IDE

MC-02

INTERACTIVE DEVELOPMENT ERVIRONMENT FOR MC-02 MOTION CONTROLLER

INTERINAR ELECTRONICS
http://www.interinar.com

rev.1.00

Copyright Information

Disclaimer of Liability

Interinar Electronics is not responsible for special, incidental, or consequential damages resulting from any breach of warranty, or under any legal theory, including lost profits, downtime, goodwill, damage to or replacement of equipment or property, or any costs of recovering, reprogramming, or reproducing any data stored in or used with Interinar products.
Interinar Electronics is also not responsible for any personal damage, including that to life and health, resulting from use of any of our products. Customer takes full responsibility for any application where Interinar products are implemented.

Interinar Electronics Technical Support
Email: support@interinar.com
Website: http://www.interinar.com

1 MC-02 SOFTWARE REFERENCE

The MC-02 Interactive Development Environment (IDE) software works only with MC-02A4, MC-02A2 and MC-02A1 motion controllers.
NOTE: IDE software is a tool for testing functionality of MC-02 and it is not a user-end application. With IDE, the user can enter and verify motion parameters and test short programs before creating a final application.

1.1 SOFTWARE INSTALLATION

SYSTEM REQUIREMENTS: Microsoft Windows 7 with Microsoft .NET Framework 3.5 or higher.

The MC-02 software installation is an automated process.
Download newest version from our website http://www.interinar.com and save it on your computer.
Next, double click on the file you just saved and installation process will begin.
When this application is installed on the client machine, a shortcut will be added to the Start Menu, and the application can be uninstalled via Add/Remove Programs.
Program will open in a single window with empty parameter fields.

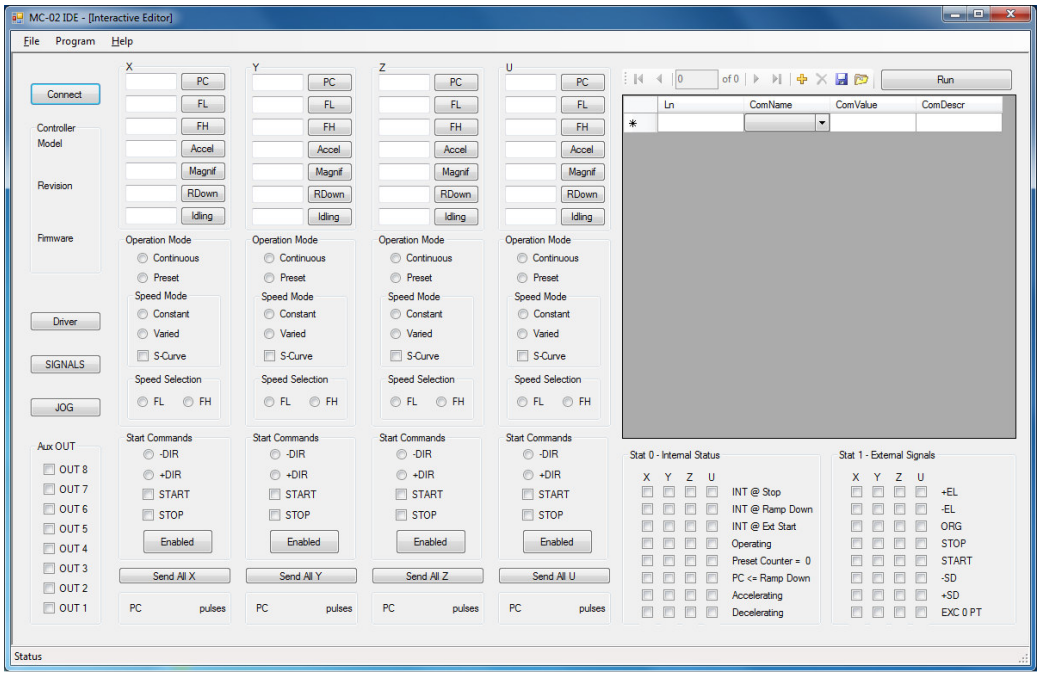
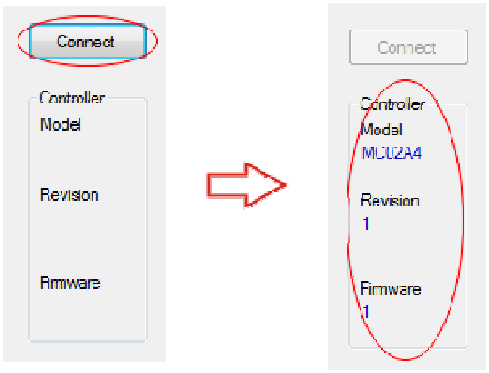


