ORiN2 SDK

User's guide

Version 2.1.59

October 22, 2024

【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.
2020/07/28	2.1.51	DENSO SE1-HU-P provider added DENSO RC9 provider added Addition of OMRON FZ provider command

		Compatible with Basler Pylon 6 Add Amazon AWS S3 provider Add Microsoft Azure Strage provider Addition of KEYENCE LK-G3000 provider Addition of KEYENCE LK-G3000Lkif provider Add Sick PLOC 2D provider Add SINTOKOGIO ZYXer provider Add FANUC FIELD system provider Modbus.X provider: UDP compatible OMRON FZ provider: SCENE, SCNGROUP command improvements IoTDS provider: Strengthening the function of limiting external connections [Bug fix] SLMP provider: Fixed a problem that an error occurs when a specific address is specified. [Bug fix] Mitsubishi QnA3E provider: Fixed a problem that an error occurs when a specific address is specified [Bug fix] Mitsubishi QnA3C provider: Fixed version information acquisition process [Bug fix] DENSO Scanner provider: Fixed the problem that character string cannot be set to @QUEUE variable [Bug fix] DENSO Scanner provider: Fixed deadlock when disconnecting while getting thumbnail [Bug fix] LocalFile provider: Fixed a problem that an error occurs when getting the list of file names and the result is empty. [Bug fix] DataImport provider: Fixed a problem that the file name of read event is the previous file name [Bug fix] IDS μEye provider: Fixed a problem that eye leaks when getting/setting gamma values [Bug fix] DirectShow provider: Fixed a memory leak when connecting/disconnecting [Bug fix] DENSO Scanner provider: Fixed a memory leak when connecting/disconnecting [Bug fix] CANON Webview Provider: Fixed a memory leak when connecting/disconnecting [Bug fix] CANON N10-W02 provider: Fixed a memory leak when connecting/disconnecting [Bug fix] DENSO IC Card provider: Fixed memory leak when connection

		failed [Bug fix] OMRON NJ provider: Fixed a problem that abnormal termination occurs when a list of variable names is acquired while global variables are not set in NJ. [Bug fix] KEYENCE LJ-V7000 provider: Fixed a problem that the error occurs when 0 is put in the argument of GetError command.
2020/12/01	2.1.52	Updated the provider list category. Add CaoTester2 Add KEYENCE LJ-X8000 provider Add KEYENCE LJ-X8000A provider Add MTConnect provider Dummy Robot provider: Add task CSV specification function [Bug fix] CaoOPCUA: Fixed a problem where setting Variant as the data type for a scalar type array would result in an incorrect termination. [Bug fix] IoTDS provider: Fix memory leak [Bug fix] Dummy PLC provider: Fixed a problem that crashed when pressing Alt + Tab [Bug fix] OPC UA provider: Fixed a problem where Variant arrays could not be used
2021/03/09	2.1.53	[Bug fix] CaoSQL: Disable the log output function of asynchronous Queue of Trigger Action [Bug fix] CaoOPCUA: Fixed a problem of abnormal termination when reading invalid XML [Bug fix] CaoOPCUA: Fixed a problem that the server function stops immediately after starting if the specified user name and password are too long. [Bug fix] FTPS provider: Fixed a problem where some FTP servers could not be connected [Bug fix] Scanner provider: Fixed a memory leak and handle leak when connecting / disconnecting [Bug fix] QRCode provider: Fixed a memory leak and handle leak when connecting / disconnecting [Bug fix] OMRON CJ provider: Fixed an issue that caused a memory access violation during the disconnect process if no communication response was returned [Bug fix] Fixed the problem that files are not copied when upgrading from

		ORiN2SDK 2.1.51
2021/5/25	2.1.54	Google Cloud Storage provider added DummyRobot provider: Supports multiple arms TLS1.2 support and out-of-process at runtime - AWS IoT provider - AWS S3 provider - Microsoft Azure IoT provider - IBM Watson IoT Platform provider - SAP Cloud provider - Google IoT Core provider - FUJITSU COLMINA provider [Bug fix] OPC provider: Fixed a memory leak when regenerating a controller object [Bug fix] ModbusX provider: Fixed the problem that the value stored in the array data does not match the data type. [Bug fix] FTPS provider: Fixed the problem that RAW command terminates abnormally when executing a command that is not supported by FTP [Bug fix] IoTDS provider: Fixed an issue that does not cause an error when writing to a read-only item [Bug fix] CaoTester2: Fixed an issue where an exception occurs when a large number of messages are received. [Bug fix] CaoTester2: Fixed the problem that an error occurs when PutValue / GetValue of empty data in the file class. [Bug fix] CaoTester2: Fixed the problem that the input candidates of the controller name are not displayed correctly. [Bug fix] CaoTester2: Fixed a memory leak when displaying an image [Bug fix] CaoSQL: Fixed the problem that the update date and time cannot be obtained normally for array type items. [Bug fix] CaoSQLWebAPI: Fixed an issue where an error did not occur when writing to a read-only item
2022/2/1	2.1.55	Update supported OS CaoOPCUA, OPCUA provider: Library upgrade CaoOPCUA, OPCUA provider: Added security policy support CaoOPCUA, OPCUA provider: Added support for node ID OPC provider: Added tag name option OPCUA provider: Support Ipv6

		Added option to specify tag names for OPC providers. Reviewed session management for CaoSQLWebAPI communication. YAMAHA RCX3 provider added TOSHIBA TEC TPCL provider added. KAWADA ROBOTICS NEXTAGE OPEN provider added. Detailed provider error information - OMRON CJ provider - OMRON NJ provider Corrected manufacturer name (Toshiba Machine → Shibaura Machine) Support OpenSSL 1.1.1k [Bug Fix] bCapService: Fixed the problem of abnormal termination when communication is concentrated. [Bug Fix] bCapService: Fixed a problem where the waiting time at the time of termination was too long. [Bug Fix] b-CAP provider: Fixed the problem of argument error when SSL communication option is specified. [Bug Fix] DataQueue provider: Fixed problem where data may be lost when resizing @Qsize variable. [Bug Fix] IoTDSCore provider: Fixed problem with deleting exiting library information when unregistering. [Bug Fix] OPC provider: Fixed the problem of connection failure due to communication error. [Bug fix] OPC provider: Fixed the problem that the fine cutting cannot be obtained when the communication with the OPC server is cut off. [Bug Fix] Fixed an issue where errors would stop working by default with cloud related providers. [Bug fix] Fixed the problem that the process does not terminate when the provider is run in out-process. [Bug fix] Fixed problem with misrecognition of errors for the following providers - CONTEC AIO provider - IAI SEL provider - KEYENCE KV provider - KEYENCE LK-G3000 provider - MettlerToledo WMF204C provider
2022/2/25	2.1.56	[Bug Fix] CaoSQL : Fixed command execution process.

2022/8/23	2.1.57	DENSO UR40 provider: additional data to be given upon ERROR notification OPCUA provider: AC event support enhancement CaoTester2: Added a function that allows the controller name to be determined by pressing Enter when selecting a list of controller name candidates Azure IoT provider: Additional DPS endpoint options Azure IoT provider: Add certificate authentication DummyPLC provider: multiple activation capability added Kawasaki Heavy Industries Robot provider addition Mitsubishi Electric MX Component4 provider added MTConnect provider: Enhanced tag access range OPCUA Batch Request provider addition Stream provider: Multicast IP support for UDP communication [Bug Fix] DENSO UR30 provider: fixed a problem that prevented the StartInventory command from being executed without arguments [Bug Fix] OMRON CJ provider: Fixed problem with value shift when reading/writing to word device with BOOL, BIT, I1, and UI1 arrays [Bug Fix] OMRON CJ_Hostlink provider: Fixed problem with value shift when reading/writing to word device with BOOL, BIT, I1, and UI1 arrays [Bug Fix] OMRON NJ provider: Fixed a problem with @Version to get the correct version [Bug Fix] Rockwell System5000 provider: Fixed an issue where data could not be retrieved correctly when response data came back in multiple packets [Bug Fix] Stream provider: fixed problem with AddController failing if COM option is uppercase [Bug Fix] CaoTester2: Fixed providerName input candidate display and history list behavior [Bug Fix] ManagedCaoProv Addins: Fixed a bug that the add-in menu is displayed in Japanese even if the language setting of Visual Studio is English [Bug Fix] Azure IoT provider: Fixed problem of receiving the same cloud-to-device message multiple times when using HTTP protocol [Bug Fix] Google Cloud IoT Core provider: Fixed problem where HttpEventInterval could not be changed [Bug Fix] Google Cloud IoT Core provider: Fixed an issue where deleting

		one controller would affect other controllers when multiple controllers were created using the Http protocol [Bug Fix] MxComponent provider: Fixed a problem that @Buffer variable cannot be generated [Bug Fix] OPCUA provider: Fixed the problem of not terminating normally without an application certificate
2023/4/25	2.1.58	- Azure IoT provider: Add certificate authentication for DPS connections + DENSO UR40 Provider-Add Tag Write Commands + FTPS provider: TLS1.2 supported + Kawasaki KRCC provider: Error-information acquisition function added + McAfee Embedded Control provider: Name changed to McAfee→Trellix + OPC Provider: OPCEnum Support - Added search function by entering ErrorSearch:10 decimal number - OpenSSL 3.0.8 support - Add KawadaRobotics NextageApi provider - Add Google Cloud Pub/Sub provider + [Bug Fix] CAOSQL fixes + [Bug Fix] DataImport provider: Fix to not recursively call when file-loading fails + [Bug Fix] Fixed a problem that prevented the following providers from running on dllhost + Amazon AWSIoT + Amazon AWSS3 + Dummy Camera + Dummy CNC + Dummy Panel + Dummy PLC + Dummy Robot + ECHONETLite + FTPS + FUJITSU COLMINA + Google CloudIoTCore + Google CloudStorage + IBM WatsonIoTPlatform + KawadaRobotics NextageOpen + Microsoft AzureIoT

		+ Microsoft AzureStorage + SAP IoTPlatform + SIEMENS S7NetPlus + TEC TPCL + [Bug Fix] OMRON SysmacStudio provider: Remove unnecessary file output processing. + [Bug Fix] OMRON CJ provider: Fixed an error that caused an inconsistency in the length during reception. + [Bug Fix] OPCUA provider: Fixed an issue that prevented data retrieval when arrays are omitted in event data with structured arrays. + [Bug Fix] OPCUA provider: Fixed an issue that caused abnormal termination when provider terminated.
2024/10/22	2.1.59	+ DENSO UR40 Provider: Add the Do Not Show Connectivity Logging option + DENSO IoTDS provider: Additional options for event callback settings + Add C# Provider Templates for Visual Studio 2022 - Add SOFIX SOFIXSCAN Ω Eye provider - OpenSSL 3.0.14 support. + [Bug Fix] Fixed an issue that prevented some providers from registering. + [Bug Fix] Fixed an issue with CAO.exe that caused collection Remove to run from more than one thread at the same time. + [Bug Fix] OMRON NJ provider: Fixed an issue where communication errors may occur due to duplicate access numbers. + [Bug Fix] MTConnect provider: Fixed a problem that increased the size of temporary files + [Bug Fix] Rockwell Logix5000 provider: Fixed an issue that would cause no action to be returned in the event of a communication error. + [Bug Fix] Rockwell Logix5000 provider: Fixed an issue where communication errors may occur due to duplicate access numbers.

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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.

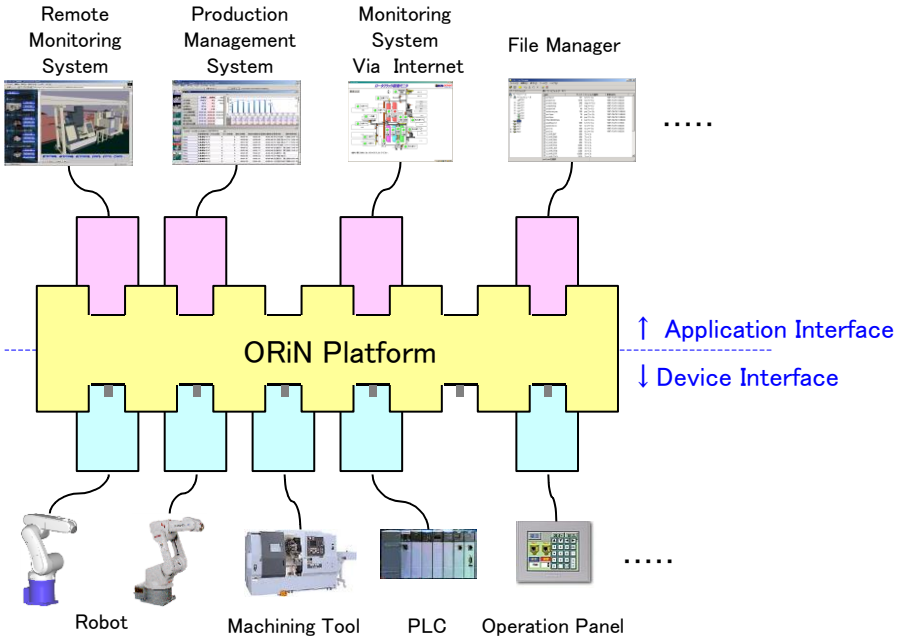

Figure1-1 Operation image of ORiN2

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.

