

# Scadaflex II

## Packaged SCADA Controller— SC2 with Relay Discrete Outputs

Scadaflex II controllers are full-featured SCADA systems in a NEMA 4X enclosure with:

- Ethernet, serial, and optional cellular + radio communications
- HMIs: Animated graphics, Text Message/E-mail, and local LCD
- Alarming by Text Message and E-mail
- Historical Trending and Event Data recording
- Report Generation
- Programmable control

Scadaflex II controllers are 100% web based for both configuration and user interface. No applications are required other than any standard web browser. They are easily supported by remote access over the Internet or a cellular link.

Scadaflex II controllers support industry standard **wired** communications using Modbus, DF1, SNP, and Ethernet IP protocols along with Ethernet-Serial bridging for Modbus or any other protocol.

Each Scadaflex II controller has both analog and digital, inputs and outputs, sufficient for pumping stations, irrigation controls, and other similar process monitoring and control applications. They can also serve as communications concentrators and protocol converters that enhance the operation of existing PLCs and process equipment.



SCADAFLEX II SC-2 SCADA Controller  
29-00x2 12DI, 2PI, 4DO, 4AI, 2AO

### Cellular options

29-0111 4G LTE Verizon

29-0121 4G LTE AT&T, International

### Radio options

29-0200 1/4W 900MHz Meshing

29-0210 1/4W 900MHz Spread Spectrum

### Battery Backup / charger option

29-0300 Up to 14 hour backup

### Built-in LCD HMI option

29-0500 Internal LCD HMI & Keypad

### AC Power option

29-9001 110/220 Vac Power

### Scadaflex II SC-2 Packaged SCADA Controller

- 14 DISCRETE AND HIGH-SPEED PULSE INPUTS
- 4 DISCRETE OUTPUTS (RELAY)
- 4 ANALOG INPUTS (mA, V, Resistance, Thermistors)
- 2 ANALOG OUTPUTS (20MA)
- 1 ETHERNET PORT
- 1 RS-232 / RS-485 SERIAL PORT
- 1 OPTIONAL 4G LTE CELLULAR MODEM
- 1 OPTIONAL MESH OR SPREAD SPECTRUM RADIO
- 1 OPTIONAL LCD HMI
- 1 OPTIONAL BUILT-IN BATTERY BACKUP

### STANDALONE OPERATION

Scadaflex II controllers are full-function SCADA systems “in a box” with SCADA communications, local and web human machine interfaces (HMIs), trending and data logging, alarming, reporting, and programmable logic control, all housed in a NEMA 4X enclosure.

### COMMUNICATIONS

Scadaflex II controllers have Ethernet and a serial port, and optional built-in cell modem and radio. They can communicate directly with Modbus devices, as well as Allen Bradley and GE PLCs. Bridging from Ethernet to Serial communications is supported. The module can serve as a communications concentrator or master controller.

### GRAPHICAL, MOBILE, AND LOCAL HMIs

Configurable graphical web and mobile device interfaces are built into Scadaflex II controllers. An optional built-in LCD display can be customized to show live process values and make setting changes.

### HISTORICAL TRENDING AND EVENT LOGGING

Scadaflex II controllers have an internal solid state flash disk, as well as a micro SD memory card slot to record over 100 years of data! You can retrieve and display historical data with built-in web tools and extract trend and event data as spreadsheet files.

### REPORTING

Reports can be created in minutes showing live values, production totals, trend and event data, alarm summaries, etc. Customize reports with your own logos and graphics. Call up reports on demand, or have them automatically transferred to your computer.

### ALARMING

A Scadaflex II controller can manage alarm conditions on any of its local inputs as well as over 500 conditions monitored by communications with other devices. Alarms conditions can be displayed locally and annunciated by text message and e-mail alerts. Alarms can be acknowledged by text message or e-mail, discrete input, or HMI button. The module maintains a journal spreadsheet file of when alarms occurred, when they were acknowledged, by whom, and when the alarm conditions cleared.

### PROGRAMMABLE LOGIC

Every Scadaflex II controller supports programmable logic written in any mix of ladder logic, function block and text languages. Programmable logic can be used for anything that can't be done with the built-in functions of the module.

### PUMP CONTROL

Scadaflex II controllers have a built-in duplex / triplex pump controller (float or level control) with alternation, error detection and alarming.

