



MotoView User's Manual

Gamatronix Configuration/Test Software
For the Gamoto Motor controller

User's Manual: Rev G

Documents the following versions:
Firmware rev 4 and later
MotoView Software v. 1.0.15 and later
PCB Hardware rev. E and later

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MotoView

Motor Controller Configuration / Test Software

1. Overview

MotoView is Windows-based software, used to test and configure the Gamoto PID motor controller. It communicates through the PC serial port, through an RS-232 TTL converter to the serial port on the Gamoto board. System Requirements are as follows:

PC running Windows 95/98/NT/2000/XP

Available serial port

RS-232 TTL converter, such as the SuperDroidRobots Type 1 converter

Gamoto motor controller

DC Motor with quadrature encoders

Power supply for Gamoto and motor

For initial setup of the hardware, refer to the Gamoto Quick-Start Guide, available on the Gamatronix website.

2. Theory of Operation

The MotoView software communicates through the PC serial port using the Gamoto serial protocol. Registers can be read and written to, enabling the user to set the PID tuning constants, adjust the operating modes, and test the various functions of the Gamoto.

3. Installing MotoView

MotoView can be downloaded from the Gamatronix website. The link is listed on the Gamoto product description page. After downloading the file, launch the **setup.exe** program to begin installation.

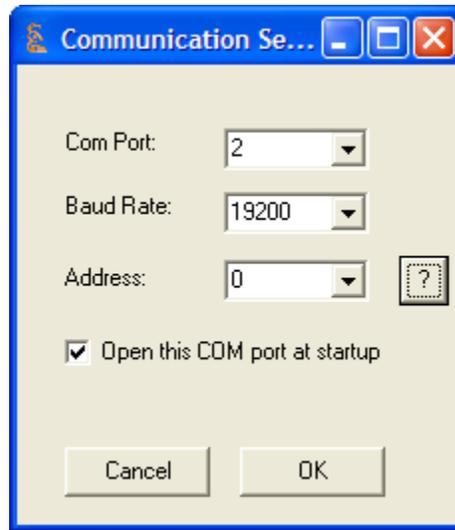
4. Running MotoView

The MotoView shortcut for launching the program should now be listed in your Start->Programs menu, in the Gamatronix program group. Launching the program will result in the following presentation:



4.1 Serial Port Setup

The first step is to configure the serial port. Choose Communication -> Settings to set the COM port and baud rate. The default is COM 1, 19200. If you select 9600 baud, you need to change a dipswitch setting (SW2, ON=9600) on the Gamoto board to match this option. Next step is to open the Communication port. If you choose 115200 baud, you must have already set the 115200 enable bit in the Mode2 register of the Gamoto. Choose Communication -> Connect. If you get an error, you probably have another program using that COM port. Verify the port is available and enabled.