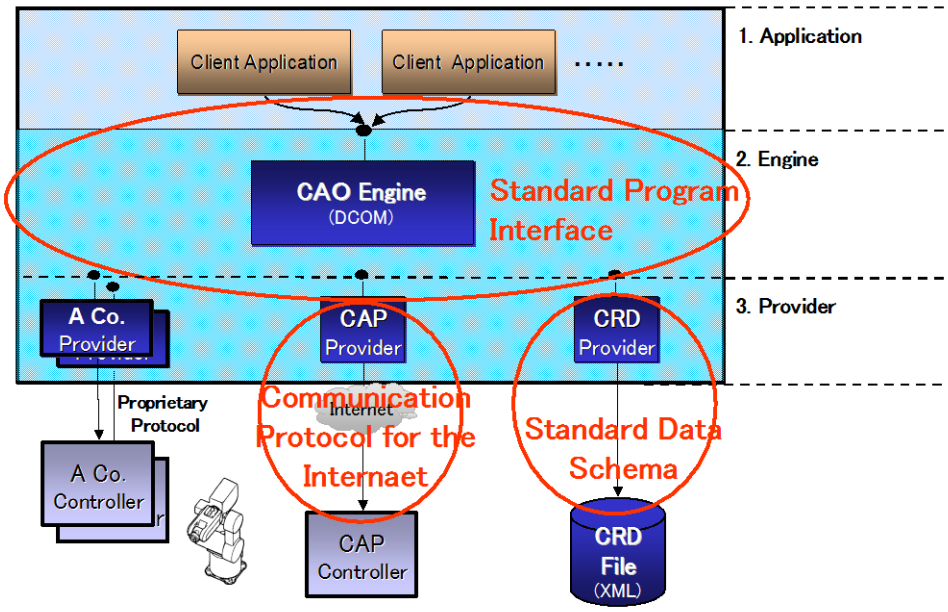

Figure2-1 Concept of ORiN2

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.

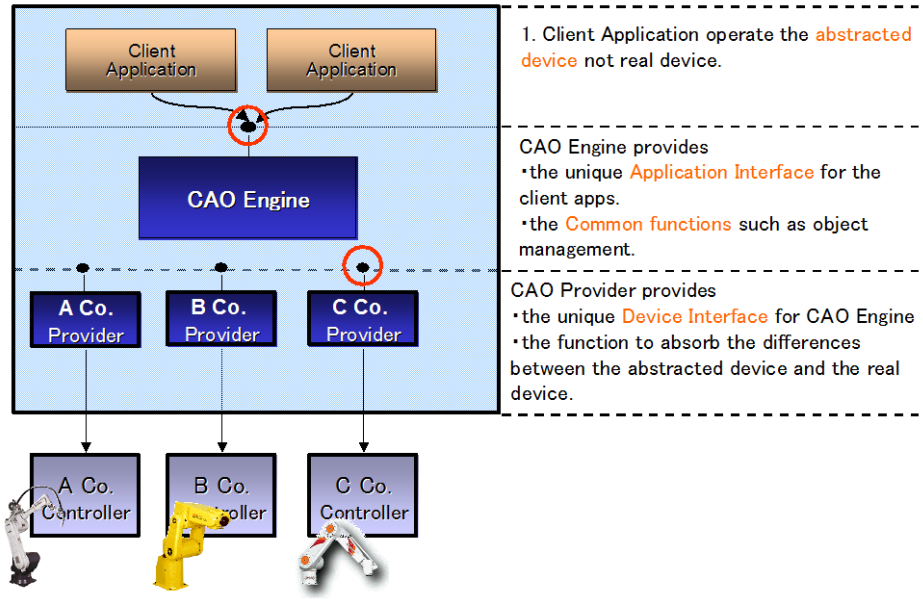

Figure2-2 Composition of CAO

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.

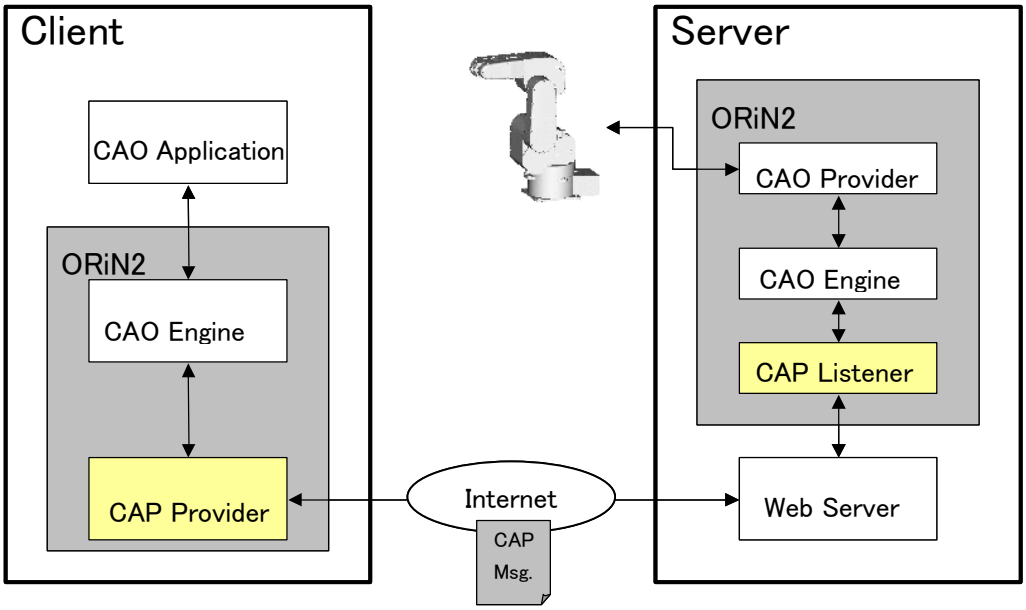

Figure2-3 Outline of CAP

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.

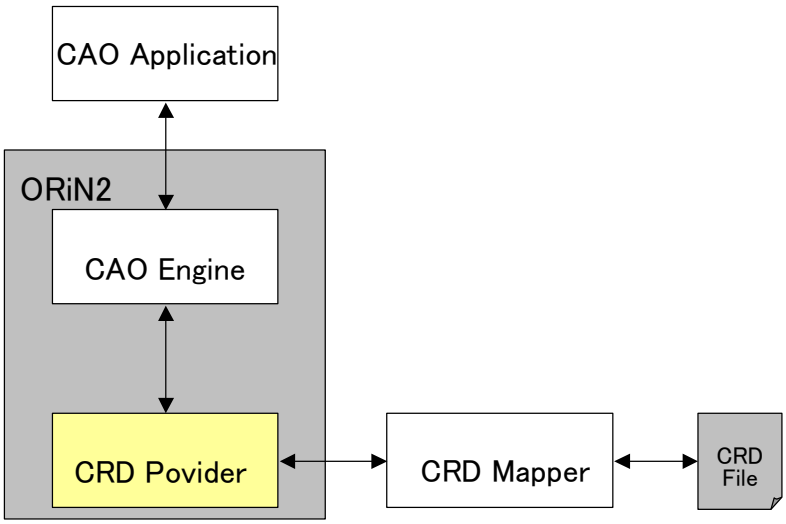

Figure2-4 Outline of access to CRD file

3. ORiN2 SDK Setup

3.1. Installation of ORiN2 SDK

Supported OS：Windows 7, Windows 8, Windows 10, Windows 11, Windows Server 2012 R2, Windows Server 2016, Windows Server 2019, Windows Server 2022

(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'.

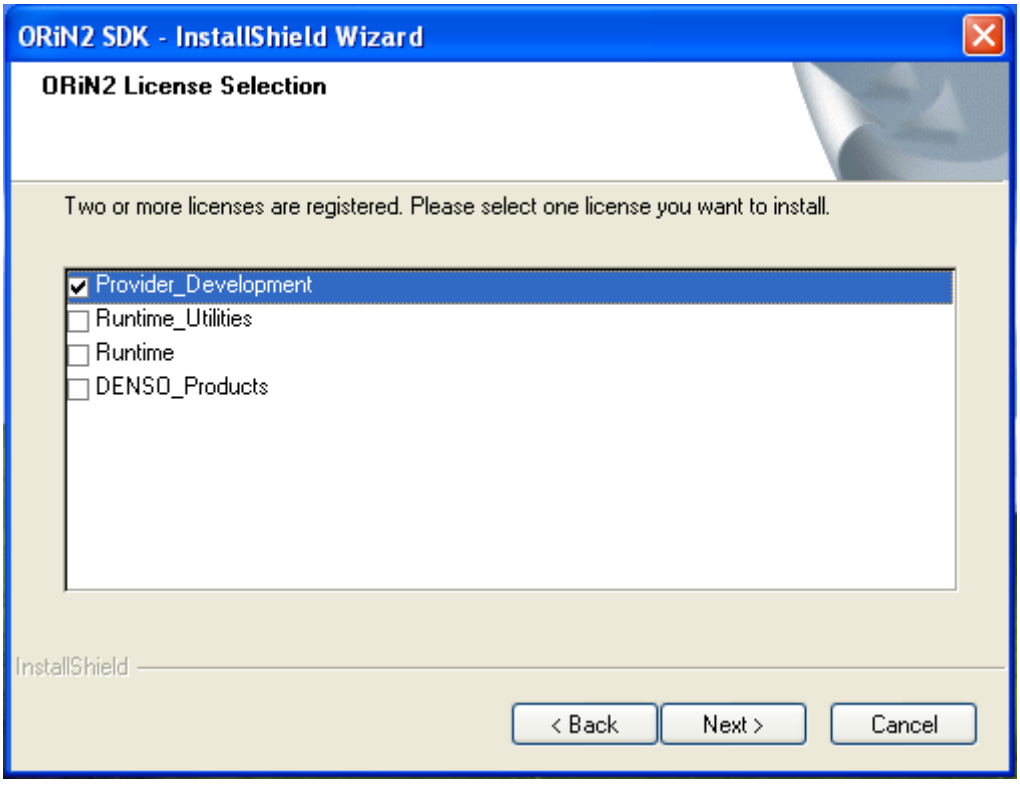

Figure3-1 Selection of component

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

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

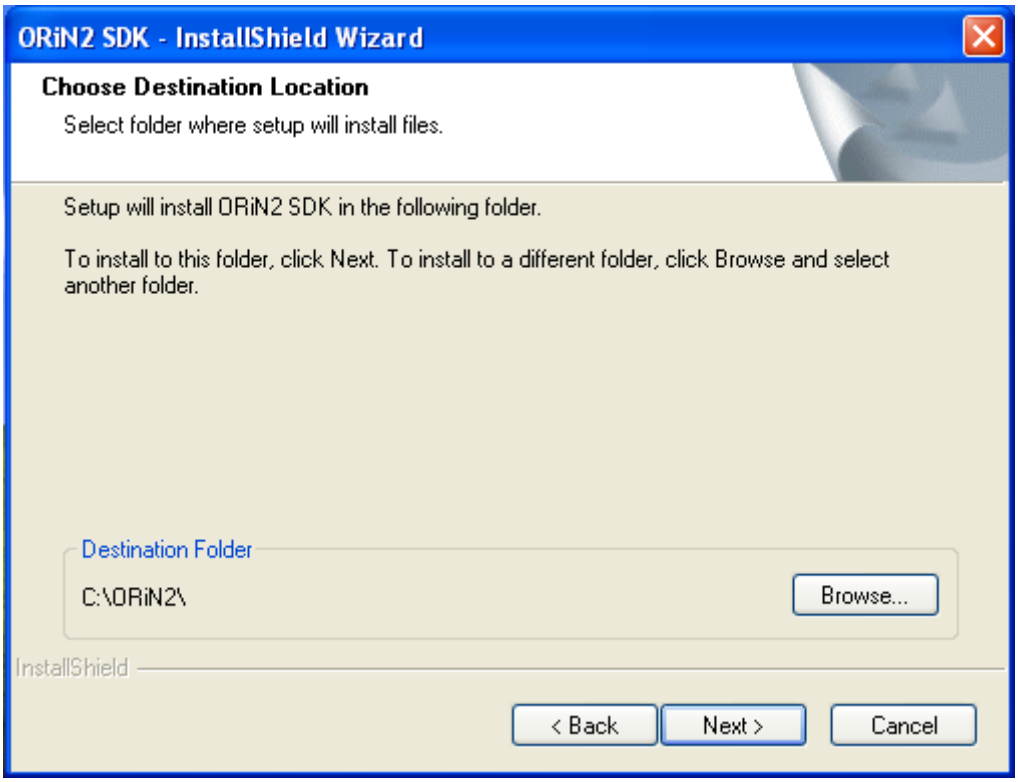

Figure3-2 Selection of folder at installation destination

(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
CaoTester2	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…".

