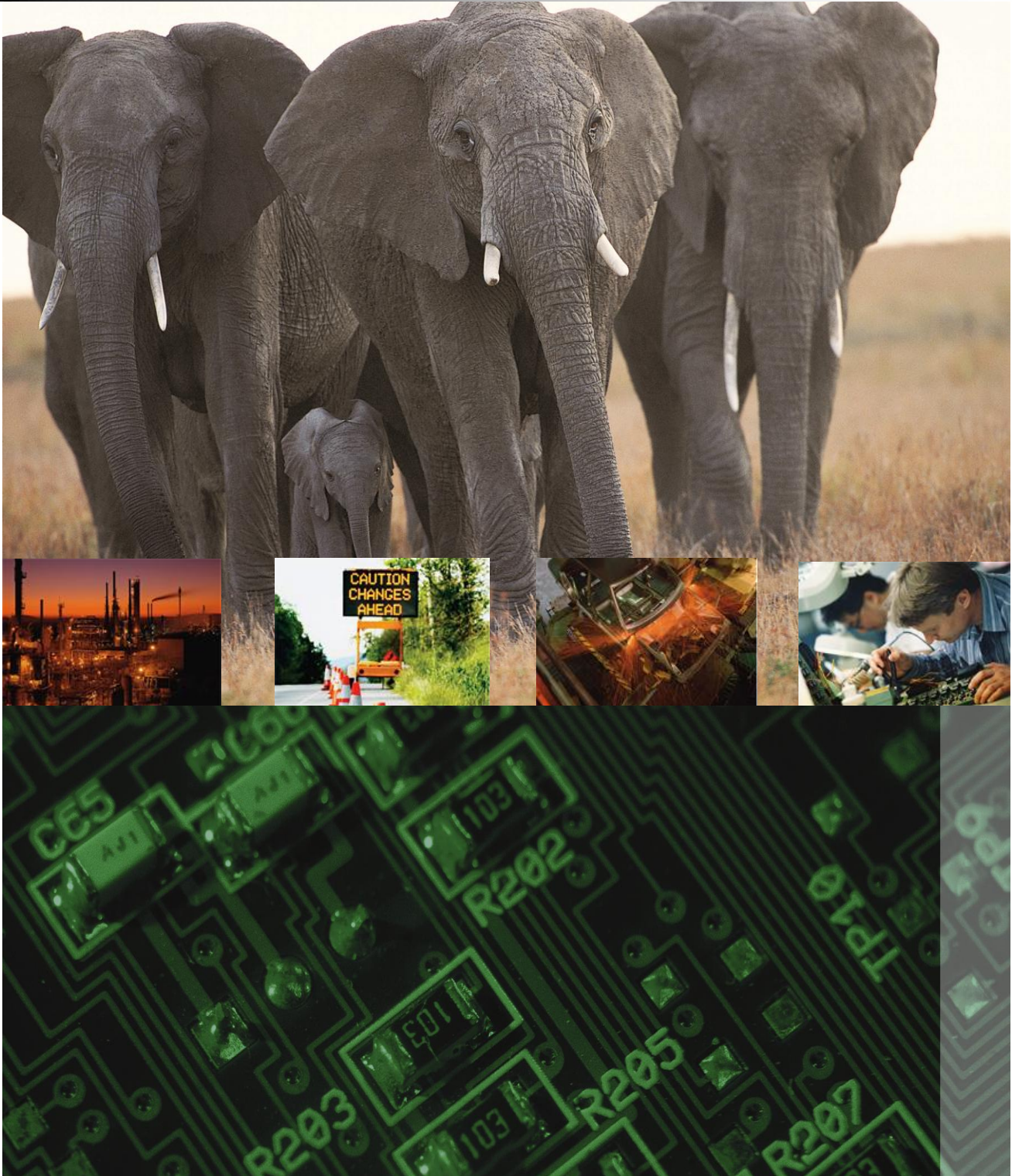


CHARGING AHEAD



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## 2013 PRODUCT CATALOG



Updated 04.18.13

***Charging Ahead of the Herd***

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## ABOUT US

Located in beautiful Englewood, Colorado, Rogue Engineering has a lot to offer its customers. Rogue Engineering has been in existence since 1991, working mostly within the oil and gas industry. We are a progressive company with an Electrical Engineering staff that thrives on solving problems. Some of our specialties include oil and gas equipment, solar battery charge controllers and low voltage disconnect devices. In addition to products designed, manufactured and sold by Rogue Engineering, we also welcome new projects that involve the design and manufacturing of new products.

Rogue Engineering's custom services can satisfy your engineering needs in several ways:

1. Update and improve an existing product
2. Design and create a prototype for a new design and will sign non-disclosure agreements to protect your rights
3. Manufacture an existing design
4. Design and manufacture an existing or new product

Rogue's advanced solar engineering has it ahead of the curve in product design, with the lowest self-consumption rates among the industry leading battery solar charge controllers. Our products are priced modestly and are simple to use. Rogue Engineering is making an impact in the solar industries much the same as it has in the oil and gas industry.

**Purpose of the organization:** to develop useful high-tech products that will increase electronics capability, stability, reliability and precision.

**What we are doing to address these needs:** Rogue engineering is concentrating its efforts on product research and development and maximizing its scope to meet the needs of many different industries.

