FA Communications Software
SYSMAC Gateway
WS02-SGWC1
CX-Compole
WS02-CPLC1
OMRON’s Upgraded FA Communications Flexible, High-speed, and Direct Data Link Computers.

The need for faster transmission of more and more information between personal computers and PLCs is coupled with the need for frequent changes to specifications, such as address allocations in PLCs, a demand for software standardization to eliminate dependence on specific applications and networks, and a demand for cost reductions.

In response to this demand, OMRON has completely renovated its FA Communications Software under new names. Data links are now possible using Ethernet. Data links can even be accessed via a LAN port on a notebook computer. And FA Communications Software can be used to access PLC data by using only tag names to enable more flexible and higher-speed access of PLC data from personal computers, and that lowers costs by eliminating the need for a special board for data links.

Software Lets You Create Applications with Access to SYSMAC PLCs from Personal Computers.

OMRON’s Upgraded FA Communications Software lets you create applications with flexible, high-speed, and direct data link access to SYSMAC PLCs from personal computers.

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The OMRON Sysmac Gateway is now accessible on Ethernet networks. The gateway can be used as communications driver on most networks. It is the successor to FireGate and has inherited all FireGate functionality.

CX-Compolet software enables easy reading and writing PLC data using Visual Basic.NET and Visual C#.NET. It is the successor to SYSMAC Compolet.

PLC data can be read and written across EtherNet/IP networks by simply reading and writing values in personal computer memory.

The same name server as for CJ2 is utilized. A PCI Controller Link Support Board was required to establish data links. There were strict limitations on the capacity and speed of Controller Link data links.

No changes are required at the application.

You can easily handle changes to specifications.

The addresses in PLC assigned to tag names can be changed without creating additional work.

No changes are required at the application.

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Data links are possible between personal computers and PLCs on Ethernet networks. PLC data was accessed using addresses, so if an address was changed in the PLC it also had to be changed in the application.

Data links are possible between personal computers and PLCs on Ethernet networks. PLC data can be read and written across EtherNet/IP networks by simply reading and writing values in personal computer memory.

PLC data is accessed using tag names, so there is no need to change addresses in the PLC. Even if PLC addresses are changed in the PLC, this enables application standardization.

− The LAN port at the personal computer is used, so no special board is required. Data links are possible even for a notebook computer.

− Software operations are used, improving personal computer and communications performance.

EtherNet/IP provides greater capacity and higher speed and because data link areas in personal computer memory are accessed, data access is faster than having to constantly access EtherNet/IP nodes.

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OMRON’s Upgraded FA Communications Software is flexible, high-speed, and direct data link access to SYSMAC PLCs from personal computers.
SYSMAC Gateway provides an OMRON PLC communications driver and virtual memory. OMRON’s FA Communications Software uses the SYSMAC Gateway communications middleware as a common platform.

In addition to FINS communications, operation of SYSMAC Gateway has been verified on EtherNet/IP.

SYSMAC Gateway absorbs the differences in the physical layers of RS-232C, USB, Ethernet, EtherNet/IP, and Controller Link.

Virtual PLC event memory is provided to enable a personal computer to participate as a data link node.

Changes to memory can be detected in applications at the personal computer.

## Software Configuration

SYSMAC Gateway can access the PLCs in all of the following configurations.

**Application Software**

Communications Driver and Virtual PLC Memory

SYSMAC Gateway can access the PLCs in all of the following configurations.

**SYSMAC Gateway**

An OMRON PLC Driver with Virtual PLC Memory Functionality

SYSMAC Gateway can access the PLCs in all of the following configurations.

**USB**

Commercially available USB cable

**Special Cable**

SYSMAC Gateway provides an OMRON PLC communications driver and virtual memory. OMRON’s FA CJ2/CP1 CJ2/CJ1/CS1 Communications Software uses the SYSMAC Gateway communications middleware as a common platform.

**Data links**

In addition to FINS communications, operation of SYSMAC Gateway has been verified on EtherNet/IP.

## Application Example

Using Events to Provide Notification of Changes in Data

- The application is notified using events only when preset conditions are met.
- Eliminating programming for checking cyclic data changes reduces the load on the personal computer processor.
- Notification of data changes is provided immediately, eliminating wasted communications time.

## Main SYSMAC Gateway Functions

**Supported protocols**: SYSWAY, SYSWAY-CV, Peripheral Bus (Toolbus), FINS, and CIP

**Supported PLCs**: CJ2, CJ1, CSi, CPi, and CVMH-CV

**Supported networks**: RS-232C (SYSWAY, SYSWAY-CV, Peripheral Bus (Toolbus)), USB, EtherNet/IP, CIP (FINS), Controller Link (FINS), and SYSMAC LINK (FINS)

**Virtual event memory**: CIE, Audiary ii (Holding ii), Work (ii), DL, and EMI to EMI

**Tag access**: For the CJ2 (with EtherNet/IP functionality), access by tag name is enabled.

## CIP Service Specifications

**Tag data link**

- **Number of communications**: 1
- **Allowed communications bandwidth**: 5,000 pps
- **Network packet size (max)**: 512 bytes
- **Link data capacity**: 150 words/sec.
- **Data rate per connection**: 720 words/sec.
- **Virtual event memory**: CIE, Audiary ii, Holding ii, Work ii, DL, and EMI to EMI

**Explicit Messages**

- **Message send function (client)**: CIP commands to a CMM and CIP connection (Class 3)
- **Message send function (server)**: CIP connections to a CMM and CIP connection (Class 3)

**Data rate**

- **CIP reading**: Not supported

**Note**: The above configurations are only examples. Communications are also possible with PLCs other than those shown here. For details, refer to page 8.
**CX-Compolet**

CX-Compolet is a package of software components that make it easy to program reading and writing OMRON PLC data.

