

ACT2-CS Convenience Store Controller

The ACT2-CS Convenience Store Controller is a fully programmable, economical controller with the ability to control 6 condensing systems, 5 separate HVAC zones, and up to 32 generic inputs and 16 generic outputs. With the addition of Maestro software, the ACT2 controller can provide remote monitoring and setup capabilities.

The ACT2-CS Convenience Store Controller is designed to save you money by:

- preventing product loss
- reducing maintenance expenditures
- saving energy costs.

The end result is stable and dependable control of refrigeration, HVAC, lighting, and auxiliary devices, combined with a truly effective diagnostic tool.

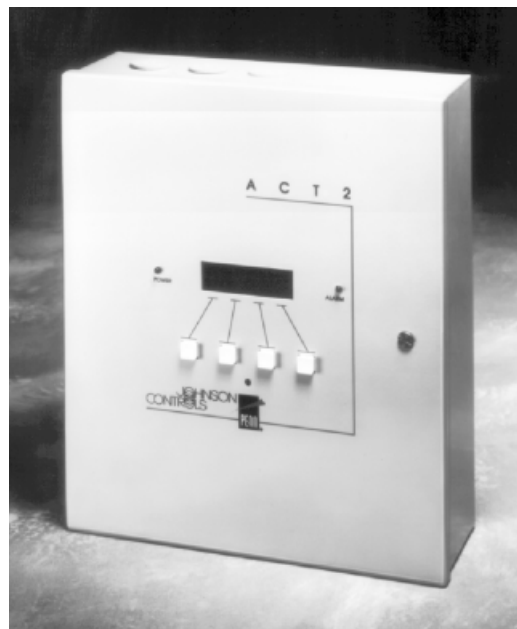


Figure 1: ACT2-CS Convenience Store Controller

Features and Benefits	
☐ 4-key Programming and Simple Menu Structure	Simplifies use
☐ Extensive Logging: 500 Logs per Input 20 Alarm Logs Up to 5 Utility Usage Logs	Supplies the historical data needed to make sound energy usage and maintenance decisions
☐ Remote Communications Capability	Allows alarm dial-out and remote monitoring, potentially reducing product loss and unnecessary maintenance costs
☐ Password Protection	Provides a level of control over who may make changes to the program
☐ Non-volatile Memory	Ensures setpoint and programming integrity during a power loss

Application Overview

The ACT2-CS convenience store controller is an economical refrigeration, HVAC, lighting, and general-purpose controller designed for convenience stores and small retail facilities. Its expandable design allows you to tailor the system to your control needs:

- add-on input and output boards provide control of as many or few items as needed
- generic inputs and outputs provide flexibility to control items not directly associated with the refrigeration or HVAC control scheme
- Maestro software package provides local or remote programming, logging, and alarm monitoring via computer when needed

Refrigeration Control Capabilities

The ACT2-CS controller controls up to six condensing units. Each condensing unit can have up to two compressors and two condenser fans. Either pressure or temperature based control may be used.

Refrigeration control capabilities include control of pump down, evaporator fans, and defrost with time or temperature termination. The ACT2 controller can also monitor oil pressure and product temperatures.

ACT2-CS refrigeration control includes:

- six condensing units
- two compressors/condensing unit (second unit may be an unloader)
- two condenser fans/condensing unit
- liquid line solenoid control
- evaporator fan control with delay
- oil pressure monitoring with lockout and auto restart options
- six electric or off-cycle defrost times with time and temperature defrost termination
- compressor pump down mode options
- phase loss monitoring

HVAC Control Capabilities

The ACT2-CS controller controls single or multi-zone facilities and can control up to five HVAC zones. Each HVAC zone can contain up to six cooling stages, four heating stages, and two auxiliary heating stages.

HVAC control includes the following:

- five independent HVAC zones
- six cooling stages/zone
- four heating stages (reclaim)/zone
- two auxiliary heating stages/zone
- one 2-speed fan control/zone
- night setback and warmup strategies

Generic I/O Capabilities

Generic inputs and outputs are used to monitor and control items not included in the refrigeration or HVAC control schemes. Acceptable input types include:

- low temperature sensors
- high temperature sensors
- humidity sensors
- liquid level sensors
- pulse sensors
- photocell sensors
- pressure transducers
- digital inputs

Outputs are controlled by an assigned input or by a schedule. Typical examples of items controlled by generic outputs include:

- parking lot lighting
- lawn watering systems
- exhaust fans over cooktops
- anti-sweat heaters on freezer doors, etc.

