Original Design Manufacturing

Application
Ready
Platforms

CONTEMPORARY CONTROLS®

Single Board Computers

Automation Platforms

Unmanaged and Managed Switches

Application Ready Platforms

HVAC Controllers
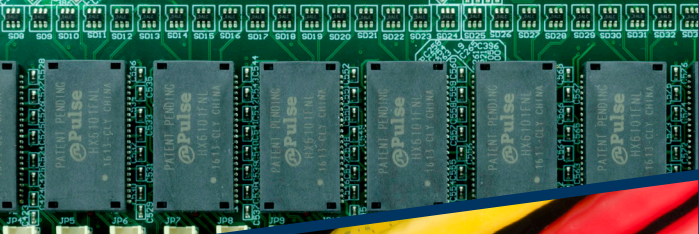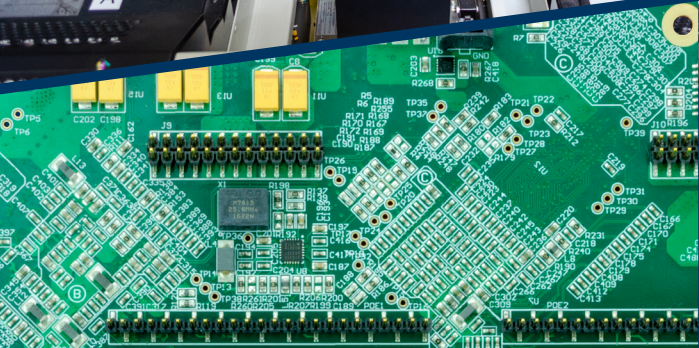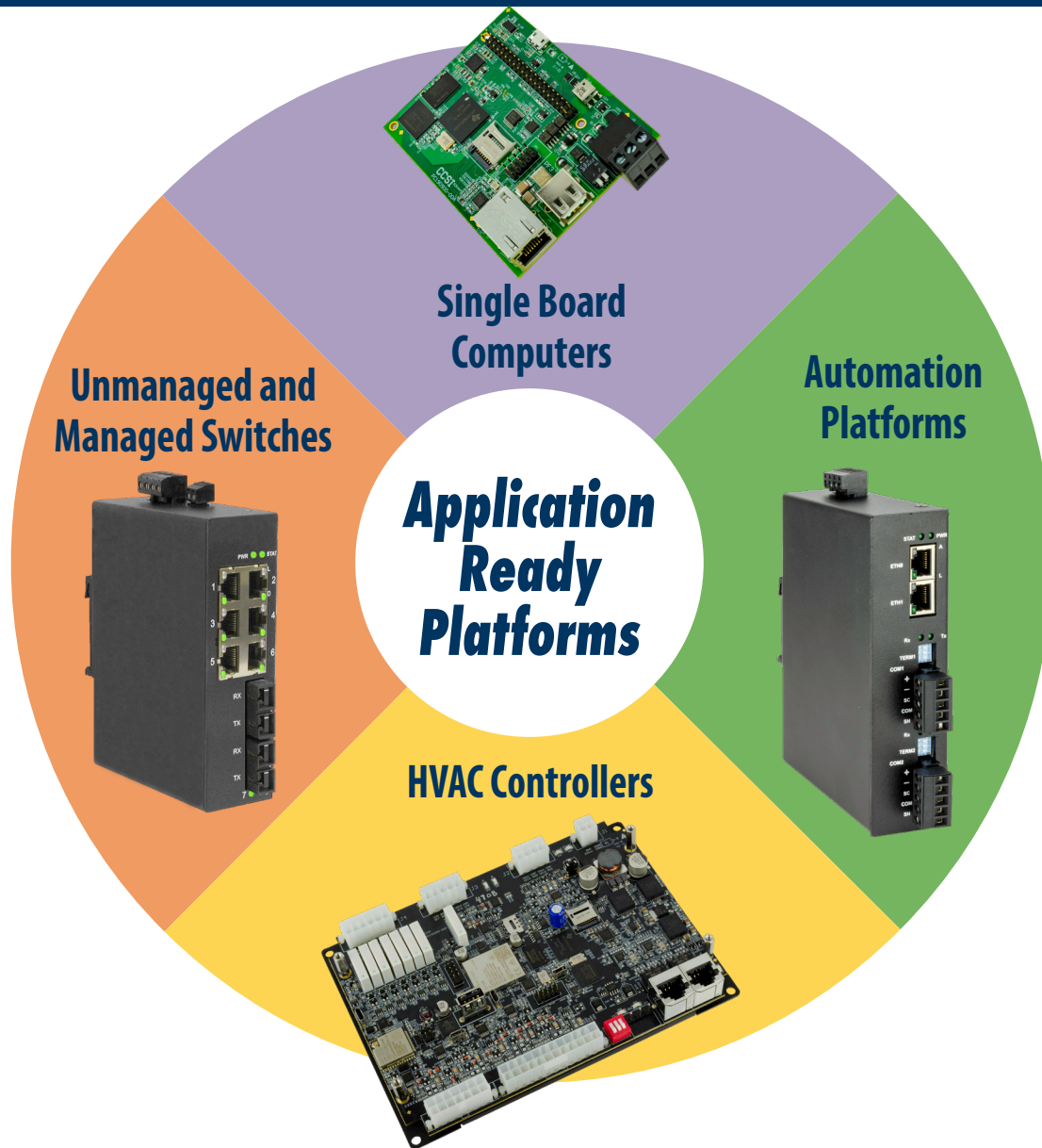
Application Ready Platforms

