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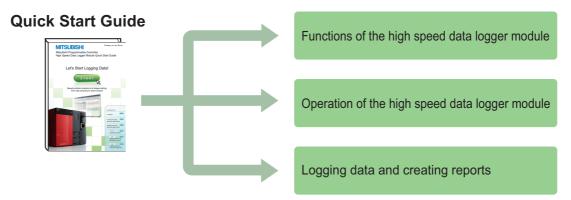
Mitsubishi Programmable Controller High Speed Data Logger Module Quick Start Guide

Let's Start Logging Data!



Introduction

This Quick Start Guide explains the basic procedures for first-time users of the high speed data logger module.



Precautions

Thoroughly read "SAFETY PRECAUTIONS" found in the QCPU User's Manual before using programmable controllers. Please pay careful attention to safety and handle the products properly.

Related manuals

The following manuals are related to the products introduced in this guide.

- High Speed Data Logger Module User's ManualSH-080818ENG
- QCPU User's Manual (Hardware Design, Maintenance and Inspection)......SH-080483ENG
- GX Developer Version8 Operating Manual......SH-080373E

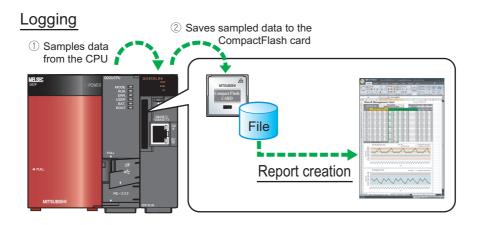
How to read this guide

The following table shows the symbols used in this guide with descriptions and examples.

Symbol	Description	Example
Remark	Remarks	When using the report creation function, the data logging file format must be set to "Binary file".
[]	Menu names on the menu bar ([] \rightarrow [] indicates drop-down menus.)	Select [Online] → [Transfer Setup].
	Buttons on the screen	Click the OK button.

Functions of the high speed data logger module

The high speed data logger module is a module that logs (records and saves) sampled programmable controller CPU data and saves them to a CompactFlash card as a file. Reports can be created from the logged file in Excel format.



Functions

'Data logging', 'Event logging', and 'Report' are the three major functions of the high speed data logger module.

Data logging : A function to log programmable controller CPU data at the specified data sampling

interval.

Event logging : A function to monitor data sampled from the programmable controller CPU and log

occurred events.

Report : A function to create reports with values and graphs obtained from data logging files and

data sampled by the programmable controller CPU. The Excel layout for the report needs

to be configured in advance.

The following are the two data logging methods:

Continuous logging : Continuously logs data at the specified data sampling interval, and creates data logging

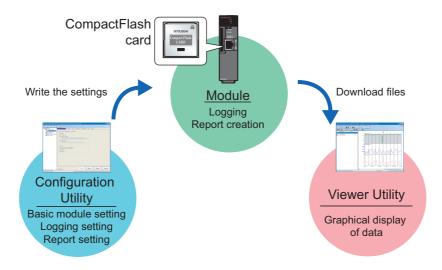
files.

Trigger logging : Logs data before and after the trigger occurrence (establishment of specified condition),

and creates data logging files.

High speed data logger module and high speed data logger module tools

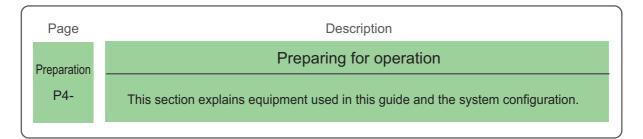
The high speed data logger module tools consist of the 'Configuration Utility' used to configure the high speed data logger module, and the 'Viewer Utility' used to display logged data.



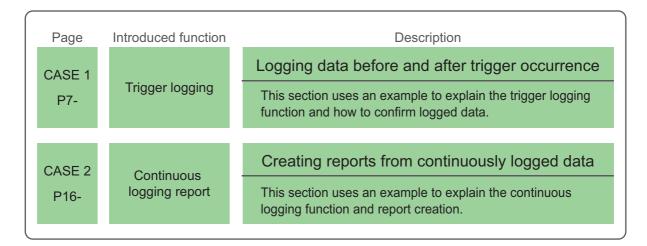
Operation of the Operating high speed data logger module

Use this guide to understand the operation of the high speed data logger module by actually configuring the 'trigger logging', 'continuous logging', and 'report' settings.

Descriptions in this guide



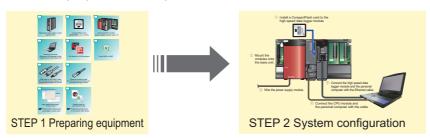




Preparation

Preparing for operation

This section describes the preparation for operations instructed in CASE 1 and CASE 2.



STEP 1

Preparing equipment

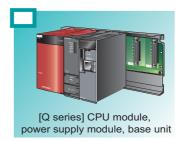
Prepare the equipment and software needed in CASE 1 and CASE 2.

Items to prepare







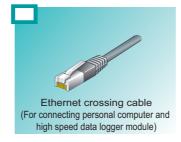


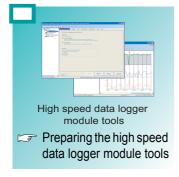














Preparing the high speed data logger module tools

For the acquisition of the high speed data logger module tools (Configuration Utility and Viewer Utility), contact your local Mitsubishi representative.

Please install the acquired tools.

Preparing sample data for the Quick Start Guide

To obtain the sample data (sample sequence programs and sample layout files) used in CASE 1 and CASE 2 in this guide, contact your local Mitsubishi representative.

