Version B

User Manual

PGTID

TiMOTION

Contents

1. Glossary

Vm+	The positive pole of power input
Vm-	The negative pole of power input
RPM	Number of turns per minute
AWG	American wiring gauge
LS	Limit switch installed inside the outer tube
UL	Upper stroke limit, fully extended position of actuator
LL	Lower stroke limit, fully retracted position of actuator
Mid LS	Middle limit switch is installed and the position is set by customer's request
EOS	End of stroke
EXT	Actuator extend
RET	Actuator retract
N.C.	The pin of the limit switch is normally closed and changed to open when the switch is triggered
N.O.	The pin of the limit switch is normally open and changed to closed when the switch is triggered
C.	The common pin of the limit switch when the circuit is either open or short to ground
Vp	Reference voltage input to POT signal
Vout	POT signal wire output value
a-sync	Absolute synchronization movement
r-sync	Relative synchronization movement

2.General

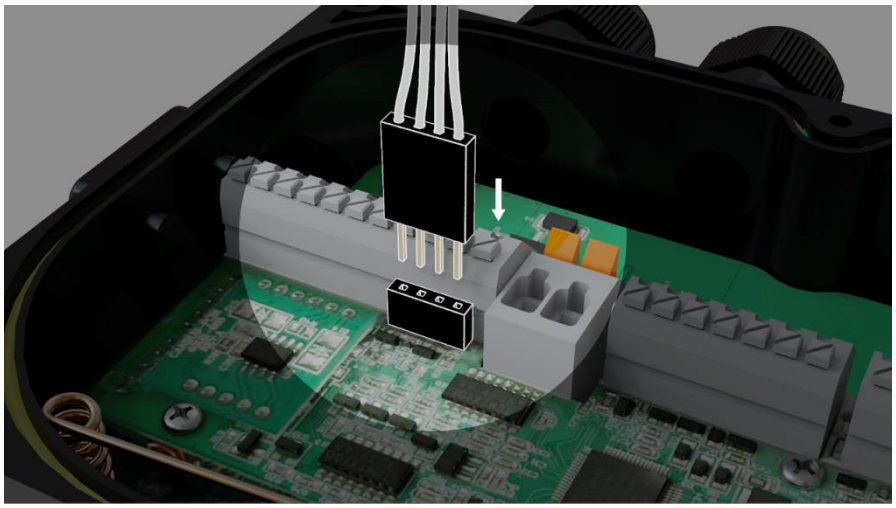
2.1 About this manual

This user manual provides instruction for how to install the PGTID and configure the TID driver. For more details on the system wiring instructions and the actuators, please reference the TID user manual.

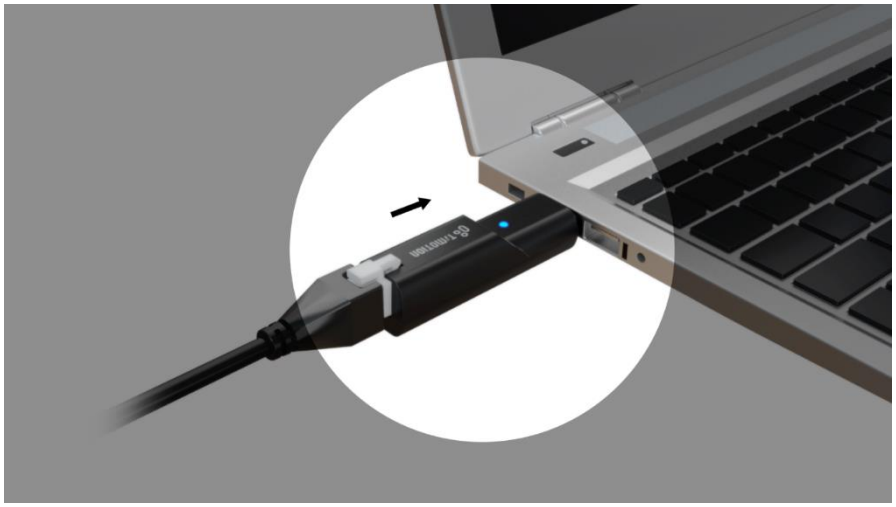
3.Installation

3.1 Connection

TAD1 and programming cable need to be ordered separately.



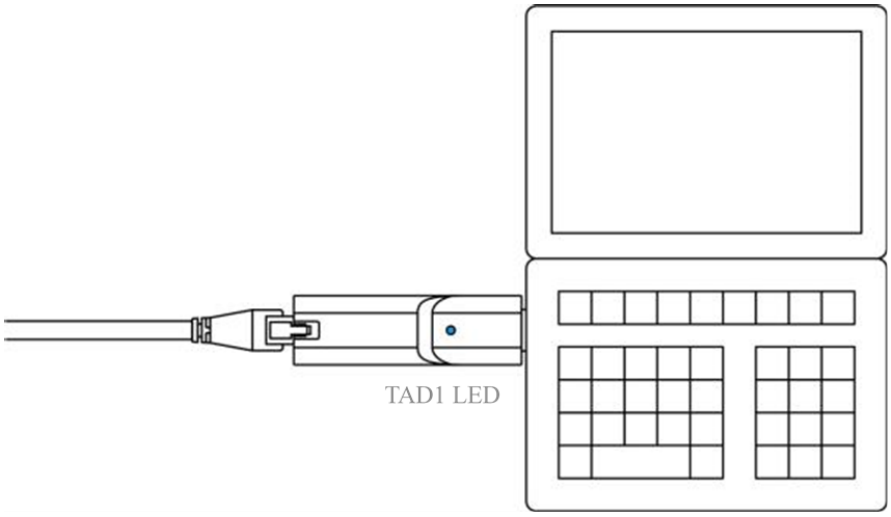
a. Connect the programming cable to the TID1.



b. Connect the opposite end (TAD1) to a PC.

