

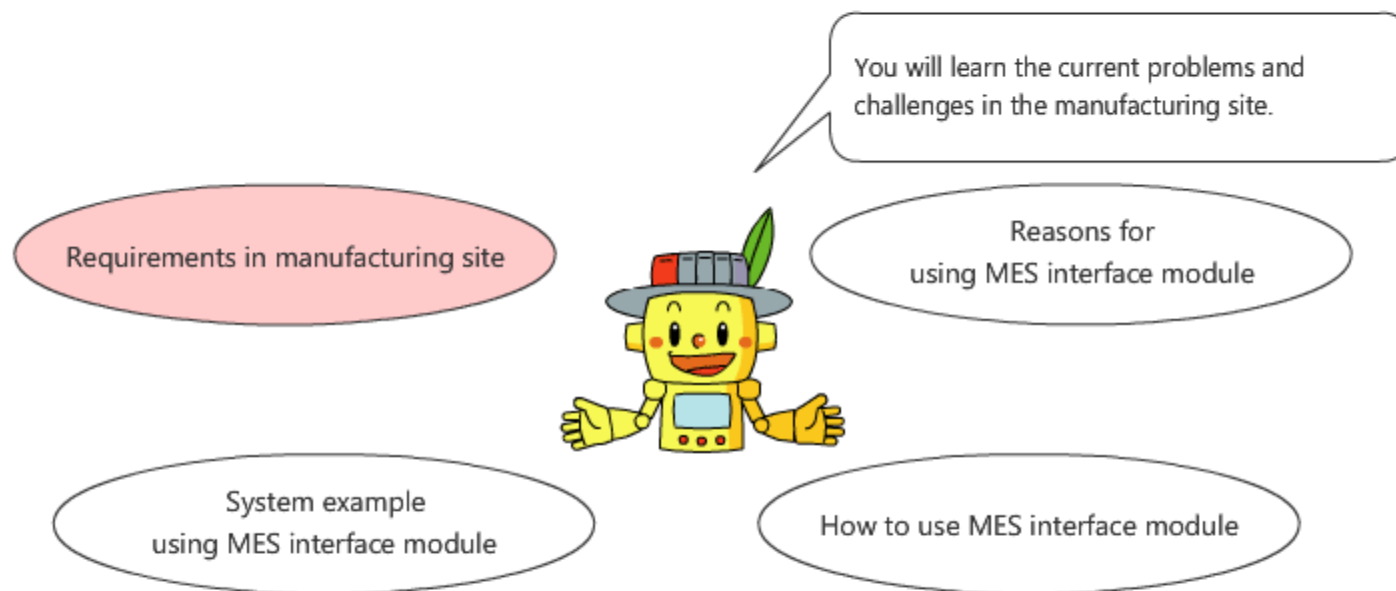
PLC

Manufacturing Visualization Basics (MELSEC iQ-R series MES interface module)

This training course is for participants who will implement the database to configure or a system using a MES interface module (RD81MES96), or will propose it.

Introduction Purpose of the Course

This course is for you to understand the current problems and challenges in the manufacturing site, and that the MES interface module can be used to solve those. You can also learn the features and how to use the MES interface module, and the system examples using it.



Introduction**Course Structure**

The contents of this course are as follows.

We recommend that you start from Chapter 1.

Chapter 1 - Requirements in Manufacturing Industry

Learn what is required for reducing the total cost in the manufacturing site of current manufacturing industry, and what kind of system can realize that.

Chapter 2 - Reasons for Selecting MES Interface Module

Learn the advantages of using the data base and MES interface module.

Chapter 3 - How to Use MES Interface Module

Learn how to configure the settings by using the MES interface function configuration tool while following the points.

Final Test

5 sections in total (5 questions) Passing grade: 60% or higher

Introduction**How to Use this e-Learning Tool**

Go to the next page

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Go to the next page.

Back to the previous page

<

Back to the previous page.

Move to the desired page

TOC

"Table of Contents" will be displayed, enabling you to navigate to the desired page.

Exit the learning

X

Exit the learning. Window such as "Contents" screen and the learning will be closed.

Introduction**Cautions for Use****Safety Precautions**

When you learn by using actual products, please fully read the safety precautions in the corresponding manuals.

Precautions in This Course

- The displayed screens of the software version that you use may differ from those in this course.
The following shows the software used in this course and each software version.

- MELSOFT MX MESInterface-R Version1 Ver.1.07H
(MES interface function configuration tool)

Reference

The following is a reference related to the topics in this course. (Please note that this reference material is not absolutely necessary as you can still complete this course without using it.)
Click the name of the reference file to download.

Name of reference	File format	File size
Recording paper	Compressed file	5.80 kB

Chapter 1 Requirements in Manufacturing Industry

In this chapter, you will learn what is required for reducing the total cost in the manufacturing site of current manufacturing industry, and what kind of system can realize that.

Contents of Chapter 1

- 1.1 Problems in the Manufacturing Site
- 1.2 "Visualization" and Data Collection of the Manufacturing Site
- 1.3 Summary

The manufacturing industry is currently in an extreme price competition.
In such situations, the manufacturing site is faced with various requirements to reduce the total cost.
Then, how can the manufacturing sites satisfy those demands?

What kind of data is necessary to solve the following cases?

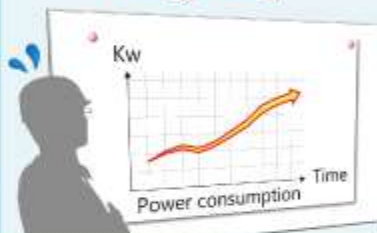
Improve productivity



Reduce defective products



Energy saving



Check the data at production afterwards



- Operating status of the equipment
- Manufacturing status of the equipment

- Quality data of manufactured product

- Power consumption at each line and machine

- Result data of manufactured product

To begin with, the informatization (visualization*) of manufacturing site is necessary.

* This visualization system is called the **MES (manufacturing execution system)** in general.

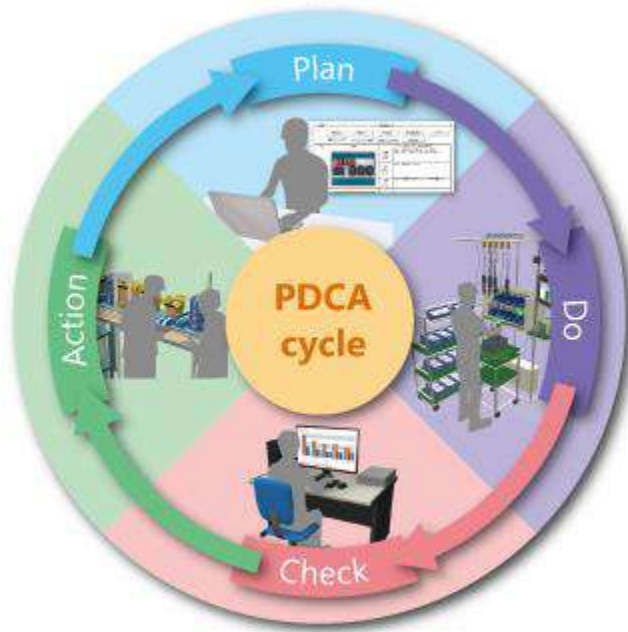


It is important to extract the collected data, execute the PDCA cycle to improve manufacturing and continue

1.1

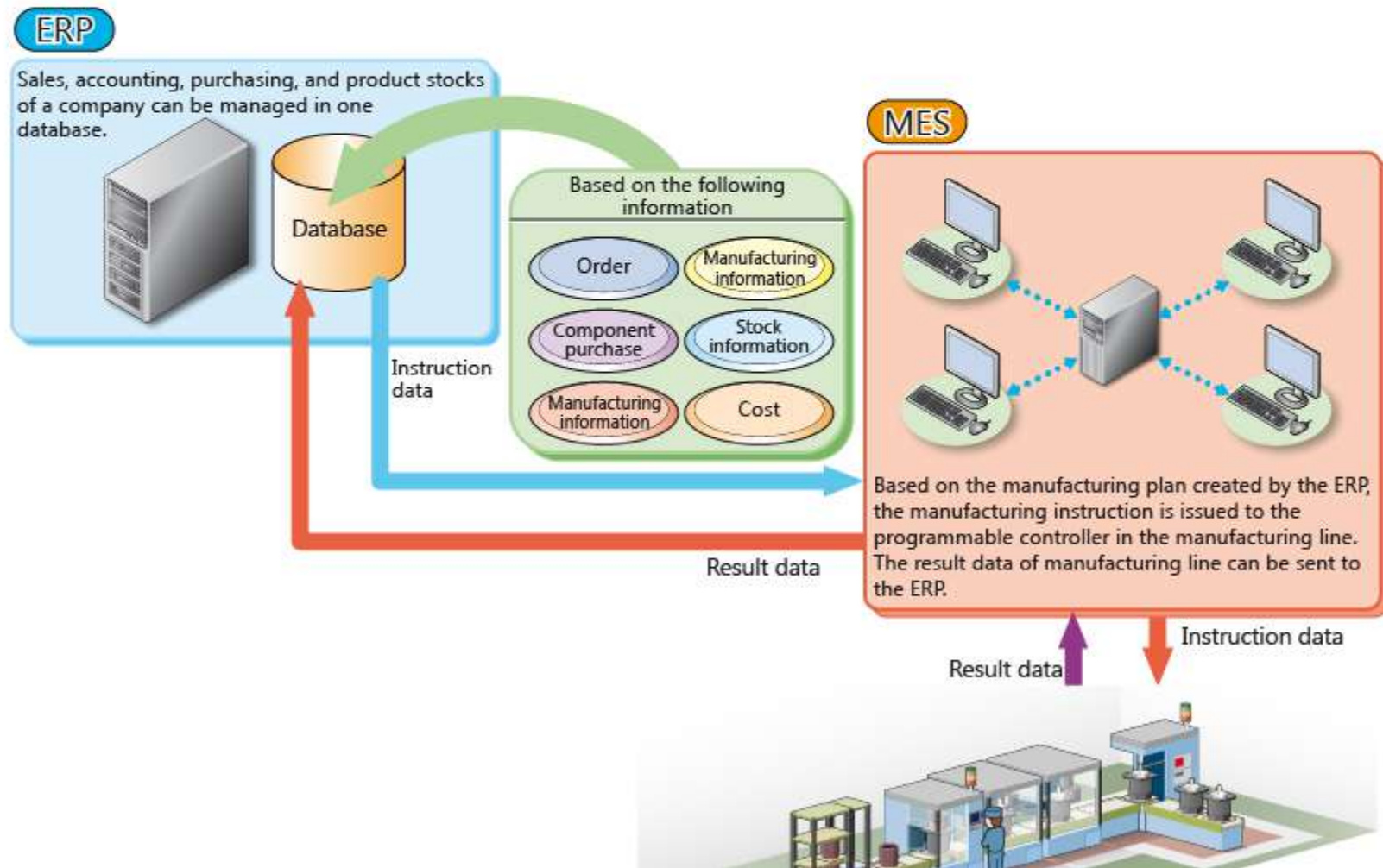
Problems in Manufacturing Site

2/2



It is important to extract the collected data, execute the PDCA cycle to improve manufacturing, and continue these actions.

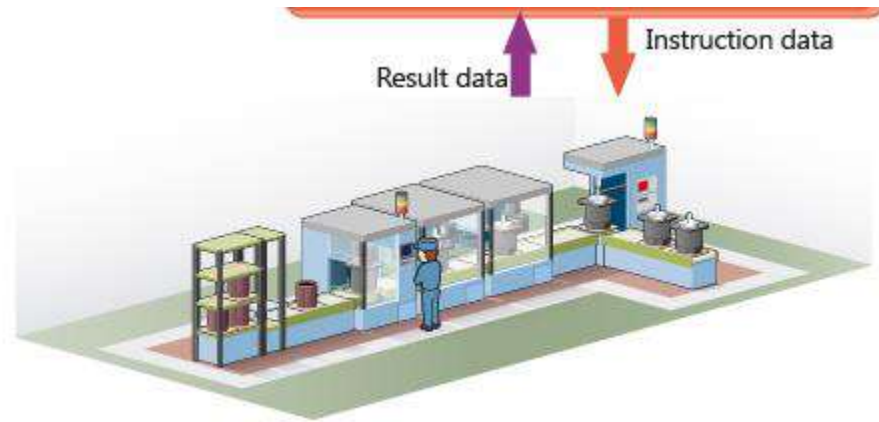
Generally, the system that manages the manufacturing site to carry out the manufacturing plan efficiently based on the collected information of manufacturing site is called the **MES (Manufacturing Execution System)**. The MES is often used with **ERP**, which manages the orders, sales, stocks, costs, and manufacturing plan. By connecting with an upper system, the plan and result can be grasped, which can be utilized for efficient business management.



1.1

Problems in Manufacturing Site

2/2



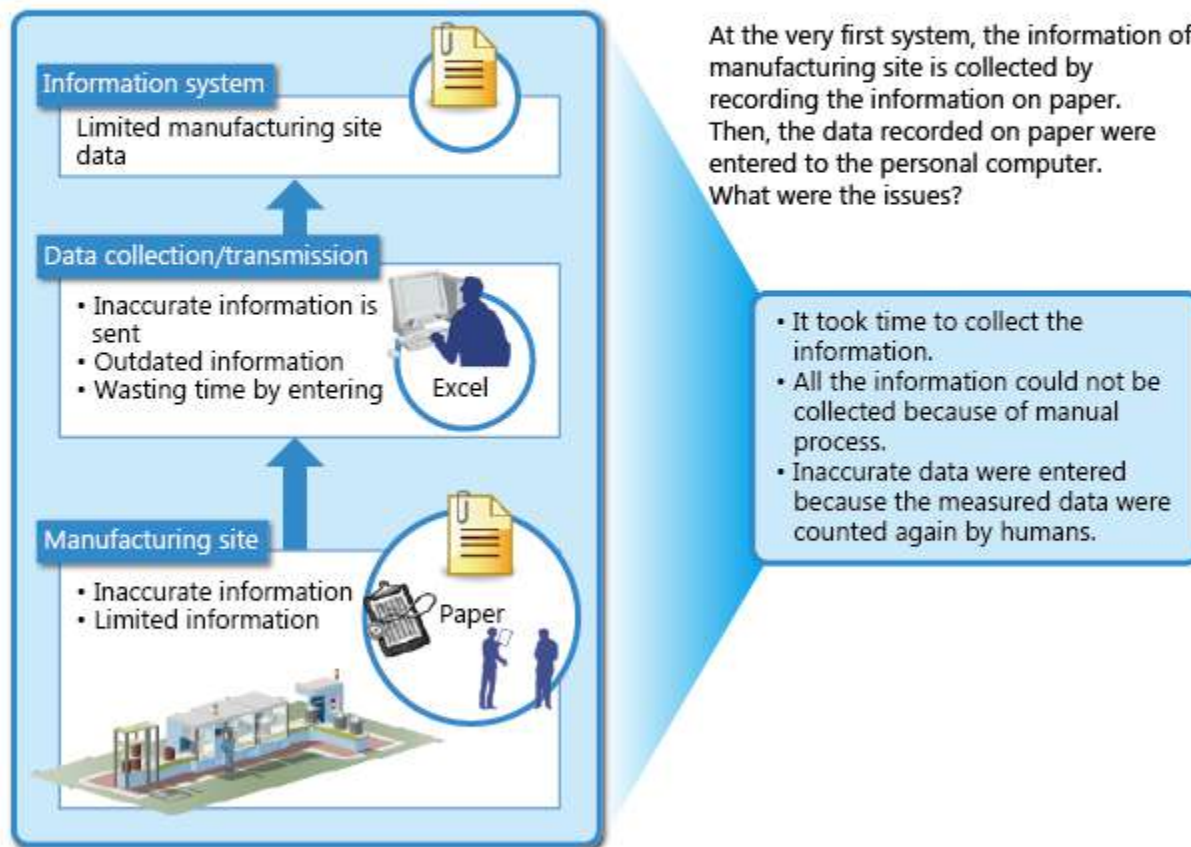
1.2

"Visualization" and Data Collection of the Manufacturing Site

In the manufacturing site, the PDCA cycle has been implemented by collecting the data in manufacturing sites to improve the manufacture.

Now, what are the advantages of using the MES interface module?

How the information system has been developed along with the advancing IT is described in this section.



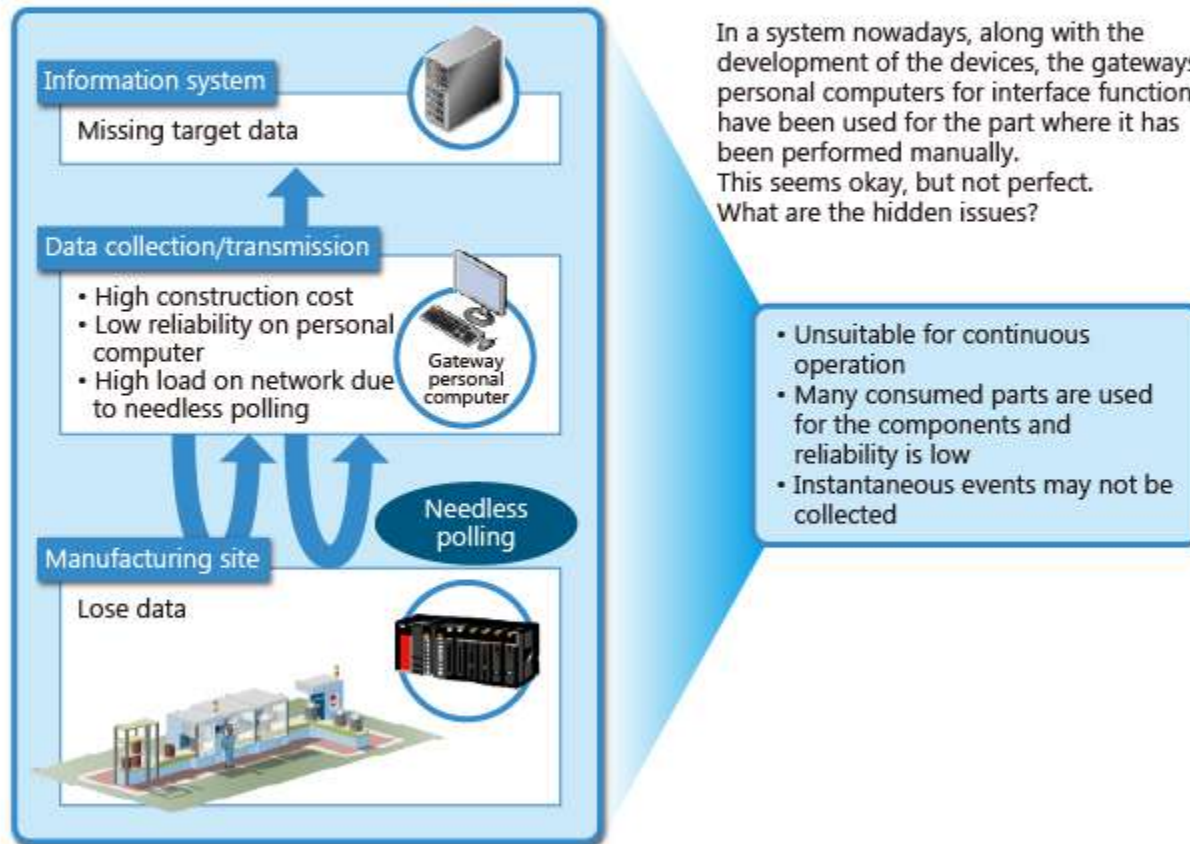
1.2

"Visualization" and Data Collection of the Manufacturing Site

In the manufacturing site, the PDCA cycle has been implemented by collecting the data in manufacturing sites to improve the manufacture.