STEP 2 System configuration

Configure the programmable controller system used in CASE 1 and CASE 2.

① Install a CompactFlash card to the

STEP 2-1 Mounting and wiring modules

Follow the instructions in order from ① to ⑤.

2 Mount the modules onto the base unit.

5 Connect the high speed data

logger module and the personal

computer with the Ethernet cable.

STEP 2-2 Activating the system

① Power ON the power supply module.

 $\ensuremath{\,\,}$ Wire the power supply module.

② Write the sample sequence program to the CPU module using GX Developer or GX Works2.

Connect the CPU module and the personal computer with the cable.

3 Switch the mode of the CPU module to 'RUN'.

Precautions

The instructions in this guide are described according to the above programmable controller system configuration.

When designing and operating an actual system, read the manuals listed on the following page.

Related manuals (P. 1)

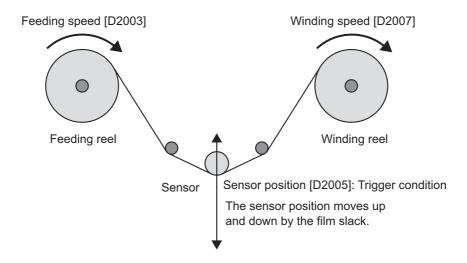
CASE 1 Logging data before and after trigger occurrence

This section explains how to perform the 'trigger logging' function using the equipment shown in the figure below as an example.

Figure

The following equipment is a winder for packaging film.

The sensor position moves up and down according to variation in the feeding reel speed, and a trigger (error) occurs when the allowable range is exceeded 100 lines (records) of data before and after the trigger occurrence are saved in a file.



Data logging settings

Target data : Feeding speed [D2003 (words)], winding speed [D2007 (words)],

sensor position [D2005 (words)]

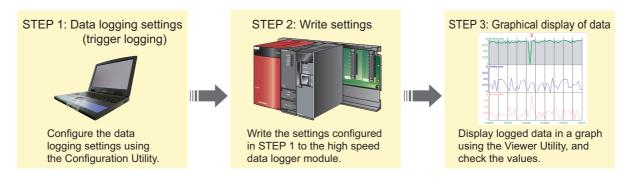
Trigger condition : Sensor position > 5, sensor position < -5

Data sampling interval : 0.1 second

Number of logging lines : 100 lines before trigger occurrence, 100 lines after trigger occurrence

Saved file format : CSV file

Operation flow



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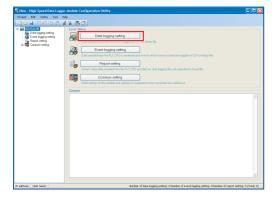
Data logging settings (trigger logging)

Configure the settings to log the programmable controller CPU data before and after the establishment of a trigger condition.

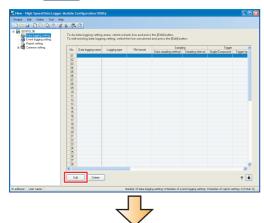
STEP 1-1) Start the Configuration Utility

- From the Window's start menu, select [All Programs] →
 [MELSEC] → [High Speed Data Logger Module Tool] →
 [Configuration Utility].
- STEP 1-2 Display the data logging setting screen

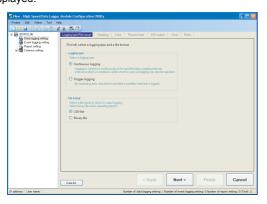




2 Click the Edit button.

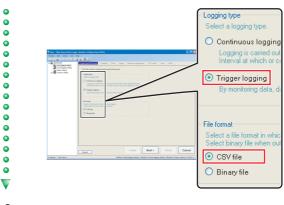


The wizard screen to configure the data logging settings is displayed.



STEP 1-3 Select the logging type and the file format

1 Select "Trigger logging" for the logging type, and "CSV file" for the file format.



2 Click the Next > button.

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STEP 1-4 Select the data sampling method

I Select "General sampling", and enter "0.1".



2 Click the Next button.

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STEP 1-5 Set the target data

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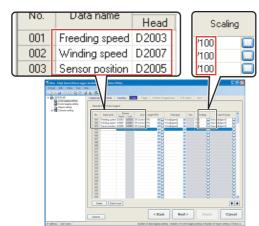
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I Specify the data to be logged.Enter data as shown in the screen below.

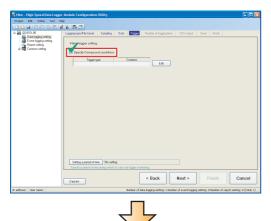


Default values are automatically displayed for "Device" (Last), "Access target CPU", and "Output Format".

2 Click the Next > button.

STEP 1-6 Configure the trigger settings

1 Check "Specify Compound conditions".



The trigger types are displayed.

2 Click the button.

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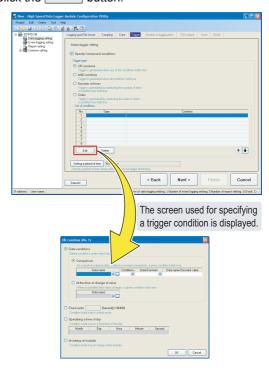
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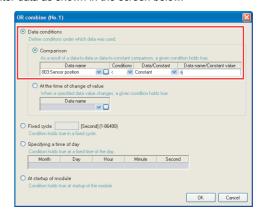
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 $oldsymbol{3}$ Specify the first trigger condition.

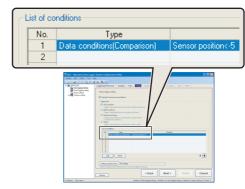
Enter data as shown in the screen below.