3.2 Installation of PGTID

1. Install the PGTID software on the PC and immediately close the program after installation is complete.
2. Once the TAD1 extension cable is replaced, connect the TAD1 to the PC. Note: The LED on the TAD1 will remain solidly illuminated, indicating a successful connection.
3. Connect the P1 cable to the DC power supply and turn on the power.
4. Execute the PGTID program.



a. Connect the TAD1 to the computer.

b. Execute the PGTID program.

4.Programmer mode

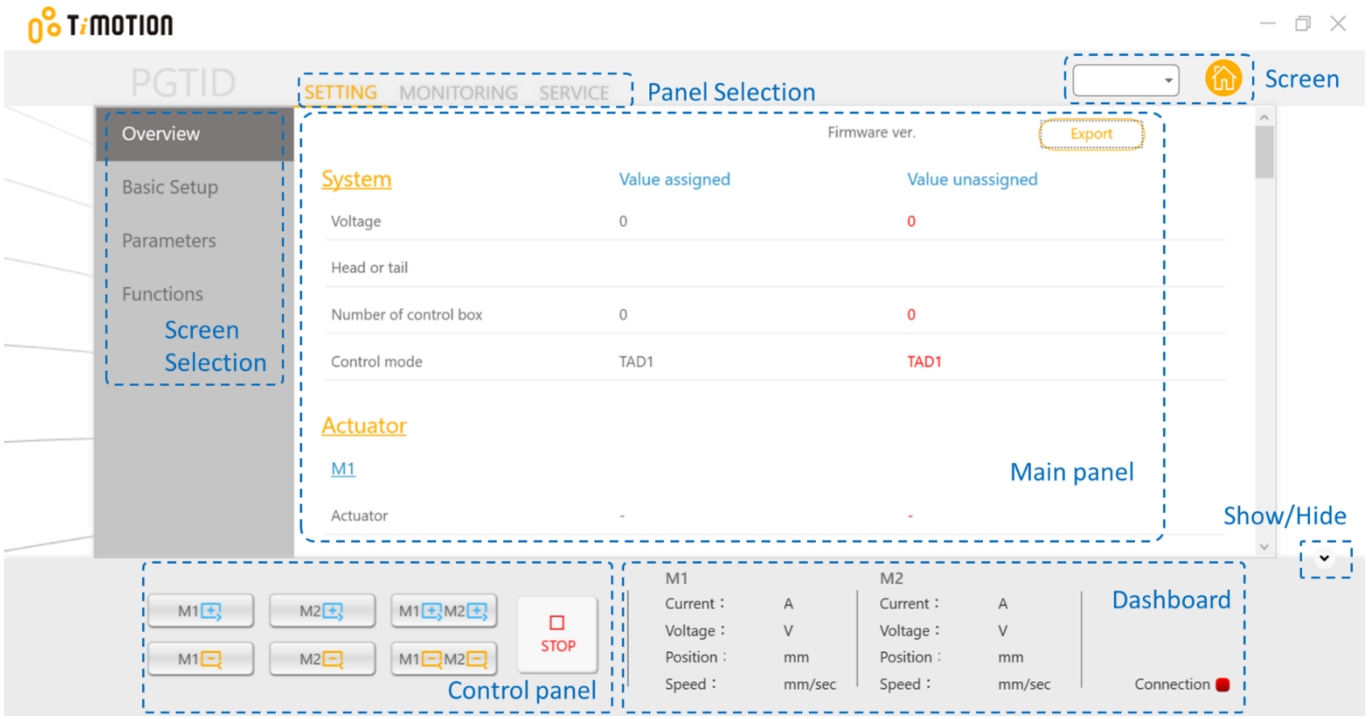
4.1 Startup screen

The PGTID startup screen is shown below.

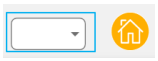
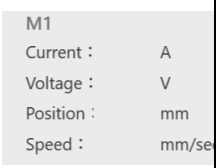
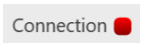
Item	Icon	Description
Startup screen		
Connect		Click “Connect” to connect the PGTID to the TID firmware.
Manual Import Offline		Click “Offline Settings” to set the parameters offline without connecting to the TID firmware.
Import		Click “Import” to explore and import the configuration parameters file (.pgtid) to the PC.
COM port	COM4	Display the USB COM ports of the UART communication.

4.2 Home screen introduction

By clicking the “Connect” or “Manual Input Offline” icons on the startup screen, the home screen is shown as below.