### BATTERY BACKUP

Scadaflex II controllers can be ordered with optional built-in battery backup that can keep the controller operating when input power fails for up to 14 hours..

# Scadaflex II SCADA Controller SC-2 Specifications

## FIELD I/O

<b>Digital Inputs:</b>	12	Optically Isolated (AC/DC, not polarity sensitive)
Input Range:		0 to 30Vdc (ON= >9V, OFF < 6V), <b>60Vdc absolute maximum</b>
Input Current:		Approximately 1 mA @ 12Vdc, 2.2mA at 24Vdc
<b>High-speed Pulse Inputs:</b>	2	Non-isolated DC or contact closure, DC to 20KHz maximum
Input Range:		Contact closure or open collector driver to ground, or 0 to 30Vdc (ON=<1.5V, OFF > 2.5V), <b>60Vdc absolute maximum</b>
Input Current:		0.5mA (internal current source)
Filtering		Individually configurable: 0 to 256mS
<b>Digital Outputs:</b>	4	Relay contacts, Form A (normally open)
Contact Output Rating:		240/277 Vac, 30Vdc, 3A maximum per output (resistive load). <b>Do not exceed 8A total of all outputs</b> A snubber diode (DC) or RC snubber (AC) must be used across the relay contacts or load connections for <b>any</b> inductive load.
<b>Analog Inputs:</b>	4	16-bit, Delta Sigma, individually selectable input ranges
Input Ranges:		• 20mA, 5V, +/- 250mV, and 65,000 ohms resistance measurement including 2250 ohm thermistors
Maximum signal level		35Vdc on any range
<b>Analog Outputs:</b>	2	12-bit, Delta Sigma
Input Range:		• 20mA, loop powered by controller

## COMMUNICATIONS

<b>Ethernet:</b>	1	10/100mb/s (10/100 Base-T)
SCADA Protocols		Modbus TCP & UDP (master/slave), Ethernet IP (master/slave), SDX (128-bit encryption, master/slave), Ethernet to Serial bridging
Internet Protocols		HTTP (server), FTP (server & client), ICMP (ping; server and client), NTP (client), DHCP (server & client), DNS, DDNS
<b>Serial:</b>	1	RS-232/RS-485
Baud Rates (all ports)		115K, 38.4K, 19.2K, 9600, 4800, 2400, 1200 baud
Protocols		Modbus RTU (master/slave), DF1 (slave), SDX (128-bit encryption, master/slave)
<b>Cellular Option:</b>	1	4G LTE: <b>[29-0111]</b> 700(B13)/AWS1700(B4)/1900(B2) (Verizon)
		4G LTE: <b>[29-0121]</b> 700(B12/B13)/850(B5)/AWS1700(B4)/1900(B2) (AT&T, T-Mobile, International)
SCADA Protocols		Modbus TCP & UDP (master/slave), Ethernet IP (master/slave), SDX (128-bit encryption, master/slave)
Internet Protocols		HTTP (server), FTP (server & client), ICMP (ping; server and client), DNS, DDNS
<b>Radio Options:</b>	1	<b>[29-0200]</b> 900MHz 1/4W (24dBm) Meshing radio, -101 dBm sensitivity @ 200kbps Proprietary ultra low-power protocol (optimized power-down/sleep), or
		<b>[29-0210]</b> 900MHz 1/4W (24dBm) Frequency Hopping Spread Spectrum radio, -110 dBm sensitivity @ 10kbps, Modbus RTU (master/slave), SDX (128-bit encryption, master/slave)

## HMIs

<b>Local LCD (option):</b>	<b>[29-0500]</b> 128x32 graphical, wide temperature range yellow backlit LED and 6 pushbuttons (navigation and change)
<b>Graphical:</b>	Web based, graphic library included. Compatible with most browsers, including Internet Explorer, Firefox, Chrome, Safari, Android
<b>Mobile:</b>	Web based, text only, up to 50 registers. Compatible with most browsers, including Internet Explorer, Firefox, Chrome, Safari, Android

## PROGRAMMING

<b>Languages:</b>	Ladder Logic, Function Block, Text—built-in web based graphical and text editor and debugger
<b>Capacity:</b>	8KB logic, 512KB source code

## STORAGE

<b>Registers:</b>	504 Numeric registers, 504 Boolean registers
<b>Internal Flash disk:</b>	32MB
<b>Removable disk:</b>	Micro SD Card (up to 256GB, supplied by customer)


