



Application Note

Establishing connection with Ethernet

Version 1.0.0

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1 Intended use and audience

This application note shows you how to connect a Nanotec controller / drive with Ethernet using a DCHP tool. For due safety, follow valid OEM instructions. All products required in this document are for use by trained experts only. Before product use, please ensure that all users read, understand and follow the instructions in this document fully.

2 Requirements

NOTICE

Malfunction from incompatibility! The products required here come in various versions. Duly select / install / configure the correct products in advance.

- ▶ Fulfil the requirements.
- ▶ Use compatible equipment only.
- ▶ Follow valid OEM instructions.

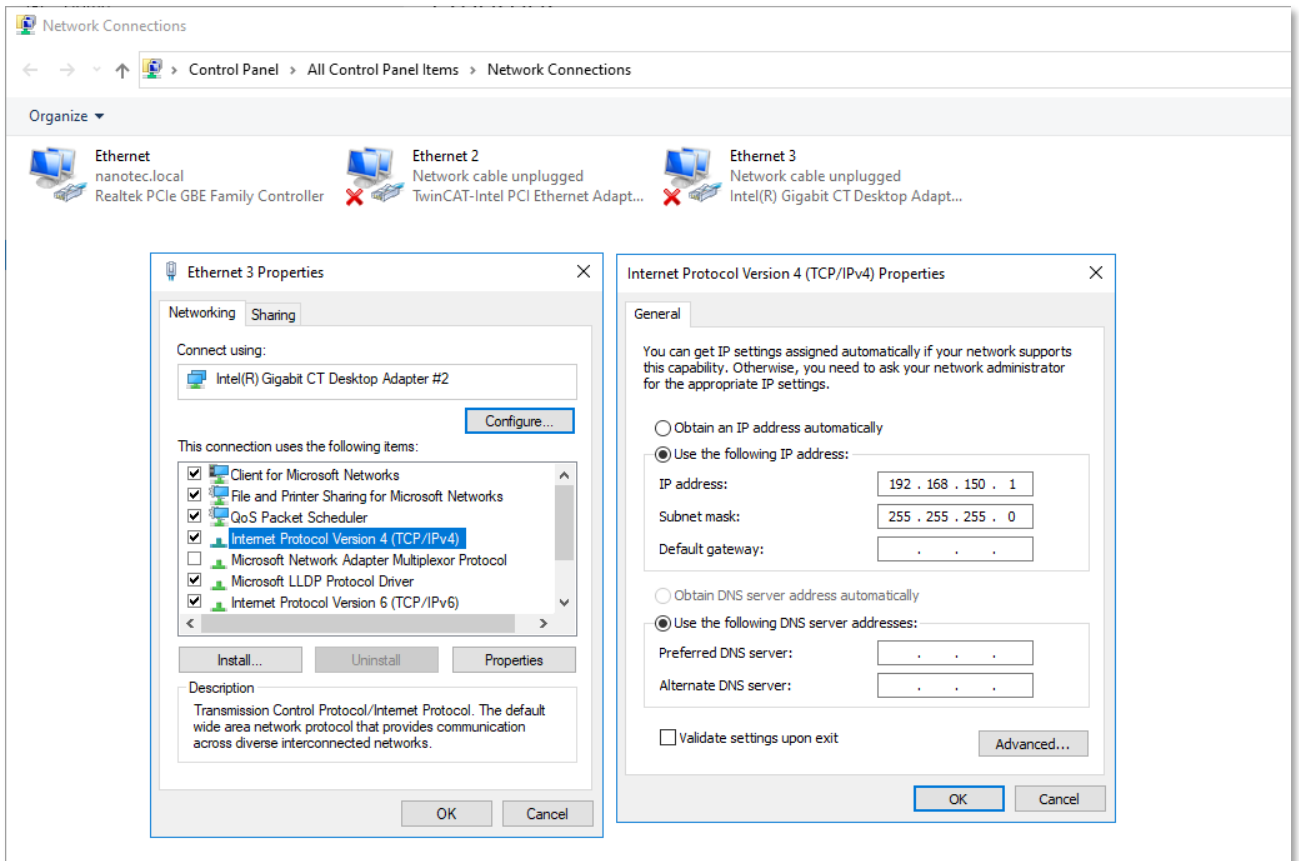
Hardware • N5-1-4, Firmware Version FIR-v1650-B561700

Software • BootP DHCP Ethernet/IP Commissioning Tool Version 3.06.00, Copyright © 2022 Rockwell Automation Inc.
• Plug & Drive Studio 1.1.1

3 Setup of the Ethernet card

To be able to use the DHCP tool, first a static IP needs to be assigned to the ethernet card of your PC.

