MITSUBISHI ELECTRIC
Changes for the Better

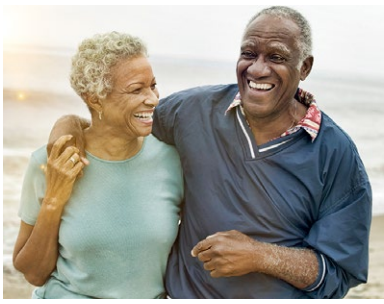
Automating the World

FACTORY AUTOMATION

Mitsubishi Electric Industrial・Collaborative Robots Robot Support Services

iQ Care MELFA Support

Automating the World



Our Factory Automation business is focused on "Automating the World" to make it a better, more sustainable environment supporting manufacturing and society, celebrating diversity and contributing towards an active and fulfilling role.

Mitsubishi Electric is involved in many areas including the following:

Energy and Electric Systems
A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices
A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance
Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems
Commercial and consumer-centric equipment, products and systems.

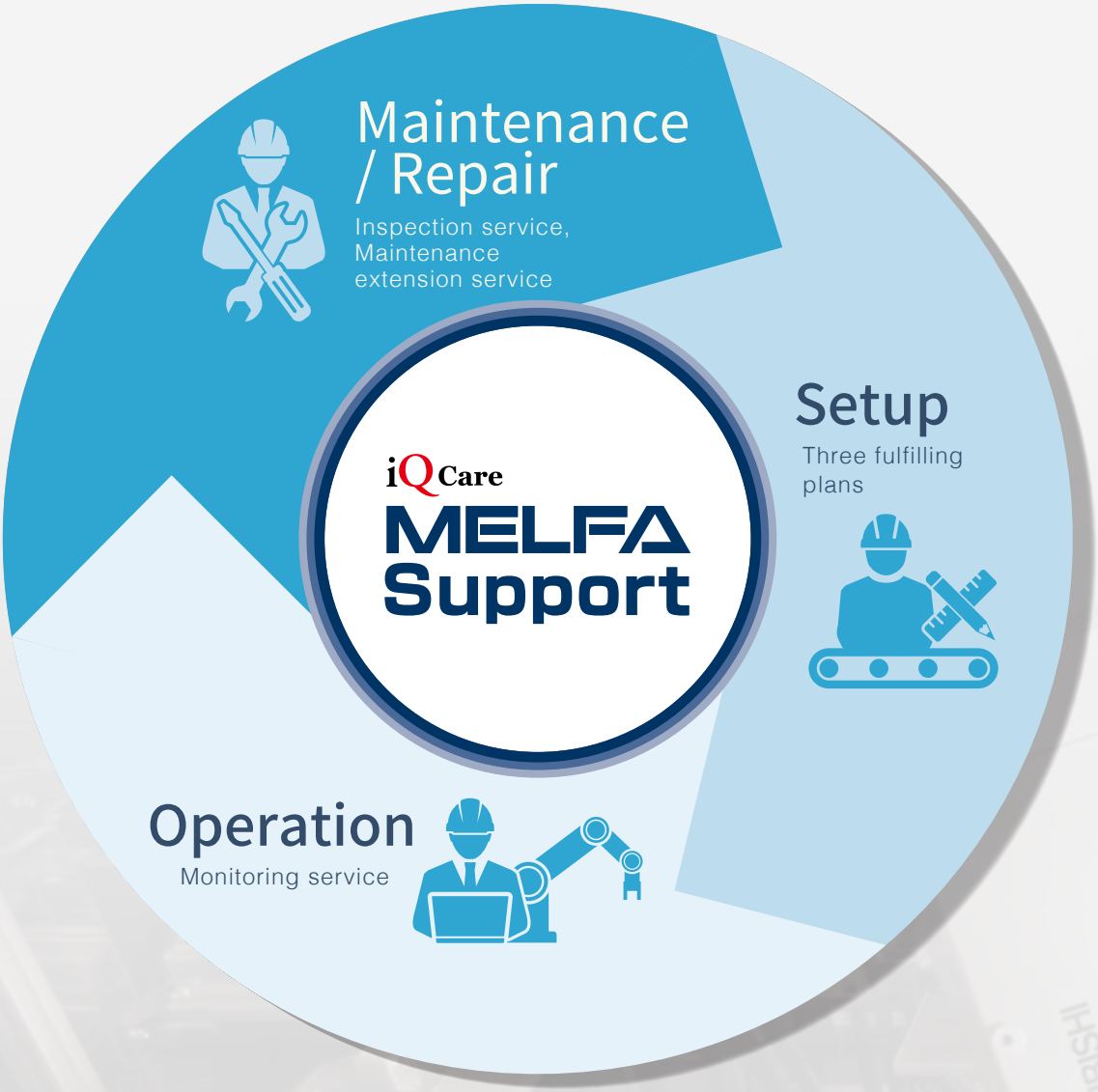
Industrial Automation Systems
Maximizing productivity and efficiency with cutting-edge automation technology.

SUSTAINABLE DEVELOPMENT GOALS

The Mitsubishi Electric Group is actively solving social issues, such as decarbonization and labor shortages, by providing production sites with energy-saving equipment and solutions that utilize automation systems, thereby helping towards a sustainable society.

OVERVIEW

MELFA working with you
Supporting with you



iQ Care MELFA Support is a single-package after-sales service plan that provides monitoring, inspection, and warranty extension.
We are committed to working closely with our customers to provide comprehensive support for production site robot automation systems.

For more information regarding iQ Care MELFA Support, please refer to the following

iQ Care MELFA Support Three Services

Monitoring service

Automatically aggregates daily robot operation data, making it easy to look up the operation status for each day.
This lets everyone monitor a wide range of information.

Setup Operation

Inspection service

A comprehensive inspection service to ensure the stable operation of robots.
This service can be utilized through our Light Inspection Service or our Detailed Inspection Service.

Maintenance / Repair

Warranty extension service

Loss costs can be reduced in the unlikely event that a robot encounters a failure as parts covered by the warranty are repaired free of charge.

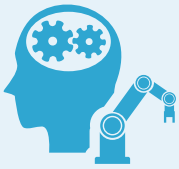
Operation Maintenance / Repair

Ensure Ongoing Stable Robot Operation!

Advantage① Best after-sales service

As various robot data necessary for stable operation is aggregated and displayed on the dashboard, it allows for integrated management of maintenance data. The automatically collected robot condition data is also used by our service engineers to help perform inspection services. Gaining a detailed understanding of the robot's status enables stable operation of the robot systems in best conditions.
We shall also provide free repairs due to our extended warranty in the unlikely event of a breakdown.

Monitoring service



Predictive Maintenance

Maintenance data in chronological order and condition information utilizing our predictive maintenance function are displayed on the dashboard.

Condition

Recovery

Automatic backups to protect against data loss and data logging in the case of a system malfunction.

Trouble support

iQ Care MELFA Support

Digital inspection service

Inspection

Robot condition diagnosis and consumables replacement through on-site inspections by service engineers.

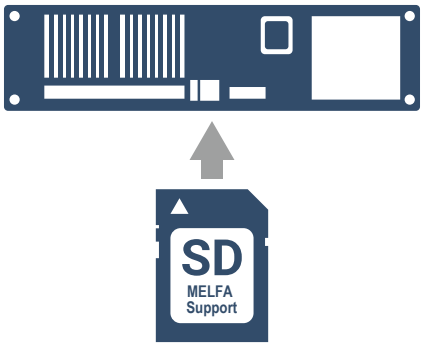
Warranty extension service

Warranty

We offer an extended warranty. In the rare event of a failure, parts covered by the warranty are repaired free of charge.

Advantage② Easy setup

Insert the SD card included with iQ Care MELFA Support into the controller to use the range of included software. Our warranty extension service will also become effective upon insertion.



Simply insert the SD card and our support starts.

＊ **For -R-Q type controllers, it is necessary to add an Ethernet cable (provided by the user) between controller CPUs. For more details, please refer to the Industrial Robot Support Service iQ Care MELFA Support Instruction Manual.**

＊ It is necessary to change parameters to activate the predictive maintenance function.

Advantage③ Simple planning structure

We have prepared six optional plans to satisfy the diverse range of requirements of customers. By purchasing the SD card corresponding to each plan, customers can get a combination of services that perfectly suit their needs.

