ORiN2 SDK

User's guide

Version 2.1.50

April 28, 2020

【Remarks】

【Revision history】

Date	Version	Content
2006/02/24	1.0	First edition.
2006/08/11	1.0.1	A runtime version and sample providers (b-CAP, NS300) were added.
2006/10/02	1.0.2	Supported OS were described.
2006/12/15	1.0.3	Sample providers (Joystick, Timer, RCB-1) were added.
2007/04/20	2.0.5	Sample providers (FIT, IFS, VBP) were added.
2007/07/02	2.0.6	b-CAP provider was added also in the 'Evaluation' installer.
2007/11/13	2.0.7	CaoSQL was added also in the 'Bundle' installer.
2008/01/08	2.0.8	All binary modules were added in the 'Runtime' installer.
2008/03/24	2.0.9	Sample providers (VB Gateway, VPS, OpenCV) were added.
2008/06/19	2.0.10	Sample providers (Genie, AIO) were added.
2008/07/01	2.0.11	Sample providers (Dummy) were added.
2008/07/11	2.0.12	Sample providers (anyfeed, SSTCCS, SSTDN3) were added.
2009/03/12	2.1.0	Start menu and folder structures were changed. DirectShow provider was added.
2009/06/12	2.1.1	b-CAP provider was added also in the 'Bundle' installer.
2010/03/04	2.1.2	Sample providers (HALCON, LINX GINGA board, TAIYO servo hand) were added.
2010/09/27	2.1.3	"How to check the installation state of ORiN2 SDK" was added. Some provider samples are added. (CCS PDS, CONTEC DIO98, DENSO IC Card, Hilsher CIFX, DirectInput, Interface Dnet, WACOH WDF-6A, Modbus).
2010/12/21	2.1.4	Provider lists were categorized.
2011/05/18	2.1.5	Sample providers (PHANTOM) were added.
2011/08/31	2.1.6	Sample providers (Timer, PCLink, CNT, GPIB, SMC) were added.
2012/05/21	2.1.7	Sample providers (TAIYO servo hand (PCI), Hivertec, ZG2, ZS, HL-C2, HL-D3, HL-G1) were added. Product name (Edition name) was changed.
2012/07/23	2.1.8	Sample providers (USBRH, Sysmac Studio) were added. Sample providers (FZ, In-Sight, V-Works for XG, PV) were added also in the provider lists
2012/09/10	2.1.9	Sample providers (RC8) were added.
2013/02/20	2.1.12	Sample providers(RLW, GT, PD3, ad-L8, IV, DynPick) were added., Support Windows 7
2013/03/11	2.1.13	Sample providers(Xport6) were added.

2013/06/20	2.1.14	CapListener : Supported the multicast protocol.
2013/08/06	2.1.15	Sample providers (Pylon GigE, uEye) were added.
2013/12/06	2.1.16	Sample providers (TwinCAT3, ACF, VeriSens, RCX, SR1) were added, CAOPCUA was added. Support Windows 8.
2013/03/04	2.1.17	Sample providers (OPCUA, WebView Livescope) were added.
2014/06/16	2.1.18	Sample provider name was changed. (PCLink provider -> Computer link provider) Sample providers (CV, CVX, MESX, ISO16100) were added.
2014/09/17	2.1.19	Sample providers (SMTP, MELSEC QnA3C) were added.
2015/02/11	2.1.20	Sample providers (Matrox RobCom, OMRON NJ) were added.
2015/09/04	2.1.22	Sample providers (MELSEC QnA3E, Modbus.X, UNIPULSE TMF, PATLITE PHN, CoAP, URG-04LX, EmbeddedControl) were added.
2016/03/24	2.1.23	Sample providers (ISO20242, OMRON CJ, MTConnect) were added.
2016/04/11	2.1.24	Provider : Syslog was added.
2016/07/08	2.1.25	Sample providers (RV, XGX) were added.
2016/11/03	2.1.26	Sample providers (Logix5000, IPPA, USBRH2, JSON, KVCOM) were added.
2017/01/16	2.1.28	Sample provider (USBRH2) was deleted. Sample providers (RICOH R-GigE, KV, Fl-net) were added. JSON provider was added also in the 'Free' installer. Install procedure of ORiN2 SDK was modified.
2017/04/24	2.1.29	Sample providers (Dummy Camera, Dummy Panel, Dummy PLC, Dummy Robot, GT2DLEP1, AzureIoT) were added.
2017/06/28	2.1.30	Sample providers (IO-Link, Amazon Web Service IoT) were added. Source codes of sample providers (anyfeed, DIO, EWHA) were deleted from 'Provider Development' installer.
2017/07/17	2.1.31	Ready for IoT Data Studio.
2017/07/31	2.1.32	Ready for IoT Data Studio.
2018/01/22	2.1.33	Sample providers (Canon N10-W02, Mitsubishi MELSEC AnA, BROTHER INDUSTRIES SPEEDIO, DENSO Scanner, DENSO Q-Platform, OPTEX FA OPPD, SIEMENS PLCSIM, EPSON ESCPOS, MettlerToledo WMF204C, IAI PCON, IAI SEL, DataQueue) were added. HALCON provider was added also in the 'DENSO Products' installer. Ping provider was added also in the 'DENSO Products' and 'Evaluation' installer.

2018/03/07	2.1.34	CaoOPCUA : Improved efficiency of multiple registration processing from client. [Bug Fix] DataStore provider : Added exclusive processing at simultaneous access. [Bug Fix] BlackBoard provider : Added exclusive processing at simultaneous access.
2018/05/24	2.1.35	Source codes of sample provider (DataQueue) was deleted from 'Provider Development' installer.
2018/07/16	2.1.36	[Bug Fix] CaoSQL : Fix memory leak of trigger function.
2018/09/18	2.1.37	Sample providers (ROSSerial, LJ-V7000, KEYENCE FSN40NUEP1, FUJITSU COLMINA, Dummy CNC, SLMP) were added.
2018/09/24	2.1.38	Edgecross Data Collector was added.
2018/11/06	2.1.39	[Bug Fix] IAI PCON provider : Fixed problem not working in specific environment. [Bug Fix] Some providers : Fixed memory leak at connection failure.
2019/01/07	2.1.40	Sample providers (DENSO UR20, KEYENCE ILDLEP1) was added. ErrorSearch tool added.
2019/01/22	2.1.41	IoT Data Share correspondence. [Bug Fix] CaoSQL : Correction of processing when specifying character string.
2019/03/05	2.1.42	Process Cleaner2 was added. SIEMENS MindConnect provider was added. FTPS provider was added. OMRON NJ provider : System performance enhancement of structure and common body. OMRON CJ provider : packet division data correspondence. Rockwell Logix5000 provider : structure correspondence. DirectShow provider : JPEG correspondence. [Bug Fix] CaoSQL: Fix NULL character.
2019/07/02	2.1.43	Sample providers (DENSO AN provider, DENSO UR30 provider, IBM Watson IoT Platform provider, KEYENCE LK-G5000 provider, KEYENCE LaserMarker provider, SIEMENS PLC S7 provider, DataImport provider) were added. UDP socket type to log type was added in CAO modules. [Bug fix] ORiNlm : LM_Lock handle leak.
2019/09/10	2.1.44	FUJITSU COLMINA provider supported multi I/F.

		[Bug Fix] OMRON NJ provider : Elem = 0 was specified for the parameter. [Bug Fix] OMRON CJ provider : accessing EM10-18. [Buf Fix] MELSEC QnA3E provider : param option.
2019/11/12	2.1.45	Sample providers (Alibaba Cloud IoT Platform provider, Dai-ichiSeiko ESTORQ provider, SAPCloud IoT Platform provider, DENSO UR40 provider) were added. Rockwell Logix5000 provider : Revised internal processing (sequence count). FUJITSU COLMINA provider : "Insecure" opiton was added. MELSEC QnA3E provider : ASCII mode was added. [Bug Fix] YAMAHA RCX, SC1 provider : License check processing was fixed.
2019/11/21	2.1.46	[Bug Fix] CaoSQL : Fixed a memory leak when reconnecting the controller.
2020/01/08	2.1.47	DENSO Scanner provider : Added "Encode" option. [Bug Fix] SLMP provider : Bug fix at AddController. [Bug Fix] Mitsubishi QnA3E provider : Bug fix at AddController.
2020/03/10	2.1.48	DENSO FD provider was added. SATO SBPL provider was added. Google Cloud IoT Core provider was added. LocalFile provider: file search command was added. Mitsubishi AnA provider: Changed the number of packet divisions. Mictosoft Azure IoT Core provider: support for Azure IoT Central Fujitsu COLMINA provider: Command addition DENSO Scanner provider: Sleep option was added. MTConnect provider : Local connecion supported. Dataqueue provider : Fixed error when allocating memory. Added support for ProvWizard VS2017, VS2019 Visual Studio 2015-19 redistributable package was added.
2020/03/26	2.1.49	CaoOPCUA : Multiple read / write support.
2020/04/28	2.1.50	[Bug Fix] Brother Protocol2 provider: Fixed an issue that caused a delay when connecting to both providers simultaneously. [Bug Fix] Mitsubishi AnA provider: Fixed an issue where a process terminated abnormally with incorrect parameters.

Contents

1. Introduction

ORiN is a middleware that offers a standard interface of various resources, like various Factory Automation (FA) equipment and databases, etc. including robots. By using ORiN, applications can be developed without depending on the manufacturer or the model type.

ORiN version1 was released in 2002 as a result of the ORiN project which begun in 1999. Since then, ORiN 1 was applied to a various FA applications, and cultivated in the application development. Based on these experiences, ORiN version2 (ORiN2) was release as a new standard.

The operation image of ORiN2 is shown in Figure1-1. ORiN2 offers interface for client applications and interface for various FA equipments like robot controllers. As a result, the client application can treat all the FA equipments in accordance with the specification of ORiN2, and the FA equipment can be connected many client applications by implementing necessary interfaces to ORiN2.

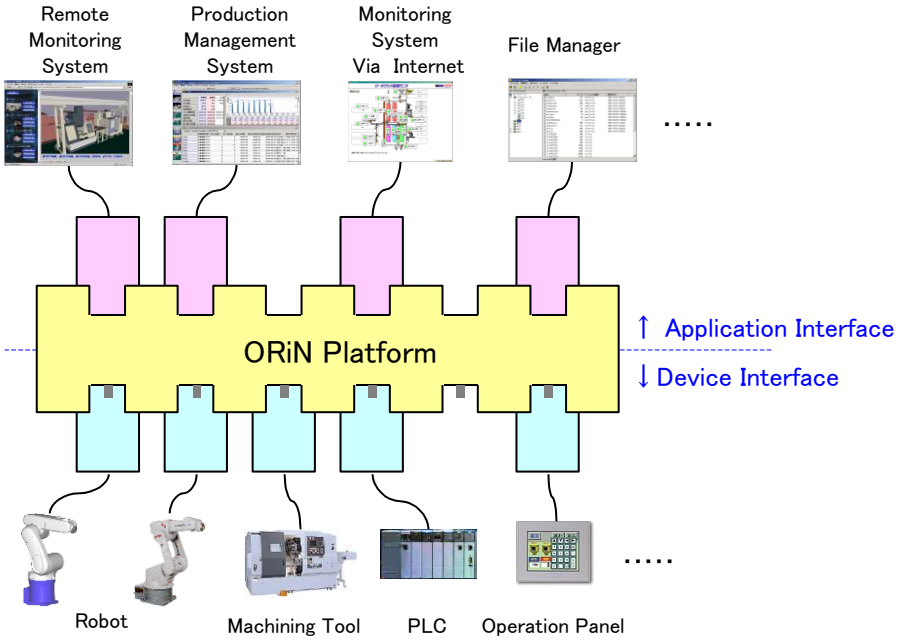

Figure1-1 Operation image of ORiN2

As basic information on ORiN2, this document explains the outline of ORiN2, the ORiN2 setup procedure, several examples of ORiN2 client implementation, and guidelines of using ORiN2. For more detailed explanations, please refer to the documents shown in the guidelines of ORiN2.

2. Outline of ORiN2

Although a lot of robot applications have been developed up to now, most of them can be used only with specific manufacturer's specific model. Even if a robot manufacture developed a very convenient application, the application is only for the manufacture's robot and users of other manufacture's robots could not use it.

To change this situation, ORiN was developed as a standard robot application platform. ORiN is an abbreviation of "Open Robot/Resource interface for the Network." ORiN is a framework for the application that can handle not only robots and FA equipment, but also a wide variety of resources like database and local files, etc. in a united way. By using ORiN, applications can be developed without depending on the manufacturer or the model of FA equipment.

Figure2-1 shows the concept of ORiN2. ORiN2 is composed of three basic technologies, CAO, CAP and CRD. CAO is "standard program interface" that offers a common interface and functions to the client application and FA equipment. CAP is "Communication protocol for the Internet" to access FA equipment over the Internet. CRD is "Standard data schema" to express FA equipment's resource information without depending on its manufacturer or model.

Following paragraphs explain the outline of CAO, CAP and CRD.

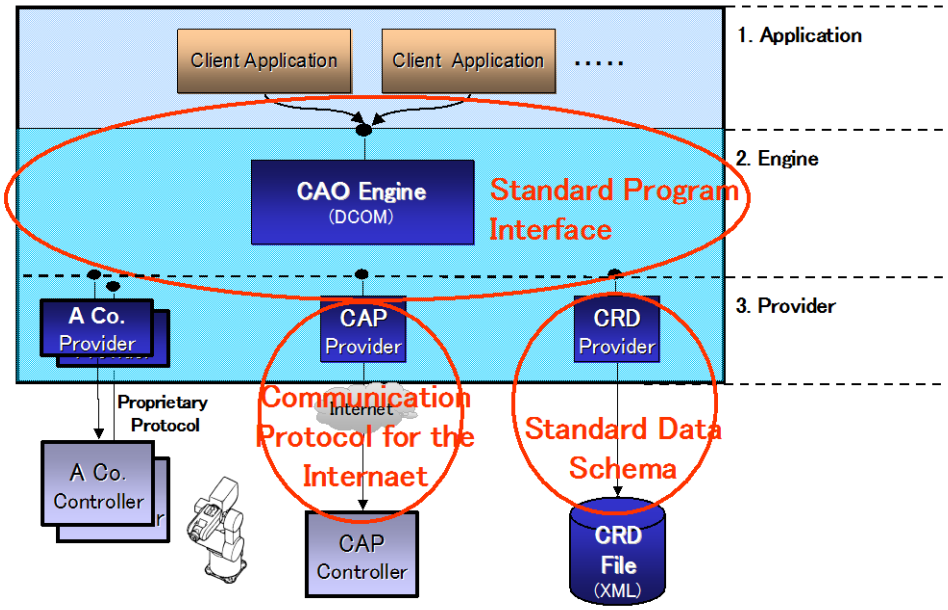

Figure2-1 Concept of ORiN2

2.1. Outline of CAO

CAO is an abbreviation of Controller Access Object. CAO is a "standard program interface" that offers

access interface for FA equipment to client applications.