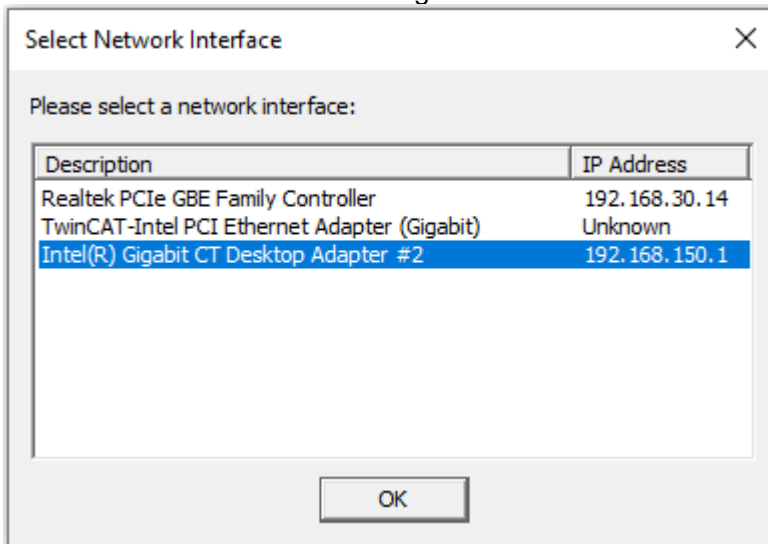
- 1 Go to your network settings options.
- 2 Open the IPv4 settings
- 3 Select the option to use a static IP address and set the IP settings to your liking.



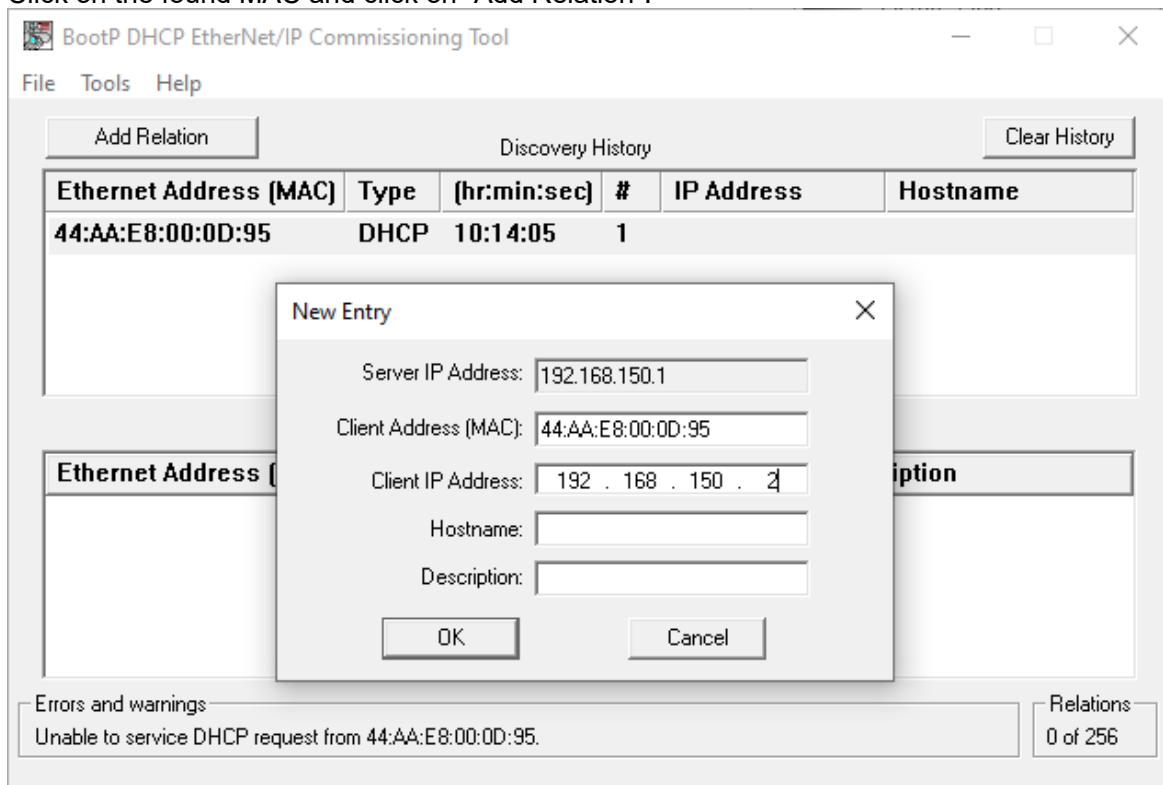
- 4 Close all windows with "OK" to confirm the changes.

