

ControlUx Installation Instructions

Installation Instructions

Table of Contents

Overview	2
Hardware Requirements	2
<i>The Computer</i>	2
<i>The Ethernet Connection</i>	2
<i>VelociGraph Connection</i>	3
Physical Connections	4
Network Connections	4
VelociGraph Connections	4
Configuring your computer	5
Network Configuration	5
Serial Port Configuration	6
<i>Installing Drivers</i>	6
<i>Determining the Serial Port of the USB->Serial Converter</i>	7
Beckhoff ADS Router	8
Software Installation	8
Install ControlUx Interface	8
Configure the Beckhoff ADC Router	9
Configure ControlUx	11
<i>MechUx and Newer ControlUx programs</i>	11
<i>Older ControlUx programs</i>	12

Overview

For production years 2015 through 2022, ControlUx was the predominant framework used for user interfaces on ADC equipment. Most ADC equipment came with the user interface built into the system with no external PC required. However, many customers prefer to run the interface on their own corporate computer, which has the following advantages:

- Smoother user interface. The embedded computer within ADC equipment has limited graphical and processing power. Any commercially-available PC will provide better response and display resolution.
- Network integration. Most corporations will not allow PCs not supplied internally onto the network. Additionally, security software cannot be installed on the ADC embedded computer, or the real-time system will not function. By running the interface on a corporate computer, it's easy to save data directly to a network drive or push live into a database or spreadsheet.
- Easier access to remote support. With a networked computer attached to the ADC equipment, ADC can easily provide remote support to the ADC system without the additional costs of an onsite visit.
 - To be clear: ADC will never have any direct remote access to your PC or ADC equipment. Remote support sessions must always be initiated by the user and are subject to corporate network policies.

Hardware Requirements

There are three considerations when connecting to ADC Equipment:

1. The Computer
2. The Ethernet connection
3. The VelociGraph connection (if a VelociGraph is used)

The Computer

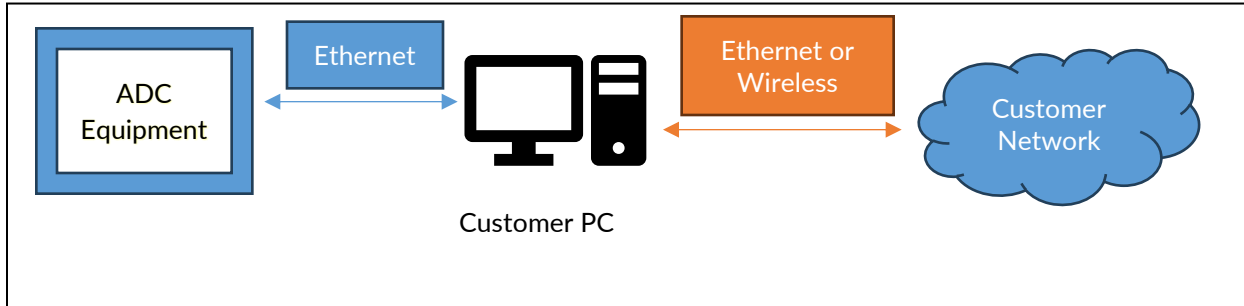
The following are the general minimum system requirements for ADC software. These specifications do not apply to software capturing data from external DAQ hardware like NI cDAQ, Dewesoft or Measurement Computing systems.

- Processor: Intel 8th generation processors (Intel i3/i5/i7/i9-7x) or equivalent.
- RAM: 4 gigabyte (GB) for 32-bit or 16 GB for 64-bit
- SSD/NVMe: at least 128 GB for both 64-bit and 32-bit OS
- Graphics card: DirectX 9 or later
- Display resolution: 1280 x 720, a minimum diagonal display size for the primary display of 7-inches or larger. 1920 x 1080 or greater recommended for maximum usability.
- Operating System: Windows 7/10 Professional, 64-Bit.
 - Windows 11 Professional generally works, although there have been compatibility issues with older versions of Control Ux.

Certain ADC applications may have different specifications particular to their application. In those cases, ADC will include their specific requirements with the system.

