Omron NX-Series Connector

NX-Series (NX102-9020)

- Name: **OmronCIP**
- Version: 1.0.0.0
- Protocol: OmronCIP (CIP over TCP/IP)
- Interface: TCP/IP
- Runtime: Multiplatform
- Configuration:
  - Devices / Protocols

Overview
Channels Configuration
Nodes Configuration
Points Configuration
Troubleshoot
Solution OmronCIP Driver -200 Fault (Legacy)

Overview

Communication with NX-Series (tested with NX102-9020)

Channels Configuration

Protocol Options

Model: Set the PLC model.

It can be:

NX-Series: For all models in the NX-Series and compatible.

Nodes Configuration

Station Configuration

Stations syntax: <IP>; <Port>; <Slot>

Where:

<**IP**> = IP address of the slave device in the network

<**Port**> = TCP port where the slave device is listening (default is 44818)

<**Slot**> = Slot is the Slot number where the CPU is connected.

Nodes Configuration Example

Name	Channel	PrimaryStation	BackupStation	Description
Node1	OmronCIP	192.168.1.101;44818;0		OmronCIP [OmronCIP Communication Driver]

Points Configuration

Address Column Configuration

The syntax for ControlLogix communication points is:

```
<Type> : <DeviceTagName>
```

<Type>: Data type of the Tag in PLC.

The valid type values are:

Type	Read	Write	Size
BOOL	Yes	Yes	1 bit
BYTE	Yes	Yes	1 byte or 8 bits
WORD	Yes	Yes	2 bytes or 16 bits

DWORD	Yes	Yes	4 bytes or 32 bits
LWORD	Yes	Yes	8 bytes or 64 bits
SINT	Yes	Yes	1 byte or 8 bits
INT	Yes	Yes	2 bytes or 16 bits
DINT	Yes	Yes	4 bytes or 32 bits
LINT	Yes	Yes	8 bytes or 64 bits
USINT	Yes	Yes	1 byte or 8 bits
UINT	Yes	Yes	2 bytes or 16 bits
UDINT	Yes	Yes	4 bytes or 32 bits
ULINT	Yes	Yes	8 bytes or 64 bits
REAL	Yes	Yes	4 bytes or 32 bits IEEE Floating point
LREAL	Yes	Yes	8 bytes or 64 bits IEEE Floating point
TIME	Yes	Yes	8 bytes or 64 bits
DATE	Yes	Yes	8 bytes or 64 bits
TIME_OF_DAY	Yes	Yes	8 bytes or 64 bits
DATE_AND_TIME	Yes	Yes	8 bytes or 64 bits
STRING	Yes	Yes	n bytes

DeviceTagName: Tag Name in PLC.

Troubleshoot

The status of the driver execution can be observed through the diagnostic tools, which are:

- TraceWindow (with Settings / Device enabled)
- PropertyWatch
- ModuleInformation

The status value of 0 (zero) means communication success. Negative values indicate internal driver errors and positive values indicate protocol errors.

Error Codes

Error Code	Description	Possible Solution
0	Success	None
-100	Error Sending Message	• Turn PLC on • Plug the PLC Ethernet cable • Check configured IP Address field in Devices / Nodes • Ping PLC using command prompt
-101	Error Sending and Waiting Message	
-102 … -105	Error Creating TCP/IP Connection	
-106	Error Receiving Message	
-112	Timeout Start Message	• Turn PLC on • Plug the PLC Ethernet cable • Ping PLC using command prompt • Check configured IP Address field in Devices / Nodes • Increase the driver timeout field in Devices / Channels
-113	Timeout Between Treated Chars	
-114	Timeout End Message	
-115	Timeout Connect	
-200	Protocol Error	• Check if the PLC model is compatible with driver documentation • Check the configured Address field in Devices / Points

-201	Invalid Protocol	• Check if the PLC model is compatible with driver documentation • Contact technical support
-202	Invalid Station	• Check configured IP Address field in Devices / Nodes • Restart the driver
-204	Invalid Message Sequence	• Check if the PLC model is compatible with driver documentation • Check the configured Address field in Devices / Points
> 0	CIP Error	See CIP error codes table

CIP Error Codes

The following error codes are in decimal.

Error Code	Description
1	Connection Failure.
2	Insufficient resources.
3	Value invalid.
4	IOI could not be deciphered or tag does not exist.
5	Unknown destination.
6	Data requested would not fit in response packet.
7	Loss of connection.
8	Unsupported service.
9	Error in data segment or invalid attribute value.
10	Attribute list error.
11	State already exists.
12	Object model conflict.
13	Object already exists.
14	Attribute not settable.
15	Permission denied.
16	Device state conflict.
17	Reply will not fit.
18	Fragment primitive.
19	Insufficient command data / parameters specified to execute service.
20	Attribute not supported.
21	Too much data specified.
26	Bridge request too large.
27	Bridge response too large.
28	Attribute list shortage.
29	Invalid attribute list.
30	Embedded service error.
31	Failure during connection.

34	Invalid reply received.
37	Key segment error.
38	Number of IOI words specified does not match IOI word count.
39	Unexpected attribute in list.