4 Using BootP DHCP tool

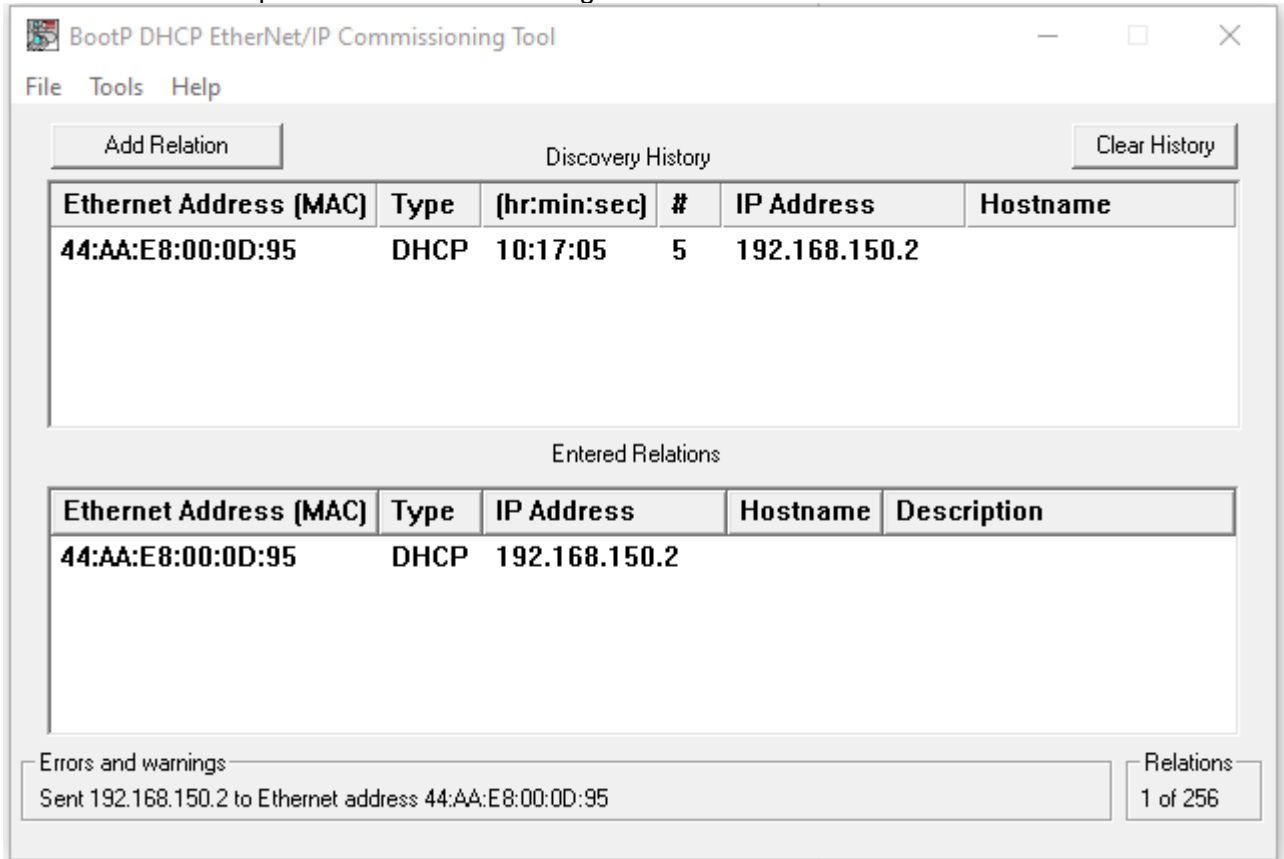
- 1 Connect the controller / drive to the power supply and connect the Ethernet input to your Ethernet card.
- 2 Start BootP DHCP tool and select the correct Ethernet card. If the right IP does not show up (eg. Shown as “Unknown”), your PC might not yet have recognized a connection on the Ethernet card. Just close the tool and restart it again.



- 3 After opening the BootP DHCP tool, the MAC address of the connected drive should show up in the “Discovery History” panel. If this is not the case, the drive might already have abandoned the DHCP process. Disconnect the Ethernet cable from the drive and reconnect again.
- 4 Click on the found MAC and click on “Add Relation”.



