Mitsubishi SCADA Software
MC Works64

MC Works
The Next Generation in Automation Software
GLOBAL IMPACT OF MITSUBISHI ELECTRIC

Through Mitsubishi Electric’s vision, “Changes for the Better” are possible for a brighter future.

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

Mitsubishi Electric is involved in many areas including the following

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

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

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

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

**Industrial Automation Systems**
Maximising productivity and efficiency with cutting-edge automation technology.
Mitsubishi Electric PA integrated solution

iQ PlantSuite

iQ PlantSuite integrates the high-performance SCADA into the factory automation products Mitsubishi Electric proudly presents to the world. Mitsubishi Electric proposes iQ PlantSuite, the process automation (PA) integration solution for monitoring and control.

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The linkage of SCADA and automation equipment to realize a sophisticated and comprehensive monitoring system
The linkage of SCADA and automation equipment to realize a sophisticated and comprehensive monitoring system.

The Next Generation in Automation Software

- Modbus®-compatible equipment
  - MELSEC Q Series
  - iQ-R Series
  - L Series
  - MELSEC redundant system

- BACnet™-compatible equipment
  - Server
  - Basic function
    - Two-/three-dimensional graphics
    - Table format display
    - GridWorX64
    - Script
    - ScriptWorX64
    - Alarm & event
    - AlarmWorX64
    - Trend
    - TrendWorX64
    - Project management tool
    - Form
    - Data conversion
    - ReportWorX Lite
    - BridgeWorX Lite
  - Advanced function
    - Design support tool
    - MC AppBuilder
    - Schedule management
    - ScheduleWorX64
    - Map information
    - EarthWorX64
    - High-speed data collection
    - Energy monitoring
    - Preventive maintenance
    - Quality control
  - MC Historian
  - AX Energy
  - AX Facility
  - AX Quality
  - Compatible database
    - Microsoft® SQL, Oracle®, MYSQL®, SAP,
    - ×64 OLE DB, ×64 ODBC
  - OPC server
  - OPC UA,
  - OPC DA, HDA, A&E
  - BACnet™
  - SNMP

- Compatible communications
  - OPC UA,
  - OPC DA, HDA, A&E
  - BACnet™
  - SNMP

- 3G/4G

- Web monitoring
  - Option
    - WebHMI Client
    - AX Portal

- Mobile monitoring
  - Option
    - MC Mobile

- Web monitoring
  - WebHMI Client
  - AX Portal

- Mobile monitoring
  - MC Mobile

* : This function is installed on a server.

- BACnet™-compatible equipment
  - GOT2000 (HMI)
  - EcoMonitorPro
  - Energy measuring unit

- AC servo
  - MR-J4

- Inverter
  - FR-F800

- Ethernet

- Option

- Option

- Option

- Option

- Option

- Solution

- Solutions

- Constructing a display
- Constructing a system
- Advanced functions
- Options
- Product list

5
Mitsubishi SCADA MC Works64 provides a highly-functional monitoring control system together with rich factory automation products.
MC Works64 provides the solutions for a variety of the needs in monitoring control.

**Enhancement of visibility and operability**

*Improve the aesthetics and usability of your monitoring control*

It may be difficult to effectively represent equipment monitoring using only two-dimensional graphics. On the other hand, three-dimensional graphics can enhance the visibility with its stereoscopic displays. Three-dimensional graphics allow you to have monitor views from various angles. This enables you to: know the condition of equipment quickly and accurately, have instinctive monitoring views and make intuitive control.

**Enhancement of reliability**

*Construct a highly reliable system that continues operation even during problematic times*

MC Works64 enables you to construct redundant server systems and server-and-client systems. It is possible to utilize two servers, a control server and a standby server, to enhance the reliability of the system and to reduce the communication load on the network. It is possible to embody a configuration suitable for the system size, from a stand-alone system to a large-scale system.

**Reducing engineering labor**

*Make efficient use of preset equipment lists to construct graphics or programs*

Various equipment lists are available to automatically generate graphics, programs, and OPC tag settings. The design support tool prevents incorrect tag settings, thus enhancing the design quality. Standard templates facilitate system configuration.
**Visualizing energy**

**Save energy and reduce costs across the entire plant and improve production efficiency**

By monitoring energy consumption, energy use can be reduced over time.

Energy consumption can be visualized through the integration of Mitsubishi Electric’s energy measurement equipment and AX Energy, an energy analysis and visualization tool.

The lineup of Mitsubishi Electric’s energy-saving equipment that includes the inverter with enhanced motor control efficiency will reduce energy consumption at your plant.

**Preventive maintenance**

**Use the collected equipment data to provide preventative maintenance**

Mitsubishi Electric’s MES interface module can be used to collect information on production control. AX Facility can then display and analyze the diagnosis and equipment failure information.

These products automatically collect the information on the condition of equipment from a large amount of data, using it for the improvement of: the availability factor, preventive maintenance, fault prediction etc.
You can monitor the video images from CCTV on a screen. As you monitor graphics at the same time, the system operation will be secure and safe.

This view satisfies the needs for simultaneous monitoring of multiple types of data and pictures brought by a highly functional system. This multi-monitor display shows graphics, alarms, trends, camera views, and more over several monitors, enabling simultaneous monitoring. (You can use six monitors at the maximum.) In the multi-view screen display, you can use one monitor to view two or more windows further improved monitoring. (You can view four windows at the maximum.)

Constructing a display
(Compatible with three-dimensional graphics)

Enhancing the visibility
Multi-monitoring and multi-view screen display

Enhancing the monitoring function
Video monitoring | GraphWorX64

You can monitor the video images from CCTV on a screen. As you monitor graphics at the same time, the system operation will be secure and safe.
You can create high definition two- and three-dimensional graphics. It may be difficult to effectively represent equipment monitoring using only two-dimensional graphics. On the other hand, three-dimensional graphics can enhance the visibility with its stereoscopic displays. You can control enlargement, reduction, rotation, and parallel movement of three-dimensional graphics to monitor anything; from the facility as a whole to individual device details. When an alarm occurs, you can zoom in to the abnormal part of the device. In addition, you can rotate a monitoring screen display to have monitor views from various angles. Thus, you do not need to move around from a screen display to another screen display, monitoring the facility without any interruption thanks to the parallel movement. You can use two-dimensional graphics for a real-time screen display to view the condition of a device, operation and measurement data. You can import two-/three-dimensional CAD data etc. to create graphics.

A set of pre-made symbols are available, known as the Symbol Library, which can reduce time spent on creating graphics. Custom symbols can be created and registered to the Symbol Library. The Symbol Library has more than one thousand types of high definition two- and three-dimensional symbols which cover a variety of industries including water treatment, building management, food, chemicals, and more.

An animation function is also included. You can register a tag to a symbol to change colors and display numbers, reducing the labor for creating a script.