Click the OK button.



The specified condition is added to the list of conditions.



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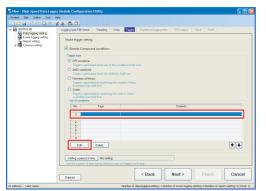
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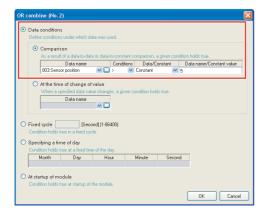
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5 Select the second line in the list of conditions, and click the button.



6 Specify the second trigger condition.

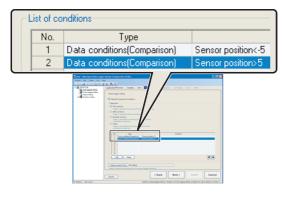
Enter data as shown in the screen below.



7 Click the 🔍 button.



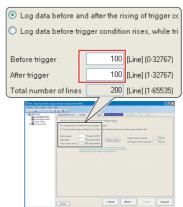
The specified condition is added to the list of conditions.



8 Click the Next > button.

STEP 1-7 Set the number of logging lines

1 Enter "100" for "Before trigger", and "100" for "After trigger".



2 Click the Next > button.

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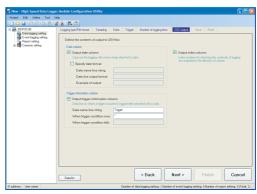
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STEP 1-8 Configure the CSV output settings

Use the default settings for the CSV output settings.



1 Click the Next > button.

STEP 1-9 Configure the save settings

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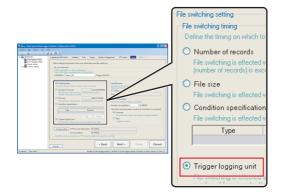
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 $m{1}$ Enter "Trigger_LOG" for the file save destination.

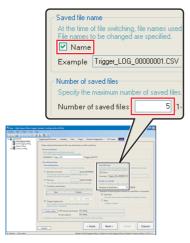


• A folder with the name specified above is created on the CompactFlash card.

2 Select "Trigger logging unit" for the file switching timing.



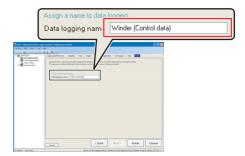
3 Check "Name" under "Saved file name", and enter "5" for the number of saved files.



4 Click the Next > button.

STEP 1-10 Enter the data logging name

1 Enter "Winder (Control data)" for the data logging name.



2 Click the Finish button.

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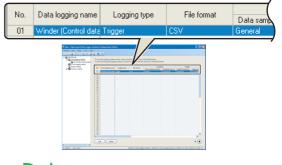
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The configured settings are added to the data logging setting list



• ▶ End

STEP 2 Write settings

Write the data logging settings configured in STEP 1 to the high speed data logger module.

STEP 2-1 Specify the target module

I Select [Online] ightarrow [Transfer Setup].

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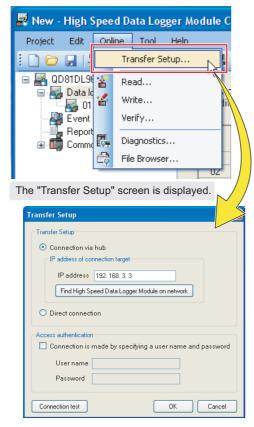
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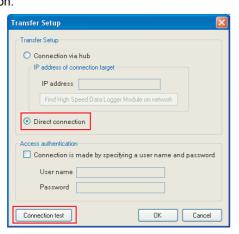
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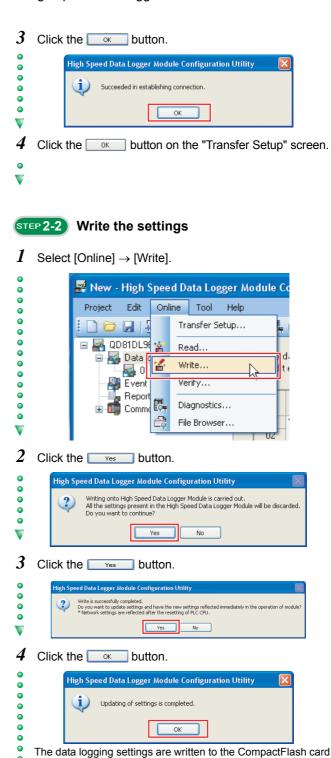
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2 Select "Direct connection" and click the Connection test button.





installed on the high speed data logger module.

Activating the system (P. 6)).

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The data logging function starts immediately after the data are written because the CPU mode was set to 'RUN' at Preparation.

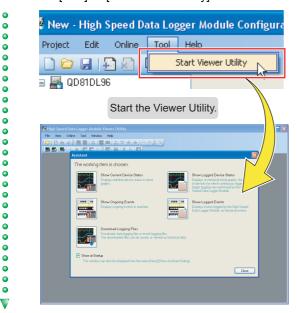
STEP 3 Graphical display of data

Display logged data in graphs using the Viewer Utility.

STEP 3-1 Start the Viewer Utility

Start the Viewer Utility from the Configuration Utility.