Contemporary Controls designs and manufacturers networking and control products used in various automation industries where performance and reliability are essential. These products, along with our comprehensive design experience with hardware, software and protocols, allow us to offer original design manufacturing (ODM) services where we provide the product you require under your brand. To speed development, our designs are based upon proven open hardware and open software platforms that are ready to execute your control or networking application.

With more than 40 years of experience in electronics design, development and manufacturing, we have a rich inventory of intellectual property that can be tapped for your next project. Two design and manufacturing locations—one in China and one in the US—provide private-label and ODM services. Leverage our design and manufacturing resources to reduce your costs and time-to-market.

Single Board Computers

Single Board Computers (SBCs) are small, but powerful board-level Linux computers that execute applications. Two families of SBCs with similar footprints are available—the SBCpi, based on the Raspberry Pi, and the SBCti, based on Texas Instruments' Sitara family of processors. These SBCs take advantage of the wealth of open software that was developed to run on either the Raspberry Pi or BeagleBone Black. Using a modular design approach, either version can be fitted into a 4M pitch (70mm wide) DIN rail mounted plastic enclosure (DIN 43880 compliant).

Expansion boards that provide additional input/output points, a power supply, or support for a unique interface to SBCs are called daughter boards, shields or hats. Hats exist for both the SBCpi and SBCti. Depending upon the hat, a 4M enclosure is available with the appropriate cutouts for field connections.

Automation Platforms

Two styles of automation platforms exist with installed boards in a metal DIN rail mounted enclosure. The PI Automation Platform incorporates the Raspberry Pi compute module while the TI Automation Platform incorporates a TI Sitara processor module. Both feature dual serial ports and dual Ethernet ports and will execute code developed for the Raspberry Pi or BeagleBone Black. A daughter board socket offers flexibility for other interfaces.

HVAC Controllers

For air handlers (AHUs), rooftop units (RTUs), and other HVAC applications, panel mounted freely programmable BACnet/IP or BACnet MS/TP controllers are available along with a library of Sedona function block programs for typical HVAC applications. These programs can easily be modified for custom sequence of operations using the license-free Contemporary Controls' BAScontrol Toolset.

Unmanaged and Managed Switches

Various plug and play Ethernet switches with varying copper or fiber port counts to 24 are available in panel mounted or DIN rail mounted metal enclosures. Features include auto-negotiated data rates to one gigabit, auto MDIX, half or full duplex. Fiber optic options include single-mode or multimode operation with various connectors.

Managed Ethernet switches have all the same features as unmanaged switches while supporting the Simple Network Management Protocol (SNMP). Utilizing Contemporary Controls' M-Software, these managed switches support a host of features such as port configuration, port mirroring, VLANs, trunking, Quality of Service (QoS), port forwarding, Rapid Spanning Tree Protocol (RSTP) and rate limiting.

