MITSUBISHI ELECTRIC
Changes for the Better

e-F@ctory Case study

Productivity Improvement

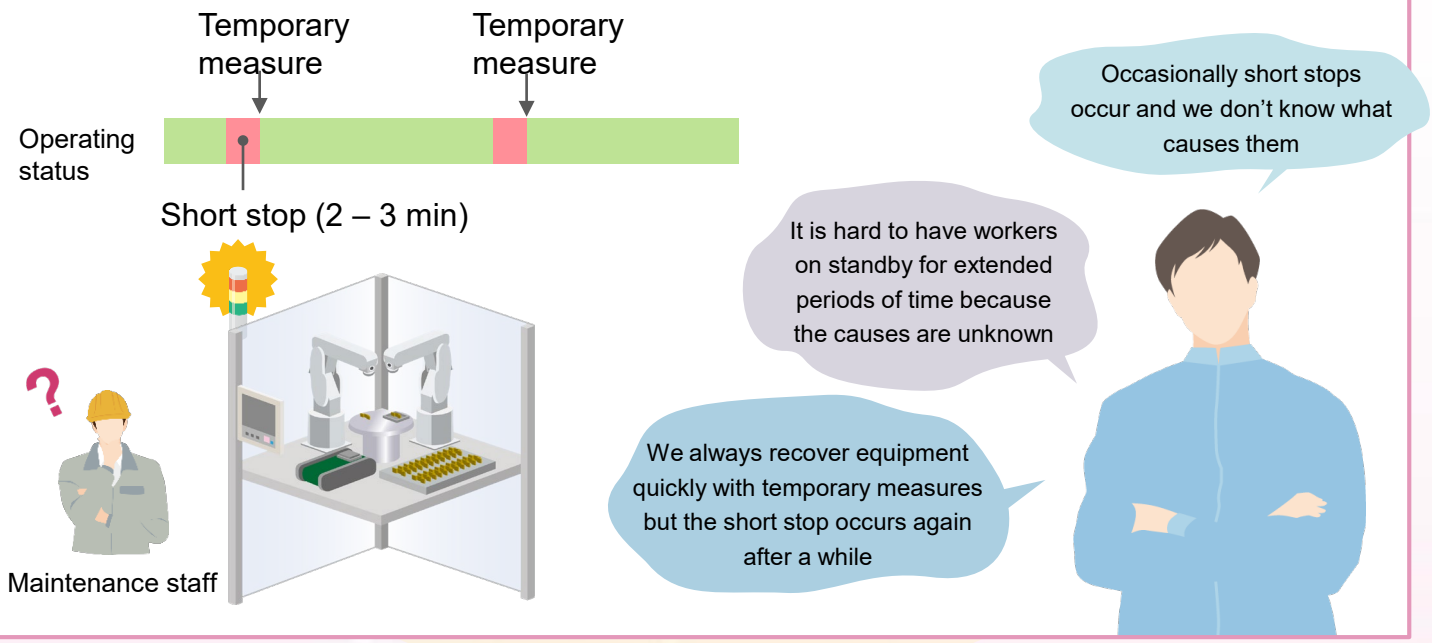
Identify the cause of problems fast. Achieves ZERO short stops!

Company A was troubled by short stops on equipment caused by rare problems. The company became able to identify the causes of the problems based on the equipment operation logs and video data that was recorded and eliminate short stops by taking permanent measures. This consequently improved equipment operating ratio. What is the secret to Company A's success? What is the secret to its success?

See inside for details!

Customer's Concern

In the past, when short stops occurred frequently, we identified the cause was insufficient mechanical accuracy based on data collection and factor analysis, and made mechanical readjustments to suit. This greatly reduced the number of short stops occurrences, but some short stops could not be resolved, and the causes were shrouded in mystery.



What has improved

All device labels, event history, and camera footage before and after an equipment problem occurs are recorded. By linking and analyzing all the data, it is possible to quickly identify that the cause of short stops was insufficient pickup accuracy by vision sensors – a cause that could not be identified until now. By modifying the program, we achieved zero short stops.