Now, what are the advantages of using the MES interface module?

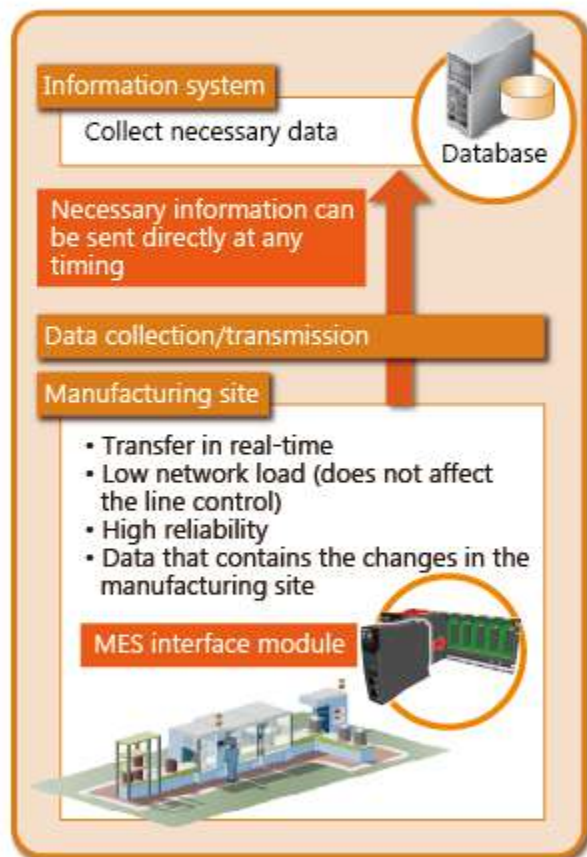
How the information system has been developed along with the advancing IT is described in this section.



In the manufacturing site, the PDCA cycle has been implemented by collecting the data in manufacturing sites to improve the manufacture.

Now, what are the advantages of using the MES interface module?

How the information system has been developed along with the advancing IT is described in this section.



What if the MES interface module is used?

By gathering the functions to the equipment side, the data are automatically transferred by the equipment.

Therefore, all the data are collected and a system without a gateway personal computer can be realized.

By using the MES interface module, the data can be collected in real-time, and high-reliability system can be realized.

You will learn other features in Chapter 2.

1.3**Summary**

In this chapter, you have learned:

- Problems in manufacturing site
- "Visualization" and data collection of the manufacturing site

Points

Problems in manufacturing site	<ul style="list-style-type: none">• To meet the various needs in the manufacturing industry, PDCA cycle implementation by the informatization (visualization) of the manufacturing site is necessary.• The system that manages the manufacturing site to carry out the manufacturing plan efficiently based on the collected information of manufacturing site is called the MES (Manufacturing Execution System).• By connecting with an upper system (ERP), the plan and result can be grasped, which can be utilized for efficient business management.
"Visualization" and data collection of the manufacturing site	The gateway personal computers use lots of the MES. However, a system that can collect all the data in real-time can be easily implemented by using the MES interface module.

1.4**Comprehension Test**

[Comprehension test]

Have you fully understood the contents in Chapter 1?

Please take the comprehension test to check and review the contents.

(3 sections, 3 questions)

Test**Comprehension Test 1**

Select the correct application for managing the manufacturing site and efficiently performing the manufacture. (Select one.)

☐ **ERP**☐ **PDM**☐ **MES**

Test

Comprehension Test 2

Select the wrong answer as the advantage of using the MES interface module to collect the data in manufacturing site. (Select one.)

- ☐ The data is sent/received to/from the database automatically by installing the MES interface module to the programmable controller that controls the equipment.
- ☐ The database and CPU module can be connected by creating a communication program and registering it to the MES interface module.
- ☐ The data can be collected in real-time in the system that uses the MES interface module, and that system reliability is high.

Test**Comprehension Test 3**

Select the correct description for PDCA cycle that is implemented for improving the manufacture in the manufacturing site. (Select one.)

- ☐ One execution of PDCA cycle is enough to improve the manufacture.
- ☐ Executing the PDCA cycle continuously is important to improve the manufacture.
- ☐ In Plan, the first step of PDCA cycle, a rough plan based on the assumption is made without using the actual data.

Test

Result of Comprehension Test

You have completed the comprehension test of Chapter 1.
The following is your test result.

How was your result?
It is recommended to try the questions again that you answered incorrectly.

		1	2	3	4	5	6	7	8	9	10
	Comprehension test 1	<input type="radio"/>									
	Comprehension test 2	<input type="radio"/>									
	Comprehension test 3	<input type="radio"/>									

Total questions: **3**

Correct answers: **3**

Percentage: **100** %

Clear

Chapter 2 Reasons for Selecting MES Interface Module

In the previous chapter, the concept of the MES and the advantages of using the MES interface module for "visualizing" and collecting data in manufacturing site were described.

In fact, there are more advantages in the MES implementation.

The advantages of using the database and MES interface module are described in this chapter.



Contents of Chapter 2

- 2.1 Why is Database Used?
- 2.2 Features of MES Interface Module
- 2.3 Summary

2.1

Why is Database Used?

First, let's think why the database are used for the data collection.

How is the collected data used?

They are used for displaying the current status, comparing the situation before and after when measures are taken, extracting data in specific condition, etc.

Thus, data are required to be accumulated.

It is also important that the data can be utilized easily.

For these reasons, data is often accumulated in either of two ways: Storing in files such as Excel, or storing in the database.

The following shows the differences between those two ways.

	Database	File (Excel, etc.)	Description
Data amount	○	△	Not much data can be stored in a file. 1048576 rows × 16384 columns (in 1 sheet) * For Excel 2016
Data searchability	○	△	Data cannot be searched easily in a file.
Exclusive processing	○	×	Simultaneous editing cannot be performed in a file.

As described above, there are various advantages of using the database. Although it can be easily used with applications that are operated in the IT system, it tends to be avoided because using the data requires programming knowledge.

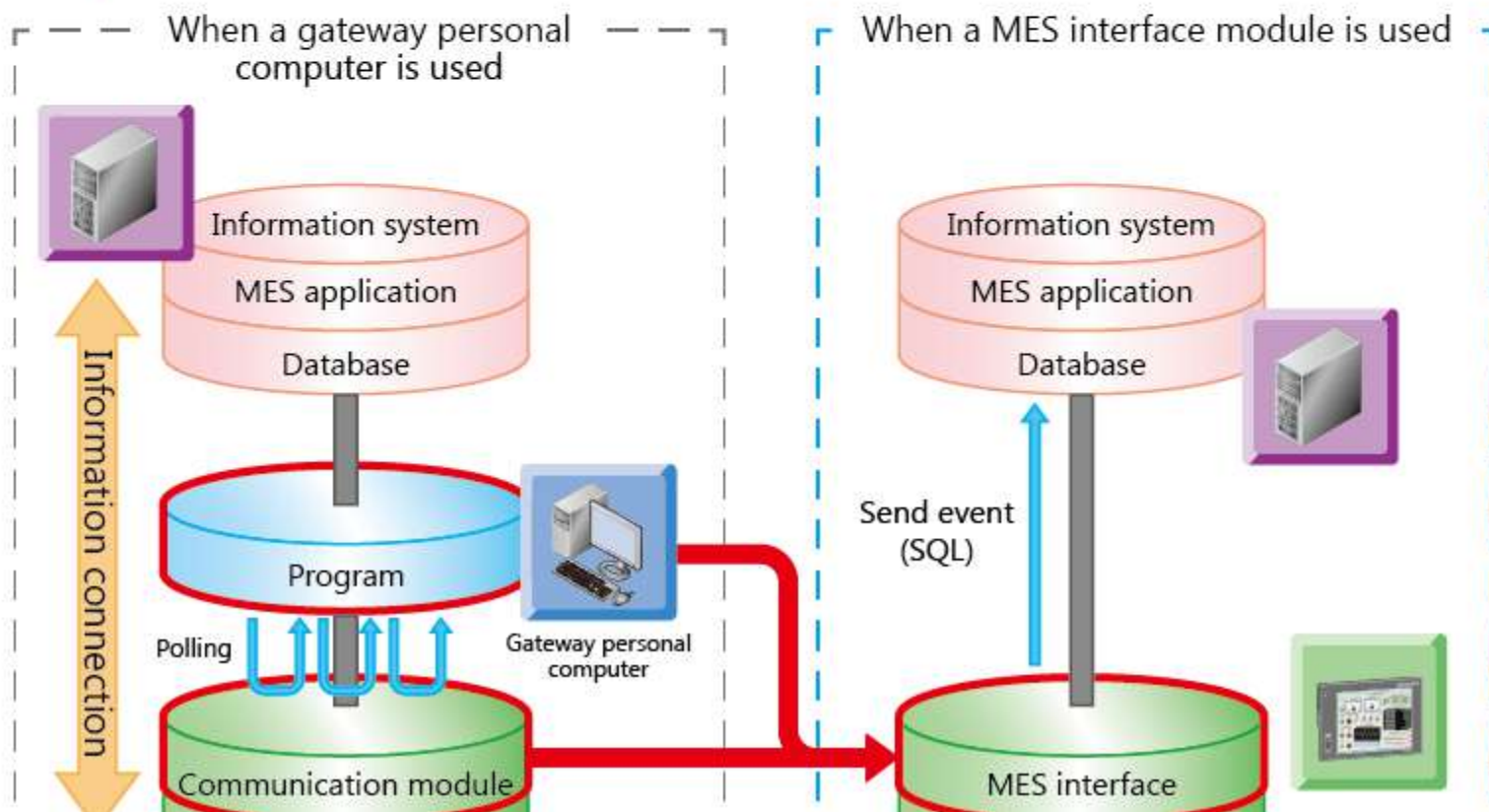
However, by using the MES interface module, those data can be used easily.

The MES interface module is a module that makes connection with the database easier. There are more features other than the ones that you have learned in section 1.2. In this section, those features are described.

<1. Personal computerless/programless>

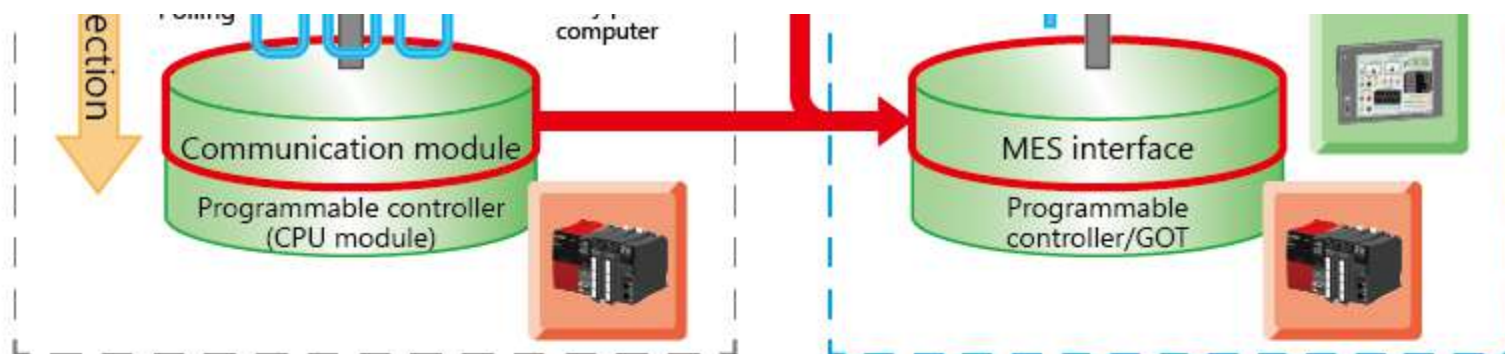
When connecting with the database using a gateway personal computer, a communication program to collect the equipment data and a program to access the database are required to be created.

By using the MES interface module, a gateway personal computer or program will be unnecessary, and the database can be easily connected at low cost.



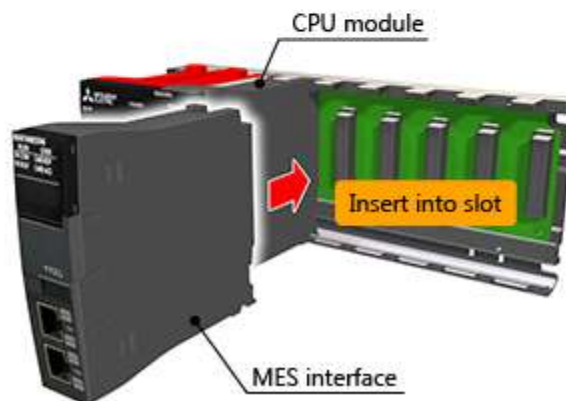
2.2

Features of MES Interface Module



<2. Simple implementation>

The MES interface module can be implemented just by installing it to the programmable controller, and the ladder program for control is not required to be changed.



2.2

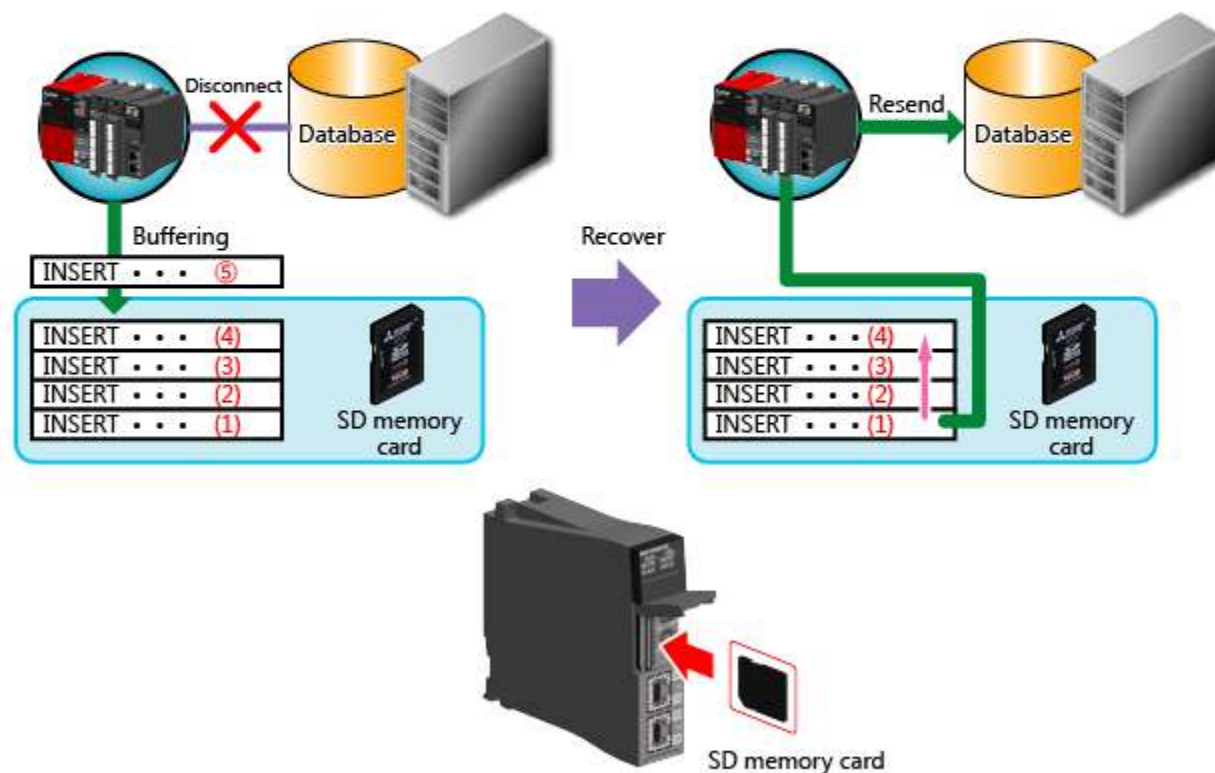
Features of MES Interface Module

<3. Preventing data collecting omission by DB buffering function>

When a gateway personal computer is used, what happens if the network is disconnected or the database server goes down?

The data cannot be sent, and data collecting omission occurs.

With the MES interface module, the data is buffered to the inserted SD memory card and resent automatically after the recovery.

