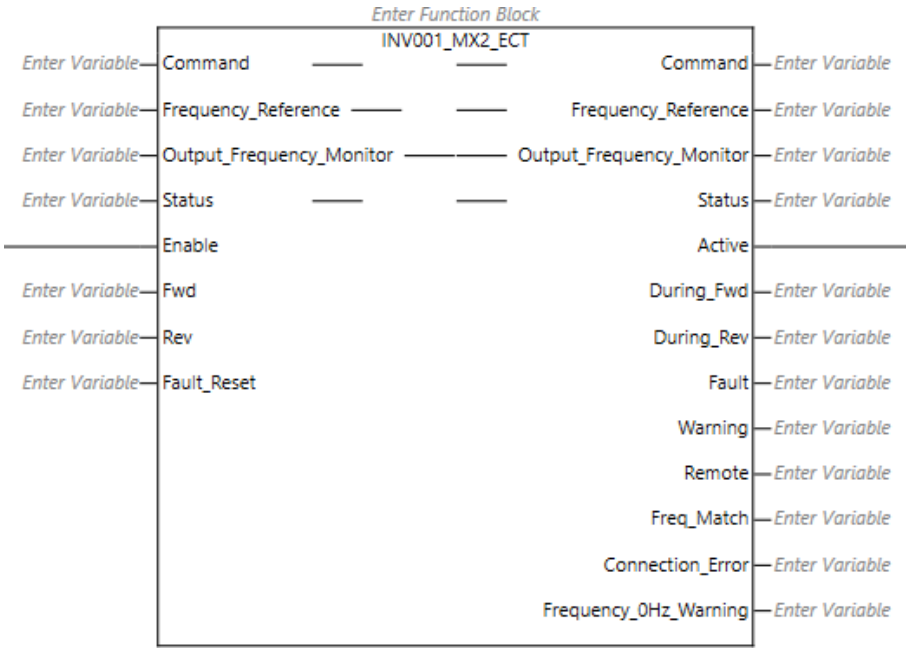
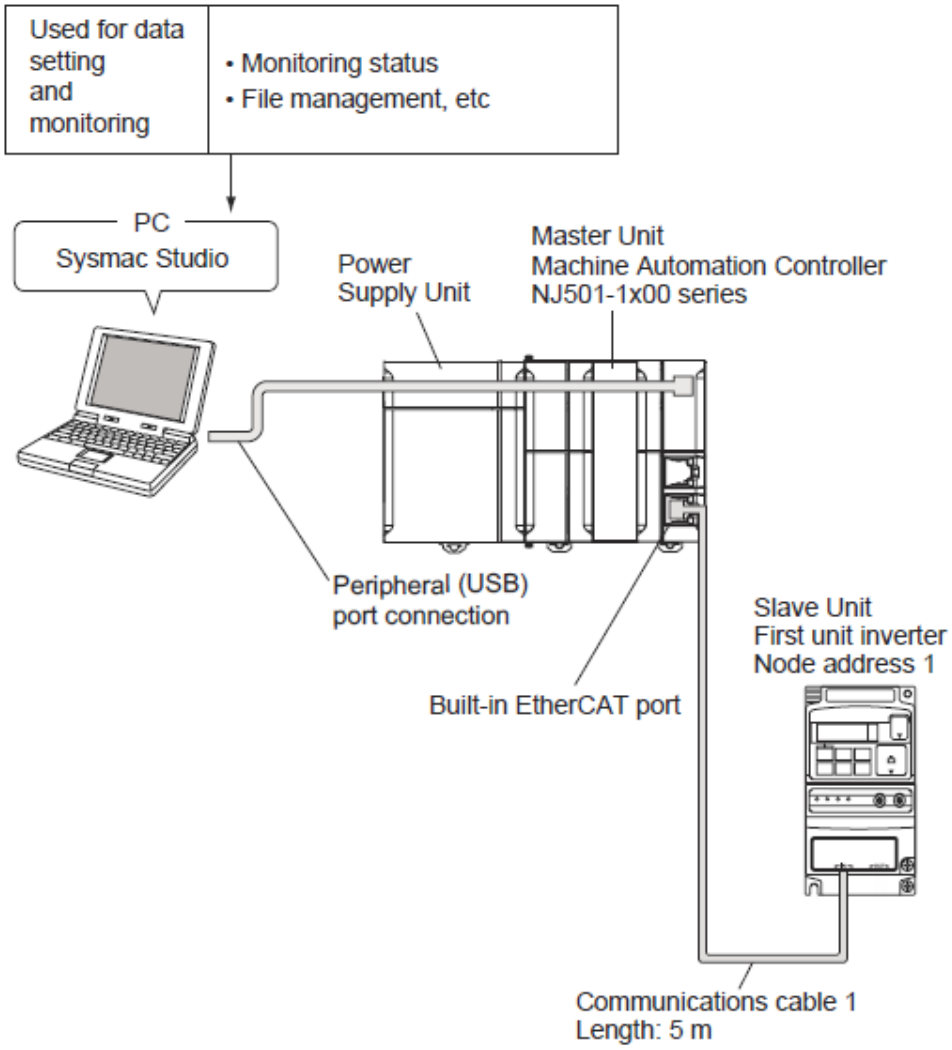
Library	Sysmac simple controlling 3G3MX2
Library name	INV00x_MX2_ECT
Library version	V1.0.9

3G3MX2	INV001_MX2_ECT

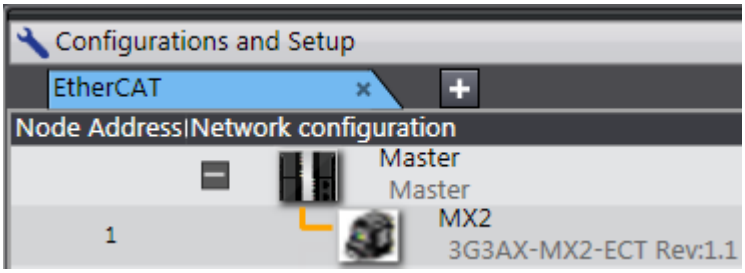
Basic function	A function block that can be used for controlling 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV001_MX2_ECT		
FB version	v1.0.5		
Applicable models	Applicable Target	All 3G3MX2 with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*2NJ101- series *1NJ301- series *1NJ501- series *2NX701- series	*3NX1P2- series *4NX102- series *3NY- series
	Sysmac Studio	Version 1.13 or higher *1Firmware version 1.05 or higher is needed *2Firmware version 1.10 or higher is needed *3Firmware version 1.13 or higher is needed *4Firmware version 1.30 or higher is needed	
Function description	This function block is created to make it easy to read and write to 3G3MX2. It takes the variables that are created in the I/O Map under Configuration and Setup and then map it to the function block. Without changing anything in the PDO-mapping of the 3G3AX-MX2-ECT option board.		

Example

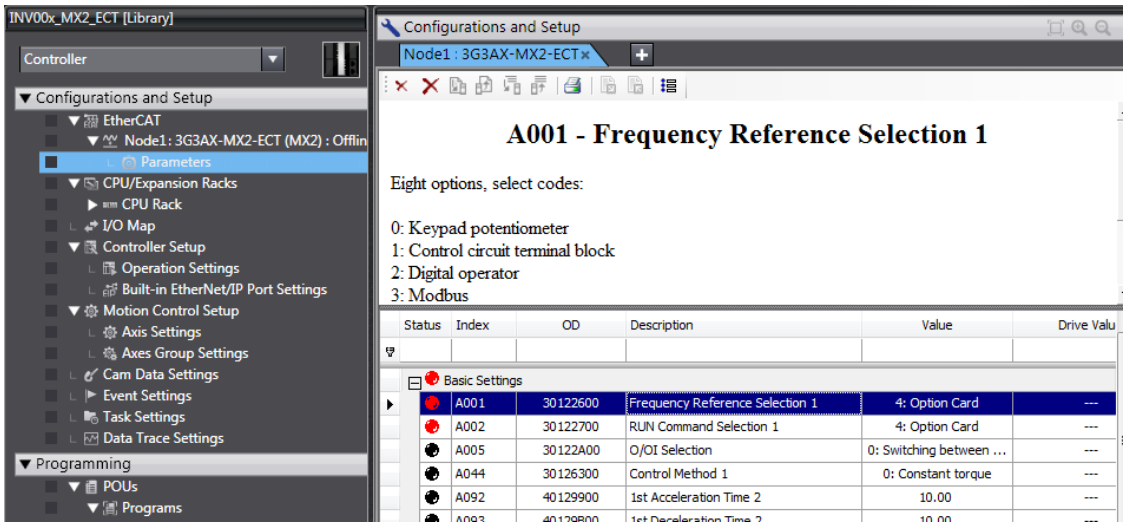


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

EtherCAT setting in Sysmac Studio (No changes done in the PDO mapping):

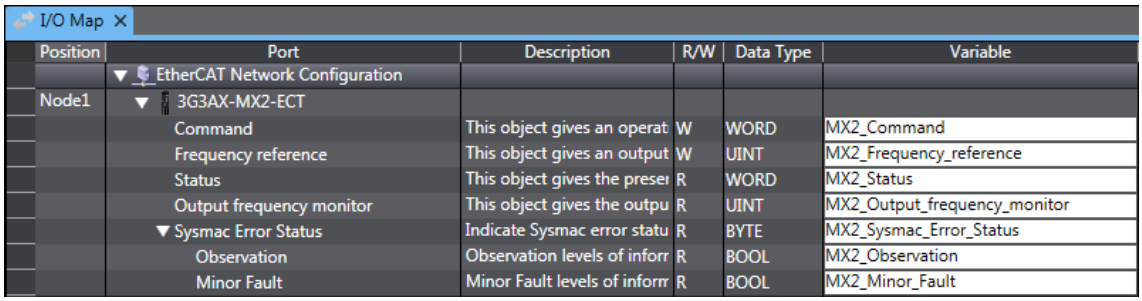


Parameters that needs to be changed in the 3G3MX2:

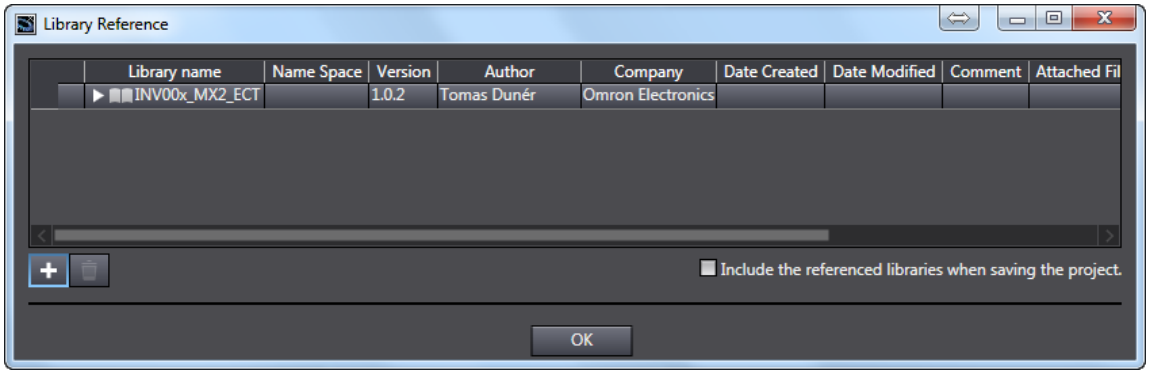


Index	Description	Value	Default
A001	Frequency Reference Selection 1	**4**: Option Card	1: Control circuit terminal block
A002	RUN Command Selection 1	**4**: Option Card	1: Control circuit terminal block

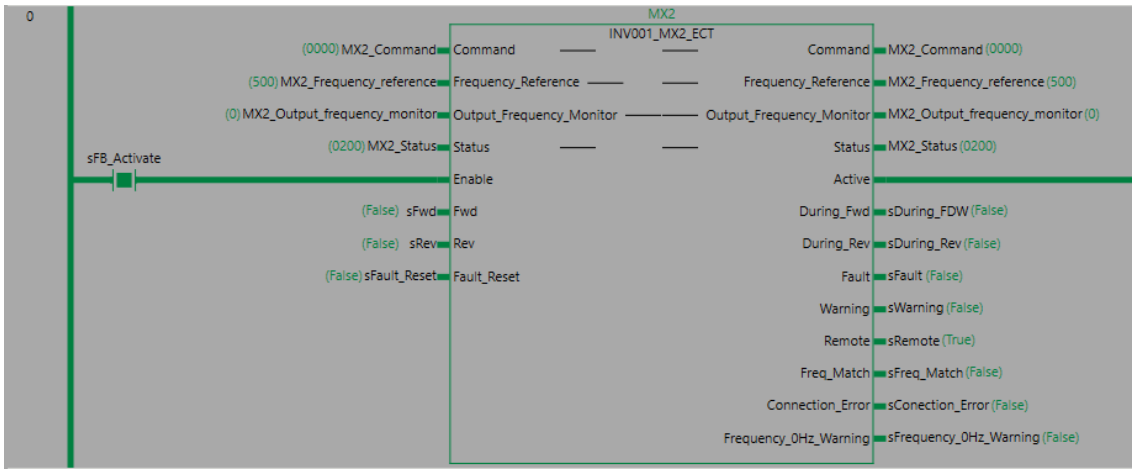
I/O Map:



Add the INV00x_MX2_ECT in the library:



Use the INV001_MX2_ECT FunctionBlock and make the necessary (RED) connections like the example below:

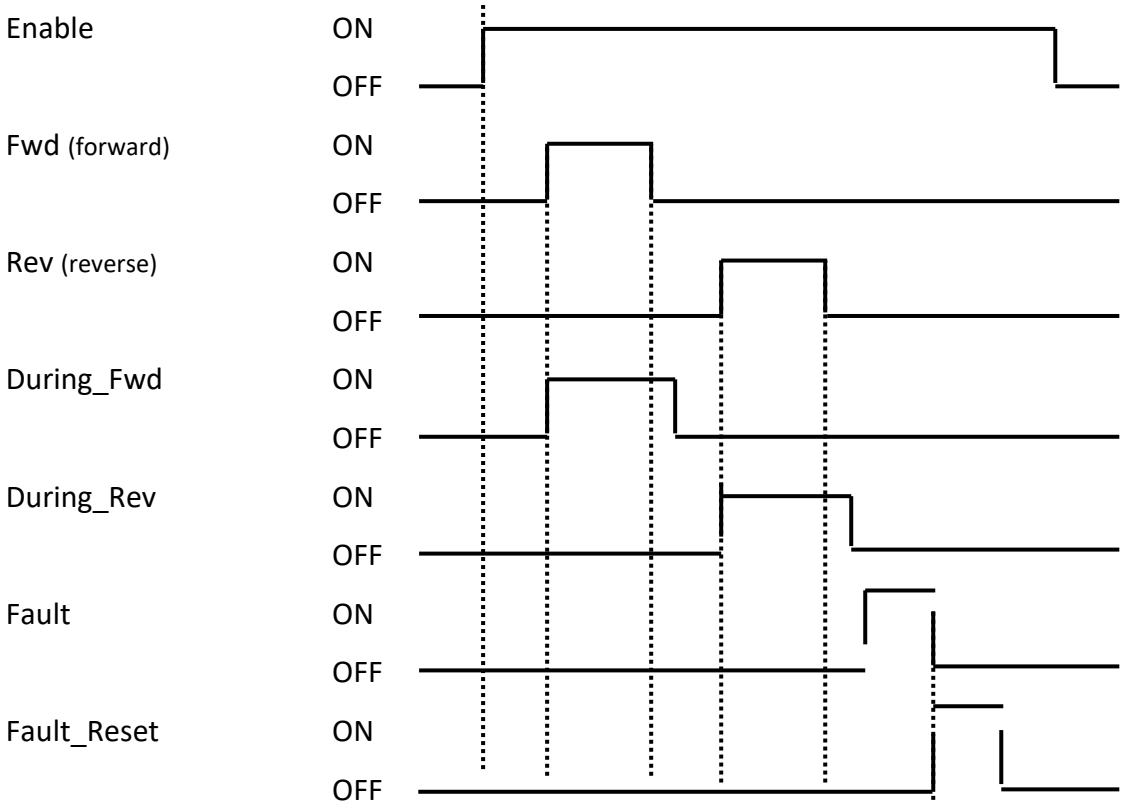


Variables

sFB_Activate = Enables the FB

MX2_Frequency_reference = 5000 (50.00Hz) (Max settings is depending on what A004 - Maximum Frequency 1 is set to)

sFwd = Start forward

FB precautions	Time Chart for the BOOL signals: 

Input Variables from the I/O mapping of 3G3MX2

Variable name	Name	Data type	Description
Command	Control command	WORD	The bit data for the command is shown below.

