Datasheet

Acromag
THE LEADER IN INDUSTRIAL I/O

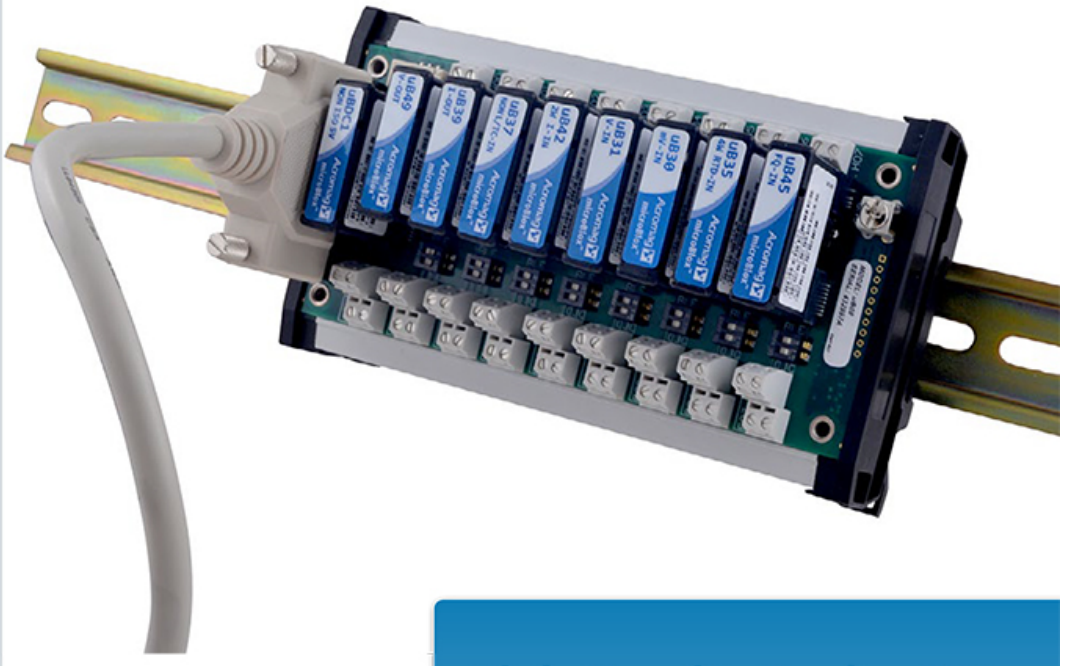
MONITORING & CONTROL SOLUTIONS

microBlox™ Signal Conditioners

Bluetooth Configurable

Pre-calibrated Ranges

Rugged



High-Density Analog I/O Signal Conditioners

8400-890

Innovative Signal Conditioning

MicroBlox™ Series featuring Bluetooth® Wireless Technology

New Product Announcement

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

microBlox I/O Modules Advantages

- Selection of 175 I/O modules with Bluetooth wireless technology capability, fixed-range, and cost-saving commercial grade versions
- User-configurable I/O ranges with smartphone or tablet
- Input polling with trend charts in Android® or iOS® app
- Alarm output function with setpoint and deadband
- 1500Vac isolation field-to-host and channel-to-channel
- Up to 0.05% accuracy and 130db CMR
- Shock and vibration-resistant without screws

User-configurable & fixed I/O range models available	
Input Modules	
uB30/uB40	±10mV to ±100mV input, 0-5V or ±5V output
uB31/uB41	±1V to ±60V input, 0-5V or ±5V output
uB32	0-20mA or 4-20mA DC input, 0-5V or ±5V output
uB34/uB35	RTD input, 0-5V or ±5V output
uB37/47	Thermocouple input, 0-5V or ±5V output
uB42	2-wire transmitter (0-20mA) input, 0-5V or ±5V output
uB45	0-50KHz input, 0-5V or ±5V output
Output Modules	
uB39	0-20mA or 4-20mA DC field output, ±5V host input
uB49	0-10V or ±10V field output, ±10V host input
Backpanels	
uB04/uB04D	4 channel uB backpanel, surface or DIN-rail mount
uB08/uB08D	8 channel uB backpanel, panel or DIN-rail mount
uB16/uB16D	16 channel uB backpanel, panel or DIN-rail mount
Power Options	
uBDC1	5V DC power module, 10-32V DC supply input

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Signal Conditioning: microBlox™ Series

Key Features & Benefits

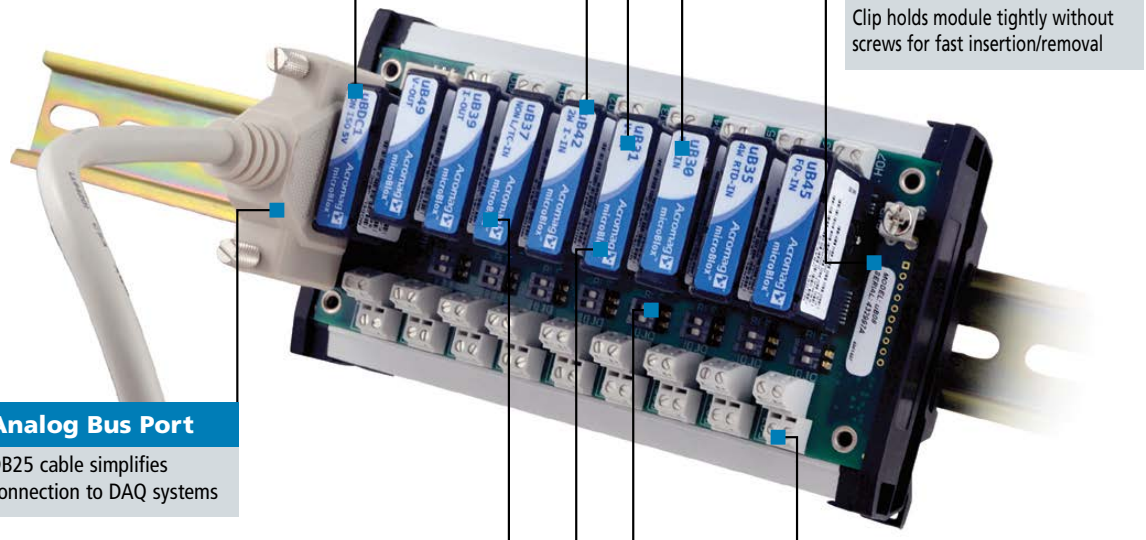
Alarm Function
Wireless (-B) models support alarm setpoint/deadband control to drive 0 or 5V output

Wireless Configuration
Easily set I/O scaling and alarms or poll inputs using Bluetooth wireless technology with a smartphone or tablet using Android or iOS app.