Figure 1. MC-02 Interactive Development Environment

1.1.1 COMMUNICATION WITH MC-02 CONTROLLER

Connect the MC-02 controller to the USB port.
If this is the first time the MC-02 is connected to client machine, the Windows will detect it as a new device and it will load the driver.
Once new device is detected, you may click the "Connect" button.
If successful and the MC-02 controller is recognized, then the following information will show up:



"Controller" block:

- Model – model number
- Revision – hardware revision
- Firmware – firmware version

The changes to the main window will include:

- Motion Parameters section of the screen will be filled with default parameters
- PC counters will be reset to 0
- Status section will be updated with current conditions

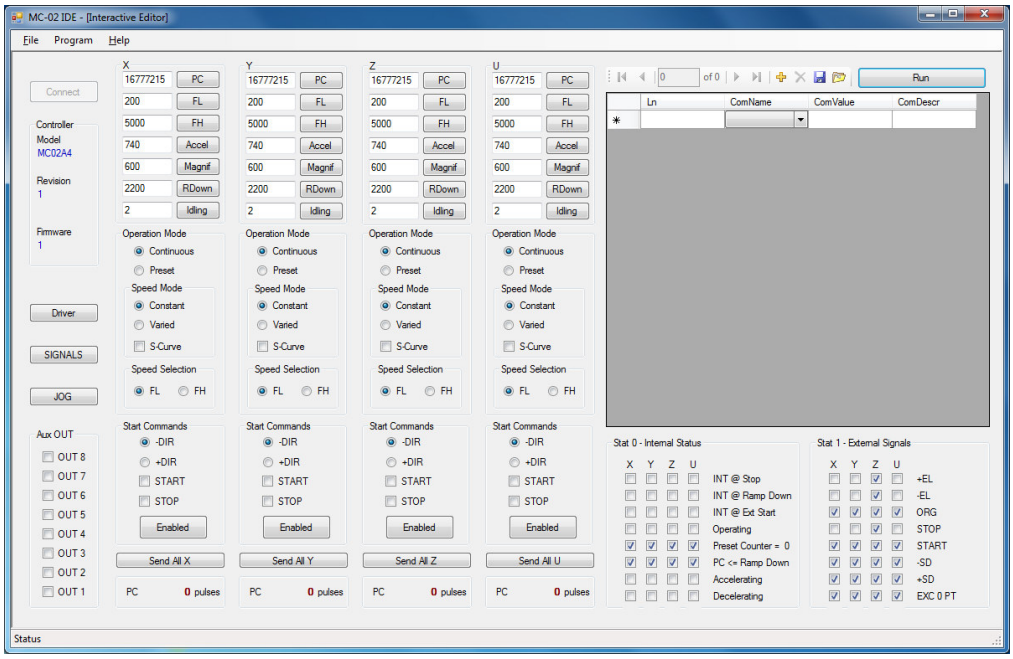
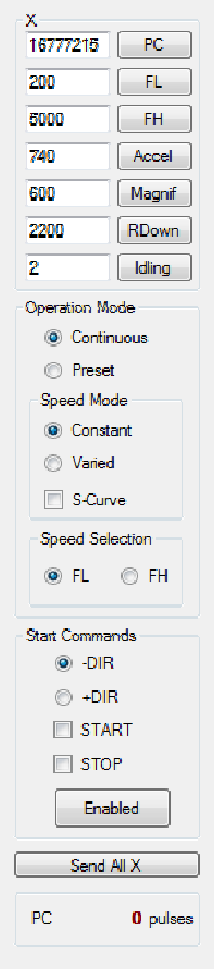


Figure 2. MC-02 connected and ready

1.2 MOTION PARAMETERS

This section allows sending commands to MC-02 without writing any code. It is highly recommended that customer will start using this section before entering the Project Editor, where minimum knowledge of MC-02 hardware and language will be required.