Utility Usage Monitoring

Up to five usage parameters are available to track electricity or water usage, or usage of any other item that can be monitored with a pulse meter. The ACT2 controller accepts a pulsed signal input either directly from the utility company or from a pulse meter.

The ACT2 controller provides a reading for current, total, and peak usage per day, total and peak usage per month, and total and peak usage since last reset.

In addition, the total and peak daily usage is logged for the past 48 days, and the total and peak monthly usage is logged for the last 18 months.

Logging Capabilities

Logging is provided for each of the inputs. Storage is provided for 500 readings for each input. This provides a history of over five days if the logging interval is set to take a reading every fifteen minutes. The logging interval can be changed per input as desired. The ACT2 controller keeps:

- 500 logs of system inputs
- last 20 alarms

Remote Communication Capabilities

ACT2 controllers can be set up and the installation can be remotely monitored by setting up communication between the controller and a computer running Maestro software. ACT2 controller communication can be configured several ways:

- A single ACT2 controller can communicate with a local computer—this allows a service person to directly plug in to the ACT2 controller and download a program, minimizing on-site setup time.
- Several ACT2 controllers can be networked, so that connection to one communication port allows access to multiple ACT2 controllers at that site.
- A single ACT2 controller or a network of controllers can communicate with a remote computer via a modem connection—this allows monitoring of multiple stores from one location, and also can help the service person troubleshoot problems before a trip to the site is needed.

In addition, the ACT2 controller can be set up to dial out to various monitoring devices when an alarm condition is detected. Typical dial-out locations include:

- a computer with Maestro software
- a printer
- an answering service
- an audible alarm or strobe light
- a pager

Product Overview

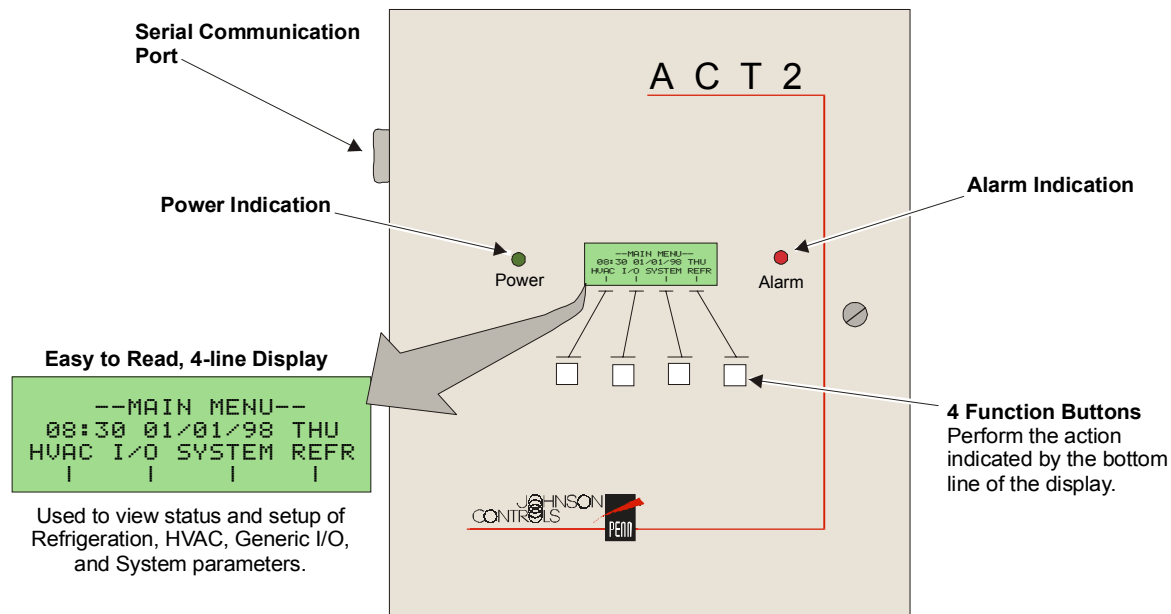


Figure 2: ACT2 Controller Front Panel

Hardware Capabilities

The ACT2 controller is enclosed in a standard electrical box enclosure, with multiple conduit knockouts to facilitate wiring connections.

The ACT2-CS controller includes:

- 16 input points
- 9 output relays
- 2 analog outputs
- 1 dedicated alarm relay output

Viewing the status of HVAC and refrigeration systems is easily accomplished via the display on the front of the unit.

