

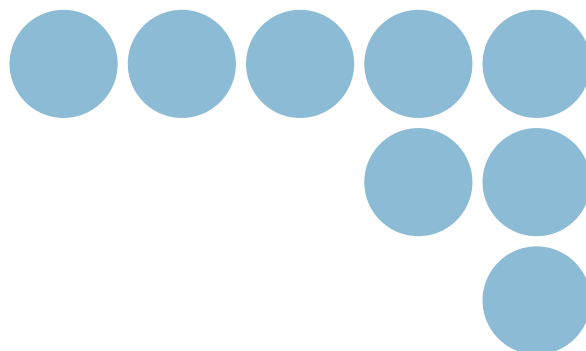
FA Communications Software

SYSMAC Gateway

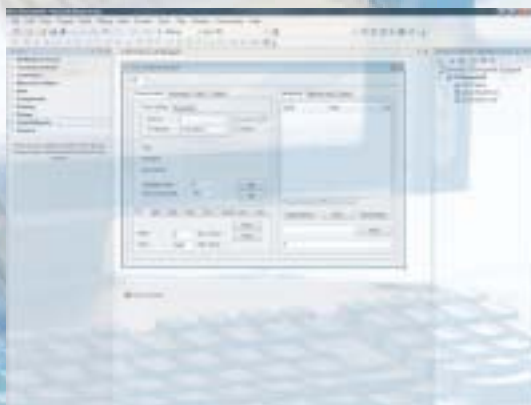
WS02-SGWC1

CX-Compolet

WS02-CPLC1



SYSMAC Gateway

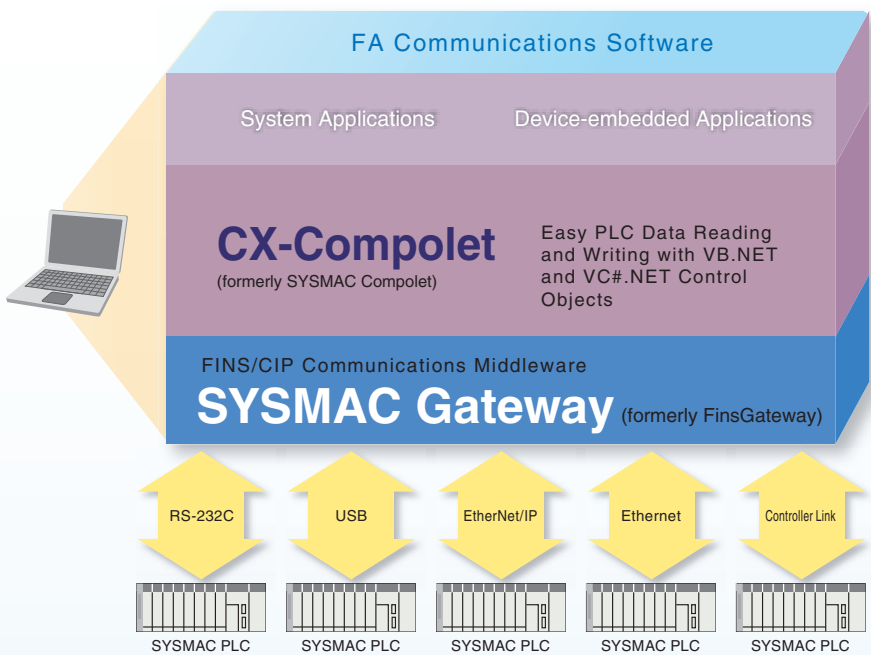


CX-Compolet

OMRON's Upgraded FA Communications Software Flexible, High-speed, and Direct Data Link Access to SYSMAC PLCs from Personal 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.



Product Positioning

SYSMAC Gateway

SYSMAC Gateway can be used as the communications driver on most networks. It is the successor to FinsGateway and has inherited all FinsGateway functionality.

CX-Compolet

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

Upgraded Functions for FA Communications Software

Item		SYSMAC Gateway	CX-Compolet
Operating system		Windows Vista	
Network	EtherNet/IP	Yes (Tag access and data links enabled.)	
	USB	Yes (CJ2, CP1)	
PLCs		CJ2 (with EtherNet/IP functionality)	
Other functions		Checking operation on EtherNet/IP	Visual Studio.NET 2008 • Array variables are supported.