CAO offers two interfaces. One is for client applications and another is for FA equipment. By using the interfaces, robot manufacturers can offer API for FA equipment that does not depend on the client application. Application venders can develop client applications that do not depend on the type of FA equipment. CAO uses DCOM distributed object technology, and FA equipment can be located at any place on the network.

Figure2-2 shows CAO composition. The ORiN2 program on PC is divided into three layers as shown in figure.

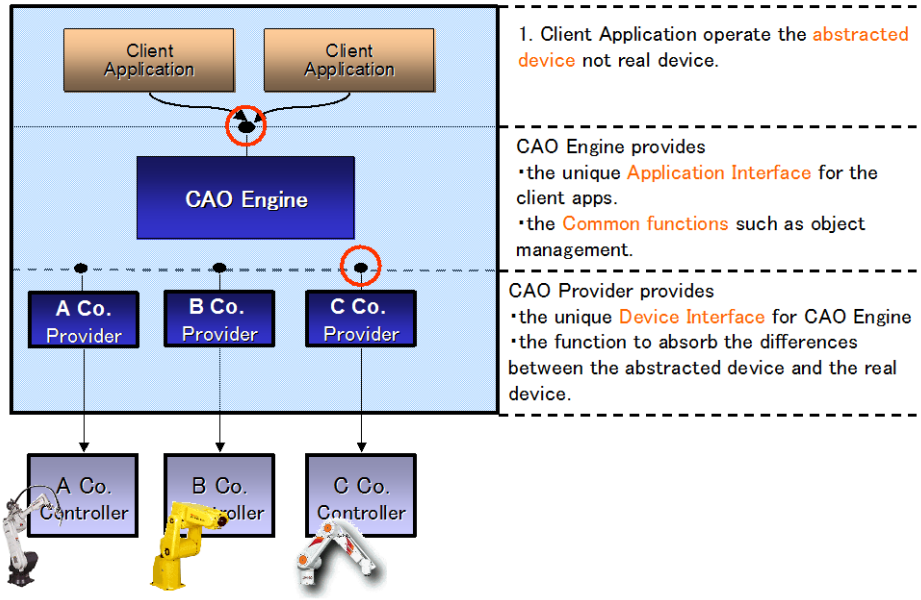

Figure2-2 Composition of CAO

First layer is client applications. By designing applications based on the API specifications of CAO engine, applications can be implemented without considering the difference of FA equipment. Moreover, simultaneous execution of plural CAO client applications is possible.

Second layer is CAO engine, and the layer offers standard program interfaces and common functions. By using the standard program interface, client applications does not depend on the manufacturer of FA equipment. CAO engine also provides common functions like provider management, asynchronous processing, etc., and by using these functions, client applications and robot controllers can be developed effectively.

Third layer is CAO provider. The provider has interface to FA equipment, and absorbs the difference of FA equipment model or manufacture. Providers are implementation of interface to FA equipment, but they can also be used to add new functions to CAO. CRD and CAP, which are described later on this document, are implemented by developing respective providers. Moreover, a robot controller can be implemented on a provider.

2.2. Outline of CAP

CAP is abbreviation of “Controller Access Protocol”, and is an "Internet oriented communication protocol " to access CAO provider over the Internet. CAO engine uses DCOM to access remote CAO providers. However, because of security reasons, DCOM based access over the Internet is usually not possible. To overcome this problem, CAP was developed in ORiN2.

CAP is a protocol for remote access between objects over the Internet based on SOAP (Simple Object Access Protocol) technology. By using CAP provider in ORiN2 SDK, CAP messages can be generated and transferred. As a result, if HTTP connection is available, ORiN2 system can be easily connected to remote providers through the Internet.

The outline of operation of CAP is shown in Figure2-3.

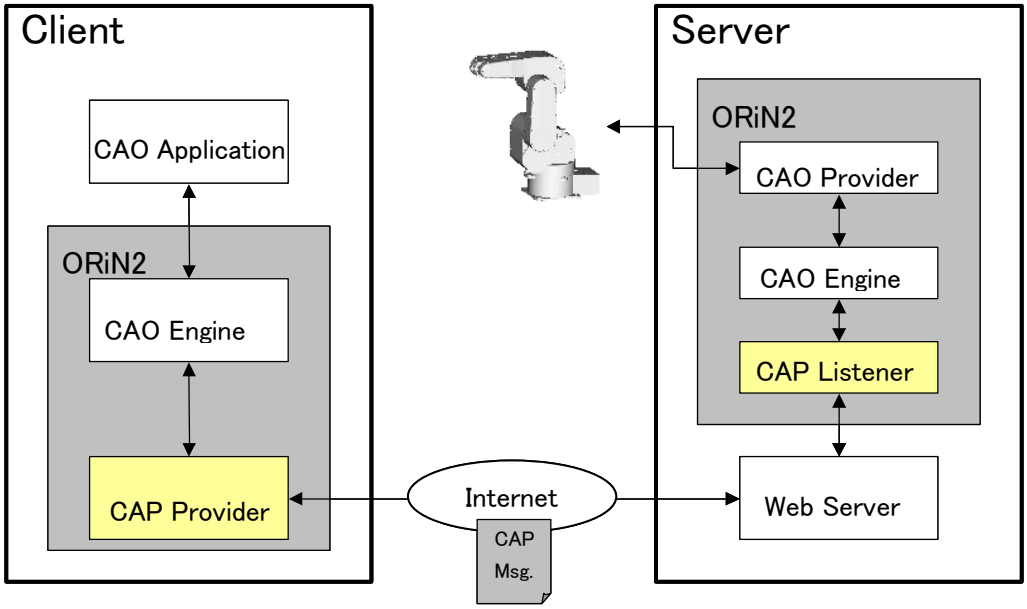

Figure2-3 Outline of CAP

As shown in the figure, CAP provider sends messages to Web server, and the messages are transferred to remote CAO provider. CAP listener, which is called from Web server, analyzes CAP message, and calls target CAO provider.

As a result, client applications can access remote robot controller through Internet, just as same as local robot controller.

2.3. Outline of CRD

CRD is abbreviation of “Controller Resource Definition.” CRD is a "Standard Schema" to share robot controller's resource information. The resource is defined independent from robot manufacture and represented in XML.

Robot controllers have two types of information; dynamic information (for instance, angle and position of

the arm) and static information (for instance, link configuration of the arm). Among of them, static information needs not to be purposely acquired from the robot controller. Therefore, in ORiN2, resource information format is defined by XML schema technology.

In ORiN2 SDK, the CRD provider is offered as a means to access CRD file. Figure2-4 The operation outline chart of CRD provider is shown. The format of the CRD file is equal to the interface structure of CAO interface. Therefore, client applications can access data in CRD file in similar way to access data through CAO interface.

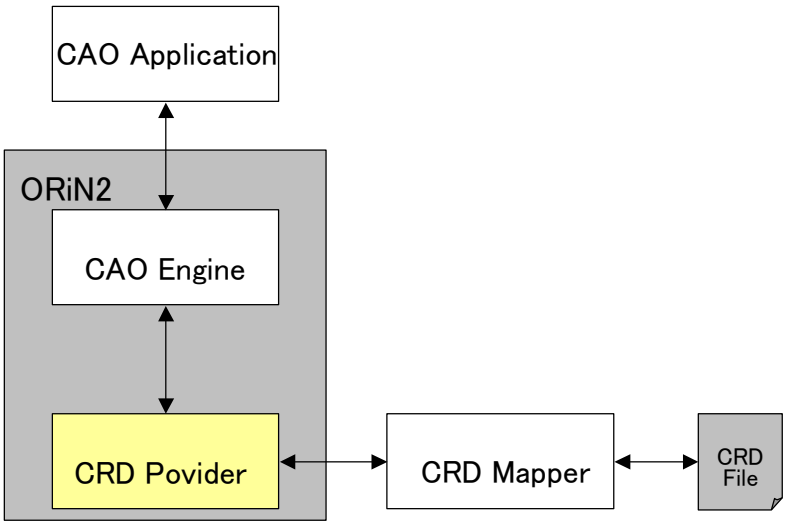

Figure2-4 Outline of access to CRD file

3. ORiN2 SDK Setup

3.1. Installation of ORiN2 SDK

Supported OS: Windows XP SP1 or later, Windows Vista, Windows 7, Windows 8

(1) Once Setup disk of ORiN2 SDK is put into a drive, launcher will start up automatically.
If it doesn't start automatically, do "Setup.exe" in Setup disk.
Then, press Install button to boost installer.

(2) A dialog box 'Welcome to the InstallShield Wizard for ORiN2 SDK' appears, Click 'Next'.

(3) The License Agreement dialog box appears, Click 'Yes' to accept the license.

(4) 'ORiN2 License Manager' appears, click 'Add' and input ORiN2 SDK License Key on the License Registration dialog box. Click 'Close'.

(5) If there are two or more licenses registered, select one license you want to install. Click 'Next'.

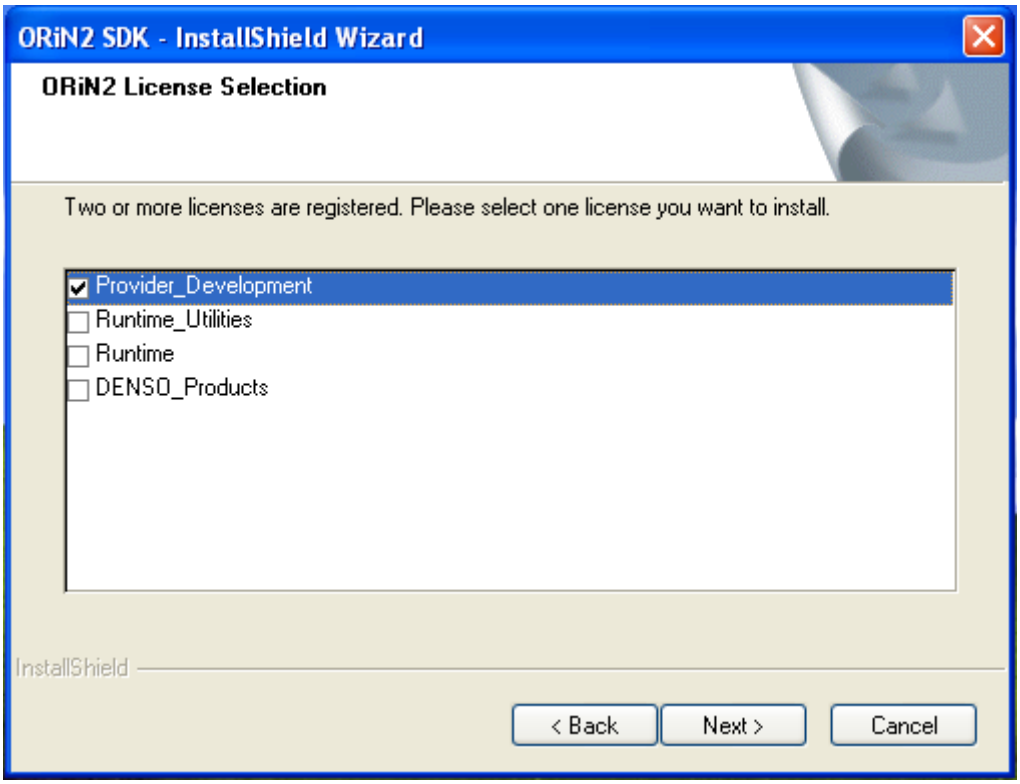

Figure3-1 Selection of component

(6) In the 'License Registration' dialog box, Input user name and company name, and click 'Next'.

(7) Select installation destination folder.
Default「C:¥ORiN2」

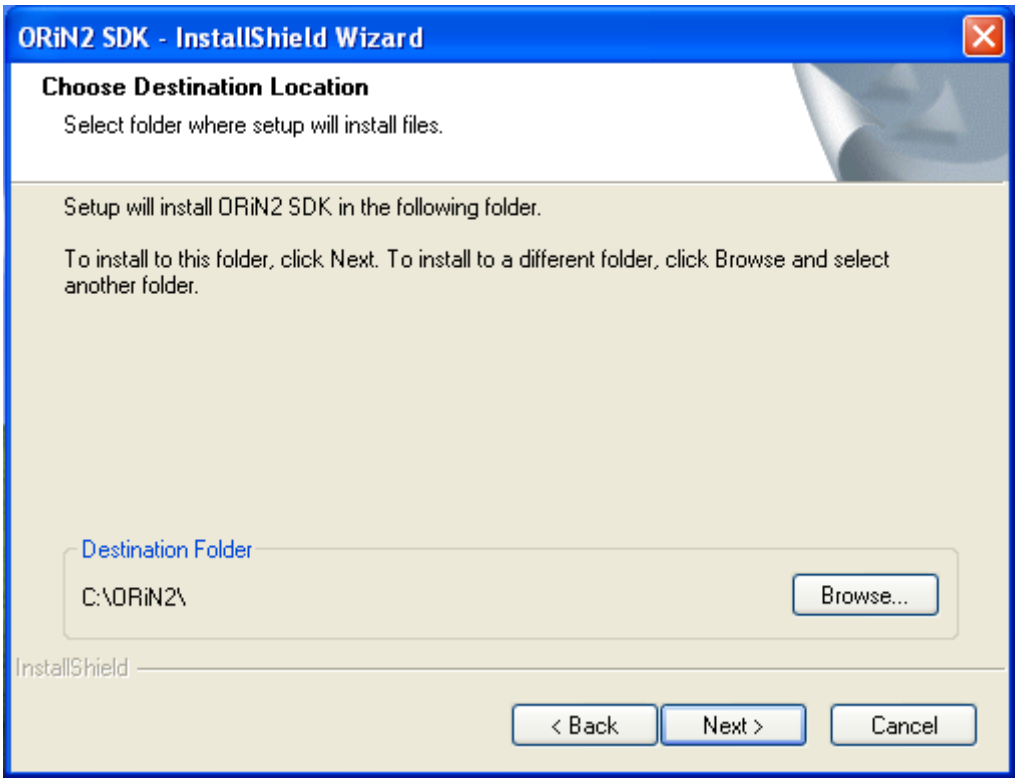

Figure3-2 Selection of folder at installation destination

(8) After installation Wizard is completed, ReadMe file is displayed.