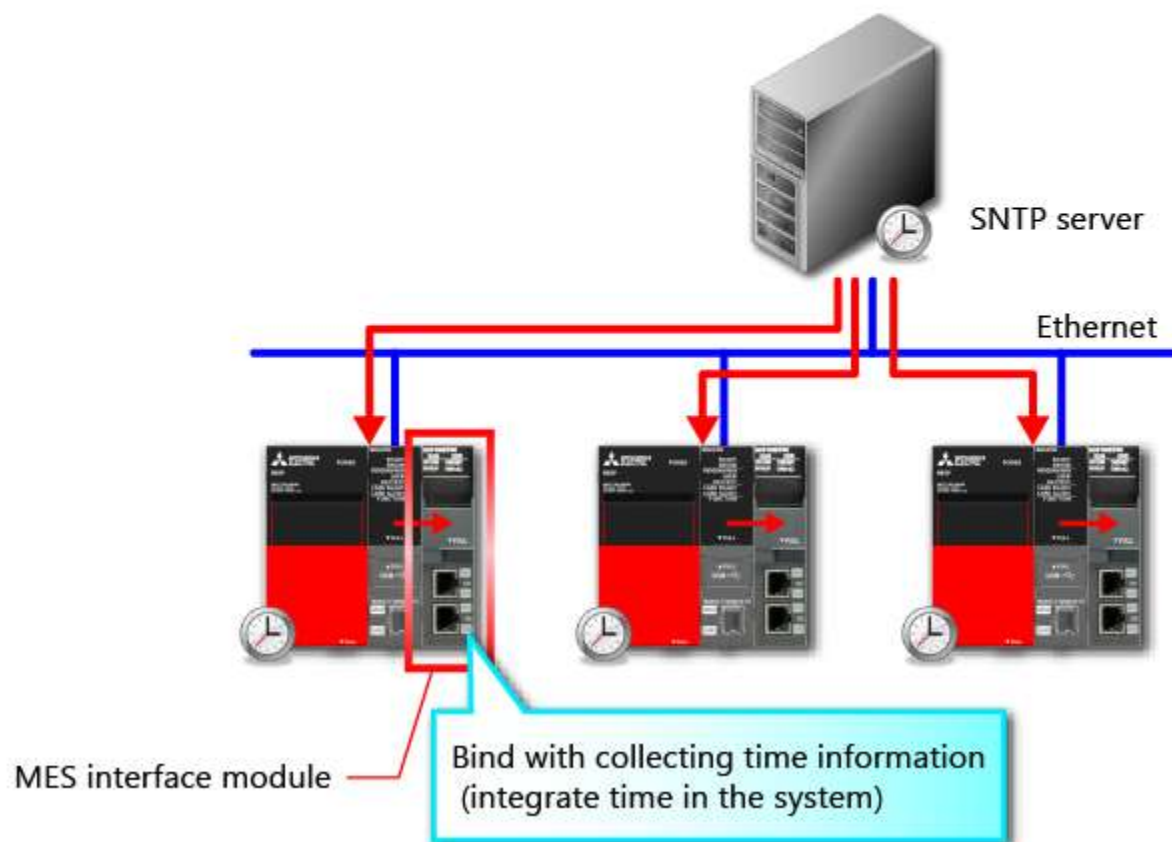


<4. Time synchronization within systems>

Matching time in each equipment within the system is very important.

For example, when an error occurs in the manufacturing line, if the time among the equipment are different, the accurate status cannot be known with the collected data.

The MES interface module can be synchronized with the time of the CPU module. Therefore, synchronizing the time of the CPU module with the SNTP server in advance to put an accurate time stamp on the data from each equipment.

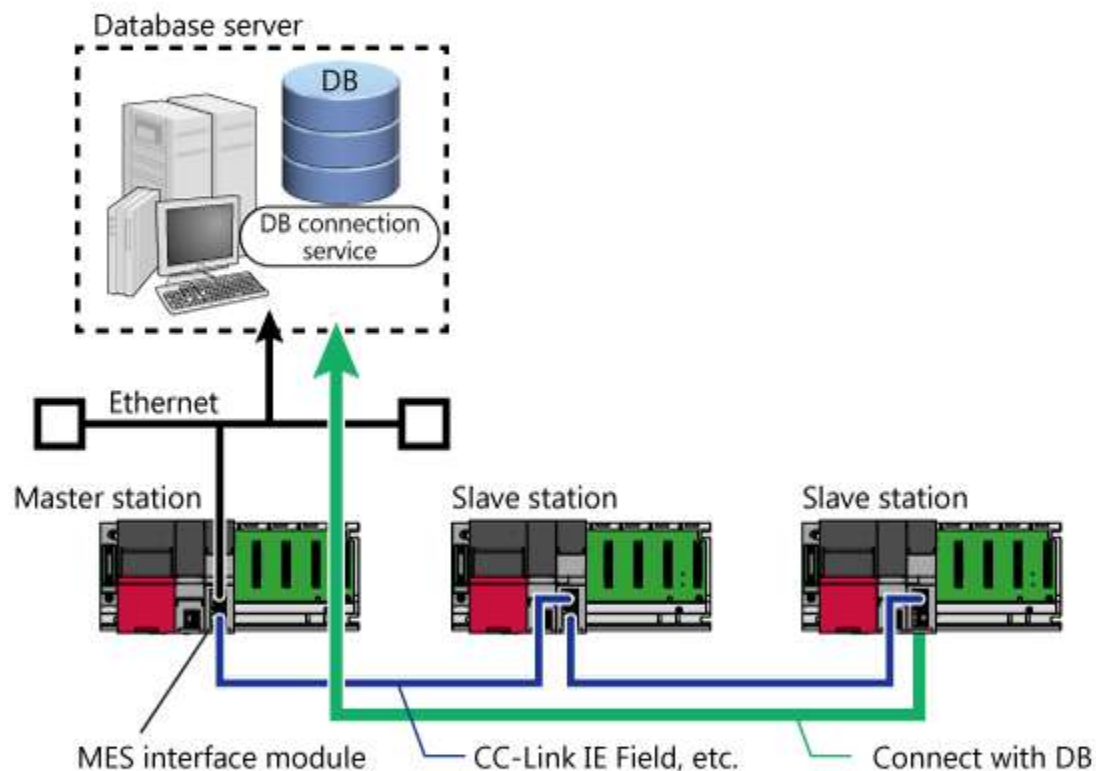


2.2

Features of MES Interface Module

<5. Information of other PLC station is connectable>

Since it supports other networks such as CC-Link IE Field, the information of the other PLC stations can be connected through a network.



2.3**Summary**

In this chapter, you have learned:

- Why is the database used?
- Features of MES interface module

Points

Why is the database used?	<ul style="list-style-type: none">• By using the database, information that is collected simultaneously by multiple people can be checked, and the collected information can be sorted and extracted easily.• Because the manufacturing status is checked simultaneously from multiple devices at the manufacturing site, and the progress of the whole factory is checked from the office, using the database is optimum.
Features of MES interface module	<p>The following five features are the main features of the MES interface module.</p> <ol style="list-style-type: none">1) The database can be connected without a personal computer and program.2) Simple installation just by installing the MES interface module to PLC is possible.3) Data collection omission does not occur even at communication error since the data is resent automatically after the recovery.4) Time can be synchronized with the server by using the time synchronization setting function of the CPU module.5) Information of other PLC stations can be connected with the database through a network.

2.4**Comprehension Test**

[Comprehension test]

Have you fully understood the contents in Chapter 2?

Please take the comprehension test to check and review the contents.

(3 sections, 3 questions)

Test**Comprehension Test 1**

Select the wrong answer as an advantage of using the database in comparison to the data management using files. (Select one.)

- ☐ **Much data can be managed and data searchability is high.**
- ☐ **Less data can be managed, but data searchability is high.**
- ☐ **Multiple simultaneous access is supported since it has high performance in exclusive processing.**

Test**Comprehension Test 2**

Select the correct description for the DB buffering function, which is the feature of the MES interface module.
(Select one.)

- ☐ The data collecting omission can be prevented even at network failure since the data can be buffered in the SD memory card and automatically resent after the recovery.
- ☐ The data in the database can be saved into the SD card at any time by setting the MES interface function configuration tool in advance.
- ☐ The DB buffering function buffers the data to the internal memory in the MES interface module at network failure.

Test**Comprehension Test 3**

Select the correct description for the time synchronization function of the MES interface module. (Select one.)

- ☐ Only the time of the CPU module can be synchronized.
- ☐ Only the time of the server can be synchronized.
- ☐ Time cannot be synchronized.

Test

Result of Comprehension Test

You have completed the comprehension test of Chapter 2.
The following is your test result.

How was your result?
It is recommended to try the questions again that you answered incorrectly.

		1	2	3	4	5	6	7	8	9	10
	Comprehension test 1	<input type="radio"/>									
	Comprehension test 2	<input type="radio"/>									
	Comprehension test 3	<input type="radio"/>									

Total questions: **3**

Correct answers: **3**

Percentage: **100** %

Clear

Chapter 3 How to Use MES Interface Module

In the previous chapter, the effectiveness of the database and various features of the MES interface module were explained. In this chapter, how to configure the settings by using the MES interface function configuration tool is described with the points explained.

When installing the MES interface module, the followings are necessary.

- MES interface module (RD81MES96)
- MES interface function configuration tool MX MESInterface-R (SW1DND-RMESIF-J/E)

The following software are stored in MX MESInterface-R.

- MES interface function configuration tool
 - DB connection service and setting tool
 - Project file conversion tool * Not used in this chapter.
- SD memory card



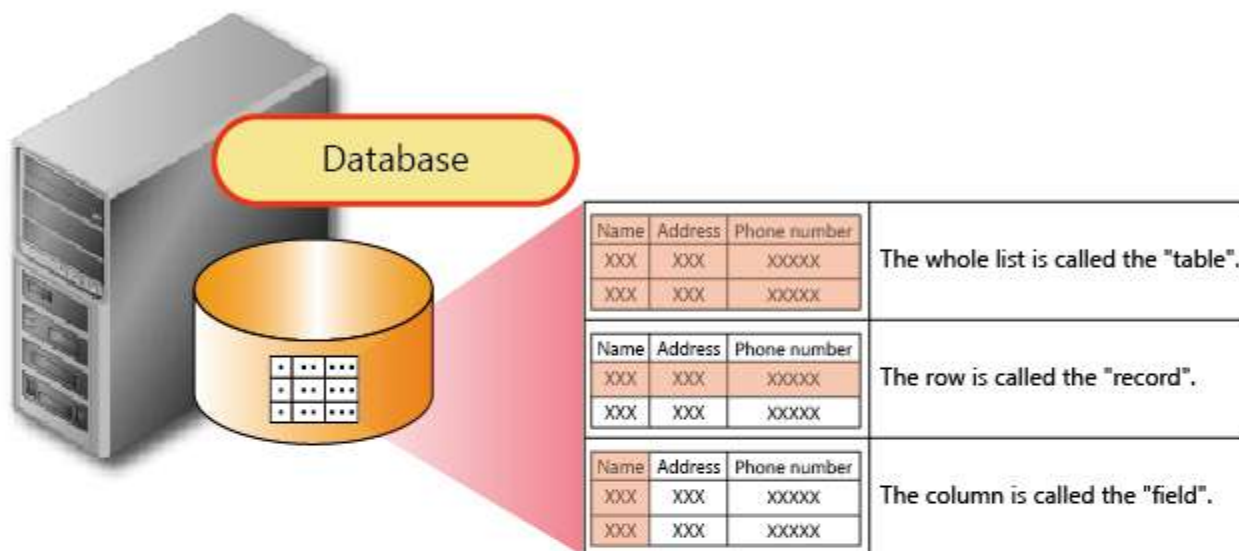
Contents of Chapter 3

- 3.1 Structure of Database
- 3.2 System Configuration
- 3.3 Starting the MES Interface Function Configuration Tool
- 3.4 Setting with the MES Interface Function Configuration Tool
- 3.5 System Example of the MES Interface Module
- 3.6 Summary

3.1

Structure of Database

Before the explanation of the setting method, how the data is managed in the database is explained.

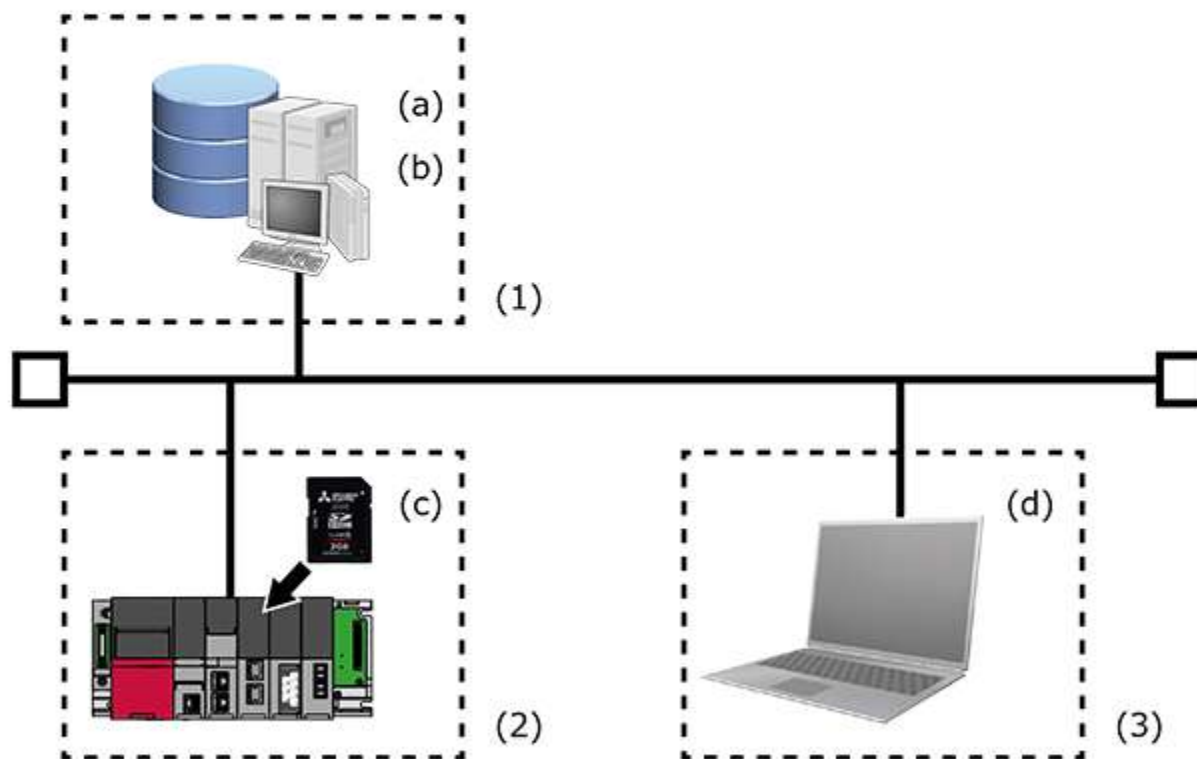


The system configuration of the MES interface module is shown below.

In the system configuration, there is a programmable controller that controls the database server and machine, and the MES interface module is installed to the programmable controller.

The database server and MES interface module are connected via Ethernet.

In this chapter, it is assumed that the installation of the MES interface function configuration tool, DB connection service, and setting tool is completed.



System configuration

(a)

- DB connection service

3.2

System Configuration

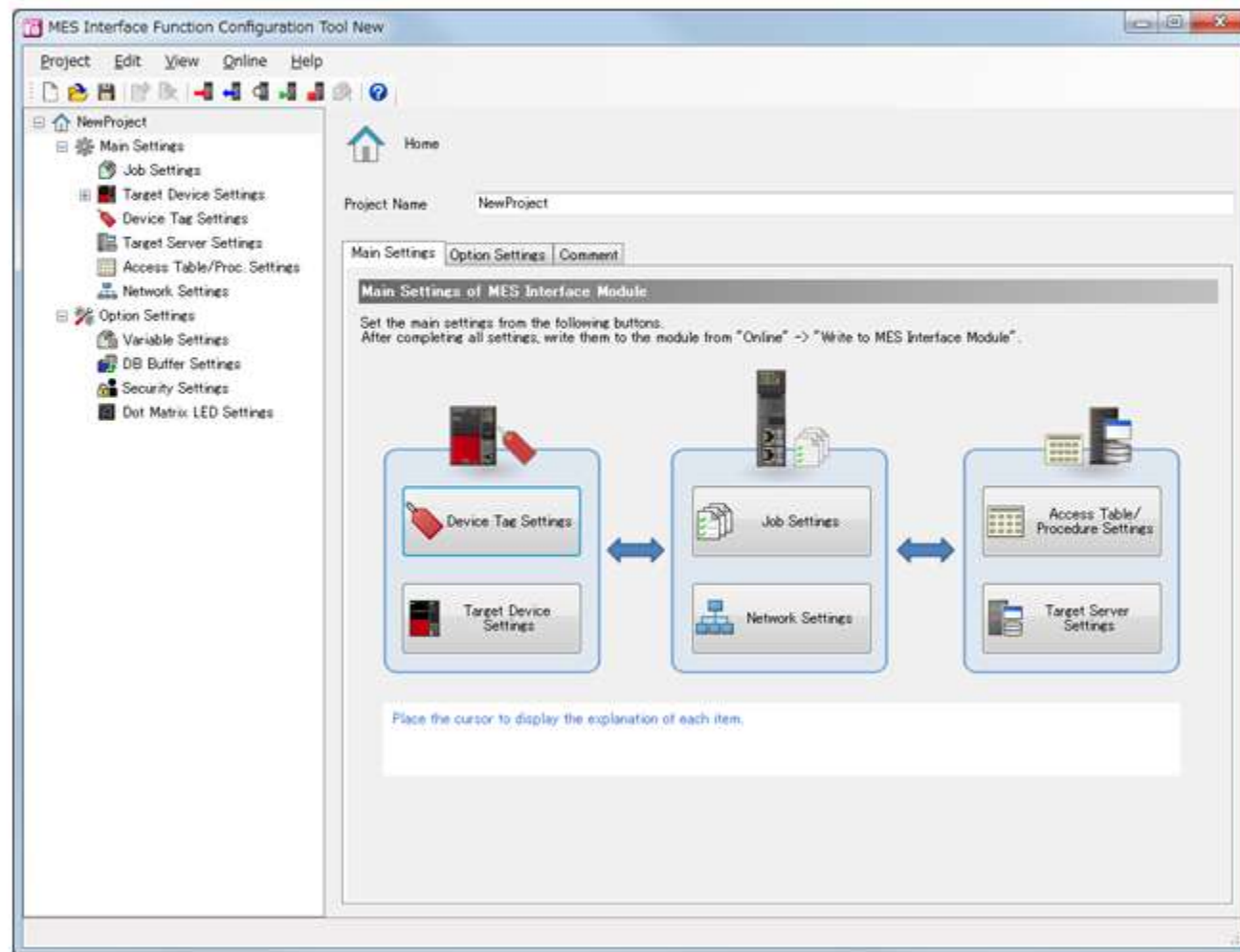
2/2

System configuration

(1)	Database server	(a)	<ul style="list-style-type: none">• DB connection service• DB connection server setting tool
		(b)	<ul style="list-style-type: none">• Microsoft Access
(2)	MES interface module	(c)	<ul style="list-style-type: none">• SD memory card (required)
(3)	Personal computer for configuration	(d)	<ul style="list-style-type: none">• MES interface function configuration tool