Application Ready Platforms

It is expensive and time consuming to develop sophisticated electronic circuitry, system software, application software, and conduct a design validation review along with obtaining the required regulatory approvals before launching a product to market. A more cost effective and quicker approach is to use a proven hardware/software platform that is ready to be loaded with a customer-developed application program that then can be branded as a proprietary product. At Contemporary Controls, we have the platforms and design resources to make it happen.

With application ready platforms, non-recurring engineering (NRE) fees are minimized. OEMs can take advantage of our experience in developing control and networking products using open hardware and software technologies.

Our design experience is with automation products including direct digital controllers (DDC), supervisors, IP routers and switches, protocol routers and gateways for BACnet and Modbus, and MQTT gateways for cloud computing. Our control and communications capabilities can be bundled in our application ready platforms.

What We Design, We Make

Contemporary Controls has two manufacturing locations, one in Downers Grove, Illinois and the other in Suzhou, PRC. Both operations are ISO9001:2015 registered and are under Underwriters Laboratories (UL) surveillance. In addition to self-manufacturing, Contemporary Controls sources complementary networking and control products for the convenience of our customers. The US operation has modern Panasonic multi-function, surface-mount technology (SMT) process lines that produce sophisticated, lead-free, high-density printed circuit board assemblies (PCBAs) that incorporate ball-grid-array (BGA) components. These PCBAs are then installed into their enclosures, tested and stored in their final packaging in an environmentally controlled warehouse ready for worldwide shipment.

While the US operation is ideal for prototyping, and producing high-mix, low-volume and Made in USA products, the China operation with its sourcing partners are better suited for high-volume, low-mix production. In either location, intellectual property is protected. Both plants follow IPC workmanship standards recognized in the electronics industry.

Open Hardware – Open Software

The automation market for networking and control products requires compliance to worldwide standards. Those standards determine the required performance, environmental compliance, security, and safety of the products we produce. Having witnessed the evolution of automation from electromechanical controls, to solid-state electronics, to direct digital control, and now to cloud-based computing; the adherence to standards is even more important in remaining competitive. The quick pace of technological innovations requires us to develop open, flexible platforms that remain agile in this rapidly changing market. For an operating system we have chosen Linux for its universal support and acceptance. For hardware, we use any platform the runs Linux. This includes the Raspberry Pi and BeagleBone Black.

We consider the Raspberry Pi and BeagleBone Black as reference designs. If your application runs on one of these platforms, it will most likely run on one of our hardened Application Ready Platforms. This is the quickest way to the market. Port your compliant software to one of our platforms that already carries the necessary environmental, EMC, and safety approvals.

Our embedded hardware and software engineers are familiar with protocols such as BACnet, Modbus, CAN, MQTT, TCP/IP and the family of IP-based protocols. For wired connectivity, they are skilled with Ethernet copper and fiber networks, as well as various EIA-485 serial protocols. For wireless, we have experience with Wi-Fi, Bluetooth, EnOcean, and LTE cellular.

Our Worldwide Resources

ODM projects are managed from our Downers Grove, IL USA facility where most of our technical resources are based. Depending upon the requirements of the project, we have a design team at our Suzhou location as well as a network of technical specialists in different parts of the world available to assist with unique requirements. Most application ready projects simply require custom labeling on the product, packaging and documentation, and possibly branding changes to web pages. Custom projects will take more effort.

With custom designs such as a hat for one of the SBC designs, or a hardware feature added to an automation platform, prototyping and pilot production is accomplished in Downers Grove. The same is true for pre-compliance EMC for conducted and radiated emissions. Environmental testing which includes temperature and humidity can be accomplished in-house.

For network communication compliance, specialized Ethernet copper and fiber optic testing, as well as RFC protocol test reports can be accomplished on our Spirent tester. For BACnet protocol interoperability testing, we have protocol analyzers as well as a wall of mixed vendor BACnet MS/TP devices to validate designs.

Our goal is to provide our customers a fully functioning ODM product meeting their requirements of "dock-to-stock."

SBC*pi* Raspberry Pi SBC

The Raspberry Pi is one of the most successful single board computers ever released. Its low-cost but powerful processor is attractive to technical professionals and hobbyist alike. Due to its popularity, numerous programs have been written for the Pi including programs intended for home, commercial, or industrial automation. With the proper packaging and powering, this popular single board computer can be made suitable for field installations.