Flexible Power
5V power modules enables use of 10-32V supplies

Mix-and-Match Modules
175 modules support a wide variety of input and output signal types

Easy, Secure Mounting
Clip holds module tightly without screws for fast insertion/removal



Analog Bus Port
DB25 cable simplifies connection to DAQ systems

Rugged, Over-molded Circuit
Superior shock, vibration, moisture, and dust protection

High-Density Analog I/O
Up to 16 channels in a compact footprint

High-performance
High-accuracy / high noise immunity

-40 to 80°C

User-Programmable I/O Ranges
Models with Bluetooth wireless technology allow custom input and output ranges

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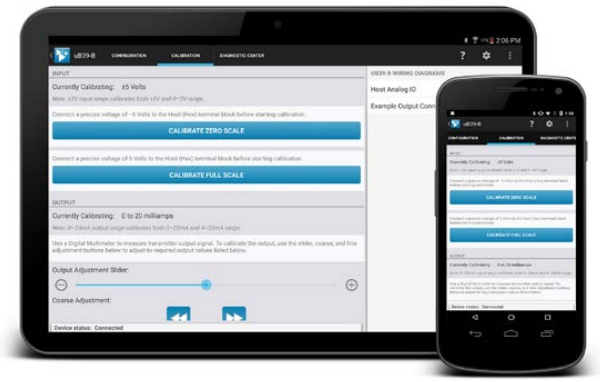
Signal Conditioners: microBlox™ Series

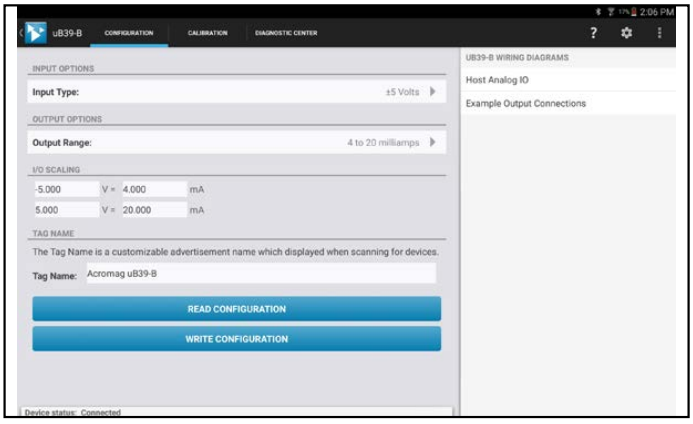
Acromag Agility™ Config Tool Mobile Application

The Agility™ Config Tool is a mobile application that allows easy setup and configuration of Acromag microBlox™ Series signal conditioners. Connect via *Bluetooth*® wireless technology to smart devices with Android 4.3 or higher or iOS 5.0 or later.

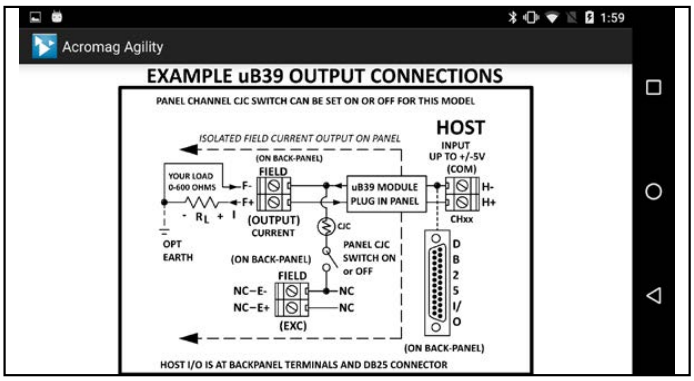
This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App Store® at itunes.apple.com (Apple iOS).



Bluetooth®



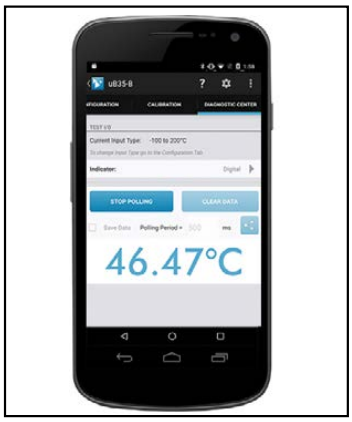
With a couple of taps, quickly configure input, output, unit and scaling options.



Quick and easy access to the wiring diagram, even offline without internet access.

Key Features & Benefits

- Connects to microBlox signal conditioners via Bluetooth wireless technology
- Requires the use of a smart device
- Configures and calibrates microBlox UB Series products via phone or tablet running Android 4.3 or later or iOS 5.0 or later.
- View wiring diagrams, even without an internet connection
- Perform quick and easy field diagnostics and troubleshooting
- Ideal for field technicians
- Trend and share field data



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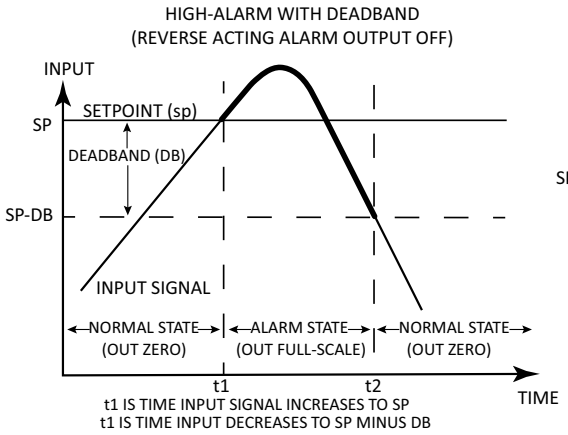
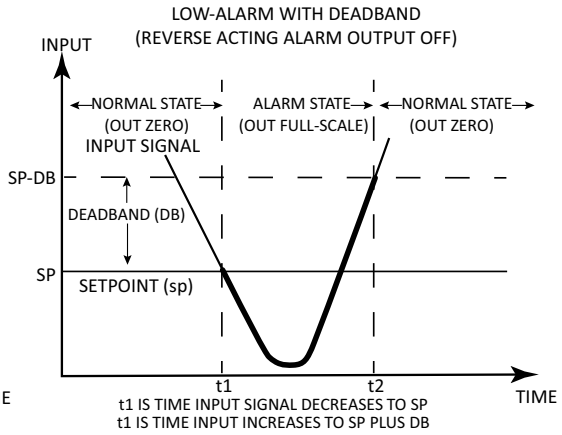
Signal Conditioners: microBlox™ Series

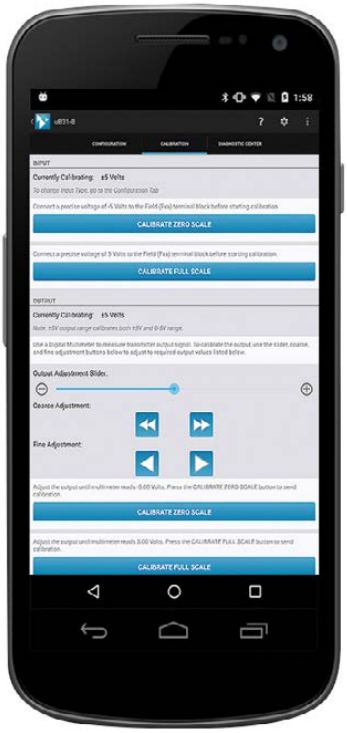
Acromag Agility™ Config Tool Mobile Application

