



# PoScope Plasma SensOut Torch Height Controller User Manual

[Home](#) » [poscope](#) » PoScope Plasma SensOut Torch Height Controller User Manual 



## Plasma SensOut Torch Height Controller User Manual



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## Contents

- [1 Description](#)
- [2 Features](#)
- [3 Connectors and pinout](#)
- [4 Connection to PlasmaSens and CNC controller board](#)
- [5 Users interface](#)
- [6 Setup menu](#)
- [7 Mach3 – PlasmaSensOut configuration using PoKeys57CNC](#)
- [8 Mach4 – PlasmaSensOut configuration using PoKeys57CNC](#)
- [9 Grant of license](#)
- [10 Documents / Resources](#)
  - [10.1 References](#)
- [11 Related Posts](#)

## Description

PlasmaSensOut is a universal torch height controller (THC) for use with the PlasmaSens torch height sensor device. Thanks to an optical connection, it is fully electrically (galvanically) isolated from high voltage plasma cutter's equipment and so it is safe to use.

The device supports a wide range of plasma arc voltage (from 45V up to 265 V).

PlasmaSensOut provides standard programmable ARC OK, UP, and DOWN signals and it's compatible with most CNC controller boards on the market. A simple user-friendly interface allows quick and efficient moving through the menu using three menu buttons. Led display in default state shows current arc voltage and led diodes to signalize the state of the output. Users can set the following THC parameters: reference voltage, hysteresis (non-active range around the reference height), the delay time for outputs, and anti-dive limit voltage. All parameters can be modified during operation and the last setup is saved. An additional feature "test mode" allows easy torch height setup without plasma arc being in operation.



Figure 1: PlasmaSensOut set

## Features

- Output signals: Arc Ok, Up, and Down (normally-open solid-state relay outputs)
- Programmable reference and hysteresis voltage, delay time, and anti-dive limit voltage
- Current plasma voltage presentation on the LED display
- LED signalization of arc present, up and down signals
- Full optical input isolation; transmitter and receiver connected over an optical cable
- Test mode operation
- Wide power supply voltage range (6 – 36 V)
- Compatible with most CNC controller boards
- DIN-rail mountable housing

