



for a greener tomorrow



**MITSUBISHI  
ELECTRIC**

*Changes for the Better*

**FACTORY AUTOMATION**

# FA Application Package iQ Monozukuri Smart Work Navigator

**e-Factory**



- ▶ Applicable to various work support systems!
- ▶ Work instruction sheets are easily created with the data setting tool!
- ▶ Work records visualization with the BI tool supports analysis and improvement!



**iQ** Monozukuri

# GLOBAL IMPACT OF MITSUBISHI ELECTRIC



Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

## ***Changes for the Better***

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximizing the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

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.

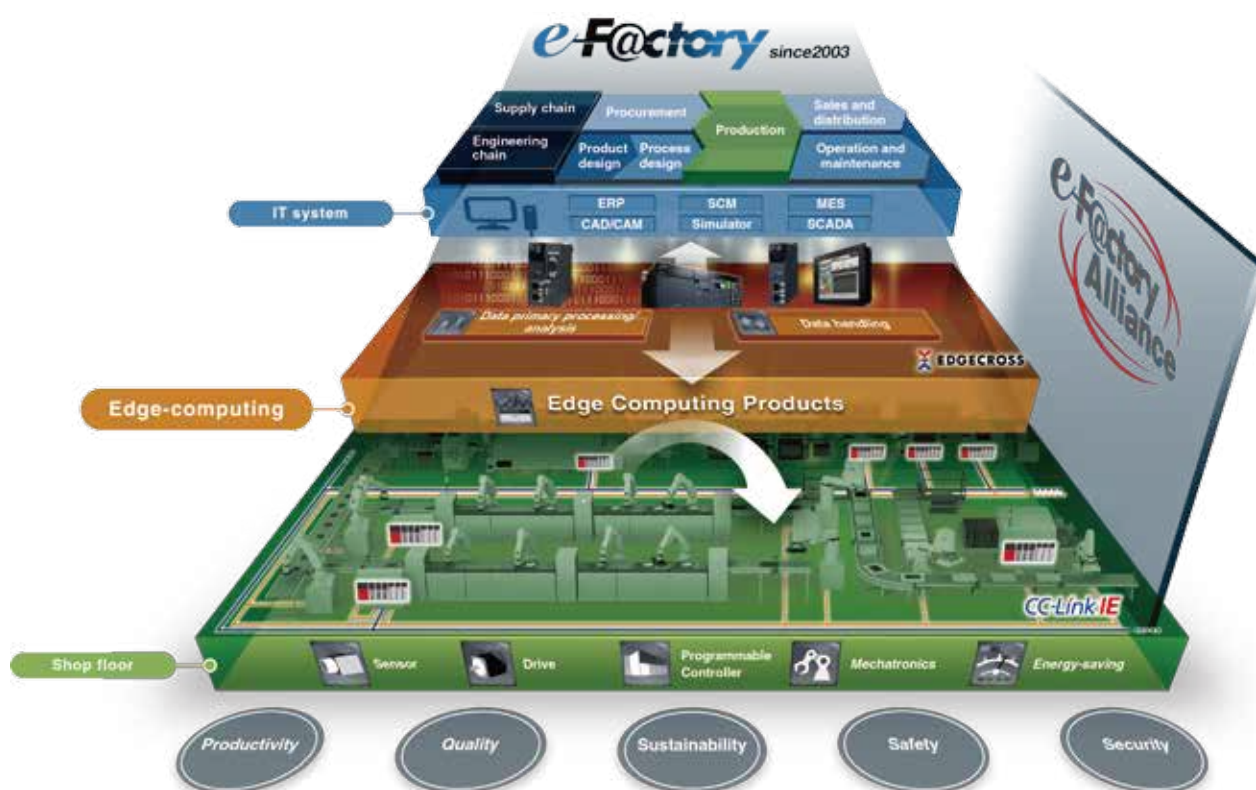
### **Industrial Automation Systems**

Maximizing productivity and efficiency with cutting-edge automation technology.



# e-F@ctory

e-F@ctory is a concept for a further step on "Monozukuri", which reduces the total cost for development, production, and maintenance, and continuously supports improvement activities of the customer by utilizing the FA technology and IT technology.



In the increasingly complex manufacturing sites, coordination between "Man" and "Machine" through the best use of information from the production site is a key concept.

Productivity and quality can be improved not only with the information obtained from the devices at the production site, but the improvement triggered by on-site notice and flexible human actions. Similarly, automatic adjustment of equipment based on the information recognized by human is indispensable for the promotion of automation.

We have realized the "Next-generation manufacturing" through the use of the "e-F@ctory" information proposed by Mitsubishi Electric, the effective and flexible manufacturing realized through the coordination between man and machine, and the optimization of the production site, and the entire supply chain and engineering chain.



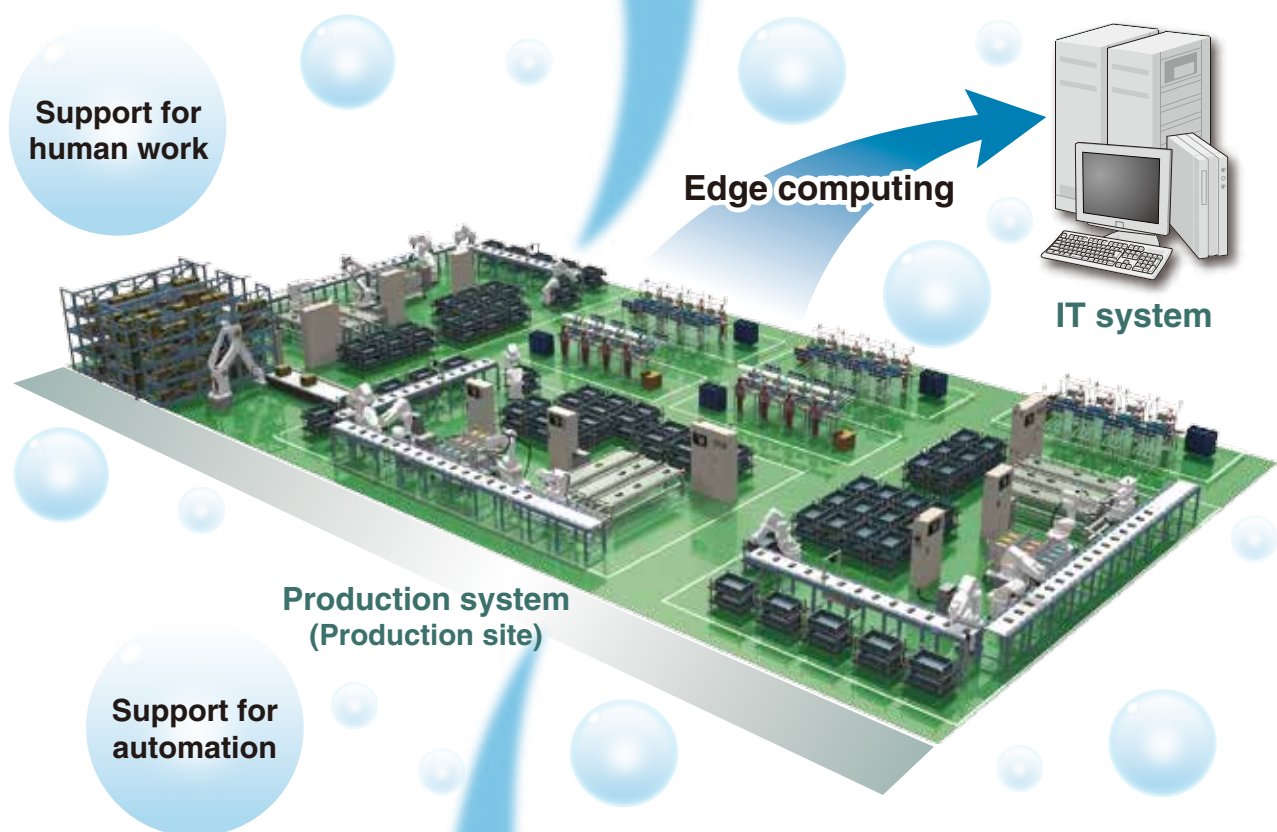


## " iQ Monozukuri " is a step toward achieving e-F@ctory.

The FA application package "iQ Monozukuri" is a product that has been optimized through the accumulation of knowhow, which supports various problem solutions of the customer during manufacturing, and enables effective system installation, expansion, and operation/maintenance.

### What iQ Monozukuri provides

- A wide range of applications prepared by "process", "usage", and "equipment"
- Know-hows and ideas about "Monozukuri" accumulated by Mitsubishi Electric and our partners over the years
- System consisting of highly reliable FA products manufactured by Mitsubishi Electric and partner companies



### FA products

Mitsubishi Electric has been making persistent technical innovations from small-batch production systems to the developed flexible production systems in order to comply with the needs of the customers. It offers a wide range of extremely diverse FA products from control devices, driving devices, energy-saving support devices, and power distribution control devices to industrial mechatronics. It plays an active part in every production site for the purpose of automation, energy-saving, and quality improvement.



# FA Application Package Features of iQ Monozukuri Smart Work Navigator

It supports all phases including installation, operation, analysis, and improvement in order to perform picking or screw tightening work effectively and properly!

## Installation

Flexible system configuration,  
Creation of work instruction sheet

- ▶ Quick startup with the screen data and control program included in the package!
- ▶ System construction according to the usage or scale!
- ▶ Work instruction sheets are easily created and managed with the data setting tool!



## Operation

Improvement in productivity and quality,  
Collection of work records

- ▶ Display device navigates work details and procedures!
- ▶ Lamps indicate which part or tool should be used!
- ▶ Work records are collected in the database!