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### Specifications of GraphWorX64

<table>
<thead>
<tr>
<th>Screen</th>
<th>Resolution</th>
<th>Unlimited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>Layer</td>
<td>Zoom</td>
</tr>
<tr>
<td></td>
<td>DeciIter with zooming</td>
<td>Window (Menu on/off, scroll bar, option, move, resize)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Two-dimensional shapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-dimensional drawing</td>
</tr>
<tr>
<td>Two-dimensional image</td>
</tr>
<tr>
<td>Reference</td>
</tr>
<tr>
<td>Two-dimensional advancement</td>
</tr>
<tr>
<td>Two-dimensional symbol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Three-dimensional shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three-dimensional drawing</td>
</tr>
<tr>
<td>Three-dimensional import</td>
</tr>
<tr>
<td>Three-dimensional advancement</td>
</tr>
<tr>
<td>Three-dimensional symbol</td>
</tr>
</tbody>
</table>

### Effect/format

**Color**
- Fill: RGB, Gradients, image tile
- Line: RGB, Gradients, image tile

**Object**
- General: Opacity, inclination, drop shadow, brilliance, blur
- Object: Line format, linewidth, line vertex, line joint
- Rectangle: Roundness (X, Y)
- Ellipse: Radius (X, Y)
- Polygon: Vertex control

**Text**
- Font: Process point, data input, time/date
- Button: Button, check box, radio button, display button
- Dimension: Size, position, rotation
- Color: Object fill color, object line color, disable, hide, text background color, text foreground color, text border color
- Selection: State, range

**Selection control**
- Window: Close a window
- Navigation: Show in rear, show in front
- Screen: [Refresh display, popup menu, object display setting, view setting]
- Alasing: [Global alias setting, language setting, local alias setting]
- Value: [Write value, toggle value]
- Application: [Start application]
- Script: [Start script]

**Other**
- Database: Upload, start form (ReportWorX), start transaction (BridgeWorX)
- Security: Login/Logout dialog

**NET Controls**
- Module: GraphWorX64, GridWorX64, AlarmWorX64, TrendWorX64, EarthWorX64, AX Energy
- Design: Pipe, scale, smart tile
- Video: Static protocol (WMV, AVI, MPEG, MOV, MP4), Streaming protocol (HTTP, HTTPS, MS-WMSP, MMS and RTSP)

**GEO-SCADA**
- Smart pin, push pin (EarthWorX64)
You can use two- and three-dimensional image data to reduce the scripting for creating graphics. You can import AutoCAD® files and other existing data to construct a screen display.

When you monitor a large amount of data, it may be effective to organize the values on a grid in the spreadsheet format. You can use GridWorX64 to realize the visualization of data by customizing data sets and using a large-size grid. When making a design, you can easily set data sources in a grid, reducing the scripting for illustration. During runtime, an operator can sort, group, and filter data in real time for monitoring. As a result of sorting, an operator may find some critical data. By grouping data, an operator can quickly organize the data for improved visualization.

This is a server application to execute VBA (Visual Basic® for Applications) scripts. You can set time triggers, data triggers, and other various conditions to execute scripts. Watchdog monitoring, an automatic recovery function, and an execution queue function are available. These enable easy implementation of complicated periodical processes and event-dependent processes.

### An example of the process to store production achievement data

**Batch processing**

**ScriptWorX64**

**Achievement data storage table**

**PLC**

**OPC server**

**SQL server**

**AutoCAD®**

**GridWorX64**

**GraphWorX64**

Enhancing visibility/reducing the labor for illustration

<table>
<thead>
<tr>
<th>CAD compatible</th>
<th>GraphWorX64</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Table format displays</th>
<th>GridWorX64</th>
</tr>
</thead>
</table>

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### Specifications of GridWorX64

<table>
<thead>
<tr>
<th>Refresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
</tr>
<tr>
<td>Automatic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row [Unlimited (One million rows or less recommended)]</td>
</tr>
<tr>
<td>Column [Unlimited (One hundred columns or less recommended)]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background, Foreground, Font Size, Font Weight, Font Family, Font Style</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boolean value, character string, time and date, 16-bit integer, 32-bit integer, 64-bit integer, double unsigned 16-bit integer, unsigned 32-bit integer, unsigned 64-bit integer, OPC UA status code</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
</tr>
<tr>
<td>Grouping</td>
</tr>
<tr>
<td>Sort</td>
</tr>
<tr>
<td>Read out [Readable point only]</td>
</tr>
<tr>
<td>Write in [Writable point only]</td>
</tr>
</tbody>
</table>

Reducing the labor for illustration

<table>
<thead>
<tr>
<th>Script</th>
</tr>
</thead>
<tbody>
<tr>
<td>ScriptWorX64</td>
</tr>
</tbody>
</table>

This is a server application to execute VBA (Visual Basic® for Applications) scripts. You can set time triggers, data triggers, and other various conditions to execute scripts. Watchdog monitoring, an automatic recovery function, and an execution queue function are available. These enable easy implementation of complicated periodical processes and event-dependent processes.
Quickly attend to any situation by monitoring alarm tag data and issuing alarm notices. In addition, the software collects alarm information from the alarm server and stores it in a database; logging it in the alarm history. Alarm controls can be used to display data real-time and historical alarm information on the graphics. An operator can filter alarm information during operation to view only necessary data. By altering the conditions to match the user’s needs (e.g. sort and combine alarm charts) alarms can be analyzed efficiently.

It is also possible to view real-time and historical trend data. Real-time data is collected directly from the OPC server and is shown as a real-time trend. On the other hand, historical data is stored in the database and logged as a trend history. The logged data will be shown as a historical trend. You can add trend graphs to graphic displays to supply trend data to operators alongside other important data.

You can view multiple data items in one trend display and can split or overlap a view/s. In addition, you can pause a trend display, add display data, and change a display scale.

### Specifications of AlarmWorX64

| OPC connection | OPC UA | Client [A/E] |
| OPC Classic | Server [A/E], Client [A/E] |

**AlarmWorX64 Server**
- Basic alarm type: Limit, digital, deviation, rate of change
- Advanced alarm type: Rate limit/trigger limit
- Support: Alarm area, Alarm template, Relevant value, Online change

**AlarmWorX64 Logger**
- Logger type: Database
- Logger setting: Reservation type
- Support: Multi-setting, Redundancy, Database table management, Printer logging, Conversion logging

**AlarmWorX64 Viewer**
- Data type: Real-time, history, event (A/E, log alarm and event)
- Integration: GraphWorX64
- Support: Multi-grid, Multi-tab, Custom format, Filter, Grouping

**MC Alarm64 MMX**
- Optional Package: E-mail Notifications for alarms

### Specifications of TrendWorX64

| OPC connection |
| OPC UA | Client [DA, HDA] |
| OPC Classic | Client [DA, HDA] |

**TrendWorX64 Logger**
- Logger type: Database
- Logger setting: Tag
- Max. capacity: 5,000 tags (recommended)
- Support: Multi-logging group, Multi-database group, Save and transfer, Start/stop status, Database table management

**TrendWorX64 Viewer**
- Data type: Real-time, history (DA, HDA)
- Integration: GraphWorX64
- Trend count: 250 or more (25 or less recommended for reliability)
- Time and rate: Trend time, summary period, data collection rate, display refreshing rate, history refreshing rate
- Time and date: UTC, Local
- Plot type: Line [Time, Time spline, Step time, XY], Area [Time area, Time spline area, Time step area], Other [Bar, Histogram, Circle, Pie, SPC management chart]
- Pen type: Line [Solid line, Broken line, Dotted line, Dotted-broken line, Custom], Marker [None, Circle, Square, Triangle]
- Value format: Currency, Decimal, Exponent, Fixed decimal, General, Number, Percent, Hexadecimal
- Range: Automatic, Automatic scale, Fixed (Min., Max.)
- Support: Bad Quality marker, Multi-grid, Multi-tab, Multi-chart, Custom format, Trend stop, Alarm line, Ideal pen
Enhancing maintenance performance

Project management tool Workbench(-SL)

Workbench(-SL) is a project management tool to construct applications for all MC Works64-related products. MC Works64 can utilize GraphWorX64 to create graphics, AlarmWorX64 to set up alarms, and more. Workbench(-SL) has uniform management of these applications, saving files as one project.

