Delta Line
www.delta-line.com

Start Up Guide

DLStudio

Delta Line
Studio

RoHS compliant

CE

IMPORTANT NOTICE

Release	Date	Description	Release
1.00	21/03/2024	GVE	First release

Delta Line

Via Prè d'là, 1
CH-6814 Lamone, Switzerland
Phone: +41 (0)91 612 85 00
Fax: +41 (0)91 612 85 19
E-mail: info@delta-line.com

Sommario

1.0 Hardware set-up

For what concerns the motor and drive connections, please follow the instruction in the short manual of the corresponding drive. Each drive has a different connector for: phases of the motor, power supply for the drive, inputs/outputs, feedback sensors and communication interface. In the short manual of the drive these connectors are numbered. You will find the meaning of all the connector pins, some of them are related to the motor phases and feedback. Get the information about the motor connection in the motor datasheet. So, by reading both the short manual of the drive and datasheet of the motor you should be able to match the cables and correctly connect the motor to the drive.

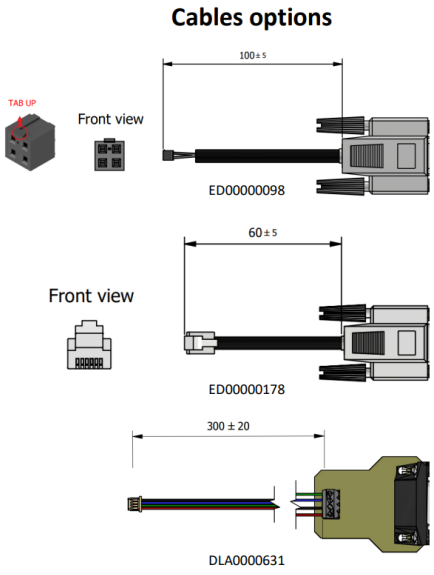
2.0 Software set-up

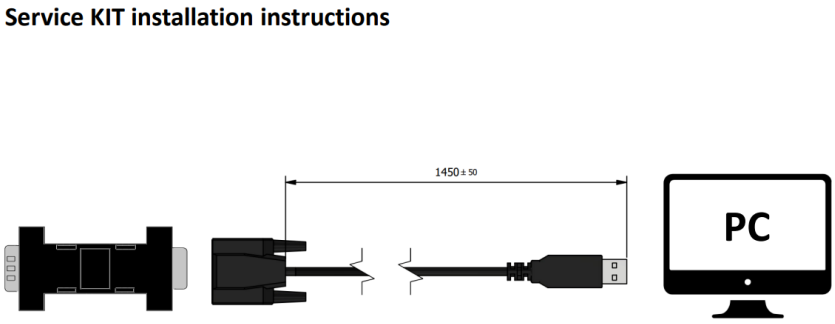
Once that the motor is correctly connected to the drive, follow in order the following instructions:

2.1 Communication Interface

2.1.1 Communication Interface Connection

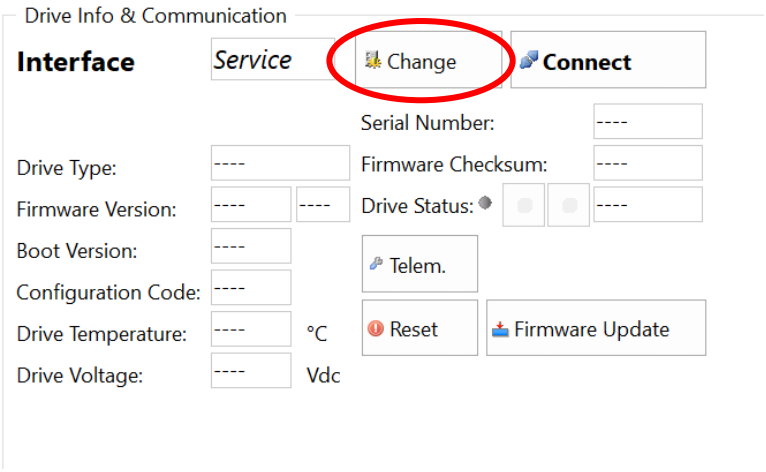
The first thing to do, is to connect the communication service. Here you can see the three possible cables for the Service Serial Interface and how to connect them (check the short manual of the drive to know in which CN to connect it).





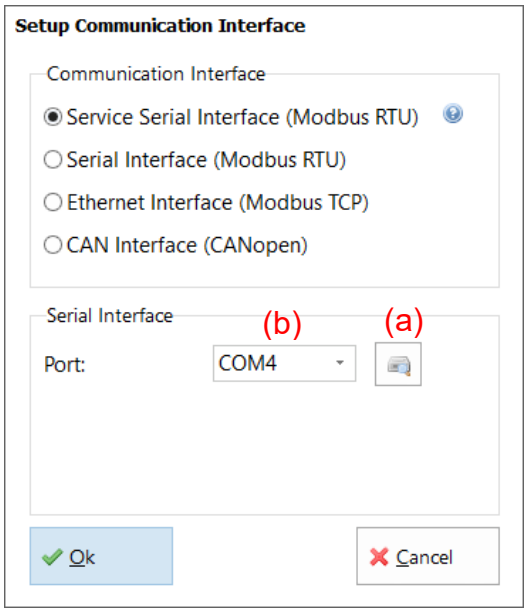
2.1.2 Communication Interface Selection

Now select the communication interface that you are using.

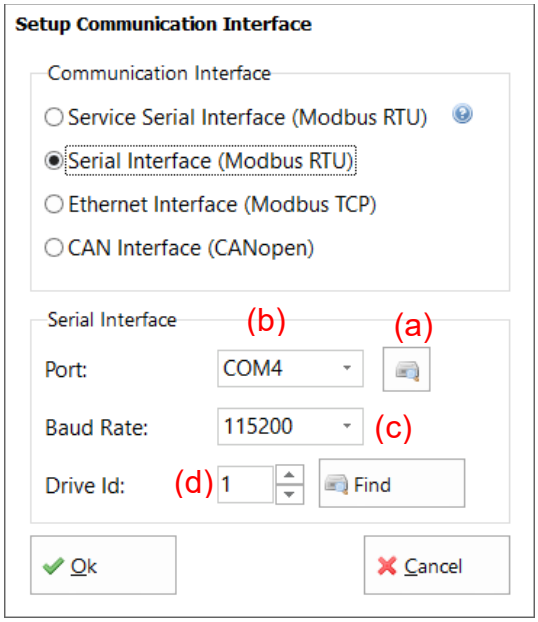


Click on ***Change***, a window will pop out. There will be four types of communication interface, select the one that you are using.