## Improvement

Re-training of workers,  
Revision of process and design

- ▶ The cause of the problem is investigated!
- ▶ An improvement plan is proposed and implemented!



## Analysis

Analysis by the BI tool\*1

- ▶ Work records accumulated in the database are visualized with the BI tool\*1!
- ▶ Problems of production delay or defective parts are extracted by analyzing from various perspectives!

\*1: Business intelligence tool



Repeating these procedures leads to further

**"improvement in productivity and quality".**



# Quick Steps from System Design to Startup!

## ► Quick installation with the project file and tool included in the package!

The project file (screen data and control program) and data setting tool are included in the product package.

They can be used simply by writing to the GOT, writing to the PLC, creating the definition files and creating the work instruction sheets.<sup>\*1</sup>

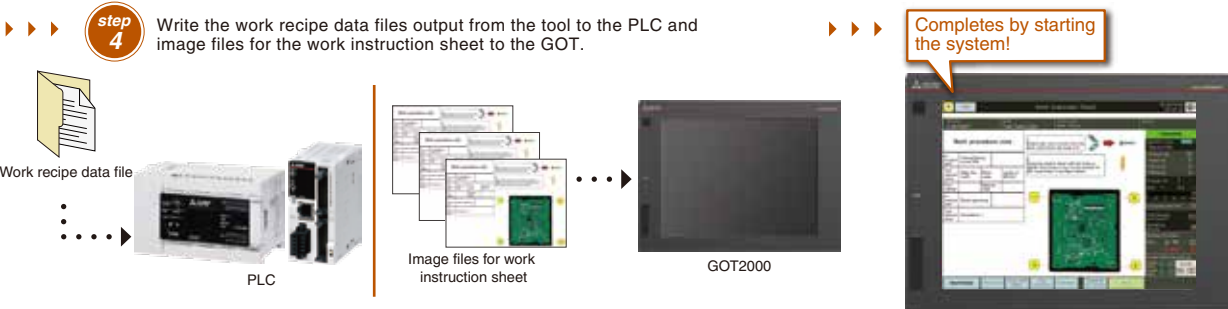
<sup>\*1</sup>: It is necessary to request a license key beforehand and write it to the PLC.

The start-up procedure differs depending on the display device used.

The following describes the procedure using the GOT.

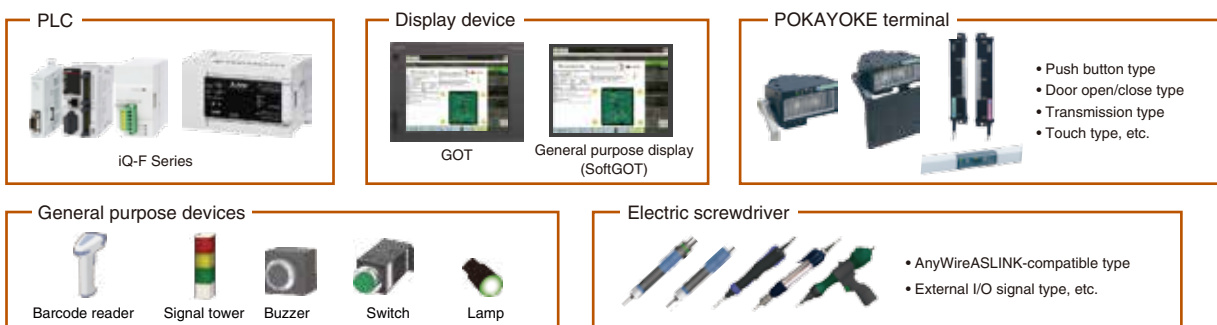


<sup>\*2</sup>: It is necessary to create definition files beforehand.



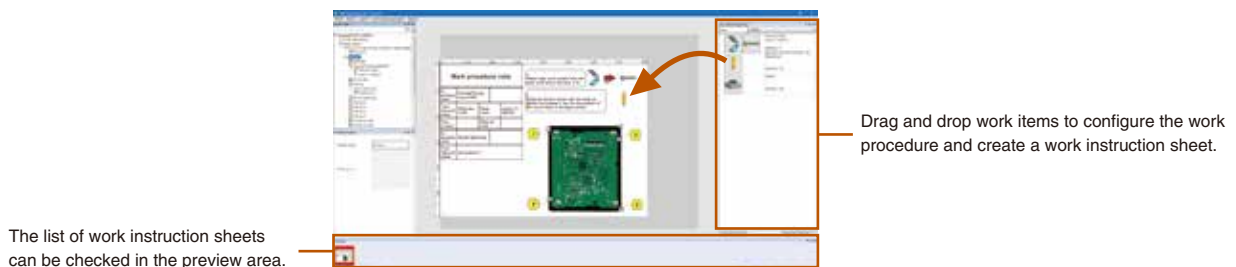
## ► Flexible system configuration

Devices can be selected according to the usage or scale.



## ► Work instruction sheets are easily created and managed with the data setting tool!

With the data setting tool, the work instruction sheet can be created simply by dragging and dropping the system components and work components.



# Navigation of Picking and Assembly Work! Collection of Work Records

## ► Lamps indicate which part or tool should be used! Display device navigates work details and procedures!

### Advantages

- ✓ The time loss on selection of parts and tools can be eliminated!  
(Case of Mitsubishi Electric's production site)
- ✓ Errors such as incorrect mounting can be eliminated! (Case of Mitsubishi Electric's production site)
- ✓ The quality is improved as beginners can work like veterans!

### ● In the case of picking work

#### Stockout prevention with an alarm on the signal tower

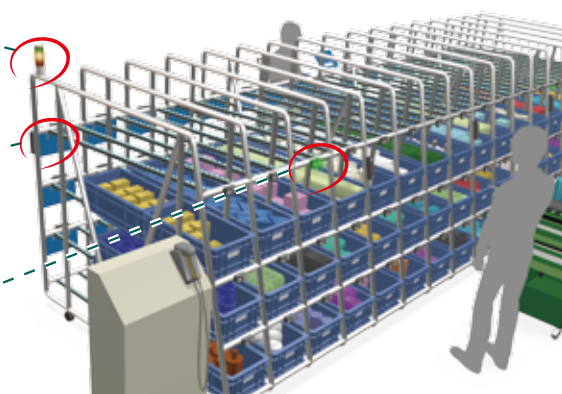
Avoiding stockouts thanks to an alarm triggered by stock shortage.

#### Wrong supply prevention with door-type shelves

Door-type POKAYOKE terminals on the supply side prevent wrong parts supply.

#### Lamp indication of parts to be picked up

Lamp indication of the target parts shelf helps beginners to choose parts.



### ● In the case of screw tightening work

#### Work instruction display on the screen for screw tightening, etc

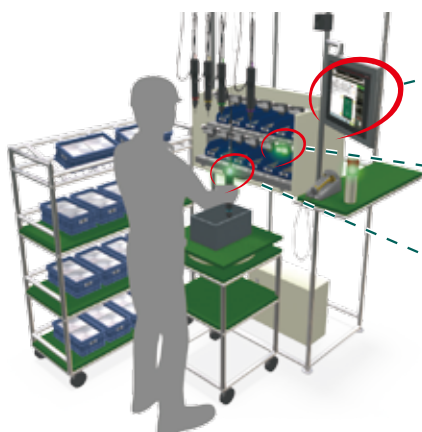
Screen display of work procedure such as screw tightening helps beginners to perform work.

#### Lamp indication of parts to be used

Lamp indication of the target screw (parts) shelf helps beginners to choose parts.

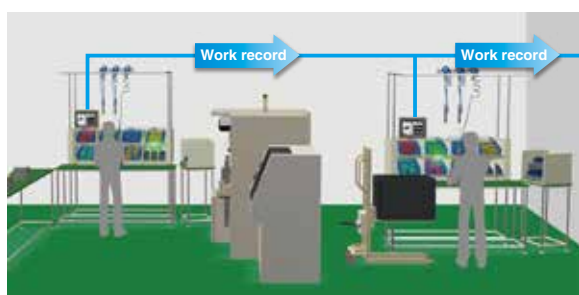
#### Lamp indication of electric screwdriver to be used

Lamp indication of electric screwdriver to be used saves time for tool selection.



## ► Work records are collected in the database!

The work records of picking and screw tightening are collected in the database server.



Ethernet



Database server

# Collected Work Records are visualized and Problems are Extracted

With the BI tool, the work records are visualized in accordance with the purpose of the manager. Examples of screens of the BI tool are shown below.

## Average cycle time graph

This graph displays the average work time (average cycle time) from work start to work completion and the standard work time for each model, worker, process, and work table.

► **Effect**  
Identifying the points to be improved



## Alarm occurrence rate graph

This graph displays the alarm occurrence rate of each date, model, or worker. The number of occurred alarms depending on the cause can be checked in the alarm cause graph.

► **Effect**  
Early problem detection, Improvement check



## Screw tightening time graph

This graph displays the minimum/maximum/average values of the screw tightening time for each process.

► **Effect**  
Work efficiency improvement, Planning a training



## Growth curve graph

This graph displays the transition of the work record time per product.

► **Effect**  
Worker's skill check



## Stock alarm occurrence status graph

The upper graph displays the stocks and the stockout warning threshold for the parts shelf which causes a stockout alarm or stockout/stock warning in the selected work table. The lower graph displays the stocks on all the parts shelves in the selected work table.