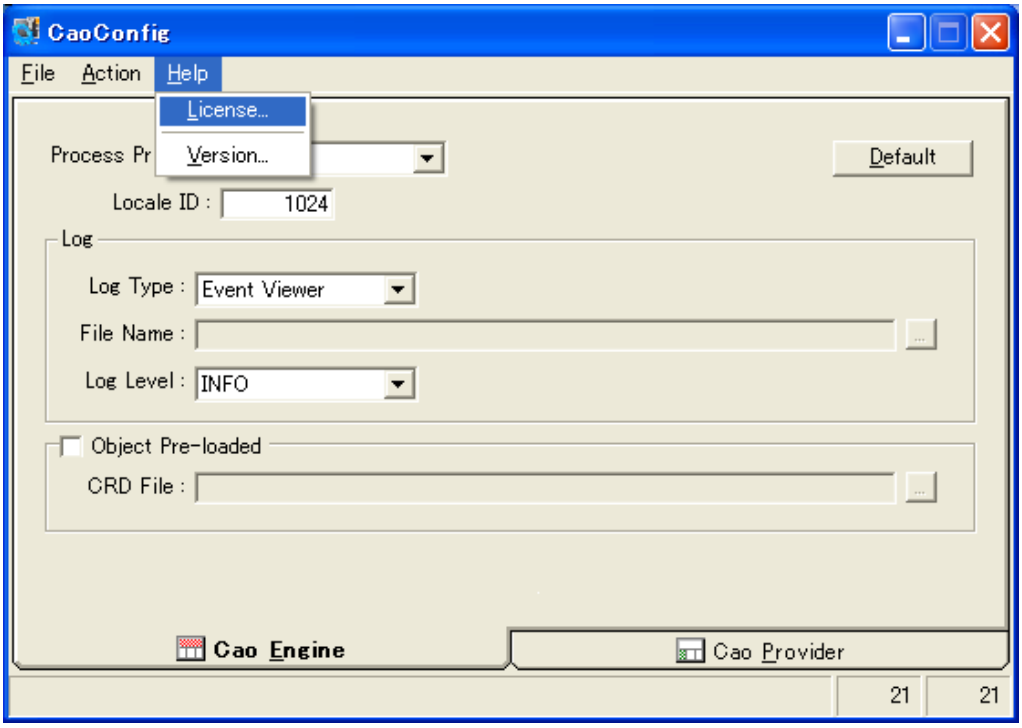

Figure3-3 The main screen of CaoConfig

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

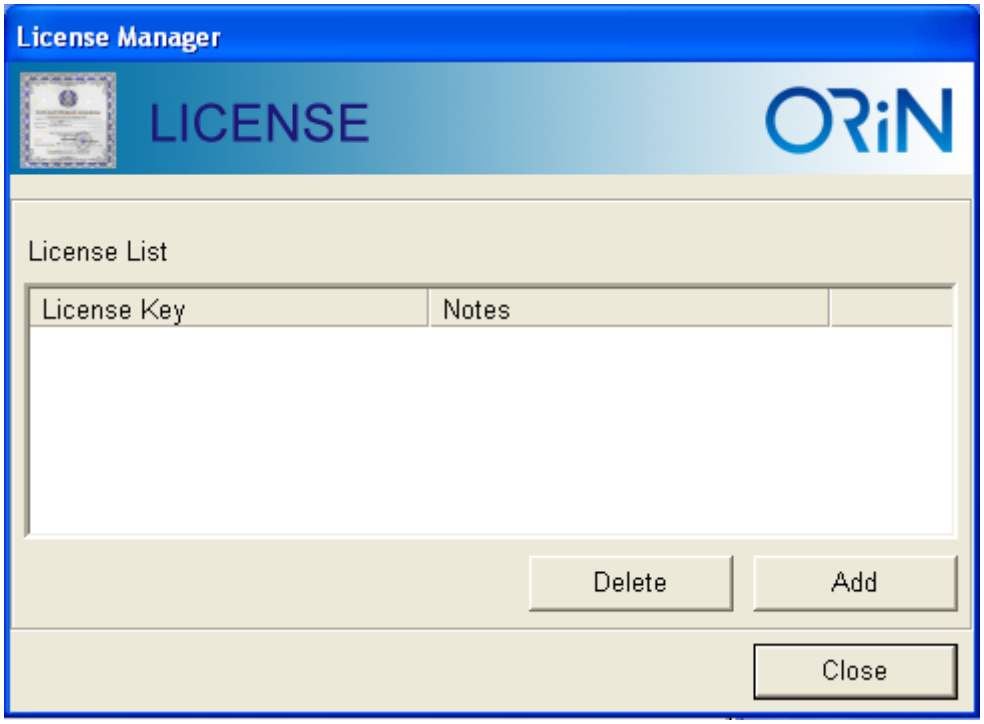

Figure3-4 ORiN2 License Manager screen

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

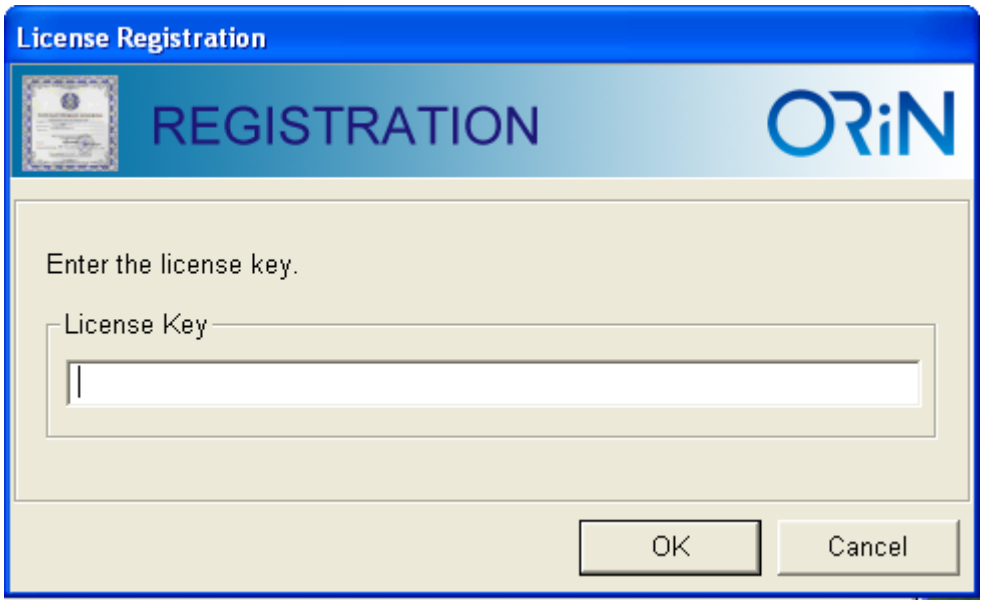

Figure3-5 License Registration screen

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]

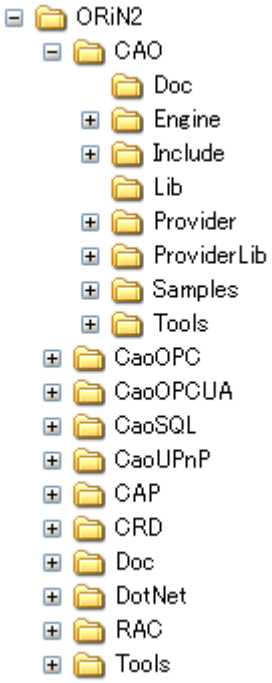

Figure3-6 ORiN2 SDK folder composition

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 three tools, CaoConfig, CaoTester and CaoTester2, 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 three tools, CaoConfig, CaoTester and CaoTester2, are supported.

CAO¥Provider	CAO provider template library	-	-	-
CAO¥ProviderLib	Each company provider	See Table 3-10		
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 four tools, CaoConfig ,CaoTester and CaoTagEditor, CaoTester2, are not included.
[6] Only four tools, CaoConfig ,CaoTester and CaoTagEditor, CaoTester2, 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 three tools, CaoConfig, CaoTester and CaoTester2, are 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)

Location	Description	Support	Binary	Source
Gateway				
CAO¥ProviderLib¥Alibaba¥IoTPlatform	Alibaba Cloud IoT Platform Provider	−	V	−
CAO¥ProviderLib¥Amazon¥AWSIoT	AWS IoT Provider	−	V	−
CAO¥ProviderLib¥Amazon¥S3	AWS S3 Provider	−	V	−
CAO¥ProviderLib¥b-CAP	b-CAP Provider	V	V	V
CAO¥ProviderLib¥Balluff¥IO-Link	Balluff IO-Link Provider	−	V	−
CAO¥ProviderLib¥Beckhoff¥TwinCAT3	TwinCAT3 ADS Provider	V	V	−
CAO¥ProviderLib¥CAP	CAP Provider	V	V	−
CAO¥ProviderLib¥CORBA	CORBA Provider	−	V	V
CAO¥ProviderLib¥Database	Database Provider	−	V	V
CAO¥ProviderLib¥DataImport	DataImport Provider	V	V	−
CAO¥ProviderLib¥DDE	DDE Provider	−	V	V
CAO¥ProviderLib¥DENSO¥Stream	Stream Provider	V	V	−
CAO¥ProviderLib¥DENSO¥IoTDS	IoTDS Provider	V	V	−
CAO¥ProviderLib¥e-CAP	e-CAP Provider	−	V	V
CAO¥ProviderLib¥FANUC¥FIELDsystem	FIELD system Provider	V	V	−
CAO¥ProviderLib¥FL-net	FL-net Provider	V	V	−
CAO¥ProviderLib¥FTP	FTP Provider	−	V	V
CAO¥ProviderLib¥FTPS	FTPS Provider	−	V	−
CAO¥ProviderLib¥FUJITSU¥COLMINA	COLMINA Provider	−	V	−
CAO¥ProviderLib¥Google¥CloudIoTCore	Cloud IoT Core Provider	−	V	−
CAO¥ProviderLib¥Google¥CloudStorage	Cloud Storage Provider	―	V	―

CAO¥ProviderLib¥Google¥CloudPubSub	Cloud Pub/Sub Provider	—	V	—
CAO¥ProviderLib¥HLA	HLA Provider	-	V	-
CAO¥ProviderLib¥IBM¥WatsonIoTPlatform	Watson IoT Platform Provider	-	V	-
CAO¥ProviderLib¥IETF¥CoAP	CoAP Provider	-	V	-
CAO¥ProviderLib¥LocalFile	LocalFile Provider	V	V	V
CAO¥ProviderLib¥MESX	MESX Provider	-	V	-
CAO¥ProviderLib¥Microsoft¥AzureIoT	Azure IoT Provider	-	V	-
CAO¥ProviderLib¥Microsoft¥Storage	Azure Storage Provider	-	V	-
CAO¥ProviderLib¥MindConnect	MindConnect Provider	-	V	-
CAO¥ProviderLib¥Modbus.X	Modbus Provider	-	V	-
CAO¥ProviderLib¥OPC	OPC Provider	V	V	-
CAO¥ProviderLIb¥OPCUA	OPC UA Provider	V	V	-
CAO¥ProviderLIb¥OPCUAMultiple	OPC UA Multiple Provider	-	V	-
CAO¥ProviderLib¥RAC	RAC Provider	-	V	V
CAO¥ProviderLib¥RAOP	RAOP Provider	-	V	V
CAO¥ProviderLib¥Roboticsware¥IPLink	IPLink Provider	-	V	V
CAO¥ProviderLib¥ROS¥ROSSerial	ROSSerial Provider	-	V	-
CAO¥ProviderLib¥SAP¥IoTPlatform	SAP Cloud IoT Platform Provider	-	V	-
CAO¥ProviderLib¥SMTP	SMTP Provider	-	V	-
CAO¥ProviderLib¥ECHONETLite	ECHONET Lite Provider	-	V	-
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard Provider	-	V	V
CAO¥ProviderLib¥CRD	CRD Provider	V	V	-
CAO¥ProviderLib¥DataQueue	DataQueue Provider	V	V	-
CAO¥ProviderLib¥DataStore	DataStore Provider	V	V	V
CAO¥ProviderLib¥DENSO¥Timer	Timer Provider	-	V	V
CAO¥ProviderLib¥Dummy	Dummy Camera Provider	-	V	V
CAO¥ProviderLib¥Dummy	Dummy CNC Provider	-	V	V
CAO¥ProviderLib¥Dummy	Dummy Panel Provider	-	V	V
CAO¥ProviderLib¥Dummy	Dummy PLC Provider	-	V	V
CAO¥ProviderLib¥Dummy	Dummy Robot Provider	-	V	V
CAO¥ProviderLib¥Dummy	Dummy Provider	-	V	V
CAO¥ProviderLib¥FUJITSU¥VPS	VPS Provider	-	V	-
CAO¥ProviderLib¥ISO16100	ISO16100 Provider	-	V	-

