

# SMART PROGRAMMABLE RELAYS

series  
**900**

c3controls line of compact programmable relays are integrated, and ready to use, with a wide range of programmable functions. With up to 250 lines of ladder logic programming, these devices are a cost-effective solution designed for use in small commercial and industrial automation.



Programmable Relays	497
Accessories	499
Specifications	500
Dimensions	502

## PROVEN



### Conformity to Standards:

UL 508  
IEC 61000-4, 61010-1

### Certifications:


UL File #: E334798 (Guide NRAQ, NRAQ7)  
CE Marked (per EU Low Voltage Directive 2006/95/EC, EMC 2004/108/EC, RoHS Directive 2011/65/EU and WEEE Directive 2002/96/EC)

Visit [www.c3controls.com](http://www.c3controls.com) to download product certifications.

# SMART PROGRAMMABLE RELAYS

All our products are fully certified, rated, and backed by our lifetime warranty to meet the needs of the machine builder, and our Series 900 Smart Programmable Relays are no exception. Check out the incredible features in the chart below!

## DESIGNED TO SIMPLIFY PROGRAMMING AND ELIMINATE EXTRA INVENTORY.

✓ <b>Proven</b>	Our Smart Programmable Relays are rated IP20 and IP40 for enclosure, with UL and CE markings meeting global standards requirements. 
✓ <b>Fast Programming</b>	No more rewiring. Now you can accommodate more complex programs and increase your application options with features like daylight savings time and analog comparators, not to mention up to 250 lines of ladder logic programming.
✓ <b>Compact Size</b>	Only 72mm wide x 90mm high x 65mm deep (2-53/64" x 3-35/64" x 2-9/16"), our programmable relay reduces your panel area.
✓ <b>Expandable</b>	8 digital inputs, 4 relay outputs, and two analog comparators (0 ~ 10V) in 12 ~ 24V DC model, which can be used as digital inputs. Add up to three (3) expansion modules, expanding digital inputs to 32 and relay outputs to 16, as your application grows.
✓ <b>Secure Installation</b>	The Series 900 relay features quick and easy 35mm DIN rail mounting or a more secure panel mounting for high shock and vibration applications.
✓ <b>Data Entry</b>	We've built our programmable relay with soft keys and a local display so you can create and edit programs right on the device.
✓ <b>Clear Visibility</b>	A backlit LCD display allows you to see the I/O status, runtime counters, timers, and application or diagnostic messages, as well as the code while you're programming.
✓ <b>Customizable Logic</b>	Create what you want in your application with customized logic that includes counters, timers, virtual relays and other features.
✓ <b>Modbus Compatible</b>	Use the Series 900 with our open-source Modbus communication module.
✓ <b>Data Transfer in a Snap</b>	Transfer data or back up programs with the memory card or connect directly to a PC or laptop with the USB cable or a serial cable.
✓ <b>Lifetime Warranty*</b>	Every product is backed by our lifetime warranty—unmatched in the industry—bringing you quality components that perform in the most demanding applications.
✓ <b>Guaranteed Same-Day Shipping*</b>	Product availability reduces inventory, and improves cash-flow—saving you money. With c3controls any order for standard catalog items received by 6:00pm ET is guaranteed to ship same-day.
✓ <b>Advantage Pricing</b>	Our approach to product development, manufacturing, and focus on servicing the OEM and Electrical Equipment Builder reduces cost. The result—the best value in the industry.

\*See c3controls Terms & Conditions

“Before, we had used a bunch of Allen Bradley ice cube relays, but c3controls’ Series 900 is nicer, easier, programs better, and gets rid of multiple relays. We just fine-tune the program to make any changes and no longer have to figure out what wire to move or fix.”

