NX_ReadObj

The NX_ReadObj instruction reads data from an NX object in an EtherCAT Coupler Unit or NX Unit.

Instruction	Name	FB/FUN	Graphic expression	ST expression
NX_ReadObj	Read NX Unit Object	FB	NX_ReadObj_instance NX_ReadObj Execute — Done UnitProxy — Busy Obj — Error TimeOut — ErrorID ReadDat - - - - - - - - - - - - - - - - - ErrorIDEx	NX_ReadObj_instance(Execute, UnitProxy, Obj, TimeOut, ReadDat, Done, Busy, Error, ErrorID, ErrorIDEx);

Variables

Name	Meaning	I/O	Description	Valid range	Unit	Default
UnitProxy	Specified Unit	Input	Unit from which to read data	---	---	*
Obj	Object parameter		Object parameter			---
TimeOut	Timeout time		Timeout time If 0 is set, the timeout time is 2.0 s.	0 to 60,000	ms	2000 (2.0 s)
ReadDat	Read data	In-out	Data read from NX object	Depends on data type.	---	---

* If you omit the input parameter, the default value is not applied. A building error will occur.

	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
UnitProxy	Refer to *Function* for details on the structure _sNXUNIT_ID.																			
Obj	Refer to *Function* for details on the structure _sNXOBJ_ACCESS.																			
TimeOut							OK													
ReadDat	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	An array can also be specified.																			

Function

The NX_ReadObj instruction reads data from an NX object in an EtherCAT Coupler Unit, an NX Unit on the EtherCAT Coupler Unit, or an NX Unit connected to the NX bus of the CPU Unit and stores the data in *ReadDat*. The Unit from which the data is read is specified with *UnitProxy*.

TimeOut specifies the timeout time. If a response does not return within the timeout time, it is assumed that communications failed. In that case, the data is not read.

The data type of *UnitProxy* is structure _sNXUNIT_ID. The meanings of the members are as follows:

Name	Meaning	Content	Data type
UnitProxy	Specified Unit	Specified Unit	_sNXUNIT_ID
NodeAdr	Node address	Node address of the Communications Coupler Unit	UINT
IPAdr	IP address	IP address of the Communications Coupler Unit	BYTE[5]
UnitNo	Unit number	Unit number of specified Unit	UDINT
Path	Path	Path information to the specified Unit	BYTE[64]
PathLength	Valid path length	Valid path length	USINT

Pass the device variable that is assigned to the specified Unit to *UnitProxy*.

The data type of *Obj* is structure _sNXOBJ_ACCESS. The meanings of the members are as follows:

Name	Meaning	Content	Data type	Valid range	Unit	Default
Obj	Object parameter	Object parameter	_sNXOBJ _ACCESS	---	---	---
Index	Index	Index	UINT	Depends on data type.	---	0
Subindex	Subindex	Subindex	USINT			
IsCompleteAccess[*1]	Complete access	Complete access	BOOL	FALSE only		FALSE

*1 This member is not used for this instruction. Always set the value to FALSE.

Notation Example

The following notation example shows how to read the unit version from an NX-ID4342 Digital Input Unit.
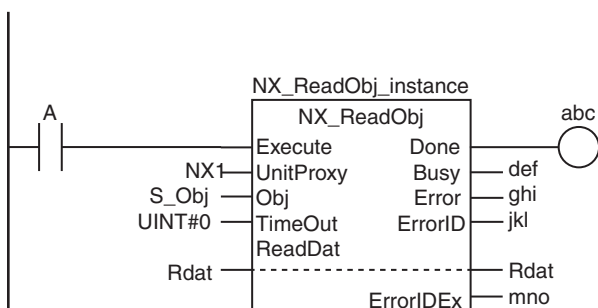
The read data is stored in *Rdat,* which is a UDINT variable.

