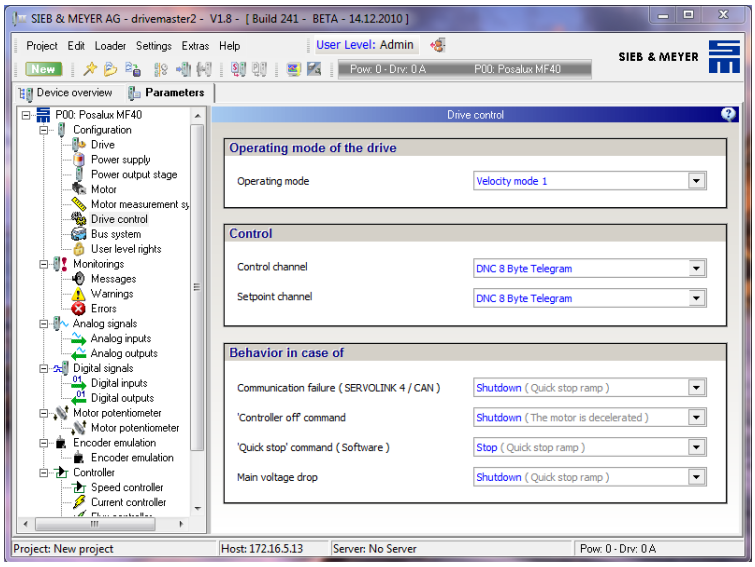
1. Setting drivemaster2

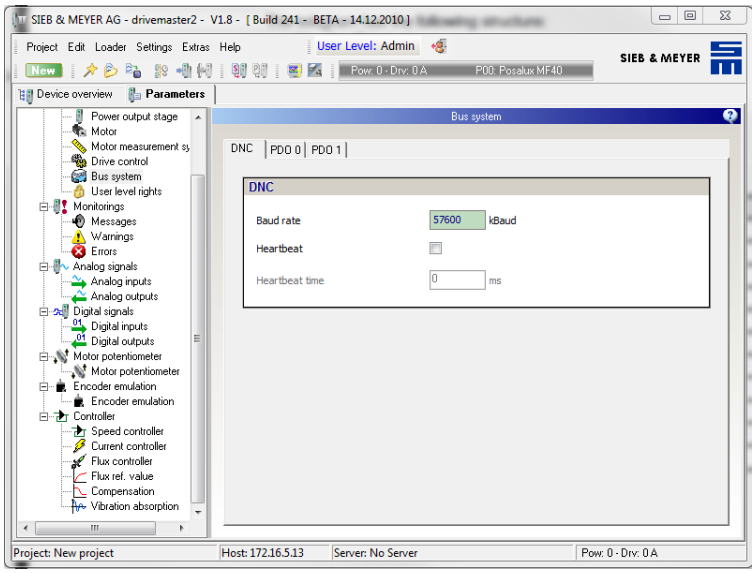
1.1. Device control

Set the Device Control to 8 DNC Byte Telegram



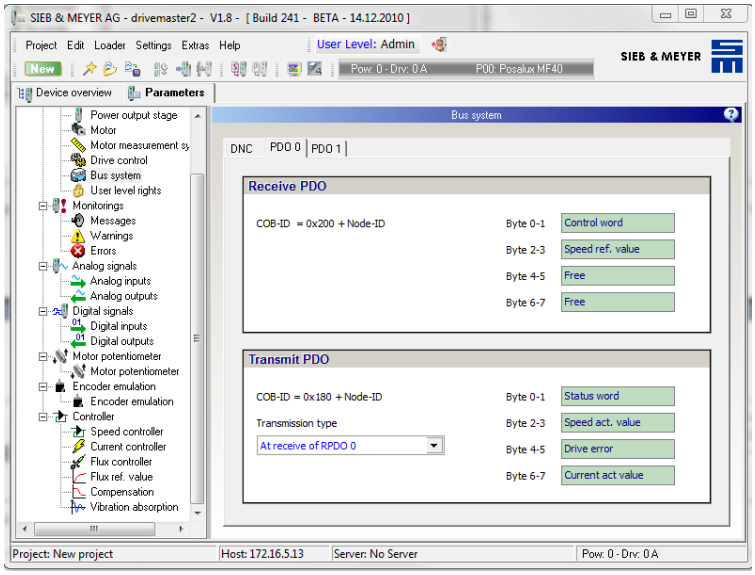
1.2. Baudrate and heartbeat

Set the Baudrate to 57600 and disable the heartbeat.



