Makersplayce Machine Manual

DC Power Supply

INSTEK GPS-3303



Introduction

This is the user guide of the INSTEK GPS-3303 linear DC dual power supply. This machine can be used to power any load plugged in, with up to 30V. Reading through the manual is highly encouraged before use as it can be dangerous to handle electronics, especially if the user is a beginner. The aim of this manual is to help understand how to operate the power supply, and to introduce the functions it has.

The power supply has two three channels. CH1 & CH2 can supply 0-30V and 0-3A, and CH3 works as a fixed 5V 3A power supply.

Overview

Figure 1 gives an overview of the power supply and its different buttons for adjusting output settings.



Figure 1: Overview photo of the power supply with different sections

Switch 1: Turns the power supply itself on, not the outputs. When off, there will be no voltage or current values displayed. Needs to be turned on to use it.

Switch 2: **Turns all the outputs on/off**. When turned on, all the outputs will be active, so it is important to take out any cables from the three outputs, if that output is not being used. When on, the little light under the button will turn green.

CH1& CH2 Knobs: The two knobs of each channel can be used to set the maximum output voltage/current value. If the outputs are turned off, the maximum set values will be displayed on the screen per channel. If the outputs are turned on and the power supply is actively supplying power, the current and voltage that is being used will be displayed per channel. In that case, there are 2 scenarios to be aware of to take measures:

1- **CV (Constant Voltage)** means the power supply is operating in voltage regulation mode. The voltage remains fixed at the set value while the current varies depending on the load. The indication light between the knobs will be green if the power supply is in CV.
2- **CC (Constant Current)** means the power supply is operating in current regulation mode. The current remains fixed at the set value, while the voltage drops as necessary to maintain that current. In most cases, this is caused by a short circuit, and the voltage will be dropping drastically in order to keep the current from going up as well. **Outputs need to be turned OFF immediately** in this case to prevent significant damage to the load that is plugged in. The indication light between the knobs will be red if the power supply is in CC.

Outputs: The load should be connected to these outputs, depending on the operation mode currently selected by the two mode selection switches between the CH1 & CH2 knobs. These modes determine how the channels interact with each other:

1- **Independent (INDEP.) Mode**: Each channel operates separately, meaning they function as two individual power supplies with their own voltage and current settings.
2- **Parallel Mode (PARALLEL)**: The two channels are combined to work as a single output with double the current capacity. In this mode:
    - CH1 (Master) controls both channels.
    - CH2 follows CH1's voltage setting.
    - The total output current = CH1 current limit + CH2 current limit.
3- **Series Mode (SERIES):** The two channels are connected in series, meaning the output voltage is doubled, but the current remains the same as a single channel.
    - CH1 (Master) controls both channels.
    - CH2 follows CH1's voltage setting.
    - Total output voltage = CH1 voltage setting + CH2 voltage setting.
    - If the GND terminal is connected to the middle point (CH1 negative / CH2 positive), the output becomes a ± voltage supply (e.g., ±30V), useful for loads needing an AC power supply. This way the machine can be manually turned into an AC power supply.

Additionally, the fixed 5V, 3A CH3 provides a steady 5V output with up to 3A current. It does not have a display, but an indicator light shows when it is active. This light will be green if it is in CV, and red if it is in CC and needs to be turned off immediately as well.

How to Use

To safely use the power supply, follow the next steps:

1- Turn the Power switch (Switch 1) on to start up the power supply. Take out any cables connected at the outputs.
2- Determine which output mode you want to use and adjust channel outputs accordingly. To adjust the maximum current and voltage, turn the current and voltage knobs clockwise or counter clockwise.
3- Connect the cables **only** to the output(s) that's going to be used, according to the currently selected mode. Carefully connect the circuit/load to the outputs via these cables.
4- Turn the on/off switch on (Switch 2), to turn on all outputs. Pay close attention to the indication lights, and turn off outputs if they turn red.

5- When the power supply is no longder needed, take out all the cables and put them back to their place after turning off all outputs. Afterwards, turn the power supply off by clicking the power button.