

Connections DB3.6 controller Version 2

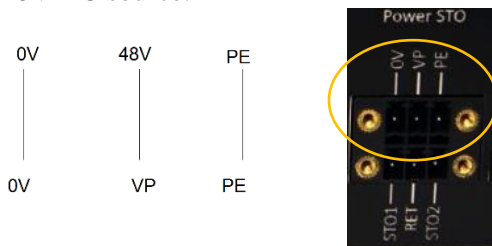


Hardware connections

Power supply

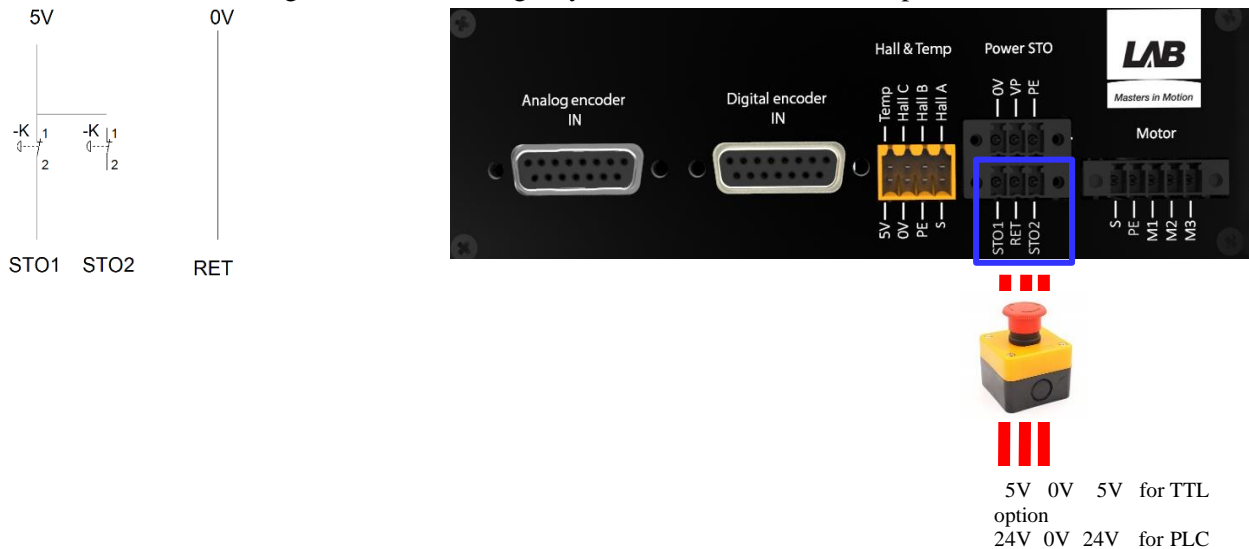
You can use LAB's Power Supply or a third-party power supply to provide 24V or 48V to Controller. LAB Power Supply (picture below) equipped with the 220V power cable, and a 24V or 48V power cable to connect with the Controller. Please connect the Power Supply with the Controller's power port as in following pictures. The voltage has to be 24V or 48V, please double check with your LAB sales engineer.

A voltage source should be connected to the power port on the drivebox. The voltage source has to be a 48V DC source.

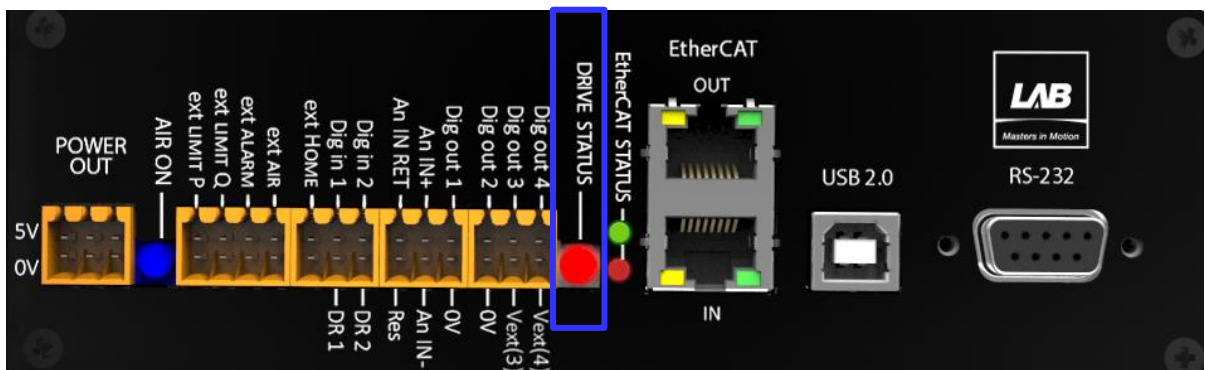


Safety

The driver will not work if the Safe Torque Off is not powered. STO1 and STO2 should be powered with a 5V DC source in respect to RET, if TTL is mentioned on the drivebox. If PLC is written on the drivebox, the STO voltage is 24V. An emergency circuit should be added to power the STO socket.

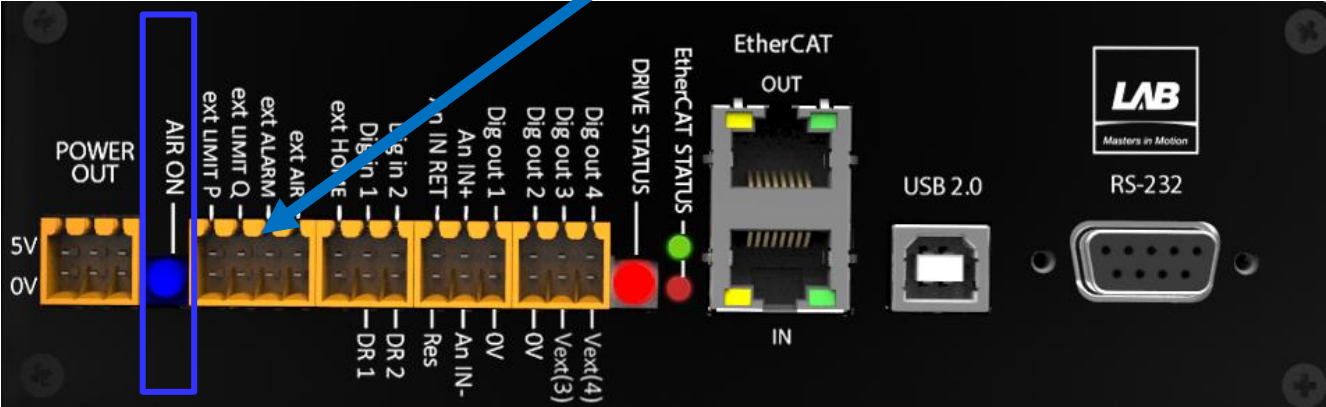


When the power supply and STO are OK the LED of the Drive status will turn green.