1 Select [Tool] \rightarrow [Start Viewer Utility].



STEP 3-2 Specify the data to be displayed



2 Select "Direct Connection" and click the button.

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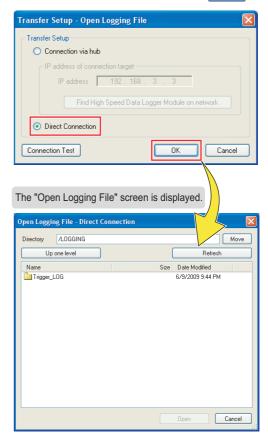
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3 Select "Trigger_LOG" and click the _____ button.



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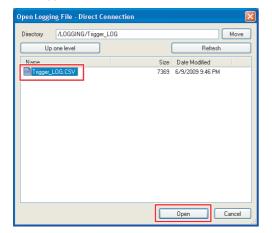
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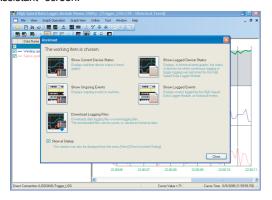
4 Select "Trigger_LOG.CSV" and click the _____ button.



Click the Refresh button when "Trigger_LOG.CSV" is not displayed in the list.



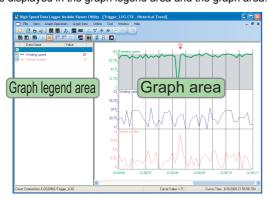
A list of data names and graphs are displayed behind the "Assistant" screen.



5 Click the Close button on the "Assistant" screen.



The data specified as target data in the data logging settings are displayed in the graph legend area and the graph area.



 Note that in this guide, the background color was changed to white in graph properties ([Graph View] → [Graph Properties]).

STEP 3-3 Display multiple cursors

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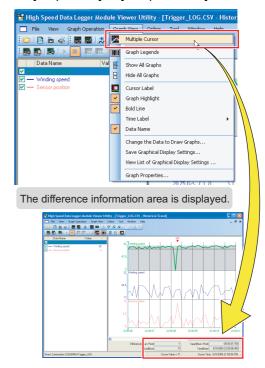
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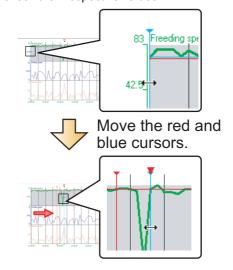
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1 Select [Graph View] \rightarrow [Multiple Cursor].



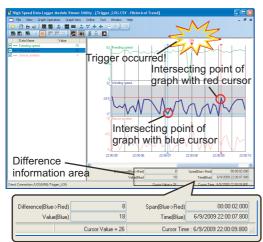
STEP 3-4 Check data using the cursors

Select a graph. Move the red and blue cursors, located at the left edge of the graph, to the desired positions and check their respective values.

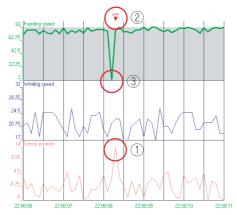


- 2 Check the cursor details displayed in the difference information area.
 - The elapsed time and the value difference between the two cursors (blue to red) are displayed.

In addition, the value and time of each cursor's position are also displayed.



- $\boldsymbol{3}$ Analyze the cause of error from the graphs
 - The sensor position rose rapidly (1), and a trigger occurred (2).
 - The feeding speed drastically decreased (③) immediately before the rise in sensor position, and thus, this could have caused the trigger.



Errors are primarily diagnosed by checking the data before and after the trigger occurrence.

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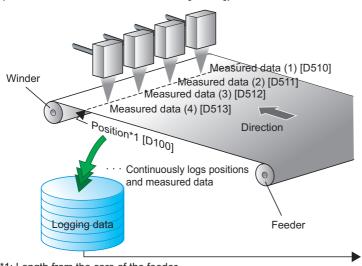
CASE 2 Creating reports from continuously logged data

This section explains 'continuous logging function' and 'report creation' using Xbar-R management chart as an example.

Figure

The thickness of the film (measured data) is measured at four points, and recorded in the report named Xbar-R management chart (Excel format).

(Production item: MB-5Z6004K [D502])





Data logging settings

Target data : Position [D100 (double word)], measured data (1) [D510 (word)],

measured data (2) [D511 (word)], measured data (3) [D512 (word)],

measured data (4) [D513 (word)]

Data sampling interval : 2 seconds
Saved file format : Binary file

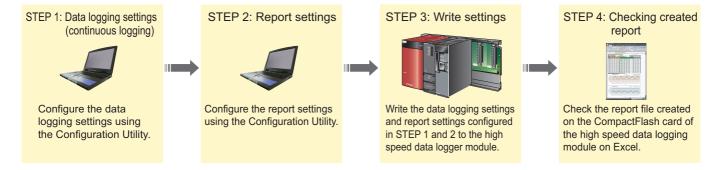
Report settings

Report output data : Target data, production item [D502 (string)], creation time

Number of logging lines in a report : 25

Report creation period : 50 seconds

Operation flow



^{*1:} Length from the core of the feeder.

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Data logging settings (continuous logging)

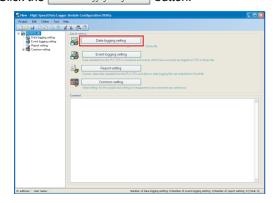
Configure the settings to log the programmable controller CPU data at the specified data sampling interval.

STEP 1-1 Start the Configuration Utility

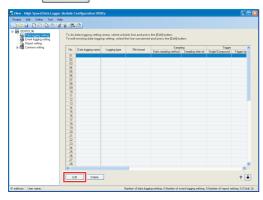
- ullet From the Window's start menu, select [All Programs] ightarrow
- MELSEC] → [High Speed Data Logger Module Tool] →
 [Configuration Utility].