3.3 Starting the MES Interface Function Configuration Tool

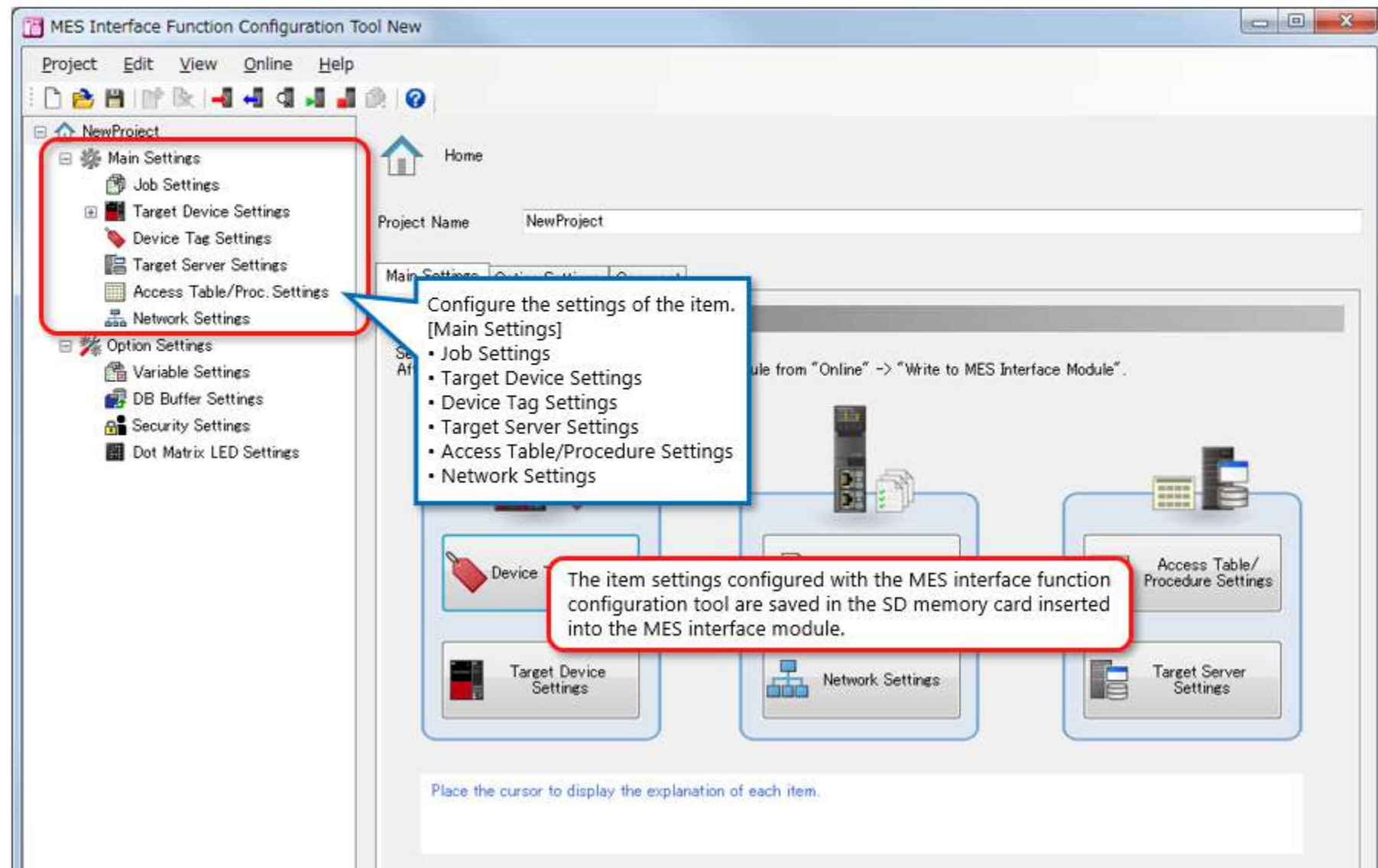
The MES interface function configuration tool is for configuring the settings to the MES interface module that are required to operate it.



3.3 Starting the MES Interface Function Configuration Tool

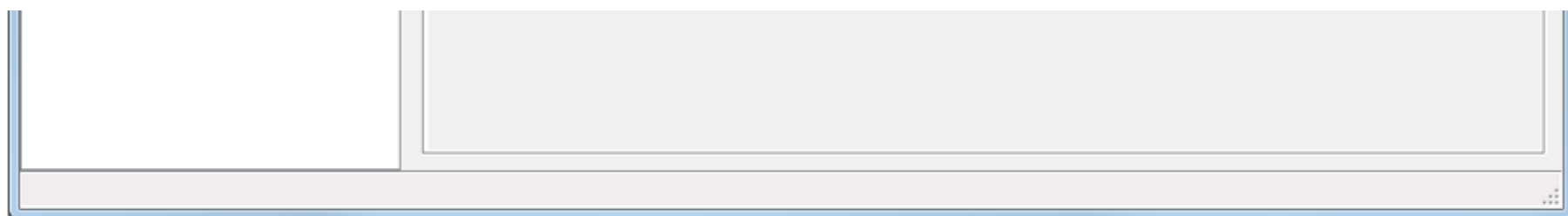
1/2

When the MES interface function configuration tool is started, the following window is displayed.
In the window at the left side of the screen, the items to be configured are displayed as the main items under "NewProject".



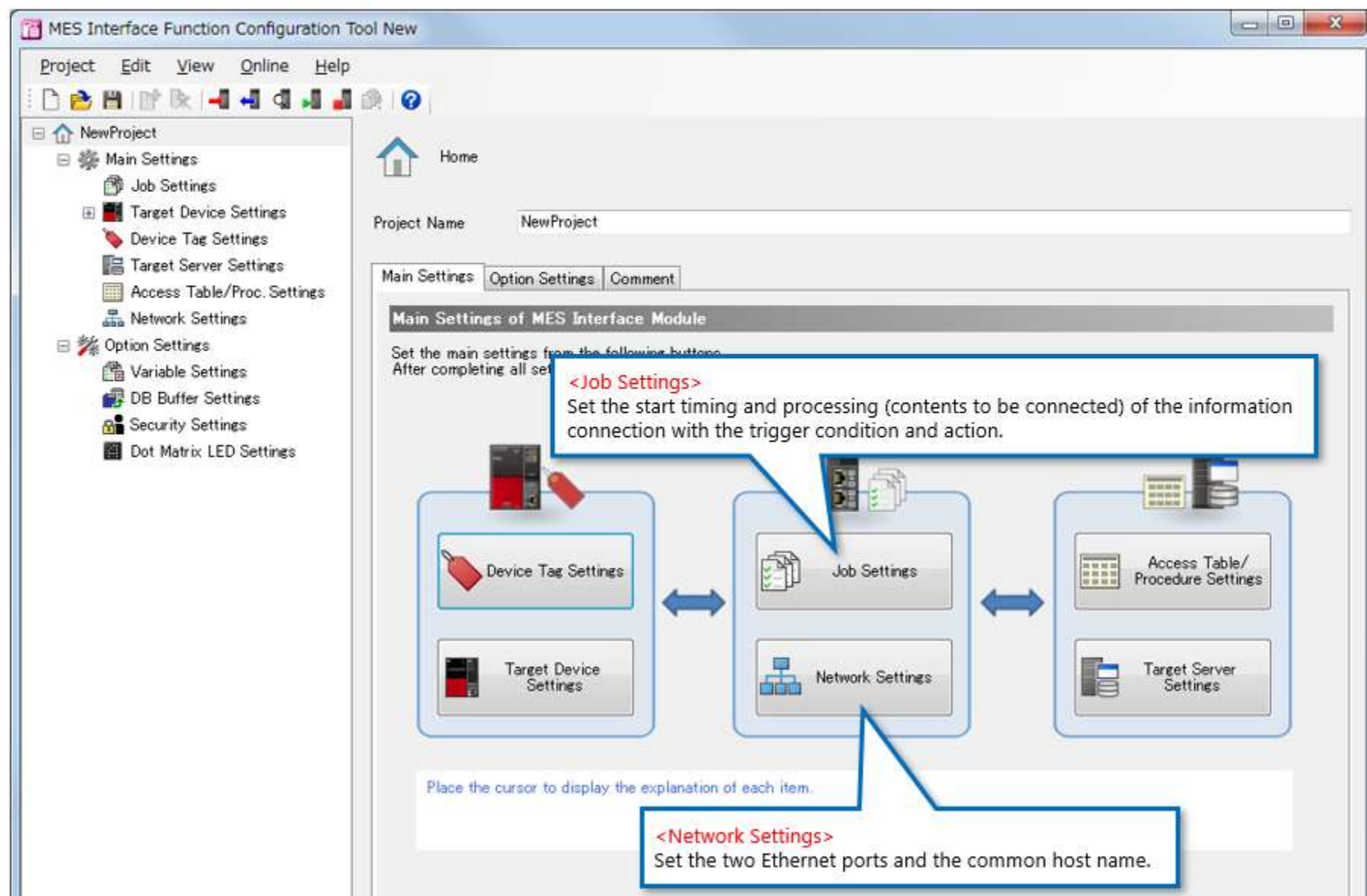
3.3 Starting the MES Interface Function Configuration Tool

2/2



The settings using the actual screen are described in Section 3.3.
Each setting item is explained briefly from the next page.

The following shows "Job Settings" and "Network Settings" that are set in the MES interface function configuration tool.



3.3

Setting Items of MES Interface Function Configuration Tool

2/2

<Network Settings>

Set the two Ethernet ports and the common host name.

The following shows "Target Device Settings" and "Device Tag Settings" that are set in the MES interface function configuration tool.

The screenshot displays the "MES Interface Function Configuration Tool New" window. The left sidebar shows a tree structure of settings categories: NewProject, Main Settings, Job Settings, Target Device Settings, Device Tag Settings, Target Server Settings, Access Table/Proc. Settings, Network Settings, Option Settings, Variable Settings, DB Buffer Settings, Security Settings, and Dot Matrix LED Settings. The main area shows the "Home" tab with a "Project Name" field set to "NewProject" and tabs for "Main Settings", "Option Settings", and "Comment".

<Device Tag Settings>
Set the logic name to the device memory of the target device as the device tag component. Also, the group of device tag components is set as the device tag. The global label and common device comment set in the engineering tool project can be imported to the device tag component.

<Target Device Settings>
Set the unit type, multiple-CPU No., and the network communication path for the access from the MES interface module, etc.

The diagram illustrates the configuration structure with three main components connected by double-headed arrows:

- Device Tag Settings** (represented by a red tag icon) and **Target Device Settings** (represented by a black and red icon) are grouped together in a box.
- Job Settings** (represented by a document icon) and **Network Settings** (represented by a network icon) are grouped together in a box.
- Access Table/Procedure Settings** (represented by a document icon) and **Target Server Settings** (represented by a server icon) are grouped together in a box.

3.3

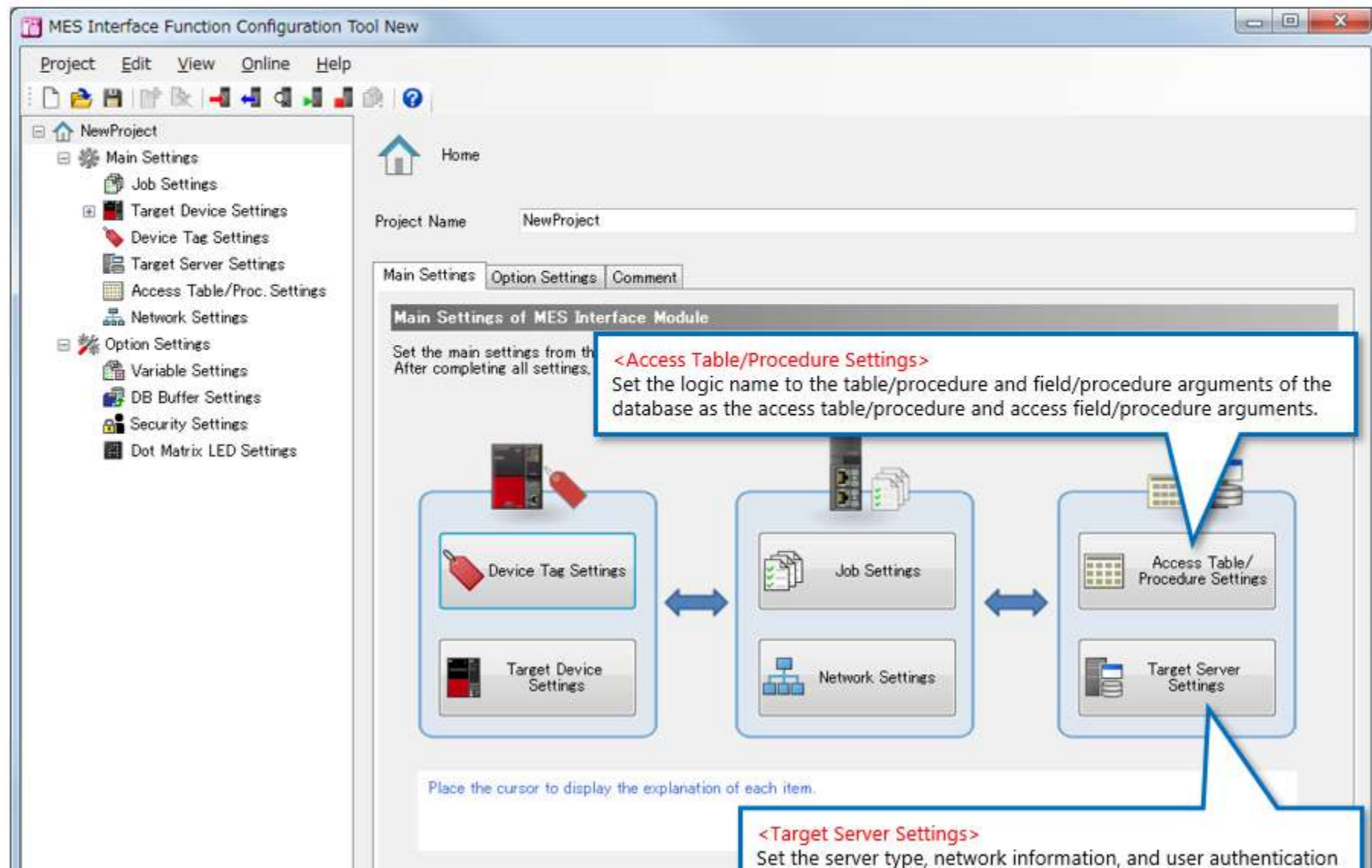
Setting Items of MES Interface Function Configuration Tool

2/2

<Target Device Settings>

Set the unit type, multiple-CPU No., and the network communication path for the access from the MES interface module, etc.

The following shows "Target Server Settings" and "Access Table/Procedure Settings" that are set in the MES interface function configuration tool.



3.3

Setting Items of MES Interface Function Configuration Tool

2/2

Place the cursor to display the explanation of each item.

<Target Server Settings>

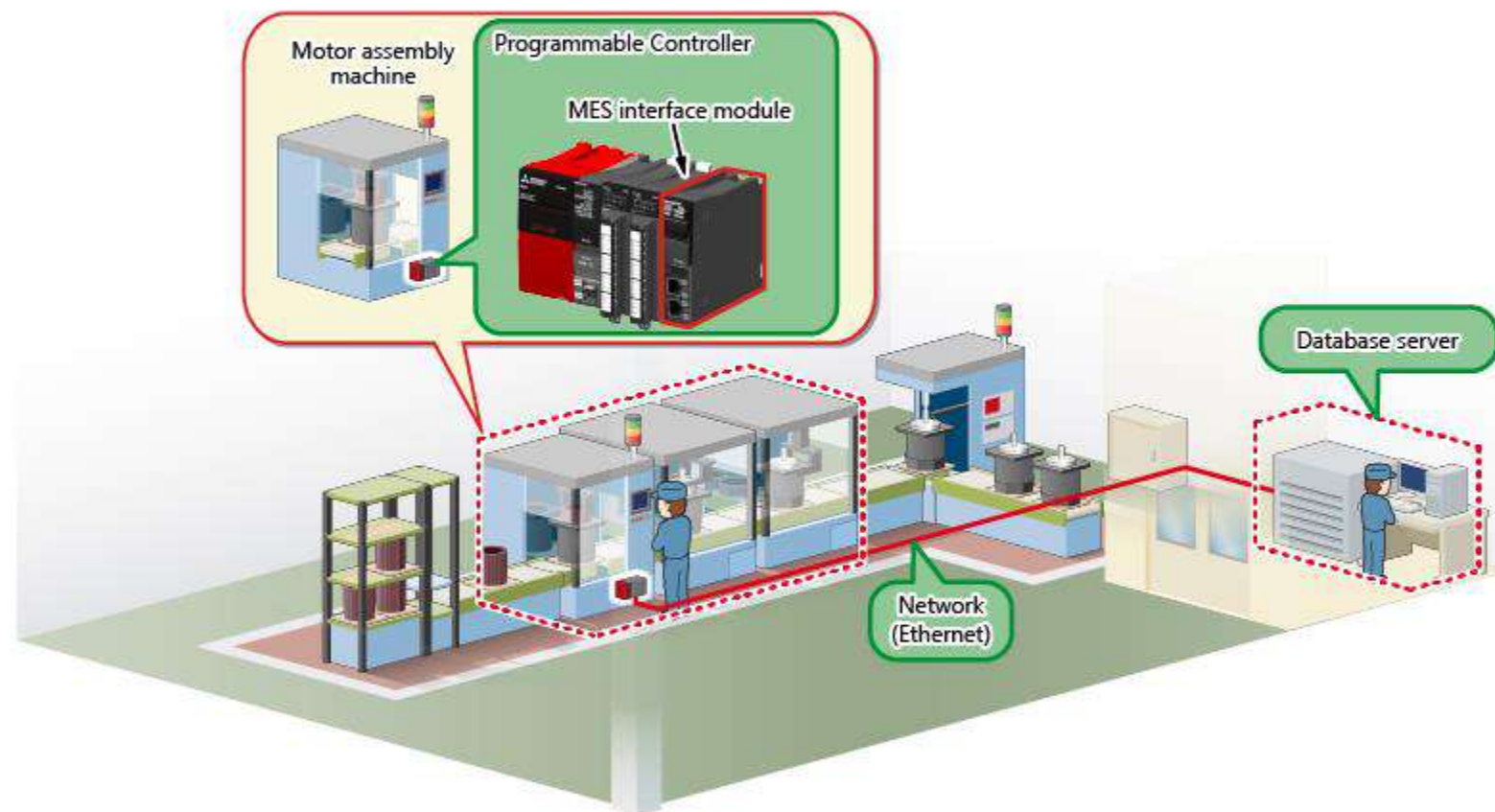
Set the server type, network information, and user authentication information.