The SBCpi is considered a building block in a modular system that includes an expansion "hat" and a 4M plastic enclosure suitable for DIN rail mounting. The hat provides I/O expansion and a power supply so the SBCpi can be powered from a conventional 24 VAC/VDC source instead of a micro USB port.

The 4M enclosure is DIN 43880 compliant and its clear plastic cover and removable label makes it ideal for private label branding.

SBCpi Raspberry Pi single board computer
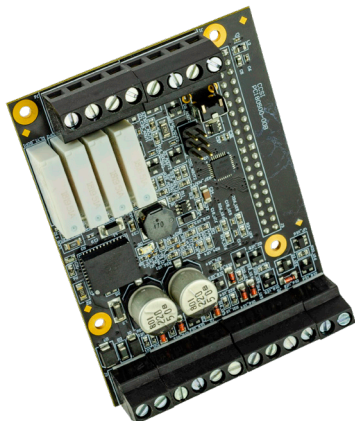
Input/Output hat for the SBCpi

Versatile Single Board Computer

- Broadcom Quad-core Cortex-A53 (ARMv8) 64-bit CPU with 1.2 GHz clock
- GPU: Broadcom VideoCore IV
- 1 GB LPDDR2 SDRAM
- Micro SD card slot for storage
- 10/100 Mbps Ethernet
- 2.4 GHz 802.11n Wi-Fi
- Bluetooth 4.1 classic, BLE
- GPIO 40-pin header
- HDMI video port
- Analog audio port
- 4 USB 2.0 ports
- 0°C to +60°C temperature operation
- Linux operating system
- FCC, CE, and EMC compliance

Flexible Input/Output Expansion

- Six universal inputs, six relay outputs
- Six universal inputs, four relay outputs, two analog outputs
- BACnet/IP and BACnet MS/TP communication
- Sedona function block programming

Applications

- Protocol converter
- Edge controller
- Supervisor
- IoT cloud gateway


SBCpi and hat in 4M enclosure

SBC*ti* TI SBC

The Texas Instrument Sitara line is one of the more popular processor families. Used on the BeagleBone Black, a wealth of software exists supporting this processor. Based upon the success of the SBCpi modular design, a similar approach was taken with the SBCti. Although the SBCti is not as powerful as the SBCpi, it offers wide temperature operation making it suitable for outdoor installations.

The SBCti is considered a building block in a modular system that includes an expansion hat and a 4M plastic enclosure suitable for DIN rail mounting. The hat provides I/O expansion and a power supply so that the SBCti can be powered from a conventional 24 VAC/VDC source.

The 4M enclosure is DIN 43880 compliant and its clear plastic cover and removable label make it ideal for private label branding.
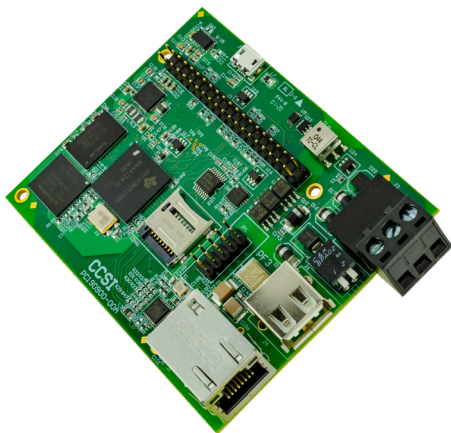
SBCti TI Sitara single board computer
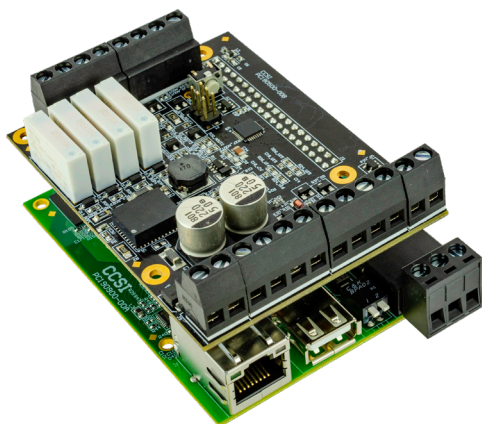
Input/Output hat mounted to the SBCti