CAO¥ProviderLib¥ISO20242	ISO20242 Provider	−	V	−
CAO¥ProviderLib¥ICMP	ICMP Provider	−	V	V
CAO¥ProviderLib¥JSON	JSON Provider	−	V	V
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl Provider	−	V	−
CAO¥ProviderLib¥Ping	Ping Provider	−	V	V
CAO¥ProviderLib¥VBP	VBP Provider	−	V	−

I/O				
CAO¥ProviderLib¥CONTEC¥AIO	AIO Provider	−	V	−
CAO¥ProviderLib¥CONTEC¥CNT	CNT Provider	−	V	−
CAO¥ProviderLib¥CONTEC¥DIO	DIO Provider	−	V	−
CAO¥ProviderLib¥CONTEC¥DIO98	DIO98 Provider	−	V	V
CAO¥ProviderLib¥CONTEC¥FIT	FIT Provider	−	V	V
CAO¥ProviderLib¥CONTEC¥GPIB	GPIB Provider	−	V	−
CAO¥ProviderLib¥hilscher¥CIF	CIF Provider	−	V	V
CAO¥ProviderLib¥hilscher¥CIFX	CIFX Provider	−	V	−
CAO¥ProviderLib¥Hivertec¥CTR	CTR Provider	−	V	−
CAO¥ProviderLib¥Interface¥DNet	Interface DeviceNet Provider	−	V	V
CAO¥ProviderLib¥Lantronix¥XPort6	XPort6 Provider	−	V	V
CAO¥ProviderLib¥OMRON¥DNet	OMRON DeviceNet Provider	−	V	V
CAO¥ProviderLib¥PATLITE¥PHC	PHC Provider	−	V	V
CAO¥ProviderLib¥PATLITE¥PHN	PHN Provider	−	V	−
CAO¥ProviderLib¥SUNX¥S-LINK	S-Link Provider	−	V	V
CAO¥ProviderLib¥SUNX¥S-LINKV	S-LinkV Provider	−	V	V
CAO¥ProviderLib¥Woodhead¥SSTCCS	SSTCCS Provider	−	V	−
CAO¥ProviderLib¥Woodhead¥SSTDN3	SSTDN3 Provider	−	V	−
CAO¥ProviderLib¥XPort	XPort Provider	−	V	V
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC Provider	V	V	−
CAO¥ProviderLib¥DENSO¥RC8	RC8 Provider	V	V	−
CAO¥ProviderLib¥DENSO¥RC9	RC9 Provider	V	V	−
CAO¥ProviderLib¥Futaba¥RSC-U485	RSC-U485 Provider	−	V	−
CAO¥ProviderLib¥IAI¥E-Con	E-Con Provider	−	V	V
CAO¥ProviderLib¥IAI¥PCON	PCON Provider	V	V	−
CAO¥ProviderLib¥IAI¥SEL	SEL Provider	V	V	−
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 Provider	−	V	V
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 Provider	−	V	V
CAO¥ProviderLib¥YAMAHA¥SR1	SR1 Provider	V	V	−
CAO¥ProviderLIb¥YAMAHA¥RCX	RCX Provider	V	V	−
CAO¥ProviderLIb¥YAMAHA¥RCX3	RCX3 Provider	−	V	−
CAO¥ProviderLib¥KawadaRobotics¥NextageOpen	NEXTAGE OPEN Provider	−	V	V

CAO¥ProviderLib¥KawadaRobotics¥NextageApi	NEXTAGE API Provider	−	V	−
CAO¥ProviderLIb¥Kawasaki¥KRCC	KRCC Provider	−	V	−
Hand				
CAO¥ProviderLib¥KOGANEI¥EWHA	EWHA Provider	−	V	−
CAO¥ProviderLib¥TAIYO¥ESC11	ESC11 Provider	−	V	−
CAO¥ProviderLib¥TAIYO¥ESC11PCI	ESC11PCI Provider	−	V	−
PLC				
CAO¥ProviderLib¥KEYENCE¥KV	KV Provider	−	V	−
CAO¥ProviderLib¥KEYENCE¥KVCOM	KVCOM Provider	−	V	−
CAO¥ProviderLib¥MELCO¥MELSEC	MELSEC Provider	−	V	V
CAO¥ProviderLib¥MELCO¥MxCompo	MxComponent Provider	−	V	V
CAO¥ProviderLib¥MELCO¥MxCompo4	MxComponent4 Provider	−	V	−
CAO¥ProviderLib¥MELCO¥PCLink	PCLink Provider	−	V	V
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC AnA Provider	−	V	−
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C Provider	V	V	−
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E Provider	V	V	−
CAO¥ProviderLib¥OMRON¥CJ	CJ Provider	−	V	−
CAO¥ProviderLib¥OMRON¥CJ_TAG	CJ TAG Provider	−	V	−
CAO¥ProviderLib¥OMRON¥NJ	NJ Provider	V	V	−
CAO¥ProviderLib¥OMRON¥Sysmac¥Studio	Sysmac Studio Provider	−	V	−
CAO¥ProviderLib¥Rockwell¥Logix5000	Logix5000 Provider	−	V	−
CAO¥ProviderLib¥SIEMENS¥PLCSIM	PLCSIM Provider	V	V	−
CAO¥ProviderLib¥SIEMENS¥S7NetPlus	S7NetPlus Provider	V	V	−
CAO¥ProviderLib¥SLMP	SLMP Provider	−	V	−
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	TCmini Provider	−	V	V
NC & MC				
CAO¥ProviderLib¥Brother¥Protocol2	Protocol2 Provider	−	V	−
CAO¥ProviderLib¥DENSO¥MTConnect	MTConnect Provider	−	V	−
CAO¥ProviderLib¥MELCO¥MELSERVO	MELSERVO Provider	−	V	V
CAO¥ProviderLib¥YASKAWA¥Ns300	Ns300 Provider	−	V	V
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE Provider	−	V	−
CAO¥ProviderLib¥BAUMER¥VeriSens	VeriSens Provider	−	V	−

CAO¥ProviderLib¥Canon¥N10-W02	N10-W02 Provider	－	V	－
CAO¥ProviderLib¥Canon¥RV	RV Provider	－	V	－
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	－	V	－
CAO¥ProviderLib¥Cognex¥In-Sight	In-Sight Provider	－	V	－
CAO¥ProviderLib¥DALSA¥Genie	Genie Provider	－	V	－
CAO¥ProviderLib¥DirectShow	DirectShow Provider	V	V	V
CAO¥ProviderLib¥HALCON	HALCON Provider	－	V	－
CAO¥ProviderLib¥IDS¥uEye	uEye Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥CV	CV Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥CVX	CVX Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥VWXG	V-Works for XG Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥XGX	XGX Provider	－	V	－
CAO¥ProviderLib¥LinX¥GINGA	GINGA Provider	－	V	－
CAO¥ProviderLib¥Matrox¥RobCom	RobCom Provider	－	V	－
CAO¥ProviderLib¥National¥A110	A110 Provider	－	V	V
CAO¥ProviderLib¥OMRON¥F160	F160 Provider	－	V	V
CAO¥ProviderLib¥OMRON¥FZ	FZ Provider	－	V	－
CAO¥ProviderLib¥OpenCV	OpenCV Provider	V	V	－
CAO¥ProviderLib¥Panasonic¥PV	PV Provider	－	V	－
CAO¥ProviderLib¥RICOH¥R-GigE	R-GigE Provider	－	V	－
CAO¥ProviderLib¥SEC¥Camera	USB Camera Provider	－	V	V
CAO¥ProviderLib¥SHARP¥IV	IV Provider	－	V	－
CAO¥ProviderLib¥SICK¥PLOC2D	PLOC2D Provider	－	V	－
CAO¥ProviderLib ¥SOFIX¥SOFIXCANOmegaEye	SOFIXCAN Omega Eye Provider	―	V	―
CAO¥ProviderLib¥Asyril¥Eye+	Eye+ Provider	－	V	－
Sensor (Displacement meter)				
CAO¥ProviderLib¥KEYENCE¥GT	GT Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥GT2DLEP1	GT2DLEP1 Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥ILDLEP1	ILDLEP1 Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥LJ-V7000	LJ-V7000 Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥LJ-X8000	LJ-X8000 Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥LJ-X8000A	LJ-X8000A Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥LK-G3000	LK-G3000 Provider	－	V	－

CAO¥ProviderLib¥KEYENCE¥LK-G3000LkIF	LK-G3000LkIF Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥LK-G5000	LK-G5000 Provider	－	V	－
CAO¥ProviderLib¥OMRON¥ZX	ZX Provider	－	V	V
CAO¥ProviderLib¥OMRON¥ZG2	ZG2 Provider	－	V	V
CAO¥ProviderLib¥OMRON¥ZS	ZS Provider	－	V	V
CAO¥ProviderLib¥SUNX¥TRC11	TRC11 Provider	－	V	V
CAO¥ProviderLib¥SUNX¥HL-C2	HL-C2 Provider	－	V	V
CAO¥ProviderLib¥SUNX¥HL-D3	HL-D3 Provider	－	V	V
CAO¥ProviderLib¥SUNX¥HL-G1	HL-G1 Provider	－	V	V
Sensor (Other)				
CAO¥ProviderLib¥Dai-ichiSeiko¥ESTORQ	ESTORQ Provider	－	V	－
CAO¥ProviderLib¥DENSO¥AN	AN Provider	V	V	－
CAO¥ProviderLib¥DENSO¥Scanner	Scanner Provider	V	V	－
CAO¥ProviderLib¥DENSO¥SE1HUP	SE1-HU-P Provider	V	V	－
CAO¥ProviderLib¥DENSO¥ICCard	IC Card Provider	V	V	－
CAO¥ProviderLib¥DENSO¥UR20	UR20 Provider	V	V	－
CAO¥ProviderLib¥DENSO¥UR30	UR30 Provider	V	V	－
CAO¥ProviderLib¥DENSO¥UR40	UR40 Provider	V	V	－
CAO¥ProviderLib¥DENSO¥FD	FD Provider	V	V	－
CAO¥ProviderLib¥DENSO¥Q-Platform	Q-Platform Provider	V	V	－
CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX Provider	－	V	－
CAO¥ProviderLib¥MettlerToledo¥WMF204C	WMF204C Provider	－	V	－
CAO¥ProviderLib¥OJIYAS¥ad-L8	ad-L8 Provider	－	V	－
CAO¥ProviderLib¥OMRON¥V600	V600 Provider	－	V	V
CAO¥ProviderLib¥NITTA¥IFS	IFS Provider	－	V	V
CAO¥ProviderLib¥TAKASU¥RLW	RLW Provider	－	V	－
CAO¥ProviderLib¥UNIPULSE¥TMF	TMF Provider	－	V	－
CAO¥ProviderLib¥WACOH¥DynPick	DynPick Provider	－	V	－
CAO¥ProviderLib¥WACOH¥WDF-6A	WDF-6A Provider	－	V	－
CAO¥ProviderLib¥KEYENCE¥FSN40NUEP1	FSN40NUEP1 Provider	－	V	－
CAO¥ProviderLib¥SINTOKOGIO¥ZYXer	ZYXer Provider	－	V	－
HID				
CAO¥ProviderLib¥3Dconnexion¥3DMouse	3D mouse Provider	－	V	V
CAO¥ProviderLib¥DENSO¥Joystick	Joystick Provider	－	V	V

CAO¥ProviderLib¥DENSO¥TP	TPComm Provider	V	V	-
CAO¥ProviderLib¥DirectInput	DirectInput Provider	V	V	V
CAO¥ProviderLib¥SensAble¥PHANTOM	PHANTOM Provider	-	V	V
Other				
CAO¥ProviderLib¥CCS¥PDS	PDS Provider	-	V	V
CAO¥ProviderLib¥CCS¥PD3	PD3 Provider	-	V	-
CAO¥ProviderLib¥CONTEC¥SMC	SMC Provider	-	V	-
CAO¥ProviderLib¥EPSON¥ESCPOS	ESCPOS Provider	-	V	-
CAO¥ProviderLib¥FlexFactory¥anyfeed	anyfeed Provider	-	V	-
CAO¥ProviderLib¥IMAC¥IPPA	IPPA Provider	-	V	-
CAO¥ProivderLib¥KEBA¥ACF	ACF Provider	-	V	-
CAO¥ProviderLib¥KEYENCE¥LaserMarker	LaserMarker Provider	-	V	-
CAO¥ProviderLib¥National¥ANB	ANB Provider	-	V	V
CAO¥ProviderLib¥OPTEX-FA¥OPPD	OPPD Provider	-	V	-
CAO¥ProviderLib¥SATO¥SBPL	SBPL Provider	-	V	-
CAO¥ProviderLib¥StrawberryLinux¥USBRH	USBRH Provider	-	V	V
CAO¥ProviderLib¥ToshibaTec¥TPCL	TPCL Provider	-	V	-