STEP 1-2 Display the data logging setting screen

 $m{I}$ Click the Data logging setting button.

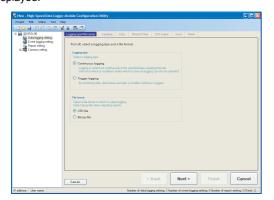


2 Click the Edit button.



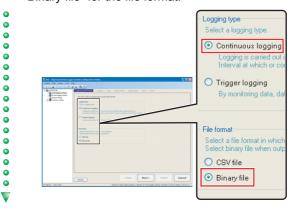


The wizard screen to configure the data logging settings is displayed.

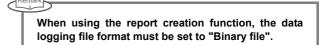


Select the logging type and the file format

I Select "Continuous logging" for the logging type, and "Binary file" for the file format.



2 Click the Next > button.



STEP 1-4) Select the data sampling method

I Select "General sampling", and enter "2".



Click the Next > button.

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STEP 1-5 Set the target data

To set the target data, specify devices individually, or specify consecutive devices in batch.

 $m{I}$ Enter the target data. (Individual)

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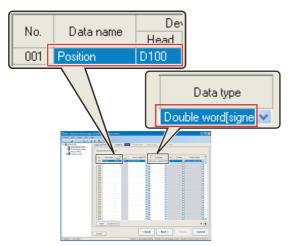
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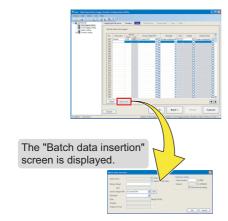
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Enter data as shown in the screen below.



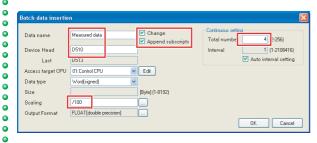
Default values are automatically displayed for "Device" (Last), "Access target CPU", and "Output Format".

2 Click the Batchinsert button. (Batch)
Set the consecutive devices in batch.



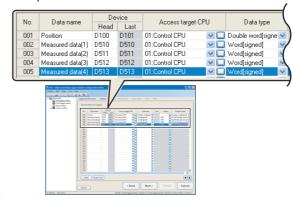
 ${f 3}$ Enter the information regarding the target data, and click the ${f OK}$ button.

Specify data as shown in the screen below. Enter the data name after "Change" is checked.





The specified data are added to the list.



4 Click the Next > button.

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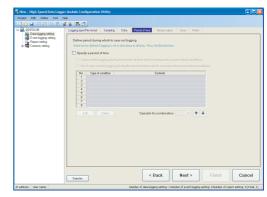
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STEP 1-6 Set the logging period

Use the default settings for the logging period.

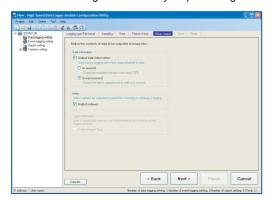


1 Click the Next > button.

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STEP 1-7 Configure the binary output settings

Use the default settings for the binary output settings.



 \boldsymbol{I} Click the Next > button.

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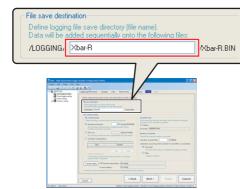
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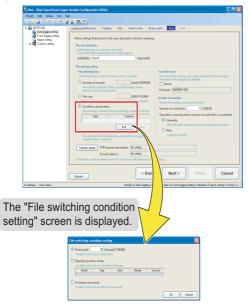
STEP 1-8 Configure the save settings

 $m{I}$ Enter "Xbar-R" for the file save destination.

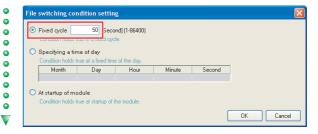


A folder with the name specified above is created on the CompactFlash card.

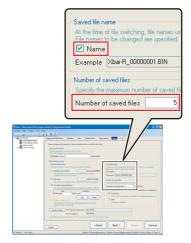
2 Select "Condition specification" for the file switching timing, and click the button.



3 Select "Fixed cycle", enter "50", and click the button.



4 Check "Name" under "Saved file name", and enter "5" for the number of saved files.



5 Click the Next > button.

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STEP 1-9 Enter the data logging name

1 Enter "Winder (Management data)" for the data logging name.



2 Click the Finish button.

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The configured settings are added to the data logging setting list.



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Report settings

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Configure the settings to create a report (Excel format) using data sampled by the high speed data logger module.

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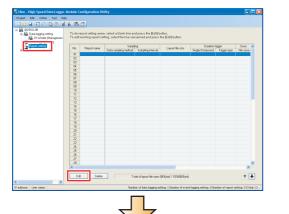
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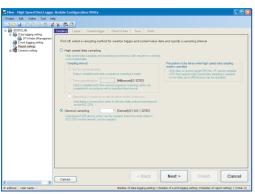
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STEP 2-1 Display the report setting screen

1 Click "Report setting" on the tree and click the button.

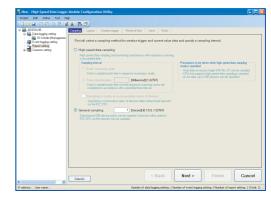


The wizard screen to configure the report settings is displayed.



STEP 2-2 Select the data sampling method

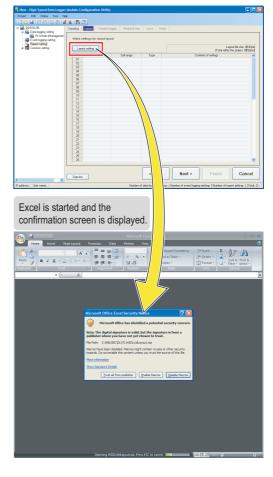
Use the default settings for the data sampling method.