Alarm Function

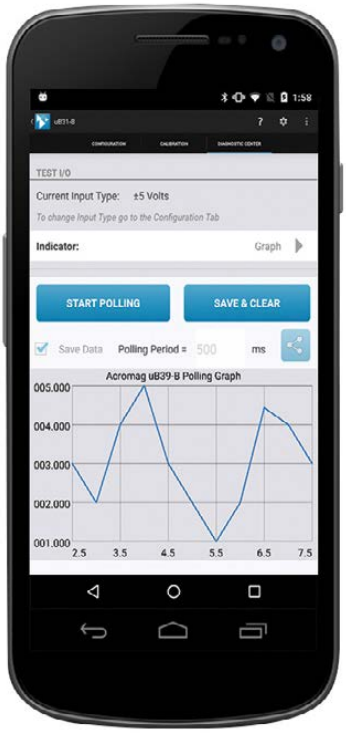




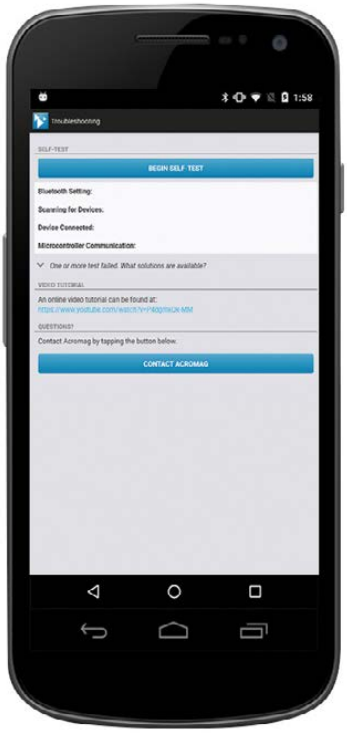
Calibration



Data Logging



Diagnostics



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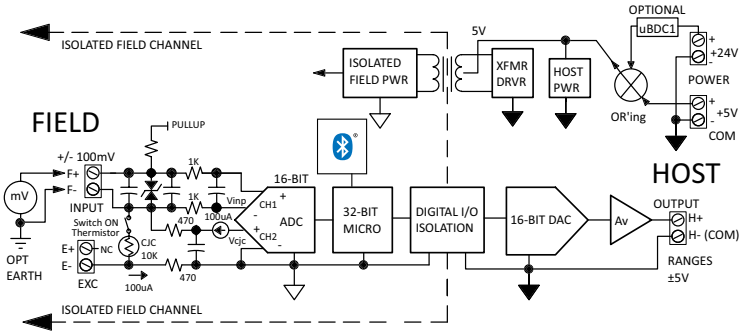
Datasheet

Signal Conditioners: microBlox™ Series

uB30/40 milliVolt Field Input

Bluetooth®



Bluetooth® wireless configuration option ◆ Narrow or wide band mV field input ◆ Voltage host output

Description

Field Input: ±10mV to ±100mV ranges
Host Output: 0-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB30 and uB40 models condition and convert a low-level DC voltage field input signal to a scaled 0-5V or ±5V output. The uB30 has more filtering for low-band applications, while the uB40 relaxes filtering for higher speed applications. uB30 modules are recommended for noisier environments where conversion speed is less of a concern. uB40 modules drive a faster response, but with less filtering for noise.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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AS9100
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Signal Conditioners: microBlox™ Series

uB30/40 milliVolt Field Input

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: ±10mV, ±50mV or ±100mV.
User-configurable -B models: ranges inside ±100mV.

Resolution
16-bit ADC, ±10mV: 1/28894.
±50mV/±100mV: 1/36118.

Resistance
100MΩ.

Input Sample Rate
uB30: 40sps.
uB40: 2Ksps.

Normal Mode (Bandwidth)
uB30: -3dB at 5Hz, typical.
uB40: -3dB at 1KHz, typical.

Protection
TVS & diode clamps built-in plus additional protection on back-panel.

Common Mode Rejection
103dB typical, 50-60Hz.

Host Output

Host Range
0-5V or ±5V per range model.
User-configurable -B models: ±5V.

Resolution
16-bit DAC. 0-5V: 1/26305. ±5V: 1/52610.

Current Drive
5V into 1KΩ minimum or 5mA maximum.

Response Time
uB30: Output step 0-98% in 300ms, typical.
uB40: Output step 0-98% in 2ms, typical.

General

Power Consumption
0.25W, 50mA from +5V maximum.

I/O Resolution
Effective resolution is the least of input (A/D) and output (D/A) resolution: uBx0-01: 1/28894.
uBx0-02/-03: 1/36118. uBx0-04/-05/-06: 1/26305.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise
Less than 0.03% of span p-p, rms.

Ambient Effect
Less than ±80ppm/°C.

Dimensions
Height: 1.380" with connectors, 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered,10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB30-01-CG.

Model (5Hz)	Model (1KHz)	Field Input	Host Output
uB30-01	uB40-01	±10mV DC	±5V DC
uB30-02	uB40-02	±50mV DC	±5V DC
uB30-03	uB40-03	±100mV DC	±5V DC
uB30-04	uB40-04	±10mV DC	0-5V DC
uB30-05	uB40-05	±50mV DC	0-5V DC
uB30-06	uB40-06	±100mV DC	0-5V DC
uB30-B	uB40-B	Configurable ±100mV DC	0-5V DC or ±5V DC

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app supports smart devices with Android 4.3 + or iOS 5.0 +. You can download the Agility application free of charge from the Google Play™ store or the Apple® App Store®.

Accessories

Model	Description
uBDC-1	Non-isolated, 10-32V: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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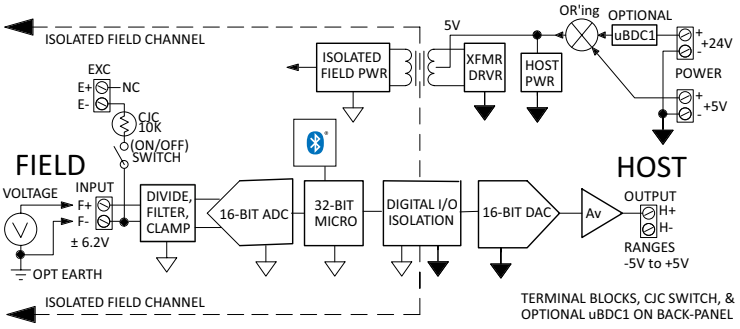
Datasheet

Signal Conditioners: microBlox™ Series

uB31/41 DC Voltage Field Input

Bluetooth®



Bluetooth® wireless configuration option ◆ Narrow or wide band voltage field input ◆ Host voltage output

Description

Field Input: ±1V to ±60V ranges
Host Output: 0-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages

The uB31 and uB41 models condition and convert a high-level DC voltage field input signal to a scaled 0-5V or ±5V output. The uB31 has more filtering for low-band applications, while the uB41 relaxes filtering for higher speed applications. uB31 modules are recommended for noisier environments where conversion speed is less of a concern. uB41 modules drive a faster response, but with less filtering for noise.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app. can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB31/41 DC Voltage Field Input

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: ±1V to ±60V.
User-configurable -B models: DC ranges up to ±60V.

Resolution
16-bit ADC ±1V: 1/27395. ±5V/±10V/±20V: 1/34244. ±40V/±60: 1/51366.

Resistance
203.32KΩ (via resistive input divider x0.0163).

Input Sample Rate
uB31: 40sps.
uB41: 2000sps.

Normal Mode (Bandwidth)
uB31: -3dB at 4Hz.
uB41: -3dB at 1KHz.

Common Mode Rejection
103dB typical, 50-60Hz.

Host Output

Host Range
Fixed ranges: 0-5V or ±5V DC.
User-configurable -B models: ±5V.

Resolution
16-bit DAC, 0-5V: 1/26305. ±5VDC: 1/52610.

Current Drive.
5V into 1KΩ minimum or 5mA max.

Response Time.
uB31: Output Step 0-98% in 200ms.
uB41: Output step 0-98% in 2ms.

General

Power Consumption
Up to 0.25W, or 50mA max. from 5V.

I/O Resolution
Effective resolution is the least of input (A/D) and output (D/A) resolution: uBx1-01/-04: 1/27395. uBx1-02/-03: 1/34244. uBx1-04/-05/-06: 1/26305. uBx1-07: 1/34244. uBx1-08/-10/-13: 1/26305. uBx1-09/-12: 1/51366.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise
Less than 0.03% of 10V span p-p rms.

Ambient Effect
Less than ±80ppm/°C.

Dimensions
Height: 1.380" with connectors, 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB31-01-CG.