Pressure guard

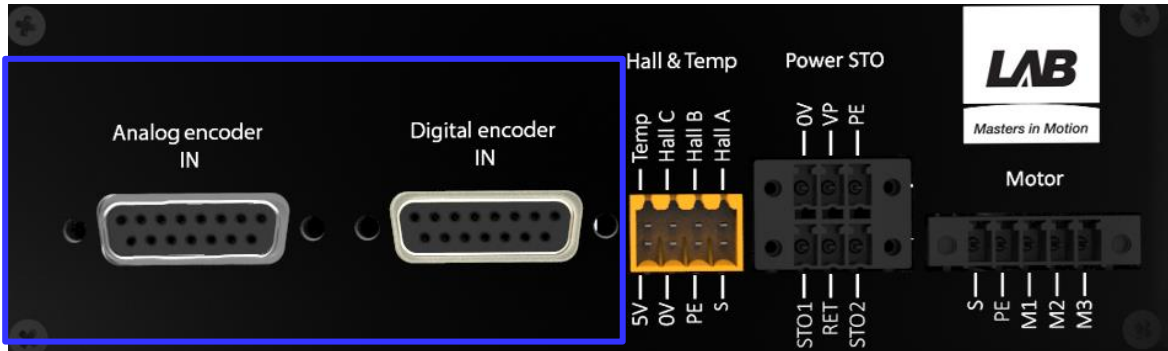
To stop the stage in case the pressure drops, connect the pressure guard to the EXT air input



When the air supply is OK the Blue indicator LED Air ON will also turn on.

Encoder

(!) Make sure to connect the correct encoder. An analog encoder should **never** be exchanged by a digital encoder.



The “blind” plug cover was provided by LAB to prevent mistakes. Analog connector always recognized with the ‘black plastic’ digital connector, Digital connector always provide with ‘transparent plastic’ (see the pictures below). It is very important to distinguish correctly between both of them, they have a different pin layout!

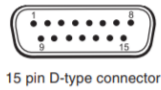


Analog Connector



Digital Connector

Pin layout:



Analogue output encoder connector

Marked by Ti0000 in the numbering format, Only connect to Analogue encoder input of Controller!, Pin layout:

Analogue output connector			
PIN Interface Ti0000	Description	Signal	Color at encoder readhead
1	Incremental cosine	V1 -	Blue
2	Incremental sine	V2 -	Green
3	Reference mark	V0 +	Violet
4	Power	5 V	Brown
5	Power	5 V	Brown
6	Set-up	Vx	Clear
7	Limits	Vp	Pink
8	Limits	Vq	Black
9	Incremental Cosine	V1 +	Red
10	Incremental sine	V2 +	Yellow
11	Reference mark	V0 -	Grey
12	Power	0 V	White
13	Power	0 V	White
14	Remote CAL	CAL	Orange
	Inner shield	connected to 0V inside the Ti interface	Green/Yellow
	Outer Shield	Case	Outer screen

Digital output encoder connector

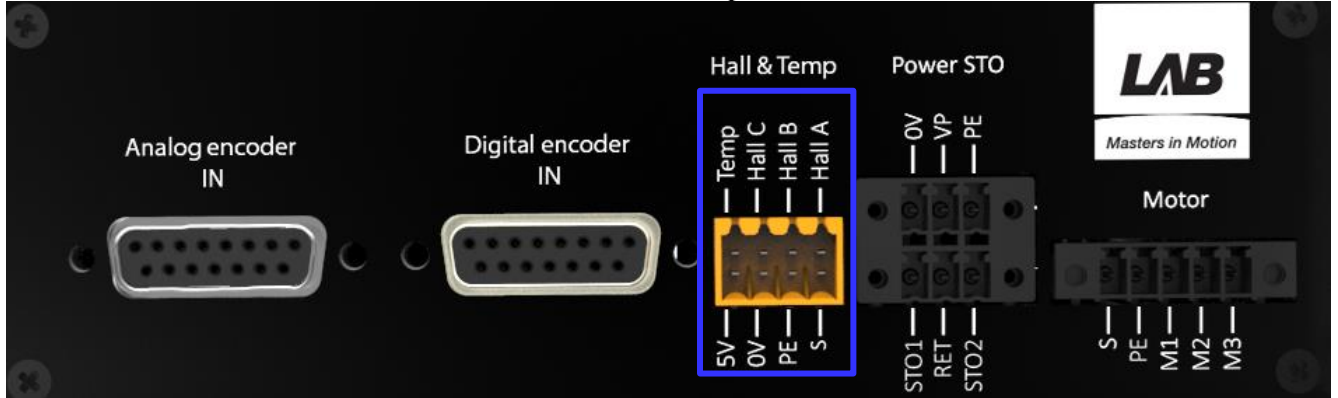
Marked by Ti0004 – Ti20KD in the numbering format, Only connect to Digital encoder input of Controller!, Pin layout:

PIN Interface TiXXXX	Description	Signal
1	Set-up	X
2	Power	0V
3	Alarm	E-
4	Reference Mark	Z-
5	Incremental	B-
6	Incremental	A-
7	Power	5V
8	Power	5V
9	Power	0V
10	Limit	Q
11	Limit	P
12	Reference Mark	Z+
13	Incremental	B+
14	Incremental	A+

	Inner Shield	-
	Outer Shield	Case

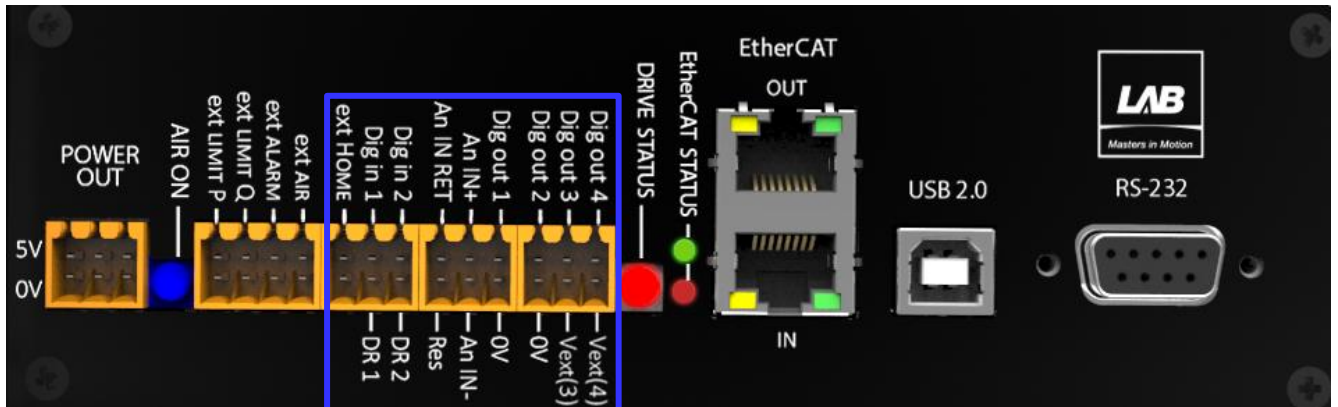
hall sensor

The hall and temperature sensor cable can be found in the box of RT-S SERIES AIR BEARING STAGES. Connect it with the interface of Controller like the picture below.