<table>
<tr><th></th><th colspan="2">Monitoring service</th><th colspan="2">Inspection service</th><th>Warranty extension service</th></tr>
<tr><td>Name of the plan</td><td>Predictive maintenance function</td><td>Condition monitoring function
Recovery function
Trouble support function</td><td>Light inspection</td><td>Detailed inspection</td><td>Warranty extension</td></tr>
<tr><td>1-year warranty extension plan</td><td>1 year</td><td rowspan="2">Unlimited</td><td rowspan="2">Not covered</td><td rowspan="2">Not covered</td><td>1 year</td></tr>
<tr><td>2-year warranty extension plan</td><td>2 year</td><td>2 year</td></tr>
<tr><td>Inspection service light inspection plan</td><td rowspan="2">1 year</td><td rowspan="2">Unlimited</td><td>Once</td><td>Not covered</td><td rowspan="2">Not covered</td></tr>
<tr><td>Inspection service detailed inspection plan</td><td>Not covered</td><td>Once</td></tr>
<tr><td>1-year warranty extension + Inspection service light inspection plan</td><td rowspan="2">1 year</td><td rowspan="2">Unlimited</td><td>Once</td><td>Not covered</td><td rowspan="2">1 year</td></tr>
<tr><td>1-year warranty extension + Inspection service detailed inspection plan</td><td>Not covered</td><td>Once</td></tr>
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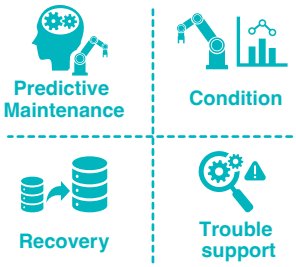
＊ **Please note that conditions apply for joining the 1-year/2-year warranty extension plans and the 1-year warranty extension + inspection service light/detailed inspection service plans.**

Monitoring service



This service automatically aggregates daily robot operating data. It is possible to closely monitor the state of system operation and robot components. In the unlikely event of a problem, the software allows rapid troubleshooting and resolution.

Dedicated support software (RT ToolBox3, sold separately) is required to check each function.

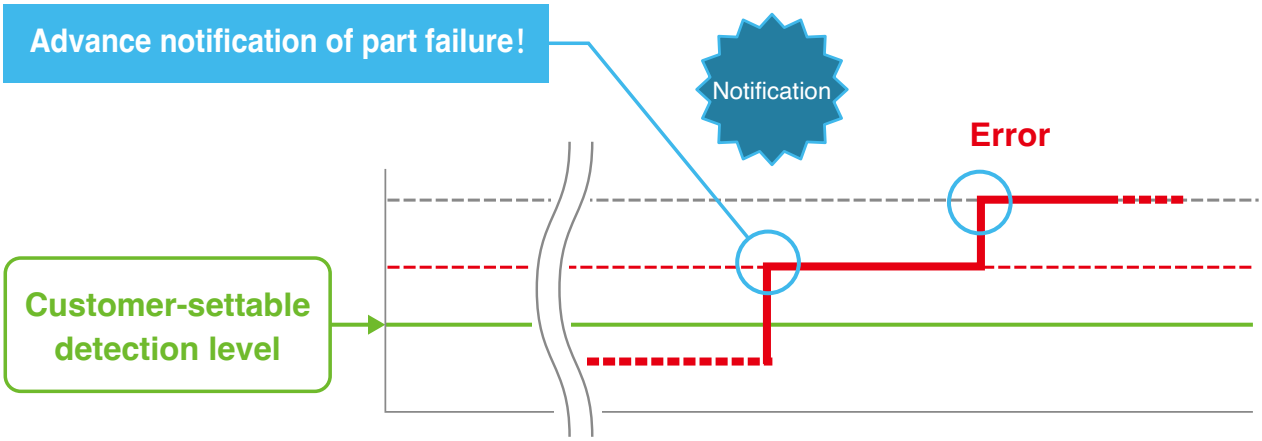
1. Long-time robot operation support: Predictive maintenance function

Our advanced predictive maintenance function*1 is available*2. By notifying users of any abnormalities or deterioration of parts as early as possible, downtime is greatly reduced. In addition, notification of maintenance and replacement schedule for each part allows for more efficient maintenance.

※1 This function can only be used for the first year after signing up for the service or during the warranty period.

Abnormality detection

A function that detects abnormalities or deterioration of robot component parts at an early stage. It can detect abnormalities in parts before symptoms of abnormalities appear in robot behavior, which results in downtime reduction.



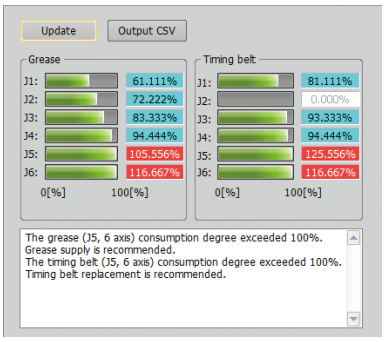
Maintenance Simulation

Simulating using our dedicated support software (RT ToolBox3, optional) or an actual machine estimates the replacement period for maintenance parts and forma a recommended maintenance schedule assuming that a motion pattern in a specified robot program is repeated.

■Output data

The grease replenishment period, the timing belt replacement period, and the recommended maintenance schedule for overhaul parts.

Wear level calculation function



A function that calculates the wear level*3 of robot component parts and the time until maintenance inspection and overhaul based on operating condition according to robot motion or posture.

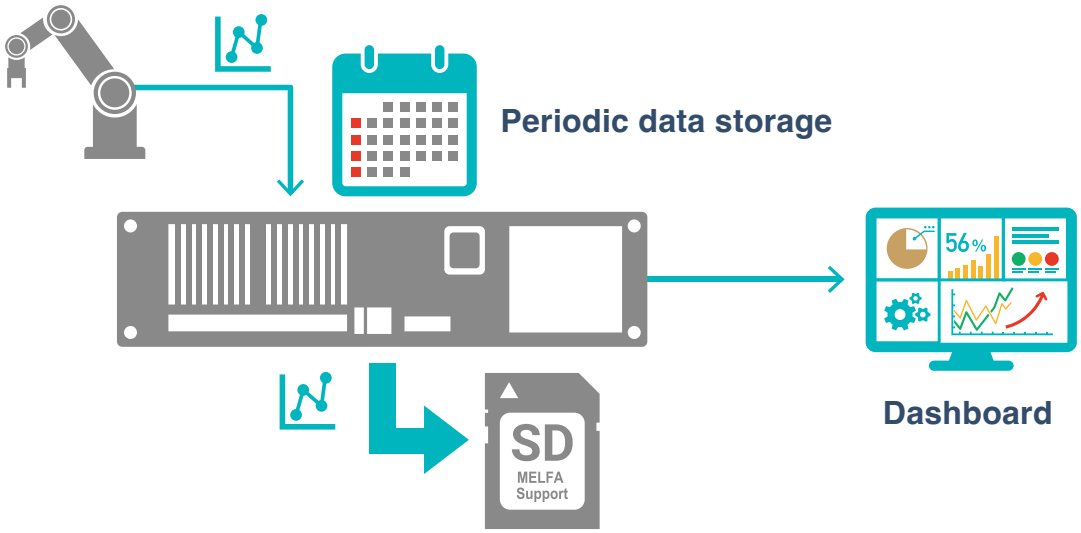
■Applicable parts

Service parts (grease, timing belts, etc.), overhaulable parts (reduction gears, bearings, ball screws, ball splines)

※3 The wear level is a reference value that is used to perform maintenance inspection calculations. It does not guarantee a long service life.

2.Automatic aggregation of robot operation data: Condition monitoring function

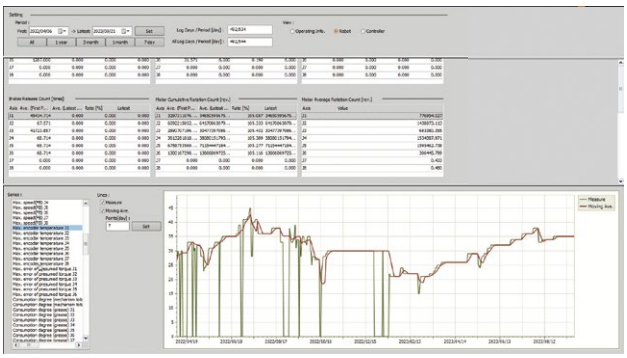
The iQ Care MELFA Support dedicated SD card automatically aggregates and saves robot operation and maintenance data for every single day. This allows customers to easily look up operation data*1 without having to perform any time-consuming preparation of the data. As the data is saved in plaintext CSV format, it is simple for them to perform any additional custom data processing. This function is linked with the predictive maintenance function, making it much easier to monitor own robots.



［Comprehensive condition screen］

This screen displays basic contract details such as the current service plan and the inspection service date. Furthermore, its predictive maintenance function enables the view of various details of the robot status such as the wear level and recommended inspection schedule.