Model (4Hz)	Model (1KHz)	Field Input	Host Output
uB31-01	uB41-01	-1V to +1V	±5V
uB31-02	uB41-02	-5V to +5V	±5V
uB31-03	uB41-03	-10V to +10V	±5V
uB31-04	uB41-04	-1V to +1V	0 to +5V
uB31-05	uB41-05	-5V to +5V	0 to +5V
uB31-06	uB41-06	-10V to +10V	0 to +5V
uB31-07	uB41-07	-20V to +20V	±5V
uB31-08	uB41-08	-20V to +20V	0 to +5V
uB31-09	uB41-09	-40V to +40V	±5V
uB31-10	uB41-10	-40V to +40V	0 to +5V
uB31-12	uB41-12	-60V to +60V	±5V
uB31-13	uB41-13	-60V to +60V	0 to +5V
uB31-B	uB41-B	Config. ±1V to ±60V DC	Config. ±5V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App. Store® at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	10-32V, non-isolated: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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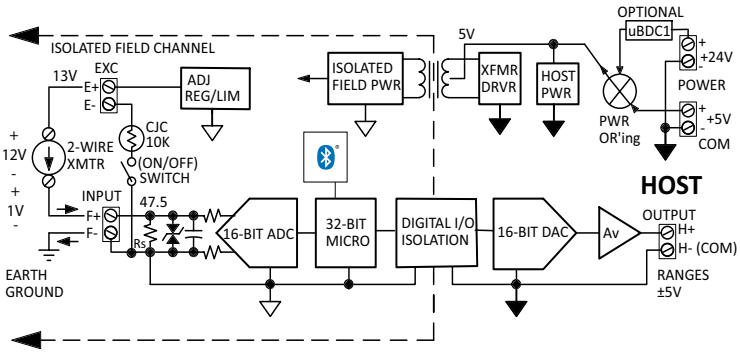
Datasheet

Signal Conditioners: microBlox™ Series

uB32 Narrow Band DC Current Field Input

Bluetooth®



Bluetooth® wireless configuration option ◆ Narrow band DC current field input ◆ Voltage host output

Description

Field Input: 0-20mA or 4-20mA DC
Host Output: 0-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB32 model conditions and converts a DC process current field input signal to a scaled 0-5V or ±5V output. To convert AC current signals, Acromag offers the model 5020-350 toroid sensor which provides a 0 to 11.17mA output. For interfacing two-wire transmitters, please refer to the uB42 which is similar to the uB32 but provides field excitation for the loop-powered transmitter.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB32 Narrow Band DC Current Field Input

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: 0-20mA or 4-20mA DC.
User-configurable -B models: 0 to 20mA.

Resolution
16-bit ADC. 0-20mA 1/30399. 4-20mA: 1/24319.
0-11.17mA: 1/16978.

Resistance
47.5Ω (input shunt to ground/return).

Input Sample Rate
40sps.

Normal Mode (Bandwidth)
-3dB at 7Hz, typical.

Common Mode Rejection
130dB typical, 50-60Hz.

Protection
TVS & diode clamps built-in plus additional protection on back-panel.

Host Output

Host Range
Fixed ranges: 0-5V.
User-configurable -B models: ±5V.

Resolution
16-bit DAC. 0-5V: 1/26305. ±5VDC: 1/52610.

Current Drive
5V into 1KΩ minimum or 5mA maximum.

Response Time
Output Step 0-98% in 150ms typical.

General

Power Consumption
0.25W or 50mA from 5V maximum.

I/O Resolution
Effective resolution is the least of input (A/D) and output (D/A) resolution: uB32-01/uB32-02: 1/26305. uB32-03: 1/16978.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise
Less than 0.06% of span p-p, rms.

Ambient Effect
Less than ±80ppm/°C.

Dimensions
Height: 1.380" with connectors, 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB32-01-CG.

Model	Field Input	Host Output
uB32-01	4 to 20mA DC	0-5V DC
uB32-02	0 to 20mA DC	0-5V DC
uB32-03	0 to 11.17mA DC	0-5V DC
uB32-B	Configurable 0-20mA	Configurable ±5V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App Store® at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	10-32V, non-isolated: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount
5020-350	AC current sensor

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Datasheet

Signal Conditioners: microBlox™ Series

uB34/uB35 Platinum RTD Field Input

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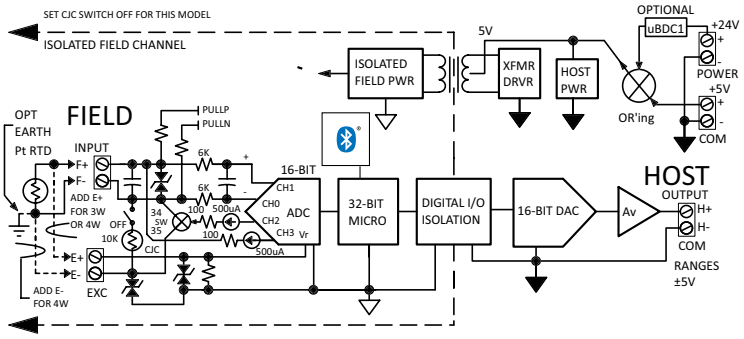

Bluetooth® wireless configuration option ◆ Platinum RTD (2,3, or 4-wire) field input ◆ Voltage host output

Description

Field Input: -100 to +100°C or
0 to 600°C ranges, 3Hz
Host Output: 0-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB34 and uB35 models condition and convert a Platinum RTD sensor or resistance signal to a scaled 0-5V or ±5V output. For two and three-wire RTDs, use the uB34. Four-wire RTDs use the uB35. Both models provide sensor excitation, linearization, lead-wire compensation, lead-break or sensor burnout protection, and input isolation.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB34/uB35 Platinum RTD Field Input

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: ±100°C or 0-100/200/600°C.
User-configurable -B models: inside -200°C to +850°C range limits for 100Ω Pt RTD sensors, or linear resistance.

Resolution
16-bit ADC. uB34-01: 1/12431. uB34-02: 1/6118. uB34-03: 1/12052. uB34-04: 1/16976.

Resistance
100MΩ.

Excitation
uB35: 500uA.
uB34: 1mA (Dual matched 500uA sources at ± leads).

Lead-Wire Compensation
Up to 25Ω/lead and requires balanced ±sensor leads (same size, length, type).

Lead Resistance Effect
Less than ±0.01% of output shift per ohm of lead resistance with a maximum shift less than ±0.1% for up to 10Ω per ±lead.

Lead Break Detection
-B model: Upscale, or selectable upscale/downscale.

Input Sample Rate
40sps.

Normal Mode (Bandwidth)
-3dB at 3Hz, typical.

Protection
TVS & diode clamps built-in plus additional protection on back-panel.

Common Mode Rejection
130dB typical, 50-60Hz.

Host Output

Host Range
Fixed ranges: 0-5V per range model.
User-configurable -B models: 0-5V/±5V selectable.

Resolution
16-bit DAC, 0-5V: 1/26305. ±5V: 1/52610.

Current Drive
5V into 1KΩ minimum or 5mA maximum.

Response Time
Output Step 0-98% in 250ms, typical/

General

Power Consumption
0.23W, or 46mA from +5V maximum.

I/O Resolution
Effective resolution is least of input (A/D) & output (D/A) resolution (see Input).

Non-Linearity
Better than ±0.05%, typical.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Noise
Better than 0.06% of span p-p rms.

Ambient Effect
Better than ±80ppm/°C.

Dimensions
Height: 1.380" with connectors, 0.970"without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional (requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB34-01-CG.

