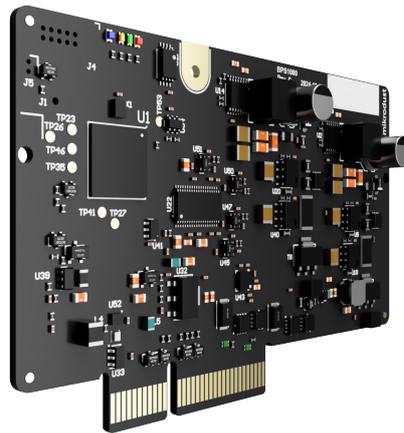


AtoMik® SMU Instrument



Key Features

- USB Controlled
- Power supply 0-15V, 0-2.5A
- x2 Independent power channel
- Accurate current Measurement
- Remote sense voltage feedback
- Built-in soft fuse function
- I2C/SPI expansion
- Powered by +24V/+5V

Description

The SMU Instrument provides two high-precision software-controlled supply voltage channels with individual built-in software fuses. It has an onboard high-performance MCU with an Arm® Cortex®-M7 core running a RTOS (Real-Time Operating System), which also provides a USB 2.0 channel to an external host.

Each channel offers configurable settings of slew rate and also remote sense voltage feedback with possibility to increase voltage accuracy. Current can be measured in 3 different ranges (mA, uA, nA) with high precision configured manual or in automatic mode. Different types of external expansion such as number of power supply channels is possible by utilizing the built-in expansion interface.

P i n	Name	Description	P i n	Name	Description
A 1	+24V_IN	+24V Input Power Supply	B 1	USB_N	USB D- signal
A 2	+24V_IN	+24V Input Power Supply	B 2	USB_P	USB D+ signal
A 3	+24V_IN	+24V Input Power Supply	B 3	GND	Ground
A 4	+24V_IN	+24V Input Power Supply	B 4	GND	Ground
A 5	+5V_IN	+5V Input Power Supply	B 5	GND	Ground
A 6	+5V_IN	+5V Input Power Supply	B 6	GND	Ground
A 7	+5V_IN	+5V Input Power Supply	B 7	GND	Ground
A 8	+5V_IN	+5V Input Power Supply	B 8	GND	Ground
A 9	RST_N	Reset signal	B 9	RSV	Reserved
A 10	PWR_EN	Power enable of the instrument	B 10	RSV	Reserved
A 11	RSV	Reserved	B 11	RSV	Reserved
A 12	EXP_I2C_SCL/EXP_SPI_CS1	Expansion Interface I2C SCL or SPI CS1	B 12	EXP_SPI_SCLK	Expansion Interface SPI Clock-signal
A 13	EXP_I2C_SDA/EXP_SPI_CS2	Expansion Interface I2C SDA or SPI CS2	B 13	EXP_SPI_MOSI	Expansion Interface SPI MOSI

A 1 4	EXP_SPI_CS3	Expansion Interface SPI CS3	B 1 4	EXP_SPI_MISO	Expansion Interface SPI MISO
A 1 5	EXP_SPI_CS4	Expansion Interface SPI CS4	B 1 5	EXP_SPI_CS0	Expansion Interface SPI CS0
A 1 6	EXP_RST_N	Expansion Interface Reset output active low	B 1 6	GND	Ground
A 1 7	+5V_EXP	+5VDC Power Supply for Expansion	B 1 7	GND	Ground
A 1 8	RSV	Reserved	B 1 8	RSV	Reserved
A 1 9	RSV	Reserved	B 1 9	RSV	Reserved
A 2 0	RSV	Reserved	B 2 0	RSV	Reserved
A 2 1	RSV	Reserved	B 2 1	RSV	Reserved
A 2 2	RSV	Reserved	B 2 2	RSV	Reserved
A 2 3	VSENSE2+	Remote pos voltage feedback 2	B 2 3	VSENSE2-	Remote neg voltage feedback 2
A 2 4	+VOUT2	Output Power Supply 2	B 2 4	GND	Ground
A 2 5	+VOUT2	Output Power Supply 2	B 2 5	GND	Ground

A 2 6	+VOUT2	Output Power Supply 2	B 2 6	GND	Ground
A 2 7	+VOUT2	Output Power Supply 2	B 2 7	GND	Ground
A 2 8	VSENSE1+	Remote pos voltage feedback 1	B 2 8	VSENSE1 -	Remote neg voltage feedback 1
A 2 9	+VOUT1	Output Power Supply 1	B 2 9	GND	Ground
A 3 0	+VOUT1	Output Power Supply 1	B 3 0	GND	Ground
A 3 1	+VOUT1	Output Power Supply 1	B 3 1	GND	Ground
A 3 2	+VOUT1	Output Power Supply 1	B 3 2	GND	Ground

Absolute Maximum Ratings

Exceeding ABSOLUTE MAXIMUM RATINGS can cause permanent damage to the device.

	Min	Max
USB_P, USB_N	-0.5 V	+5.5 V
+24V Input Power Supply	-0.3 V	+25.5 V
+5V Input Power Supply	-0.3 V	+5.2 V
Voltage on any Digital Pin	-0.3 V	+3.6 V
Voltage on any VSENSEx Pin	-0.3 V	+15.3 V

Recommended Operating Conditions

Specifications are valid at 25°C unless otherwise noted and with a warm-up time of >10min.

	Conditions	Min	Typ	Max
+24V Input Power Supply		+23.0 V	+24.0 V	+25.0 V
+24V Input Power Supply Quiescent Current			+29 mA	
+5V Input Power Supply		+4.8 V	+5.0 V	+5.2 V
+5V Input Power Supply Quiescent Current			+154 mA	
Expansion +5V Output Power Supply	Load = +140 mA	+4.8 V	+5.0 V	+5.2 V
Expansion +5V Output Power Supply Current				+140 mA
Expansion Digital Input High Voltage		+2.4 V		
Expansion Digital Input Low Voltage				+0.8 V
Expansion Digital Output High Voltage	Load = +2 mA	+2.6 V		
Expansion Digital Output Low Voltage	Load = -2 mA			+0.7 V
Expansion I2C bit rate		100 kbit/s		1 Mbit/s
Expansion SPI Clock frequency				13.5 MHz
Output Voltage Range		0.0 V		+15.0 V
Output Voltage Resolution		12 bits		
Output Voltage Accuracy		-20.0 mV		+20.0 mV
Output Voltage Slew Rate		10 V/s		500 V/s
Output Voltage Load-transient Regulations			70 mVpp 1.5 ms to DC stabilization	

Output Voltage Noise				
Output Current Measurement Range			0-2.5 A	
Output Current Measurement Resolution			Nano: 20 nA steps Micro: 422 nA steps Milli: 12 uA steps	
Output Current Measurement Accuracy				
Output Current Software Fuse Range		50 mA		2500 mA
Output Current Software Fuse Resolution			1 mA	
Output Current Software Fuse Response Time			< 2 ms	
Output Current Software Fuse Delay Time Range		0		2000 ms
Sense Voltage Range		0		15 V
Sense Voltage Resolution			3.8 mV	
Sense Voltage Accuracy			0.5 %	

Environmental

The SMU Instrument is designed for following environmental conditions and for indoor use only.

	Min	Max
Operating Temperature	0°C	+55°C
Operating Humidity	10% RH	90% RH
Storage Temperature	0 °C	+70 °C

Storage humidity	5% RH	95% RH
Pollution Degree		2

Attachment

[3D Model](#)

Ordering information

Item	Part Number
AtoMik® Source Monitoring Unit (SMU) Instrument	IPS-1000-C2