- 5 Enter your desired IP address settings. Note that the first three numbers of the IP must match your Ethernet card to be able to connect.
- 6 The new entry should now show up in the “Entered Relations” panel. You might need to disconnect the Ethernet cable from the drive / controller and reconnect it to restart the DHCP request and have the IP assigned.



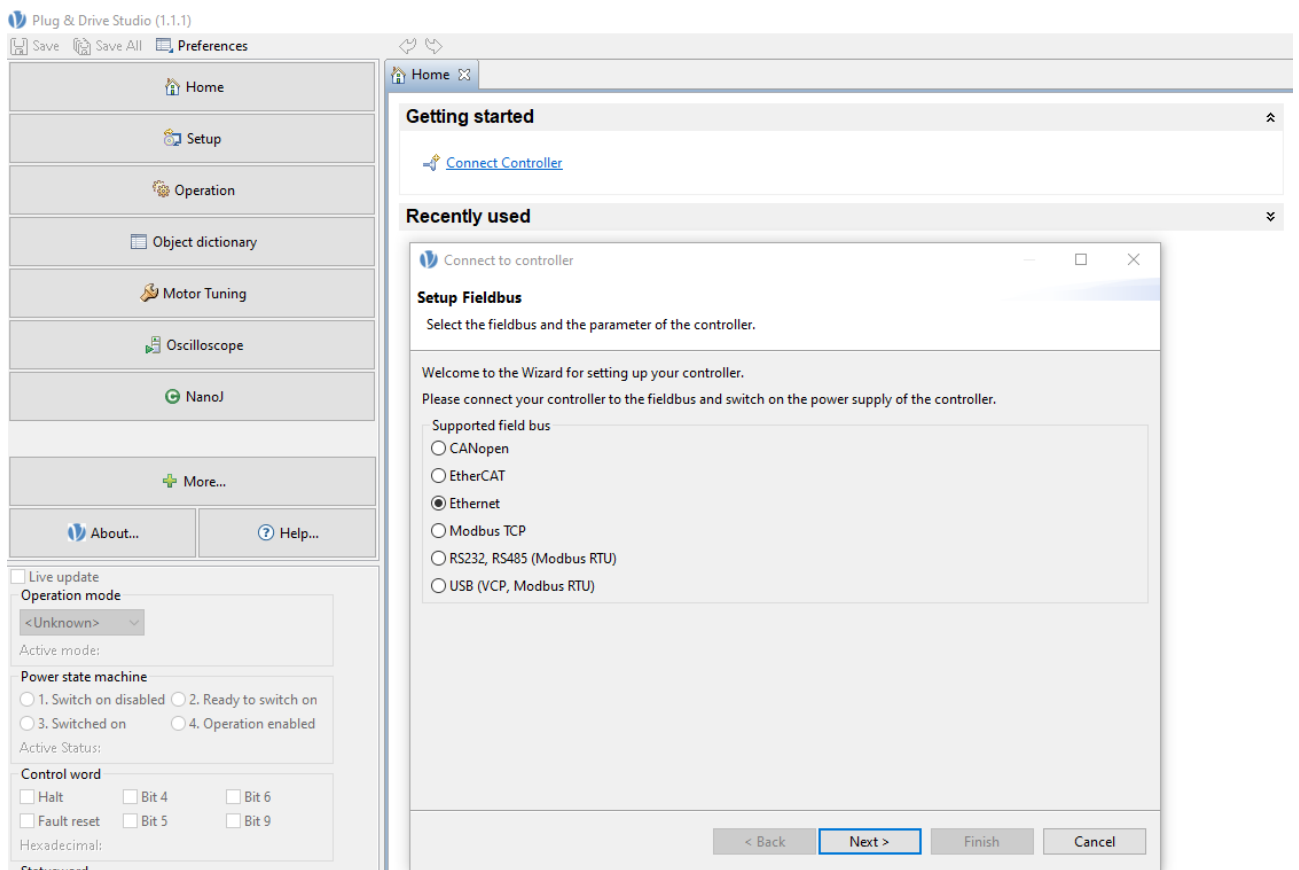
- 7 Your IP address is now set until you restart the drive / controller.