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

Flexibility

- Tag Access
- Two Types of Access

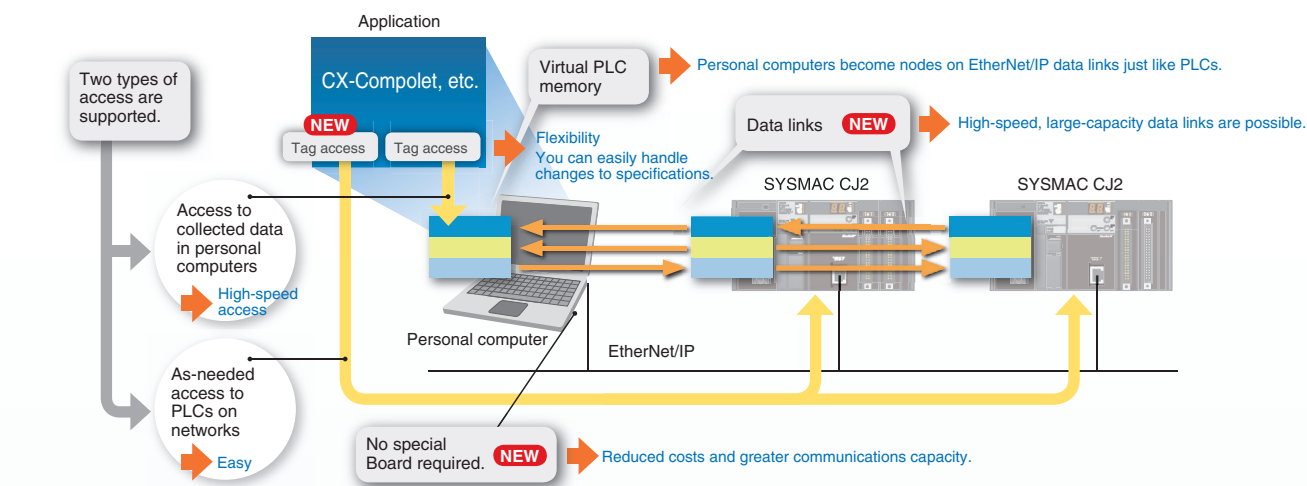
High Speed

- Access to personal computers via data links.
- Communicate using software processing.

Direct Data Link Access

- Special Boards, such as Controller Link and SYSMAC LINK Support Boards, are not required.

Simultaneous Upgrade for All OMRON FA Communications Software



Two New Features

Tag Access

Application data can be accessed using tag names rather than addresses.

- 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.

FROM: PLC data was accessed using addresses, so if an address was changed in the PLC it also had to be changed in the application.

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

Data Links

Data links are possible between personal computers and PLCs on Ethernet networks.*1

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

FROM: 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.

TO: 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.

*1 EtherNet/IP is required for data links on Ethernet networks.

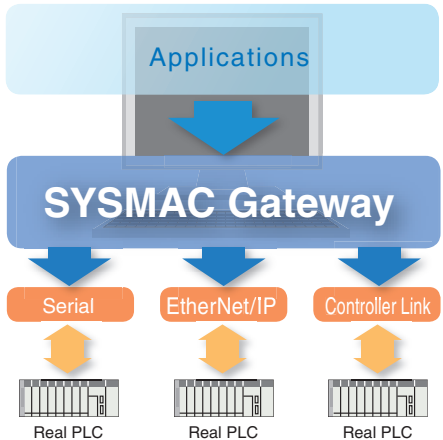
An OMRON PLC Driver with Virtual PLC Memory Functionality

SYSMAC Gateway

Communications Driver and Virtual PLC Memory

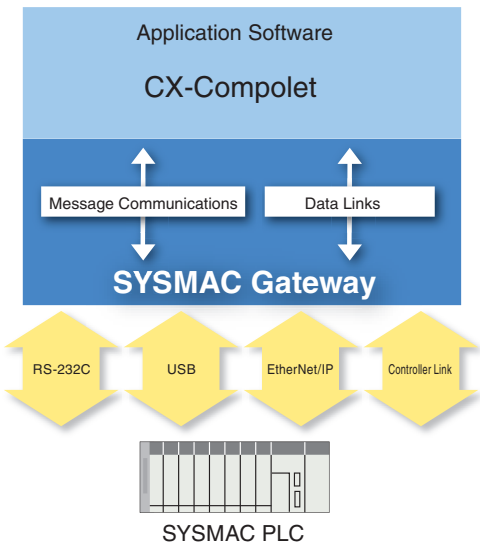
SYSMAC Gateway provides an OMRON PLC communications driver and virtual memory. OMRON's FA Communications Software uses the SYSMAC Gateway communications middleware as a common platform.

