DENSO

ORiN2 Software Development Kit
Case studies

ORiN Version 2

Case 1
Inspection process automation

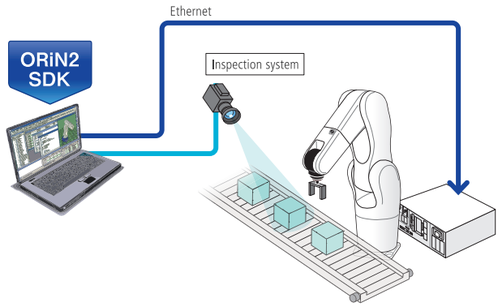
Aim A visual inspection system is running on a personal computer. Establish an automatic inspection process by combining the system and robots.

Is it possible to control all operations with a personal computer because our staff have excellent knowledge of computer programming languages?

ORiN2

ORiN makes it easy to control robots in existing inspection system

Since ORiN supports variety of programming languages, such as VB, C++, Java, users can easily incorporate robot control commands into the existing inspection system.



Case 2
Production process automation

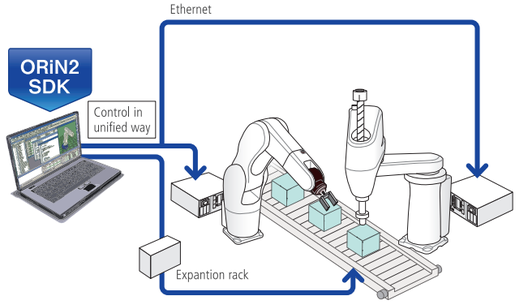
Aim By using a computer for the system control instead of PLC, establish a versatile production system that can control respective devices uniformly.

Our staffs do not have good knowledge of PLCs or robots, but have enough personal computer knowledge. Are there any simple solutions for automation?

ORiN2

With general computer programming languages, ORiN establishes versatile production system

By using providers that support robots and devices, users can create control programs with general computer programming language, and this will provide uniform development environment.



Case 3
Factory information system development

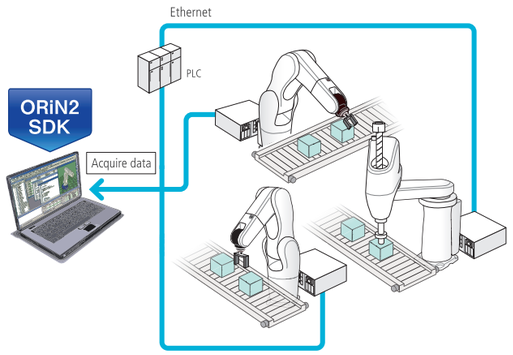
Aim Create software that exports information from robots and PLCs to databases and monitors equipment status of the facilities.

Our staff have VBA (Access, Excel) level of programing knowledge. Is there any cost-efficient development method?

ORiN2

ORiN software supports data correction to allow PC-based equipment management

ORiN2 SDK tools (CaoSQL, etc.) enable quick and easy data collection from equipment, by allowing users to develop by VBA or other general program languages.



DENSO

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Open
Resource
Interface for the
Network

ORiN
Open Resource Interface for the Network

ORiN2
PC Integration Middleware

ORiN2 is a middleware specification designed for IT systems
in the factory automation domain that has been established by ORiN Consortium.