**What principles or beliefs guide our work:** Rogue Engineering believes that it is a leader in the industry of electronics and that separating itself from its competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

## Pricing and Ordering Information

Product pricing and ordering information can be accessed directly through our secure website at: [www.rogue-engr.com](http://www.rogue-engr.com)

For volume discount pricing on our products and or pricing for design services, please contact us by email or phone.

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## CUSTOM SERVICES

### ELECTRONIC DESIGN AND MANUFACTURING SERVICES

#### Electronics Manufacturing:

- Single or double-sided circuit board assembly
- Through-hole and surface-mount technology
- Pick and place to 12 mil lead spacing
- Wire cutting, stripping, and crimping machines
- Custom testing of circuit boards
- QA testing of circuit boards
- OEM services

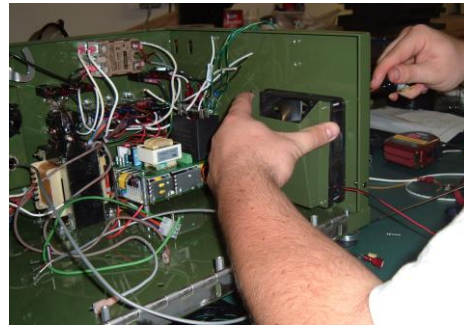


#### Mechanical Manufacturing:

- Complex hand assembly
- Kitting and assembly to customer specifications
- Custom packaging solutions
- Pneumatic systems

#### Electronic Engineering:

- Analog and digital hardware design
- Embedded / PC / Server software
- Real time control
- Battery / Ultra low powered design
- Communications / Wireless / SCADA
- Mixed signal
- Rugged harsh environments
- Motor control design
- Custom automated testing equipment
- User interface hardware/software
- Hazardous locations



#### Why Choose Rogue Engineering?

- Over 50 years combined experience
- Experience with UL, CE, CSA Standards
- Varied industry exposure including:
  - Oil and gas well controls
  - Solar Powered battery chargers
  - Dental equipment control devices

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## PRODUCTS

### THE RHINO-5 LINE OF SOLAR CHARGE CONTROLLERS

Rogue Engineering's "3 stage" Rhino-5, 5 amp charge controllers are designed to operate with no maintenance in the most challenging industrial and recreational settings. The majority of our Rhino-5 charge controllers consume only 400 micro amps, the smallest self-consumption rate in the industry. The Rhino-5 Controller provides optimal battery performance. Simple and rugged, this charger can be powered by a solar panel or an AC adaptor for either on or off-grid systems.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the Rhino-5 Charge Controller?

##### Three Stage Automatic Charging

The Rhino-5 are some of the only 5 amp chargers to feature Fast, Absorption and Float. The Rhino also switches from Fast charge to Float charge when batteries are full. Float charge continuously monitors battery to maintain a fully charged state.

##### Multiple Versions

Rogue offers multiple versions of the Rhino-5 chargers including 6, 12 and 24 Volt, LVD, SLA, Flooded Cell, and Non-temperature-compensated versions.

##### Adaptable

Output voltage automatically adjusts to compensate for the temperature of the battery.

##### Linear Charging

The Rhino-5's Linear Charge method provides for steady charging while decreasing self-consumption.

##### Urethane Encapsulation

Rogue encapsulates all of its 5 and 10 amp chargers in Urethane to ensure reliability at low temperatures and a decreased failure rate.

##### Testing and Reliability

Each Rhino-5 charge controller is fully tested and inspected, ensuring reliability.

##### Convenient

Pluggable connectors for quick and easy installation. Compact simple design allows for use in hard to access locations.

##### Rated For Hazardous Locations

CSA Approved for Class 1, Division 2 Groups C, D T4 (Model 1950-136)



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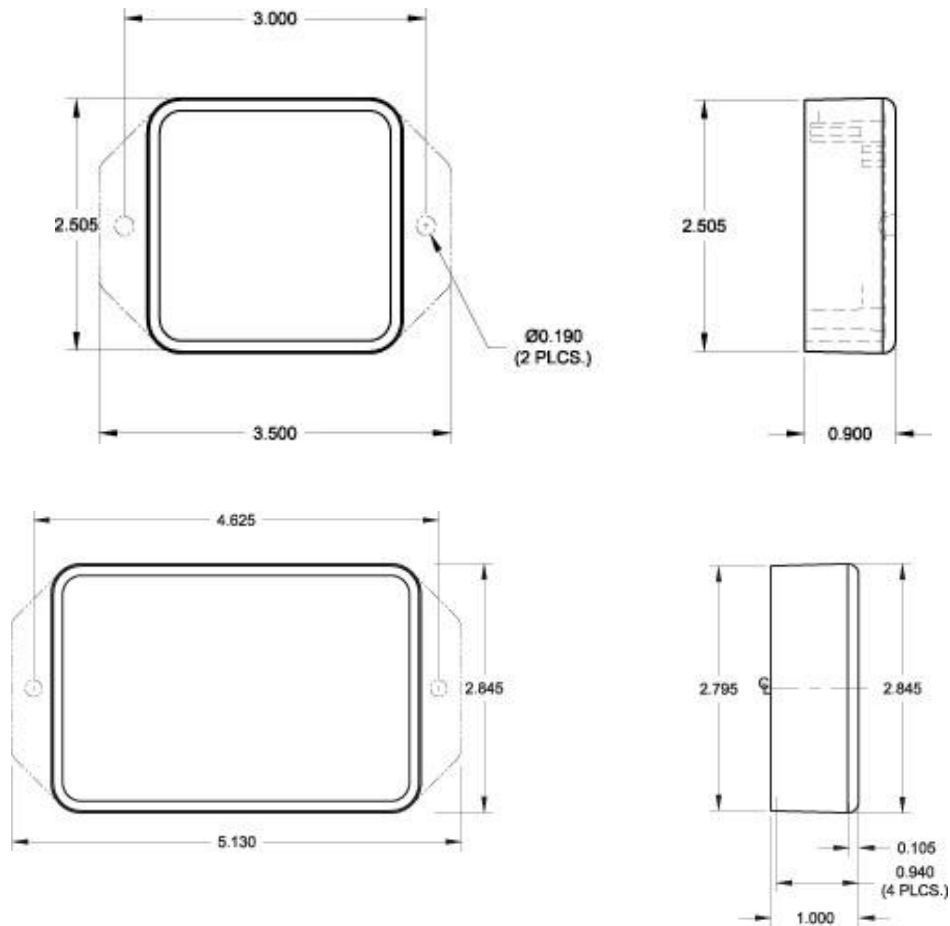
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## PRODUCTS