3.2. Uninstalling ORiN2 SDK

(1) From start menu, start ”Settings” -> “Control Panel” -> “Add/Remove Programs”

(2) Select “ORiN2 SDK”, and click “Change/Remove”

(3) Follow the on-screen instructions to uninstall ORiN2 SDK

3.3. Start menu composition

SDK installation registers the following items in the start menu.

Table3-1 Registered start menu items after installation

項目	内容
ORiN2	
CAO	
Provider	
CaoProvLauncher	CAO provider proxy process start tool
CaoProvWizard	CAO provider programming wizard
ProviderLib	
ComEdit	Communication configurator for DENSO Robot
OcvTester	DENSO Robot Imaging Library test tool
QRCodeScanner	QR Code Scanner
RobMaster	Tinny operation panel for DENSO Robot
CaoConfig	CAO setup tool
CaoTester	CAO test tool
CaoFile Manager	CAO file manager
CaoScript	CAO program development tool
CaoScript Manager	CAO Script manager
CaoSQL	
CaoSQLConfig	CaoSQL setup tool
CaoSQLTester	CaoSQL test tool
CaoSQLLauncher	CaoSQL start tool
CaoOPC	
CaoOPCConfig	CaoOPC setup tool
CaoOPCUA	
CaoOPCUAConfig	CaoOPCUA setup tool
CaoUPnP	
CaoUPnPConfig	CaoUPnP setup tool
Tools	Utility tools
Document Index	Link to documents related with ORiN

3.4. License registration

(1) From start menu, start "ORiN2" -> "CAO" -> "CAOConfig".

(2) From menu bar, select "Help" →"License…".

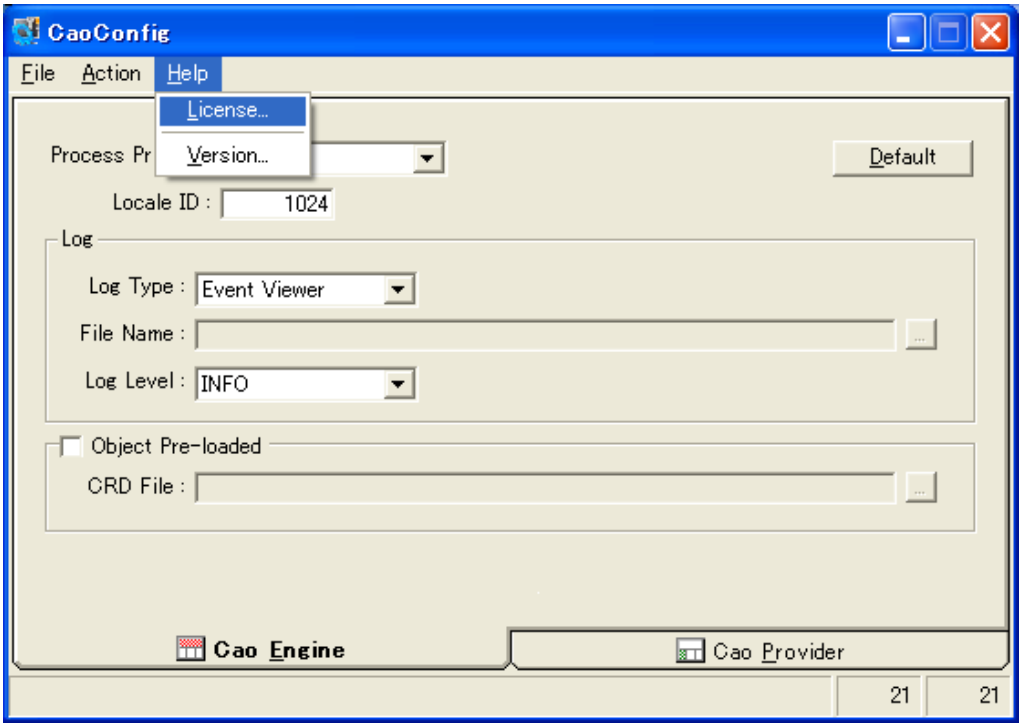

Figure3-3 The main screen of CaoConfig

(3) On the License Manager screen, press “Add” button.

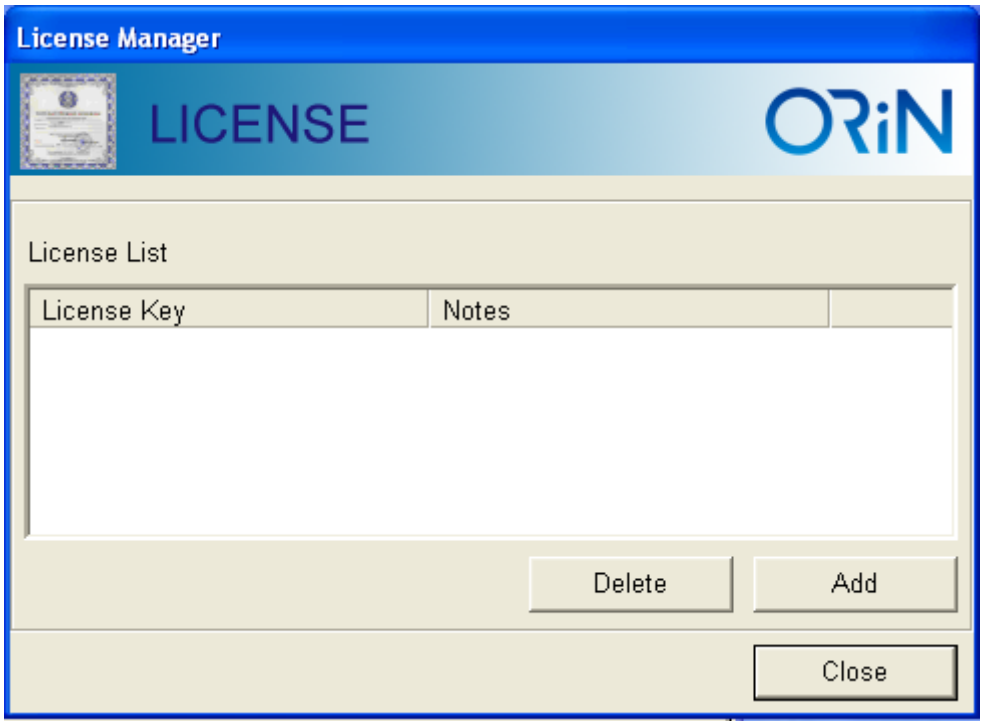

Figure3-4 ORiN2 License Manager screen

(4) On license registration screen, enter "License Key" and click “OK”.

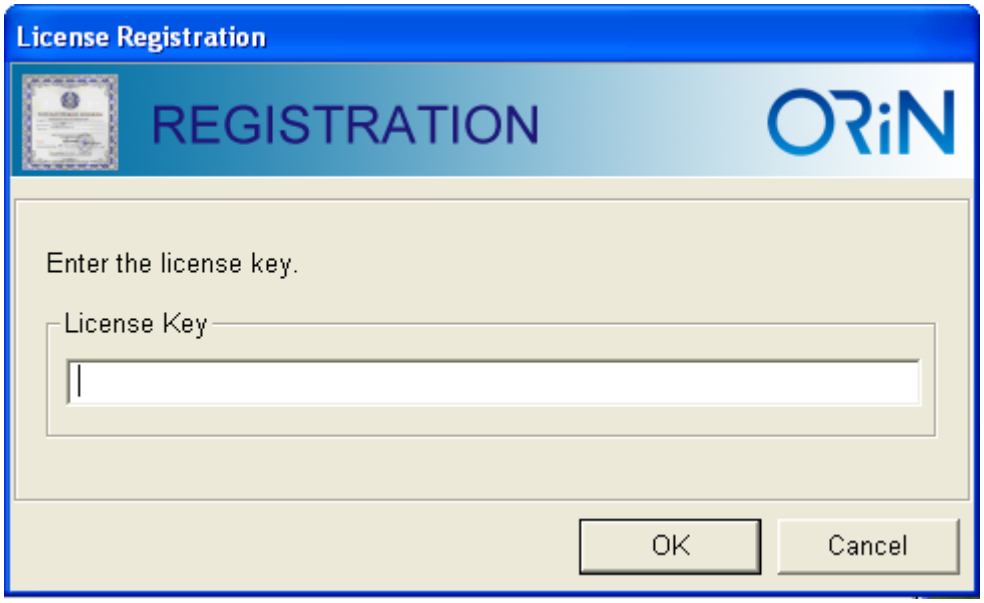

Figure3-5 License Registration screen

The following is a license key for evaluation.

・ License key (valid for three months) for evaluation:「SKDP-Y1WW-1583-BM1S」

3.5. Setting of Visual C++6.0

3.5.1. Client application development

When CAO application is developed with Visual C++6.0, follow the procedures below.

(1) Select "Tool (T)" →"Option (O)" from Visual C++ menu.

(2) Select "Directory" tab on option dialog.

(3) Select "Include file" from the displayed directory, and add the include folder of ORiN2 to the list of the directory. The include folder is in the following place.
< ORiN2 root folder > ¥CAO¥Include

(4) Select "Library file" from the displayed directory, and add the library folder of ORiN2 to the list of the directory. The library folder is in the following place.
< ORiN2 root folder > ¥CAO¥Lib

3.5.2. CaoSQL application development

When CaoSQL application is developed with Visual C++6.0, follow the procedures blow.

(1) In the similar way as 3.5.1, add the include folder of CaoSQL to the list of the directory. The include folder is in the following place. < ORiN2 root folder > ¥CaoSQL¥Include

3.6. Folder composition

When you select the default install folder, related files are installed in "C:¥ORiN2" folder. There are following subfolders under his folder. [1]

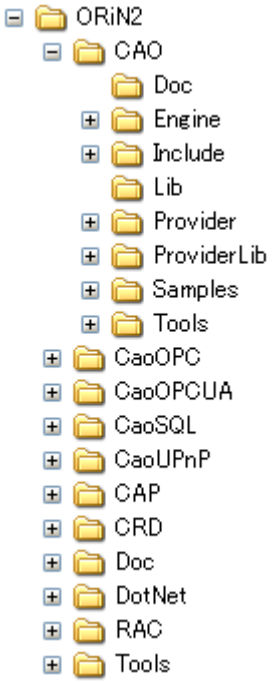

Figure3-6 ORiN2 SDK folder composition

Following table shows ORiN2 support status.

Table3-2 ORiN2 SDK support status(Provider Development)[2]

Place	Content	Support	Binary	Source
CAO¥Engine	CAO engine	∨	∨	-
CAO¥Provider	CAO provider template library	∨	∨	∨
CAO¥ProviderLib	Each company provider	See Table3-8		
CAO¥Samples	Sample program	-	∨	∨
CAO¥Tools	Test and set tool	∨[3]	∨	-
CaoOPC	CaoOPC	∨	∨	-
CaoOPCUA	CaoOPCUA	∨	∨	-

[1] The folder composition depends on the installed version.
[2] The edition name of "ORiN2 SDK" was changed from version 2.1.8 such as "Full set" edition to "Provider development" edition, "Runtime" edition to "Runtime and utilities set" edition, "Runtime"(new), "Bundle" edition to "DENSO products" edition. The functions and contents are the same.
[3] Only two tools, CaoConfig and CaoTester, are supported.

CaoSQL	CaoSQL	∨	∨	-
CaoUPnP	CaoUPnP	-	∨	-
CAP	CAP	-	∨	-
CAP¥b-CAP	b-CAP	-	∨	-
CAP¥e-CAP	e-CAP	-	∨	-
CRD	CRD	-	∨	-
RAC	RAC interpreter	-	∨	∨
Tools	Utility	-	∨	-

Table3-3 ORiN2 SDK support status (Runtime + Utilities Set)

Place	Content	Support	Binary	Source
CAO¥Engine	CAO engine	∨	∨	-
CAO¥Provider	CAO provider template library	-	-	-
CAO¥ProviderLib	Each company provider	See Table3-9		
CAO¥Samples	Sample program	-	∨	∨
CAO¥Tools	Test and set tool	∨[4]	∨	-
CaoOPC	CaoOPC	∨	∨	-
CaoOPCUA	CaoOPCUA	∨	∨	-
CaoSQL	CaoSQL	∨	∨	-
CaoUPnP	CaoUPnP	-	∨	-
CAP	CAP	-	∨	-
CAP¥b-CAP	b-CAP	-	∨	-
CAP¥e-CAP	e-CAP	-	∨	-
CRD	CRD	-	∨	-
RAC	RAC interpreter	-	-	-
Tools	Utility	-	∨	-

Table3-4 ORiN2 SDK support status (Runtime)

Place	Content	Support	Binary	Source
CAO¥Engine	CAO engine	∨	∨	-

[4] Only two tools, CaoConfig and CaoTester, are supported.

