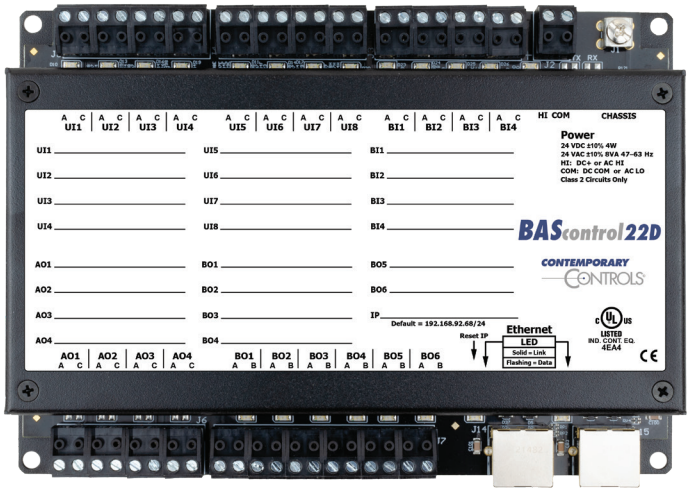
BAScontrol22D – BACnet/IP Sedona Unitary Controller with Dual Ethernet and Client/Server Connectivity

The BAScontrol22D is a 22-point unitary controller which supports BACnet client/server operation over BACnet/IP. The controller complies with the B-ASC device profile having a convenient mix of 8 universal inputs, 4 binary inputs, 4 analog outputs, and 6 binary outputs. Unique to the unit are 48 web components which link Sedona wiresheet readable/writeable data to webpages, and 24 virtual points which link Sedona wiresheet readable/writeable data to a BACnet client.

The device is fully webpage configurable, and freely programmable using Sedona's function block programming methodology of assembling components onto a wiresheet to create applications. The unit can be programmed using the BAScontrol Toolset. The controller is powered by a 24VAC/VDC source. Rugged design, low profile, and wide temperature operation make it suitable for indoor or outdoor use.

Versatile Control Device — Unitary controller or remote Ethernet I/O

- BACnet/IP client/server
- BACnet B-ASC device profile
- License-free Sedona function block programming
- Programmable via BAScontrol Toolset
- Configurable with a common web browser
- Dual 10/100 Mbps auto-negotiation Ethernet ports
- NTP or manually settable real-time clock
- COV subscriptions – 14 binary and 2 analog
- Wide operating temperature range of -40°C to +75°C



Flexible Input/Output — 22-points of physical I/O

- Eight configurable universal inputs: thermistor, resistance, voltage, binary, pulse
- Four voltage-free binary inputs
- Four analog outputs
- Six relay outputs

BASautomation® Sedona OPEN CONTROL

BAScontrol22D – Overview

The BAScontrol22D utilizes a 32-bit ARM7 processor with 512 kB of flash memory, plus a 16 Mbit serial flash file system for storing configuration data and an application program. By operating at the BACnet/IP level, the BAScontrol22D can share the same Ethernet network with supervisory controllers, operator workstations, or IP routers. Dual 10/100 Mbps auto-negotiating Ethernet ports support protocols such as BACnet/IP, Sedona Sox, HTTP, and FTP. The unit can be configured for a fixed IP address or can operate as a DHCP client receiving its IP address from a DHCP server. An LED indicator identifies a link condition while flashing during data transfer. Depressing a hidden IP Reset switch returns the controller to default IP address settings.

As a BACnet server device, the BAScontrol22D will respond to a BACnet client request by default over the IP port. This means that the BAScontrol22D can function as remote I/O to BACnet clients over IP without needing a Sedona program. Through webpage configuration of connected BACnet servers, the BAScontrol22D can function as a BACnet client to these devices over IP. This requires the use of Sedona network variables (NetVs) found in the NetV kit. This capability allows the BAScontrol22D to initiate messages over IP to other BACnet devices without the need for BACnet headend intervention.