## Connectors and pinout

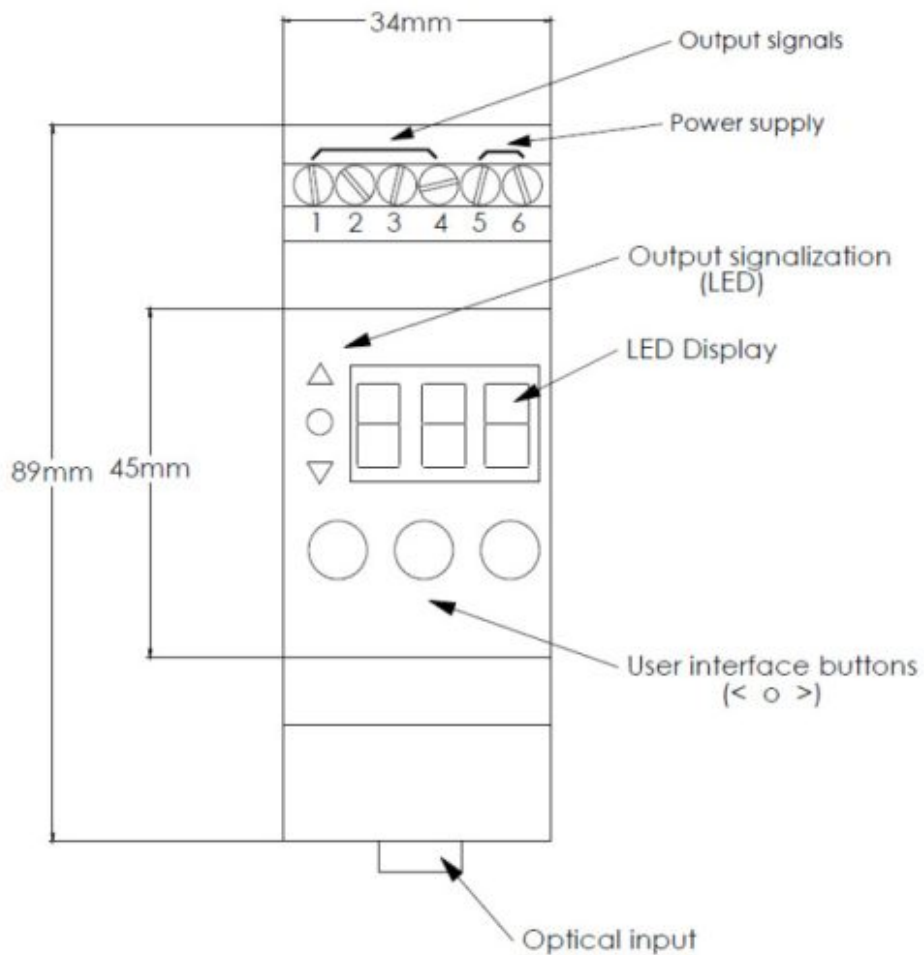


Figure 2: Device dimensions and layout

Terminal pin		Function
1	OUTPUT Solid state relay Max load: 200mA Ron<0.6Ω	THC Up
2		Arc OK
3		THC Down
4		Common
5	—	DC power supply (6-36 VDC)
6	+	
Optical input	Optical fiber cable	

### Connection to PlasmaSens and CNC controller board

PlasmaSensOut requires a DC power supply. The voltage applied can be from 6 V to 36 V. Use the provided optical cable for optical connection with PlasmaSens. Make sure that the connector on the optical cable is fully

inserted.

Read the PlasmaSens user's manual for detailed information on how to connect PlasmaSens to plasma cutter equipment!

All outputs signals are isolated. Solid-state relays are used.

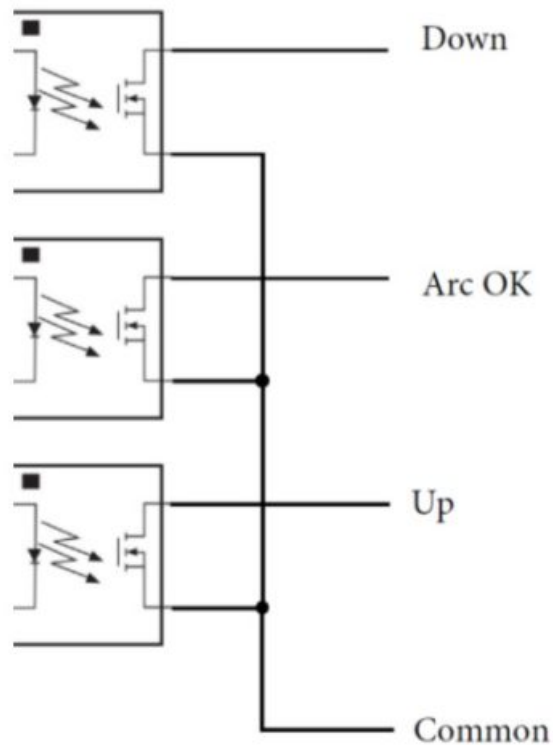


Figure 3: PlasmaSensOut outputs

Please refer to your CNC controller board's manual for detailed information about input ports.

## Users interface



Parameters can be modified during operation and will immediately affect the output signals! PlasmaSens will automatically save the last settings.

During the plasma cutter's operation, the current arc voltage is shown on the display.

If there is no arc voltage present, the display shows ---.

The reference voltage (Ref) can be set by pushing V (left) or (right) button. (During operation the green (OK) led flashes when a reference voltage is setting). Users can set Ref from 45 V to 265 V. Factory setting 180 V.

## Setup menu

To enter a setup menu press and hold the • (middle) button for one sec. The LED display will start flashing then the setup menu will appear.

Select the parameter by pressing the • button. Press V / button to modify the parameter's value.

**Set** – Set delay time from 0.1 to 9.9 sec. The time between Arc OK signal appears and generation of signals up and down is enabled. Factory setting 0.5 s.

**HYS** – Hysteresis from 2V to 32 V (2 V step). Voltage frame around the reference. If arc voltage is higher than  $\text{Ref} + \text{HYS}/2$  then a down signal is generated. If voltage is lower than  $\text{Ref} - \text{HYS}/2$ , an up signal is generated (see the output signal example below). Factory setting 6 V.

**ADL** – Anti-dive limit from 50 V to 300 V. Arc voltage that disables THC. If the voltage goes higher than the Anti-dive limit all output signals go low. The parameter's value must be set higher than the reference voltage. Factory setting 220 V.