CAO¥Provider	CAO provider template library	-	-	-
CAO¥ProviderLib	Each company provider	See Table3-10		
CAO¥Samples	Sample program	-	∨	∨
CAO¥Tools	Test and set tool	-	∨[5]	-
CaoOPC	CaoOPC	-	-	-
CaoOPCUA	CaoOPCUA	-	-	-
CaoSQL	CaoSQL	∨	∨	-
CaoUPnP	CaoUPnP	-	∨	-
CAP	CAP	-	∨	-
CAP¥b-CAP	b-CAP	-	∨	-
CAP¥e-CAP	e-CAP	-	∨	-
CRD	CRD	-	∨	-
RAC	RAC interpreter	-	-	-
Tools	Utility	-	∨	-

Table3-5 ORiN2 SDK support status (DENSO Products)

Place	Content	Support	Binary	Source
CAO¥Engine	CAO engine	∨	∨	-
CAO¥Provider	CAO provider template library	-	-	-
CAO¥ProviderLib	Each company provider	See Table3-11		
CAO¥Samples	Sample program	-	∨	∨
CAO¥Tools	Test and set tool	-	∨[6]	-
CaoOPC	CaoOPC	-	-	-
CaoOPCUA	CaoOPCUA	-	-	-
CaoSQL	CaoSQL	∨	∨	-
CaoUPnP	CaoUPnP	-	-	-
CAP	CAP	-	-	-
CAP¥b-CAP	b-CAP	-	∨	-
CAP¥e-CAP	e-CAP	-	-	-
CRD	CRD	-	∨	-
RAC	RAC interpreter	-	-	-

[5] Only three tools, CaoConfig ,CaoTester and CaoTagEditor, are not included.
[6] Only three tools, CaoConfig ,CaoTester and CaoTagEditor, are not included.

Tools	Utility	-	∨	-

Table3-6 ORiN2 SDK support status (evaluation[7])

Place	Content	Support	Binary	Source
CAO¥Engine	CAO engine	-	∨	-
CAO¥Provider	CAO provider template library	-	∨	∨
CAO¥ProviderLib	Each company provider	See Table3-12		
CAO¥Samples	Sample program	-	∨	∨
CAO¥Tools	Test and set tool	-	∨	-
CaoOPC	CaoOPC	-	-	-
CaoOPCUA	CaoOPCUA	-	-	-
CaoSQL	CaoSQL	-	∨	-
CaoUPnP	CaoUPnP	-	-	-
CAP	CAP	-	∨	-
CAP¥b-CAP	b-CAP	-	∨	-
CAP¥e-CAP	e-CAP	-	-	-
CRD	CRD	-	∨	-
RAC	RAC interpreter	-	-	-
Tools	Utility	-	∨	-

Table3-7 ORiN2 SDK support status (free)

Place	Content	Support	Binary	Source
CAO¥Engine	CAO engine	∨	∨	-
CAO¥Provider	CAO provider template library	-	-	-
CAO¥ProviderLib	Each company provider	See Table3-13		
CAO¥Samples	Sample program	-	∨	∨
CAO¥Tools	Test and set tool	-	∨[8]	-
CaoOPC	CaoOPC	-	-	-
CaoOPCUA	CaoOPCUA	-	-	-

[7] 'Evaluation' version is valid for 60 days after installation.
[8] Only two tools, CaoConfig and CaoTester, are not included.

CaoSQL	CaoSQL	-	-	-
CaoUPnP	CaoUPnP	-	-	-
CAP	CAP	-	-	-
CAP¥b-CAP	b-CAP	-	-	-
CAP¥e-CAP	e-CAP	-	-	-
CRD	CRD	-	-	-
RAC	RAC interpreter	-	-	-
Tools	Utility	-	-	-

Table3-8 ORiN2 SDK standard provider support status (Provider Development)

Place	Content	Support	Binary	Source
Standard communication protocol				
CAO¥ProviderLib¥Balluff¥IO-Link	IO-Link provider	-	∨	-
CAO¥ProviderLib¥b-CAP	b-CAP provider	∨	∨	∨
CAO¥ProviderLib¥CAP	CAP provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Stream	Stream provider	∨	∨	-
CAO¥ProviderLib¥e-CAP	e-CAP provider	-	∨	∨
CAO¥ProviderLib¥FTP	FTP provider	-	∨	-
CAO¥ProviderLib¥FTPS	FTPS provider	-	∨	∨
CAO¥ProviderLib¥ICMP	ICMP provider	-	∨	∨
CAO¥ProviderLib¥IETF¥CoAP	CoAP provider	-	∨	-
CAO¥ProviderLib¥Modbus.X	Modbus provider	-	∨	-
CAO¥ProviderLib¥Ping	Ping provider	-	∨	∨
CAO¥ProviderLib¥RAC	RAC provider	-	∨	∨
CAO¥ProviderLib¥SMTP	SMTP provider	-	∨	-
Gateway				
CAO¥ProviderLib¥Alibaba¥IoTPlatform	Alibaba Cloud IoT Platform provider	-	∨	-
CAO¥ProviderLib¥Amazon¥AWSIoT	Amazon Web Service IoT provider	-	∨	-
CAO¥ProviderLib¥Beckhoff¥TwinCAT3	TwinCAT3 ADS provider	∨	∨	-
CAO¥ProviderLib¥CORBA	CORBA provider	-	∨	∨
CAO¥ProviderLib¥DDE	DDE provider	-	∨	∨
CAO¥ProviderLib¥FL-net	FL-net provider	∨	∨	-

CAO¥ProviderLib¥FUJITSU¥COLMINA	FUJITSU COLMINA provider	-	∨	-
CAO¥ProviderLib¥HLA	HLA provider	-	∨	-
CAO¥ProviderLib¥IBM¥WatsonIoTPlatform	IBM Watson IoT Platform provider	-	∨	-
CAO¥ProviderLib¥MESX	MESX provider	-	∨	-
CAO¥ProviderLib¥Microsoft¥AzureIoT	Microsoft Azure IoT provider	-	∨	-
CAO¥ProviderLib¥OPC	OPC provider	∨	∨	-
CAO¥ProviderLib¥OPCUA	OPCUA provider	∨	∨	-
CAO¥ProviderLib¥RAOP	RAOP provider	-	∨	∨
CAO¥ProviderLib¥Roboticsware¥IPLink	IPLink provider	-	∨	∨
CAO¥ProviderLib¥ROS¥ROSSerial	ROSSerial provider	-	∨	-
CAO¥ProviderLib¥SAP¥IoTPlatform	SAPCloud IoT Platform provider	-	∨	-
CAO¥ProviderLib¥SLMP	SLMP provider	-	∨	-
CAO¥ProviderLib¥VBP	VBGateway provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥MindConnect	MindConnect provider	-	∨	-
CAO¥ProviderLib¥Google¥CloudIoTCore	Google Cloud IoT Core provider	-	∨	-
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard provider	-	∨	∨
CAO¥ProviderLib¥CRD	CRD provider	∨	∨	-
CAO¥ProviderLib¥DataBase	Database provider	-	∨	∨
CAO¥ProviderLib¥DataQueue	DataQueue provider	∨	∨	-
CAO¥ProviderLib¥DataStore	DataStore provider	∨	∨	∨
CAO¥ProviderLib¥DENSO¥Timer	Timer provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy camera provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy CNC provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy panel provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy PLC provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy Robot provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy provider	-	∨	∨
CAO¥ProviderLib¥ISO16100	ISO16100 provider	-	∨	-
CAO¥ProviderLib¥ISO20242	ISO20242 provider	-	∨	-
CAO¥ProviderLib¥LocalFile	Local file provider	∨	∨	∨
I/O				
CAO¥ProviderLib¥CONTEC¥AIO	AIO provider	-	∨	-

CAO¥ProviderLib¥CONTEC¥CNT	CNT provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥DIO	DIO provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥DIO98	DIO98 provider	-	∨	∨
CAO¥ProviderLib¥CONTEC¥FIT	FIT provider	-	∨	∨
CAO¥ProviderLib¥hilscher¥CIF	CIF provider	-	∨	∨
CAO¥ProviderLib¥hilscher¥CIFX	CIFX provider	-	∨	-
CAO¥ProviderLib¥Hivertec¥CTR	CTR provider	-	∨	-
CAO¥ProviderLib¥Interface¥DNet	Interface DeviceNet provider	-	∨	∨
CAO¥ProviderLib¥Lantronix¥XPort6	XPort provider	-	∨	∨
CAO¥ProviderLib¥Modbus	Modbus provider	-	∨	∨
CAO¥ProviderLib¥OMRON¥DNet	OMRON DeviceNet provider	-	∨	∨
CAO¥ProviderLib¥PATLITE¥PHC	PHC provider	-	∨	∨
CAO¥ProviderLib¥PATLITE¥PHN	PHN provider	-	∨	-
CAO¥ProviderLib¥SUNX¥S-LINK	S-LINK provider	-	∨	∨
CAO¥ProviderLib¥SUNX¥S-LINKV	S-LINK V provider	-	∨	∨
CAO¥ProviderLib¥Woodhead¥SSTCCS	SSTCCS provider	-	∨	-
CAO¥ProviderLib¥Woodhead¥SSTDN3	SSTDN3 provider	-	∨	-
CAO¥ProviderLib¥XPort	XPort provider	-	∨	∨
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥RC8	RC8 provider	∨	∨	-
CAO¥ProviderLib¥IAI¥E-Con	E-Con provider	-	∨	∨
CAO¥ProviderLib¥IAI¥PCON	IAI PCON provider	∨	∨	-
CAO¥ProviderLib¥IAI¥SEL	IAI SEL provider	∨	∨	-
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 provider	-	∨	∨
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 provider	-	∨	∨
CAO¥ProviderLib¥YAMAHA¥SR1	SR1 provider	∨	∨	-
CAO¥ProviderLib¥YAMAHA¥RCX	RCX provider	∨	∨	-
Hand				
CAO¥ProviderLib¥KOGANEI¥EWHA	EWHA provider	-	∨	-
CAO¥ProviderLib¥TAIYO¥ESC11	TAIYO servo hand provider	-	∨	-
CAO¥ProviderLib¥TAIYO¥ESC11PCI	TAIYO servo hand (PCI) provider	-	∨	-
PLC				
CAO¥ProviderLib¥KEYENCE¥KV	KEYENCE KV provider	-	∨	-

CAO¥ProviderLib¥KEYENCE¥KVCOM	KEYENCE KVCOM provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MELSEC	MELSEC provider	-	∨	∨
CAO¥ProviderLib¥MELCO¥MxCompo	MxComponent provider	-	∨	∨
CAO¥ProviderLib¥MELCO¥PCLink	Computer link provider	-	∨	∨
CAO¥ProviderLib¥Mitsubishi¥MELSEC	Mitsubishi MELSEC AnA provider	-	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C provider	∨	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E provider	∨	∨	-
CAO¥ProviderLib¥OMRON¥CJ	CJ provider	-	∨	-
CAO¥ProviderLib¥OMRON¥NJ	NJ provider	∨	∨	-
CAO¥ProviderLib¥OMRON¥Sysmac¥Studio	SysmacStudio provider	-	∨	-
CAO¥ProviderLib¥Rockwell¥Logix5000	Logix5000 provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥S7NetPlus	SIEMENS PLC S7 provider	∨	∨	-
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	Tcmini provider	-	∨	∨
NC & MC				
CAO¥ProviderLib¥Brother¥Protocol2	BROTHER INDUSTRIES SPEEDIO provider	-	∨	-
CAO¥ProviderLib¥DENSO¥MTConnect	MTConnect provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MELSERVO	MELSERVO provider	-	∨	∨
CAO¥ProviderLib¥YASKAWA¥Ns300	NS300 provider	-	∨	∨
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE provider	-	∨	-
CAO¥ProviderLib¥BAUMER¥VeriSens	VeriSens provider	-	∨	-
CAO¥ProviderLib¥Canon¥N10-W02	Canon N10-W02 provider	-	∨	-
CAO¥ProviderLib¥Canon¥RV	RV provider	-	∨	-
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	-	∨	-
CAO¥ProviderLib¥Cognex¥In-Sight	In-Sight provider	-	∨	-
CAO¥ProviderLib¥DALSA¥Genie	Genie provider	-	∨	-
CAO¥ProviderLib¥DirectShow	DirectShow provider	∨	∨	∨
CAO¥ProviderLib¥HALCON	HALCON provider	-	∨	-
CAO¥ProviderLib¥IDS¥uEye	uEye provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥CV	CV provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥CVX	CVX provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥VWXG	V-Works for XG provider	-	∨	-

CAO¥ProviderLib¥KEYENCE¥XGX	XGX provider	-	∨	-
CAO¥ProviderLib¥LinX¥GINGA	LINX GINGA borad provider	-	∨	-
CAO¥ProviderLib¥Matrox¥RobCom	RobCom provider	-	∨	-
CAO¥ProviderLib¥National¥A110	A110 provider	-	∨	∨
CAO¥ProviderLib¥OMRON¥F160	F160 provider	-	∨	∨
CAO¥ProviderLib¥OMRON¥FZ	FZ provider	-	∨	-
CAO¥ProviderLib¥OpenCV	OpenCV provider	∨	∨	-
CAO¥ProviderLib¥Panasonic¥PV	PV series provider	-	∨	-
CAO¥ProviderLib¥RICOH¥R-GigE	RICOH R-GigE provider	-	∨	-
CAO¥ProviderLib¥SEC¥Camera	USB camera provider	-	∨	∨
CAO¥ProviderLib¥SHARP¥IV	IV provider	-	∨	-
Displacement sensors				
CAO¥ProviderLib¥KEYENCE¥FSN40NUEP1	KEYENCE FSN40NUEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥GT	GT provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥GT2DLEP1	KEYENCE GT2DLEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥ILDLEP1	KEYENCE ILDLEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LJ-V7000	LJ-V7000 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LK-G5000	KEYENCE LK-G5000 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZX	ZX provider	-	∨	∨
CAO¥ProviderLib¥OMRON¥ZG2	ZG2 provider	-	∨	∨
CAO¥ProviderLib¥OMRON¥ZS	ZS provider	-	∨	∨
CAO¥ProviderLib¥SUNX¥TRC11	TRC11 provider	-	∨	∨
CAO¥ProviderLib¥SUNX¥HL-C2	HL-C2 provider	-	∨	∨
CAO¥ProviderLib¥SUNX¥HL-D3	HL-D3 provider	-	∨	∨
CAO¥ProviderLib¥SUNX¥HL-G1	HL-G1 provider	-	∨	∨
Other sensors				
CAO¥ProviderLib¥Dai-ichiSeiko¥ESTORQ	Dai-ichiSeiko ESTORQ provider	-	∨	-
CAO¥ProviderLib¥DENSO¥AN	DENSO AN provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥QRCode	QRCode provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Scanner	DENSO Scanner provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥ICCard	IC card provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR20	UR20 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR30	DENSO UR30 provider	∨	∨	-