1.3. PDO 0

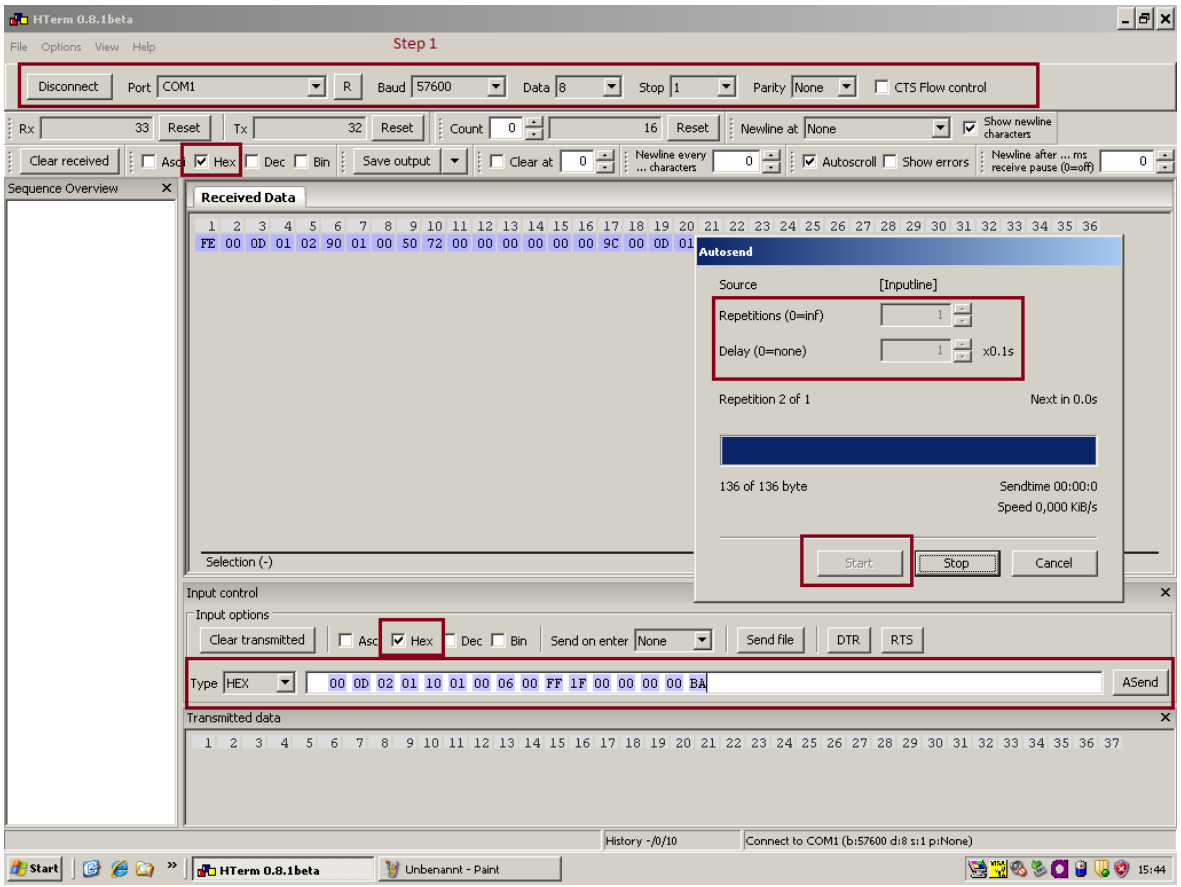
Set the transmission type to “At receive of RPDO 0”