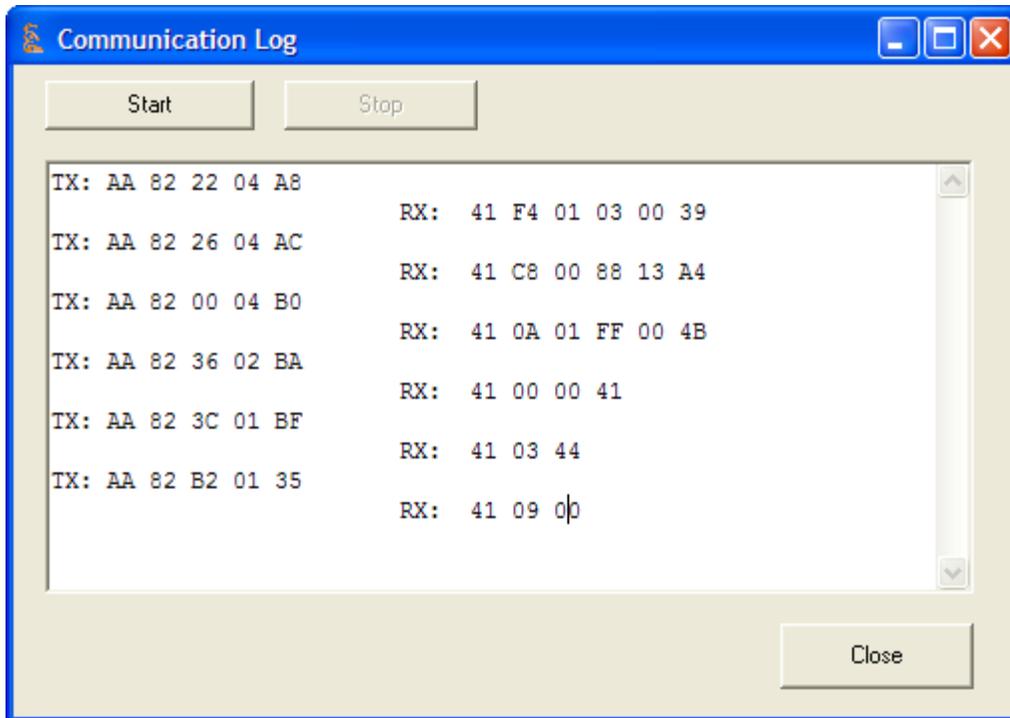
Address Setting

The Gamoto Address setting allows MotoView to communicate with up to 8 Gamotos on the same RS-485 (or RS-232 with SerialShare enabled) serial line. This Address should correspond to switches 3, 4, and 5 of Dipswitch 1. It is normally set to 0 (all three switches in the OFF position), in the case of a normal RS-232 serial connection. Note that to use this feature, you must have firmware version 7 or higher (Help-About will display firmware version).

SW3	SW4	SW5	Gamoto Address
OFF	OFF	OFF	0
OFF	OFF	ON	1
OFF	ON	OFF	2
OFF	ON	ON	3
ON	OFF	OFF	4
ON	OFF	ON	5
ON	ON	OFF	6
ON	ON	ON	7

4.2 Communication Logging

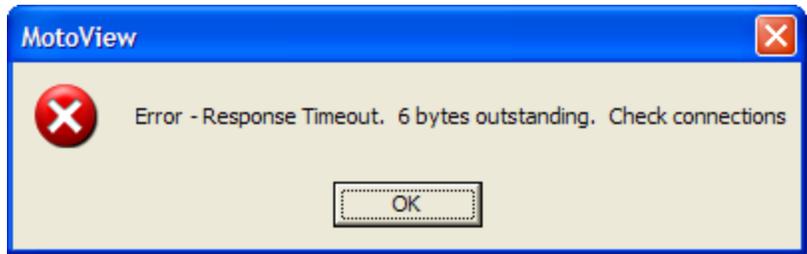
In the Communication menu, there is an item called Logging, that brings up a communication log window. This allows you to capture the “conversation” between MotoView and the Gamoto, to better understand how the protocol works, and how to implement different commands. The logging window looks like similar to the image here:



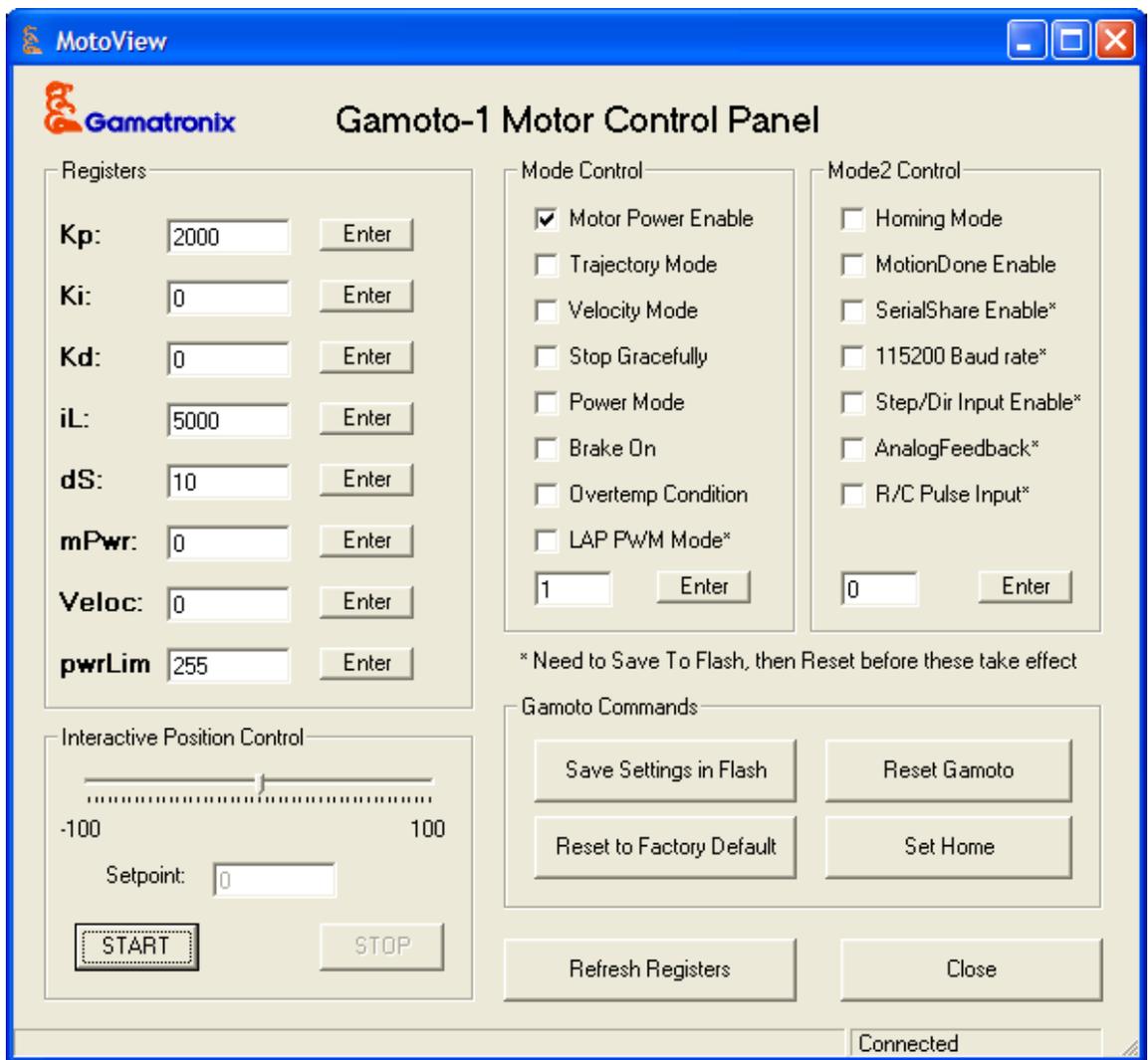
The TX lines are data sent from MotoView to the Gamoto. The RX lines are data received from the Gamoto. The example picture shows what happens when you open the PID window, and several registers are read from the Gamoto.