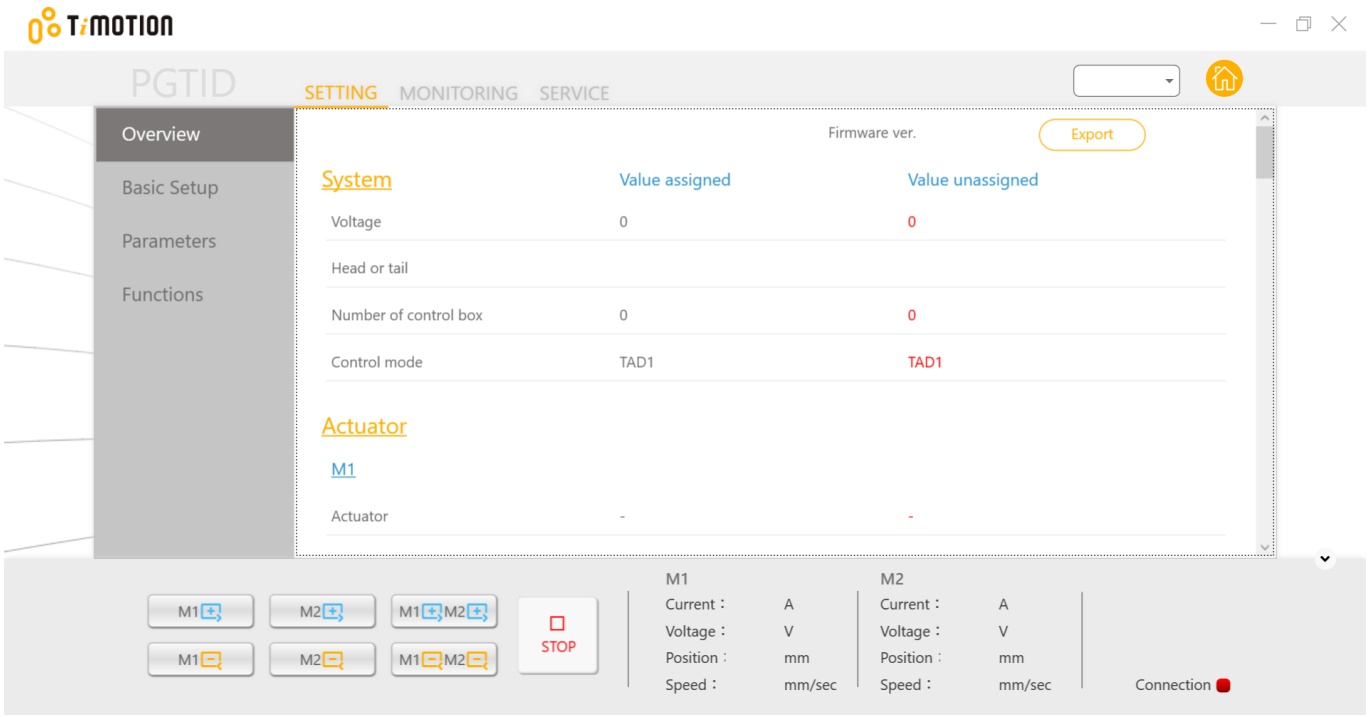
Item	Icon	Description
Panel Selections		
SETTING		Contains “Overview”, “Basic Setup”, “Parameters” and “Functions” settings.
MONITORING		In the monitoring panel, the user can control the actuators through the PGTID control panel and monitor the performance instantly.
SERVICE		Contains “System” and “Actuator” settings.
SETTING Panel		
Overview		Overview of settings.
Basic Setup		System and actuator type settings.
Parameters		Adjustment of the parameter settings.
Functions		Controls function settings.
SERVICE Panel		
System		Monitoring of system and software statistics.
Actuator		Monitoring of actuator statistics.

Main panel		
Apply		Apply the set parameters to the TID1. *Not applicable for “Manual Input Offline” mode.
Export		Save the configured setting parameters file as filename (.pgtid) to the computer.
Firmware version		Display the firmware version of the TID.
Screens		
Home		Return to the Startup screen.
Devices		Switch to preview the status of other connecting TID1. Selectable only when the system is set as “number of actuator≧2 (parallel system)” with proper hardware settings. The control panel mentioned below will only operate M1 & M2 based on which device is selected.
Control panel *The function is not accessible and icons are hidden if selecting “Manual Input Offline” mode.		
M1+		Click the button to extend M1.
M1-		Click the button to retract M1.
M2+		Click the button to extend M2.
M2-		Click the button to retract M2.
M1+M2+		Click the button to extend M1 & M2 in synchronized movement.
M1-M2-		Click the button to retract M1 & M2 in synchronized movement.
Stop		Stop the actuator(s) movement.
Dashboard *The function is not accessible and icons are hidden if selecting “Manual Input Offline” mode.		
Dashboard		Real time monitoring of actuator(s) current, voltage, position, and speed.
Connection indicator		Green light: The device is connected to the programmer. Red light: Not connected.

Show/Hide		Click to show/hide the Dashboard & control panel.

4.3 SETTING-Overview

The overview section shows the system settings, and assigned/unassigned values.