［Condition log screen］

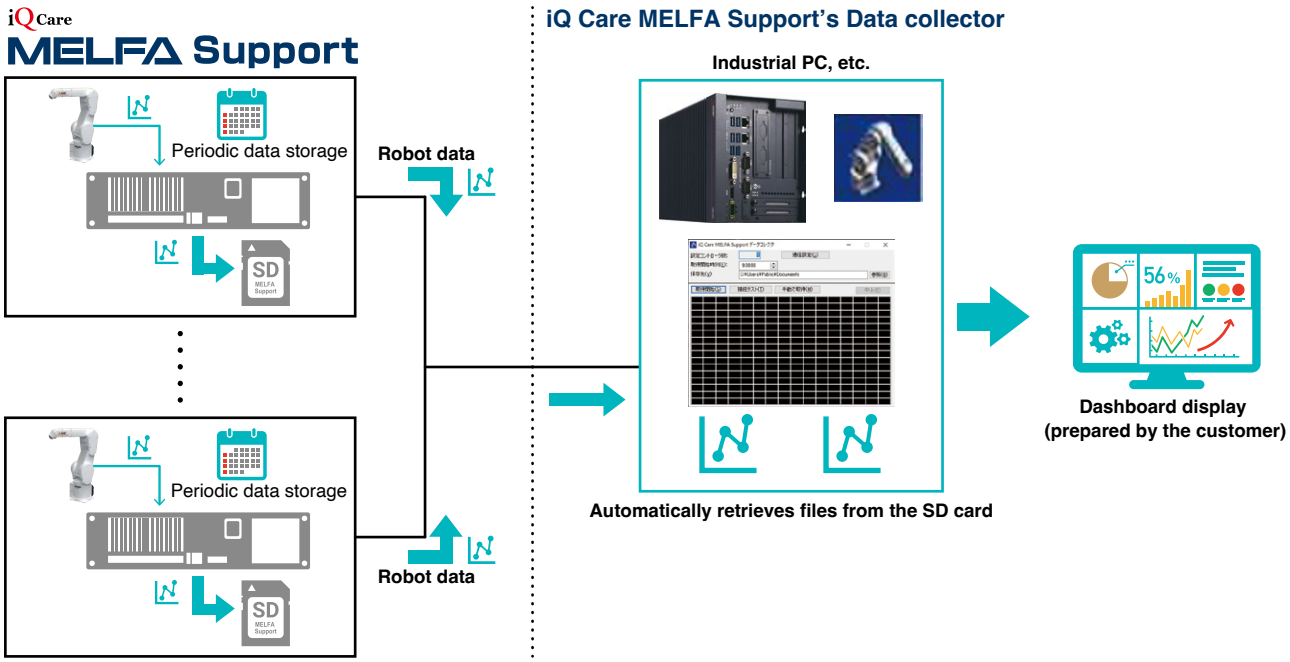


This screen uses the collected historical data over time to display graphs and charts that summarize robot operation and controller data. The time periods and graph ranges can be easily adjusted to assist analyzing the operation status and confirming whether maintenance is required.

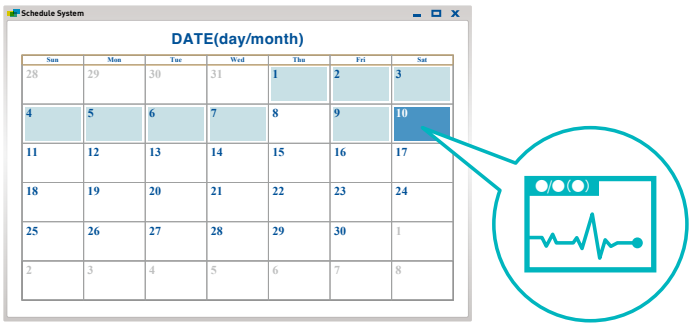
iQ Care MELFA Support's Data Collector

The iQ Care MELFA Support Data Collector is a software package that automates periodic backups of iQ Care MELFA Support industrial robot support service data to storage media such as an industrial PC.
The iQ Care MELFA Support robot data that is periodically saved to the SD card is automatically backed up to the PC according to the time interval set in the iQ Care MELFA Support Data Collector software*1.
It is possible to check the robot's status via the dashboard using the BI tool, etc.

※1 As this software can be run independently, there is no need to install our dedicated support software (RT ToolBox3).



3.Data trouble recovery support: Recovery function

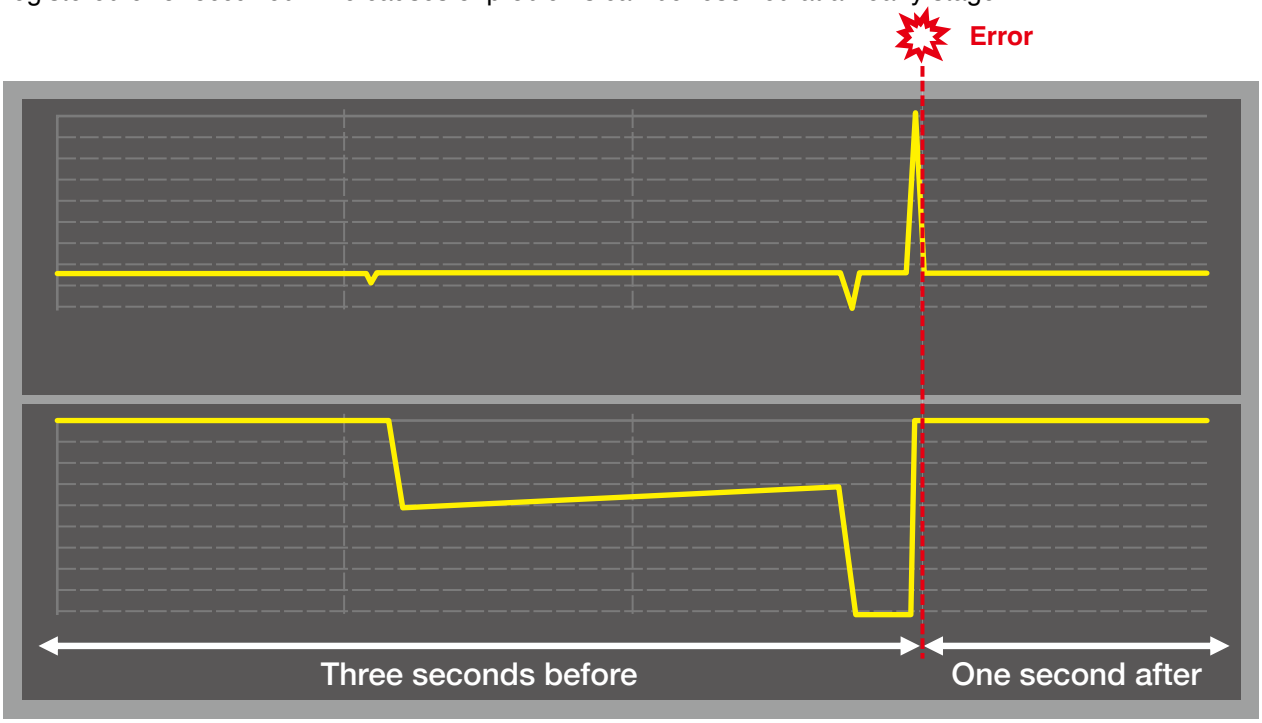


The calendar view is useful to easily check which dates have data backups and select a particular backup to restore the robot settings. Since the data backup is automatically completed, robot operation no longer needs any bothersome setting.

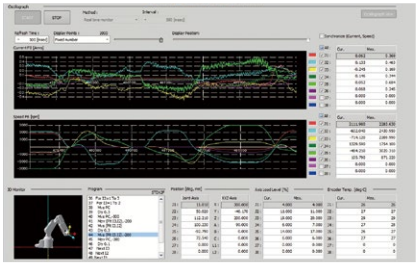
4.Early resolution of causes of trouble: Trouble support function

Drive recorder function

This function saves all applicable robot data (servo commands, servo status, position commands, position feedback, speed feedback, Trq feedback, bus voltage) for three seconds before and one second after a registered error occurred. The causes of problems can be resolved at an early stage.



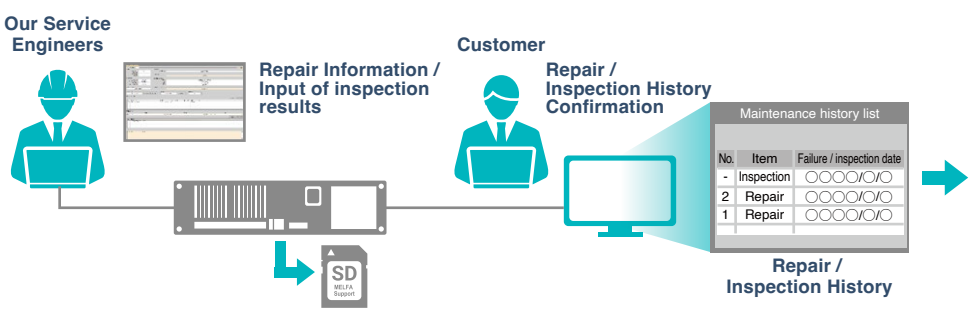
Oscillograph function



This function automatically saves various types of robot data (motor current values for each axis, motor rpm, etc.) at a predetermined time every single day so that it can be used for future reference*2. This saved data is used during various inspection services to check for deterioration over time and identify any malfunctioning parts.

