FinsGateway SDK Version 3.0
Users' Guide

2000/6/30

FinsGateway SDK provides the software, manuals, sample, and source code for developing applications using FinsGateway.
In order to install FinsGateway SDK, either the FinsGateway Runtime or Embedded Edition must already be installed.
Full agreement with the terms and conditions of using FinsGateway is also required.

1 FinsGateway SDK

The following functions are provided with FinsGateway SDK:

1. FinsGateway V3 SDK

Libraries

Import library to use the FinsGateway functions

Class library to use the FinsGateway functions from C++.

C-language Interface Header File

Sample Program

Manuals

API reference manuals for FINS communication, EventMemory, and UDM

C++ class online reference manual

2. NSP SDK

Libraries

Library for creating a FinsGateway service program (communication unit)

C-language Interface Header File

Manuals

Manual describing the creation of a communication unit

Library functions online reference manual

Sample NSP Source Code

NSP sample

3. ProtoDLL SDK

Manual

Manual describing the creation of a serial communication protocol conversion module (ProtoDLL)

Library functions online reference manual

Sample DLL Source Code

ProtoDLL sample

4. OPC Server RS Edition(FINS OPC Server)

OPC Server

OPC server based on the Rockwell Tool Kit

OPC Sample Client

VB, and Excel sample program

OPC Server Source Code

OPC server source code

*"RSServer OPC Toolkit" is necessary, when you build this program.

5. Java Interface Evaluation Edition

Java Class Package

JAR archive package (FinsGateway V3 C++ class library wrapped in Java class)

Native Library

Library to access C++ classes from Java classes

Manual

Online Reference Manual

Sample Program

Java application program developed by SUN JDK

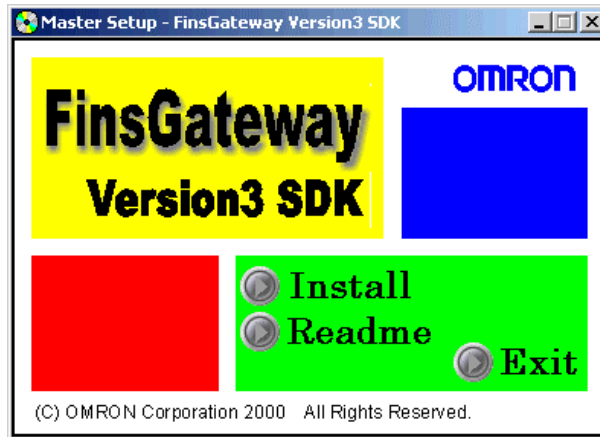Java application program developed by RAD(Symantec Visual Cafe)

Source Code

Java class package, and native library source code

2 Installing/Uninstalling

Installing

1. Insert the CD-ROM into the drive.

2. The following image appears automatically.

3. First, Click Readme. Please read carefully.

4. Click Install.

5. According to the menu, and the installation will begin.

Uninstalling

1. Click the Start button, and select Settings | Control Panel.

2. Double-click the Add/Remove Applications icon.

3. Select the function to remove from the list.

4. Click the Add/Remove button.

5. The selected function will be removed.

3 Operating Environment

1) Win32 DLL - Fins API, EventMemory, UDM API

General-use 32-bit DLL can be used.The development environment point to consider is compatibility between the data structures used as interfaces by the library and C language. Features of this are the use of the C language structure and byte array operations. To determine whether these interfaces can be used, refer to the development environment specifications.

2) Class libraries - FgwAL, FgwCmnDlg, FgwGL

The FinsGateway SDK class libraries can be used only from Microsoft Visual C++ Operation can be confirmed only by Microsoft Visual C++ Version6.0.

3)Java Class Package - omron.fins

Java class package provided in FinsGatewaySDK is available from RAD tools such as Symantec Visual Cafe, Imprise JBuilder and IBM VisualAge.   When using these   RAD tools, set CLASSPATH.

4) OPC server - FDAS.EXE(FinsDataAccessServer)

According to the OPC specifications, the runtime environment of OPC server should be Windows NT4.0 or higher. The runtime environment of OPC client requires Windows95/98, Windows NT4.0 or higher. Execution of OPC server on Windows95/98 is not guaranteed. On Windows95/98, DCOM allows OPC server to be connected to other remote OPC server on Windows NT and used.