 $m{1}$ Click the $m{ t Next}$ button.

STEP 2-3 Display the "Layout setting" screen

 $m{1}$ Click the Layout setting button.



2 Click the <u>Trust all from publisher</u> button.
(Click the <u>Enable Macros</u> button for Excel 2003.)

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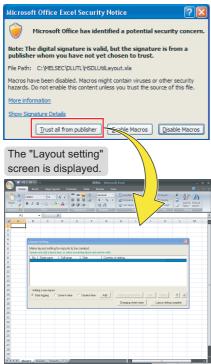
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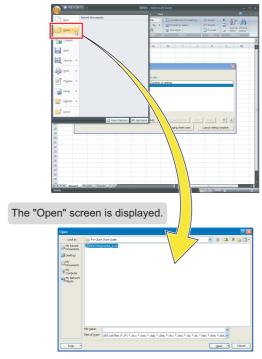


STEP 2-4 Load a sample layout

In this guide, the layout is set by using the provided sample layout. (Preparation (P. 5))

Copy the sample layout sheet to the sheet used for layout setting.

1 Select \longrightarrow [Open] on Excel 2007. (For Excel 2003, select [File] \rightarrow [Open].)



2 Select the acquired "I08147eng-layout_a.xls" file and click the permitable button.



The "Xbar-R Management chart" sheet is displayed with tables and graphs.

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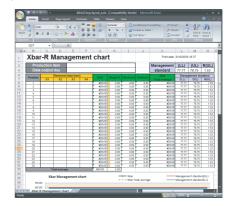
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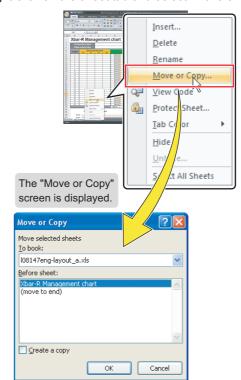
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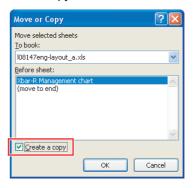
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3 Right-click on the sheet tab and select "Move or Copy".



Check "Create a copy".



5 Select "QD81DL96YYYYMMDDxls" from the list of "To book".

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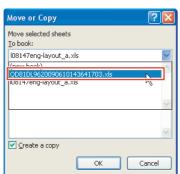
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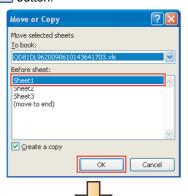
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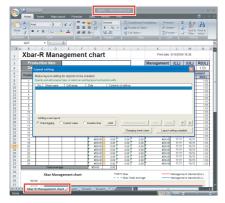
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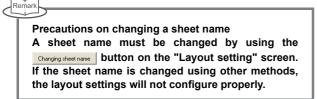
6 Select "Sheet1" from the list of "Before sheet", and click the button.



The "Xbar-R Management chart" sheet is copied to the file "REP01" on which the layout settings are configured.



Close "I08147eng-layout_a.xls" because it is not used for the later operation.



STEP 2-5 Specify the production item

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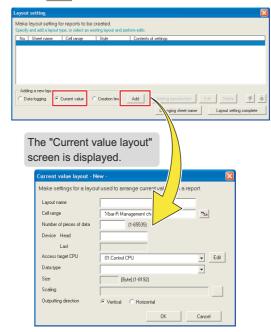
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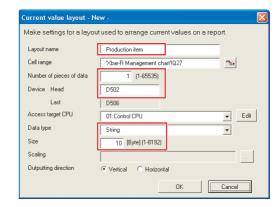
Designate a cell in the report file to display the production item code (current data stored in D502).

1 Select "Current value" for "Adding a new layout", and click the Add button.

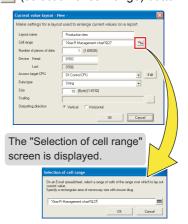


2 Specify the data for "Production item" (except for the cell range).

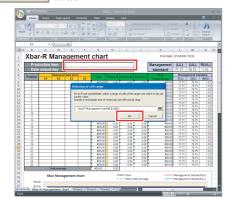
Enter data as shown in the screen below.



3 Click the ங (selection of cell range) button.



4 Select the cell to the right of "Production item" and click the button.



5 Click the button.

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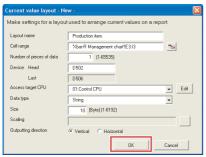
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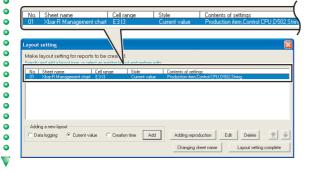
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The current value layout is added to the list on the "Layout setting" screen.



STEP 2-6 Specify the data output day

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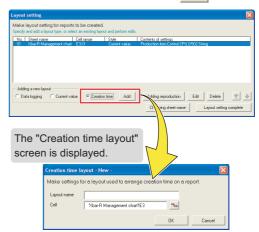
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Designate a cell in the report file to display the report creation time.

 ${\it 1}$ Select "Creation time" and click the ${\tiny f Add}$ button.



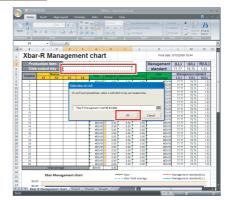
 $oldsymbol{2}$ Enter "Data output day" for the layout name.