**tSt** – Test mode. Only available when no arc voltage is present! Pressing V or button generates output signals. The display indicates direction.

To leave a setup menu, do not press any button for around 2 seconds.

In case of communication failure **E – I** is shown on the display. Please check the optical cable is properly inserted on both sides and that the PlasmaSens sensor device is turned on.

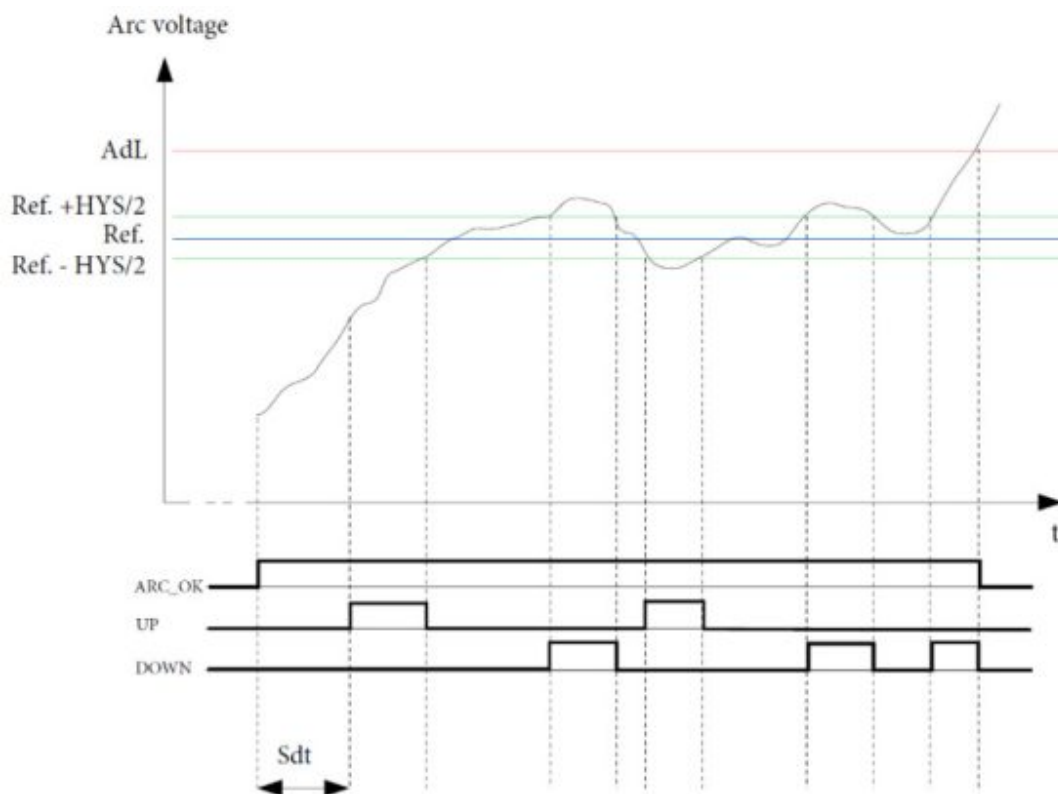


Figure 4: Output signals diagram example

## Mach3 – PlasmaSensOut configuration using PoKeys57CNC

Download and install the latest PoKeys Mach3 plugin from [www.poscope.com](http://www.poscope.com). Look for the PoKeys setup package, which also includes the Mach3 plugin.

In Mach3 software under Plugin, Control-> Configure PoKeys57CNC->Device settings you will find the PoKeys



mapping tab. Map connected pins as shown below. In our example, we select PoKeys pins 8, 12, and 13 as input. In the Pulse engine settings tab at THC, settings-axis Z selects Up/Down signals.