Workbench(-SL) constructs MC Works64-related applications and has the capability to test runtime operation.

The easy-to-understand ribbon menu enables you to activate a function easily.

The object explorer has a hierarchical view, enabling you to understand and control objects intuitively.

More than 1,500 two-dimensional symbols and more than 300 three-dimensional symbols are provided as standard, enabling you to create beautiful screen displays easily.

You can activate the runtime mode while creating a screen display to have a quick check on an operation.

Besides creating an illustration, you can switch functions to set up alarms, trends, optional functions, etc. in the same environment.

You can create scripts in the same environment.

You can use the property window to set up the display, behavior, etc. of an object at the same time.
Data from databases can be extracted and used to create various types of reports including: daily, weekly, monthly, and yearly reports. This software can create a form in the Microsoft® Excel® format and can also save files in HTML and PDF formats. In addition, you can register multiple form format templates. MC Works64 includes a simplified version of this software called ReportWorX Express that supports OPC, TrendWorX64 Logger Database, MC Historian, AlarmWorX64 Logger Database, Energy Star, and AX Quality. Among them, ReportWorX Lite (option) is recommended. ReportWorX Lite can create forms in Japanese, but its menu environment supports English only.

Function linkage

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Enhancing visibility/global application

Multi-language display

- Language Aliasing
  During runtime, it is possible to change the language of a display.
  The global function supports a wide variety of languages including: English, Japanese, Chinese and Spanish.
- Language pack
  Natively, the Workbench(-SL) configuration environment supports English. It is possible to add support for other languages through the installation of a language pack.
  Japanese and Chinese language packs are available.
Constructing a system

MC Works supports server and client systems and redundancy. You can use two servers to configure a control server and a standby server, enhancing the reliability of a system and reducing the communication load on a network. MC Works can be configured to suitably match the needs of the system; be it a standalone or large scale system.

Enhancement of reliability

**Server & client**

MC Works supports server and client systems and redundancy. You can use two servers to configure a control server and a standby server, enhancing the reliability of a system and reducing the communication load on a network. MC Works can be configured to suitably match the needs of the system; be it a standalone or large scale system.

Compatibility with Internet environments

**Web monitoring  |  WebHMI (option)**

WebHMI uses your MC Works64 server as a web server. This allows operators to monitor and manipulate data over the Internet or Intranets. Almost all of the functions available in MC Works64 can be used in any client type.
MC Works64

Compatibility with Internet environments

**Mobile monitoring | MC Mobile (option)**

MC Mobile is the mobile software that monitors important applications of a building or a plant. It is easy to set up and use MC Mobile efficiently. The user can have access to, and monitor, important data anytime, anywhere and from any terminal. The manager, the engineer, the maintenance worker and the operator can: access and monitor data in real-time, view data on alarms, trends, energy, quality, production information etc. MC Works supports server and client systems and redundancy. MC Mobile is compatible with mobile terminals using the following technologies; Microsoft® Windows Phone®, and Surface®, Apple® iPhone® and iPad®, Android® phones and tablets, or HTML5.

**Inter-functional linkage**

**Database**

MC Works64 is compatible with SQL, SAP MySQL®, OLE DB, ODBC and other databases. MC Works64 is bundled with SQL Server® 2012 Express (English version).

**Data conversion | BridgeWorX Lite (option)**

BridgeWorX integrates information from different data sources and can transfer data to different target systems. BridgeWorX realizes the data transfer between the programmable controller on a production site and the SQL server in an MES system and the data transfer among ERP applications. BridgeWorX has a transaction diagram that enables you to set up data transfer. You do not need any knowledge about programming to set up the transaction diagram, simply drag-and-drop and use the help of a wizard to supply the necessary information.

**Anti-virus software | Partner product**

**McAfee® Application Control**

McAfee® Application Control provides means for efficiently blocking malicious applications on servers, desktops, and integrated equipment. Different from simple white listing, Application Control uses a dynamic trust model, which saves you the troublesome labor usually required to update the list of trusted applications.

**Centralized integration management**

You can use McAfee® ePolicy Orchestrator (ePO) to optimize and simplify management processes. ePO enables you to use a sole centralized management console to monitor and control all security functions.

**Inquiry**

McAfee Embedded Solution Sales Division
E-mail: MFE_JPN_BD@McAfee.com

Perfect protection from unfavorable applications

Application Control expands the applicable scope to Java®, ActiveX® Controls, scripts, batch files and dedicated codes, enhancing the controllability of application components.

A sure protection of integrated systems and legacy systems

Application Control has such compact designing that it is applied to kiosk terminals, POS terminals, and other dedicated devices, operating with a RAM less than 10 MB and a minimum CPU. Its unique protection layer is expanded to Microsoft® Windows NT®, Windows® 2000 system and other legacy systems.

Simplifying patch application processes that can be troublesome

McAfee® Application Control enables you to temporarily delay a patch application until a regular patch application cycle. Even in a case where you worry about some vulnerabilities that do not have correction patches released, white listing can block such programs that make use of those vulnerabilities, thus allowing you can cope with them.
Enhancing connectivity

**Connection to a PLC and other equipment**

MC Works64 supports the connection for equipment including programmable controllers via OPC servers and other networks. MC Works64 can connect to the OPC servers that are compatible with OPC UA and OPC Classic (DA, HDA, A/E). An OPC server connects to a programmable controller by way of several types of network. It is recommended that a DeviceXPlorer OPC server (partner product) is applied.

In addition, when a programmable controller is connected by way of an MES interface, it is possible to directly connect to an SQL server of MC Works64 to read or write data.

**OPC server connection**

**MX OPC Server**

**MX OPC UA Server**

- Add MX OPC UA Server
- Support the auto-generation for the Setting of OPC UA Server in MC AppBuilder
- Monitor and operate the equipment with OPC UA

**DNP3.0 Support**

- Support for the DNP3.0 protocol in MX OPC Server
- Monitor and operate the equipment for DNP3.0
  
  [DNP3.0: Open communication protocol that is used in power and water supply facilities]

**MELSEC iQ-R Series Process CPU, MELSEC iQ-F Series**

Enhancement of Support H/W in MX OPC Server

NOTE: Support the auto-generation in MC AppBuilder

**Partner product**

**DeviceXPlorer OPC Server**

DeviceXPlorer OPC Server is the communication software that is compatible with MELSEC-Q Series, C Controller, Motion Controller, and GOT (HMI).