Flexible Input and Output

Configuration of the eight universal inputs (UIs) is accomplished using webpages. Universal inputs can be configured for voltage, temperature, resistance, pulse, and voltage-free contact closure. Type II and Type III 10 kΩ thermistor curves as well as 20 kΩ and 100 kΩ curves are resident in the unit. The 100 kΩ follows the Tasserson (PSB) curve.

- The four binary inputs (BIs) intended for voltage-free contact closure monitoring are BACnet configurable via a webpage.
- The four 0-10 VDC analog outputs (AOs) each capable of driving up to 4 mA are BACnet configurable via a webpage.
- The six SPST relay outputs (BOs) each capable of switching 2 A at 30 V (NEC class 2 wiring) are BACnet configurable via a webpage.
- The 24 virtual components (VTs) are webpage configurable for either an AV or BV read from wiresheet or write to wiresheet by a BACnet client.

The 48 web components (WCs) are webpage configurable for either a read from wiresheet or write to wiresheet by a web browser.

The BAScontrol22D is powered from either a 24VAC or 24VDC power source. Its half-wave rectified power supply can share the same power source with other half-wave rectified equipment. An LED indicates power is applied.

Sedona Open Control

Sedona function block graphical programming is used to develop control sequences for the BAScontrol22 series of controllers. Using the Sedona Application Editor (SAE) running on a Windows PC, components are assembled onto a wiresheet, configured, and then interconnected with other components to create applications. Programming can be accomplished live on the target controller or emulated using the BASemulator. Once the program is finalized, it can be saved along with BACnet configurations using BASbackup and restored as needed. The use of Sedona and the BAScontrol Toolset is license-free.

BAScontrol Toolset – Essential Tools for Programming the BAScontrol22 Series

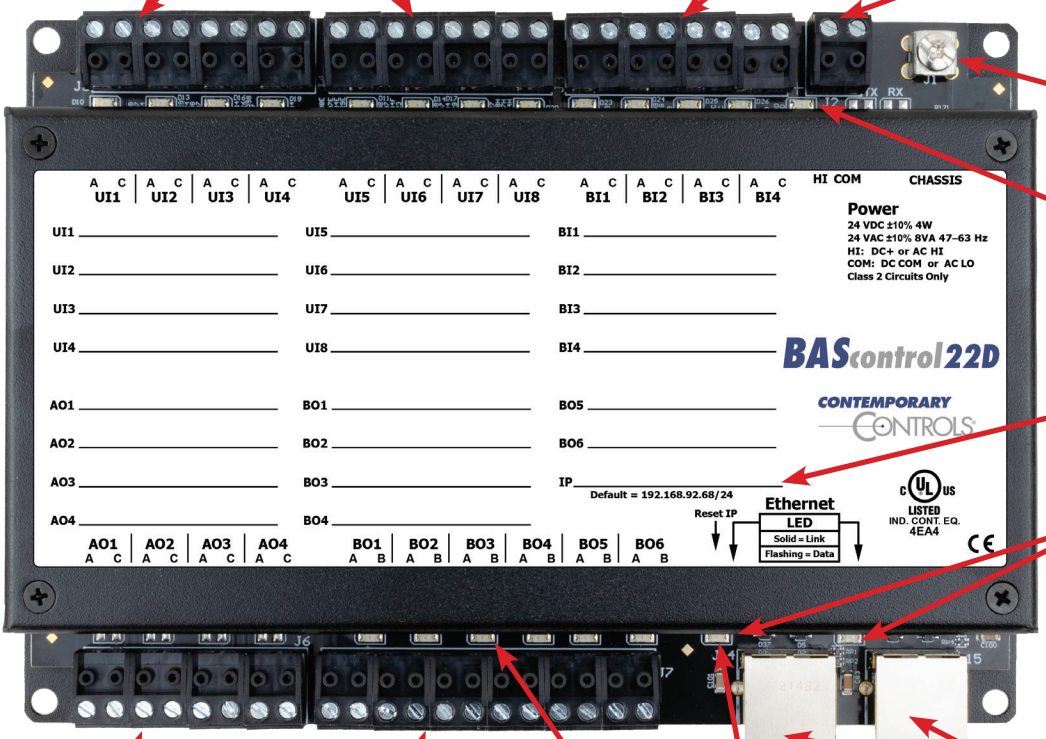
The BAScontrol Toolset includes the SAE, BASbackup—the BAScontrol Project Utility, and BASemulator—BAScontrol emulation on a PC. Provided free of charge, these tools simplify controller programming, program testing, and project archiving. All three programs are available as a single install on a Window PC sharing a common Sedona bundle of kits and components. Along with a common web browser, the toolset is all that is needed to commission a BAScontrol unitary controller.