To control more points than are contained within the basic unit, the ACT2-CS controller provides the capability to add input and output boards per application requirements. Add-on input and output board capabilities include:

- up to 20 additional input boards (16 inputs per board)
- up to 32 additional output boards (8 outputs per board)

Add-on Input and Output Boards

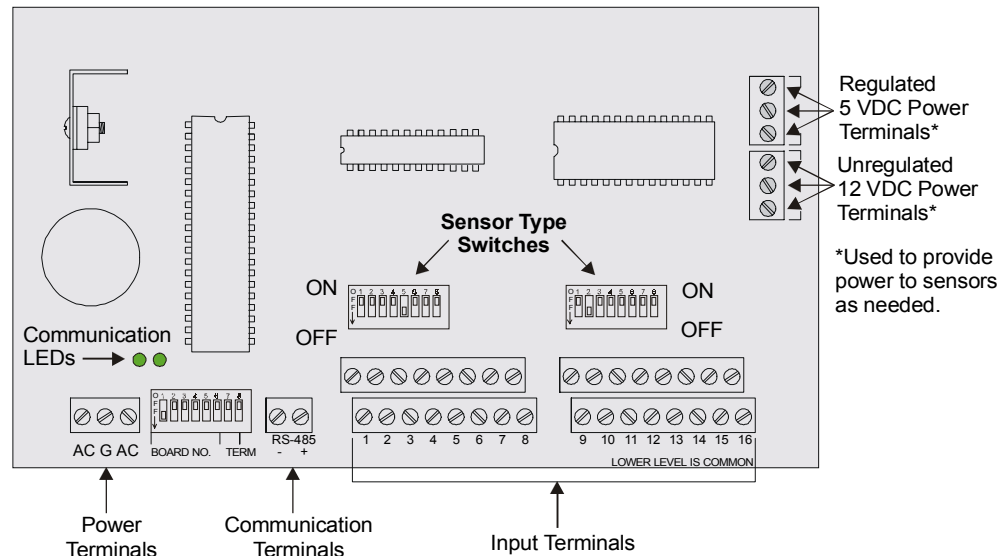


Figure 3: Add-on Input Board

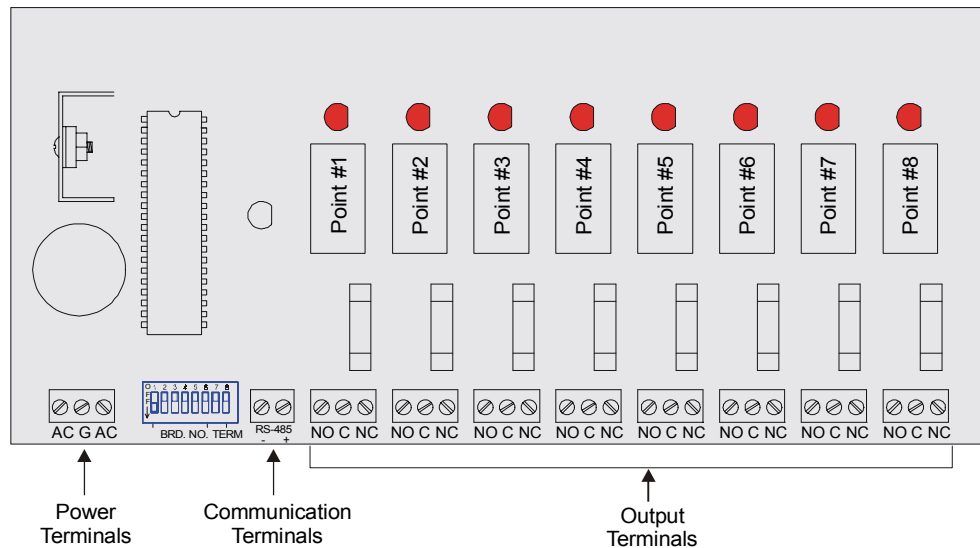


Figure 4: Add-on Output Board

Add-on input and output boards are used to extend the number of conditions monitored and devices controlled.

Add-on output boards have eight On/Off relay outputs.

