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proNet - EtherNet/IP -
CIP Safety Communication
Module Configuration Instructions

amGardpro

CIP Safety communication module Configuration Instructions

This document includes instructions for the configuration of an amGardpro proNet EtherNet/IP device with a Rockwell Automation PLC using Studio 5000 Logix Designer. The device uses both safety and standard communication in parallel. The PLC must support this feature for the full functionality of the device. Standard-only communication can only be used in a non-safety application.

Important:

The proNet systems are designed for use according to the installation and operating instructions enclosed. It must be installed by competent and qualified personnel who have read and understood the whole of this document prior to commencing installation. If the device or guarded machinery equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. The device is not to be used as a Mains Isolator. The device is a component to be added to a permanent electrical installation meeting the requirements of the applicable IEC/EN standards. All the voltages used within the connected circuits must be derived from a Safety Extra Low Voltage or Protected Extra Low Voltage power supply (SELV or PELV). **Fortress Interlocks Ltd accepts no liability whatsoever for any situation arising from misuse or misapplication of the Device.**

BEWARE OF INTENTIONAL MISUSE CAUSED BY OPERATORS WANTING TO BYPASS SAFETY SYSTEMS. THE INSTALLER SHOULD ASSESS THE RISKS AND MITIGATE AGAINST THEM.

In order to maintain device safety rating, overall system must be validated to ISO 13849-2 and/or evaluated in accordance with IEC 62061.

IF YOU HAVE ANY QUESTIONS OR QUERIES OF ANY NATURE WHATSOEVER PLEASE CONTACT THE SUPPLIER WHO WILL BE PLEASSED TO ADVISE AND ASSIST.

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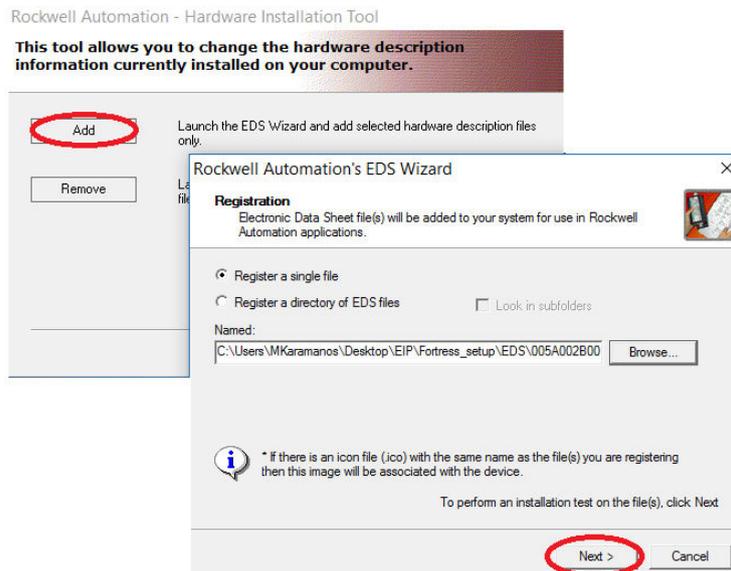
Setup Overview

1. Ensure the provided EDS file has been installed on the computer (Refer to section EDS Installation).
2. Create and configure module in Studio 5000 (Refer to section Integration with Studio 5000).
3. Connect power to unit (MS:Green flash , NS:Off , CS:Green flash ). (Refer to Installation Instructions).
4. Connect data to unit (MS:Green flash , NS: Off , CS:Green flash , Link:Amber ). (Refer to Installation Instructions).
5. Set IP address of unit (MS:Green+Red flash , NS:Green flash , CS:Green flash , Link:Amber flash ). (Refer to section Setting or Changing the IP Address).
6. Reset ownership of the unit if it was previously connected to a different PLC or if the IP address has been changed after a Safety Network Number (SNN) has been set. (MS, NS, CS flashing Green ). (Refer to section Resetting Safety Ownership).
7. Set the SNN (Safety Network Number) and disable Configuration Signature once the unit has connected (MS, NS, CS solid Green ). (Refer to section Configuring the Safety Functions and Configuration Signature).
8. Set PLC to run mode and check that the unit is now running.

Initial Setup

EDS Installation

The provided EDS file should be added to your machine using the “EDS Hardware Installation Tool” by Rockwell Automation.



Integration with Studio 5000

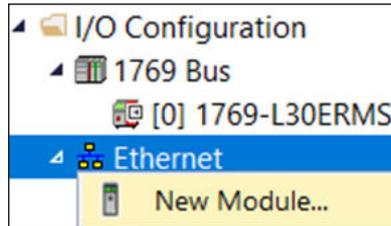
The following are basic instructions to configure the device within Studio 5000 Logic Designer. The user is responsible for ensuring that the settings used meet the requirements of the safety system.

