DSENERGY

The DSENERGY Group of companies

Intelligent DC Soft Start Controller

12V to 56V 20A



The Intelligent Soft Start Controller is a user configurable input protection and inrush current control device with an integrated high current relay.

All parameters are configurable through our companion software:

- Under/Overvoltage Protection
- DC & Transient Current Limits
- Thermal Shutdown Limit
- Power Good Threshold
- Inrush Current Ramp Profile
- Short Circuit Protection

Additional functionality includes:

- Regulated Auxiliary 12V Output
- USB-C Interface for Control
- Internal Power Relay
- External Temperature Monitoring

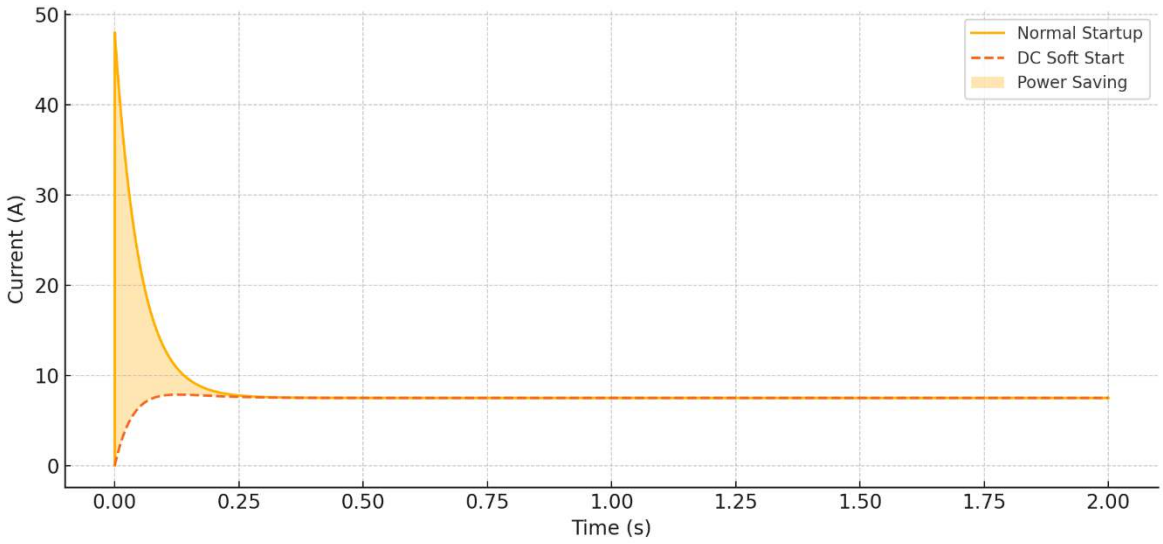
The provided companion software includes a utility to tune the soft start ramp profile to a specific application/load with live plots of voltage and current displayed.

Application Example - Solar Powered Pump Controller

In this example, a 24V 180W DC motor is being switched with a duty cycle of 2s ON and 10s OFF in continuous use at a solar powered pump station.

Reduction in Inrush Current

The inrush current is reduced by 6x, significantly reducing thermal and electrical stress on the system. This also improves the efficiency of the solar system.



Power Saving

Eliminating the inrush transient lowers power consumption by 15%, improving overall energy efficiency.

Extends System Lifetime

Reduced peak currents decrease battery degradation and thermal loads, increasing the lifespan of key components. This lowers operational costs.