3.4

Operation Overview

You have understood the main items, then let's configure the details.
The operation of the manufacturing equipment that is set this time is explained.

The motor assembly machine is used as an example for the setting configuration.



3.4

Operation of the Manufacturing Equipment

The manufacturing equipment operates as shown below.

Before starting the manufacturing with the machine, the standard value data is imported from the database server.
(Manufacturing pattern 2 is used in this case.)

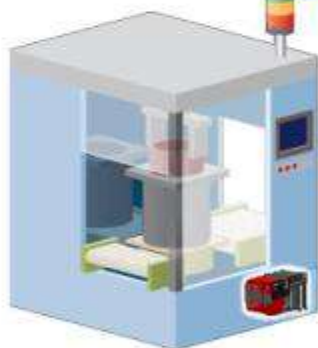


When the standard value is set, manufacturing starts.
At this point, the manufacturing pattern and start time are sent to the database server.

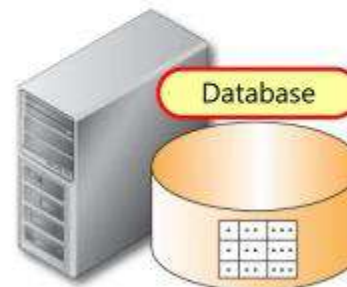


When the manufacturing is completed, the end time and result value data are sent to the database server.

Click to proceed to the next page.



Manufacturing machine



Database server

Back

In this course, Access 2016 is used as the database.

It is assumed that the following two tables, ParamTable and ResultTable, are prepared in the database server.

The standard values (parameters) of the equipment to be used for manufacturing are registered in ParamTable in advance. There are three fields in the table:

- Pattern No. (PatterNo)
- Press-fitting load (Load)
- Press-fitting height (Height)

The programmable controller controls the machine according to the press-fitting load and height.

<Table name: ParamTable>

PatternNo	Load	Height
1	100	1000
2	80	2000
3	120	1500

ResultTable is used for storing the result data after the manufacturing is completed.

There are five fields in the table:

- Manufactured Pattern No. (PatternNo)
- Result value of press-fitting load (LoadResult)
- Result value of press-fitting height (HeightResult)

3.4

Table Structure in the Database Server

2/2

- Start time of manufacturing (StartTime)
- End time of manufacturing (EndTime)

Create a record and set PatternNo and StartTime when the motor assembly is started. Set the data to the remaining fields after the assembly is completed.

<Table name: ResultTable>

PatternNo	LoadResult	HeightResult	StartTime	EndTime

3.4

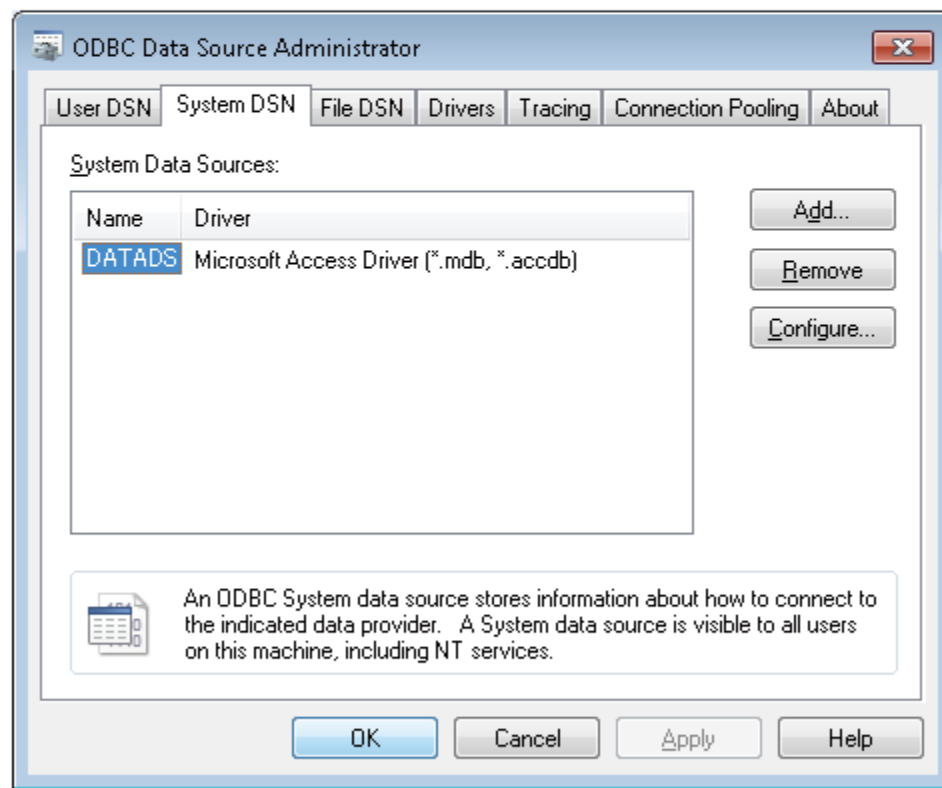
ODBC Function

The MES interface module accesses the database via ODBC.

To use the ODBC function, the database type, data source name, and database name to be used are required to be set in the ODBC setting of Windows.

The data source name is used in the target server setting of the MES interface function configuration tool.

In this course, it is assumed that the ODBC setting is completed in advance.



3.4

Device Memory List

<Device map of the CPU module>

The following shows the lists of the device memory that are used in this setting.

<Bit device>

Device memory	Meaning of device memory
M0	Manufacturing ready
M1	Start manufacturing
M2	Manufacturing complete

<Word device>

Device memory	Meaning of device memory
D0	Pattern No.
D100	Setting value of press-fitting load
D101	Setting value of press-fitting height
D200	Result value of press-fitting load
D201	Result value of press-fitting height

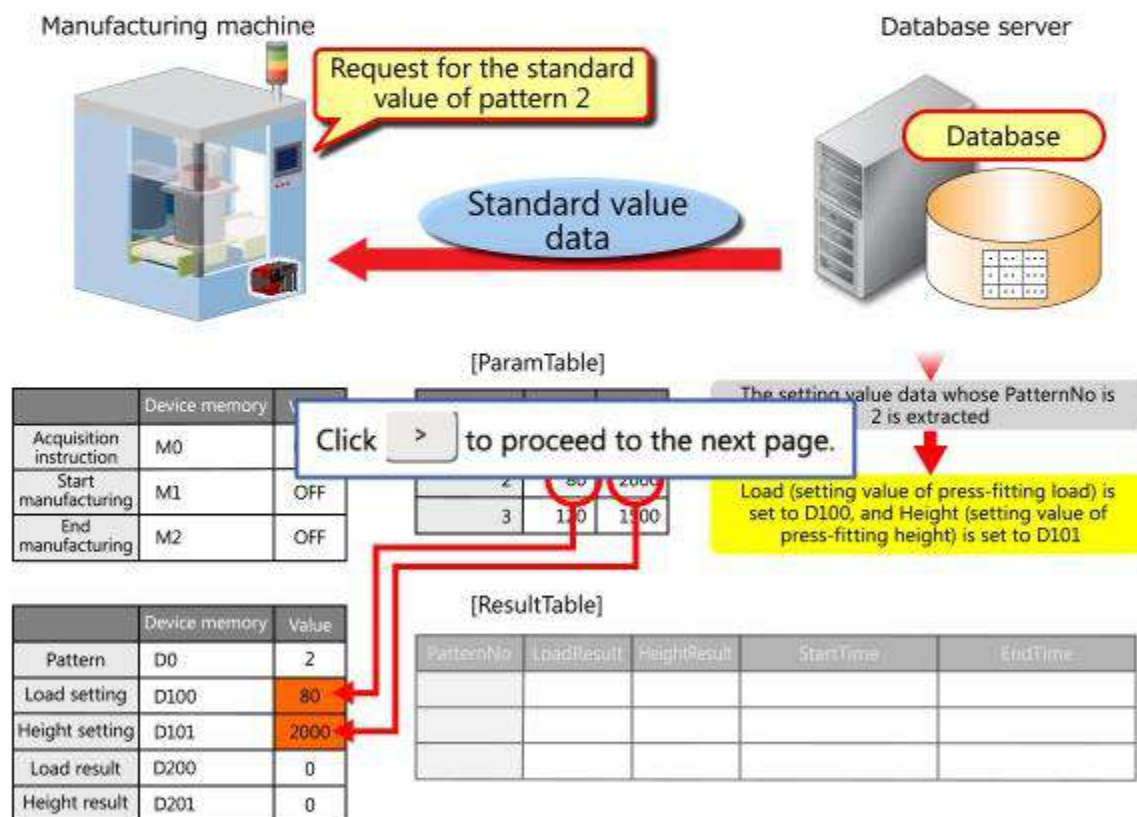
3.4

Setting with MES Interface Function Configuration Tool (Data Acquisition)

<Process of acquiring data from the database>

When the acquisition instruction (M0) is turned on while the manufacturing pattern (D0 = 2) is set in the equipment, the MES interface module extracts the setting value data of PatternNo = 2 in ParamTable, Load (setting value of press-fitting load) is set to D100, and Height (setting value of press-fitting height) is set to D101.

<Data process>



Back

3.4

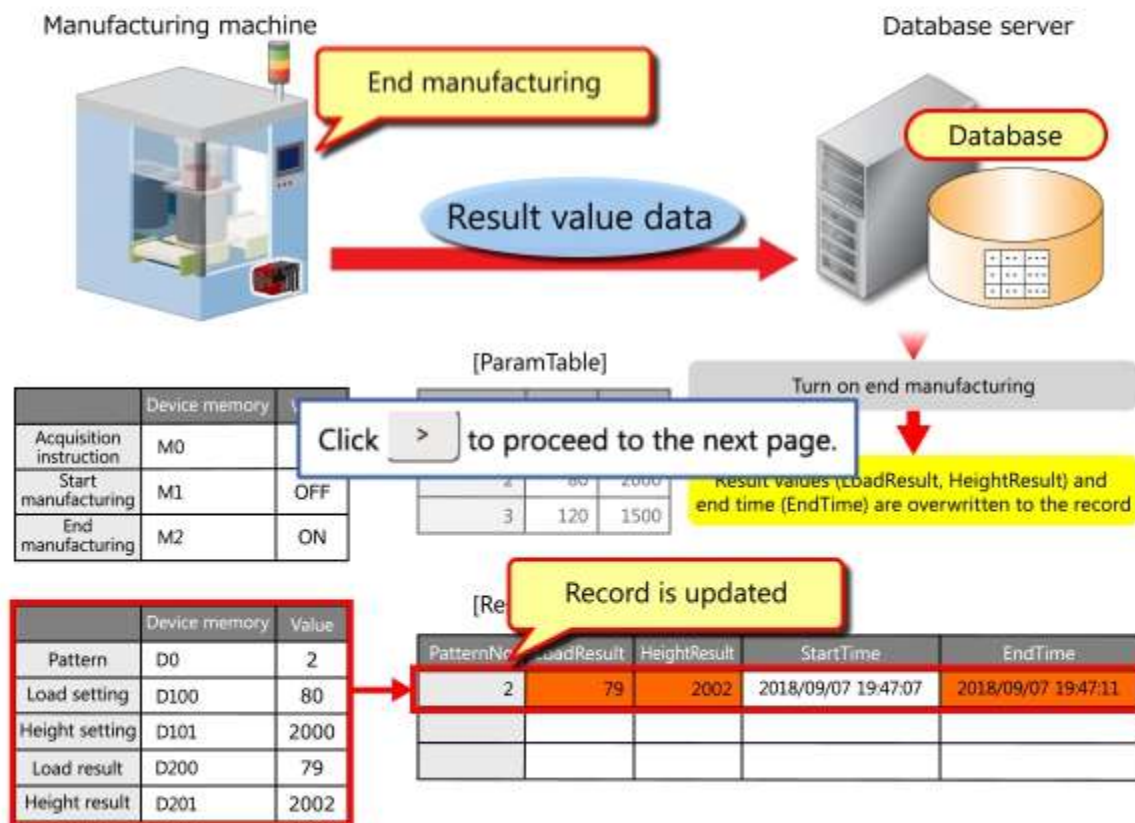
Setting with MES Interface Function Configuration Tool (Setting to Database)

<Process of setting the programmable controller data to the database>

- 1) By starting the manufacturing (M1 = ON), write the manufacturing pattern (PatternNo) and start time (StartTime) to ResultTable.
- 2) When the manufacturing is completed (M2 = ON), the records of 1) are overwritten by the result values (LoadResult and HeightResult) and end time (EndTime).

* For the time , the time data of the MES interface module is used.

<Data process>



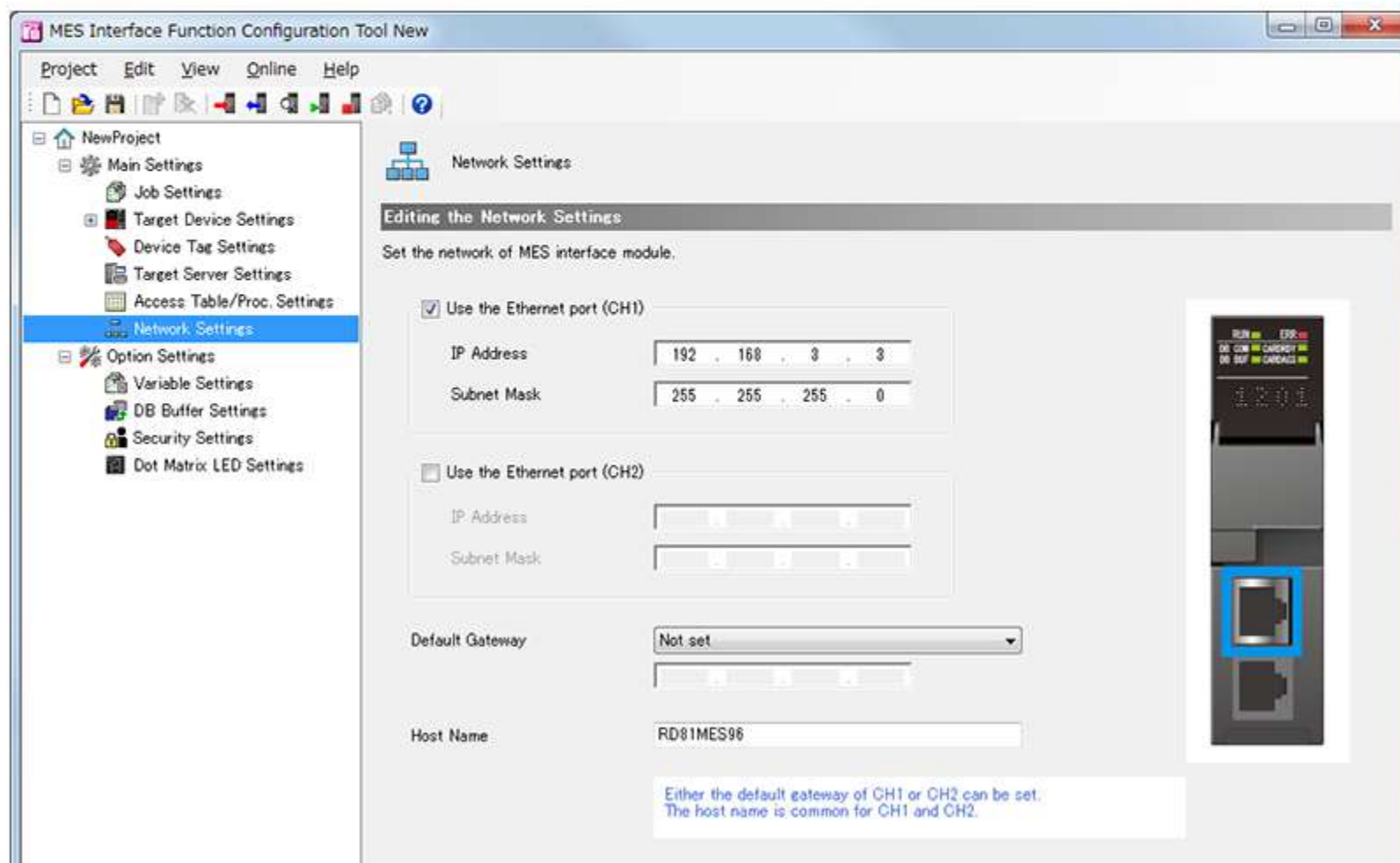
Back

<Settings of the MES interface module>

Configure the settings to extract the data in the database and write it to the device memory of the CPU module. The following describes the necessary settings in the MES interface function configuration tool.

[Network Settings]

The default setting is used in this course.



3.4**Setting with MES Interface Function Configuration Tool (Network Settings)****2/2**

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
- Job Settings
- Target Device Settings
- Device Tag Settings
- Target Server Settings
- Access Table/Proc. Settings
- Network Settings
- Option Settings
- Variable Settings
- DB Buffer Settings
- Security Settings
- Dot Matrix LED Settings

Home

Project Name: NewProject

Main Settings | Option Settings | Comment

Main Settings of MES Interface Module

Set the main settings from the following buttons.
After completing all settings, write them to the module from "Online" -> "Write to MES Interface Module".

```
graph LR; A[Device Tag Settings] <--> B[Job Settings]; B <--> C[Access Table/Procedure Settings];
```

Place the cursor to display the explanation of each item.