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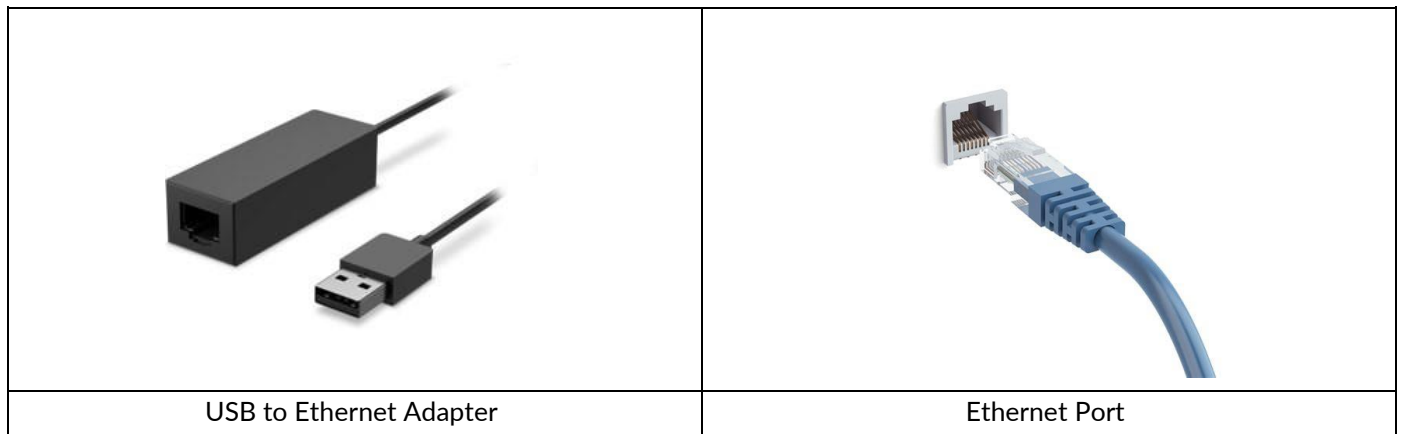
The Ethernet Connection



To connect to an ADC system for control, support or data collection, a hard-wired Ethernet connection is required. Usually, the customer would like to connect their PC to the ADC system and their corporate network simultaneously. Typical setups include, but are not limited to:

- A desktop computer with two hard-wired Ethernet ports.
- A laptop with a USB->Ethernet port and a wireless port

A common problem is that a customer tries to use a laptop with both a wireless and hard-wired port built-in. Unfortunately, lower-end laptops tend to share this port, and the laptop can only use one connection at a time. If unsure, use a USB->Ethernet port adaptor.



VelociGraph Connection

Connecting directly to a VelociGraph for speed data collection using the standard USB->RS485 converter requires one USB 2.0 port and installation of the FTDI drivers, available from the downloads section of the ADC website.

https://automateddesign.com/download/ftdi_drivers_manuals_all.zip

This is only required if your system has a VelociGraph, which is typical of systems with a ball cannon. If your system is a load frame, like the GEN IV, GEN6, CTS or Bat Roller, you do not need to worry about connecting to a VelociGraph.

Physical Connections

Network Connections

To use a laptop PC as the control computer:

- Connect the USB to Ethernet adapter to a USB port on the laptop.
- Connect an Ethernet cable from the USB to Ethernet adapter to the SERVER port on the ADC System.
- Optionally: Connect the laptop to your corporate wireless network so that the system has access to the Internet.

To use a desktop PC as the control computer:

The desktop must have TWO (2) network interfaces.

- Connect an Ethernet cable from one network interface of the desktop computer to the SERVER port on the ADC System.
- Optionally: Connect the other network interface of the desktop computer to your corporate network.

VelociGraph Connections

Both the VG03 and VG02 require the serial -> USB converter specific to the device. The VG03 utilizes RS485 serial communication, while the VG02 utilizes RS232 communication. Only adapters and cables provided by ADC are supported.



- VG03: ADC2325-RS422
- VG02: Startech ICUSB232V2
 - Note: If your PC has an actual RS232 port built in, that will also work well.

For VG03:

- Plug the USB->Serial RS485 converter into a USB port on your PC, and connect the M8 connector to any COMM port on the VG03 unit.

For VG02:

- Plug the USB->Serial RS232 converter into a USB port on your PC, and connect an RS232C cable between the converter and the VelociGraph.