Lower System Cost

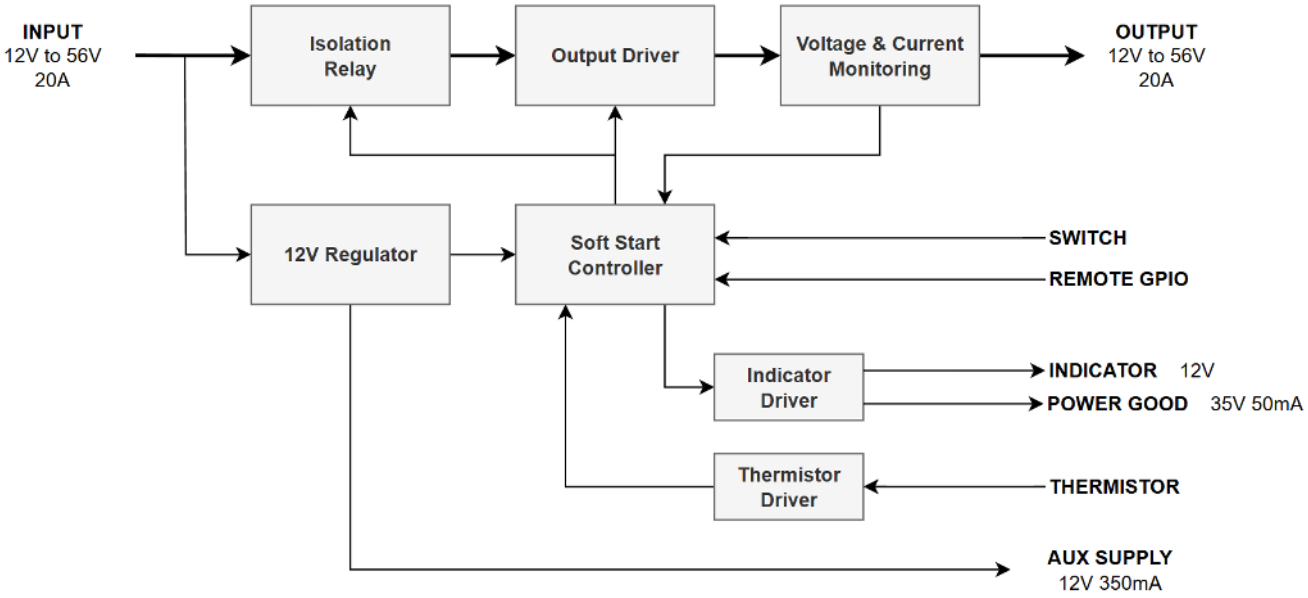
Lower peak demand enables the use of smaller and more affordable solar arrays, batteries, and power electronics with reduced maintenance and replacement costs.

Simplified Control Architecture

Eliminates the need for external relays - the main supply can remain connected to the input continuously with a low-voltage input pin used for ON/OFF control.

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System Block Diagram

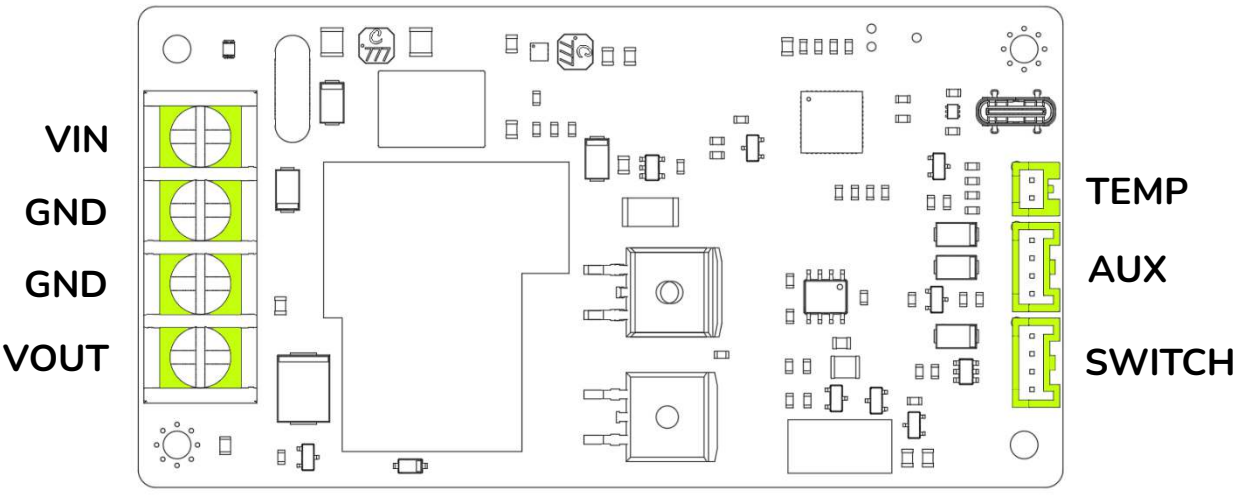


System Specifications

Input Voltage	12V to 56V DC
Rated Current	20A Max (75A, 10ms Peak)
Quiescent Current	<2mA OFF
Power Consumption	2W Max.
Power Good Output	Open Drain (48V, 50mA)
Regulated Output	12V 350mA
Indicator Voltage	12V
Ext. Temp. Sensor	-20°C to +160°C
Operating Temp.	-5°C to +105°C