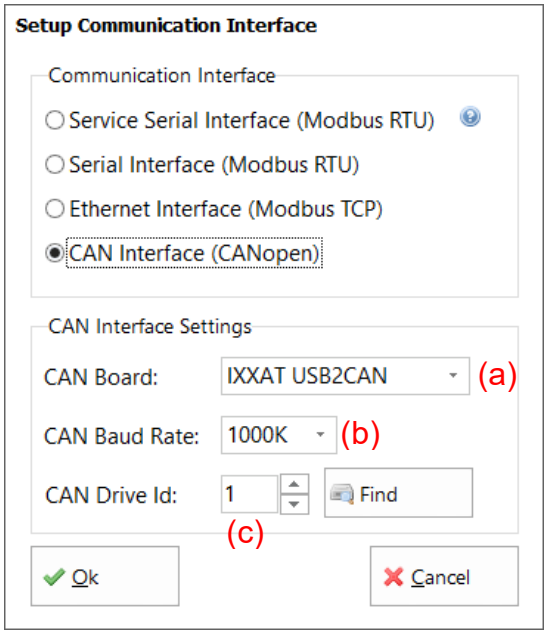
The typology of communication interface depends on the drive that is used. Depending on the communication interface that you select, you have some parameter to set. In the following images you can see the four possibilities with the corresponding parameters to be set in each case. Once that you correctly set everything, click ***ok***. In the following pictures there are the default values for the four cases.



In case you have a drive that has the connection for a Service Serial (one out of the three cables shown previously), then select the first communication interface in this window.
Now check the ports number that are available (a).
Select one of the available ports here (b).
Click ***ok***.



In case you have a drive based on Modbus RTU or an integrated motor that does not have the connection for the Serial Interface, then you need a converter RS485. Select the second communication interface in this window.
Now check the port number that are available (a).
Select one of the available ports here (b).
Set the Baud Rate (c).
Select the Drive Id (d).
Click ***ok***.

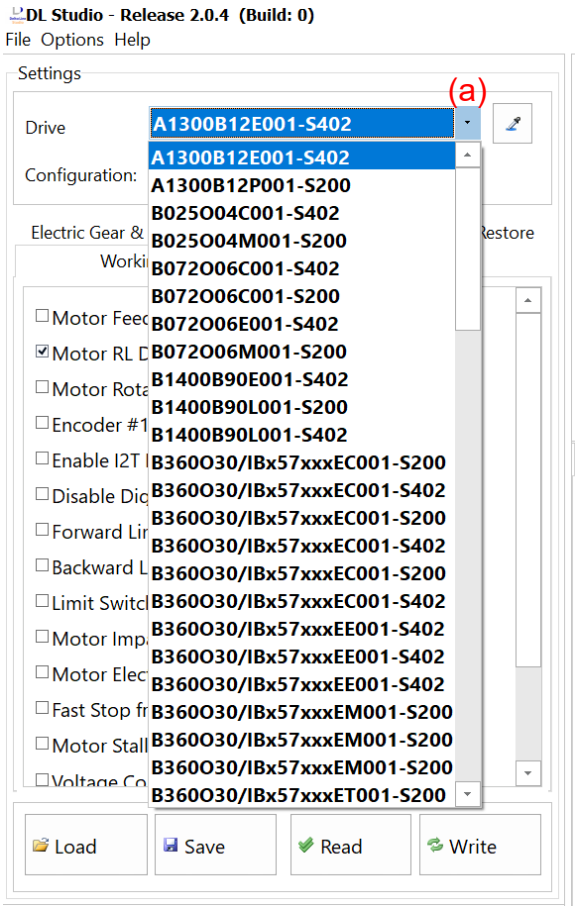


In case you have a drive based on CAN or an integrated motor that does not have the connection for the Serial Interface, then you need a CAN converter, it can be for example: GCAN (property of Delta-Line), IXXAT, PEAK.
Select the fourth communication interface in this window.
Set the CAN board (a).

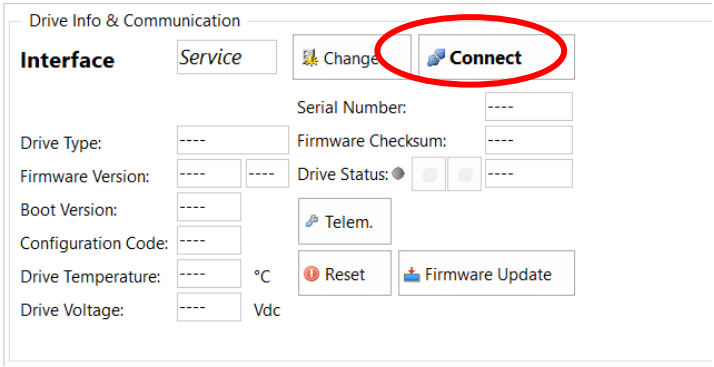
Set the Baud Rate (b).
Select the Drive Id (c).
Click ***ok***.

2.2 Driver Selection

In the main window, on the upper-left side, you can see a setting section called ***Drive***.



Click on the arrow (a) and a list of code will pop-out. Read the code written on your drive and select this code between the ones that you see in this list.

