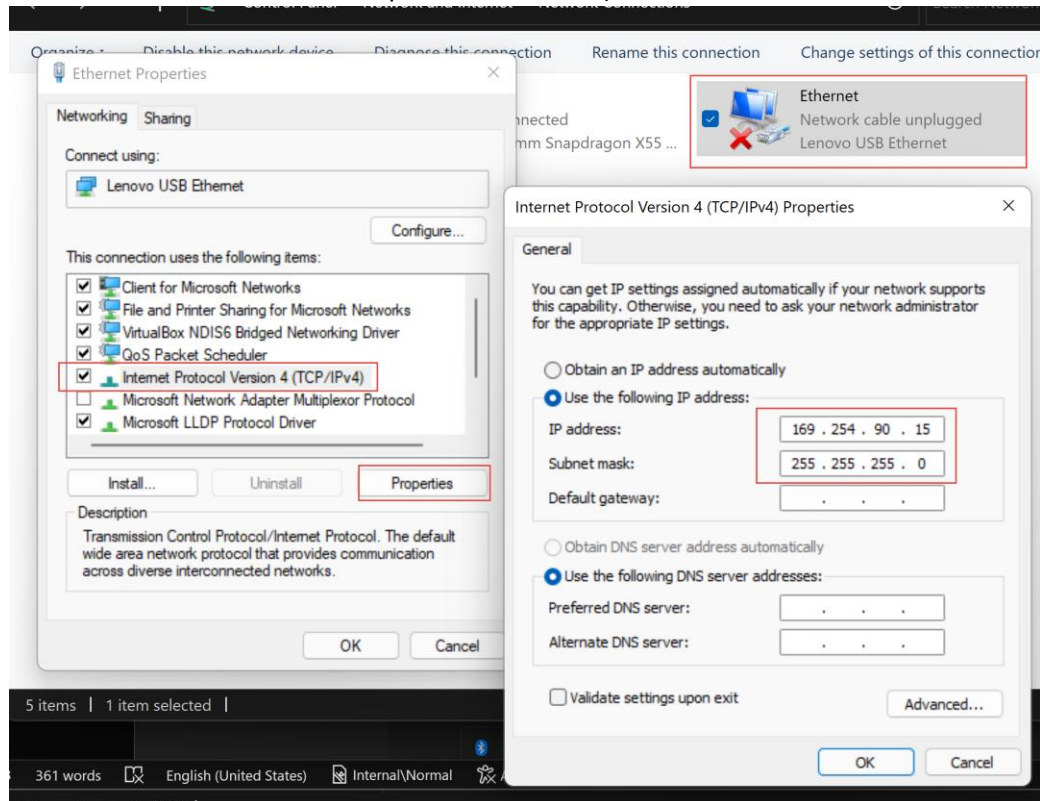


ADS communication between TwinCAT3 and ROS2

This guide is based on: <https://blog.katastros.com/a?!D=01800-09bba240-3edf-4ab2-a162-e758eeb4c75f>

1. IP addresses

- The IP address of the Beckhoff IPC (PLC) PC port is **169.254.90.242** and Netmask: **255.255.255.0**
- The IP address of the PC with TwinCAT IDE should then be **169.254.90.<xxx>** (something else then **242** or **243** – for example **169.254.90.15**) and Netmask: **255.255.255.0**

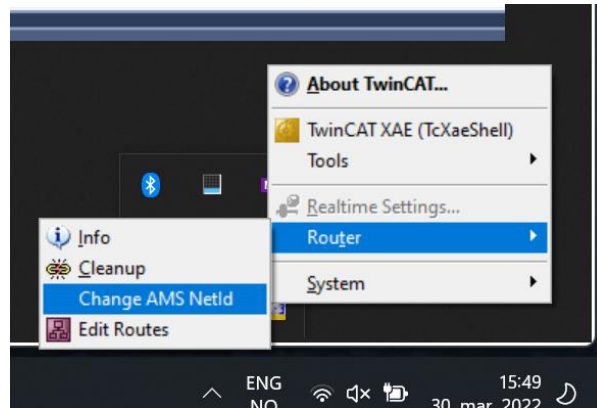


- The IP address of the PC with Ubuntu and ROS2s should then be **169.254.90. <xxx>** (something else then **242**, **243**, or the IP address of the PC with TwinCAT XAE – for example **169.254.90.42**) and Netmask: **255.255.255.0**
- To test the connection, try to ping between Ubuntu PC and Windows PC. If problem pinging, switch off Firewall.