CAO¥ProviderLib¥DENSO¥UR40	DENSO UR40 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥FD	DENSO DPM Scanner provider	∨	∨	-
CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX provider	-	∨	-
CAO¥ProviderLib¥MettlerToledo¥WMF204C	MettlerToledo WMF204C provider	-	∨	-
CAO¥ProviderLib¥OJIYAS¥ad-L8	ad-L8 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥V600	V600 provider	-	∨	∨
CAO¥ProviderLib¥NITTA¥IFS	IFS provider	-	∨	∨
CAO¥ProviderLib¥TAKASU¥RLW	RLW provider	-	∨	-
CAO¥ProviderLib¥UNIPULSE¥TMF	TMF provider	-	∨	-
CAO¥ProviderLib¥WACOH¥DynPick	DynPick provider	-	∨	-
CAO¥ProviderLib¥WACOH¥WDF-6A	WDF-6A provider	-	∨	-
HID (Human Interface Device)				
CAO¥ProviderLib¥3Dconnexion¥3DMouse	3D Mouse provider	-	∨	∨
CAO¥ProviderLib¥DENSO¥Joystick	Joystick provider	-	∨	∨
CAO¥ProviderLib¥DENSO¥TP	TPComm provider	∨	∨	-
CAO¥ProviderLib¥DirectInput	DirectInput provider	∨	∨	∨
CAO¥ProviderLib¥SensAble¥PHANTOM	PHANTOM provider	-	∨	∨
Other				
CAO¥ProviderLib¥CCS¥PDS	PDS provider	-	∨	∨
CAO¥ProviderLib¥CCS¥PD3	PD3 provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥GPIB	GPIB provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥SMC	SMC provider	-	∨	-
CAO¥ProviderLib¥DataImport	DataImport provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Q-Platform	DENSO Q-Platform provider	∨	∨	-
CAO¥ProviderLib¥EPSON¥ESCPOS	EPSON ESCPOS provider	-	∨	-
CAO¥ProviderLib¥FlexFactory¥anyfeed	anyfeed provider	-	∨	-
CAO¥ProviderLib¥FUJITSU¥VPS	VPS provider	-	∨	-
CAO¥ProviderLib¥IMAC¥IPPA	IPPA provider	-	∨	-
CAO¥ProviderLib¥JSON	JSON provider	-	∨	∨
CAO¥ProivderLib¥KEBA¥ACF	ACF provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LaserMarker	KEYENCE LaserMarker provider	-	∨	-
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl provider	-	∨	-

CAO¥ProviderLib¥National¥ANB	ANB provider	-	∨	∨
CAO¥ProviderLib¥OPTEX-FA¥OPPD	OPTEX FA OPPD provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥PLCSIM	SIEMENS PLCSIM provider	∨	∨	-
CAO¥ProviderLib¥StrawberryLinux¥USBRH	USBRH provider	-	∨	∨
CAO¥ProviderLib¥SATO¥SBPL	SATO SBPL provider	-	∨	-

Table3-9 ORiN2 SDK standard provider support status (Runtime + Utilities Set)

Place	Content	Support	Binary	Source
Standard communication protocol				
CAO¥ProviderLib¥Balluff¥IO-Link	IO-Link provider	-	∨	-
CAO¥ProviderLib¥b-CAP	b-CAP provider	∨	∨	-
CAO¥ProviderLib¥CAP	CAP provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Stream	Stream provider	∨	∨	-
CAO¥ProviderLib¥e-CAP	e-CAP provider	-	∨	-
CAO¥ProviderLib¥FTP	FTP provider	-	∨	-
CAO¥ProviderLib¥FTPS	FTPS provider	-	∨	-
CAO¥ProviderLib¥ICMP	ICMP provider	-	∨	-
CAO¥ProviderLib¥IETF¥CoAP	CoAP provider	-	∨	-
CAO¥ProviderLib¥Modbus.X	Modbus provider	-	∨	-
CAO¥ProviderLib¥Ping	Ping provider	-	∨	-
CAO¥ProviderLib¥RAC	RAC provider	-	∨	-
CAO¥ProviderLib¥SMTP	SMTP provider	-	∨	-
Gateway				
CAO¥ProviderLib¥Alibaba¥IoTPlatform	Alibaba Cloud IoT Platform provider	-	∨	-
CAO¥ProviderLib¥Amazon¥AWSIoT	Amazon Web Service IoT provider	-	∨	-
CAO¥ProviderLib¥Beckhoff¥TwinCAT3	TwinCAT3 ADS provider	∨	∨	-
CAO¥ProviderLib¥CORBA	CORBA provider	-	∨	-
CAO¥ProviderLib¥DDE	DDE provider	-	∨	-
CAO¥ProviderLib¥FL-net	FL-net provider	∨	∨	-
CAO¥ProviderLib¥FUJITSU¥COLMINA	FUJITSU COLMINA provider	-	∨	-
CAO¥ProviderLib¥HLA	HLA provider	-	∨	-

CAO¥ProviderLib¥IBM¥WatsonIoTPlatform	IBM Watson IoT Platform provider	-	∨	-
CAO¥ProviderLib¥MESX	MESX provider	-	∨	-
CAO¥ProviderLib¥Microsoft¥AzureIoT	Microsoft Azure IoT provider	-	∨	-
CAO¥ProviderLib¥OPC	OPC provider	∨	∨	-
CAO¥ProviderLib¥OPCUA	OPCUA provider	∨	∨	-
CAO¥ProviderLib¥RAOP	RAOP provider	-	∨	-
CAO¥ProviderLib¥Roboticsware¥IPLink	IPLink provider	-	∨	-
CAO¥ProviderLib¥ROS¥ROSSerial	ROSSerial provider	-	∨	-
CAO¥ProviderLib¥SAP¥IoTPlatform	SAPCloud IoT Platform provider	-	∨	-
CAO¥ProviderLib¥SLMP	SLMP provider	-	∨	-
CAO¥ProviderLib¥VBP	VBGateway provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥MindConnect	MindConnect provider	-	∨	-
CAO¥ProviderLib¥Google¥CloudIoTCore	Google Cloud IoT Core provider	-	∨	-
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard provider	-	∨	-
CAO¥ProviderLib¥CRD	CRD provider	∨	∨	-
CAO¥ProviderLib¥DataBase	Database provider	-	∨	-
CAO¥ProviderLib¥DataQueue	DataQueue provider	∨	∨	-
CAO¥ProviderLib¥DataStore	DataStore provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Timer	Timer provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy camera provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy CNC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy panel provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy PLC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy Robot provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy provider	-	∨	-
CAO¥ProviderLib¥ISO16100	ISO16100 provider	-	∨	-
CAO¥ProviderLib¥ISO20242	ISO20242 provider	-	∨	-
CAO¥ProviderLib¥LocalFile	Local file provider	∨	∨	-
I/O				
CAO¥ProviderLib¥CONTEC¥AIO	AIO provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥CNT	CNT provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥DIO	DIO provider	-	∨	-

CAO¥ProviderLib¥CONTEC¥DIO98	DIO98 provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥FIT	FIT provider	-	∨	-
CAO¥ProviderLib¥hilscher¥CIF	CIF provider	-	∨	-
CAO¥ProviderLib¥hilscher¥CIFX	CIFX provider	-	∨	-
CAO¥ProviderLib¥Hivertec¥CTR	CTR provider	-	∨	-
CAO¥ProviderLib¥Interface¥DNet	Interface DeviceNet provider	-	∨	-
CAO¥ProviderLib¥Lantronix¥XPort6	XPort provider	-	∨	-
CAO¥ProviderLib¥Modbus	Modbus provider	-	∨	-
CAO¥ProviderLib¥OMRON¥DNet	OMRON DeviceNet provider	-	∨	-
CAO¥ProviderLib¥PATLITE¥PHC	PHC provider	-	∨	-
CAO¥ProviderLib¥PATLITE¥PHN	PHN provider	-	∨	-
CAO¥ProviderLib¥SUNX¥S-LINK	S-LINK provider	-	∨	-
CAO¥ProviderLib¥SUNX¥S-LINKV	S-LINK V provider	-	∨	-
CAO¥ProviderLib¥Woodhead¥SSTCCS	SSTCCS provider	-	∨	-
CAO¥ProviderLib¥Woodhead¥SSTDN3	SSTDN3 provider	-	∨	-
CAO¥ProviderLib¥XPort	XPort provider	-	∨	-
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥RC8	RC8 provider	∨	∨	-
CAO¥ProviderLib¥IAI¥E-Con	E-Con provider	-	∨	-
CAO¥ProviderLib¥IAI¥PCON	IAI PCON provider	∨	∨	-
CAO¥ProviderLib¥IAI¥SEL	IAI SEL provider	∨	∨	-
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 provider	-	∨	-
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 provider	-	∨	-
CAO¥ProviderLib¥YAMAHA¥SR1	SR1 provider	∨	∨	-
CAO¥ProviderLib¥YAMAHA¥RCX	RCX provider	∨	∨	-
Hand				
CAO¥ProviderLib¥KOGANEI¥EWHA	EWHA provider	-	∨	-
CAO¥ProviderLib¥TAIYO¥ESC11	TAIYO servo hand provider	-	∨	-
CAO¥ProviderLib¥TAIYO¥ESC11PCI	TAIYO servo hand (PCI) provider	-	∨	-
PLC				
CAO¥ProviderLib¥KEYENCE¥KV	KEYENCE KV provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥KVCOM	KEYENCE KVCOM provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MELSEC	MELSEC provider	-	∨	-

CAO¥ProviderLib¥MELCO¥MxCompo	MxComponent provider	-	∨	-
CAO¥ProviderLib¥MELCO¥PCLink	Computer link provider	-	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	Mitsubishi MELSEC AnA provider	-	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C provider	∨	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E provider	∨	∨	-
CAO¥ProviderLib¥OMRON¥CJ	CJ provider	-	∨	-
CAO¥ProviderLib¥OMRON¥NJ	NJ provider	∨	∨	-
CAO¥ProviderLib¥OMRON¥Sysmac¥Studio	SysmacStudio provider	-	∨	-
CAO¥ProviderLib¥Rockwell¥Logix5000	Logix5000 provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥S7NetPlus	SIEMENS PLC S7 provider	∨	∨	-
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	Tcmini provider	-	∨	-
NC & MC				
CAO¥ProviderLib¥Brother¥Protocol2	BROTHER INDUSTRIES SPEEDIO provider	-	∨	-
CAO¥ProviderLib¥DENSO¥MTConnect	MTConnect provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MELSERVO	MELSERVO provider	-	∨	-
CAO¥ProviderLib¥YASKAWA¥Ns300	NS300 provider	-	∨	-
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE provider	-	∨	-
CAO¥ProviderLib¥BAUMER¥VeriSens	VeriSens provider	-	∨	-
CAO¥ProviderLib¥Canon¥N10-W02	Canon N10-W02 provider	-	∨	-
CAO¥ProviderLib¥Canon¥RV	RV provider	-	∨	-
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	-	∨	-
CAO¥ProviderLib¥Cognex¥In-Sight	In-Sight provider	-	∨	-
CAO¥ProviderLib¥DALSA¥Genie	Genie provider	-	∨	-
CAO¥ProviderLib¥DirectShow	DirectShow provider	∨	∨	-
CAO¥ProviderLib¥KEYENCE¥CV	CV provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥CVX	CVX provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥VWXG	V-Works for XG provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥XGX	XGX provider	-	∨	-
CAO¥ProviderLib¥HALCON	HALCON provider	-	∨	-
CAO¥ProviderLib¥IDS¥uEye	uEye provider	-	∨	-
CAO¥ProviderLib¥LinX¥GINGA	LINX GINGA borad provider	-	∨	-

CAO¥ProviderLib¥Matrox¥RobCom	RobCom provider	-	∨	-
CAO¥ProviderLib¥National¥A110	A110 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥F160	F160 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥FZ	FZ provider	-	∨	-
CAO¥ProviderLib¥OpenCV	OpenCV provider	∨	∨	-
CAO¥ProviderLib¥Panasonic¥PV	PV series provider	-	∨	-
CAO¥ProviderLib¥RICOH¥R-GigE	RICOH R-GigE provider	-	∨	-
CAO¥ProviderLib¥SEC¥Camera	USB camera provider	-	∨	-
CAO¥ProviderLib¥SHARP¥IV	IV provider	-	∨	-
Displacement sensors				
CAO¥ProviderLib¥KEYENCE¥FSN40NUEP1	KEYENCE FSN40NUEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥GT	GT provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥GT2DLEP1	KEYENCE GT2DLEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥ILDLEP1	KEYENCE ILDLEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LJ-V7000	LJ-V7000 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LK-G5000	KEYENCE LK-G5000 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZX	ZX provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZG2	ZG2 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZS	ZS provider	-	∨	-
CAO¥ProviderLib¥SUNX¥TRC11	TRC11 provider	-	∨	-
CAO¥ProviderLib¥SUNX¥HL-C2	HL-C2 provider	-	∨	-
CAO¥ProviderLib¥SUNX¥HL-D3	HL-D3 provider	-	∨	-
CAO¥ProviderLib¥SUNX¥HL-G1	HL-G1 provider	-	∨	-
Other sensors				
CAO¥ProviderLib¥Dai-ichiSeiko¥ESTORQ	Dai-ichiSeiko ESTORQ provider	-	∨	-
CAO¥ProviderLib¥DENSO¥AN	DENSO AN provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥QRCode	QRCode provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Scanner	DENSO Scanner provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥ICCard	IC card provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR20	UR20 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR30	DENSO UR30 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR40	DENSO UR40 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥FD	DENSO DPM Scanner provider	∨	∨	-

CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX provider	-	∨	-
CAO¥ProviderLib¥MettlerToledo¥WMF204C	MettlerToledo WMF204C provider	-	∨	-
CAO¥ProviderLib¥OJIYAS¥ad-L8	ad-L8 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥V600	V600 provider	-	∨	-
CAO¥ProviderLib¥NITTA¥IFS	IFS provider	-	∨	-
CAO¥ProviderLib¥TAKASU¥RLW	RLW provider	-	∨	-
CAO¥ProviderLib¥UNIPULSE¥TMF	TMF provider	-	∨	-
CAO¥ProviderLib¥WACOH¥DynPick	DynPick provider	-	∨	-
CAO¥ProviderLib¥WACOH¥WDF-6A	WDF-6A provider	-	∨	-
HID (Human Interface Device)				
CAO¥ProviderLib¥3Dconnexion¥3DMouse	3D Mouse provider	-	∨	-
CAO¥ProviderLib¥DENSO¥Joystick	Joystick provider	-	∨	-
CAO¥ProviderLib¥DENSO¥TP	TPComm provider	∨	∨	-
CAO¥ProviderLib¥DirectInput	DirectInputprovider	∨	∨	-
CAO¥ProviderLib¥SensAble¥PHANTOM	PHANTOM provider	-	∨	-
Other				
CAO¥ProviderLib¥CCS¥PDS	PDS provider	-	∨	-
CAO¥ProviderLib¥CCS¥PD3	PD3 provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥GPIB	GPIB provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥SMC	SMC provider	-	∨	-
CAO¥ProviderLib¥DataImport	DataImport provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Q-Platform	DENSO Q-Platform provider	∨	∨	-
CAO¥ProviderLib¥EPSON¥ESCPOS	EPSON ESCPOS provider	-	∨	-
CAO¥ProviderLib¥FlexFactory¥anyfeed	anyfeed provider	-	∨	-
CAO¥ProviderLib¥FUJITSU¥VPS	VPS provider	-	∨	-
CAO¥ProviderLib¥IMAC¥IPPA	IPPA provider	-	∨	-
CAO¥ProviderLib¥JSON	JSON provider	-	∨	-
CAO¥ProivderLib¥KEBA¥ACF	ACF provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LaserMarker	KEYENCE LaserMarker provider	-	∨	-
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl provider	-	∨	-
CAO¥ProviderLib¥National¥ANB	ANB provider	-	∨	-
CAO¥ProviderLib¥OPTEX-FA¥OPPD	OPTEX FA OPPD provider	-	∨	-

CAO¥ProviderLib¥SIEMENS¥PLCSIM	SIEMENS PLCSIM provider	∨	∨	-
CAO¥ProviderLib¥StrawberryLinux¥USBRH	USBRH provider	-	∨	-
CAO¥ProviderLib¥SATO¥SBPL	SATO SBPL provider	-	∨	-

Table3-10 ORiN2 SDK standard provider support status (Runtime)

Place	Content	Support	Binary	Source
Standard communication protocol				
CAO¥ProviderLib¥Balluff¥IO-Link	IO-Link provider	-	∨	-
CAO¥ProviderLib¥b-CAP	b-CAP provider	∨	∨	-
CAO¥ProviderLib¥CAP	CAP provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Stream	Stream provider	∨	∨	-
CAO¥ProviderLib¥e-CAP	e-CAP provider	-	∨	-
CAO¥ProviderLib¥FTP	FTP provider	-	∨	-
CAO¥ProviderLib¥FTPS	FTPS provider	-	∨	-
CAO¥ProviderLib¥ICMP	ICMP provider	-	∨	-
CAO¥ProviderLib¥IETF¥CoAP	CoAP provider	-	∨	-
CAO¥ProviderLib¥Modbus.X	Modbus provider	-	∨	-
CAO¥ProviderLib¥Ping	Ping provider	-	∨	-
CAO¥ProviderLib¥RAC	RAC provider	-	∨	-
CAO¥ProviderLib¥SMTP	SMTP provider	-	∨	-
Gateway				
CAO¥ProviderLib¥Alibaba¥IoTPlatform	Alibaba Cloud IoT Platform provider	-	∨	-
CAO¥ProviderLib¥Amazon¥AWSIoT	Amazon Web Service IoT provider	-	∨	-
CAO¥ProviderLib¥Beckhoff¥TwinCAT3	TwinCAT3 ADS provider	∨	∨	-
CAO¥ProviderLib¥CORBA	CORBA provider	-	∨	-
CAO¥ProviderLib¥DDE	DDE provider	-	∨	-
CAO¥ProviderLib¥FL-net	FL-net provider	∨	∨	-
CAO¥ProviderLib¥FUJITSU¥COLMINA	FUJITSU COLMINA provider	-	∨	-
CAO¥ProviderLib¥HLA	HLA provider	-	∨	-
CAO¥ProviderLib¥IBM¥WatsonIoTPlatform	IBM Watson IoT Platform provider	-	∨	-

CAO¥ProviderLib¥MESX	MESX provider	-	∨	-
CAO¥ProviderLib¥Microsoft¥AzureIoT	Microsoft Azure IoT provider	-	∨	-
CAO¥ProviderLib¥OPC	OPC provider	∨	∨	-
CAO¥ProviderLib¥OPCUA	OPCUA provider	∨	∨	-
CAO¥ProviderLib¥RAOP	RAOP provider	-	∨	-
CAO¥ProviderLib¥Roboticsware¥IPLink	IPLink provider	-	∨	-
CAO¥ProviderLib¥ROS¥ROSSerial	ROSSerial provider	-	∨	-
CAO¥ProviderLib¥SAP¥IoTPlatform	SAPCloud IoT Platform provider	-	∨	-
CAO¥ProviderLib¥SLMP	SLMP provider	-	∨	-
CAO¥ProviderLib¥VBP	VBGateway provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥MindConnect	MindConnect provider	-	∨	-
CAO¥ProviderLib¥Google¥CloudIoTCore	Google Cloud IoT Core provider	-	∨	-
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard provider	-	∨	-
CAO¥ProviderLib¥CRD	CRD provider	∨	∨	-
CAO¥ProviderLib¥DataBase	Database provider	-	∨	-
CAO¥ProviderLib¥DataQueue	DataQueue provider	∨	∨	-
CAO¥ProviderLib¥DataStore	DataStore provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Timer	Timer provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy camera provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy CNC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy panel provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy PLC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy Robot provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy provider	-	∨	-
CAO¥ProviderLib¥ISO16100	ISO16100 provider	-	∨	-
CAO¥ProviderLib¥ISO20242	ISO20242 provider	-	∨	-
CAO¥ProviderLib¥LocalFile	Local file provider	∨	∨	-
I/O				
CAO¥ProviderLib¥CONTEC¥AIO	AIO provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥CNT	CNT provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥DIO	DIO provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥DIO98	DIO98 provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥FIT	FIT provider	-	∨	-

CAO¥ProviderLib¥hilscher¥CIF	CIF provider	-	∨	-
CAO¥ProviderLib¥hilscher¥CIFX	CIFX provider	-	∨	-
CAO¥ProviderLib¥Hivertec¥CTR	CTR provider	-	∨	-
CAO¥ProviderLib¥Interface¥DNet	Interface DeviceNet provider	-	∨	-
CAO¥ProviderLib¥Lantronix¥XPort6	XPort provider	-	∨	-
CAO¥ProviderLib¥Modbus	Modbus provider	-	∨	-
CAO¥ProviderLib¥OMRON¥DNet	OMRON DeviceNet provider	-	∨	-
CAO¥ProviderLib¥PATLITE¥PHC	PHC provider	-	∨	-
CAO¥ProviderLib¥PATLITE¥PHN	PHN provider	-	∨	-
CAO¥ProviderLib¥SUNX¥S-LINK	S-LINK provider	-	∨	-
CAO¥ProviderLib¥SUNX¥S-LINKV	S-LINK V provider	-	∨	-
CAO¥ProviderLib¥Woodhead¥SSTCCS	SSTCCS provider	-	∨	-
CAO¥ProviderLib¥Woodhead¥SSTDN3	SSTDN3 provider	-	∨	-
CAO¥ProviderLib¥XPort	XPort provider	-	∨	-
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥RC8	RC8 provider	∨	∨	-
CAO¥ProviderLib¥IAI¥E-Con	E-Con provider	-	∨	-
CAO¥ProviderLib¥IAI¥PCON	IAI PCON provider	∨	∨	-
CAO¥ProviderLib¥IAI¥SEL	IAI SEL provider	∨	∨	-
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 provider	-	∨	-
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 provider	-	∨	-
CAO¥ProviderLib¥YAMAHA¥SR1	SR1 provider	∨	∨	-
CAO¥ProviderLib¥YAMAHA¥RCX	RCX provider	∨	∨	-
Hand				
CAO¥ProviderLib¥KOGANEI¥EWHA	EWHA provider	-	∨	-
CAO¥ProviderLib¥TAIYO¥ESC11	TAIYO servo hand provider	-	∨	-
CAO¥ProviderLib¥TAIYO¥ESC11PCI	TAIYO servo hand (PCI) provider	-	∨	-
PLC				
CAO¥ProviderLib¥KEYENCE¥KV	KEYENCE KV provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥KVCOM	KEYENCE KVCOM provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MELSEC	MELSEC provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MxCompo	MxComponent provider	-	∨	-
CAO¥ProviderLib¥MELCO¥PCLink	Computer link provider	-	∨	-

CAO¥ProviderLib¥Mitsubishi¥MELSEC	Mitsubishi MELSEC AnA provider	-	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C provider	∨	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E provider	∨	∨	-
CAO¥ProviderLib¥OMRON¥CJ	CJ provider	-	∨	-
CAO¥ProviderLib¥OMRON¥NJ	NJ provider	∨	∨	-
CAO¥ProviderLib¥OMRON¥Sysmac¥Studio	SysmacStudio provider	-	∨	-
CAO¥ProviderLib¥Rockwell¥Logix5000	Logix5000 provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥S7NetPlus	SIEMENS PLC S7 provider	∨	∨	-
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	Tcmini provider	-	∨	-
NC & MC				
CAO¥ProviderLib¥Brother¥Protocol2	BROTHER INDUSTRIES SPEEDIO provider	-	∨	-
CAO¥ProviderLib¥DENSO¥MTConnect	MTConnect provider	-	∨	-
CAO¥ProviderLib¥MELCO¥MELSERVO	MELSERVO provider	-	∨	-
CAO¥ProviderLib¥YASKAWA¥Ns300	NS300 provider	-	∨	-
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE provider	-	∨	-
CAO¥ProviderLib¥BAUMER¥VeriSens	VeriSens provider	-	∨	-
CAO¥ProviderLib¥Canon¥N10-W02	Canon N10-W02 provider	-	∨	-
CAO¥ProviderLib¥Canon¥RV	RV provider	-	∨	-
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	-	∨	-
CAO¥ProviderLib¥Cognex¥In-Sight	In-Sight provider	-	∨	-
CAO¥ProviderLib¥DALSA¥Genie	Genie provider	-	∨	-
CAO¥ProviderLib¥DirectShow	DirectShow provider	∨	∨	-
CAO¥ProviderLib¥HALCON	HALCON provider	-	∨	-
CAO¥ProviderLib¥IDS¥uEye	uEye provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥CV	CV provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥CVX	CVX provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥VWXG	V-Works for XG provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥XGX	XGX provider	-	∨	-
CAO¥ProviderLib¥LinX¥GINGA	LINX GINGA borad provider	-	∨	-
CAO¥ProviderLib¥Matrox¥RobCom	RobCom provider	-	∨	-
CAO¥ProviderLib¥National¥A110	A110 provider	-	∨	-

CAO¥ProviderLib¥OMRON¥F160	F160 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥FZ	FZ provider	-	∨	-
CAO¥ProviderLib¥OpenCV	OpenCV provider	∨	∨	-
CAO¥ProviderLib¥Panasonic¥PV	PV series provider	-	∨	-
CAO¥ProviderLib¥RICOH¥R-GigE	RICOH R-GigE provider	-	∨	-
CAO¥ProviderLib¥SEC¥Camera	USB camera provider	-	∨	-
CAO¥ProviderLib¥SHARP¥IV	IV provider	-	∨	-
Displacement sensors				
CAO¥ProviderLib¥KEYENCE¥FSN40NUEP1	KEYENCE FSN40NUEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥GT	GT provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥GT2DLEP1	KEYENCE GT2DLEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥ILDLEP1	KEYENCE ILDLEP1 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LJ-V7000	LJ-V7000 provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LK-G5000	KEYENCE LK-G5000 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZX	ZX provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZG2	ZG2 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥ZS	ZS provider	-	∨	-
CAO¥ProviderLib¥SUNX¥TRC11	TRC11 provider	-	∨	-
CAO¥ProviderLib¥SUNX¥HL-C2	HL-C2 provider	-	∨	-
CAO¥ProviderLib¥SUNX¥HL-D3	HL-D3 provider	-	∨	-
CAO¥ProviderLib¥SUNX¥HL-G1	HL-G1 provider	-	∨	-
Other sensors				
CAO¥ProviderLib¥Dai-ichiSeiko¥ESTORQ	Dai-ichiSeiko ESTORQ provider	-	∨	-
CAO¥ProviderLib¥DENSO¥AN	DENSO AN provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥QRCode	QRCode provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Scanner	DENSO Scanner provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥ICCard	IC card provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR20	UR20 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR30	DENSO UR30 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR40	DENSO UR40 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥FD	DENSO DPM Scanner provider	∨	∨	-
CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX provider	-	∨	-
CAO¥ProviderLib¥MettlerToledo¥WMF204C	MettlerToledo WMF204C	-	∨	-

	provider			
CAO¥ProviderLib¥OJIYAS¥ad-L8	ad-L8 provider	-	∨	-
CAO¥ProviderLib¥OMRON¥V600	V600 provider	-	∨	-
CAO¥ProviderLib¥NITTA¥IFS	IFS provider	-	∨	-
CAO¥ProviderLib¥TAKASU¥RLW	RLW provider	-	∨	-
CAO¥ProviderLib¥UNIPULSE¥TMF	TMF provider	-	∨	-
CAO¥ProviderLib¥WACOH¥DynPick	DynPick provider	-	∨	-
CAO¥ProviderLib¥WACOH¥WDF-6A	WDF-6A provider	-	∨	-
HID (Human Interface Device)				
CAO¥ProviderLib¥3Dconnexion¥3DMouse	3D Mouse provider	-	∨	-
CAO¥ProviderLib¥DENSO¥Joystick	Joystick provider	-	∨	-
CAO¥ProviderLib¥DENSO¥TP	TPComm provider	∨	∨	-
CAO¥ProviderLib¥DirectInput	DirectInputprovider	∨	∨	-
CAO¥ProviderLib¥SensAble¥PHANTOM	PHANTOM provider	-	∨	-
Other				
CAO¥ProviderLib¥CCS¥PDS	PDS provider	-	∨	-
CAO¥ProviderLib¥CCS¥PD3	PD3 provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥GPIB	GPIB provider	-	∨	-
CAO¥ProviderLib¥CONTEC¥SMC	SMC provider	-	∨	-
CAO¥ProviderLib¥DataImport	DataImport provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Q-Platform	DENSO Q-Platform provider	∨	∨	-
CAO¥ProviderLib¥EPSON¥ESCPOS	EPSON ESCPOS provider	-	∨	-
CAO¥ProviderLib¥FlexFactory¥anyfeed	anyfeed provider	-	∨	-
CAO¥ProviderLib¥FUJITSU¥VPS	VPS provider	-	∨	-
CAO¥ProviderLib¥IMAC¥IPPA	IPPA provider	-	∨	-
CAO¥ProviderLib¥JSON	JSON provider	-	∨	-
CAO¥ProivderLib¥KEBA¥ACF	ACF provider	-	∨	-
CAO¥ProviderLib¥KEYENCE¥LaserMarker	KEYENCE LaserMarker provider	-	∨	-
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl provider	-	∨	-
CAO¥ProviderLib¥National¥ANB	ANB provider	-	∨	-
CAO¥ProviderLib¥OPTEX-FA¥OPPD	OPTEX FA OPPD provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥PLCSIM	SIEMENS PLCSIM provider	∨	∨	-
CAO¥ProviderLib¥StrawberryLinux¥USBRH	USBRH provider	-	∨	-