For this driver, it is very important to enable the TraceWindow messages, as invalid addresses can cause all the communication block with the PLC to fail. The TraceWindow tool will display the first invalid address found on the block. To enable Device error messages, open the TraceWindow and click on the Settings button. Enable the Devices option in Modules.

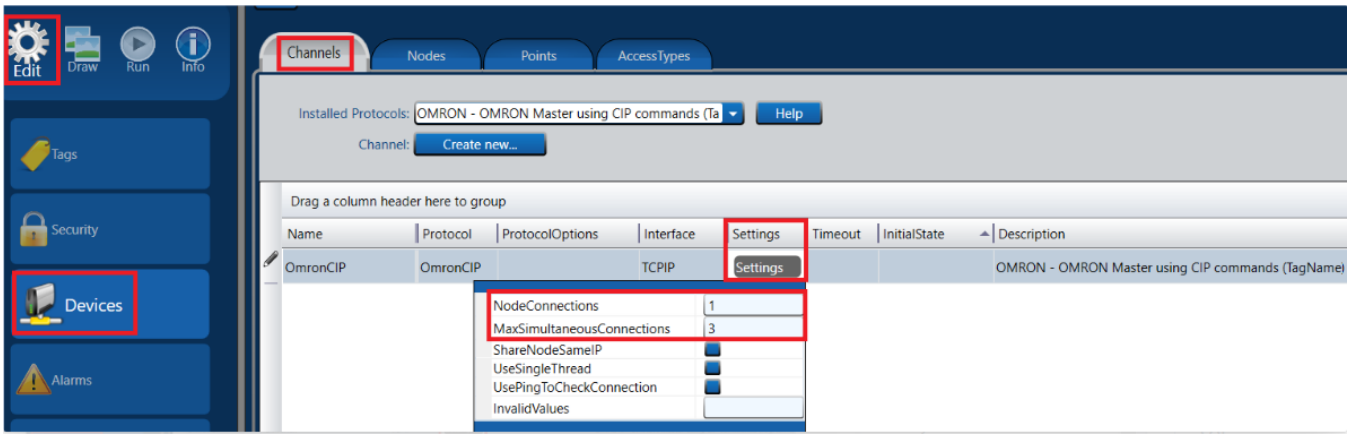
In order to have a quick view on the many communication blocks, open the ModuleInformation, navigate on the tree to find OmronCIP and them select the Read Groups. Looking at the success and fail communication counters, you can easily identify if there is a block with errors and then use TraceWindow to locate the wrong address.

Solution OmronCIP Driver -200 Fault (Legacy)

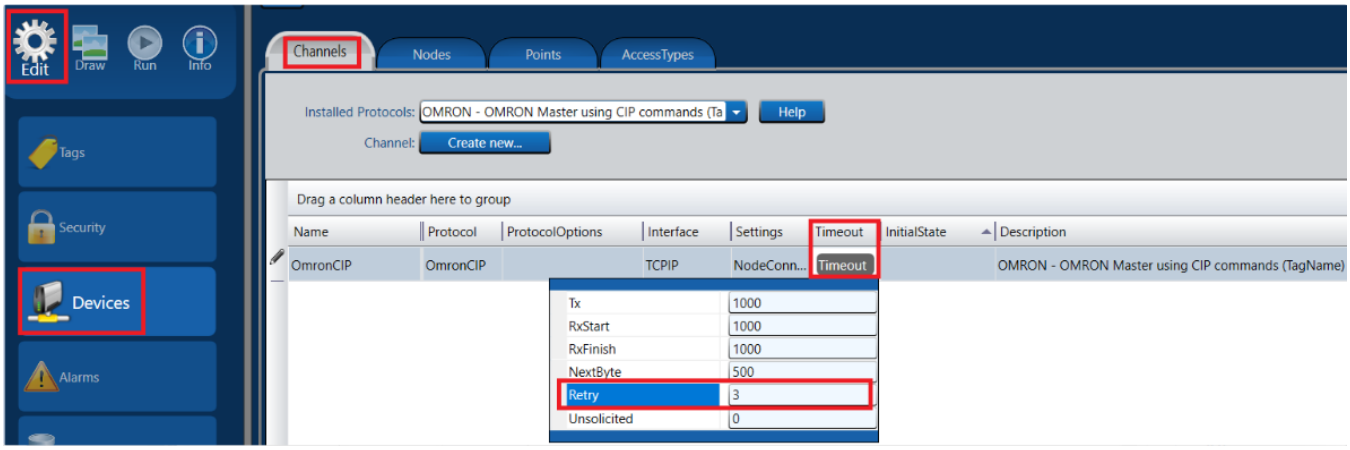
This section refers to FrameworX version 9.

Using the OmronCIP driver to communicate with an Omron NX-102 PLC.

Decrease the value of your MaxSimultaneousConnections property. If it is set to 5, you can try to decrease it to 4 or 3. Besides that, you can try to decrease the value of NodeConnections too. These properties can be found in Edit > Devices > Channels > Settings, like the image below:



Add value 3 to retry property, in Edit > Devices > Channels > Timeout, like the image bellow:



In this section...