► **Effect**  
Control of stocks, Stockout prevention



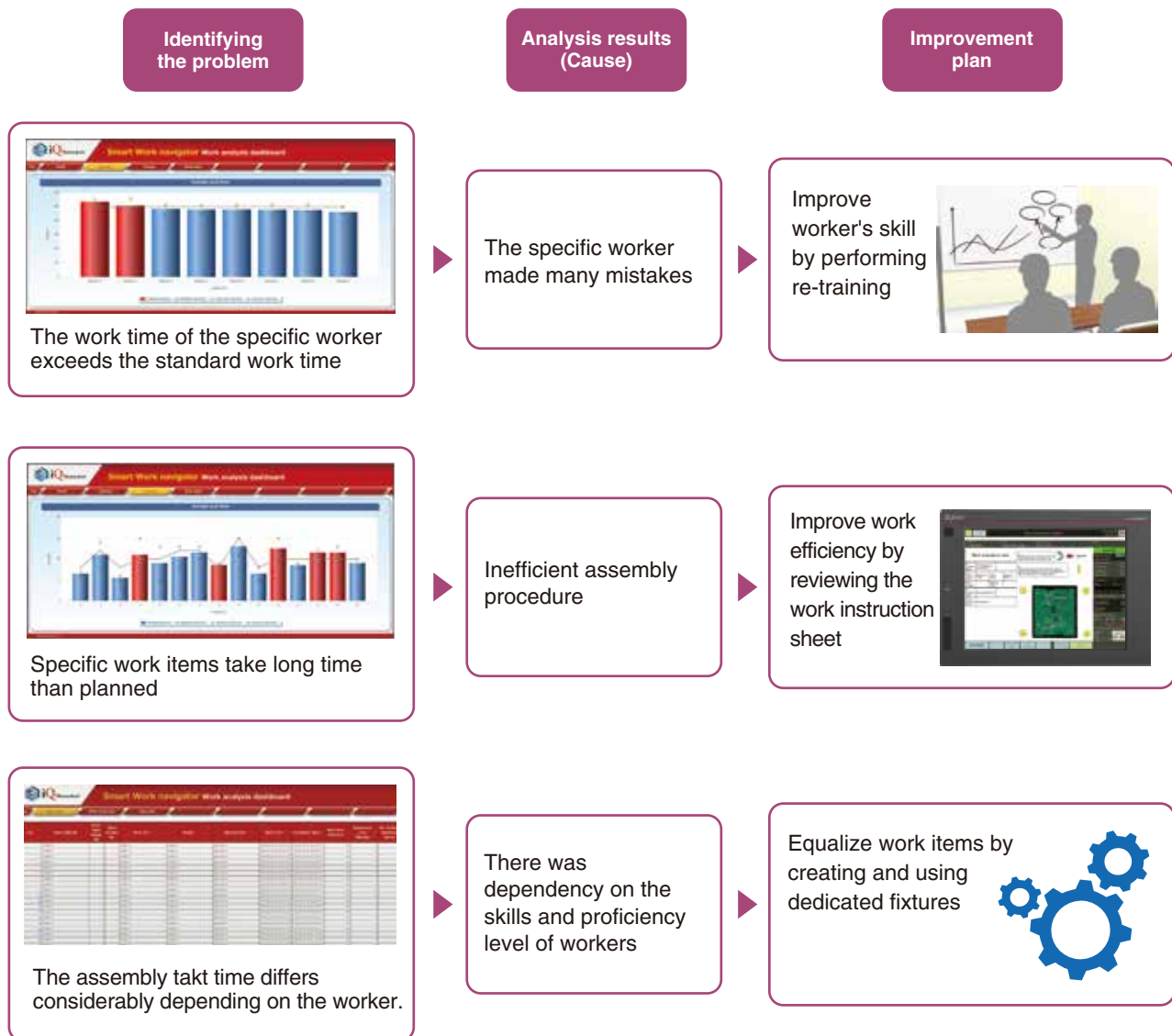
The following list screens can be used as well.

Work record list screen / Work process list screen / Order progress status list screen / Alarm list screen



# The cause of the problem is investigated and an improvement plan is proposed and implemented

The work items that tend to be problematic, such as "work items that tend to fail" and "work items that take time" can be identified on the basis of data visualized by the BI tool. As a result, specific activities for improvement, such as "Re-training of workers" or "Revision of work processes" can be made.



**A specific improvement plan can be seen as in the example above!**

# Installation Example of the Product

**Effect of installation** In addition to the fact that stock management error and assembly defects are eliminated, the following effects are also provided.

- 1 The number of assembled units from the start of training until mastering the work is **reduced by 22%**
- 2 The training time is **reduced by 65%**
- 3 Model switching time is **reduced by 18%**
- 4 Assembly time is **reduced by 12%**

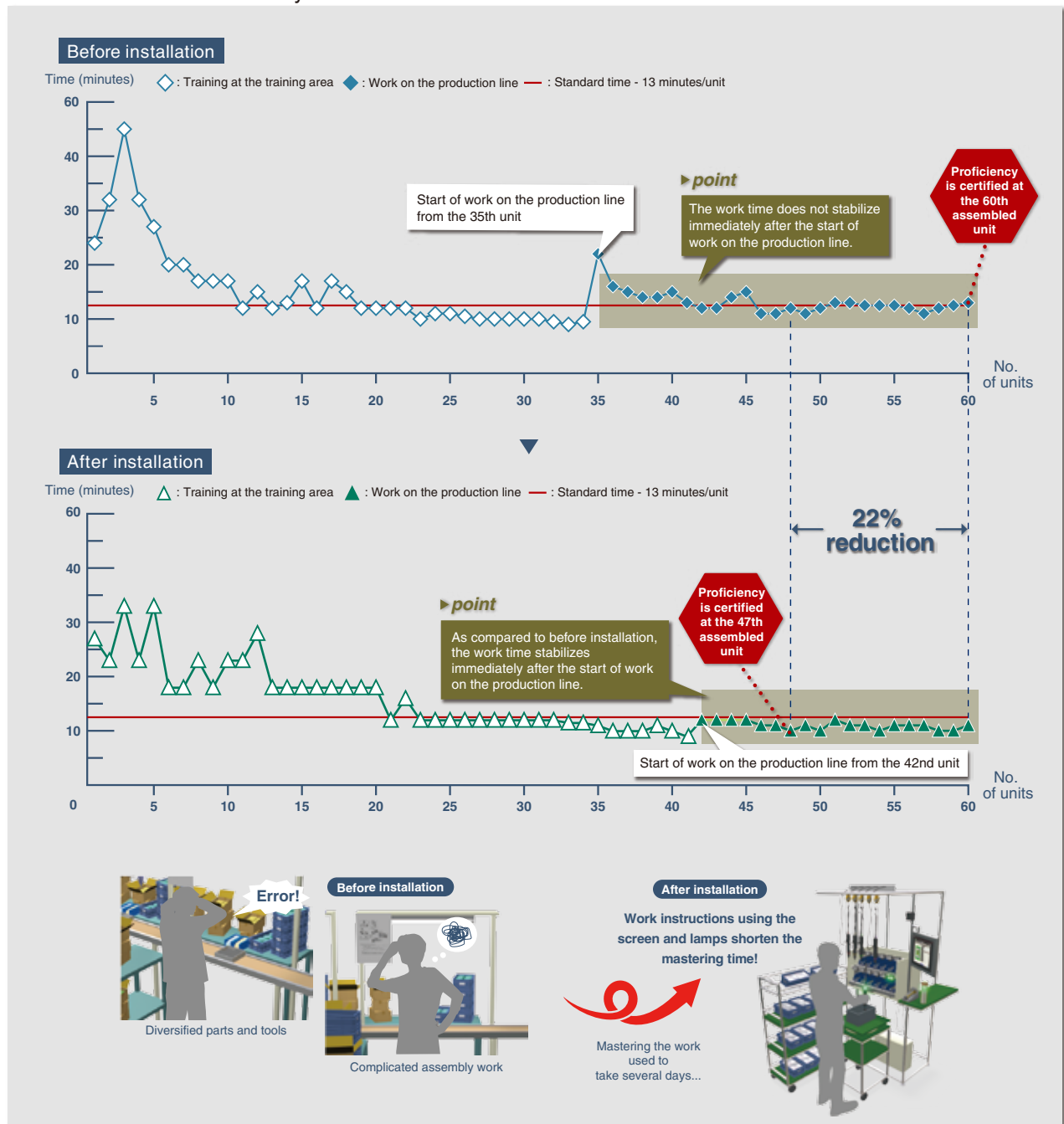
→ These reductions lead to **an increase by 30% in production efficiency!**

This is an example based on the measurement results at the cell production site (assembly process) of Mitsubishi Electric. The effect may vary depending on the usage environment or the judgment criteria of work.

