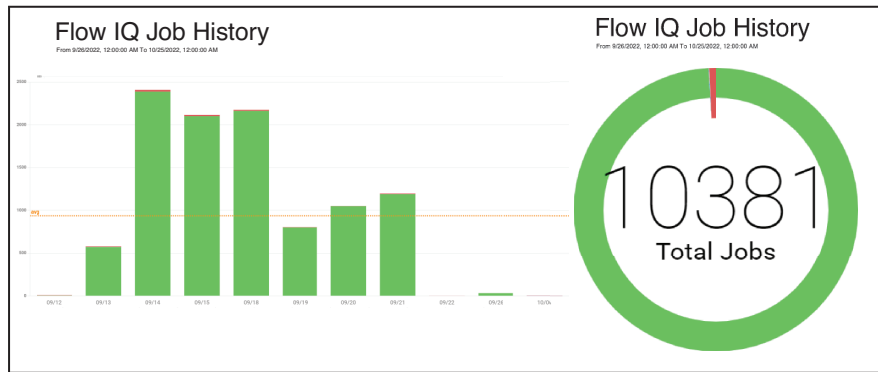
Include all Graphs

Download

- 2 Download the Information Area view, using the Download panel, by selecting the format and clicking the **Download** Button.



- 3** Download the Information Area and the Side Bar graph, using the Download panel, by selecting the format and clicking the **Include all Graphs** Check Box, and click the **Download** Button.



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