BAScontrol22D – Overview

Universal Inputs

Eight input points can be configured — all discoverable as BACnet objects.

- Analog inputs: 0–10 VDC, 12-bit resolution, 0–20 mA (with external resistor)
- Temperature inputs: Type II or Type III 10 kΩ thermistors; 20 kΩ thermistor, 100 kΩ thermistor
- Resistance inputs: 1 kΩ to 100 kΩ
- Contact closure, voltage-free
- Configure as binary inputs UI1-UI8
- Pulse input accumulators (UI1-UI4): accommodates active or passive sources (40 Hz max)



Binary Inputs
Four points of voltage-free contact closure

Power Input
24 VAC/VDC 8 VA/4W half-wave rectified allows power sharing with other half-wave devices.

Ground Lug
Connect to earth or panel ground

Power LED
Indicates power applied

IP Address
Fixed or DHCP client

Ethernet LEDs
Lights on link and flashes with data

Ethernet Switch Ports
10/100 Mbps Ethernet with auto-negotiation and Auto-MDIX. Protocols supported include HTTP, UDP, TCP, BACnet/IP, NTP, DNS, DHCP, FTP, and Sedona SOX.

Analog Outputs
0–10 V, 10-bit resolution

Binary Outputs
Six form "A" relays for 30 VAC/VDC 2 A loads. Class 2 circuits only.

Point LEDs
On selected points

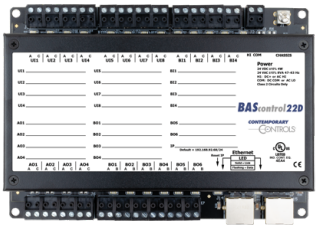
Reset
To factory IP defaults (recessed)

BACnet Protocol Implementation Conformance (PIC) Statement

CONTEMPORARY CONTROLS®

BAScontrol22D

BACnet/IP Sedona Unitary Controller



BACnet Protocol Implementation Conformance Statement (Annex A)

Date: May 12, 2022
Vendor Name: Contemporary Controls
Product Name: BAScontrol22D
Product Model Number: BASC-22DR
Applications Software Version: 1.2.28 **Firmware Revision:** 4.0.2 **BACnet Protocol Revision:** 15
Product Description: BACnet/IP compliant 22-point field controller or remote I/O that allows a direct connection to Ethernet without the need of a BACnet router.

BACnet Standardized Device Profile (Annex L):

- ☐ BACnet Operator Workstation (B-OWS)
- ☐ BACnet Building Controller (B-BC)
- ☐ BACnet Advanced Application Controller (B-AAC)
- ☒ BACnet Application Specific Controller (B-ASC)
- ☐ BACnet Smart Sensor (B-SS)
- ☐ BACnet Smart Actuator (B-SA)

List all BACnet Interoperability Building Block Supported (Annex K):

- DS-RP-B Data Sharing — ReadProperty – A, B
- DS-WP-B Data Sharing — WriteProperty – A, B
- DS-RPM-B Data Sharing — ReadPropertyMultiple – B
- DS-COV-B Data Sharing — ChangeOfValue – B
- DS-WPM-B-WritePropertyMultiple-B
- DM-DDB-B Device Management — Dynamic Device Binding – B
- DM-DOB-B Device Management — Dynamic Object Binding – B
- DM-DCC-B Device Management — Device Communication Control – B
- DM-TS-B Device Management — Time Synchronization – B

Segmentation Capability:

- ☐ Able to transmit segmented messages Window Size:
- ☐ Able to receive segmented messages Window Size:

Standard Object Types Supported:

Object Type Supported	Can Be Created Dynamically	Can Be Deleted Dynamically
Analog Input	No	No
Analog Output	No	No
Analog Value	No	No
Binary Input	No	No
Binary Output	No	No
Binary Value	No	No
Device	No	No

No optional properties are supported.