Versatile Single Board Computer

- Texas Instruments AM3352 Arm Cortex-A8 CPU with 300/ 600/ 800/1000 MHz clock options
- DDR3L DRAM memory with 512 MB
- pSLC eMMC flash with options for 5/10/21 GB of storage
- Micro SD card slot for additional storage capacity
- 10/100 Mbps Ethernet port
- Wide temperature operation of -40°C to +75°C
- Linux operating system
- FCC, CE, industrial EMC

Flexible Input/Output Expansion

- Six universal inputs, six relay outputs
- Six universal inputs, four relay outputs, two analog outputs
- EnOcean wireless communication
- BACnet/IP and BACnet MS/TP communication
- Sedona function block programming

Applications

- Protocol converter
- Edge controller
- Supervisor
- IoT cloud gateway

SBCti and hat in 4M enclosure for a wireless gateway

PI Automation Platform

The PI Automation Platform is a robust and powerful hardware platform ready to run any application software compliant with the Raspberry Pi. Instead of using the SBCpi, the PI Automation Platform uses the Raspberry Pi system on module (SOM) called the Compute Module. Unlike the SBCpi, the PI Automation Platform includes two 10/100 Mbps Ethernet ports with separate MAC addresses thereby providing two subnets. Two isolated EIA-485 serial ports are suitable for BACnet MS/TP, Modbus RTU or other serial protocols. Bias and termination are switch selectable.

The metal enclosure can be DIN rail mounted and powered from a 24 VAC/VDC power source. A socket exists for an optional daughter board supporting either Wi-Fi or cellular communications. The platform has been pre-certified for EMC compliance.
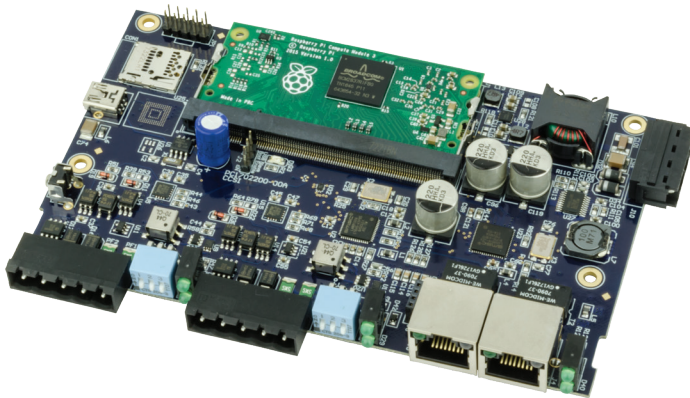
**PI Platform using the
Raspberry Pi Compute Module**

Versatile Communication Device

- Broadcom Quad-core Cortex-A53 (ARMv8) 64-bit CPU with 1.4 GHz clock
- 1 GB LPDDR2 SDRAM
- pSLC eMMC flash with options for 5/10/21 GB of storage
- Micro SD card slot for additional storage capacity
- Dual individual (non-switched) 10/100 Mbps Ethernet ports
- Dual optically isolated EIA-485 serial ports with Tx/Rx LEDs
- Individual DIP switches for easy EIA-485 bias and termination configuration
- Optional daughter boards for Wi-Fi (802.11 b/g/n), or LTE/3G cellular, or EnOcean
- Capacitor-backed Real Time Clock (RTC) for retention on power loss
- Power LED and a programmable Status LED
- Programmable momentary Reset switch
- 24VAC/VDC power input with provision for backup power
- 0°C to +60°C temperature operation
- Rugged metal enclosure with DIN-rail mounting
- Linux operating system
- FCC, CE, and industrial EMC compliance

Applications

- Protocol converter
- Router or gateway
- Supervisor
- IoT cloud gateway

**PI Platform – Dual Ethernet
and EIA-485 connectivity**

TI Automation Platform

The TI Automation Platform is a series of robust and powerful hardware platforms ready to run any application software compliant with the BeagleBone Black. The TI Automation Platform utilizes similar circuitry as the SBCti less the hat connector. Depending upon features, there are several versions of the TI Automation Platform. Options include two 10/100 Mbps Ethernet ports with separate MACs or two switched ports; one or two isolated EIA-485 serial ports; a Wi-Fi or cellular communication port.