Support for a device with parallel safety and standard communications is a feature of Studio 5000 version 28 and later only.

Support for EDS files with parallel safety and standard communications is a feature of version 32 and later only. Fortress recommends using the instructions for Version 28 and Later for all users, as this allows the project to include a range of Fortress units with different memory map sizes in the same project. However, if the user is only using Fortress units with the same memory map sizes, an EDS file is available.

Studio 5000 Version 32 and Later

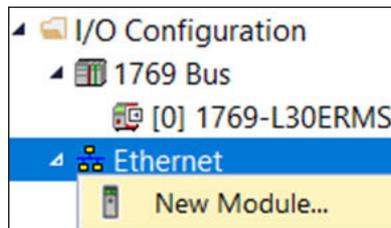
1. Within a Studio 5000 project with an EtherNet/IP-enabled PLC, right-click the EtherNet/IP driver under 'I/O Configuration' and select 'New Module...'



2. Search for the "Fortress Interlocks" module and select 'Create'.
3. Give the new module a name and set its EtherNet address to match the IP address of the unit.
4. Set the Safety Network Number as described in 'Safety Network Number'.
5. Set the Configuration Signature as described in 'Configuration Signature'.
6. After confirming and downloading these settings to the PLC, the module status should switch to 'Running'. Should a fault occur, the module's 'Connection' tab will display a description of the fault.
7. Refer to the supplied memory map when writing your main and safety programs.

Studio 5000 Version 28 and Later

1. Within a Studio 5000 project with an EtherNet/IP-enabled PLC, right-click the EtherNet/IP driver under 'I/O Configuration' and select 'New Module...'



2. Search for the "Generic EtherNet/IP Safety and Standard Module" module and select 'Create'.
3. Give the new module a name and set its EtherNet address to match the IP address of the unit.
4. Change the 'Module Definition' to the following device-specific parameters:

General	
Vendor	1425
Product Type	35
Product Code	5
Major Revision	1
Minor Revision	1

Electronic Keying	Exact Match
Connection:	Safety and Standard
Input Data:	Safety and Standard
Output Data:	Safety and Standard
Data Format:	SINT (8-Bit)

Note that the values marked '*' may differ from those shown here for some devices. Please refer to the supplied memory map document for the values for your specific device.

Connections

Connection	Input		Output		Configuration	
	Assembly Instance	Size (bytes)	Assembly Instance	Size (bytes)	Assembly Instance	Size (bytes)
Safety Input	612	3	199	-	832	-
Safety Output	199	-	768	3	-	-
Standard	100	17*	150	7*	5	0

5. Set the safety network number as described in 'Safety Network Number'.
6. Set the Configuration Signature as described in 'Configuration Signature'.
7. After confirming and downloading these settings to the PLC, the module status should switch to 'Running'. Should a fault occur, the module's 'Connection' tab will display a description of the fault.
8. Refer to the supplied memory map when writing your main and safety programs.

Setting or Changing the IP Address

To set an IP address on a device Fortress recommends using the DIP switches or the *proNet* Support Tool.

The device also hosts a web page that can be used to change the IP address and disable the DHCP functionality. It is also possible to change the IP address using alternative DHCP services.

Note that changing the IP address of the device will invalidate its Safety Network Number and require its safety ownership be reset – this is also done through the *proNet* Support Tool. See 'Resetting Safety Ownership' for details.

DIP Switches

Set the switches to your desired IP address. When using the DIP switches the IP address of the unit will always have the format "192.168.1.xxx". The DIP-Switches are used to identify the last byte of the address which must be between 1 and 254. 'Figure 1 – DIP switches for 192.168.1.200' shows an example configuration.

