



DBS

I/O Setup

DBS 55/---/--
DBS 80/--/--

Rev 01

*** DBS Firmware $\geq$ v4.036 **

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You've chosen to buy our Servomotor, and for that we thank you. Now you have to connect it to your systems to use it. In this I/O setup guide you'll find instruction on how to make the motor work in the various non-fieldbus operating mode. For more in depth information, the relevant documents, downloads and guides will be linked throughout this guide.

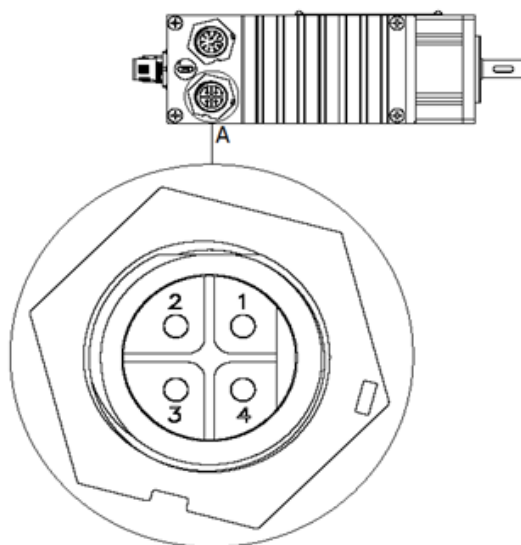
Reference manual revision: Rev24

Reference DBS firmware: 4.036

SETUP – Connections

Power connection

DBS55



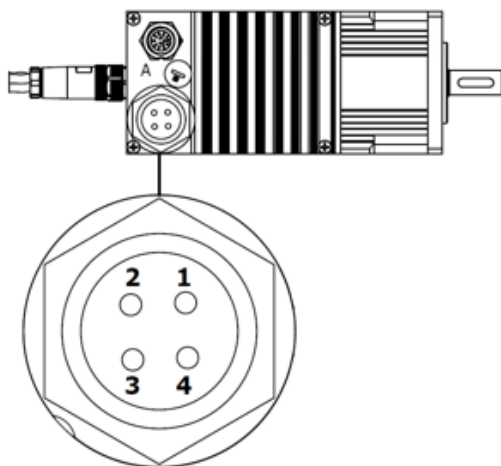
CN1				
Pin		Descrizione	55/50/----	55/100/--
1		Logic GND	0V	0V
2		Power GND	0V	0V
3		+ Power	From 24 to 48Vdc	48Vdc
4		+ Logic	From 24 to 48 Vdc	

Awg 18 cable is recommended for power connection.

WARNING: the picture represents the top view of the connector fixed on the motor case.

WARNING: Logic and Power GND must have common ground.

DBS80



CN1				
Pin		Descrizione	80/50/--	80/100/--
1		GND logic	0V	0V
2		+Power	48Vdc	48Vdc
3		GND Power	0V	0V
4		+ Logic	From 24 to 48Vdc	

Awg 11 cable is recommended for power connection.

WARNING: the picture represents the top view of the connector fixed on the motor case.

WARNING: Logic and Power GND must have common ground.

Figure 4

Logic and power supply are separated. This enables for emergency stop cutting only the power while keeping the electronics (logic) alive. More relevant in fieldbus enabled drives than I/O operated ones.

Each DBS systems comes with flying connectors which you can weld. Otherwise you can order from Minimotor pre-molded cable. Please refer to the DBS Manual for the whole cable catalogues and color codes.

I/O Connector

Use a shield cable Awg 22 for control connection

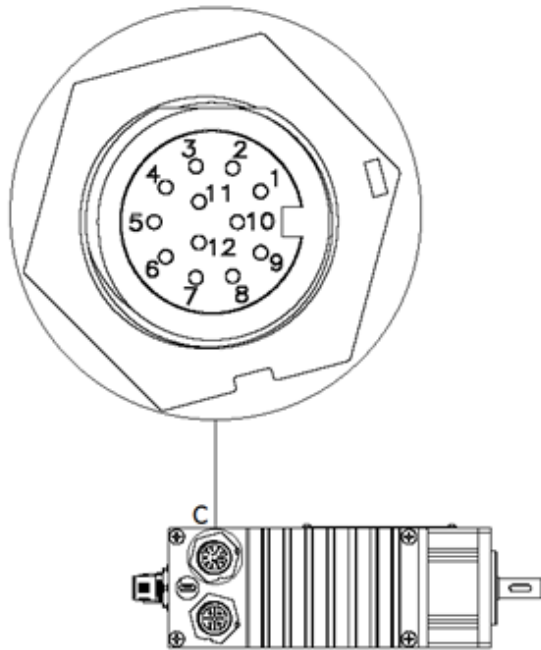


Figure 4

CN2			
Pin	ID	Description	
1	DIN 1	Multifunction digital input 24Vdc pnp max 500kHz	
2	DIN 2		
3	DIN 3 / S1+	Multifunction digital input 24Vdc pnp max 7kHz	*STO In 1
4	DIN 4 / S2+		*STO In 2
5	DIN 5		
6	DIN GND	Digital input ground	** Logic GND (Pin1 CN1)
7	AIN +	Positive input for analog signal***	
8	AIN -	Negative input for analog signal***	
9	AGND	Ground for analog signal	
10	+10Vdc	Service power for analog input max 5mA	
11	Com	Relay common digital output	
12	NO	NO contact relay digital output max 2A	** + Logic (Pin 4 CN1)

* STO Optional on request.

**DO logic supply on CN2 connector optional on request, maximum 40mA of output.

***MA Analog input configured for 0-20mA / 4-20mA optional on request.

The IO connector must be cabled according to the desired functionality. The Digital input functions and fully programmable.

USB connection

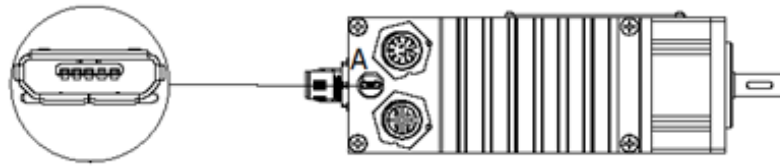


Figure 5

 The USB cable must be connected to the DBS system only with the drive powered up

The micro USB (μ USB) connector is found under the silver cap found on the motor radiator.



Troubleshooting

The μ USB is a delicate connector and it can absorb electrical noise from the surrounding environment so if you cannot establish connection with the motor:

- Make sure that the device drivers are installed on the PC. [You can download them here.](#)
- Be sure that the USB is making proper contact. If the plastic housing is too big it can prevent full contact. Use lean USB design.
- Disconnect the USB – Power off the DBS – Wait for 3 seconds – Power up the DBS – Reconnect the USB. This should clear noise generated by switching PSU.
- If you have frequent disconnect, you can add a Ferrite Ring around the USB cable to protect from noisy environment.

Parametrization interface

Software installation

- 1 Download the “BSI software” e “BSI Usb Driver” at the following link:
- 2 <https://www.minimotor.com/prodotti/dbs/>
- 3 Extract and run the downloaded files. Follow the installation guide procedure until it is finished.

After the download extract the .zip file and run BSI.exe inside the folder (Figure 1).

WARNING: this is not an installation file. It directly runs the interface software, so you do not need to install it. Cause of this, every time the user wants to use the software only need to double click on this icon.

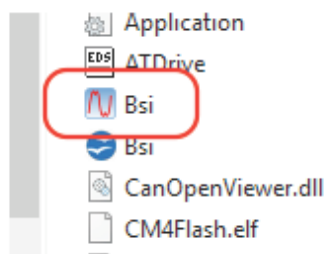


Figure 1

- 4 Connect the device through the micro USB to the pc and check that the logic is connected to the power.
- 5 Once the program is run, select the connection type. If choosing USB, wait for the device to be found and connect. If the DBS is connected via Fieldbus to a net that can exchange data over Ethernet (Ethernet IP, Profinet, Powerlink and EtherCAT with EoE functionality) you can connect typing the DBS IP address. (Figure 2).

