

khs

instruments

analog::blocks

***USB to ± 12 V Power Modules
and Boards***

User Manual

Rev. 1.0

Contents

1) General Description	1
2) Common Circuit	2
3) Configuration Notes	3
4) Prototype Board	3
5) Populated Function Modules	4
5.1) Isolated USB to ± 12 V Power Module	4
5.2) +12 V powered	4
5.3) USB powered +5 V	4
6) Module Interface and Pin Assignment	5
History:	6

1) General Description

The analog::blocks USB Power Board uses a configurable pre-routed DC/DC converter circuit that can be populated for different power supply applications. The same PCB is used for the unpopulated Prototype Board and the ready-to-use Function Modules.

Configurable resistor positions allow the DC/DC converter to be powered either from the USB connector or from the +12 V rail. Depending on the converter and component population, the output can be connected to the ± 5 V or ± 12 V supply rails.

The board can also be configured to connect the USB +5 V supply directly to the +5 V rail without a DC/DC converter.

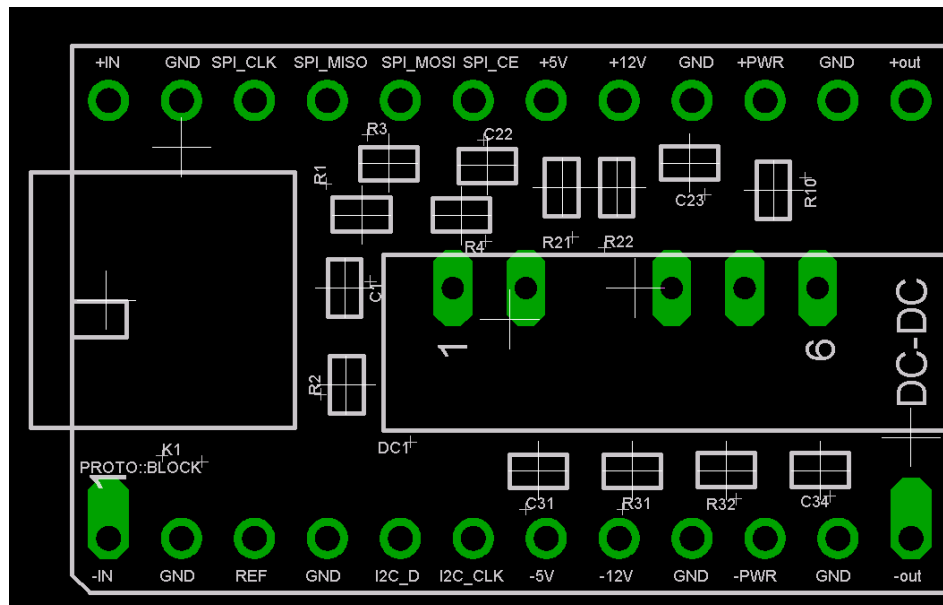


Figure 1. Common Power Module Board layout

2) Common Circuit

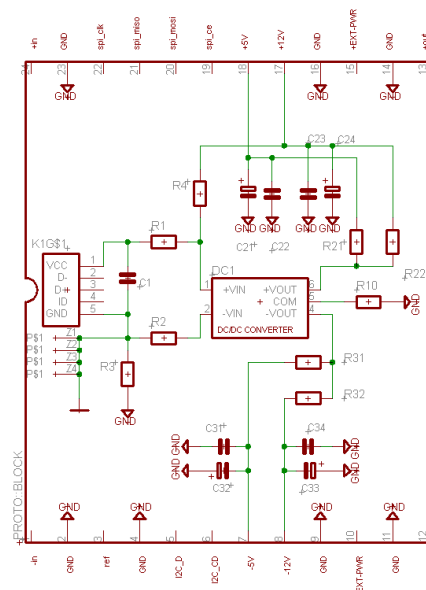


Figure 2. Common Power Module circuit.

Components / pads	Function
R1 / R2 K1 / C1	Isolated USB powered; requires DC/DC converter with 5 V input.
R1 / R3 / R4 / R21 / R22 K1 / C1	+5 V USB powered. Pin 17 must be removed.
R2 / R3 / R4	+12 V powered, requires DC/DC converter with 12 V input.
R21 / R31 / R10 C31 / C32 / C21 / C22	± 5 V output, requires ± 5 V output DC/DC converter.
R22 / R32 / R10 C33 / C34 / C23 / C24	± 12 V output, requires ± 12 V output DC/DC converter.

3) Configuration Notes

The PCB supports Isolated USB powered and +12 V powered. The output can be configured for ± 5 V and ± 12 V power rails.

Isolated USB powered:

The DC/DC converter is powered from the USB connector. A converter with a 5 V input voltage is required. The converter output can be connected to either the ± 5 V or ± 12 V supply rails.

+12 V powered: The DC/DC converter is powered from the +12 V rail. A converter with a 12 V input voltage is required. This configuration is intended for generating the ± 5 V supply rails.

± 12 V power output : A DC/DC converter with 5 V input and ± 12 V output is powered from the USB connector and connected to the ± 12 V supply rails.

± 5 V power output : The ± 5 V supply rails can be generated either from USB using a 5 V input DC/DC converter or from the +12 V rail using a 12 V input DC/DC converter.

USB powered +5 V: The USB supply is connected directly to the +5 V rail. Pin 17 (+12 V) of the module connector must be removed.

