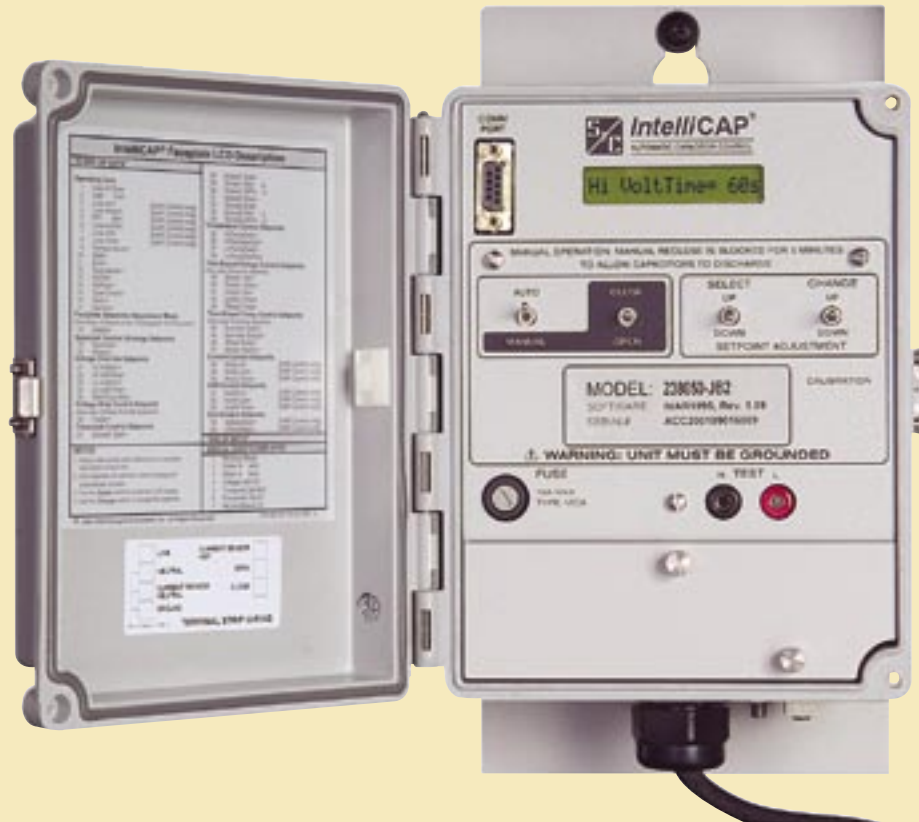


# S&C IntelliCAP®

## Automatic Capacitor Controls



The Intelligent Alternative to Electromechanical Capacitor Controls



**S&C ELECTRIC COMPANY**  
Specialists in Electric Power Switching and Protection

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S&C IntelliCAP Automatic Capacitor Controls are specifically engineered for the control of pole-mounted and pad-mounted switched capacitor banks in electric distribution systems. These reliable, easy-to-use, flexible devices give you the benefits of an intelligent, microprocessor-based control for about the same price as an electromechanical capacitor control.

IntelliCAP Controls do not require a computer to set up most typical installations.

For the IntelliCAP Control with VAR option, S&C offers the inexpensive CS Series Current Sensor. This high-performance sensor is easy to install and requires no calibration.

CapSite™, a sophisticated spreadsheet program that helps you find the optimal locations for capacitor banks, is a unique planning resource, available only from S&C.

### Automatic Control Functions

IntelliCAP Controls offer a full range of automatic functions:

- Voltage, time, temperature, time-biased voltage, and time-biased temperature in a single unit.
- Optional VAR and current control strategies.
- Voltage override.
- Automatic calculation of voltage change due to capacitor bank switching.
- Automatic adjustments for daylight savings and holidays.
- Daily limit on automatic switching operations.

### Compact Size

IntelliCAP Controls are plug-compatible with electromechanical capacitor controls and are available in electric meter base, pole mounting bracket, or wall mounting bracket configurations. The compact enclosure is strong, lightweight, and UV-stable for reliable operation in the harsh environments seen in electric utility applications.