Data Link Layer Options:

- ☒ BACnet IP, (Annex J)
- ☒ BACnet IP, (Annex J), Foreign Device
- ☐ ISO 8802-3, Ethernet (Clause 7)
- ☐ ANSI/ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s):
- ☐ MS/TP master (Clause 9), baud rate(s):
- ☐ MS/TP slave (Clause 9), baud rate(s):
- ☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):
- ☐ Point-To-Point, modem, (Clause 10), baud rate(s):
- ☐ LonTalk, (Clause 11), medium:
- ☐ Other:

Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) ☐ Yes ☒ No

Networking Options:

- ☐ Router, Clause 6 – List all routing configurations, e.g., ARCNET-Ethernet-MS/TP, etc.
- ☐ Annex H, BACnet Tunnelling Router over IP
- ☐ BACnet/IP Broadcast Management Device (BBMD)
  Does the BBMD support registrations by Foreign Devices? ☐ Yes ☐ No

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

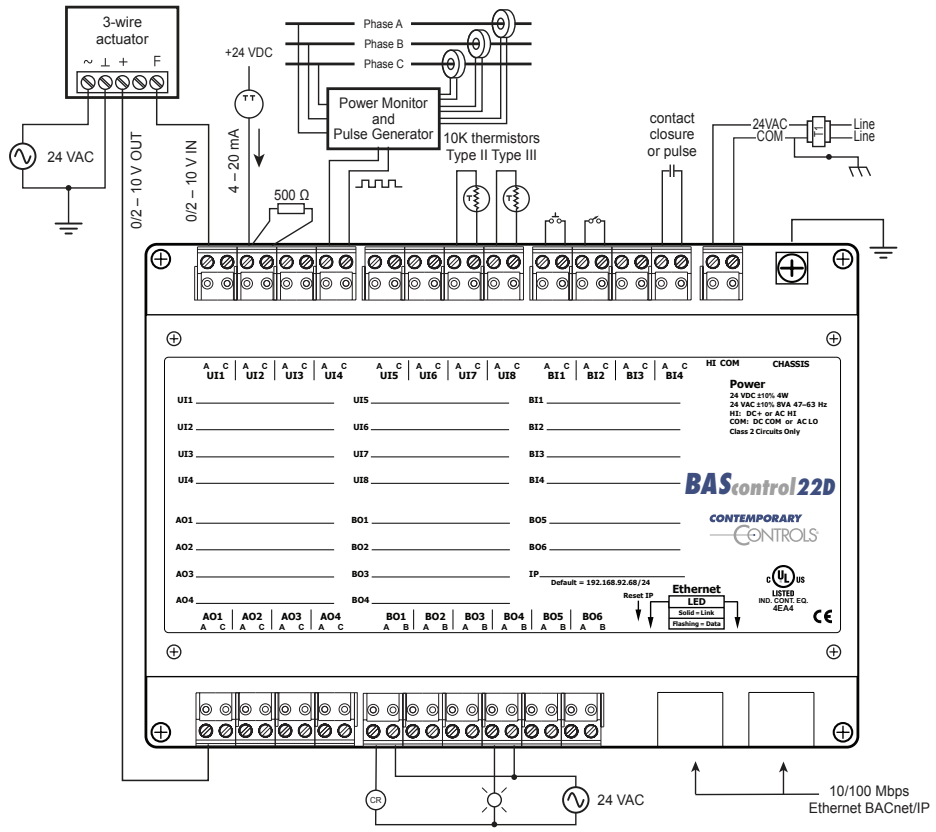
- ☒ ANSI X3.4
- ☐ IBM™/Microsoft™ DBCS
- ☐ ISO 8859-1
- ☐ ISO 10646 (UCS-2)
- ☐ ISO 10646 (UCS-4)
- ☐ JIS C 6226