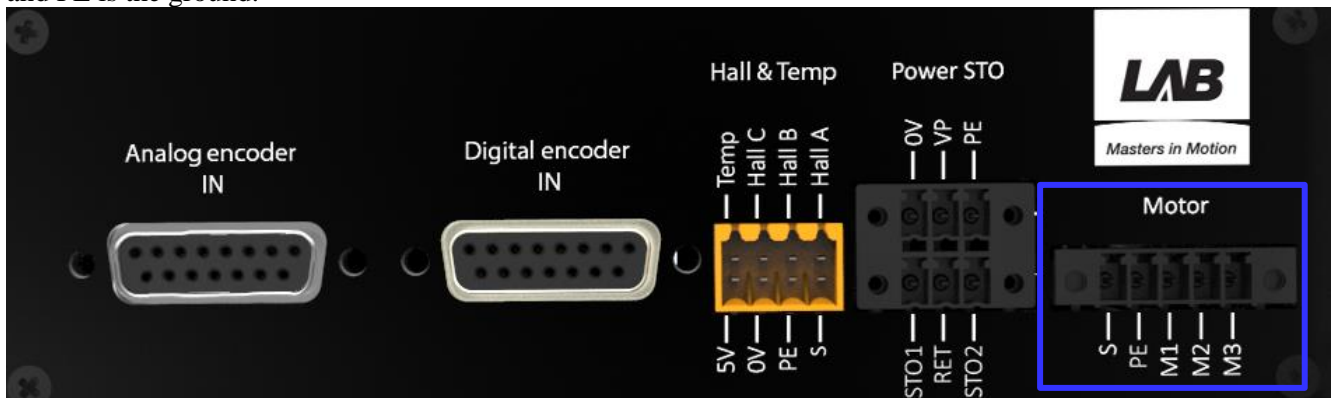
Input I/O

LAB Controller provides some free Analog/Digital Input and Output for customer, as mentioned in the picture below. If you want to use digital input / output signals check which signal level you have.

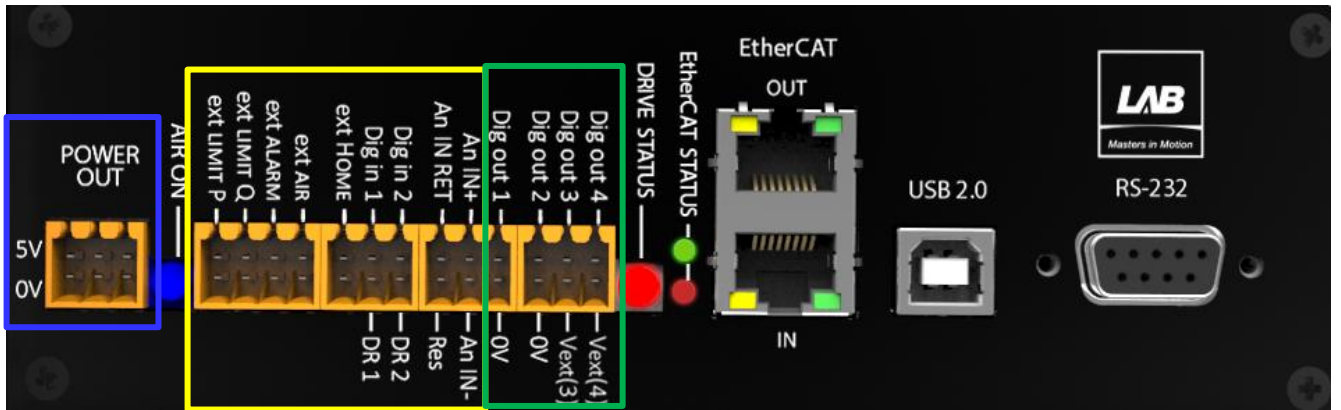


motor

The motor cable can be found in the RT-S SERIES AIR BEARING STAGES box. Connect the motor cable to the motor socket of the Controller. M1, M2 and M3 are the motor phases. S stands for shield and PE is the ground.



Other Input and Output



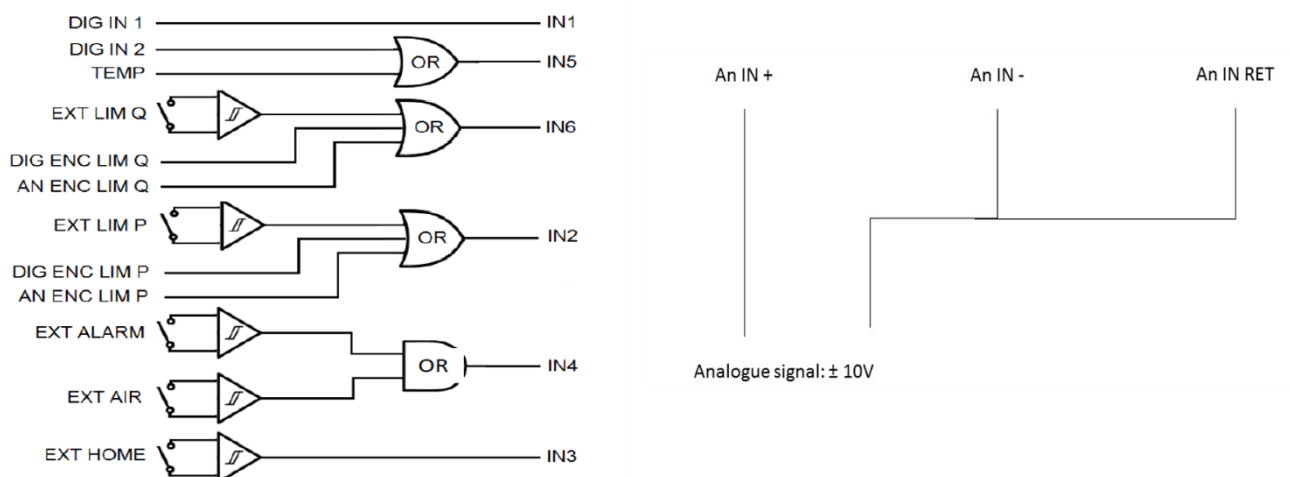
The Controller contains a 5V power output (blue color). This output signal can only be used for ‘floating devices’. The maximum current in this socket is 50mA.

All digital and analogue inputs are marked with yellow color. All digital outputs are marked with green color. The voltage level is 5V unless defined different. There are 2 kinds of digital inputs: Dry Contact and Non-Dry Contact.

