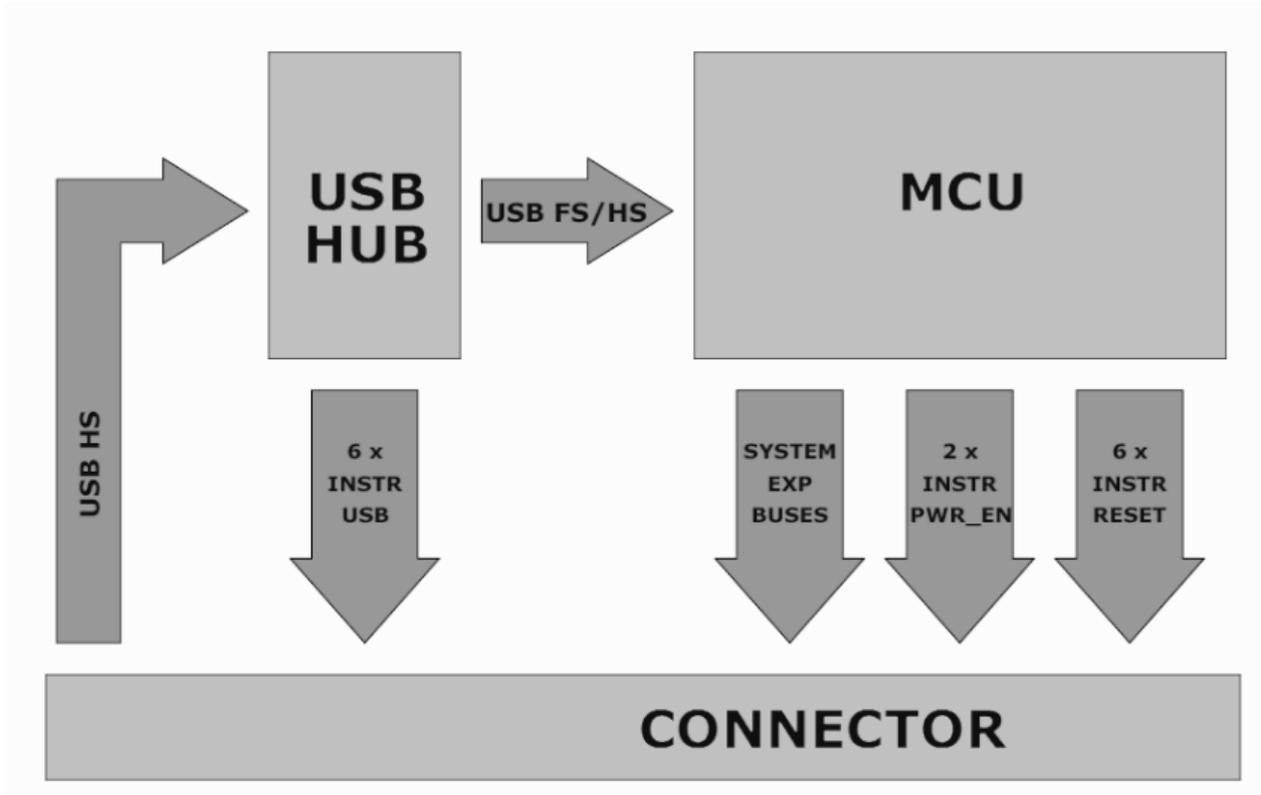# AtoMik® BAS Instrument

Key Features

- USB controlled
- x6 USB HUB expansion
- x6 Instrument power enable signals
- x6 Instrument reset signals•
- I2C/SPI expansion
- Powered by +24V/+5V

Description

The BAS Instrument is the link between an external host computer and additional test instruments. It has an embedded high-performance MCU with an Arm® Cortex®-M7 core running a Real-Time Operating System (RTOS), which also provides a USB 2.0 channel to the external host.

The instrument includes a USB hub to expand an incoming USB channel from an external host to an additional six test instruments. It also provides power enable and reset signals for up to six instruments. Various types of external expansion are possible through the built-in expansion interface.

BAS Instrument Block Diagram
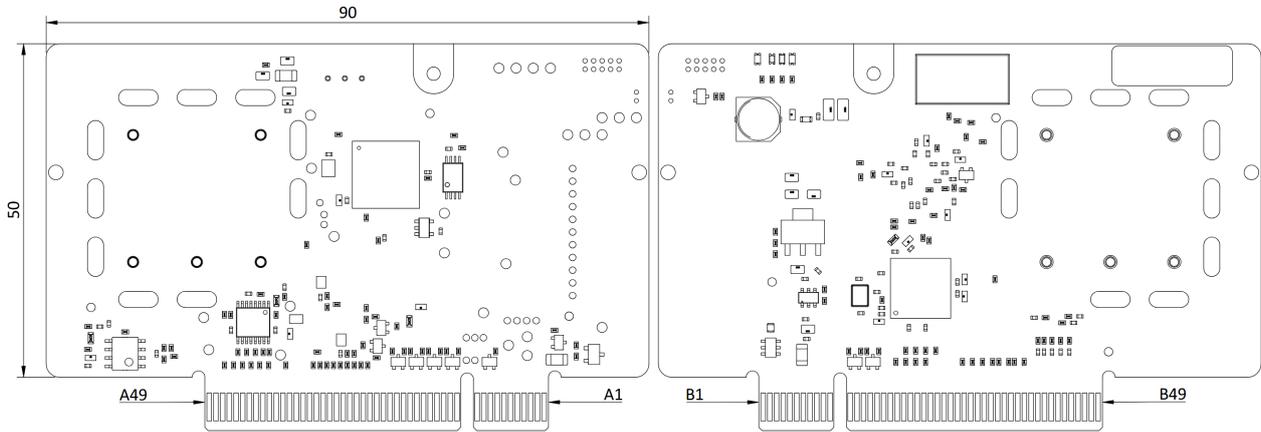
BAS Instrument Layout