### THE RHINO-5 LINE OF SOLAR CHARGE CONTROLLERS

Part No.	Voltage	Max Current	Weight	Internal Current Consumption	Temperature Range	LVD	Battery	Temperature Compensation	Hazardous Locations
1950-136	6/12VDC	5A	4oz	< 400 $\mu$ A	-40°C-60°C	No	SLA	Yes	CSA Class 1 Div 2 Certification
1950-149	6/12VDC	5A	4oz	< 400 $\mu$ A	-40°C-60°C	No	Flooded	Yes	-



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## PRODUCTS

### 10 Amp 12/24 SLA or Flooded (switch selectable) Solar Charge Controller CSA Class 1 Div 2

Part No. 190-253

#### WIRING

GND	-Negative battery terminal
+BAT	-Positive battery terminal
GND	-Negative terminal of the solar panel (or other source of charging power)
+IN	-Positive terminal of the solar panel (or other source of charging power)



#### SWITCH SETTINGS

To gain access to the switches, remove the plug-in connectors and the four screws from the corners of the cover. There is one switch to select between 12V or 24V and one to select for SLA or Flooded battery.

#### TEMPERATURE COMPENSATION

The charge controller has built-in temperature compensation. The charger should be mounted in the battery box near the battery for optimal compensation.

#### REVERSE BATTERY INDICATOR

If the battery is wired with the positive and negative terminals reversed, the Red Reverse Battery LED will light. The controller is internally protected from damage from reverse wiring on both the solar and battery terminals, but must be wired correctly to charge the battery.

#### SPECIFICATIONS

Battery Voltage	12V/24V
Maximum Charging Current	10 Amps
Battery Charge Regulation	3 Stage
Self Consumption	400 $\mu$ A Typical (not charging) 1.8 mA Typical (charging)
Temperature Compensation	-3.3mV / ° C / Cell
Operating Temperature	-40 to 60° C
Environmental	Encapsulated
Pluggable Connectors	12 AWG Max Wire Size
Small Form Factor	2.5" x 2.5" x 0.9"

	SLA	FLOODED
Fast/Compensation Mode ON Voltage	12.7V/25.4V	12.3V/24.6V
Fast/Compensation Mode OFF Voltage	14.8V/29.6V	14.4V/28.8V
Float Mode Voltage	13.8V/27.6V	13.6V/27.2V

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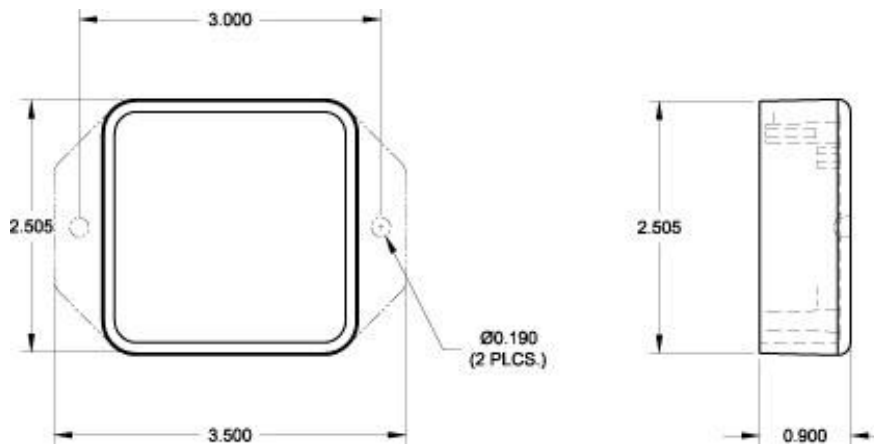
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## PRODUCTS

### 10 Amp 12/24 SLA or Flooded (selectable switch) Solar Charge Controller CSA Class 1 Div 2

Part No.	Voltage	Max Current	Weight	Internal Current Consumption	Temperature Range	LVD	Battery	Temperature Compensation	Hazardous Locations
1950-253	12/24VDC Switch Selectable	10A	4oz	400 $\mu$ A	-40°C-60°C	No	SLA/Flooded Switch Selectable	Yes	CSA Class 1 Div 2 Certification



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## PRODUCTS

### THE RHINO-10 SOLAR CHARGE CONTROLLER

Part No. 1950-162

Rogue Engineering's "3 stage" Rhino-10, 10 amp charge controller is designed to operate with no maintenance in the most challenging industrial and recreational settings. Simple and rugged, this charger can be powered by a solar panel or an AC adaptor for either on or off-grid systems.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the Rhino-10 Charge Controller?

