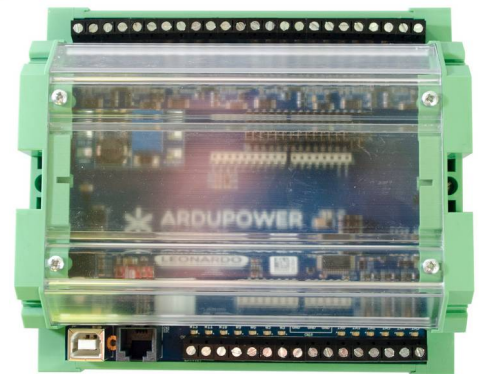
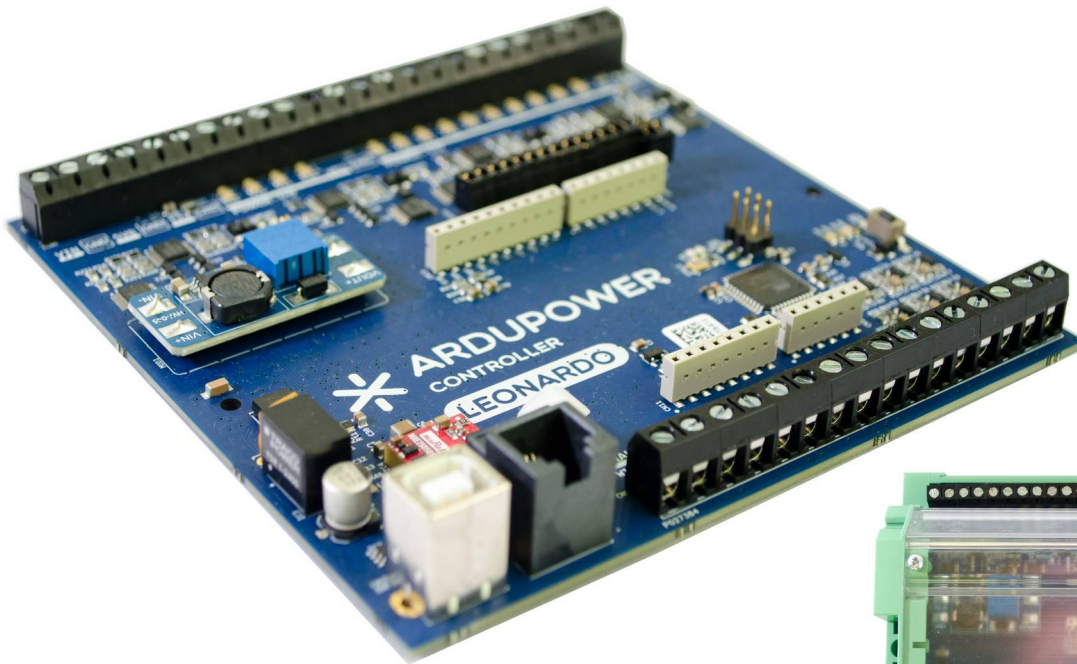




# ARDUPOWER CONTROLLER

## POWER CONTROLLER PLC (ARDUINO COMPATIBLE) DATASHEET



- 14 PowerIO (5-34 V) channels, software configured as inputs or 3.3 A outputs
- 6 Analog (0-10 V ) Inputs and 7 Analog (0-10V) Outputs
- Real time LED signaling system shows channel configuration and status
- 100% software compatible with Arduino Leonardo boards
- Voltage supply range: 5-32 V

ArduPower Controller is a power controller PLC (Arduino - Compatible) designed for Industry, Smart Home & Makers automation.

To provide greater versatility, all PowerIO channels can be software configured as input or output. In addition, they are grouped into blocks allowing outputs at different voltage levels. All outputs are 3.3A capable, some are extended to 4,7 A and all can be paralleled adding up higher current capabilities.

No special libraries or configuration settings are needed, it's 100% software compatible with Arduino Leonardo boards

It has a LED signaling system that shows the real time configuration of each PowerIO channel (green is input and yellow is output) as well as its voltage state (bright for high and dimmed for low level state). On the Analog Inputs and Outputs the brightness is proportional to the voltage value.

With a design created looking towards many application fields, standard Arduino shields can be assembled to the Ardupower Controller

It has standard ICSP connector for bootloader update and maintenance.

Application examples:

Smart home, access control, lighting automation, climate control, irrigation system , greenhouses and farming, CNC and 3D printers, caravanning and boating, Industry 4.0, IoT projects...

# TECHNICAL SPECIFICATIONS

## GLOBAL

Arduino Leonardo (Rev 3d) compatible.