- 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.



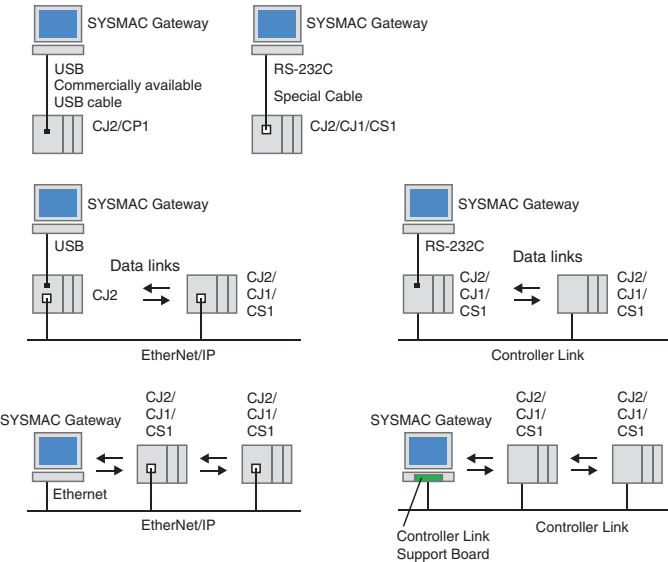
Note: USB and Ethernet can also be used for communications.

Software Configuration



System Configuration Examples

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

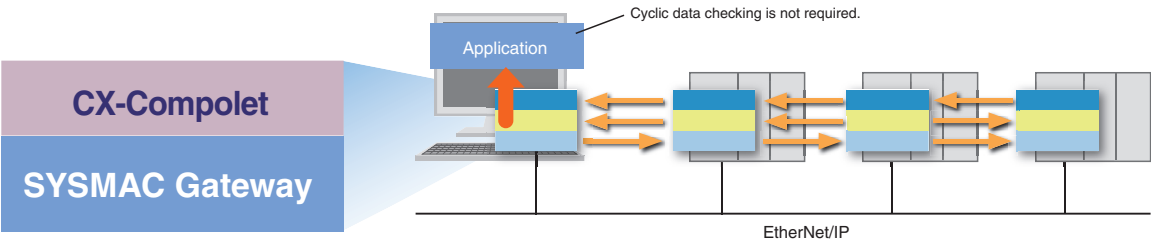


Note: The above configurations are only examples. Communications are also possible with PLCs other than those shown here. For details, refer to page 8.

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.



Situation → Developing or Modifying PLC Applications Is Too Much Work

Problem	
Customers who have created their own communications programs	Modifying programs for different networks is a lot of work.
Customers who are already using FinsGateway	–Insufficient speed. –Insufficient data link capacity.
	Programming communications to send and receive messages for each node or block of data is too much work.
Customers who want to standardize personal computer applications	Having to modify personal computer applications whenever the PLC memory map is changed is too much work.

Solution with SYSMAC Gateway	
Time spent on programming communications can be reduced by absorbing the differences between networks. 	
Using EtherNet/IP enables high-speed, large-capacity data links with no need for a special communications board. 	
Communications efficiency can be optimized by using EtherNet/IP data links. 	No special board is required.
For the CJ2 with EtherNet/IP functionality, tag access and tag data links (*1) provide freedom from PLC memory maps. 	

*1 Tag data links are not possible from a C language library. They are possible only with .NET.

Main SYSMAC Gateway Functions

Item	Description
Supported protocols	SYSDAY, SYSDAY-CV, Peripheral Bus (Toolbus), FINS, and CIP
Supported PLCs	CJ2, CJ1, CS1, CP1, C, and CVM1/CV
Supported networks	RS-232C (SYSDAY, SYSDAY-CV, Peripheral Bus (Toolbus)) USB, EtherNet/IP*1, Ethernet (FINS), Controller Link (FINS), and SYSMAC LINK (FINS) *1 Data links are supported.
Virtual event memory	CIO, Auxiliary (A), Holding (H), Work (W), DM, and EM1 to EM1F
Tag access	For the CJ2 (with EtherNet/IP functionality), access by tag name is enabled.

