K-Link Software Manual

K-Link is the free software provided by Kolver to automatically store the tightening results from one or more K-Ducer or EDU2AE control units, with no user intervention required.

K-Links works as a service, in other words, it is a program that runs in the background, hidden from the user, and that starts automatically shortly after login.

To download K-Link, visit www.kolver.com, select "Industry 4.0 | K-DUCER Series" and click the download buttons on the right side., or contact kolver to obtain a copy.

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CHANGELOG

Version	Date	Notes
V1.0	10/2022	First version
V1.1	07/2023	Compatibility with KDU-NT controllers Compatibility with EDU2AE using ethernet-to-serial converters Caching of the results while a file is opened in Excel Faster reconnection in the situation where a controller connected to K-Link is powered off and then on again New options (on by default): - The timestamp of each result is replaced with the PC timestamp - New multi-line results format with "Tightening ID" - Saves high-resolution graphs when a KDU-1A with v38 or later is connected - Other advanced options described in this manual
V1.1.1	12/2023	Fixed issue with KDU-NT results when using a barcode scanner

SYSTEM REQUIREMENTS

- PC with Windows 8 or newer, or Linux
- Ethernet connection (RJ45)
- KDU-1A controller with mainboard firmware version 36 or newer (if you have an older version, contact Kolver to schedule a free software upgrade to v36)
- Properly configured IP settings on the PC, on each K-Ducer, and on the router or DHCP server if one is used

*if you need a version for a different operating system, contact us at kolver@kolver.com

IP CONFIGURATION

Direct connection or via ethernet switch (static IP)

If connecting the PC directly to the K-Ducer, or directly to an ethernet switch where multiple K-Ducers are also connected:

- Configure the IP address of the PC to static (manual). Refer to this this Microsoft article if unsure.
- Configure each K-Ducer controller to "Modbus TCP" protocol (general settings menu)

- Configure the IP address of the K-Ducer so that it uses the same subnet mask of the PC, and an IP address that is identical in the first three groups of digits, and different in the last group of digits

Example with static IP address:

Device	Subnet Mask	IP address
Windows PC	255.255.255.0	192168.100.**22** last digits are different from others in the network
K-Ducer #1	255.255.255.0 same as PC's	192.168.100.**23** last digits are different from others in the network
K-Ducer #2	255.255.255.0 same as PC's	192.168.100.**24** last digits are different from others in the network

Connection via router or DHCP server (automatic or static IP)

If connecting the PC and the K-Ducer controllers to a LAN network with a router or other DHCP server:

- your router (or other DHCP server) must allow a range of addresses to be used with static IP, with room for at least one address per K-Ducer controller
    - **Only for KDU-1A v38** (or other DHCP-enabled controllers): you can activate the automatic assignment of an IP address to the KDU-1A by enabling the corresponding DHCP option on the controller. However, you will still have to reserve an IP address for each KDU on your DHCP server, so that the same IP address is always assigned to the same controller and K-Link can reliably connect to it
- configure your PC for either automatic (DHCP) or manual IP address. Refer to this this Microsoft article if unsure. If choosing manual (static) IP, ensure you're using an address that is outside the DHCP address range of your router or DHCP server
- Configure each K-Ducer controller to "Modbus TCP" protocol (general settings menu)
- Configure the IP address of the K-Ducer so that it uses the same subnet mask of the PC, and an IP address outside of the DHCP address range of your router or DHCP server, identical in the first three groups of digits to the DHCP range, and different in the last group of digits

Example with dynamic IP addresses:

Device	Subnet Mask	IP address
Router (DHCP server)	255.255.255.0	192.168.100.**1** DHCP range: 192.168.100.**2** to 192.168.100.**100**
Windows PC	Automatic, or: 255.255.255.0 same as router's	Automatic, or: 192.168.100.**101** last digits are outside the DHCP range and different from others in the network
K-Ducer #1	255.255.255.0 same as router's	192.168.100.**102** last digits are outside the DHCP range and different from others in the network
K-Ducer #2	255.255.255.0 same as router's	192.168.100.**103** last digits are outside the DHCP range and different from others in the network

On the K-Ducer, leave the gateway IP address to 0.0.0.0 unless otherwise required by your IT infrastructure.