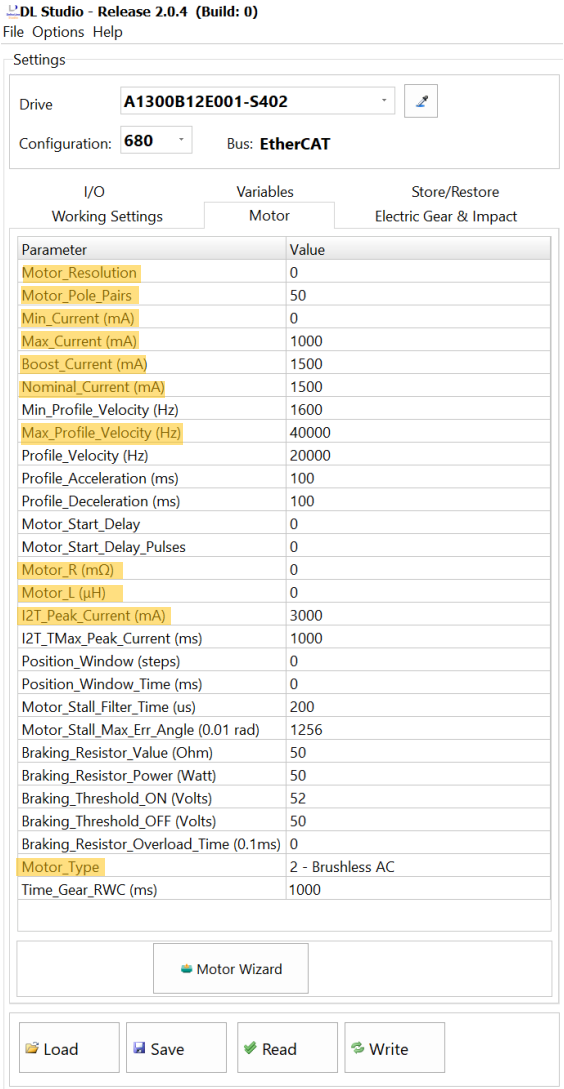


Now you can do a check if the communication is correctly set. From the main page, click ***Connect***. If you manage to go online, it means that the communication is correctly set.

Do not care about eventual alarm or error warning since you haven't parametrized the motor yet.
If it doesn't work, check if you set correctly all the previous parameters.

2.3 Motor Configuration

Once that you are sure that the communication is working, you can go on with the motor parametrization.

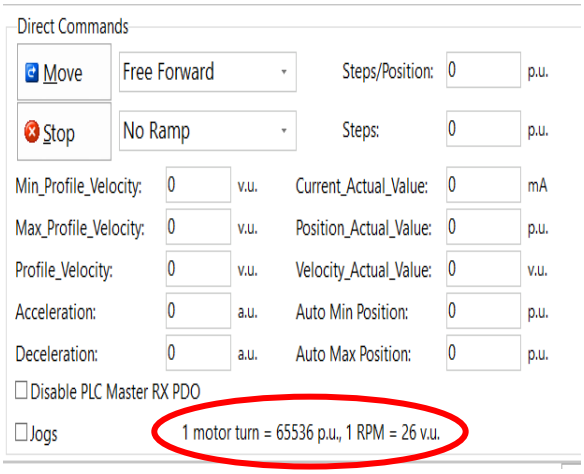


In the main Window, on the left, there are the various sections in which all the working settings must be defined.

Motor section: The underlined parameters are the ones that must be changed. Number of poles, nominal (=max) and peak (=boost) current, max(=nominal) speed, resistance and inductance can be found in the datasheet of the motor. Set the ***Min_Current*** to 500mA. Set ***I2T_Peak_Current()*** to the same value of the peak current, **do not exceed the max current of the drive!**

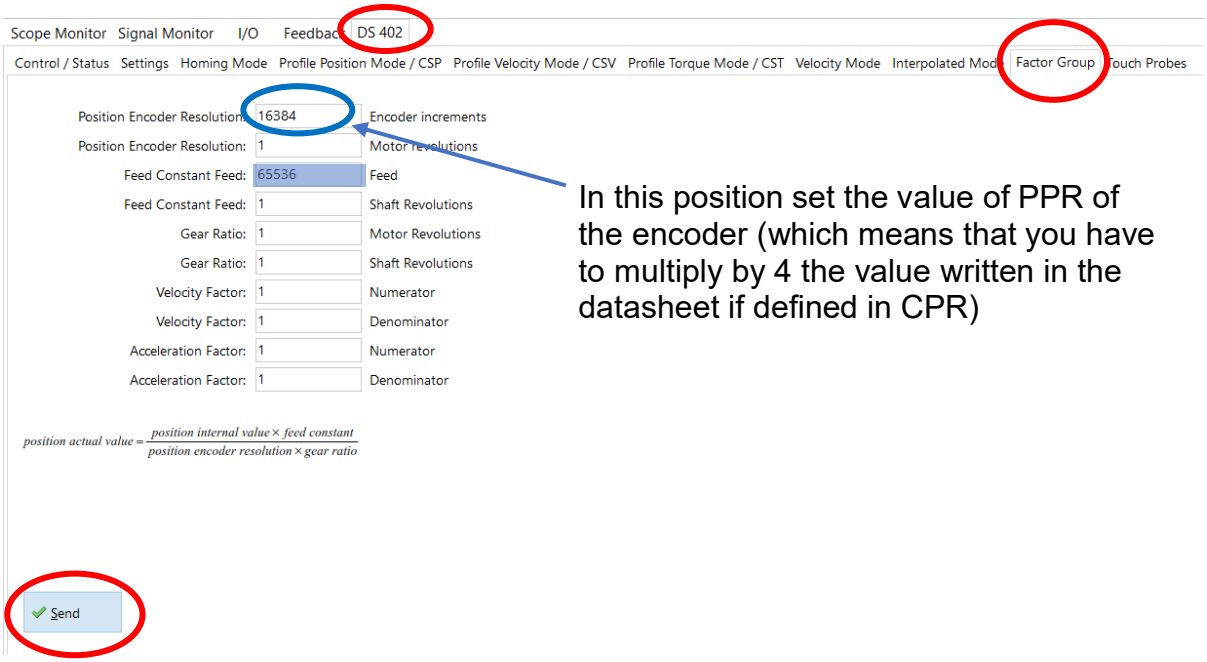
If using a brushless motor, select the maximum resolution reachable, which is 65536.
If using a **stepper motor**, set the resolution that you want to use. For example: if you want

to work in full step, then select 1/1, if you want to work in half step, then select ½ and so on.