Network setting is completed.
Click [>](#) to proceed to the next page.

[Target Device Settings]

The default setting is used in this course.

Target Device Setting No.[1]

Target Device Name Comment

Target Device Settings

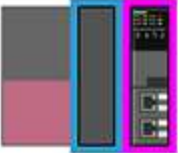
Set the target device for data access from MES interface module.

Device Type: Multiple CPU Setting:

Network Communication Route:

☐ Set the network communication route to a device existing over a single network

Source System Settings	Target (Relay Station) System Settings
Module Type: <input type="text" value="CC-Link IE Controller Network Module"/>	Module Type: <input type="text" value="CC-Link IE Controller Network Module"/> <input type="text" value="CC-Link IE Field Network Module"/> <input type="text" value="MELSECNET/H Network Module"/> <input type="text" value="Ethernet Interface Module"/>
Route: <input type="text" value="Direct access to Ethernet Port"/>	
	Network No.: <input type="text" value="1"/>
	Station No.: <input type="text" value="1"/>



3.4

Setting with MES Interface Function Configuration Tool (Target Device Settings)

2/2

Global Label/Common Device Comment Settings (optional)

☐ Use the global label/common device comment

Global Label/Common Device Comment Import Source Setting: ...

Communication Test OK Cancel

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
- Job Settings
- Target Device Settings
- ControlCPU
- Device Tag Settings
- Target Server Settings
- Access Table/Proc. Settings
- Network Settings
- Option Settings
- Variable Settings
- DB Buffer Settings
- Security Settings
- Dot Matrix LED Settings

Target Device Setting List

Home

Adding/Editing the Target Device Settings

When adding a target device setting, select a blank line and click the "Edit" button.
When editing the existing target device setting, select the applicable line and click the "Edit" button.

No.	Target Device Name	Comment	Device Type	Multiple CPU Setting
1	ControlCPU		MELSEC (ROPU)	No Specification
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Edit Delete

The target device settings are completed.
Click > to proceed to the next page.

[Device Tag Settings]

Configure the setting that extracts the data from the database and writes it to the device memory of the CPU module as "GettingData".

(1) Device tag name : GettingData

Sampling settings : Normal sampling (one second)

Component Name	Target Device	Device Memory (Start)	Data Type
PatternNo	ControlCPU	D0	Word [Unsigned]/Bit String [16-bit]
SettingValueofPressFittingLoad	ControlCPU	D100	Word [Unsigned]/Bit String [16-bit]
SettingValueofPressFittingHeight	ControlCPU	D101	Word [Unsigned]/Bit String [16-bit]
ManufacturingSettingValueAcquisition	ControlCPU	M0	Bit

Device Tag Setting No.[1]

Device Tag Name Comment

Device Tag Settings

Set the device tag as the logical group of device memory to be used in the job.
Further, set a component name as the logical name for each device memory.

No.	Component Name	Target Device	Device Memory (Start)	Device Memory (End)	Data Type
1	PatternNo	ControlCPU	...	D0	Word [Unsigned]/Bit String [16-bit]
2	SettingValueofPressFittingLoad	ControlCPU	...	D100	Word [Unsigned]/Bit String [16-bit]
3	SettingValueofPressFittingHeight	ControlCPU	...	D101	Word [Unsigned]/Bit String [16-bit]
4	ManufacturingSettingValueAcquisi	ControlCPU	...	M0	Bit
5			...		
6			...		

6			...		
7			...		
8			...		
9			...		
10			...		
11			...		
12			...		

Delete

↑ ↓

Data Write-Protect Setting (optional)

☐ Protect data writing

Array Tag Settings (optional)

☐ Set the array tag to be used for the assignment destination of Multiple Select

Array Tag Setting

[Device Tag Components in the Project] 4

Configure the setting that writes the data in the device memory of the CPU module to the database as "PuttingData".

- (2) Device tag name : PuttingData
 Sampling settings : Normal sampling (one second)

Component Name	Target Device	Device Memory (Start)	Data Type
PatternNo	ControlCPU	D0	Word [Unsigned]/Bit String [16-bit]
ResultValueofPressFittingLoad	ControlCPU	D200	Word [Unsigned]/Bit String [16-bit]

ResultValueofPressFittingHeight	ControlCPU	D201	Word [Unsigned]/Bit String [16-bit]
StartManufacturing	ControlCPU	M1	Bit
EndManufacturing	ControlCPU	M2	Bit

Device Tag Setting No.[2]

Device Tag Name

PuttingData

Comment

Device Tag Settings

Set the device tag as the logical group of device memory to be used in the job.
Further, set a component name as the logical name for each device memory.

No.	Component Name	Target Device	Device Memory (Start)	Device Memory (End)	Data Type
1	PatternNo	ControlCPU	...	D0	Word [Unsigned]/Bit String [16-bit]
2	ResultValueofPressFittingLoad	ControlCPU	...	D200	Word [Unsigned]/Bit String [16-bit]
3	ResultValueofPressFittingHeight	ControlCPU	...	D201	Word [Unsigned]/Bit String [16-bit]
4	StartManufacturing	ControlCPU	...	M1	Bit
5	EndManufacturing	ControlCPU	...	M2	Bit
6			...		
7			...		
8			...		
9			...		
10			...		
11			...		
12			...		

Delete



Data Write-Protect Setting (optional)

Array Tag Settings (optional)

☐ Protect data writing☐ Set the array tag to be used for the assignment destination of Multiple Select

Array Tag Setting

-

[Device Tag Components in the Project] 9

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MES Interface Function Configuration Tool New

Project Edit View Online Help

Device Tag Setting List

Home


Adding/Editing the Device Tag Settings

When adding a device tag setting, select a blank line and click the "Edit" button.
When editing the existing device tag setting, select the applicable line and click the "Edit" button.

No.	Device Tag Name	Comment	Data Writing	Array Size
1	GettingData		-	-
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of device tag "GettingData" is completed.

Click  to proceed to the next page.

[Device Tag Components in the Project] 4

[Back](#)

The screenshot shows the 'MES Interface Function Configuration Tool New' window. The left sidebar contains a tree view with the following items: NewProject, Main Settings, Job Settings, Target Device Settings, ControlCPU, Device Tag Settings (selected), GettingData, PuttingData, Target Server Settings, Access Table/Proc. Settings, Network Settings, Option Settings, Variable Settings, DB Buffer Settings, Security Settings, and Dot Matrix LED Settings. The main area is titled 'Device Tag Setting List' and contains a section 'Adding/Editing the Device Tag Settings' with instructions: 'When adding a device tag setting, select a blank line and click the "Edit" button. When editing the existing device tag setting, select the applicable line and click the "Edit" button.' Below this is a table with 5 columns: No., Device Tag Name, Comment, Data Writing, and Array Size. The table has 21 rows. Row 1 is 'GettingData' and row 2 is 'PuttingData', both with dashes in the 'Data Writing' and 'Array Size' columns. Row 2 is highlighted in blue. At the bottom of the table are 'Edit' and 'Delete' buttons. A callout box points to row 2 with the text: 'The setting of device tag "PuttingData" is completed. Click > to proceed to the next page.' The status bar at the bottom right shows '[Device Tag Components in the Project] 9'.

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
- Job Settings
- Target Device Settings
- ControlCPU
- Device Tag Settings
- GettingData
- PuttingData
- Target Server Settings
- Access Table/Proc. Settings
- Network Settings
- Option Settings
- Variable Settings
- DB Buffer Settings
- Security Settings
- Dot Matrix LED Settings

Device Tag Setting List

Home

Adding/Editing the Device Tag Settings

When adding a device tag setting, select a blank line and click the "Edit" button.
When editing the existing device tag setting, select the applicable line and click the "Edit" button.

No.	Device Tag Name	Comment	Data Writing	Array Size
1	GettingData		-	-
2	PuttingData		-	-
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of device tag "PuttingData" is completed.
Click > to proceed to the next page.

[Device Tag Components in the Project] 9

[Target Server Settings]

Use the same data source name as configured in the ODBC settings.

Setting item	Setting
Target Server Name	DataServer
Server Type	Database Server
IP Address	192.168.3.100
Port No.	5112
Communication Timeout Time	10
Data Source Name	DATADS
User Name	-
Password	-
Database Type	Access 2016
Access Error Notification Setting	Not Notify

Target Server Setting No.[1]

Target Server Name

DataServer

Comment

Target Server Common Settings

Set the target server with which MES interface module communicates.

3.4

Setting with MES Interface Function Configuration Tool (Target Server Settings)

2/2

Server Type Database Server

IP Address 192 . 168 . 3 . 100

Port No. 5112

Communication Timeout Time 10 s



Target Server Individual Settings

Set the information to access the database.

Data Source Name DATADS

User Name

Password

Database Type Access 2016

Access Error Notification Settings (optional)

Access Error Notification Setting Not Notify

Change

Communication
Test

OK

Cancel

[Back](#)

The screenshot shows the 'MES Interface Function Configuration Tool New' window. The left sidebar contains a tree view of settings categories: NewProject, Main Settings, Job Settings, Target Device Settings, ControlCPU, Device Tag Settings, GettingData, PuttingData, Target Server Settings (selected), DataServer (selected), Access Table/Proc. Settings, Network Settings, Option Settings, Variable Settings, DB Buffer Settings, Security Settings, and Dot Matrix LED Settings. The main area is titled 'Target Server Setting List' and includes a 'Home' button. Below the title is a section 'Adding/Editing the Target Server Settings' with instructions: 'When adding a target server setting, select a blank line and click the "Edit" button. When editing the existing target server setting, select the applicable line and click the "Edit" button.' A table with 5 columns (No., Target Server Name, Comment, Server Type, IP Address) and 16 rows is displayed. The first row is highlighted in blue and contains the text: '1', 'DataServer', (blank), 'Database Server', '192.168.3.100'. At the bottom of the window are 'Edit' and 'Delete' buttons. A message box at the bottom right states: 'The access target server setting is completed. Click > to proceed to the next page.'

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
- Job Settings
- Target Device Settings
 - ControlCPU
- Device Tag Settings
 - GettingData
 - PuttingData
- Target Server Settings
 - DataServer**
 - Access Table/Proc. Settings
- Network Settings
- Option Settings
 - Variable Settings
 - DB Buffer Settings
 - Security Settings
 - Dot Matrix LED Settings

Target Server Setting List

Home

Adding/Editing the Target Server Settings

When adding a target server setting, select a blank line and click the "Edit" button.
When editing the existing target server setting, select the applicable line and click the "Edit" button.

No.	Target Server Name	Comment	Server Type	IP Address
1	DataServer		Database Server	192.168.3.100
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Edit Delete

The access target server setting is completed.
Click > to proceed to the next page.

[Access Table/Procedure Settings]

Configure the access table/procedure to which the MES interface module is connected.

(1) Access Table/Procedure Name : GetPlan

Target Server : DataServer

Table/Procedure Type : Access Table

DB Table Name : ParamTable

Access Field Name	DB Field Name	Data Type	Precision Hold	Default Value Setting	Default Value
PatternNo	PatternNo	Integer	Disable	Disable	-
Load	Load	Integer	Disable	Disable	-
Height	Height	Integer	Disable	Disable	-

Access Table/Procedure Setting No.[1]

Access Table/Procedure Name

GetPlan

Comment

Access Table/Procedure Settings

Set the target server to be used and type of access table/procedure.

Target Server

DataServer

...


Table/Procedure Type


☒ Access Table

☐ Access Procedure

Access Table Detailed Settings

Set the DB table to be accessed, and set the DB field as the access field.

 Browse DB Table Information

 Browse DB Field Information

DB Table Name

ParamTable

No.	Access Field Name	DB Field Name	Data Type	Precision Hold	Default Value Setting
1	PatternNo	PatternNo	Integer	Disable	Disable
2	Load	Load	Integer	Disable	Disable
3	Height	Height	Integer	Disable	Disable
4					
5					
6					
7					
8					

Delete

OK Cancel

[DB Field Name] 19 characters

(2) Access Table/Procedure Name : PutPlan1

Target Server : DataServer

Table/Procedure Type : Access Table

DB Table Name : ResultTable

Access Field Name	DB Field Name	Data Type	Precision Hold	Default Value Setting	Default Value
PatternNo	PatternNo	Integer	Disable	Disable	-

LoadResult	LoadResult	Integer	Disable	Disable	-
HeightResult	HeightResult	Integer	Disable	Disable	-
StartTime	StartTime	Date and Time [Without Time Zone]	Disable	Disable	-

Access Table/Procedure Setting No.[2]

Access Table/Procedure Name PutPlan1
Comment

Access Table/Procedure Settings

Set the target server to be used and type of access table/procedure.

Target Server DataServer

Table/Procedure Type ☒ Access Table ☐ Access Procedure

Access Table Detailed Settings

Set the DB table to be accessed, and set the DB field as the access field.

Browse DB Table Information
Browse DB Field Information

DB Table Name ResultTable

No.	Access Field Name	DB Field Name	Data Type	Precision Hold	Default Value Setting
1	PatternNo	PatternNo	Integer	Disable	Disable
2	LoadResult	LoadResult	Integer	Disable	Disable
3	HeightResult	HeightResult	Integer	Disable	Disable
4	StartTime	StartTime	Date and Time [Without Time Zone]	Disable	Disable
5					
6					
7					
8					

Delete

Up Arrow Down Arrow

OK Cancel

[DB Field Name] 40 characters

(3) Access Table/Procedure Name : PutPlan2

Target Server : DataServer

Table/Procedure Type : Access Table

DB Table Name : ResultTable

Access Field Name	DB Field Name	Data Type	Precision Hold	Default Value Setting	Default Value
PatternNo	PatternNo	Integer	Disable	Disable	-
LoadResult	LoadResult	Integer	Disable	Disable	-
HeightResult	HeightResult	Integer	Disable	Disable	-
EndTime	EndTime	Date and Time [Without Time Zone]	Disable	Disable	-

Access Table/Procedure
Name PutPlan2

Comment

Access Table/Procedure Settings

Set the target server to be used and type of access table/procedure.

Target Server

DataServer

Table/Procedure Type

☒ Access Table☐ Access Procedure**Access Table Detailed Settings**

Set the DB table to be accessed, and set the DB field as the access field.

Browse DB
Table InformationBrowse DB
Field Information

DB Table Name

ResultTable

No.	Access Field Name	DB Field Name	Data Type	Precision Hold	Default Value Setting
1	PatternNo	PatternNo	Integer	Disable	Disable
2	LoadResult	LoadResult	Integer	Disable	Disable
3	HeightResult	HeightResult	Integer	Disable	Disable
4	EndTime	EndTime	Date and Time [Without Time Zone]	Disable	Disable
5					
6					
7					
8					

Delete



OK

Cancel

[DB Field Name] 38 characters

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
 - Job Settings
 - Target Device Settings
 - ControlCPU
 - Device Tag Settings
 - GettingData
 - PuttingData
 - Target Server Settings
 - DataSet
 - Access Table/Proc. Settings
 - GetPlan
- Network Settings
- Option Settings
 - Variable Settings
 - DB Buffer Settings
 - Security Settings
 - Dot Matrix LED Settings

Access Table/Procedure Setting List

Adding/Editing the Access Table/Procedure Settings

When adding an access table/procedure setting, select a blank line and click the "Edit" button.
When editing the existing access table/procedure setting, select the applicable line and click the "Edit" button.

No.	Access Table/Procedure Name	Comment	Target Server Name	Table/Procedure Type
1	GetPlan		DataSet	Access Table
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of the access table/procedure, "GetPlan" is completed.
Click [>](#) to proceed to the next page.

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help


Access Table/Procedure Setting List

Adding/Editing the Access Table/Procedure Settings

When adding an access table/procedure setting, select a blank line and click the "Edit" button.
When editing the existing access table/procedure setting, select the applicable line and click the "Edit" button.

No.	Access Table/Procedure Name	Comment	Target Server Name	Table/Procedure Type
1	GetPlan		DataSource	Access Table
2	PutPlan1		DataSource	Access Table
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of the access table/procedure, "PutPlan1" is completed.
Click  to proceed to the next page.

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
 - Job Settings
 - Target Device Settings
 - ControlCPU
 - Device Tag Settings
 - GettingData
 - PuttingData
- Target Server Settings
 - DataSeter
- Access Table/Proc. Settings
 - GetPlan
 - PutPlan1
 - PutPlan2
- Network Settings
- Option Settings
 - Variable Settings
 - DB Buffer Settings
 - Security Settings
 - Dot Matrix LED Settings

Access Table/Procedure Setting List

Home


Adding/Editing the Access Table/Procedure Settings

When adding an access table/procedure setting, select a blank line and click the "Edit" button.
When editing the existing access table/procedure setting, select the applicable line and click the "Edit" button.

No.	Access Table/Procedure Name	Comment	Target Server Name	Table/Procedure Type
1	GetPlan		DataSeter	Access Table
2	PutPlan1		DataSeter	Access Table
3	PutPlan2		DataSeter	Access Table
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of the access table/procedure, "PutPlan2" is completed.

Click  to proceed to the next page.

[Job Settings]

Create a job that extracts the data in the database when manufacturing is ready.

(1) Job Name: GetPlan

[Job Configuration]

Job Configuration: Main Configuration

Job Setting No.[1]

Job Name Comment

Job Configuration **Trigger Conditions** **Read Data at Trigger Judgment** **Pre-Processing** **Main-Processing** **Post-Processing** **Verification Settings**


Job Configuration Selection

Select the configuration of the job being set.


Job Configuration


Set a job with the main configuration.
Set the action only for the main-processing.

Trigger Conditions

 **Target Device**

Main-Processing
such as DB Communication

 **MES Interface Module**

 **Target Server**

The diagram illustrates the data flow for the Main-Processing step. It shows a 'Target Device' (represented by a red and black icon) sending data to a 'MES Interface Module' (represented by a black icon with a green arrow pointing to it). The 'MES Interface Module' then communicates with a 'Target Server' (represented by a server rack icon) via a blue double-headed arrow, indicating bidirectional communication. The text 'such as DB Communication' is placed above the MES Interface Module and Target Server.