–	–	–	–	–	–	–	–	7	–	–	–	–	–	1	0

Bit	Name	Meaning
0	Forward/stop	0: Stop 1: Forward command
1	Reverse/stop	0: Stop 1: Reverse command
7	Fault reset	↑: Resets an error or trip for the unit or inverter.
-	(Reserved)	The reserved area. Set 0.

Variable name	Name	Data type	Description
Frequency_Reference	Frequency reference	UINT	Specify the reference frequency in increments of 0.01 Hz. When a value is set that exceeds the maximum frequency, operation is performed at the maximum frequency. Setting range: 0 to maximum frequency
Output_Frequency_Monitor	Output frequency monitor	UINT	Displays the output frequency in increments of 0.01 Hz.
Status	Status	WORD	The bit data for the status information is shown below.

15	–	–	12	–	–	9	–	7	–	–	–	3	–	1	0

Bit	Name	Meaning
0	Forward operation in progress	0: Stopped/during reverse operation 1: During forward operation
1	Reverse operation in progress	0: Stopped/during forward operation 1: During reverse operation
3	Fault	0: No error or trip occurred for the unit or inverter 1: Error or trip occurred for the unit or inverter
7	Warning	0: No warning occurred for the unit or inverter 1: Warning occurred for the unit or inverter
9	Remote	0: Local (Operations from EtherCAT are disabled) 1: Remote (Operations from EtherCAT are enabled)
12	Frequency matching	0: During acceleration/deceleration 1: Frequency matched
15	Connection error between the Optional Unit and inverter	0: Normal 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)
–	(Reserved)	The reserved area. Set 0.

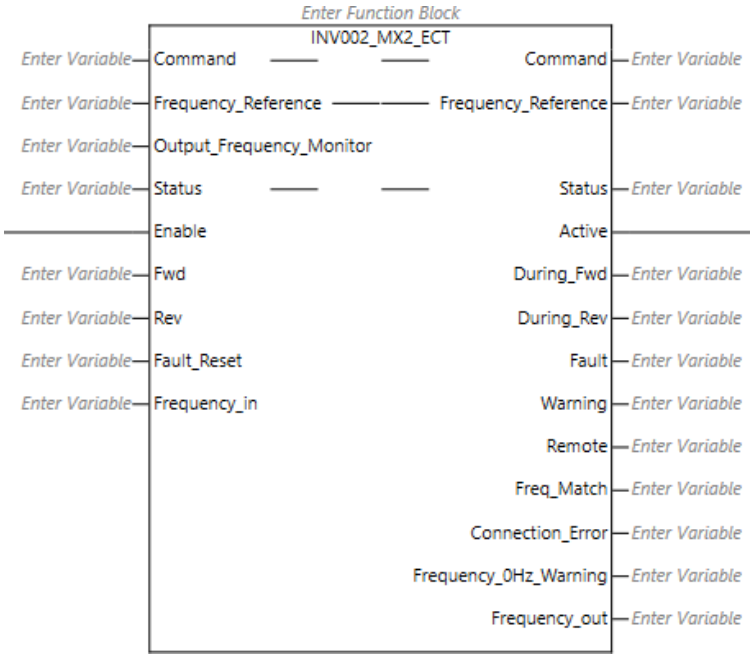
Input Variables

Variable name	Name	Data type	Description
Enable	Enable	BOOL	1 (ON): FB started. 0 (OFF): FB not started.
Fwd	Start forward drive	BOOL	0: Stop. 1: Forward command.
Rev	Start reverse drive	BOOL	0: Stop. 1: Reverse command.
Fault_Reset	Fault reset	BOOL	↑: Resets an error or trip for the inverter.

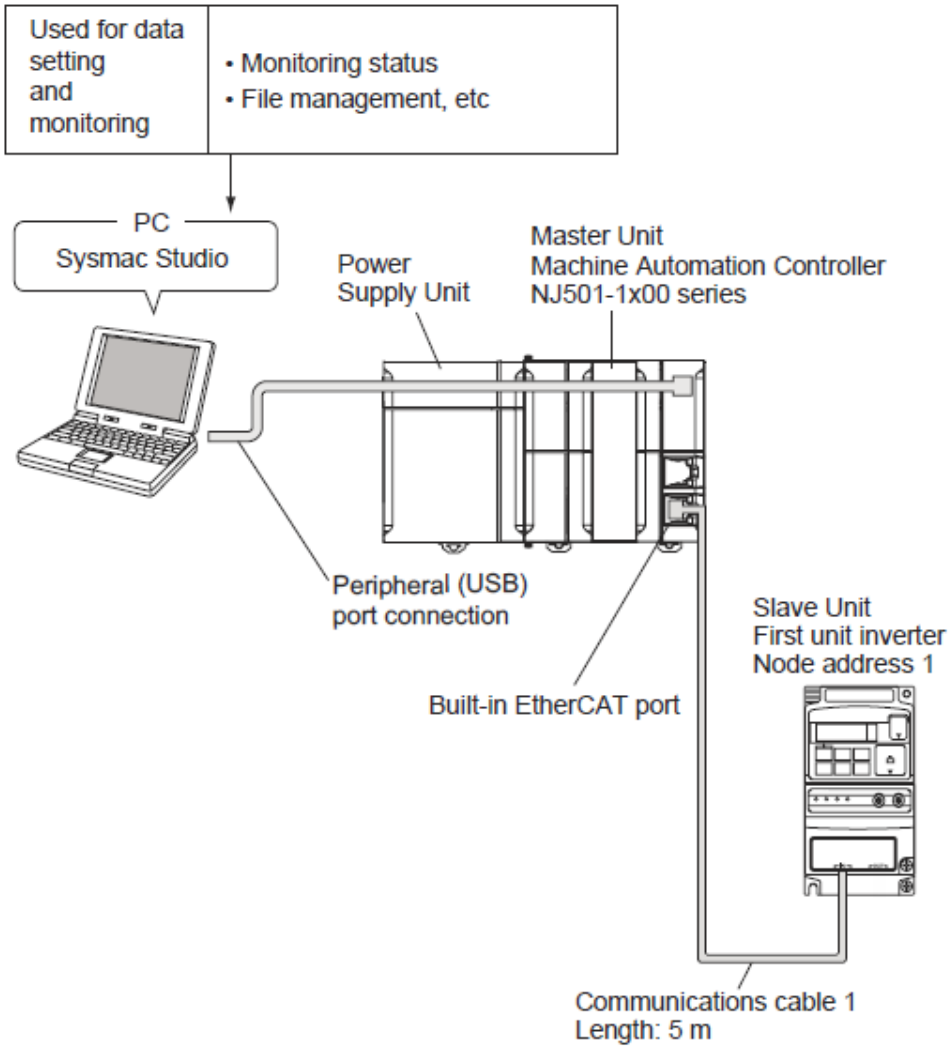
Output Variables

Variable name	Name	Data type	Description
Active	Enable output	BOOL	1 (ON): FB processed normally. 0 (OFF): FB not processed or ended in an error.
During_Fwd	Forward operation in progress	BOOL	0: Stopped/during reverse operation. 1: During forward operation.
During_Rev	Reverse operation in progress	BOOL	0: Stopped/during forward operation. 1: During reverse operation.
Fault	Fault	BOOL	0: No error or trip occurred for the unit or inverter. 1: Error or trip occurred for the unit or inverter.
Warning	Warning	BOOL	0: No warning occurred for the unit or inverter. 1: Warning occurred for the unit or inverter.
Remote	Remote	BOOL	0: Local (Operations from EtherCAT are disabled). 1: Remote (Operations from EtherCAT are enabled).
Freq_Match	Frequency matching	BOOL	0: During acceleration/deceleration. 1: Frequency matched.
Connection_Error	Connection error between the CPU and inverter	BOOL	0: Normal. 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)

3G3MX2	INV002_MX2_ECT

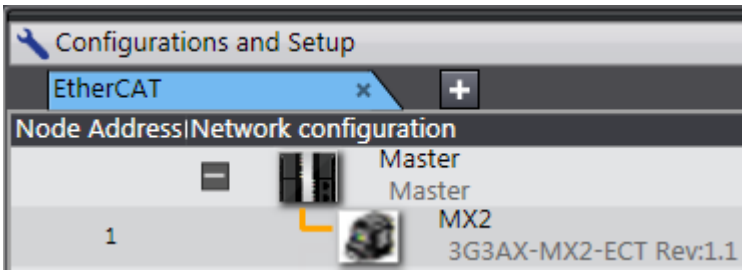
Basic function	A function block that can be used for controlling 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV002_MX2_ECT		
FB version	v1.0.3		
Applicable models	Applicable Target	All 3G3MX2 with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*2NJ101- series *1NJ301- series *1NJ501- series *2NX701- series	*3NX1P2- series *4NX102- series *3NY- series
	Sysmac Studio	Version 1.13 or higher *1Firmware version 1.05 or higher is needed *2Firmware version 1.10 or higher is needed *3Firmware version 1.13 or higher is needed *4Firmware version 1.30 or higher is needed	
Function description	Difference between INV001_MX2_ECT and INV002_MX2_ECT is that this function block makes it easy to set and read the frequency in a REAL value. It is prepared with a REAL value conversion that can convert REAL to UINT for the SP and converts UINT to REAL for the PV. It takes the variables that are created in the I/O Map under Configuration and Setup and then map it to the function block. Without changing anything in the PDO-mapping of the 3G3AX-MX2-ECT option board.		

Example

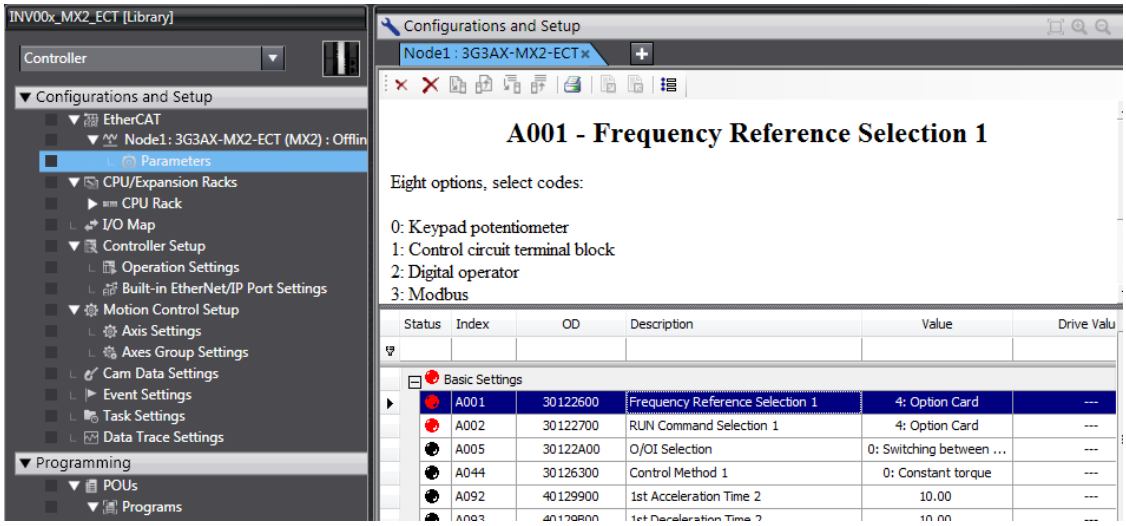


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

EtherCAT setting in Sysmac Studio (No changes done in the PDO mapping):

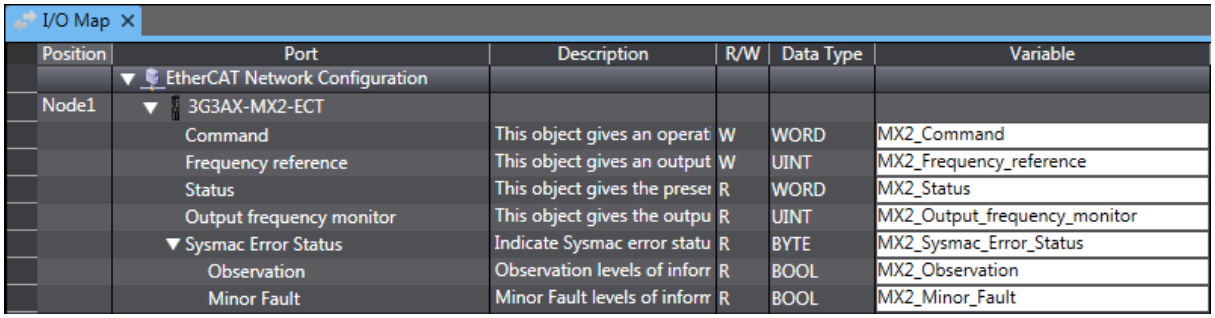


Parameters that needs to be changed in the 3G3MX2:

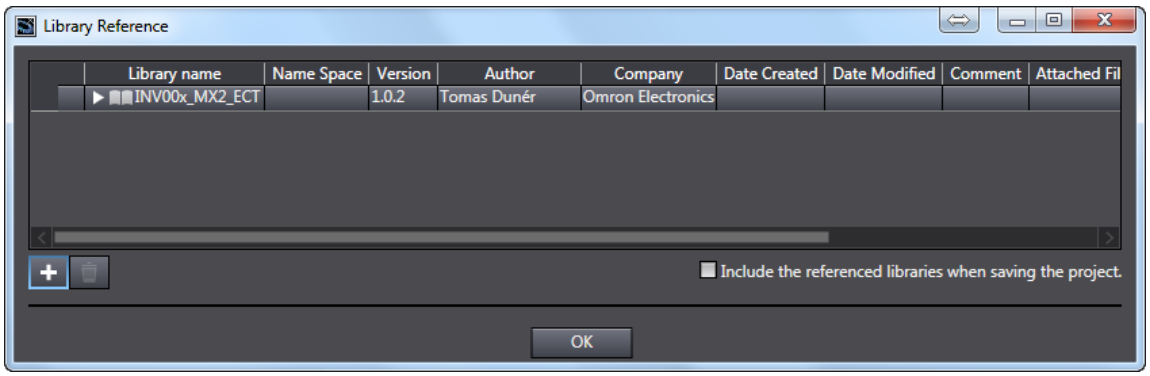


Index	Description	Value	Default
A001	Frequency Reference Selection 1	**4**: Option Card	1: Control circuit terminal block
A002	RUN Command Selection 1	**4**: Option Card	1: Control circuit terminal block

