

EtherCAT[®] is a world-greatest-class machine control network which can achieve high-capacity and high-speed communication to multi axes and multi nodes without installing expansion boards, only by directly controlling LAN ports on industrial PCs (IPC).
RSI-ECAT is an EtherCAT master stack software for using this EtherCAT[®] on real time OS "INtime[®]"

◆ What is RSI-ECAT-Master?

● Ultrafast and Real-time Fieldbus

EtherCAT[®] has a communication environment based on 100Mbps Ethernet whose two-way transmission is communicating data frames like ringed railways so as to enhance transmission efficiency between master and slave. Since the data is circulated at high speed, a communicative delay can be kept to a minimum. You can achieve more high-speed real time fieldbus using mighty CPU power of IPC.

● Maximum Extension Distance and Maximum Node Number

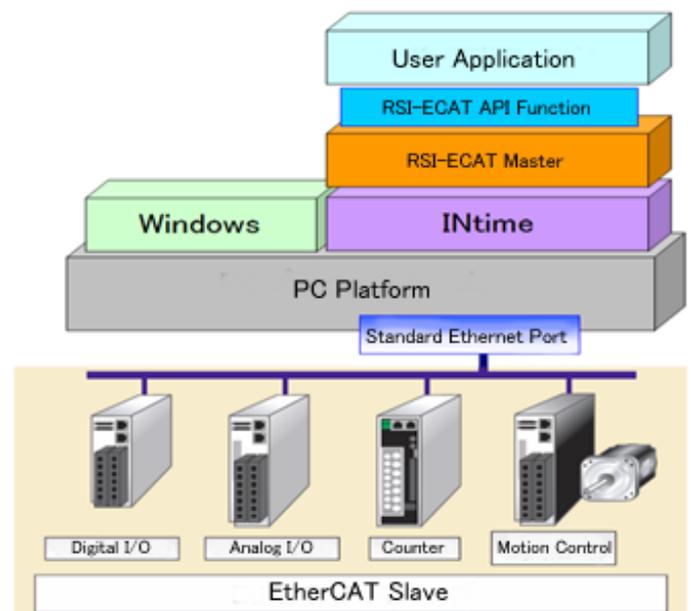
The maximum extension distance is 100m of EtherCAT[®], this is the same situation as Ethernet whose maximum extension distance of 100Base-TX is 100m. According to EtherCAT[®] specifications, the maximum number of nodes is 65535, therefore you can adopt flexible wiring patterns.

● Without Expansion Boards, Achieve Fieldbus Promptly

RSI-ECAT-Master enables you to achieve fieldbus without installing any expansion boards. You can configure it if you only have an Ethernet interface in your IPC and you can use a general-purpose Ethernet cable as a network cable. Therefore you can lower costs towards hardware.

◆ Main Features

- RSI-ECAT is an EtherCAT master software for INtime[®] RTOS.
- Development environments for applications: Visual Studio Ver 2008 / 2010 / 2012
- C / C++ language can be used in developing applications
- Beginners can make EtherCAT applications easily by using user-friendly APIs.
- You can connect to various EtherCAT slave devices.
- To make the configuration of devices, RSI-ECAT-Studio is used.



⊕ API List (Excerpt)

Initialization	EhOpen()	Start EtherCAT communication
	EhClose()	End EtherCAT communication
Master Control	EhRqState()	Change Master state
	EhGetState()	Get Master state
	EhWaitForCyclic()	Wait for Master Cyclic Process
Search / Manage Slave	EhFindSlave()	Search Slave
	EhGetSlaveStatus()	Get Slave status
	EhGetOnlineSlaveCount()	Get connected Slave Count
ProcessData Access	EhReadByte()	Read 8 bit Data from VIOS IN area
	EhWriteByte()	Write 8 bit Data to VIOS OUT area
	EhReadWord()	Read 16 bit Data from VIOS IN area
	EhWriteWord()	Write 16 bit Data to VIOS OUT area
	EhReadDWord()	Read 32 bit Data from VIOS IN area
	EhWriteDWord()	Write 32 bit Data to VIOS OUT area

⊕ Development Environment

Visual Studio	Support Version : 2008, 2010, 2012 Support Development Language : C, C++
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※ Please prepare for development language environment by yourselves.

⊕ Control Programming of RSI-ECAT

RSI-ECAT is created so that you can control multi EtherCAT slave instruments as if they were devices directly connected to I/O ports. For example, Initialization steps which originally needs complicated EtherCAT master procedures are completed just by calling some API which are user-friendly.

In addition, I/O functions themselves are designed simply. So even if you don't have expert knowledge about EtherCAT, but if you have only experiences about I/O devices, you can focus on your control programming. This is the feature of RSI-ECAT-Master.

Basic Control Steps on RSI-ECAT

Basically RSI-ECAT controls slave instruments by the following steps.

- ① **Initialize Master**
Application firstly initializes connection with RSI-ECAT-Master.
- ② **Change Master state to OPERATIONAL**
Start EtherCAT cyclic communication.
- ③ **Search Target Slave**
Involatile IDs (= VendorID and ProductCode) are written in EtherCAT Slave. Existence and Position of Target Slave are searched and obtained by these IDs.
- ④ **Wait for Master Cycle**
Wait for Master Cycle coming
- ⑤ **Control I/O**
EtherCAT Slave instruments are relocated in successive virtual address space (=VIOS) by RSI-ECAT.
You can control EtherCAT Slave instruments such as I/O Slaves, Motion Slave controlling I/O to EtherCAT Slave instruments as if you handled I/O address spaces.

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※ EtherCAT® is a registered trademark of Beckhoff Automation GmbH, Germany and the technology protected by patent.

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Micronet

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※ The specifications in this catalog might change without any previous notice. (2014/04/100)

⊕ Materials contained in RSI-ECAT-Master

Installation CD-ROM for RSI-ECAT-Master	■ EtherCAT Master software
	■ API Libraries
	■ Instruction Manual
	■ Sample Programs These are sample codes which show how to use EtherCAT® functions by API call. (For Microsoft Visual Studio 2008)

⊕ Operating Environment

OS	Windows 7 (32bit/64bit) Windows 8 (32bit/64bit) INtime® 5
CPU	More than Intel Core 2 Duo
Memory	More than 1GB (Use 64MB in it)
HDD Capacity	More than 100 MB free space
Supported onboard network・PCI/PCIe network cards	Intel Pro/100, Intel Pro/1000 Realtek 100M, Realtek1G (In Above, Ethernet controllers corresponding to HPE2)

⊕ Products

RSI-ECAT-Master	EtherCAT Master Software for INtime®
RSI-ECAT-Master/DC	Support DC function(= Distributed Clock). Needed if you'd like to controll EtherCAT slaves which requires DC functions.
RSI-ECAT-Master/RED	Cable Redundancy functions which use 2 Ethernet ports toward 1 EtherCAT line so that you can achieve redundancy of communication. And this also supports Cable Hot Plug. (In addition, including above DC functions)

※Package deal with Intime® Runtime License.

⊕ Option Products

EtherCAT Configuration Tool "RSI-ECAT-Studio"	This is a configuration tool which automatically detect / cognize the configuration information of EtherCAT Slave. You must purchase one license so that you can make the configuration information for RSI-ECAT-Master use..
Hivertec, Inc "HLS-ECMC0106/RSI"	This is EtherCAT Motion Control Software for INtime® developed by Hivertec, Inc. It achieves motion controls by APIs functions based on international standard specifications.
Techno CO., LTD. "RSI-RTPL-EC"	This is EtherCAT Motion Control Software for INtime® developed by Techno CO., LTD. It achieves motion controls by original API functions.