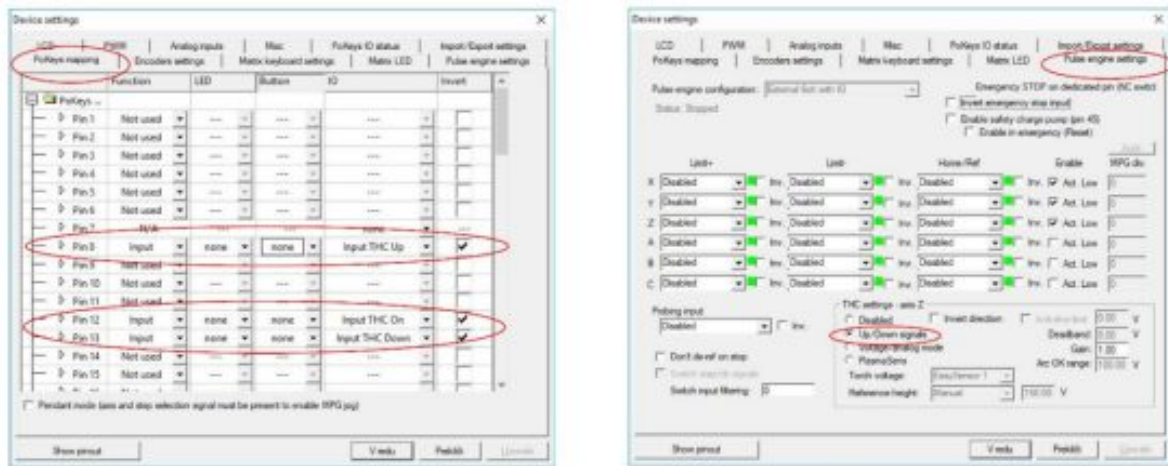


Figure 5: PoKeys Mach3 plugin setup window

**Note:** PlasmaSenseOut should not be configured with a separate 'PlasmaSens' option in the PoKeys plugin configuration dialog. PlasmaSens option is used with direct connection of the optical cable to PoKeys57CNC via PlasmaSens interface.

## Mach4 – PlasmaSenseOut configuration using PoKeys57CNC

Download and install the latest PoKeys Mach4 plugin from [www.poscope.com](http://www.poscope.com). Unzip and copy files: Mach4PoKeysPlugin.m4pw and Mach4PoKeysPlugin.sig to "Mach4\Plugins" folder. Run Mach4 (Plasma profile)

- Go to Configure → Control... → Axis Mapping tab enable axis X (0), Y (1), Z (2) and OB1 (6)

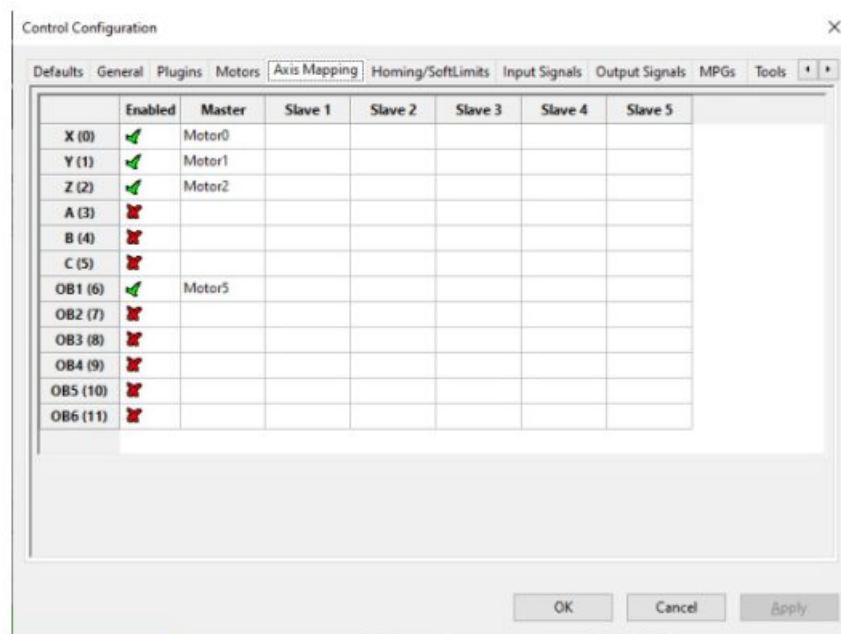


Figure 6: Mach4 Axis Mapping

- Under the Motors tab enable Motors for X (0), Y (1), Z (2), and OB1 (6). The motor tuning settings for Motor5 (OB1 (6)) must match those of Motor 2 (Z)!



