



Continuum™

b3850 Series Terminal Controllers

The Andover Continuum b3850 series controllers are native BACnet controllers that communicate on an RS-485 field bus as Master devices using the MS/TP BACnet protocol. The b3850, b3851, and b3853 provide cost-effective DDC control of individual terminal units: VAV boxes, fan-powered induction units, unit ventilators, heat pumps, etc. The b3850 series is a perfect fit for your VAV applications where external damper actuators are used. And because all b3850s feature a built-in expansion port for additional I/O, these controllers are perfect for your more demanding control applications.

- Native BACnet MS/TP Communications for Interoperability to Third-Party Systems
- Supports 18 BACnet Object Types including Trends, Schedules, Calendars, and Loops
- Powerful, Flexible Local Controller for the Most Demanding Applications
- Expandable I/O Meets Additional Point Count Needs
- Non-Volatile Flash Memory Provides Utmost Reliability — Stores Both Application Program and Operating System
- Optional Display/Keypad Provides Easy Operator Interface (Mounted Separately)
- Local, Extended Storage of Log Data
- View and Modify Information with Optional Smart Sensor Display
- Local, On-Board Service Port
- BTL Listed B-AAC Controller with Local Trends



Choose the b3850 series controller with the input configuration that matches your application:

- The b3850 is designed for single-duct VAV applications, with four universal inputs plus an on-board air flow sensor.
- The b3851 contains four Universal inputs as well, but does not have the on-board air flow sensor and is perfect for applications such as heat pumps and fan coils.
- The b3853 is for dual-duct VAV applications. It contains two on-board airflow sensors and four universal inputs.

All three models feature an additional room sensor input, which supports Andover Continuum Smart Sensor, or any standard room temperature sensor; plus three Form A relays and one Form K Tri-state relay output.

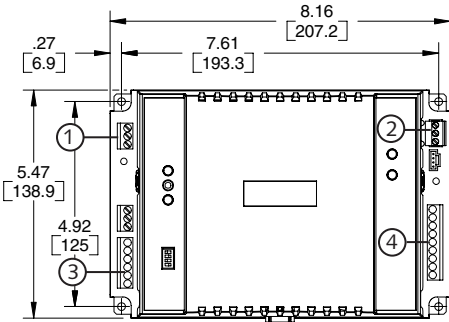
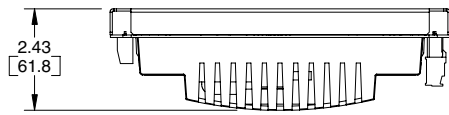
The b3850 series features Flash memory, increased user memory, and a fast (32-bit) processor for faster scan times, with plenty of memory available for data logging of your critical data.

As native BACnet controllers, the b3850 series can communicate with other BACnet devices on the MS/TP network, in strict accordance with ANSI/ASHRAE standard 135-2004, and are listed with the BACnet Testing Labs (BTL) as BACnet Advanced Application Controllers (B-AAC). By connection to the Andover Continuum b4920 or bCX1 network controller, the b3850s and other MS/TP devices can share and gather data from the wider Ethernet/IP network of controllers. Among those Ethernet controllers can be Continuum controllers (BACnet or Infinet) or third-party BACnet IP devices. All Andover Continuum devices, both BACnet and Infinet, are fully compatible with the Andover Continuum CyberStation front-end software, a fully native BACnet Operator Workstation (B-OWS) application.

INCREASED RELIABILITY WITH FLASH MEMORY

The b3850's non-volatile Flash memory stores your operating system and application programs, so that in the event of a power loss, your application will be restored when power is returned. In addition, the Flash memory allows for easy upgrades of your operating system via software downloads, eliminating the need to swap out proms. The b3850 controllers include an on-board battery to safeguard your runtime data — protecting all point data and log data from being lost if power is removed.

b3850 Series Terminal Controllers



Dimensional Drawing

INPUTS

The input configuration on the b3850 series consists of four full range Universal inputs that accept voltage (0-5VDC), digital (on/off), counter signals (up to 4Hz), temperature signals, or supervised alarm circuits for security applications. The b3850 features one on-board air flow sensor; the b3853 provides two. All models offer an additional input to support the Andover Smart Sensor, or any standard room temperature sensor.