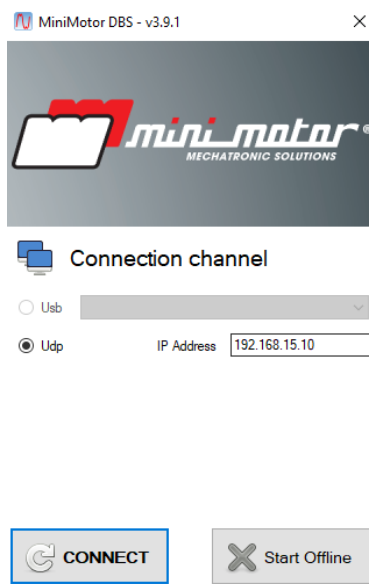


Figure 2

- 6 If the firmware stored in the device is no up to date the screen in Figure12 appears.
Select UPDATE to store the last version of the firmware. **Update is only possible over USB connection.**
Wait for the process to be completed and then click on CLOSE.

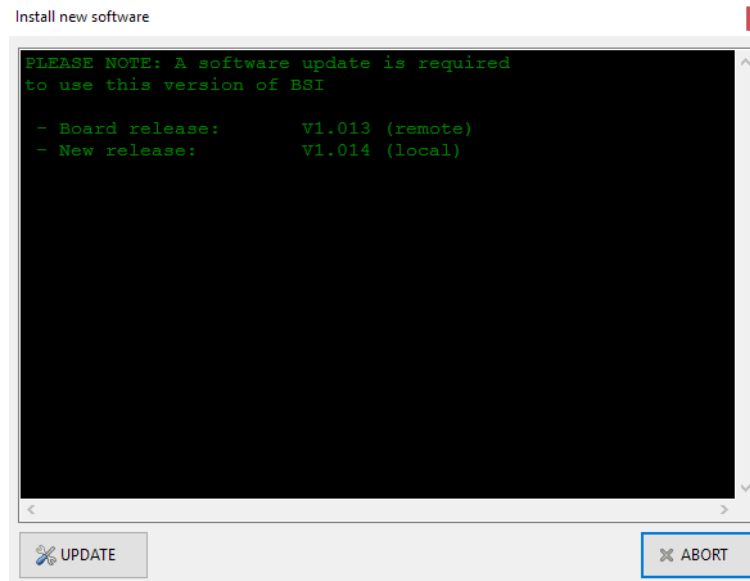


Figure 3

Software

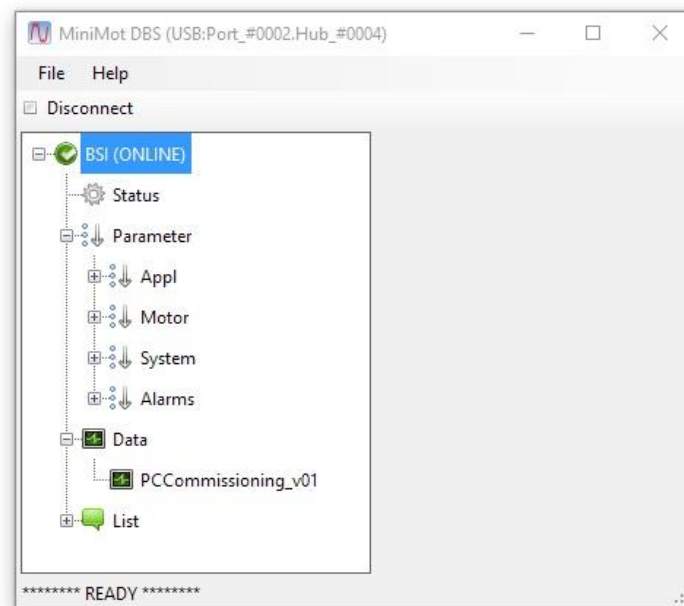


Figure 4

The Figure 4 represents the main screen of BSI software.
Following the menu it is possible to act on the motor parameter and to monitor the functional settings.

Status

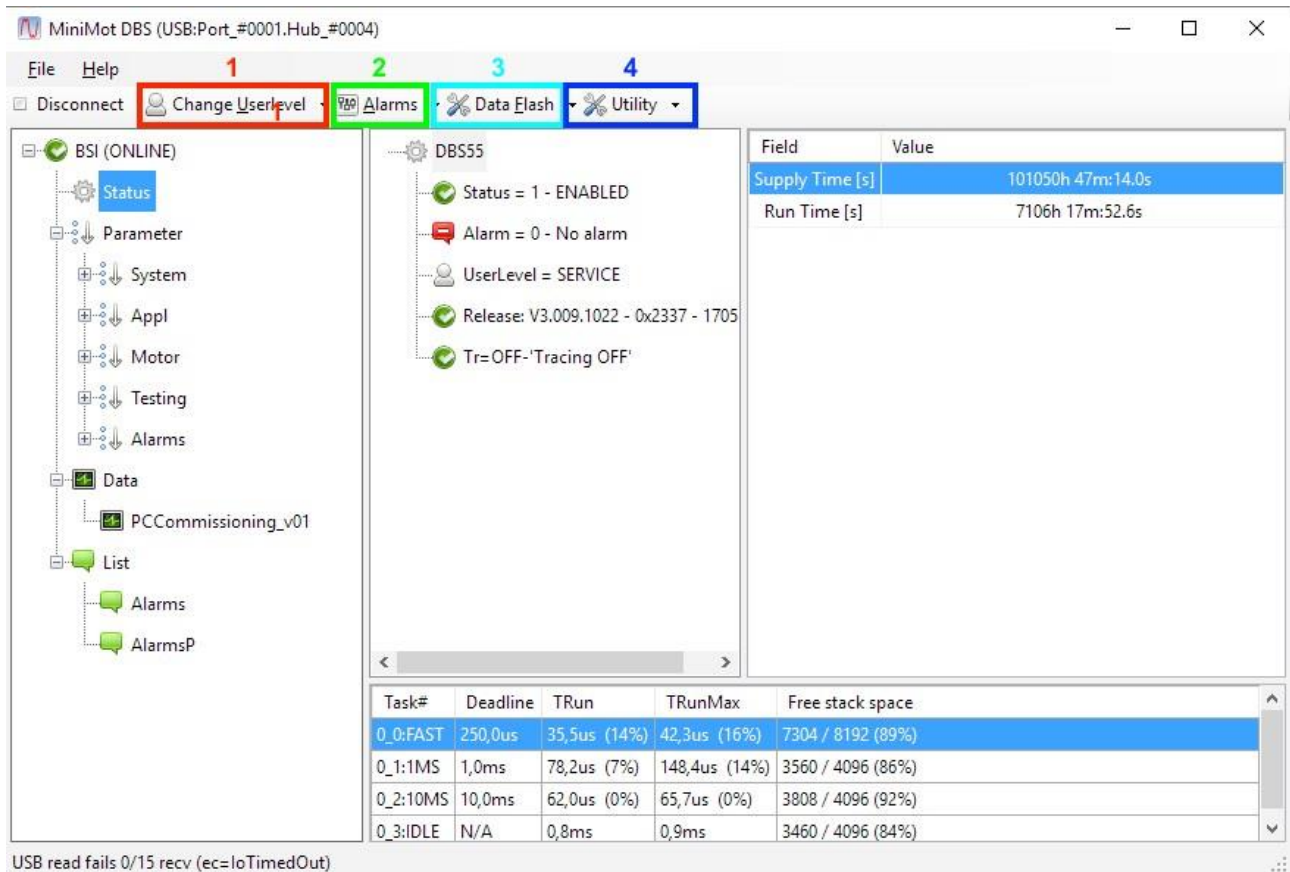


Figure 5

Click on "Status" in order to know the motor status, manage the presence of fault and change the software user level.

- 1 "Change User Level": use this option in order to change the software user level and have acces to more setting parameters.

User	Free acces
Advance	Free acces
Eol	PW needed
Service	PW needed

- 2 "Alarms": this button gives acces to the alarm menu:

Clear alarms	Reset the alarm situation
--------------	---------------------------

- 3 "Data Flash": diagnostic tool to save the Flash memory image.;
- 4 "Utility": Diagnostic tool.