- Read and write I/O memory in the PLC, change the operating mode, read error logs, and perform other operations.
- Can be used from Visual Basic.NET and Visual C# .NET.
- For the CJ2 with EtherNet/IP functionality, I/O memory in the PLC can be accessed by using tag names rather than addresses.
- Array variable access is possible.

**.NET Control Objects**  
*ActiveX Control Objects are also included.*

**Software Configuration**

CX-Compolet can access the PLCs in all of the following configurations.

- USB
- RS-232C
- .NET Control Objects
  - ActiveX Control Objects are also included.

**Application Example**

Easily Program Device Alarm Monitoring.

- Using the control components provided by CX-Compolet, frees the application designers from having to program the communications portions of the application.
- Data for device alarms and other data are sent to the applications using non-solicited EtherNet/IP communications events.
- Standardization is made easy by specifying data using tag names (such as “Alarm A” and “Alarm B”) in the applications.

**System Configuration Examples**

CX-Compolet can access the PLCs in all of the following configurations.

- VB.NET/VC#.NET
- CJ2/CJ1/CS1
- SYSMAC Gateway

**Main CX-Compolet Functions**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties</td>
<td>Communications with SYSMAC PLC</td>
<td>Specifies the PLC to communicate with, and reads network information.</td>
</tr>
<tr>
<td>Properties</td>
<td>Reading and writing I/O memory</td>
<td>Reads and writes data in memory areas, such as the DM Area or CIO Area. For example, DM word 100 can be specified by using “D100” or by using a tag name.</td>
</tr>
<tr>
<td>Properties</td>
<td>Operating status</td>
<td>Reads and changes the operating mode.</td>
</tr>
<tr>
<td>Properties</td>
<td>Area information</td>
<td>Reads information such as the program area size and number of DM Area words.</td>
</tr>
<tr>
<td>Properties</td>
<td>Error information</td>
<td>Reads the error message when an error occurs.</td>
</tr>
<tr>
<td>Properties</td>
<td>Other SYSMAC PLC information</td>
<td>Reads the model and reads and changes the clock.</td>
</tr>
<tr>
<td>Methods</td>
<td>Reading and writing I/O memory</td>
<td>Reads and writes memory, such as consecutive words in the DM Area or CIO Area. For example, it is possible to specify the data type (integer, single, etc.) or change the data type (BCD, BIN, SBIN).</td>
</tr>
<tr>
<td>Methods</td>
<td>Creating I/O tables</td>
<td>Creates the I/O table for the present configuration.</td>
</tr>
<tr>
<td>Methods</td>
<td>Form-setting, frame-setting, and clearing bits</td>
<td>Frame-set, frame-reset, and clear bits.</td>
</tr>
<tr>
<td>Methods</td>
<td>Communications with SYSMAC PLC</td>
<td>Specifies the PLC to communicate with.</td>
</tr>
<tr>
<td>Methods</td>
<td>PRD service execution</td>
<td>Sends the commands and gives the responses that are received.</td>
</tr>
</tbody>
</table>

**Environment for CX-Compolet**

- **Development environment**: Microsoft Visual Studio .NET (x86 32-bit), .NET Framework 2.0, .NET Framework 3.0, or .NET Framework 3.5
- **Supported OS**: Windows 2000, XP, or Vista and 2003 Server
- **Supported executable environment**: .NET Framework 2.0, 3.0, or 3.5

**Note:** Only the components compatible with SYSMAC Compolet version 2003 are supported. A development environment of .NET 2003 or higher is required for CIP communications.
### Ordering Information

**SYSMAC Gateway (Communications Middleware)**

<table>
<thead>
<tr>
<th>Product name</th>
<th>Specification</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSMAC Gateway</td>
<td>Communications middleware for personal computers running Windows. Supports CIP communications and tag data links (EtherNet/IP) in addition to FinsGateway functions. Supported communications: RS-232C, USB, Controller Link, SYSMAC LINK, Ethernet, EtherNet/IP. 10 additional licenses (This product provides only additional licenses.)</td>
<td>WS02-SGW1</td>
<td>NEW</td>
</tr>
</tbody>
</table>

**CX-Compolet**

Supported OS: Microsoft Windows Vista, XP, 2000, and 2003 Server  
1 One license is required per computer.

### Correspondence between Main PLC Models and Connected Networks

<table>
<thead>
<tr>
<th>PLC</th>
<th>Personal computer</th>
<th>USB</th>
<th>Ethernet (LAN)</th>
<th>Controller Link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS-232C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYSWAY - Host Link C Mode (CV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYSWAY - CV (Host Link FINS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CompoWay/F (master at personal computer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peripheral Bus</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>FINS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>(Peripheral Bus – CS/CJ)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CPS1</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>C200HX/HS/HE, COM1H</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CPM1/CPM2</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CVM1/CV</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CompoWay/F Slaves, such as Temperature Controllers</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Correspondence between FA Communications Software and Connected Networks

<table>
<thead>
<tr>
<th>FA Communications Software</th>
<th>Communications method</th>
<th>Personal Computer Boards</th>
<th>SYSDAM Board</th>
<th>CS1 Board</th>
<th>CS1 Bus Interface Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSMAC Gateway</td>
<td>Message communications</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data link communications</td>
<td></td>
<td>FINS communications</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CX-Compolet</td>
<td>Message communications</td>
<td></td>
<td>FINS communications</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1 A separate Communications Unit is required.  
2 Specification using tag names is not possible.

**Note:** Do not use this document to operate the Unit.

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In the interest of product improvement, specifications are subject to change without notice.

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