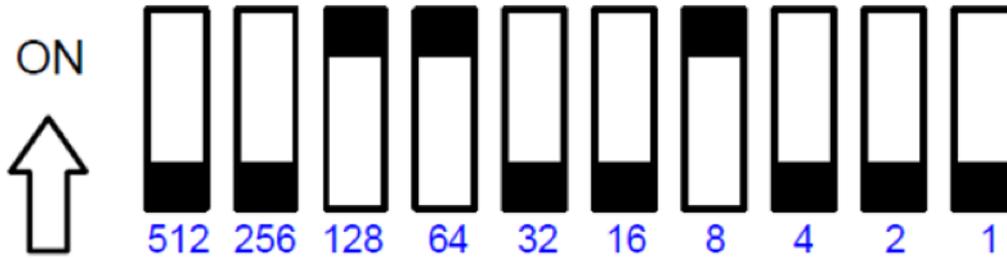


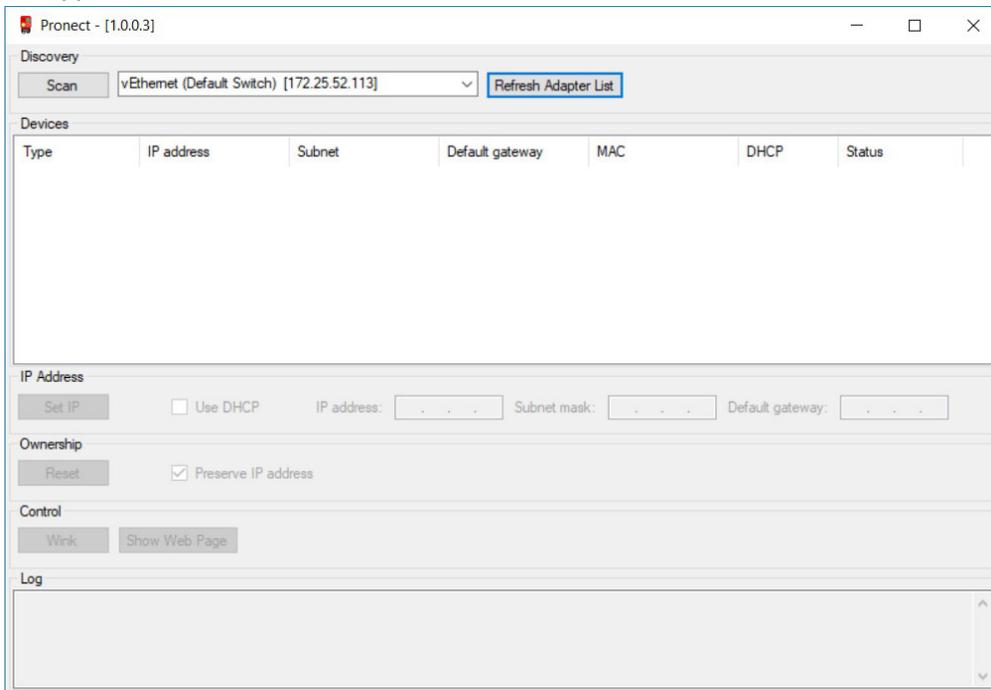
Figure 1 – DIP switches for 192.168.1.200

proNet Support Tool

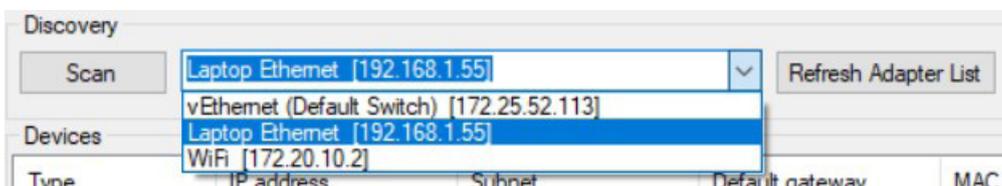
The *proNet* support tool contains useful features including setting device IP address and resetting Ownership. The *proNet* Support Tool can be downloaded from the Fortress website.

