

NCV70628EVK

1. Micro-Stepping motor driver evaluation software with USB-LIN Interface

The NCV70628 is a single-chip micro-stepping motor driver with position controller and control/diagnostic interface. It is ready to build dedicated mechatronics solutions connected remotely with a LIN master.

Following section describes how to run NCV70628 application commands.

After installing the setup please run the application as per Figure1 - - Start The NCV70628EVK

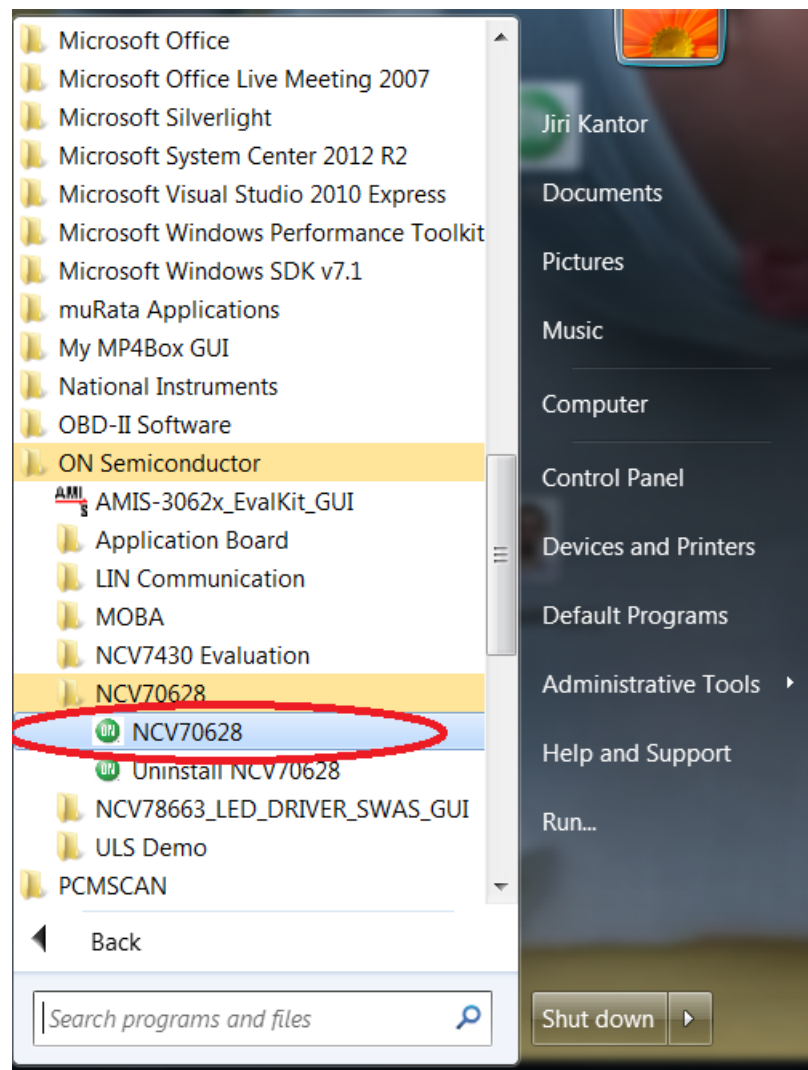


Figure 1 - Start The NCV70628EVK

You will get the window as per figure 2 - - Select The USB To Lin Comm Board

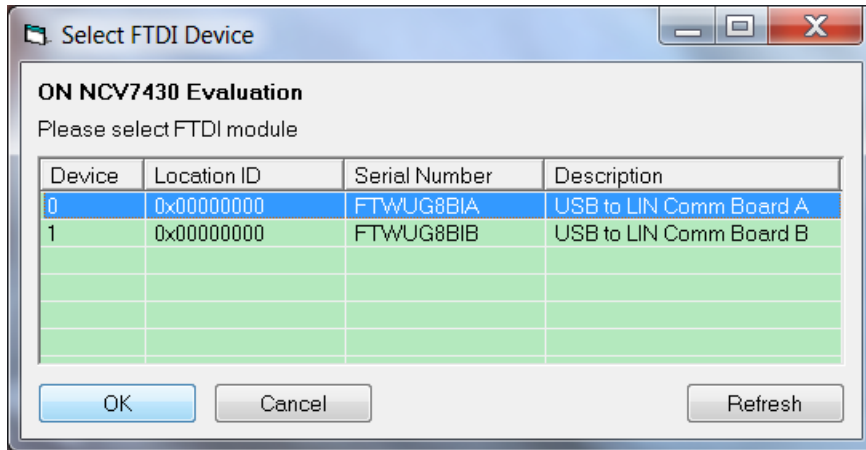


Figure 2 - Select The USB To Lin Comm Board

Then the main window of the application emerges – NCV70628 Main Window

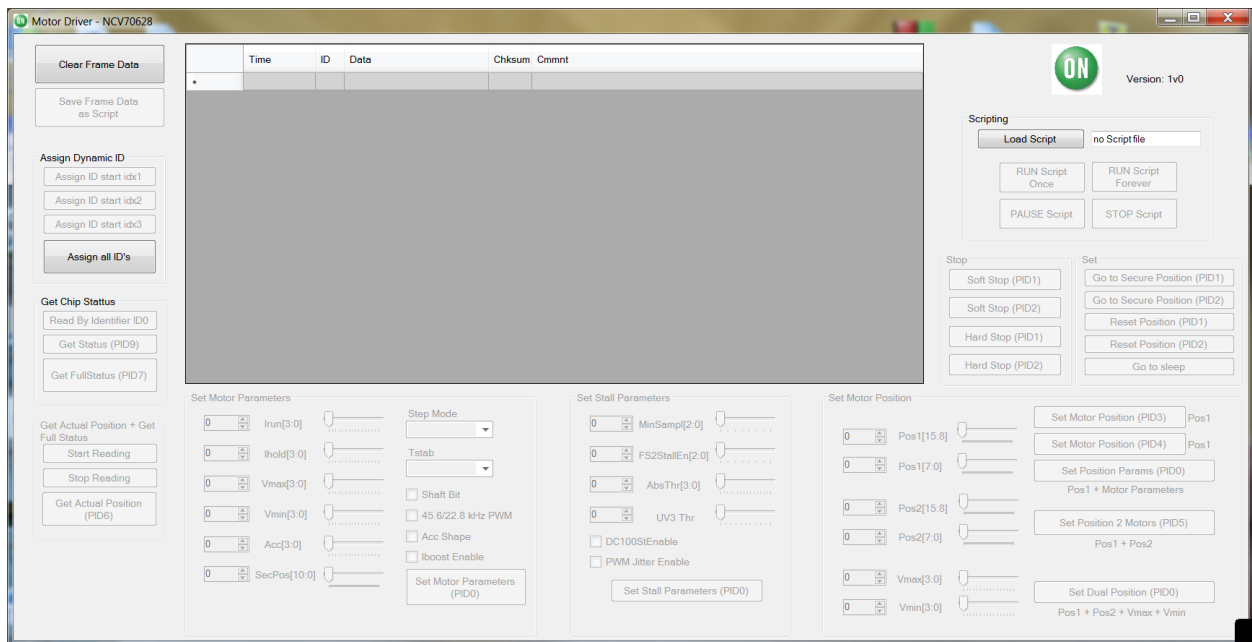


Figure 3 NCV70628 Main Window