Issue  
1

## Training new workers takes time

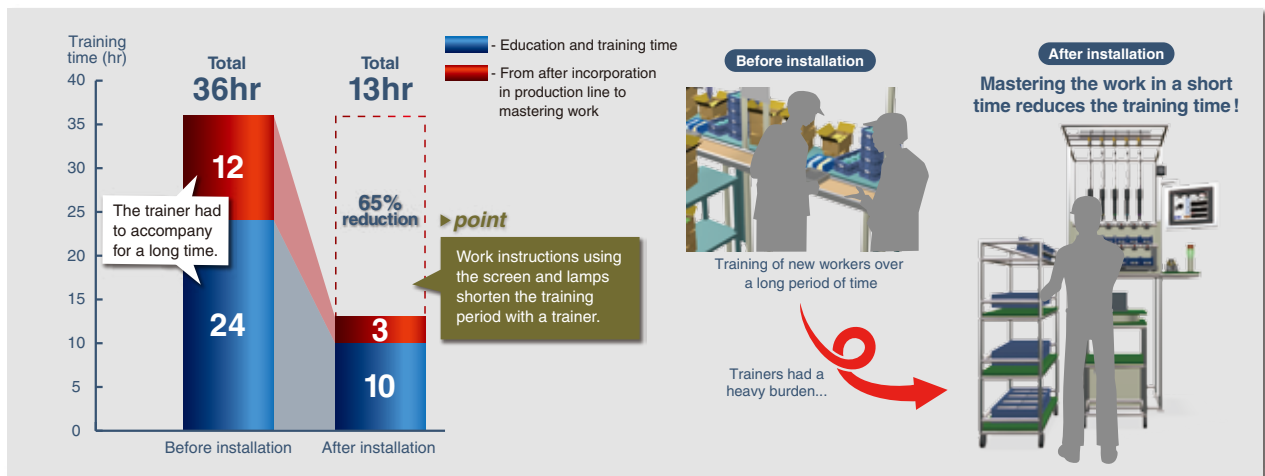
**Effect** ▶▶ The number of assembled units from the start of training until mastering the work is reduced by 22%



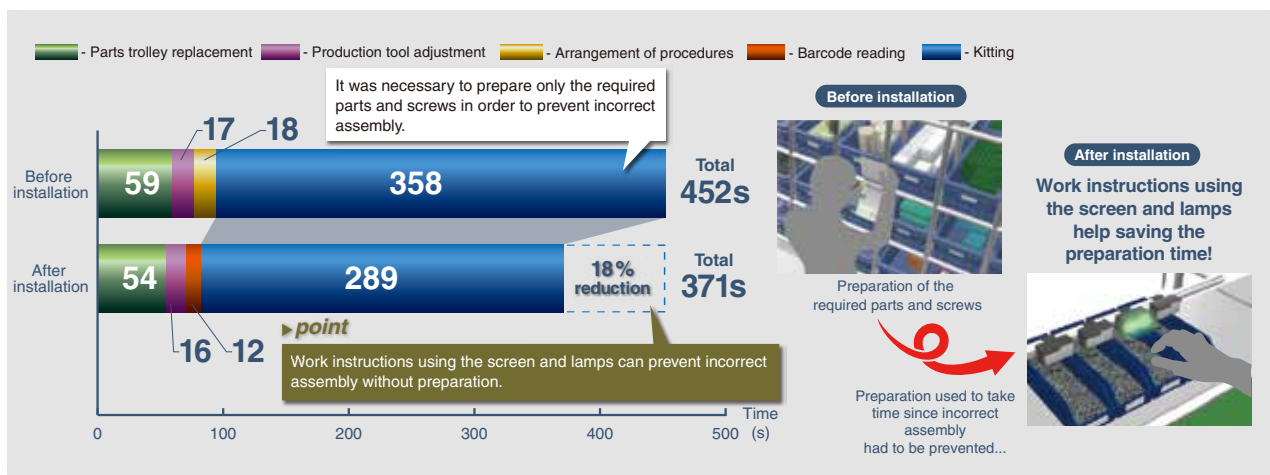


Issue  
2

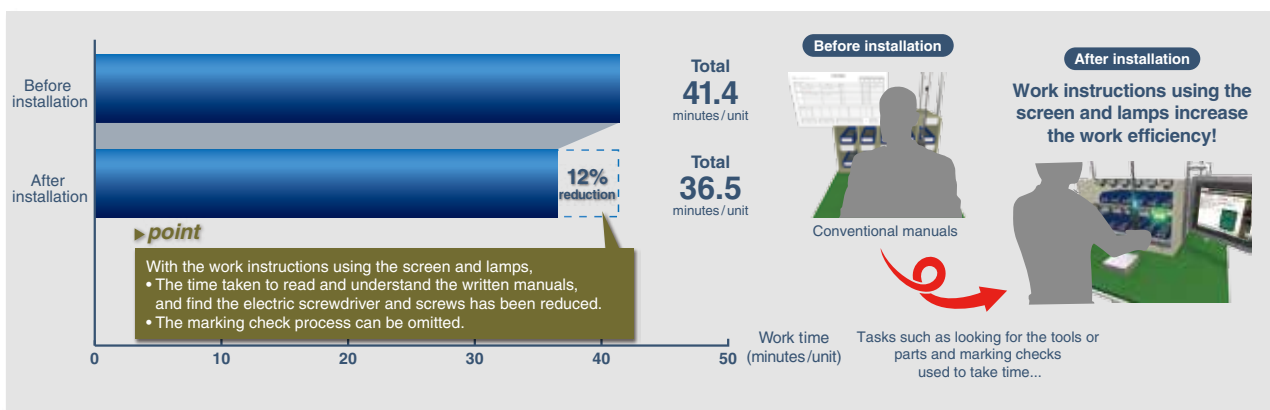
## Training of new workers puts a heavy burden on trainers

Effect ►► The training time is reduced by **65%**Issue  
3

## Setup time is long

Effect ►► Model switching time is reduced by **18%**Issue  
4

## The assembly work takes time

Effect ►► The assembly work time is reduced by **12%**

# Product Contents

This product is composed of software and documents. It is necessary to prepare hardware and engineering software separately. For details, refer to "Necessary Software & Device List (P.19)".

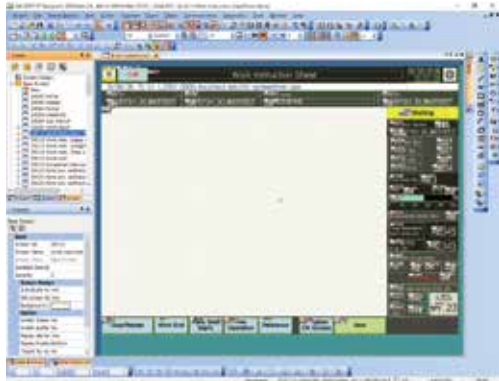
## Software



### Screen data (GT Designer3 project file<sup>\*1</sup>)

<sup>\*1</sup>: MELSOFT GT Designer3 is required.

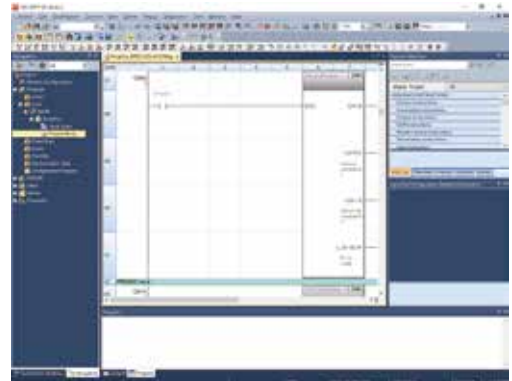
Screen data for displaying the work instruction sheet



### Control program (GX Works2 project file<sup>\*2</sup>)

<sup>\*2</sup>: MELSOFT GX Works2 is required.

FBs for each function.



### Data setting tool

A tool for creating work recipe data and image files for the work instruction sheet<sup>\*3</sup>.



<sup>\*3</sup>: It is necessary to create definition files beforehand.



### PLC-DB Transfer<sup>\*4</sup>

<sup>\*4</sup>: MELSOFT MX Component Ver. 4 is required.

A tool for accumulating the work records acquired from the PLC CPU in the database.



### Analysis template files

Template files for visualizing the work records accumulated in the database with the BI tool (SQL Server Reporting Services).



## Documents



### Manuals (PDF files)

- Startup Manual
- Operating Manual



# Connectable Devices

Smart Work Navigator can be connected with various devices.

Devices can be selected according to the usage or scale of the system to be constructed.

## PLC (MELSEC iQ-F series)



## Display device



GOT



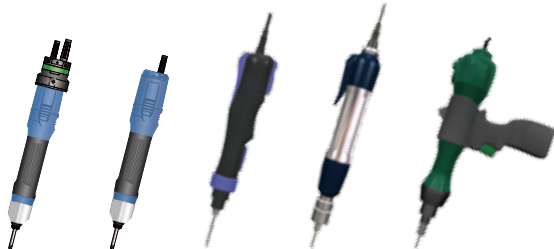
General purpose  
display (SoftGOT)

## POKAYOKE terminal



- Pushbutton type
- Door open/close type
- Transmission type
- Touch type etc.

## Electric screwdriver



- AnyWireASLINK-compatible type
- External I/O signal type, etc.

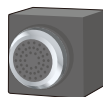
## General purpose devices



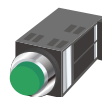
Barcode reader



Signal tower



Buzzer



Switch



Lamp

# Application example

Each production site faces various problems.

System construction depending on the situation and purpose is achieved by selecting devices according to the usage or scale, and it helps solving problems on production sites.