IDE Connector: USB “Standard” Type B. (not original Arduino Leonardo “Micro” type). Resettable fuse 1.1 A max VBUS, and transient USB voltage protected.

At the 5V0 terminal, a 5.0 V ±4% voltage output is available for up to a 0.5 A auxiliary use.

At the 12V terminal, a 12,0V ±6% voltage output is available for up to 0,3 A auxiliary use.

Original Arduino LEDs: “ON” (green), “L” Arduino activity (yellow), “RX” and “TX” (yellow).

Standard Arduino shield socket for function extension modules.

Take out jumpers D3SCL+ and D4SDA when using IC2 RJ11 extension connection.

Configurable 10 kΩ pull-ups for I2C bus lines (placing jumpers enables pull-ups).

Reset button as Arduino standard.

ICSP standard connector for Arduino’s microcontroller firmware and bootloader updates and repair.

## POWER-IO SECTION

P0 to P13 terminals in correspondence with Arduino Leonardo’s 0 to 13 digital I/O.

Each power channel acts automatically as an output or an input depending on the user’s programming, being able to change its mode in real time.

Power supplies connected to VP1 and VP2 must be able to supply enough current for the connected loads.

Remember connecting the 0V reference wire from your VP1 and VP2 power supplies to the GND terminals.

VP1 & VP2 are not reverse-voltage protected. Always connect the positive wire to VPn and the negative to GND.

VP1 & VP2 shall always be connected to the operating voltage, even when terminal are only used as inputs.

Internal output MOSFET on resistance: 70 mΩ Typ. (180mΩ max @Tj=150°C)

Default channel state before any programming: Input – LOW (dimmed green LED).

Default P13 channel state is configured as Output - LOW because of led L connection.

With alternative uses of each channel, like PWM outputs, the Pnn will also be active and show its activity on the channel LED even if it is useless.

Channel jumper: by unplugging each, its Power-IO interface is disconnected so it will not interfere with shield applications. Check technical documentation regarding each shield for advice on which jumpers to take out. When a channel jumper is taken out, the power interface goes to input low mode, and the green led lights dimmed.

## ANALOG-IN SECTION

IA0 to IA5 terminals (in correspondence with Arduino Leonardo’s A0 to A5 main analog inputs).

Arduino’s A6 to A11 alternative analog inputs are not available at terminals, only at shield contacts.

IA0 to IA5 can be used as 10V or even 5V digital inputs.

IA0 to IA5 can be used as 5V digital outputs, as soon as the input impedance connected is high (>50kΩ).

## ANALOG-OUT SECTION

W3 to W13 terminals (in correspondence with Arduino Leonardo’s ~3 to ~13 main PWM outputs).

W3 to W13 can be used as 10V digital outputs (corresponding P3 to P13 will simultan. be active as outputs).

W3 to W13 can not be used as inputs (please use corresponding P3 to P13 terminals).

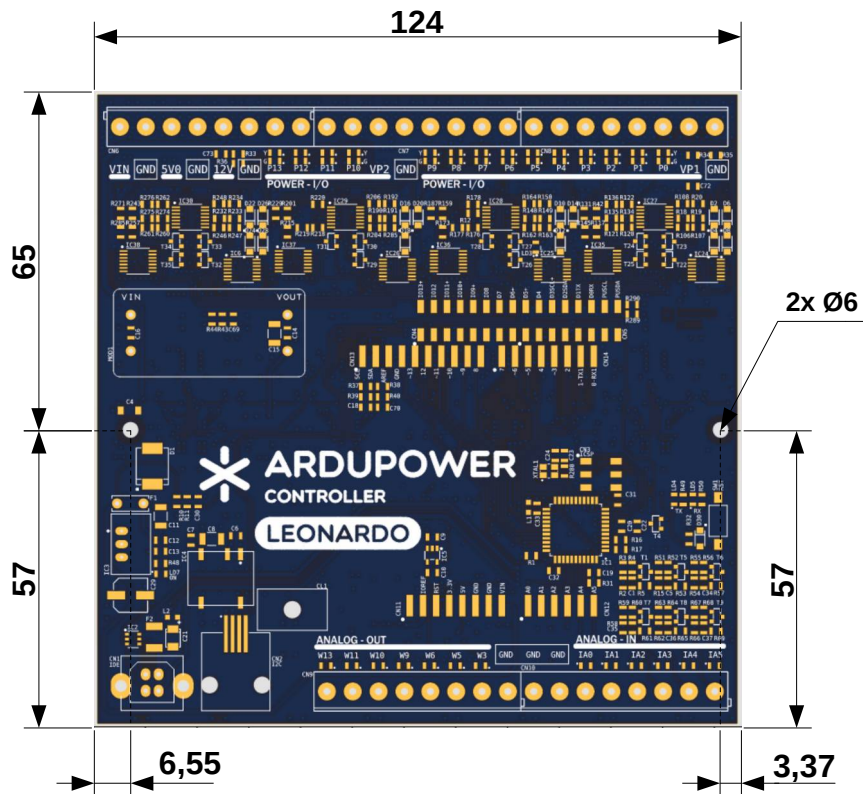
Low impedance output driver.