Here, all system registers and most important commands are easily available. This section is a container for other controls grouped by function:

- Register Access – from R0 to R6 (top to bottom). For convenience the buttons are labeled with their function and not with register name.
- Operation Mode
- Speed Mode
- Speed Selection
- Start and Direction Commands
- Enable Driver button
- Send All button
- PC Counter - Actual Value

1.2.1 REGISTER ACCESS

This section allows writing to each of the seven (7) registers. Enter the value in the text box and click the button next to it. The value must be within the range specified for each register (see User Manual). The registers are labeled as:

- R0 - PC Preset counter
- R1 - FL Low speed pulse rate
- R2 - FH High speed pulse rate
- R3 - Accel Acceleration/Deceleration pulse rate
- R4 - Magnif Magnification factor
- R5 - RDown Ramping Down Point
- R6 - Idling Number of Idling pulses

Instead of clicking on each button separately, you may enter values for all registers, and then click the "Send ALL" button located on the bottom of the block.

No reading is permitted with the exemption of R0. The PC pulses shown on the bottom of the column represent the current value of R0.

1.2.2 OPERATION MODE

Two operation modes:

- Continuous – R0 (PC) value is disregarded and step pulse is output continuously
- Preset – step pulse is output as long as R0 (PC) value is greater than 0

Checking either Radio Button will activate selected mode.

1.2.3 SPEED MODE

Two basic speed modes:

- Constant – operation at FL or FH speed, instant changes between FL and FH
- Varied – operation at FL of FH speed, gradual changes (ramping) between FL and FH

Checking either Radio Button will activate selected Mode.

When selected Varied, then the acceleration (ramping up) and deceleration (ramping down) can follow:

- Linear characteristic
- S-Curve characteristic

Checking the Check Box will activate the S-Curve.

1.2.4 SPEED SELECTION

Manual speed selection between:

- FL – Low speed
- FH – High speed

Checking either Radio Button will activate selected speed.

1.2.5 START AND DIRECTION COMMANDS

Direction selection:

- +DIR - Positive Direction
- - DIR - Negative Direction

The actual direction of rotation will depend on motor's connection with the driver.
Matching the +DIR with clockwise or counter-clockwise rotation of the motor can be achieved by swapping the wires of only one phase of the motor.

Start and Stop commands:

- START - Start and Reset
- STOP - Immediate Stop

The result of the START command depends on the STOP command and the STOP command has a higher priority.
Checking either Check Box will activate selected command.

1.2.6 ENABLE DRIVE BUTTON

The ENABLED button in this section allows enabling or disabling the driver.
Only drivers from Interinar will have direct access to the Enable signal:

- BSD-02
- BSD-02LH
- BSD-071

Other drivers may have this signal not available and may require using an external wire jumper.
The step motor driver must be enabled in order to power (energize) the motor.

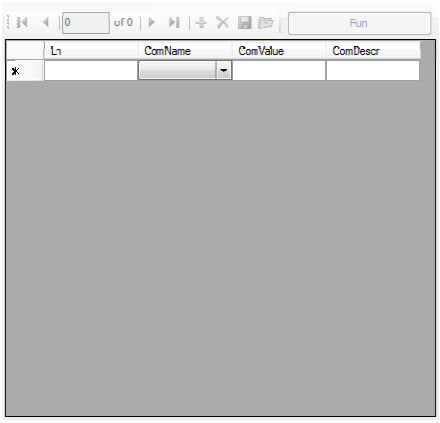
1.2.7 SEND ALL BUTTON

Instead of clicking on each button in Registers section, you may first enter all values and then use single "Send ALL" button located on the bottom of the column.