2. Serial program

2.1. Serial program

- Select port
- Set baudrate to 57600
- Set data 8
- Set stop 1
- Set parity none
- Press connect
- Set all to values to Hex type
- Put in the Hex code (16/24 byte) and press Asend. Repetitions:1 /Delay: 1. Start



3. Example of Hex codes

3.1. Cyclic data

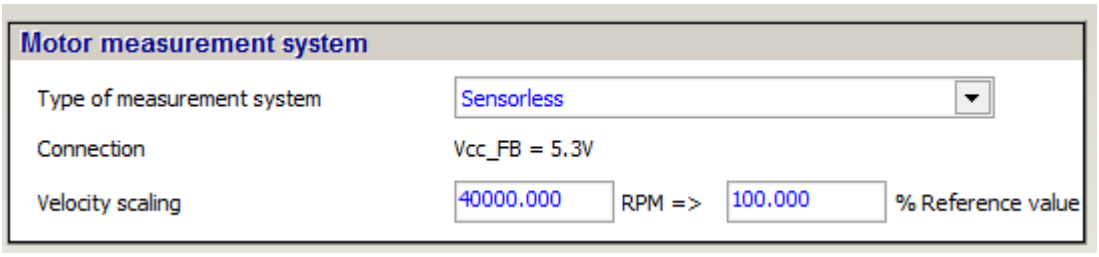
DNC 8 Byte Prompt Telegram

Byte	Name	Value	Protocol
1	zero	0	DNC
2	Length	13	DNC
3	dest	Module address plus 2	DNC
4	Source	1 for PC	DNC
5	CMD	0x10 (const)	DNC
6	PDO Header	PDO Header 0	Cyclic channel
7	PDO Header	PDO Header 1	Cyclic channel
8	PDO Data	PDO Data 0	Cyclic channel
⋮	PDO Data	⋮	Cyclic channel
15	PDO Data	PDO Data 7	Cyclic channel
16	check(1)	Checksum	DNC

(1) Check = 0xFF - (sum of the bytes 2 to 15)

3.1.1. Switch off (Shutdown)

- Header 0 Togglebit 0 (when you use the Heartbeat)
- Speed reference to 50%
- PDO Data 0 / 1 Command 6
- PDO Data 2 / 3 Speed (1FFF=50% of velocity scaling in the drivemaster2 parameter)



PDO Data 2 / 3:

0 = Speed 0 …… 3FFF = Speed 100%
FFFF = Speed 0 …. C000 = Speed -100%

send:

Zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x02	0x01	0x10	0x01	0x00	0x06	0x00	0xff	0x1f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0xba

reply: (ready to switch on)

- PDO Data 0 / 1 Status word （当前状态）
- PDO Data 2 / 3 Speed actual value （当前速度）
- PDO Data 4 / 5 Drive Error （当前错误）
- PDO Data 6 / 7 Current actual value （当前电流）

Zero	len	dest	source	Cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x01	0x02	0x90	0x01	0x00	0x31	0x72	0x00	0x00	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0x?

3.1.2. Switch on

- PDO Data 0 / 1 Command 7
- Header 0 Togglebit 1 (when you use the Heartbeat)

send:

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x02	0x01	0x10	0x05	0x00	0x07	0x00	0xff	0x1f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0xb5

reply: (switched on)

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x01	0x02	0x90	0x05	0x00	0x33	0x72	0x00	0x00	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x21	0x43	0x?

3.1.3. Enable operation

- PDO Data 0 / 1 Command F
- PDO Data 2 / 3 Speed (1FFF=50% of velocity scaling in the drivemaster2 parameter)
- Header 0 Togglebit 0 (when you use the Heartbeat)

send:

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x02	0x01	0x10	0x01	0x00	0x0f	0x00	0xff	0x1f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0xb1

reply: (operation enable)

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x01	0x02	0x90	0x01	0x00	0x37	0x72	0xff	0x1f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x21	0x43	0x?