CAO¥ProviderLib¥SATO¥SBPL	SATO SBPL provider	-	∨	-

Table3-11 ORiN2 SDK provider support status (DENSO Products)

Place	Content	Support	Binary	Source
Standard communication protocol				
CAO¥ProviderLib¥b-CAP	b-CAP provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Stream	Stream provider	∨	∨	-
CAO¥ProviderLib¥FTP	FTP provider	-	∨	-
CAO¥ProviderLib¥FTPS	FTPS provider	-	∨	-
CAO¥ProviderLib¥Ping	Ping provider	-	∨	-
CAO¥ProviderLib¥SMTP	SMTP provider	-	∨	-
Gateway				
CAO¥ProviderLib¥VBP	VBGateway provider	-	∨	-
Utility				
CAO¥ProviderLib¥CRD	CRD provider	∨	∨	-
CAO¥ProviderLib¥DataQueue	DataQueue provider	∨	∨	-
CAO¥ProviderLib¥DataStore	DataStore provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Timer	Timer provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy camera provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy CNC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy panel provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy PLC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy Robot provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy provider	-	∨	-
CAO¥ProviderLib¥LocalFile	LocalFile provider	∨	∨	-
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥RC8	RC8 provider	∨	∨	-
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE provider	-	∨	-
CAO¥ProviderLib¥Canon¥N10-W02	Canon N10-W02 provider	-	∨	-
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	-	∨	-
CAO¥ProviderLib¥DirectShow	DirectShow provider	∨	∨	-

CAO¥ProviderLib¥HALCON	HALCON provider	-	∨	-
CAO¥ProviderLib¥IDS¥uEye	uEye provider	-	∨	-
CAO¥ProviderLib¥OpenCV	OpenCV provider	∨	∨	-
Other sensors				
CAO¥ProviderLib¥DENSO¥AN	DENSO AN provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥QRCode	QRCode provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥Scanner	DENSO Scanner provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥ICCard	IC card provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR20	UR20 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR30	DENSO UR30 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥UR40	DENSO UR40 provider	∨	∨	-
CAO¥ProviderLib¥DENSO¥FD	DENSO DPM Scanner provider	∨	∨	-
HID (Human Interface Device)				
CAO¥ProviderLib¥DENSO¥TP	TPComm provider	∨	∨	-
CAO¥ProviderLib¥DirectInput	DirectInputprovider	∨	∨	-
Other				
CAO¥ProviderLib¥DENSO¥Q-Platform	DENSO Q-Platform provider	∨	∨	-
CAO¥ProviderLib¥JSON	JSON provider	-	∨	-

Table3-12 ORiN2 SDK standard provider support status (evaluation)

Place	Content	Support	Binary	Source
Standard communication protocol				
CAO¥ProviderLib¥b-CAP	b-CAP provider	-	∨	-
CAO¥ProviderLib¥CAP	CAP provider	-	∨	-
CAO¥ProviderLib¥DENSO¥Stream	Stream provider	-	∨	-
CAO¥ProviderLib¥e-CAP	e-CAP provider	-	∨	-
CAO¥ProviderLib¥FTP	FTP provider	-	∨	-
CAO¥ProviderLib¥FTPS	FTPS provider	-	∨	-
CAO¥ProviderLib¥ICMP	ICMP provider	-	∨	-
CAO¥ProviderLib¥IETF¥CoAP	CoAP provider	-	∨	-
CAO¥ProviderLib¥Ping	Ping provider	-	∨	-
CAO¥ProviderLib¥RAC	RAC provider	-	∨	∨
CAO¥ProviderLib¥SMTP	SMTP provider	-	∨	-

Gateway				
CAO¥ProviderLib¥OPC	OPC provider	-	∨	-
CAO¥ProviderLib¥VBP	VBGateway provider	-	∨	-
CAO¥ProviderLib¥SIEMENS¥MindConnect	MindConnect provider	-	∨	-
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard provider	-	∨	-
CAO¥ProviderLib¥CRD	CRD provider	-	∨	-
CAO¥ProviderLib¥DataQueue	DataQueue provider	-	∨	-
CAO¥ProviderLib¥DataStore	DataStore provider	-	∨	∨
CAO¥ProviderLib¥DENSO¥Timer	Timer provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy camera provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy CNC provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy panel provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy PLC provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy Robot provider	-	∨	∨
CAO¥ProviderLib¥Dummy	Dummy provider	-	∨	∨
CAO¥ProviderLib¥LocalFile	Local file provider	-	∨	-
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC provider	-	∨	-
CAO¥ProviderLib¥DENSO¥RC8	RC8 provider	-	∨	-
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 provider	-	∨	∨
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 provider	-	∨	∨
PLC				
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C provider	-	∨	-
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E provider	-	∨	-
CAO¥ProviderLib¥OMRON¥NJ	NJ provider	-	∨	-
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	Tcmini provider	-	∨	∨
Vision				
CAO¥ProviderLib¥OpenCV	OpenCV provider	-	∨	-
CAO¥ProviderLib¥SEC¥Camera	USB camera provider	-	∨	∨
CAO¥ProviderLib¥DirectShow	DirectShow provider	-	∨	-
Other sensors				
CAO¥ProviderLib¥DENSO¥AN	DENSO AN provider	-	∨	-

CAO¥ProviderLib¥DENSO¥QRCode	QRCode provider	-	∨	-
CAO¥ProviderLib¥DENSO¥Scanner	DENSO Scanner provider	-	∨	-
CAO¥ProviderLib¥DENSO¥ICCard	IC card provider	-	∨	-
CAO¥ProviderLib¥DENSO¥UR20	UR20 provider	-	∨	-
CAO¥ProviderLib¥DENSO¥UR30	DENSO UR30 provider	-	∨	-
CAO¥ProviderLib¥DENSO¥UR40	DENSO UR40 provider	-	∨	-
CAO¥ProviderLib¥DENSO¥FD	DENSO DPM Scanner provider	-	∨	-
CAO¥ProviderLib¥HOKUYO¥URG-04LX	HOKUYO URG-04LX provider	-	∨	-
HID (Human Interface Device)				
CAO¥ProviderLib¥DENSO¥Joystick	Joystick provider	-	∨	∨
CAO¥ProviderLib¥DENSO¥TP	TPComm provider	-	∨	-
CAO¥ProviderLib¥DirectInput	DirectInput provider	-	∨	-
Other				
CAO¥ProviderLib¥DENSO¥Q-Platform	DENSO Q-Platform provider	-	∨	-
CAO¥ProviderLib¥JSON	JSON provider	-	∨	∨
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl provider	-	∨	-

Table3-13 ORiN2 SDK provider support status (free)

Place	Content	Support	Binary	Source
Standard communication protocol				
CAO¥ProviderLib¥CAP	CAP provider	-	∨	-
Utility				
CAO¥ProviderLib¥CRD	CRD provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy camera provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy CNC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy panel provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy PLC provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy Robot provider	-	∨	-
CAO¥ProviderLib¥Dummy	Dummy provider	-	∨	-
Other				
CAO¥ProviderLib¥DENSO¥Q-Platform	DENSO Q-Platform provider	-	∨	-
CAO¥ProviderLib¥JSON	JSON provider	-	∨	-

3.7. How to check the installation state of ORiN2 SDK

ORiN2 SDK installation state can be checked by referring the following registry key.

HKEY_CLASSES_ROOT¥Software¥ORiN2SDK

If there was no key, ORiN2 SDK had not installed yet. Each key shows the following states.

InstallResult	(DWORD)	:	Installation result 0: Succeeded（restart was not required） 1: Succeeded（restart was required） -1: Failed
Locale	(DWORD)	:	Local ID during installation
Owner	(STRING)	:	Invoked applications by the installer
ProductType	(STRING)	:	Install type
ProductVersion	(STRING)	:	Version
TargetDir	(STRING)	:	Installation target directly

4. Client application tutorial

For those who want to make a simple application and get the feeling of ORiN, this chapter describes the method of making client application with several providers cooperated.

Figure4-1 shows the outline of client application. This application transmits Ping to remote PC on the network using the ICMP provider, and acquires the error status of Ping from the CRD file, and the display).

First of all, in 4.2an application that transmits Ping is developed. In 4.3process to acquire the error message from the CRD file is added.

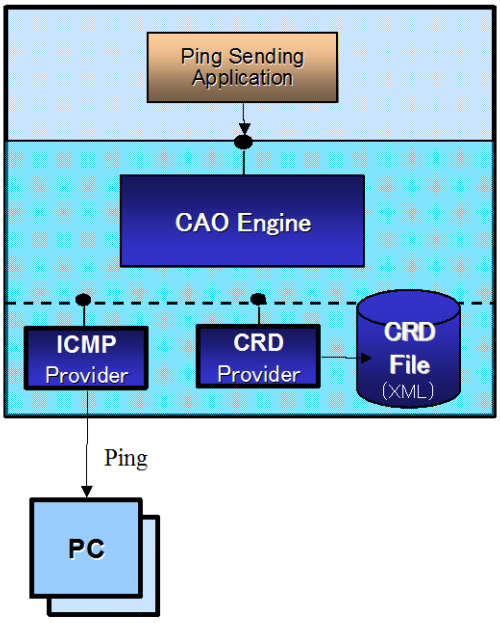

Figure4-1 Outline of sample application

4.1. Before you start

ORiN2 assumes Microsoft Visual Studio 6.0 and Visual Studio.NET as a development environment. In this user's guide, Visual Basic 6.0 is used for application development. If you use Visual Studio .NET, please refer to ORiN2 Programming Guide.

The CAO provider released from each company is developed using DCOM distributed object technology. First of all, please read the following content of MSDN.

(1) Development method in Visual Studio 6.0

(2) Basic knowledge of COM

・ Data type named BSTR, SAFEARRAY, and VARIANT

・ Early binding / Rate binding

4.2. CAO tutorial

First of all, Ping transmission application is developed using the ICMP provider.

The ICMP provider is to transmit Ping to PC on the specified network, and to confirm whether target PC is connected on the network.

(1) Start Visual Basic 6.0, and select "Make of a new project" →"Standard EXE".

(2) Add "CAO1.0 type library" from "Project" →"Reference setting" as shown in Figure4-2. As a result, the library of CAO can be used from the client application.

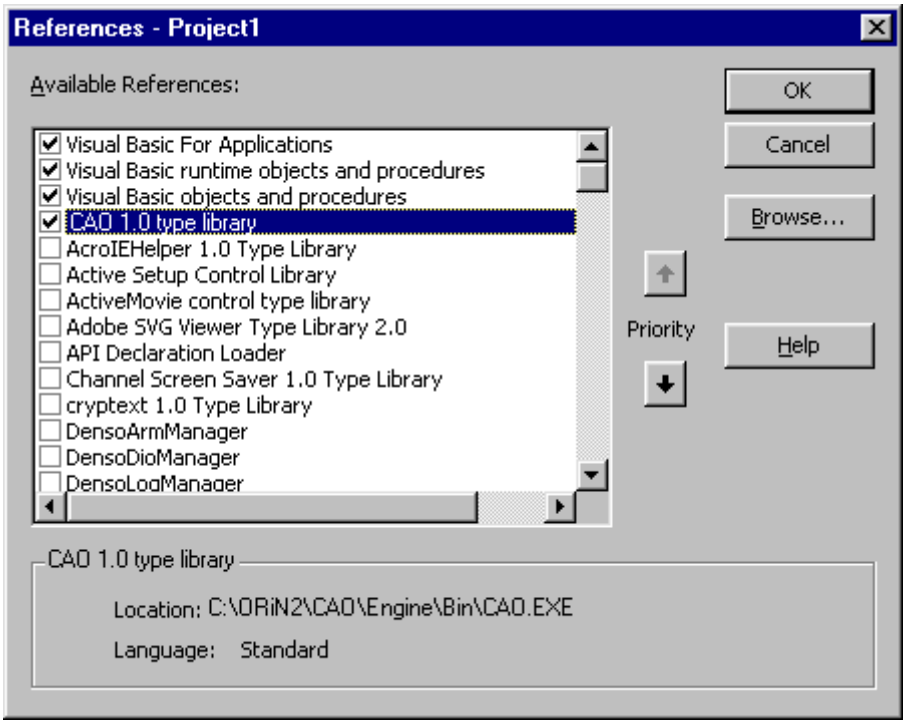

Figure4-2 Reference to CAO type library

(3) Next, make the form with 2 text boxes and one button as shown in Figure4-3. In this application, when Internet Protocol address is input in text box (Text1), and button (Command1) is pressed, the transmission result of Ping is displayed to text box (Text2).