Maintenance history function NEW!

It is possible to check the repair and inspection history that has been carried out.
It is also possible to display reports for each repair and inspection history.

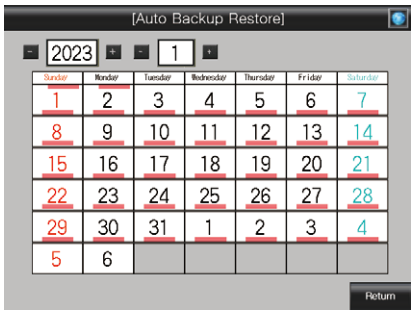


Repair / inspection Report

Sample library for iQ Care MELFA Support NEW!

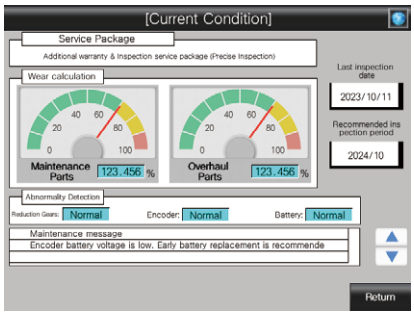
The monitoring service of iQ Care MELFA Support is available from the GOT.

Restoring the automatic backup data



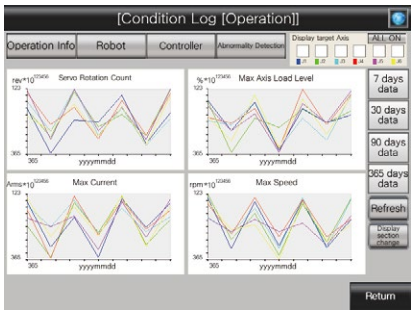
The backup data automatically saved by the recovery function can be restored from the GOT to the robot.

Checking the current condition



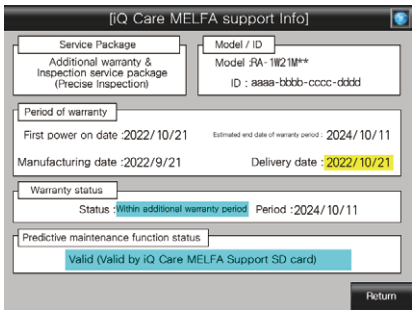
The wear level and error detection status of the service parts and overhaulable parts currently used can be checked.

Checking the condition log



Daily robot condition information (operation information, robot information, controller information, and error detection information) can be checked in graphs.
Analysis of the operating status and confirmation of maintenance requirements are possible from the GOT.

Checking the iQ Care MELFA Support information



The current plan, warranty status, warranty period, etc. can be checked.

This sample library can be downloaded free of charge from the FA site.

Note 1) Only R-Type robot controllers are supported.
Note 2) A GOT (GT25 or GT27 series) and an MELSEC iQ-R Series PLC (R04CPU or higher) are required.
*Please refer to the sample library manual for details.

MEMO

Warranty extension service

With this service, parts covered by the warranty shall be repaired free of charge in the unlikely event that the robot encounters a failure. It is possible to extend the standard warranty period of your robot, and further extensions are available by re-subscribing to the service.

Definition of Warranty period

Without iQ Care MELFA Support

1 | Standard warranty period (free warranty period)

The standard warranty period (free warranty period) is twelve months after the robot is purchased or delivered to the specified location.

After purchasing the robot or delivery to the specified location → 《Standard Warranty Period》 Free one-year warranty

With iQ Care MELFA Support

2 | Extended warranty period (paid warranty period)

The standard warranty period (free warranty period) starts from when the power is first turned on or six months after purchasing the robot, whichever comes first. After the standard warranty period (free warranty period) elapses, the extended warranty period (paid warranty period) continues coverage for the number of years specified by the service.

Up to six months after power is first turned on or after purchase → 《Standard Warranty Period》 Free one-year warranty → 《Extended warranty period》 Paid warranty period

※Re-subscribing to the current iQ Care MELFA Support

3 | Renewing the warranty within the extended warranty period

There shall be a renewal grace period of two months (60 days) after the end of the extended warranty period. During this grace period, you can re-subscribe to the warranty extension service and further extend your extended warranty.

《Standard Warranty Period》 Free one-year warranty → 《Extended warranty period》 Paid warranty period → 《Warranty Renewal Grace Period》 60 days

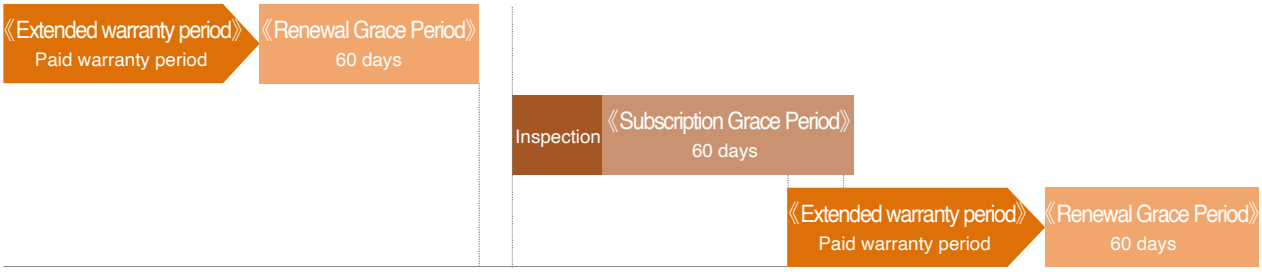
《Extended warranty period》 Paid warranty period → 《Renewal Grace Period》 60 days

＊ If the renewal is made before the end of the grace period, the remaining period of warranty shall be added to the new period.

※Re-subscribing after iQ Care MELFA Support has expired

4 | Extending the warranty after the extended warranty period has expired

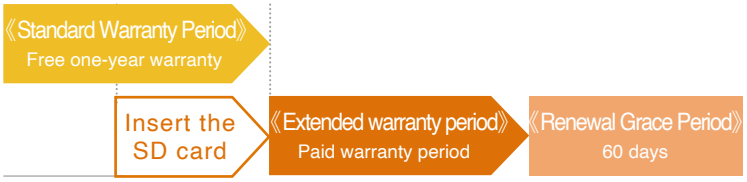
If you do not renew the warranty extension service during the warranty extension plan or inspection plan renewal grace period, coverage will automatically expire. To subscribe to the warranty extension plan again, it is required to receive the iQ Care MELFA Support inspection service beforehand.



＊ If the renewal is made before the end of the grace period, the remaining period of warranty shall be added to the new period.

5 | Extending the warranty during the standard warranty period

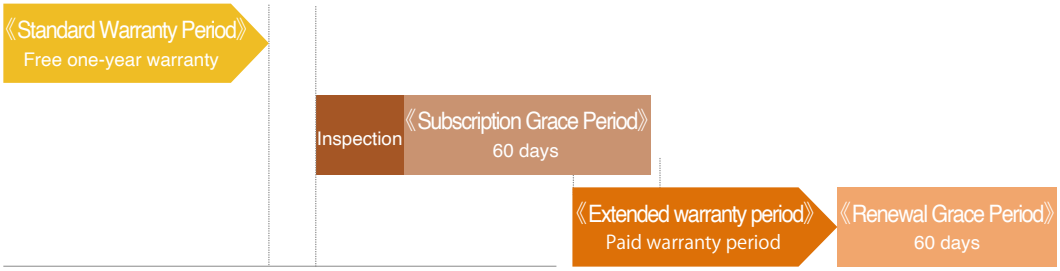
If you purchase the warranty extension plan during the standard warranty period, you can insert the SD card into the robot controller and activate the extended warranty after the standard warranty ends.



＊ The extended warranty period shall commence as soon as the standard warranty period elapses. After inserting the SD card, the robot controller will be able to utilize various functions such as the predictive maintenance function and the monitoring service.

6 | Extending the warranty after the standard warranty period has expired

You will not be able to use the warranty extension plan if you do not purchase it within the standard warranty period. After the standard warranty period expires, there will be a check period that requires the iQ Care MELFA Support inspection service.



＊ Once the inspection service expires, there is a two-month (60 day) warranty renewal grace period. During this grace period, you can purchase the warranty extension service to start the extended warranty period (paid warranty period) for receiving warranty.