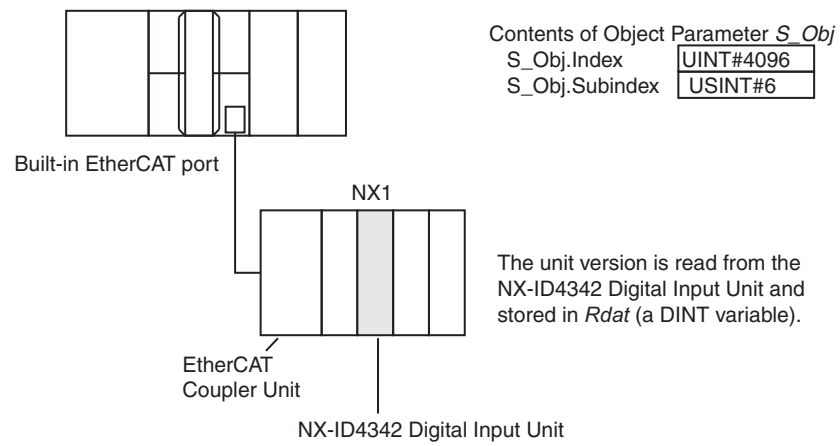A variable that is named 'NX1' with a data type of _sNXUNIT_ID is assigned to the Unit from which to read the data.

For the NX-ID4342, the index of the Unit version is UINT#16#1000 and the subindex is USINT#6.

LD

```
        NX_ReadObj_instance
            NX_ReadObj                  abc
   A     Execute      Done            ( )
  ─┤├─   UnitProxy    Busy ───── def
   NX1   Obj          Error ───── ghi
  S_Obj  TimeOut      ErrorID ──── jkl
 UINT#0  ReadDat
  Rdat ──────────────────────── Rdat
                      ErrorIDEx ── mno
```

ST

```
NX_ReadObj_instance(A, NX1, S_Obj, UINT#0,
                    Rdat, abc, def, ghi, jkl, mno);
```

Built-in EtherCAT port

Contents of Object Parameter *S_Obj*

S_Obj.Index	UINT#4096
S_Obj.Subindex	USINT#6

NX1

The unit version is read from the NX-ID4342 Digital Input Unit and stored in *Rdat* (a DINT variable).

EtherCAT
Coupler Unit

NX-ID4342 Digital Input Unit

Related System-defined Variables

Variable	Name	Data type	Description
_EC_MBXSlavTbl[i] "i" is the node address.	Message Communications Enabled Slave Table	BOOL	This variable indicates whether communications are possible for each slave. TRUE: Communications are possible. FALSE: Communications are not possible.
_NXB_UnitMsgActiveTbl[i]	NX Unit Message Enabled Status	BOOL	This table indicates the slaves that can perform message communications. Use this variable to confirm that communications with the relevant slave are possible.

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.

- Refer to *Using this Section* (page 2-3) for a timing chart for *Execute*, *Done*, *Busy*, and *Error*.

- If *ReadDat* is an array, make sure that the overall size of the array is the same as the size of the NX object to read in the specified Unit

- For *UnitProxy*, specify the device variable that is assigned to an EtherCAT Coupler Unit, an NX Unit on the EtherCAT Coupler Unit, or an NX Unit connected to the NX bus of the CPU 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.

- This instruction is related to NX Message Communications Errors. If too many instructions that are related to NX Message Communications Errors are executed at the same time, an NX Message Communications Error will occur. Refer to Instructions Related to NX Message Communications Errors (page A-25) for a list of the instructions that are related to NX Message Communications Errors.

- *Error* is TRUE if an error occurred. The meanings of the values of *ErrorID* and *ErrorIDEx* are given in the following table.