The speed unit is v.u, which is defined on the upper-right side of the main window. So, the speed to set will be the one in RPM multiplied by the number of v.u per 1RPM.

The definition of v.u. depends on the value that is set here (You can find this section starting from the main window, go to ***DS 402*** and then go to the subsection ***Factor Group***).



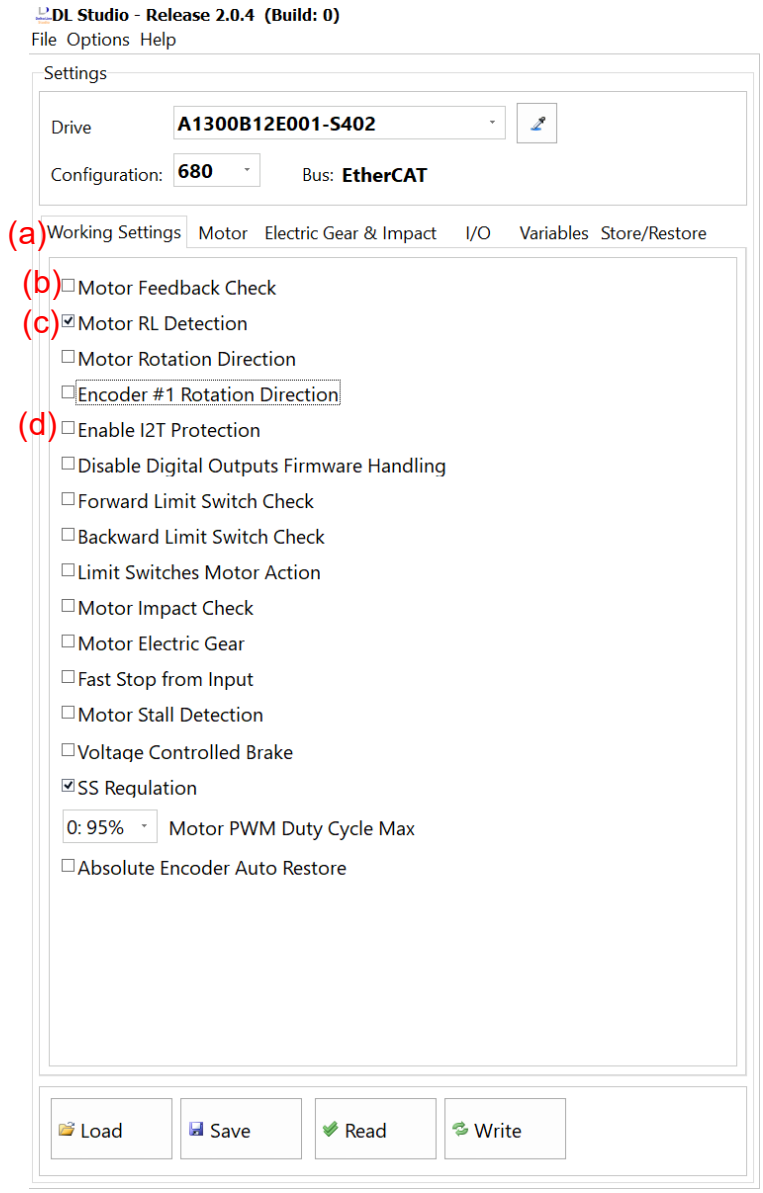
In this position set the value of PPR of the encoder (which means that you have to multiply by 4 the value written in the datasheet if defined in CPR)

Once that these two values are set Press on the button ***Send.***

2.4 Feedback Settings

2.4.1 Working Setting

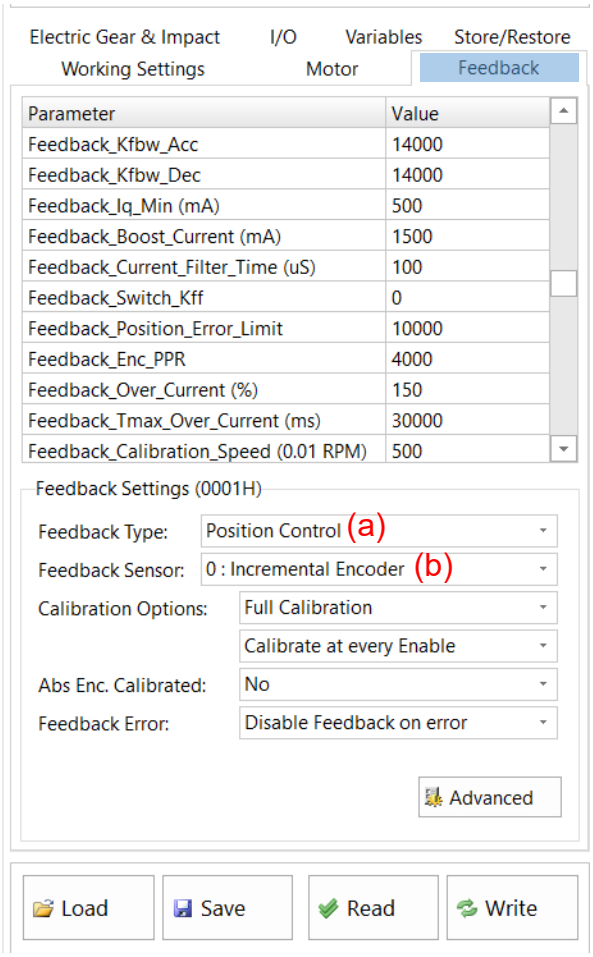
From the main window, select the *Working Settings* (a) :



If you want to work in closed loop, select the option ***Motor Feedback Check*** (b).
If you want to read the inductance and resistance of the motor, select the ***Motor RL Detection*** (c).
Set the flag ***Enable I2T Protection*** (d) to have a protection from high currents.

If you are working in closed loop, so if you selected the ***Feedback Check*** at the previous point, you need to set the feedback parameters.