### Easy Operation

Rugged faceplate switches make it easy for field personnel to work with IntelliCAP Controls. You can access the test points and fuse from the faceplate. The manual override switch lets you control the bank state from the faceplate.

The faceplate liquid-crystal display lets you set up, monitor, and troubleshoot the IntelliCAP Control without a computer. It scrolls all relevant real-time information and applicable set points. Faceplate switches let you change the set points. A PC operating under Windows® 95 or later can be connected via a DB9 faceplate connector, and IntelliLink® software used to view real-time data, manage set points, and download historical data for reports.

### Extensive Data Logging

IntelliCAP Controls have extensive data logging capabilities.

- You can adjust the data logging interval from 1 minute to 60 minutes, for 2 days to 120 days of voltage and temperature data.
- The control logs the time and reason for the last 14 switching events, as well as the voltage (and VAR, if applicable) levels before and after bank switching.
- The control records the time and date of the last 15 power cycles.
- You can view the daily minimum and maximum voltages and temperatures, and the number of switching cycles for the last month and since installation.

### Field-Proven Design

You have the security of S&C's field-proven microprocessor-based technology, manufactured in an ISO 9002-certified plant. Thousands of S&C Controls are in use by over 100 utilities.

## Features

### Low Cost

Full-featured, microprocessor-based capacitor control at a price comparable to electromechanical controls.

### Compact size

The IntelliCAP Control has a 6½" × 6½" × 4¾" enclosure and weighs approximately 4 lbs. It has a four-jaw or six-jaw electric meter base mounting with latch for a padlock.

### Faceplate LCD and switches

The LCD displays all real-time data and key set points. You can scroll through the data and change various set points with the faceplate switches.

### Automatic control strategies

Time, temperature, voltage, time-biased voltage, and time-biased temperature are all standard on every control. With the VAR sensing option, current and VAR are also available. Voltage override is standard with the time, temperature, current, and VAR strategies.

### Automatic bank voltage change calculation

The IntelliCAP Control automatically calculates the bank voltage change due to switching the capacitor bank. It uses this value to prevent unnecessary cycling.

### Automatic switching cycle limit

You can specify the number of automatic cycles allowed in one day.

### Automatic holidays, daylight savings; accurate timeclock

The IntelliCAP Control automatically accounts for holidays that occur on specific days and holidays that you define. It also accounts for leap year and daylight savings adjustments.

### Extensive data logging

The IntelliCAP records daily high and low voltages and temperatures, number of switching cycles, power outage information, and current and kVARs (VAR option). You can adjust the data logging interval for 2 to 120 days of data. IntelliLink software lets you view historical data as graphs, which are scaled to show as much detail as possible.

### User-friendly software interface

Software is simple and easy to use. Screens are very similar across the entire family of capacitor controls.

### Designed for domestic and international applications

You can set the nominal voltage to 110, 115, 120, 127, 220, 230, or 240 Vac. The IntelliCAP Control operates at ±20% of the nominal voltage, and logs voltages of ±15% of the nominal voltage. You can also choose the unit of temperature that the control uses and displays.

## Benefits

- Low initial cost for new installations.
- Very cost-effective for upgrading existing electromechanical controls.
- Small size makes installation easier.
- Unobtrusive on distribution poles.
- Plug-compatible for retrofit applications.
- Typical installations require no computer for installation, monitoring, or troubleshooting control operation.
- Simplifies inventorying because only one control is needed.
- Reduces distribution losses.
- Better control strategies get the most out of your investment in capacitor banks.
- Automatically adapts to bank voltage changes due to circuit reconfiguration.
- Extends switch life by reducing unnecessary bank cycling.
- Eliminates problems associated with inaccurate timeclocks and holiday programming.
- Eliminates periodic maintenance needed for holidays and daylight savings adjustments.
- Confirms proper operation of the control.
- Lets you evaluate the effect of capacitors on voltage regulation.
- Monitors power outage information.
- Gives your planning department distribution line data to verify distribution models.
- Reduces time required for training personnel.
- One kind of control serves utilities around the world.