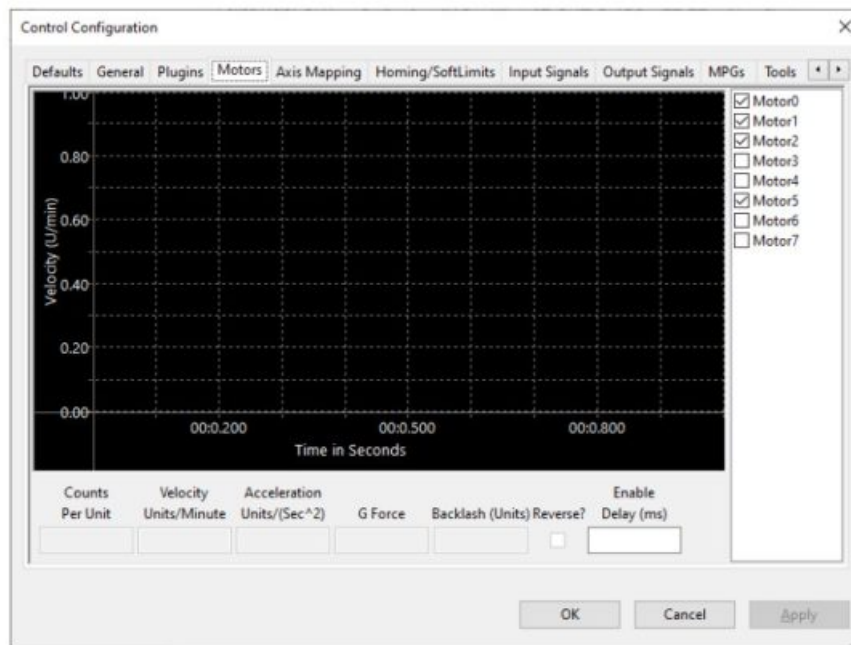


Figure 7: Mach4 Motors assigning

Please read also Mach4 user's documentation located in the Mach4 folder under Docs\Plasma\_Configuration.pdf

- Configure → PlasmaScreenConfiguration Set Default THC mode: Digital; THC Axis: 6



Figure 8: Mach4 Motors assigning

- Configure → Control... → Input Signals tab. Select PoKeys input pins for THC On, Up and Down signals

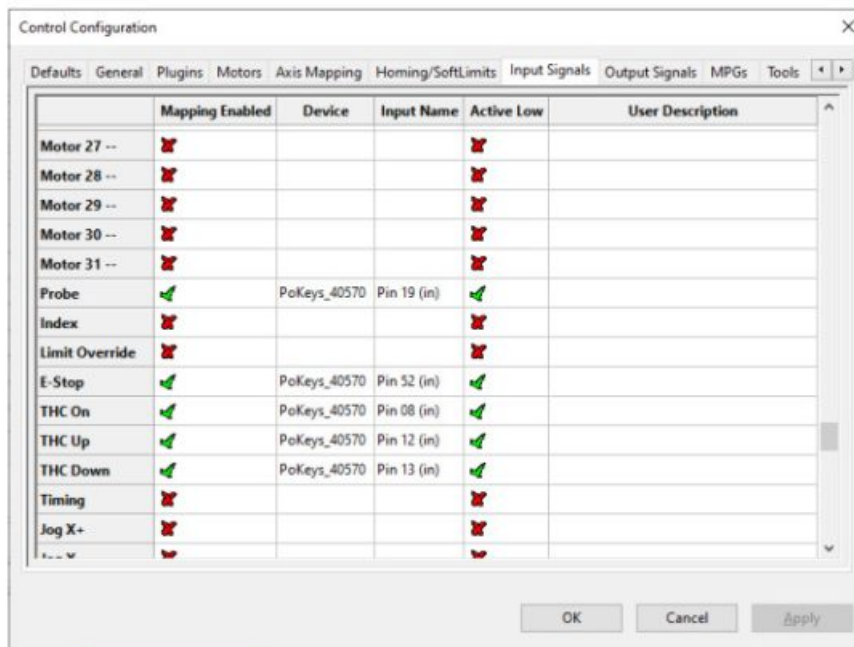


Figure 9: Mapping THC input signals

- Use Mach4 THC Cut Start Settings and THC tab to set up cutting parameters. If “Touchoff” is included the Probe input must be mapped! (Configure → Control... → Input signals tab)



Figure 10: Mach4 THC settings

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## Documents / Resources

	<p><a href="#">PoScope Plasma SensOut Torch Height Controller</a> [pdf] User Manual Plasma SensOut Torch Height Controller, Plasma SensOut, Torch Height Controller</p>
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## References

-  [PoLabs Support](#)
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