

## ECAT\_RD\_Sys\_Data

The function block will read the system variables provided in the service data. System data consist of product information of which the information is listed below. The function block uses IOL\_ReadObj function to read the variables and arranges the information into a single structure.

Uses Namespace: ECAT\Sys\_Data

Instruction	Name	FB/FUN	Graphic expression	ST expression
ECAT_RD_Sys_Data	Read IO-Link F3SG-SR System Data	FB		ECAT_RD_Sys_Data (Execute, DevicePort, RetryCfg, Sec_Sens1_Mnt, Sec_Sens2_Mnt, ReadDat, Done, Busy, Error, ErrorID, ErrorType);

## Variables

Name	Meaning	I/O	Description	Valid range	Unit	Default
DevicePort	Device Port	Input	Object that represents a device port	---	---	---
RetryCfg	Execution retry setting		Setting for the instruction execution retry	---	---	---
Sec_Sens1_Mnt	Secondary Sensor 1 Mounted		Indicates Secondary Sensor 1 is Mounted	Bool	---	FALSE
Sec_Sens2_Mnt	Secondary Sensor 2 Mounted		Indicates Secondary Sensor 2 is Mounted	Bool	---	FALSE
ReadDat	Read data		Data read from the IO-Link F3SG	Depends on data type	---	0
ErrorType	Error Type	Output	Error code that is returned by IO-Link device is stored when ErrorID is 4800 hex.	16#0000 to 16#FFFF	---	---

	Boolean	Bit strings				Integers								Real numbers		Times, durations, dates, and text strings				
	BOOL	BYTE	WORD	DWORD	LWORD	USINT	UINT	UDINT	ULINT	SINT	INT	DINT	LINT	REAL	LREAL	TIME	DATE	TOD	DT	STRING
DevicePort	Refer to Function for details on the structure _sDEVICE_PORT.																			
RetryCfg	Refer to Function for details on the structure _sIOL_RETRY_CFG.																			
Sec_Sens1_Mnt	OK																			
Sec_Sens2_Mnt	OK																			
ReadData	Refer to Function for details on the structure sServ_Data_Sys.																			
ErrorType			OK																	

## Function

The ECAT\_RD\_Sys\_Data reads the system data from the “Service Data” Listing and then loads this information into a convenient structure.

For the DevicePort input variable, set the IO-Link master unit and the port number to which the target IO-Link device for reading is connected.

The data type of the DevicePort input variable is structure \_sDEVICE\_PORT. The specifications are as follows:

Name	Meaning	Description	Data type	Valid range	Unit	Default
DevicePort	Device port	Object that represents a device port	_sDEVICE_PORT	---	---	---
DeviceType	Device type	Type of the device to specify	_eDEVICE_TYPE	_DeviceNXUnit _DeviceEcat-Slave _DeviceOption-Board	---	---
NxUnit	Specified Unit	NX Unit to control	_sNXUNIT_ID	---	---	---
EcatSlave	Specified slave	EtherCAT slave to control	_sECAT_ID	---	---	---
OptBoard	Specified Option Board	Option Board to control	_sOPTBOARD_ID	---	---	---
Reserved	Reserved	Reserved	---	---	---	---

PortNo	Port number	Port number	USINT	Depends on data type.	---	---
		1: Port 1				
		2: Port 2				
		3: Port 3				
		4: Port 4				
		5: Port 5				
		6: Port 6				
		7: Port 7				
		8: Port 8				

Use DeviceType to specify the device type. Specify \_DeviceNXUnit for an NX type of IO-Link master unit and \_DeviceEcatSlave for a GX type of IO-Link master unit. The variable used to specify the device is determined by the specified device type.

For this instruction, it is determined as follows:

To specify the NX type, use NxUnit to specify the device. In this case, EcatSlave is not used. To NxUnit, pass the device variable that is assigned to the device to specify.

To specify the GX type, use EcatSlave to specify the device. In this case, NxUnit is not used. To EcatSlave, pass the device variable that is assigned to the device to specify.

Use PortNo to set the port number to which the IO-Link device is connected.  
The number of ports differs depending on the type of IO-Link master unit.

NX type: 1 to 4

GX type: 1 to 8

The data type of DeviceType is enumerated type \_eDEVICE\_TYPE.  
The meanings of the enumerators of enumerated type \_eDEVICE\_TYPE are as follows:

Enumerator	Meaning
_DeviceNXUnit	NX Unit is specified.
_DeviceEcatSlave	EtherCAT slave is specified.

Use the RetryCfg input variable to set retry processing for instruction execution.  
The data type of RetryCfg is structure \_sIOL\_RETRY\_CFG. The specifications are as follows:

Name	Meaning	Description	Data type	Valid range	Unit	Default
RetryCfg	Execution retry setting	Setting for the instruction execution retry	_sIOL_RETRY_CFG	---	---	---

TimeOut	Timeout time	2.0 s when the timeout time is set to 0	TIME	0 to 300s	---	T#2.0s
RetryNum	Number of retries	3 times if the number of retries at timeout is set to 0	UINT	Depends on data type.	Times	3

Sec\_Sens1\_Mnt and Sec\_Sens2\_Mnt set this to TRUE if the Safety Light curtain is set up for cascade connection. Sec\_Sens1\_Mnt is set to TRUE if the cascaded connection is directly off of the primary sensor. Sec\_Sens2\_Mnt is set to TRUE if the cascaded connection is directly off of the primary sensor and the Sec\_Sens1\_Mnt sensor. If these BOOLS are not set the function block will not read the variables for these sticks.