If this product is a communication gateway, describe the types of non-BACnet equipment/network(s) that the gateway supports:

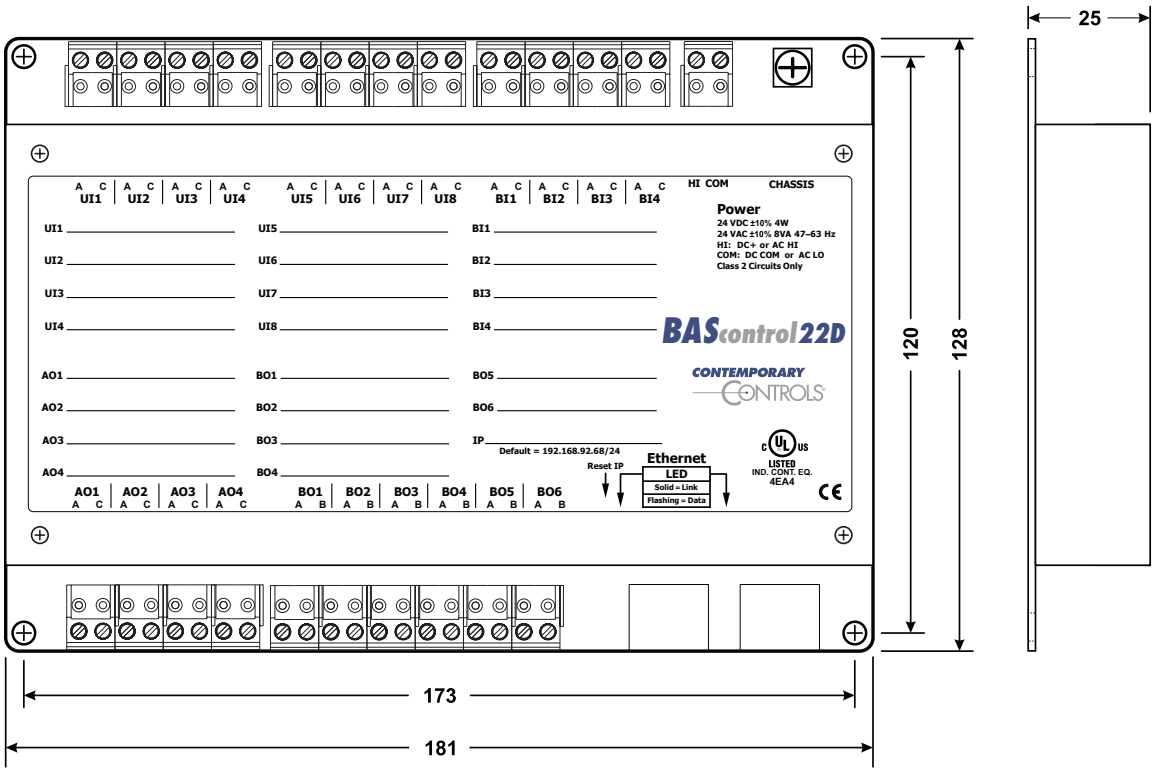
No gateway support.

12 May 2022 PI-BASC22DR-AA0

Wiring Diagram



Dimensions (all dimensions are in mm)



Specifications

Power – Input Power (Class 2 Circuits Only)

Item	*Limits*
Input power	24 VAC/VDC ± 10%, 47-63 Hz, 8 VA/4 W

Universal Inputs (UI-UI8)