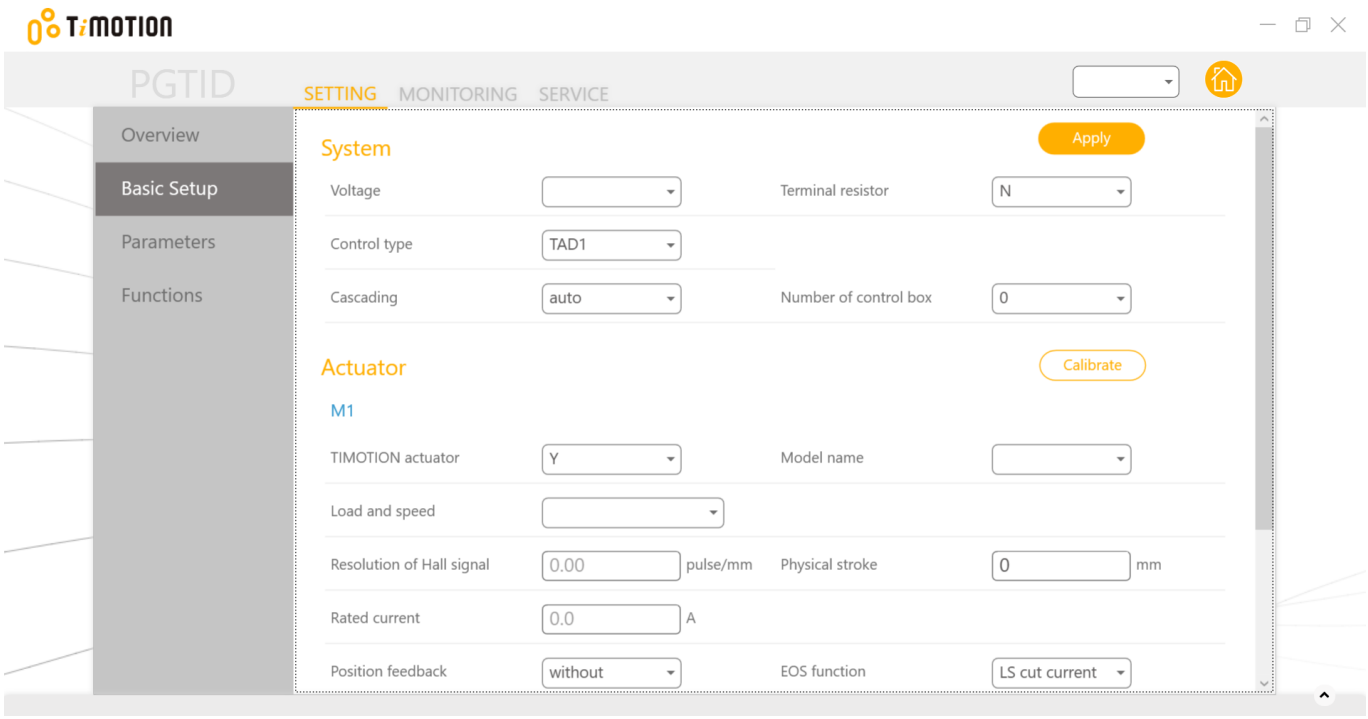


Item	Icon	Description
Overview		
Value assigned /unassigned	Value assigned	Any setting change of the parameters on the programmer will be indicated in red under the “Value unassigned” column and have not been saved to the device yet. After clicking the “Apply” button, the parameters will be saved to the device, with all the refreshed parameters displayed in black under the “Value assigned” column.

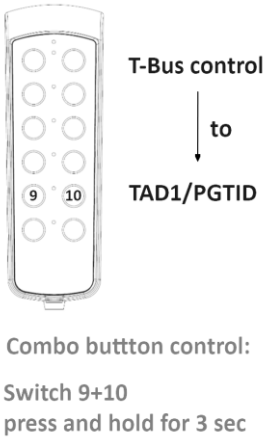
4.4 SETTING-Basic setup

The user is required to define the correct System parameters, Control and Actuator.

*Note: For all non-standard settings, please consult your TiMOTION representative in advanced to ensure all the parameters are achievable.



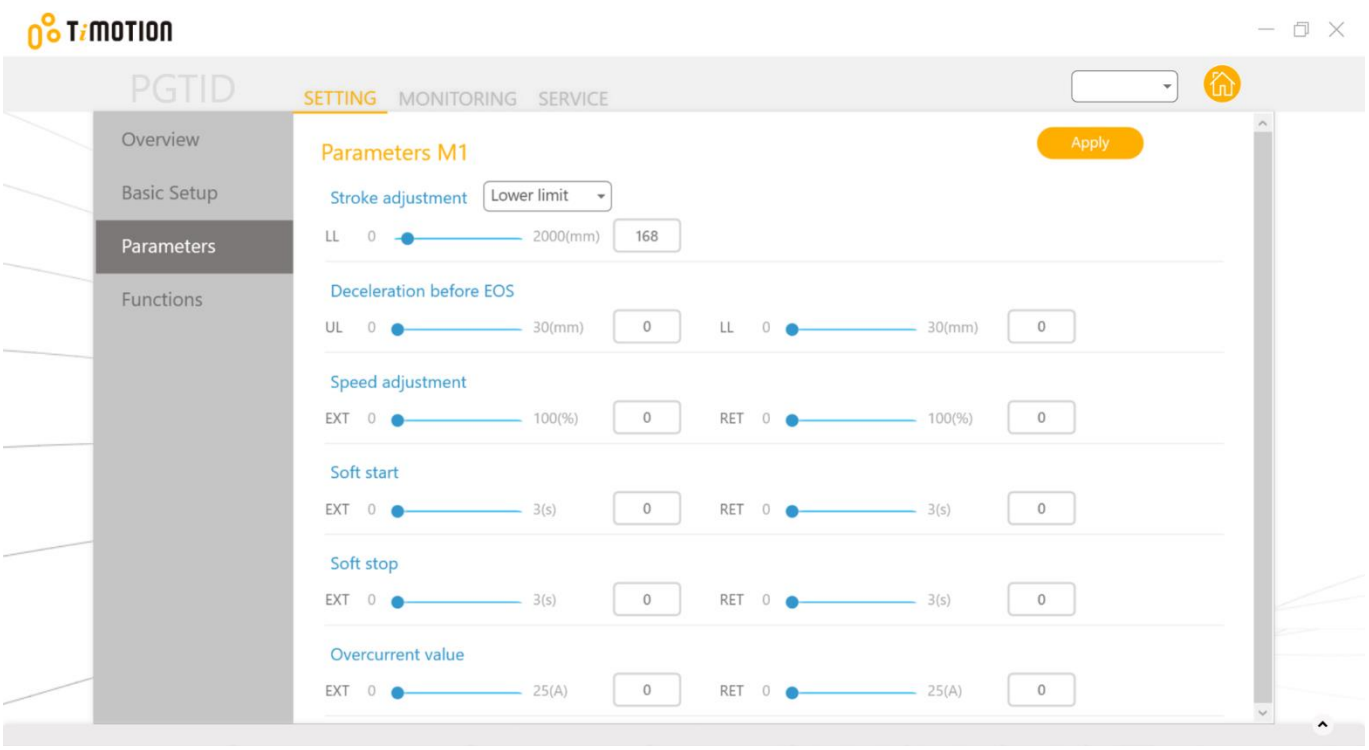
Item	Options	Default	Description
System Section			
Voltage	12V, 24V		Set the rated voltage of the system. *Warning-Voltage setting must match the DC input and actuator to avoid damage to the system.
Terminal resistor	Y, N	N	Enable the function of the TID located in the final position within the connected control loop. "Y" indicates the embedded 120ohm terminal resistor will be enabled.
Cascading	Auto, manual	Auto	Auto: Setup the TID1 ID automatically for cascading. Manual: Manually select/adjust the TID1 ID for cascading.
Number of control box	1, 2, 3, 4	1	Set the number of control box in the sync loop. "1" indicates single TID system.
Control type	TAD1, POT,	TAD1	TAD1 is in general default mode so the driver can be connected to the PGTID.