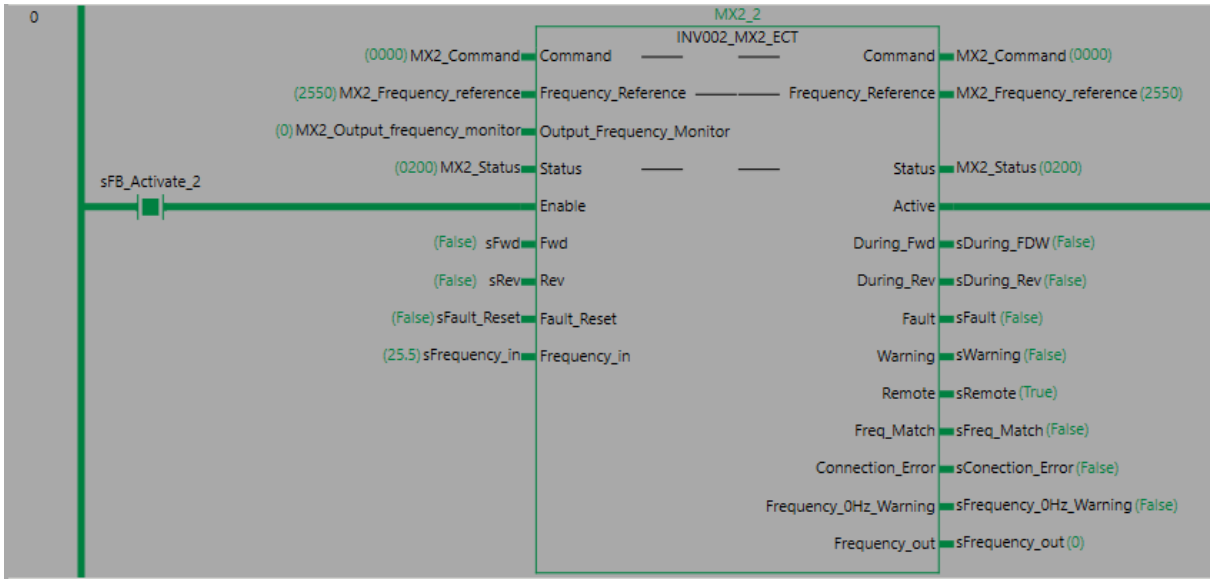
I/O Map:



Add the INV00x_MX2_ECT in the library:



Use the INV002_MX2_ECT FunctionBlock and make the necessary (RED) connections like the example below:

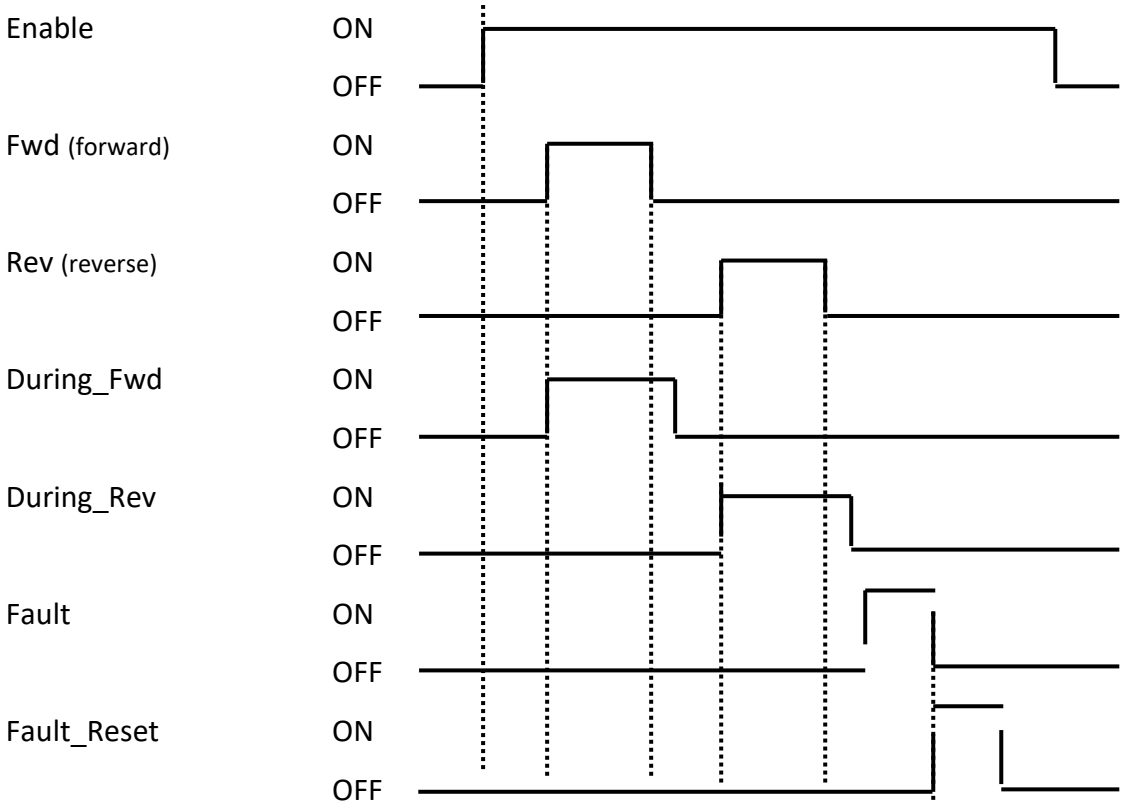


Variables

sFB_Activate = Enables the FB

sFrequency_in = 25.50Hz (Max settings is depending on what A004 - Maximum Frequency 1 is set to)

sFwd = Start forward

FB precautions	Time Chart for the BOOL signals: 

Input Variables from the I/O mapping of 3G3MX2

Variable name	Name	Data type	Description
Command	Control command	WORD	The bit data for the command is shown below.

–	–	–	–	–	–	–	–	7	–	–	–	–	–	1	0

Bit	Name	Meaning
0	Forward/stop	0: Stop 1: Forward command
1	Reverse/stop	0: Stop 1: Reverse command
7	Fault reset	↑: Resets an error or trip for the unit or inverter.
-	(Reserved)	The reserved area. Set 0.

Variable name	Name	Data type	Description
Frequency_Reference	Frequency reference	UINT	Specify the reference frequency in increments of 0.01 Hz. When a value is set that exceeds the maximum frequency, operation is performed at the maximum frequency. Setting range: 0 to maximum frequency
Output_Frequency_Monitor	Output frequency monitor	UINT	Displays the output frequency in increments of 0.01 Hz.
Status	Status	WORD	The bit data for the status information is shown below.

15	–	–	12	–	–	9	–	7	–	–	–	3	–	1	0

Bit	Name	Meaning
0	Forward operation in progress	0: Stopped/during reverse operation 1: During forward operation
1	Reverse operation in progress	0: Stopped/during forward operation 1: During reverse operation
3	Fault	0: No error or trip occurred for the unit or inverter 1: Error or trip occurred for the unit or inverter
7	Warning	0: No warning occurred for the unit or inverter 1: Warning occurred for the unit or inverter
9	Remote	0: Local (Operations from EtherCAT are disabled) 1: Remote (Operations from EtherCAT are enabled)
12	Frequency matching	0: During acceleration/deceleration 1: Frequency matched
15	Connection error between the Optional Unit and inverter	0: Normal 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)
–	(Reserved)	The reserved area. Set 0.

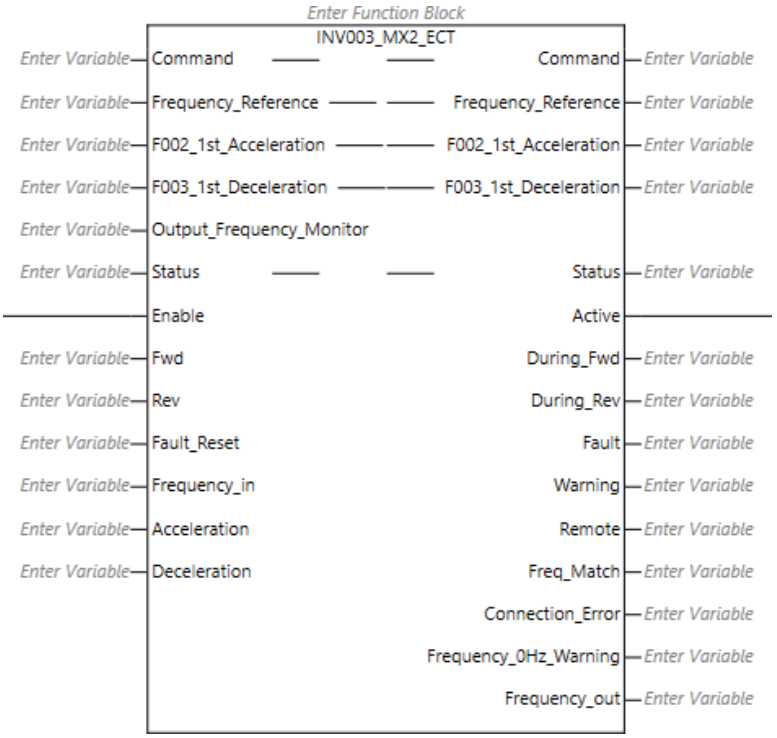
Input Variables

Variable name	Name	Data type	Description
Enable	Enable	BOOL	1 (ON): FB started. 0 (OFF): FB not started.
Fwd	Start forward drive	BOOL	0: Stop. 1: Forward command.
Rev	Start reverse drive	BOOL	0: Stop. 1: Reverse command.
Fault_Reset	Fault reset	BOOL	↑: Resets an error or trip for the inverter.
Frequency_in	Frequency that are set to the MX2	REAL	Set the frequency in a REAL value Ex. 15.50 Hz

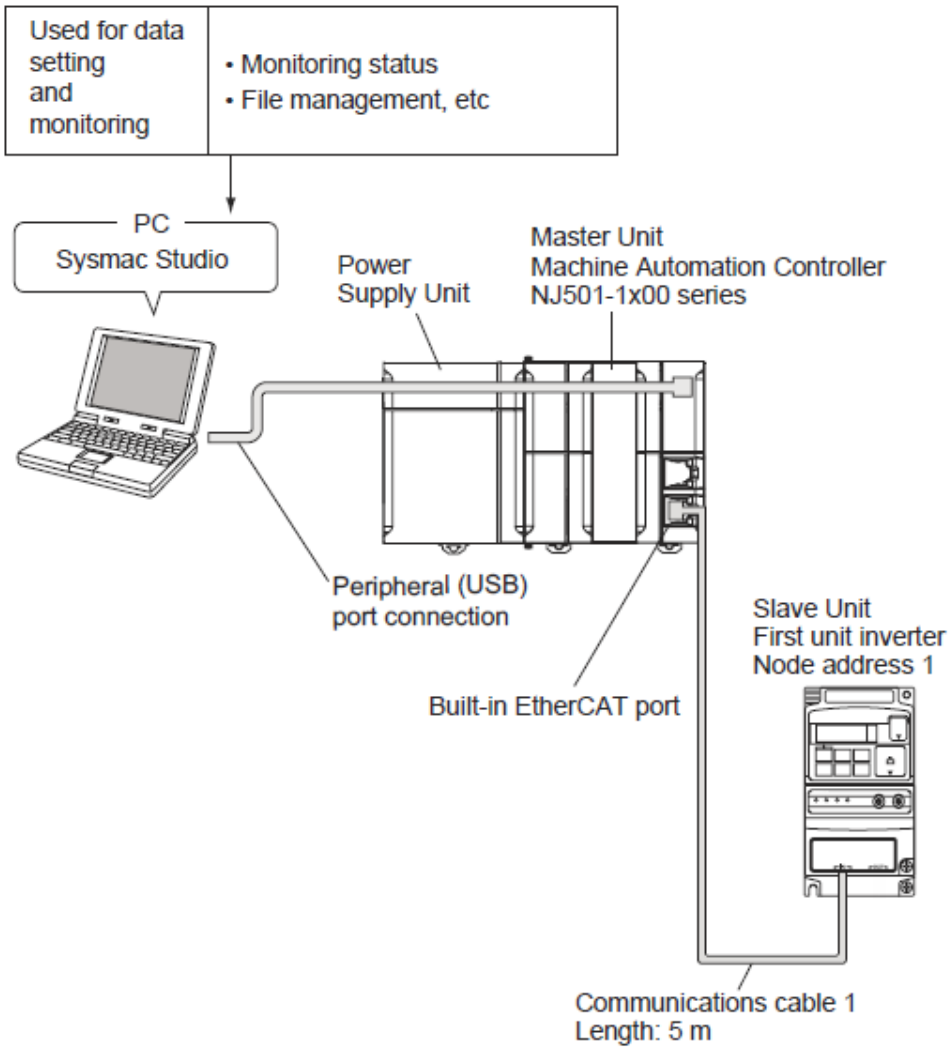
Output Variables

Variable name	Name	Data type	Description
Active	Enable output	BOOL	1 (ON): FB processed normally. 0 (OFF): FB not processed or ended in an error.
During_Fwd	Forward operation in progress	BOOL	0: Stopped/during reverse operation. 1: During forward operation.
During_Rev	Reverse operation in progress	BOOL	0: Stopped/during forward operation. 1: During reverse operation.
Fault	Fault	BOOL	0: No error or trip occurred for the unit or inverter. 1: Error or trip occurred for the unit or inverter.
Warning	Warning	BOOL	0: No warning occurred for the unit or inverter. 1: Warning occurred for the unit or inverter.
Remote	Remote	BOOL	0: Local (Operations from EtherCAT are disabled). 1: Remote (Operations from EtherCAT are enabled).
Freq_Match	Frequency matching	BOOL	0: During acceleration/deceleration. 1: Frequency matched.
Connection_Error	Connection error between the CPU and inverter	BOOL	0: Normal. 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)
Frequency_out	Actual frequency that the MX2 has	REAL	The frequency in a REAL value that the MX2 has. Ex. 15.50 Hz

3G3MX2	INV003_MX2_ECT

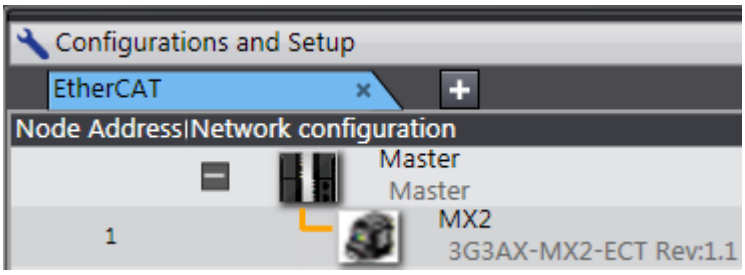
Basic function	A function block that can be used for controlling 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV003_MX2_ECT		
FB version	v1.0.3		
Applicable models	Applicable Target	All 3G3MX2 with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*2NJ101- series *1NJ301- series *1NJ501- series *2NX701- series	*3NX1P2- series *4NX102- series *3NY- series
	Sysmac Studio	Version 1.13 or higher *1Firmware version 1.05 or higher is needed *2Firmware version 1.10 or higher is needed *3Firmware version 1.13 or higher is needed *4Firmware version 1.30 or higher is needed	
Function description	Difference between INV002_MX2_ECT and INV003_MX2_ECT is that this function block makes it easy to set the acceleration and deceleration in a REAL value. It is prepared with a REAL value conversion that can convert REAL to UINT for the SP. It takes the variables that are created in the I/O Map under Configuration and Setup and then map it to the function block. Only adding the F002 and F003 parameters in the PDO-mapping of the 3G3AX-MX2-ECT option board.		