ORiN2

Open Resource Interface for the Network

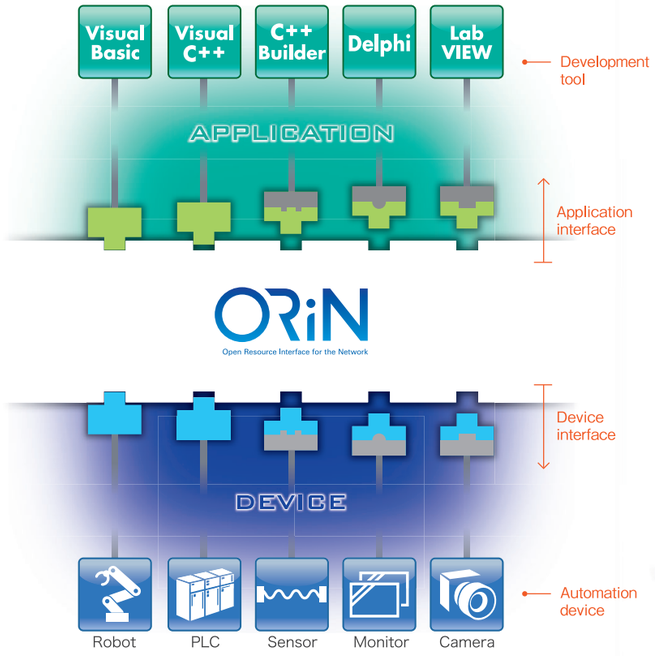
What is ORiN2

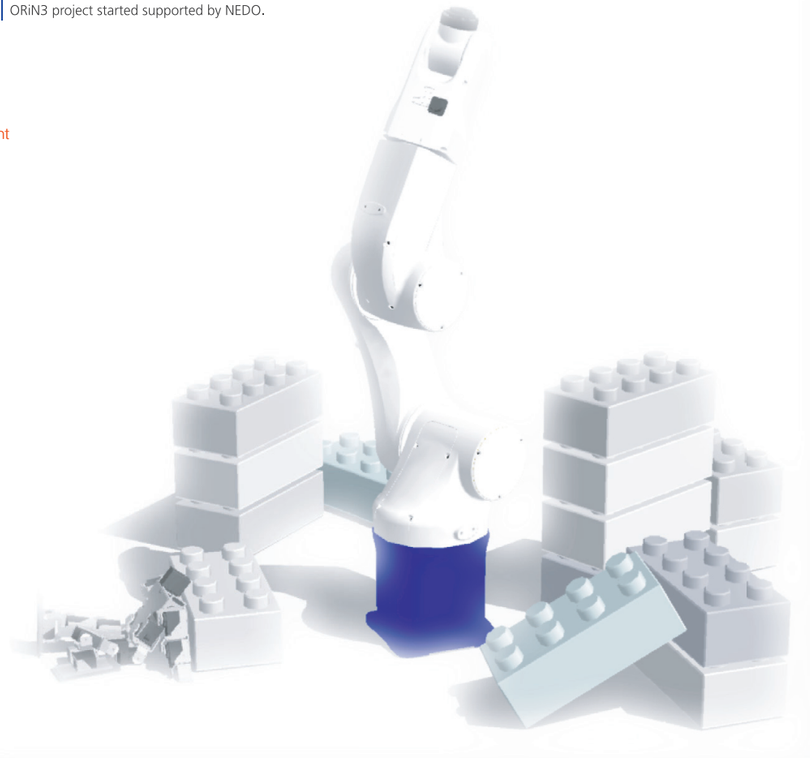
ORiN is a standard middleware specification that has been established for factory IT systems. ORiN2 is the second version of this specification. ORiN2 provides a standard interface for applications, devices, specifications and data schemas including standard communication protocols. Creating provider module (expansion module) based on this specification will realize the standardized access method for various devices. This enhances the reusability and the reliability of factory IT systems, reduces the system development time, and achieves rapid implementation.

History

1999	Started as a part of standardization activity in Japan Robot Association (JARA). *NEDO (New Energy and Industrial Technology Development Organization) supported ORiN development for three years.
1999	ORiN was exhibited at the International Robot Exhibition (iREX). *At iREX2001, JARA member companies participated in ORiN field connection demonstration.
2001	Version 1.0 was formally established.
2002	ORiN Consortium was founded to promote and enhance the ORiN standard.
2005	Version 2.0 was formally established.
2006	ORiN2 SDK was released by DENSO.
2007	ORiN2 SDK was awarded in The Robot Award by the Ministry of Economy, Trade and Industry of Japan.
2011	Application example of ORiN was approved as a part of ISO20242-4.
2016	ORiN3 project started supported by NEDO.

Function image





Concerns on system development environment

In general, one production line consists of various manufacturer's robots and PLCs, and each of them is controlled by manufacturer-original communication specification, making the entire system complicated.

LOSS Longer development time, higher maintenance cost.

ORiN2

ORiN2 benefits

Using general programming languages and unified connection by ORiN platform will

reduce development time and maintenance cost.

PC Integration Middleware

DENSO

ORiN Version 2

ORiN2 Software Development Kit

ORiN2 SDK is a software tool kit used to develop an application program or provider based on ORiN2 specification.
With this middleware, users easily control various automation devices and develop equipment information collection systems by using computer general programming languages. Also, this middleware has development assistance functions to realize connection with various automation devices and integration with other communication standards.

Features

Providing standard interfaces

To make the system development of distributed object technology-supporting systems (such as DCOM, SOAP) easy, two types of standard interfaces are prepared; for application and for device.

Development tool options

OLE (COM, Active-X) -supported development tools are available.
・Visual C++ ・C++ Builder ・Visual Basic
・Delphi ・LabVIEW ・Excel etc.

Application reuse

Providing a common gateway for different communication specifications improves the reusability of existing application.

Create original provider

With "Provider Wizard", users can create original provider for function expansion.

Package Type	ORiN2 Software Development Kit (ver.2.1.34)											
	Provider Development			Runtime + Utilities Set			Runtime			DENSO Products		
Purpose	Provider Development + Execution Environment			Execution Environment + Expanded Components			Execution Environment			Execution Environment (limited to DENSO Products)		
Application	Support	Binary	Source	Support	Binary	Source	Support	Binary	Source	Support	Binary	Source
ORiN engine *1	✔	✔		✔	✔		✔	✔		✔	✔	
ORiN provider development tools	✔	✔										
ORiN provider *2 (quantity)	✔	✔	✔	✔	✔		✔	✔		✔	✔	
	29	155	62	29	155	0	29	155	0	16	32	0
Test and configuration tools	✔	✔		✔	✔		✔	✔*8		✔	✔*8	
CaoOPC *3	✔	✔		✔	✔							
CaoOPCUA *4	✔	✔		✔	✔							
CaoSQL *5	✔	✔		✔	✔		✔	✔		✔	✔	
CaoUPnP *6		✔			✔							
CaoScript *7		✔			✔							

*1. EXE type COM component. It is middleware that implements ORiN interface and works as a core of ORiN. It provides common function and ORiN interface for client.
*2. DLL type COM component. It is communication interface connecting automation devices and computers. It absorbs the communication specification differences among devices.
*3. Gateway module for ORiN that provides OPC server functions.
*4. Gateway module for ORiN that provides OPC UA server functions. If you use CaoOPCUA, you need to prepare an OPC UA server license separately.
*5. It is middleware for data management that collects data from various automation devices and provides the collected data to the client application of CaoSQL (e.g., operation management and production instruction software).
*6. Gateway module for ORiN that provides UPnP (Universal Plug and Play) device functions.
*7. Simple program development environment. Users can develop simple application programs with script language (CaoScript).
*8. Only CaoConfig, and CaoTester are offered.

System requirements 【OS】Windows® 7 / 8 / 10
【PC】CPU : Pentium® Ⅲ 1 GHz or faster, Memory : 512 MB or more, HDD : more than 500 MB of free space