

SG2 PROGRAMMABLE LOGIC RELAY

3RD EDITION

SAME LOW PRICES

PLC?

- Input Supply**
- 12VDC
 - 24VDC
 - 85-240VAC

Full-featured Model
from **\$89**

Note: Some options require the use of specific base units.

- Built-in HMI (full-featured units)**
- 12x4 *16x4* LCD backlit display
 - 8 function keys, 4 user defined keys
 - *15 31* customizable message screens



- Inputs**
- Digital
 - Analog
 - *NEW* Pt100 (optional temperature module)

*EXPANDABLE TO 56 I/O**

- Outputs**
- Relay (8A resistive load)
 - Transistor
 - *NEW* Analog (optional 0-10V or 0-20mA module)

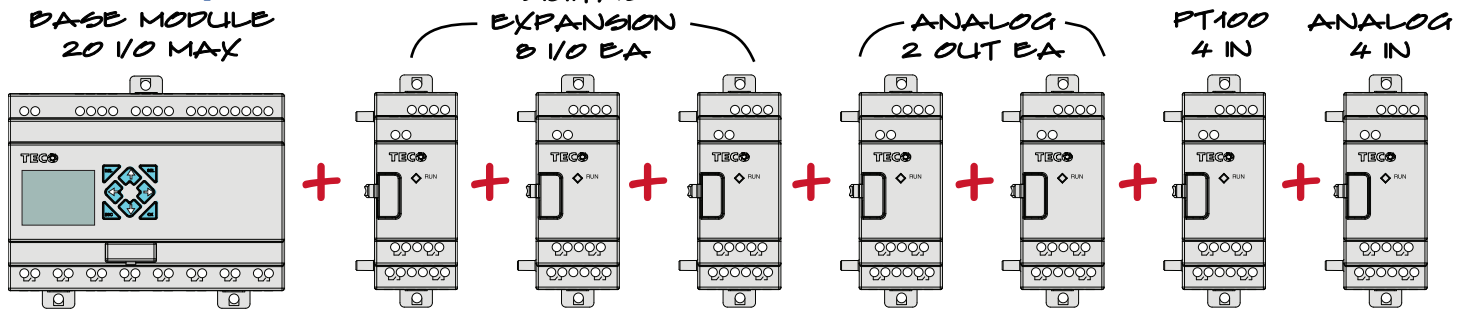


- Other Powerful Features**
- Retentive FLASH memory to safely store programs, no battery required
 - Real-time clock/calendar *WITH DAYLIGHT SAVINGS MODE*
 - Dual purpose analog 0-10V / DC digital inputs on DC power models
 - Removable memory cartridge for program backup, transferring programs to multiple PLRs, or ship updates to onsite customers
 - Optional "V" Series units include RS-485 Modbus port
 - Snap-on expansion modules allow expansion up to 56 I/O depending upon base module and expansion configuration
 - IP20 enclosed case (all but bareboard)
 - Removable Spare Memory Cartridge Option
 - 2 channel high-speed DC inputs (1 kHz) for single channel encoder or pulse catch
 - PWM DC output, 1CH / 16-bit
 - DIN-rail or panel mount

- BIGGER Memory Capacity**
- *200 500* Ladder rungs
 - *90 260* Function block instructions
 - *15 126* Internal auxiliary instructions
 - *15 31* Timer instructions
 - *15 31* HMI instructions
 - *15 31* Counter instructions
 - *15 31* Real-time Clock instructions
 - *15 31* Analog compare instructions
 - *NEW* 240 Data registers
 - *NEW* 15 PID instructions
 - *NEW* 15 Multiplexer instructions (2 bit)
 - *NEW* 62 Math instructions (+, -, x, ÷)
 - *NEW* 15 Analog ramp instructions
 - *NEW* 2 PWM instructions
 - *NEW* Shift instruction

NOW WITH PID!

Maximum Expansion



Note: All SG2 "V-type", "H-type", and "K-type" units are expandable. Maximum expansion allows for 3 digital modules, 2 analog output modules, 2 analog input modules (1 each of SG2-4PT and SG2-4AI). When used, SG2-4AI must be installed last.

To order call **1.800.972.0436** or visit **factorymation.com**

No Games, No Gimmicks...
...Just Great Products at Great Prices!!!