Configuring EDU2AE controllers for K-Link

To connect a EDU2AE controller to K-Link, you will need a serial-to-ethernet device such as Kolver P/N 020075. Other brands and models will also work, if they support working as a "TCP Server". In that case, you will need to configure the serial side of the converter (9600 baud, 8 data bit, 1 stop bit, no parity, no flow control), as well as the ethernet side of the converter (to work as a TCP server without inactivity timeouts). Note down the TCP Server Port and the IP address of the converter, which you will need when installing K-Link.

First off, on the EDU2AE controller:

1. Connect the serial port (DB9) of the serial-ethernet converter to the female DB9 serial port of the EDU2AE controller dedicated to the "serial print" function (i.e. printer connection). On EDU2AE/TOP/TA models, this is called CN7, on other models it may have a different name, refer to the user manual specific for your model if in doubt.
2. Activate the "**Serial Prt**" function with value "**1**" of each EDU2AE program for which you want results recorded by K-Link. The value of the "Serial Prt" function indicates the number of empty lines in between each result. For K-Link, what matters is that this value is not set to "off".

The following instructions are specific for Kolver P/N 020075:

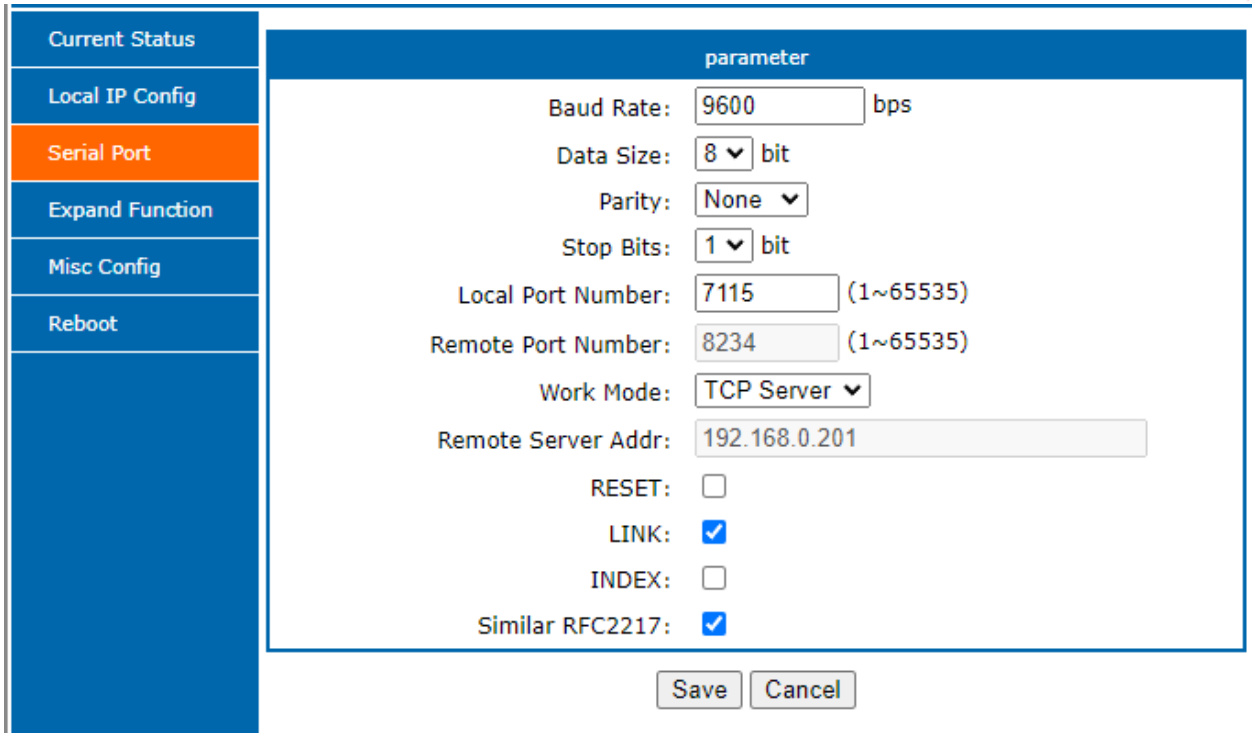
1. Uninstall the USR-VCOM software if it was previously installed for use with p/n 020075.

2. Reset the device to its factory settings by powering on the device (i.e. plugging it in), and then once it's on, pressing and holding the reset button for at least 5 seconds. This will set the device to a static IP address of **192.168.0.7**. You will need to configure the IP address of your PC accordingly (for example 192.168.0.8) in order to connect to it, refer to the "configuring IP addresses" section for more information on IP configurations.

