

NO: PC-326
DATE: April 2016

PRODUCT: NX/NJ Firmware Update
TYPE: Modification Notice

NJ/NX series Machine Automation Controller CPUs—New Firmware Version 1.11

Effective date: Products with April 2016 lot codes

Reason for modification: NJ/NX series machine automation controllers will have Version 1.11 firmware installed that improves the performance and usability of the controllers.

Affected Parts

Product	Model	Version
NX701	Standard	NX701-1600/1700
NJ501	Standard	NJ501-1300/1400/1500
	DB	NJ501-1320/1420/1520
	SECS	NJ501-1340
	Robot	NJ501-4300/4400/4500/4310
	Robot & DB	NJ501-4320
NJ301	Standard	NJ301-1100/1200
NJ101	Standard	NJ101-1000/9000
	DB	NJ101-1020/9020

Functions supported by Firmware Version 1.11

	Function
Enhancing EtherCAT troubleshooting	1. Diagnosis/statistics log
	2. Identify error locations when EtherCAT frames are not received
Other additional and improved functions	3. Program transfer from SD Memory Card
	4. Improve overflow errors when using the infinite axis application
	5. Keep the present values of retained variables even if the structure members or the number of array elements are changed
New instructions	6. Instructions for CIF Units
	7. Read number of overwrites of SD Memory Cards (A function for a specific customer)

For more information

Contact your local Omron Field Application Engineer or Motion Solutions Engineer if an upgrade is required to satisfy a customer requirement.

Detail of Differences

1. Diagnosis/statistics log:

If a communications error intermittently occurs due to faulty cable, faulty connector contact, or noise of EtherCAT, the number of error frames is recorded as the diagnostic and statistical information. And the following improvements are performed:

Version 1.10 or earlier	Version 1.11 or later
Because the maximum number of error frames is 255, the maximum number is almost displayed in most nodes when analyzing, so that the error location is difficult to identify.	Increase the maximum number of error frames.
The diagnostic and statistical information for master and slaves are cleared due to power ON/OFF, so that the error location cannot be confirmed later.	You can save the diagnostic and statistical information for master and slaves within the range from 30 seconds to 30 minutes as a CSV log file in the SD Memory Card. The start and end of the log function is operated by writing the system-defined variables.

2. Identify error locations when EtherCAT frames are not received:

The EtherCAT frame is not received in the communications path even if the link is established because the cable is faulty, the connector contact is faulty, the slave has failed, or the cable installation is incorrect. If such an error occurs, the error location cannot be identified and a lot of time is required for troubleshooting in the past.

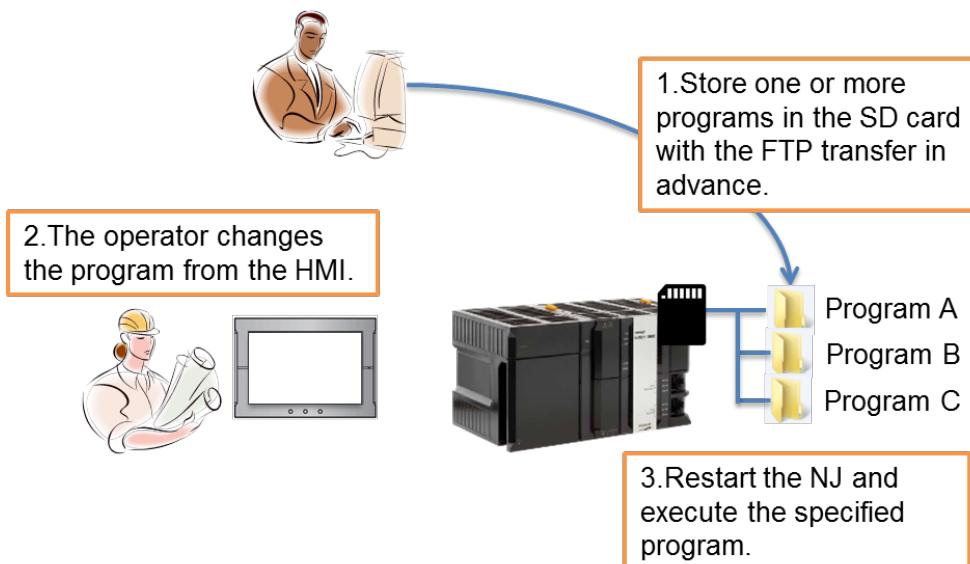
With the NJ/NX version 1.11, when turning ON the power supply of the Controller or restarting the CPU Unit,

- If the EtherCAT frame non-reception and re-send continues in one second, the error location identification sequence is executed.
- When the error location is identified, it is recorded in the event log as a partial fault.
- If the error location cannot be identified, a Network Configuration Verification Error is recorded in the event log.