Powerful Options for the SG2

Full-Featured



from **\$89**

Expansion Modules



from **\$56**

OP10 HMI



from **\$119**

Bareboard Type



from **\$67**

Power Supply



\$48

IP65 Enclosures



from **\$22**

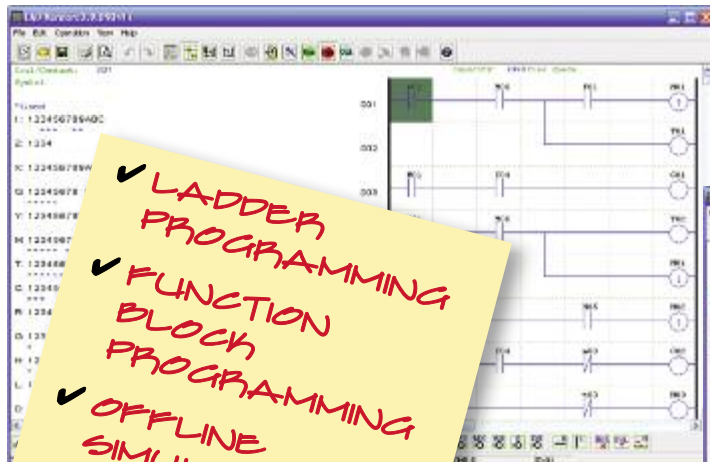
Part Number	Input Power	Inputs	Outputs	Display	Communications	Max I/O*	Price
SG2-12HR-12D	12 VDC	6 DC, 2 Analog	4 Relay	✓	N/A	12*	\$104
SG2-20HR-12D		8 DC, 4 Analog	8 Relay	✓	N/A	20*	\$145
SG2-12HR-D	24 VDC	6 DC, 2 Analog	4 Relay	✓	N/A	48	\$89
SG2-12HT-D		6 DC, 2 Analog	4 Trans.	✓	N/A	48	\$94
SG2-20HR-D		8 DC, 4 Analog	8 Relay	✓	N/A	56	\$128
SG2-20HT-D		8 DC, 4 Analog	8 Trans.	✓	N/A	56	\$144
SG2-20VR-D		8 DC, 4 Analog	8 Relay	✓	Built-in MODBUS	56	\$152
SG2-20VT-D		8 DC, 4 Analog	8 Trans.	✓	Built-in MODBUS	56	\$162
SG2-10HR-A	85-240 VAC	6 AC	4 Relay	✓	N/A	34*	\$98
SG2-20HR-A		12 AC	8 Relay	✓	N/A	44*	\$144
OEM "Blind" Models, No Keypad, No Display, Expandable							
SG2-12KR-D	24VDC	6 DC, 2 Analog	4 Relay	N/A	N/A	48	\$75
SG2-20KR-D		8 DC, 4 Analog	8 Relay	N/A	N/A	56	\$100
SG2-10KR-A	85-240VAC	6 AC	4 Relay	N/A	N/A	34*	\$84
SG2-20KR-A		12 AC	8 Relay	N/A	N/A	44*	\$113
Expansion Modules							
SG2-8ER-D	24VDC	4 DC	4 Relay	N/A	N/A	N/A	\$56
SG2-8ET-D		4 DC	4 Trans.	N/A	N/A	N/A	\$61
SG2-8ER-A	85-240VAC	4 AC	4 Relay	N/A	N/A	N/A	\$68
SG2-4AI	24 VDC	4 Analog In	N/A	N/A	N/A	N/A	\$109
SG2-2AO	24 VDC	N/A	2 Analog Out	N/A	N/A	N/A	\$110
SG2-4PT	24 VDC	4 Pt100 In	N/A	N/A	N/A	N/A	\$129
OEM "Bareboard" Models, No Keypad, No Display, Not Expandable							
SG2-12CR-D	24VDC	6 DC, 2 Analog	4 Relay	N/A	N/A	12	\$67
SG2-20CR-D		8 DC, 4 Analog	8 Relay	N/A	N/A	20	\$84
SG2-10CR-A	85-240VAC	6 AC	4 Relay	N/A	N/A	10	\$73
SG2-20CR-A		12 AC	8 Relay	N/A	N/A	20	\$91
Accessories							
SG2-ULINK	SG2 Programming Cable (USB to SG2)						\$33
SG2-PM05	SG2 Memory cartridge						\$11
SG2-SW	SG2 & OP10 Programming software. Available on CD or FREE via download.						\$4
SG2-10PS-24	Power Supply, Output: 24VDC, 30 Watts (max); Input Voltage: 100-240VAC						\$48
ICB-0465	IP65 Enclosure, built-in DIN rail, hinged translucent cover, snap-in mounting for SG2				fits 10 or 12 I/O units		\$22
ICB-0865	(see Enclosure section)				fits 20 I/O units		\$28
ICB-1265	(see Enclosure section)				fits 20 I/O units + 2 exp units		\$51