	Before	After
Short stop frequency	Approx. **65** times/month (short stop time: 156 min/month)	**0** times/month (short stop time: **0** min/month)

Achieved ZERO

e-F@ctory Key Points

Point 1 Fully records all device labels and video data before/after equipment problems arise

Point 2 Even in the case of high-speed operating equipment, high-precision recording is possible by supporting cameras up to 200 fps. Strongly supports investigation of true causes without missing information.

Point 1

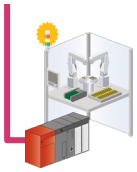
Fully record data before/after problem occurs to easily identify cause

Obtain recorded data

Programmable controller (for equipment control)

All device label data

Image data



Programmable controller (for robot control)

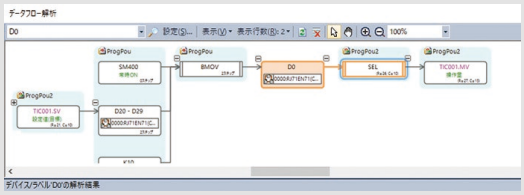
High-speed frame rate FA camera

Check footage from time that problem occurred

GX VideoViewer

Use data flow analysis function to go back and find true error location

GX Works3

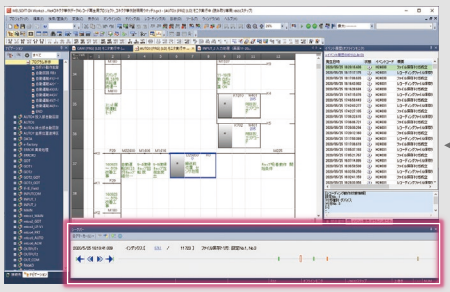


Able to automatically generate device flow diagram from program

Check program behavior when a problem occurred and identify the cause

Check the values of each device before/after problem occurrence

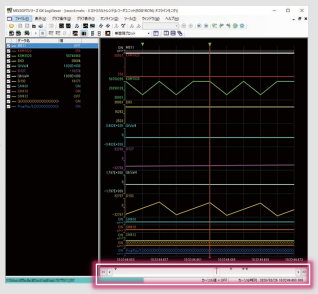
GX Works3



Linked play

Convert main data values to a graph and check

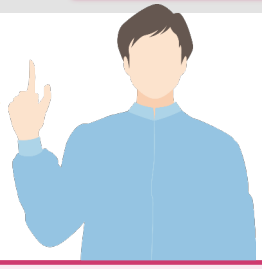
GX LogViewer



Point 2

Captures even high-speed movement with certainty

With this method we can identify the true cause of errors



See the next page for configuration of this system

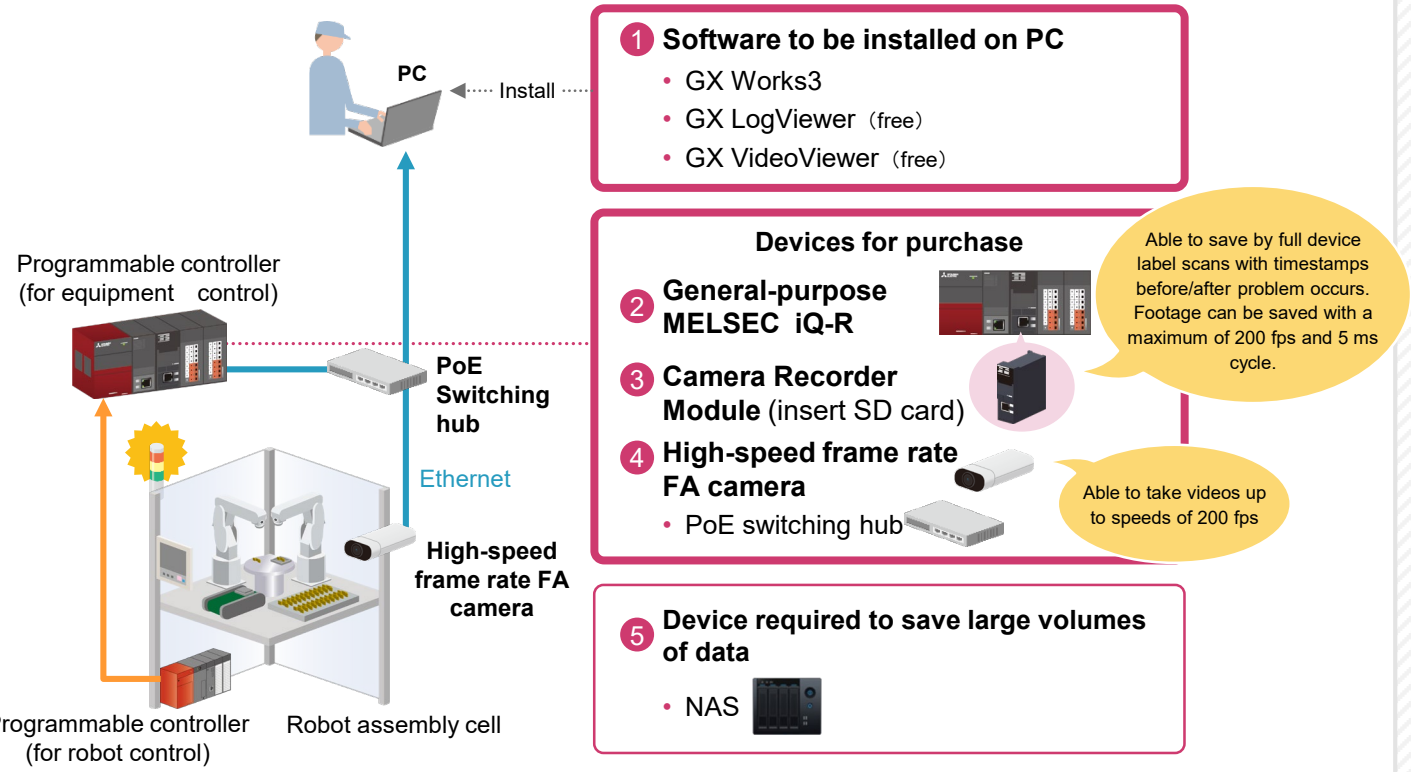
Return on investment (ROI)

Cost	Construction period	Payout period
Approx. **800,000** yen /equipment (incl. system build costs)	Approx. **2** days	Approx. **5** months