## Case 1 Picking work

### Before installation

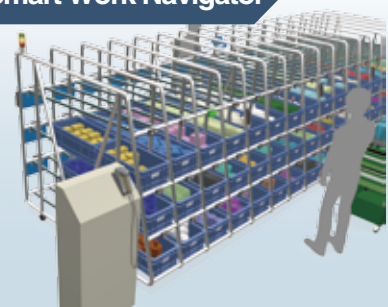


- Finding parts takes time
- Wrong parts pickup/supply should be eliminated



### After installation of Smart Work Navigator

- 1) Lamps indicate which parts should be picked up
- 2) An alarm on the signal tower prevents stockout
- 3) Door-type shelves prevents wrong parts supply



### System configuration example

Package to be used: Smart Work Navigator Entry<sup>1</sup>

Devices to be used:



PLC



POKAYOKE terminal

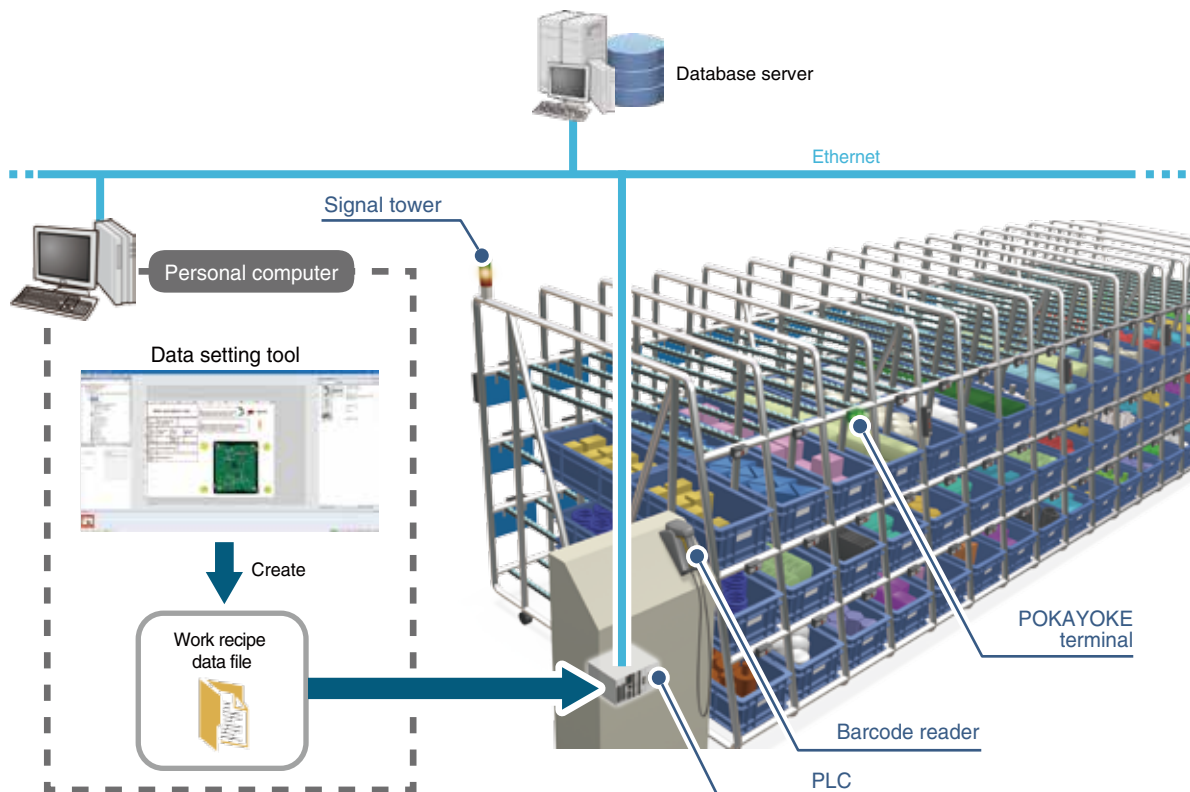


Signal tower



Barcode reader

<sup>1</sup>: For details, refer to "FA Application Package" in "Necessary Software & Device List".





## Case 2 Assembly work

### Before installation



- Work efficiency is poor due to procedure check and parts selection
- Mistakes are repeated



### After installation of Smart Work Navigator

- 1) Lamps indicate which parts should be used
- 2) Work procedure is displayed on the screen
- 3) Work progress can be checked on the screen



### System configuration example

Package to be used: Smart Work Navigator Standard<sup>\*2</sup>

Devices to be used:

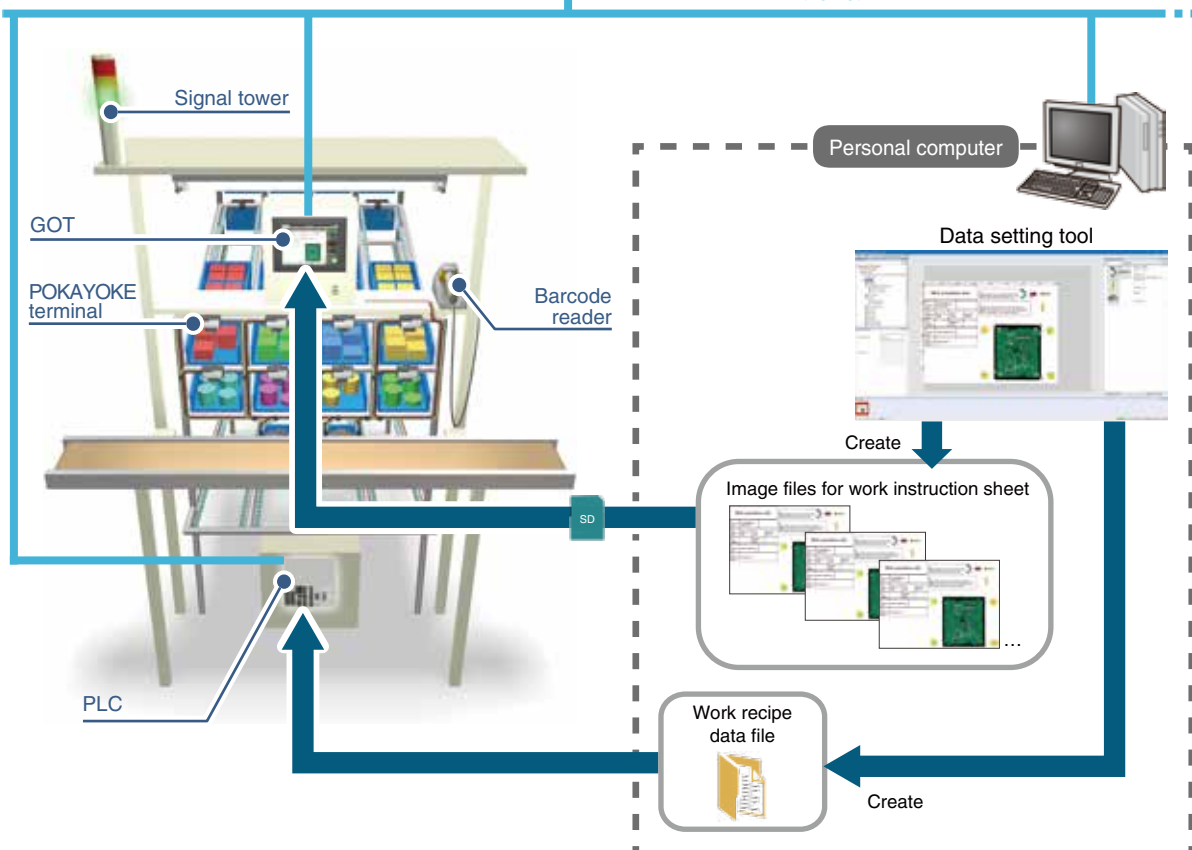


<sup>\*2</sup>: For details, refer to "FA Application Package" in "Necessary Software & Device List".



Database server

Ethernet



## Case 3

## Screw tightening work

## Before installation

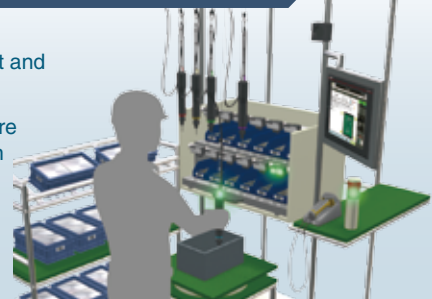


- Inexperienced workers need time to complete many work processes



## After installation of Smart Work Navigator

- 1) Lamps indicate which part and tool should be used
- 2) Screw tightening procedure is displayed on the screen



## System configuration example

Package to be used: Smart Work Navigator Standard\*3

Devices to be used:

PLC



GOT



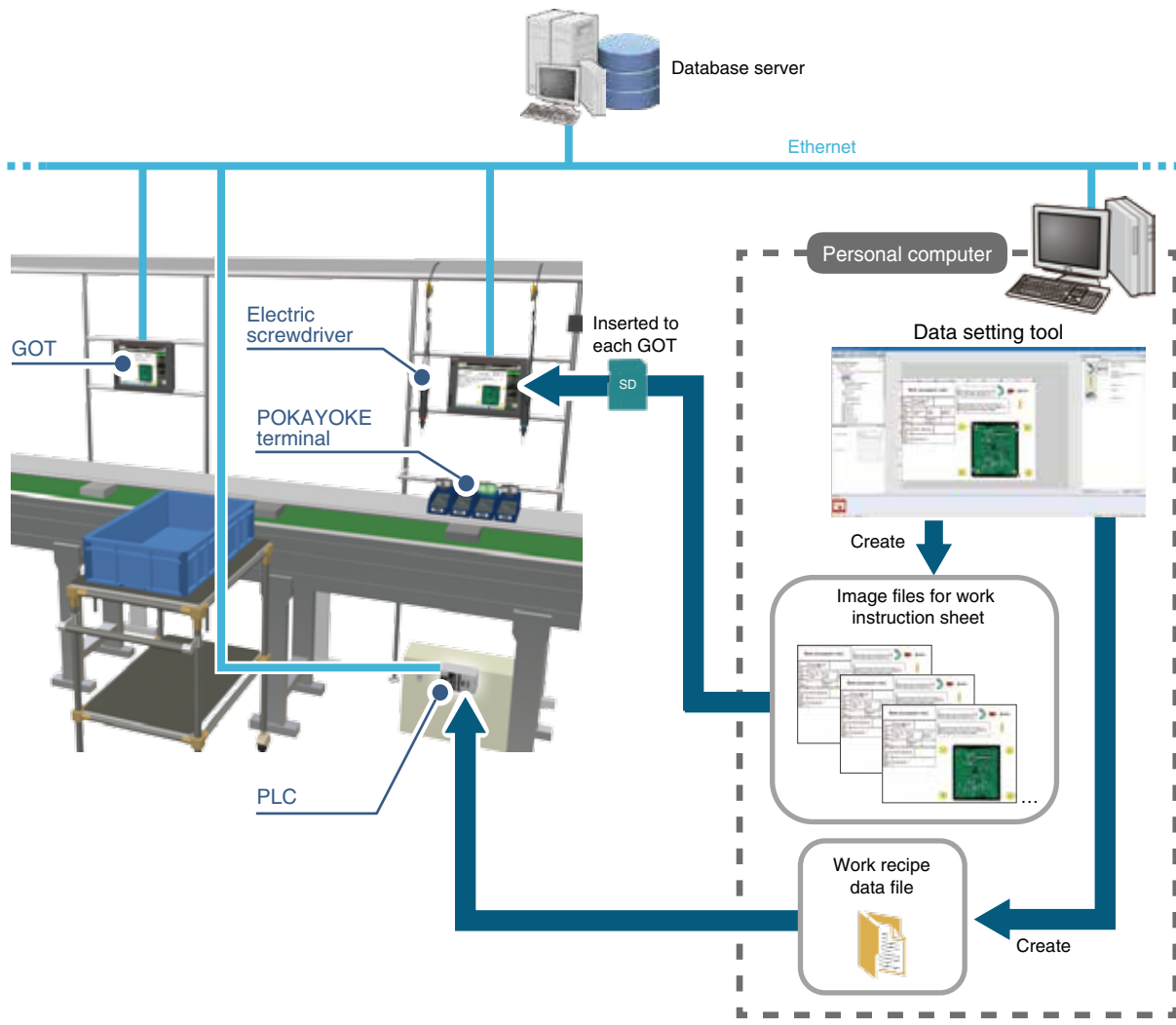
POKAYOKE terminal



Electric screwdriver



\*3: For details, refer to "FA Application Package" in "Necessary Software & Device List".

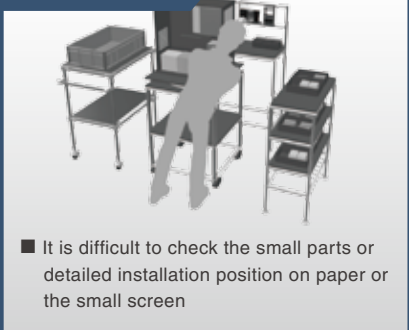




## Case 4

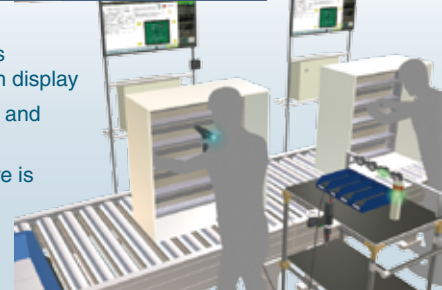
## Checking the detailed work on the large screen

### Before installation



### After installation of Smart Work Navigator

- 1) General purpose display is available as a large screen display
- 2) Lamps indicate which part and tool should be used
- 3) Screw tightening procedure is displayed on the screen



### System configuration example

Package to be used: Smart Work Navigator Standard\*4

Devices to be used:

PLC



General purpose display (SoftGOT)



POKAYOKE terminal



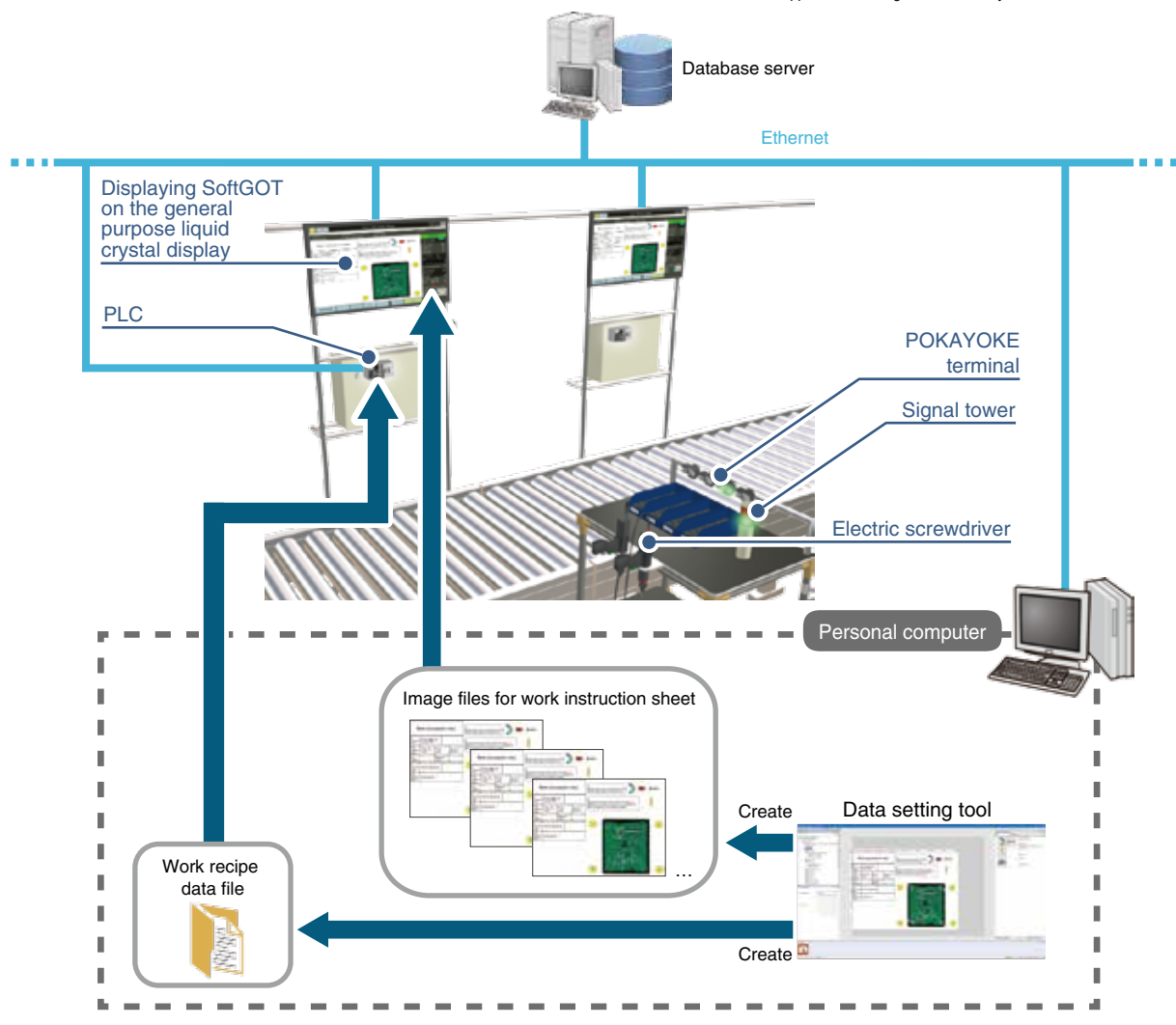
Electric screwdriver



Signal tower



\*4: For details, refer to "FA Application Package" in "Necessary Software & Device List".



# Specifications

## Operating environment of personal computer for tool

Item	Description	Remarks
Operation guaranteed OS	Microsoft® Windows® 10 (Home, Pro, Enterprise)	-
	Microsoft® Windows® 7 (Professional, Ultimate, Enterprise)	-
CPU	64-bit OS: 2 GHz or more / 32-bit OS: 2 GHz or more (Intel core i3 or higher processor is recommended.)	-
Memory	64-bit OS: 2 GB or more / 32-bit OS: 2 GB or more	-
Free disk space	64-bit OS: 20 GB or more / 32-bit OS: 20 GB or more	-
Disk drive	DVD drive	Installation DVD-ROM
Interface	SD memory card slot (for SDHC)	For data read/write between the personal computer and GOT
Application	MELSOFT GX Works3	For setting control program
	MELSOFT GT Designer3 (GOT2000)	For setting GOT screen data
	Microsoft® Excel®	For SWN Definition File Generator operation
	Microsoft® .NET Framework 3.5	For SWN Data Configurator operation

## Operating environment of personal computer for database server

Item	Description	Remarks
Operation guaranteed OS	Microsoft® Windows® 10 (Pro, Enterprise)	-
	Microsoft® Windows® 7 (Professional, Ultimate, Enterprise)	-
CPU	64-bit OS: 2 GHz or more / 32-bit OS: 2 GHz or more	-
Memory	64-bit OS: 4 GB or more / 32-bit OS: 4 GB or more	-
Free disk space	64-bit OS: 20 GB or more / 32-bit OS: 16 GB or more	-
Disk drive	DVD drive	Installation DVD-ROM
Web browser	Microsoft® Internet Explorer® 11 or later	For displaying SWN Analysis templates (resolution 1920 x 1080)
Database management system	Microsoft® SQL Server®	-
Application	Microsoft® .NET Framework 4.6	For database management system operation
	Microsoft® Excel®	For SWN DB Configuration File Generator operation
	MX Component	For communication between the personal computer and PLC

# Necessary Software & Device List

## FA Application Package

Product name	Manufacturer	Model	Work instruction method	Number of licenses*1	Price
FA application package iQ Monozukuri Smart Work Navigator Entry	Mitsubishi Electric Corporation	AP10-SWN001AA-MA	Lamp only	1	Open price
		AP10-SWN001AA-MB		5	
		AP10-SWN001AA-MC		10	
		AP10-SWN001AA-MD		15	
		AP10-SWN001AA-ME		20	
		AP10-SWN001AA-MF		25	
FA application package iQ Monozukuri Smart Work Navigator Standard	Mitsubishi Electric Corporation	AP10-SWN001BA-MA	Lamp/screen	1	Open price
		AP10-SWN001BA-MB		5	
		AP10-SWN001BA-MC		10	
		AP10-SWN001BA-MD		15	
		AP10-SWN001BA-ME		20	
		AP10-SWN001BA-MF		25	

\*1: One license is required per system.