Dustin Hock, Electrical Controls Installer • **FormPak, Inc.**

Base Module



Expansion Module



Communication Module



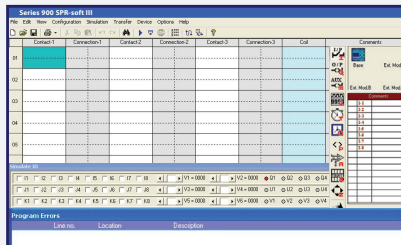
**UNIQUE PRODUCT LINE FEATURES**

**MULTIPLE FUNCTIONS**



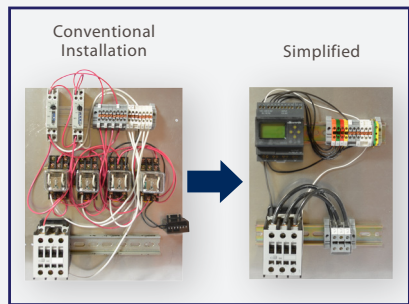
Our wide range of programmable functions include 16 timers, 16 retentive selectable 4 digit up/down counters, 16 time switches, 16 compare counters, 16 soft text messages, 64 auxiliary relays and 12 analog comparators.

**TEST SIMULATOR**



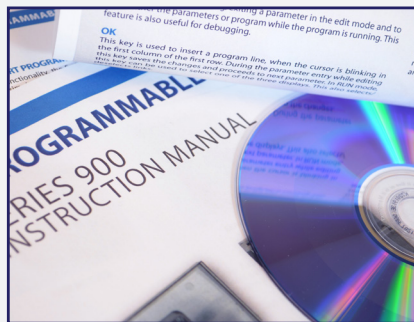
Software includes a relay simulator which allows users to test their circuit and logic, reducing troubleshooting and installation time.

**ADVANTAGES WHEN REPLACING**



**Multiple General Purpose Relays and/or Electronic Timing Relays:**  
Because you can write customized logic that includes counters, timers, and other features, you can lose the extra relays; creating more space and eliminating re-wiring.

**COMPLIMENTARY SOFTWARE**



Series 900 SPR-soft III PC software and manual for easy program creation, a simulation tool, and a how-to on transferring programs to and from the device are available for free download at [www.c3controls.com](http://www.c3controls.com).

- System Requirements:**
- Pentium II PC (200 MHz or higher)
  - 256MB RAM
  - 80MB free hard drive space
  - Screen Resolution 800x600 or better
- Operating Systems:**
- Windows 2000, XP, Vista, 7, 8, and 10

**A Smart Programmable Relay:**  
Our easy-to-use ladder logic provides you with quick and simple programming, and our Modbus communication module allows the Series 900 to communicate with other devices or systems.

**A PLC:**  
Our Series 900 programmable relay is more compact and less expensive than equally powered competitive relays.

**FIND IT FAST**

Smart Programmable Relays



- Certifications
- Specifications
- Dimension Drawings
- Installation Instructions
- Software and Manual
- Easy to Buy

[www.c3controls.com](http://www.c3controls.com)

**IT'S EASY TO BUILD YOUR OWN PROGRAMMABLE RELAY**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Smart Programmable Relays**

**8I 40**  
I II III IV

Example: To build one of our most popular Programmable Relays, the part number would be **I + 8I + 40 + IV** or **900-SBA8I4OZC**



**I. MODULE TYPE**

CODE	DESCRIPTION	LIST
900-SBA	Smart Programmable Relay Base Module	\$161.00
900-SEA	Smart Programmable Relay Expansion Module*	\$102.00

\*NOTE: If you are purchasing an expansion module, its voltage must match the base module in your application.

**II. NUMBER OF INPUTS**

CODE	DESCRIPTION
8I	8 Power Inputs*

\*NOTE: 8 Digital Inputs for 110 ~ 240V AC Model; 6 Digital Inputs & 2 Analog Inputs (analog inputs can be used as digital) for 12 ~ 24V DC Model.

**III. NUMBER OF OUTPUTS**

CODE	DESCRIPTION
40	4 Relay Outputs

**IV. VOLTAGE \***

CODE	DESCRIPTION
ZC	12 ~ 24V DC
M	110 ~ 240V AC (50/60 Hz)

\*NOTE: If you are purchasing an expansion module, its voltage must match the base module in your application.