Note: the device must be plugged in (turned on) to enable resetting it.

3. Connect the device to a PC via the ethernet cable, open a web browser, and navigate to 192.168.0.7. If prompted for a login, enter "admin" for both the username and password fields.

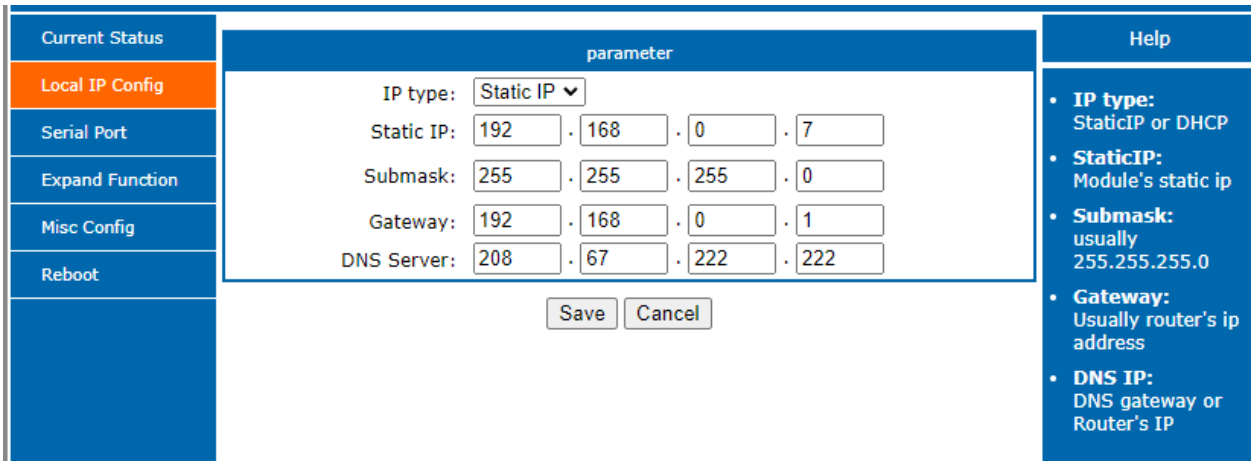
4. Click on "Serial Port" and set all parameters as follows:



You may enter a different number for “Local Port Number” if desired. This will be the PORT number to use when adding a EDU2AE to K-Link via the line “EDU2AE = IP, PORT” when installing K-link.

5. On the “Misc Config” section you can modify the login credentials of the converter device.

6. On the “Local IP Config” you may now change the IP address of the device to suit your network/needs. You will need the IP address of the device when configuring K-Link.