4.3 Read/Set Current Parameters

To check the current PID constants and mode settings, open the Tools -> PID Settings window. If you get an immediate error when opening the window, the board is not communicating. If this is the case, the error will most likely look something like this:



Check all cables, power to the Gamoto, and all connections. The window you should see should look similar to the window below:



In this window, you change any of the settings that are shown in the white text boxes, and click Enter or hit Enter on your keyboard to send this new setting to the Gamato. Changing

settings this way does not make them permanent – after power-cycling the Gamoto, the settings will return to previous values.

4.4 Saving Settings to Flash

To save settings in flash (to become the new power-on defaults), edit all the desired settings (pressing Enter at each one), then press the “Save Settings in Flash” button to save them to flash. Now if you power cycle the board, the settings should not have changed.

4.5 Returning to Factory Defaults

To return all settings to the factory defaults, press the “Reset to Factory Default” button.

4.6 Reset Gamoto

Pushing this button will send a reset command to the Gamoto, the same as power-cycling the board. Any parameters not saved in flash will be lost.

4.7 Set Home

The Set Home button will send a SetHome command to the Gamoto, which will set the current actual and set position registers to zero.

4.8 Mode Settings

The Mode settings are set by checking the desired boxes, then clicking on the Enter button at the bottom of the list. The Mode Byte is constructed by adding up each binary bit, depending on which modes are enabled. The number at the bottom is the result of the construction of that Mode Byte. Refer to the Gamoto user’s manual for the meaning of each mode, and for the valid combinations of modes to use together.

The Homing Mode checkbox is for the Mode2 byte, and will be greyed out if your firmware is earlier than version 8. This feature was added with firmware version 8. See the Gamoto user manual for details about the Homing mode.

The MotionDone Enable checkbox is part of the Mode2 byte, and will be greyed out if your firmware is earlier than version 9. This feature was added with firmware version 9. It changes Analog pin A2 to an output, to be used to send a signal when a motion has been completed. See the Gamoto manual for details.

The SerialShare Enable checkbox is part of the Mode2 byte, and will be greyed out if your firmware is earlier than version 10. This feature allows you to string several Gamotos on the same serial TX and RX lines. See the Gamoto user manual for more information.