3.1.4. Change speed (Enable operation)

- PDO Data 0 / 1 Command 10
- PDO Data 2 / 3 Speed (0FFF=25% of velocity scaling in the drivemaster2 parameter)
- Header 0 Toggelbit 1 (when you use the Heartbeat)

send:

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x02	0x01	0x10	0x05	0x00	0x0f	0x00	0xff	0x0f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0xbd

reply:

zero	Len	dest	source	Cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x01	0x02	0x90	0x05	0x00	0x37	0x72	0xff	0x0f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x21	0x43	0x?

3.1.5. Disable operation

- PDO Data 0 / 1 Command 7
- Header 0 Togglebit 0 (when you use the Heartbeat)

send:

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x02	0x01	0x10	0x01	0x00	0x07	0x00	0xff	0x0f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0xc9

reply: (switched on)

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x01	0x02	0x90	0x05	0x00	0x33	0x72	0x00	0x00	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x21	0x43	0x?

3.1.6. Switch off (Shutdown)

- PDO Data 0 / 1 Command 6
- Header 0 Togglebit 1 (when you use the Heartbeat)

send:

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x02	0x01	0x10	0x05	0x00	0x06	0x00	0xff	0x0f	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x00	0x00	0xc6

reply:

zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●
0x00	0x0d	0x01	0x02	0x90	0x05	0x00	0x31	0x72	0x00	0x00	0x00	

●●●	PDO Data 5	PDO Dat 6	PDO Data 7	psum
	0x00	0x21	0x43	0x?

3.2. Acyclic service data

Read out POWER_STAGE_LOAD_ACTUAL **(object 39 / 27 hex):**

- The Bytes 0,2,3,4 and 6 to 14 must be the same as the last send command.
- The length change to 15 hex. Attention: It is also possible use 24 Bytes length for the cyclic data.
- The header 0 the togglebit change
- Ctrl

Service Control (Byte 17)

Service Control:

Bit	Description
0	ServiceValidToggle
1	ServiceFunction bit 0
2	ServiceFunction bit 1
3	ServiceLastValidByteIndex bit 0
4	ServiceLastValidByteIndex bit 1
5	–
6	–
7	–

3

ServiceFunction bit 1, 2:
- 0 = Read Object
- 1 = Set Array Index
- 2 = Write Object
- 3 = free → fault

ServiceLastValidByteIndex bit 3, 4:

Number of valid bytes:
- 0 = 1 byte
- 1 = 2 bytes
- 2 = 3 bytes
- 3 = 4 bytes

- Index 0 = object number (hex) low byte
- Index 1 = object number (hex) high byte

send:

Zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●	
0x00	0x15	0x02	0x01	0x10	0x01	0x00	0x06	0x00	0xff	0x0f	0x00		
	●●●	PDO Data 5	PDO Dat 6	PDO Data 7	0	ctrl	index 0	index 1	s-data 0	s-data 1	s-data 2	s-data 3	psum
		0x00	0x00	0x00	0x00	0x08	0x27	0x00	0x00	0x00	0x00	0x00	0x93

reply: (value in the s-data Byte 0 to 3)

Zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●	
0x00	0x15	0x01	0x02	0x90	0x01	0x00	0x31	0x72	0x00	0x00	0x00		
	●●●	PDO Data 5	PDO Dat 6	PDO Data 7	0	state	index 0	index 1	s-data 0	s-data 1	s-data 2	s-data 3	psum
		0x00	0x21	0x43	0x00	0x01	0x27	0x00	0x ?	0x ?	0x?	0x?	0x?