This software can use Ethernet, CC-Link and a variety of types of network to access production information.

**Compatible models**

MELSEC iQ-R Series, Q Series, L Series, QnA Series, A Series, FX Series, GOT, Mitsubishi CNC, EcoWebServer III, E-Energy, EcoMonitor, M5CM

**Compatible networks**

Ethernet, serial, CC-Link, CC-Link IE, MELSECNET/H

**Supported regions**

Japan, China, Asia (other than Japan and China), Europe, North America, South and Central America, Africa

**Takebishi Corporation**

**Inquiry**

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TEL: +81-75-325-2171

E-mail: fa-support@takebishi.co.jp

URL: http://www.faweb.net/
**Connection to the MES interface module**

**MELSEC-Q MES interface**
You do not need a gateway or a communication program for a direct connection between a programmable controller and MES.
- To store and control a variety of information in a plant involving production plans, quality, energy, and more on a seamless network
- To use a field network to collect detailed information up to end terminals
- To use an open network to simply gather information on the facility using a third-party’s programmable controller for a machine tool

**Connection to other networks**

BACnet™ and SNMP are both supported. You can use BACnet™ to connect a BACnet™-compatible device and it in MC Works64 server.
Advanced functions

MC AppBuilder

What is MC AppBuilder?
MC AppBuilder is an engineering support tool that enables you to easily construct a plant system where MC Works64 and a Mitsubishi programmable controllers are used. MC AppBuilder is bundled with MC Works64 as standard.

Automatically generating a monitoring screen, tag setting, and PLC project
MC AppBuilder automatically generates a monitoring screen (including symbol parts and face plate parts), OPC tag settings (including alarms and trend settings) and a PLC project (including PLC programs and label definitions). This automatic generation makes your designing easy, reducing the labor for the registration of tag settings. In addition, this function enhances the affinity with Mitsubishi Electric’s automation equipment.

Using templates*1 to reduce the labor for designing
You can gather the common design details for each type of equipment into a template that can be saved into the Symbol Library. You can assign an applicable template to a piece of equipment in the system tree, thus reducing design labor time. Templates are not only provided by the manufacturer but also registered, and reused, by the customers from their own know-how.

*1: Templates include symbols, face plates, and other graphic parts information as well as function blocks and other program information and each type of interface information (alarms and trend settings).

Easy renewal of a system
It is easy to add and remove equipment from a system. When renewing a system, this reduces design labor.

Simplifying the monitoring of energy measurement equipment
In MC AppBuilder you can import measurement point information created by the EcoWebServer III setting tool, Mitsubishi Electric’s energy-saving data collection server, thus automatically generating a monitoring screen and OPC tag settings. This link with the EcoWebServer III setting tool reduces the labor required to create these settings.

Easy creation of GOT(HMI) screen displays
Symbols and face plates are integrated for creating GOT, contributing to the reduction of the labor for creating GOT screen displays. See the list of template libraries (on page 19) for the GOT screen displays integrated with MC Works64.

A tree format for the management of a system configuration
You can import an equipment list (in CSV format) that is created with CAD or Microsoft® Visio® to construct a system tree showing the equipment configuration of a plant. This intuitively understandable tree format enables you to take management of the equipment configuration of a plant.

*1: Templates include symbols, face plates, and other graphic parts information as well as function blocks and other program information and each type of interface information (alarms and trend settings).
List of template libraries

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor</td>
<td>Displays the input status from a connected sensor.</td>
</tr>
<tr>
<td>Fan</td>
<td>Controls ON/OFF switching of a fan.</td>
</tr>
<tr>
<td>Motor</td>
<td>Controls ON/OFF switching of a motor.</td>
</tr>
<tr>
<td>Pump</td>
<td>Controls ON/OFF switching of a pump.</td>
</tr>
<tr>
<td>Valve</td>
<td>Controls Open/Close switching of a valve.</td>
</tr>
<tr>
<td>Damper</td>
<td>Controls Open/Close switching of a damper.</td>
</tr>
<tr>
<td>FanVSD</td>
<td>Specifies a fan speed to control ON/OFF switching.</td>
</tr>
<tr>
<td>MotorVSD</td>
<td>Specifies a motor speed to control ON/OFF switching.</td>
</tr>
<tr>
<td>PumpVSD</td>
<td>Specifies a pump speed to control ON/OFF switching.</td>
</tr>
<tr>
<td>FanVSD WithCClink</td>
<td>Uses CC-Link to specify a fan speed to control ON/OFF switching.</td>
</tr>
<tr>
<td>MotorVSD WithCClink</td>
<td>Uses CC-Link to specify a motor speed to control ON/OFF switching.</td>
</tr>
<tr>
<td>PumpVSD WithCClink</td>
<td>Uses CC-Link to specify a pump speed to control ON/OFF switching.</td>
</tr>
<tr>
<td>ControlValve</td>
<td>Controls OPEN/CLOSE switching of a valve that can have the open/closed status specified in the range from 0 to 100.</td>
</tr>
<tr>
<td>ControlDamper</td>
<td>Controls OPEN/CLOSE switching of a damper that can have the open/closed status specified in the range from 0 to 100.</td>
</tr>
<tr>
<td>Measurement WithinThreshold</td>
<td>Shows the status of a measured value depending on the predefined range from HH to LL. If an alarm is issued with HH or higher and/or LL or lower, A warning is issued with H or higher or L or lower.</td>
</tr>
<tr>
<td>LightController</td>
<td>Control ON/OFF switching of lights with a light controller.</td>
</tr>
<tr>
<td>Air Conditioning Controller</td>
<td>Control ON/OFF switching of air conditioning controller.</td>
</tr>
<tr>
<td>Energy Measuring Module</td>
<td>Shows measurement values from a energy measuring module (QC64P, QC61HC, QC68HC, QC66HC, QC64P, QC66HC, QC68HC).</td>
</tr>
<tr>
<td>Insulation Monitor Module</td>
<td>Shows measurement values from an insulation monitor module (QC64P).</td>
</tr>
<tr>
<td>Converter FrontEngineeringFormat</td>
<td>Executes a scale conversion of an input engineering value to a output engineering value.</td>
</tr>
<tr>
<td>Converter FrontEngineeringResolution</td>
<td>Executes a scale conversion of an input engineering value to an analog module.</td>
</tr>
<tr>
<td>Converter FrontEngineeringInput</td>
<td>Executes a scale conversion of an input engineering value to a input engineering value.</td>
</tr>
<tr>
<td>Converter FrontEngineeringResolution</td>
<td>Executes a scale conversion of an input engineering value to an analog module.</td>
</tr>
</tbody>
</table>

Example: Control Valve

1. Face plate
2. Symbol
3. Function block
You can follow a schedule to automatically actuate building illumination, air-conditioning, plant facility and so forth. Refer to a schedule and set up tag values for daily, weekly, and monthly schedule management.