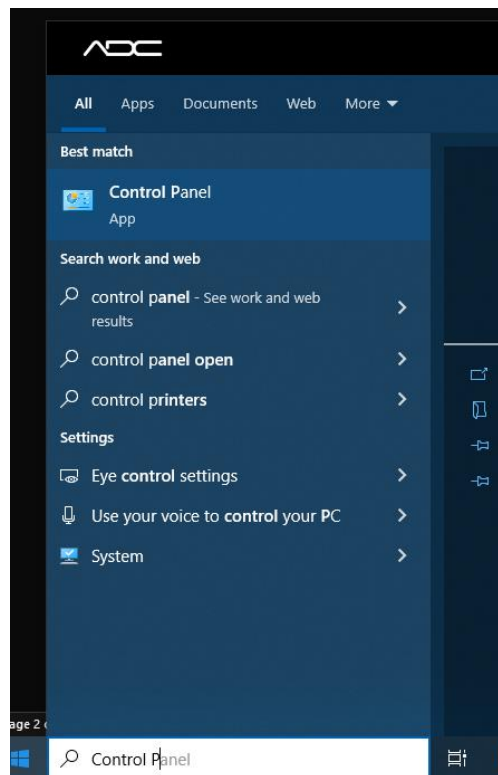
	
<p>USB->RS485 Port iBeams and VG03 Programming Cable</p>	<p>USB->RS232 Port VG02 or VG01</p>

Configuring your computer

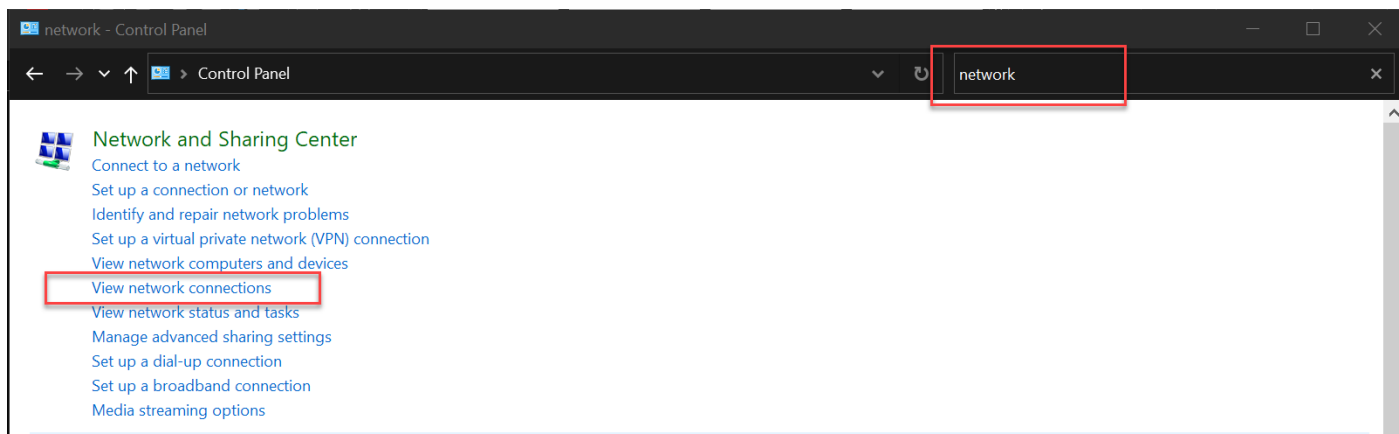
Network Configuration

Make sure the ethernet cable is connected between your PC and the ADC equipment, then configure the network adaptor on your computer connected to the ADC equipment for DHCP. This is the default in Windows. To check:

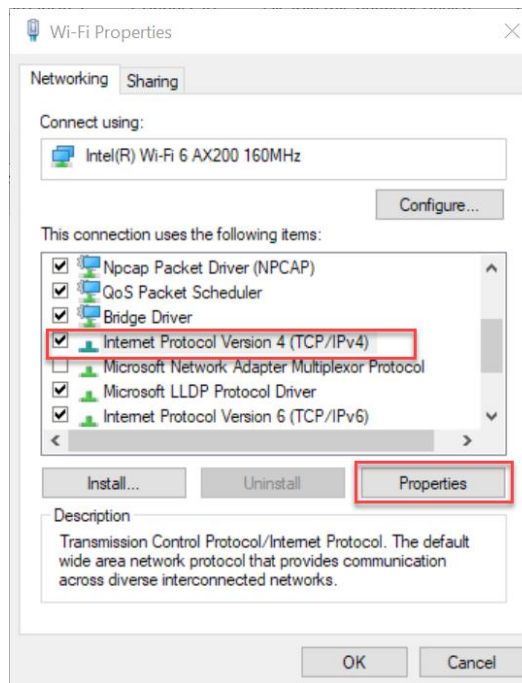
- Open the Windows Start Menu and type: Control Panel