The metal enclosure can be DIN rail mounted and powered from a 24 VAC/VDC power source. A socket exists for an optional daughter board supporting either Wi-Fi or cellular communications. The platform has been pre-certified for EMC compliance.

TI Platform – Ethernet and EIA-485 connectivity

TI Platform – Ethernet, EIA-485 and Cellular connectivity

Versatile Communication Device

- Texas Instruments AM3352 ARM Cortex-A8 CPU with 300/ 600/ 800/1000 MHz clock options
- DDR3L DRAM memory with 512 MB
- pSLC eMMC flash with options for 5/10/21 GB of storage
- Micro SD card slot for additional storage capacity
- One or two 10/100 Mbps Ethernet ports
- One or two optically isolated EIA-485 serial ports
- DIP switch for easy EIA-485 bias and termination configuration
- Optional daughter boards for Wi-Fi (802.11 b/g/n) or LTE/3G cellular
- Capacitor-backed real time clock (RTC) for retention on power loss
- Power LED and a programmable status LED
- Programmable momentary reset switch
- 24VAC/VDC power input with provision for backup power
- Wide temperature operation -40°C to +75°C
- Rugged metal enclosure with DIN rail or panel mount options
- Linux operating system
- FCC, CE, and industrial EMC compliance

Applications

- Protocol converter
- Router or gateway
- Supervisor
- IoT cloud gateway

RTU38 – Advanced Rooftop Controller

The RTU38 is an advanced rooftop controller capable of monitoring, controlling, analyzing, or energy optimizing the operation of constant volume or variable volume multistage heating/cooling rooftop units or air handlers. Custom sequences can be developed in Sedona meeting the needs of mechanical equipment OEMs, energy companies, or performance contractors. A library of sequences exists for economizing, demand control ventilation, optimal start, supply air pressure reset, and exception reporting to the cloud.

The powerful 38-point unitary controller supports BACnet/IP using a 2-port Ethernet switch, or BACnet MS/TP over an EIA-485 port. The controller complies with the B-ASC device profile, having a mix of 16 universal inputs, 10 binary inputs, 4 analog outputs and 8 relay outputs. Pin and socket connectors speed controller installation in the RTU.

Rugged design, low profile, and wide temperature operation make it suitable for indoor or outdoor use. The controller is manufactured in the USA.
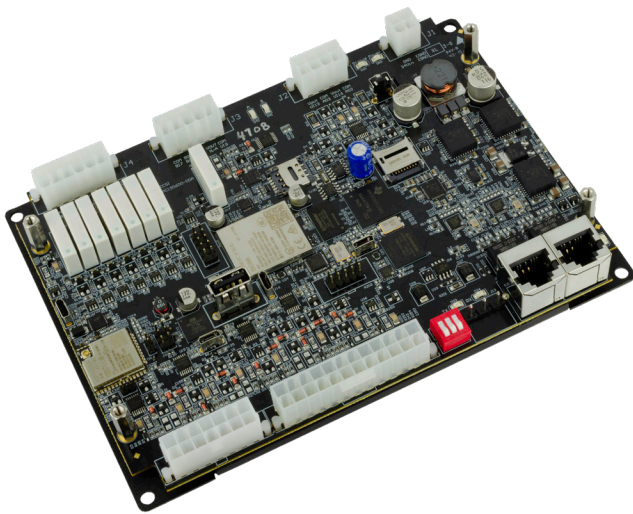
Versatile Monitoring or Control Device

- BACnet/IP and BACnet MS/TP client/server
- Resident Sedona Virtual machine (SVM)
- Programmable with free BAScontrol Toolset
- Configurable with a common web browser
- Capacitor-backed Real Time Clock (RTC) for retention on power loss
- Built-in 10/100 Mbps Ethernet two-port switch
- TI AM3352 1 GHz processor with 512 MB RAM and 5 GB eMMC memory
- Non-volatile FRAM memory for storing runtimes and pulses
- 24 VAC/VDC powered
- Outdoor temperature operation -40°C to +75°C