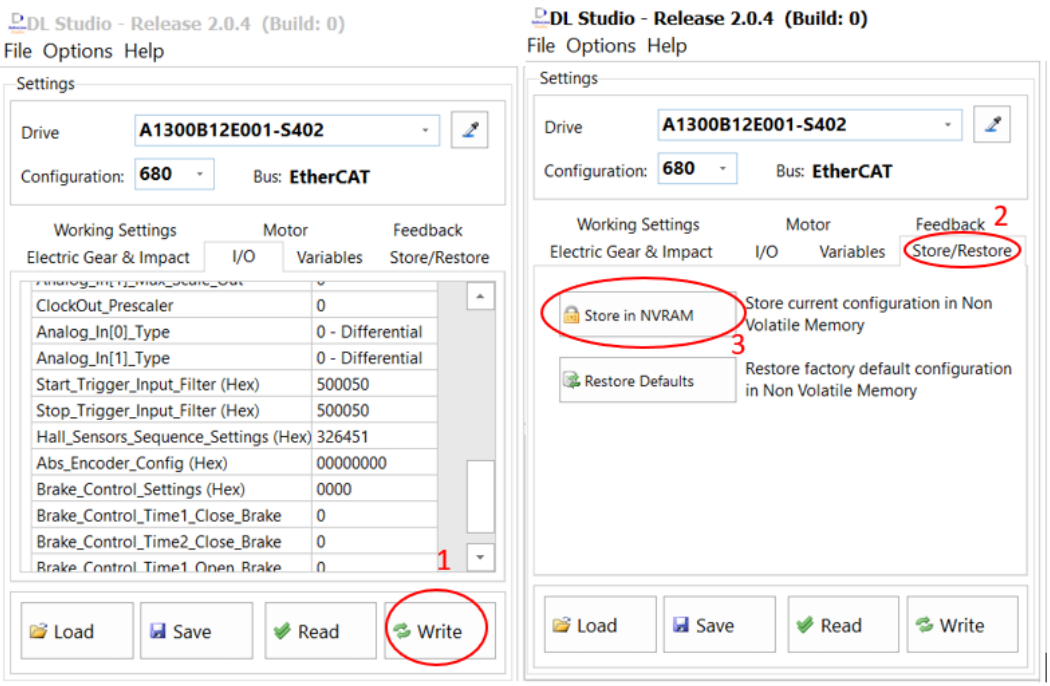
2.4.2 Feedback section



In the *Feedback* section, scroll the parameter until you find ***Feedback_Boost_Current()*** and set the value of the peak current that is written in the datasheet of your motor (written in mA). **Again, do not exceed the max current of the drive!**
Increase the default values of the two variables ***Feedback_Position_Error_Limit*** (ex: set it to 10000000) and ***Feedback_Velocity_ErrorLimit*** (0.01RPM) (ex: set it to 10000000).
If you are using an incremental encoder, in the same section, find the parameter ***Feedback_Enc_PPR*** and set the resolution of your encoder in PPR (set the value you find in the motor datasheet multiplied by 4)
In (a) select the type of control and in (b) select the type of sensor that you are using.

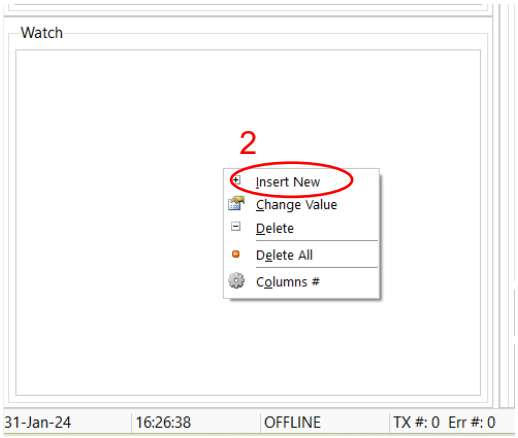
Now that everything is set, you can close the loop again. Save the configuration, so that the parameters are saved in the non-volatile memory: in the upper-left side of the main window click on Write and then Store:

1- Write
2- Go in Store/Restore section
3- Store in NRAM

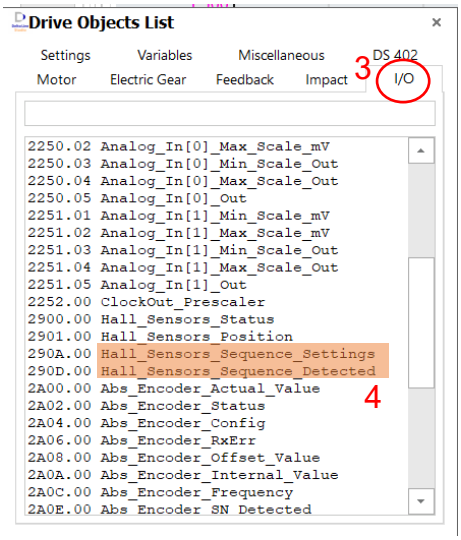


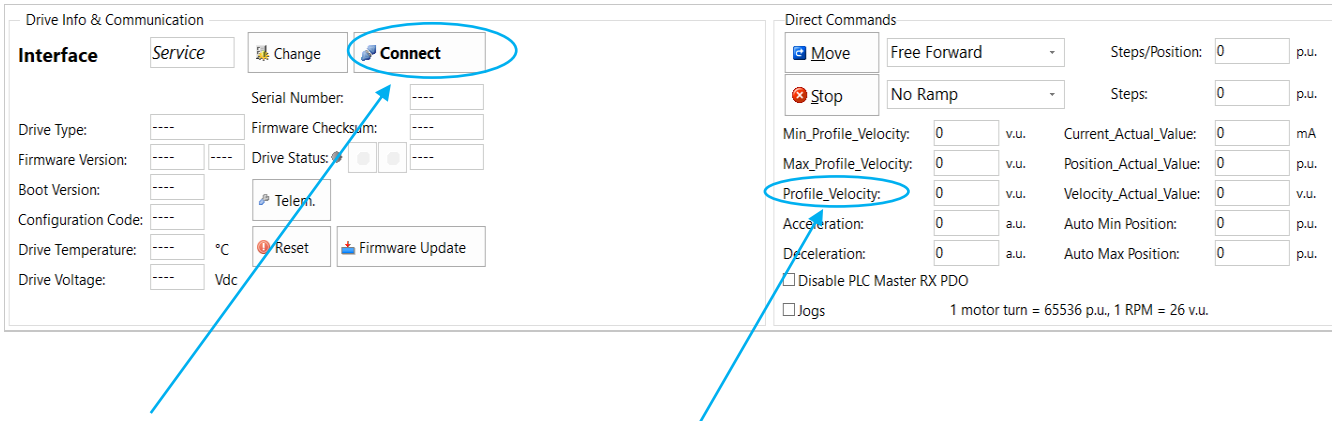
2.4.3 Hall Sensor settings

If you are working with Hall sensors, follow these instructions:
1- Deselect the Motor Feedback Check that you selected in the previous point
2-Right click on the watch window, select insert new.

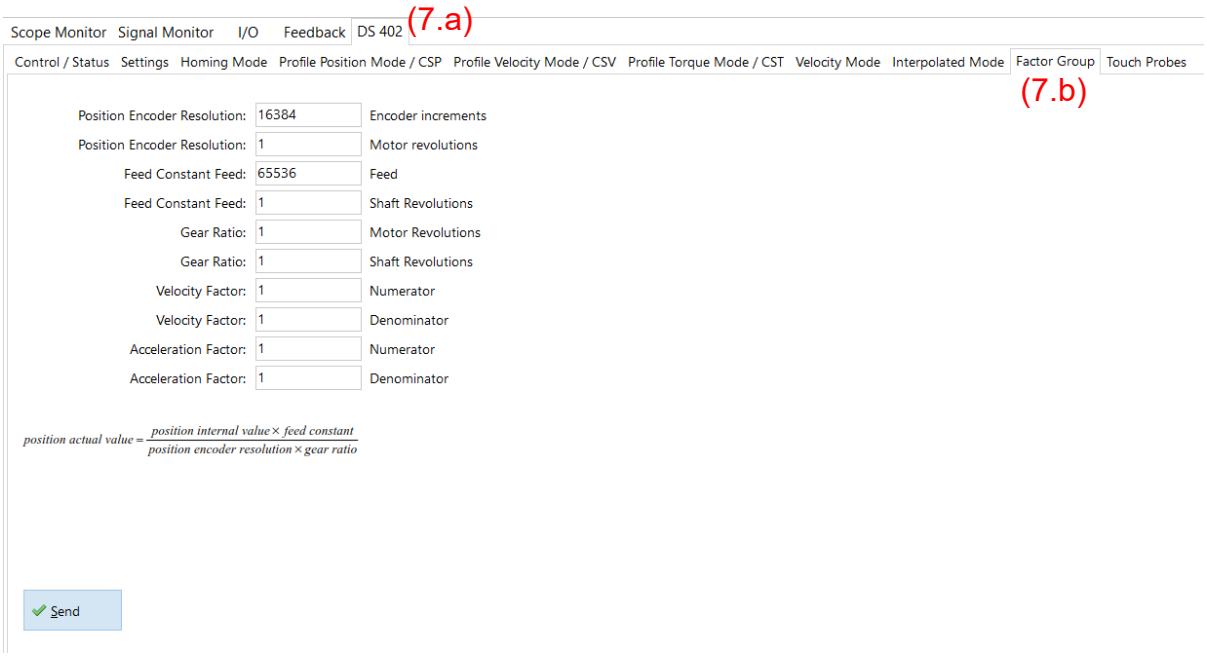


3- go in the I/O section
4- select (double click) both ***Hall_Sensors_Detected*** and ***Hall_Sensors_Setting.***