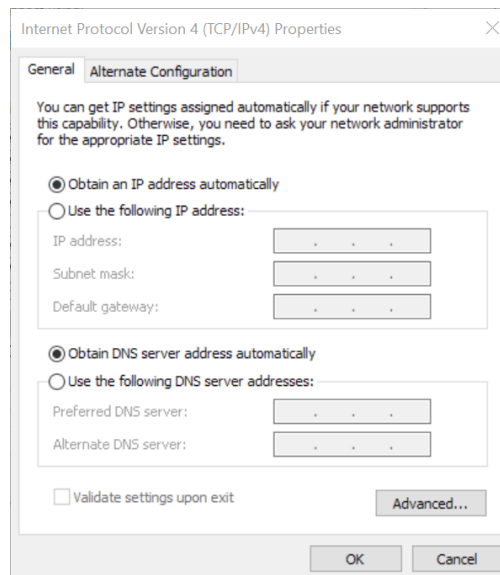
- Select Control Panel.
- Locate the search box and type: network
- Select: View network connections.



- Locate the network connection for the ADC, right-click and select Properties.



- Scroll down, select Internet Protocol Version 4 (TCP/IPv4), then click the Properties button.



- Select Obtain an IP address automatically and Obtain DNS server address automatically.
- Click OK on the dialog box, then click OK on the remaining dialog box.

Serial Port Configuration

Installing Drivers

Before a USB->Serial adapter can be used, the drivers for the device must be installed. The drivers built-in to Windows almost never work properly, even if the COM port appears to the computer.

Most USB->serial adapters use the same chip from FTDI, and so the FTDI drivers supplied on ADC's website are usually what's required. The installer for the drivers can be downloaded here:

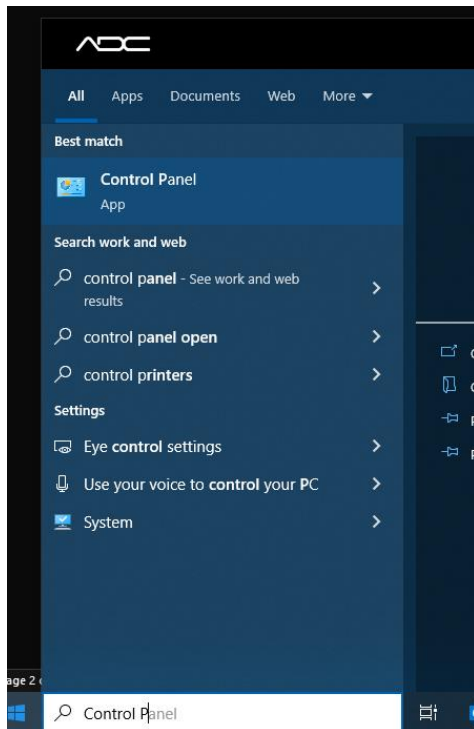
https://automateddesign.com/download/ftdi_drivers_manuals_all.zip

Run the installer after downloading, accepting all defaults.

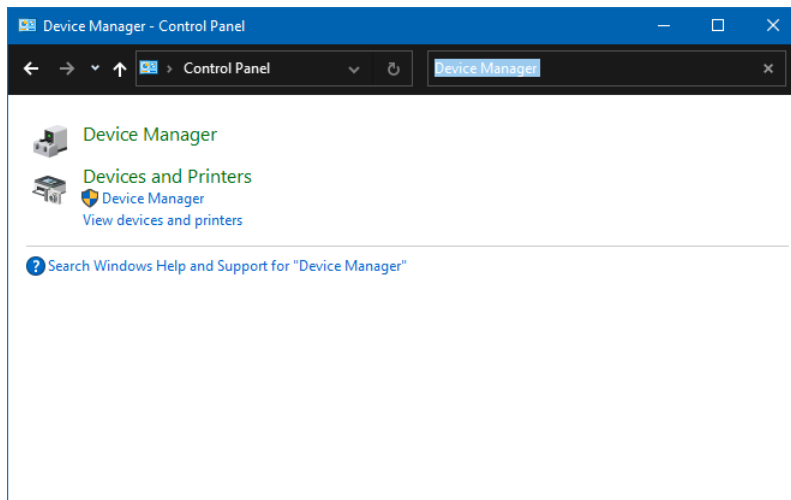
Determining the Serial Port of the USB->Serial Converter

A COM port on a Windows computer is named simply COMx, where x is a number (i.e. COM1, COM5, COM7). When you plug in the USB->Serial adapter to the computer, Windows assigns a named COM port to the device. There is no way to predict this COM port name, but it is easy to find out which name has been assigned.