Alarm list

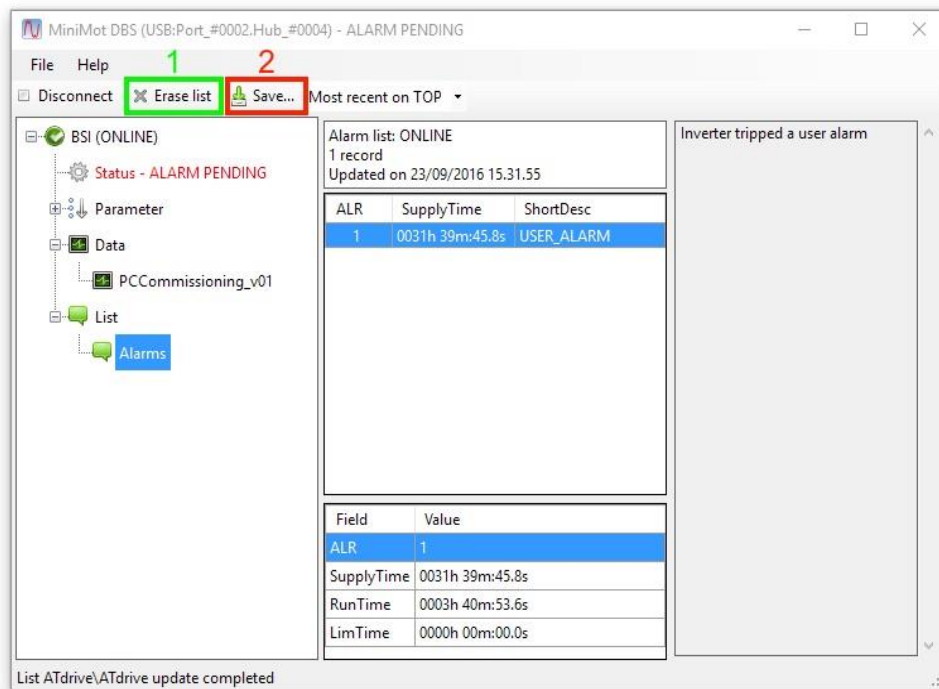
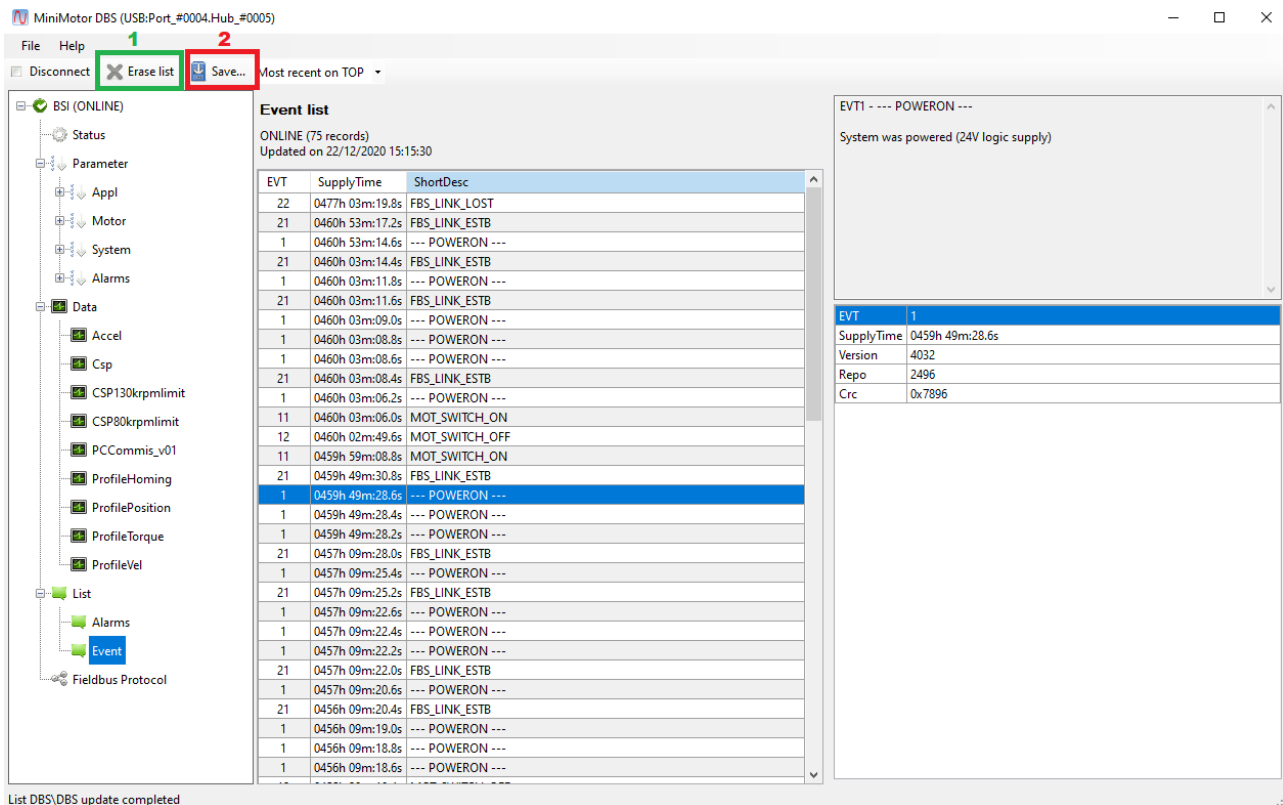


Figure 6

By selecting “list” under the “alarm” voice, it is possible to find the alarm history list.

- 1 “Erase List”: use this command to erase the hole list.
- 2 “Save”: use this button to save the list into an external file.

Event List



Under the “List” category, selecting the Event list it’s possible to see the history of the motor events. There are non critical events.

- 1 “Erase List”: attraverso questo comando è possibile cancellare lo storico degli eventi
- 2 “Save”: grazie a questo comando è possibile salvare la lista eventi in un file esterno

Parameter

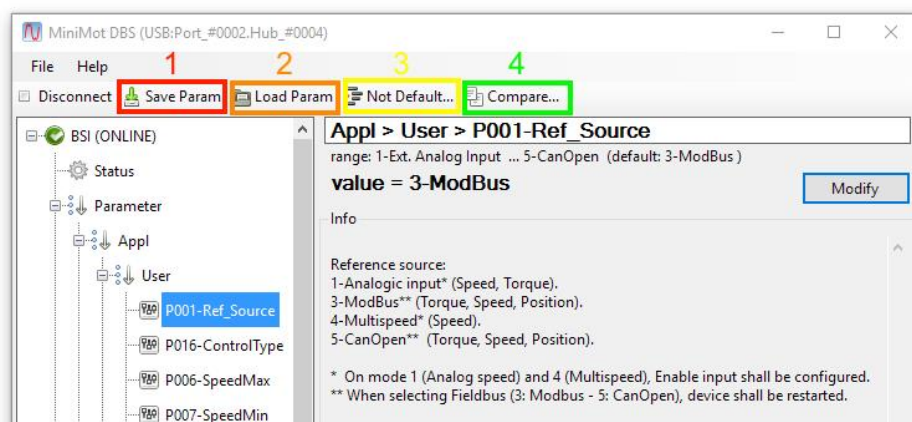


Figure 7

Under “Parameter” it is possible to find and set all the motor parameters.

See the section of this guide in order to understand the meaning of all point and set de desired configuration.

In order to change the value or to select a different voice in one of the parameters, click on modify, change the value and then select Update to load the changement Figure 8.



Figure 8

When the voice “parameter” is selected in the top of the window there are several usefull option:

- 1 “Save Param”: allows to save the parameter setting into an external file.
- 2 “Load Param”: allows to upload the parameter stored into an external file, directly in the driver storage.
- 3 “Not default”: shows wich parameter have been changed in respect of the default value.
- 4 “Compare”: allows to compare the parameter stored in the device with the parameters contained into an external file.