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System Pinout



TEMP – External Thermistor Connector

Mating Connector: JST PAP-02V-S

Measurement Range: -20°C to +160°C

Requires a NTC Thermistor with R_{25} = 10kΩ, β = 3950K to 4000K

AUX – Auxiliary I/O Connector

Mating Connector: JST PAP-04V-S

Pin	Name	Description
1	REMOTE	Connect to GND to turn the output ON. Configured using the companion software. Pulled up internally to 3.3V.
2	PWR GD	Open drain Power Good output. Requires external pull up resistor. Max rating 48V 50mA. Configured using the companion software.
3	12V	Regulated 12V output at 350mA max. The supply is always enabled when VIN is present.
4	GND	-

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SWITCH – Illuminated Switch Connector

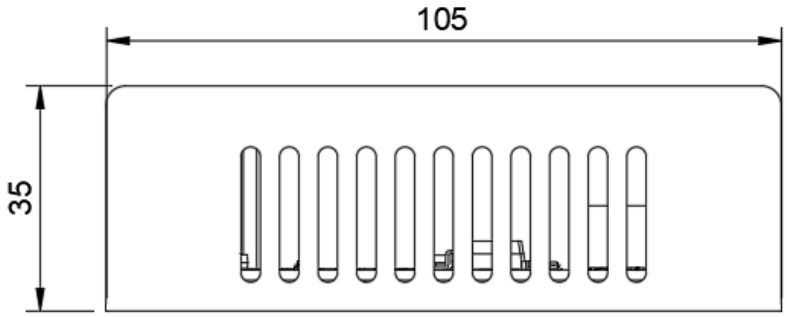
Mating Connector: JST PAP-04V-S

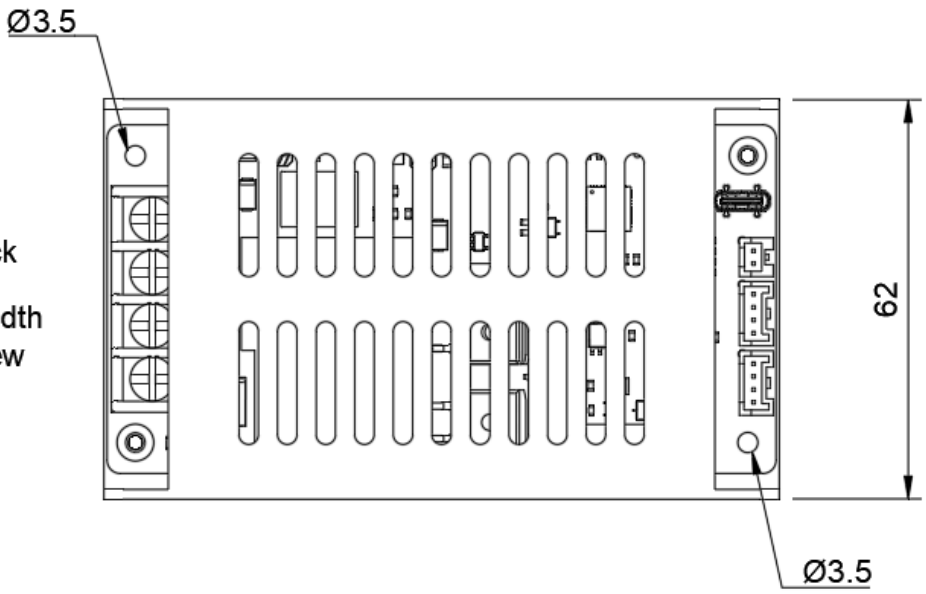
Requires a Latching PTM Switch or Rocker Switch

Pin	Name	Description
1	SWITCH	Connect to GND to turn the output ON. The input pin must remain at GND to keep the output ON. Pulled up internally to 3.3V.
2	GND	-
3	INDICATOR	12V Indicator Output. Configured to be always ON, always OFF or controlled by Power Good (default) using the companion software.
4	GND	-

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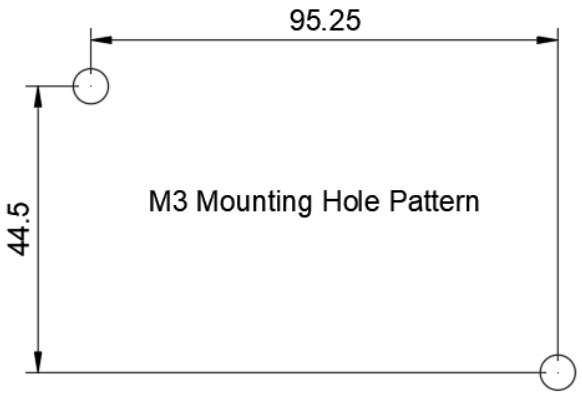
System Dimensions





Terminal Block

6.9mm Slot Width
Ø3.5mm Screw



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