Write the Object Parameter_Set to select the parameter set to 0,1…64 **(object 352 / 160 hex):**

- The Bytes 0,2,3,4 and 6 to 14 must be the same as the last send command.
- The length change to 15 hex. Attention: It is also possible to the 24 Bytes length for the cyclic data.
- The header 0 the togglebit change
- Index 0 = object number (hex) low byte
- Index 1 = object number (hex) high byte
- S-data 0 = 1 for parameter set 1

send:

Zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●	
0x00	0x15	0x02	0x01	0x10	0x05	0x00	0x06	0x00	0xff	0x0f	0x00		
	●●●	PDO Data 5	PDO Dat 6	PDO Data 7	0	ctrl	index 0	index 1	s-data 0	s-data 1	s-data 2	s-data 3	psum
		0x00	0x00	0x00	0x00	0x0d	0x60	0x01	0x01	0x00	0x00	0x00	0x4f

reply:

Zero	len	dest	source	cmd	header 0	header 1	PDO Data 0	PDO Data 1	PDO Date 2	PDO Data 3	PDO Data 4	●●●	
0x00	0x15	0x01	0x02	0x90	0x01	0x00	0x31	0x72	0x00	0x00	0x00		
	●●●	PDO Data 5	PDO Dat 6	PDO Data 7	0	state	index 0	index 1	s-data 0	s-data 1	s-data 2	s-data 3	psum
		0x00	0x21	0x43	0x00	0x00	0x60	0x01	0x01	0x00	0x00	0x00	0x?

PDO Data 2 / 3:

0 = Speed 0 …… 3FFF = Speed 100% 1FFF=50% 0FFF=25%
FFFF = Speed 0 …. C000 = Speed -100%

4.0 举例调试时一些可发送命令：
程序中启动应按以下发送时序：

- “Shutdown”初使化变频器状态……....000d02011001000600ff1f00000000ba
  变频器变为“Ready to switch on”,返回指令 000D010290010031720000000OFEFFBE
- “Switch on”使能变频器 ……....000d02011001000700ff1f00000000b9
  变频器变为“ Switched On”,返回指令 000D010290010031720000000OFEFFBE
- “Enable operation”旋转 50%速度……....000d02011005000f00ff1f00000000ad
  变频器变为“ Operation Enabled”,返回指令 000D010290050033720000000OBD06F2

Switch on: 00 0D 02 01 10 01 00 06 00 FF 1F 00 00 00 00 BA
起转，带 50%转转速值 Speed start at 50%：00 0d 02 01 10 01 00 0f 00 ff 1f 00 00 00 00 b1
转速 1W： 00 0d 02 01 10 01 00 0f 00 ff 0f 00 00 00 00 c1

转速 25%指令： 00 0d 02 01 10 05 00 0f 00 ff 0f 00 00 00 00 bd
使能 switch on 指令 ： 00 0d 02 01 10 05 00 07 00 ff 1f 00 00 00 00 b5
停止 stop 指令： 00 0d 02 01 10 01 00 07 00 ff 0f 00 00 00 00 c9
switch off 指令: 00 0d 02 01 10 05 00 06 00 ff 0f 00 00 00 00 c6

5.0 电流和转速反馈值的计算

反馈最大数值：十六进制 3FFF=十进制 16383

电流比例：
0362120DC 峰值电流（变频器固定）20A=3FFF=16383，比例常数=20A/16383=0.00122
0362141EC 峰值电流（变频器固定）40A=3FFF=16383，比例常数=20A/16383=0.00244

如果从驱动器返回来的值：
0362120DC 电流：Byte[14..15]=0x3F12=十六进制 123F=十进制 4671, 4671*0.00122/ √2=4.03Arms
0362141EC 电流：Byte[14..15]=0x3F12=十六进制 123F=十进制 4671, 4671*0.00244/ √2=8.06Arms

==========
转速比例：
0362120DC/0362141EC 最大转速（变频器参数设定,Motor measurement system）60000=3FFF=16383，比例常数=60000/16383=3.66233

如果从驱动器返回来的值：
0362120DC/0362141EC 转速：Byte[10..11]=0x3F12=十六进制 123F=十进制 4671,
4671*3.66233=17106rpm