<table>
<tr><td rowspan="2"></td><td>T-Bus</td><td></td><td rowspan="2">When choosing POT mode- the TAD1/PGTID connection is still workable.
When choosing T-bus (ex. TH12 or TH30 2.4H remote control), the PGTID connection will automatically disconnect after the “Apply” button is clicked.
To toggle from T-Bus mode to TAD1 mode, a special combo button control is needed.
The table below illustrates the relationship of each mode to the enabled control type.</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td></td><td colspan="3"><table>
<tr><th>Mode</th><th>PGTID</th><th>POT control</th><th>TH12 (Wired control)</th><th>TH30 (2.4G wireless)</th><th>PR3 (315/433 wireless)</th></tr>
<tr><td>TAD1</td><td>V</td><td>X</td><td>X</td><td>X</td><td>V</td></tr>
<tr><td>POT</td><td>V</td><td>V</td><td>X</td><td>X</td><td>V</td></tr>
<tr><td>T bus</td><td>X</td><td>X</td><td>V</td><td>V</td><td>V</td></tr>
</table>
V: Function enabled X: Not applicable</td></tr>
<tr><td colspan="4">Actuator Section</td></tr>
<tr><td>TIMOTION actuator</td><td>Y, N</td><td>Y</td><td>Enable the TID to work with the TiMOTION actuator.</td></tr>
<tr><td>Model name</td><td colspan="2">TiMOTION model number</td><td>“Y” must be selected for “TIMOTION actuator” to allow selection of TiMOTION actuator model.</td></tr>
<tr><td>Load and speed</td><td colspan="2">Selectable</td><td>“Y” must be selected for “TIMOTION actuator to allow setting of the desired load and speed code of the actuator</td></tr>
<tr><td>Resolution of Hall signal</td><td colspan="2">Manual input for non-standard settings</td><td>Dependent parameter will be shown automatically if the TiMOTION actuator is chosen with defined “Model name”, “load and speed” and the position feedback is set as “Hall signal”.
Otherwise, the resolution has to be input manually. Please consult your TiMOTION representative with any questions.</td></tr>
<tr><td>Physical stroke</td><td colspan="2">Manual input</td><td>Manually input the physical stroke of the actuator.</td></tr>
<tr><td>Rated current</td><td colspan="2">Manual input for non-TiMOTION actuators</td><td>Dependent parameter will be shown automatically after the system “Voltage”, TiMOTION actuator “Model name” and “load and speed” are defined.
Parameters must be input manually if the actuator is not a TiMOTION model or any of the above parameters are</td></tr>
</table>

		customized. Please consult your TiMOTION representative with any questions.
Position feedback	Without 2*Hall signals POT	Setting for the position feedback type of the actuator.
EOS function	LS cut current LS send signal	Setting for limit switch function at end of stroke: Stop the actuator or send signal.
Low temp. OCP compensation *Professional settings	Manual input for non-TiMOTION actuator	Dependent parameter will be shown automatically after the system "Voltage", the TiMOTION actuator "Model name" and "load and speed" are defined. User must input the OCP value (over current protection criteria) manually if the actuator is not a TiMOTION model or any of the above parameters are customized. Maximum of four settings to define the protection current UNDER 0°C, with the lowest temperature setting as -10°C. Ex. The setting below means Temp1 ranges from 0~-10°C with OCP 8.0A, while Temp2 ranges from -10~-15°C with OCP 12.0A. 
Type of M2	None Same as M1 Independent	Selection for actuator type of M2. None: No M2 Same as M1: All the settings of M2 will be the same as M1 Independent: Setup M2 settings independently

4.5 SETTING-Parameters

The user is required to define each parameter of the actuator M1 and M2(if applicable).