You can use Bing Maps and other map systems via the Internet to display geographical information for wide area monitoring. You can monitor business bases and plants distributed around the world on a single map. In addition, when you use a pin, you can view detailed information and alarm statuses. You can also use GPS data for monitoring.

---

**Schedule management**

*ScheduleWorX64*

<table>
<thead>
<tr>
<th>Specification of ScheduleWorX64</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Schedule type</strong></td>
</tr>
<tr>
<td>Periodical</td>
</tr>
<tr>
<td>One time</td>
</tr>
<tr>
<td><strong>View</strong></td>
</tr>
<tr>
<td><strong>Support</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Wide area monitoring**

*EarthWorX64*

<table>
<thead>
<tr>
<th>Specifications of EarthWorX64</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Map</strong></td>
</tr>
<tr>
<td>Bing®</td>
</tr>
<tr>
<td>Esri®</td>
</tr>
<tr>
<td>Google®</td>
</tr>
<tr>
<td>OGC WMS</td>
</tr>
<tr>
<td><strong>EarthWorX64 Viewer</strong></td>
</tr>
<tr>
<td><strong>Zoom</strong></td>
</tr>
<tr>
<td>Level</td>
</tr>
<tr>
<td>Region</td>
</tr>
<tr>
<td><strong>Layer</strong></td>
</tr>
<tr>
<td>Opacity</td>
</tr>
<tr>
<td>Visibility</td>
</tr>
<tr>
<td><strong>Capacity information</strong></td>
</tr>
<tr>
<td>Bing®</td>
</tr>
<tr>
<td>Esri®</td>
</tr>
<tr>
<td>OGC WMS</td>
</tr>
</tbody>
</table>

**Smart pin**

| Allocation                  | GraphWorX64 object, latitude/longitude |
| Setting                     | Dialog |
| Size                        | [Add/delete row/column] |
| Color                       | [In smart icon] |
| Data collection             | [OPC, OPC UA, Global Aliasing, Language Aliasing, simulation, expression, Local Aliasing] |
| Tool tip                    | [Settable, data accepted] |

**Pushpin**

| Allocation                  | GraphWorX64 object, latitude/longitude |
| Setting                     | Fill, zoom, shadow |

---

**Cloud**

*Windows Azure®*

[Partner product]

Windows Azure®, the Cloud service by Microsoft®, is supported. You can store data and server applications on the Cloud to construct a flexible system.

1. How to use Windows Azure® as a communication route
   *You can monitor a subject easily and safely.*

2. How to have a server application on Windows Azure®
   *You can save the labor for the management of a server personal computer.*
MC Historian is a data logger of high performance and high reliability.
While MC Works64 has the ability to collect 20,000 points per second; MC Historian has the capability of collecting 100,000. Calculation formulas allow calculated data to be logged as opposed to just raw values. The high performance and compression function reduces log sizes, thus enabling logging for extended periods. MC Historian has a highly reliable redundant function which creates a dependable system.

It is possible to visualize and analyze CO2 emissions and the consumption of energy, including electricity and gas, based on plant, facility and device leading to energy savings and cutting costs. You can express daily and monthly energy consumption in the form of a graph, and you can easily switch their views. You can also use Microsoft® Excel® to create a form in the format of your choice.
You can use a web browser to monitor screens created in MC Works64, AX Energy, AX Facility and AX Quality.
You can divide a screen for the integral view of these functions.

Preventive maintenance
AX Facility

It is possible to use prior knowledge on equipment faults to create a resource that improves recovery times. It is possible to analyze the causes of facility troubles together with their frequency to know their trends, providing aid for preventive maintenance. You can use Microsoft® Excel® to create a form in the format of your choice from the result of analysis.

Quality control
AX Quality

AX Quality creates management charts for the analysis of quality control and process capacity, reducing the labor of onsite operators and managers. AX Quality provides SQC/SPC data analysis, SQC charts, reports, and SPC rule-based alarms.
We propose MC Works64 for the monitoring control of each process and utility at a steel plant. Redundant CPUs enables you to construct a highly reliable system. A CC-Link IE Control network connects a programmable controller for integration. Moreover, you can use a MELSECNET/H remote I/O network to connect distributed I/Os for the construction of a hierarchical network system.
Food and Beverage

We propose MC Works64 for the monitoring control of production processes of a food/beverage plant ranging from the upstream processes (the PA control of compound processes etc.) to the downstream processes (the factory automation control of packing, transport, etc.) as well as for the monitoring control of utilities.

The monitoring control by MC Works64 involves server redundant and server and client configuration to construct a system where the load distribution is enabled in a highly reliable network. In addition, you can use a CC-Link IE Control network to connect a programmable controller for integration and, furthermore, you can use a MELSECNET/H remote I/O network to distribute and connect I/Os, thus realizing the configuration of a hierarchical network system.
We recommend MC Works64 for the monitoring control of building and plant air-conditioning and facilities. This provides a variety of solutions: monitoring control linked to an air-conditioning controller, the visualization of energy with EcoWebServer III and energy measurement equipment. It also provides an energy-saving solution linked to a high-efficiency inverter and a building's wire-saving network.
MC Works64 can be applied to an incineration power plant for monitoring and controlling: the incinerator, the boiler, utilities, gas treatment, and power generation processes. Redundant CPUs, a CC-Link IE Control network and redundant MC Works64 servers can construct a high reliability system. Mitsubishi Electric proposes a total solution ranging from the process monitoring control with redundant CPUs to the visualization of generated energy with MC Works64.
e-F@ctory is the Mitsubishi Electric solution for improving the performance of any manufacturing enterprise by enhancing productivity, and reducing the maintenance and operations costs together with seamless information flow throughout the plant.
MC Works64 can be applied at every process in an automotive plant to create a complete monitoring control system. For production control, the yield and facility information based on each process is stored on a database server in MC Works64 via the integrated programmable controller and the MES interface.
MC Works64 can be applied for the monitoring control of an assembly plant of electrical machinery and electronics. The programmable controller of each process uses the two-dimensional codes inscribed on work to collect the product ID. Each process’ yield is stored in the MC Works64 database using the MES interface which manages each unit of work. Based upon recipe data, production information and quality information in the database, it is possible to create various forms (such as assembly yields and quality records) to secure traceability.
**Product List**

### Basic products

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW2DND-MCHC-H-E</td>
<td>MC Historian R remote collector license to add a distributed collection server to MC Historian ET (MC Historian R remote collector license to add a distributed collection server to redundant MC Historian ET)</td>
</tr>
<tr>
<td>SW2DND-MCHC-R-E</td>
<td>Additional 1 client license for redundant configuration</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-E</td>
<td>Additional 5/25 development version client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-EK</td>
<td>Additional 1 development version client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ET</td>
<td>Additional 1 client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ETK</td>
<td>Additional 5/25 development version client license</td>
</tr>
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</table>