##### Three Stage Automatic Charging

The Rhino-10 is one of the only 10 Amp chargers to feature Fast, Absorption and Float. The Rhino-10 also switches from Fast charge to Float charge when batteries are full. Float charge continuously monitors battery to maintain a fully charged state.

##### Adaptable

Output voltage automatically adjusts to compensate for the temperature of the battery.

##### LVD Warning

The Rhino-10's LVD warning output provides advanced notice of an impending low voltage disconnect event, allowing your equipment to shut down in a safe manner

##### LVD Reset

The Rhino-10's LVD reset button allows you to override the LVD feature without resorting to tricks required by other similar charge controllers.

##### Urethane Encapsulation

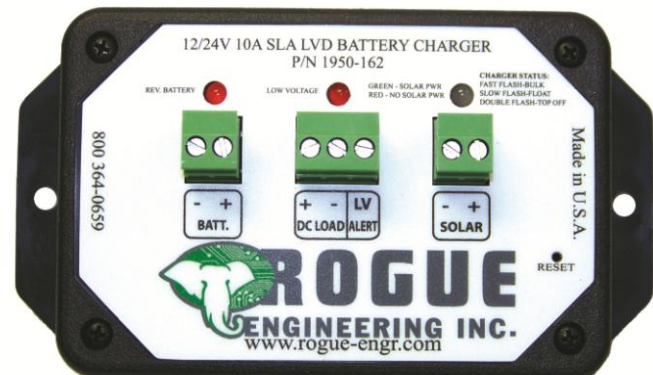
Rogue encapsulates all of its 5 and 10 amp chargers in Urethane to ensure reliability at low temperatures and a decreased failure rate.

##### Testing and Reliability

Each Rhino-10 charge controller is fully tested and inspected, ensuring reliability.

##### Convenient

Pluggable connectors for quick and easy installation. Compact simple design allows for use in hard to access locations.



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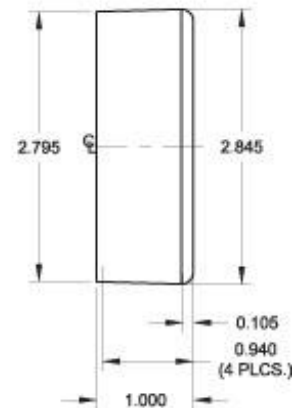
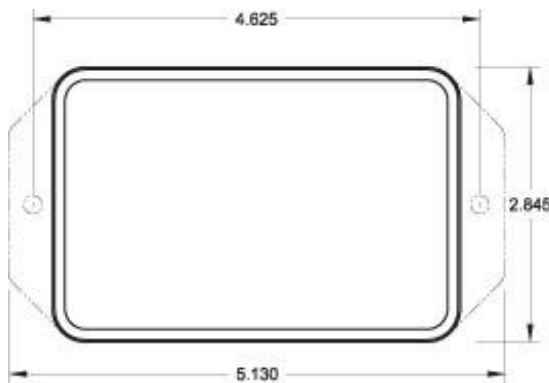
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## PRODUCTS

### THE RHINO-10 SOLAR CHARGE CONTROLLER

Product	Voltage	Max Current	Weight	Internal Current Consumption	Temperature Range	LVD	Battery	Temperature Compensation
1950-162	12/24VDC	10A	7.1oz	3mA nom.	-40°C-60°C	Yes	SLA	Yes



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## PRODUCTS

### THE RHINO-10C SOLAR CHARGE CONTROLLER

Part No. 1950-229

Rogue Engineering's "3 stage" Rhino-10C, 10 amp Charge Controller is designed to operate with no maintenance in the most challenging industrial and recreational settings. Simple and rugged, this charger can be powered by a solar panel or an AC adaptor for either on or off-grid systems.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the Rhino-10C Charge Controller?

##### Three Stage Automatic Charging

The Rhino-10C is one of the only 10 amp chargers to feature Fast, Absorption and Float. The Rhino-10C also switches from Fast charge to Float charge when batteries are full. Float charge continuously monitors battery to maintain a fully charged state.

#### Configuration

Field configurable via Modbus:

- Battery Type – SLA or Flooded
- Low Voltage Disconnect / Reconnect

#### Optional I/O Module

A standard I/O module may be used for digital input/output. The Grayhill Series 70 or Crydom IAC, IDC, etc. or equivalent may be used.

#### LVD Reset

The Rhino-10C's LVD reset button allows you to override the LVD feature without resorting to tricks required by other similar charge controllers.

#### Communications

Industry standard Modbus RTU protocol and RS-232 port. Supports extended Modbus addressing and multiple baud rates.

#### Testing and Reliability

Each Rhino-10C charge controller is fully tested and inspected, ensuring reliability.

#### Convenient

Pluggable connectors for quick and easy installation. Compact simple design allows for use in hard to access locations.



