

Instras Motor Interface Module (MiM)

PC Communication Protocol Description

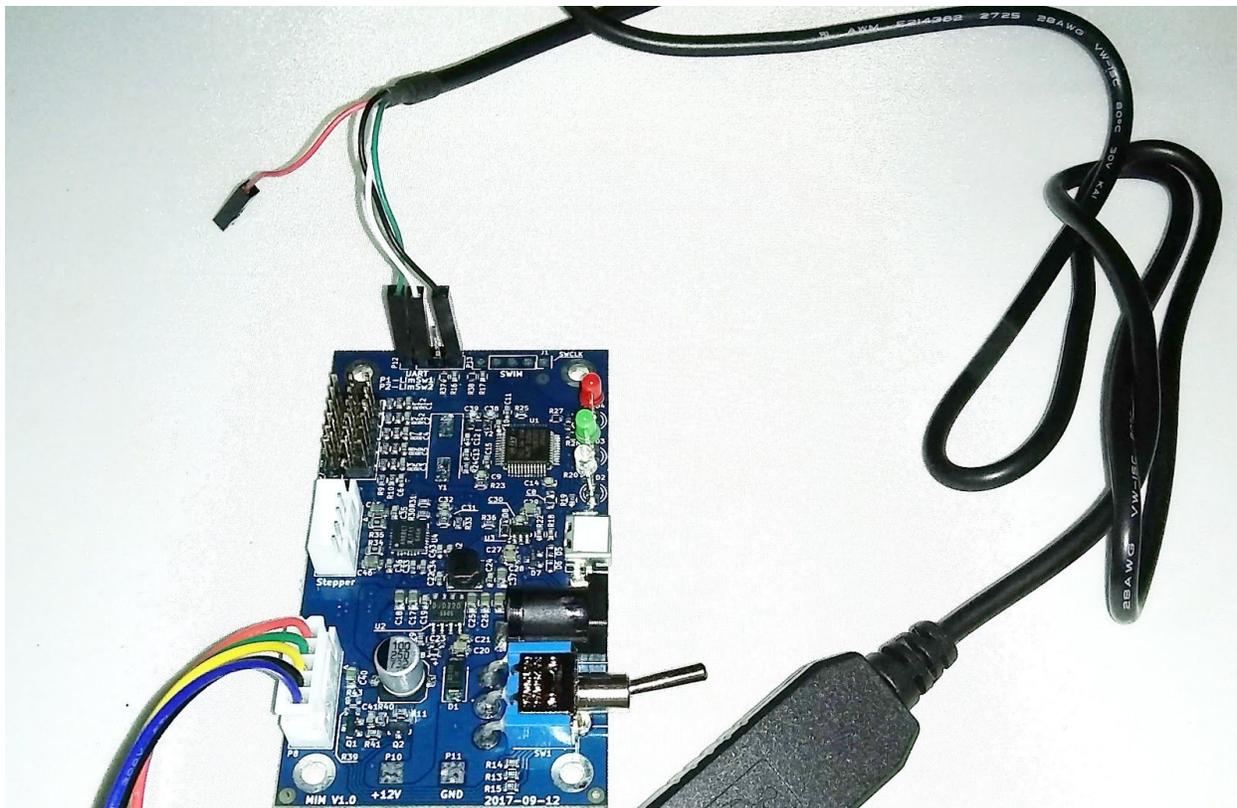
Purpose of this document

Purpose of this document is to describe the Instras MiM device firmware communication.

Device description and working principles

The Motor Interface Module (MiM) used in the SCK-300/SCK-300P spin coater units can be connected to any device that supports either a USB-COM(UART) protocol converter or has the COM/RS232 interface. The device supports 3.3V logic level signals, thus it can not be connected directly to regular RS232 communication port. To use it with regular RS232 port, voltage level converter must be used. The pins for connecting the data cable are shown in the following image.

Beware – TX shows the pin through which it TRANSMITS the data, and RX – RECEIVES. In most of the cases it is necessary to connect the TX of one device with the RX of other and vice versa.



Instras MiM supports UART communication with 19200 baud rate, 8 data bits, 1 stop bit, RTS/CTS flow control and no parity bits. All commands and responses sent to or from the MiM are in text (ASCII) format. Every command and response ends with new line (10 in ASCII table) and carriage return (13 in ASCII table) symbols.

The MiM device can receive commands from external device. This allows setting and getting the current RPM of the spin coater motor, as well as control a stepper motor for future expansion.

Commands to Connect and Control SCK-300[P] Spin Coater units.

1. Send Commands to Initialize the SCK-300 unit. These must be sent every time the SCK is powered on since they are not stored on MiM board.
 - 1.1. Send command to set the Start PWM: **“SetStartPWM,110”**. This is used to make sure motor spins if the speed is set at rpms below 1000 rpms initially.
 - 1.2. Send command to set the motor profile slope: **“SetSlope,950”**. This is the slope from the motor profile x100 to turn it into an integer.
 - 1.3. Send command to set the motor profile intercept: **“SetIntercept,550”**. This is the intercept from the motor profile. For the SCK-300 use a value of 200 instead.
 - 1.4. Lastly, send command to turn on the spin coater motor: **“BLDCon”**
2. Send commands to set the desired speed in RPMs and measure the actual RPM value
 - 2.1. Send command to set speed to 1500 rpms: **“SetRPM,1500”**. The speed can be changed while motor is already spinning.
 - 2.2. Send command to get current speed: **“GetRPM”**. This command is usually ran in a loop to continuously monitor speed.
 - 2.3. Send command to stop motor: **“SetRPM,0”**.
3. Send command to turn off motor: **“BLDCoff”**

A full list of supported commands can be found at the GitHub Gist below.

<https://gist.github.com/ns96/ef95fd06573a871adfa1c4bed21eef43>

Connecting MiM Using 3.3V TTL RS232-USB Adapter

Using the [Kootek PL2303HX USB adapter](#) the connectivity is as above. The [Termite](#) program can be used for testing. Note, only connect the RX, TX, Ground pins. Do NOT connect the Voltage (Red) pin.

Connecting STV3S Using HC-06 Serial Bluetooth Wireless RF Transceiver Module

It is also possible to use a [Serial Bluetooth Transceiver](#) to make wireless connections from bluetooth enabled devices (phones, tablets, laptops etc).

Sample Java Code

Sample Java code for communicating with the MiM can be downloaded from github at the link below. <https://github.com/ns96/pdcTouch/blob/master/src/mim/MiMTalk.java>