3 Click the **Selection** of cell) button.



Select the cell to the right of "Data output day" and click the button.



5 Click the ____ button.

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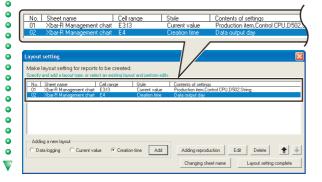
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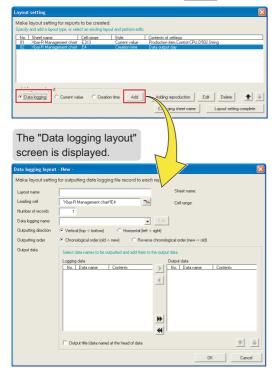
The creation time layout is added to the list on the "Layout setting" screen.



STEP 2-7 Specify the logging data

Designate the cells labelled 'position' and 'measured data' in the report file to display the logging data (D100, D510 to D513).

 $m{1}$ Select "Data logging" and click the $oxedsymbol{\mathbb{L}}$ button.



2 Specify the data used for data logging (except for the leading cell and output data).

Enter data as shown in the screen below.

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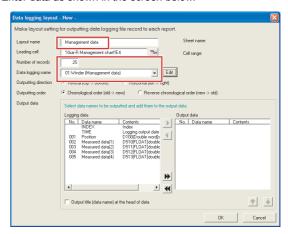
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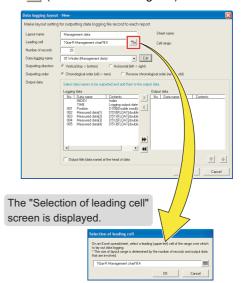
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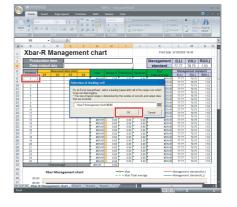
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3 Click the 🔜 (selection of leading cell) button.



4 Select the cell under "Position" and click the button.



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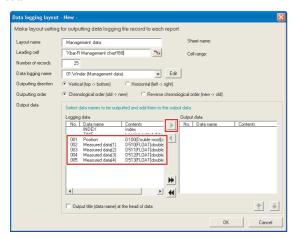
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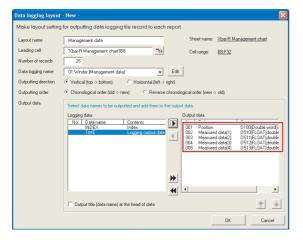
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Select the logging data from No. 001 to 005 one by one and click (repeat the operation for each data).
Add the logging data No. 001 to 005 to the field of "Output data".



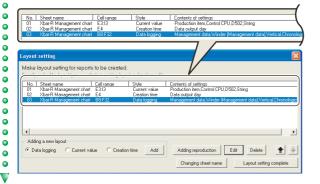




6 Click the button on the "Data logging layout" screen.

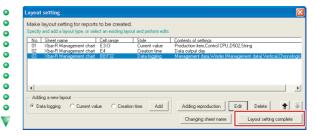


The data logging layout is added to the list on the "Layout setting" screen.



STEP 2-8 Finish the layout settings

 $m{I}$ Click the Layout setting complete button.



2 Click the ves button.

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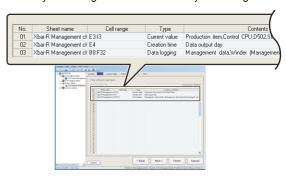
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Three layout settings are added to the layout setting list.



3 Click the \sim button.

STEP 2-9 Configure trigger settings

1 Click the Edit button.

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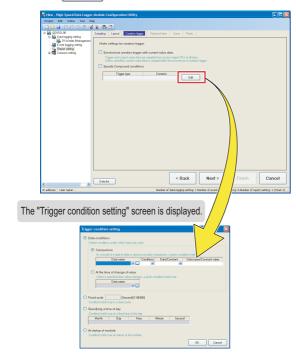
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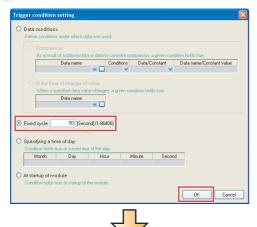
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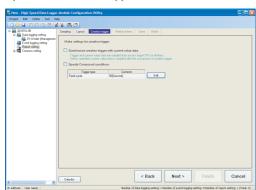
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2 Select "Fixed cycle", enter "50", and click the button.



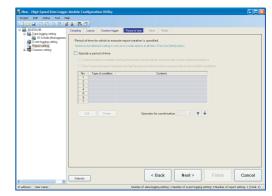
The specified condition is applied to the wizard screen.



 ${\it 3}$ Click the ${\tiny \tiny {\sf Next}>}$ button.

STEP 2-10 Set the report creation periods

Use the default settings for the report creation periods.



1 Click the Next > button.

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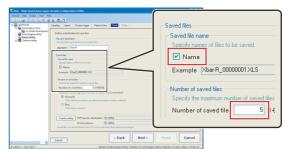
STEP 2-11 Configure the save settings

1 Enter "Xbar-R" for the file save destination.



A folder with the name specified above is created on the CompactFlash card.

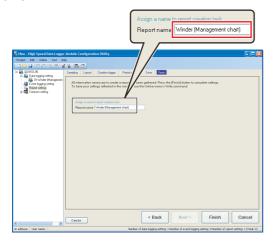
2 Check "Name" under "Saved file name", and enter "5" for the number of saved files.



 $\boldsymbol{3}$ Click the Next > button.