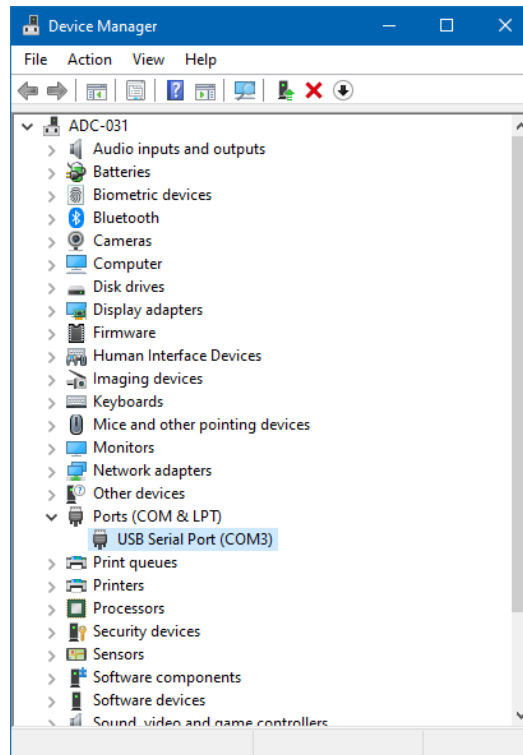
- Make sure the USB->Serial Adapter is connected to the computer.
- Open the Windows Start Menu and type: Control Panel



- Select Control Panel.
- When the Windows Control Panel appears, locate the search box and type: Device Manager



- Select Device Manager
- In the device tree, expand Ports (COM & LPT). The COM port for the USB adapter should be displayed there.
- NOTE: Other pre-existing COM ports will also be displayed. If multiple COM ports are displayed, remove the USB->Serial adapter from the computer. One of the ports listed will disappear. Then, plug the USB->Serial Adapter into the



In the case of this example, the COM port of the connected USB->Serial adapter is COM3

Beckhoff ADS Router

ControlUx uses the Beckhoff ADS router to communicate to the ADC equipment. The installer for this program is a free download from the Beckhoff website, and we also provide a direct link on our website.

<https://automateddesign.com/download/TC31-ADS-Setup.3.1.4024.32.exe>

Download this installer to your system and execute, accepting all defaults. Restart the system when installation completes.

Software Installation

Install ControlUx Interface

Obtain a copy of the ControlUx installer from ADC, if you have not already done so. If needed, contact ADC support at support@automateddesign.com. Please provide the serial number of the machine in question.

ADC user interfaces are distributed as standard Windows installers. Simply double-click the installer file and follow through the Wizard, accepting all defaults.

Configure the Beckhoff ADC Router

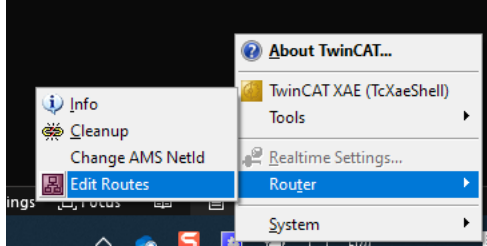
The ADC system must be connected to your PC to continue. This step only needs to be completed once when the ADS Router software is first installed.

Note: Beckhoff supplies a video of this process here: <https://youtu.be/2M9Hjz-uC24>

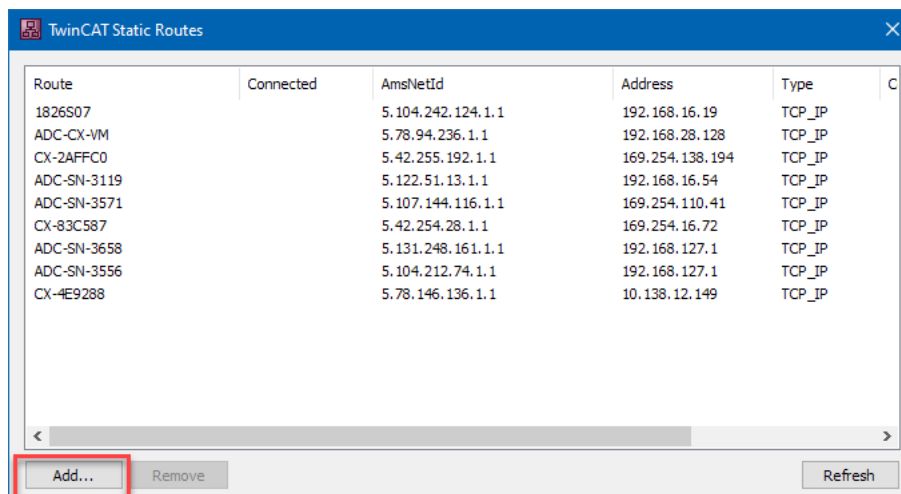
Locate the TwinCAT icon in the Taskbar.