Flexible Inputs and Outputs

- Sixteen configurable universal inputs
  - Thermistor, resistance, analog voltage, binary input, retentive pulse inputs
- Six 24 VAC binary inputs for monitoring RTU control signals.
- Four additional voltage-free binary inputs
- Four 0 to 10 VDC analog outputs
- Eight binary (relay) outputs

Applications

- Economizer
- Demand control ventilation
- Connected commissioning
- Energy optimization
- Analytics

Unmanaged and Managed Switches

Unmanaged switches provide a simple, cost-effective method of expanding Ethernet networks. Auto-negotiation, in which data rate (10/100/1000 Mbps) and duplex (half or full) are set between link partners without user intervention, is standard on copper ports. Auto-MDIX eliminates the need for a crossover cable when cascading switches. Models are available with either multimode (MM) or single-mode (SM) fiber optic ports to accommodate long distances through hostile environments.

The ultimate in performance and flexibility can be found in a SNMP compliant managed switch, providing data on network health and performance. By configuring the switch through either a web page or console screen, advanced features can be invoked, including: virtual LANs to segment traffic within a single physical network, several Quality of Service (QoS) methods (including 802.1p) to prioritize traffic, port security to guard against intrusions, port mirroring for troubleshooting, and a programmable fault-relay that can be tied to a host controller for alarming.

Unmanaged Ethernet copper and fiber optic switches

Unmanaged Features
- 10BASE-T/100BASE-TX/100BASE-FX compliant
- 1000BASE-T GigE (GT models)
- Auto-MDIX on all copper ports
- Auto-negotiated data rate, duplex and flow control on twisted-pair
- DIN rail mountable
- Full or half-duplex
- Activity/link and data rate LEDs
- 10-36 VDC or 24 VAC powered
- 0°C to +60°C temperature operation

Managed Features
- SNMP protocol
- Configurable by web browser
- IGMP snooping with query
- Virtual LAN (VLAN)
- Quality of Service (QoS)
- RSTP cable redundancy
- Port mirroring, port security and rate limiting
- Trunking
- Auto-negotiation or static port settings

Managed switch

Optional Features
- Power over Ethernet (PoE)
- Programmable fault relay
- Rugged metal enclosure
- Diagnostic LEDs
- Enhanced EMC compliance
- 24 VAC/VDC powered (non-PoE models)

Quality Policy

Contemporary Controls develops, manufactures and markets innovative networking and control products to the benefit of our automation customers worldwide. We are committed to delivering products and services that meet customer requirements and expectations through our continuous improvement efforts.

This quality policy is communicated and explained throughout Contemporary Controls and is reviewed for continuing suitability to the quality management system by Contemporary Controls' Management Team.

- Our customers depend upon us to deliver products and services that meet their needs. Their success provides us the means to exist.
- Our suppliers are important to our success and, therefore, we treat them as partners.
- Each employee is considered a professional, independent of position, and a contributor to the success of the organization.
- We are all members of a working team, striving to develop innovative products, technologies, and processes.
- We stress quality in everything we do and know we can do better through continuous improvement efforts.
- The ethical way of doing business is the only way.

QAS INTERNATIONAL
ISO 9001:2015
REGISTERED COMPANY
Certificate No. US4340

ASHRAE **BACnet®**
INTEREST GROUP EUROPE

Member of
BACnet
International

enocean®alliance
Member

CABA
Continental Automated
Buildings Association

PCI SIG

CONTEMPORARY CONTROLS®

Contemporary Control Systems, Inc.
2431 Curtiss Street
Downers Grove, IL 60515
USA
+1 630 963 7070
info@ccontrols.com

Contemporary Controls Ltd
14 Bow Court
Fletchworth Gate
Coventry CV5 6SP
United Kingdom
+ 44 (0) 24 7641 3786
info@ccontrols.co.uk

Contemporary Controls GmbH
Fuggerstraße 1 B
04158 Leipzig, Germany
+ 49 (0) 341 520359 0
info@ccontrols.de

Contemporary Controls (Suzhou) Co. Ltd
19F, Metropolitan Towers,
No.199 Shishan Road,
Suzhou New District,
215009 China
+ 86 512 68095866
info@ccontrols.com.cn

www.ccontrols.com