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

Location	Description	Support	Binary	Source
Gateway				
CAO¥ProviderLib¥Alibaba¥IoTPlatform	Alibaba Cloud IoT Platform Provider	—	V	—
CAO¥ProviderLib¥Amazon¥AWSIoT	AWS IoT Provider	—	V	—
CAO¥ProviderLib¥Amazon¥S3	AWS S3 Provider	—	V	—
CAO¥ProviderLib¥b-CAP	b-CAP Provider	V	V	—
CAO¥ProviderLib¥Balluff¥IO-Link	Balluff IO-Link Provider	—	V	—
CAO¥ProviderLib¥Beckhoff¥TwinCAT3	TwinCAT3 ADS Provider	V	V	—
CAO¥ProviderLib¥CAP	CAP Provider	V	V	—
CAO¥ProviderLib¥CORBA	CORBA Provider	—	V	—
CAO¥ProviderLib¥Database	Database Provider	—	V	—
CAO¥ProviderLib¥DataImport	DataImport Provider	V	V	—
CAO¥ProviderLib¥DDE	DDE Provider	—	V	—

CAO¥ProviderLib¥DENSO¥Stream	Stream Provider	V	V	―
CAO¥ProviderLib¥DENSO¥IoTDS	IoTDS Provider	V	V	―
CAO¥ProviderLib¥e-CAP	e-CAP Provider	―	V	―
CAO¥ProviderLib¥FANUC¥FIELDsystem	FIELD system Provider	V	V	―
CAO¥ProviderLib¥FL-net	FL-net Provider	V	V	―
CAO¥ProviderLib¥FTP	FTP Provider	―	V	―
CAO¥ProviderLib¥FTPS	FTPS Provider	―	V	―
CAO¥ProviderLib¥FUJITSU¥COLMINA	COLMINA Provider	―	V	―
CAO¥ProviderLib¥Google¥CloudIoTCore	Cloud IoT Core Provider	―	V	―
CAO¥ProviderLib¥Google¥CloudStorage	Cloud Storage Provider	―	V	―
CAO¥ProviderLib¥Google¥CloudPubSub	Cloud Pub/Sub Provider	―	V	―
CAO¥ProviderLib¥HLA	HLA Provider	―	V	―
CAO¥ProviderLib¥IBM¥WatsonIoTPlatform	Watson IoT Platform Provider	―	V	―
CAO¥ProviderLib¥IETF¥CoAP	CoAP Provider	―	V	―
CAO¥ProviderLib¥LocalFile	LocalFile Provider	V	V	―
CAO¥ProviderLib¥MESX	MESX Provider	―	V	―
CAO¥ProviderLib¥Microsoft¥AzureIoT	Azure IoT Provider	―	V	―
CAO¥ProviderLib¥Microsoft¥Storage	Azure Storage Provider	―	V	―
CAO¥ProviderLib¥MindConnect	MindConnect Provider	―	V	―
CAO¥ProviderLib¥Modbus.X	Modbus Provider	―	V	―
CAO¥ProviderLib¥OPC	OPC Provider	V	V	―
CAO¥ProviderLIb¥OPCUA	OPC UA Provider	V	V	―
CAO¥ProviderLIb¥OPCUAMultiple	OPC UA Multiple Provider	―	V	―
CAO¥ProviderLib¥RAC	RAC Provider	―	V	―
CAO¥ProviderLib¥RAOP	RAOP Provider	―	V	―
CAO¥ProviderLib¥Roboticsware¥IPLink	IPLink Provider	―	V	―
CAO¥ProviderLib¥ROS¥ROSSerial	ROSSerial Provider	―	V	―
CAO¥ProviderLib¥SAP¥IoTPlatform	SAP Cloud IoT Platform Provider	―	V	―
CAO¥ProviderLib¥SMTP	SMTP Provider	―	V	―
CAO¥ProviderLib¥ECHONETLite	ECHONET Lite Provider	―	V	―
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard Provider	―	V	―
CAO¥ProviderLib¥CRD	CRD Provider	V	V	―
CAO¥ProviderLib¥DataQueue	DataQueue Provider	V	V	―

CAO¥ProviderLib¥DataStore	DataStore Provider	V	V	―
CAO¥ProviderLib¥DENSO¥Timer	Timer Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy Camera Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy CNC Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy Panel Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy PLC Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy Robot Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy Provider	―	V	―
CAO¥ProviderLib¥FUJITSU¥VPS	VPS Provider	―	V	―
CAO¥ProviderLib¥ISO16100	ISO16100 Provider	―	V	―
CAO¥ProviderLib¥ISO20242	ISO20242 Provider	―	V	―
CAO¥ProviderLib¥ICMP	ICMP Provider	―	V	―
CAO¥ProviderLib¥JSON	JSON Provider	―	V	―
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl Provider	―	V	―
CAO¥ProviderLib¥Ping	Ping Provider	―	V	―
CAO¥ProviderLib¥VBP	VBP Provider	―	V	―

I/O				
CAO¥ProviderLib¥CONTEC¥AIO	AIO Provider	―	V	―
CAO¥ProviderLib¥CONTEC¥CNT	CNT Provider	―	V	―
CAO¥ProviderLib¥CONTEC¥DIO	DIO Provider	―	V	―
CAO¥ProviderLib¥CONTEC¥DIO98	DIO98 Provider	―	V	―
CAO¥ProviderLib¥CONTEC¥FIT	FIT Provider	―	V	―
CAO¥ProviderLib¥CONTEC¥GPIB	GPIB Provider	―	V	―
CAO¥ProviderLib¥hilscher¥CIF	CIF Provider	―	V	―
CAO¥ProviderLib¥hilscher¥CIFX	CIFX Provider	―	V	―
CAO¥ProviderLib¥Hivertec¥CTR	CTR Provider	―	V	―
CAO¥ProviderLib¥Interface¥DNet	Interface DeviceNet Provider	―	V	―
CAO¥ProviderLib¥Lantronix¥XPort6	XPort6 Provider	―	V	―
CAO¥ProviderLib¥OMRON¥DNet	OMRON DeviceNet Provider	―	V	―
CAO¥ProviderLib¥PATLITE¥PHC	PHC Provider	―	V	―
CAO¥ProviderLib¥PATLITE¥PHN	PHN Provider	―	V	―
CAO¥ProviderLib¥SUNX¥S-LINK	S-Link Provider	―	V	―
CAO¥ProviderLib¥SUNX¥S-LINKV	S-LinkV Provider	―	V	―
CAO¥ProviderLib¥Woodhead¥SSTCCS	SSTCCS Provider	―	V	―
CAO¥ProviderLib¥Woodhead¥SSTDN3	SSTDN3 Provider	―	V	―
CAO¥ProviderLib¥XPort	XPort Provider	―	V	―
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC Provider	V	V	―
CAO¥ProviderLib¥DENSO¥RC8	RC8 Provider	V	V	―
CAO¥ProviderLib¥DENSO¥RC9	RC9 Provider	V	V	―
CAO¥ProviderLib¥Futaba¥RSC-U485	RSC-U485 Provider	―	V	―
CAO¥ProviderLib¥IAI¥E-Con	E-Con Provider	―	V	―
CAO¥ProviderLib¥IAI¥PCON	PCON Provider	V	V	―
CAO¥ProviderLib¥IAI¥SEL	SEL Provider	V	V	―
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 Provider	―	V	―
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 Provider	―	V	―
CAO¥ProviderLib¥YAMAHA¥SR1	SR1 Provider	V	V	―
CAO¥ProviderLIb¥YAMAHA¥RCX	RCX Provider	V	V	―
CAO¥ProviderLIb¥YAMAHA¥RCX3	RCX3 Provider	-	V	-
CAO¥ProviderLib¥KawadaRobotics¥NextageOpen	NEXTAGE OPEN Provider	-	V	-

CAO¥ProviderLib¥KawadaRobotics¥NextageApi	NEXTAGE API Provider	−	V	−
CAO¥ProviderLib¥Kawasaki¥KRCC	KRCCProvider	−	V	−

Hand				
CAO¥ProviderLib¥KOGANEI¥EWHA	EWHA Provider	―	V	―
CAO¥ProviderLib¥TAIYO¥ESC11	ESC11 Provider	―	V	―
CAO¥ProviderLib¥TAIYO¥ESC11PCI	ESC11PCI Provider	―	V	―
PLC				
CAO¥ProviderLib¥KEYENCE¥KV	KV Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥KVCOM	KVCOM Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MELSEC	MELSEC Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MxCompo	MxComponent Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MxCompo4	MxComponent4 Provider	―	V	―
CAO¥ProviderLib¥MELCO¥PCLink	PCLink Provider	―	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC AnA Provider	―	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C Provider	V	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E Provider	V	V	―
CAO¥ProviderLib¥OMRON¥CJ	CJ Provider	―	V	―
CAO¥ProviderLib¥OMRON¥CJ_TAG	CJ TAG Provider	―	V	―
CAO¥ProviderLib¥OMRON¥NJ	NJ Provider	V	V	―
CAO¥ProviderLib¥OMRON¥Sysmac¥Studio	Sysmac Studio Provider	―	V	―
CAO¥ProviderLib¥Rockwell¥Logix5000	Logix5000 Provider	―	V	―
CAO¥ProviderLib¥SIEMENS¥PLCSIM	PLCSIM Provider	V	V	―
CAO¥ProviderLib¥SIEMENS¥S7NetPlus	S7NetPlus Provider	V	V	―
CAO¥ProviderLib¥SLMP	SLMP Provider	―	V	―
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	TCmini Provider	―	V	―
NC & MC				
CAO¥ProviderLib¥Brother¥Protocol2	Protocol2 プロバイダ	―	V	―
CAO¥ProviderLib¥DENSO¥MTConnect	MTConnect プロバイダ	―	V	―
CAO¥ProviderLib¥MELCO¥MELSERVO	MELSERVO プロバイダ	―	V	―
CAO¥ProviderLib¥YASKAWA¥Ns300	NS300 プロバイダ	―	V	―
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE Provider	―	V	―
CAO¥ProviderLib¥BAUMER¥VeriSens	VeriSens Provider	―	V	―
CAO¥ProviderLib¥Canon¥N10-W02	N10-W02 Provider	―	V	―
CAO¥ProviderLib¥Canon¥RV	RV Provider	―	V	―

CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	—	V	—
CAO¥ProviderLib¥Cognex¥In-Sight	In-Sight Provider	—	V	—
CAO¥ProviderLib¥DALSA¥Genie	Genie Provider	—	V	—
CAO¥ProviderLib¥DirectShow	DirectShow Provider	V	V	—
CAO¥ProviderLib¥HALCON	HALCON Provider	—	V	—
CAO¥ProviderLib¥IDS¥uEye	uEye Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥CV	CV Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥CVX	CVX Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥VWXG	V-Works for XG Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥XGX	XGX Provider	—	V	—
CAO¥ProviderLib¥LinX¥GINGA	GINGA Provider	—	V	—
CAO¥ProviderLib¥Matrox¥RobCom	RobCom Provider	—	V	—
CAO¥ProviderLib¥National¥A110	A110 Provider	—	V	—
CAO¥ProviderLib¥OMRON¥F160	F160 Provider	—	V	—
CAO¥ProviderLib¥OMRON¥FZ	FZ Provider	—	V	—
CAO¥ProviderLib¥OpenCV	OpenCV Provider	V	V	—
CAO¥ProviderLib¥Panasonic¥PV	PV Provider	—	V	—
CAO¥ProviderLib¥RICOH¥R-GigE	R-GigE Provider	—	V	—
CAO¥ProviderLib¥SEC¥Camera	USB Camera Provider	—	V	—
CAO¥ProviderLib¥SHARP¥IV	IV Provider	—	V	—
CAO¥ProviderLib¥SICK¥PLOC2D	PLOC2D Provider	—	V	—
CAO¥ProviderLib ¥SOFIX¥SOFIXCANOmegaEye	SOFIXCAN Omega Eye Provider	—	V	—
CAO¥ProviderLib¥Asyril¥Eye+	Eye+ Provider	—	V	—
Sensor (Displacement meter)				
CAO¥ProviderLib¥KEYENCE¥GT	GT Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥GT2DLEP1	GT2DLEP1 Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥ILDLEP1	ILDLEP1 Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LJ-V7000	LJ-V7000 Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LJ-X8000	LJ-X8000 Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LJ-X8000A	LJ-X8000A Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LK-G3000	LK-G3000 Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LK-G3000LkIF	LK-G3000LkIF Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LK-G5000	LK-G5000 Provider	—	V	—