Since the NCV70628 uses LIN2.2 compatible link layer, almost all application commands need to be assigned prior to using. Exception are 2 LIN frames, which still uses diagnostics and configuration frame ID's (0x3C) – Dynamic IDs writing frame and Read by identifier 0.

The first command that master should send to the NCV70628 is write Dynamic IDs frame, followed by the GetFullstatus (PID7) frame. The GUI is designed that way that after the start-up, the only command

allowed to be executed by the GUI is Assigned all ID's. After that, GUI suggests that you should click the GetFullStatus(PID7) – see the Figure 4 - - NCV70628 Main Window (ID Assigned)

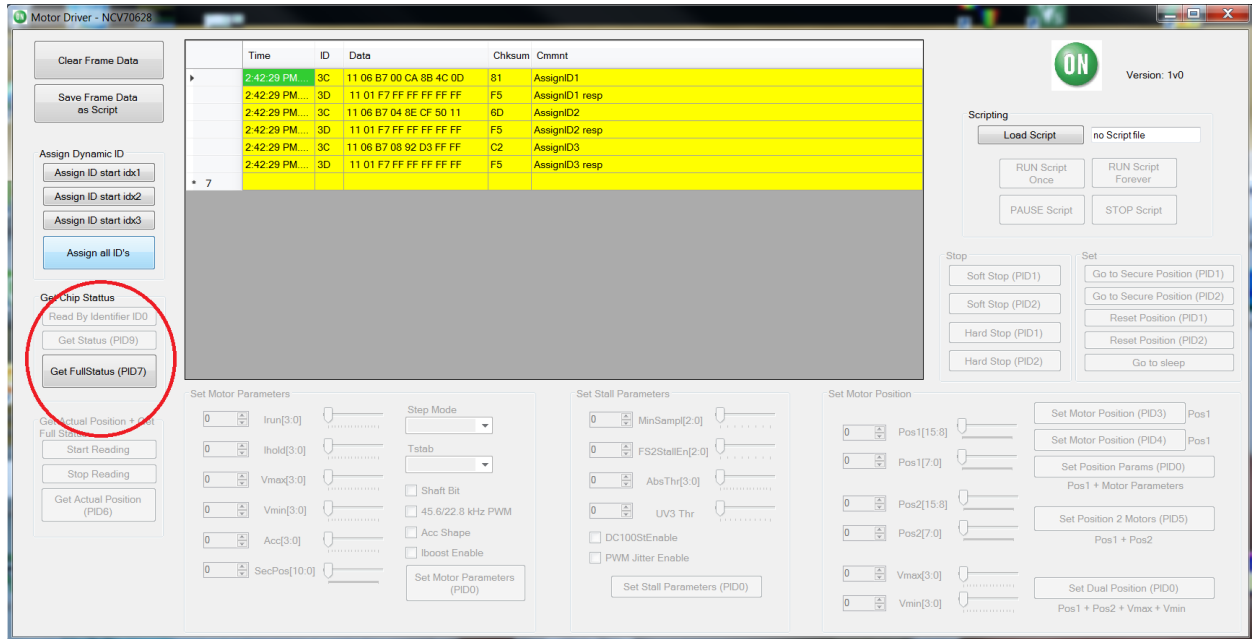


Figure 4 - NCV70628 Main Window (ID Assigned)

After that, all commands are already available for you – see Figure 5 - NCV70628 Main Window (ID Assigned + GFS executed)