## CLOCK

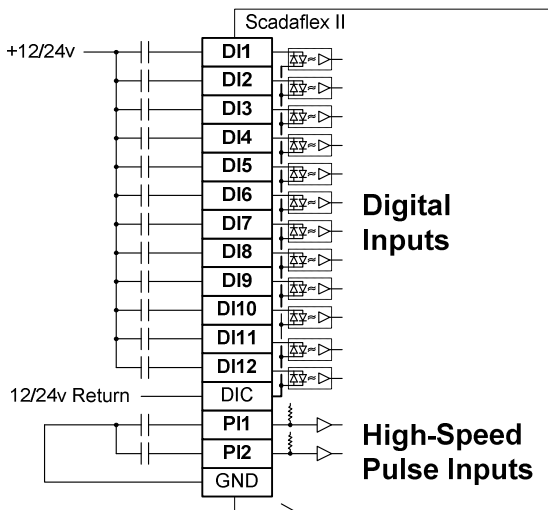
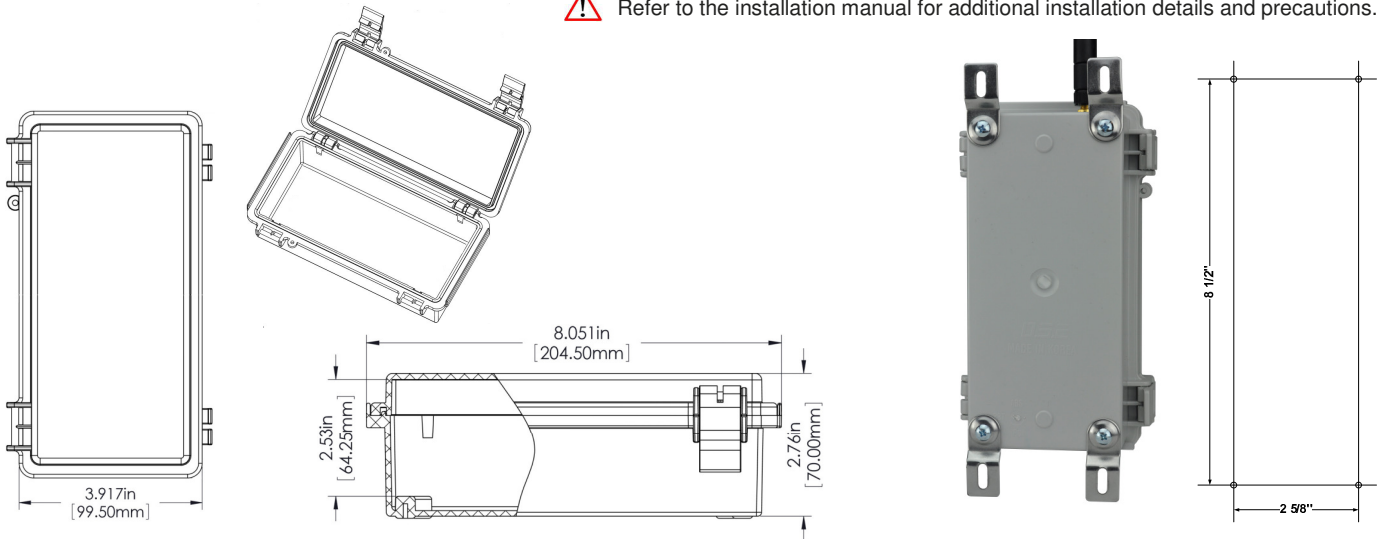
<b>Real Time Clock:</b>	With lithium battery backup power
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## GENERAL