Model (2/3 Wire)	Model (4-WIRE)	FIELD INPUT	HOST OUTPUT
uB34-01	uB35-01	±100°C	0-5V DC
uB34-02	uB35-02	0 °C to +100°C	0-5V DC
uB34-03	uB35-03	0 °C to +200°C	0-5V DC
uB34-04	uB35-04	0 °C to +600°C	0-5V DC
uB34-B	uB35-B	Config. -200°C to +850°C	Config. ±5V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App Store® at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	10-32V, non-isolated: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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Datasheet

Signal Conditioners: microBlox™ Series

uB37/uB47 Thermocouple Field Input

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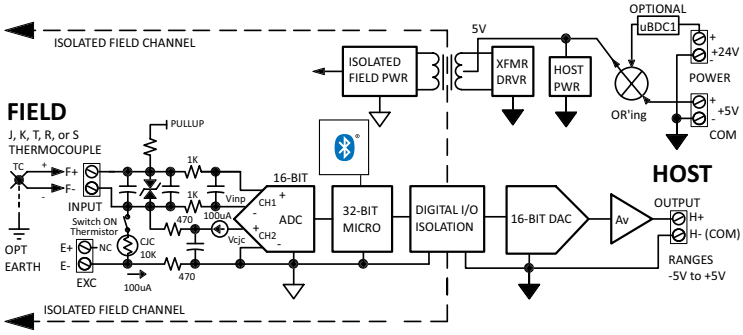

Bluetooth® wireless configuration option ◆ Thermocouple (type J,K,T,R,S) field input ◆ Voltage host output

Description

Field Input: T/C type J, K, T, R, S
Host Output: 0-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB37 and uB47 models condition and convert low-level input voltages from field thermocouple sensors to a scaled 0-5V or ±5V output. On uB37 models, output is linear with thermocouple voltage, while uB47 output is linear with thermocouple temperature. Both models have up/downscale sensor-break detection. Cold junction compensation is performed on the backpanel.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB37/uB47 Thermocouple Field Input

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: TC type per range model.
User-configurable -B models: TC type/range.

Resolution
16-bit ADC. Varies by model & calibration from 1/5878 to 1/36118 (see manual).

Resistance
100MΩ.

Lead Break Detection
-B model: Upscale, or selectable upscale/downscale.

Input Sample Rate
40sps.

Normal Mode (Bandwidth)
3dB at 5Hz, typical.

Common Mode Rejection
130dB typical, 50-60Hz.

Host Output

Host Range
Fixed ranges: 0-5V. User-configurable -B models: ±5V.

Resolution
16-bit DAC. 0-5V: 1/26305.
±5V: 1/52610.

Current Drive
5V into 1KΩ minimum or 5mA maximum.

Response Time
Output Step 0-98% in 300ms typical.

General

Power Consumption
0.25W maximum, 50mA from +5V maximum.

I/O Resolution
Varies by range. See manual for details.

Accuracy/Non-Linearity
Better than ±0.1%. 0.05% typical for full range.
-CG models: Better than ±0.125%. 0.075% typical.
See manual for accuracy details on narrow ranges.

Cold Junction Compensation
Better than ±2°C, typical.

Noise
Better than 0.03% of span p-p rms.

Ambient Effect
Better than ±80ppm/°C.

Dimensions
Height: 1.380" with connectors, 0.970" without.
Width: 0.425". Length: 1.425".

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Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional.
Requires uBDC-1 power module & backpanel.

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (as a group including 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). ANSI/ISA-82.01-1988.

Shock and Vibration Immunity

Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow input/output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android or iOS. Download the Agility app. of charge from Google Play™ store play.google.com (Android), or the Apple® App Store® itunes.apple.com (Apple iOS).

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB37J-CG.

MODEL	FIELD INPUT	HOST OUTPUT
Non-Linearized		
uB37J	-100 to +760°C	0-5V DC
uB37K	-100 to +1350°C	0-5V DC
uB37T	-100 to +400°C	0-5V DC
uB37R	0 to +1750°C	0-5V DC
uB37S	0 to +1750°C	0-5V DC
uB37-B	Config. J, K, T, R, S	Config. ±5V

MODEL	FIELD INPUT	HOST OUTPUT
Linearized		
uB47J-01	0 to +760°C	0-5V DC
uB47J-02	-100 to +300°C	0-5V DC
uB47J-03	0 to +500°C, 5Hz	0-5V DC
uB47J-12	-100 to +760°C	0-5V DC
uB47K-04	0 to +1000°C	0-5V DC
uB47K-05	0 to +500°C	0-5V DC
uB47K-05	-100 to +1350°C	0-5V DC
uB47K-13	0 to +1200°C	0-5V DC
uB47T-06	-100 to +400°C	0-5V DC
uB47T-07	0 to +200°C	0-5V DC
uB47-B	Config. J, K, or T	Config. ±5V

Accessories

Model	Accessories Description
uBDC-1	Non-isolated, 10-32V: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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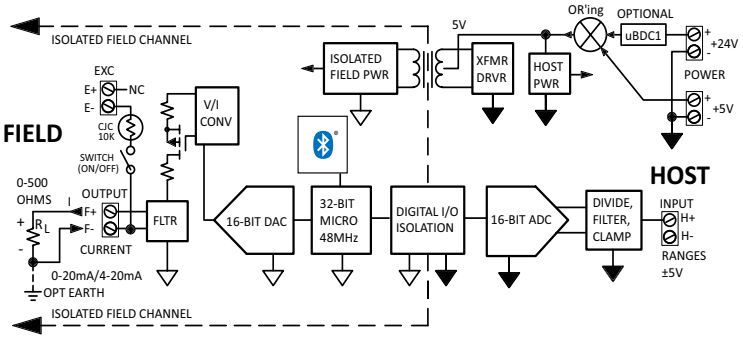
Datasheet

Signal Conditioners: microBlox™ Series

uB39 DC Current Field Output

Bluetooth®



Bluetooth® wireless configuration option ◆ DC current field output ◆ Voltage host input

Description

Host Input: ±5V or 0-5V ranges
Field Output: 0-20mA or 4-20mA DC ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB39 model converts a 0-5V or ±5V signal received from the host system to drive a scaled process current field output signal. It functions like an isolated, voltage-controlled current source to drive field instruments.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB39 DC Current Field Output

Performance Specifications

See Backpanels for additional system specifications.

Host Input

Host Range
Fixed ranges: ±5V or 0-5V.
User-configurable -B models: ±5V.

A/D Resolution
16-bit A/D. ±5V: 1/58886. 0-5V: 1/29442.

Input Resistance
111.4KΩ.

Input Sample Rate
1200sps.

Normal Mode (Bandwidth)
100Hz. -3dB at 110Hz typical.

Protection
TVS & diode clamps built-in.

Field Output

Field Range
0-20mA or 4-20mA DC, per model.
User-configurable -B models: 0-20mA.

D/A Resolution
4-20mA: 1/47395. 0-20mA: 1/59244.

Output Maximum
21.5mA, typical.

Response Time
Output Step 0-98% into 250Ω load in 7ms, typical.

General

Power Consumption
Output 0mA: 0.18W max. or 35mA max. from +5V.
Output 20mA: 0.59W max. or 117mA max. from +5V.

Resolution
Effective resolution is the least of input (A/D) or output (D/A) resolution.
uB39-01: 1/29442.
uB39-02: 1/47395.
uB39-03: 1/59244.
uB39-04: 1/59244.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise
Less than 0.08% of span p-p, rms.

Ambient Effect
Less than ±80ppm/°C.

Common Mode Rejection
100dB typical, 50-60Hz.

Dimensions
Height: 1.380" with connectors. 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB39-01-CG.