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## PRODUCTS

### THE RHINO-10C SOLAR CHARGE CONTROLLER

#### SPECIFICATIONS

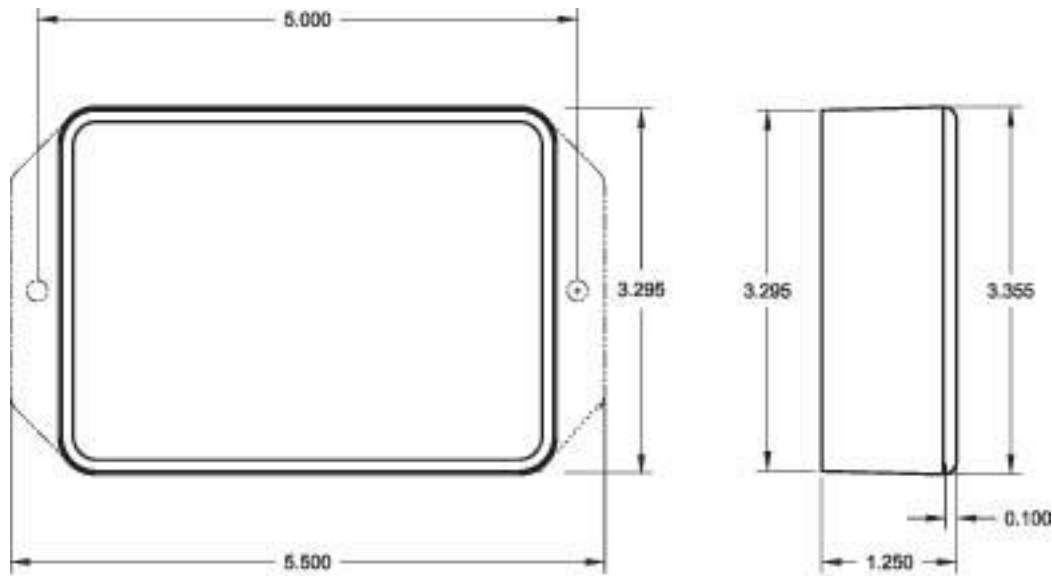
Battery Type:	SLA or Flooded selected by Modbus
Maximum Charger Current	10 Amps, external fuse required
Self Consumption	6mA Typical
Temperature Compensation	-3mV/degree C/cell
Operating Temperature	-40 to 60°C
Pluggable Connectors	10 AWG Max Wire size
Maximum input voltage	40 V
RS-232 Port	RTU Modbus, 8N1, 9600 / 19.2k / 57.6k

#### Charging at 25°C

#### SLA

#### FLOODED

Bulk (Fast) Mode on Voltage	12.8V / 25.6V	12.8V / 25.6V
Top-Off Voltage	14.8V / 29.6V	14.6V / 29.2V
Float Mode Voltage	14.5V / 28.1V	13.6V / 27.1V



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## PRODUCTS

### THE RHINO-20 LINE OF SOLAR CHARGE CONTROLLERS

Rogue Engineering's "3 stage" Rhino-20, 20 amp charge controllers are designed to operate with no maintenance in the most challenging industrial and recreational settings. Simple and rugged, this charger can be powered by a solar panel or an AC adaptor for either on or off-grid systems. Each controller is fully tested and inspected, ensuring reliability.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the Rhino-20 Charge Controller?

##### Three Stage Automatic Charging

The Rhino-20 is one of the 20 amp chargers to feature Fast, Absorption and Float. The Rhino-20 also switches from Fast charge to Float charge when batteries are full. Float charge continuously monitors battery to maintain a fully charged state.

##### Adaptable

The Rhino-20 features an external temperature sensor, mountable directly to your battery for increased accuracy. Output voltage automatically adjusts to compensate for the temperature of the battery.

##### LVD Warning

The Rhino-20's LVD warning output provides advanced notice of an impending low voltage disconnect event, allowing your equipment to shut down in a safe manner.

##### LVD Reset

The Rhino-20's LVD reset button allows you to override the LVD feature without resorting to tricks required by other similar charge controllers.

##### Convenient

Heavy-duty spring loaded cage clamp terminals allow for quick and easy installation without sacrificing reliability. Easily replaceable automotive style fuses protect both the battery and load terminals.



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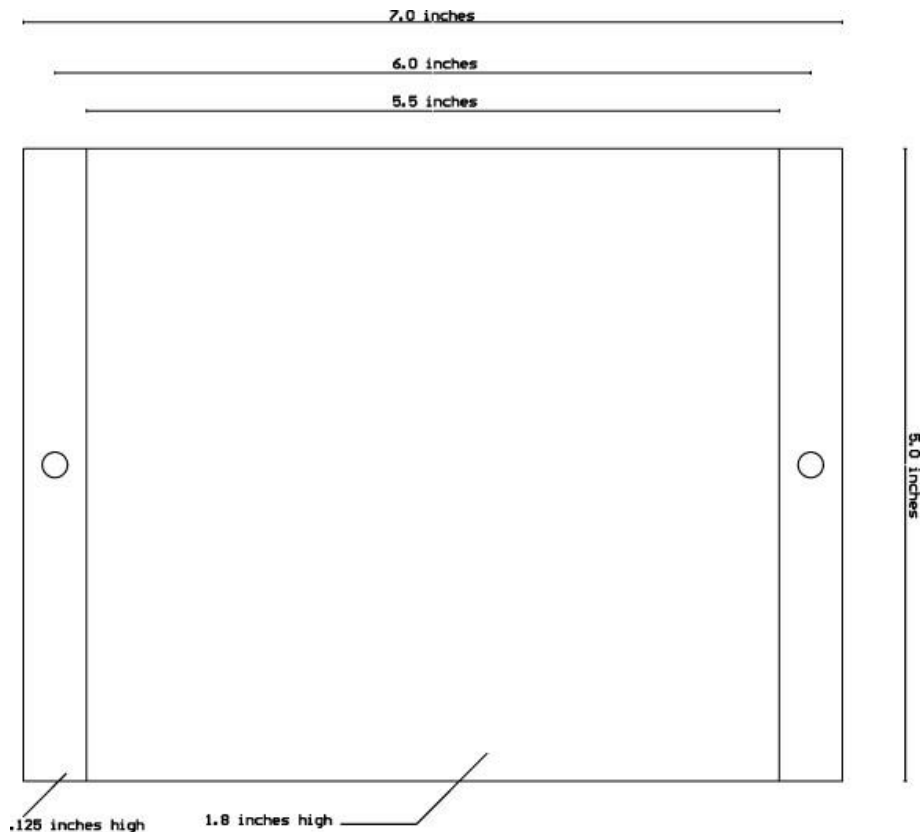
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## PRODUCTS