Discover Units

1. Run the Pronect.exe application.

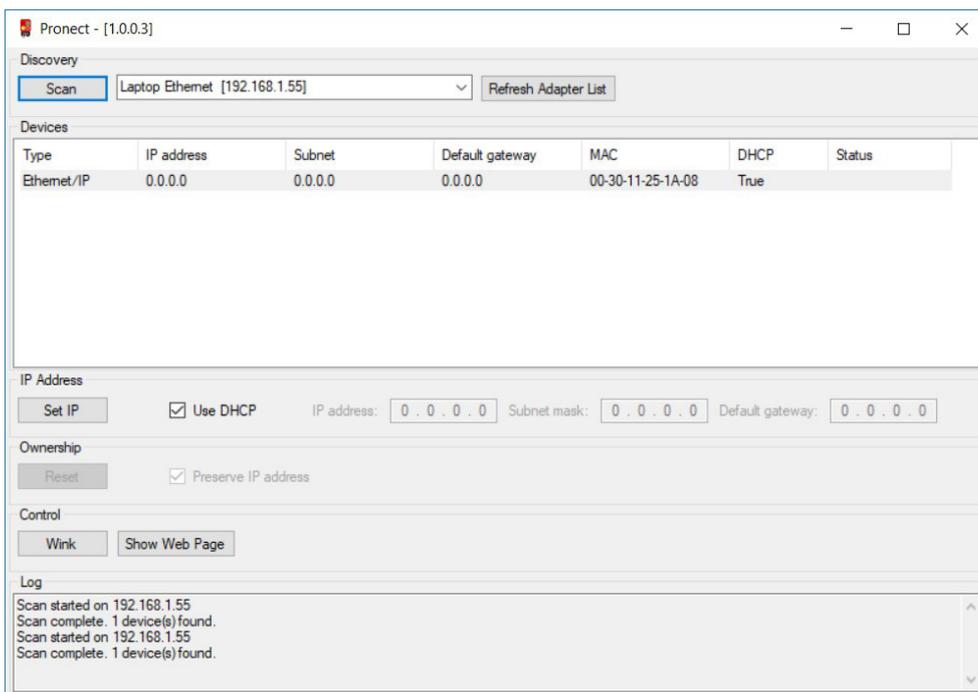


2. Select the network adapter that is connected to the amGard *proNet* unit.



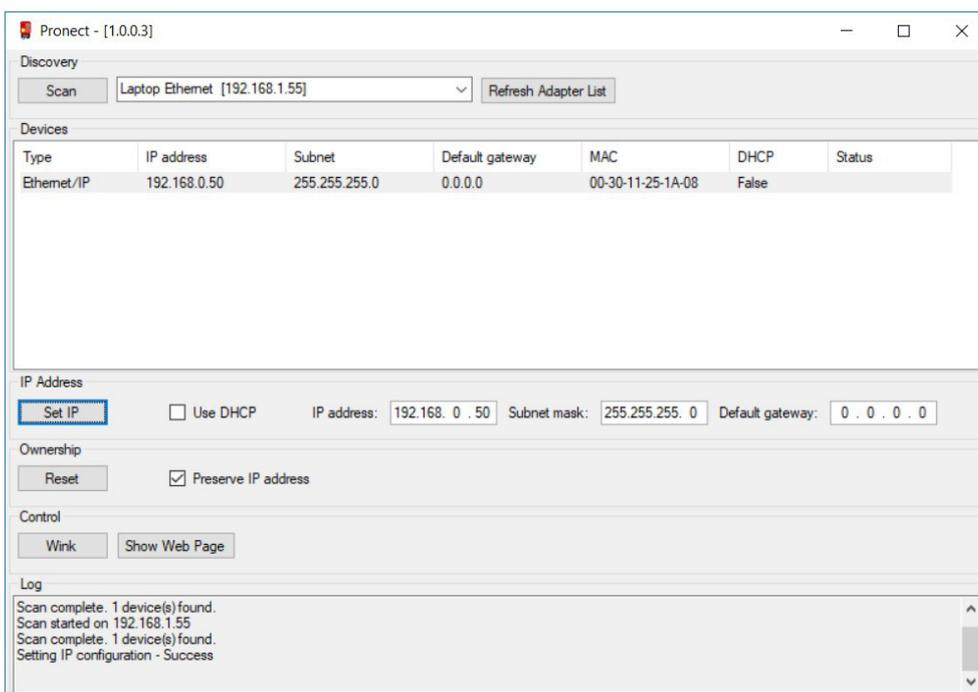
Setting or Changing the IP Address

3. Press 'Scan'. A list of accessible amGard *pro*Net units will appear, including those that do not yet have an IP address. A Windows Firewall notification may appear.



Set IP Address

1. Select the unit which you would like to assign an IP address to.
2. Uncheck 'Use DHCP'.
3. Enter the desired IP address and subnet mask and then press 'Set IP'.



Setting or Changing the IP Address

Other Methods

DHCP

By default DHCP IP allocation is enabled on the device. The use of the DIP switches to set an IP address disables DHCP.

Changing the DIP switches from a non-zero value to zero while the device is operating will re-enable DHCP if it was previously disabled.

The device webpage can be used to disable the DHCP functionality.

If the DHCP functionality is not disabled, the device will require a DHCP service every time it is power cycled.

Fortress recommends using dip switches or the *proNet* Support Tool to assign IP addresses. If using a DHCP server, be aware that DHCP lease expiry may interrupt communications.

Device Web Page

Should the device have an IP address set, a web page will be hosted at that address. The 'IP Configuration' tab allows the user to set any static IP address of their choice. The DHCP functionality can also be disabled from this page using the highlighted selection box.



IP Configuration (Back)

Using this page can prevent interlocks from reconnecting to the network

Parameter	Value
DHCP	Disabled ▾
IP Address	192.168.1.8
Subnet Mask	255.255.255.0
Gateway Address	0.0.0.0
Host Name	
Domain name	
DNS Server #1	0.0.0.0
DNS Server #2	0.0.0.0