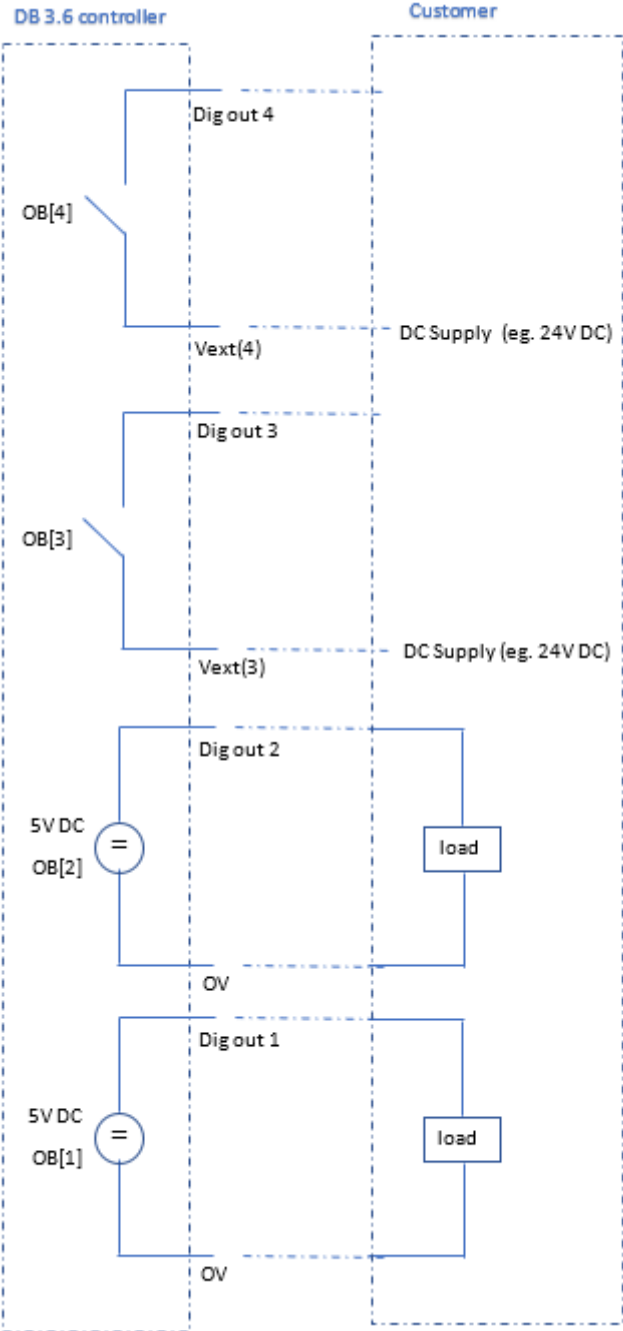
Dry contacts can be connected directly to a normally open switch or a normally closed switch. Non-dry contacts should be powered with a 5-volt power source. In the picture below, you can find more information about the inputs and the input in the software they are linked with.

The dry contact are the ones with the trigger symbol. If there are more signals on one input, the 1-signal will be chosen.

The analog input should be connected with the pins An IN + in respect to An IN – in and An IN RET like in the picture below. The maximum voltage applied should be $\pm 10V$ (10V absolute).



Digital outputs 1 and 2 are always 5V DC. Outputs 3 and 4 are selectable and will follow the externally supplied voltage (maximum 24V).



Software

A. Some necessary steps before making connection

- 1) Gently rotate the stage by hand for at least one complete rotation. Verify that the stage rotates without any friction (note that for the S-series, a damping force is normal).
- 2) Check that the connections are well fixed and secured well.

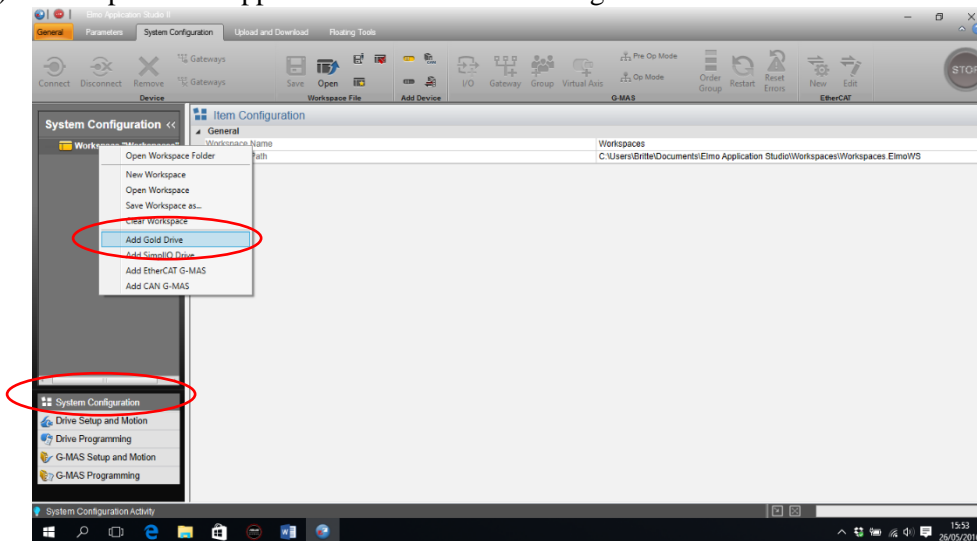
B. Making software connection with the rotary stage (direct access USB / RS232)

There are 2 ways to connect the Controller to a PC: USB and RS-232. It is also possible to connect the Controller (or more Controllers) to a Master Controller (like a PLC) via EtherCAT. Follow the procedure below for connect with PC via USB or RS232 (USB is recommended, an USB cable is provided by LAB, please find it in the box).

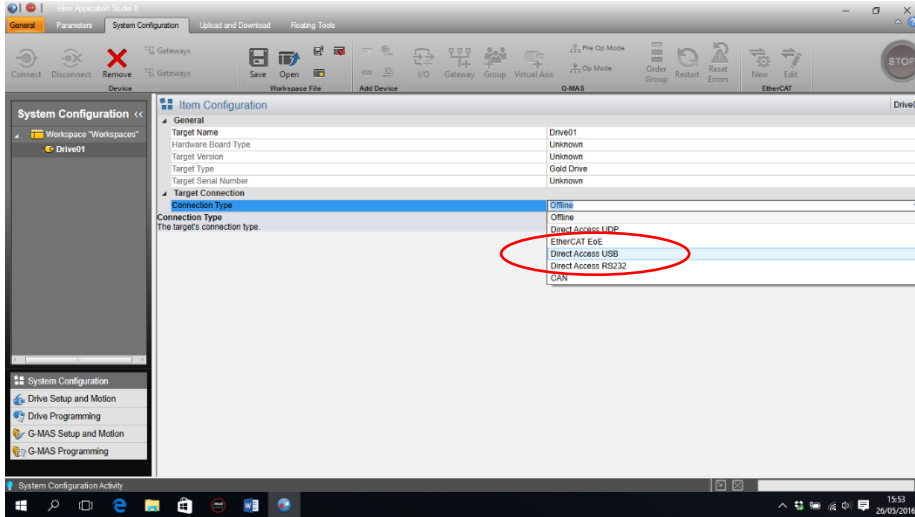
- 1) Start Elmo Application Studio II.
- 2) Go to System Configuration -> Workspace -> Add Gold Drive.
- 3) Item configuration
 - a. Give the drive a name
 - b. Define the connection type (Direct Access USB or Direct Access RS232)
 - c. Select the right serial port: the dropdown menu will make a preselection
- 4) The interface shows when the connection is made.