Model	Field Output	Host Input
uB39-01	4mA to 20mA DC	0-5V DC
uB39-02	4mA to 20mA DC	±5V DC
uB39-03	0 to 20mA DC	0-5V DC
uB39-04	0 to 20mA DC	±5V DC
uB39-B	Configurable 0 to 20mA	Configurable ±5V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App Store® at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	Non-isolated, 10-32V: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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Datasheet

Signal Conditioners: microBlox™ Series

uB42 2-Wire Transmitter Field Input with Loop Excitation

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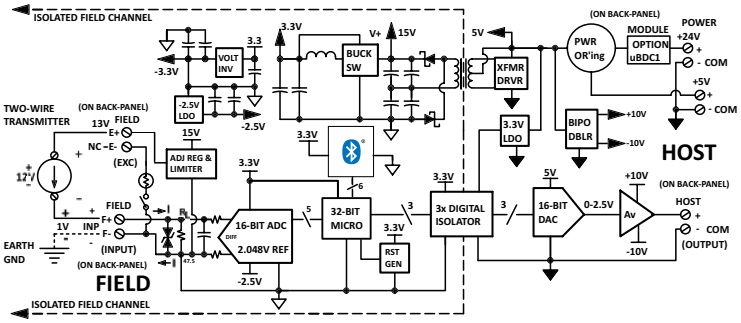

Bluetooth® wireless configuration option ◆ DC current input - 2-wire loop excitation ◆ Voltage host output

Description

Field Input: 0-20mA or 4-20mA DC ranges
Host Output: 0-5V, 1-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB42 model conditions and converts a DC process current field input signal from a 2-wire transmitter to a scaled 0-5V or ±5V output. It provides field excitation (12V/22mA) for the transmitter and is useful to isolate non-isolated transmitters. This module can also interface AC current signals with the model 5020-350 toroid sensor producing a 0 to 11.17mA input.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app. configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB42 2-Wire Transmitter Field Input with Loop Excitation

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: 0-20mA or 4-20mA.
User-configurable -B models: 0-20mA DC.

Resolution
16-bit ADC. 4-20mA: 1/24319. 0-20mA: 1/30399.
When used with AC Current Sensor 5020-350:
1/16978 for 0-11.17mA range.

Resistance
47.5Ω ±0.1%. Input shunt to ground or loop load.

Excitation
+13V loop power supply. 12V to transmitter and 1V for internal input shunt resistor.

Input Sample Rate
1200sps.

Normal Mode (Bandwidth)
-3dB at 100Hz, 180Hz typical.

Protection
TVS & diode clamps built-in plus additional protection on back-panel.

Common Mode Rejection
130dB typical, 50-60Hz.

Host Output

Host Range
uB42-01: 0-5V. uB42-02: 1-5V. uB42-03: 0-5V.
uB42-B: User-configurable ±5V.

Resolution
16-bit DAC. 0-5V: 1/26305. ±5VDC: 1/52610.
1-5V: 1/21044.

Drive Capability
5V into 1KΩ minimum or 5mA maximum load.

Response Time
Output Steps 0-98% in 6ms, typical.

General

Power Consumption
0.25W max. with no excitation load, 0.6W max. or 120mA from 5V with 20mA excitation load.

I/O Resolution
Effective resolution is the least of input (A/D) and output (D/A) resolution with 0-20mA/0-5V: 1/30399. 4-20mA/1-5V 1/21044. 0-11.17mA/0-5V: 1/16978.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise:
Less than 0.06% of span p-p, rms.

Ambient Effect:
Less than ±80ppm/°C.

Dimensions
Height: 1.380" with connectors. 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis, for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB42-01-CG.

Model	Field Input	Host Output
uB42-01	0-20mA DC with excitation, 100Hz	0-5V DC
uB42-02	4-20mA DC with excitation, 100Hz	1-5V DC
uB42-B	Config. 0-20mA DC with excitation	Config. ±5V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® app. store at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	Non-isolated, 10-32V: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount
5020-350	AC current sensor

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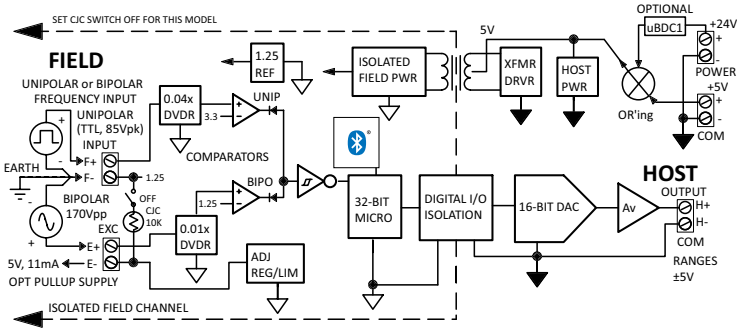
Datasheet

Signal Conditioners: microBlox™ Series

uB45 Frequency Input Module with Excitation Supply

Bluetooth®



Bluetooth® wireless configuration option ◆ Frequency field input ◆ Voltage host output

Description

Field Input: 0-50kHz frequency ranges
Host Output: 0-5V or ±5V ranges

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB45 model conditions and converts a frequency field input signal to a scaled 0-5V or ±5V output. It includes a 5V excitation at the input for interface pull-up when using sensors such as magnetic pickups or contact closures. Bipolar (zero-crossing) and unipolar (digital/TTL) signals are supported.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app. configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Datasheet

Signal Conditioners: microBlox™ Series

uB45 Frequency Input Module with Excitation Supply

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges from 0-50KHz.
User-configurable -B models: 0-50KHz.

Resistance
10.4MΩ unipolar (IN+ to IN-).
10.1M bipolar (EX+ to IN-) excitation.

Threshold
Bipolar (zero-crossing) ±60-85mVpk (1-50kHz) up to ±85Vpk (60V AC or 170Vp-p max.).

Unipolar (TTL) 85Vpk (170Vp-p max), 0.8V max. TTL input low, 2.3-2.7V (5-50kHz) min. TTL high.

Hysteresis
120mVp-p bipolar/zero-crossing, 1.5V unipolar.

Field Excitation
+5V/11mA supply (EX- to IN-), for interface applications requiring external pull-up.

Protection
TVS & diode clamps built-in plus additional protection on back-panel.

Common Mode Rejection
130dB typical, 50-60Hz.

Host Output

Host Range
Fixed ranges: 0-5V DC.
User-configurable -B models: ±5V.

DAC Resolution
16-bit, 0-5V: 1/26305, ±5VDC: 1/52610.

Drive Current
5V into 1KΩ minimum or 5mA max load.

Response Time
uB45-01: 160ms
uB45-02: 80ms
uB45-03: 35ms
uB45-04: 16ms
uB45-05: 8.5ms
uB45-06: 3.4ms
uB45-07: 1.6ms
uB45-B: varies by range

General

Power Consumption
0.45W, 90mA from 5V max. with no exc. & 5mA host load, or 0.6W, 120mA from 5V w/ 10mA exc. load & 5mA host load.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise
Less than 0.05% of span p-p rms.

Ambient Effect
Less than ±40ppm/°C.

Dimensions
Height: 1.380" with connectors. 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB45-01-CG.

Model	Field Input	Min Hz	Host Output
uB45-01	0-500Hz	2Hz	0-5V DC
uB45-02	0-1KHz	4Hz	0-5V DC
uB45-03	0-2.5KHz	8Hz	0-5V DC
uB45-04	0-5KHz	14Hz	0-5V DC
uB45-05	0-10KHz	20Hz	0-5V DC
uB45-06	0-25KHz	30Hz	0-5V DC
uB45-07	0-50KHz	30Hz	0-5V DC
uB45-B	Configurable 0-50KHz	30Hz	Configurable ±5V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App Store® at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	Non-isolated, 10-32V: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount
5020-350	AC current sensor, outputs 0-11.17mA

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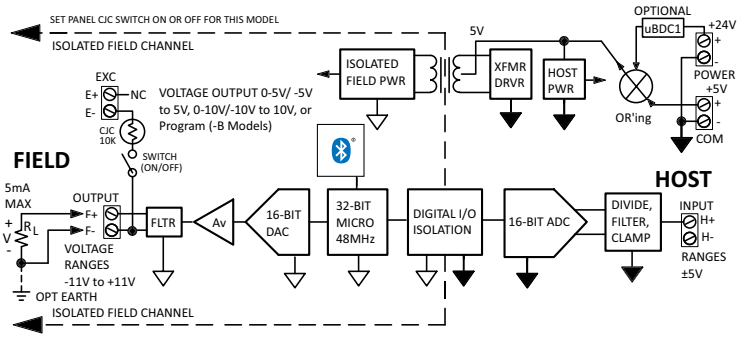
Datasheet

Signal Conditioners: microBlox™ Series

uB49 DC Voltage Field Output

Bluetooth®



Bluetooth® wireless configuration option ◆ DC voltage field output ◆ Voltage field input

Description

Field Output: ±5V, ±10V, 0-5V, 0-10V
Host Input: ±5V, ±10V, 0-5V, 0-10V or programmable ±10V

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uB49 model conditions a DC voltage signal received from the host system to drive a scaled process voltage field output signal. It functions as an isolated, voltage-controlled voltage source to drive field instruments.