**SOME OF OUR POPULAR CONFIGURATIONS:**

**SMART PROGRAMMABLE RELAYS**

CATALOG NUMBER	DESCRIPTION	LIST
900-SBA8I4OZC	Smart Programmable Relay, Base Module, 8 Inputs/4 Outputs, 12-24V DC Operating Voltage	\$161.00
900-SBA8I4OM	Smart Programmable Relay, Base Module, 8 Inputs/4 Outputs, 110-240V AC Operating Voltage	\$161.00
900-SEA8I4OZC	Smart Programmable Relay, Expansion Module, 8 Inputs/4 Outputs, 12-24V DC Operating Voltage	\$102.00
900-SEA8I4OM	Smart Programmable Relay, Expansion Module, 8 Inputs/4 Outputs, 110-240V AC Operating Voltage	\$102.00

**AVAILABLE MODULES FOR SMART PROGRAMMABLE RELAYS**



Base Module



Expansion Module



## SERIES 900 SMART PROGRAMMABLE RELAYS

The c3controls Series 900 Smart Programmable Relay family was designed for use in small commercial and industrial automation applications, including packaging machines, printing machines, domestic and commercial building controls, auto parking controls, lighting applications, and more. Rated IP20 (and IP40 for the enclosure), with UL and CE markings, making them suitable for use anywhere in the world.

Product features include:

- Compact size – only 72mm wide x 90mm high x 65mm deep (2-53/64" x 3-35/64" x 2-9/16"), reducing panel area requirements for lower installed costs.
- Integrated, ready to use, wide range of programmable functions including 16 timers, 16 retentive selectable 5-digit up/down counters, 16 time switches, 16 compare counters, 16 soft text messages, 64 auxiliary relays 12 analog comparators, and now with hour meters.
- Ability to add up to three (3) expansion modules, expanding I/O to 32 digital inputs, 16 relay outputs.
- 35mm DIN rail mounting for fast and easy installation and removal or panel mounting for a more secure installation in high shock and vibration applications.
- Ability to set when Daylight Savings Time begins and ends.
- Up to 250 lines of ladder logic programming.
- Series 900 SPR-soft III PC software and manual available for download ([www.c3controls.com](http://www.c3controls.com)), for easy program creation, simulation and data/program transfer to and from the device.

### System Requirements:

- Pentium II PC (200 MHz or higher)
- 256MB RAM
- 80MB free hard drive space
- Screen Resolution 800x600 or better

### Operating System:

- Windows 2000, XP, Vista, 7, 8, and 10



SMART PROGRAMMABLE RELAYS

## UNIQUE PRODUCT FEATURES



1. 8 digital inputs, 4 relay outputs for each base or expansion module.
2. Two (2) analog inputs (0 ~ 10V) in 12 ~ 24V DC model, which can be used as digital inputs.
3. Backlit LCD screen for display and modification of pre-selected parameters of function blocks, runtime messages, viewing I/O status and easy programming on the device.
4. Soft keys for convenient creation and editing of programs, runtime operator actions, and trouble shooting at the device.
5. Connection point for module-to-module connections: base module to expansion module, or expansion module to expansion module.
6. Available memory card for data transfer and program backups.
7. Available USB cable allows for easy connection to a PC or laptop for quick program and data transfer.
8. Connection port on base module. Allows connection of memory card, PC cable, or communication module.
9. Communication module inputs allow programmable relay to be connected to a Modbus network.
10. Connect external power.

**PC SERIAL CABLE**



The Series 900 Smart Programmable Relay Serial Cable allows for easy connection to a PC or Laptop for quick program and data transfer. The serial cable is a 9 pin female connector.

CODE	DESCRIPTION	LIST
900-SCC1A	PC Serial Cable	\$ 60.00

**PC USB CABLE**



The Series 900 Smart Programmable Relay USB Cable allows for easy connection to a PC or Laptop for quick program and data transfer. The USB cable is USB 2.0 compatible.

CODE	DESCRIPTION	LIST
900-SCC2A	USB Cable	\$ 34.00



**MEMORY CARD**



The Series 900 Memory Card allows for quick copy and distribution of program files from one Series 900 Smart Programmable Relay to another, removing the requirement of connecting each programmable relay to a PC or laptop.