Below pictures you can find some references regarding how to connect the software with the rotary stage:

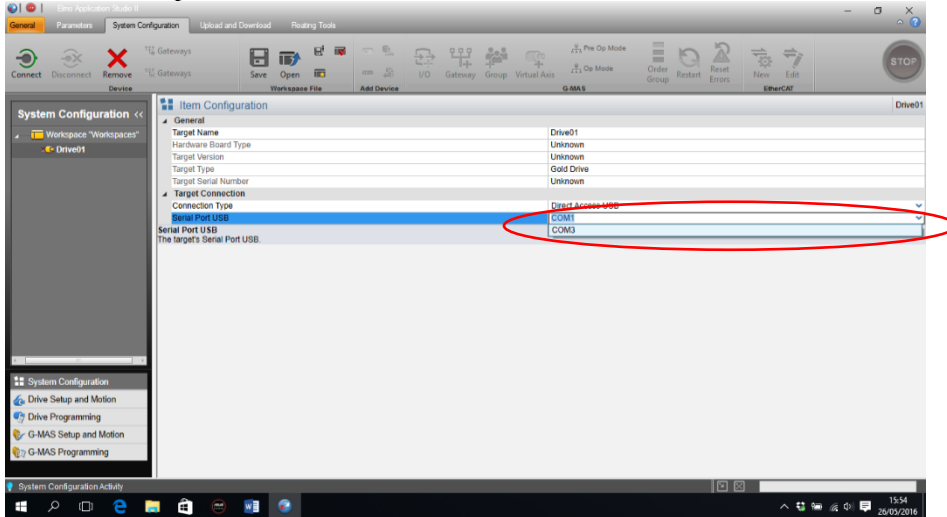
- 1) First open Elmo application studio. Then add a gold drive:



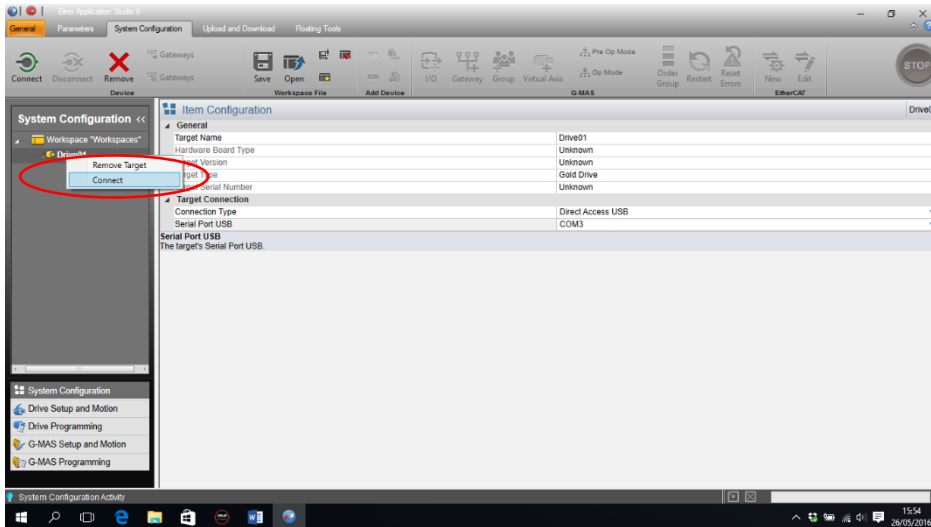
2) Select USB connection



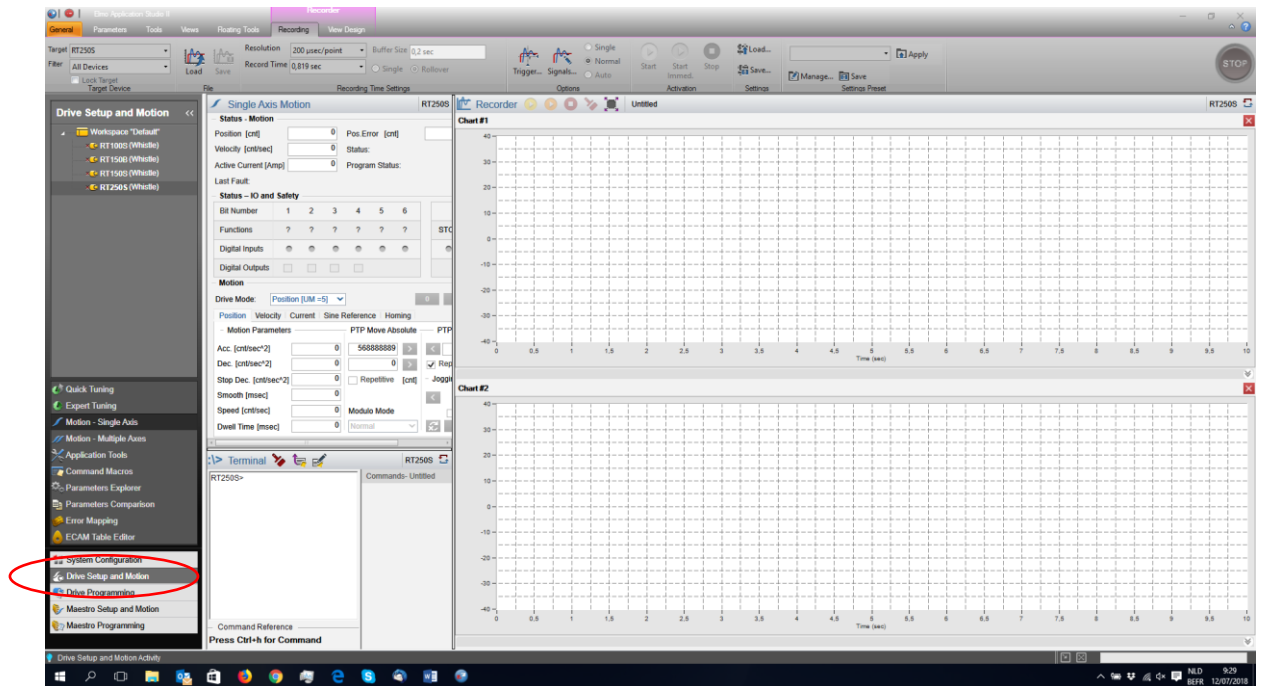
3) Choose the right port (In this example USB). The dropdown menu will automatically show all the connected ports:



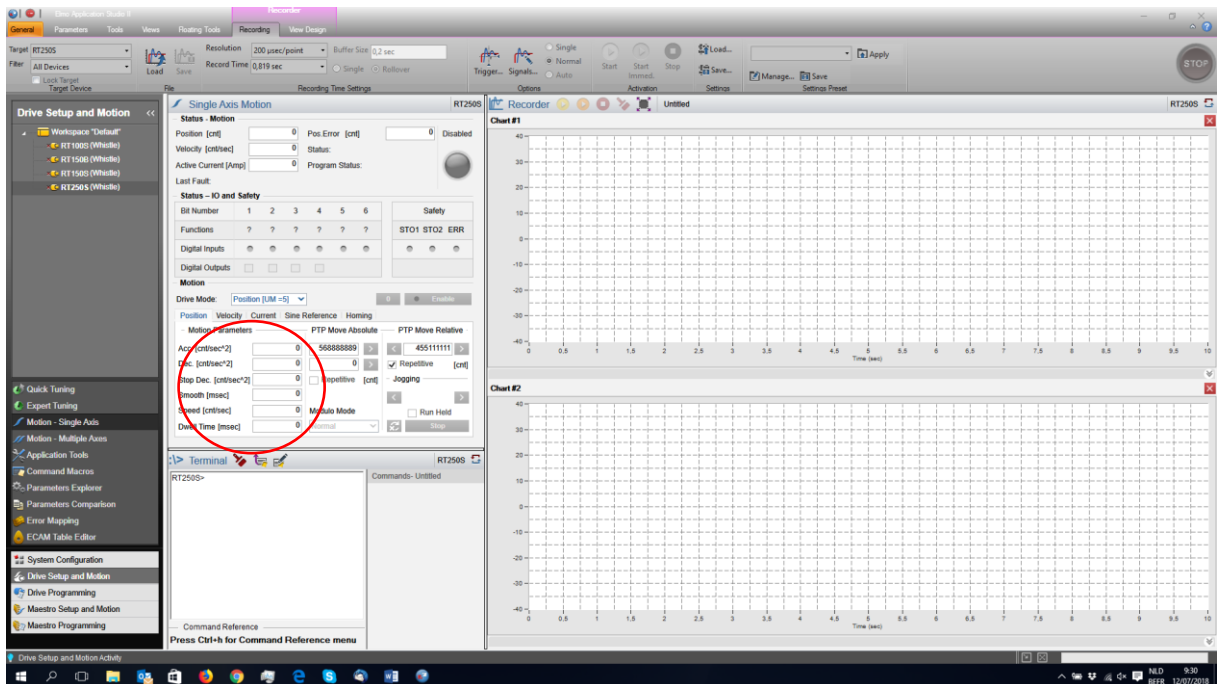
4) Then connect the driver:



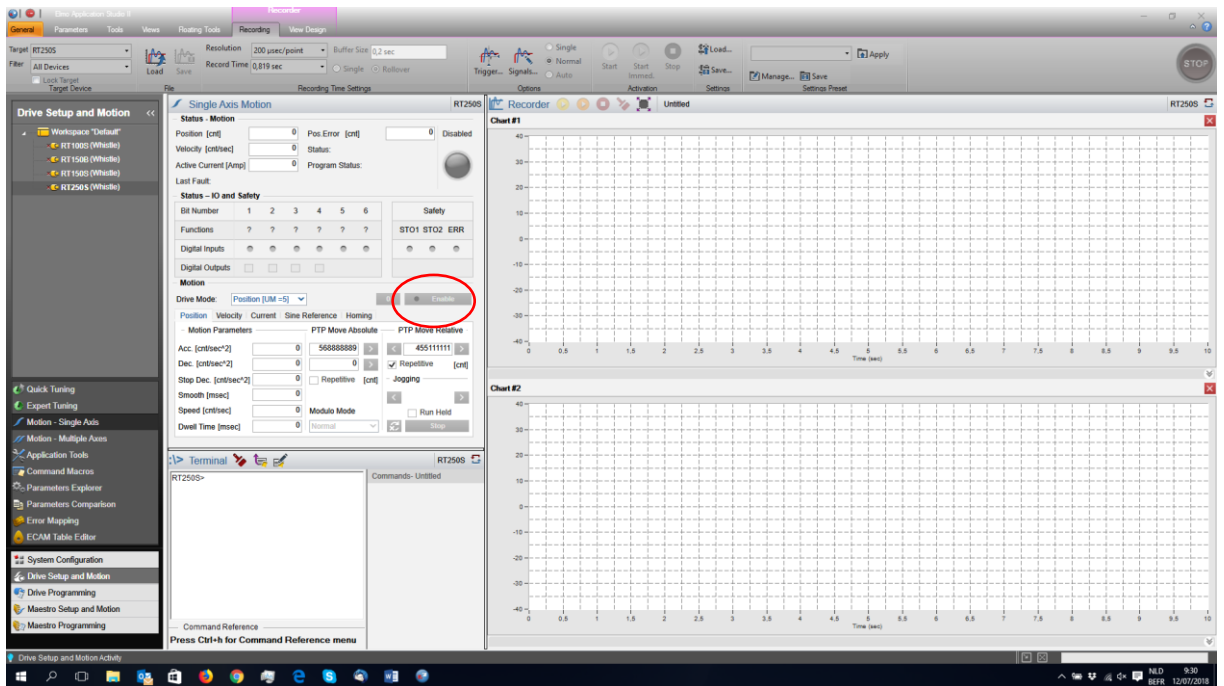
5) Once connected, go to drive setup and motion



6) Fill in the requested speed, acceleration (mind the units)