2. AMS Net ID

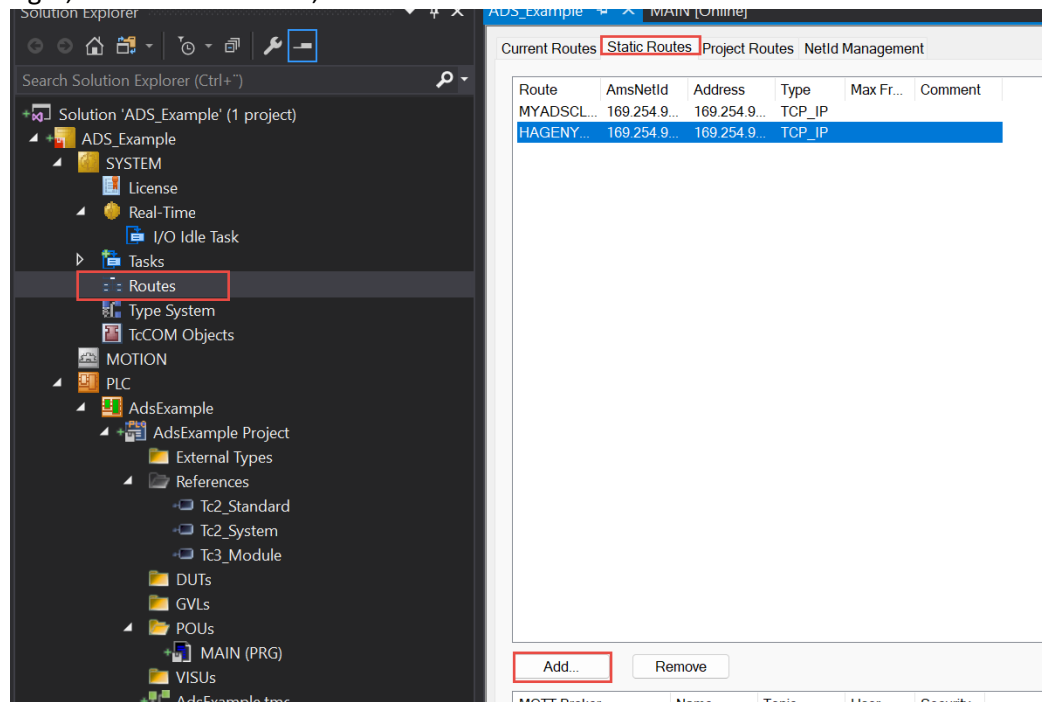
- The AMS Net Id of the Beckhoff IPC (PLC) is **5.80.90.242.1.1**

- For LAB #11 you will use your own PC thus you should modify your AMS Net ID to be <IP address of pc>.1.1 (for example **169.254.90.15.1.1**)
- To modify the AMS ID of your PC with TwinCAT XEA or XAR find the small TwinCAT icon in the lower right corner of the win10 computer, as shown in the following figure (restart is needed):



3. TwinCAT XAE Shell settings

- Set up a static route: After opening the Shell, find **SYSTEM-> Routes** under the Solution Explorer on the right, double-click Routes, and the setting interface will pop up on the right, select Static Routes, and click Add in the lower left corner.



- At this time, the Add Route Dialog pops up, click Advanced Settings in the lower left corner to enter the advanced settings. Set ADS static routing in the advanced settings (that is, tell TwinCAT how to find the ubuntu system), see example depicted below using the IP address for the Ubuntu machine (for example **169.254.90.42**), then click Add Route:

Add Route Dialog

✕

Enter Host Name / IP:

Refresh Status

Broadcast Search

Host Name

Connected

Address

AMS NetId

TwinCAT

OS Version

Fingerprint

Comment

Route Name (Target):

MyAdsClient

AmsNetId:

169.254.90.42.1.1

Virtual AmsNetId (NAT):

Transport Type:

TCP_IP

Address Info:

169.254.90.42

☒ Host Name

☐ IP Address

Connection Timeout (s):

5

Max Fragment Size (kByte):

0

Route Name (Remote):

UIAA107228S

Target Route

☐ Project

☒ Static

☐ Temporary

Remote Route

☒ None / Server

☐ Static

☐ Temporary

☒ Advanced Settings

☐ Unidirectional

Add Route

Close

- Click **OK** on popup:



Add Remote Route

☐ Secure ADS (TwinCAT 3.1 >= 4024)

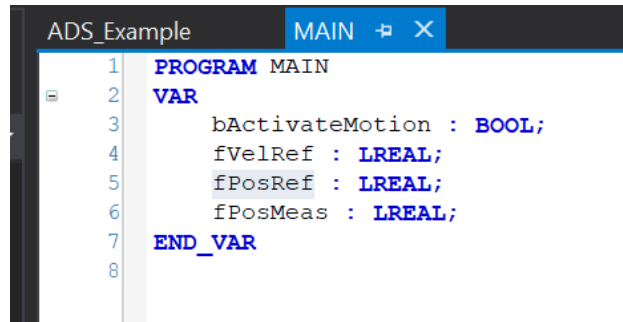
OK Cancel

- And then click Close, and check that you have added a static route as shown below

ADS_Example					
MAIN [Online]					
Current Routes Static Routes Project Routes NetId Management					
Route	AmsNetId	Address	Type	Max Fr...	Comment
MYADSCIENT	169.254.90.15.1.1	169.254.90.15	TCP_IP		

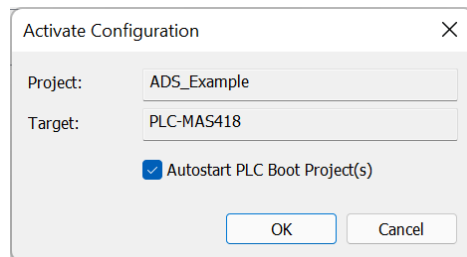
4. TwinCAT test code

- For the example add the following variables to the main program:



```
1 PROGRAM MAIN
2 VAR
3     bActivateMotion : BOOL;
4     fVelRef : LREAL;
5     fPosRef : LREAL;
6     fPosMeas : LREAL;
7 END_VAR
8
```

- Set the program to start to run automatically, and the ROS node can communicate with TwinCAT normally when running. This is done by clicking on Activate Configuration and then this pop up should appear and the activate **AutoStart PLC Boot Projects(s)**:



5. ROS2 test code

- See description in this Git repo: <https://github.com/kristianmk/ros2-examples-ads>