Example

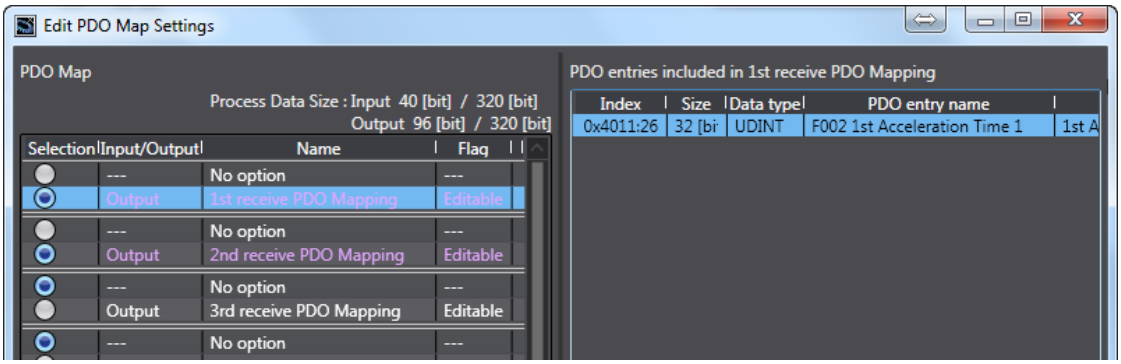


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

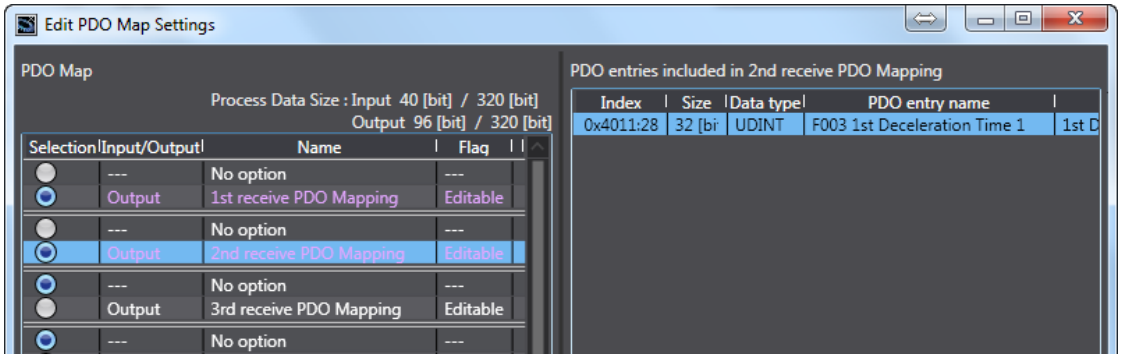
EtherCAT setting in Sysmac Studio:



Add the ***F002 1st Acceleration Time 1*** in the 1st receive PDO Mapping.



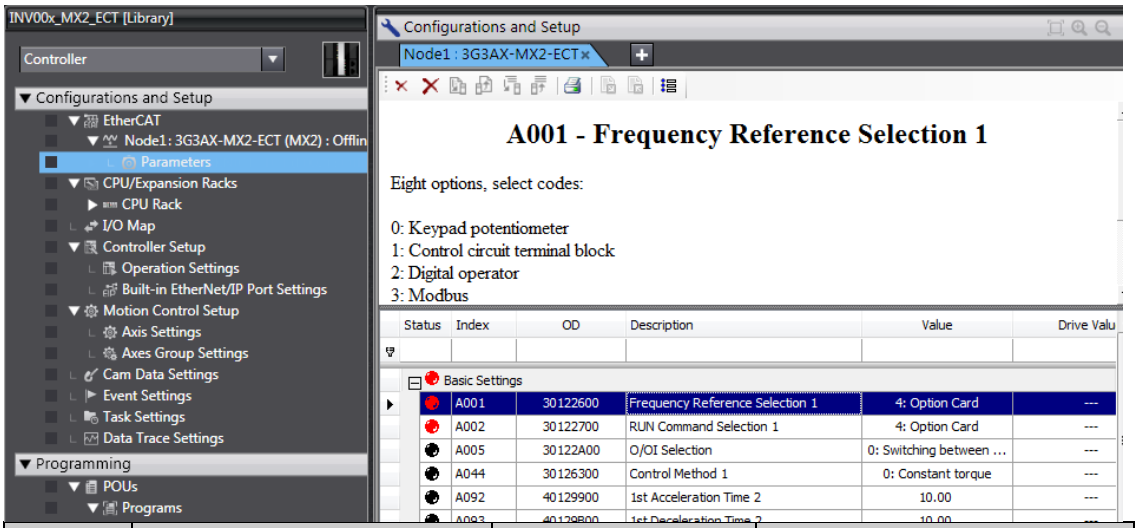
Add the ***F003 1st Deceleration Time 1*** in the 2st receive PDO Mapping.



The PDO free format has the restrictions that are described below.

- Up to 2 objects can be allocated to each PDO mapping from 1st receive PDO Mapping to 5th receive PDO Mapping and 1st transmit PDO Mapping to 5th transmit PDO Mapping. Keep the total size of the allocated objects to within 4 bytes.
- Up to five PDOs can be selected for both of the output and input sides.
- An object from 5000 to 5999 cannot be allocated to RxPDO (master to slave) together with an object from 6000 to 6999.
- The inverter parameters (objects 3000 to 3999 and 4000 to 4999) that can be allocated to RxPDO (master to slave) are limited to those that can be changed during operation.
- It is not possible to allocate only the LSW or only the MSW to RxPDO or TxPDO.
- The greater the number of RxPDOs or TxPDOs is, the longer the data updating cycle becomes.

Parameters that needs to be changed in the 3G3MX2:



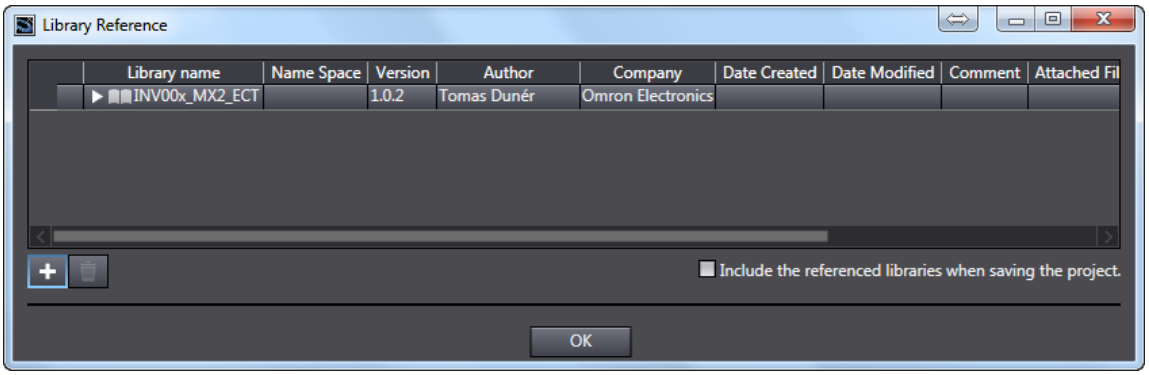
Index	Description	Value	Default
A001	Frequency Reference Selection 1	**4**: Option Card	1: Control circuit terminal block
A002	RUN Command Selection 1	**4**: Option Card	1: Control circuit terminal block

I/O Map:

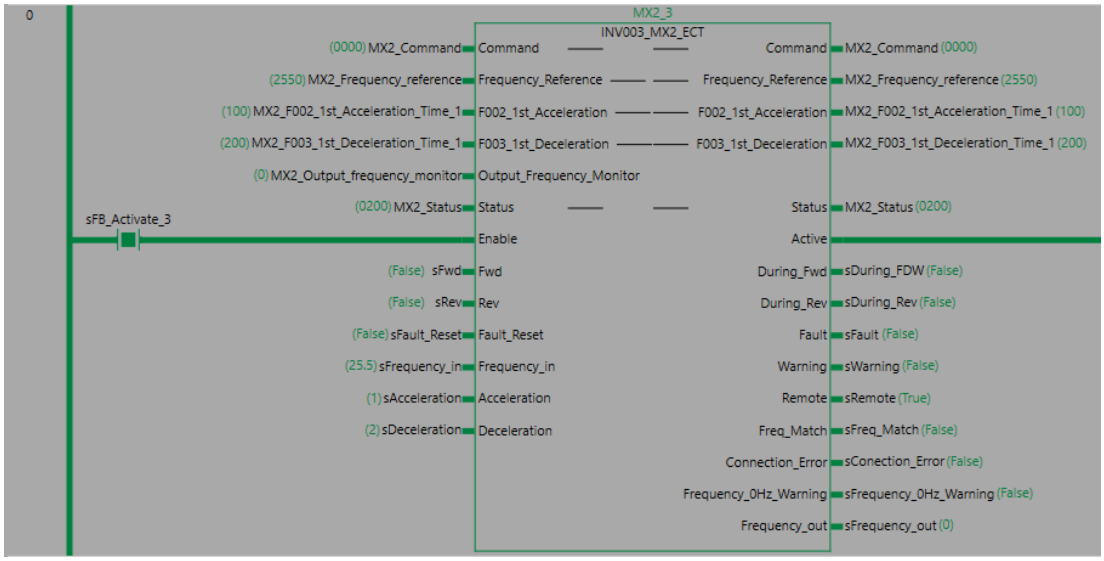
I/O Map

Position	Port	Description	R/W	Data Type	Variable
	EtherCAT Network Configuration				
Node1	3G3AX-MX2-ECT				
	Command	This object gives an operat	W	WORD	MX2_Command
	Frequency reference	This object gives an output	W	UINT	MX2_Frequency_reference
	F002 1st Acceleration Time 1	1st Acceleration Time 1	W	UDINT	MX2_F002_1st_Acceleration_Time_1
	F003 1st Deceleration Time 1	1st Deceleration Time 1	W	UDINT	MX2_F003_1st_Deceleration_Time_1
	Status	This object gives the preser	R	WORD	MX2_Status
	Output frequency monitor	This object gives the outpu	R	UINT	MX2_Output_frequency_monitor
	Sysmac Error Status	Indicate Sysmac error statu	R	BYTE	MX2_Sysmac_Error_Status
	Observation	Observation levels of inforr	R	BOOL	MX2_Observation
	Minor Fault	Minor Fault levels of inforr	R	BOOL	MX2_Minor_Fault

Add the INV00x_MX2_ECT in the library:



Use the INV003_MX2_ECT FunctionBlock and make the necessary connections like the example below:



Variables

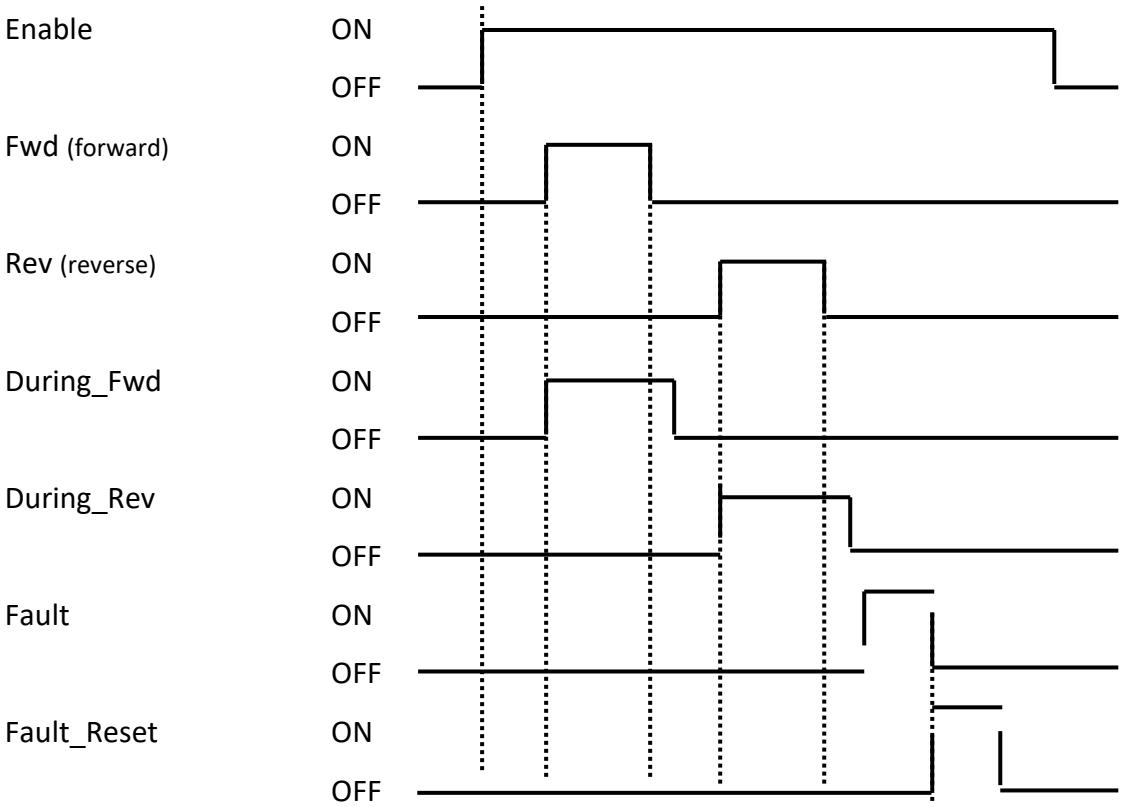
sFB_Activate = Enables the FB

sFrequency_in = 25.50Hz (Max settings is depending on what A004 - Maximum Frequency 1 is set to)

sFwd = Start forward

sAcceleration = 1.00s

sDeceleration = 2.00s

FB precautions	Time Chart for the BOOL signals: 

Input Variables from the I/O mapping of 3G3MX2

Variable name	Name	Data type	Description
Command	Control command	WORD	The bit data for the command is shown below.

–	–	–	–	–	–	–	–	7	–	–	–	–	–	1	0

Bit	Name	Meaning
0	Forward/stop	0: Stop 1: Forward command
1	Reverse/stop	0: Stop 1: Reverse command
7	Fault reset	↑: Resets an error or trip for the unit or inverter.
-	(Reserved)	The reserved area. Set 0.

Variable name	Name	Data type	Description
Frequency_Reference	Frequency reference	UINT	Specify the reference frequency in increments of 0.01 Hz. When a value is set that exceeds the maximum frequency, operation is performed at the maximum frequency. Setting range: 0 to maximum frequency
Output_Frequency_Monitor	Output frequency monitor	UINT	Displays the output frequency in increments of 0.01 Hz.
Status	Status	WORD	The bit data for the status information is shown below.