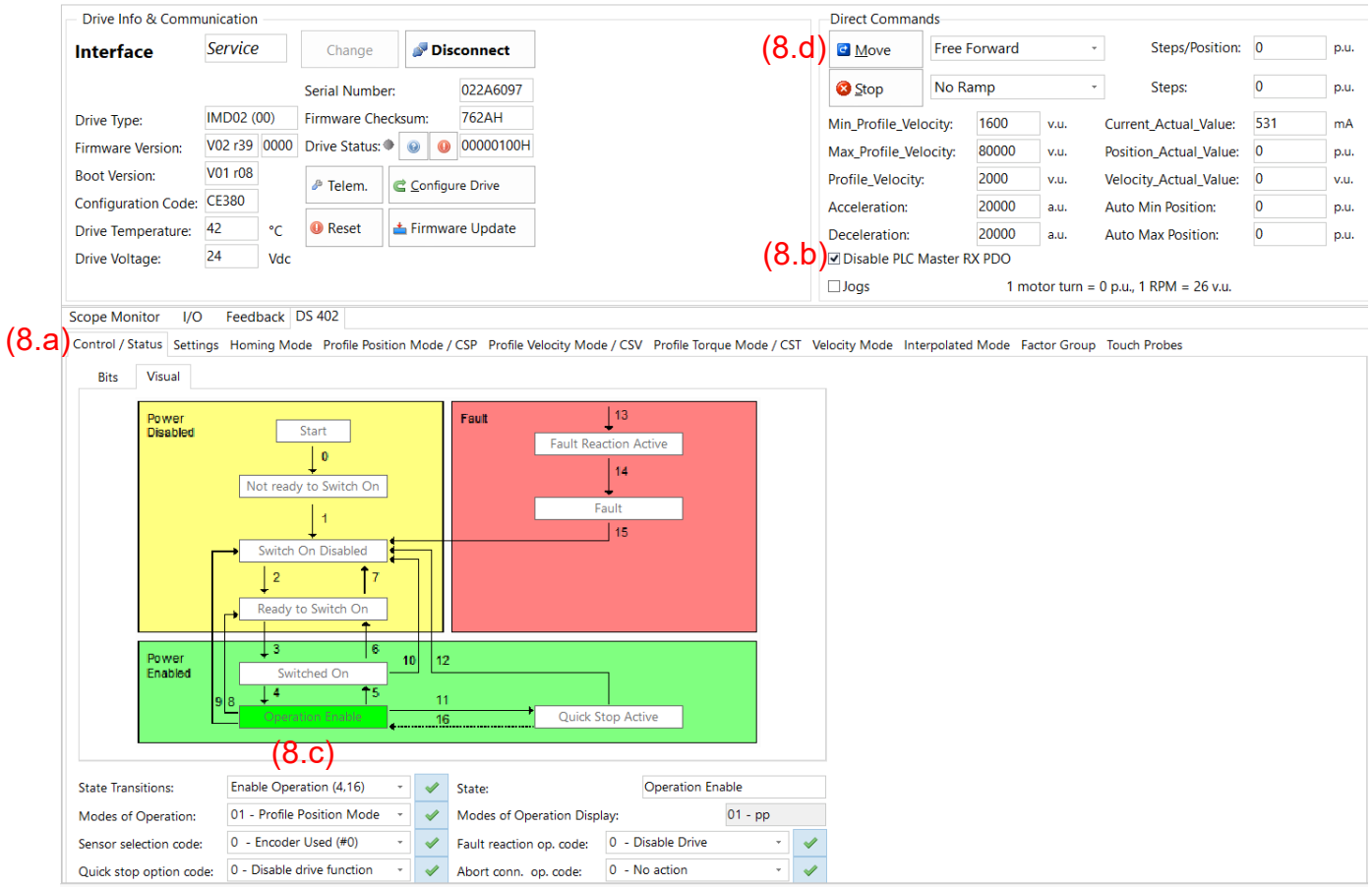




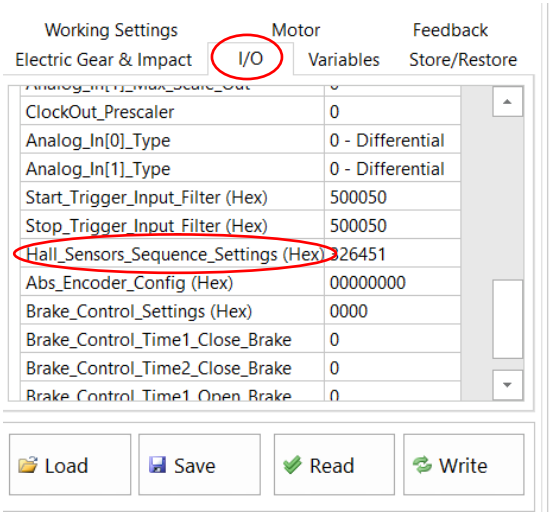
5- Click on ***Connect*** (if not connected already)
6- Select the speed at which you want to move (start with low speeds, like 100 RPM)
7- If you are using a non-programmable solution (**DS402**), some additional steps have to be done in order to be able to move the motor. From the main window, go in the section *DS402* (7.a) and then in the subsection ***Factor Group*** (7.b) and be sure that these parameters are correctly set (see *Motor Configuration*):



8- Now go in the subsection ***Control/Status*** (8.a), disactivate the PLC Master (8.b), click on ***Operation Enable*** (8.c) and move the motor (8.d), see next picture:

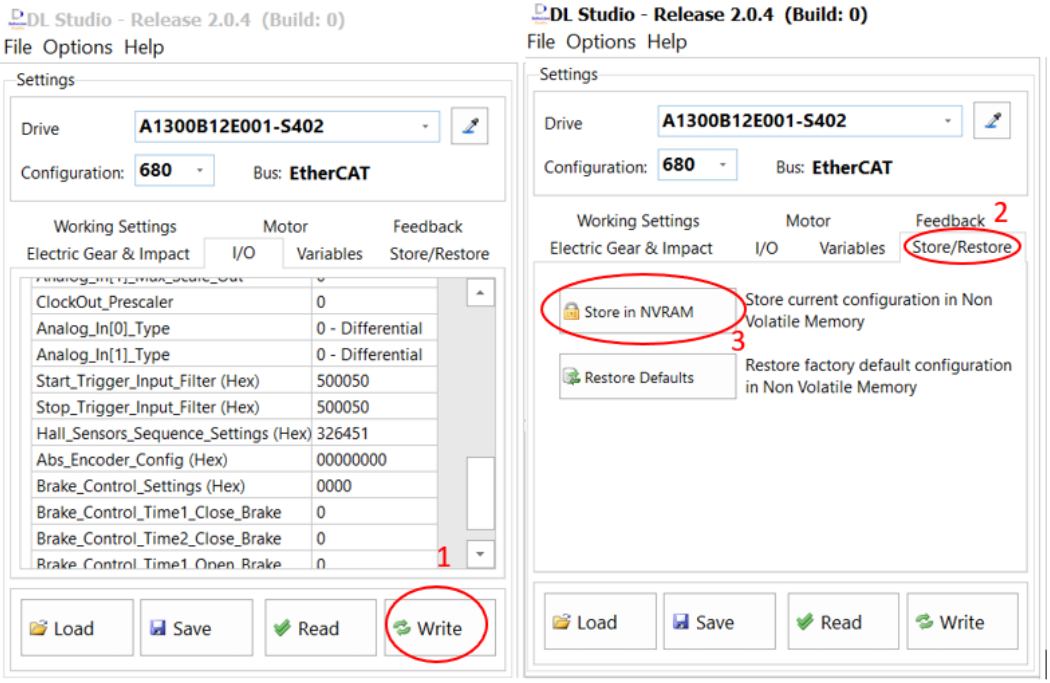


9- Read what is written in the variable ***Hall_Sensors_Detected*** in the watch window, if it does not correspond to what is written in the variable ***Hall_Sensors_Setting*** then: copy the value in ***Hall_Sensors_Detected*** and paste it in the variable ***Hall_Sensors_Setting*** that you find in the section I/O in the upper-left side of the main window.