CODE	DESCRIPTION	LIST
900-SMEM1A	Memory Card	\$ 20.00

**COMMUNICATION MODULES**



The Series 900 Smart Programmable Relay Communication Modules allow the Series 900 Smart Programmable Relay to be connected to a Modbus network through an RS 485 link. The communication module is available in two (2) operating voltages, 12 ~ 24V DC and 85 ~ 265V AC. The connection between the communication module and smart programmable relay base module is made through the communication module's cable (included).

CODE	DESCRIPTION	LIST
900-SCM1ZC	RS 485, 12 ~ 24V DC Communication Module	\$277.00
900-SCM1M	RS 485, 110 ~ 240V AC Communication Module	\$277.00

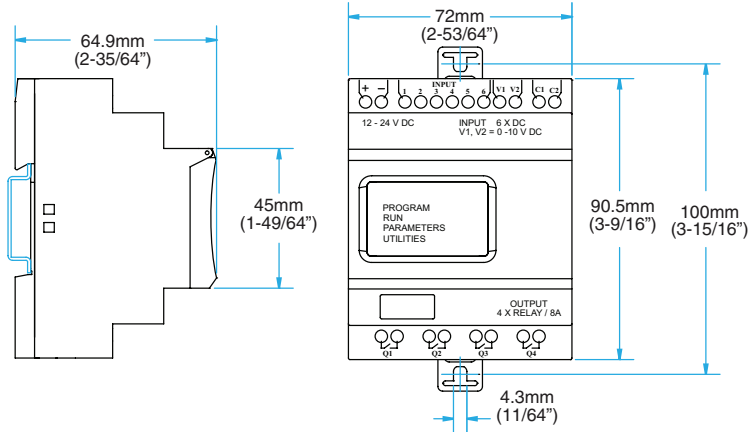
SPECIFICATIONS:

SMART PROGRAMMABLE RELAYS					
		900-SBA8140ZC	900-SBA8140M	900-SEA8140ZC	900-SEA8140M
<b>ELECTRICAL GENERAL</b>					
		<b>UNITS</b>			
Module Type		Base	Base	Expansion	Expansion
Operating Voltages		12 ~ 24V DC	110 ~ 240V AC	12 ~ 24V DC	110 ~ 240V AC
Frequency	Hz	N/A	50/60	N/A	50/60
Power Consumption	VA	5			
Current Draw	mA	360	36	360	36
Protection					
Reverse Polarity (for the supply)		Yes	NA	Yes	NA
Number of I/O		8 Inputs / 4 Outputs			
Input Type					
Number of Digital Inputs		8			
Number of Analog Inputs		2	0	2	0
Output Type		Relay			
I/O Expansion Modules		Yes			
Maximum Number		3			
Modbus Communication		Yes			
Type		RTU			
Master / Slave		Slave			
<b>AVAILABLE FUNCTIONS</b>					
Timers		16			
Timing Functions		13			
Counters		16 Up / Down			
Selective Retentive		Yes			
Count Limit		5 Digits (99999)			
Counter Scaling		Yes			
Time Switches (RTC)		16 Weekly			
Analog Comparators		12	0		
Analog Scaling		Yes			
Hour Meter		Yes			
Compare Counters		16			
Count Limit		5 Digits			
Soft Text Messages		16 Priority Driven			
Auxiliary / Holding Relays		64			
<b>PROCESSING CHARACTERISTICS</b>					
Cycle Time	msec.	100 with all special function blocks and retentive timers			
Response Time	msec.	8.5 + Cycle Time			
Backup Duration	Hrs.	100			
Clock Accuracy		1.7 sec per day			
Timer Block Accuracy					
Seconds	msec.	±5			
Minute-Seconds	msec.	±330			
Hour-Minutes	s	±20			