Monitoring

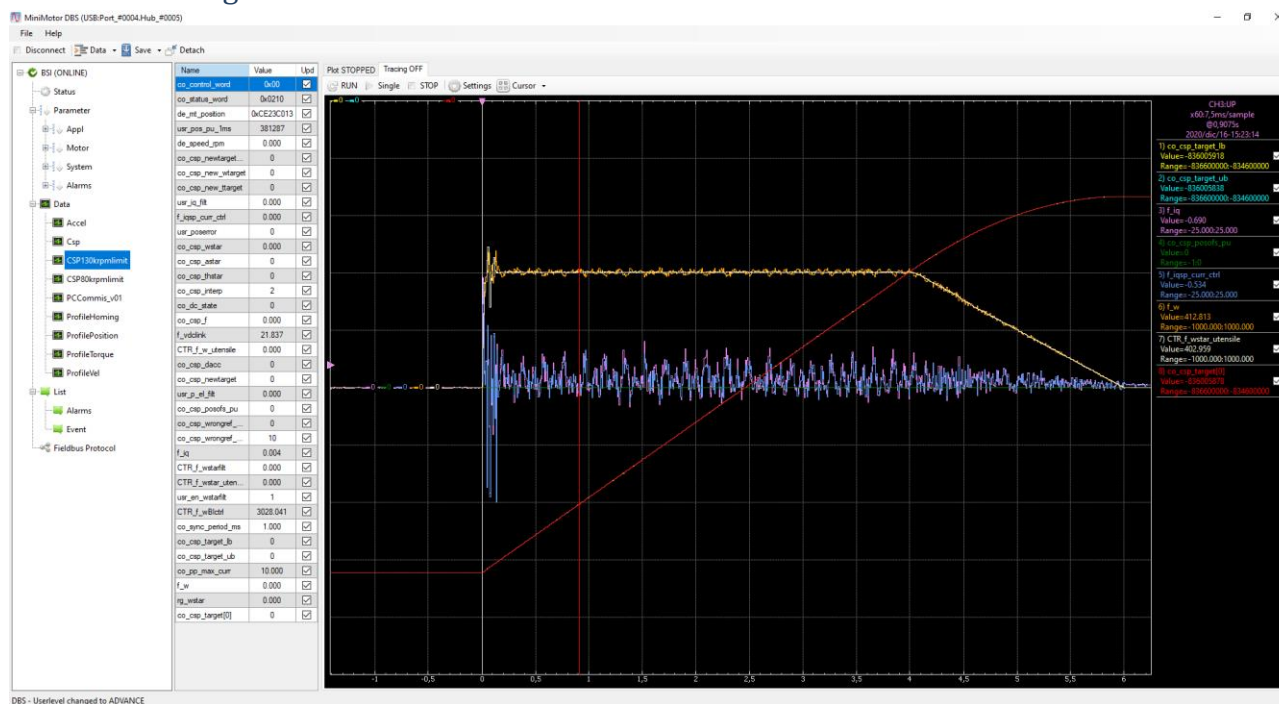


Figure 9

The program BSI is equipped with a tool useful in order to monitor the variables during the motor employment. Click on data and select PCCommissioning to see window shown in Figure 9

To activate the control of one or more variables toggle the white square under column “Upd”. The value is represent under the column “Value”.

To use the oscilloscope, open the window settings and set the desired measurement, then click on single in order to obtain the measurement.

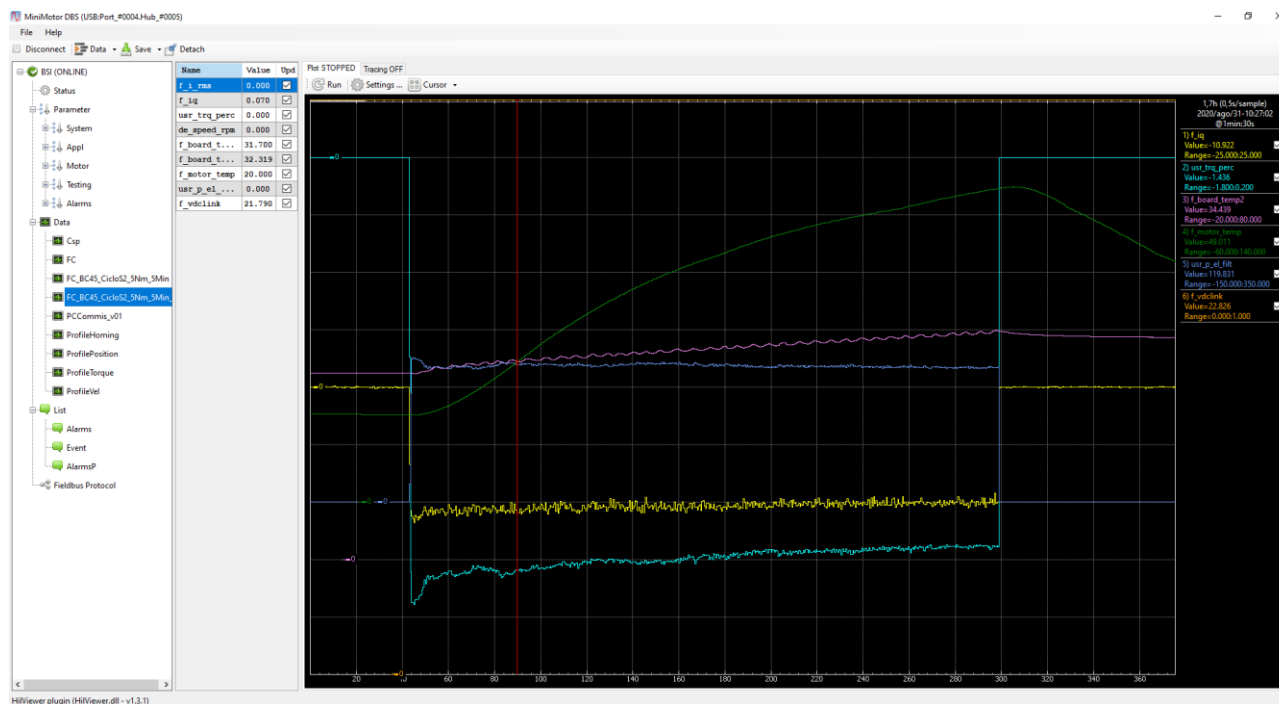


Figure 10

The PLOT function, shown in Figure 20, , enables to track values over longer period of time.

CONTROL METHODS FOR I/O

You are commanding our motor with the digital and analog inputs. To do this, you will have to make the relevant connections to the I/O connector CN2.

Our [BSI software](#) is required to fully customize the function of the Digital and Analog I/O.

The following control method are available:

- **Speed Analog In** – Use an external analogic -10+10V/0-10V to command the motor speed.
- **Torque Analog In** – Use and external analogic- 10+10V/0-10V to command the motor torque.
- **Multispeed** – Use up to 3 digital inputs to select up to 8 different speeds to execute.
- **MultiTorque** – Use up to 3 digital inputs to select up to 8 different torque to execute.
- **MultiPosition** – use up to 3 digital inputs to select up to 8 position to execute in relative or absolute mode.
- **MultispeedCycle** – Cycle between 8 speeds automatically in sequence.
- **MultipositionCycle** – Cycle between 8 positions automatically in sequence.

Note: NO/NC Signals

Motor Enable and Disable

The motor needs at least 1 digital input configured as the enable signal to work.

You can configure the system In two ways: with dual input or single input.

Dual Input

Configure two digital inputs as follow:

- Enable/StandBy
- Run/Stop

The screenshot shows the BSI (ONLINE) software interface. On the left, a tree view displays the system hierarchy: Status, Parameter, System, Appl, User, Input_Output, Analog, and Digital. The 'Digital' folder is expanded, showing a list of digital inputs: P010-InputFunc1, P011-InputFunc2, P012-InputFunc3, P013-InputFunc4, P014-InputFunc5, P032-AinFunc, P015-OutFunc, and P020-DigInInvMask. On the right, a table titled 'Group: Appl > Input_Output > Digital' lists the configuration for these inputs. The table has two columns: 'Name' and 'Value'.

Name	Value
AppI\Input_Output\Digital\P010-InputFunc1	1-Enable/Stand-by
AppI\Input_Output\Digital\P011-InputFunc2	2-Run/Stop
AppI\Input_Output\Digital\P012-InputFunc3	0-Not used
AppI\Input_Output\Digital\P013-InputFunc4	0-Not used
AppI\Input_Output\Digital\P014-InputFunc5	0-Not used
AppI\Input_Output\Digital\P032-AinFunc	0-Analog input
AppI\Input_Output\Digital\P015-OutFunc	0-NOT_USED
AppI\Input_Output\Digital\P020-DigInInvMask	0b00000 [bit]
AppI\Input_Output\Digital\P064-TargReachedHyst	0 rpm/mA/step
AppI\Input_Output\Digital\P065-TargReachedHystTime	0 ms

With this configuration, when Enable/Standby is active, the motor is torque enable and will hold position. When Run/Stop is active together with Enable/Standby the motor will execute the command specific to the operating mode.