15	–	–	12	–	–	9	–	7	–	–	–	3	–	1	0

Bit	Name	Meaning
0	Forward operation in progress	0: Stopped/during reverse operation 1: During forward operation
1	Reverse operation in progress	0: Stopped/during forward operation 1: During reverse operation
3	Fault	0: No error or trip occurred for the unit or inverter 1: Error or trip occurred for the unit or inverter
7	Warning	0: No warning occurred for the unit or inverter 1: Warning occurred for the unit or inverter
9	Remote	0: Local (Operations from EtherCAT are disabled) 1: Remote (Operations from EtherCAT are enabled)
12	Frequency matching	0: During acceleration/deceleration 1: Frequency matched
15	Connection error between the Optional Unit and inverter	0: Normal 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)
–	(Reserved)	The reserved area. Set 0.

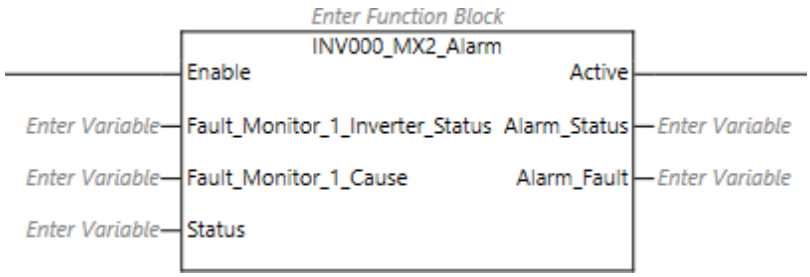
Input Variables

Variable name	Name	Data type	Description
Enable	Enable	BOOL	1 (ON): FB started. 0 (OFF): FB not started.
Fwd	Start forward drive	BOOL	0: Stop. 1: Forward command.
Rev	Start reverse drive	BOOL	0: Stop. 1: Reverse command.
Fault_Reset	Fault reset	BOOL	↑: Resets an error or trip for the inverter.
Frequency_in	Frequency that are set to the MX2	REAL	Set the frequency in a REAL value Ex. 15.50 Hz
Acceleration	Acceleration that are set to the RX	REAL	Set the acceleration in a REAL value Ex. 1.00 seconds
Deceleration	Deceleration that are set to the RX	REAL	Set the deceleration in a REAL value Ex. 2.00 seconds

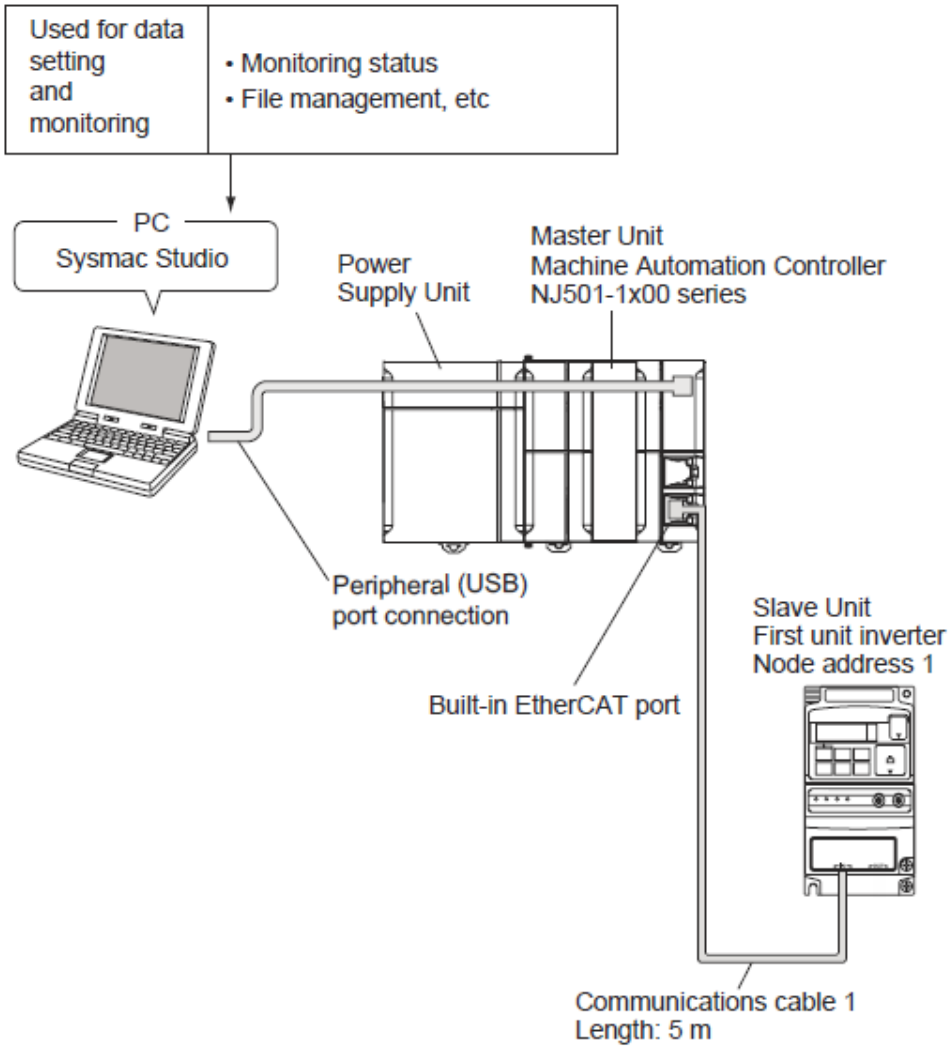
Output Variables

Variable name	Name	Data type	Description
Active	Enable output	BOOL	1 (ON): FB processed normally. 0 (OFF): FB not processed or ended in an error.
During_Fwd	Forward operation in progress	BOOL	0: Stopped/during reverse operation. 1: During forward operation.
During_Rev	Reverse operation in progress	BOOL	0: Stopped/during forward operation. 1: During reverse operation.
Fault	Fault	BOOL	0: No error or trip occurred for the unit or inverter. 1: Error or trip occurred for the unit or inverter.
Warning	Warning	BOOL	0: No warning occurred for the unit or inverter. 1: Warning occurred for the unit or inverter.
Remote	Remote	BOOL	0: Local (Operations from EtherCAT are disabled). 1: Remote (Operations from EtherCAT are enabled).
Freq_Match	Frequency matching	BOOL	0: During acceleration/deceleration. 1: Frequency matched.
Connection_Error	Connection error between the CPU and inverter	BOOL	0: Normal. 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)
Frequency_out	Actual frequency that the MX2 has	REAL	The frequency in a REAL value that the MX2 has. Ex. 15.50 Hz

3G3MX2	INV000_MX2_Alarm

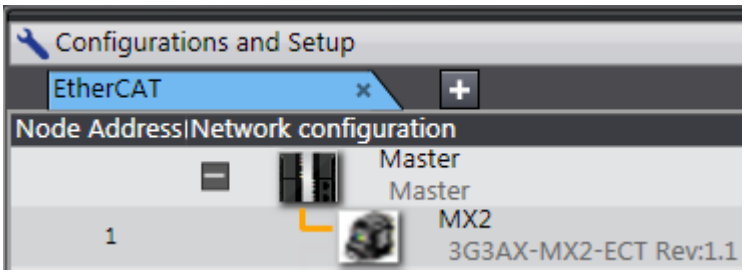
Basic function	A function block that can be used for monitoring alarms on 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV000_MX2_Alarm		
FB version	v1.0.2		
Applicable models	Applicable Target	All 3G3MX2 with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*[2]NJ101- series *[1]NJ301- series *[1]NJ501- series *[2]NX701- series	*[3]NX1P2- series *[4]NX102- series *[3]NY- series
	Sysmac Studio	Version 1.13 or higher *[1]Firmware version 1.05 or higher is needed *[2]Firmware version 1.10 or higher is needed *[3]Firmware version 1.13 or higher is needed *[4]Firmware version 1.30 or higher is needed	
Function description	The INV000_MX2_Alarm is a function block that makes it easy to read the alarm status of the 3G3MX2. It takes the variables that are created in the I/O Map under Configuration and Setup and then map it to the function block. Only adding the D081 Fault Monitor 1 Cause and Inverter Status parameters in the PDO-mapping of the 3G3AX-MX2-ECT option board.		

Example

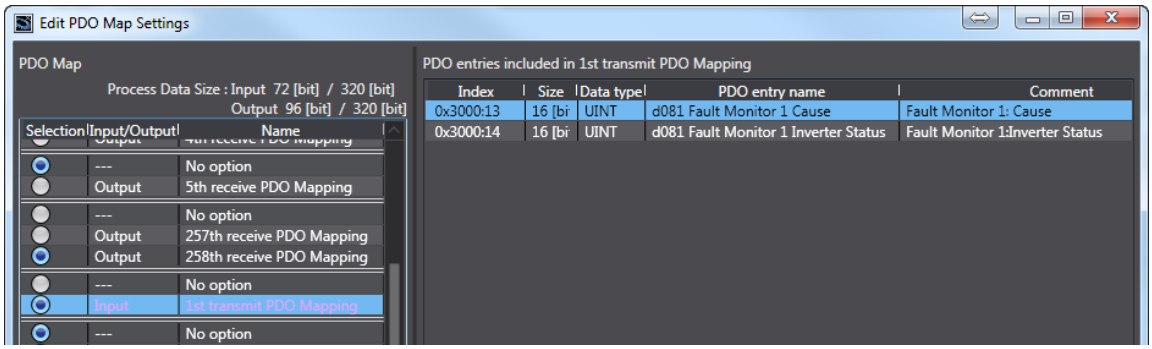


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

EtherCAT setting in Sysmac Studio:



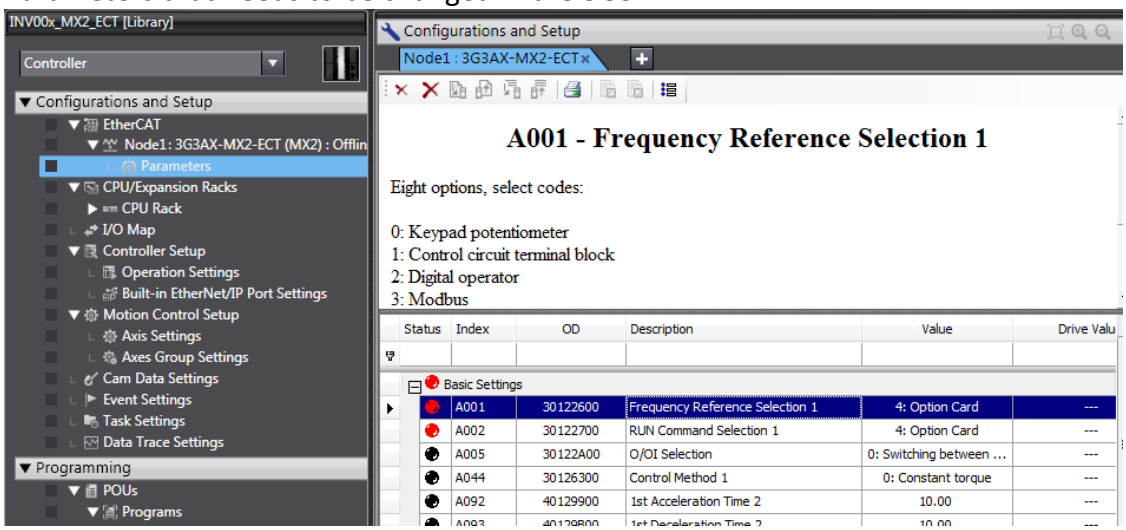
Add the ***D081 Fault Monitor 1 Cause*** and ***D081 Fault Monitor 1 Inverter Status*** in the 1st transmit PDO Mapping.



The PDO free format has the restrictions that are described below.

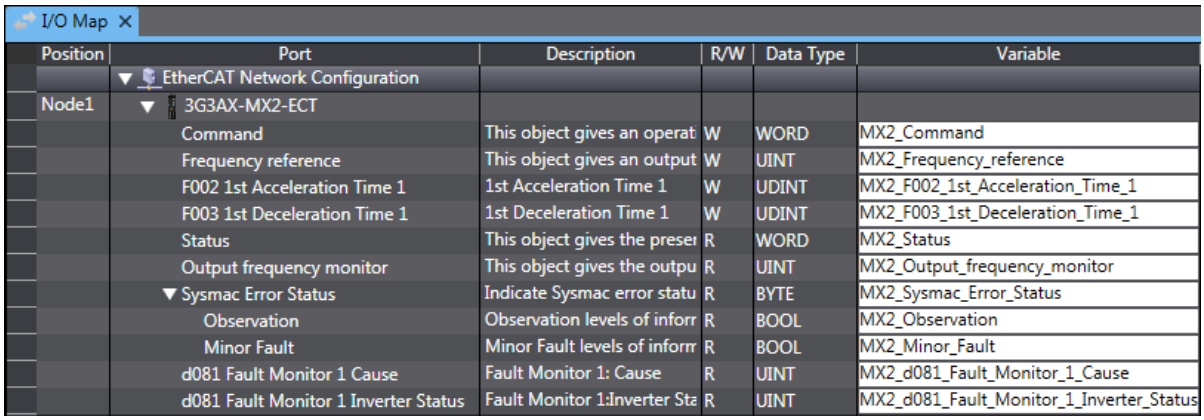
- Up to 2 objects can be allocated to each PDO mapping from 1st receive PDO Mapping to 5th receive PDO Mapping and 1st transmit PDO Mapping to 5th transmit PDO Mapping. Keep the total size of the allocated objects to within 4 bytes.
- Up to five PDOs can be selected for both of the output and input sides.
- An object from 5000 to 5999 cannot be allocated to RxPDO (master to slave) together with an object from 6000 to 6999.
- The inverter parameters (objects 3000 to 3999 and 4000 to 4999) that can be allocated to RxPDO (master to slave) are limited to those that can be changed during operation.
- It is not possible to allocate only the LSW or only the MSW to RxPDO or TxPDO.
- The greater the number of RxPDOs or TxPDOs is, the longer the data updating cycle becomes.