OUTPUTS

The b3850 series contains three Form A relay outputs and one Form K Tri-state output. Each is rated for 24 VAC/VDC, 3 amp. These outputs can be used separately for on/off or pulsed control of lighting, heat, and fan units. The pre-configured Form K Tri-state output can be used for bi-directional control of dampers and valves.

(Note: Any two consecutive Form A outputs can be configured to form an additional Form K output.)

I/O EXPANSION

The b3850 series contains an I/O expansion port for the addition of up to two Andover xP expansion modules directly on the bottom of the controller. The xP family of modules includes the DI-8, UI-4, DO-2, D0-4, AO-2, and AO-4. In addition, the I/O bus supports the xP Local Display Module, which allows the user to view and change point values.

SOFTWARE CAPABILITIES

The dynamic memory of the b3850 can be allocated for any combination of programs, scheduling, alarming, and data logging using the powerful Andover Controls Plain English programming language. Our object-oriented Plain English language with intuitive keywords provides an easy method to tailor the controller to meet your exact requirements. Programs are entered into the b3850 using the Andover Continuum CyberStation. Programs are then stored and executed by the b3850 controllers.

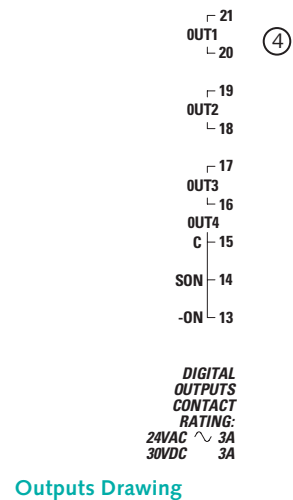
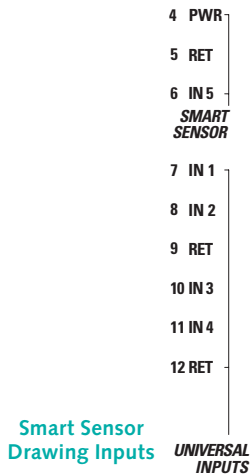
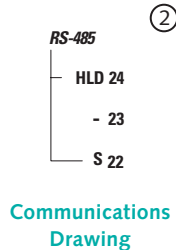
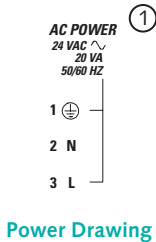
Programming multiple b3850 controllers is inherently easy with Plain English. A complete copy of one b3850's programs can be loaded directly into other b3850s without changing any point names or programs.

SMART SENSOR INTERFACE

The b3850 provides a built-in connection for the Andover Continuum Smart Sensor. The Smart Sensor provides a 2-character LED display and a 6-button programmable keypad that enables operators and occupants to change setpoints, balance VAV boxes, monitor occupancy status, and turn equipment on and off. An enhanced version of the Smart Sensor is also available with a 4-digit custom LCD that provides the following icons: PM, %, °, Setpoint, Cool, Heat, CFM, Fan, OA, and SP.

LOCAL DISPLAY

The local display with keypad (xP Display) allows for the addition of a fully programmable local display module that can be mounted within 10 feet (3 meters) of the controller. Connected via a ribbon cable, the xP-Display easily allows the Operator Interface to be mounted on the door of an enclosure or on a wall below or next to the controller.



SPECIFICATIONS

b3850 Series Terminal Controllers

ELECTRICAL

Power

24 VAC, +10% -15%, 50/60 Hz

Power Consumption

20 VA

Overload Protection

Fused with 2 amp fuse. MOV protected.