### THE RHINO-20 LINE OF SOLAR CHARGE CONTROLLERS

	Rhino-20 Models	
	1950-191 SLA	1950-192 Flooded
Voltage	12/24VDC	12/24VDC
Max Current	20A	20A
Weight	1.5 LBS	1.5 LBS
Internal Current Consumption	< 10mA	< 10mA
Temperature Range	-40°C-60°C	-40°C-60°C
LVD	Yes	Yes
Battery	SLA	Flooded
Temperature Compensation	Yes	Yes
Wire Gage	10-24 AWG	10-24 AWG



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## PRODUCTS

### THE RHINO-25 SOLAR CHARGE CONTROLLER

Part No. 1950-214 (without probe) and 1950-227 (with probe)

Rogue Engineering's "3 stage" Rhino-25, 25 amp charge controller is designed to operate with no maintenance in the most challenging recreational settings. The Rhino-25 Controller provides optimal battery performance. Simple and rugged, this charger can be powered by a solar panel or an AC adaptor for either on or off-grid systems.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the Rhino-25 Charge Controller?

##### Three Stage Automatic Charging

The Rhino-25 is one of the only 25 amp chargers to feature Fast, Absorption and Float. The Rhino-25 also switches from Fast charge to Float charge when batteries are full. Float charge continuously monitors battery to maintain a fully charged state.

##### Testing and Reliability

Each controller is fully tested and inspected, ensuring reliability.

##### Testing and Reliability

Each Rhino-25 charge controller is fully tested and inspected, ensuring reliability.

##### Temperature Compensation

The Rhino-25 has an optional remote temperature sensor to ensure your battery is charged properly in all weather conditions.

##### Convenient

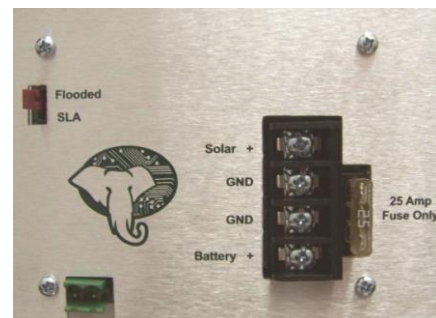
Screw terminals allow for quick and easy installation without sacrificing reliability. An easily replaceable automotive style fuse protects the battery. User can select between SLA or Flooded battery using the jumper select.

##### Specifications

Voltage	12VDC
Max Current	25A
Weight	< 1.0 LB
Internal Current Consumption	< 15mA
Temperature Range	0°C - 50°C
Battery Type	SLA or Flooded
Wire Gage	10-24 AWG
Temp. Comp. P/N 1950-227 Only	-3mV per cell per °C

##### At 25°C      SLA      FLOODED

Bulk Charge	14.8V	14.3V
Float Charge	14.0V	13.5V



Backside of Charger



Optional – 25'  
Temperature Probe

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## PRODUCTS

### THE RHINO-25C SOLAR CHARGE CONTROLLER

Part No. 1950-244

Rogue Engineering's "3 stage" Rhino-25C, 25 amp Charge Controller is designed to operate with no maintenance in the most challenging industrial and recreational settings. Simple and rugged, this charger can be powered by a solar panel or an AC adaptor for either on or off-grid systems.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the Rhino-25C Charge Controller?

##### Three Stage Automatic Charging

The Rhino-25C is one of the only 25 amp chargers to feature Fast, Absorption and Float. The Rhino-25C also switches from Fast charge to Float charge when batteries are full. Float charge continuously monitors battery to maintain a fully charged state.

#### Configuration

Field configurable via Modbus:

- Battery Type – SLA or Flooded
- Low Voltage Disconnect / Reconnect

#### Optional I/O Module

A standard I/O module may be used for digital input/output. The Grayhill Series 70 or Crydom IAC, IDC, etc. or equivalent may be used.

#### LVD Reset

The Rhino-25C's LVD reset button allows you to override the LVD feature without resorting to tricks required by other similar charge controllers.

#### Communications

Industry standard Modbus RTU protocol and RS-232 port. Supports extended Modbus addressing and multiple baud rates.

#### Testing and Reliability

Each Rhino-25C charge controller is fully tested and inspected, ensuring reliability.

#### Convenient

Pluggable connectors for quick and easy installation. Compact simple design allows for use in hard to access locations.