***Concept regarding cost recovery time** By introducing this system, the duration of short stops per month was reduced from 2.6 hours to 0 hours. As a result, if we assume profit per hour to be 60,000 yen, this outcome means that a total of 156,000-yen worth of production can be achieved per month (2.6 x 60,000 yen).
If system build cost is 800,000 yen, the recovery period will be 800,000 yen ÷ 156,000 ≒ 5 months.

System Overview

The system introduced in this application example comprises the general-purpose programmable controller, **MELSEC iQ-R**, and by using a **Camera Recorder Module**, is able to reproduce conditions of equipment problems using full recorded data, thus easily identifying causes.



Equipment Configuration (example)

Please separately prepare cables for connection to devices other than the major devices listed below.

Type	Model	Overview	Standard price (yen)
1 Software to be installed on PC			
GX Works3	SW1DND-GXW3-J	Ver.1.072A or later	150,000
GX LogViewer	SW1DNN-VIEWER-M	Ver.1.106K or later	Free
GX VideoViewer	SW1DNN-REPROA-M	Tool to play recorded camera footage, Ver.1.009K or later	Free
2 General-purpose MELSEC iQ-R			
Power module	R61P	Input: 100~240V AC, output: 5V DC 6.5A	20,000
Base module	R38B	8 slots	30,000
CPU module	R04CPU	I/O points: 4096 Program capacity: 40K steps Manufacturing information 3, 4 digits: "19" or later, firmware version: "55" or later	120,000
3 Camera Recorder Module	RD81RC96-CA	Collects all device/label, event history, video data	180,000
SD card	NZ1MEM-4GBSD	Inserted in Camera Recorder Module to record collected data. (4GB)	50,000
4 Network camera			
High-speed frame rate FA camera	FAC-1020	Able to connect with a variety of cameras depending on the application! Please see our Technical News for details!	Open
PoE switching hub (third-party product)	-	Please prepare if required.	-
5 Device required on an as required basis			
NAS (third-party product)	-	Collected data can be recorded on NAS instead of an SD card	-

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