## Software

Product name	Quantity	Manufacturer	Model	Remarks
GOT Screen Design Software MELSOFT GT Works3 <sup>*2</sup>	1	Mitsubishi Electric Corporation	SW1DND-GTWK3-E	Version 1.195D or later
PLC Engineering Software MELSOFT GX Works3	1	Mitsubishi Electric Corporation	SW1DND-GXW3-E	Version 1.043V or later
Communication library MELSOFT MXComponent Ver.4 <sup>*3</sup>	1	Mitsubishi Electric Corporation	SW4DNC-ACT-E	Version 4.16S or later
License key for GT SoftGOT2000 <sup>*4</sup>	1	Mitsubishi Electric Corporation	GT27-SGTKEY-U	GT SoftGOT2000 Version 1.195D or later for USB port
Microsoft® Excel®	1	Microsoft Corporation	Microsoft® Excel® 32-bit version	2013 or later
Microsoft® SQL Server® <sup>*3</sup>	1	Microsoft Corporation	Microsoft® SQL Server® Microsoft® SQL Server® Express Edition	2012 or later

\*2: MELSOFT GT Designer3 and GT SoftGOT2000 are included in MELSOFT GT Works3.

\*3: It is required when the work record data is collected in the database.

\*4: It is required when GT SoftGOT2000 is used.

## Device<sup>\*5</sup>

Device name	Quantity <sup>*6</sup>	Manufacturer	Model	Remarks
CPU module	1	Mitsubishi Electric Corporation	FX5U-32MR/ES	Any of the models on the left (Use the product with the firmware version "1.060" or later.)
			FX5U-32MT/ES	
			FX5U-32MT/ESS	
			FX5U-64MR/ES	
			FX5U-64MT/ES	
			FX5U-64MT/ESS	
			FX5U-80MR/ES	
			FX5U-80MT/ES	
			FX5U-80MT/ESS	
			FX5U-32MR/DS	
			FX5U-32MT/DS	
			FX5U-32MT/DSS	
			FX5U-64MR/DS	
			FX5U-64MT/DS	
			FX5U-64MT/DSS	
			FX5U-80MR/DS	
			FX5U-80MT/DS	
			FX5U-80MT/DSS	
			FX5UC-32MT/D	
			FX5UC-32MT/DSS	
			FX5UC-64MT/D	
			FX5UC-64MT/DSS	
			FX5UC-96MT/D	



## Product List

Device name	Quantity <sup>*6</sup>	Manufacturer	Model	Remarks	
CPU module	1	Mitsubishi Electric Corporation	FX5UC-96MT/DSS	Any of the models on the left (Use the product with the firmware version "1.060" or later.)	
			FX5UC-32MT/DS-TS		
			FX5UC-32MT/DSS-TS		
AnyWireASLINK system master module	1	Mitsubishi Electric Corporation	FX5-ASL-M	-	
GOT	1	Mitsubishi Electric Corporation	GT2715-XTBA/D	Screen size: 15 inch XGA	Any of the models on the left
			GT2712-STBA/D	Screen size: 12.1-inch SVGA	
			GT2512-STBA/D	Screen size: 12.1-inch SVGA	
			GT2510-WXTBD/SD	Screen size: 10.1-inch WXGA	
SD memory card	1	Mitsubishi Electric Corporation	NZ1MEM-2GBSD	SD memory card 2 GB	Any of the models on the left
			NZ1MEM-4GBSD	SDHC memory card 4 GB	
			NZ1MEM-8GBSD	SDHC memory card 8 GB	
			NZ1MEM-16GBSD	SDHC memory card 16 GB	
Barcode reader	1	DENSO WAVE INCORPORATED	AT26Q-SM(R)	Any of the models on the left	
			AT21Q-SM(R)		
			AT25Q-SM(R)		
			AT20Q-SM(R)		
		Cognex Corporation	DMR-8050-0100		
OK buzzer	1	Optional	-	-	
NG buzzer	1	Optional	-	-	
Signal tower	1	Optional	-	Two-color light or three-color light	

\*5: For other supported devices, contact your local Mitsubishi Electric representative.

\*6: Necessary quantity per system.

## Optional<sup>\*7</sup>

Device name	Quantity	Manufacturer	Model	Description	Remarks
POKAYOKE terminal	Optional	Anywire Corporation	BL227XB-K02V-P	Small lever switch type terminal (Selection of one color from seven colors)	ASLINK POKAYOKE series
			BL227XB-K06M-P	Small lever switch type terminal (RGB each color independent ON/OFF)	
			BL227XB-K02VN-P	Small pushbutton switch type terminal (Selection of one color from seven colors)	
			BL227XB-K06MN-P	Small pushbutton switch type terminal (RGB each color independent ON/OFF)	
			BL227XB-K02VL-P	Small reflection type terminal (Selection of one color from seven colors)	
			BL227XB-K06ML-P	Small reflection type terminal (RGB each color independent ON/OFF)	
			BL227PB-T07P02V-P (light emission)	Small transmission type terminal (7 cm, Selection of one color from seven colors)	
			BL227XB-T07P02V-C (light reception)		
			BL227PB-T07P06M-P (light emission)	Small transmission type terminal (7 cm, RGB each color independent ON/OFF)	
			BL227XB-T07P06M-C (light reception)		
			BL227PB-T14P02V-P (light emission)	Small transmission type terminal (14 cm, Selection of one color from seven colors)	
			BL227XB-T14P02V-C (light reception)		
			BL227PB-T14P06M-P (light emission)	Small transmission type terminal (14 cm, RGB each color independent ON/OFF)	
			BL227XB-T14P06M-C (light reception)		
			BL227XB-F2K04V-P	Small lever switch door type terminal (Selection of one color from seven colors, vertical metal arm)	
			BL227XB-F2K08M-P	Small lever switch door type terminal (RGB each color independent ON/OFF, vertical metal arm)	
			BL227XB-F2K04VN-P	Small pushbutton switch door type terminal (Selection of one color from seven colors, vertical metal arm)	
			BL227XB-F2K08MN-P	Small pushbutton switch door type terminal (RGB each color independent ON/OFF, vertical metal arm)	
			BL227XB-F2K04VL-P	Small reflection door type terminal (Selection of one color from seven colors, vertical metal arm)	
			BL227XB-F2K08ML-P	Small reflection door type terminal (RGB each color independent ON/OFF, vertical metal arm)	
			BL227XB-R2K04V-P	Small lever switch door type terminal (Selection of one color from seven colors, horizontal metal arm)	
			BL227XB-R2K08M-P	Small lever switch door type terminal (RGB each color independent ON/OFF, horizontal metal arm)	
			BL227XB-R2K04VN-P	Small pushbutton switch door type terminal (Selection of one color from seven colors, horizontal metal arm)	
			BL227XB-R2K08MN-P	Small pushbutton switch door type terminal (RGB each color independent ON/OFF, horizontal metal arm)	