4 Operation

Win32 API

Microsoft Visual C++ Version5.0

First, set the folders for the Developer Studio.

   1) Start Microsoft Developer Studio.

   2) Select Tools | Options from the menu. The Option dialog will be displayed.

   3) Select the Directory tab.

   4) Enter the folder with the FinsGateway SDK header file in the "Included Files" field.
   e.g. C:¥Program Files¥OMRON¥FinsServerNT¥include

   5) Enter the folder with the FinsGateway SDK library files in the "Library Files" field.
   e.g. C:¥Program Files¥OMRON¥FinsServerNT¥lib

The next development project, add the library to the project settings.

   1) Start Microsoft Developer Studio.

   2) Open the workspace for the application to develop.

   3) Select Project | Settings from the menu. The Project Settings dialog will be displayed.

   4) Select the Link tab.

   5) Add the FinsGateway SDK library to the Object/Library Module field.

      a) To use the FINS API, "FinsGW32.lib"

      b) To use the EventMemory API, "EvtMem32.lib"

      c) To use the UDM API, "FgwUdm32.lib"

      To use the class libraries, it is not necessary to set the import libraries here.

OPC automation interface

The usage of OPC automation interface with Microsoft Visual Basic Version6.0 is explained here.

   1) Start Micorosoft Visual Basic.

   2) Execute Project | References from the menu. Then References dialog will be opened.

   3) Tick RSI Automation 2.0 from the available references.

   4) Execute View | object browser. Then object browser screen will be displayed.
   If selecting RSIAutomation from the upper combo box, then available classes will be displayed.

Fins JNI package

Fins JNI package is available from various Java RAD tools. The usages of Symanctec Visual Cafe Version3.0 and Imprise JBuilder 3 are explained here.

First, the environmet settings of Visual Cafe are explained.

1) Start Visual Cafe.

2) Execute Tools | Environment Options from the menu. Then Environment Options dialog will be displayed.

3) Select Internal VM tab in the Environment Options dialog.

4) Add the FinsGateway SDK JNI package name to Classpath Settings.
   e.g. C:¥Program Files¥OMRON¥FinsServerNT¥lib¥fins.jar)

5) By restarting Visual Cafe, the environment settings set up above will become valid.

Then, when developing an application, add the class package to the project settings.

1) Start Visual Cafe.

2) Open a project of application or applet.

3) Execute Project | Options from the menu. Then Project Options dialog will be displayed.

4) Select Directories tab in the Project Options dialog.

5) Select a Show directories for Input class files and add the classpath of fins.jar package to Directories.

Next, the environment settings of Imprise JBuilder 3 are explained.

1) Start JBuilder 3.

2) Execute Project | Default Properties from the menu. Then Default Project Properties dialog will be opened.

3) Select Paths tab in the Default Project Properties dialog.

4) Press Add button of Java libraries. Then Select a Java library to add dialog will be opened. Press New button here and set the name of the Java library.
   (e.g. Fins 2.5)
   Enter a Fins JNI package name to classpath.
   (e.g. C:¥Program Files¥OMRON¥FinsServerNT¥lib¥fins.jar)

Then, when developing an application, add the class package to the project settings.

1) Start JBuilder 3.

2) Execute Project | Properties from the menu. Then untitled1.jpr Project Properties dialog will be opened.

3) Select Path tab in untitled1.jpr Project Properties dialog.

4) Press Add button of Java Libraries. Then Select a Java library to add dialog will be opened. Select the Java library set above.

5 OPC Server RS Edition

OPC Server

This OPC server is implemented by Rockwell "RS OPC Toolkit", and connect the Rockwell "RSView32" only. Connection with the SCADA software of other companies is not guaranteed.

Naming Conventions

The server name, group name, item name for communication with the OPC server are as follows:

Item	Description
Server name	"OMRON.FDAS.1" "(Vender Name).(Program Name).(Version)" Added to the registry at installation, according to OPC specifications. The user connects to the OPC server using this name.
Group name	ASCII character string, excluding "." (dot), and " " (space); up to 256 bytes

Item name	Hexadecimal ASCII character string, fixed in length at 18 bytes.
	The data address and size are to R/W by FINS command are specified. The data is specified in the following order, from the beginning of the string:
	(1) 2 bytes: network number (00 to FF)
	(2) 2 bytes: node number (00 to FF)
	(3) 2 bytes: unit number (00 to FF)
	(4) 2 bytes: area type (00 to FF)
	(5) 6 bytes: start address (000000 to FFFFFF)
	(6) 4 bytes: data length (0000 to FFFF)
	Data type is only Bit/Byte/Word/Dword.
	