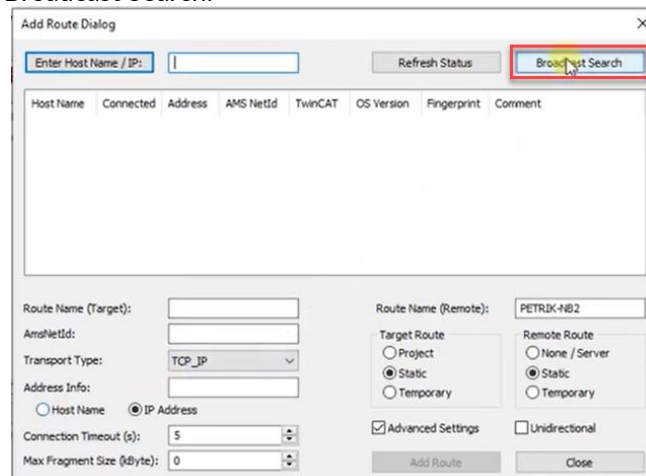
Right-click the icon and select Router->Edit Routes.



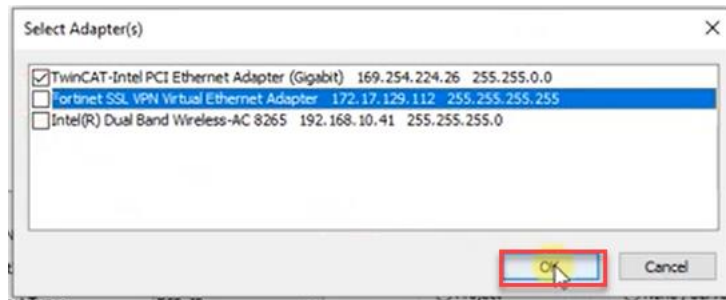
The TwinCAT Static Routes dialog will appear. Select Add...



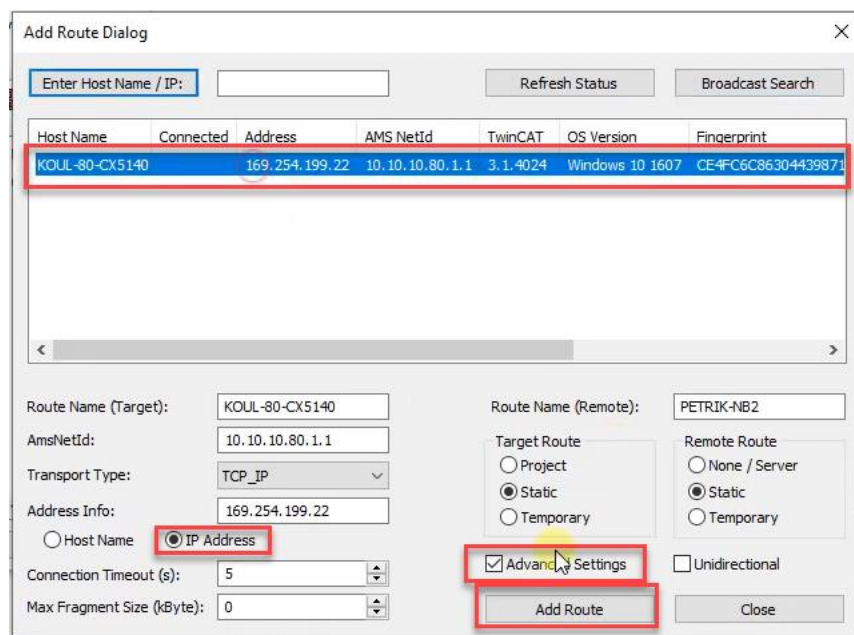
In the Add Route dialog, select Broadcast Search.



In the Select Adaptors dialog that appears, deselect the any wireless or virtual ethernet adaptors, then click OK.