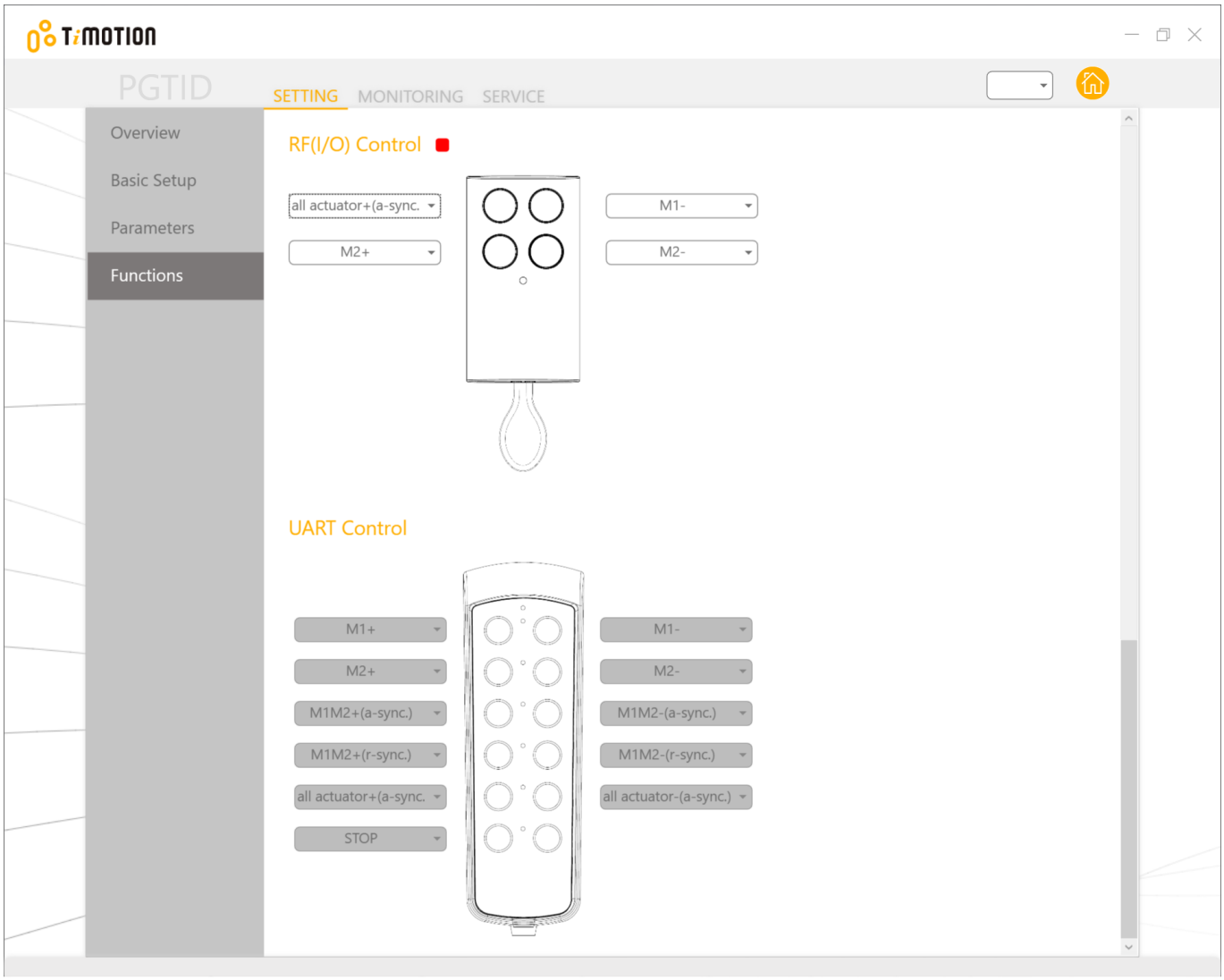


Item		Parameter	Default	Description
Parameter Section-M1				
Stroke adjustment		Upper limit Lower limit	Physical stroke 0	Setting for the virtual stroke limit type and input value. *It is not possible to set both the virtual upper and lower limit at the same time, since it is required to have at least one physical end of stroke limit switch for positional calibration.
Deceleration before EOS	UL	0~30 mm	0	Setting for the distance to end of stroke when the actuator should begin decelerating.
	LL	0~30 mm	0	
Speed adjustment	EXT	60~100 %	100	Setting for the TID1 output percentage to the actuators. *In order to provide sufficient power to the

	RET	60~100 %	100	actuators, the minimum setting value should be ≥ 60%. *This parameter sets only the PWM output % from the TID, rather than a close-loop speed control by calculating the Hall sensors count of the actuators.
Soft start	EXT	0.0~3.0 s	0.1 s	It is recommended that the setting is≧0.5 sec.
	RET	0.0~3.0 s	0.1 s	
Soft stop	EXT	0.0~3.0 s	0.1 s	
	RET	0.0~3.0 s	0.1 s	
Overcurrent value		0~25A	20A	The actuator will cut off when it reaches the defined overcurrent value.
Parameter section-M2				
Same parameters as M1 if the SETTING-> Actuator section-> Type of M2 is selected as “Same as M1”. Selectable only when the Type of M2 is set as “Independent”.				

4.6 SETTING-Functions

The user is required to define the function of the control.