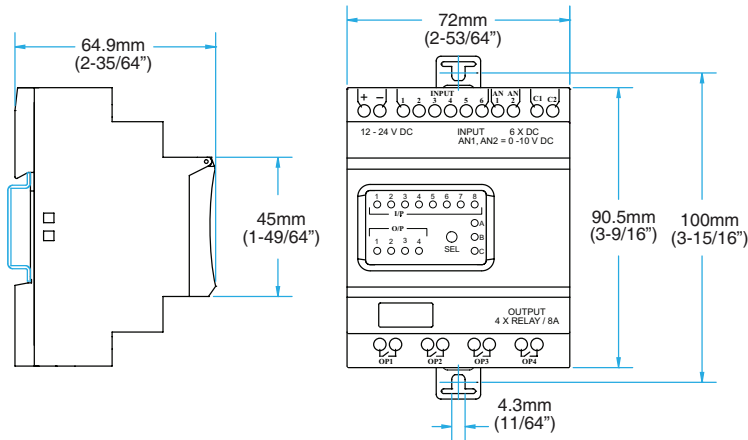
<b>SMART PROGRAMMABLE RELAYS</b>					
		<b>900-SBA8140ZC</b>	<b>900-SBA8140M</b>	<b>900-SEA8140ZC</b>	<b>900-SEA8140M</b>
<b>INPUT CHARACTERISTICS</b>					
		<b>UNITS</b>			
Digital Inputs					
Input Range	V	0 ~ 4V DC – Off 8 ~ 26.5V DC – On	0 ~ 50V AC – Off 85 ~ 265V AC – On	0 ~ 4V DC – Off 8 ~ 26.5V DC – On	0 ~ 50V AC – Off 85 ~ 265V AC – On
Input Impedance	kΩ	44	660	44	660
Maximum Voltage	V	26.5V DC	265V AC	26.5V DC	265V AC
Maximum Input Frequency	Hz	10	5	10	5
Analog Inputs					
Number of Analog Inputs		2	NA	2	NA
Input Range	V	0 ~ 10V DC (10-bit resolution)	NA	0 ~ 10V DC (10-bit resolution)	NA
Input Impedance	kΩ	44	NA	44	NA
Maximum Input Voltage	V	26.5V DC	NA	26.5V DC	NA
Maximum Cable Length Between Modules	cm	15			
<b>OUTPUT CHARACTERISTICS</b>					
Operating Range	V	10 ~ 26.5V DC or 80 ~ 265V AC			
Contact Type		Form A			
Maximum Operating Current					
Resistive Load	A	8A @ 250V AC, 5A @ 30V DC			
Inductive Load	A	5 (at $\cos\phi = 0.4$ )			
Maximum Switching Rate					
Mechanical	Ops./hr.	36,000			
Electrical	Ops./hr.	360			
Mechanical Life	Ops. (mil)	10			
Electrical Life	Ops.	100,000			
<b>CONSTRUCTION</b>					
Ingress Protection					
Enclosure	IP	40			
Terminals	IP	20			
Terminal Capacity					
Solid Strand	mm <sup>2</sup>	1.0 ~ 2.5			
Fine Strand	mm <sup>2</sup>	1.0 ~ 2.5			
	AWG	18 ~ 14			
Tightening Torque					
	Nm	0.5 ~ 0.8			
	Lb-in.	5 ~ 7			
Weight					
	g	232	248	232	248
	oz.	8.2	8.7	8.2	8.7
Ambient Operating Temperature	°C / °F	0 to +50 / +32 to +122			
Ambient Storage Temperature	°C / °F	-20 to +70 / -4 to +158			
Shock		30g at 11msec (Non-repetitive)			
Vibration	g	5			
Humidity		35% to 85% Relative Humidity (Non-condensing)			
Altitude	m / ft.	2,000 / 6,528			
<b>ROHS COMPLIANCE</b>					
For RoHS compliance documentation by product, refer to <a href="http://www.c3controls.com">www.c3controls.com</a>					