Pinout

Pin	Name	Description	Pin	Name	Description
A1	+24V_IN	+24V Input Power Supply	B1	USB_N	USB D- signal
A2	+24V_IN	+24V Input Power Supply	B2	USB_P	USB D+ signal
A3	+24V_IN	+24V Input Power Supply	B3	GND	Ground
A4	+24V_IN	+24V Input Power Supply	B4	GND	Ground
A5	+5V_IN	+5V Input Power Supply	B5	GND	Ground
A6	+5V_IN	+5V Input Power Supply	B6	GND	Ground
A7	+5V_IN	+5V Input Power Supply	B7	GND	Ground
A8	+5V_IN	+5V Input Power Supply	B8	GND	Ground
A9	RST_N	Reset signal	B9	RSV	Reserved
A10	RSV	Reserved	B10	RSV	Reserved
A11	RSV	Reserved	B11	RSV	Reserved
A12	EXP_I2C_SCL/EXP_SPI_CS1	Expansion Interface I2C SCL or SPI CS1	B12	EXP_SPI_SCLK	Expansion Interface SPI Clock-signal
A13	EXP_I2C_SDA/EXP_SPI_CS2	Expansion Interface I2C SDA or SPI CS2	B13	EXP_SPI_MOSI	Expansion Interface SPI MOSI

A14	EXP_SPI_CS3	Expansion Interface SPI CS3	B14	EXP_SPI_MISO	Expansion Interface SPI MISO
A15	EXP_SPI_CS4	Expansion Interface SPI CS4	B15	EXP_SPI_CS0	Expansion Interface SPI CS0
A16	EXP_RST_N	Expansion Interface Reset output active low	B16	GND	Ground
A17	EXP_SPI_CS5	Expansion Interface SPI CS5	B17	INS0_USB_N	Instrument 0 USB data D-
A18	EXP_SPI_CS6	Expansion Interface SPI CS6	B18	INS0_USB_P	Instrument 0 USB data D+
A19	EXP_DI	Generic Digital Input (Pull-up 10K)	B19	GND	Ground
A20	GND	Ground	B20	INS1_USB_N	Instrument 1 USB data D-
A21	RSV	Reserved	B21	INS1_USB_P	Instrument 1 USB data D+
A22	RSV	Reserved	B22	GND	Ground
A23	RSV	Reserved	B23	INS2_USB_N	Instrument 2 USB data D-
A24	RSV	Reserved	B24	INS2_USB_P	Instrument 2 USB data D+
A25	GND	Ground	B25	GND	Ground

A26	INSA_PWR_EN	Instruments A PWR Enable Output (Pull-down 10K)	B26	INS3_USB_N	Instrument 3 USB data D-
A27	INSB_PWR_EN	Instruments B PWR Enable Output (Pull-down 10K)	B27	INS3_USB_P	Instrument 3 USB data D+
A28	INS0_RST_N	Instrument 0 Reset active low	B28	GND	Ground
A29	INS1_RST_N	Instrument 1 Reset active low	B29	INS4_USB_N	Instrument 4 USB data D-
A30	INS2_RST_N	Instrument 2 Reset active low	B30	INS4_USB_P	Instrument 4 USB data D+
A31	INS3_RST_N	Instrument 3 Reset active low	B31	GND	Ground
A32	INS4_RST_N	Instrument 4 Reset active low	B32	INS5_USB_N	Instrument 5 USB data D-
A33	INS5_RST_N	Instrument 5 Reset active low	B33	INS5_USB_P	Instrument 5 USB data D+
A34	RSV	Reserved	B34	GND	Ground
A35	RSV	Reserved	B35	RSV	Reserved
A36	RSV	Reserved	B36	RSV	Reserved
A37	RSV	Reserved	B37	GND	Ground

A38	GND	Ground	B38	RSV	Reserved
A39	RSV	Reserved	B39	RSV	Reserved
A40	RSV	Reserved	B40	GND	Ground
A41	RSV	Reserved	B41	RSV	Reserved
A42	RSV	Reserved	B42	RSV	Reserved
A43	RSV	Reserved	B43	EXP0_USB_N	Expansion 0 USB data D-
A44	RSV	Reserved	B44	EXP0_USB_P	Expansion 0 USB data D+
A45	RSV	Reserved	B45	GND	Ground
A46	RSV	Reserved	B46	RSV	Reserved
A47	RSV	Reserved	B47	RSV	Reserved
A48	RSV	Reserved	B48	EXP1_USB_N	Expansion 1 USB data D-
A49	RSV	Reserved	B49	EXP1_USB_P	Expansion 0 USB data D+

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

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			+63 mA	
+5V Input Power Supply		+4.8 V	+5.0 V	+5.2 V
+5V Input Power Supply Quiescent Current			+123 mA	
Digital Input High Voltage		+2.4 V		
Digital Input Low Voltage				+0.8 V
Digital Output High Voltage	Load = +2 mA	+2.6 V		
Digital Output Low Voltage	Load = -2 mA			+0.7 V
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

Environmental

The BAS 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® Base Control (BAS) Instrument	IIB-1000-C1