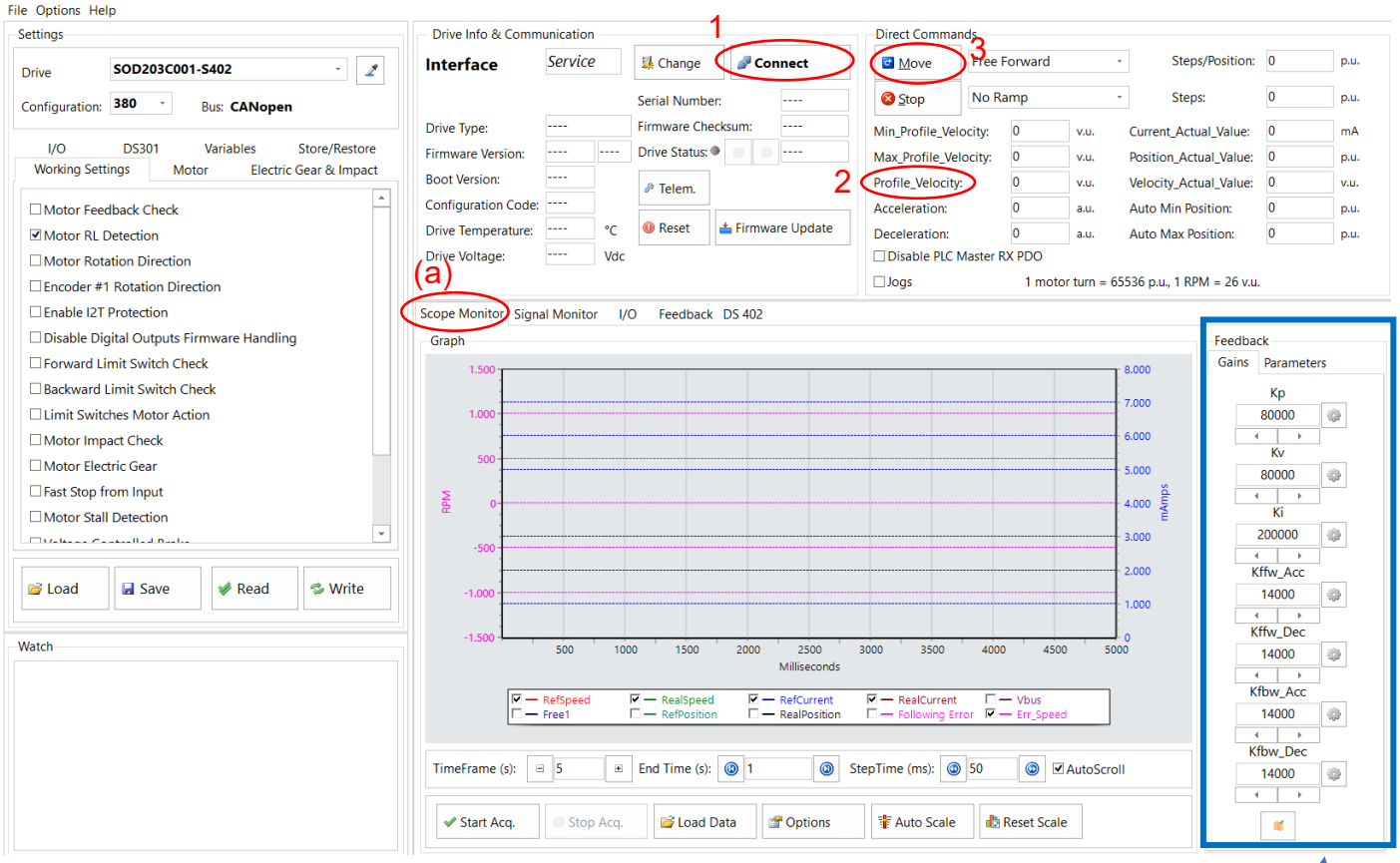
Now that everything is set, you can close the loop again. Save the configuration, so that the parameters are saved in the non-volatile memory: in the upper-left side of the main window click on Write and then Store:

4- Write
5- Go in Store/Restore section
6- Store in NRAM



2.5 Motor Motion

If everything is set correctly, you can move your motor from the main window.



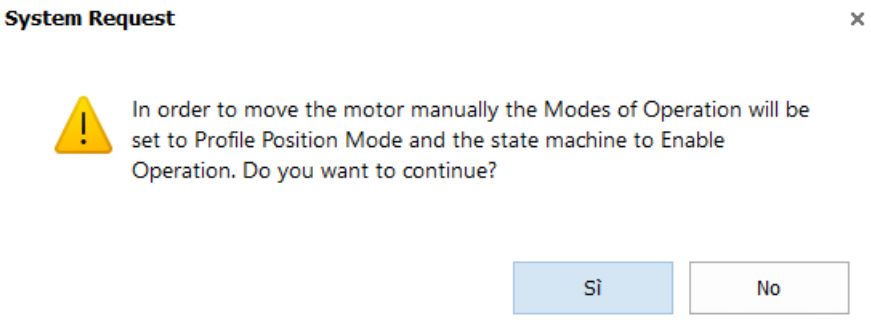
Click on ***Connect*** (1) to go online. Choose the speed at which you want your motor (2) to run and then move (3).

If you are working in close loop, you can tune the gains of the control (Kp, Kv and Ki) on the right. If you are working with a stepper motor it is better to put lower values of the gains with respect to the default ones. For example, try with Kp=1000, Kv=Ki=25000.

If you are working in velocity control it is suggested to set Kp=1000.

The performances can be checked in the graph in the section Scope Monitor (a).

If you are working with a non-programmable solution, once that you click on ***Move*** this window will pop-out. Click on ***Yes*** in order to be able to move the motor.



Delta Line

Delta Line SA
Via Prè d'là, 1
CH-6814 Lamone
Switzerland

+41 (0)91 612 85 00
info@delta-line.com
www.delta-line.com

Headquarters

Delta Line North America, Inc DTC
Tech
4600 South Syracuse, 9th Floor
Denver, CO 80237, USA

+1 303 256 6212

infous@delta-line.com

North America

Changzhou Delta Line Trade
Company Limited, 414
Building 1,
FuChen HuaYuan
New North District Changzhou,
Jiangsu, China

Asia