### Function list

**Product name**

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<th>Model</th>
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<tr>
<td>SW2DND-MCHC-H-E</td>
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<tr>
<td>SW2DND-MCHC-R-E</td>
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<tr>
<td>SW2DND-MCHC-V-E</td>
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</tr>
<tr>
<td>SW2DND-MCHC-V-EK</td>
<td>Additional 1 development version client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ET</td>
<td>Additional 1 client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ETK</td>
<td>Additional 5/25 development version client license</td>
</tr>
</tbody>
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<th>Description</th>
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</thead>
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<td>SW2DND-MCHC-V-EK</td>
<td>Additional 1 development version client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ET</td>
<td>Additional 1 client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ETK</td>
<td>Additional 5/25 development version client license</td>
</tr>
</tbody>
</table>


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**Function list**

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<tr>
<td>SW2DND-MCHC-H-E</td>
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<td>SW2DND-MCHC-R-E</td>
<td>Additional 1 client license for redundant configuration</td>
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<td>SW2DND-MCHC-V-E</td>
<td>Additional 5/25 development version client license</td>
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<tr>
<td>SW2DND-MCHC-V-EK</td>
<td>Additional 1 development version client license</td>
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<tr>
<td>SW2DND-MCHC-V-ET</td>
<td>Additional 1 client license</td>
</tr>
<tr>
<td>SW2DND-MCHC-V-ETK</td>
<td>Additional 5/25 development version client license</td>
</tr>
</tbody>
</table>

## Selecting basic products

### Selecting an MC Works64 server

**Example:**

<table>
<thead>
<tr>
<th>MC Works64</th>
<th>DV</th>
<th>OL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

- **(1) Selecting server functions**
  1. If you will use graphics, alarms, and trend functions, select MC Works64.
  2. If you will use only graphics functions, select MC Graph64.
  3. If you will use only alarm functions, select MC Alarm64.
  
- **(2) Selecting server development versions/runtime versions**
  1. If you will use a development version on a server (the tag count depends on dynamic tags), select DV.
  2. If you will use a runtime version (display function) on a server (the tag count depends on dynamic tags), select RT.

- **(3) Selecting OPC servers**
  1. If you will use an MX OPC server, select “–” (an MX OPC server is bundled).
  2. If you will not use an MX OPC server, select OL (MX OPC Server is not bundled).

### Selecting redundant servers

1. If redundant servers are required, select two licenses or a redundant version of the product.
2. If redundant servers are not required, only select single license products.

### Selecting MC Works64/MC Historian client

**Example:**

<table>
<thead>
<tr>
<th>MC Works64</th>
<th>CL</th>
<th>RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **(1) Selecting MC Works64/MC Historian client**
  1. If you do not need data collection or if the collection speed is 50k points per minute or less, use the trend functions of MC Works64. Go to 3.

### Selecting MC Historian remote collector

**Example:**

<table>
<thead>
<tr>
<th>MC Historian</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
</tr>
</tbody>
</table>

- **(1) Selecting MC Historian remote collector**
  1. If you do not need a remote collector, go to 5.

### Selecting MC Mobile

**Example:**

<table>
<thead>
<tr>
<th>MC Mobile</th>
<th>ET</th>
<th>OL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td></td>
</tr>
</tbody>
</table>

- **(1) Selecting MC Mobile depending on whether you have an MC Works64 license**
  1. If you have MC Works64 DV license and if you need MC Mobile CL (2 licenses), select DV.
  2. If you want to select MC Works64 DV (35 tags) and MC Mobile CL (2 licenses) as a set, select LT.

- **(2) Selecting OPC servers**
  1. If you will use an MX OPC server, select “–” (an MX OPC server is bundled).
  2. If you will not use an MX OPC server, select OL (MX OPC Server is not bundled).

### Additional purchase of MC Mobile licenses

**Example:**

<table>
<thead>
<tr>
<th>MC Mobile</th>
<th>CL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
</tr>
</tbody>
</table>

- **(1) Adding additional purchase of MC Mobile licenses**
  1. If you do not need these licenses, go to 7.

### Selecting an MC Works64 license authentication type

1. If you will use different personal computers for development and runtime (display function), go to 10.
2. If you will use the same personal computer for development and runtime, use the Internet for the S/W license authentication.

### Additional Japanese-language and Chinese-language package products

1. If you need a Japanese-language or Chinese-language package, select MC Works64 Language Pack.
2. If you do not need a Japanese-language or Chinese-language package, select “–”.

### Adding MC Alarm MMX

1. If MC Mobile ET or OL are selected, select “–”.
2. If you do not need a Japanese-language or Chinese-language package, select “–”.

### Selecting BridgeWorX Lite

1. If you need BridgeWorX Lite, select BridgeWorX Lite.
2. If you do not need BridgeWorX Lite, select “–”.

### Selecting ReportWorX Lite

1. If you need ReportWorX Lite, select ReportWorX Lite.
2. If you do not need ReportWorX Lite, select “–”.

---

*Example: Select MC Works64 DV [two licenses] when you need redundant servers.*

*Example: Select MC Works64 CL [DV] when you need a redundant configuration.*
### AnalytiX® products

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model</th>
<th>Asset**</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX Energy SV</td>
<td>SW2DND-Axesv-ET</td>
<td>5</td>
<td>Energy monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ MC Historian SD (including 5 tags)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ ReportWorX (1 report)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(MC Works64 license needs to be purchased separately.)</td>
</tr>
<tr>
<td>AX Energy AS</td>
<td>SW2DND-Axesas-ET</td>
<td>—</td>
<td>Energy monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 10 tags added to MC Works64</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 1 asset added to +AX Energy*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(MC Works64 license needs to be purchased separately.)</td>
</tr>
<tr>
<td>AX Energy*</td>
<td>SW2DND-Axes-ET</td>
<td>5</td>
<td>Energy monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ MC Works64 DV (including 75 tags)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ MC Historian SD (including 5 tags)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 1 MC Works64 CL RT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ ReportWorX (1 report)</td>
</tr>
<tr>
<td>AX Facility</td>
<td>SW2DND-Axfs-ET</td>
<td>—</td>
<td>Preventive maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 10 tags added to MC Works64</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 1 asset added to +AX Facility*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(MC Works64 license needs to be purchased separately.)</td>
</tr>
<tr>
<td>AX Quality SV</td>
<td>SW2DND-Axqsv-ET</td>
<td>—</td>
<td>Quality control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ MC Works64 (including 150 tags)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ MC Historian (including 150 tags)*</td>
</tr>
<tr>
<td>AX Portal SV</td>
<td>SW2DND-Axpsv-ET</td>
<td>—</td>
<td>Web monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 1 AX Portal CL (MC Works64 license needs to be purchased separately.)</td>
</tr>
<tr>
<td>AX Portal ET</td>
<td>SW2DND-Axpet-ET</td>
<td>—</td>
<td>Web monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ MC Works64 DV (including 15k tags)</td>
</tr>
<tr>
<td>AX Portal CL</td>
<td>SW2DND-Axpcl-ET</td>
<td>—</td>
<td>1 additional AX Portal client license</td>
</tr>
<tr>
<td>AX Client</td>
<td>SW2DND-Axc-ET</td>
<td>—</td>
<td>1 additional AX Energy/AX Facility client license</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(MC Works64 license needs to be purchased separately.)</td>
</tr>
</tbody>
</table>

**1:** AX Energy/AX Facility is licensed depending on the analysis (asset) count not on the tag count.  
**2:** MX OPC Server does not support Japanese. If you want to use Japanese, purchase DeviceXPlorer OPC server.  
**3:** You can assign AX Quality’s functions to all the tags of MC Historian.