Save settings

Parameter	Value
Port 1	Auto ▾
Port 2	Auto ▾

Save settings

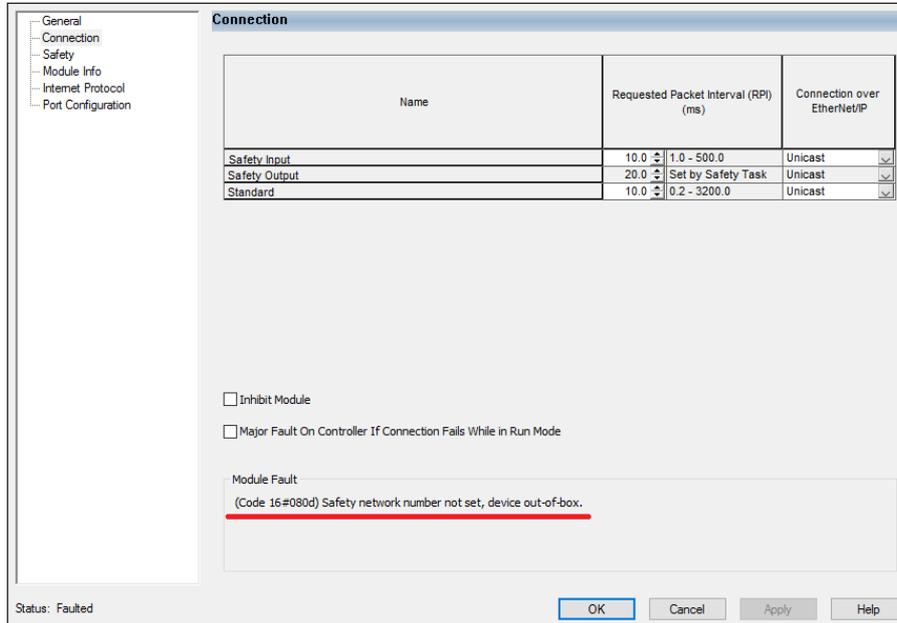
The user must press the highlighted 'Save settings' button and then power cycle the device for the new settings to take effect.

Configuring the Safety Functions and Configuration Signature

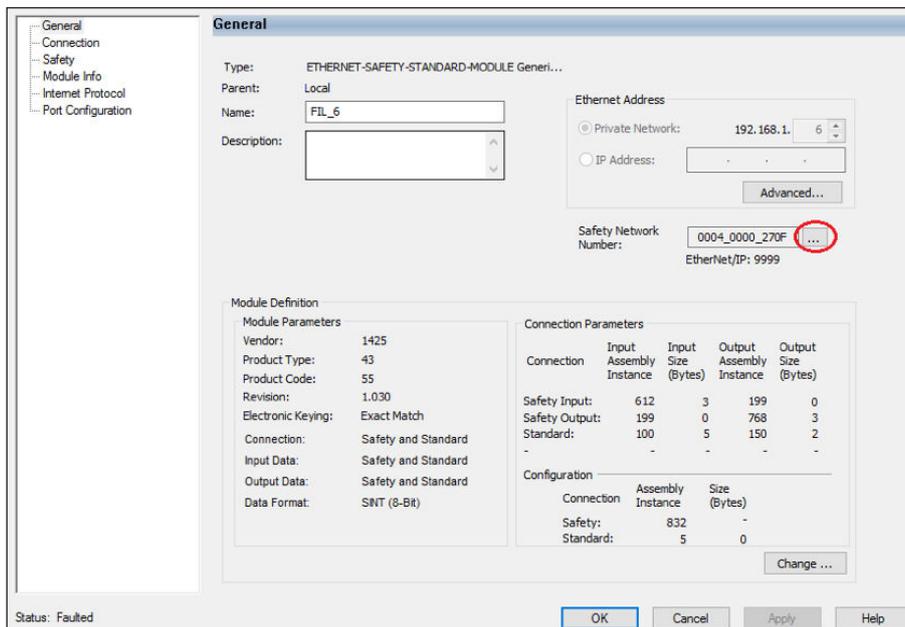
Safety Network Number

Should the connection tab of the module properties show the fault "(Code 16#080d) Safety network number not set, device out-of-box", a new Safety Network Number must be sent to the device, using the instructions below.

The Safety Network number will need to be reset should the IP address of the device change, as described in 'Resetting Safety Ownership'.



1. Under the general tab and open the Safety Network Number dialogue:



Configuring the Safety Functions and Configuration Signature

2. Ensure that the 'Number' matches that of the safety PLC.
3. Press the 'Set' button to send this value to the device. This action will need to be confirmed.

Safety Network Number [X]

Format:

Time-based Generate

Manual

EtherNet/IP: (Decimal)

Number:

(Hex) Copy

Paste

Set ←

OK Cancel Help

Set Safety Network Number in Module [X]

 **DANGER.** Setting Safety Network Number in module.

Network status indicator on module's front panel is alternating red and green to help validate module addressing.

If two or more controllers are attempting to configure module, setting Safety Network Number will result in configuration ownership being granted to first controller that successfully configures module.

If two or more controllers are attempting to connect to outputs of module, setting Safety Network Number will result in output ownership being granted to first controller that successfully connects to outputs.