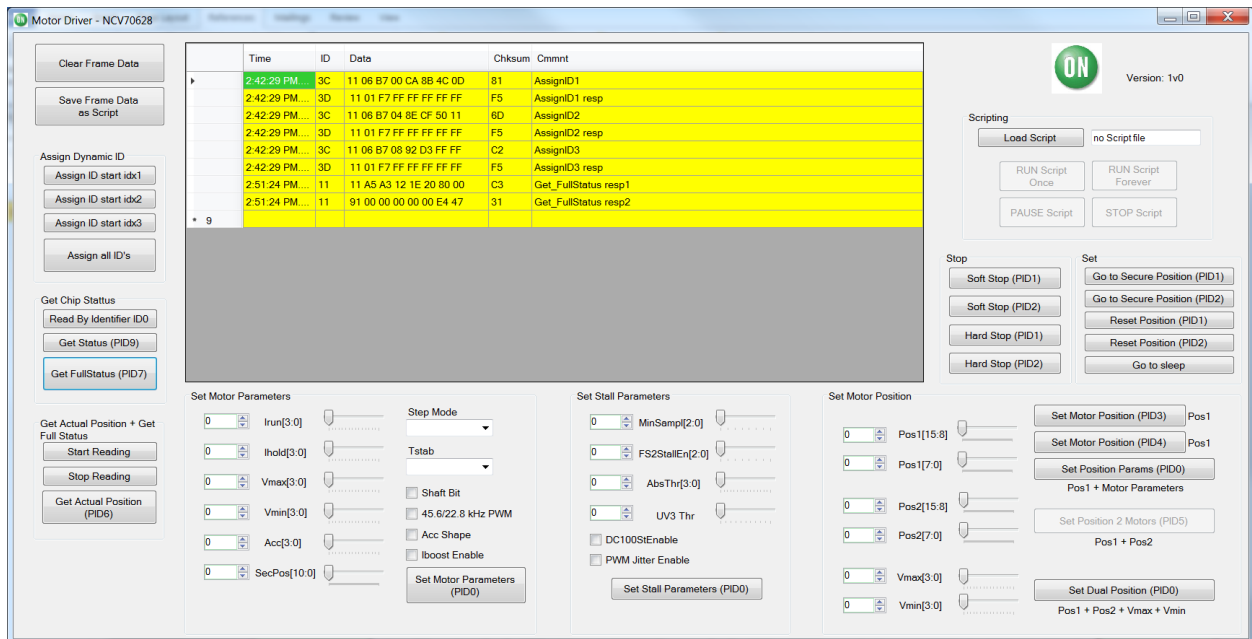


Figure 5 NCV70628 Main Window (ID Assigned + GFS executed)

Please note that if you do not issue Assign ID and execute GetFullStatus(PID7) till 4.46 s after the POR of the chip than you will get the following LIN response Figure 6 - NCV70628 Main Window (ID Assigned, Assign ID1 No Response)

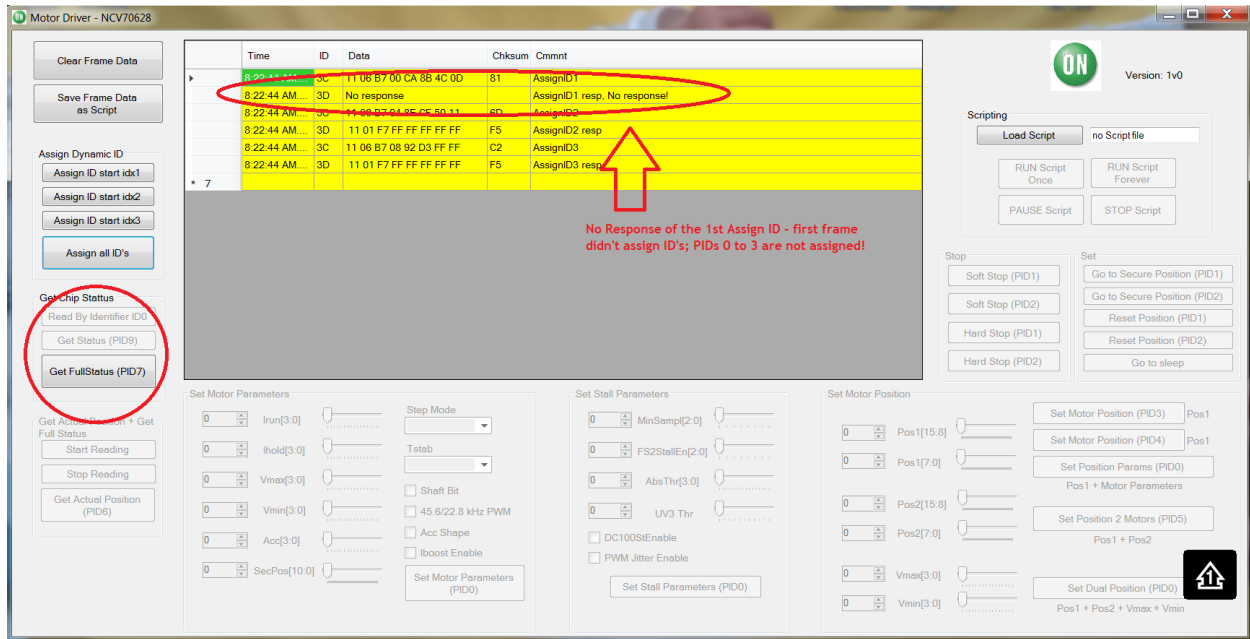


Figure 6 - NCV70628 Main Window (ID Assigned, Assign ID1 No Response)

This is valid case and according to specification of the NCV70628 (the first Assign ID command is recognized as an wake-up from the sleep). What you need to do is to click Assign ID start idx1 to assign PID0 to PID3 – Figure 7 - NCV70628 Main Window (ID Assigned, Assign ID1 No Response, Assign ID idx1)