4.9 Reading Registers

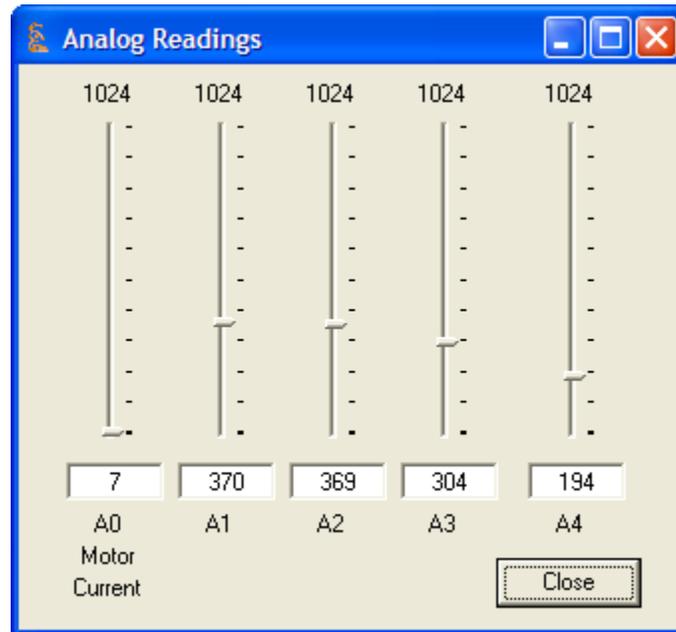
Clicking on the Refresh Registers button will refresh the values by reading from the Gamoto and updating the shown fields. This is done automatically when the window opens, so it is usually not necessary to manually activate this function.

4.10 Interactive Position Control

To test motor control in an interactive way, click on the Start button in the lower left area of

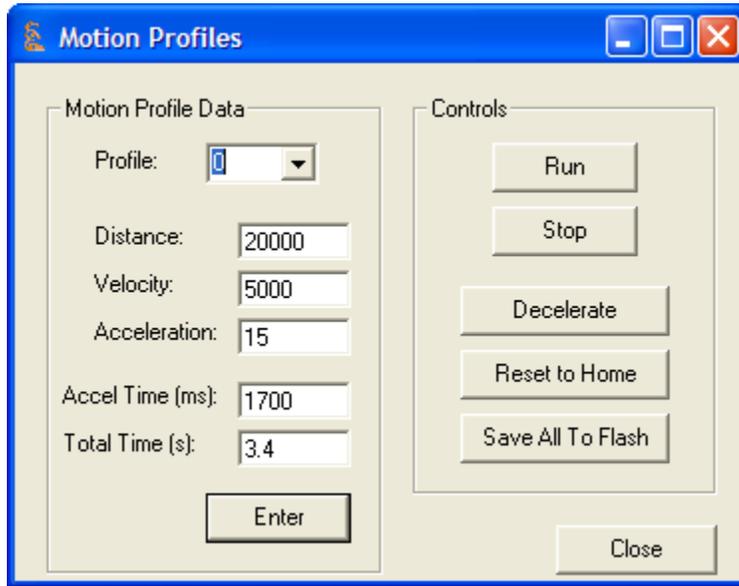
the window. This will begin streaming a position set-point to the motor. The set-point will depend on the position of the mouse over the left-right slider. Move the mouse and watch the set-point change, and watch the motor shaft respond. The min and max values of the setpoint can be changed by clicking on either value, and entering new values.

5. Read Analog Values



To see the analog readings from the Gamoto board in real time, click on Tools -> Analog Values. Five channels will be displayed. Channel 0 is dedicated to displaying motor current. The other channels are available for the user to connect to the analog connector on the Gamoto board. If they are not connected, they will be floating, and may fluctuate randomly.