Back Next OK Cancel

[Device Tag Components] 0 . 0 points [Global Variable] 0 bytes [Used Field/Arguments] 0 unit [Date and Time] 0 unit [Character strings] 0

[Trigger Conditions]

- Trigger Conditions Configuration Settings

Configuration Type: Single Event

- Event/Condition Settings

Event/Condition Type: Condition (Value Monitoring)

Monitoring target	(Data type)	Comparing condition	Comparing target	(Data type)
[TAG] GettingData.ManufacturingSettingValueAcquisition	Bit	=	[INT]1	

- Trigger Buffering Setting (optional)

Trigger Buffering: Disable

Job Setting No.[1]

Job Name GetPlan Comment

Read Data

Job Configuration

Trigger Conditions

Read Data at Trigger Judgment

Pre-Processing

Main-Processing

Post-Processing

Verification Settings

Trigger Condition Configuration Settings

Select the configuration of the trigger condition.

Configuration Type

Single Event

Condition Combination Type

AND Combination

The timing of the specified event occurrence is considered as the satisfaction of the trigger condition.
In the case of using the condition, the timing of the condition satisfaction is considered as the event occurrence.

Event/Condition Settings

Set each event/condition to be used at Trigger Judgment.

No.	Event/Condition Type	Detail Type	Content
1	Condition (Value Monit...	-	[TAG]GettingData.Manufacturing...

Edit

Delete

↑

↓

No.1

Event

Trigger Condition is Satisfied

OR

No.1

Event

Condition

Trigger Condition is Satisfied

Trigger Buffering Setting (optional)

Set the operation of the job whenever the trigger conditions are satisfied at the same time.

Trigger Buffering

Disable

When disabled, even if the trigger condition of the same job is satisfied again while executing the job, the satisfied trigger condition will be disabled.

Back

Next

OK

Cancel

[Device Tag Components] 1 . 1 points

[Global Variable] 0 bytes

[Used Field/Arguments] 0 unit

[Date and Time] 0 unit

[Character strings] 0

[Read Data at Trigger Judgment]

- Access Type Selection
Access Type: General Access
- Access Interval Settings
Access Interval: Seconds Specification/1s
- Reading Target Data Setting (optional)
Reading Target Data: The Data to be used in Trigger Condition only

Job Setting No.[1]

Job Name: GetPlan Comment:

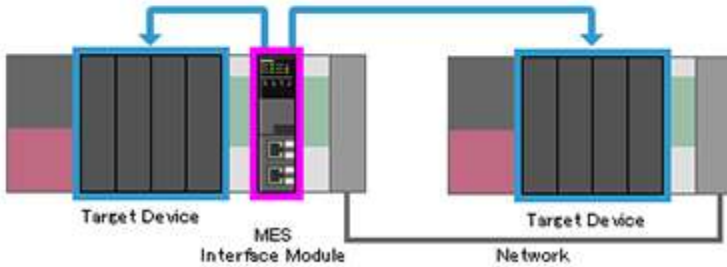
Job Configuration **Trigger Conditions** **Read Data at Trigger Judgment** Pre-Processing Main-Processing Post-Processing Verification Settings

Access Type Selection

Select the data reading method to be used at trigger judgment.

Access Type: General Access

For "General Access", accessing to all access target devices is possible.
When the number of pieces of data is large, the data may become inconsistent.



Target Device MES Interface Module Target Device Network

Access Interval Settings

Set the interval to read the data used at trigger judgment.

Access Interval: ☒ Seconds Specification 1 s

Access Interval ☒ Seconds Specification 1 s
☐ Milliseconds Specification 1 * 100 ms

Reading Target Data Setting (optional)

Reading Target Data The Data to be used in Trigger Condition only

[Device Tag Components] 1 , 1 points [Global Variable] 0 bytes [Used Field/Arguments] 0 unit [Date and Time] 0 unit [Character strings] 0

[Main-Processing]

• Main-Processing Settings

Action Type : DB Communication Action

DB Communication Type : Select

Access Table : GetPlan.Database

Data Assignment tab

Access Field	(Data type)	↔	Assigned data	(Data type)
PatternNo	Integer	→	-	
Load	Integer	→	[TAG]GettingData.SettingValueofPressFittingLoad	Word [Unsigned]/Bit String [16-bit]
Height	Integer	→	[TAG] GettingData.SettingValueofPressFittingHeight	Word [Unsigned]/Bit String [16-bit]

Narrowing-Down Condition tab

Combination	Access Field	(Data type)	Comparing condition	Comparing target
	PatternNo	Integer	=	[TAG]GettingData.PatternNo

- DB Buffering Settings (optional)

DB Buffering: No Buffering

Job Setting No.[1]

Job Name Comment

☒ Job Configuration ☒ Trigger Conditions ☒ Read Data at Trigger Judgment ☐ Pre-Processing ☒ Main-Processing ☐ Post-Processing ☐ Verification Settings

Main-Processing Settings

When adding an action to be executed in the main-processing, select a blank line and click the "Edit" button.
When editing the existing action, select the applicable line and click the "Edit" button.

No.	Action Type	Content
▶ 1	DB Communication Action	[Content] Select, [GetPlan] -> [[TAG]GettingData.SettingValueofPressFittingLoad...
2		
3		
4		
5		
6		
7		
8		
9		
10		

Operation Settings at Main-Processing Failure (optional)

At Processing Failure Notification: "Not Set"

DB Buffering Settings (optional)

DB Buffering No Buffering

DB Buffer Use Size [byte] -

[Device Tag Components] 4 , 4 points [Global Variable] 0 bytes [Used Field/Arguments] 3 unit [Date and Time] 0 unit [Character strings] 0

[Verification Settings]

- Working History Settings (optional)
Working History: Not output
- Data Output Inhibition Necessity Settings (optional)
Inhibit the data output to the target device : Do not select
Inhibit the data output to the target server : Do not select
- Job Execution Inhibition Necessity Settings (optional)
Inhibit the job execution even when the trigger condition is satisfied.: Do not select

Job Setting No.[1]

Job Name GetPlan Comment

Job Configuration Trigger Conditions Read Data at Trigger Judgment Pre-Processing Main-Processing Post-Processing **Verification Settings**

Working History Settings (optional)

Working History Settings (optional)

Set the output necessity of the working history (job execution history) and the detailed log (execution history of each action of the job).

Working History Not output ▼

Detailed Log Not output ▼

Data Output Inhibition Necessity Settings (optional)

Set the settings for inhibiting the data output to avoid affecting to the database and target device at the job operation verification.

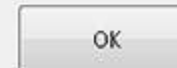
☐ Inhibit the data output to the target device

☐ Inhibit the data output to the target server

Job Execution Inhibition Necessity Settings (optional)

Set the necessity of the job execution inhibition.

☐ Inhibit the job execution even when the trigger condition is satisfied.



[Device Tag Components] 4 , 4 points [Global Variable] 0 bytes [Used Field/Arguments] 3 unit [Date and Time] 0 unit [Character strings] 0

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

NewProject

- Main Settings
 - Job Settings
 - GetPlan
 - Target Device Settings
 - Device Tag Settings
 - Target Server Settings
 - Access Table/Proc. Settings
 - GetPlan
 - PutPlan1
 - PutPlan2
 - Network Settings
 - Option Settings
 - Variable Settings
 - DB Buffer Settings
 - Security Settings
 - Dot Matrix LED Settings

Job Setting List


Home

Adding/Editing the Job Settings

When adding a job setting, select a blank line and click the "Edit" button.
When editing the existing job setting, select the applicable line and click the "Edit" button.

No.	Job Name	Comment	Job Configuration	Event/Condition Type No.1
1	GetPlan		Main Configuration	Condition (Value Monitoring)
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of job, "GetPlan" is completed.
Click  to proceed to the next page.

[Device Tag Component used in the Project] 4 points . 0 points(High-Speed) [Field/Argument used in the Project] 3 unit

[Job Settings]

Create a job that writes the record to the database when starting the manufacturing.

(2) Job Name: PutPlan1

[Job Configuration]

Job Configuration: Main Configuration

Job Setting No.[2]

Job Name PutPlan1 Comment

Job Configuration Trigger Conditions Read Data at Trigger Judgment Pre-Processing **Main-Processing** Post-Processing Verification Settings

Job Configuration Selection

Select the configuration of the job being set.

Job Configuration Main Configuration

Set a job with the main configuration.
Set the action only for the main-processing.

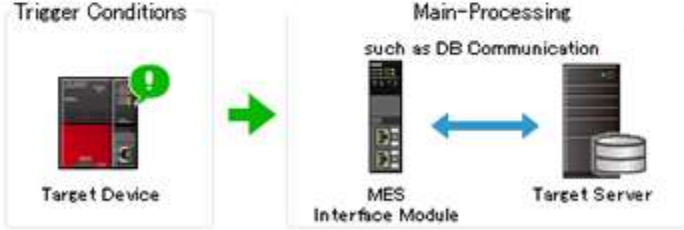
Trigger Conditions

Target Device

Main-Processing
such as DB Communication

MES Interface Module

Target Server



Back Next OK Cancel

[Device Tag Components] 0 . 0 points [Global Variable] 0 bytes [Used Field/Arguments] 0 unit [Date and Time] 0 unit [Character strings] 0

[Trigger Conditions]

- Trigger Conditions Configuration Settings

Configuration Type: Single Event

- Event/Condition Settings

Event/Condition Type: Condition (Value Monitoring)

Monitoring target	(Data type)	Comparing condition	Comparing target	(Data type)
[TAG]PuttingData.StartManufacturing	Bit	=	[INT]1	

- Trigger Buffering Setting (optional)

Trigger Buffering: Disable

Job Setting No.[2]

Job Name PutPlan1 Comment

Read Data

3.4

Setting with MES Interface Function Configuration Tool (Job Settings)

3/8

Job Configuration

Trigger Conditions

Read Data at Trigger Judgment

Pre-Processing

Main-Processing

Post-Processing

Verification Settings

Trigger Condition Configuration Settings

Select the configuration of the trigger condition.

Configuration Type: Single Event

Condition Combination Type: AND Combination

The timing of the specified event occurrence is considered as the satisfaction of the trigger condition. In the case of using the condition, the timing of the condition satisfaction is considered as the event occurrence.

Event/Condition Settings

Set each event/condition to be used at Trigger Judgment.

No.	Event/Condition Type	Detail Type	Content
1	Condition (Value Monit...	-	[TAG]PuttingDataStartmanufact...

Edit

Delete

Up Arrow

Down Arrow

No.1 Event

Trigger Condition is Satisfied

OR

No.1 Event Condition

Trigger Condition is Satisfied

Trigger Buffering Setting (optional)

Set the operation of the job whenever the trigger conditions are satisfied at the same time.

Trigger Buffering: Disable

When disabled, even if the trigger condition of the same job is satisfied again while executing the job, the satisfied trigger condition will be disabled.

Back

Next

OK

Cancel

[Device Tag Components] 1 . 1 points

[Global Variable] 0 bytes

[Used Field/Arguments] 0 unit

[Date and Time] 0 unit

[Character strings] 0

[Read Data at Trigger Judgment]

- Access Type Selection

Access Type: General Access

- Access Interval Settings

Access Interval: Seconds Specification/1s

- Reading Target Data Setting (optional)

Reading Target Data: The Data to be used in Trigger Condition only

Job Setting No.[2]

Job Name PutPlan1 Comment

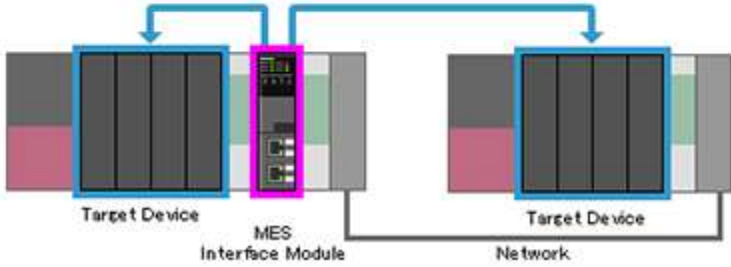
Job Configuration Trigger Conditions **Read Data at Trigger Judgment** Pre-Processing Main-Processing Post-Processing Verification Settings

Access Type Selection

Select the data reading method to be used at trigger judgment.

Access Type General Access

For "General Access", accessing to all access target devices is possible.
When the number of pieces of data is large, the data may become inconsistent.



Target Device MES Interface Module Target Device Network

Access Interval Settings

Set the interval to read the data used at trigger judgment.

Access Interval Seconds Specification 1 s

Access Interval ☒ Seconds Specification 1 s
☐ Milliseconds Specification 1 * 100 ms

Reading Target Data Setting (optional)

Reading Target Data The Data to be used in Trigger Condition only

[Device Tag Components] 1 , 1 points [Global Variable] 0 bytes [Used Field/Arguments] 0 unit [Date and Time] 0 unit [Character strings] 0

[Main-Processing]

• Main-Processing Settings

Action Type : DB Communication Action

DB Communication Type : Insert

Access Table : PutPlan1.Database

Data Assignment tab

Access Field	(Data type)	↔	Assigned data	(Data type)
PatternNo	Integer	←	[TAG]PuttingData.PatternNo	Word [Unsigned]/Bit String [16-bit]
LoadResult	Integer	←	[TAG]PuttingData.ResultValueofPressFittingLoad	Word [Unsigned]/Bit String [16-bit]
HeightResult	Integer	←	[TAG]PuttingData.ResultValueofPressFittingHeight	Word [Unsigned]/Bit String [16-bit]
	Date and Time			

StartTime	Date and Time [Without Time Zone]	←	[MACRO]Job Execution Start Date and Time	Date and Time
-----------	---	---	--	---------------

- DB Buffering Settings (optional)
DB Buffering: Buffering to DBBuf1

To configure the DB buffering, select "Use the DB buffer 1." in [DB Buffer Settings] of [Option Settings] in advance.

Job Setting No.[2]

Job Name PutPlan1 Comment

☒ Job Configuration
 ☒ Trigger Conditions
 ☒ Read Data at Trigger Judgment
 ☐ Pre-Processing
 ☒ Main-Processing
 ☐ Post-Processing
 ☐ Verification Settings

Main-Processing Settings

When adding an action to be executed in the main-processing, select a blank line and click the "Edit" button.
When editing the existing action, select the applicable line and click the "Edit" button.

No.	Action Type	Content
▶ 1	DB Communication Action	[Content] Insert, [PutPlan1] <- [[TAG]PuttingData.PatternNo] [[TAG]PuttingData...
2		
3		
4		
5		
6		
7		
8		
9		
10		

Edit Delete

Operation Settings at Main-Processing Failure (optional)

At Processing Failure Notification: "Not Set" Change

DB Buffering Settings (optional)

DB Buffering Buffering to DBBuf1 Change

DB Buffer Use Size [byte] 270

Back Next OK Cancel

[Device Tag Components] 4, 4 points [Global Variable] 0 bytes [Used Field/Arguments] 4 unit [Date and Time] 1 unit [Character strings] 0

[Verification Settings]

- Working History Settings (optional)
Working History: Not output
- Data Output Inhibition Necessity Settings (optional)
Inhibit the data output to the target device : Do not select
Inhibit the data output to the target server : Do not select
- Job Execution Inhibition Necessity Settings (optional)
Inhibit the job execution even when the trigger condition is satisfied.: Do not select

Job Setting No.[2]

Job Name PutPlan1 Comment

Job Configuration Trigger Conditions Read Data at Trigger Judgment Pre-Processing Main-Processing Post-Processing Verification Settings

Working History Settings (optional)

Set the output necessity of the working history (job execution history) and the detailed log (execution history of each action of the job).

Working History Not output ▾

Detailed Log Not output ▾

Data Output Inhibition Necessity Settings (optional)

Set the settings for inhibiting the data output to avoid affecting to the database and target device at the job operation verification.

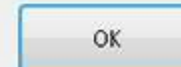
☐ Inhibit the data output to the target device

☐ Inhibit the data output to the target server

Job Execution Inhibition Necessity Settings (optional)

Set the necessity of the job execution inhibition.

☐ Inhibit the job execution even when the trigger condition is satisfied.



[Device Tag Components] 3 , 3 points [Global Variable] 0 bytes [Used Field/Arguments] 4 unit [Date and Time] 1 unit [Character strings] 0

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

Job Setting List


Home

Adding/Editing the Job Settings

When adding a job setting, select a blank line and click the "Edit" button.
When editing the existing job setting, select the applicable line and click the "Edit" button.

No.	Job Name	Comment	Job Configuration	Event/Condition Type No.1
1	GetPlan		Main Configuration	Condition (Value Monitoring)
2	PutPlan1		Main Configuration	Condition (Value Monitoring)
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of job "PutPlan1" is completed.
Click  to proceed to the next page.

[Device Tag Component used in the Project] 0 points . 0 points(High-Speed) [Field/Argument used in the Project] 7 unit

[Job Settings]

Create a job that updates the data in the record of the database when the manufacturing is completed.

(3) Job Name: PutPlan2

[Job Configuration]

Job Configuration: Main Configuration

Job Setting No.[3]

Job Name PutPlan2 Comment

Job Configuration Trigger Conditions Read Data at Trigger Judgment Pre-Processing Main-Processing Post-Processing Verification Settings

Job Configuration Selection

Select the configuration of the job being set.

Job Configuration Main Configuration

Set a job with the main configuration.
Set the action only for the main-processing.