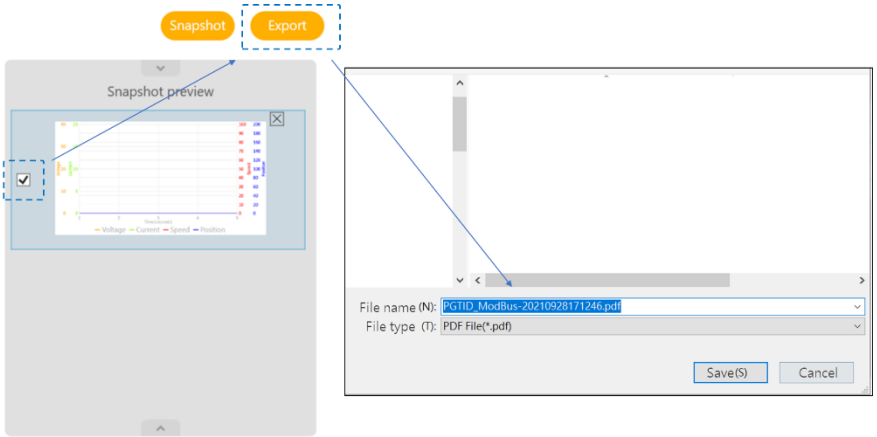
RF & Switch type control			
Item	Parameter	Default	Description
KEY1	Refer to the chart below	M1+	*Synchronization (sync) is available only when the Type of M2 is selected as “Same as M1”. *a-sync: Absolute synchronization. *r-sync: Relative synchronization.
KEY2		M1-	
KEY3		M2+	
KEY4		M2-	

UART control			
Item	Parameter	Default	Description
KEY1	Refer to the chart below	M1+	*Synchronization function(sync.) is available only when the Type of M2 is selected as Same as M1".*
KEY2		M1-	
KEY3		M2+	
KEY4		M2-	
KEY5		M1M2+(r-sync.)	
KEY6		M1M2-(r-sync.)	
KEY7		M1M2+(a-sync.)	
KEY8		M1M2-(a-sync.)	
KEY9		all actuator+	
KEY10		all actuator-	

Definition of function	
M1+	Actuator1 extends.
M1-	Actuator1 retracts.
M2+	Actuator2 extends.
M2-	Actuator2 retracts.
M1M2+ (r-sync.)	Actuator1 and Actuator2 extend synchronously in relative position.
M1M2- (r-sync.)	Actuator1 and Actuator2 retract synchronously in relative position.
M1M2+ (a-sync.)	Actuator1 and Actuator2 extend synchronously in same position.
M1M2- (a-sync.)	Actuator1 and Actuator2 retract synchronously in same position.
all actuator+ (a-sync)	All actuators on cascaded TID1 extend synchronously.
all actuator- (a-sync)	All actuators on cascaded TID1 extend synchronously.
reset (UL/LL)	Keep sending command for 5 seconds after the actuators reach end position, then the actuators will calibrate their position.

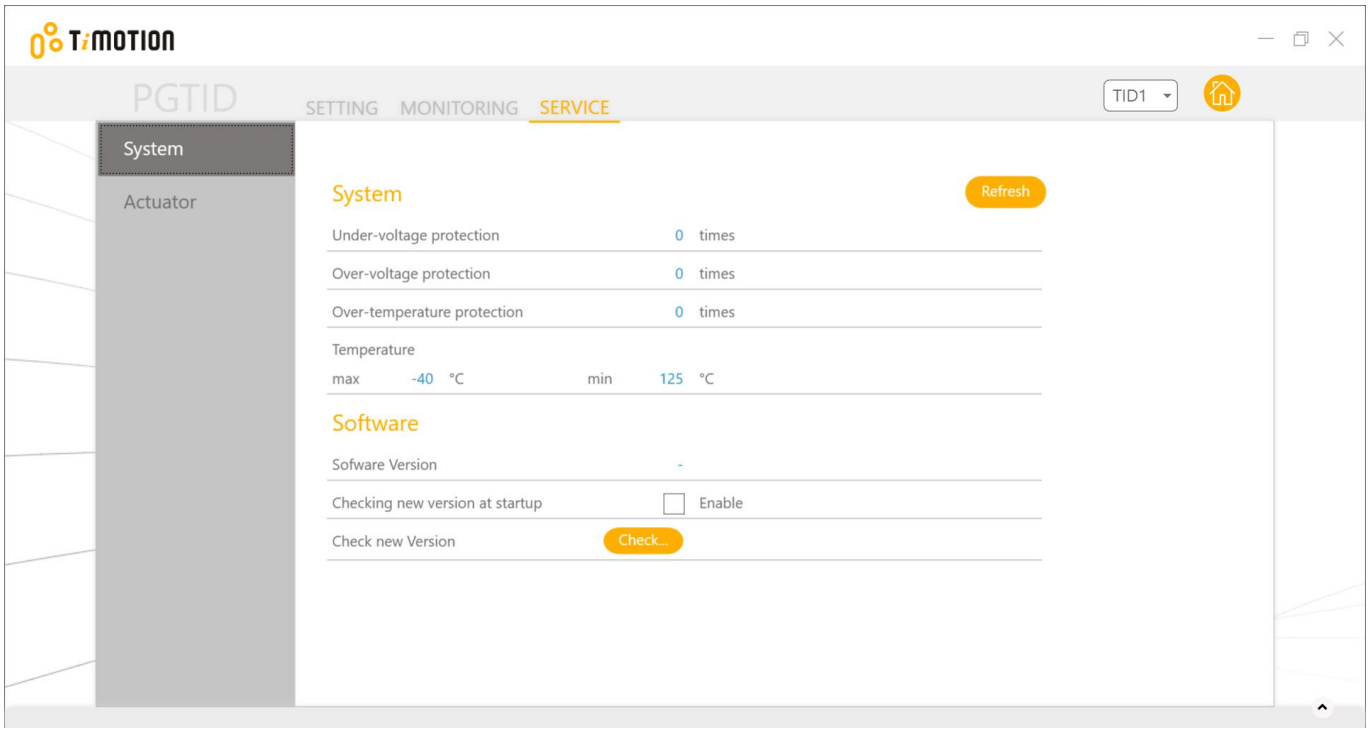
4.7 MONITORING

The MONITORING screen includes the oscilloscope and snapshot preview.