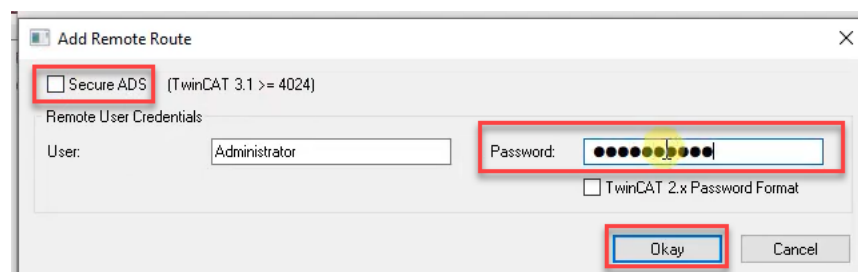
After a moment, your device will appear in the Add Route Dialog. Select it, then make sure that the Advanced Settings checkbox is selected, as well as the IP Address radio button. Click Add Route.



You will be asked to supply a username password.

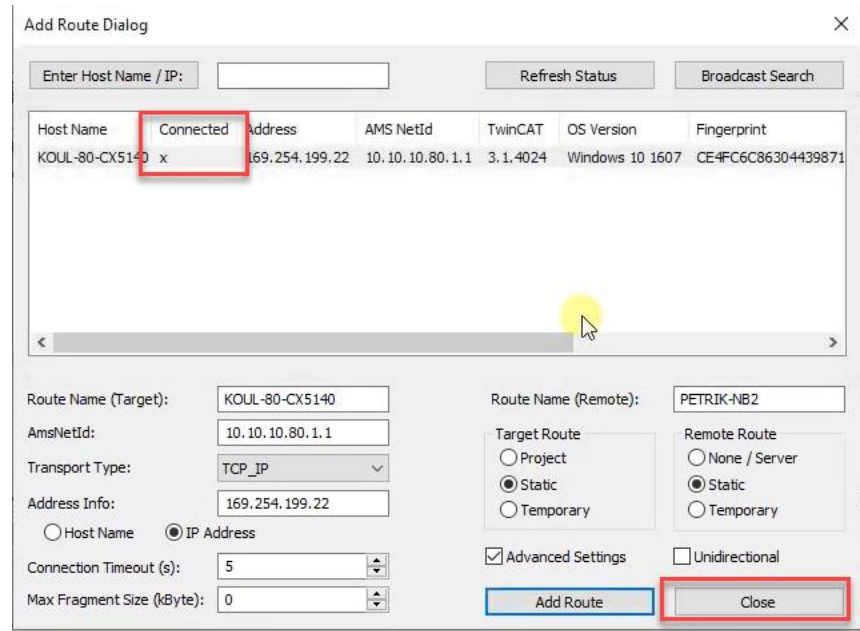
- Make sure the Secure ADS check box is unchecked.
- The user name is always Administrator.
- The password will be:
 - Kmf!<4 digit serial number of your machine>
 - o Example: Kmf!1234
 - If not, the password is simply: 1

Click the Okay button to set the security details.

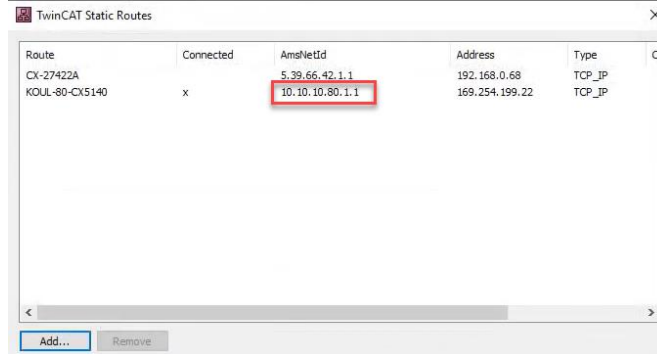


Ensure the route for your ADC system now has an “x” in the Connected column, then click the Close button.

If there is no “x” in the Connected column, then click Add Route and try again.



Make note or write down the AMSNetId value of your route. You will need this number later.



Close the TwinCAT Static Routes dialog.