Environment for SYSMAC Gateway

Item	Description
Languages	English or Japanese
Supported OS	Windows 2000, XP, or Vista and 2003 Server

CIP Service Specifications

Tag data links	Number of connections	256
	Allowable communications bandwidth	5,000 pps
	Refresh period (RPI)	1 to 10,000 ms (unit: 1 ms)*1
	Link data capacity	184, 832 words max.
Explicit messages	Data size per connection	722 words (1,444 bytes) max.
	Message send function (client)	CIP connectionless (UCMM) and CIP connection (Class 3) communications
	Message receive function (server)	CIP connectionless (UCMM) and CIP connection (Class 3) communications
	Data size	502 bytes
CIP routing		Not supported.

*1 The RPIs that can be set depend on the number of connections.

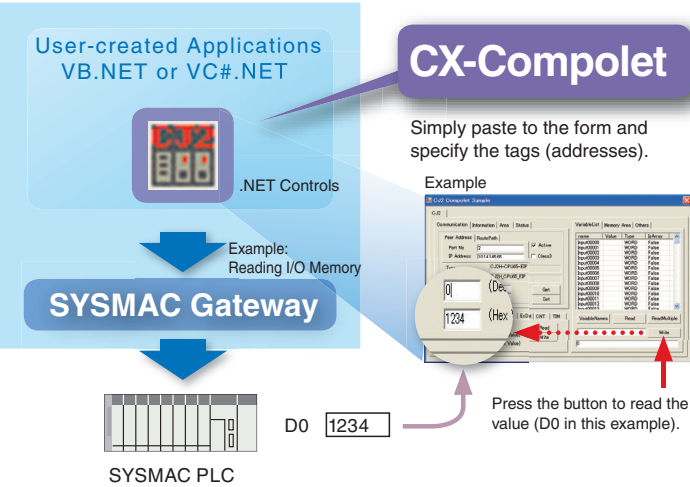
Easily Create Programming to Read and Write PLC Data using VB or VC#.

CX-Compolet

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

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.
- Supports Microsoft Visual Studio.NET 2008. **NEW**
- 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. **NEW**
- Array variable access is possible. **NEW**

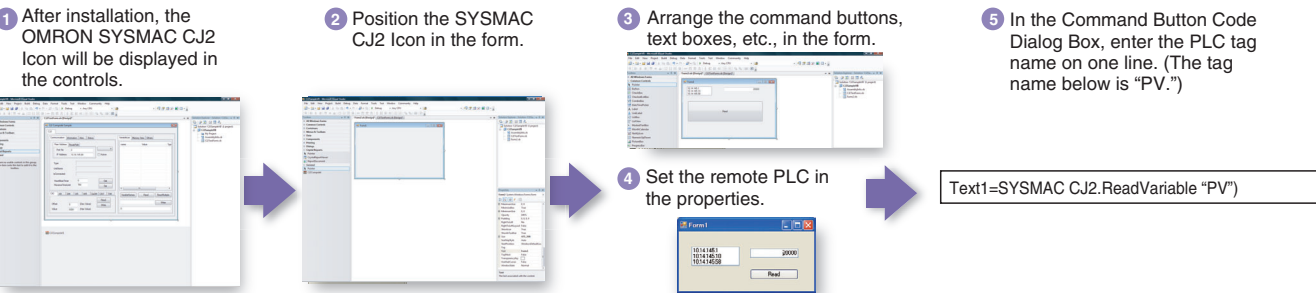


Situation → Creating and Modifying VB/VC# Communications Programming Is Too Much Work

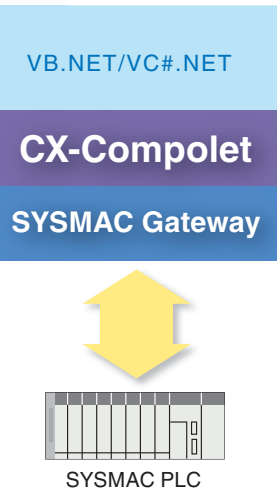
Problem	
Customers who are developing VB/VC# programs including communications with PLCs	Having to program communications frame assembly, reception response interpretation, and monitoring is too much work.
	Having to change communications processing, e.g., for Ethernet and serial communications, is too much work.
	Handling PLC address changes is particularly time consuming.
	For a block of data of the same data type, it is too much work to have to specify the addresses one by one rather than being able to view them as one group and access that data as an element.
Solution with CX-Compolet	
▶	Processing such as communications frame assembly is prepared in advance!
	Data is accessed by using tag names rather than by using addresses, so programming does not have to be changed even if PLC addresses are changed. Note: When combined with the CJ2 with EtherNet/IP functionality.
	Array variables are supported, so data can be easily specified by simply changing the element subscript with the same tag name.