Warranty Details

If any of the following parts happen to fail, they shall be repaired free of charge: Components inside the controller, robot PCBs, and encoders. Please note that the warranty shall not cover any failures caused by acts performed by the customer (modifications, collisions, power supply surges, etc.), parts with a limited service life (reducers, ball screws, etc.), and designated special parts.

Inspection service

With this service, a qualified service engineer will visit the location of the robot and perform inspection a detailed inspection. Through our inspection service that is linked to the software package, we can quantitatively determine the robot's operating condition through a quick and highly accurate diagnosis procedure. This enables the early detection of abnormalities and actively prevents robot system failures.

Benefits of the inspection service

Early detection of abnormalities

This service greatly increases the possibility of early detection of abnormalities, reducing the risk of line stoppages due to sudden failures.

Extended robot service life

By performing periodic inspections, checking the condition of parts, and replenishing or replacing consumable parts, it is possible to extend the service life.

Smart equipment planning

Having a better grasp of the robot's condition makes it easier to plan for future equipment. It also helps reduce the costs associated with unexpected repairs.

Two inspection plans

Light inspection ••• For people who want to keep robot downtime for inspection as short as possible

In addition to checking the robot's basic functions, appearance, cables/connectors, the robot's condition will also be diagnosed from stored data. Also, some worn parts such as batteries will be replaced.

Detailed inspection ••• For people who want to thoroughly check the robot's condition.

The contents of the light inspection plus inspection of the inside of the robot and controller, replacement of parts worn by long-term operation such as grease, quantitative measurement diagnosis using measuring instruments are performed.

Name	Estimated hours of labor※1	Inspection details				
		Consumables replacement	Saved data diagnosis	Operation diagnosis	Measurement diagnosis	Preventive maintenance work
Light inspection	1 to 2 hours	△	○	○	×	△
Detailed inspection	4 to 6 hours	○	○	○	○	○

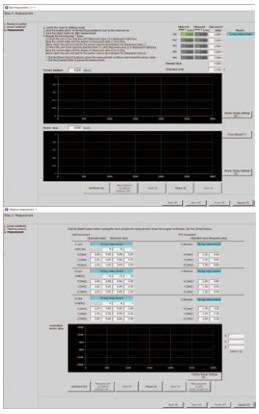
○:Implemented、△:Partially implemented、×:Not implemented

※1 The estimated hours of labor shall only be used as a rough guide. The actual time may vary depending on the installation environment and the robot model.

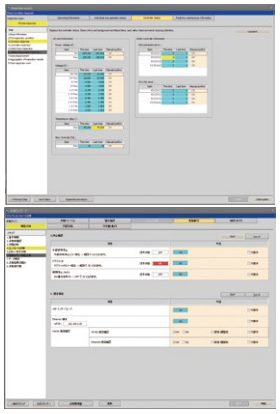
In principle, these procedures will be performed by a single service engineer. We request that customers take appropriate measures to ensure safety supervision during the inspection work.

Digital inspection service

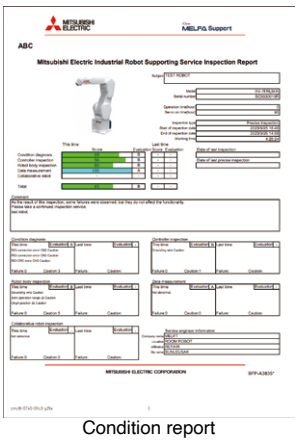
In addition to the conventional inspection service provided by qualified service engineers, we have launched the new digital inspection service that is linked to our software package and measurement devices. Comprehensive digitization is being encouraged through initiatives such as the inspection of new items, partial automation of decision-making processes, and the creation of condition reports. It is now possible to provide more advanced inspection services that lead to higher efficiency and allow for preventative and predictive maintenance programs.



New item inspection



Partially automated decision-making

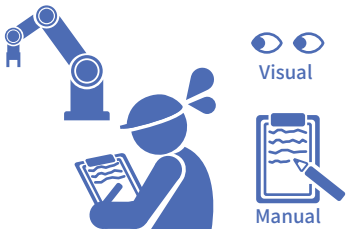


Condition report

Main benefits of the digital inspection service

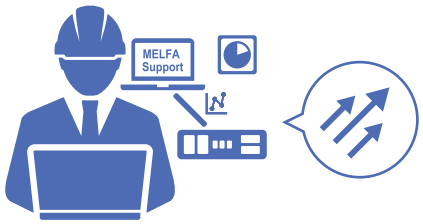
Quantitative judgement using measuring instruments

General inspection



Mainly consists of sensory assessments by a service engineer.

iQ Care MELFA Support Inspection Service



Using measuring instruments to perform quantitative measurements allows you to determine the system condition without having to rely on the skill of the engineer.

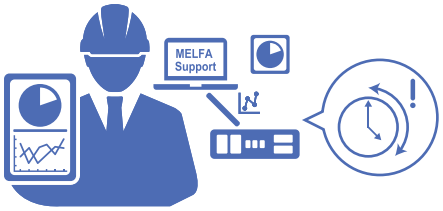
Improved quality of service inspections

Linking the robot software with our inspection service

General inspection

Low efficiency as various items need to be inspected visually and manually.

iQ Care MELFA Support Inspection Service

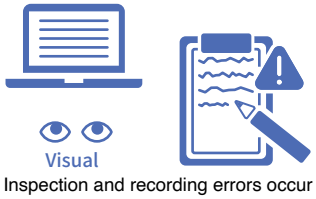


Linking the inspection service to the dedicated software package allows for inspections that are faster and more efficient than traditional techniques.

Shortened inspection time

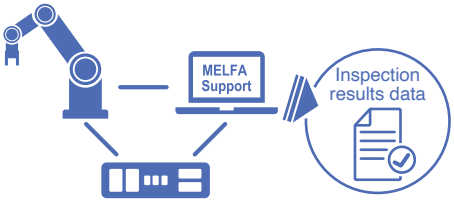
Accumulation of various chronological and inspection data

General inspection



Inspection and recording errors occur due to the visual and manual inspection.

iQ Care MELFA Support Inspection Service



Automatic data entry improves efficiency and prevents errors.

Improved failure analysis accuracy

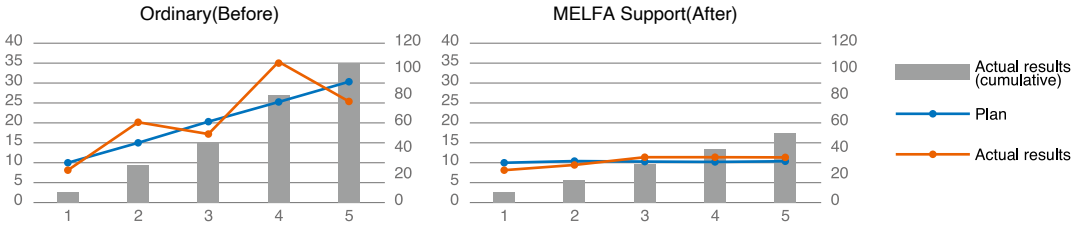
Advantages | Stable maintenance costs

Business owner

It is difficult to predict maintenance costs in the case of a sudden robot failure. I would really like to fix budget...

iQ Care MELFA Support allows free repairs due to the warranty extension service and stable maintenance costs due to the scheduled inspection service. It also helps the management of business indicators.

[Example]

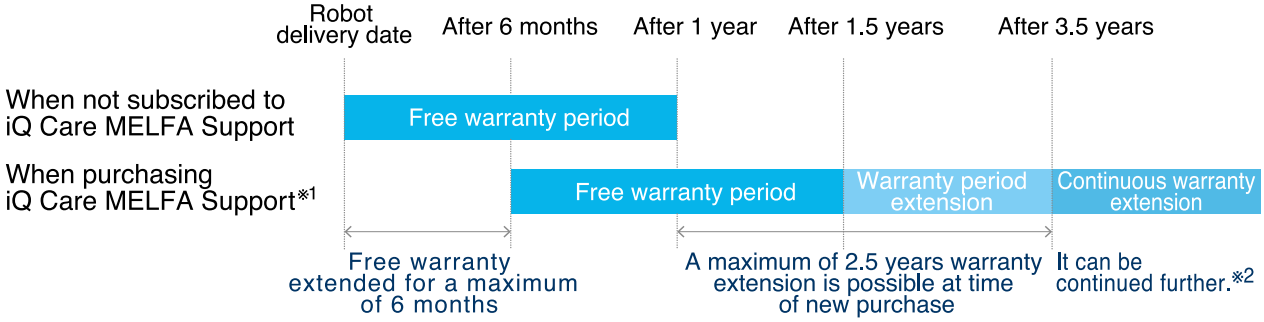


Advantages | An extended warranty period

System integrator・equipmentmanufacturer

Although it comes with a one-year manufacturer's warranty, by the time it is delivered to the end user, the warranty period might be expired.