Single Input

You can program a digital input only as

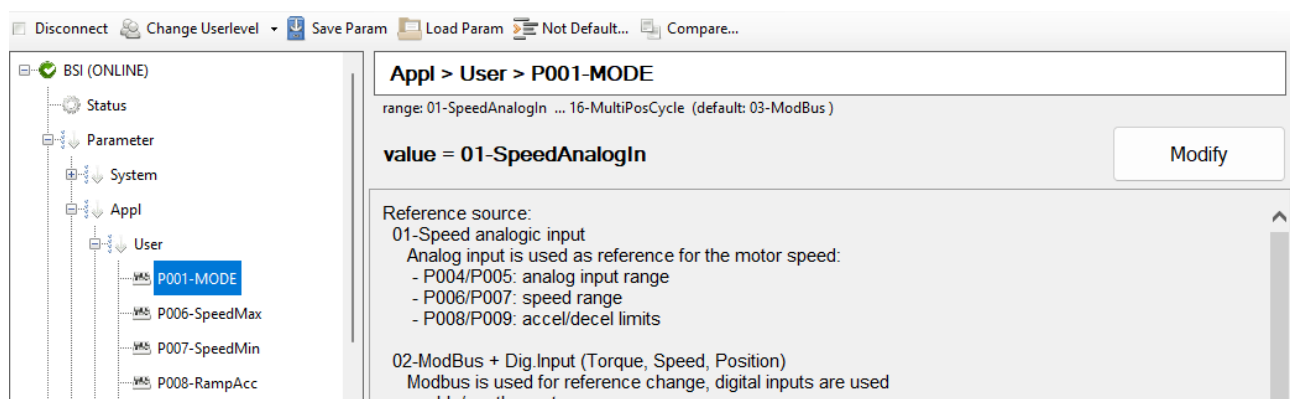
- Enable/Standby.

When this digital input is active, the motor will automatically execute the relevant command.

Speed Analog In

The **Speed Analogue In** is an operating mode that makes the motor go to a specific speed controlled via an analogue digital input.

To activate this mode, put **P001** to **01-SpeedAnalogIn**.



You can then use the following parameters to adjust the motor behavior:

- P008 - Acceleration ramp when changing speed IN RPM/S
- P009 - Deceleration ramp when changing speed in rpm/s
- P021 - Change the motor direction permanently (like for a mirror-like motor placement driving both with the same inputs, one will have P012 at 0 and the other at 1)
- P017 - The maximum current that the motor can use. Can be used to enable boost torque or limit torque.

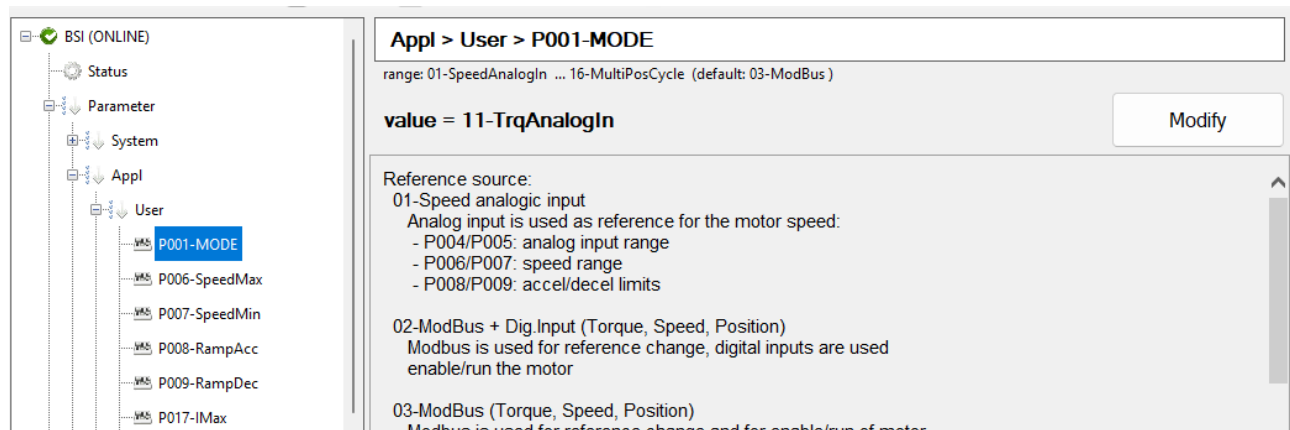
You can use the following parameters to modulate the analog signal:

- P004/P005 - Regulate the minimum and maximum reference of the analog signal.
- P043 - Select between -10V+10V and 0..10V on normal motors and 0..20mA and 4..20mA for MA option code motors.
- P045 - Select an offset for connecting the analog signal
- P046 - Select a multiplicative gain for the analog signal
- P047 - Select a threshold from which the signal start affecting the behavior of the motor

Torque Analogue In

The **Torque Analogue In** is an operating mode that makes the motor go to a specific speed controlled via an analogue digital input.

To activate this mode, put **P001** to **11-TrqAnalogIn**.



You can then use the following parameters to adjust the motor behavior:

- P008 - Acceleration ramp when changing speed IN RPM/S
- P009 - Deceleration ramp when changing speed in rpm/s
- P021 - Change the motor direction permanently (like for a mirror-like motor placement driving both with the same inputs, one will have P012 at 0 and the other at 1)
- P017 - The maximum current that the motor can use.

You can use the following parameters to modulate the analog signal:

- P004/P005 - Regulate the minimum and maximum reference of the analog signal.
- P043 - Select between -10V+10V and 0..10V on normal motors and 0..20mA and 4..20mA for MA option code motors.
- P045 - Select an offset for connecting the analog signal
- P046 - Select a multiplicative gain for the analog signal
- P047 - Select a threshold from which the signal start affecting the behavior of the motor

MultiSpeed

Multispeed mode uses a combination of digital inputs to select from up to 8 different preselected speeds.

To activate this mode, put **P001** to **04-MultiSpeed**

BSI (ONLINE)

- Status
- Parameter
 - System
 - Appl
 - User
 - P001-MODE**
 - P006-SpeedMax
 - P007-SpeedMin
 - P008-RampAcc
 - P009-RampDec
 - P017-IMax
 - P021-MotorChangeDir
 - P164-PosMin

Appl > User > P001-MODE

range: 01-SpeedAnalogIn ... 16-MultiPosCycle (default: 03-ModBus)

value = 04-MultiSpeed Modify

Reference source:

01-Speed analogic input
 Analog input is used as reference for the motor speed:
 - P004/P005: analog input range
 - P006/P007: speed range
 - P008/P009: accel/decel limits

02-ModBus + Dig.Input (Torque, Speed, Position)
 Modbus is used for reference change, digital inputs are used enable/run the motor

03-ModBus (Torque, Speed, Position)
 Modbus is used for reference change and for enable/run of motor

04-MultiSpeed
 Speed reference is selected via digital input configured as

Then put up to 3 digital inputs to **Multispeed binary sel**, depending on how many speeds you need to select from.

BSI (ONLINE)

- Status
- Parameter
 - System
 - Appl
 - User
 - Input_Output
 - Analog
 - Digital**
 - P010-InputFunc1
 - P011-InputFunc2
 - P012-InputFunc3
 - P013-InputFunc4
 - P014-InputFunc5

Group: Appl > Input_Output > Digital

Name	Value
Appl\Input_Output\Digital\P010-InputFunc1	1-Enable/Stand-by
Appl\Input_Output\Digital\P011-InputFunc2	2-Run/Stop
Appl\Input_Output\Digital\P012-InputFunc3	10-Multispeed binary sel 1
Appl\Input_Output\Digital\P013-InputFunc4	11-Multispeed binary sel 2
Appl\Input_Output\Digital\P014-InputFunc5	12-Multispeed binary sel 3
Appl\Input_Output\Digital\P032-AinFunc	0-Analog input
Appl\Input_Output\Digital\P015-OutFunc	0-NOT_USED
Appl\Input_Output\Digital\P020-DigInInvMask	0b00000 [bit]
Appl\Input_Output\Digital\P064-TargReachedHyst	0 rpm/mA/step
Appl\Input_Output\Digital\P065-TargReachedHystTime	0 ms

You can then select which speed is each selection in the parameters P110 – P117

- Input_Output
 - Analog
 - Digital
 - Accelerometer
 - Collision
 - MultiTrq
 - MultiSpeed**
 - P110-MultiSpeed1
 - P111-MultiSpeed2
 - P112-MultiSpeed3
 - P113-MultiSpeed4
 - P114-MultiSpeed5
 - P115-MultiSpeed6
 - P116-MultiSpeed7
 - P117-MultiSpeed8

Group: Appl > MultiSpeed

Name	Value
Appl\MultiSpeed\P110-MultiSpeed1	750 rpm
Appl\MultiSpeed\P111-MultiSpeed2	0 rpm
Appl\MultiSpeed\P112-MultiSpeed3	-750 rpm
Appl\MultiSpeed\P113-MultiSpeed4	0 rpm
Appl\MultiSpeed\P114-MultiSpeed5	750 rpm
Appl\MultiSpeed\P115-MultiSpeed6	0 rpm
Appl\MultiSpeed\P116-MultiSpeed7	-750 rpm
Appl\MultiSpeed\P117-MultiSpeed8	0 rpm