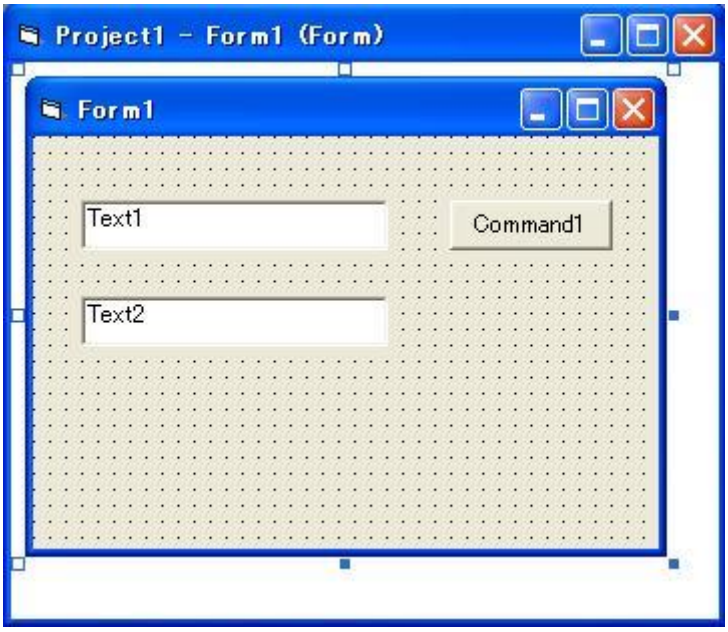

Figure4-3 Making of form

(4) Please describe the following codes.

List 4-1 Form1.frm

```
Private eng As CaoEngine                                                    ①
Private caoWS As CaoWorkspace
Private icmpCtrl As CaoController
Private icmpVar As CaoVariable

Private Sub Form_Load()
      Generation of Set eng=New CaoEngine 'CAO engine instantiation         ②
      Set caoWS = eng.Workspaces(0)
End Sub

Private Sub Command1_Click()
      'Connect to ICMP provider.                                            ③
      Set icmpCtrl = caoWS.AddController
                        ("Sample", "CaoProv.ICMP", "", "Host=" & Text1.Text)
      Set icmpVar = icmpCtrl.AddVariable("@ERROR_CODE")
      'Transmit PING                                                        ④
      Text2.Text = icmpVar
      caoWS.Controllers.Remove icmpCtrl.Index
End Sub
```

1. Private variables to maintain the object are declared. caoEng and caoWS are a necessary objects to connect to each provider. icmpCtrl and icmpVar are objects to use the ICMP provider.

2. The CAO engine and the CAO workspace are generated in the Form_Load function.
3. Application is connected to ICMP provider. In ORiN2, the AddController method is used to connect to each provider. The fourth argument of this AddController method is different in each provider. Please refer to the user's guide of each provider for details. Internet Protocol address of the Ping destination (host name) and the time-out time can be specified for the ICMP provider. AddVariable ("@ERROR_CODE") is the process to acquire the Variable object to transmit Ping in the ICMP provider.
4. The Command1_Click function is to transmit Ping and to display the result to the text box. Whenever the Variable object is referred, Ping is transmitted in the ICMP provider.

(5) Execute the program, and press Command1 button is. If "0" is displayed to the text box as shown in the left side of Figure4-4, the transmission of Ping is a success. If the transmission failed, the error code is displayed to the text box as shown in the right side of Figure4-4.

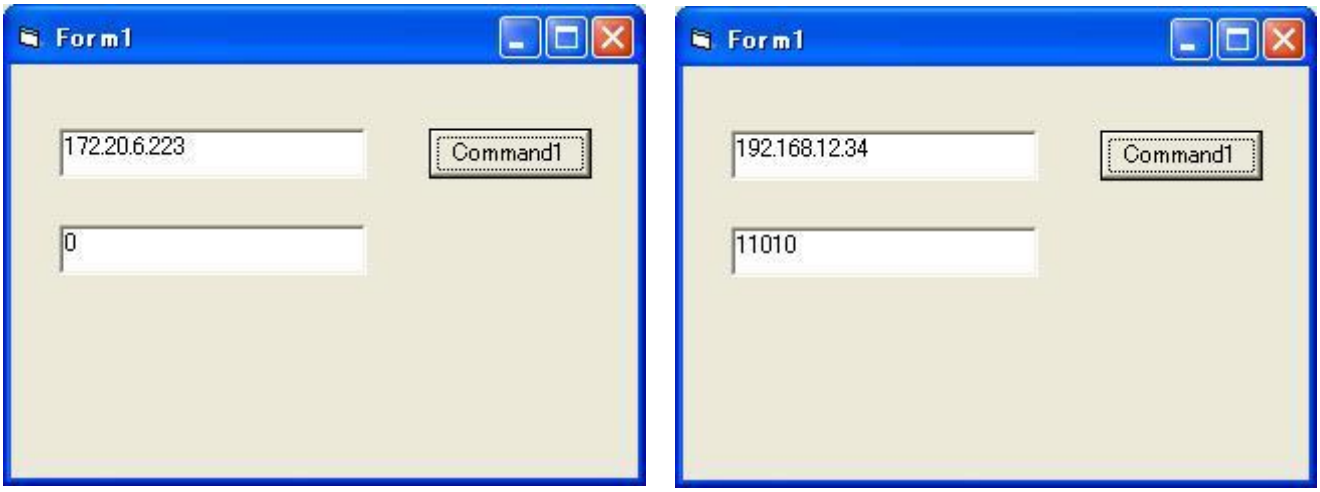

Figure4-4 ICMP provider execution result

4.3. CRD tutorial

In the previous application, ping was transmitted to PC on the network. However, because the result of Ping transmitting is displayed by the numerical value, it is difficult to understand whether Ping transmission was succeeded or not. Therefore, the definition of the error code is described in the CRD file, and the new application will display the error message.

(1) First of all, the CRD file that associates the return value of Ping and the error message is made based on the ICMP provider guide. Please make the following file, and save it as "tutorial.xml".

List 4-2 tutorial.xml

```
<?xml version="1.0" encoding="Shift_JIS"?>
<CRD xmlns="http://www.orin.jp/CRD/CRDSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.orin.jp/CRD/CRDSchema CRDSchema.xsd">
 <Controller name="PingStatus">
 <Variable name="0"><Value type="VT_BSTR">
 <bstrVal>IP_SUCCESS</bstrVal>
 </Value></Variable>
 <Variable name="11001"><Value type="VT_BSTR">
 <bstrVal>IP_BUF_TOO_SMALL</bstrVal>
 </Value></Variable>
 <Variable name="11002"><Value type="VT_BSTR">
 <bstrVal>IP_DEST_NET_UNREACHABLE</bstrVal>
 </Value></Variable>
 <Variable name="11003"><Value type="VT_BSTR">
 <bstrVal>IP_DEST_HOST_UNREACHABLE</bstrVal>
 </Value></Variable>
 <Variable name="11004"><Value type="VT_BSTR">
 <bstrVal>IP_DEST_PROT_UNREACHABLE</bstrVal>
 </Value></Variable>
 <Variable name="11005"><Value type="VT_BSTR">
 <bstrVal>IP_DEST_PORT_UNREACHABLE</bstrVal>
 </Value></Variable>
 <Variable name="11006"><Value type="VT_BSTR">
 <bstrVal>IP_NO_RESOURCES</bstrVal>
 </Value></Variable>
 <Variable name="11007"><Value type="VT_BSTR">
 <bstrVal>IP_BAD_OPTION</bstrVal>
 </Value></Variable>
 <Variable name="11008"><Value type="VT_BSTR">
 <bstrVal>IP_HW_ERROR</bstrVal>
 </Value></Variable>
 <Variable name="11009"><Value type="VT_BSTR">
 <bstrVal>IP_PACKET_TOO_BIG</bstrVal>
 </Value></Variable>
 <Variable name="11010"><Value type="VT_BSTR">
 <bstrVal>IP_REQ_TIMED_OUT</bstrVal>
 </Value></Variable>
 <Variable name="11011"><Value type="VT_BSTR">
 <bstrVal>IP_BAD_REQ</bstrVal>
 </Value></Variable>
 <Variable name="11012"><Value type="VT_BSTR">
 <bstrVal>IP_BAD_ROUTE</bstrVal>
 </Value></Variable>
 <Variable name="11013"><Value type="VT_BSTR">
 <bstrVal>IP_TTL_EXPIRED_TRANSIT</bstrVal>
 </Value></Variable>
 <Variable name="11014"><Value type="VT_BSTR">
 <bstrVal>IP_TTL_EXPIRED_REASSEM</bstrVal>
 </Value></Variable>
 <Variable name="11015"><Value type="VT_BSTR">
 <bstrVal>IP_PARAM_PROBLEM</bstrVal>
 </Value></Variable>
 <Variable name="11016"><Value type="VT_BSTR">
 <bstrVal>IP_SOURCE_QUENCH</bstrVal>
 </Value></Variable>
 <Variable name="11017"><Value type="VT_BSTR">
 <bstrVal>IP_OPTION_TOO_BIG</bstrVal>
 </Value></Variable>
 <Variable name="11018"><Value type="VT_BSTR">
 <bstrVal>IP_BAD_DESTINATION</bstrVal>
 </Value></Variable>
 </Controller>
```

```
</CRD>
```

In this CRD file, a controller named PingStatus maintains variable tags. The variable tag maintains the error code as name attribute, and maintains the error message of the character string form (BSTR form) as a value.

(2) Rewrite the source code as follows. The full path of the CRD file made by (1) is described in argument of "Path=D:¥tutorial.xml" part.

List 4-3 Form1.frm

```
Private eng As CaoEngine
Private caoWS As CaoWorkspace
Private icmpCtrl As CaoController
Private icmpVar As CaoVariable
Private crdPingStatus As CaoController                                    ①

Private Sub Form_Load()
        Set eng=New CaoEngine        'CAO engine instantiation
        Set caoWS = eng.Workspaces(0)
        Set crdPingStatus = caoWS.AddController( _                        ②
        "PingStatus", "CaoProv.CRD", "", "Path=D:¥tutorial.xml")
End Sub

Private Sub Command1_Click()
        'Connect to ICMP provider
        Set icmpCtrl = caoWS.AddController("Sample", "CaoProv.ICMP", "", "Host=" & Text1.Text)
        Set icmpVar = icmpCtrl.AddVariable("@ERROR_CODE")
        Set Result = icmpVar                                    'TransmitPING
        Set stVar = crdPingStatus.AddVariable(Result)  'check the return value meaning  ③
        Text2.Text = stVar.Value
        crdPingStatus.Variables.Remove stVar.Index
        caoWS.Controllers.Remove icmpCtrl.Index
End Sub
```

Explanation of the changed code:

1. CRD provider access variable declaration
2. The process to access the CRD provider is described in the Form_Load function. The first argument of AddController method is the name attribute of the Controller tag in the CRD file. The full path name of the CRD file is specified for the fourth argument.
3. Command1_Click function acquires Variable controller using AddVaribale method. The argument of the method specifies the name attribute of Variable tag. In the next line, Variable controller value is acquired. In the last two lines, the acquired object is released.

(3) Now, let's execute it. Please input IP address of the Ping destination to text box (Text1), and press the

Command1 button. When the Ping transmission succeed, “IP_SUCCESS" is displayed as shown in the left of Figure4-5. When time-out is detected, a message “IP_REQ_TIMED_OUT" is displayed as shown in the right of figure.

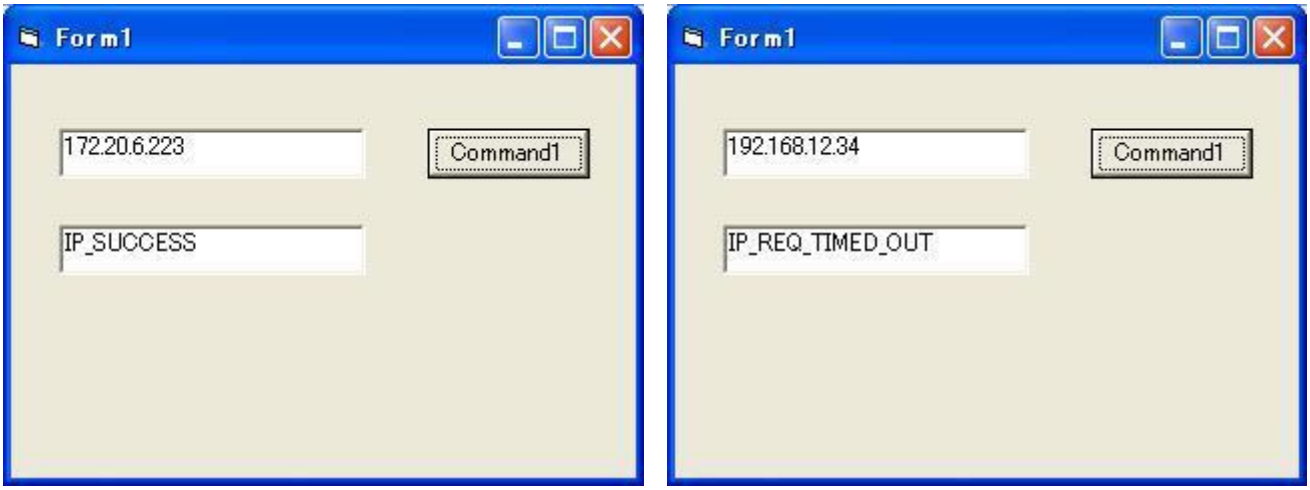

Figure4-5 Example of executing application using CRD

5. Further reading on ORiN2

5.1. To learn ORiN2 programming

In ORiN2 SDK, the user's guide is prepared to learn the programming using ORiN2.

(1) I want to make the client application.

ORiN2 Programming Guide

5.2. To use standard CAO provider

In ORiN2, a lot of providers are prepared by the standard. The client application using the data base access and the Ping transmission function, etc. can be easily constructed by using these providers.

(1) If you want to use FA equipment such as special robots and PLC.

・ If want to access NetwoRC controller of the DENSO robot.

NetwoRC Provider User's Guide

NetwoRC Quick Tour

5.3. Support

(1) Official site of ORiN consortium.

http://www.orin.jp/

(2) ORiN consortium bulletin board system on technical questions.

http://www.orin.jp/support_bbs.html