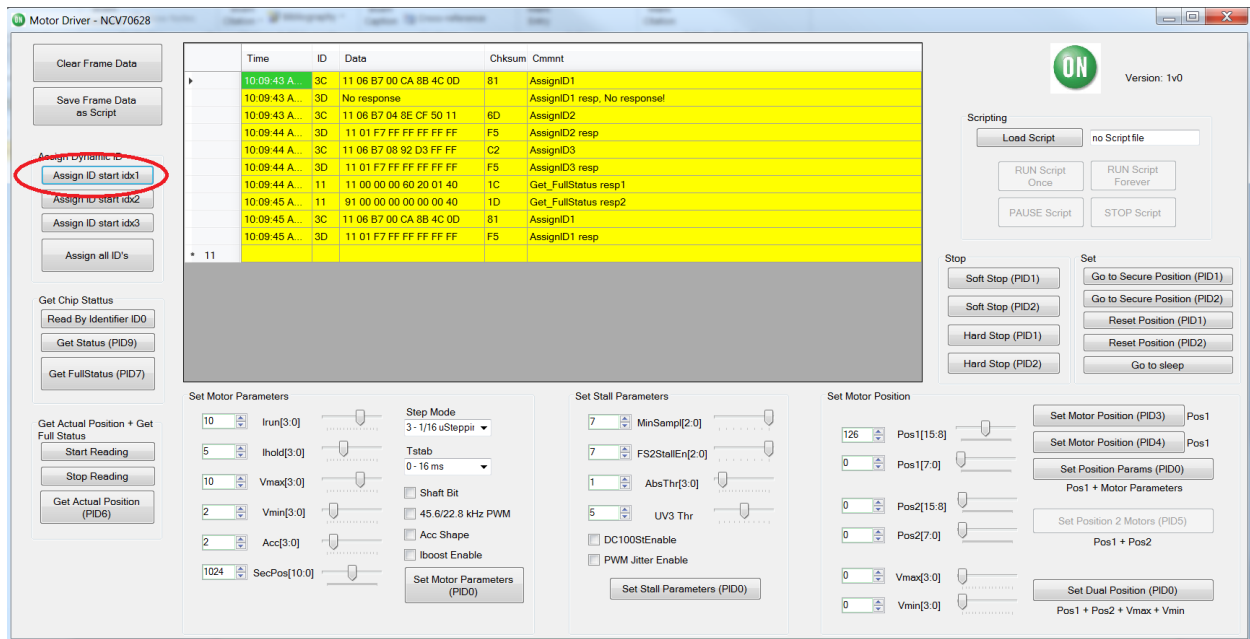


Figure 7 - NCV70628 Main Window (ID Assigned, Assign ID1 No Response, Assign ID idx1)

After that the all PIDs are properly assigned and you can use the all available commands. To run the motor, you need to select proper values in Set Motor Parameters Group Box and click Set Motor Parameters(PID0). Then select proper values in Set Stall Parameters Group Box and click Set Stall Parameters(PID0) - Figure 8 - NCV70628 Main Window - Set Motor and Stall Parameters

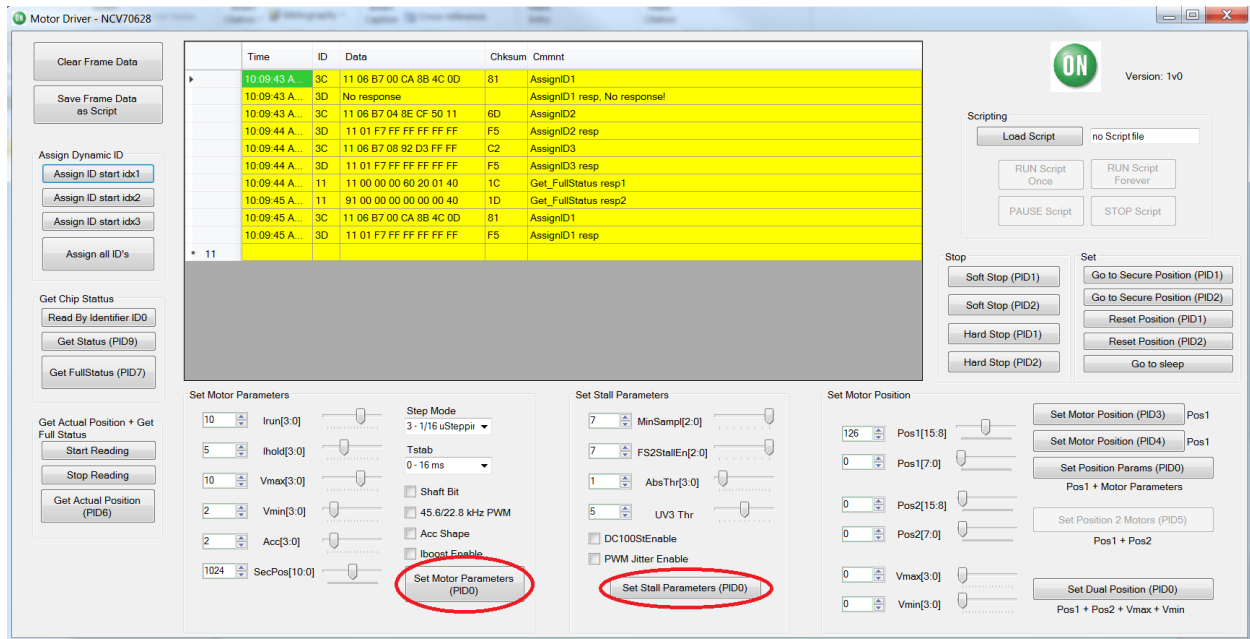


Figure 8 - NCV70628 Main Window - Set Motor and Stall Parameters

After that you need to select proper values in Set Motor Position Group Box and click Set Motor Position(PID3 or PID4).

