Problem:

For running a brushless motor with sinusoidal current commutation it is necessary to know with accuracy the electrical position of a motor. For systems having an incremental position sensor the start of the motor is usually done with an initial pole lock.
Some applications do not allow moving the motor in an uncontrolled way as the initial pole lock does. For such applications for PMSM with encoder and halls, the motor can be started in brushless DC mode (trapezoidal current commutation) until the first hall transition is detected, then switched automatically to the sinusoidal current commutation mode (PMSM).

Solution:

- **Drive** : Technosoft Intelligent Servo Drive **IDM680 – 8EI**
- **S/W environment** : Technosoft **EasyMotion Studio**

Description:

This application note explains you:

- how to configure in your application the 'Start mode' with halls in order to follow the imposed reference from the beginning
- how to run your application.

Project set-up:

1. Install **EasyMotion Studio** on your PC. Find the setup kit on our web site.

2. Perform all the hardware connections as it is explained in **P091.048.IDM.APN-DOC.201.x.pdf** document (***Getting started using IDM680-8EI with a brushless motor***).

3. Start EasyMotion Studio, then create a new project using the template "**IDM680 - 8EI → BRUSHLESS MOTOR → Incremental Encoder**" (see the section *"1. Create a new project "* of **P091.048.IDM.APN-DOC.201.x.pdf** document))

4. Select in the Project window left side, in your application "**S** Setup", and click the **Edit/View** button.

5. In the Brushless Motor Setup window perform all the tests as it is described in the section "*3.8 Brushless Motor Setup*" of **P091.048.IDM.APN-DOC.201.x.pdf** document.

6. Click on the **Drive Setup** button then perform all the settings in accordance to description in paragraph "*Define the control scheme, tune and test controllers*" of **P091.048.IDM.APN-DOC.201.x.pdf** document. Besides, for the 'Start mode' select the option 'Direct using Hall sensors' as you can see in the figure below:

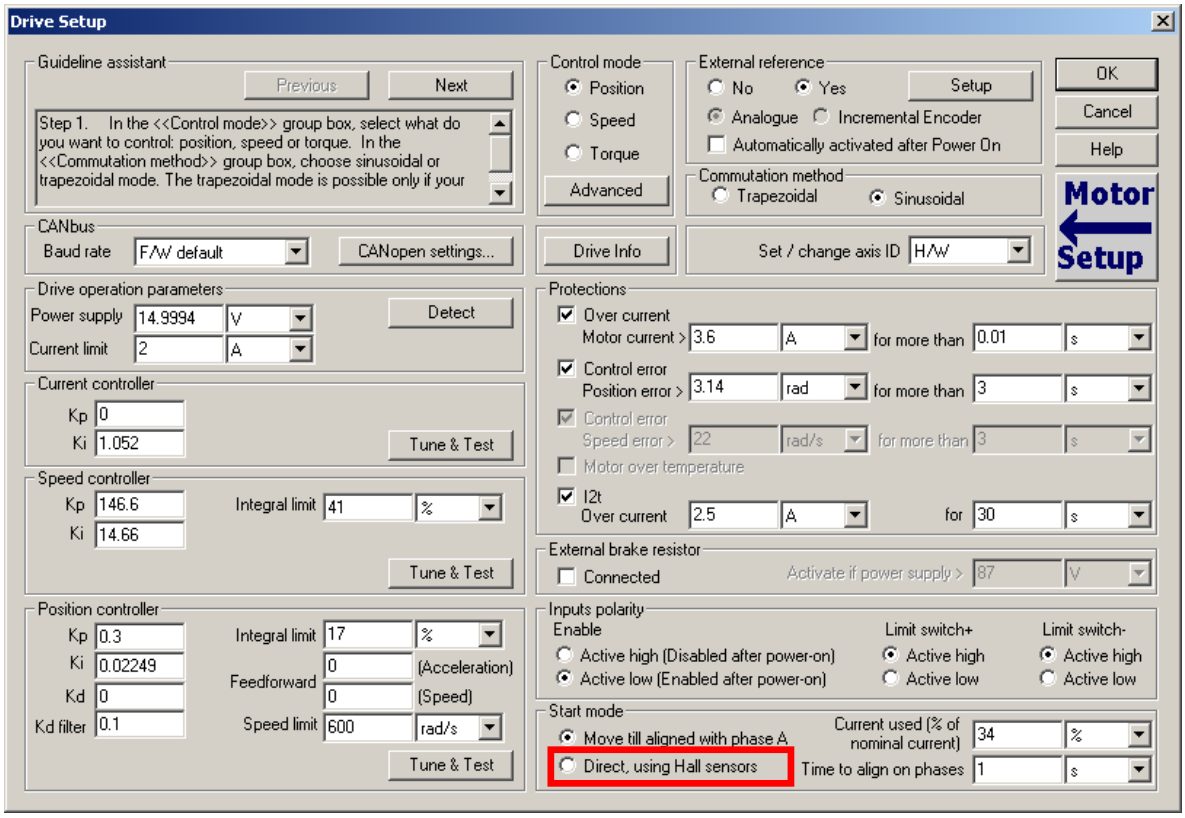

Figure 1. *How to set the 'Start mode' with halls*

7. Click on the **OK** button and then select in the Project window left side, in your application "**M** Motion" and insert your specific motion sequences commands.

Application running:

In order to run your application, follow the next steps:

1. Power up the IDMx40 drive
2. Download the setup, using the menu command '**Application | Setup | Download to Drive/Motor**' or by pressing the correspondent button from EasyMotion Studio toolbar
3. Download and execute the programmed motion sequences, by pressing the button from EasyMotion Studio toolbar

For more details about other configuration for your application, using of data analysis tools and saving your project/application refer to **P091.048.IDM.APN-DOC.201.x.pdf** document (***Getting started using IDM680-8EI with a brushless motor***).