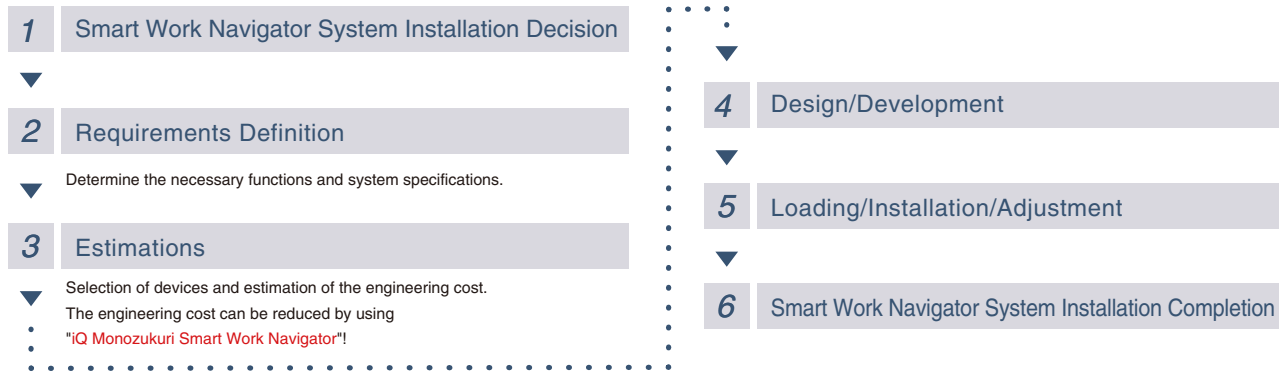
Device name	Quantity	Manufacturer	Model	Description	Remarks
POKAYOKE terminal	Optional	Anywire Corporation	BL227XB-R2K04VL-P	Small reflection door type terminal (Selection of one color from seven colors, horizontal metal arm)	ASLINK POKAYOKE series
			BL227XB-R2K08ML-P	Small reflection door type terminal (RGB each color independent ON/OFF, horizontal metal arm)	
			BL227XB-F3K04V-P	Small lever switch door type terminal (Selection of one color from seven colors, vertical plastic arm)	
			BL227XB-F3K08M-P	Small lever switch door type terminal (RGB each color independent ON/OFF, vertical plastic arm)	
			BL227XB-F3K04VN-P	Small pushbutton switch door type terminal (Selection of one color from seven colors, vertical plastic arm)	
			BL227XB-F3K08MN-P	Small pushbutton switch door type terminal (RGB each color independent ON/OFF, vertical plastic arm)	
			BL227XB-F3K04VL-P	Small reflection door type terminal (Selection of one color from seven colors, vertical plastic arm)	
			BL227XB-F3K08ML-P	Small reflection door type terminal (RGB each color independent ON/OFF, vertical plastic arm)	
			BL227XB-F04V-P	Standard lever switch door type terminal (Selection of one color from seven colors, vertical metal arm)	
			BL227XB-F04VL-P	Standard pushbutton switch door type terminal (Selection of one color from seven colors, vertical metal arm)	
			B292XB-02VL	Touch stationary type terminal (Selection of one color from seven colors)	
			B292XB-06ML	Touch stationery type terminal (RGB each color independent ON/OFF)	
			BL2101XB-02VL-P	Touch surface-emitting type terminal (Selection of one color from seven colors)	
Electric screwdriver	Optional	NITTO KOHKI CO., LTD.	DLV30A06L-ASL (AA)	0.4 to 1.6 N•m, 650 rpm	Electric screwdriver interlocking with other FA devices (lever start)
				1.2 to 3.0 N•m, 650 rpm	
			DLV30A12L-ASL (AA)	0.4 to 1.6 N•m, 1200 rpm	
				1.2 to 3.0 N•m, 1200 rpm	
			DLV30A20L-ASL (AA)	0.4 to 1.6 N•m, 2000 rpm	
				1.2 to 3.0 N•m, 2000 rpm	
			DLV45A06L-ASL (AA)	2.0 to 4.5 N•m, 650 rpm	Electric screwdriver interlocking with other FA devices (push to start)
			DLV45A12L-ASL (AA)	2.0 to 4.5 N•m, 1200 rpm	
			DLV70A06L-ASL (AA)	3.8 to 7.0 N•m, 650 rpm	
			DLV30A06P-ASL (AA)	0.4 to 1.6 N•m, 650 rpm	
				1.2 to 3.0 N•m, 650 rpm	
			DLV30A12P-ASL (AA)	0.4 to 1.6 N•m, 1200 rpm	
				1.2 to 3.0 N•m, 1200 rpm	
			DLV30A20P-ASL (AA)	0.4 to 1.6 N•m, 2000 rpm	
				1.2 to 3.0 N•m, 2000 rpm	
			DLV45A06P-ASL (AA)	2.0 to 4.5 N•m, 650 rpm	Electric screwdrivers with screw tightening counter (lever start)
			DLV45A12P-ASL (AA)	2.0 to 4.5 N•m, 1200 rpm	
			DLV70A06P-ASL (AA)	3.8 to 7.0 N•m, 650 rpm	
			DLV30A06L-SPC (AA)	0.4 to 1.6 N•m, 650 rpm	
				1.2 to 3.0 N•m, 650 rpm	
			DLV30A12L-SPC (AA)	0.4 to 1.6 N•m, 1200 rpm	
				1.2 to 3.0 N•m, 1200 rpm	
			DLV30A20L-SPC (AA)	0.4 to 1.6 N•m, 2000 rpm	
				1.2 to 3.0 N•m, 2000 rpm	
			DLV45A06L-SPC (AA)	2.0 to 4.5 N•m, 650 rpm	Electric screwdrivers with screw tightening counter (push to start)
			DLV45A12L-SPC (AA)	2.0 to 4.5 N•m, 1200 rpm	
			DLV70A06L-SPC (AA)	3.8 to 7.0 N•m, 650 rpm	
			DLV30A06P-SPC (AA)	0.4 to 1.6 N•m, 650 rpm	
				1.2 to 3.0 N•m, 650 rpm	
			DLV30A12P-SPC (AA)	0.4 to 1.6 N•m, 1200 rpm	
				1.2 to 3.0 N•m, 1200 rpm	
			DLV30A20P-SPC (AA)	0.4 to 1.6 N•m, 2000 rpm	
				1.2 to 3.0 N•m, 2000 rpm	
			DLV45A06P-SPC (AA)	2.0 to 4.5 N•m, 650 rpm	
			DLV45A12P-SPC (AA)	2.0 to 4.5 N•m, 1200 rpm	
			DLV70A06P-SPC (AA)	3.8 to 7.0 N•m, 650 rpm	

\*7: For other supported devices, contact your local Mitsubishi Electric representative.

# Procedure for installing the system

The procedure for installing the system is as shown below.

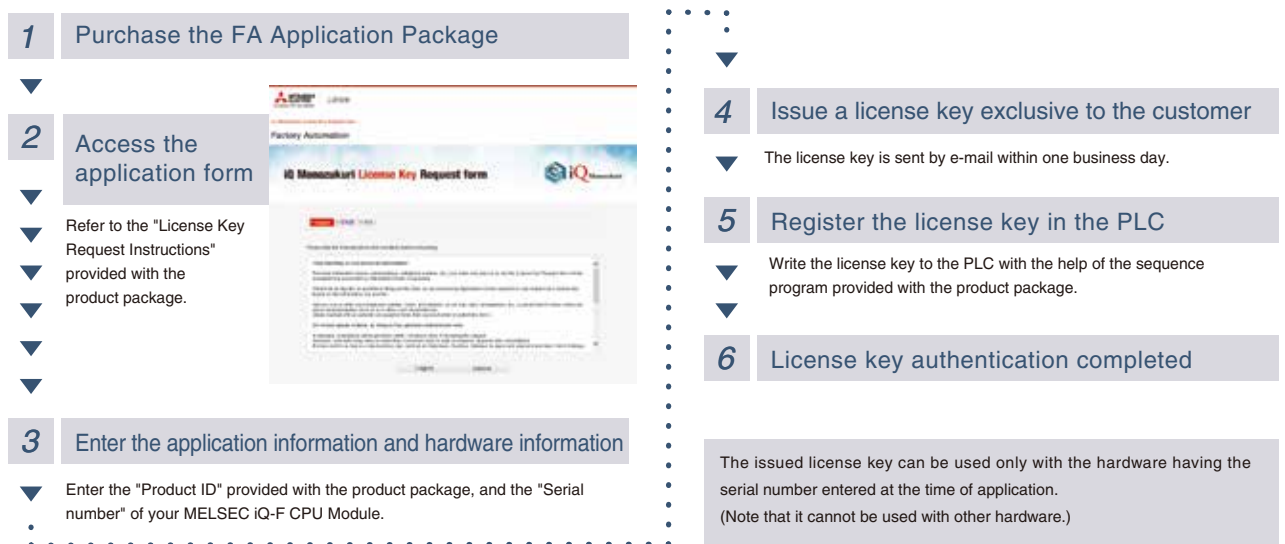
If it is difficult for the customer to construct the system, we will introduce a system integrator.



# FA Application Package Procedure of license key authentication

To use the FA application package "iQ Monozukuri Smart Work Navigator", authenticating a license key is required.

The procedure of obtaining and authenticating the license key is as follows:







## FA Application Package Lineup

### Processes and Usages

Packages in line with the status and purposes such as where to use or with what intention

#### ANDON

The visualization of the production site is achieved easily through GOT2000 and a general-purpose web browser.



#### Deburring/Polishing

Deburring and polishing can be automated just by rough teaching.



#### Force sensor application

Various force sensing operations such as assembly, fitting, and inspection have been automated.



#### Conveyor tracking

Workpieces can be transported and arranged by robots without stopping the conveyor.



#### Machine tool loading

The setup and development of a machine tool loading/unloading system is supported.



#### Smart Work Navigator

Systems for supporting picking and assembly work can be easily developed and operated.

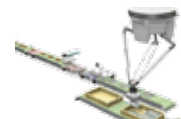


### Equipment

Packages realizing shortening of the system development time and easy development

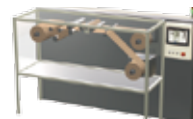
#### HANDLING

The development of a conveyance mechanism that requires the calculation of coordinate conversion is supported.



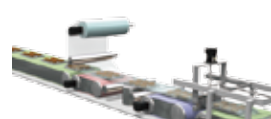
#### CONVERTING

The development of a converting system that requires unwinding and winding control is supported.



#### PACKAGING

The development of a packaging machine that requires cam control and position correction is supported.



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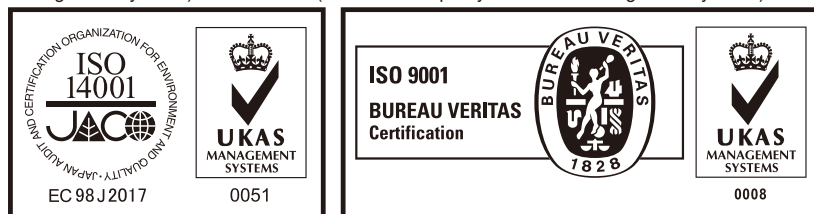
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Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO 14001 (standards for environmental management systems) and ISO 9001 (standards for quality assurance management systems).



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