Bluetooth wireless technology versions enable configuration using a smart phone or tablet. Acromag's Agility™ app, available for Android™ and iOS® mobile devices, helps you vary input/output ranges and scaling to your specific application. The Agility app can also set an alarm output function with a setpoint limit and deadband. Other app functions include polling inputs, trending values in a sharable chart, updating calibration, and diagnostic troubleshooting.

For cost-sensitive projects, a commercial-grade version is available (-CG models). These units offer similar performance, but over a limited temperature range and lack hazloc approvals.

Backpanels provide power, I/O wiring terminals, and host access to an industry-standard analog signal bus. Modules are hot-swappable without screws. Data acquisition boards can access all host I/O signals on the DB25 bus connector.

Key Features & Benefits

- Wide variety of input and output ranges
- Mixes with different I/O types on compact 4, 8, or 16 channel backpanels
- Select fixed I/O range models or Bluetooth wireless technology user-configurable models
- Cost-saving commercial-grade versions available for less demanding applications
- Android® and iOS® apps simplify wireless configuration with a smartphone or tablet
- Mobile app configures I/O ranges, sets scaling, calibrates and performs diagnostics
- Optional alarm function with setpoint and deadband control driving 0/5V host output
- Poll and trend I/O values to sharable charts
- High accuracy, noise immunity, and stability
- Isolated field-to-host and channel-to-channel (1500Vac peak, 250Vac/354Vdc continuous)
- Over-molded I/O circuits offer superior shock, vibration, moisture, and dust protection.
- Wide operating temperature range
- UL/cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Datasheet

Signal Conditioners: microBlox™ Series

uB49 DC Voltage Field Output

Performance Specifications

See Backpanels for additional system specifications.

Field Input

Field Range
Fixed ranges: ±5V, 0-5V, ±10V, 0-10V.
User-configurable -B models: ±10V.

A/D Resolution
16-bit A/D, ±5V/±10V: 1/60275. 0-5V/0-10V: 1/30137.

Resistance
103.1KΩ.

EInput Sample Rate
1200sps.

Normal Mode (Bandwidth)
100Hz minumin, -3dB at 102Hz typical.

Protection
TVS & diode-to-rail clamps built-in.

Host Output

Host Range
Fixed ranges: ±5V, 0-5V, ±10V, 0-10V.
User-configurable -B models: ±10V.

D/A Resolution
±5V: 1/29701.
0-5V: 1/14850.
±10V: 1/59401.
0-10V: 1/29700.

Output Over-Range
±11V, typical.

Output Load
10V into 2KΩ minimum or 5mA maximum.

Response Time:
Output Step 0-98% of 5V into 5KΩ load in 9ms, typical.

General

Power Consumption
0.28W maximum, 56mA from +5V maximum w/ 5mA field load.

Effective Resolution
The least of input (A/D) and output (D/A) resolution: uB49-01/-02: 1/29701. uB49-03: 1/14850. uB49-04: 1/30137. uB49-05: 1/59401. uB49-06: 1/29700. uB49-07: 1/59401.

Accuracy
Better than ±0.1%. 0.05% typical.
-CG models: Better than ±0.125%. 0.075% typical.

Non-Linearity
Better than ±0.05%, typical.

Noise
Better than 0.03% of span p-p rms.

Ambient Effect
Better than ±80ppm/°C.

Common Mode
100dB typical, 50-60Hz.

Dimensions
Height: 1.380" with connectors. 0.970" without
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).
-CG models: 0 to 55°C (32 to 131°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Power Requirement
5V powered.10-32V power optional
(requires uBDC-1 power module & backpanel.)

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group include 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2. No UL or ATEX on -CG models.

Ordering Information

To order commercial grade modules append with -CG (except -B models) e.g., uB49-01-CG.

Model	Field Output	Host Input
uB49-01	±5V	0 to +5VDC
uB49-02	±5V	±5V
uB49-03	0V to +5V DC	±5V
uB49-04	±10V	0V to +10VDC
uB49-05	±10V	±10V
uB49-06	0V to +10V	±10V
uB49-07	±10V	±5V
uB49-B	Configurable ±10V	Configurable ±10V

Configuration using Agility™ Config. Tool via Bluetooth technology

The Acromag Agility™ configuration tool is a mobile application that allows easy setup, calibration, and reconfiguration of microBlox™ I/O modules.

Bluetooth wireless technolgy microBlox™ modules (-B models) allow their input and output ranges to be wirelessly reconfigured and calibrated using a smart phone or tablet. This mobile app. supports smart devices with Android 4.3 or later or iOS 5.0 or later. You can download the Agility application free of charge from the Google Play™ store at play.google.com (Android), or the Apple® App Store® at itunes.apple.com (Apple iOS).

Accessories

Model	Description
uBDC1	Non-isolated, 10-32V: 5V/1A power supply
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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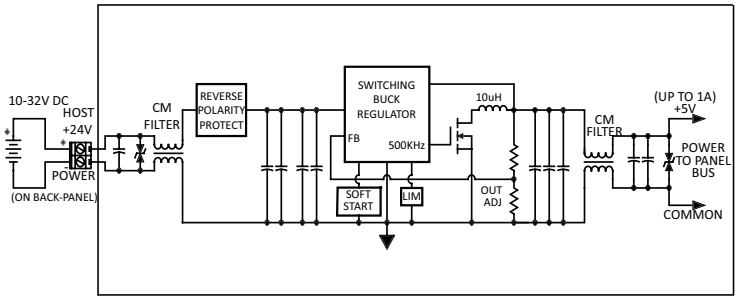
Datasheet

Signal Conditioners: microBlox™ Series

uBDC1 DC Power Module



Wide-Range DC Voltage Input ◆ 5V/1A DC Output to Backpanel ◆ Supports Redundant Power

Description

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

The uBDC1 power module allows a backpanel populated with I/O modules to operate off DC power voltage levels other than 5V. This optional module plugs into a special socket on the backpanel to convert a power supply voltage from 10-32V DC to 5V/1A which will drive up to 16 I/O modules. uBDC1 modules include over-voltage, reverse-voltage and short-circuit protection (current limiting).

With the uBDC1 power module, users can also implement redundant power methods for the backpanel. In redundant applications, the uBDC1 becomes the primary power source.

Key Features & Benefits

- Allows use of wide range 10-32V DC power supplies to operate backpanels
- Enables implementation of redundant power to uB backpanels.
- Polarized to only fit in panel power slot
- Over-molded circuit has superior shock, vibration, moisture, and dust protection.
- -40 to 80°C (-40 to 176°F) operation
- UL, cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uBDC1 DC Power Module

Performance Specifications

See Backpanels for additional system specifications.

General

Dimensions
Height: 1.380" with connectors. 0.970" without.
Width: 0.425". Length: 1.425".