### Function list

<table>
<thead>
<tr>
<th>Product name</th>
<th>Energy monitoring</th>
<th>Preventive maintenance</th>
<th>Modbus® OPC server</th>
<th>BACnet® connection</th>
<th>SNMP connection</th>
<th>Screen generation (Depending on client type)</th>
<th>ReportWorX (Form tool)</th>
<th>ReportWorX Express (Simplified form tool)</th>
<th>MC Works64 package</th>
<th>Merit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX Energy SV</td>
<td>●</td>
<td>–</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● (report)</td>
<td>●</td>
<td>●</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>AX Energy</td>
<td>●</td>
<td>–</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● (report)</td>
<td>●</td>
<td>●</td>
<td>MC Works64</td>
<td>–</td>
</tr>
<tr>
<td>AX Facility</td>
<td>–</td>
<td>–</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● (report)</td>
<td>●</td>
<td>●</td>
<td>MC Works64</td>
<td>–</td>
</tr>
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<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td>Additional package to MC Works64</td>
<td></td>
</tr>
<tr>
<td>AX Portal ET</td>
<td>–</td>
<td>–</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● (report)</td>
<td>●</td>
<td>●</td>
<td>MC Works64</td>
<td>–</td>
</tr>
</tbody>
</table>

*ReportWorX Express is an on-demand form tool that runs with 32-/64-bit Microsoft® Excel®. Purchase ReportWorX Lite for the outputs in HTML, PDF, or other formats and for automatic daily/monthly form outputs.
### Selecting AnalytiX® products

#### Energy monitoring - Selecting AX Energy (if you do not need AX Energy, go to 3.)

1. **Example:** AX Energy SV
   - Consider (1) as shown below.

   **(1) Selecting the availability of MC Works64 licenses and OPC servers**
   1. If you have MC Works64 license and want AX Energy license, ReportWorX license, and AX Energy license, select SV.
   2. If you select MC Works64 license (75 tags), MC Historian license (50 tags), and AX Energy license (5 assets), select SV.
   3. If you select MC Works64 license (75 tags), MC Historian license (50 tags), and AX Energy license (5 assets) and do not use MX OPC server, select “–”.

   **Example:** Select AX Energy [OL] when you select MC Works64 licenses and AX Energy and use a DeviceXPlorer OPC server.

#### Preventive maintenance - Selecting AX Facility (if you do not need AX Facility, go to 5.)

2. **Example:** AX Facility OL
   - Consider (1) as shown below.

   **(1) Selecting the availability of MC Works64 licenses and OPC servers**
   1. If you will use an MX OPC server, select “–” (an MX OPC server is bundled).
   2. If you will not use a MX OPC server, select OL (MX OPC Server is not bundled).

   **Example:** Select AX Facility [OL] when you use a DeviceXPlorer OPC server.

#### Adding AX Energy tag/asset (if you do not need to add this, go to 3.)

1. If you want to add AX Energy (10 or 1,000 tags), MC Historian (1 or 100 tags), and AX Energy (1 or 100 assets), select AX Energy AS.
2. If you do not want to add tags/assets, select “–”.

#### Adding AX Facility tags and assets (if you do not need to add these, go to 5.)

1. If you want to add AX Energy (10 or 1,000 tags) and AX Facility (1 or 100 assets), select AX Facility AS.
2. If you do not add tags or assets, select “–”.

#### Quality control - Selecting AX Quality (if you do not need AX Quality, go to 6.)

3. **Example:** AX Quality SV
   - Consider (1) as shown below.

   **(1) Selecting the availability of MC Works64/MC Historian licenses and OPC servers**
   1. If you have MC Works64/MC Historian licenses and want AX Quality, select SV.
   2. If you select MC Works64 license (150 tags), MC Historian license (150 tags), and AX Quality and use an MX OPC server, select “–”.
   3. If you select MC Works64 license (150 tags), MC Historian license (150 tags), and AX Quality and do not use a MX OPC server, select OL.

   **Example:** Select AX Quality [OL] when you select MC Works64 licenses, MC Historian licenses and AX Quality and use a DeviceXPlorer OPC server.

#### Adding AX Client licenses (client licenses of AX Energy/AX Facility) (if you do not need to add these licenses, go to 7.)

4. 1. If you want to add AX Client (1, 5, or 25 licenses), select AX Client.
    2. If you do not add AX Client, select “–”.

#### Web monitoring - Selecting AX Portal (if you do not need AX Portal, end here.)

5. **Example:** AX Portal ET OL
   - Consider (1) and (2) as shown below.

   **(1) Selecting AX Portal depending on the availability of MC Works64 licenses**
   1. If you have MC Works64 license and want to select AX Portal license, select SV.
   2. If you want to select MC Works64 license (100 tags) and AX Portal (25 licenses), select ET.

   **Example:** Select AX Portal [ET] when you purchase MC Works64 licenses and AX Portal as a set.

   **(2) Selecting OPC servers**
   1. If you will use an MX OPC server, select “–” (an MX OPC server is bundled).
   2. If you will not use a MX OPC server, select OL (MX OPC Server is not bundled).

   **Example:** Select AX Portal ET [OL] when you select MC Works64 and AX Portal and use a DeviceXPlorer OPC server.

#### Adding AX Portal clients (if you do not need to add these, end here.)

6. 1. If you want to add AX Portal (1, 5, or 25 licenses), select AX Portal CL.
    2. If you do not add AX Portal (1, 5, or 25 licenses), select “–”.

---

*Example:*
- AX Ener gy SV
- AX Facility OL
- AX Portal ET OL
- AX Quality SV
- AX Client
- AX Portal CL
### Operation environment

#### System requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>MC Works64</th>
<th>MC Graph64</th>
<th>MC Alarm64</th>
<th>MC Historian</th>
<th>MC Mobile</th>
<th>AX Energy</th>
<th>AX Facility</th>
<th>AX Quality</th>
<th>AX Portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>PC/AT-compatible personal computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CPU</td>
<td>Dual/Quad/Hex Core 1.6 GHz or higher recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>4 GB (8 GB or larger recommended)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Hard disk drive (for installation)</td>
<td>Free space of 4 GB or larger</td>
<td></td>
<td></td>
<td>Free space of 160 GB or larger</td>
<td>Free space of 4 GB or larger</td>
<td>Free space of 20 GB or larger</td>
<td>Free space of 50 GB or larger recommended</td>
<td></td>
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<tr>
<td>Virtual memory (for operation)</td>
<td>512 MB or larger</td>
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<tr>
<td>Disk drive</td>
<td>DVD-ROM drive</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>OS*1</td>
<td>Windows® 8, 8.1*1</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Web server*2</td>
<td>Microsoft® Internet Information Services (IIS) 7.0 or later</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Other requirements</td>
<td>–</td>
<td></td>
<td>–</td>
<td>–</td>
<td></td>
<td>Microsoft SharePoint® Server 2012*2</td>
<td>Microsoft SharePoint® Server 2010 and SharePoint® Foundation 2010*4</td>
<td>Microsoft® Office Excel® (2003 or later)*4</td>
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<tr>
<td>Q Works</td>
<td>1.91V or later</td>
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<td>–</td>
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### OS compatibility