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## PRODUCTS

### THE RHINO-25C SOLAR CHARGE CONTROLLER

Part No. 1950-244

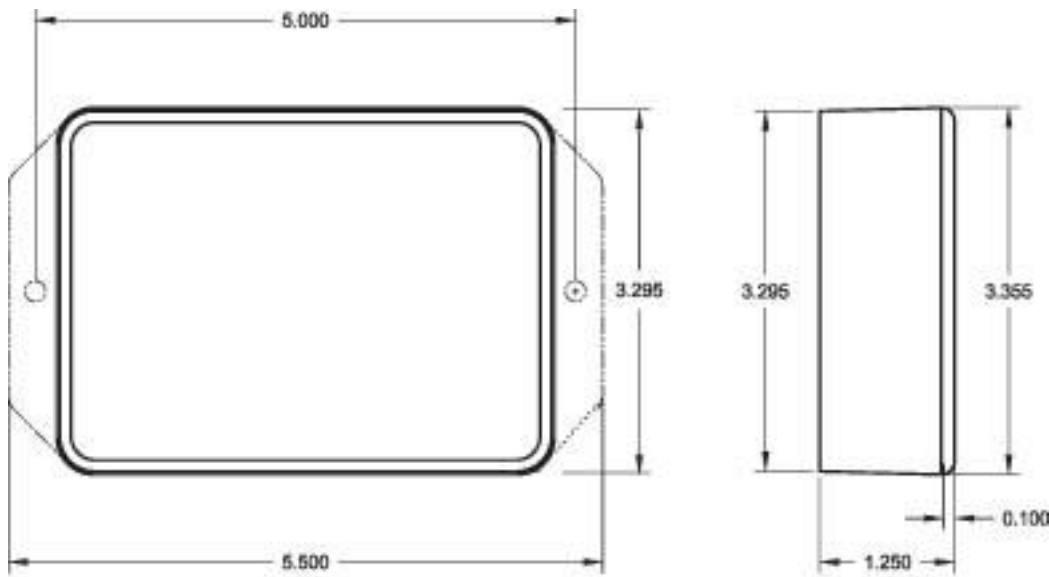
#### Specifications

Battery Type:	SLA or Flooded selected by Modbus
Maximum Charger Current	25 Amps, external fuse required
Self Consumption	6mA Typical
Temperature Compensation	-3mV/degree C/cell
Operating Temperature	-40 to 60°C
Pluggable Connectors	10 AWG Max Wire size
Maximum input voltage	40 V

RS-232 Port

RTU Modbus, 8N1, 9600 / 19.2k / 57.6k

Charging at 25°C	SLA	FLOODED
Bulk (Fast) Mode on Voltage	12.8V / 25.6V	12.8V / 25.6V
Top-Off Voltage	14.8V / 29.6V	14.6V / 29.2V
Float Mode Voltage	14.5V / 28.1V	13.6V / 27.1V



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## PRODUCTS

### ROGUE DC/DC BOOSTER with 60 Watt Capacity and Three Position Switch

Part No. 1950-169

Rogue Engineering's DC Booster is designed to provide a DC power source that is either equal to the input, or boosted to a higher voltage, up to 30V.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose the DC Booster?

##### Benefits

- Adjustable: Output voltage can be set from 9V to 30V
- Efficient: Typical efficiency is 94%
- Simple: Output is selected or turned off with a 3 position switch.
- Convenient: Uses pluggable connectors for ease of set up.

##### Applications

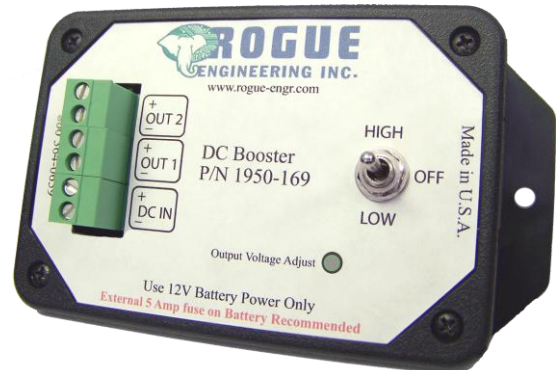
- Motor / Fan Power Source
- Battery Powered Systems

#### Specifications

- Input Voltage: 6V-15V
- Output Voltage: 9V-30V
- Maximum Input Current: 5A, external fuse on +In recommended
- Maximum Output Power: 60 Watts
- Maximum Temperature: 60°C
- Minimum Load: 25mA recommended

#### Testing and Reliability

Each DC/DC Booster is fully tested and inspected, ensuring reliability.



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## PRODUCTS

### 12V 15 Amp Low Voltage Disconnect (LVD)

Part Number 1950-222

With Rogue Engineering's stand-alone LVD module, you never again need to worry about the battery in your RV or boat being drained by your appliances. Simply wire the module into the power leads for the appliance, and when the battery voltage drops below the set value, power will be disconnected. Power to the appliance will automatically be restored the next time the battery is charged back up.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose Rogue's 12V LVD?

##### Benefits

- Easy to install
- Control up to 150 Watt Appliances directly or add a separate relay to control even larger appliances
- 7 position selector switch makes it easy to choose the shut-off voltage or "always on" LVD override
- Disconnect voltage selection range from 9.0V to 11.5V
- Uses an automotive style fuse for protection and easy replacement

##### Applications

- Idle reduction for work vehicles
- Off-grid solar installations
- Recreational vehicles
- And many more battery-powered installations

#### Specifications

- Supports all 12V lead acid batteries
- 15 Amp automotive style fuse
- Conformal Coated and potted for humid conditions
- Disconnect voltages are very 0.5V from 9.0V to 11.5V
- Reconnect voltage is fixed at 1 volt above selected disconnect voltage
- Self-Consumption: Battery (supply) voltage above disconnect threshold: 2 milliamps (mA) and battery (supply) voltage below disconnect threshold: 550 microamps (uA)
- Alternative configurations available upon request. Minimum order quantities would apply.