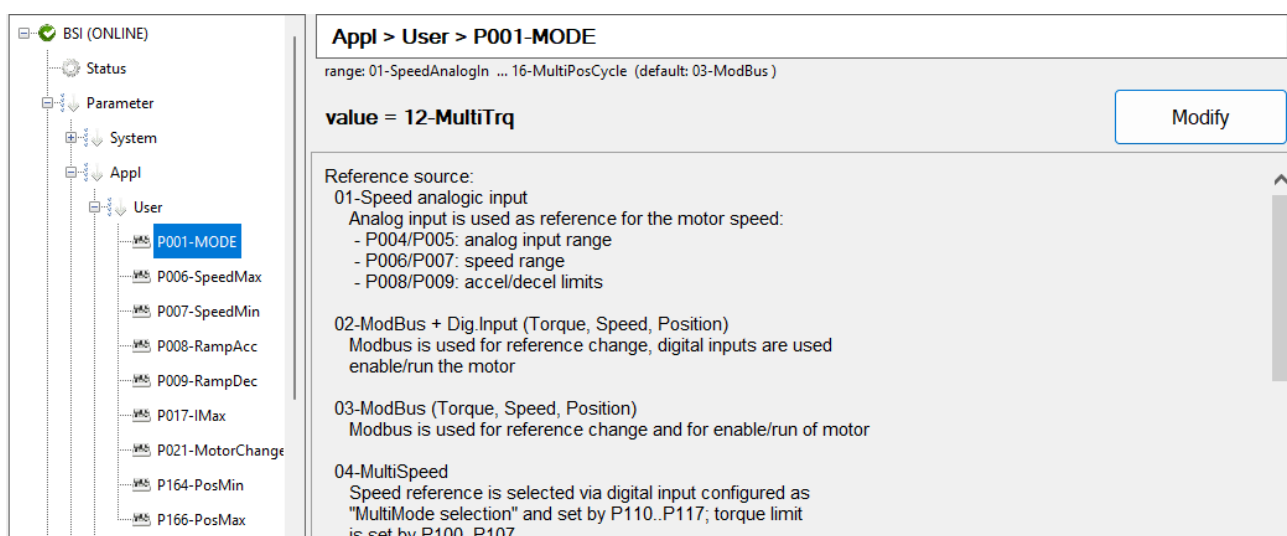
When the motor is enabled, the selected profile according to the digital inputs will be executed.

All profiles use the same acceleration and deceleration defined in P008 and P009 respectively.

MultiTorque

Multitorque mode uses a combination of digital inputs to select from up to 8 different preselected torque profiles.

To activate this mode, put **P001** to **12-MultiTrq**



BSI (ONLINE)

Status

Parameter

System

Appl

User

P001-MODE

P006-SpeedMax

P007-SpeedMin

P008-RampAcc

P009-RampDec

P017-IMax

P021-MotorChange

P164-PosMin

P166-PosMax

Appl > User > P001-MODE

range: 01-SpeedAnalogIn ... 16-MultiPosCycle (default: 03-ModBus)

value = 12-MultiTrq Modify

Reference source:

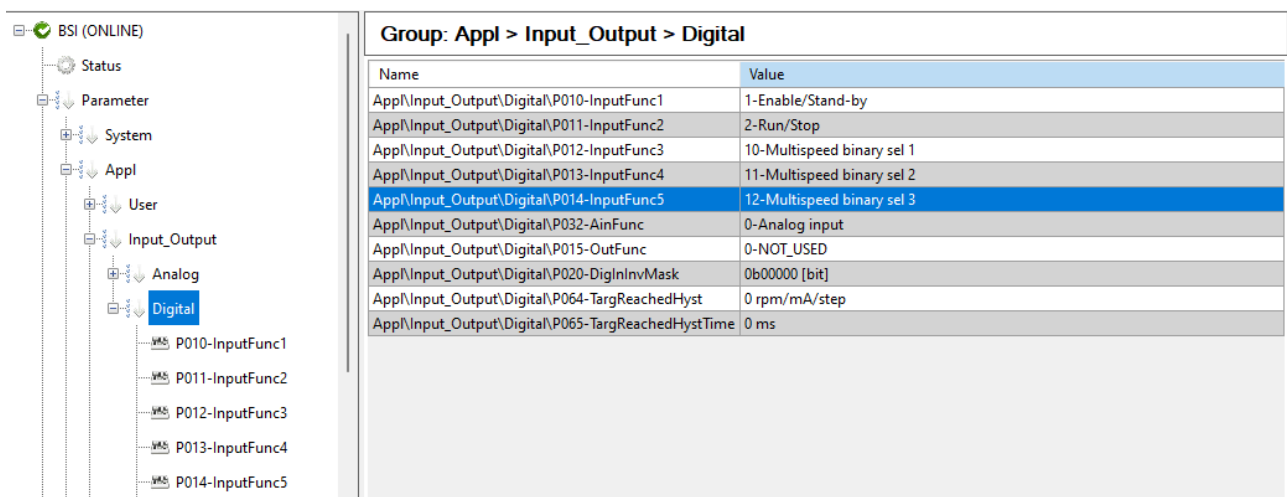
01-Speed analogic input
 Analog input is used as reference for the motor speed:
 - P004/P005: analog input range
 - P006/P007: speed range
 - P008/P009: accel/decel limits

02-ModBus + Dig.Input (Torque, Speed, Position)
 Modbus is used for reference change, digital inputs are used enable/run the motor

03-ModBus (Torque, Speed, Position)
 Modbus is used for reference change and for enable/run of motor

04-MultiSpeed
 Speed reference is selected via digital input configured as "MultiMode selection" and set by P110..P117; torque limit is set by P100..P107

Then put up to 3 digital inputs to **Multispeed binary sel**, depending on how many speeds you need to select from.



BSI (ONLINE)

Status

Parameter

System

Appl

User

Input_Output

Analog

Digital

P010-InputFunc1

P011-InputFunc2

P012-InputFunc3

P013-InputFunc4

P014-InputFunc5

Group: Appl > Input_Output > Digital

Name	Value
App\Input_Output\Digital\P010-InputFunc1	1-Enable/Stand-by
App\Input_Output\Digital\P011-InputFunc2	2-Run/Stop
App\Input_Output\Digital\P012-InputFunc3	10-Multispeed binary sel 1
App\Input_Output\Digital\P013-InputFunc4	11-Multispeed binary sel 2
App\Input_Output\Digital\P014-InputFunc5	12-Multispeed binary sel 3
App\Input_Output\Digital\P032-AinFunc	0-Analog input
App\Input_Output\Digital\P015-OutFunc	0-NOT_USED
App\Input_Output\Digital\P020-DigInInvMask	0b00000 [bit]
App\Input_Output\Digital\P064-TargReachedHyst	0 rpm/mA/step
App\Input_Output\Digital\P065-TargReachedHystTime	0 ms

You can select the torque applied with each profile with parameters P102 – P109.