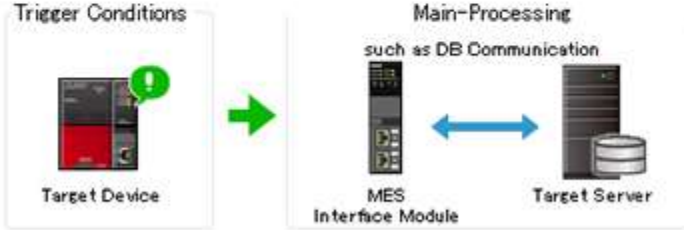
Trigger Conditions

Target Device

Main-Processing
such as DB Communication

MES Interface Module

Target Server



[Device Tag Components] 1, 1 points [Global Variable] 0 bytes [Used Field/Arguments] 0 unit [Date and Time] 0 unit [Character strings] 0

[Trigger Conditions]

- Trigger Conditions Configuration Settings
Configuration Type: Single Event
- Event/Condition Settings
Event/Condition Type: Condition (Value Monitoring)

Monitoring target	(Data type)	Comparing condition	Comparing target	(Data type)
[TAG]PuttingData.EndManufacturing	Bit	=	[INT]1	

- Trigger Buffering Setting (optional)
Trigger Buffering: Disable

Job Name PutPlan2 Comment

3.4

Setting with MES Interface Function Configuration Tool (Job Settings)

Job Configuration

Trigger Conditions

Read Data at Trigger Judgment

Pre-Processing

Main-Processing

Post-Processing

Verification Settings

Trigger Condition Configuration Settings

Select the configuration of the trigger condition.

Configuration TypeSingle Event

Condition Combination TypeAND Combination

The timing of the specified event occurrence is considered as the satisfaction of the trigger condition.
In the case of using the condition, the timing of the condition satisfaction is considered as the event occurrence.

Event/Condition Settings

Set each event/condition to be used at Trigger Judgment.

No.	Event/Condition Type	Detail Type	Content
1	Condition (Value Monit...	-	[TAG]PuttingData.Endmanufactu...

EditDelete

UpDown

No.1Event

Trigger Condition is Satisfied

OR

No.1Event

Trigger Condition is Satisfied

Trigger Buffering Setting (optional)

Set the operation of the job whenever the trigger conditions are satisfied at the same time.

Trigger BufferingDisable

When disabled, even if the trigger condition of the same job is satisfied again while executing the job, the satisfied trigger condition will be disabled.

BackNext

OKCancel

[Device Tag Components] 1 . 1 points

[Global Variable] 0 bytes

[Used Field/Arguments] 0 unit

[Date and Time] 0 unit

[Character strings] 0

[Read Data at Trigger Judgment]

- Access Type Selection
Access Type: General Access
- Access Interval Settings
Access Interval: Seconds Specification/1s
- Reading Target Data Setting (optional)
Reading Target Data: The Data to be used in Trigger Condition only

Job Setting No.[3]

Job Name PutPlan2 Comment

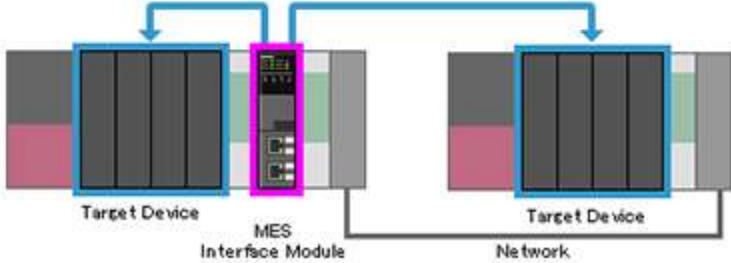
☒ Job Configuration ☒ Trigger Conditions ☒ Read Data at Trigger Judgment ☐ Pre-Processing ☐ Main-Processing ☐ Post-Processing ☐ Verification Settings

Access Type Selection

Select the data reading method to be used at trigger judgment.

Access Type

For "General Access", accessing to all access target devices is possible.
When the number of pieces of data is large, the data may become inconsistent.



Target Device MES Interface Module Target Device Network

Access Interval Settings

Set the interval to read the data used at trigger judgment.

Access Interval ☒ Seconds Specification s

Access Interval ☒ Seconds Specification 1 s
☐ Milliseconds Specification 1 * 100 ms

Reading Target Data Setting (optional)

Reading Target Data The Data to be used in Trigger Condition only

[Device Tag Components] 1 , 1 points [Global Variable] 0 bytes [Used Field/Arguments] 0 unit [Date and Time] 0 unit [Character strings] 0

[Main-Processing]

• Main-Processing Settings

Action Type : DB Communication Action

DB Communication Type : Update

Access Table : PutPlan2.Database

Data Assignment tab

Access Field	(Data type)	↔	Assigned data	(Data type)
PatternNo	Integer	←	-	Word [Unsigned]/Bit String [16-bit]
LoadResult	Integer	←	[TAG]PuttingData.ResultValueofPressFittingLoad	Word [Unsigned]/Bit String [16-bit]
HeightResult	Integer	←	[TAG]PuttingData.ResultValueofPressFittingHeight	Word [Unsigned]/Bit String [16-bit]
	Date and Time			

EndTime	Date and Time [Without Time Zone]	←	[MACRO]Job Execution Start Date and Time	Date and Time
---------	--------------------------------------	---	--	---------------

Narrowing-Down Condition tab

Combination	Access Field	(Data type)	Comparing condition	Comparing target	(Data type)
	PatternNo	Integer	=	[TAG] GettingData.PatternNo	Word [Unsigned]/Bit String [16-bit]
AND	LoadResult	Integer	=	[INT]0	
AND	HeightResult	Integer	=	[INT]0	

- DB Buffering Settings (optional)
DB Buffering: Buffering to DBBuf2

To configure the DB buffering, select "Use the DB buffer 2." in [DB Buffer Settings] of [Option Settings] in advance.

Job Setting No.[3]

Job Name PutPlan2 Comment

☒ Job Configuration
 ☒ Trigger Conditions
 ☒ Read Data at Trigger Judgment
 Pre-Processing
☒ Main-Processing
 Post-Processing
 Verification Settings

Main-Processing Settings

When adding an action to be executed in the main-processing, select a blank line and click the "Edit" button.

When adding an action to be executed in the main-processing, select a blank line and click the "Edit" button.
When editing the existing action, select the applicable line and click the "Edit" button.

No.	Action Type	Content
1	DB Communication Action	[Content] Update, [PutPlan2] <- [[TAG]PuttingData.ResultValueofPressFittingLoa...
2		
3		
4		
5		
6		
7		
8		
9		
10		

Edit

Delete



Operation Settings at Main-Processing Failure (optional)

At Processing Failure

Notification: "Not Set"

Change

DB Buffering Settings (optional)

DB Buffering

Buffering to DBBuf2

Change

DB Buffer Use Size 350
[byte]



Back



Next

OK

Cancel

[Device Tag Components] 4 . 4 points [Global Variable] 0 bytes [Used Field/Arguments] 4 unit [Date and Time] 1 unit [Character strings] 0

[Verification Settings]

- Working History Settings (optional)
Working History: Not output
- Data Output Inhibition Necessity Settings (optional)

- Data Output Inhibition Necessity Settings (optional)
 Inhibit the data output to the target device : Do not select
 Inhibit the data output to the target server : Do not select
- Job Execution Inhibition Necessity Settings (optional)
 Inhibit the job execution even when the trigger condition is satisfied.: Do not select

Job Setting No.[3]

Job Name PutPlan2 Comment

☒ Job Configuration
 ☒ Trigger Conditions
 ☒ Read Data at Trigger Judgment
 ☐ Pre-Processing
 ☒ Main-Processing
 ☐ Post-Processing

Working History Settings (optional)

Set the output necessity of the working history (job execution history) and the detailed log (execution history of each action of the job).

Working History

Detailed Log

Data Output Inhibition Necessity Settings (optional)

Set the settings for inhibiting the data output to avoid affecting to the database and target device at the job operation verification.

☐ Inhibit the data output to the target device

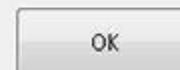
☐ Inhibit the data output to the target server

Job Execution Inhibition Necessity Settings (optional)

Set the necessity of the job execution inhibition.

Set the necessity of the job execution inhibition.

☐ Inhibit the job execution even when the trigger condition is satisfied.



[Device Tag Components] 4 . 4 points [Global Variable] 0 bytes [Used Field/Arguments] 4 unit [Date and Time] 1 unit [Character strings] 0

[Back](#)

MES Interface Function Configuration Tool New

Project Edit View Online Help

Job Setting List


Home

Adding/Editing the Job Settings

When adding a job setting, select a blank line and click the "Edit" button.
When editing the existing job setting, select the applicable line and click the "Edit" button.

No.	Job Name	Comment	Job Configuration	Event/Condition Type No.1
1	GetPlan		Main Configuration	Condition (Value Monitoring)
2	PutPlan1		Main Configuration	Condition (Value Monitoring)
3	PutPlan2		Main Configuration	Condition (Value Monitoring)
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Edit Delete

The setting of job "PutPlan2" is completed.
Click  to proceed to the next page.

[Device Tag Component used in the Project] 12 points , 8 points(High-Speed) [Field/Argument used in the Project] 11 unit

3.5

System Example of MES Interface Module

You have completed setting the MES interface module system for this course.

The setting is actually required to be written to the MES interface module after it is completed, that procedure is skipped in this course though.

The operations and data flow of the configured system is shown below. **(Check the following clip.)**

[SettingDataTable]

PatternNo	Load	Height	TestValue
1	100	1000	800
2	80	500	750
3	120	1500	900

[ProductResultTable]

ID	PatternNo	LoadResult	HeightResult	StartTime	EndTime
1	2	79	510	2018/09/07 19:46:55	2018/09/07 19:47:02
2	2	79	510	2018/09/07 21:00:53	2018/09/07 21:01:00

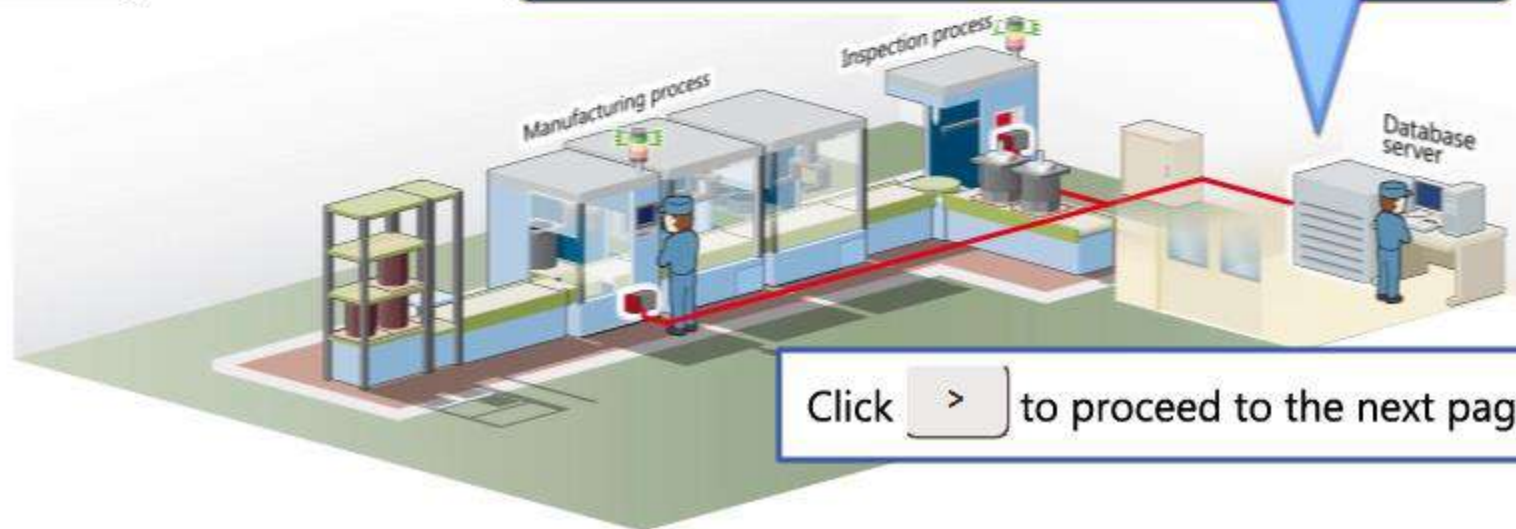
[ResultTable]

ID	PatternNo	TestResult	StartTime	EndTime
1	2	OK	2018/09/07 19:47:07	2018/09/07 19:47:11
2	2	NG	2018/09/07 21:01:04	2018/09/07 21:01:08

1st motor manufacturing



2nd motor manufacturing



Click  to proceed to the next page.

In this chapter, you have learned:

- Structure of database
- Role of the MES interface function configuration tool
- Trigger types
- Action types

Points

Structure of database	<p>The database is an assembly of data that are shared by multiple applications or users.</p> <p>Assembly of data is represented by table, and its column is called the field (column), and row is called the record.</p>
Role of the MES interface function configuration tool	<p>With the MES interface module, set which value of the programmable controller is connected to which the data of the database and at what timing.</p> <p>When the completed setting is written to the MES interface module, it operates with the configured setting.</p>
Trigger types	<p>The operating timing (trigger condition) differs depending on the combination of six types of events and conditions, and various patterns can be selected.</p> <p><Common in event/condition></p> <ul style="list-style-type: none">• Condition (Value Monitoring): This is used to operate when the values of the device tag component and variable meet the specific condition. <p><Condition></p> <ul style="list-style-type: none">• Condition (Period of Time): This is used to operate within the specified start time to end time. <p><Event></p>

<Event>

- Event (Value Changed): This is used to operate when the values of device tag component and variable are changed from the previous value.
- Event (Fixed Time): This is used to operate at the specific time.
- Event (Fixed Cycle): This is used to operate at the specified timer interval, or at specified intervals based on the specified time.
- Event (Module Monitoring): This is used to operate when the MES interface module is started, the interface function is restarted or its setting is updated, or the status of management CPU is changed.
- Handshake: This is used when starting or completing jobs in synchronization with the equipment programmable controller.

Action types

The following six types of actions are the functions to communicate with the database.

- Select: Extracts data from the database.
- Insert: Adds data to the database.
- Update: Updates the data in the database.
- Delete: Deletes the data in the database.
- Multiple Select: Extracts multiple data from the database.
- Stored Procedure: Executes the processing registered in the database.

3.7**Comprehension Test**

[Comprehension test]

Have you fully understood the contents in Chapter 3?

Please take the comprehension test to check and review the contents.

(3 sections, 3 questions)

Test**Comprehension Test 1**

Select either correct or incorrect for the following description of the database.
The database is structured by a list called the table, and its row is called the "field", and its column is called the "record".

☐ **Correct**☐ **Incorrect**

Test**Comprehension Test 2**

Select either correct or incorrect for the following description of the device tag settings.
In "Device Tag Settings", configure the setting so that the device name of the CPU module (such as D100) and the field name of the database are directly linked.

☐**Correct**☐**Incorrect**

Test**Comprehension Test 3**

Select either correct or incorrect for the following description of the MES interface module.
The MES interface module can be used without an SD memory card.

☐**Correct**☐**Incorrect**

Test

Result of Comprehension Test

You have completed the comprehension test of Chapter 3.
The following is your test result.

How was your result?
It is recommended to try the questions again that you answered incorrectly.

		1	2	3	4	5	6	7	8	9	10
	Comprehension test 1	<input type="radio"/>									
	Comprehension test 2	<input type="radio"/>									
	Comprehension test 3	<input type="radio"/>									

Total questions: **3**

Correct answers: **3**

Percentage: **100** %

Clear

Test

Final Test

Now that you have completed all of the lessons of the **Manufacturing Visualization Basics (MELSEC iQ-R series MES interface module)** Course, you are ready to take the final test. If you are unclear on any of the topics covered, please take this opportunity to review those topics.

There are a total of 5 questions (5 items) in this Final Test.

You can take the final test as many times as you like.

Score results

The number of correct answers, the number of questions, the percentage of correct answers, and the pass/fail result will appear on the score page.

		1	2	3	4	5	6	7	8	9	10	
Retry	Final Test 1	✓	✓	✓	✗							Total questions: 28
	Final Test 2	✓	✓	✓	✓							Correct answers: 23
	Final Test 3	✓										Percentage: 82 %
	Final Test 4	✓	✓									
	Final Test 5	✓	✓									
Retry	Final Test 6	✓	✗	✗	✗							
	Final Test 7	✓	✓	✓	✓							
	Final Test 8	✓	✓	✓	✓	✓						
	Final Test 9	✓										
Retry	Final Test 10	✗										

To pass the test, 60% of correct answers is required.

Test**Final Test 1**

Select the correct application for managing the manufacturing site and efficiently performing the manufacture. (Select one.)

☐ **ERP**☐ **PDM**☐ **MES**

Test**Final Test 2**

Select the wrong answer as an advantage of using the database in comparison to the data management using files. (Select one.)

- ☐ Much data can be managed and data searchability is high.
- ☐ Less data can be managed, but data searchability is high.
- ☐ Multiple simultaneous access is supported since it has high performance in exclusive processing.

Test**Final Test 3**

Select either correct or incorrect for the following description of the database.
The database is structured by a list called the table, and its row is called the "field", and its column is called the "record".

☐**Correct**☐**Incorrect**

Select the correct description for PDCA cycle that is implemented for improving the manufacture in the manufacturing site. (Select one.)

- ☐ One execution of PDCA cycle is enough to improve the manufacture.
- ☐ Executing the PDCA cycle continuously is important to improve the manufacture.
- ☐ In Plan, the first step of PDCA cycle, a rough plan based on the assumption is made without using the actual data.

Select the wrong answer as the advantage of using the MES interface module to collect the data in manufacturing site. (Select one.)

- ☐ The data is sent/received to/from the database automatically by installing the MES interface module to the programmable controller that controls the equipment.
- ☐ The database and CPU module can be connected by creating a communication program and registering it to the MES interface module.
- ☐ The data can be collected in real-time in the system that uses the MES interface module, and that system reliability is high.

Test**Test Score**

You have completed the Final Test. Your results are as follows.
To end the Final Test, proceed to the next page

		1	2	3	4	5	6	7	8	9	10
	Final Test 1	<input type="radio"/>									
	Final Test 2	<input type="radio"/>									
	Final Test 3	<input type="radio"/>									
	Final Test 4	<input type="radio"/>									
	Final Test 5	<input type="radio"/>									

Total questions: **5**Correct answers: **5**Percentage: **100** %**Clear**

You have completed the Manufacturing Visualization Basics (MELSEC iQ-R series MES interface module) Course.

Thank you for taking this course.

We hope you enjoyed the lessons and the information you acquired in this course is useful for configuring systems in the future.

You can review the course as many times as you want.

Review

Close