* Higher I/O counts are possible by adding 24VDC Expansion Modules

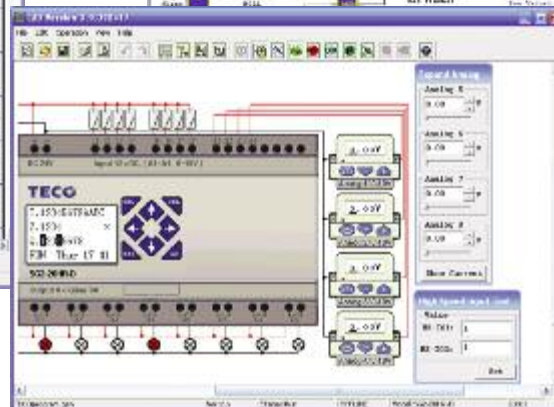
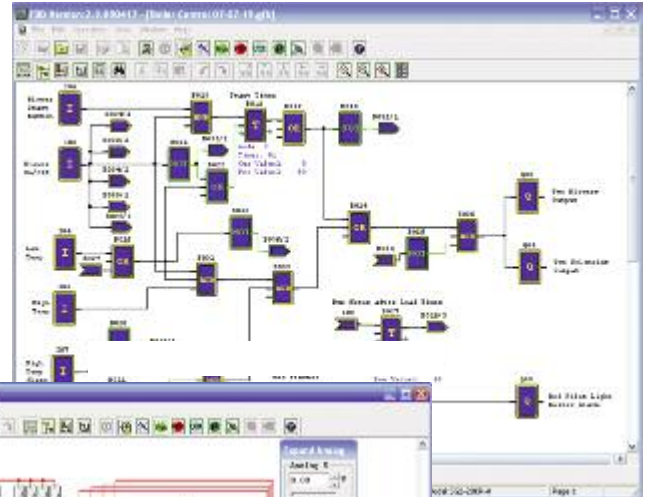
FREE Programming Software

Program using ladder logic or function block interface. Dual mode off-line simulations allow testing of entire program within the programming environment or graphically with our virtual PLR. Download at www.factorymation.com

Relay Ladder Logic Programming



Function Block Programming



Virtual PLR Simulator

- ✓ LADDER PROGRAMMING
- ✓ FUNCTION BLOCK PROGRAMMING
- ✓ OFFLINE SIMULATION
- ✓ ONLINE MONITORING

FREE Ground Shipping!
for online orders over \$500



General Specifications

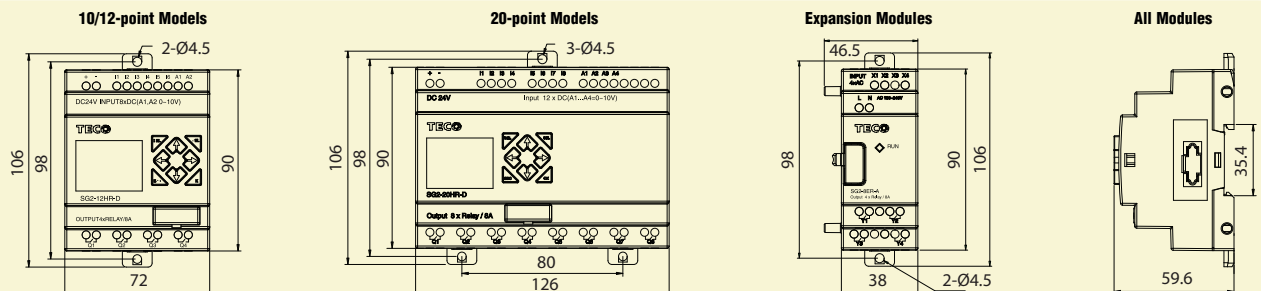
Power Supply	
Input Power Voltage Range	12VDC Models: 10.4-14.4V 24VDC Models: 20.4-28.8V 110/220VAC: 85-265VAC
Power Consumption	12VDC: 12-point: 150mA 20-point: 150mA 24VDC: 12-point: 90mA 20-point: 150mA 100-240VAC: 90mA
Wire Size (all terminals)	26 to 14 AWG
Programming	
Programming languages	Ladder/Function Block
Program Memory	300 Lines or 260 Function Blocks
Programming storage media	Flash
Execution Speed	10ms/cycle
Built-in HMI	
Customizable screens	31 (H coils)
LCD Display	4 lines x 16 characters
Function Keys	8, 4 user-defined (Z inputs)
Auxiliary Coils	
Maximum Number	126 (63 M-coils, 63 N-coils)
Timers	
Maximum Number	31 T-coils
Timing ranges	0.01s-9999min
Counters	
Maximum Number	31 C-coils
Highest count	999999
RTC (Real Time Clock)	
Number available	31 R-coils
Resolution	1 min
Time span available	week, year, month, day, hour, min
Daylight Savings feature	Yes
Power off RTC retention	240 hours
Compare Instructions (Analog, Timer, or Counter Values)	
Number available	31 G-coils
Compare functions	EQ, LT, GT, LE, GE, NE
NEW! PID Control (Proportional-Integral-Derivative)	
Maximum Number	15 Loops (PI Coils)
NEW! Math Instructions	
Number available	62 (31 AS Coils, 31 MD Coils) up to 124 additional (plus unused T, C, R, G coils)
Math Operations	+ - x /
Data Multiplexer Instructions	
Number available	15 (MX Coils)
Resolution	2-bit, 4 data registers
Data Registers	
Number available	240 (DR Coils, 16-bit)
Shift Instruction	
Number available	1 8-bit (S Coil)
Analog Ramp Instructions	
Number available	31 (AR Coils)
Environmental	
Enclosure Type	IP20
Maximum Vibration	1G according to IEC60068-2-6
Operating Temperature Range	-4° to 131°F (-20° to 55°C)
Storage Temperature Range	-40° to 158°F (-40° to 70°C)
Maximum Humidity	90% (Relative, non-condensing)
Vibration	0.075mm amplitude; 1.0g acceleration
Weight	10-point: 230g; 8-point: 190g; 20-point: 345g
Agency Approvals	cUL , CE, UL