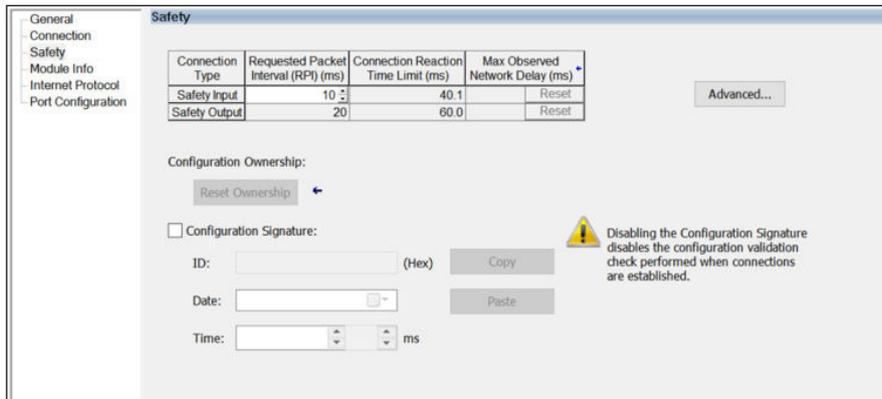
Set Safety Network Number?

Yes No Help

After a few seconds the unit should change to the status "Running".

Configuring the Safety Functions and Configuration Signature

The device does not have any user-configurable safety functionality and therefore does not support the safety configuration signature. Un-check this box in order to create the module.



Resetting Device Ownership

Ownership Reset

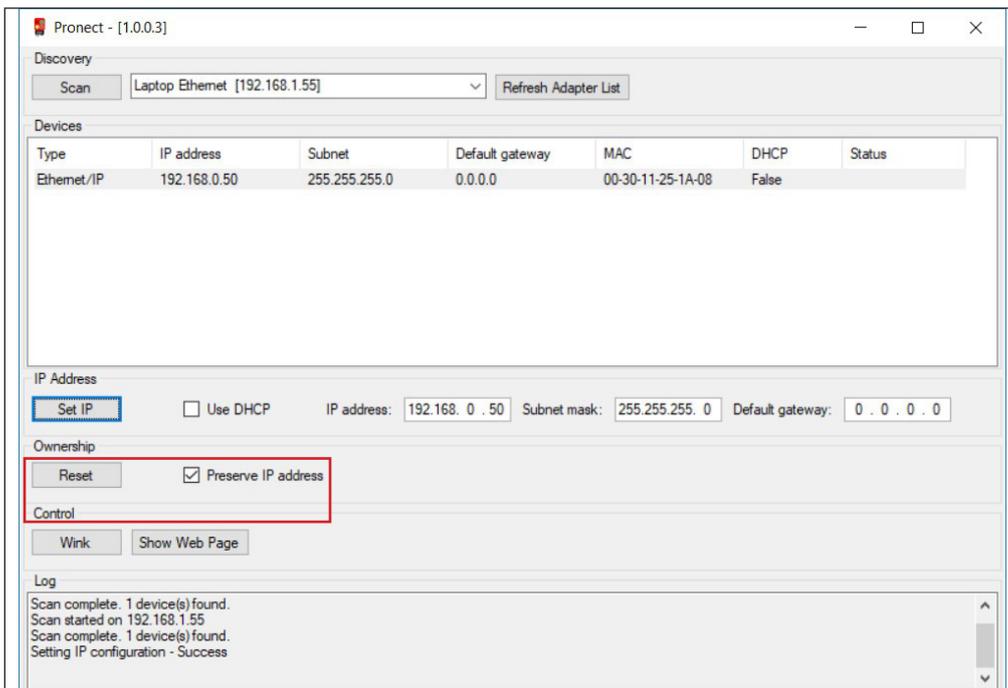
It will be necessary to reset device ownership if a device has previously had a SNN set and the IP address is changed. There are two methods to reset ownership on amGard *proNet* EIP devices.

Note that the device cannot be reset while it is connected to a PLC. Inhibit the relevant module on the PLC first if necessary. This process will be necessary if the IP address of a unit is changed, as it allows a new Safety Network Number to be set.

Resetting ownership using Fortress *proNet* Support Tool

Fortress recommends using the *proNet* Support Tool available from the Fortress website. See earlier section for use of general use of the *proNet* Support Tool. The Fortress *proNet* support Tool is available from the Fortress website.

1. Select the unit which you would like to reset the ownership for.
2. Ensure that the unit is on the same subnet as the machine running the *proNet* Support Tool.
3. Ensure that the unit is not connected to a running PLC, as safety ownership cannot be reset during safety operation. This can also be achieved by inhibiting the connection as shown later.
4. Press 'Reset' under 'Ownership'. This process will remove the unit's IP address and cause the unit to power-cycle. If 'Preserve IP address' is checked, the *proNet* Support Tool will re-assign the unit its Id IP address settings once this process is complete.