6. Motion Profiles



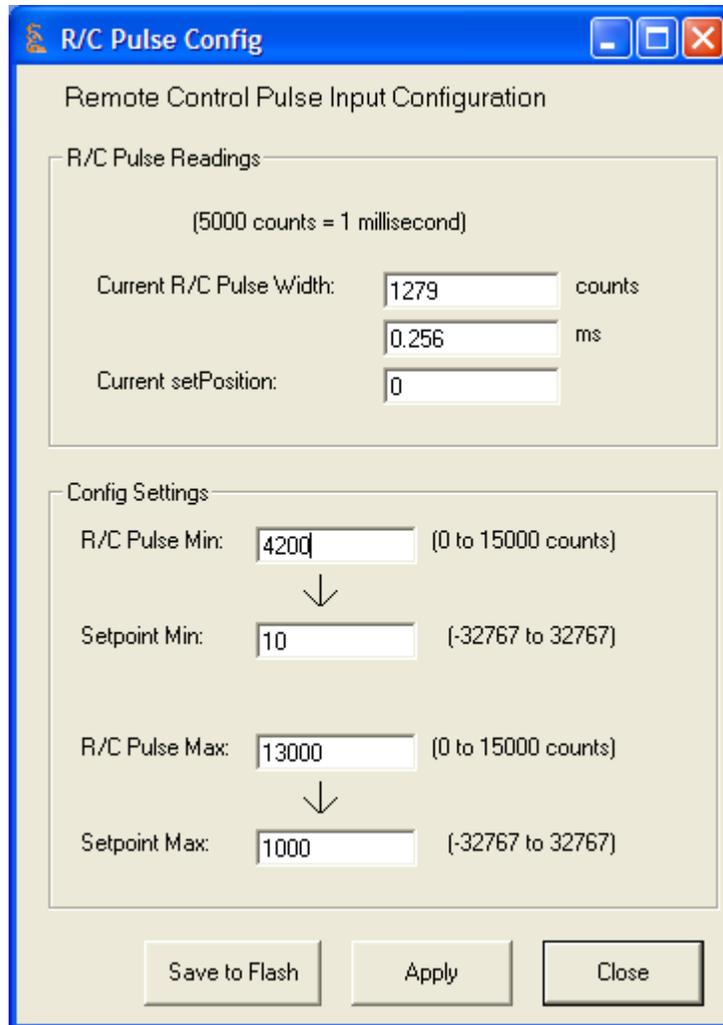
To configure and test the motion profiles, open the Tools -> Motion Profiles window, as shown above. The values shown are the currently saved profiles. From the factory, these values will be random. Try different values for distance, velocity and acceleration, then press Enter to send them to the Gamoto. Press Run to execute the motion. To save this profile in flash, press the “Save All To Flash” button. Please note that this saves all settings to flash, including any changes that were made in other windows to the PID constants and other key registers.

There are eight profiles stored in the Gamoto. To switch between profiles, choose a profile in the drop-down selector labeled Profile. All six profiles are written to flash when the Save All to Flash button is pressed.

To aid in choosing reasonable numbers in the profiles, the calculated Acceleration time and Total time are shown in this window. Use these as a guide to determine how long it will take to achieve full speed (Accel Time), and how long the entire trajectory will take (Total Time).

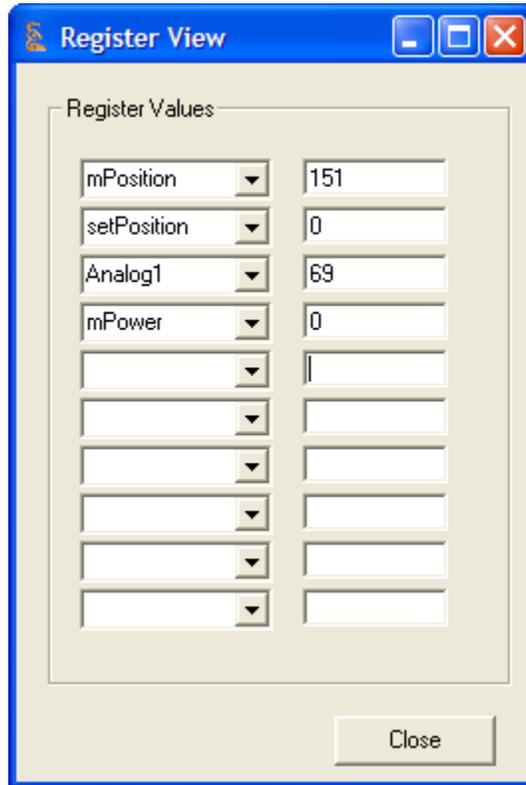
7. R/C Pulse Configuration

To configure the R/C (Remote Control) Pulse option, use the Tools -> R/C Pulse Configure dialog, shown below.



This gives a live view of the incoming R/C pulses in the top section, and allows you to configure the scaling in the lower section, as well as saving to flash. Please refer to the Gamoto User Manual for more details on the R/C Pulse settings.

8. View Registers



To View any register or group of registers in real time, open the Tools -> Register View window. In the left-hand column are fields that can be set to any register name. In the right column are the values of that register, as read from the Gamoto. This Register View window, as with all of the Tools windows, can be open at the same time as other windows, for troubleshooting or testing.

9. Which Version Firmware, Software?

To find out which version of Gamoto firmware you have, and to see the MotoView version number, open the Help -> About window. It should look similar to the window shown here:



10. Customizing MotoView

If there are features you would like to add to MotoView, or a part of MotoView you would like to incorporate into your own program, this can be done by modifying the source code. MotoView is written in Visual Basic, and the full source code is downloadable from the Gamatronic website, in the Gamoto product description page.

Please note that this code is provided "as-is", bugs and all. MotoView was written as a very simple way to configure that Gamoto board, and was not planned to be a robust, bug-free software product. If you find or fix any bugs, please report them to Gamatronic!