1.2.8 PC COUNTER - ACTUAL VALUE

R0 register, which is called a Pulse Counter (PC), can be read indirectly during the Status calls and its value is displayed on the bottom as PC pulses. This counter is updated continuously and it always shows the current (or remaining) value in the register R0.

1.3 PROGRAM EDITOR



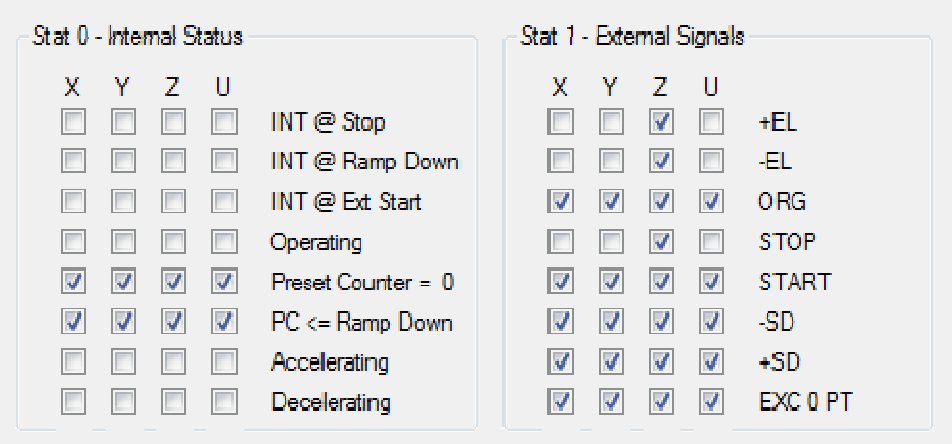
This section is intended for writing and testing short programs.

NOTE: This feature is not available in this version.

1.4 STATUS

This section of the screen represents the current state of the internal and external signals. Once the communication with MC-02 is established, the status is updated continuously.

1.4.1 STAT 0 – INTERNAL SIGNALS



Stat 0 indicates the current condition of Internal Signals

- INT @ Stop
  – if checked, the Interrupt signal is set each time the controller stops (reserved – not available in this version)
- INT @ Ramp Down
  – if checked, the Interrupt signal is set each time the PC reaches the Ramp Down Point (reserved – not available in this version)
- INT @ Ext Start
  – if checked, the Interrupt signal is set each time the controller receives External Start signal (reserved – not available in this version)
- OPERATING
  – if checked, the step pulse is present on the output. It does not mean the motor is running. If the driver is disabled, the motor will not increment position even in the presence of the step pulse.
- PRESET COUNTER = 0
  – if checked, the PC value is 0 (zero).
- PC <= Ramp Down
  – if checked, the value of PC is less or equal to the value of Ramp Down Point.
- Accelerating
  – if checked, the motor is accelerating
- Decelerating
  – if checked, the motor is decelerating

1.4.2 STATUS 1 – EXTERNAL SIGNALS

Stat 1 indicates the current condition of External Signals connected to MC-02.

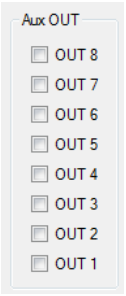
- +EL POSITIVE END LIMIT
  - if is checked, the +EL signal connected to +EL terminal is High. It means the mechanical End

Limit in Positive direction of the travel has been reached and the controller executed immediate stop. It may also mean the Limit Sensor is NOT CONNECTED.