Inputs can be from the following devices:

- an On/Off digital sensor such as a door switch
- a passive sensor such as a typical temperature sensor
- an active sensor such as a pressure transducer

Dimensions

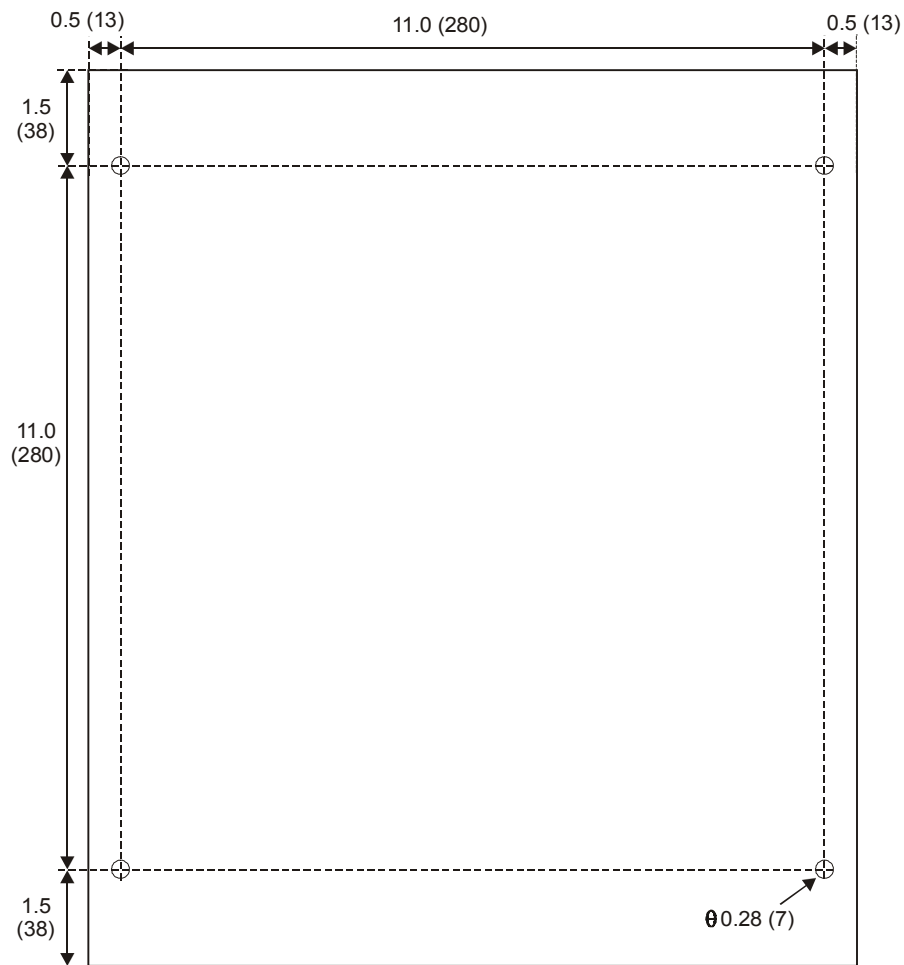


Figure 5: ACT2-CS Convenience Store Controller Mounting Dimensions, in. (mm)

Ordering Information

Table : Ordering Information

Product Code Number	Description
800-2012	ACT2-CS Convenience Store Controller
800-7600	Add-on Input Board - 16 inputs
800-7500	Add-on Output Board - 8 relay outputs
700-1005	20 VAC Center Tap Transformer - supplies power for up to 5 add-on boards
700-1010	20 VAC Center Tap Transformer - supplies power for up to 10 add-on boards
600-3220	Low Temperature Sensor [<120°F (< 49°C)]
600-3300	High Temperature Sensor [>120°F (< 49°C)]
200-9211	Wall-mount Sensor Enclosure (sensor sold separately)
700-0024	Outdoor Air Sensor with Enclosure
700-0600	Light Level Sensor
700-0800	Humidity Sensor
700-0100	Low Pressure Transducer (<100 psi)
700-0500	High Pressure Transducer (<500 psi)
700-0820	Door Switch
700-0257	Phase Monitor 208/240 VAC
700-0206	Phase Monitor Base
610-3360	33.6 Modem
600-2109	ACT2 Remote Software - Maestro

Specifications

Product	ACT2-CS Convenience Store Controller
Power Requirements	120/208 VAC at 50/60 Hz 500 mA Maximum Current
Outputs	Dry Contact Form-C Outputs, 240 VAC, 2A Maximum
Alarm Contact Rating	240 VAC, Pilot Duty
Input Power Fuse	1 Ampere, 240 VAC Buss GMA
Output Fuses	2 Ampere, 240 VAC Buss GMA
Ambient Operating Conditions	32 to 90°F (0 to 32°C); 95% RH, non-condensing
Ambient Storage Conditions	32 to 100°F (0 to 38°C); 95% RH, non-condensing
Dimensions (H x W x D)	14 x 12 x 4 in. (356 x 305 x 102 mm)
Agency Listings	UL Listed, File E152562, Control No. 3F80
Shipping Weight	16 lb (7.27 kg)

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult Johnson Controls application engineering at (414) 274-5535. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



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