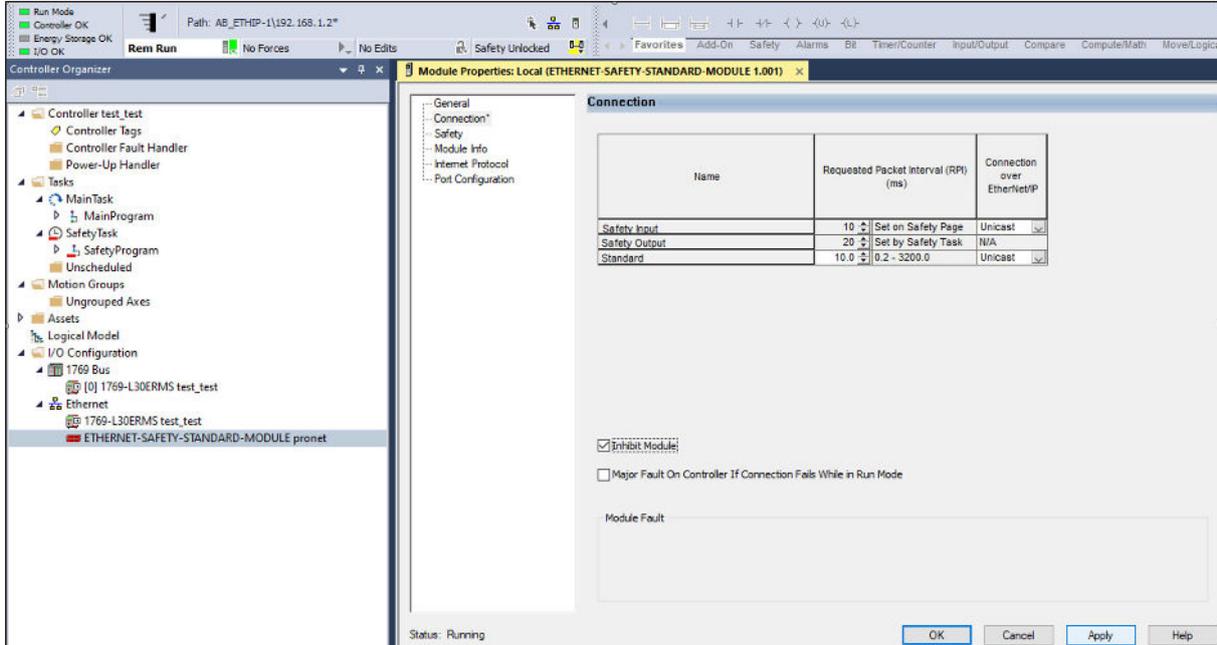
Resetting Device Ownership

Ownership Reset in Studio 5000

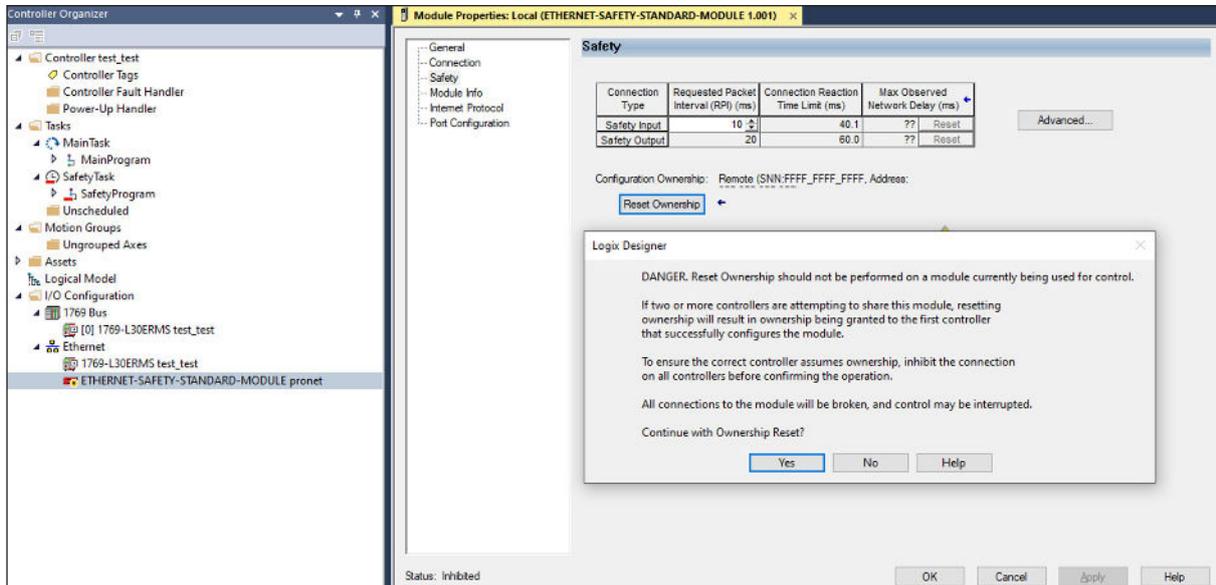
proNet device must be inhibited in the PLC program before ownership reset.