Supply voltage			
VIN (main power supply)		6.5 V to 32 V	
VIN protection		Resettable fuse 3.0 A max	
5V0		5 V ± 10% (Leaving VIN free)	
USB		For test proposes. It doesn't enable the POWER-IO Section	
POWER-IO Section ( P0 to P13)			
Number of digital inputs/outputs		14	
Power voltage VP1 (P0 to P9)		5.0 to 34 V	
Power voltage VP2 (P10 to P13)		5.0 to 34 V	
Input ON/OFF threshold voltage		33% (±5 %) * Vpn	
Iomax	Every single output		3.3 A
	Group (Outputs in each group can also be paralleled to increase output capacity)	P0-P1-P2-P3	7.3 A
		P4-P5-P6	7.3 A
		P7-P8-P9	7.3 A
		P10-P11-P12-P13	7.3 A
Doubled (P6 & P9)		4.7 A	
Output protections		Overload, current limit(12A), thermal shutdown, undervoltage and overvoltage shutdown with auto-restart and hysteresis and ESD	
Output switching time (Ton/Toff)		500 µs typ. (1 ms máx)	
Leds	Output	LOW	Dimmed YELLOW
		HIGH	Bright YELLOW
	Input	LOW	Dimmed GREEN
		HIGH	Bright GREEN
ANALOG-IN Section ( IA0 - IA5 )			
Number of analog inputs		6	
Input voltage range		0.0 V to 10.0 V	
Input scale factor		x0.5	
Input impedance		>5 kΩ	
Input analog noise filter		Fmax = 40kHz	
Resolution		10 bits	
LEDS		GREEN LEDES shine from zero brightness to maximum according to input value.	
ANALOG-OUT Section ( W3, W5, W6, W9, W10, W11, W13)			
Number of analog outputs		7	
Output voltage range		0.0 V to 10.0 V	
Output current per channel		25 mA	
Output scale factor		x2	
Output lowpass filter		2 <sup>nd</sup> order, fc= 0,5 Hz	
LEDS		YELLOW LEDES shine from zero brightness to maximum according to output value.	
Environmental			
Temperature range		-10°C to 60°C	
Dimensions			
Width		122 mm	
Height		124 mm	
Depth		21.3 mm	
Instalation			
A DIN rail box solution is available			

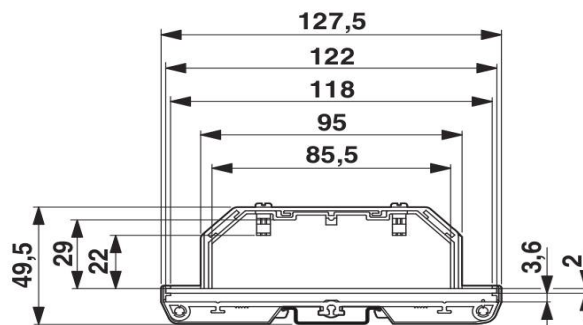
Note : These specs are the result of the V1.0 design process and its prototypes and can be changed in future releases or even verified to differ as testing and debugging is being developed.

# PHYSICAL DIMENSIONS

PCB



DIN RAIL BOX



Notes: Din Rail Box large = 114,9  
All dimensions in mm.

**WARNING: DON'T CHANGE THE SETTING OF THE MOD1 DC-DC CONVERTER (MT3608) POTENCIOMETER. IT MAY DAMAGE THE CIRCUIT**

### ORDERING CODE

Ardupower Controller Leonardo: 90300017  
Ardupower Controller Leonardo with DIN RAIL BOX: 90300018

### LICENSE NOTICES

Part of the Ardupower work is a derivative of the "Arduino Leonardo" work, released by arduino.cc at its board page (<https://store.arduino.cc/arduino-leonardo-with-headers>), used under [Creative Commons Attribution-ShareAlike 4.0 license](https://creativecommons.org/licenses/by-sa/4.0/). See disclaimers provided by Arduino.

Some changes were made: a DC-DC converter improves power supply efficiency, a reseatable fuse improves power input protection, other minor changes and clearer schematics.

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A product by:

More information in [www.ardupower.com](http://www.ardupower.com)



Made in EU



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Rúa de Melide 11 - 3B, 15705  
Santiago de Compostela - Spain