CAO¥ProviderLib¥OMRON¥ZX	ZX Provider	—	V	—
CAO¥ProviderLib¥OMRON¥ZG2	ZG2 Provider	—	V	—
CAO¥ProviderLib¥OMRON¥ZS	ZS Provider	—	V	—
CAO¥ProviderLib¥SUNX¥TRC11	TRC11 Provider	—	V	—
CAO¥ProviderLib¥SUNX¥HL-C2	HL-C2 Provider	—	V	—
CAO¥ProviderLib¥SUNX¥HL-D3	HL-D3 Provider	—	V	—
CAO¥ProviderLib¥SUNX¥HL-G1	HL-G1 Provider	—	V	V
Sensor (Other)				
CAO¥ProviderLib¥Dai-ichiSeiko¥ESTORQ	ESTORQ Provider	—	V	—
CAO¥ProviderLib¥DENSO¥AN	AN Provider	V	V	—
CAO¥ProviderLib¥DENSO¥Scanner	Scanner Provider	V	V	—
CAO¥ProviderLib¥DENSO¥SE1HUP	SE1-HU-P Provider	V	V	—
CAO¥ProviderLib¥DENSO¥ICCard	IC Card Provider	V	V	—
CAO¥ProviderLib¥DENSO¥UR20	UR20 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥UR30	UR30 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥UR40	UR40 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥FD	FD Provider	V	V	—
CAO¥ProviderLib¥DENSO¥Q-Platform	Q-Platform Provider	V	V	—
CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX Provider	—	V	—
CAO¥ProviderLib¥MettlerToledo¥WMF204C	WMF204C Provider	—	V	—
CAO¥ProviderLib¥OJIYAS¥ad-L8	ad-L8 Provider	—	V	—
CAO¥ProviderLib¥OMRON¥V600	V600 Provider	—	V	—
CAO¥ProviderLib¥NITTA¥IFS	IFS Provider	—	V	—
CAO¥ProviderLib¥TAKASU¥RLW	RLW Provider	—	V	—
CAO¥ProviderLib¥UNIPULSE¥TMF	TMF Provider	—	V	—
CAO¥ProviderLib¥WACOH¥DynPick	DynPick Provider	—	V	—
CAO¥ProviderLib¥WACOH¥WDF-6A	WDF-6A Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥FSN40NUEP1	FSN40NUEP1 Provider	—	V	—
CAO¥ProviderLib¥SINTOKOGIO¥ZYXer	ZYXer Provider	—	V	—
HID				
CAO¥ProviderLib¥3Dconnexion¥3DMouse	3D mouse Provider	—	V	—
CAO¥ProviderLib¥DENSO¥Joystick	Joystick Provider	—	V	—
CAO¥ProviderLib¥DENSO¥TP	TPComm Provider	V	V	—
CAO¥ProviderLib¥DirectInput	DirectInput Provider	V	V	—

CAO¥ProviderLib¥SensAble¥PHANTOM	PHANTOM Provider	—	V	—
Other				
CAO¥ProviderLib¥CCS¥PDS	PDS Provider	—	V	—
CAO¥ProviderLib¥CCS¥PD3	PD3 Provider	—	V	—
CAO¥ProviderLib¥CONTEC¥SMC	SMC Provider	—	V	—
CAO¥ProviderLib¥EPSON¥ESCPOS	ESCPOS Provider	—	V	—
CAO¥ProviderLib¥FlexFactory¥anyfeed	anyfeed Provider	—	V	—
CAO¥ProviderLib¥IMAC¥IPPA	IPPA Provider	—	V	—
CAO¥ProivderLib¥KEBA¥ACF	ACF Provider	—	V	—
CAO¥ProviderLib¥KEYENCE¥LaserMarker	LaserMarker Provider	—	V	—
CAO¥ProviderLib¥National¥ANB	ANB Provider	—	V	—
CAO¥ProviderLib¥OPTEX-FA¥OPPD	OPPD Provider	—	V	—
CAO¥ProviderLib¥SATO¥SBPL	SBPL Provider	—	V	—
CAO¥ProviderLib¥StrawberryLinux¥USBRH	USBRH Provider	—	V	—
CAO¥ProviderLib¥ToshibaTec¥TPCL	TPCL Provider	-	V	-

Table 3-10 ORiN2 SDK standard provider support status (Runtime)

Location	Description	Support	Binary	Source
Gateway				
CAO¥ProviderLib¥Alibaba¥IoTPlatform	Alibaba Cloud IoT Platform Provider	—	V	—
CAO¥ProviderLib¥Amazon¥AWSIoT	AWS IoT Provider	—	V	—
CAO¥ProviderLib¥Amazon¥S3	AWS S3 Provider	—	V	—
CAO¥ProviderLib¥b-CAP	b-CAP Provider	V	V	—
CAO¥ProviderLib¥Balluff¥IO-Link	Balluff IO-Link Provider	—	V	—
CAO¥ProviderLib¥Beckhoff¥TwinCAT3	TwinCAT3 ADS Provider	V	V	—
CAO¥ProviderLib¥CAP	CAP Provider	V	V	—
CAO¥ProviderLib¥CORBA	CORBA Provider	—	V	—
CAO¥ProviderLib¥Database	Database Provider	—	V	—
CAO¥ProviderLib¥DataImport	DataImport Provider	V	V	—
CAO¥ProviderLib¥DDE	DDE Provider	—	V	—
CAO¥ProviderLib¥DENSO¥Stream	Stream Provider	V	V	—
CAO¥ProviderLib¥DENSO¥IoTDS	IoTDS Provider	V	V	—

CAO¥ProviderLib¥e-CAP	e-CAP Provider	—	V	—
CAO¥ProviderLib¥FANUC¥FIELDsystem	FIELD system Provider	V	V	—
CAO¥ProviderLib¥FL-net	FL-net Provider	V	V	—
CAO¥ProviderLib¥FTP	FTP Provider	—	V	—
CAO¥ProviderLib¥FTPS	FTPS Provider	—	V	—
CAO¥ProviderLib¥FUJITSU¥COLMINA	COLMINA Provider	—	V	—
CAO¥ProviderLib¥Google¥CloudIoTCore	Cloud IoT Core Provider	—	V	—
CAO¥ProviderLib¥Google¥CloudStorage	Cloud Storage Provider	—	V	—
CAO¥ProviderLib¥Google¥CloudPubSub	Cloud Pub/Sub Provider	—	V	—
CAO¥ProviderLib¥HLA	HLA Provider	—	V	—
CAO¥ProviderLib¥IBM¥WatsonIoTPlatform	Watson IoT Platform Provider	—	V	—
CAO¥ProviderLib¥IETF¥CoAP	CoAP Provider	—	V	—
CAO¥ProviderLib¥LocalFile	LocalFile Provider	V	V	—
CAO¥ProviderLib¥MESX	MESX Provider	—	V	—
CAO¥ProviderLib¥Microsoft¥AzureIoT	Azure IoT Provider	—	V	—
CAO¥ProviderLib¥Microsoft¥Storage	Azure Storage Provider	—	V	—
CAO¥ProviderLib¥MindConnect	MindConnect Provider	—	V	—
CAO¥ProviderLib¥Modbus.X	Modbus Provider	—	V	—
CAO¥ProviderLib¥OPC	OPC Provider	V	V	—
CAO¥ProviderLIb¥OPCUA	OPC UA Provider	V	V	—
CAO¥ProviderLIb¥OPCUAMultiple	OPC UA Multiple Provider	—	V	—
CAO¥ProviderLib¥RAC	RAC Provider	—	V	—
CAO¥ProviderLib¥RAOP	RAOP Provider	—	V	—
CAO¥ProviderLib¥Roboticsware¥IPLink	IPLink Provider	—	V	—
CAO¥ProviderLib¥ROS¥ROSSerial	ROSSerial Provider	—	V	—
CAO¥ProviderLib¥SAP¥IoTPlatform	SAP Cloud IoT Platform Provider	—	V	—
CAO¥ProviderLib¥SMTP	SMTP Provider	—	V	—
CAO¥ProviderLib¥ECHONETLite	ECHONET Lite Provider	—	V	—
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard Provider	—	V	—
CAO¥ProviderLib¥CRD	CRD Provider	V	V	—
CAO¥ProviderLib¥DataQueue	DataQueue Provider	V	V	—
CAO¥ProviderLib¥DataStore	DataStore Provider	V	V	—
CAO¥ProviderLib¥DENSO¥Timer	Timer Provider	—	V	—

CAO¥ProviderLib¥Dummy	Dummy Camera Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy CNC Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Panel Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy PLC Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Robot Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Provider	—	V	—
CAO¥ProviderLib¥FUJITSU¥VPS	VPS Provider	—	V	—
CAO¥ProviderLib¥ISO16100	ISO16100 Provider	—	V	—
CAO¥ProviderLib¥ISO20242	ISO20242 Provider	—	V	—
CAO¥ProviderLib¥ICMP	ICMP Provider	—	V	—
CAO¥ProviderLib¥JSON	JSON Provider	—	V	—
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl Provider	—	V	—
CAO¥ProviderLib¥Ping	Ping Provider	—	V	—
CAO¥ProviderLib¥VBP	VBP Provider	—	V	—

I/O				
CAO¥ProviderLib¥CONTEC¥AIO	AIO Provider	—	V	—
CAO¥ProviderLib¥CONTEC¥CNT	CNT Provider	—	V	—
CAO¥ProviderLib¥CONTEC¥DIO	DIO Provider	—	V	—
CAO¥ProviderLib¥CONTEC¥DIO98	DIO98 Provider	—	V	—
CAO¥ProviderLib¥CONTEC¥FIT	FIT Provider	—	V	—
CAO¥ProviderLib¥CONTEC¥GPIB	GPIB Provider	—	V	—
CAO¥ProviderLib¥hilscher¥CIF	CIF Provider	—	V	—
CAO¥ProviderLib¥hilscher¥CIFX	CIFX Provider	—	V	—
CAO¥ProviderLib¥Hivertec¥CTR	CTR Provider	—	V	—
CAO¥ProviderLib¥Interface¥DNet	Interface DeviceNet Provider	—	V	—
CAO¥ProviderLib¥Lantronix¥Xport6	Xport6 Provider	—	V	—
CAO¥ProviderLib¥OMRON¥Dnet	OMRON DeviceNet Provider	—	V	—
CAO¥ProviderLib¥PATLITE¥PHC	PHC Provider	—	V	—
CAO¥ProviderLib¥PATLITE¥PHN	PHN Provider	—	V	—
CAO¥ProviderLib¥SUNX¥S-LINK	S-Link Provider	—	V	—
CAO¥ProviderLib¥SUNX¥S-LINKV	S-LinkV Provider	—	V	—
CAO¥ProviderLib¥Woodhead¥SSTCCS	SSTCCS Provider	—	V	—
CAO¥ProviderLib¥Woodhead¥SSTDN3	SSTDN3 Provider	—	V	—
CAO¥ProviderLib¥Xport	Xport Provider	—	V	—
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC Provider	V	V	—
CAO¥ProviderLib¥DENSO¥RC8	RC8 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥RC9	RC9 Provider	V	V	—
CAO¥ProviderLib¥Futaba¥RSC-U485	RSC-U485 Provider	—	V	—
CAO¥ProviderLib¥IAI¥E-Con	E-Con Provider	—	V	—
CAO¥ProviderLib¥IAI¥PCON	PCON Provider	V	V	—
CAO¥ProviderLib¥IAI¥SEL	SEL Provider	V	V	—
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 Provider	—	V	—
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 Provider	—	V	—
CAO¥ProviderLib¥YAMAHA¥SR1	SR1 Provider	V	V	—
CAO¥ProviderLIb¥YAMAHA¥RCX	RCX Provider	V	V	—
CAO¥ProviderLIb¥YAMAHA¥RCX3	RCX3 Provider	-	V	-
CAO¥ProviderLib¥KawadaRobotics¥NextageOpen	NEXTAGE OPEN Provider	-	V	-

CAO¥ProviderLib¥KawadaRobotics¥NextageApi	NEXTAGE API Provider	－	V	－
CAO¥ProviderLib¥Kawasaki¥KRCC	KRCC Provider	－	V	－
]Hand				
CAO¥ProviderLib¥KOGANEI¥EWHA	EWHA Provider	―	V	―
CAO¥ProviderLib¥TAIYO¥ESC11	ESC11 Provider	―	V	―
CAO¥ProviderLib¥TAIYO¥ESC11PCI	ESC11PCI Provider	―	V	―
PLC				
CAO¥ProviderLib¥KEYENCE¥KV	KV Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥KVCOM	KVCOM Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MELSEC	MELSEC Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MxCompo	MxComponent Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MxCompo4	MxComponent4 Provider	―	V	―
CAO¥ProviderLib¥MELCO¥PCLink	PCLink Provider	―	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC AnA Provider	―	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C Provider	V	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E Provider	V	V	―
CAO¥ProviderLib¥OMRON¥CJ	CJ Provider	―	V	―
CAO¥ProviderLib¥OMRON¥CJ_TAG	CJ TAG Provider	―	V	―
CAO¥ProviderLib¥OMRON¥NJ	NJ Provider	V	V	―
CAO¥ProviderLib¥OMRON¥Sysmac¥Studio	Sysmac Studio Provider	―	V	―
CAO¥ProviderLib¥Rockwell¥Logix5000	Logix5000 Provider	―	V	―
CAO¥ProviderLib¥SIEMENS¥PLCSIM	PLCSIM Provider	V	V	―
CAO¥ProviderLib¥SIEMENS¥S7NetPlus	S7NetPlus Provider	V	V	―
CAO¥ProviderLib¥SLMP	SLMP Provider	―	V	―
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	TCmini Provider	―	V	―
NC & MC				
CAO¥ProviderLib¥Brother¥Protocol2	Protocol2 Provider	―	V	―
CAO¥ProviderLib¥DENSO¥MTConnect	MTConnect Provider	―	V	―
CAO¥ProviderLib¥MELCO¥MELSERVO	MELSERVO Provider	―	V	―
CAO¥ProviderLib¥YASKAWA¥Ns300	Ns300 Provider	―	V	―
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE Provider	―	V	―
CAO¥ProviderLib¥BAUMER¥VeriSens	VeriSens Provider	―	V	―