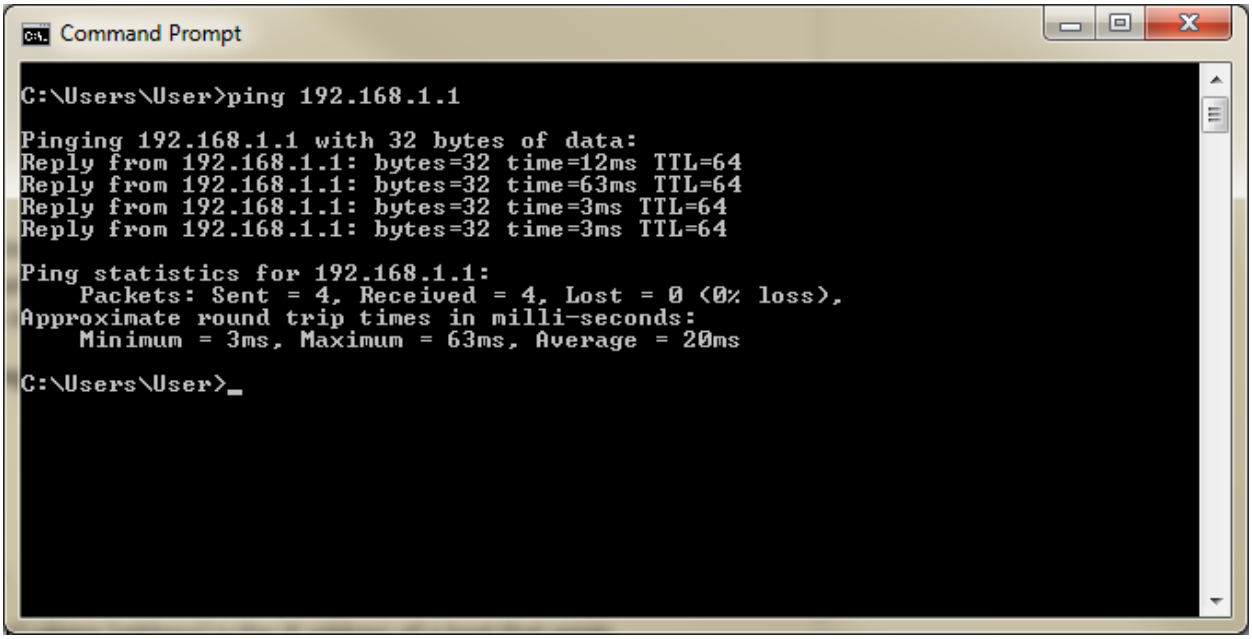


7. Follow the K-Link installation instructions to add a EDU2AE controller to K-Link.

Verification of IP settings

On the PC, open the command prompt (CMD) and type “ping 192.168.100.101” without quotes, and changing the 192.168.100.101 IP address with the one you assigned to your K-Ducer controller. Repeat for each controller.

If the output shows “reply from 192.168.100.101 […]”, then the IP settings are properly configured, for example:



Refer to this Microsoft article if unsure how to use the ping command on Windows.

INSTALLATION

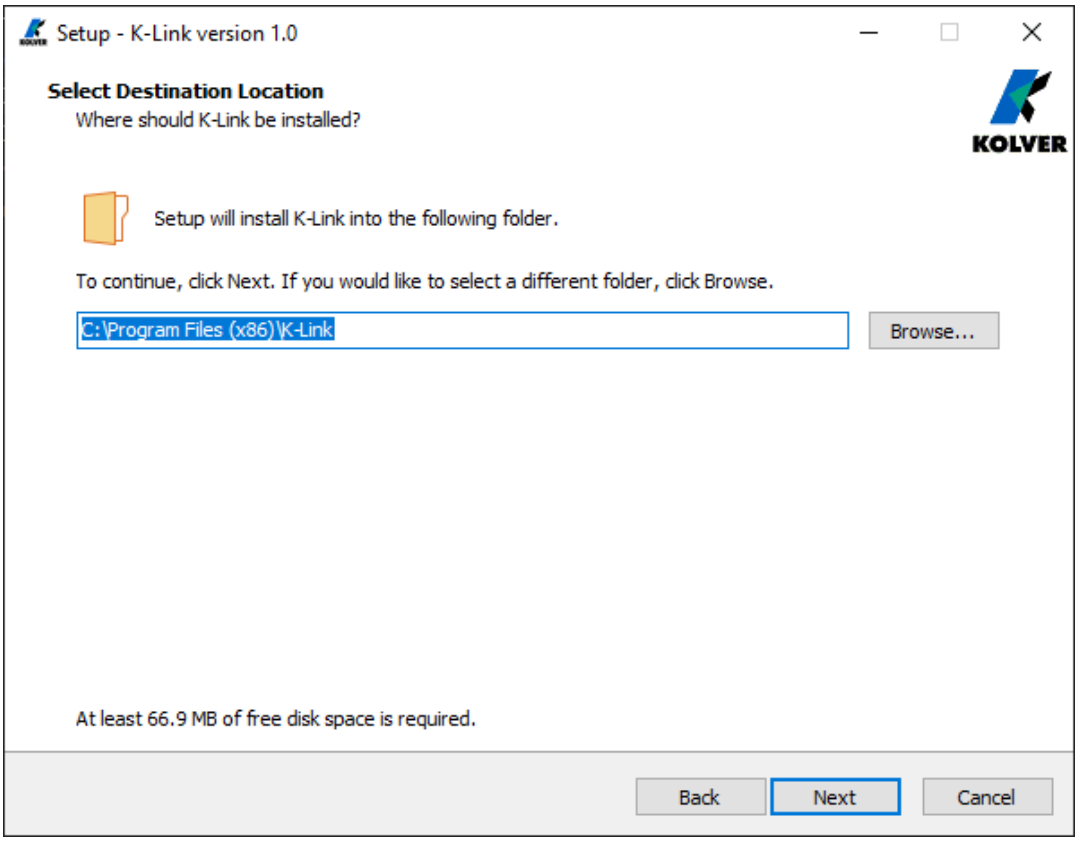
Open the K-Link-Setup.exe file and follow the instructions.