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<thead>
<tr>
<th>OS</th>
<th>MC Works64</th>
<th>MC Graph64</th>
<th>MC Alarm64</th>
<th>MC Historian</th>
<th>MC Mobile</th>
<th>AX Energy</th>
<th>AX Facility</th>
<th>AX Quality</th>
<th>AX Portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows® 8, 8.1*1</td>
<td>●</td>
<td>●</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>●</td>
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<tr>
<td>Windows® 7</td>
<td>● (SP1) *1</td>
<td>● (SP1) *1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>● (SP1) *1</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

*1: Compatible only with Professional and Enterprise versions

*2: Compatible only with Professional, Enterprise, and Ultimate versions

*3: A server OS is required (e.g. Windows Server 2008 R2 or later)

*4: Only the Silverlight®-version HMI screen is displayed.

### Database compatibility (data storage)

<table>
<thead>
<tr>
<th>Database</th>
<th>MC Works64</th>
<th>MC Graph64</th>
<th>MC Alarm64</th>
<th>MC Historian</th>
<th>AX Energy</th>
<th>AX Facility</th>
<th>AX Quality</th>
<th>AX Portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQL Server® 2014</td>
<td>●</td>
<td>●</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SQL Server® 2012</td>
<td>●</td>
<td>●</td>
<td>–</td>
<td>–</td>
<td>●</td>
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<tr>
<td>SQL Server® 2008 R2*3</td>
<td>●</td>
<td>●</td>
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<td>–</td>
<td>●</td>
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</tr>
</tbody>
</table>

*1: AX Energy is compatible only with SQL Server® 2008 R2 Standard, Enterprise, and Developer versions. (The Express version is not supported.)

*2: The free “Express” version can be used. However, please be aware of the limitations when using SQL Server Express (database sizes are capped etc.).

### Web browser compatibility (screen display)

<table>
<thead>
<tr>
<th>Web browser</th>
<th>MC Works64</th>
<th>MC Graph64</th>
<th>MC Alarm64</th>
<th>MC Historian</th>
<th>AX Energy</th>
<th>AX Facility</th>
<th>AX Quality</th>
<th>AX Portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer® 8-11</td>
<td>●</td>
<td>●</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet Explorer® 7</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firefox® 3 or later</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safari®</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Google Chrome®</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other web browsers (compatible with Silverlight®)</td>
<td>●*1</td>
<td>●*1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*1: Only the Silverlight®-version HMI screen is displayed.
**Steps for starting up MC Works64**

**Registration of license (Software key)**

1. **Order**
2. **Purchase**
3. **Install product into PC**
4. Acquire license file from Mitsubishi Electric website http://www.mcworkslicensing.com/
5. **Register license**

**Registration of license (Hardware key)**

1. **Order**
2. **Purchase**
3. Install product into PC
4. Register product information on Mitsubishi Electric website http://www.mcworkslicensing.com/
5. **Register license**

**License Certificate**

1. Product Name
2. Customer Key
3. Product Registration No.

* Refer to the manual enclosed with the product for details.
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* All products are not available in all countries.
<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Sales office</th>
<th>Tel/Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>MITSUBISHI ELECTRIC AUTOMATION, INC.</td>
<td>Tel : +1-847-478-2100</td>
</tr>
<tr>
<td></td>
<td>500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.</td>
<td>Fax : +1-847-478-2253</td>
</tr>
<tr>
<td>Mexico</td>
<td>MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch</td>
<td>Tel : +52-55-3067-7500</td>
</tr>
<tr>
<td></td>
<td>Mariano Escobedo #69, Col. Zona Industrial, Tlalnepantla Edo. Mexico, C.P.54030</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>MITSUBISHI ELECTRIC DO BRASIL COMERCIO E SERVIÇOS LTDA.</td>
<td>Tel : +55-11-4689-3000</td>
</tr>
<tr>
<td></td>
<td>Rua Jussara, 1750-Bloco B Anexo, Jardim Santa Cecilia, CEP 06465-070, Barueri-SP, Brasil</td>
<td>Fax : +55-11-4689-3016</td>
</tr>
<tr>
<td>Germany</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. German Branch</td>
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</tr>
<tr>
<td></td>
<td>Gothaer Strasse 8, D-40880 Ratingen, Germany</td>
<td>Fax : +49-2102-486-1120</td>
</tr>
<tr>
<td>UK</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. UK Branch</td>
<td>Tel : +44-1707-28-8760</td>
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<tr>
<td></td>
<td>Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, U.K.</td>
<td>Fax : +44-1707-27-6695</td>
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<tr>
<td>Ireland</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch</td>
<td>Tel : +353-1-4198800</td>
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<tr>
<td></td>
<td>Westgate Business Park, Ballymount, Dublin 24, Ireland</td>
<td>Fax : +353-1-4198890</td>
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<tr>
<td>Italy</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch</td>
<td>Tel : +39-039-60531</td>
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<tr>
<td></td>
<td>Centro Direzionale Colleoni-Palazzo Sirio Viale Colleoni 7, 20864 Agrate Brianza(Milano) Italy</td>
<td>Fax : +39-039-6053-312</td>
</tr>
<tr>
<td>Spain</td>
<td>MITSUBISHI ELECTRIC EUROPE, B.V. Spanish Branch</td>
<td>Tel : +34-935-65-3131</td>
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<tr>
<td></td>
<td>Carretera de Rubi, 76-80-Apto. 420, 08190 Sant Cugat del Vallés (Barcelona), Spain</td>
<td>Fax : +34-935-89-1579</td>
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<tr>
<td>France</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. French Branch</td>
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<tr>
<td></td>
<td>25, Boulevard des Bouvets, 92741 Nanterre Cedex, France</td>
<td>Fax : +33-1-55-68-57-57</td>
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<tr>
<td>Czech Republic</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch</td>
<td>Tel : +420-251-551-470</td>
</tr>
<tr>
<td></td>
<td>Avenir Business Park, Radlicka 751/113e, 158 00 Praha5, Czech Republic</td>
<td>Fax : +420-251-551-471</td>
</tr>
<tr>
<td>Poland</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch</td>
<td>Tel : +48-12-630-47-00</td>
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<tr>
<td></td>
<td>ul. Krakowska 50, 32-083 Balice, Poland</td>
<td>Fax : +48-12-630-47-01</td>
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<tr>
<td>Sweden</td>
<td>MITSUBISHI ELECTRIC EUROPE B.V. (Scandinavia)</td>
<td>Tel : +46-8-625-10-00</td>
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<tr>
<td></td>
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Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO 14001 (standards for environmental management systems) and ISO 9001 (standards for quality assurance management systems).

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