Discrete Inputs	
Current consumption	4mA @ 12VDC 3.2mA @ 24VDC 1.3mA @ 100-240VAC
Input Signal "OFF" Threshold	12VDC: < 2.5VDC; 24VDC: < 5VDC; 110/220VAC: < 40VAC
Input Signal "ON" Threshold	12VDC: > 7.5VDC; 24VDC: > 15VDC; 110/220VAC: > 79VAC
Input On delay	DC: 5ms; 240VAC: 50ms; 120VAC: 90ms
Input Off Delay	DC: 3ms; 240VAC: 50ms; 120VAC: 90ms
Transistor Type	3-wire PNP Sensor compatible
High Speed Input frequency	1kHz
Standard Input frequency	< 40 Hz
Required protection	Inverse voltage protection required
Analog Inputs	
Resolution	12 bit
Acceptable Input Range	Base module: Analog input: 0-10VDC voltage, 24VDC when used as discrete input Expansion module: Analog input: 0-10VDC voltage or 0-20mA current
Input Signal "OFF" Threshold	< 5VDC (as 24VDC discrete input)
Input Signal "ON" Threshold	> 9.8VDC (as 24VDC discrete input)
Isolation	None
Short circuit protection	Yes
Total number available	Base module: A01-A04 Expansion module: A05-A08
Temperature Input (SG2-4PT Expansion Module)	
Sensor Type	3-wire PT100
Temperature input range	-100°C - 600°C
Resolution	0.1°C
Accuracy	±1%
Relay Outputs	
Contact material	Ag Alloy
Current rating	8A
HP rating	1/3HP @ 120V 1/2HP @ 250V
Maximum Load	Resistive: 8A/point; Inductive: 4A/point
Maximum operating time	15ms (normal condition)
Life expectancy (rated load)	100k operations
Minimum load	16.7mA
Transistor Outputs	
Pulse Outputs	1 PWM and 1 PWM or Pulse Output
PWM max. output frequency	0.5kHz (1ms on, 1ms off)
Standard max. output frequency	100Hz
Voltage specification	10-28.8VDC
Current capacity	1A
Maximum Load	Resistive: 0.5A/point; Inductive: 0.3A/point
Minimum Load	0.2mA
Analog Outputs (SG2-2AO Expansion Module)	
Analog output range	0V-10V (load > 500 ohm), 0-20mA (load < 500 ohm)
Resolution	10-bit
Full scale accuracy	2.5%

Communication Options

Built-in RS485 Communication (SG2-20Vx-x units only)	
Modbus-RTU	Master/Slave mode, 4800-115.2kb, supports Modbus function codes 1, 3, 5, 6, 16
DataLink	Link up to 8 Remote-I/O slave units (SG2-20Vx-x only) to 1-master unit at 8.4kb
Remote-I/O	Link up to 3 SG2-20Vx-x units (1-master, 2-slaves) at 38.4kb

Dimensions



OP10 HMI

The TECO OP10 monochrome HMI offers a simple but powerful user interface for the SG2 (Ver 3) programmable Logic Relay. Monitor data registers in real time, change parameters, perform switching functions, list alarms, and transfer data between networked SG2's*.