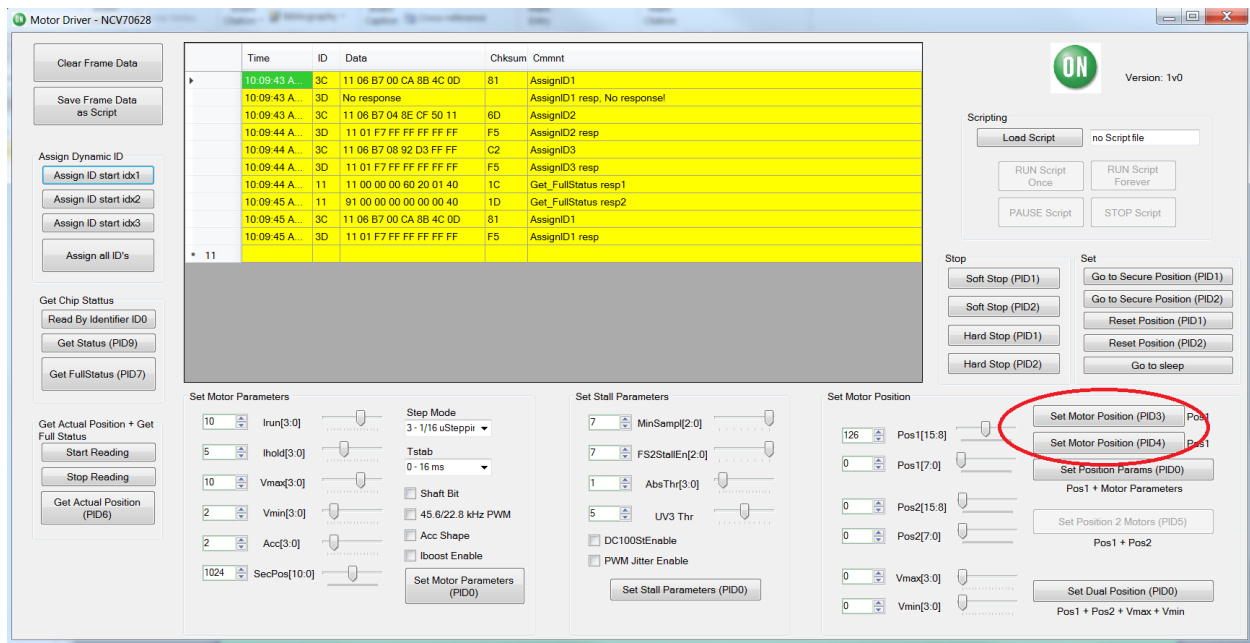


Figure 9 - NCV70628 Main Window Set Motor Position

Scripting functionality

The NCV70628 Evaluation software contains the script functionality (which is similar to the software for NCV70627/AMIS30623).

The scripting functionality is located in the Evaluation software here – Figure 10 - NCV70628 Main Window - Scripting

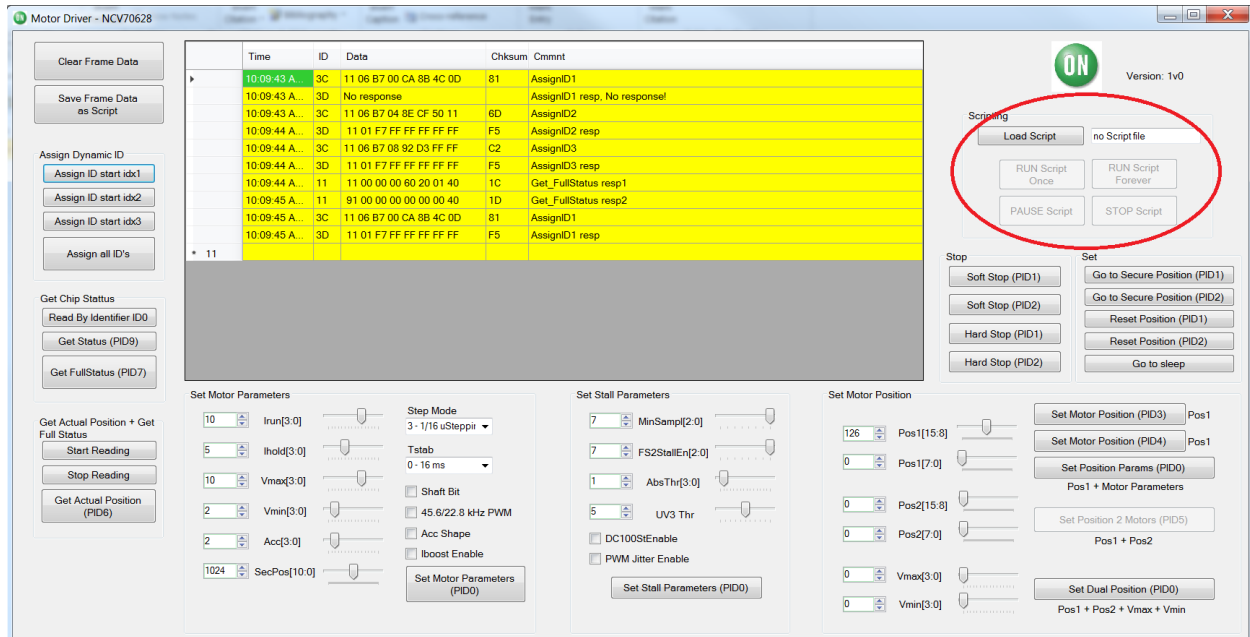


Figure 10 - NCV70628 Main Window - Scripting

The example of the script for NCV70628 Evaluation software is as follows:

NCV70628 SCRIPT FILE

```
>0000050:3C 11 06 B7 00 CA 8B 4C 0D'AssignID1  
>0000500:7D'AssignID1Response  
>0000050:3C 11 06 B7 00 CA 8B 4C 0D'AssignID1  
>0000500:7D'AssignID1Response  
>0000050:3C 11 06 B7 04 8E CF 50 11'AssignID2  
>0000500:7D'AssignID2Response  
>0000050:3C 11 06 B7 08 92 D3 FF FF'AssignID3  
>0000500:7D'AssignID3Response  
>0000500:11'GetFullStatus1  
>0000500:11'GetFullStatus2  
>0000500:0A 11 09 A5 A3 02 00 1C'SetMotorParam; Irun=0Ah; Ihold=05h; Vmax=0Ah; Vmin=02h;  
Acc=02h; StepMode=03h;  
>0000500:0A 11 16 A5 A3 12 E7 1E'SetStallParam; Irun=0Ah; Ihold=05h; Vmax=0Ah; Vmin=02h;  
Acc=02h; StepMode=03h; AbsThr=01h; MinSamp=07h; FS2StEn = 7  
>0003000:0D 11 00 28'SetPosition; Pos[15:8]=40; Pos[7:0]=00  
>0003000:0D 11 00 00'SetPosition; Pos[15:8]=00; Pos[7:0]=00
```

Description of the script

1. The first line should be **NCV70628 SCRIPT FILE**
2. The LIN commands should start at the new line with character **>**
3. The first 7 digits means delta time [in ms] between execution of the following LIN command , i.e.
>0000050:7D'AssignID1Response means that the command 7D is issued in 50ms from previous one
4. The granularity of the commands is 50ms (due to latency of the software running on the PC). That means timing for all commands should multiple 50 (i.e. 50, 100, 250, 500 etc)
5. The character **'** is a comment and is ignored by the Evaluation software

The script is loaded by pressing a button Load Script. If there is not a bug in the script the Message box with the loaded script appears – Figure 11 - NCV70628 Main Window - Script Loaded

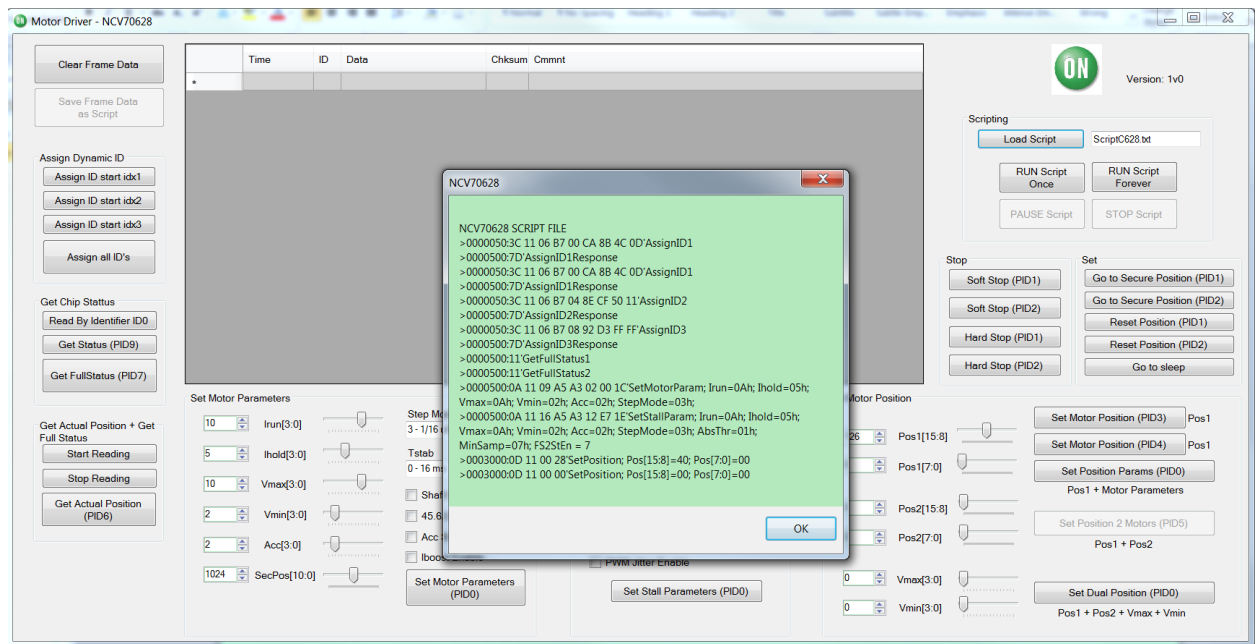


Figure 11 - NCV70628 Main Window - Script Loaded

If there is a bug in the script, the error message appears.

When the script is loaded, you can run the script once, run the script forever, pause or stop the script –