- ▼ P008-RampAcc
- ▼ P009-RampDec
- ▼ P017-IMax
- ▼ P021-MotorChangeDir
- ▼ P164-PosMin
- ▼ P166-PosMax
- ▼ Input_Output
- ▼ Accelerometer
- ▼ Collision
- ▼ MultiTrq
 - ▼ P102-MultiTrq1
 - ▼ P103-MultiTrq2
 - ▼ P104-MultiTrq3
 - ▼ P105-MultiTrq4
 - ▼ P106-MultiTrq5
 - ▼ P107-MultiTrq6
 - ▼ P108-MultiTrq7
 - ▼ P109-MultiTrq8
- ▼ MultiSpeed

Group: Appl > MultiTrq	
Name	Value
App\MultiTrq\P102-MultiTrq1	100.0 %
App\MultiTrq\P103-MultiTrq2	100.0 %
App\MultiTrq\P104-MultiTrq3	100.0 %
App\MultiTrq\P105-MultiTrq4	100.0 %
App\MultiTrq\P106-MultiTrq5	100.0 %
App\MultiTrq\P107-MultiTrq6	100.0 %
App\MultiTrq\P108-MultiTrq7	100.0 %
App\MultiTrq\P109-MultiTrq8	100.0 %

You can then select the maximum speed of each torque profile with parameters P110 – P117

- ▼ Input_Output
- ▼ Analog
- ▼ Digital
- ▼ Accelerometer
- ▼ Collision
- ▼ MultiTrq
- ▼ MultiSpeed
 - ▼ P110-MultiSpeed1
 - ▼ P111-MultiSpeed2
 - ▼ P112-MultiSpeed3
 - ▼ P113-MultiSpeed4
 - ▼ P114-MultiSpeed5
 - ▼ P115-MultiSpeed6
 - ▼ P116-MultiSpeed7
 - ▼ P117-MultiSpeed8

Group: Appl > MultiSpeed	
Name	Value
App\MultiSpeed\P110-MultiSpeed1	750 rpm
App\MultiSpeed\P111-MultiSpeed2	0 rpm
App\MultiSpeed\P112-MultiSpeed3	-750 rpm
App\MultiSpeed\P113-MultiSpeed4	0 rpm
App\MultiSpeed\P114-MultiSpeed5	750 rpm
App\MultiSpeed\P115-MultiSpeed6	0 rpm
App\MultiSpeed\P116-MultiSpeed7	-750 rpm
App\MultiSpeed\P117-MultiSpeed8	0 rpm

All profiles use the same acceleration and deceleration defined in P008 and P009 respectively.

Multiposition

Multiposition mode uses a combination of digital inputs to select from up to 8 different preselected positions

To activate this mode, put **P001** to **13-MultiPos**

BSI (ONLINE)

- Status
- Parameter
 - System
 - Appl
 - User
 - P001-MODE**
 - P006-SpeedMax
 - P007-SpeedMin
 - P008-RampAcc
 - P009-RampDec
 - P017-IMax
 - P021-MotorChangeDir
 - P164-PosMin
 - P166-PosMax
 - Input_Output
 - Accelerometer
 - Collision

Appl > User > P001-MODE

range: 01-SpeedAnalogIn ... 16-MultiPosCycle (default: 03-ModBus)

value = 13-MultiPos Modify

Reference source:

01-Speed analogic input
 Analog input is used as reference for the motor speed:
 - P004/P005: analog input range
 - P006/P007: speed range
 - P008/P009: accel/decel limits

02-ModBus + Dig.Input (Torque, Speed, Position)
 Modbus is used for reference change, digital inputs are used enable/run the motor

03-ModBus (Torque, Speed, Position)
 Modbus is used for reference change and for enable/run of motor

04-MultiSpeed
 Speed reference is selected via digital input configured as "MultiMode selection" and set by P110..P117; torque limit is set by P100..P107

05-CanOpen - DSP402
 Communication is performed via DS301 over can-bus while motor behaviour is managed by DS402 state machine; input/outputs digital and analog can be accessed via object dictionary (pdo or sdo)

Then put up to 3 digital inputs to **Multispeed binary sel**, depending on how many speeds you need to select from.

BSI (ONLINE)

- Status
- Parameter
 - System
 - Appl
 - User
 - Input_Output
 - Analog
 - Digital**
 - P010-InputFunc1
 - P011-InputFunc2
 - P012-InputFunc3
 - P013-InputFunc4
 - P014-InputFunc5

Group: Appl > Input_Output > Digital

Name	Value
App\Input_Output\Digital\P010-InputFunc1	1-Enable/Stand-by
App\Input_Output\Digital\P011-InputFunc2	2-Run/Stop
App\Input_Output\Digital\P012-InputFunc3	10-Multispeed binary sel 1
App\Input_Output\Digital\P013-InputFunc4	11-Multispeed binary sel 2
App\Input_Output\Digital\P014-InputFunc5	12-Multispeed binary sel 3
App\Input_Output\Digital\P032-AinFunc	0-Analog input
App\Input_Output\Digital\P015-OutFunc	0-NOT_USED
App\Input_Output\Digital\P020-DigInInvMask	0b00000 [bit]
App\Input_Output\Digital\P064-TargReachedHyst	0 rpm/mA/step
App\Input_Output\Digital\P065-TargReachedHystTime	0 ms

You can then use P120 – P135 to write the desired positions

- ☑ P021-MotorChangeDir
- ☑ P164-PosMin
- ☑ P166-PosMax
- ☑ Input_Output
- ☑ Accelerometer
- ☑ Collision
- ☑ MultiTrq
- ☑ MultiSpeed
- ☑ **MultiPos_Ref**
- ☑ MultiPos_Mode
- ☑ MultiDelay
- ☑ Homing
- ☑ PosScaling
- ☑ Fieldbus
- ☑ Motor

Group: Appl > MultiPos_Ref

Name	Value
App\MultiPos_Ref\P120-MultiPos_Ref1	0 posunits
App\MultiPos_Ref\P122-MultiPos_Ref2	4096 posunits
App\MultiPos_Ref\P124-MultiPos_Ref3	8192 posunits
App\MultiPos_Ref\P126-MultiPos_Ref4	12288 posunits
App\MultiPos_Ref\P128-MultiPos_Ref5	16384 posunits
App\MultiPos_Ref\P132-MultiPos_Ref6	20480 posunits
App\MultiPos_Ref\P134-MultiPos_Ref7	24576 posunits
App\MultiPos_Ref\P135-MultiPos_Ref8	28672 posunits

You can use a lot of parameters to define the positioning behavior.

- All profiles use the same acceleration and deceleration defined in P008 and P009 respectively.
- You can select for each position the respective speed in parameters P110 – 117
- You can limit the torque for each position with parameters P102-P109
- You can choose the type of position behavior for each position with parameter P221-228
 - Absolute: Position setpoint is interpreted as Absolute value to be reached on index selection
 - Relative: Position setpoint is interpreted as relative to motor OFF position on index selection
 - Additive: Position setpoint is interpreted as relative on previous setpoint; offset is added on run rising edge

Homing

If you need to home the motor for the use of Profile Position, you can operate in the following way:

- Define the Homing procedure parameters in the specific homing section of the software

- ☑ Accelerometer
- ☑ Collision
- ☑ MultiTrq
- ☑ MultiSpeed
- ☑ MultiPos_Ref
- ☑ MultiPos_Mode
- ☑ MultiDelay
- ☑ **Homing**
 - ☑ P152-HomingType
 - ☑ P153-HomingSwitchSpeed
 - ☑ P154-HomingIndexSpeed
 - ☑ P155-HomingAccel
 - ☑ P156-HomingDecel
 - ☑ P157-HomingTimeOut
 - ☑ P158-HomingMaxCurr
 - ☑ P159-HomingEnable
 - ☑ P168-HomingOffsetLOW
 - ☑ P169-HomingOffsetHIGH

Name	Value
App\Homing\P152-HomingType	3: CURRENT POSITION
App\Homing\P153-HomingSwitchSpeed	200 rpm
App\Homing\P154-HomingIndexSpeed	150 rpm
App\Homing\P155-HomingAccel	3000 rpm/s
App\Homing\P156-HomingDecel	6000 rpm/s
App\Homing\P157-HomingTimeOut	180 s
App\Homing\P158-HomingMaxCurr	10.000 A
App\Homing\P159-HomingEnable	0-DISABLE
App\Homing\P168-HomingOffsetLOW	0x0000 posunits
App\Homing\P169-HomingOffsetHIGH	0x0000 posunits