Open the properties page of the desired module and inhibit the *proNet* device by checking the 'Inhibit Module' under the 'Connection' tab, then select 'apply'.

The Status will be updated from 'Running' to 'Inhibited'.



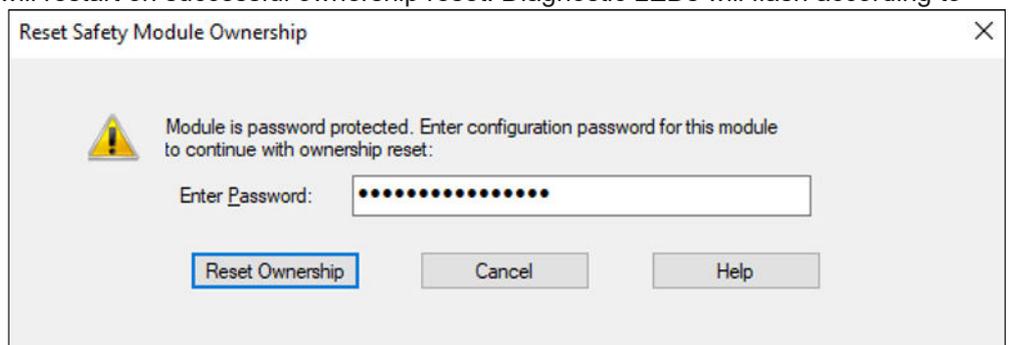
Under the 'Safety' tab, select 'Reset Ownership', and press Yes.



Studio 5000 will request a password to reset ownership. On amGard *proNet* E/IP device the password is: **IXXAT_SafeT100CS**

Select 'Reset Ownership'. *proNet* device will restart on successful ownership reset. Diagnostic LEDs will flash according to boot up.

IP address will preserve upon reset.

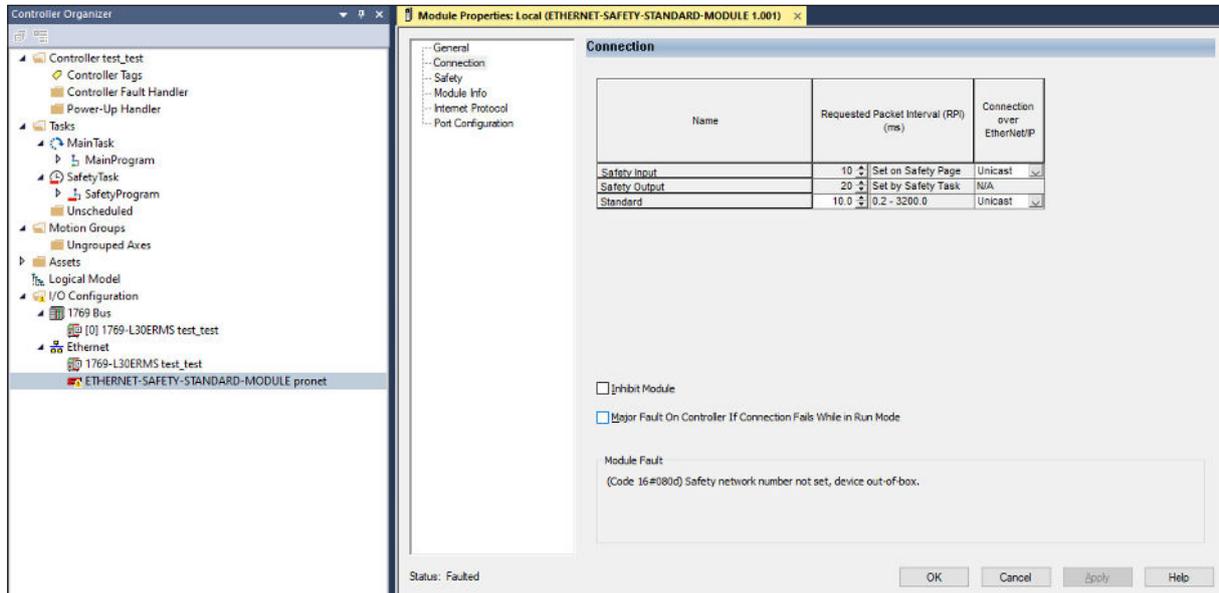


Resetting Device Ownership

Un-inhibit the *proNet* device by deselecting 'Inhibit Module' under the 'connection' tab. Press 'apply'

proNet device will be activated and Studio 5000 will present Module Fault Code: 16#080d Safety network number not set, device out-of-box.

This confirms the *proNet* device ownership has been reset successfully



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