Configured As	*Limits*
Analog input	0–10 VDC or 0–20 mA (with external resistor). 12-bit resolution. Input impedance 1 MΩ on voltage. (NOTE: external resistors not provided)
Temperature input	Type II 10 kΩ thermistor –10° to +190 °F (–23.3° to +87.8°C) Type III 10 kΩ thermistor –15° to +200 °F (–26.1° to +93.3°C) 20 kΩ thermistor 15° to 215° F (-9° to +101° C) 100 kΩ Tasseron (PSB) thermistor 68° to 338° F (20° to 170° C)
Contact closure input	Excitation current 0.5 mA. Open circuit voltage 12 VDC. Sensing threshold 3 VDC and below (logic TRUE) and 7 VDC and above (logic FALSE). Response time 20 ms.
Pulse input (Points UI1–UI4)	1 MΩ input impedance for 0-10 VDC active output devices. Current sinking passive output devices will be pulled up internally to 12 VDC and must be capable of sinking 1.2 mA. 40 Hz maximum input frequency with 50% duty cycle. Adjustable high and low thresholds.
Resistance	1 kΩ -100 kΩ range

Binary Inputs (BI1-BI4)

Configured As	*Limits*
Voltage-free contact closure input	Excitation curent 1.2 mA. Open circuit voltage 12 VDC. Sensing threshold 3 VDC and below (logic TRUE) and 7 VDC and above (logic FALSE). Response time 20 ms.

Analog Outputs (AO1- AO4)

Configured As	*Limits*
Analog output	0-10 VDC. 10-bit resolution. 4 mA maximum.

Relay Outputs (Points BO1-BO6) (Class 2 Circuits Only — requires external power source)

Configured As	*Limits*
Binary output	Form "A" relay (NO contact). 30 VAC/VDC 2 A. Class 2 circuits only. All contacts isolated from one another.

Specifications (continued)

Data Link/Physical Layer Communication

Data Link	Compliance
Ethernet	IEEE 802.3 10/100 Mbps data rate 10BASE-T, 100BASE-TX physical layer 100 m (max) CAT5 cable length. Auto-negotiation of speed and duplex. Auto-MDIX.

Protocol Compliance

Data Link	Compliance
Internet	HTTP, FTP, UDP, TCP, NTP, DNS, DHCP. Default IP address is 192.168.92.68.
BACnet	ANSI/ASHRAE 135 (ISO 16484-5) Release 15—A Data Communication Protocol for Building Automation and Control Networks. Application specific controller device profile B-ASC
Sedona	SOX Sedona 1.2.28

General Specifications

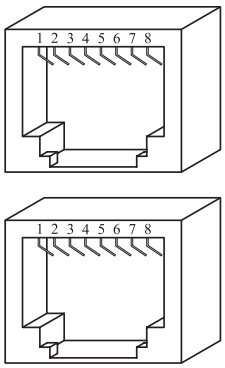
Item	Description
Environmental	Operating temperature -40°C to +75°C Storage temperature -40°C to +85° Relative humidity 10 to 95%, non-condensing
Weight	0.8 lbs. (0.36 kg)
Regulatory	CE Mark; RoHS; UL 508, C22.2 #142-M1987, UKCA

Electromagnetic Compatibility

Test Method	Description
EN 61000-4-2	Electromagnetic discharge immunity test
EN 61000-4-3	Radiated, radio frequency, electromagnetic field immunity test
EN 61000-4-4	Electrical fast transient/burst immunity test
EN 61000-4-5	Surge immunity test
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11	Voltage dips, short interruptions, and voltage variations immunity tests
CISPR 16	Conducted Emissions
CISPR 16	Radiated Emissions

Specifications (continued)

Ethernet Connector Pin Assignments



10BASE-T/100BASE-TX

Terminal	Usage
1	TD +
2	TD –
3	RD +
6	RD –
Other pins	Not Used

Applications – BAScontrol22 Pre-Built Applications

Pre-built Sedona applications for constant volume air handlers, fan coils, and heat pumps exist for the BAScontrol22 series of controllers. Application versions address multi-staged or analog heating/cooling, fixed or variable speed exhaust fans, dual dry-bulb or enthalpy economizers, wall-setters, or network occupied/unoccupied setpoints. These applications come with a pre-assigned BACnet points list, sequence of operation, system schematic, and suggested device list. Pre-built applications speed up installation time by only requiring configuration during installation. Sequences can be modified using the SAE and saved using BASbackup.

Ordering Information

Model	***Description***
BASC-22DR	BAScontrol22 2-Ethernet

United States
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