Figure 12 - NCV70628 Main Window - Run the script

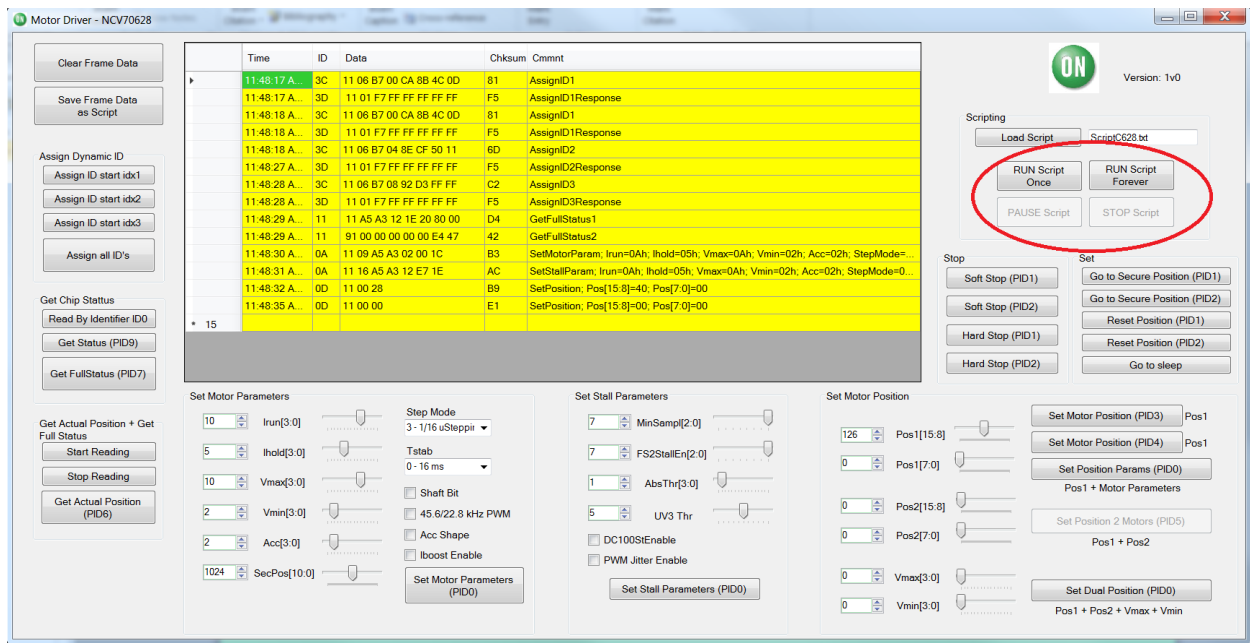


Figure 12 - NCV70628 Main Window - Run the script

You can also save the script from the current data LIN Data grid view by clicking the Save Frame Data as Script – Figure 13 - NCV70628 Main Window - Save the Script

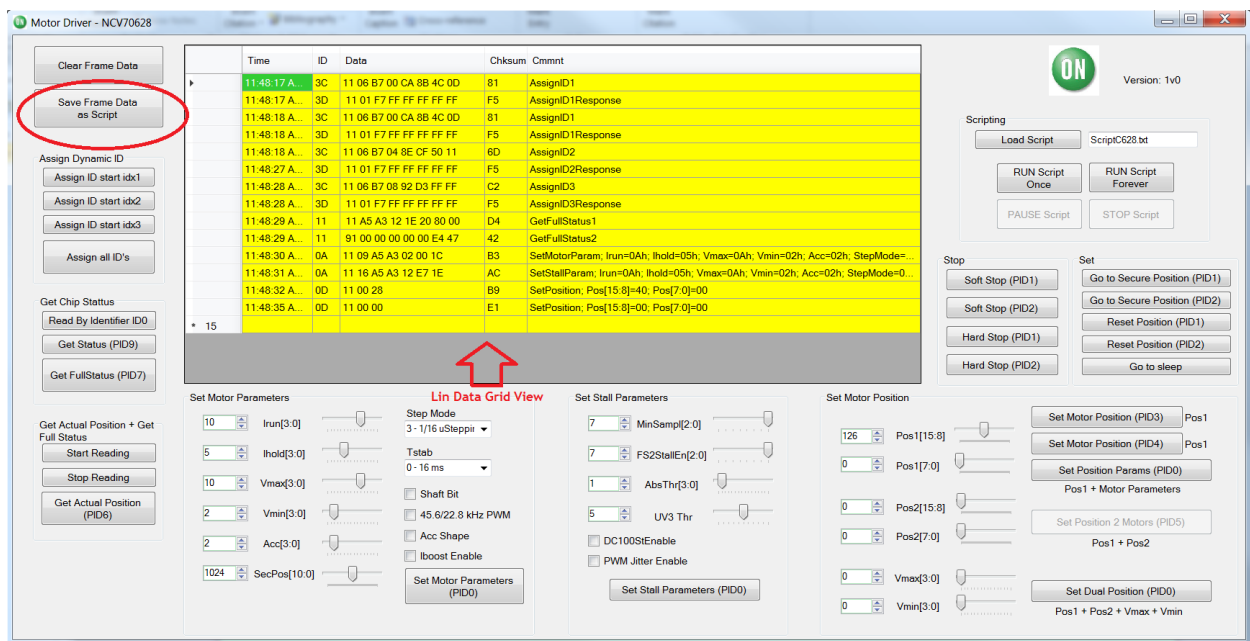


Figure 13 - NCV70628 Main Window - Save the Script

You can also save the script from the current

How to work with the LIN Data Grid View

The communication is logged into LIN Data Grid View. It can be cleared by click the button Clear Frame Data - Figure 14 - NCV70628 Main Window - Clear Frame Data

