

# Instras PDC 3.2 (STV3S) Firmware

## PC Communication Protocol Description

### **Purpose of this document**

Purpose of this document is to describe the Instras PDC3 device firmware communication.

### **Device description and working principles**

Instras PDC3 firmware containing devices can be connected to any device that supports either 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 PDC3 supports UART communication with 9600 baud rate, 1 stop bit and no parity bits. All commands and responses sent to or from Instras PDC 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.

Instras PDC3 device can receive commands from external device. This allows setting and getting the output PWM width of channels S1 and S2. Also, Instras PDC3 can send the last measured RPM value.

When external device is connected, it must switch the Instras PDC3 device to PC control mode before issuing any other commands. Any commands other than setting the mode will not affect the operation of Instras PDC3 device if it is in a normal operation mode.

## Supported commands and error messages

Table 1. Instras PDC3 supported commands

Command	Syntax	Response	Description
PC control mode	<b>MODE PC</b>	OK	This command switches the device to PC control mode
Normal operation mode	<b>MODE NORMAL</b>	OK	This command switches the device to normal operation mode
Set S1 PWM width	<b>SET S1 xxxx</b>	OK	This Command sets the PWM output width for channel S1. Here xxxx – PWM output width in microseconds. PWM output width can be 1000-2000us or 0us (no PWM signal)
Set S2 PWM width	<b>SET S2 xxxx</b>	OK	This Command sets the PWM output width for channel S2. Here xxxx – PWM output width in microseconds. PWM output width can be 1000-2000us or 0us (no PWM signal)
Get S1 PWM width	<b>GET S1</b>	xxxx	Instras PDC3 transmits current S1 channel PWM width in microseconds
Get S2 PWM width	<b>GET S2</b>	xxxx	Instras PDC3 transmits current S2 channel PWM width in microseconds
Set measured motor RPM	<b>GET RPM</b>	xxxx	Instras PDC3 transmits last measured RPM value
<b>Commands Below Are Only Valid In Stepper Motor Mode</b>			
Set S1 RPM value	<b>SET S1 xxxx</b>	OK	This Command sets the desired RPM value for the stepper motor which translates into pulses per second for channel S1. Here xxxx – RPM value in the range from 0 - SPEED value set in the device
Set S2 DIR	<b>SET S2 CW/CCW</b>	OK	This Command sets the direction of rotation for the stepper motor. Here CW will make motor move Clockwise, while CCW will move it Counter-Clockwise.

Instras PDC3 device sends the following error messages:

**ERR:3** – change of parameter is prohibited. This message is sent if PWM value was tried to be when not in PC control mode.

**ERR:1** – wrong parameter value. This message is sent if the PWM value sent are not in allowed range.

**ERR:0** – unknown command. This message is sent when Instras PDC3 receives an unknown command.

### Connecting STV3S Using 3.3V TTL RS232-USB Adapter

Using the [Kootek PL2303HX USB adapter](#) (\$8.99) the connectivity is as shown. 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 STV3S can be downloaded from github at this link (<https://github.com/ns96/SCKTalk>).