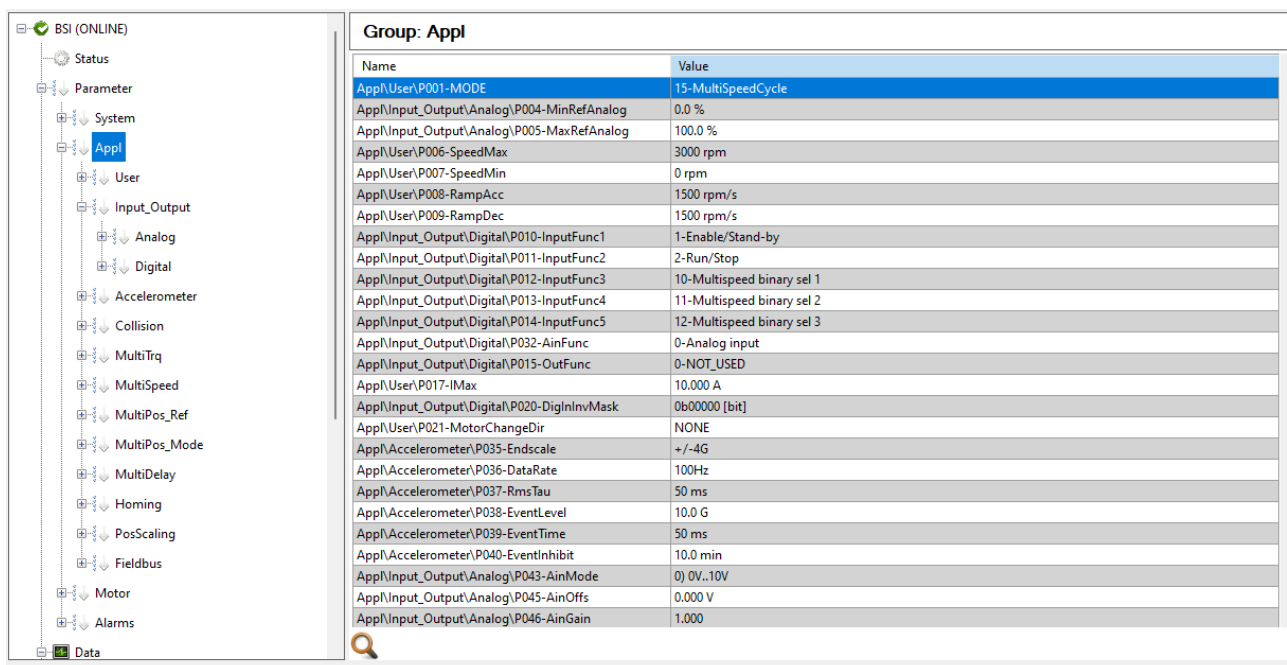
- If a Homing except the homing in place is chosen, there will be the need to connect a limit sensor or home sensor to the I/O connector and set the corresponding digital input to that role in parameters P010-P014.

- If the digital inputs are not available, you can use P032 to transform the Analogic Input into a Digital Input function. **DO NOT DRIVE ANALOG INPUT WITH 24V OR IT WILL DAMAGE THE DRIVE.** It's still a 0-10V or 0..20mA input, just working as digital internally to enable the function programmed.

MultispeedCycle - MultipositionCycle

Multispeedcycle and multipositioncycle allow respectively the use of automatic switching of Multispeed and Multiposition modes as described above.

- Set P001 to either 15 or 16



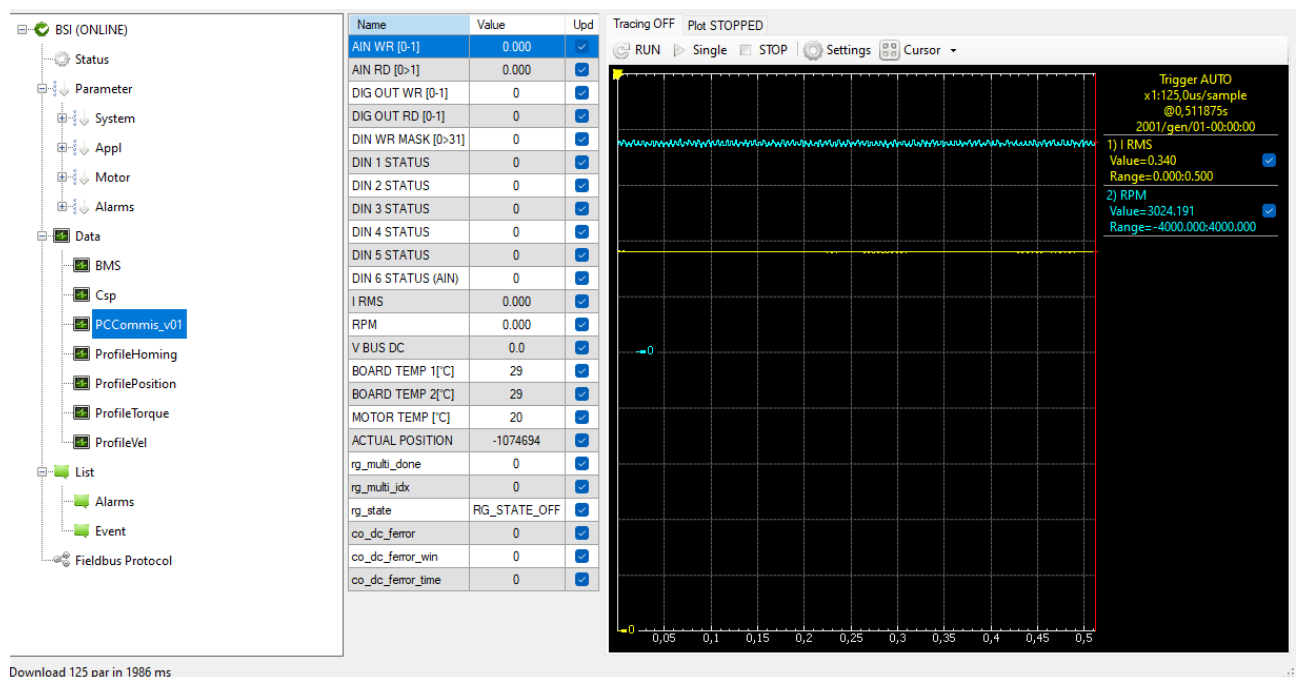
Name	Value
Appl\User\P001-MODE	15-MultiSpeedCycle
Appl\Input_Output\Analog\P004-MinRefAnalog	0.0 %
Appl\Input_Output\Analog\P005-MaxRefAnalog	100.0 %
Appl\User\P006-SpeedMax	3000 rpm
Appl\User\P007-SpeedMin	0 rpm
Appl\User\P008-RampAcc	1500 rpm/s
Appl\User\P009-RampDec	1500 rpm/s
Appl\Input_Output\Digital\P010-InputFunc1	1-Enable/Stand-by
Appl\Input_Output\Digital\P011-InputFunc2	2-Run/Stop
Appl\Input_Output\Digital\P012-InputFunc3	10-Multispeed binary sel 1
Appl\Input_Output\Digital\P013-InputFunc4	11-Multispeed binary sel 2
Appl\Input_Output\Digital\P014-InputFunc5	12-Multispeed binary sel 3
Appl\Input_Output\Digital\P032-AinFunc	0-Analog input
Appl\Input_Output\Digital\P015-OutFunc	0-NOT_USED
Appl\User\P017-IMax	10.000 A
Appl\Input_Output\Digital\P020-DigInInvMask	0b00000 [bit]
Appl\User\P021-MotorChangeDir	NONE
Appl\Accelerometer\P035-Endscale	+/-4G
Appl\Accelerometer\P036-DataRate	100Hz
Appl\Accelerometer\P037-RmsTau	50 ms
Appl\Accelerometer\P038-EventLevel	10.0 G
Appl\Accelerometer\P039-EventTime	50 ms
Appl\Accelerometer\P040-EventInhibit	10.0 min
Appl\Input_Output\Analog\P043-AinMode	0 0V..10V
Appl\Input_Output\Analog\P045-AinOffs	0.000 V
Appl\Input_Output\Analog\P046-AinGain	1.000

- Define your 8 speeds or position profiles
- Use parameters P142-149 to define the delay between each profile change once the target is reached
- Enabling the motor will automatically activate the cycle, from speed or position 1 to 8, cyclically. If you cycle has less than 8 different inputs, just repeat them in a correct pattern while filling the 8 parameters. Stopping and starting the motor will always restart from the first.

Test environment

It's possible to check and simulate all digital analog inputs behavior before wiring any physical connection, so to test the logic behind it.

- Program the drive the way you want it to behave.
- Go to the Data section in BSI and select the PCCommis_v01 interface. Click on the Upd label in the data to check all variables so they update in real time
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- Here you can write in AIN RW[0-1] the value you want for the analogic input (1.0 = 100% 0.0 = 0%). It will be reflected in the AIN RD[0-1] below.
- You can write the combination of digital inputs active using the DIN WR MASK [0-31]. The result will be reflected in the DIN 1-5 STATUS below. It uses binary combination. For the sake of brevity only the first 10 combinations have been written in this table to show the logic.

Integer Number	Din 1	Din 2	Din 3	Din 4	Din 5
0	0	0	0	0	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	0
4	0	0	1	0	0
5	1	0	1	0	0
6	0	1	1	0	0
7	1	1	1	0	0
8	0	0	0	1	0
9	1	0	0	1	0
10	0	1	0	1	0

- Putting in the right values according to the programming will activate the motor.