3. Program transfer from SD memory card:

Target: E1, E2, and OEM who want to reduce the changeover time or change the program from remote location without Support Software in the field.

With version 1.11, it is possible to change the program from the HMI or others without the Support Software.



4. Improve overflow errors when using the infinite axis application:

Target: OEM who uses the infinite axis application such as a packaging machine and other machines.

<FROM>

When a position counter overflow occurs, the position error is accumulated if the gear ratio does not divide evenly.

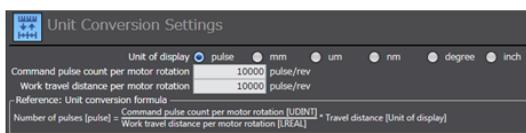
<TO>

Use the MCE to modify errors.

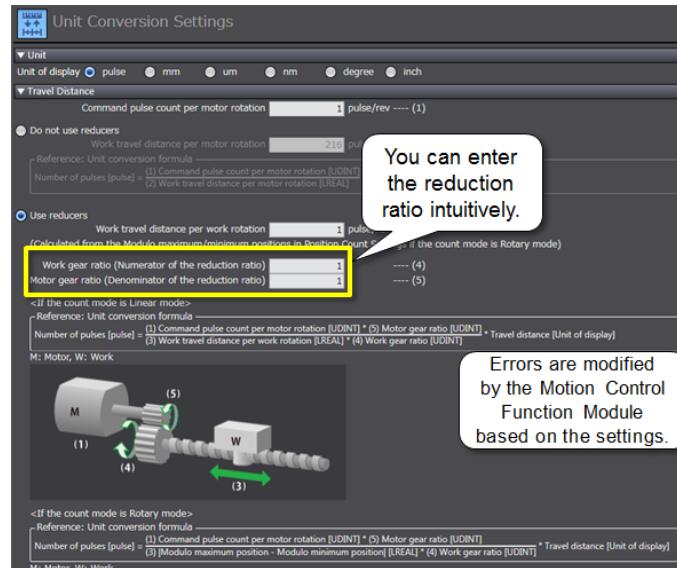
Improve the gear ratio setting tab page on the Sysmac Studio.

Gear ratio setting tab page
on the Sysmac Studio

<FROM>



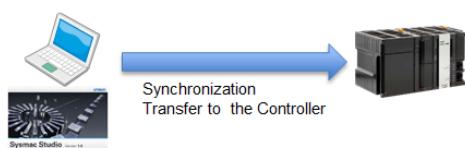
<TO>



5. Keep the present values of retained variables even if the structure members or the number of array elements are changed

Keep the present values of variables before the edition when you edit the program, such as editing (adding or deleting) the structure members with Retain attribute or changing the number of array (including structures) elements, and perform the synchronization.

With this solution, the program edition in the equipment can be simplified after the operation.



Sysmac Studio
Project

```
■ Structures
TYPE STR_1: STRUCT
  x : INT;
  y : INT;
  z : INT; <- add new member
END_STRUCT

■ Variable Registration
ABC: STR_1;
```

Values of retained variables

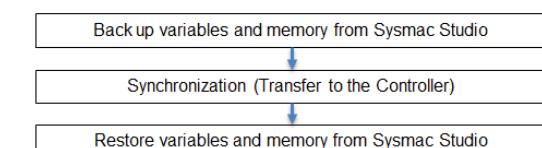
```
ABC.x := 100;
ABC.y := -200;
```

```
ABC.x := 100; Keep
ABC.y := -200; Keep
ABC.z := Initial value;
```

From:

After changing the data types, the user needs to perform the backup and restore operation before and after the synchronized transfer.

- Time and effort are needed for the operation
- The present values may be lost due to an operation mistake



To:

Even if the data types are changed, the present values of structure members of retained variables and array elements can be kept only with the synchronized transfer.

- The operation can be simplified and time can be reduced.
- The operation mistake will not occur.

Synchronization (Transfer to the Controller)

6. Instructions for CIF units

Target: Users who use the CIF Units.

Instructions for the NX-series Communications Interface Units (NX-CIF□□□) are added. With the following instructions, the no-protocol data communications and command communications with Modbus-RTU protocol can be performed to the serial communications devices.

Instruction	Name
NX_SerialSend	Send No-protocol Data
NX_SerialRcv	Receive No-protocol Data
NX_ModbusRtuCmd	Send Modbus RTU General Command
NX_ModbusRtuRead	Send Modbus RTU Read Command
NX_ModbusRtuWrite	Send Modbus RTU Write Command
NX_SerialSigCtl	Serial Control Signal ON/OFF Switching
NX_SerialBufClear	Clear Buffer
NX_SerialStartMon	Start Serial Line Monitoring
NX_SerialStopMon	Stop Serial Line Monitoring



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