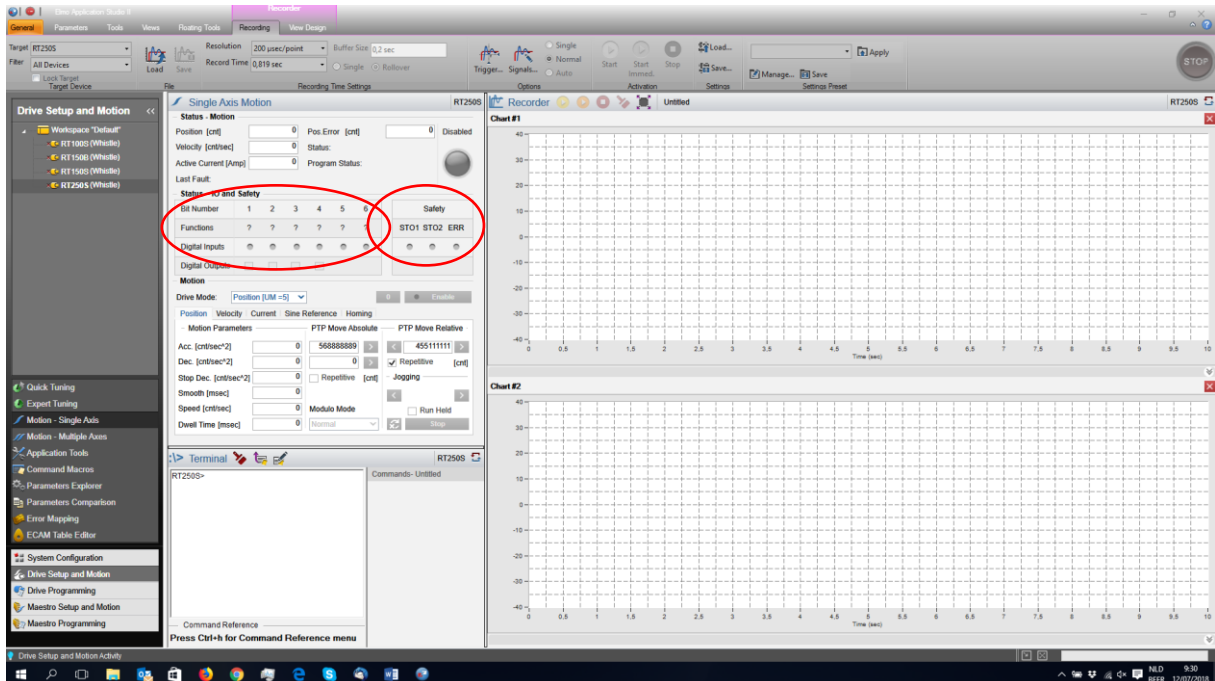


7) Enable the motor

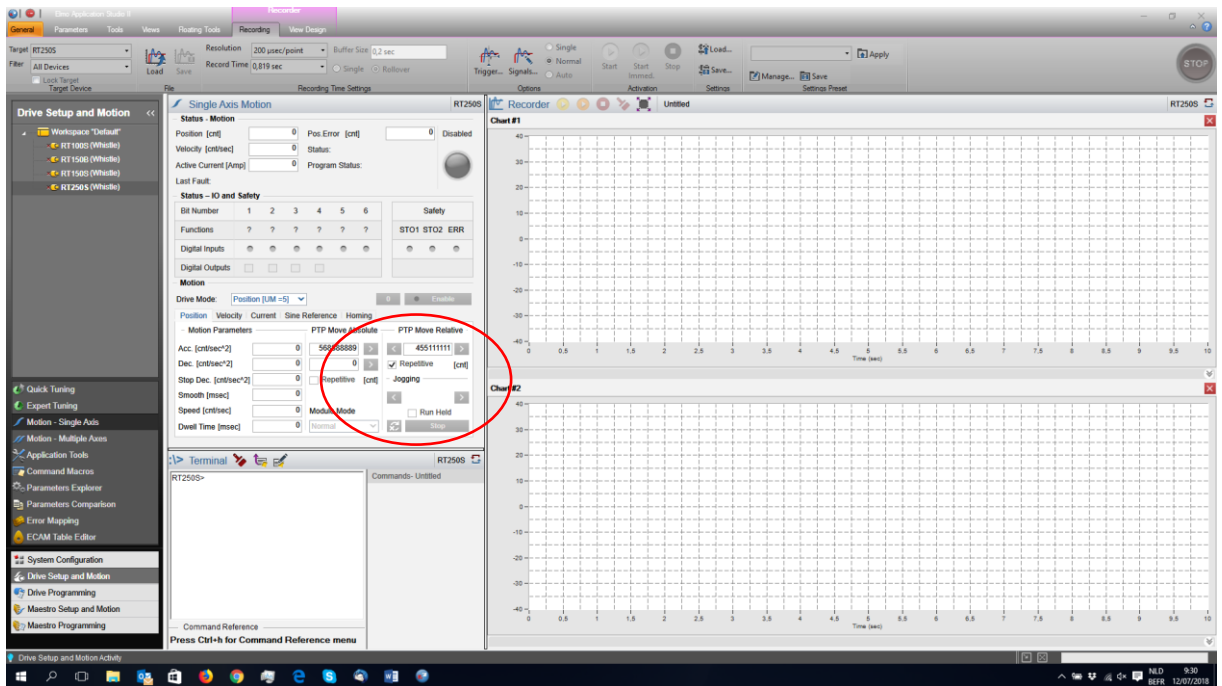


If the air supply or STO is not OK an error message will appear.

The status of the air supply, other I/O's and STO can be seen at following window. Both STO signal should work in order to enable.



8) Make a movement



Please NOTE:

- All Controllers are well tuned by LAB Motion Systems regarding to the demands of the customer. Tune or adjust the motor parameters only if really necessary. It is recommended to contact the support department of LAB Motion Systems and give the specialist the right information for the dynamical behavior that is required.
- The tuning values may need to be adjusted if the payload mass or size changes. If LAB Motion Systems was not given the application information at the time of PO, the controller was tuned with no payload mass.

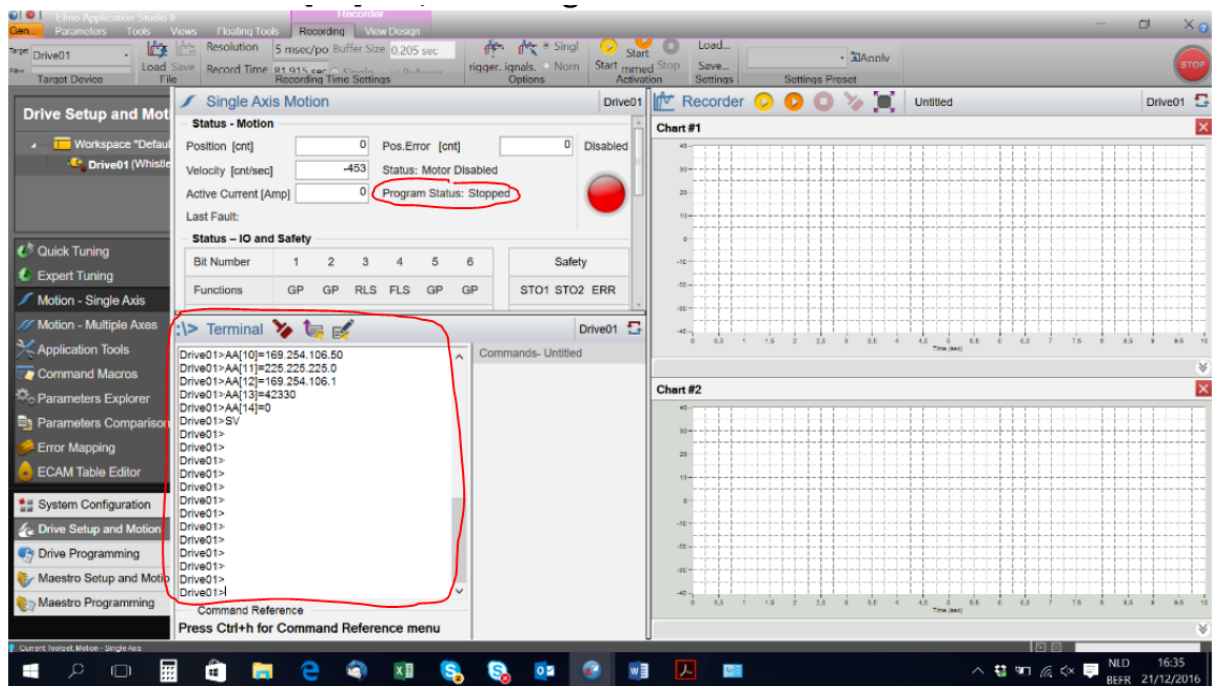
Changing ethernet settings -

log in by USB with EAS (see software section above)

Check if there is no program running, and kill it if needed by entering KL in the terminal

Change following parameters in the terminal:

- AA[10] = desired IP address for example 192.168.1.3 (similar to the Host IP)
- AA[11] = desired subnet mask set for example 255.255.255.0
- AA[12] = desired Gateway for example 192.168.1.1
- AA[13] = 42330; Enabling Ethernet communication
- AA[14] = 0; Disabling DHCP



SV; save drive parameters

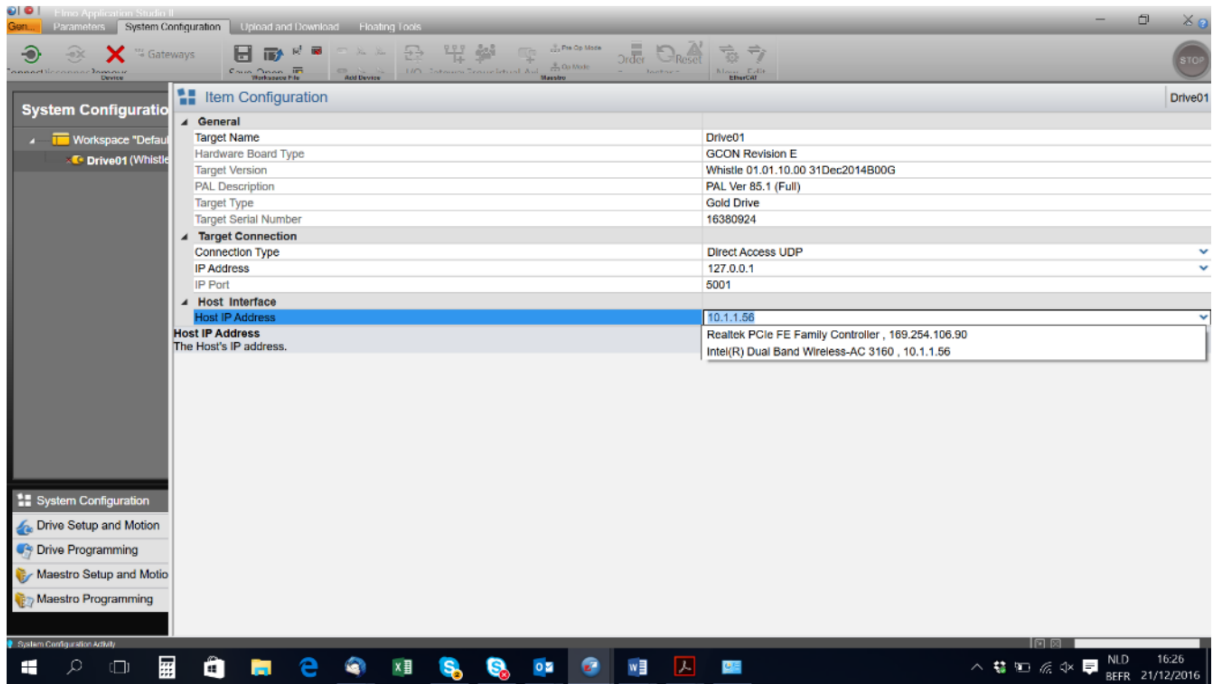
power boot (restart)