CAO¥ProviderLib¥Canon¥N10-W02	N10-W02 Provider	―	V	―
CAO¥ProviderLib¥Canon¥RV	RV Provider	―	V	―
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	―	V	―
CAO¥ProviderLib¥Cognex¥In-Sight	In-Sight Provider	―	V	―
CAO¥ProviderLib¥DALSA¥Genie	Genie Provider	―	V	―
CAO¥ProviderLib¥DirectShow	DirectShow Provider	V	V	―
CAO¥ProviderLib¥HALCON	HALCON Provider	―	V	―
CAO¥ProviderLib¥IDS¥uEye	uEye Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥CV	CV Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥CVX	CVX Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥VWXG	V-Works for XG Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥XGX	XGX Provider	―	V	―
CAO¥ProviderLib¥LinX¥GINGA	GINGA Provider	―	V	―
CAO¥ProviderLib¥Matrox¥RobCom	RobCom Provider	―	V	―
CAO¥ProviderLib¥National¥A110	A110 Provider	―	V	―
CAO¥ProviderLib¥OMRON¥F160	F160 Provider	―	V	―
CAO¥ProviderLib¥OMRON¥FZ	FZ Provider	―	V	―
CAO¥ProviderLib¥OpenCV	OpenCV Provider	V	V	―
CAO¥ProviderLib¥Panasonic¥PV	PV Provider	―	V	―
CAO¥ProviderLib¥RICOH¥R-GigE	R-GigE Provider	―	V	―
CAO¥ProviderLib¥SEC¥Camera	USB Camera Provider	―	V	―
CAO¥ProviderLib¥SHARP¥IV	IV Provider	―	V	―
CAO¥ProviderLib¥SICK¥PLOC2D	PLOC2D Provider	―	V	―
CAO¥ProviderLib ¥SOFIX¥SOFIXCANOmegaEye	SOFIXCAN Omega Eye Provider	―	V	―
CAO¥ProviderLib¥Asyril¥Eye+	Eye+ Provider	―	V	―
Sensor (Displacement meter)				
CAO¥ProviderLib¥KEYENCE¥GT	GT Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥GT2DLEP1	GT2DLEP1 Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥ILDLEP1	ILDLEP1 Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥LJ-V7000	LJ-V7000 Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥LJ-X8000	LJ-X8000 Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥LJ-X8000A	LJ-X8000A Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥LK-G3000	LK-G3000 Provider	―	V	―

CAO¥ProviderLib¥KEYENCE¥LK-G3000LkIF	LK-G3000LkIF Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥LK-G5000	LK-G5000 Provider	―	V	―
CAO¥ProviderLib¥OMRON¥ZX	ZX Provider	―	V	―
CAO¥ProviderLib¥OMRON¥ZG2	ZG2 Provider	―	V	―
CAO¥ProviderLib¥OMRON¥ZS	ZS Provider	―	V	―
CAO¥ProviderLib¥SUNX¥TRC11	TRC11 Provider	―	V	―
CAO¥ProviderLib¥SUNX¥HL-C2	HL-C2 Provider	―	V	―
CAO¥ProviderLib¥SUNX¥HL-D3	HL-D3 Provider	―	V	―
CAO¥ProviderLib¥SUNX¥HL-G1	HL-G1 Provider	―	V	―
Sensor (Other)				
CAO¥ProviderLib¥Dai-ichiSeiko¥ESTORQ	ESTORQ Provider	―	V	―
CAO¥ProviderLib¥DENSO¥AN	AN Provider	V	V	―
CAO¥ProviderLib¥DENSO¥Scanner	Scanner Provider	V	V	―
CAO¥ProviderLib¥DENSO¥SE1HUP	SE1-HU-P Provider	V	V	―
CAO¥ProviderLib¥DENSO¥ICCard	IC Card Provider	V	V	―
CAO¥ProviderLib¥DENSO¥UR20	UR20 Provider	V	V	―
CAO¥ProviderLib¥DENSO¥UR30	UR30 Provider	V	V	―
CAO¥ProviderLib¥DENSO¥UR40	UR40 Provider	V	V	―
CAO¥ProviderLib¥DENSO¥FD	FD Provider	V	V	―
CAO¥ProviderLib¥DENSO¥Q-Platform	Q-Platform Provider	V	V	―
CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX Provider	―	V	―
CAO¥ProviderLib¥MettlerToledo¥WMF204C	WMF204C Provider	―	V	―
CAO¥ProviderLib¥OJIYAS¥ad-L8	ad-L8 Provider	―	V	―
CAO¥ProviderLib¥OMRON¥V600	V600 Provider	―	V	―
CAO¥ProviderLib¥NITTA¥IFS	IFS Provider	―	V	―
CAO¥ProviderLib¥TAKASU¥RLW	RLW Provider	―	V	―
CAO¥ProviderLib¥UNIPULSE¥TMF	TMF Provider	―	V	―
CAO¥ProviderLib¥WACOH¥DynPick	DynPick Provider	―	V	―
CAO¥ProviderLib¥WACOH¥WDF-6A	WDF-6A Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥FSN40NUEP1	FSN40NUEP1 Provider	―	V	―
CAO¥ProviderLib¥SINTOKOGIO¥ZYXer	ZYXer Provider	―	V	―
HID				
CAO¥ProviderLib¥3Dconnexion¥3DMouse	3D mouse Provider	―	V	―
CAO¥ProviderLib¥DENSO¥Joystick	Joystick Provider	―	V	―

CAO¥ProviderLib¥DENSO¥TP	TPComm Provider	V	V	―
CAO¥ProviderLib¥DirectInput	DirectInput Provider	V	V	―
CAO¥ProviderLib¥SensAble¥PHANTOM	PHANTOM Provider	―	V	―
Other				
CAO¥ProviderLib¥CCS¥PDS	PDS Provider	―	V	―
CAO¥ProviderLib¥CCS¥PD3	PD3 Provider	―	V	―
CAO¥ProviderLib¥CONTEC¥SMC	SMC Provider	―	V	―
CAO¥ProviderLib¥EPSON¥ESCPOS	ESCPOS Provider	―	V	―
CAO¥ProviderLib¥FlexFactory¥anyfeed	anyfeed Provider	―	V	―
CAO¥ProviderLib¥IMAC¥IPPA	IPPA Provider	―	V	―
CAO¥ProivderLib¥KEBA¥ACF	ACF Provider	―	V	―
CAO¥ProviderLib¥KEYENCE¥LaserMarker	LaserMarker Provider	―	V	―
CAO¥ProviderLib¥National¥ANB	ANB Provider	―	V	―
CAO¥ProviderLib¥OPTEX-FA¥OPPD	OPPD Provider	―	V	―
CAO¥ProviderLib¥SATO¥SBPL	SBPL Provider	―	V	―
CAO¥ProviderLib¥StrawberryLinux¥USBRH	USBRH Provider	―	V	―
CAO¥ProviderLib¥ToshibaTec¥TPCL	TPCL Provider	-	V	-

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

Location	Description	Support	Binary	Source
Gateway				
CAO¥ProviderLib¥b-CAP	b-CAP Provider	V	V	―
CAO¥ProviderLib¥DENSO¥Stream	Stream Provider	V	V	―
CAO¥ProviderLib¥DENSO¥IoTDS	IoTDS Provider	V	V	―
CAO¥ProviderLib¥FTP	FTP Provider	―	V	―
CAO¥ProviderLib¥FTPS	FTPS Provider	―	V	―
CAO¥ProviderLib¥LocalFile	LocalFile Provider	―	V	―
CAO¥ProviderLib¥SMTP	SMTP Provider	―	V	―
Utility				
CAO¥ProviderLib¥CRD	CRD Provider	V	V	―
CAO¥ProviderLib¥DataQueue	DataQueue Provider	V	V	―
CAO¥ProviderLib¥DataStore	DataStore Provider	V	V	―
CAO¥ProviderLib¥DENSO¥Timer	Timer Provider	―	V	―

CAO¥ProviderLib¥Dummy	Dummy Camera Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy CNC Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Panel Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy PLC Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Robot Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Provider	—	V	—
CAO¥ProviderLib¥JSON	JSON Provider	—	V	—
CAO¥ProviderLib¥Ping	Ping Provider	—	V	—
CAO¥ProviderLib¥VBP	VBP Provider	—	V	—
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC Provider	V	V	—
CAO¥ProviderLib¥DENSO¥RC8	RC8 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥RC9	RC9 Provider	V	V	—
Vision				
CAO¥ProviderLib¥Basler¥Pylon¥GigE	Pylon GigE Provider	—	V	—
CAO¥ProviderLib¥Canon¥N10-W02	N10-W02 Provider	—	V	—
CAO¥ProviderLib¥Canon¥WebView	WebView Livescope Provider	—	V	—
CAO¥ProviderLib¥DirectShow	DirectShow Provider	V	V	—
CAO¥ProviderLib¥HALCON	HALCON Provider	—	V	—
CAO¥ProviderLib¥IDS¥uEye	uEye Provider	—	V	—
CAO¥ProviderLib¥OpenCV	OpenCV Provider	V	V	—
CAO¥ProviderLib¥SICK¥PLOC2D	PLOC2D Provider	—	V	—
Sensor (Other)				
CAO¥ProviderLib¥DENSO¥AN	AN Provider	V	V	—
CAO¥ProviderLib¥DENSO¥Scanner	Scanner Provider	V	V	—
CAO¥ProviderLib¥DENSO¥SE1HUP	SE1-HU-P Provider	V	V	—
CAO¥ProviderLib¥DENSO¥ICCard	IC Card Provider	V	V	—
CAO¥ProviderLib¥DENSO¥UR20	UR20 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥UR30	UR30 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥UR40	UR40 Provider	V	V	—
CAO¥ProviderLib¥DENSO¥FD	FD Provider	V	V	—
CAO¥ProviderLib¥DENSO¥Q-Platform	Q-Platform Provider	V	V	—
CAO¥ProviderLib¥SINTOKOGIO¥ZYXer	ZYXer Provider	—	V	—

HID				
CAO¥ProviderLib¥DENSO¥TP	TPComm Provider	V	V	―
CAO¥ProviderLib¥DirectInput	DirectInput Provider	V	V	―

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

Location	Description	Support	Binary	Source
Gateway				
CAO¥ProviderLib¥b-CAP	b-CAP Provider	―	V	―
CAO¥ProviderLib¥CAP	CAP Provider	―	V	―
CAO¥ProviderLib¥DENSO¥Stream	Stream Provider	―	V	―
CAO¥ProviderLib¥DENSO¥IoTDS	IoTDS Provider	―	V	―
CAO¥ProviderLib¥e-CAP	e-CAP Provider	―	V	―
CAO¥ProviderLib¥FTP	FTP Provider	―	V	―
CAO¥ProviderLib¥FTPS	FTPS Provider	―	V	―
CAO¥ProviderLib¥IETF¥CoAP	CoAP Provider	―	V	―
CAO¥ProviderLib¥LocalFile	LocalFile Provider	―	V	―
CAO¥ProviderLib¥OPC	OPC Provider	―	V	―
CAO¥ProviderLib¥RAC	RAC Provider	―	V	V
CAO¥ProviderLib¥SMTP	SMTP Provider	―	V	―
Utility				
CAO¥ProviderLib¥Blackboard	Blackboard Provider	―	V	―
CAO¥ProviderLib¥CRD	CRD Provider	―	V	―
CAO¥ProviderLib¥DataQueue	DataQueue Provider	―	V	―
CAO¥ProviderLib¥DataStore	DataStore Provider	―	V	V
CAO¥ProviderLib¥DENSO¥Timer	Timer Provider	―	V	―
CAO¥ProviderLib¥Dummy	Dummy Camera Provider	―	V	V
CAO¥ProviderLib¥Dummy	Dummy CNC Provider	―	V	V
CAO¥ProviderLib¥Dummy	Dummy Panel Provider	―	V	V
CAO¥ProviderLib¥Dummy	Dummy PLC Provider	―	V	V
CAO¥ProviderLib¥Dummy	Dummy Robot Provider	―	V	V
CAO¥ProviderLib¥ICMP	ICMP Provider	―	V	―
CAO¥ProviderLib¥JSON	JSON Provider	―	V	V
CAO¥ProviderLib¥McAfee¥EmbeddedControl	EmbeddedControl Provider	―	V	―