5 Configuration with Plug & Drive Studio (PNDS)

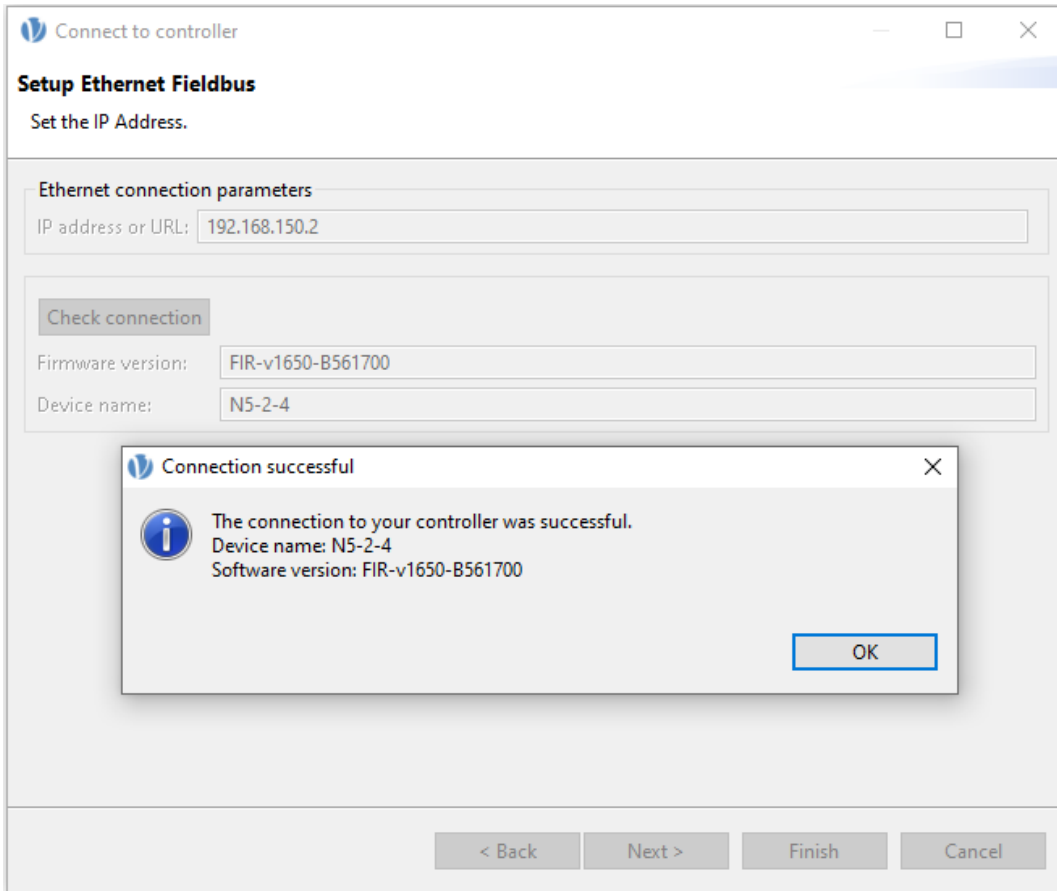
The following chapters describe how to connect with PNDS and how to set up a static IP address configuration, if needed.

5.1 Connecting with PNDS

- 1 Open PNDS and click on “Connect Controller” in the menu “Home”.
- 2 Select “Ethernet” and click on “Next >”.



- 3 Enter the IP address and click on “Check connection”. If successful, the drive / controller and its firmware should be displayed on screen.