By purchasing iQ Care MELFA Support, the free warranty period can be extended for up to six months. The extended warranty period can also be renewed so we can confidently recommend it to all end users!



※1 A case where the robot has not been turned on for more than half a year after delivery.

※2 It can be used until the end of each robot's repair-response period.

Advantages | Best timing to ensure stable operation

End user

What do I need to do to ensure the stable operation of not only new robots but also existing robots?

By purchasing our inspection service plan, you can receive inspections by our service engineers at times that are most convenient for you. This allows you to ensure stable operation.

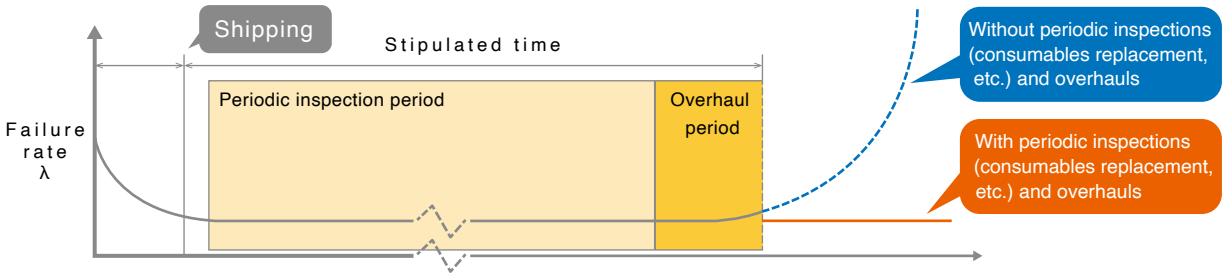


Figure 1. Periodic inspection and overhaul periods

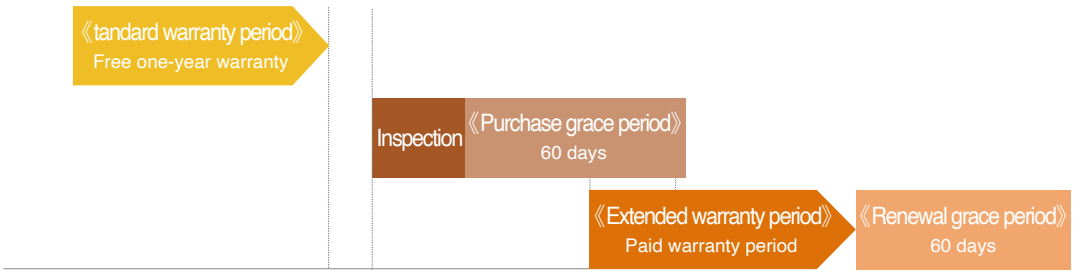
System integrator/equipment manufacturer

It is only possible to use inspection service and warranty extension plans for new robots, right? This doesn't match well with the end user's intentions.

That's not the case. Applicable robots can use our inspection service at any time. If the robot controller version is not supported, our service engineer will perform an upgrade and insert the SD card. Furthermore, if no major problems are identified with the robot after the inspection service, it is possible to purchase our warranty extension plan.※

※ Our inspection service includes both the Light and Detailed inspection plans.

When renewing the extended warranty after it has expired



Advantages | Comprehensive management of historical data

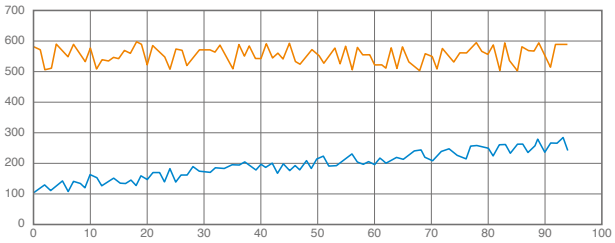
End user

Recently, I've been getting robot errors. I wonder what the situation was like when the robot was first installed.

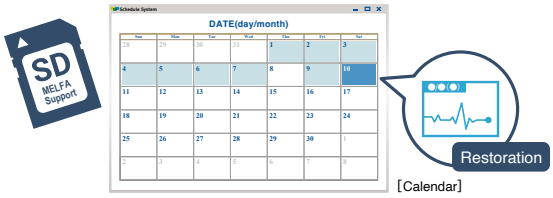
System integrator/ equipment manufacturer

It seems that the end user has deleted their robot program. The deleted program differs from the default startup data. What can I do?

Our monitoring service automatically saves the robot condition data for each day. This makes it easy to check the condition of the robot when it was first installed.



Data backups are automatically saved to the SD card at regular intervals. You can also restore backups using the calendar function.



[Calendar]

Advantages | Advance notification of when each part must be repaired or replaced

End user

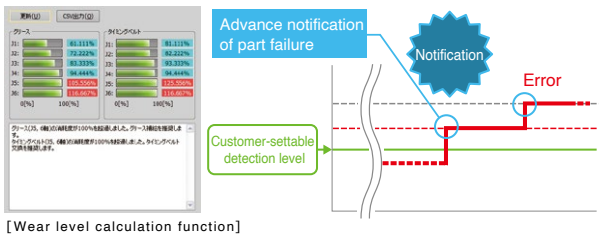
If I had a better understanding of when I would need to repair or replace parts, it would be easier to calculate running costs.

System integrator/ equipment manufacturer

When implementing a new system, customers often ask us about the equipment service life. But what about the robot maintenance period? That is highly dependent on how each robot is operated.

Our solution gives you advance notification of when it is time to repair or replace each part. This greatly improves maintenance efficiency. Since robot part abnormalities or deterioration can be detected in an earlier stage, parts can be replaced before you encounter an erroneous robot stoppage.

With our maintenance simulation function, you can calculate the maintenance period as long as you know the initial robot operation pattern.



[Wear level calculation function]

[Maintenance simulation]

Advantages | Past repair and inspection history can also be checked

End user

I remember this robot breaking down before, but what is it? Can you tell by looking at the email? But it's also a hassle to find emails...

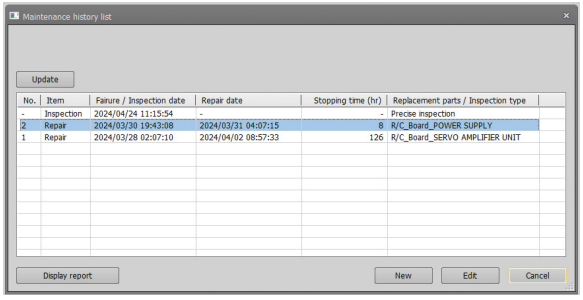
You can use the maintenance history function of iQ Care MELFA Support to check the repair and inspection history of your robot.
It is also possible to display a report for each repair / inspection history, and you can easily check the details of the implementation details.

System integrator/equipment manufacturer

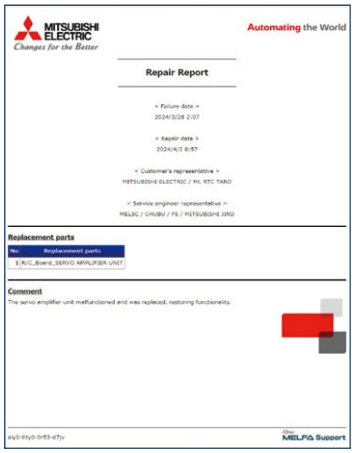
I heard someone had fixed the robot earlier, but I don't have the details. I wonder if there is a simple way for me to figure out parts replaced during repairs and if there were any problems found during the check-up.

IQ Care MELFA Support can give you a list of the last 50 repairs and inspections beforehand.
To access the history, simply click the button.
The process is straightforward.

Repair / Inspection History



Repair / inspection Report



Advantages: Checking the monitoring service with the GOT

End user

I wonder if there are any easy ways for operators to check the robot's condition during daily inspections.

By using the sample library for iQ Care MELFA Support, the robot's condition can be checked from the GOT at the production site.
The sample library can be downloaded free of charge from the FA site.

System integrator/equipment manufacturer

It seems that the end user accidentally deleted a program.
We need to recover the program as soon as possible, but bringing a PC to the production site involves complicated procedures.

By using the sample library for iQ Care MELFA Support, it is possible to restore backup data from the GOT at the production site for a specified date.
The backup data is automatically saved on a regular basis, and thus there is no need to worry in case of emergency.