Program and settings.txt file directory

The installer will first ask for a standard license agreement, followed by the directory selection.

This should be left to the default selection, unless otherwise required by your IT department.

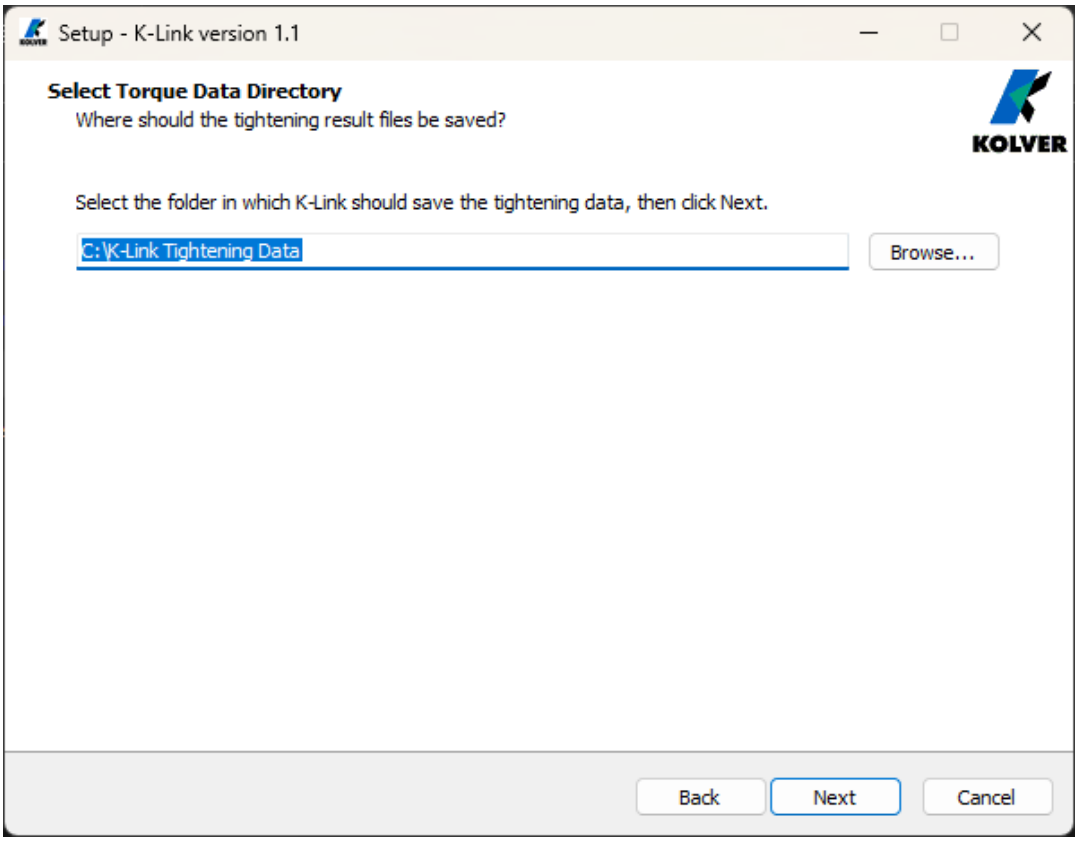
Note: This is not the directory where your torque data files will be saved to, this is just the directory where the program files and **settings.txt** file will be installed:



Tightening data files directory

The installer will then ask for the directory where to save the CSV files containing the torque data. You can choose any folder of your choice for this.

To change this folder after installation, either reinstall the K-Link program, or modify the settings.txt file in the installation directory.



List of controller IP addresses

Next the installer will ask to enter the list of IP addresses of each K-Ducer or EDU2AE controller for which you want to save tightening data.

The format has changed with K-Link v1.1 (as described here below):

Each line should be composed as follows:

`MODEL = IP`

Where MODEL is KDU-1A or KDU-NT and IP is the IP address of that controller. Repeat the line for each additional controller.