Configure ControlUx

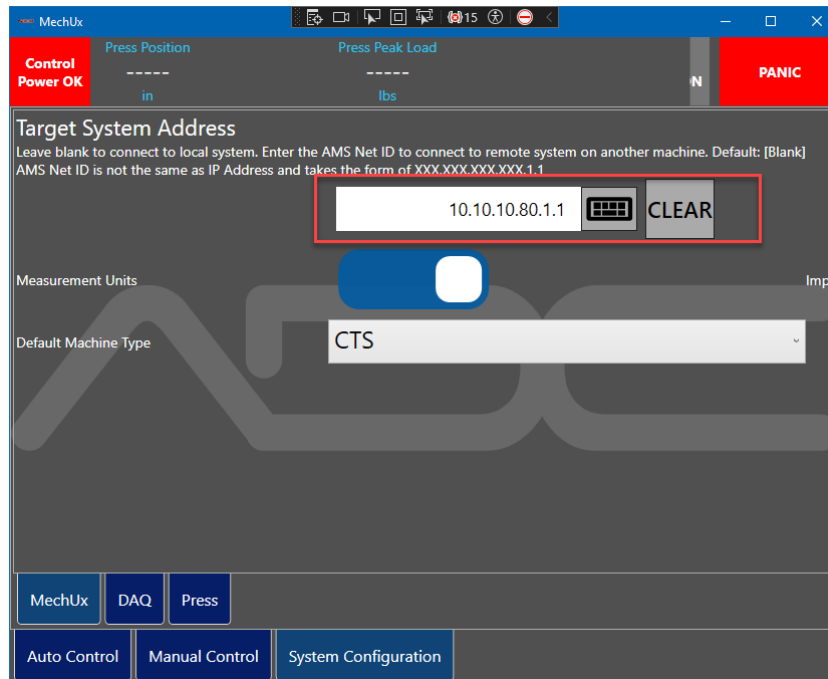
To generate the base ControlUx configuration, you must first start the ControlUx program by locating it in the Windows Start Menu. Your ControlUx program may be named:

- ControlUx
- MechUx
- Ball Durability
- Club Durability

Once the program has started, you are ready to configure it.

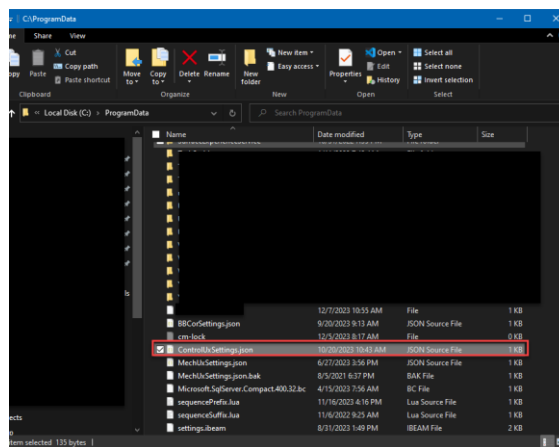
MechUx and Newer ControlUx programs

Many newer ControlUx programs allow you to configure the program from within the interface itself. For MechUx, for example, click the System Configuration tab and set the Target System Address to the AmsNetId from the TwinCAT Static Routes dialog. It must match exactly. Note that the AmsNetId is not related to the IP Address.

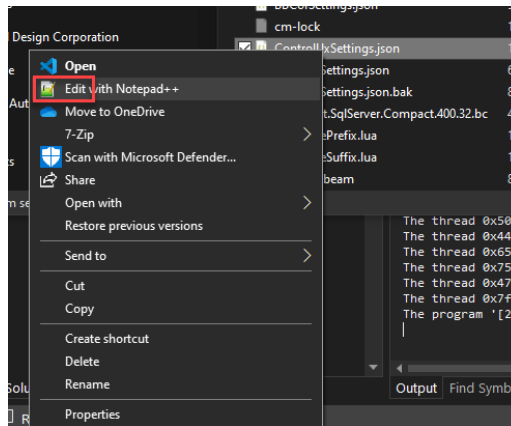


Older ControlUx programs

If the program does not have configuration settings in the user interface, it must be configured by editing the ControlUxSettings.json file using a text editor. Navigate to c:\ProgramData and locate the file ControlUxSettings.json.



Right-click the file and select Edit.



Change adsAddress to match the AmsNetId from the TwinCAT Static Routes.

```
{"vgComPort":"COM3","adsAddress":"10.10.10.80.1.1","adsPort":851,"clubBrakePosition":520,"clubBackPosition":1000,"isSuperCannon":false}
```

If using a VelociGraph, you will also want to set the vgComPort to match the serial port connected to the VelociGraph.

```
{"vgComPort":"COM3","adsAddress":"10.10.10.80.1.1","adsPort":851,"clubBrakePosition":520,"clubBackPosition":1000,"isSuperCannon":false}
```

Save the file and close the editor. Then, close the ControlUx program.

Open the ControlUx program again. After a moment, the interface should be connect to the machine.

Installation of the ControlUx software is now complete.