- 192 x 64 pixel display
- 24-key keypad
- Two serial ports:
 - COM1 supports programming and point-to-point communications
 - RS485 supports multi-drop networks
- Supports Modbus RTU
- Password protection
- Import bitmaps
- Offline program simulation
- Bar graphs, trend charts, alarm logging

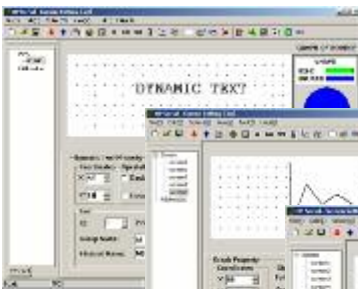


FREE Programming Software

Program the OP10 using simple fill-in-the-blank object windows. Establish network links to remote devices. Create dynamic text, trend charts, bargraphs, alarm logs, and more. View and verify your program in simulation mode.

Download software free at www.factorymation.com.

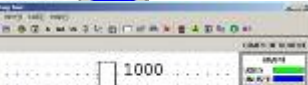
Dynamic Text



Trending



Bar Graphs



Simulation

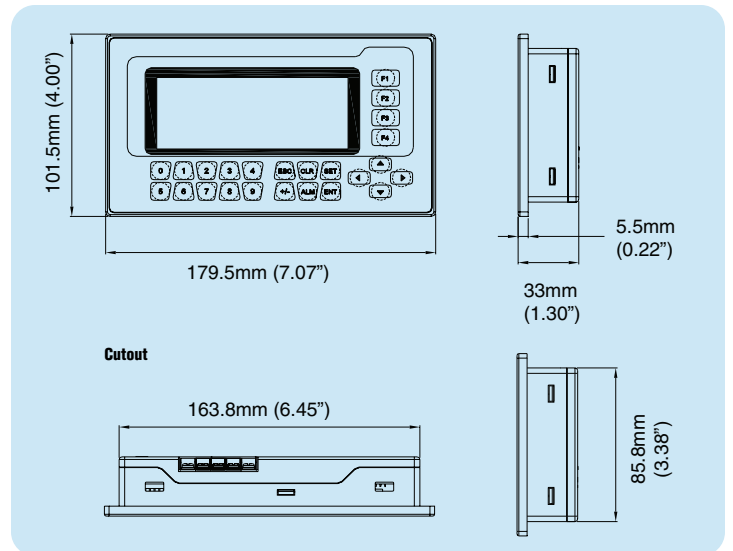


Simple Setup

Part Number	Description	Price
OP10	4.3" Monochrome Graphic Panel, 192 x 64 pixels, 4 Function Keys, Numeric Keypad, 2 serial ports, 24VDC input power	\$119
OP10-PL01	Cable (9-pin Serial, PC to 9-pin Serial, OP10)	\$14
SG2-PL01	SG2 to OP10 (COM 1) Communication Cable	\$23
FM-USB232A	IOGEAR USB to Serial (DB-9 male) Converter Cable, 14 in. cable length	\$28
SG2-SW	SG2 & OP10 Programming S/W. Available on CD or FREE via download.	\$4
SG2-10PS-24	Power Supply, Output: 24VDC, 30 Watts (max); Input Voltage: 100-240VAC	\$48

General Specifications	
Power	DC24V, -15% ~ +10%
Current Consumption	80mA Max
Approvals	UL, CE
Communication Interface	COM1: (9-pin, D-SUB, female) RS-232/422; RS485: terminal screws
Environmental Rating	IP65 (front of panel)
Maximum Devices	8 without repeater; 255 with repeater
Dimensions	179.5 x 101.5 x 33mm (7.07 x 4.00 x 1.30")
Weight	460g (~1 lb)
Environmental	
Operating Temperature	0°C ~ 55°C (32°F ~ 131°F)
Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)
Relative Humidity	10% ~ 95%, non-condensing
Vibration	1.75mm displacement, 5 - 9Hz
Impact	15G, 11ms, vertical from X, Y, Z directions

Dimensions



Communication with one SG2 via programming port



Multi-drop Modbus communications over RS485 network



*SG2 must be V-series to communicate on RS485.

FREE Ground Shipping!
for online orders over \$500



FactoryMation®