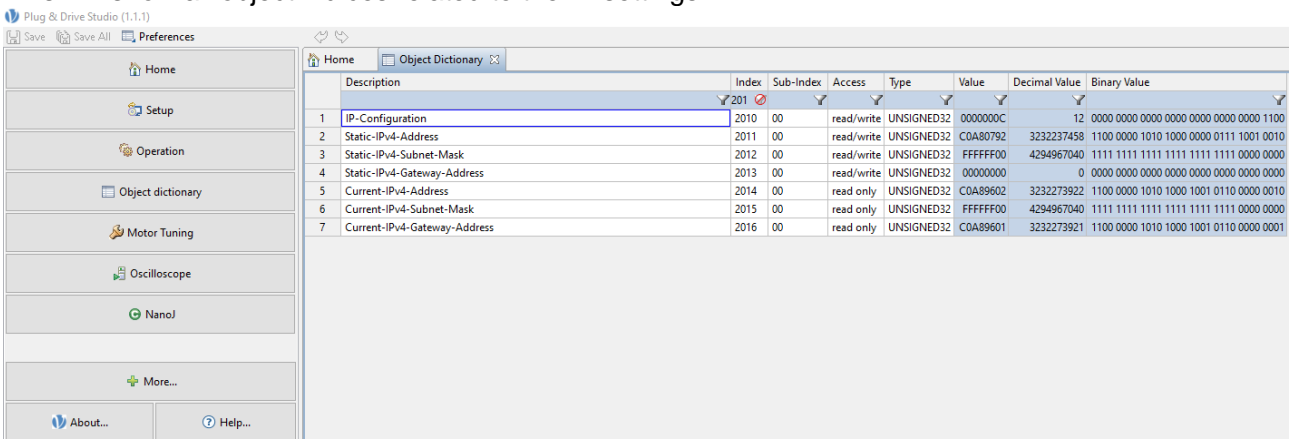


4 Click on “OK” and then on “Finish” to connect with PNDS.

5.2 Setting up a static IP address with PNDS

If you do not want to use DHCP, but instead want to use a static IP address for your drive / controller, follow these steps:

- 1 Establish communication as described in the previous chapter.
- 2 Open the menu “Object Dictionary”, click in the filter panel for “Index”, and type in “201”. This will show all object indices related to the IP settings.



- You can type in values directly in the table in the areas highlighted in light blue.
- 3 Set the value for IP-Configuration (object 0x2010:00) to value “1” to use a static IP.

- 4 Set the values for IP address (0x2011:00), subnet mask (0x2012:00), and gateway address (0x2013:00) to your liking.

The syntax for IP settings is as follows:

Two digits of the hex-value represent one number of the IP address.

E.g.

0xC0A89602 represent IP 192.168.150.2

0xC0 = 192 0xA8 = 168 0x96 = 150 0x02 = 2

	Description	Index	Sub-Index	Access	Type	Value	Decimal Value	Binary Value
1	IP-Configuration	2010	00	read/write	UNSIGNED32	00000001	1	0000 0000 0000 0000 0000 0000 0000 0001
2	Static-IPv4-Address	2011	00	read/write	UNSIGNED32	C0A89602	3232273922	1100 0000 1010 1000 1001 0110 0000 0010
3	Static-IPv4-Subnet-Mask	2012	00	read/write	UNSIGNED32	FFFFFFF0	4294967040	1111 1111 1111 1111 1111 1111 0000 0000
4	Static-IPv4-Gateway-Address	2013	00	read/write	UNSIGNED32	00000000	0	0000 0000 0000 0000 0000 0000 0000 0000
5	Current-IPv4-Address	2014	00	read only	UNSIGNED32	C0A89602	3232273922	1100 0000 1010 1000 1001 0110 0000 0010
6	Current-IPv4-Subnet-Mask	2015	00	read only	UNSIGNED32	FFFFFFF0	4294967040	1111 1111 1111 1111 1111 1111 0000 0000
7	Current-IPv4-Gateway-Address	2016	00	read only	UNSIGNED32	C0A89601	3232273921	1100 0000 1010 1000 1001 0110 0000 0001

- 5 After setting up the IP configuration you need to save it. Otherwise, it will be lost after restart. Depending on your individual firmware you might need to save different categories. Please refer to your drive / controller manual for detailed info on saving (chapter 7 Special Functions). For firmware FIR-v1650 you need to save the category “communication”, for firmware FIR-v17xx and higher you need to save the category “Ethernet”. Enter the save command (decimal value 1702257011) to the saving object 0x1010 (subindex x02 or 0x0C depending on firmware) and wait until the value is back to 0 or 1 again, indicating the end of the save procedure. You need to refresh the table to read out the value again.
- 6 Restart your drive / controller.

You should now be able to connect with the static IP settings.

6 Troubleshooting – Resetting the Ethernet communication settings

If you ever find yourself in a situation where you cannot connect to the drive / controller anymore (e.g. you have assigned a static IP and cannot recall the right IP) there is a certain hardware trick you can try to reset the communication:

- 1 Disconnect everything from the drive / controller
- 2 Connect 9V to the main power supply. The LEDs might blink out an undervoltage error, but that does not matter.
- 3 Wait for 1 minute.
- 4 Connect the ethernet cable and try to assign the IP with BootP DHCP tool again.
- 5 Now your drive / controller should show up again in the tool and you should be able to assign in IP with DHCP
- 6 Connect with PND5 and set up IP settings you want.
- 7 Save settings.
- 8 Restart in normal fashion with 24V / 48V.

7 Liability

This Application Note is based on our experience with typical user requirements in a wide range of industrial applications. The information in this Application Note is provided without guarantee regarding correctness and completeness and is subject to change by Nanotec without notice.

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8 Imprint

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