Procedure

Simply Paste to a Form and Enter a Line of Code.

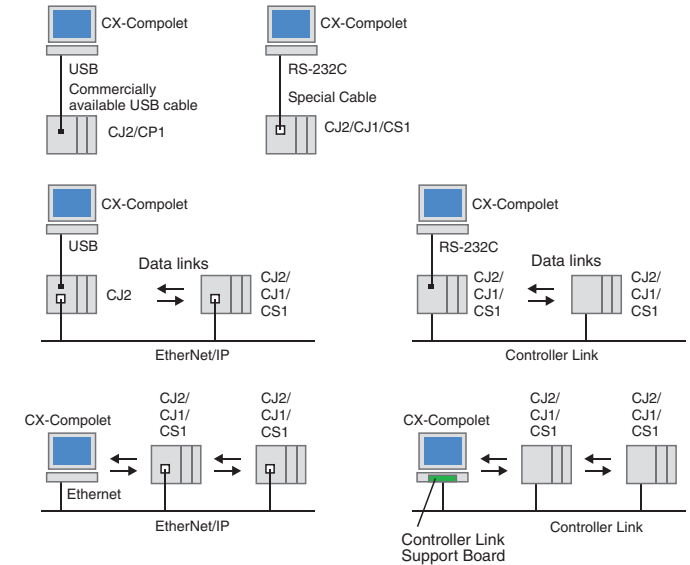


Software Configuration



System Configuration Examples

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

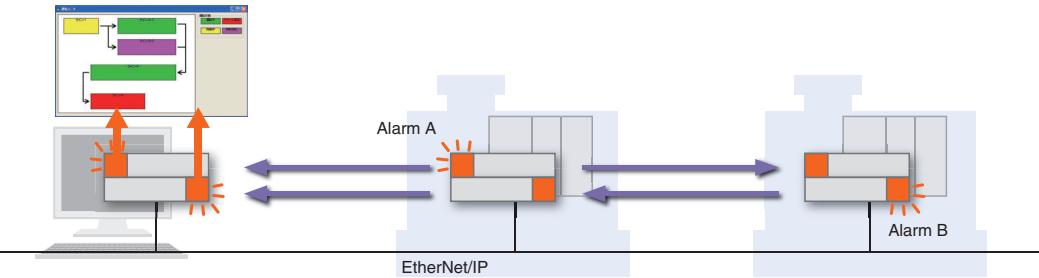


Note: The above configurations are only examples. Communications are also possible with PLCs other than those shown here. For details, refer to page 8.

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.



Main CX-Compolet Functions

Interface	Function	Description
Properties	Communications with SYSMAC PLCs	Specifies the PLC to communicate with, and reads network information.
	Reading and writing I/O memory	Read 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.
	Operating status	Reads and changes the operating mode.
	Area information	Reads information such as the program area size and number of DM Area words.
	Error information	Reads the value and error message when an error occurs.
	Other SYSMAC PLC information	Reads the model and reads and changes the clock.
Methods	Reading and writing I/O memory	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).
	Creating I/O tables	Creates the I/O tables for the present configuration.
	Force-setting, force-resetting and clearing bits	Force-sets, force-resets, and clears bits.
	Communications with SYSMAC PLCs	Specifies the PLC to communicate with.
	FINS service execution	Sends FINS commands and gets the responses that are received.
Events	Scheduled events	Events occur at regular intervals.

Environment for CX-Compolet

Item	Description
Languages	English or Japanese
Supported OS	Windows 2000, XP, or Vista and 2003 Server
Supported execution environment	.NET Framework (1.1, 2.0, 3.0, or 3.5)
Development environment	Microsoft Visual Studio .NET (See note.), .NET 2003, .NET 2005, or .NET2008 Development languages: Visual Basic.NET and Visual C#.NET Visual Basic version 5 or 6 (Only the functions compatible with Compolet V2 can be used.)