connect the drive again with USB and check

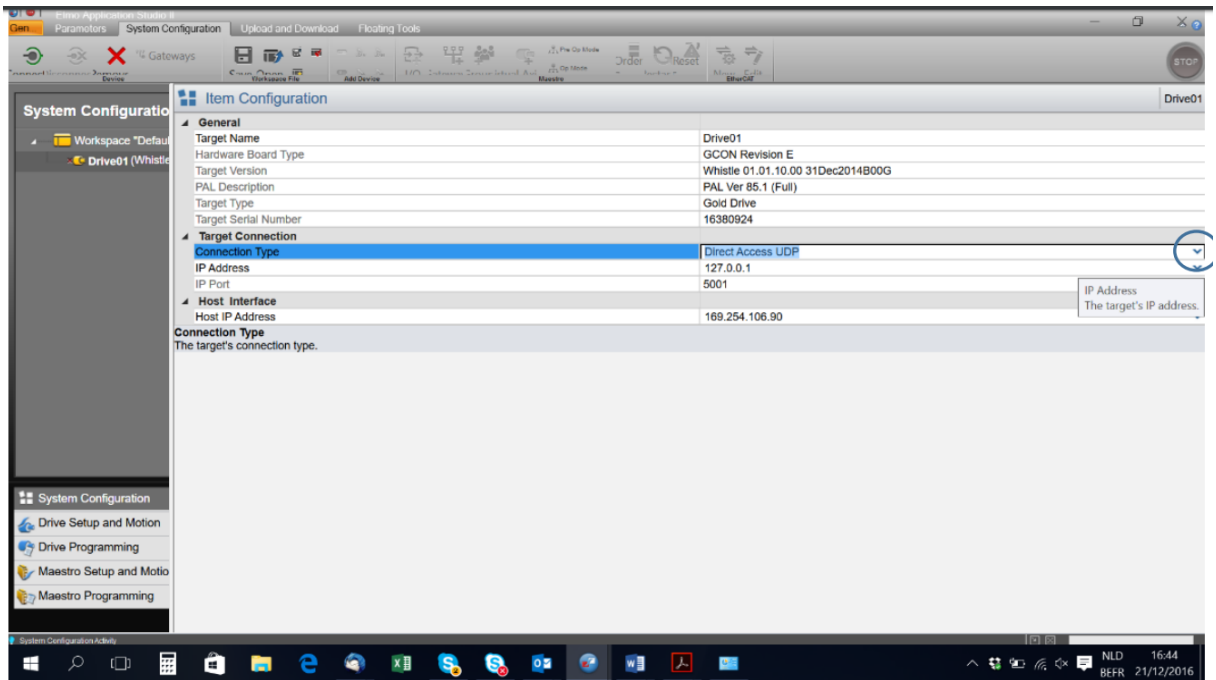
- AA[20] This should be the desired ip address

Disconnect the drive and connect the drive with your PC with a CAT 5E Ethernet cable.

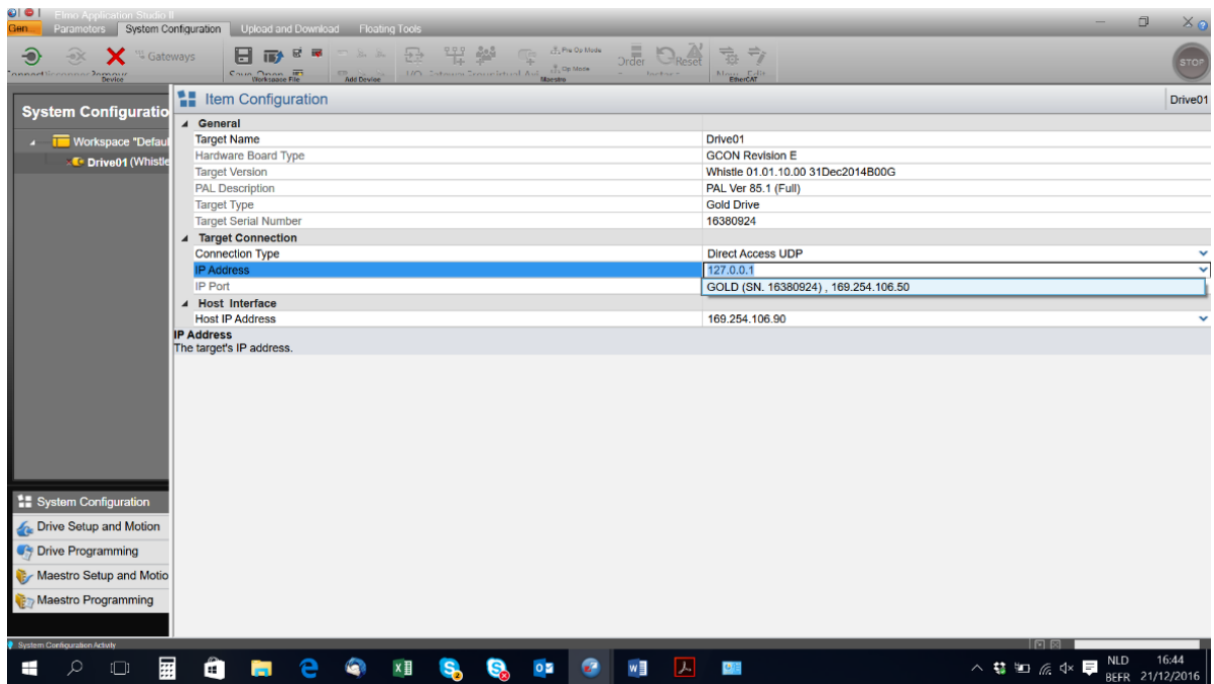
Check your IP address is in the same range as the ip address of the drive.



Let EAS2 search for the drive:



If everything is OK you will find one or more drives.



Now you can connect to the controller.

Customer Service

For any technical inquiries and orders, please contact your LAB Motion Systems sales manager or use the following contacts:

Email: support@labmotionoptions.com

Tel: +32 1640 1244

If you have questions concerning your system, please have the following information ready:

- Product name and Serial numbers of all products in the system.

If possible: Take photographs or make video