Service name rules

RA- 1W 11M JP

Fixed characters	Year of warranty※1	Inspection※2	Country of sale※3

Plan name		Monitoring service		Inspection service		Warranty extension service
		Predictive maintenance function※4	Condition monitoring function Recovery function Trouble support function	Light inspection	Detailed inspection	Warranty extension
1-year warranty extension plan	RA-1W00M**	1 year	Unlimited	Not covered	Not covered	1 year
2-year warranty extension plan	RA-2W00M**	2 years				2 years
Inspection service light inspection plan	RA-0W11M**	1 year	Unlimited	Once	Not covered	Not covered
Inspection service detailed inspection plan	RA-0W21M**			Not covered	Once	
1-year warranty extension + Inspection service light inspection	RA-1W11M**	1 year	Unlimited	Once	Not covered	1 year
1-year warranty extension + Inspection service detailed inspection plan	RA-1W21M**			Not covered	Once	

※1 Warranty extension service (0W: No extension, 1W: 1-year extension, 2W: 2-year extension)
※2 Inspection service (00M: No inspection, 11M: Light inspection × 1, 21M: Detailed inspection × 1)
※3 Country (region) of sale identification code
If using this product overseas, be sure to purchase it in the country where the robot is installed. Please contact us for more details.
※4 In the case of the warranty extension service, it can be used during the software recognized warranty period. In the case of the inspection service only, it can be used for one year. For more details, please refer to the Industrial Robot Support Service iQ Care MELFA Support Instruction Manual.

Applicable models※5

○: Applicable ×: Not applicable

Service items	Service contents	FR Series(－D/－R/－Qtypes)※7				CR Series				ASSISTA
		RV-2/4/7/13FR(L)、RV-20FR、RV-7FRLL	RV-35/50/80FR	RH-3/6/12/20FRH	RH-3FRHR	RH-3/6CRH-D	RH-10/20CRH-D	RV-8CRL-D	RV-12CRL-D	RV-5AS-D
Monitoring service	Predictive maintenance function	○	×	○	○	○	×	○	×	×
	Condition monitoring function Recovery function Trouble support function	○	○	○	○	○	○	○	○	○
Inspection service※6	Light inspection	○	○	○	○	○	○	○	○	○
	Detailed inspection	○	○	○	○	○	○	○	○	○
Warranty extension service	Warranty extension	○	○	○	○	○	○	○	○	○

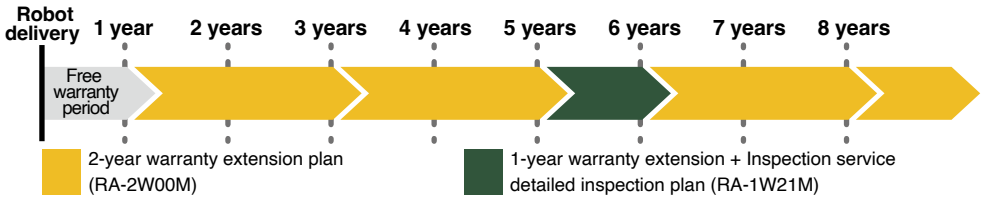
※5 For more details regarding special models (-S), please contact us or one of our sales agents.
Please refer to the Industrial Robot Support Service iQ Care MELFA Support Instruction Manual for more details regarding compatible robot controller software and RT ToolBox3 versions.
※6 Additional costs may apply for the inspection service.
※7 For -R/-Q type controllers, an Ethernet cable (sold separately) is required. For more details, please refer to the Industrial Robot Support Service iQ Care MELFA Support Instruction Manual.

Planning over the entire service life

We recommend long-term plans that combine the warranty extension and inspection plans.

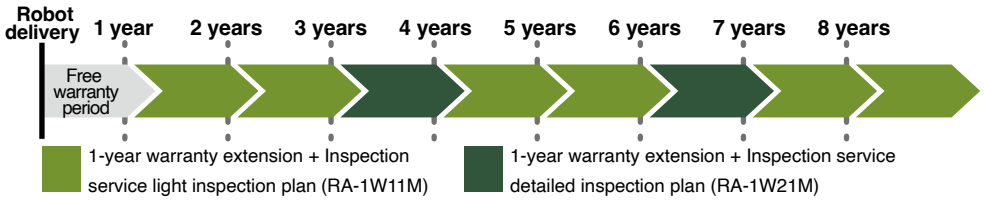
Recommendation plan A

- Robot rate of operation is low
- I wish to reduce maintenance costs



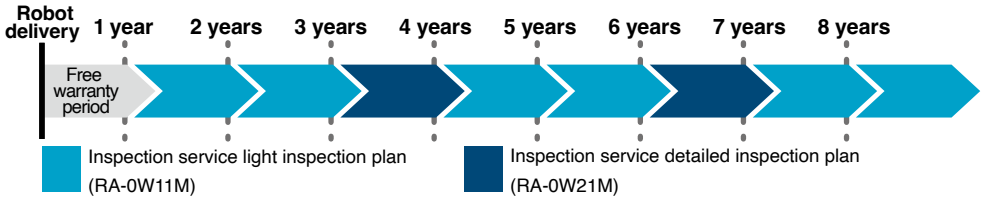
Recommendation plan B

- Robot rate of operation is high
- I have no time to perform maintenance
- I have concerns regarding in-house maintenance due to inexperience



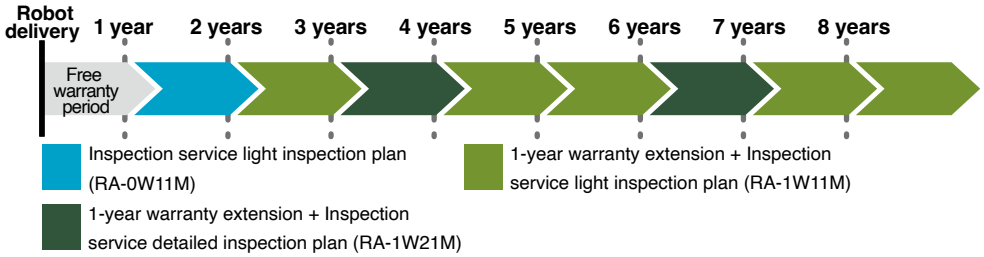
Recommendation plan C

- It is no problem if repairs are charged for each occurrence
- I wish to perform annual inspections



Recommendation plan D

- I wish to have an inspection of equipment currently in operation
- After that, I would like to get a warranty extension.

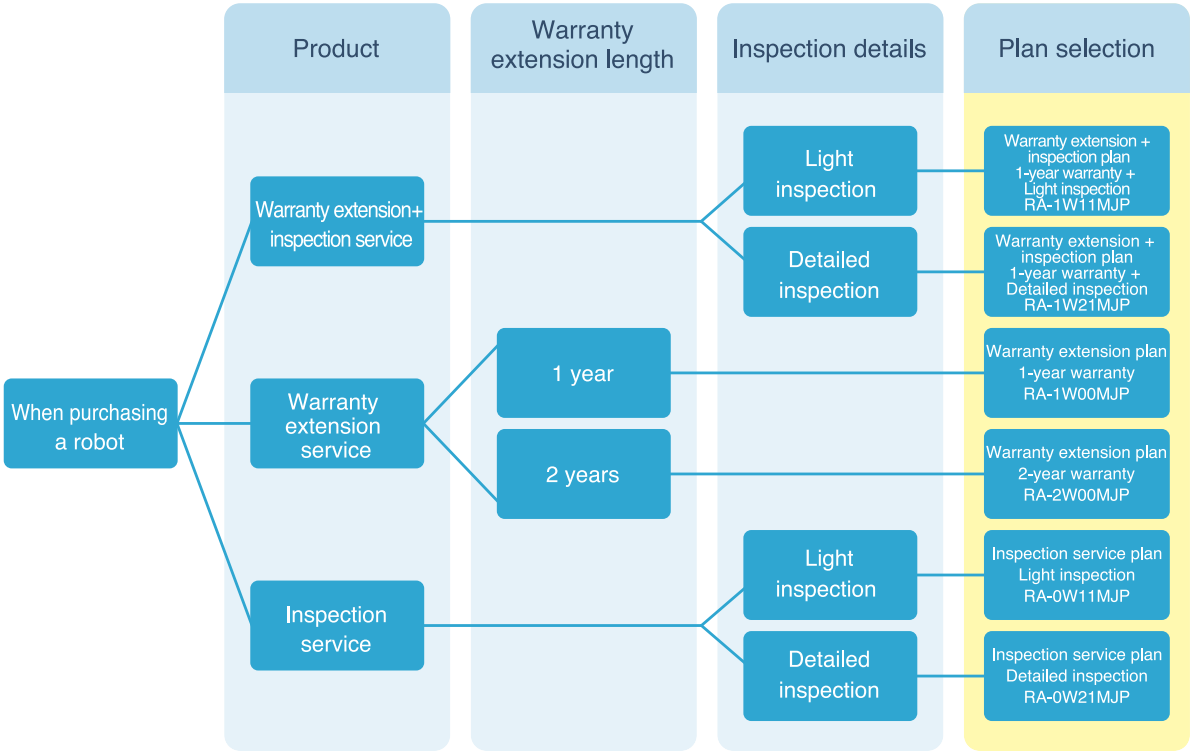


During the Detailed Inspection, we use measuring instruments to determine the condition with high accuracy and apply grease.
We recommend performing this at the overhaul time (after 24,000 hours of operation) or every three years.