MONITORING		
Item	Icon	Description
Oscilloscope	-	Display the real time curve of the actuators.
Reset	Reset	Reset the clock (X axis) of the curve.
Snapshot	Snapshot	The snapshot will be saved in the preview screen.
Export	Export	Select the snapshot needed and click Export to save the drawing into a.pdf file. 

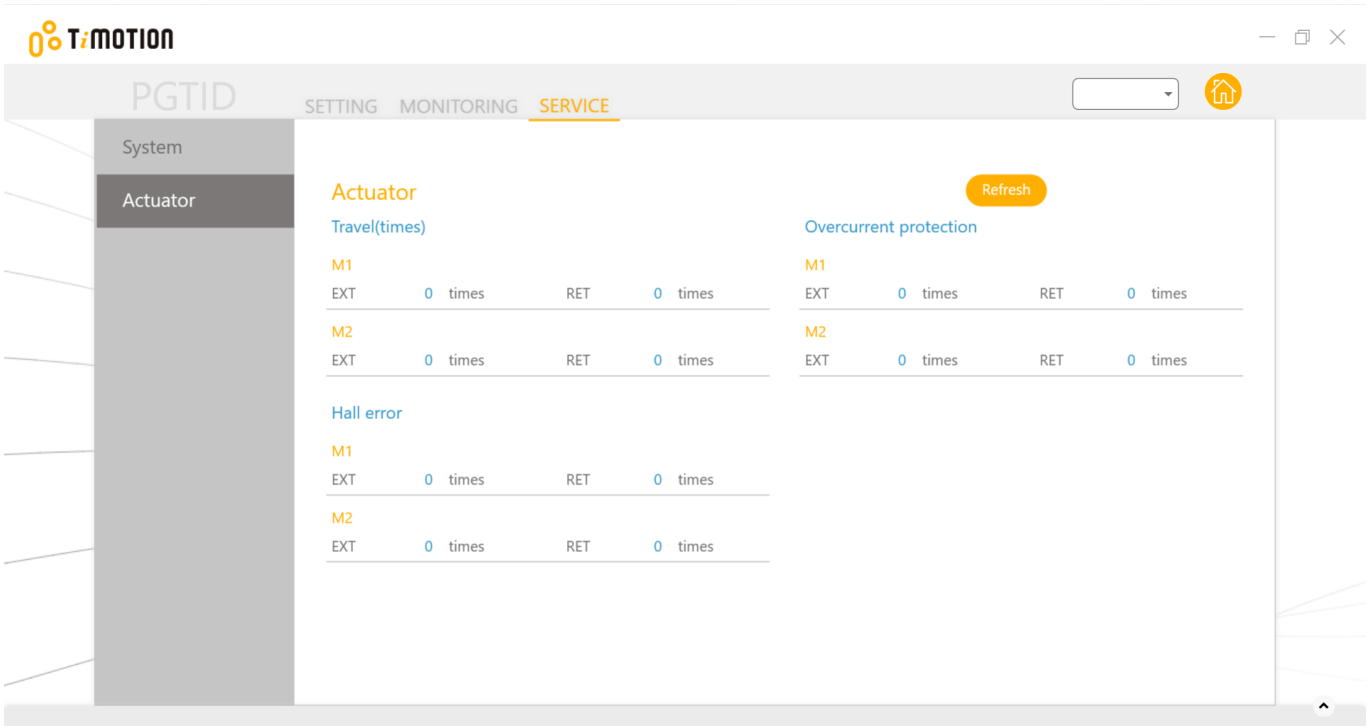
4.8 SERVICE

The SERVICE screen lists the statistics of the service information for the system and actuator.



System		
Item	**Icon**	**Description**
Refresh	Refresh	Refresh all statistics.
Under-voltage protection	-	Record the cumulative occurrence of low voltage protection. (including power cutoff in normal operation)
Over-voltage protection	-	Record the cumulative occurrence of over voltage protection.
Over-temp protection	-	Record the cumulative occurrence of over temperature protection.
Temp Max/min	-	Record the highest/lowest temperature rating detected by temp sensor.
Software		
Item	**Icon**	**Description**
Software version	-	Display the software version of the programmer.
Checking new version at	Enable	Click the checkbox to enable an automatic online check of available programmer updates during software startup.

startup		(Default: Automatic Update check disabled.)
Check new version	Check...	Manually check for the latest version of software.



Actuator		
Item		**Description**
Travel (Times)	EXT RET	Record the cumulative number of actuator movements (actuator movement ≥ 3 seconds will be calculated as one time) in both the extend or retract direction.
Hall sensor errors	EXT RET	Record the cumulative Hall sensor error occurrence detected in both the extend or retract direction.
Overcurrent protection	EXT RET	Record the cumulative Over current protection occurrence in both the extend or retract direction.

5.Troubleshooting

Error type	Information/action
Counter error	
Hall sensor error	The actuators stop. When seeing a Hall sensor error, the actuator enters 'position lost' mode, and the whole system requires calibration.
Over current	The actuators cannot continue in the same direction. The system may operate in the opposite direction, only.
Voltage	
Over-voltage or under-voltage protection	When detecting over or under voltage, the actuator will stop. Disconnect the DC power source and the TAD1, then reconnect the DC power source with the correct voltage.
Current	
Over current protection	When detecting over load current, the actuators will stop. Remove all obstacles, then operate again and the system will resume normal operation.