STEP 2-12 Enter the report name

 ${\it 1}$ Enter "Winder (Management chart)" for the report name.



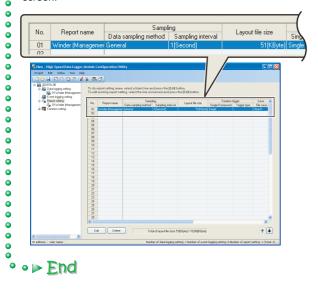
Click the Finish button.

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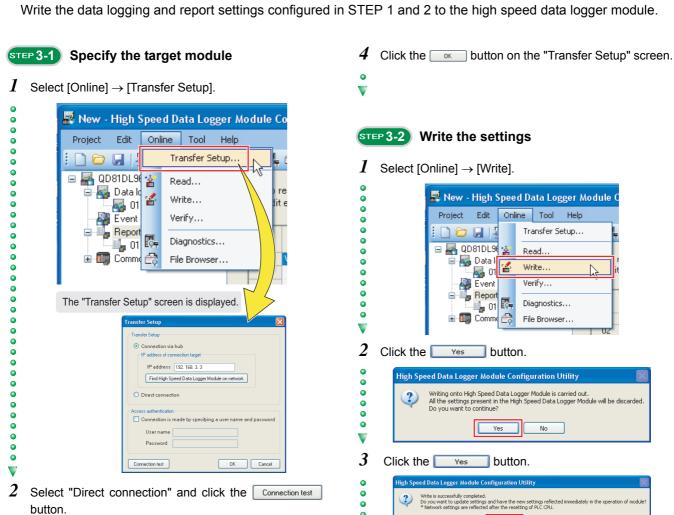


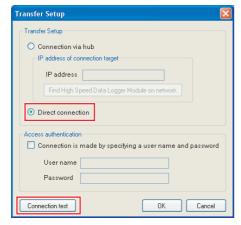
The configured settings are added to the report setting list screen.



STEP 3 Write settings

Write the data logging and report settings configured in STEP 1 and 2 to the high speed data logger module.





3 Click the ____ button.

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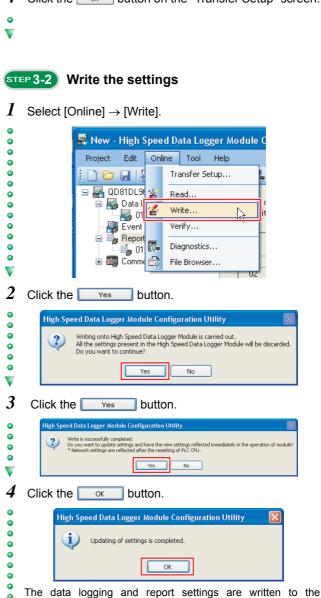
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CompactFlash card installed on the high speed data logger

The data logging function and the report creation start immediately after the data are written because the CPU mode was set to 'RUN' at Preparation. (F. 6))

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STEP 4

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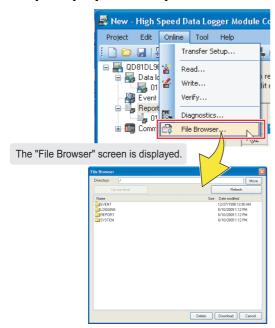
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Checking created report

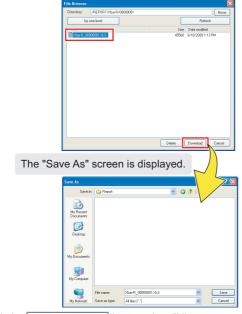
Use Excel to check the report created in STEP 3.

STEP 4-1 Download the report file

I Select [Online] ightarrow [File Browser].



- Specify the folders in the order of "REPORT", "Xbar-R", and "00000001".
- 3 Select "Xbar-R_00000001.XLS" and click the Download button

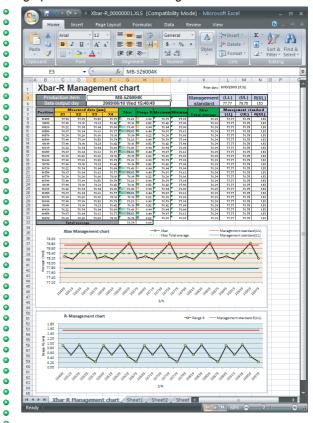


Click the Refresh button when "Xbar-R_00000001.XLS" is not displayed in the list.

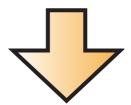
- **4** Specify the save destination on the "Save As" screen (option), and click the __save__ button.
- 5 Click the Cancel button on the "File Browser" screen.

STEP 4-2 Check the report on EXCEL

- ${\it 1}$ Open the downloaded "Xbar-R 00000001.XLS".
- 2 Check that the logged data are applied to the table and graphs on the "Xbar-R Management chart" sheet.



• • ▶ End



This concludes the Quick Start Guide on the high speed data logger module.

The high speed data logger module supports a number of functions in addition to the logging function and report function introduced in this guide.

For details on the functions, refer to the following manual:

Figh Speed Data Logger Module User's Manual SH-080818ENG

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MEMO	

Mitsubishi Electric Programmable Controllers High Speed Data Logger Module

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Thailand	Mitsubishi Electric Automation (Thailand) Co., Ltd. Bang-Chan Industrial Estate No.111 Soi Serithai 54, T.Kannayao, A.Kannayao, Bangkok 10230 Thailand	Tel: +66-2-517-1326 Fax: +66-2-517-3239
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