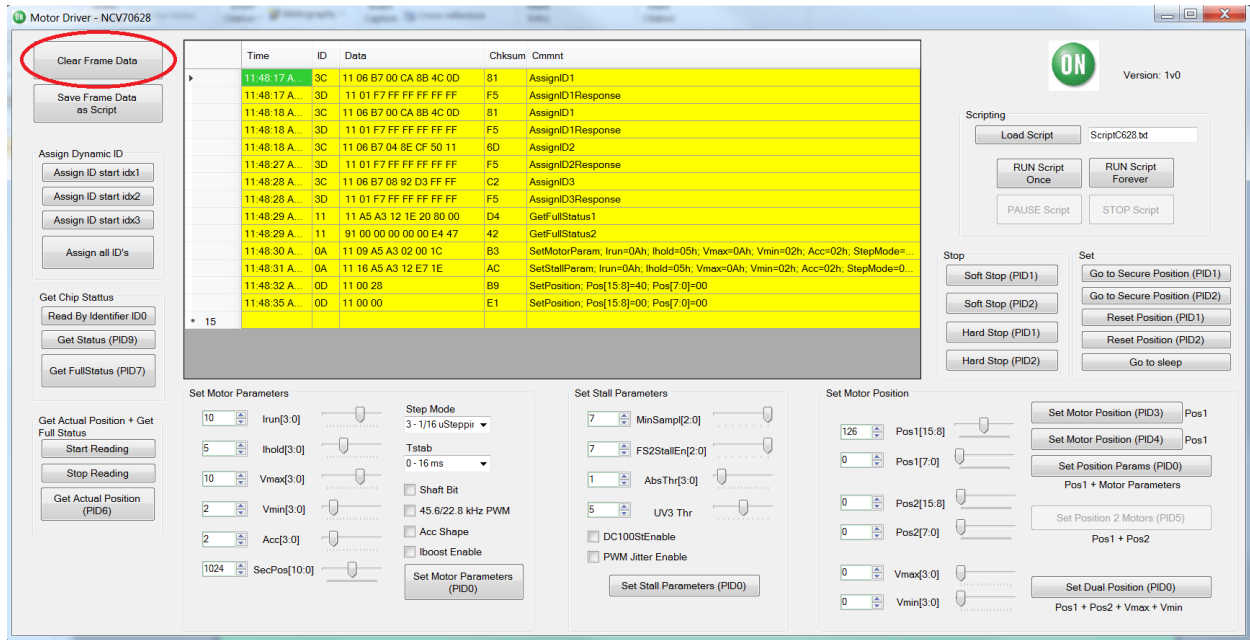


Figure 14 - NCV70628 Main Window - Clear Frame Data

The logged communication can also be copied and put into the MS Excel : Figure 15 - NCV70628 Main Window - Copy LIN Communication into the Clipbox

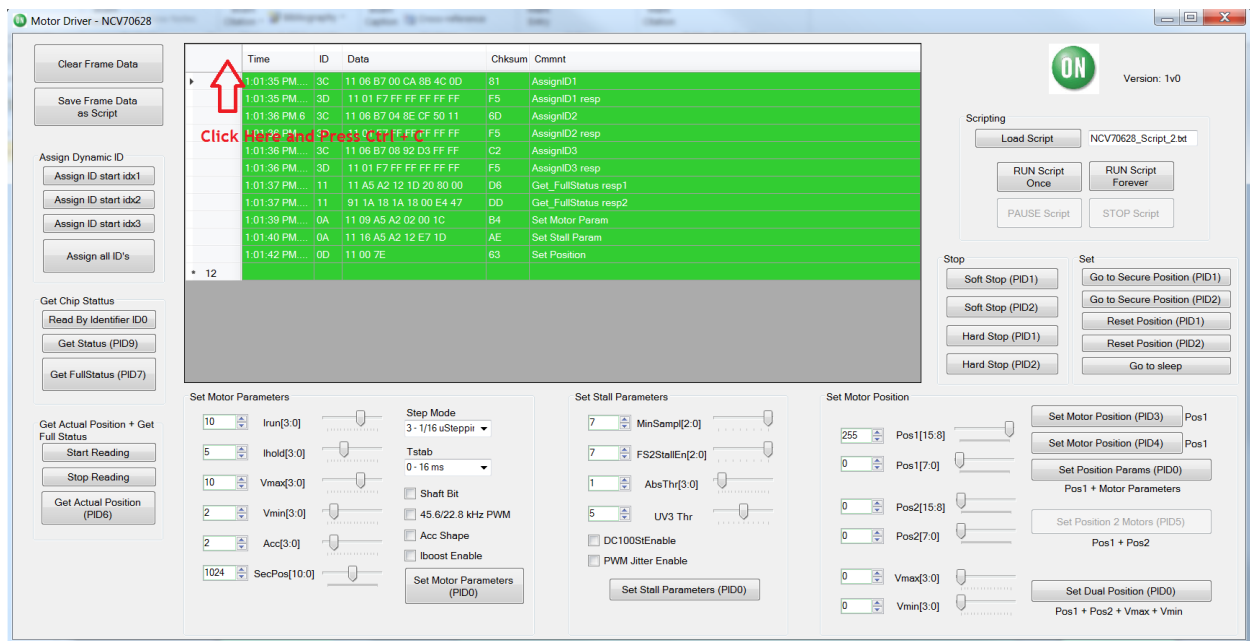


Figure 15 - NCV70628 Main Window - Copy LIN Communication into the Clipbox\

The logged communication can be put (by means of Ctrl +V) into the MS Excel :

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	1:01:35 PM.756	3C	11 06 B7 00 CA 8B 4C 0D	81	AssignID1											
2	1:01:35 PM.876	3D	11 01 F7 FF FF FF FF FF	F5	AssignID1 resp											
3	1:01:36 PM.6	3C	11 06 B7 04 8E CF 50 11	6D	AssignID2											
4	1:01:36 PM.126	3D	11 01 F7 FF FF FF FF FF	F5	AssignID2 resp											
5	1:01:36 PM.316	3C	11 06 B7 08 92 D3 FF FF	C2	AssignID3											
6	1:01:36 PM.506	3D	11 01 F7 FF FF FF FF FF	F5	AssignID3 resp											
7	1:01:37 PM.436	11	11 A5 A2 12 1D 20 80 00	D6	Get_FullS tatus resp1											
8	1:01:37 PM.566	11	91 1A 18 1A 18 00 E4 47	DD	Get_FullS tatus resp2											

Figure 16 - Logged LIN Communication into the Excel

Selected Node Address and PIDs

In this NCV70628 Evaluation software , the physical address of the circuit is 16 (0x10).

The selected PIDs for the communication with the NCV70628 are as follows:

NCV70628 PID	Frame ID	Frame ID (with Parity Bits)
PID0	0x0A	0xCA
PID1	0x0B	0x8B
PID2	0x0C	0x4C
PID3	0x0D	0x0D
PID4	0x0E	0x8E
PID5	0x0F	0xCF
PID6	0x10	0x50
PID7	0x11	0x11
PID8	0x12	0x92
PID9	0x13	0xD3
PID10	0x14	0x14