4) Prototype Board

Ordering Information: ABL-PPI-11-U12

5) Populated Function Modules

The populated Function Modules use the same configurable circuit as the Prototype Boards. Their factory configuration can therefore be modified by changing the corresponding resistor and capacitor positions.

5.1) Isolated USB to ± 12 V Power Module

Configuration:	Isolated USB powered DC/DC converter
Input:	5 V USB
Output:	± 12 V
Maximum Output Current:	40 mA per output
Ordering Information:	ABL-MPI-11-U12-12

5.2) +12 V powered

Configuration:	12V power rail powered DC/DC converter
Input:	+12 V power rail
Output:	± 5 V
Maximum Output Current:	40 mA per output
Ordering Information:	ABL-MPI-11-I12-05

5.3) USB powered +5 V

Configuration:	Isolated USB powered DC/DC converter
Input:	5 V USB
Output:	+5V
Maximum Output Current:	500 mA
Ordering Information:	ABL-MPI-11-U01-05

6) Module Interface and Pin Assignment

The module interface consists of 24 contacts. The four corner contacts are the principal analog signal connections. The signal names IN and OUT describe their usual purpose; an individual module may use these analog contacts in the opposite direction.

Pinout

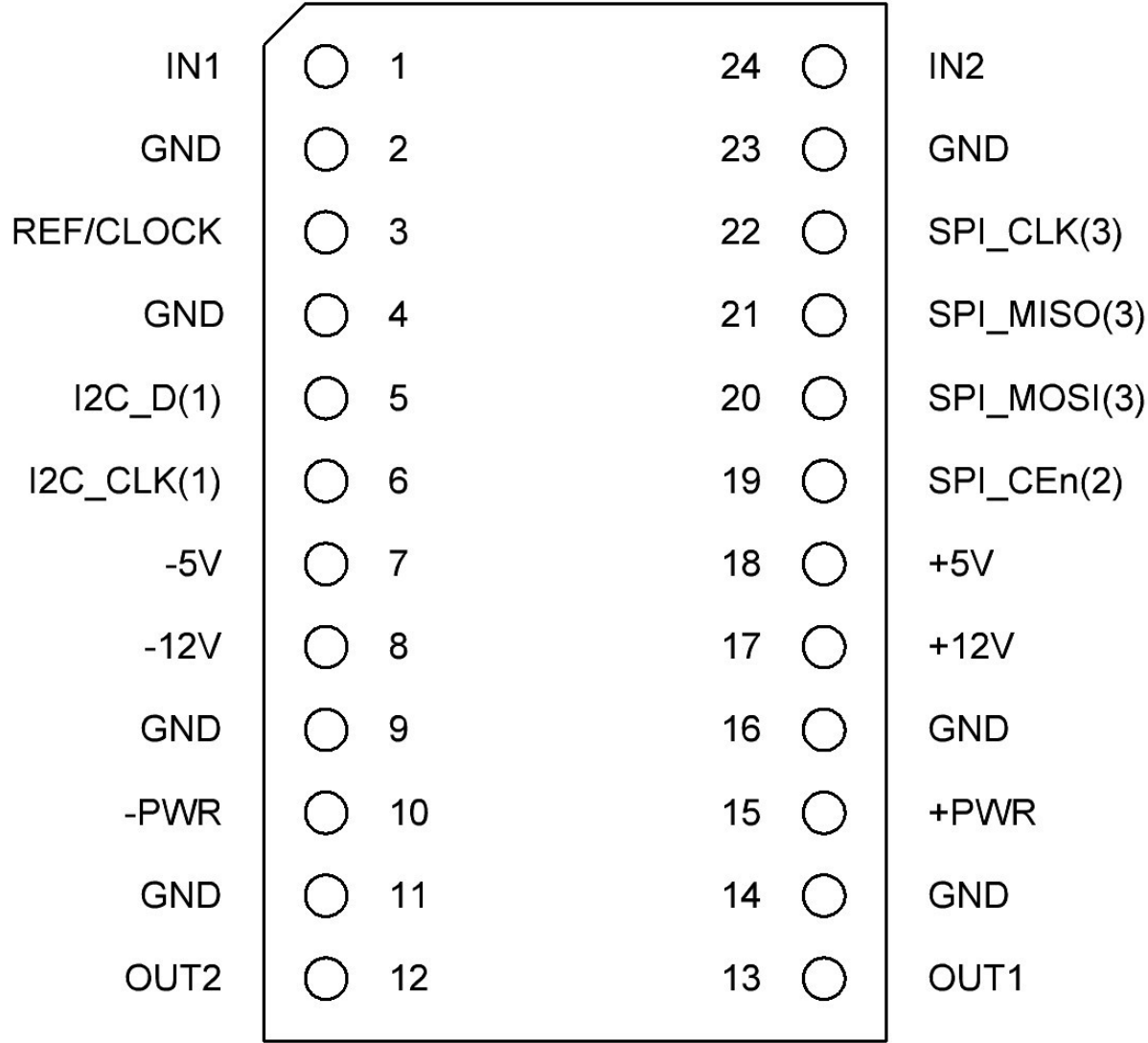


Figure 3: 24-pin analog::blocks module interface, top view.

History:

Revision	date yy/mm/dd	Changes
1.0	26/09/21	Initial.