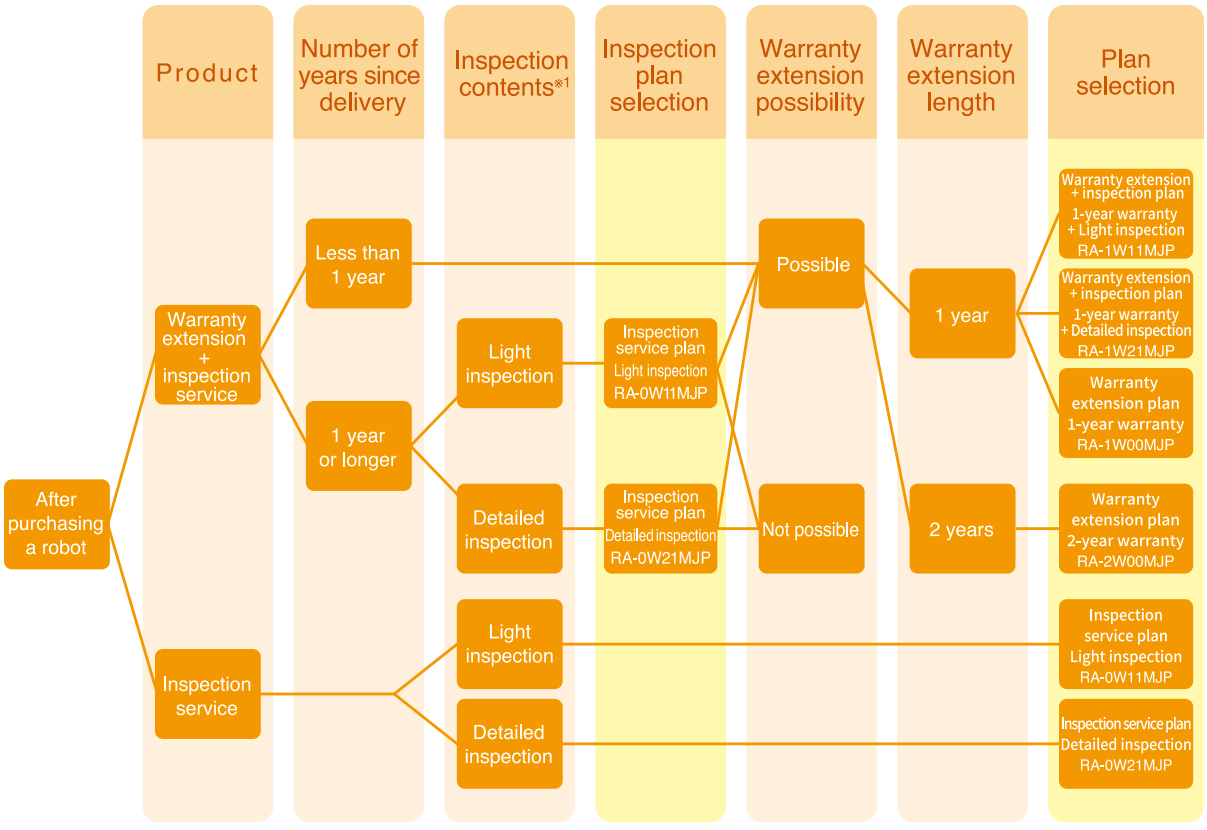
Planning template (memo) Please use this template for planning services over the robot's entire service life.

	Service name	Robot delivery	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years
1-year warranty extension plan	(RA-1W00M)									
2-year warranty extension plan	(RA-2W00M)									
Inspection service light inspection plan	(RA-0W11M)									
Inspection service detailed inspection plan	(RA-0W21M)									
1-year warranty extension + Inspection service light inspection plan	(RA-1W11M)									
1-year warranty extension + Inspection service detailed inspection plan	(RA-1W21M)									

iQ Care MELFA Support Plan Selection when purchasing a robot



iQ Care MELFA Support Plan Selection after purchasing a robot



※1 If the robot controller version is not supported, our service engineer will perform an upgrade once the service is available.
※2 If more than one year has passed since the robot was purchased, please purchase the inspection service plan.

List of inspection items

Inspection items for the precise/simple inspections are shown in the table below.

*Depending on the customer's environment and the customer's robot usage, there may be items that cannot be carried out at the time of the visit.

(1) Check before inspection

○: Performed △: Partially performed ×: Not performed

No.	Item		Precise inspection	Simple inspection	Remarks
1	Checking operating information	Running time information	○	○	
2		Servo on information	○	○	
3		Servo revolutions	○	○	
4		Number of brake release times	○	○	
5	Checking the operation status of each axis	Max. encoder temperature	○	○	
6		Max. axis load level	○	○	
7		Max. torque error	○	○	
8		Max. current	○	○	
9		Max. regeneration level	○	○	
10	Checking the controller status	Power supply voltage	○	○	
11		Control power voltage	○	○	
12		Controller in-panel temperature	○	○	
13		Max. override	○	○	
14		RIO communication error count	○	○	
15	Checking predictive maintenance information	Consumption degree of maintenance parts and their remaining time	○	○	The items are subject to inspection when the predictive and preventive maintenance function is enabled.
16		Consumption degree of overhaul parts and their remaining time	○	○	
17		Reduction gear error detection status	○	○	
18		Encoder communication error detection status	○	○	
19	Checking maintenance forecast information	Remaining time for maintenance parts	○	○	The item is subject to inspection when the predictive and preventive maintenance function is disabled.

(2) Inspection of the robot controller

No.	Item	Precise inspection	Simple inspection	Remarks
1	Appearance check	○	○	
2	Checking the cables	○	○	
3	Voltage check	○	×	
4	Battery replacement	○	○	For Q-Typer only
5	Stop check	○	○	
6	Checking the communication function	○	○	
7	Checking the connectors	○	×	
8	Inspection of the inside of the controller	○	△	Replace the filter and clean the fan even for the simple inspection.
9	Appearance check for the teaching pendant	○	○	
10	Operation check for the teaching pendant	○	○	

(3) Inspection of the robot

No.	Item	Precise inspection	Simple inspection	Remarks
1	Appearance check	○	○	
2	Checking the cables	○	○	
3	Checking the grounding wire	○	○	
4	Backlash check	○	○	
5	Checking for grease leakage	○	○	
6	Checking drive noise	○	○	
7	Checking vibration	○	○	
8	Timing belt check	○	×	
9	Timing pulley check	○	×	
10	Internal inspection	○	×	
11	Reduction gear grease replenishment	○	×	
12	Checking silicone grease	○	×	
13	Checking the joint operating range	○	○	
14	Checking the origin position	○	×	
15	Checking the ABS mark	○	×	
16	Battery replacement	○	○	Not applicable to models that do not require a battery

(4) Collaborative robot function check *For collaborative robots only

No.	Item	Precise inspection	Simple inspection	Remarks
1	STR function check	○	○	For collaborative robots only
2	Checking the operation of the operation button on the arm	○	○	
3	Checking the status indicator LED on the arm	○	○	

(5) Data measurement

No.	Item	Precise inspection	Simple inspection	Remarks
1	Backlash measurement	○	×	
2	Vibration measurement	○	×	
3	Position repeatability measurement	○	×	
4	Servo drop measurement	○	×	

(6) Confirmation after inspection

No.	Item	Precise inspection	Simple inspection	Remarks
1	cleaning	○	○	

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Our lineup of products ranges from controllers, drivers, and power management and energy-saving devices and also provides a flexible industrial network that connects each product line. Software and technology for data monitoring and controlling systems - such as SCADA, Cloud, and Edgecross - together with worldwide IT/OT partners, we fully support system construction and opperation. Mitsubishi Electric FA has everything to make IoT and Digital Manufacturing a reality.

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Mitsubishi Electric's Product Security Initiatives.

e-F@ctory

Mitsubishi Electric's e-F@ctory concept utilizes both FA and IT technologies, to reduce the total cost of development, production and maintenance, with the aim of achieving manufacturing that is a "step ahead of the times". It is supported by the e-F@ctory Alliance Partners covering software, devices, and system integration, creating the optimal e-F@ctory architecture to meet the end users needs and investment plans.

e-F@ctory Alliance

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