## Specifications

### Electrical Operating Characteristics

- Selectable nominal operating voltage: 110 Vac to 240 Vac, 50 or 60 Hz
- Operating voltage range: nominal operating voltage  $\pm 20\%$ <sup>①</sup>

### Electrical Isolation/Protection

- Insulation withstand: 2.5 kV RMS
- Surge withstand: ANSI C37.90.1 (oscillatory 2.5 kV/fast transient 5 kV crest) and ANSI C62.41 Sec. 5.3.1 (6 kV/3 kA category B3/C1 surges)<sup>②</sup>
- ESD protection: IEC 1000-4-2/IEC 802.1 severity level 4 ( $\pm 8$  kV contact,  $\pm 15$  kV air)
- Radiated emissions: EN55022/FCC Part 15 Class B
- Radiated susceptibility: IEEE C37.90.2 25-1000 MHz, 35 V/m

### Fuse

- Type MDA-10 with 10,000 A interrupting
- Spare fuse provided in readily accessible storage clip

### Faceplate Switches

- 40,000 operations

### Environmental Operating Characteristics

- Temperature:  $-30^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ <sup>③</sup>
- Humidity: 5% to 95% (non-condensing)

### Sensor Inputs<sup>④⑤</sup>

- True RMS voltage and phase current sensing
- Voltage accuracy:  $\pm 0.3\%$  full scale over temperature range; resolution: 0.15 Vac (110 to 127 Vac nominal voltage) or 0.3 Vac (220 to 240 Vac nominal voltage)
- Temperature accuracy:  $\pm 2^{\circ}\text{F}$ , resolution:  $1^{\circ}\text{F}$ ; range:  $-40^{\circ}\text{F}$  to  $158^{\circ}\text{F}$
- Timeclock (battery-backed):  $\pm 10$  minutes/year
- Current range: 0 to 800 A

- Current accuracy:  $\pm 0.6\%$  full scale over temperature range; resolution: 1 A RMS
- Phase-angle range: 0 to  $360^{\circ}$
- Phase-angle accuracy:  $\pm 1^{\circ}$  at 10% of full-scale current; resolution:  $\frac{1}{8}^{\circ}$

### Output Contacts (Relays)

- Pulsed (1 open, 1 close)
- Life expectancy: 100,000 operations at rated load
- Contact rating: 20 A @ 250 Vac, 1 HP, 120/250 Vac, 1 Phase<sup>⑥</sup>

### Enclosure

- Noncorrosive, impact-resistant, UV-stable fiberglass polyester; latch with  $\frac{3}{8}$ " hole for padlock
- $6\frac{1}{2}" \times 6\frac{1}{2}" \times 4\frac{3}{8}"$ , approximately 4 lbs.
- Four-jaw or six-jaw electric meter base, pole mounting bracket, or wall mounting bracket
- NEMA 3R

### Memory/Calendar

- Non-volatile, battery-backed RAM—10-year life in unpowered state (no battery draw when powered at 120 Vac)
- Perpetual calendar—leap year, daylight savings time, holidays

### Operation Counter

- Provided as a software function, displayed on the LCD and IntelliLink software screens

### Local Communication Port

- RS232 DB9 connector

### Quality

Manufactured in an ISO 9002-certified facility

① Software limits voltage logging to  $\pm 15\%$  of the nominal operating voltage.

② Control tested at 15 kV/7.5 kA (which is in excess of the 10 kV/5 kA required by surge category C2 of ANSI C62.41).

③ Operation of LCD to  $-20^{\circ}\text{C}$ .

④ Specification applies to control only. System accuracy depends on sensor manufacturer.

⑤ Neutral current specifications apply to VAR units only.

⑥ Tested to confirm suitability for operating Joslyn VerSaVac™ switches.



**S&C ELECTRIC COMPANY**

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