Input
10-32V DC.

Output Voltage
5V DC ±5% (4.7V to 5.3V range).

Output Current
1A (1.25A absolute maximum).

Efficiency
90% typical.

Output Ripple
Less than 150mVp-p, typical.

Response Time
Less than 15ms typical.

Over-Voltage Protection
TVS in module plus additional TVS protection provided on backpanel.

Current-Limiting
Built-In, plus additional limiting provided on backpanel.

Reverse-Voltage Protection
Built-In, plus additional protection provided on backpanel.

Filterting
Transient voltage suppression, capacitors, & common-mode I/O filtering.

Line Regulation
Less than 0.005% 10-32V, 1A, typical.

Load Regulation
Less than 4%, 0.05A to 1A, typical.

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).

Ambient Operating Temperature
-40°C to +80°C, no deration.

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Isolation
Non-isolated.
Power is common to host-side of I/O.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
CE marked, per EMC Directive 2004/108/EC.
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2.

Ordering Information

Model	Non-Isolated Input	Output
uBDC1	10-32V DC	5V, 1A DC

Accessories

Model	Description
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

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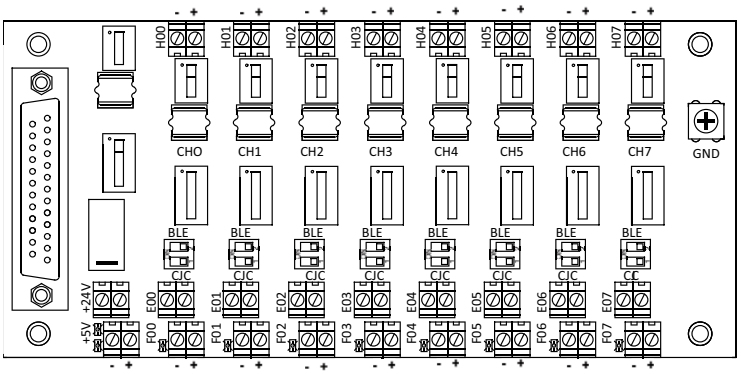
Datasheet

Signal Conditioners: microBlox™ Series

uB04/08/16 microBlox™ Backpanels



uB module carriers ◆ 4, 8, or 16 channel versions ◆ DIN-rail option ◆ CJC sensor

Description

Acromag's microBlox™ uB Series I/O modules offer a compact, high-performance solution for interfacing sensors and field devices with data acquisition systems. uB signal conditioning modules are ideal to isolate, filter, convert and amplify a wide variety of signal types for test, measurement and control systems. Just plug uB modules into 4, 8, or 16-channel backpanels in any mix for a high-density analog I/O interface. Channel-to-channel isolation provides optimal noise and surge protection from ground loops, spikes, and high common mode voltages.

These backpanels serve as a carrier for up to 16 microBlox I/O modules. They provide power connections, input/output wiring terminals, and earth grounding (host-side) for the I/O modules. Each module slot (I/O channel) has switches to enable Bluetooth communication (with LED) and cold junction compensation for thermocouple inputs.

An industry-standard analog I/O bus aggregates all host I/O channels on a DB25 connector to facilitate simultaneous access by high-speed data acquisition systems. Field points are isolated channel-to-channel and as a group to the host analog I/O bus (host includes power).

Key Features & Benefits

- Choice of 4, 8, and 16 channel carriers
- Optional DIN-rail mounting
- Bluetooth and CJC support on all slots
- Slot for DC power converter module uBDC1
- Redundant power capable
- DB25 port for simultaneous access to all I/O over a single cable connection
- -40 to 80°C (-40 to 176°F) operation
- UL, cUL Class I, Div 2, ABCD and ATEX Zone 2 hazardous location approvals

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Signal Conditioners: microBlox™ Series

uB04/08/16 microBlox™ Backpanels

Performance Specifications

See specific I/O models for additional system specifications.

General

Reverse Voltage Protection
Solid-state protection Included.

Over-Voltage Protection
1ms to break power above 8.6V.

Under-Voltage Protection
1ms to break power under 2.5V.

Transient Protection
Transient Voltage Suppressor (TVS) per field channel, plus TVS per Host channel, TVS at Host power connections.

Power
Back-panel power is +5V, sourced by wiring 5V to the +5V terminals, or via an optional uBDC1 module with wiring to the 24V terminals (10-32V). Power can be driven redundantly if both the host 5V and 24V power terminals are wired to separate power supplies and uBDC1 power module is installed (uBDC1 dominates).

Pass-Thru Power Limit
Current limiting from 5V set by capacity to 480-720mA (uB04), 990-1350mA (uB08), and 1900-2500mA (uB16).

Power Consumption
Less than 4mA (back-panel only), 30mA (including uBDC1 w/no I/O modules plugged in).

Channel I/O
Printed circuit edge connector sockets are polarized to prevent a mix-up between the power module socket and I/O module sockets.

Module Retainer
I/O modules and power module are retained via 3AG clips, 1 per channel.

Earth Ground
Screw terminal earth ground connection on panel and common to host minus.

LED Indicators
5V power: green
24V power: green
Bluetooth link: blue LED/channel.

Switches
Two DIP switches/channel: CJC enable/disable thermistor connection to IN- set ON or OFF per I/O model; enable/disable Bluetooth link ability (set ON for access to -B modules).

Interface Connector
Field & host channel: high-density screw clamp type, 16AWG maximum.
Host analog I/O bus: DB25, industry-standard I/O pin assignment bundles host-side I/O and shared host common.

Dimensions
Height: 1.380" with connectors. 0.970" without.
Width: 0.425". Length: 1.425".

Environmental

Operating Temperature
-40 to 80°C (-40° to 176°F).

Storage Temperature
-40 to 85°C (-40° to 185°F).

Relative Humidity
0 to 95% non-condensing.

Safety Isolation
Field channels are individually isolated field channel-to-field channel and from the field to the host I/O bus (host group includes 5V power) for common-mode voltages up to 250V AC, or 354V DC off DC power ground, on a continuous basis (will withstand 1500VAC HIPOT/dielectric strength test for one minute without breakdown). This complies with test requirements of ANSI/ISA-82.01-1988 for voltage rating specified.

Shock and Vibration Immunity
Conforms to:
IEC 60068-2-6: 10-500 Hz, 4G, 2 hours/axis, for sinusoidal vibration.
IEC 60068-2-64: 10-500 Hz, 4G-rms, 2 hours/axis , for random vibration.
EC 60068-2-27: 25G, 11ms half-sine, 18 shocks at 6 orientations, for mechanical shock.

Electromagnetic Compatibility (EMC) Compliance
Minimum immunity per BS EN 61000-6-1 (2007):
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Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-4.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5. Conducted RF Immunity (CRFI), per IEC 61000-4-6.

Emissions
Class B product with emissions per BS EN 61000-6-3 (2007+A1:2011): enclosure port, per CISPR 16.
Low voltage AC mains port, per CISPR 16.

Approvals
CE compliant. RoHS Compliant.
UL/cUL Class 1, Division 2, Groups ABCD.
ATEX Zone 2.

Ordering Information

Model	Description
uB04	4 channel panel, surface mount
uB04D	4 channel panel, DIN rail mount
uB08	8 channel panel, surface mount
uB08D	8 channel panel, DIN rail mount
uB16	16 channel panel, surface mount
uB16D	16 channel panel, DIN rail mount

Accessories

Model	Description
SCMXCA006-01	Interface cable for microBlox uB backpanels, 1m long
SCMXCA006-02	Interface cable for microBlox uB backpanels, 2m long
SCMXCA006-07	Interface cable for microBlox uB backpanels, 7m long
uBXIF	Universal interface board, rack mount

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