Parameters that needs to be changed in the 3G3MX2:

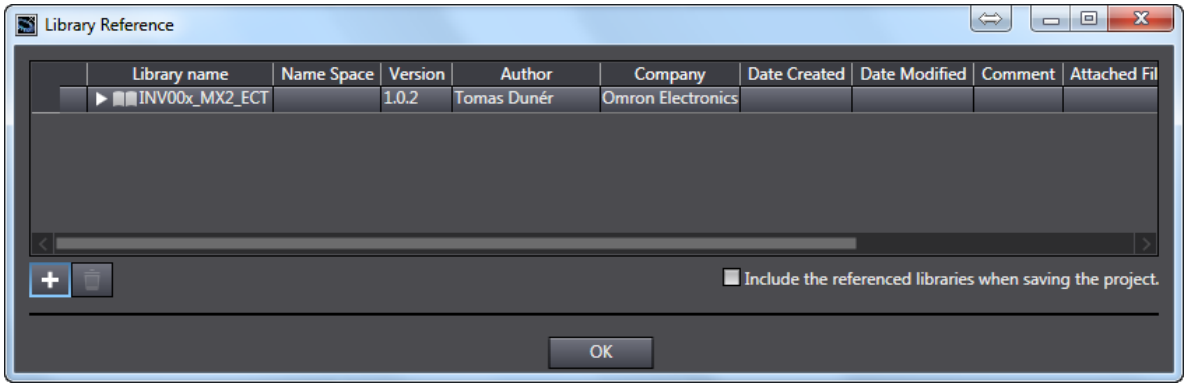


Index	Description	Value	Default
B145	GS Input Operation Selection	**1**: Trip	0: Non trip

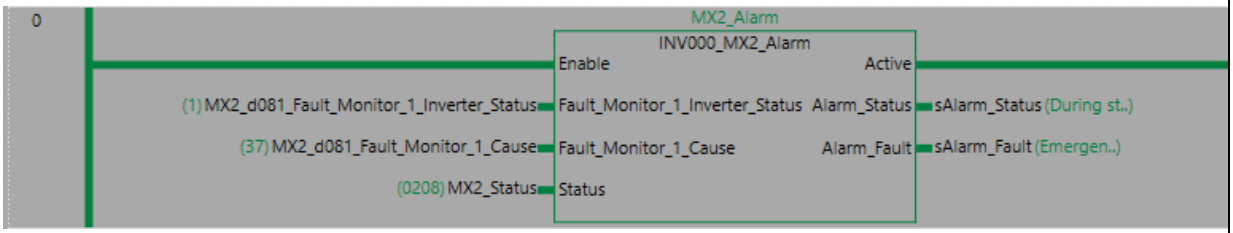
I/O Map:



Add the INV00x_MX2_ECT in the library:



Use the INV000_MX2_Alarm FunctionBlock and make the necessary (RED) connections like the example below:



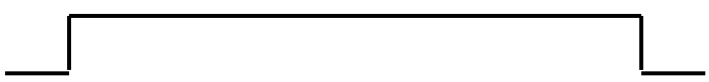
Variables

Enable = Enables the FB

Fault_Monitor_1_Inverter_Status = MX2 Cause of fault, ***D081 Fault Monitor 1 Inverter Status.***

Fault_Monitor_1_Cause = MX2 Inverter status at fault occur, ***D081 Fault Monitor 1 Cause.***

Status = Uses the Fault BOOL in the Status WORD to see when error has occurred.

FB precautions	Time Chart for the BOOL signals: Enable ON OFF 

Input Variables from the I/O mapping of 3G3MX2

Variable name	Name	Data type	Description
Fault_Monitor_1_Inverter_Status	Fault Monitor 1 Inverter Status	UINT	Fault Monitor 1Inverter Status from the 3G3MX2
Fault_Monitor_1_Cause	Fault Monitor 1 Cause	UINT	Fault Monitor 1 Cause from the 3G3MX2
Status	Status	WORD	The bit data for the status information is shown below.

15	–	–	12	–	–	9	–	7	–	–	–	3	–	1	0

Bit	Name	Meaning
0	Forward operation in progress	0: Stopped/during reverse operation 1: During forward operation
1	Reverse operation in progress	0: Stopped/during forward operation 1: During reverse operation
3	Fault	0: No error or trip occurred for the unit or inverter 1: Error or trip occurred for the unit or inverter
7	Warning	0: No warning occurred for the unit or inverter 1: Warning occurred for the unit or inverter
9	Remote	0: Local (Operations from EtherCAT are disabled) 1: Remote (Operations from EtherCAT are enabled)
12	Frequency matching	0: During acceleration/deceleration 1: Frequency matched
15	Connection error between the Optional Unit and inverter	0: Normal 1: Error (Cannot update data for the inverter. To restore, turn the power OFF and then ON again.)
–	(Reserved)	The reserved area. Set 0.

Output Variables

Variable name	Name	Data type	Description
Active	Enable output	BOOL	1 (ON): FB processed normally. 0 (OFF): FB not processed or ended in an error.
Alarm_Status	Alarm Status	STRING[256]	The alarm data for what status the 3G3MX2 was in when the fault or error occurred.

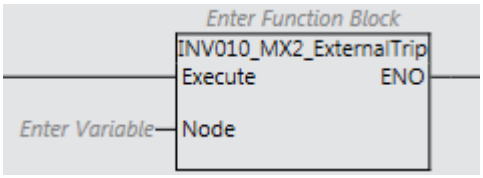
Inverter status (Alarm coder low-place)		
Name	**Alarm code**	**Data**
During reset	E□□.0	0h
During stop	E□□.1	1h
During deceleration	E□□.2	2h
At a constant speed	E□□.3	3h
During acceleration	E□□.4	4h
Operates at frequency = 0	E□□.5	5h
During startup	E□□.6	6h
DB active (DC injection braking active)	E□□.7	7h
During overload limit	E□□.8	8h

Alarm_Fault	Alarm_Fault	STRING[256]	The alarm data for the alarm status information is shown below.

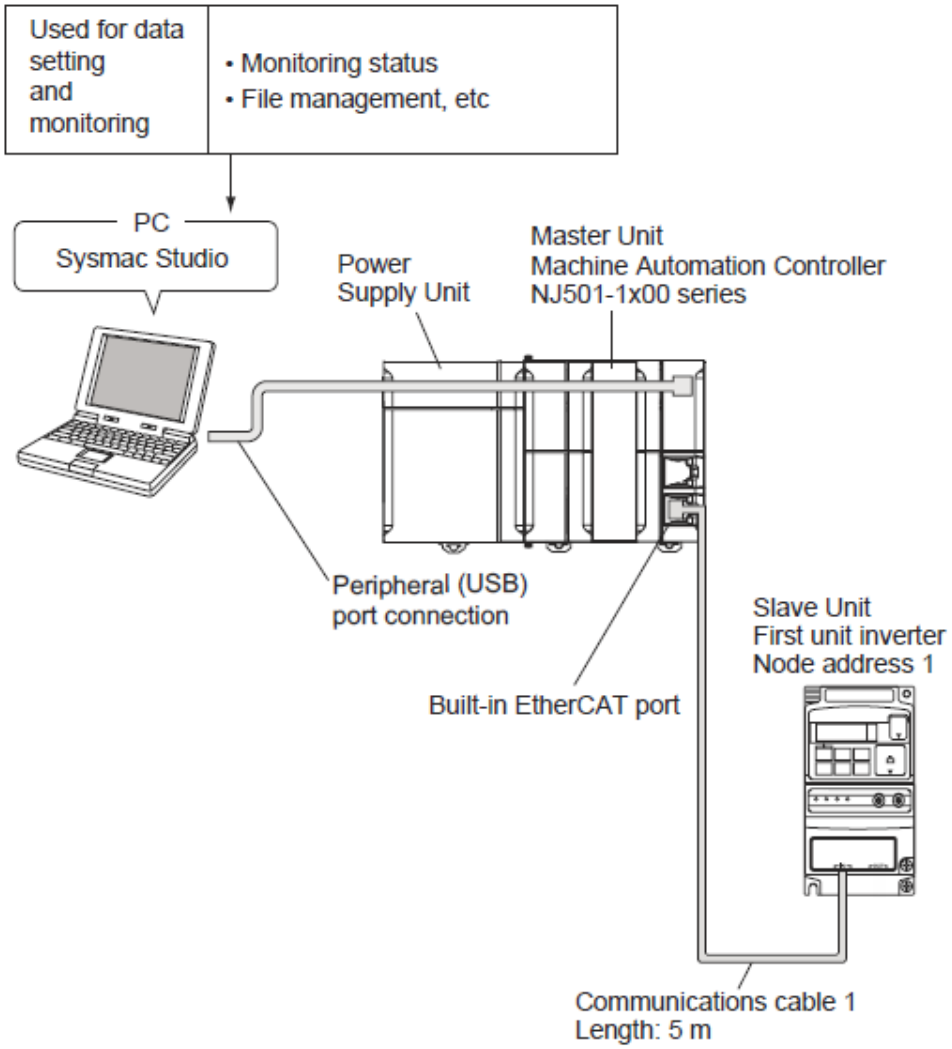
Cause (Alarm coder high-place)		
Name	**Alarm code**	**Data**
No trip factor	E00.□	0h
Overcurrent protection during constant speed	E01.□	1h
Overcurrent protection during deceleration	E02.□	2h
Overcurrent protection during acceleration	E03.□	3h
Overcurrent protection during stop	E04.□	4h
Overload protection	E05.□	5h
Braking resistor overload protection	E06.□	6h
Overvoltage protection	E07.□	7h
EEPROM error	E08.□	8h
Undervoltage protection	E09.□	9h
Current detector error	E10.□	Ah
CPU error	E11.□	Bh
External trip	E12.□	Ch
USP error	E13.□	Dh
Grounding protection	E14.□	Eh
Incoming overvoltage protection	E15.□	Fh
Abnormal temperature	E21.□	15h
Main circuit error	E25.□	19h
Driver error	E30.□	1Eh
Thermistor error	E35.□	23h
Brake error	E36.□	24h
Emergency shutoff	E37.□	25h
Overload protection in a low speed range	E38.□	26h
Digital operator connection error	E40.□	28h
Modbus communication (Modbus-RTU) error	E41.□	29h
Internal data error	E43.□ to E45.□ E50.□ to E69.□	2Bh to 2Dh 32h to 45h
Encoder disconnection	E80.□	50h
Overspeed	E81.□	51h
Position control range trip	E83.□	53h

For specific remedies, refer to *MX2 SERIES USER'S MANUAL* (Cat No.I585).

3G3MX2	INV010_MX2_ExternalTrip

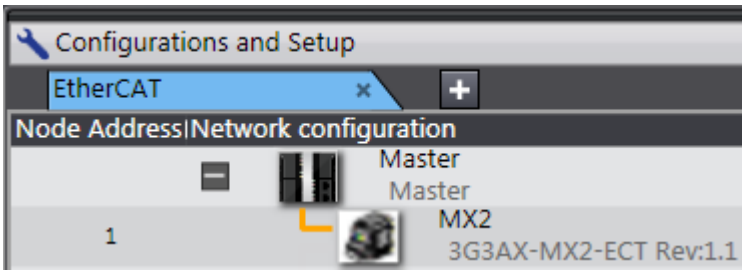
Basic function	A function block that can be used to External Trip the 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV010_MX2_ ExternalTrip		
FB version	v1.0.2		
Applicable models	Applicable Target	All 3G3MX2 with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*[2]NJ101- series *[1]NJ301- series *[1]NJ501- series *[2]NX701- series	*[3]NX1P2- series *[4]NX102- series *[3]NY- series
	Sysmac Studio	Version 1.13 or higher *[1]Firmware version 1.05 or higher is needed *[2]Firmware version 1.10 or higher is needed *[3]Firmware version 1.13 or higher is needed *[4]Firmware version 1.30 or higher is needed	
Function description	The INV010_MX2_ExternalTrip is a function block that makes it easy to External Trip the 3G3MX2. All that is needed is the node number of the 3G3MX2. It can then be reset by the *Fault_Reset* signal. No extra settings of the PDO-mapping of the 3G3AX-MX2-ECT option board is needed. This function block is using EC_CoESDOWrite so there are some Precautions. See Precautions for Correct Use.		
Precautions for Correct Use	• This instruction can be used only for the NJ/NX-series and NY-series Controller EtherCAT ports. • You can execute a maximum of 32 of the following instructions at the same time: EC_CoESDOWrite, EC_CoESDORead, EC_StartMon, EC_StopMon, EC_SaveMon, EC_CopyMon, EC_DisconnectSlave, EC_ConnectSlave, EC_ChangeEnableSetting, IOL_ReadObj, and IOL_WriteObj. • An error occurs in the following cases. Error will change to TRUE. • The EtherCAT master is not in a state that allows message communications. • The slave specified with NodeAdr does not exist. • The slave specified with NodeAdr is not in a state that allows communications. • The slave returns an error response. • The read data size is larger than the size of ReadDat. • More than 32 of the following instructions were executed at the same time: EC_CoESDOWrite, EC_CoESDORead, EC_StartMon, EC_StopMon, EC_SaveMon, EC_CopyMon, EC_DisconnectSlave, EC_ConnectSlave, EC_ChangeEnableSetting, IOL_ReadObj, and IOL_WriteObj.		

Example

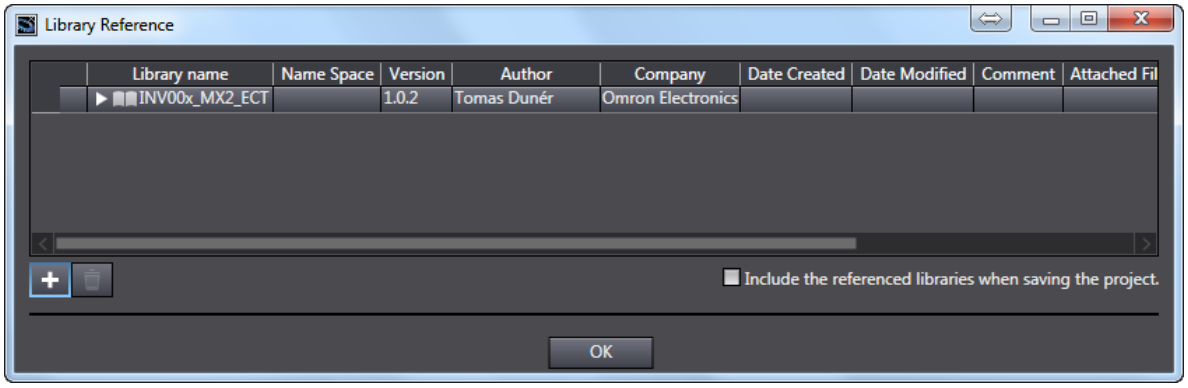


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

EtherCAT setting in Sysmac Studio:



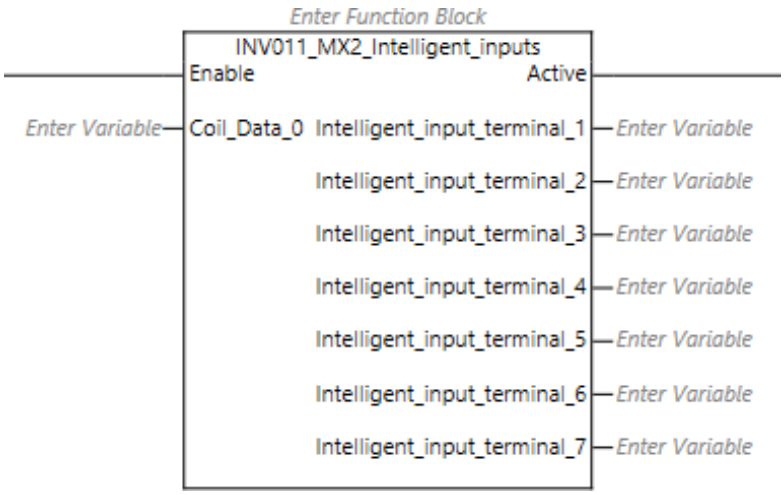
Add the INV00x_MX2_ECT in the library:



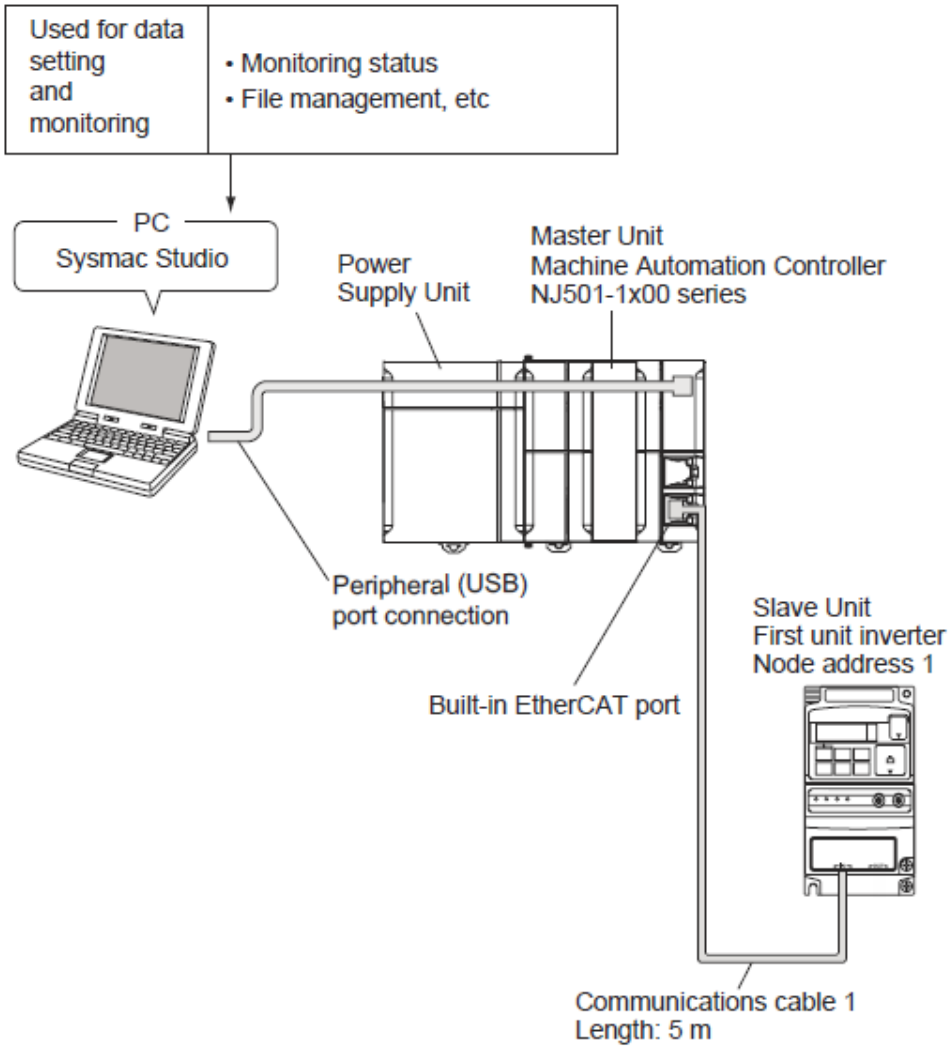
Use the INV010_MX2_ExternalTrip and make the necessary connections like the example below:

Variables
ExternalTrip = Executes the FB
Node = The node number of the 3G3MX2 that will get the External Trip**.**

3G3MX2	INV011_MX2_Intelligent_inputs

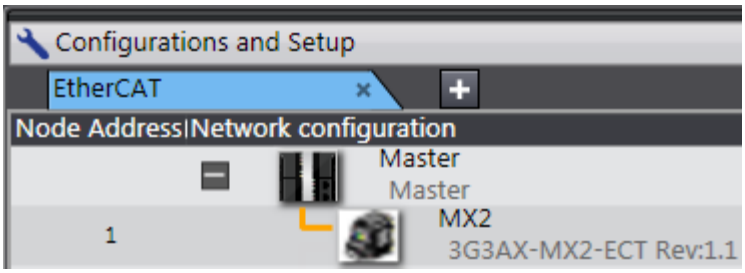
Basic function	A function block that can be used to read the digital inputs of the 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV011_MX2_ Intelligent_inputs		
FB version	v1.0.2		
Applicable models	Applicable Target	All 3G3MX2 with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*[2]NJ101- series *[1]NJ301- series *[1]NJ501- series *[2]NX701- series	*[3]NX1P2- series *[4]NX102- series *[3]NY- series
	Sysmac Studio	Version 1.13 or higher *[1]Firmware version 1.05 or higher is needed *[2]Firmware version 1.10 or higher is needed *[3]Firmware version 1.13 or higher is needed *[4]Firmware version 1.30 or higher is needed	
Function description	The INV011_MX2_ Intelligent_inputs function block is created to make it easy to read the digital input S1-S7 from 3G3MX2. It takes the variables that are created in the I/O Map under Configuration and Setup and then map it to the function block. Only adding the Coil Data 0 in the PDO-mapping of the 3G3AX-MX2-ECT option board.		

Example

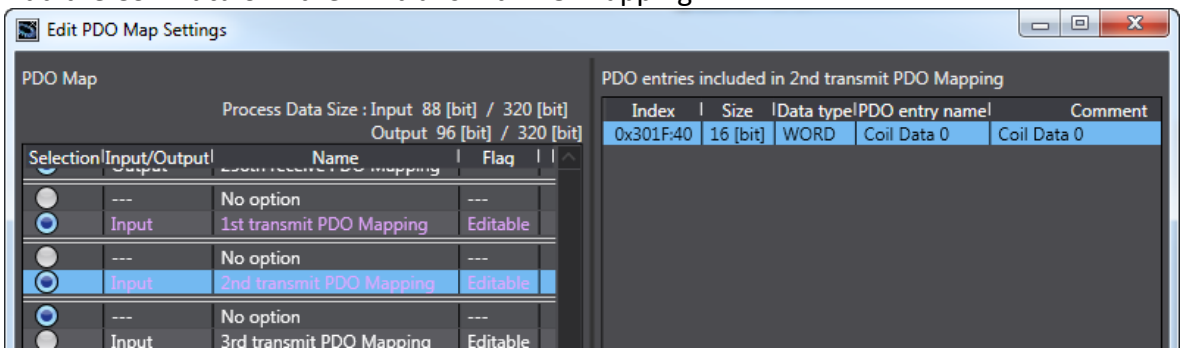


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

EtherCAT setting in Sysmac Studio:



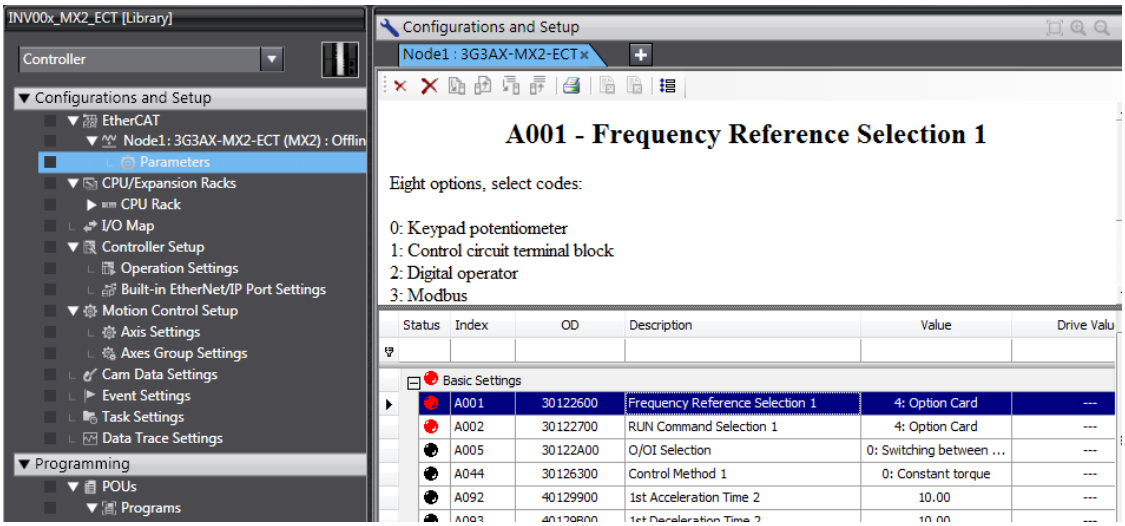
Add the ***Coil Data 0*** in the 2nd transmit PDO Mapping.



The PDO free format has the restrictions that are described below.

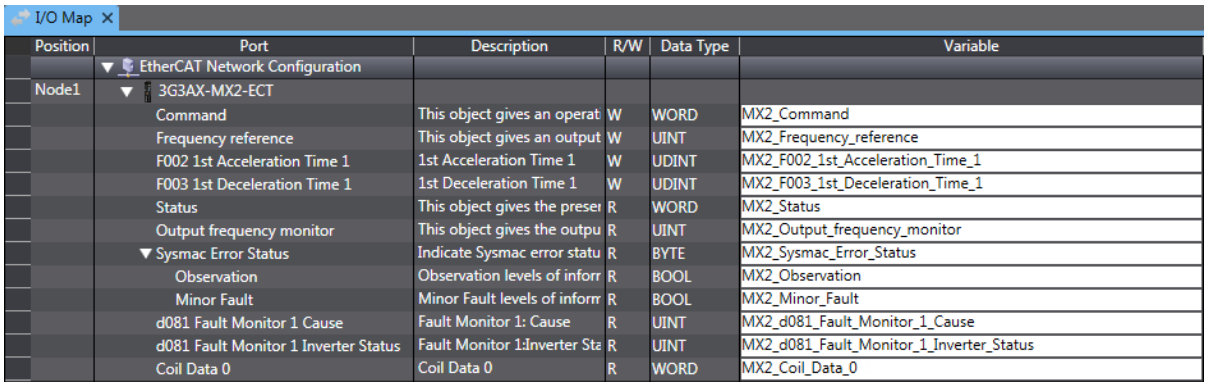
- Up to 2 objects can be allocated to each PDO mapping from 1st receive PDO Mapping to 5th receive PDO Mapping and 1st transmit PDO Mapping to 5th transmit PDO Mapping. Keep the total size of the allocated objects to within 4 bytes.
- Up to five PDOs can be selected for both of the output and input sides.
- An object from 5000 to 5999 cannot be allocated to RxPDO (master to slave) together with an object from 6000 to 6999.
- The inverter parameters (objects 3000 to 3999 and 4000 to 4999) that can be allocated to RxPDO (master to slave) are limited to those that can be changed during operation.
- It is not possible to allocate only the LSW or only the MSW to RxPDO or TxPDO.
- The greater the number of RxPDOs or TxPDOs is, the longer the data updating cycle becomes.

Parameters that needs to be changed in the 3G3MX2:

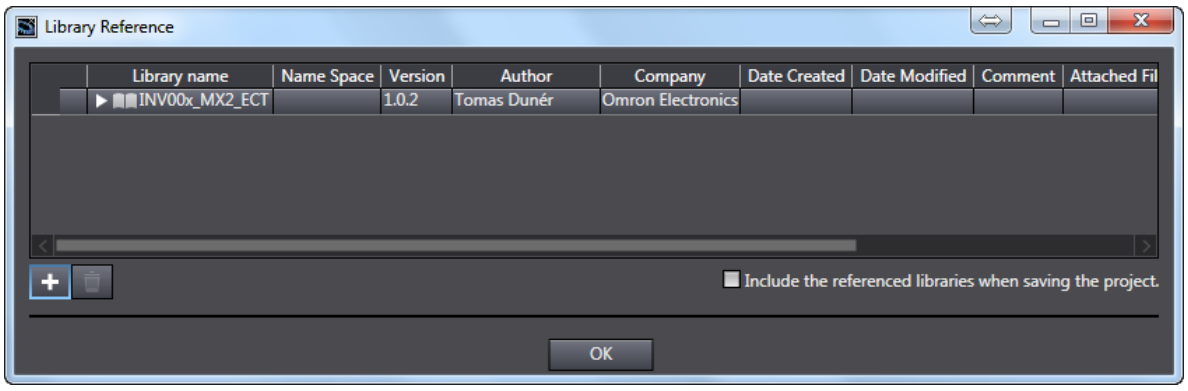


Index	Description	Value	Default
A001	Frequency Reference Selection 1	**4**: Option Card	1: Control circuit terminal block
A002	RUN Command Selection 1	**4**: Option Card	1: Control circuit terminal block

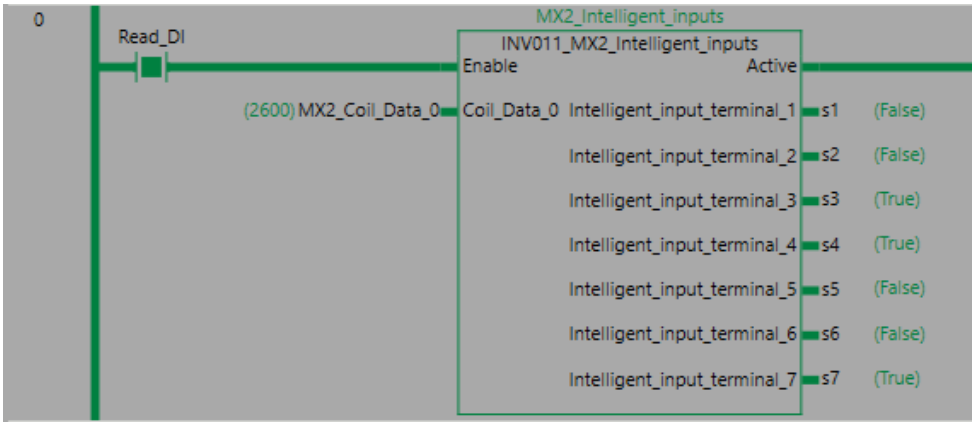
I/O Map:



Add the INV00x_MX2_ECT in the library:



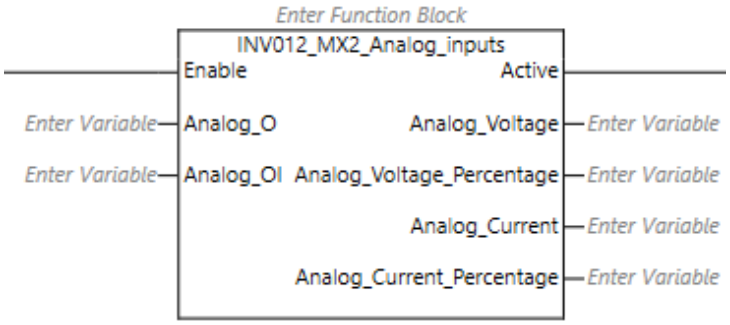
Use the INV011_MX2_Intelligent_inputs and make the necessary connections like the example below:



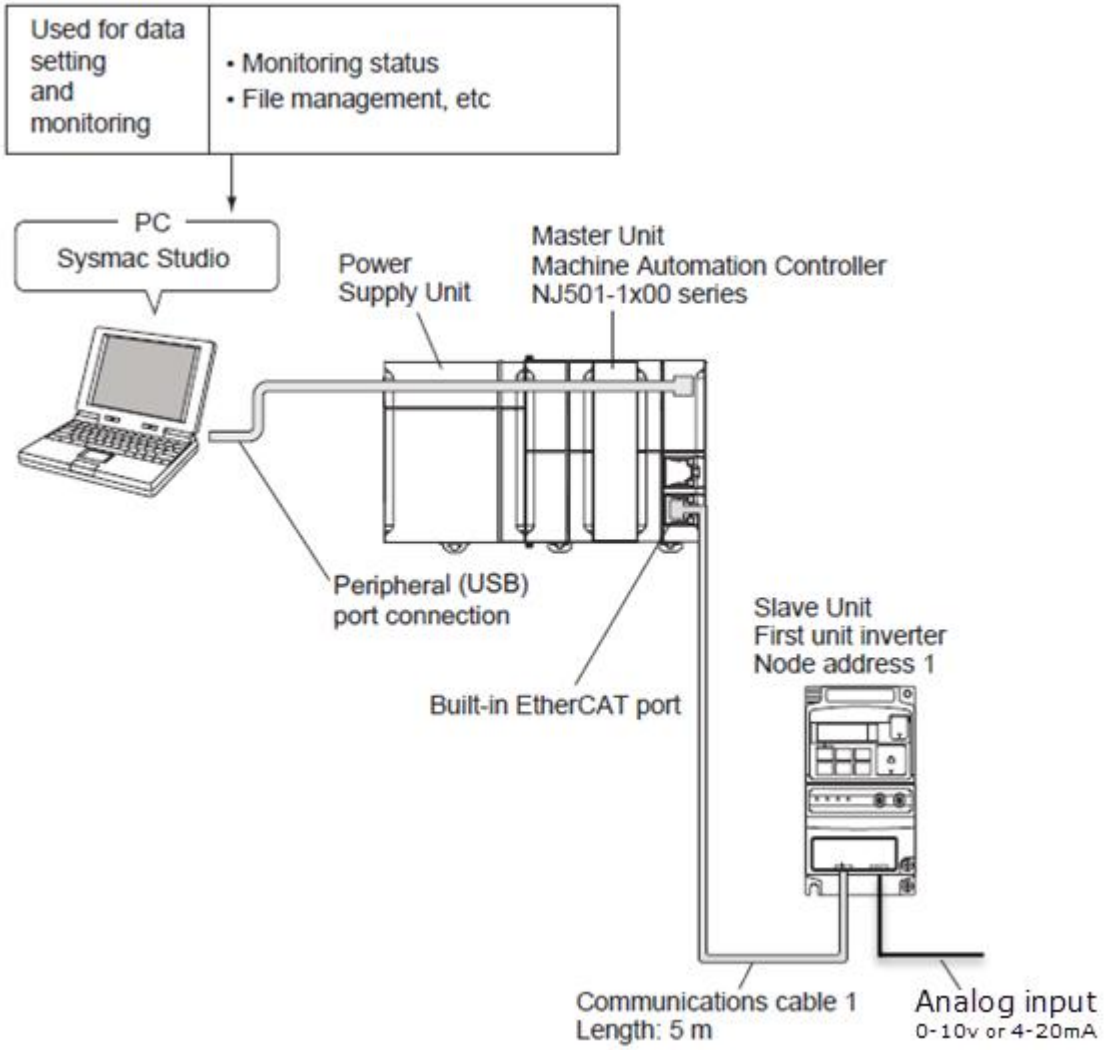
Variables
Coil_Data_0 = Contains the digital inputs from the MX2, S1-S7.
Enable = Enables the FB.

Intelligent_input_terminal (1 to 7) = This corresponds to the digital inputs on the 3G3MX2.

3G3MX2	INV012_MX2_Analog_inputs

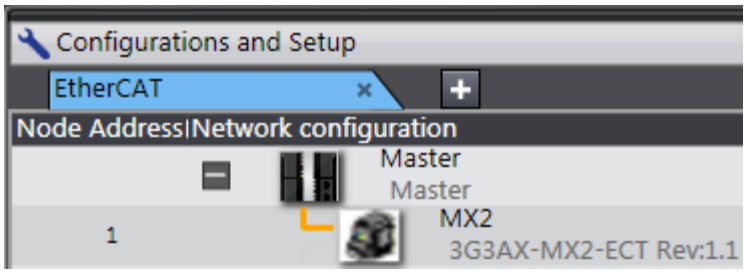
Basic function	A function block that can be used to read the analog inputs of the 3G3MX2 with Omron NJ/NX-series and NY-series Controller over EtherCAT communication		
Symbol			
FB name	INV012_MX2_Analog_inputs		
FB version	v1.0.1		
Applicable models	Applicable Target	All 3G3MX2(FW 46734672 (ACAC)) or higher with a 3G3AX-MX2-ECT v1.1 or higher.	
	CPU Unit	*[2]NJ101- series *[1]NJ301- series *[1]NJ501- series *[2]NX701- series	*[3]NX1P2- series *[4]NX102- series *[3]NY- series
	Sysmac Studio	Version 1.13 or higher *[1]Firmware version 1.05 or higher is needed *[2]Firmware version 1.10 or higher is needed *[3]Firmware version 1.13 or higher is needed *[4]Firmware version 1.30 or higher is needed	
Function description	The INV012_MX2_Analoge_inputs function block is created to make it easy to read the analog input O or OI from 3G3MX2. It takes the variables that are created in the I/O Map under Configuration and Setup and then map it to the function block. Only adding the d130 or d313 in the PDO-mapping of the 3G3AX-MX2-ECT option board.		

Example

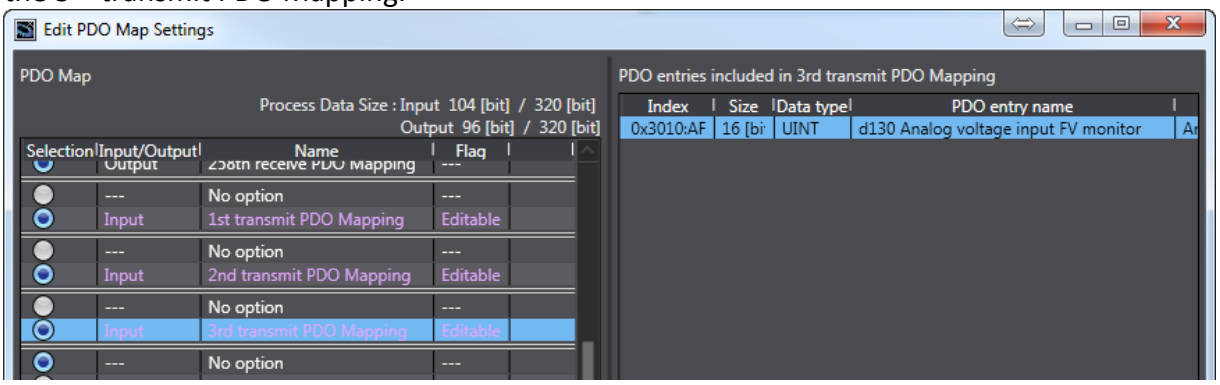


Product	Model/version
CPU Unit	NJ501-1500
Option Board	3G3AX-MX2-ECT v1.1
Support Software (for setup and creating ladder programs)	Sysmac Studio v1.08

EtherCAT setting in Sysmac Studio:



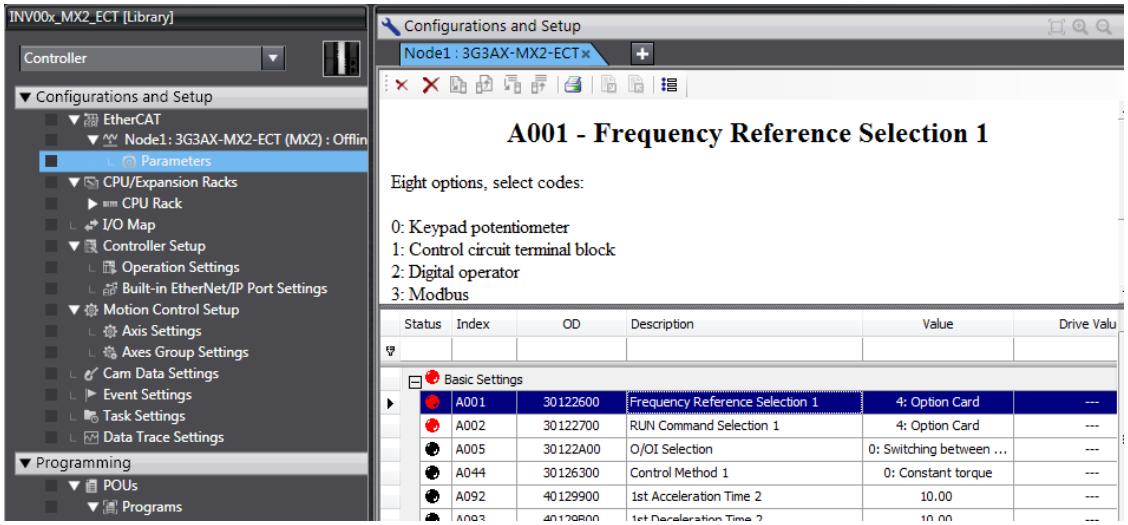
Add the ***d130 Analog voltage input FV monitor*** or ***d131 Analog current input FI monitor*** in the 3nd transmit PDO Mapping.



The PDO free format has the restrictions that are described below.

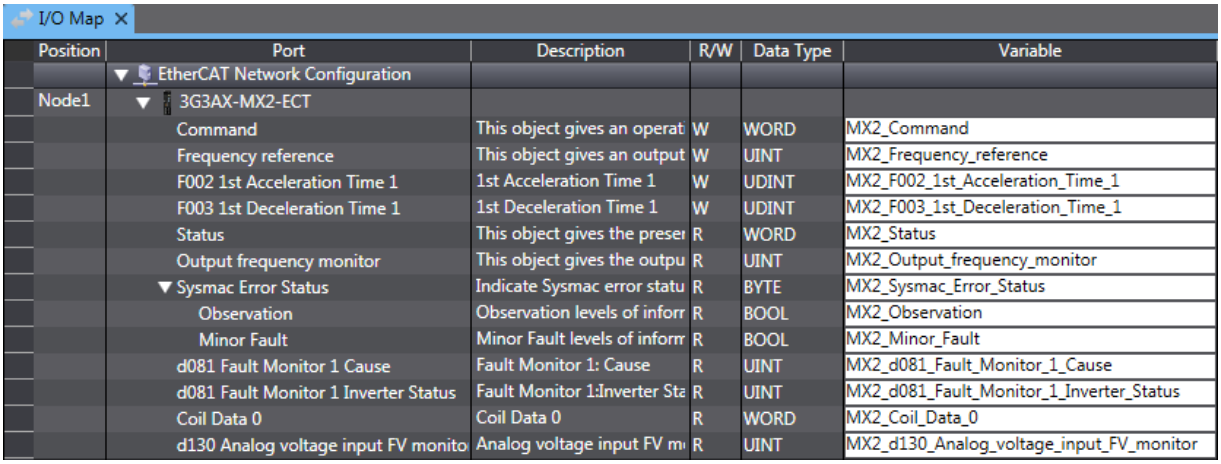
- Up to 2 objects can be allocated to each PDO mapping from 1st receive PDO Mapping to 5th receive PDO Mapping and 1st transmit PDO Mapping to 5th transmit PDO Mapping. Keep the total size of the allocated objects to within 4 bytes.
- Up to five PDOs can be selected for both of the output and input sides.
- An object from 5000 to 5999 cannot be allocated to RxPDO (master to slave) together with an object from 6000 to 6999.
- The inverter parameters (objects 3000 to 3999 and 4000 to 4999) that can be allocated to RxPDO (master to slave) are limited to those that can be changed during operation.
- It is not possible to allocate only the LSW or only the MSW to RxPDO or TxPDO.
- The greater the number of RxPDOs or TxPDOs is, the longer the data updating cycle becomes.

Parameters that needs to be changed in the 3G3MX2:

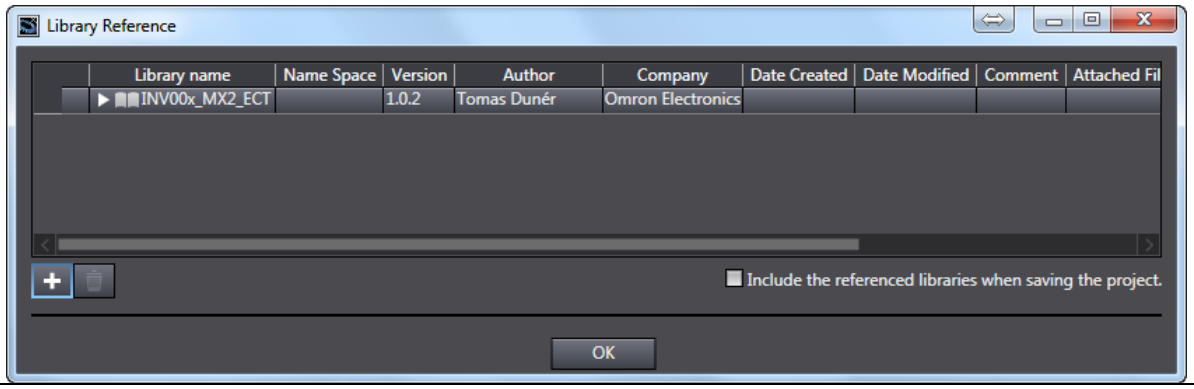


Index	Description	Value	Default
A001	Frequency Reference Selection 1	**4**: Option Card	1: Control circuit terminal block
A002	RUN Command Selection 1	**4**: Option Card	1: Control circuit terminal block

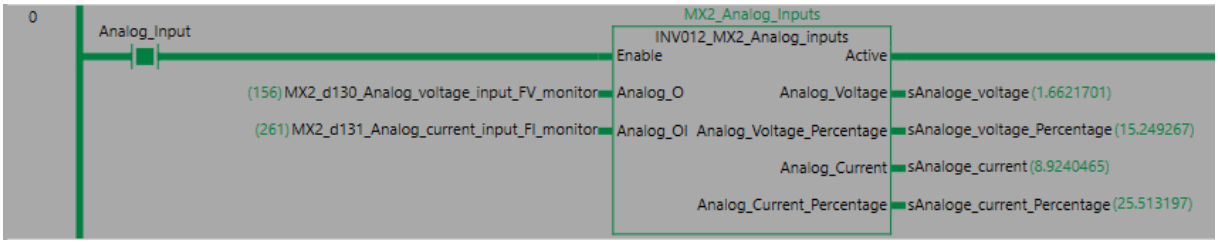
I/O Map:



Add the INV00x_MX2_ECT in the library:



Use the INV011_MX2_Analoge_inputs and make the necessary connections like the example below:



Variables

Analog_O = Contains the analog voltage (0-10vdc) inputs from the MX2, input O.
Analog_OI = Contains the analog voltage (0-10vdc) inputs from the MX2, input O.
Enable = Enables the FB.
Analog_Voltage = This corresponds to the voltage input 0-10vdc input on the 3G3MX2.
Analog_Voltage_Percentage = This percentage is of the 0-1023 bit resolution of the inputted voltage analog value.
Analog_Current = This corresponds to the current input 4-20mA input on the 3G3MX2.
Analog_Current_Percentage = This percentage is of the 0-1023 bit resolution of the inputted current analog value.

Analog Input Adjustment

If more adjustments are needed for the analog value pleas se the manual **I585-E1-03 MX2 Series Type V1 User manual – Section 7-3 Analog I/O Settings**

Parameter No.	Function name	Data	Default data	Unit
C081	FV Adjustment	0.0 to 200.0 Fine-tune the gain relative to the input voltage.	100.0	%
C082	FI Adjustment	0.0 to 200.0 Fine-tune the gain relative to the input current.	100.0	%