Software Real-Time Clock

Synchronized through MS/TP via BACnet

MECHANICAL

Operating Environment

32°–120°F (0–49°C), 10–95% RH (non-condensing)

Size

5.47" H x 8.16" W x 2.44" D (139H x 207W x 62) mm

Weight

1.08 lbs. (.50 kg)

Enclosure Type

UL Open class, IP 10. Flammability rating of UL94-5V

Mounting

Panel mount

BATTERY

Battery Backup

Replaceable, non-rechargeable, lithium battery. Provides 5 years typical accumulated power failure backup of RAM memory

COMMUNICATIONS

Communications Interface

RS-485 BACnet, MS/TP
127 devices maximum

Communications Speed

9600, 19.2K, 38.4K, 76.8K baud

Bus Length

4,000 ft. (1,220m) standard; BACnet repeater allows extension to longer distances.

Bus Media

Twisted, shielded pair, low capacitance cable

BACnet Device Profile

B-AAC, BACnet Advanced Application Controller

BTL Listed

B-AAC with Local Trends



INPUTS/OUTPUTS

Inputs

4 Universal inputs: Voltage (0-5.115 VDC); Temperature -30°F to 230°F (-34°C to 110°C), Digital (on/off), Counter (up to 4Hz at 50% duty cycle, 125 ms min. pulse width). Supervised Alarm (single or double resistor). Current input (0 - 20 mA) using external 250 ohm resistor

1 Smart Sensor Temperature Input (32°F to 105°F) (0°C to 41°C)

Airflow sensor (0 to 2" W.C.) (b3850-qty 1; b3853-qty 2)

Input Voltage Range

0-5.115 volts DC

Input Impedance

10K ohm to 5.120V or 5M ohm with pull-up resistor disabled

Input Protection

24 VAC or 24 VDC temporarily on any single channel, ±1000V transients (Tested according to EN61000-4-4)

Input Resolution

5.0 mV

Input Accuracy

±15mV (±0.56°C from -23°C to +66°C or ±1°F from -10°F to +150°F)

Airflow Input

Range: 0 to 2" W.C. (0-500 Pa)

Resolution: 0.005" W.C. (1.25 Pa) @ 23° C (73° F)

Accuracy: ±0.025" W.C. (6.25 Pa) @23°C (73°F)

Outputs

3 single pole single throw (SPST) Form A relays

1 Form K Tri-state relay output (Any two consecutive Form A outputs can be configured as one Form K Tri-state)

Output Rating

Maximum 3A, 24VAC/VDC, ±1500V transients (Tested according to EN61000-4-4)

Output Accuracy

0.1 sec. for pulse width modulation

Expansion Bus

Interfaces to optional xP I/O Expansion Modules

SPECIFICATIONS

(Continued)

CONNECTIONS

Power

3-position fixed screw terminal connector

Inputs

6-position fixed screw terminal connector

Outputs

9-position fixed screw terminal connector

Smart Sensor

3-position fixed screw terminal connector

Communications

3-position removeable screw terminal connector

Expansion Port

6-position shrouded connector

Service Port

4-position shrouded connector

USER LEDS/SWITCHES

Status Indicator LEDS:

CPU	CPU Active
TD	Transmit Data
RD	Receive Data
Output	Output Status (per output) (Digital only)

EXPANSION

PORT PWR	Power Status
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Switches

RESET	Input Pull-up Resistor Switch (per input)
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AGENCY LISTINGS

UL/CUL 916, FCC CFR 47 Part 15, ICES-003, EN55022, AS/NZS 3548, Class A, CE

OPTIONS

UL864, Smoke Control System Equipment, UUKL (b3850-S, b3851-S, b3853-S)

GENERAL

Memory

128K SRAM, 1MB FLASH

Processor

Motorola 32-bit Coldfire

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SDS-B3850
10/05

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