CAO¥ProviderLib¥Ping	Ping Provider	―	V	―
CAO¥ProviderLib¥VBP	VBP Provider	―	V	―
Robot				
CAO¥ProviderLib¥DENSO¥NetwoRC	NetwoRC Provider	―	V	―
CAO¥ProviderLib¥DENSO¥RC8	RC8 Provider	―	V	―
CAO¥ProviderLib¥DENSO¥RC9	RC9 Provider	―	V	―
CAO¥ProviderLib¥KONDO¥RCB-1	RCB-1 Provider	―	V	V
CAO¥ProviderLib¥KONDO¥RCB-3	RCB-3 Provider	―	V	V
CAO¥ProviderLib¥KawadaRobotics¥NextageOpen	NEXTAGE OPEN Provider	-	V	-
CAO¥ProviderLib¥KawadaRobotics¥NextageApi	NEXTAGE API Provider	-	V	-
PLC				
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3C Provider	―	V	―
CAO¥ProviderLib¥Mitsubishi¥MELSEC	MELSEC QnA3E Provider	―	V	―
CAO¥ProviderLib¥OMRON¥NJ	NJ Provider	―	V	―
CAO¥ProviderLib¥ToshibaMachine¥Tcmini	TCmini Provider	―	V	V
Vision				
CAO¥ProviderLib¥DirectShow	DirectShow Provider	―	V	―
CAO¥ProviderLib¥OpenCV	OpenCV Provider	―	V	―
CAO¥ProviderLib¥SEC¥Camera	USB Camera Provider	―	V	V
Sensor (Other)				
CAO¥ProviderLib¥DENSO¥AN	AN Provider	―	V	―
CAO¥ProviderLib¥DENSO¥Scanner	Scanner Provider	―	V	―
CAO¥ProviderLib¥DENSO¥SE1HUP	SE1-HU-P Provider	―	V	―
CAO¥ProviderLib¥DENSO¥ICCard	IC Card Provider	―	V	―
CAO¥ProviderLib¥DENSO¥UR20	UR20 Provider	―	V	―
CAO¥ProviderLib¥DENSO¥UR30	UR30 Provider	―	V	―
CAO¥ProviderLib¥DENSO¥UR40	UR40 Provider	―	V	―
CAO¥ProviderLib¥DENSO¥FD	FD Provider	―	V	―
CAO¥ProviderLib¥DENSO¥Q-Platform	Q-Platform Provider	―	V	―
CAO¥ProviderLib¥HOKUYO¥URG-04LX	URG-04LX Provider	―	V	―
HID				
CAO¥ProviderLib¥DENSO¥Joystick	Joystick Provider	―	V	V
CAO¥ProviderLib¥DENSO¥TP	TPComm Provider	―	V	―

CAO¥ProviderLib¥DirectInput	DirectInput Provider	—	V	—
Other				
CAO¥ProviderLib¥ToshibaTec¥TPCL	TPCL Provider	-	V	-

Table3-13 ORiN2 SDK provider support status (free)

Location	Description	Support	Binary	Source
Gateway				
CAO¥ProviderLib¥CAP	CAP Provider	—	V	—
Robot				
CAO¥ProviderLib¥KawadaRobotics¥NextageOpen	NEXTAGE OPEN Provider	-	V	-
CAO¥ProviderLib¥KawadaRobotics¥NextageApi	NEXTAGE API Provider	-	V	-
Utility				
CAO¥ProviderLib¥CRD	CRD Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Camera Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy CNC Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Panel Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy PLC Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Robot Provider	—	V	—
CAO¥ProviderLib¥Dummy	Dummy Provider	—	V	—
Other				
CAO¥ProviderLib¥ToshibaTec¥TPCL	TPCL Provider	-	V	-

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.

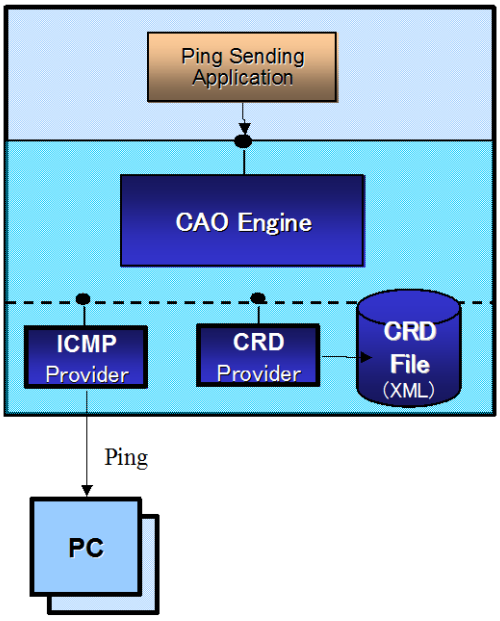

Figure4-1 Outline of sample application

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.

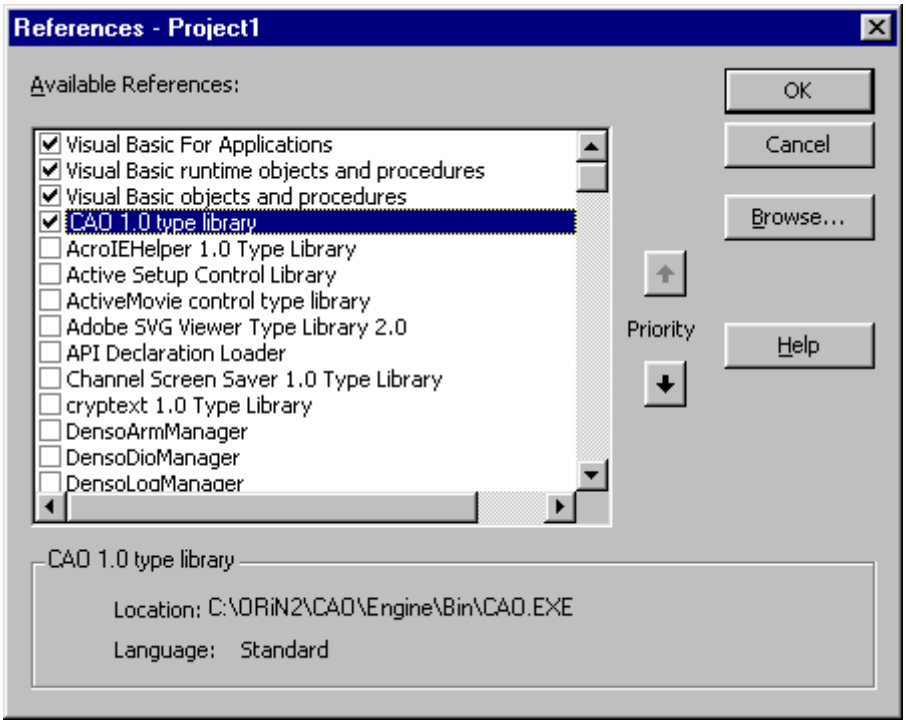

Figure4-2 Reference to CAO type library

(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).

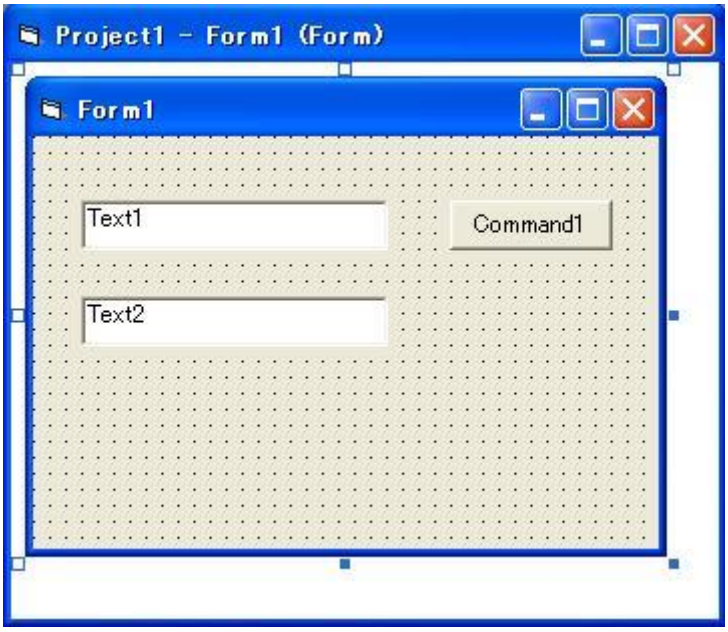

Figure4-3 Making of form

(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.

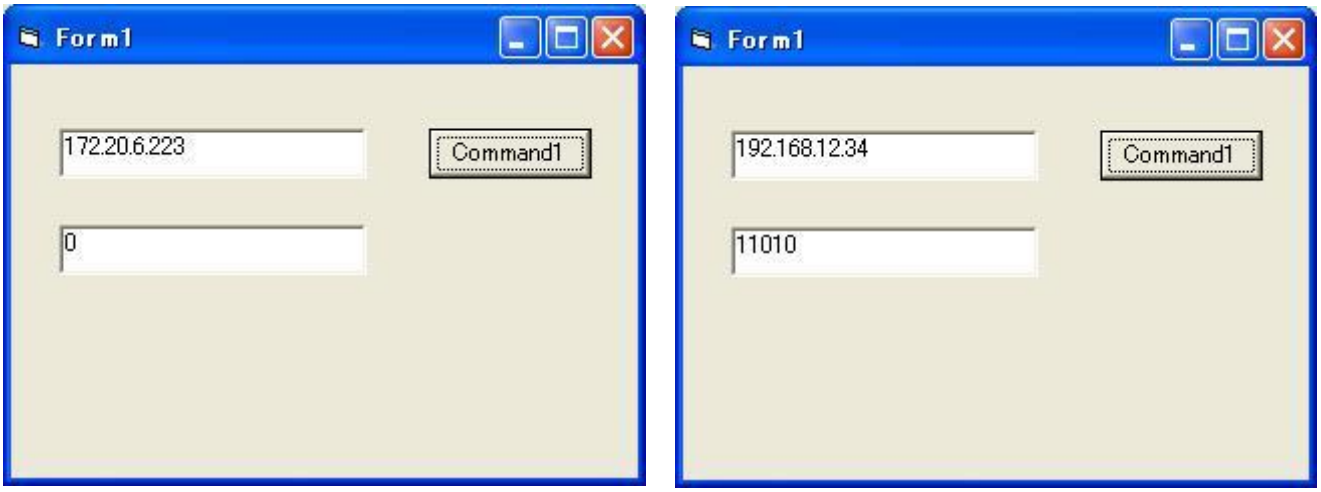

Figure4-4 ICMP provider execution result

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.

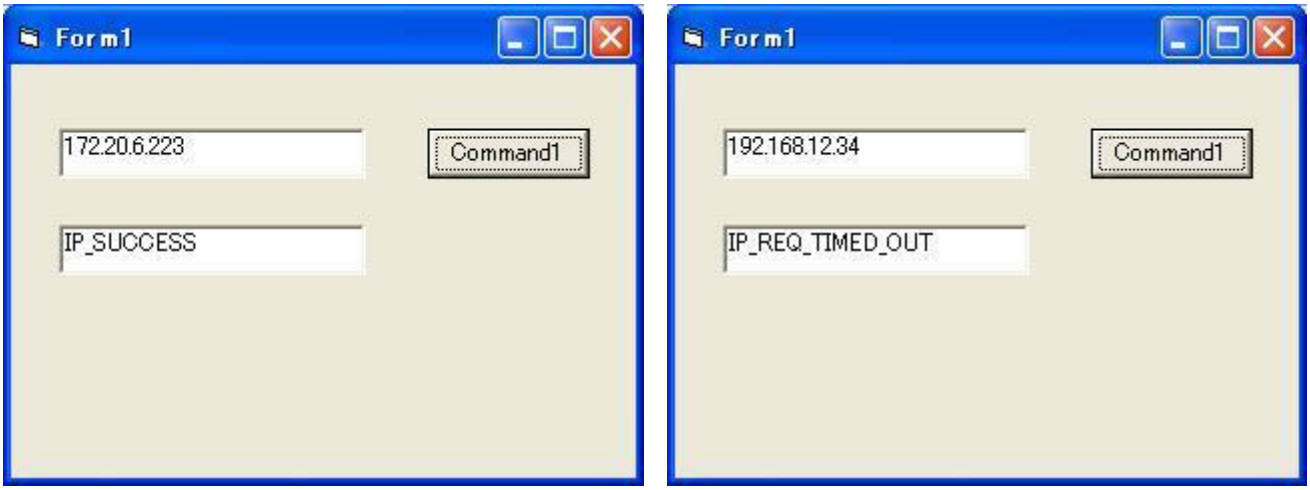

Figure4-5 Example of executing application using CRD

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/