For EDU2AE controllers, the format is:

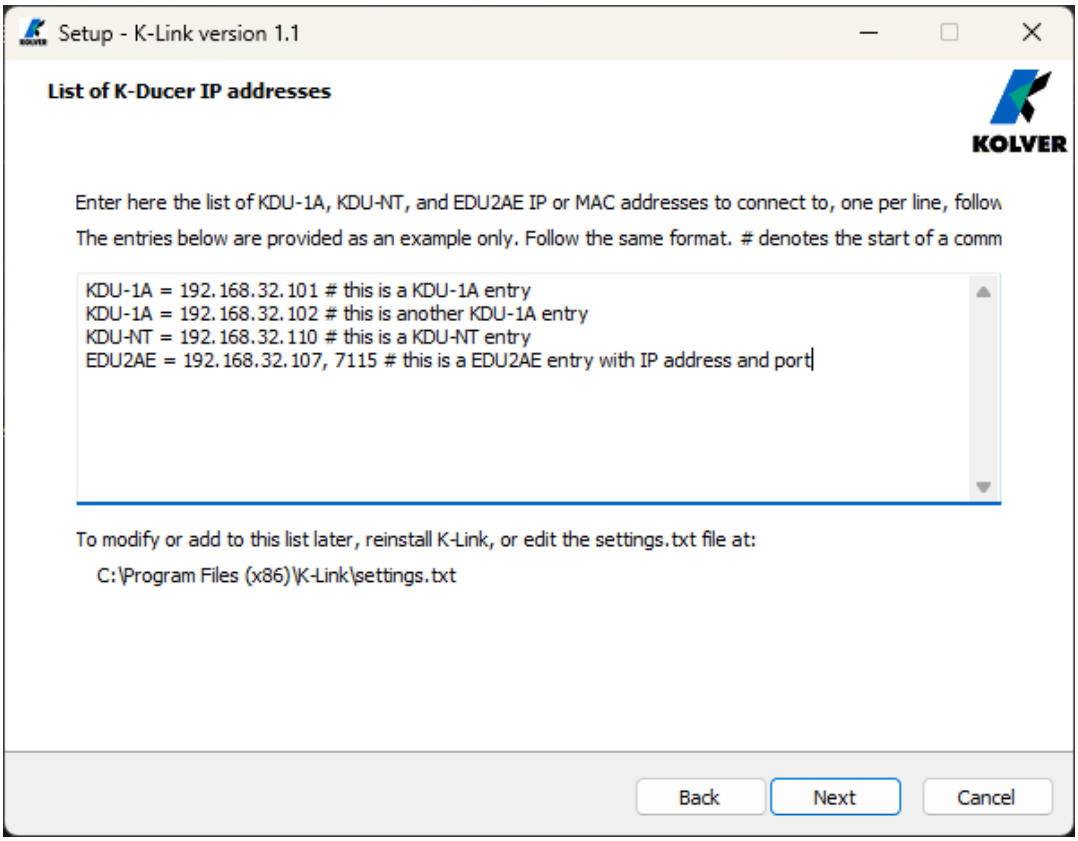
`EDU2AE = IP, PORT`

Where IP and PORT are respectively the IP address and TCP port of the TCP server configured on the serial-to-ethernet adapter connected to the EDU2AE.

You may also add notes/comments in each line by adding the character # after the relevant information. For example:

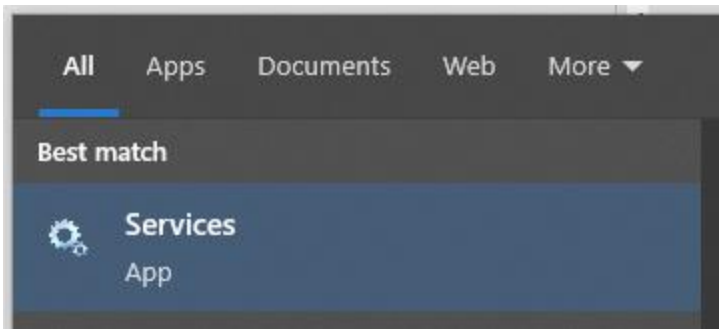
```
KDU-1A = 192.168.1.150

KDU-NT = 192.168.1.160

EDU2AE = 192.168.1.170, 7115

KDU-1A = 192.168.1.151 # 6/30/23: added new workbench
```

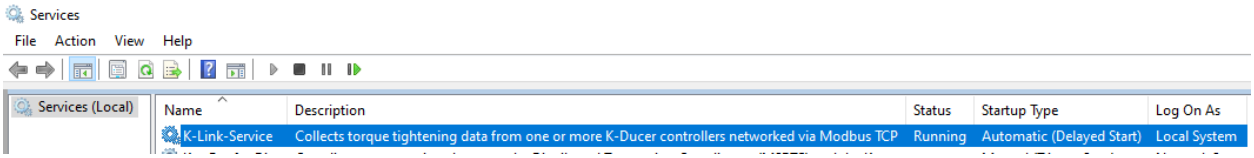
To change the list after installation, either reinstall the K-Link program, or modify the settings.txt file in the installation directory.