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)

Product name	Specification	Model	Standards
SYSMAC Gateway* ¹	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	WS02-SGWC1 NEW	—
	10 additional licenses (This product provides only additional licenses.)	WS02-SGWC1-L10 NEW	
SYSMAC Gateway SDK	Software development kit for creating communications programs using SYSMAC Gateway. Development languages: C, C++, Visual Basic.NET, Visual C#.NET	WS02-SGWC1S NEW	

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

■ CX-Compolet

Product name	Specification	Model	Standards
CX-Compolet* ¹	Software components that can make it easy to create programs for communications between a computer and controllers. This packaged product bundles SYSMAC Gateway. Development environment: Visual Studio.NET2003/.NET2005/.NET2008 Development languages: Visual Basic .NET, Visual C#.NET, Visual Basic Ver. 5/6* ² Supported communications: Equal to SYSMAC Gateway.	WS02-CPLC1 NEW	—
	3 additional licenses (This product provides only additional licenses. The software must be purchased in advance.)	WS02-CPLC1-L3 NEW	
	5 additional licenses (This product provides only additional licenses. The software must be purchased in advance.)	WS02-CPLC1-L5 NEW	
	10 additional licenses (This product provides only additional licenses. The software must be purchased in advance.)	WS02-CPLC1-L10 NEW	
	Software components only. This package doesn't include SYSMAC Gateway as communications drivers.	WS02-CPLC2 NEW	

Supported OS: Microsoft Windows Vista, XP, 2000, and 2003 Server

*¹ One license is required per computer.

*² Only functions provided by Compolet V2 as ActiveX controls are supported for Visual Basic version 5 or 6.

Correspondence between Main PLC Models and Connected Networks

Personal computer		RS-232C				USB	Ethernet (LAN)		Controller Link
		SYSDAY (Host Link C Mode)	SYSDAY- CV (Host Link FINS)	CompoWay/F (master at personal computer)	Peripheral Bus	FINS	Ethernet (FINS)	EtherNet/IP	FINS
CJ2 with EtherNet/IP functionality		Yes	Yes	No	Yes (Peripheral Bus – CS/CJ)	Yes* ²	Yes	Yes (Specification using tag names is possible.)	Yes* ¹
CJ1		Yes	Yes	No	Yes (Peripheral Bus – CS/CJ)	No	Yes (Communications Units are not required for CJ1M PLCs with Ethernet functionality)* ¹	Yes* ¹ , * ²	Yes* ¹
CS1		Yes	Yes	No	Yes (Peripheral Bus – CS/CJ)	No	Yes* ¹	Yes* ¹ , * ²	Yes* ¹
CP1		Yes	Yes	No	Yes (Peripheral Bus – CS/CJ)	Yes	Yes* ¹ (CP1H only)	No	Yes* ¹ (CP1H only)
C Series	C200HX/HG/HE, CQM1H	Yes	No	No	Yes (Peripheral Bus – C)	No	No	No	Yes* ¹
	CPM1/CPM2	Yes	No	No	Yes (Peripheral Bus – C)	No	No	No	No
CVM1/CV		Yes	Yes	No	Yes (Peripheral Bus – CV)	No	Yes* ¹	No	Yes* ¹
CompoWay/F Slaves, such as Temperature Controllers		No	No	Yes	No	No	No	No	No

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

Correspondence between FA Communications Software and Connected Networks

FA Communications Software	Communications	Communications method	Personal Computer Boards		
			SYSMAC Board	CS1 Board	CS1 Bus Interface Board
· SYSMAC Gateway	Message communications	FINS communications	Yes	Yes	Yes
· CX-Compolet	Data link communications	FINS communications	Yes	Yes	Yes

This catalog mainly provides information that is necessary for selecting suitable models, and does not contain precautions for correct use. Always read the precautions and other required information provided in product operation manuals before using the product.

- The application examples provided in this catalog are for reference only. Check functions and safety of the equipment before use.
- Never use the products for any application requiring special safety requirements, such as nuclear energy control systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, or other application involving serious risk to life or property, without ensuring that the system as a whole has been designed to address the risks, and that the OMRON products are properly rated and installed for the intended use within the overall equipment or system.

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

OMRON Corporation
Industrial Automation Company
Control Devices Division H.Q.
PLC Division

Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan
Tel: (81) 75-344-7084/Fax: (81) 75-344-7149

Regional Headquarters

OMRON EUROPE B.V.
Wegalaan 67-69-2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON Industrial Automation Global: www.ia.omron.com

OMRON ELECTRONICS LLC
One Commerce Drive Schaumburg,
IL 60173-5302 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark, Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

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