#### Testing and Reliability

Each LVD is fully tested and inspected, ensuring reliability.



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## PRODUCTS

### 12V 30 Amp Low Voltage Disconnect (LVD)

Part Number 1950-241

With Rogue Engineering's stand-alone LVD module, you never again need to worry about the battery in your RV or boat being drained by your appliances. Simply wire the module into the power leads for the appliance, and when the battery voltage drops below the set value, power will be disconnected. Power to the appliance will automatically be restored the next time the battery is charged back up.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose Rogue's 12V LVD?

##### Benefits

- Easy to install
- Control up to 360 Watt Appliances directly or add a separate relay to control even larger appliances
- 7 position selector switch makes it easy to choose the shut-off voltage or "always on" LVD override or Off
- Disconnect voltage selection range from 9.5V to 11.5V
- Uses an automotive style fuse for protection and easy replacement
- Low voltage alarm output

##### Applications

- Idle reduction for work Vehicles
- Off-grid solar installations
- Recreational vehicles
- Many other battery-powered installations

#### Specifications

- Supports all 12V lead acid batteries
- 30 Amp automotive style fuse
- Conformal Coated and potted for humid conditions
- Disconnect voltages are very 0.5V from 9.5V to 11.5V
- Reconnect voltage is fixed at 1 volt above selected disconnect voltage
- 10 second delay before disconnect
- Self-Consumption: LVD unit "ON" or set at an LVD threshold: 8 milliamps (mA) and LVD unit set to "OFF": 800 microamps (uA)
- Alternative configurations available upon request. Minimum order quantities would apply.
- 

#### Testing and Reliability

Each LVD is fully tested and inspected, ensuring reliability.



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## PRODUCTS

### ROGUE GATEWAY

#### Modbus Switch with Isolated Output

Part No. 1950-251

Rogue's Gateway Modbus Switch enables up to three different Modbus master devices to communicate and share a single slave device allowing more complex Modbus networks.

#### Why Rogue?

We are a progressive company with an Electrical Engineering staff that thrives on solving problems. We believe that we are a leader in the industry of electronics and that separating ourselves from the competition will be accomplished through advanced technological hardware, quality workmanship and customer service.

#### Why Choose Rogue's Gateway?

##### Wide Input Voltage Range

- Input Voltage (Bat+ to Bat-): 6V-30V
- Power Consumption: 85mW typical (7mA at 12V input)
- Ambient Temperature: -40 to 60°C

##### 4 COM Ports

- 1 dedicated slave RS-232 or RS-485
- 2 dedicated masters RS-232 or RS-485
- 1 dedicated master RS-232
- Active buffering and CRC checking in all incoming messages

##### Other

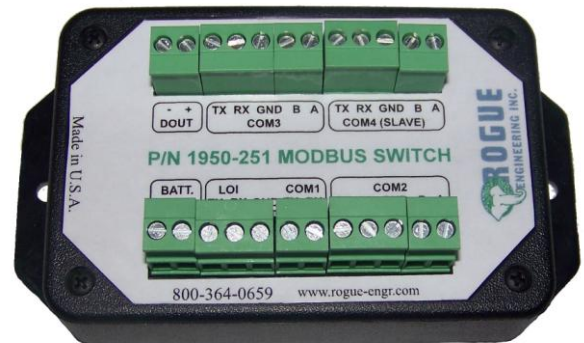
- One optically isolated digital output
- Small form factor
- Pluggable connectors
- Custom protocols and options available upon request

#### Application Examples

- 2 or 3 Modbus masters access and share a single Modbus slave device
- Use to extend communication range of Modbus master by using the Gateway Modbus Switch as a repeater with active CRC checking

#### Testing and Reliability

Each Gateway is fully tested and inspected, ensuring reliability.



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## PRODUCTS

### Plunger Sensor

Part No. 1950-243



### Intended Use

This product is intended to be installed on a lubricator to sense plunger arrival as part of a plunger-lift gas well.

### Installation and Adjustment

**WARNING!! DO NOT CONNECT OR DISCONNECT WIRING IN A HAZARDOUS ENVIRONMENT**

Install sensor on pipe or lubricator using the integrated hose clamp. Install with sensitivity adjustment pot and wiring facing down. Connect wiring as described in this table:

### Features

- Wide Input Power, 8-30V
- Simple Installation and Mounting
- Adjustable Sensitivity
- Urethane Encapsulated

Wire	Description	Electrical
Red	Power +	8-30VDC
Black	Power -	Ground
Green	Active low open drain output; pull up with external resistor, 10kOhm to 100kOhm	Open drain, with 50mA rated resettable fuse

Use a small screwdriver to adjust the sensitivity pot if necessary. Adjust clockwise for higher sensitivity, counter-clockwise for lower.

### Specifications

Part No.	1950-243
Input Voltage	8-30VDC
Current Usage	less than 100uA typical
Operating Temp.	-20 to 60 °C
Environmental	Urethane Encapsulated

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