Verifying the installation

If the installation completed successfully, you will see the "K-Link-Service" entry under the Windows Services app (to open the Services app, type "Services" on the Windows start menu):





If the entry "K-Link-Service" is not present, reinstall K-Link or contact Kolver for support.

USAGE

K-Link starts automatically whenever you turn on the Windows PC where it is installed.

The tightening data is saved to CSV files, in the directory specified at installation.

The CSV file contents follow the same data format of the files saved to the USB drive by the controller. Refer to the K-Ducer operator manual for a description of the data points included with each result, and for instructions on how to graph the torque and angle data for each tightening.

A new separate file is generated every day for each connected K-Ducer unit.

The naming convention is:

STATION NAME – IP ADDRESS – DATE.csv

Where station name is the name assigned to the K-Ducer (via the General Settings menu on the controller),IP address is the IP address assigned to the K-Ducer, and Date is the day's date, as seen by the PC, in YYYY-MM-DD format.

Note: you cannot use the K-Expand software with a K-Ducer connected to K-Link. Either pause K-Link ( ), or temporarily change the IP address of the K-Ducer controller that you want to connect to K-Expand.

Note for Excel users

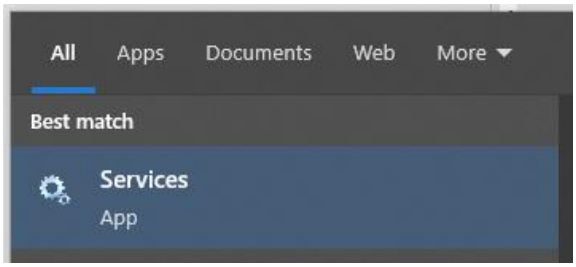
If you open a CSV file where K-Link is actively adding results with Excel (i.e. "today's" file), Excel will lock the file and prevent any new data from being saved until you close Excel. K-Link v1.1 will store in memory any new result received while Excel is open, and will insert all of the new results to the file upon receiving a result after you have closed Excel.

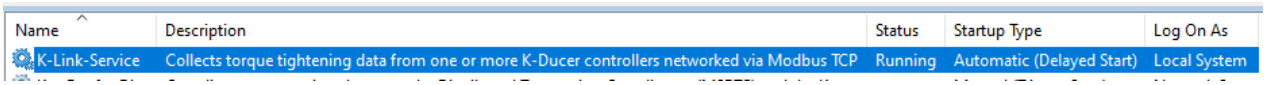
Don't forget to close Excel after looking at the file! Or better yet, make a copy of the file you want to look at, and open the copy).

Note that this not apply to files opened with notepad or with any third-party software that does not explicitly lock the file.

Pausing and resuming K-Link

If you need to temporarily pause the K-Link program, for example, to connect to a K-Ducer via K-Expand without changing the K-Ducer IP address, or to stop recording data for any other reason, open the Services app on Windows (type "Services" on the start menu to find it):