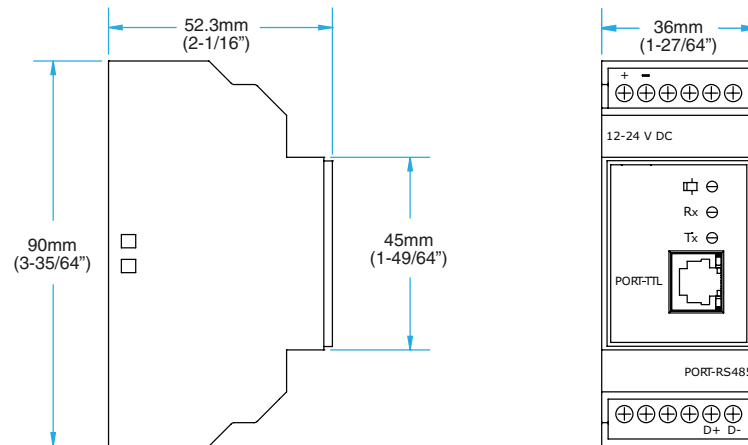
**SMART PROGRAMMABLE RELAY BASE MODULE**



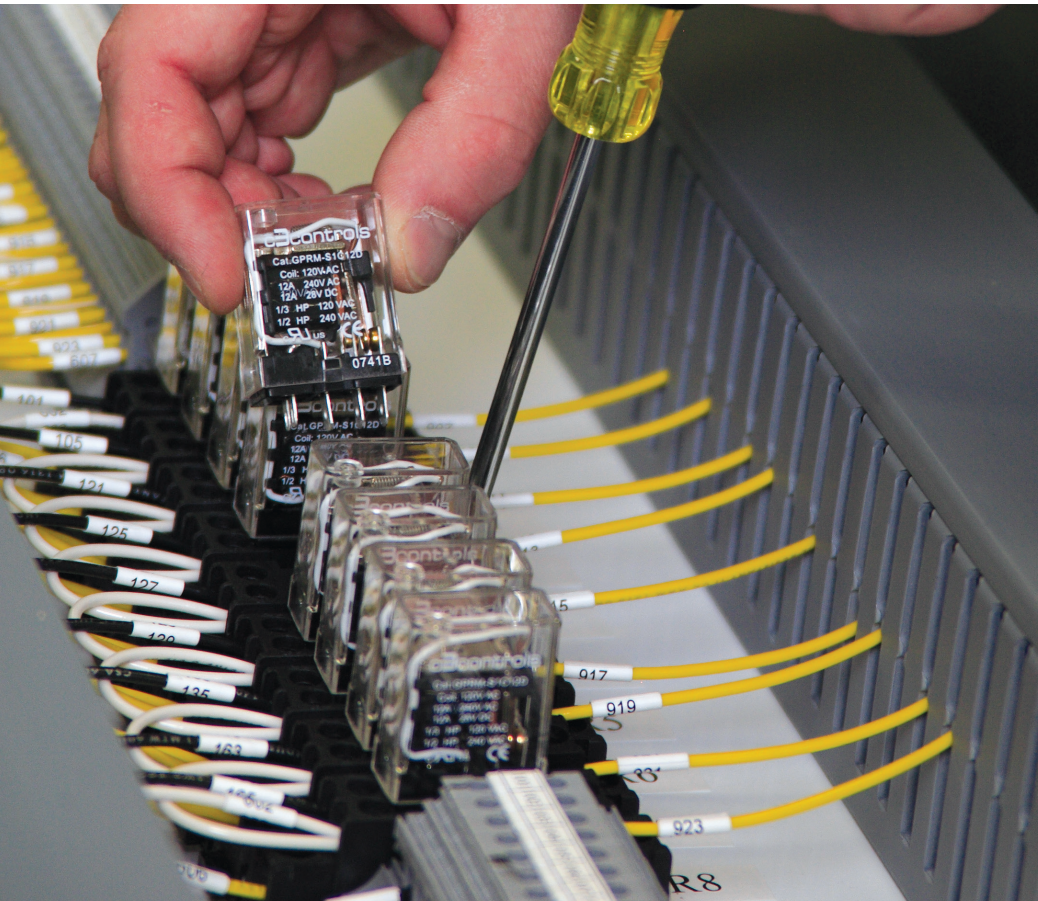
**SMART PROGRAMMABLE RELAY EXPANSION MODULE**



**SMART PROGRAMMABLE RELAY COMMUNICATION MODULE**



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DOWNLOAD CAD DRAWINGS



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