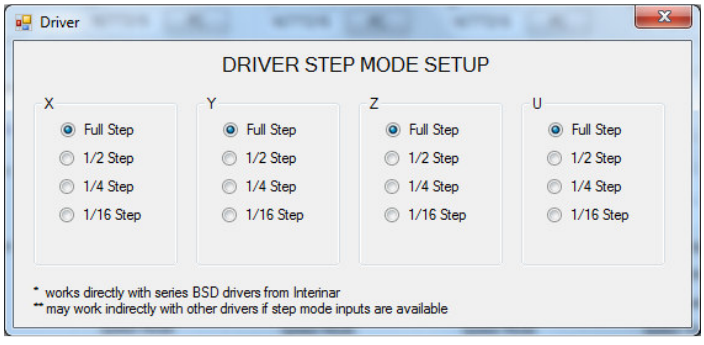
- -EL NEGATIVE END
  - if is checked, the -EL signal connected to -EL terminal is High. It means the mechanical End Limit in Negative direction of the travel has been reached and the controller executed immediate stop. It may also mean the Limit Sensor is NOT CONNECTED.
- ORG ORIGINAL
  - if checked, the ORG signal connected to ORG terminal is High. This signal is used in Origin Return routine. It may also mean the ORG Sensor is NOT CONNECTED.
- STOP
  – if checked, the STP signal connected to STP terminal is High. It means the controller executed the External Stop routine.
- START
  – if checked, the STA signal connected to STA terminal is High. It means the controller executed the External Start (only if enabled in Signals window).
- -SD
  – if checked, the -SD signal connected to -SD terminal is High.
- +SD
  – if checked, the +SD signal connected to +SD terminal is High.
- EXC 0 PT
  - excitation is at origin point (reserved and not available in this version).

1.5 AUX OUT

The MC-02 provides access to eight (8) auxiliary outputs via 14-pin header J1 (see User Manual).
Each of these outputs may be used as a simple flag, directly connected to LED or used as a trigger for an external process.
If checked the numbered box, the corresponding signal will turn ON (High).
This version of the IDE software does not read the status of the aux outputs.



1.6 STEP MODE SELECTION WINDOW

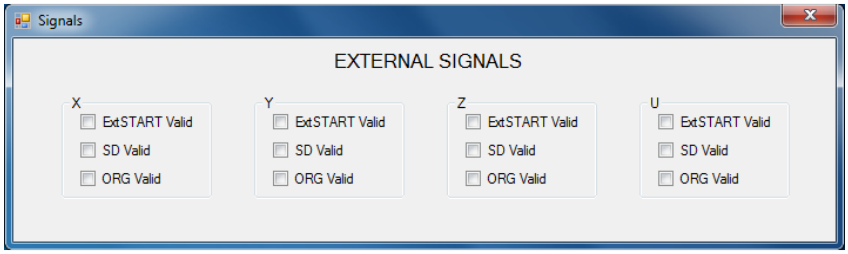


The Driver control button opens the Driver Step Mode Setup window.
Only the drivers from Interinar Electronics will respond to the changes in this window:

- BSD-02
- BSD-02LH
- BSD-071

Other drivers may or may not have available inputs for step mode setup.

1.7 EXTERNAL SIGNALS WINDOW

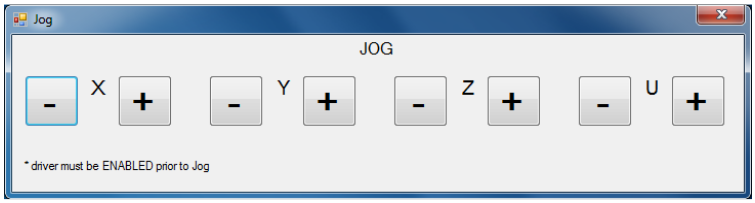


The SIGNALS control button will open the External Signals window.
This window makes possible to activate (set valid) external signals

- External Start
- SD - Start Deceleration Point
- ORG – Origin Return

If checked, the corresponding signal is active (set valid).
If unchecked, the corresponding signal is deactivated (set invalid) and MC-02 will ignore it.

1.8 JOG WINDOW



The Jog control button opens the JOG window.
Each button is an ON/OFF button.
The "+" button will cause the motor to advance in positive direction at FL speed.
The "-" button will cause the motor to advance in negative direction at FL speed.