Data read from the IO-Link device is stored in the ReadDat in-out variable. It is in a form of a Structure as follows:

Name	Base Type	Offset Type
sServ_Data_Sys	STRUCT	NJ
Vendor_Name	STRING[65]	
Vendor_Text	STRING[65]	
Product_Name	STRING[65]	
Product_Text	STRING[65]	
Serial_Number	STRING[11]	
Hardware_Version	STRING[6]	
Firmware_Version	STRING[6]	
Application_Specific_Tag	STRING[33]	
Prim_Sen_Rec_Supplier	STRING[18]	
Prim_Sen_Rec_Prod_Name	STRING[31]	
Prim_Sen_Rec_Serial_Num	STRING[12]	
Prim_Sen_Rec_HardW_Ver	STRING[6]	
Prim_Sen_Rec_FirmW_Ver	STRING[6]	
Prim_Sen_Emit_Supplier	STRING[18]	
Prim_Sen_Emit_Prod_Name	STRING[31]	
Prim_Sen_Emit_Serial_Num	STRING[12]	
Prim_Sen_Emit_HardW_Ver	STRING[6]	
Prim_Sen_Emit_FirmW_Ver	STRING[6]	
Sec_Sen_1_Rec_Supplier	STRING[18]	
Sec_Sen_1_Rec_Prod_Name	STRING[31]	
Sec_Sen_1_Rec_Serial_Num	STRING[12]	
Sec_Sen_1_Rec_HardW_Ver	STRING[6]	
Sec_Sen_1_Rec_FirmW_Ver	STRING[6]	
Sec_Sen_1_Emit_Supplier	STRING[18]	
Sec_Sen_1_Emit_Prod_Name	STRING[31]	
Sec_Sen_1_Emit_Serial_Num	STRING[12]	
Sec_Sen_1_Emit_HardW_Ver	STRING[6]	
Sec_Sen_1_Emit_FirmW_Ver	STRING[6]	
Sec_Sen_2_Rec_Supplier	STRING[18]	
Sec_Sen_2_Rec_Prod_Name	STRING[31]	
Sec_Sen_2_Rec_Serial_Num	STRING[12]	
Sec_Sen_2_Rec_HardW_Ver	STRING[6]	
Sec_Sen_2_Rec_FirmW_Ver	STRING[6]	
Sec_Sen_2_Emit_Supplier	STRING[18]	
Sec_Sen_2_Emit_Prod_Name	STRING[31]	
Sec_Sen_2_Emit_Serial_Num	STRING[12]	
Sec_Sen_2_Emit_HardW_Ver	STRING[6]	
Sec_Sen_2_Emit_FirmW_Ver	STRING[6]	

## Precautions for Correct Use

Execution of this instruction is continued until processing is completed even if the value of `Execute` changes to `FALSE` or the execution time exceeds the task period. The value of `Done` changes to `TRUE` when processing is completed. Use this to confirm normal completion of processing.

For `DevicePort.NxUnit` and `DevicePort.EcatSlave`, specify the device variable that is assigned to the IO-Link master unit in the I/O Map of the Sysmac Studio. Refer to the Sysmac Studio Version 1 Operation Manual (Cat. No. W504-E1-07 or later) for details on assigning device variables.

Always use a variable for the parameter to pass to `ReadDat`. A building error will occur if a constant is passed.

You can execute only one instruction at a time for the IO-Link master unit regardless of its type (NX or GX).

You cannot use this instruction in an event task. A compiling error will occur.

This instruction is executed when `Execute` changes to `TRUE`. The instruction is not executed when `Execute` is always `TRUE`.

You can define a maximum of 64 instances for the `IOL_ReadObj` and `IOL_WriteObj` instructions. This function block uses 1 instance to read all data contained in the structure.

An error will occur in the following cases:

A value that is out of range was set for `DevicePort.NxUnit` or `DevicePort.EcatSlave`.

The size of the IO-Link device object to read is larger than the size of *ReadDat*. If this error occurs, the read data is not stored in *ReadDat*.

An error response was received from the IO-Link device.

The upper eight bits represent `ErrorCode`, and lower eight bits represent `AdditionalCode`.

For `ErrorCode` and `AdditionalCode`, refer to the Error type specifications of the IO-Link Communication Specification. You can obtain the Error type specifications from the IO-Link Consortium. <http://www.io-link.com/>

The specified IO-Link master unit does not exist.

The maximum number of messages that the IO-Link master can process is exceeded. Instruction execution is not possible because the IO-Link master is processing the messages from other applications.

The specified IO-Link master unit is not in a condition to receive messages.

More than 32 of the following instructions were executed at the same time: `EC_CoESDOWrite`, `EC_CoESDORRead`, `EC_StartMon`, `EC_StopMon`, `EC_SaveMon`, `EC_CopyMon`, `EC_DisconnectSlave`, `EC_ConnectSlave`, `EC_ChangeEnableSetting`, `IOL_ReadObj`, and `IOL_WriteObj`.

A timeout occurred during communications.

The specified port of the IO-Link master unit is not the IO-Link mode. The port is disabled or in the SIO mode.

The IO-Link device is not connected to the specified port on the IO-Link master unit.

The IO power is not supplied to the specified port of the IO-Link master unit.

The specified port of the IO-Link master unit had a verification error or communications error.

## Sample Programming

Please see IOL\_ReadObj instruction reference for example program.