Value of *ErrorID*	Value of *ErrorIDEx*	Meaning
16#0400	16#0000 0000	• The value of *UnitProxy* is outside of the valid range. • The value of *TimeOut* is outside of the valid range.
16#0410	16#0000 0000	*ReadDat* is STRING data and it does not end in a NULL character.
16#0419	16#0000 0000	• The data type of *UnitProxy* is not correct. • The data type of *ReadDat* is not correct.
16#041C	16#0000 0000	The size of *ReadDat* is not the same as the size of the NX object to read.
16#2C00	16#0000 0401	The specified Unit does not support the instruction.
	16#0000 1001 16#0000 1002 16#0017 0000 16#0020 0000 16#0021 0000	An input parameter, output parameter, or in-out parameter is incorrect. Confirm that the intended parameter is used for the input parameter, output parameter, or in-out parameter.
	16#0000 1010	The data size of the specified NX object does not agree with the data size specified in *WriteDat*.
	16#0000 1101	The correct Unit was not specified. Check the Unit.
	16#0000 110B	The size of the read data is too large. Make sure that the read data specification is correct.
	16#0000 1110	There is no object that corresponds to the value of *Obj.Index.*
	16#0000 1111	There is no object that corresponds to the value of *Obj.Subindex.*
	16#0000 2101	The specified NX object cannot be written.
	16#0000 2110	The value of *WriteDat* exceeds the range of the values of the NX object to write.
	16#0000 2210	The specified Unit is not in a mode that allows writing data.
	16#0000 2213	Instruction execution was not possible because the specified Unit was performing an I/O check. Execute the instruction after the I/O check is completed.
	16#0000 2230	The status of the specified Unit does not agree with the value of the read source or write destination NX object. Take the following actions if the value of *Obj.Index* is between 0x6000 and 0x6FFF or between 0x7000 and 0x7FFF. • Delete the read source or write designation NX object from the I/O allocation settings. • Reset the error for the specified Unit. • Place the specified Unit in a mode that does not allow writing data.
	16#0000 2231	Instruction execution was not possible because the specified Unit was performing initialization. Wait for the Unit to start normal operation and then execute the instruction.
	16#0000 250F	Hardware access failed. Execute the instruction again.
	16#0000 2601 16#0000 2602 16#0010 0000	The specified Unit does not support this instruction. Check the version of the Unit.
	16#0000 2603	Execution of the instruction failed. Execute the instruction again. Make sure that at least one channel is enabled in the selections of the channels to use.
	16#0000 2621	The NX Unit is not in a status in which it can acknowledge the instruction. Wait for a while and then execute the instruction again.
	16#0001 0000	The specified Unit does not exist. Make sure that the Unit configuration is correct.

Value of *ErrorID*	Value of *ErrorIDEx*	Meaning
16#2C00	16#0011 0000	The specified port number does not exist. Make sure that the Unit configuration is correct.
	16#0012 0000 16#0013 0000 16#0015 0000 16#0016 0000	The value of *UnitProxy* is not correct. Set the variable that indicates the specified EtherCAT Coupler Unit again.
	16#0014 0000	The specified node address is not correct. Make sure that the Unit configuration is correct.
	16#0030 0000 16#8001 0000	The specified Unit is busy. Execute the instruction again.
	16#0031 0000	The specified Unit is not supported for connection. Check the version of the Unit.
	16#8000 0000 16#8005 0000 16#8101 0000 16#8102 0000 16#8202 0000 16#8203 0000 16#8206 0000 to 16#8FFF 0000 16#9001 0000 to 16#FFFE 0000	An error occurred in the communications network. Execute the instruction again.
	16#8002 0000 16#8003 0000 16#8103 0000 16#8200 0000	An error occurred in the communications network. Reduce the amount of communications traffic.
	16#8004 0000 16#8100 0000 16#8201 0000 16#8204 0000 16#8205 0000 16#9000 0000	An error occurred in the communications network. Check the Unit and cable connections. Make sure that the power supply to the Unit is ON.
16#2C01	16#0000 0000	The number of instructions that can be simultaneously executed was exceeded.
16#2C02	16#0000 0000	A timeout occurred during communications.

Version Information

A CPU Unit with unit version 1.05 or later and Sysmac Studio version 1.06 or higher are required to use this instruction.