	Example: 0201008201000000010
	           Network number: 2; Node number: 1; Unit number: 0
	           Area type: 82 (DM); Start address: 256ch; Data length: 16 words

Interface

This OPC server supports only the OPC data access (DA) function, for the version DA1.0a. It does not support the version DA2.0.

This OPC server has only the standard interface. It has no optional interface.

Refer to the following to confirm the interfaces that are included:

Custom Interfaces

Name	Outline	Included?
IOPC server	OPC server main.	Yes
IOPCGroupStateMgt	Manages the overall group status.	Yes
IOPCSyncIO	Performs synchronous read/write from the OPC client to the OPC server.	Yes
IOPCAsyncIO	Performs asynchronous read/write from the OPC client to the OPC server.	Yes
IenumOPCItemAttributes	Searches for group items and attributes.	Yes
IOPCItemMgt	Manages the items within the group.	Yes
IdataObject	Performs asynchronous read/write, cancel, and data change notification.	Yes
IOPC serverPublicGroups(op)	Manages the public groups.	No
IOPCBrouseServer AddressSpace(op)	Browses the item IDs that can be used by the OPC server.	No
IpersistFile(op)	Saves/retrieves the OPC server configuration data to/from a file.	No
IOPCPublicGroupStateMgt(op)	Manages the overall public group status.	No

Automation Interfaces

Name	Outline	Included?
IOPC serverDisp	OPC server object standard.	Yes
IOPCItemMgtDisp	Executes the addition, removal, and control of the items in an OPC group.	Yes
IOPCGroupStateMgtDisp	Integrated management of the groups.	Yes
IOPCSyncIODisp	Performs synchronous read/write to the OPC server.	Yes
IOPCASyncIODisp	Performs asynchronous read/write to the OPC server.	Yes
IOPCItemDisp	Provides the item object properties and methods.	Yes
IOPC server PublicGroupsDisp(op)	Manages the public groups.	No
IOPC serverBrowseServer AddressSpaceDisp(op)	Browses the data items within the OPC server from the OPC client.	No
IOPCPublicGroup StateMgtDisp(op)	Converts private groups into public groups.	No

6 Connected with RSView32. (reference)

The way that RSView32 and connection confirmation were done is shown as a reference data.

(1) The start of RSView32.

Push the start button, and select the menu Program | Rockwell Software | RSView32.
"RSView32 Works" is started.

(2) The preparation of the project.

Select the menu from File | New, and a new project is made.
The strings of a project name become folder name that a project is stored here.

(3) Setup of a system.

1) Channel.
It doesn't need to set it up when it is connected with the OPC server.

2) Node.
The establishment of the OPC server is done.
Data source : An OPC server is examined.
Name   : The host name of PC which an OPC server is being installed in is inputted.
Server-name: Select the "OMRON. FDAS. 1".

When the right […] button is pushed, an OPC Server Browser screen is
indicated.
"Type" is chosen automatically.

When push the apply button, an OPC server is registered in lower grid.
Push the Close button.

3) Scanning class.
Establishment isn't necessary.

4) Tag database.
The data area which it wants to access is registered as "Tag".

Tag
Name   : It is based on the naming rule of the OPC server.
Type   :Only a digital style (Bit access), an analog (Byte/Word/Dword access)
are effective. A character line isn't being supported.
Description : An optional explanation sentence can be described as a comment.
Data source.
Type : Select the "Device".
Node Name   : The installation point host name of the OPC server set up with node
is inputted.
Address   : The name which is the same as Tag name is set up.

5) Tag monitor.
Tag name inputted first is inputted. Tag name that a character line head becomes more than the
width of cell can't be inputted. Secure the length of cell fully in advance. When inputted Tag
name is right, "?" is indicated with "Y", "value" is "channel data (decimal)", "status" is "effective",
"description" is "The comment described on Tag database screen".
When it isn't right, "N" is indicated "?", and other areas aren't refreshed.

(4) Graphics.

"Input of numerical value" or "TagMonitor" is stuck on the screen.
Tag name set up first is inputted as Tag name.
When it is made to carry it out, the data that an OPC server started and which were acquired
are indicated.