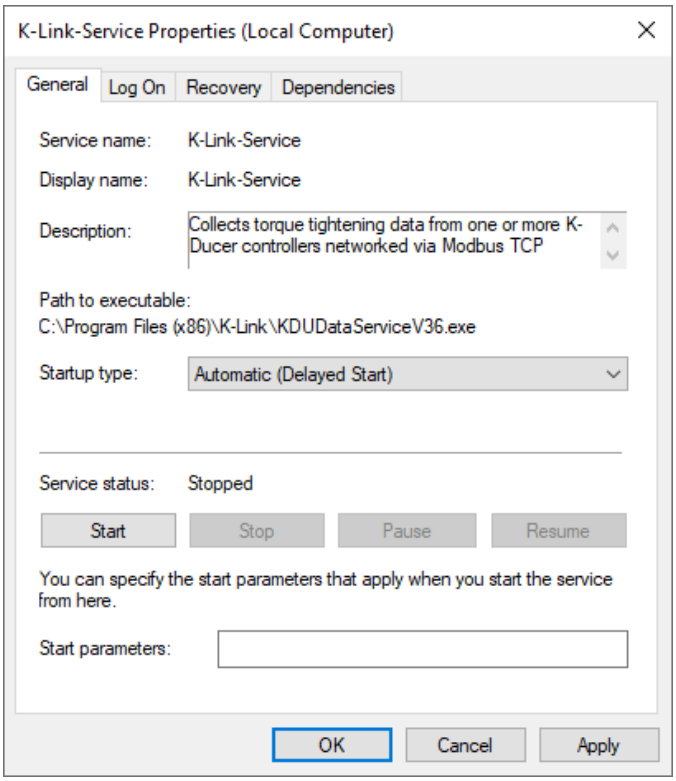




Then find the K-Link-Service entry, right click on it, and select "Stop". To restart it, right click and select "Start".

Note: K-Link will always automatically restart after you reboot your PC.

To prevent the automatic restart, uninstall K-Link via "Add or remove programs", or right click on the K-Link-Service, select "Properties", and change the "Startup type" to "Manual":



Changing IP addresses and CVS file directory

To modify the list of controller IP addresses, open the "settings.txt" file in the K-Link installation directory, and modify the list at the end of the file.

On this file, you can also modify the directory where you want your CSV files to be saved.

After modifying the "settings.txt" file, you must either reboot your PC or restart the K-Link-Service from the Windows Services app, for the changes to take effect.

Advanced settings

On the "settings.txt" file you can, optionally, modify some 'advanced' settings, by adding lines following this format:

```
$OPTION = VALUE
```

Dove impostazione e valori sono tra i seguenti:

Option (preceded by $)	Values (default value bolded)	Effect
USE_PC_TIMESTAMPS	**YES** / NO	The PC date/time replaces the result's timestamp from the controller. This is recommended because the PC will have a more accurate date/time than any controller, especially with respect to time zones and daylight/standard time changes.
CSV_FORMAT_KDU1A	**MULTILINE** / SINGLELINE	Only for KDU-1° controllers. MULTILINE uses the new multi-line format for tightening results (like KDU-1A v38 with USB drives). SINGLELINE uses the legacy single-line results (like KDU-1A v36 and v37).
USE_HIGH_RESOLUTION_GRAPHS_KDU1A	**YES** / NO	Only for KDU-1A v38 controllers. Enalbes or disables the high-resolution graph data (one datapoint every 1ms). If "NO", the legacy graph data (~70 points per tightening) is used instead. "YES" (default) only works with the MULTILINE csv format.
TCP_TIMEOUT	**1500**	The timeout for every TCP transmission in ms. If exceeded, the connection is dropped and restarted. Normally it is not necessary and not recommended to change this setting.
POLLING_INTERVAL_KDU	**50**	The polling interval for KDU controllers in ms. Normally it is not necessary and not recommended to change this setting.

LINUX INSTRUCTIONS

K-Link is also offered for Linux as a self-contained **systemd** service with no dependencies.

Create installation directory

Extract the KLink-Linux archive. Edit the **settings.txt** file with a text editor, according to the instructions in this manual and/or the guidelines written in the file itself.

Choose or create an installation directory where the KLink executable and the settings.txt files will reside. We don't recommend using the same directory specified in the **settings.txt** file, because users might accidentally delete the KLink executable or settings when clearing out old torque data files.

Move the KLink and settings.txt files to the installation directory you chose.

Installing the systemd service

Open the **KLink.service** file and edit the line:

ExecStart=/home/your_user_name/folder_with_KLink_file/KLink

Replacing **/home/your_user_name/folder_with_KLink_file/** with your K-Link installation directory. Leave **KLink** at the end of the line – that's the name of the executable. Save and close the file.

Next, open the terminal and move to the directory where the edited **klink.service** file resides.

Type the following command to move the **klink.service** file to the right folder:

```
sudo mv klink.service /etc/systemd/system/
```

Type the following command to reload the systemd daemon:

```
sudo systemctl daemon-reload
```

You can now test and start the K-Link service with the following command:

```
sudo systemctl start klink.service
```

Once it starts, if it connects successfully to at least one K-Ducer specified in the **`settings.txt`** file, you should see a corresponding CSV file appear in the K-Link torque data directory specified in the **`settings.txt`** file.

You can stop the K-Link service with the following command:

```
sudo systemctl stop klink.service
```

Finally, you can set K-Link to automatically start whenever you logon:

```
sudo systemctl enable klink.service
```

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