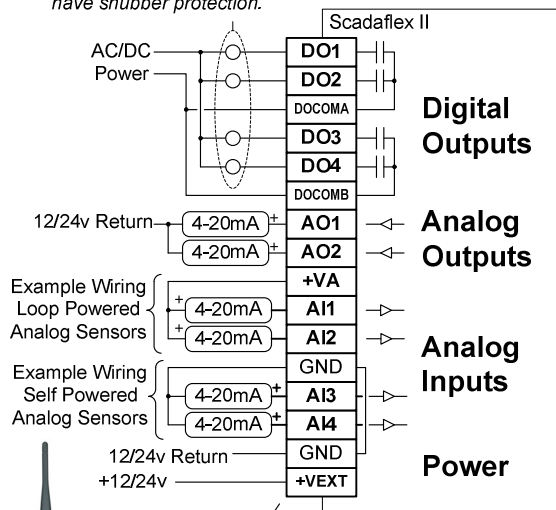
<b>Input Power:</b>	10Vdc to 30Vdc, 36Vdc absolute maximum
<b>Power Consumption (DC)</b>	
Not using Ethernet	15mA @ 12Vdc / 12mA @ 24Vdc (Ethernet power saver enabled, all relay outputs OFF)
Using Ethernet	58mA @ 12Vdc / 34mA @ 24Vdc (all relay outputs OFF)
Add per ON relay	13mA @ 12Vdc / 7mA @ 24Vdc
<i>Added power consumption for options</i>	
HMI Option	<b>[29-0500] Backlight OFF:</b> 8mA @ 12Vdc / 4mA @ 24Vdc, <b>Backlight ON</b> 35mA @ 12Vdc / 17mA @ 24Vdc
Cellular Option	<b>[29-01x1] Idle:</b> 1mA @ 12Vdc / 0.5mA @ 24Vdc, <b>Transmitting (short bursts)</b> 56mA @ 12Vdc / 28mA @ 24Vdc
Radio Option	<b>[29-02x0] Idle:</b> 13mA @ 12Vdc / 6mA @ 24Vdc, <b>Transmitting (short bursts)</b> 50mA @ 12Vdc / 25mA @ 24Vdc
Battery Backup Option	<b>[29-0300] Charging (max)</b> 150mA @ 12Vdc / 75mA @ 24Vdc
<b>AC Power Option:</b>	<b>[29-9001]</b> Input:100 to 277Vac, 2A maximum 50/60Hz, 13W Auxiliary Output: 24Vdc 0.25A maximum
<b>Battery Backup Option:</b>	3.6V 3.4Ah rechargeable lithium Ion, over-charge/over-discharge protected, up to 14 hours backup time, built-in charger
<b>Field Wiring Termination:</b>	Screw terminal blocks, 3.5mm, 22 to 14GA wires
<b>Antenna Connector:</b>	<b>Cellular [29-01x1]:</b> SMA female (female pin center conductor) <b>900Mhz Radio [29-02x0]:</b> RPSMA female (male pin center conductor)
<b>Temperature:</b>	-40°C to 70°C (operating), -40°C to 85°C (storage)
<b>Humidity:</b>	<95% RH (non-condensing)
<b>Enclosure:</b>	8"(H) x 4"(W) x 3"(D), NEMA 4X, Polycarbonate, wall mounting hardware provided
<b>Electrical Entrance/Exit:</b>	Pre-drilled for 3/4" conduit fitting

# Scadaflex II SCADA Controller SC-2 DIMENSIONS, MOUNTING and WIRING

 Refer to the installation manual for additional installation details and precautions.



All inductive loads **MUST** have snubber protection.



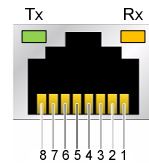
Ethernet

Serial Port

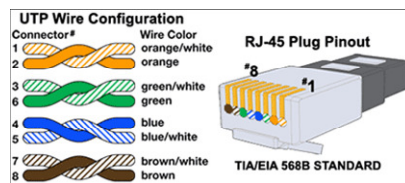


Serial Port RJ-45 to DB-9 Adapter Wiring

Pin#	RS-232/RS-485 Function	DB-9 Male	DB-9 Female	Wire Color
		modems / radios	DTE devices	
1	RS-485+			Orange/White
2	RS-485-			Orange
3	DTR Out (RTS inverted)			Green/White
4	Gnd	5	5	Green
5	RS-232 Rx In	2	3	Blue
6	RS-232 Tx Out	3	2	Blue/White
7	CTS In (not used)			Brown/White
8	RTS Out	7		Brown



Pin#	RS-232/RS-485 Function	Wire Color
1	RS-485+	Orange/White
2	RS-485-	Orange
3	DTR Out (RTS inverted)	Green/White
4	Gnd	Green
5	RS-232 Rx In	Blue
6	RS-232 Tx Out	Blue/White
7	CTS In (not used)	Brown/White
8	RTS Out	Brown





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