

Space Saver Product Line



Compact Mount (CM) Versatile Rear Mount (VM)

USER MANUAL



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1 **Description**

The SurgeX[®] Space Saver products are 120V, 15/20 Amp AC power quality products incorporating SurgeX[®] Advanced Series Mode[®] power conditioning and surge protection. The surge protection is rated A-1-1, the highest standard of the Federal Commercial Item Description for Endurance. Several mounting options and receptacle configurations are available.

SurgeX ICE[®] Inrush Current Elimination circuitry is incorporated into all of the Space Saver products. ICE[®] eliminates problems associated with inrush currents from large loads such as amplifiers. With SurgeX ICE[®] it is not necessary to take inrush currents into account when designing the AC power for a system, and special time-delay circuit breakers are not required: you only need to ensure that the steady-state currents of all products plugged into the Compact Mount or Versatile Rear Mount product are within the 15/20 Amp rating.

The Space Saver products incorporate contact closure and applied DC voltage remote control capabilities. Two or more CM or VM products can be connected together to provide control and power conditioning for larger systems. They can also control other SurgeX products with their auxiliary relay contacts and/or its 12V DC output.

A plug-in Phoenix terminal block on the rear panel accommodates the remote control connections and also the low-voltage outputs. There are three inputs which control power state; one 12V DC output; and one auxiliary relay providing normally-open contacts. The inputs can be controlled by an applied DC voltage from 5V to 30V, or by a contact closure. The inputs and 12V DC output are designed to withstand incorrect connections including polarity reversal and shorts.

2 <u>Features</u>

- SurgeX[®] Advanced Series Mode[®] surge elimination
- SurgeX[®] Impedance Tolerant[®] EMI/RFI filtering
- SurgeX[®] ICE[®] Inrush Current Elimination
- SurgeX[®] CouVs[®] Catastrophic Over/Under-Voltage Shutdown
- Accepts both DC voltage and contact closure control inputs
- Two or more units can be cascaded together for larger systems
- Auxiliary relay output can be used to control other SurgeX[®] products
- 12 Volt dc output can be used to control other SurgeX[®] products or drive LEDs
- Auxiliary relay or 12 Volt dc output can be used to provide confirmation feedback
- Flexible form factor
 - Compact Mount (CM) products have a standalone "brick" form factor, with options for built-in receptacles, or an 18 or 24 outlet power strip.
 - Versatile Rear Mount (VM) products have a 1RU form factor designed to be vertically mounted to the rear of an equipment rack with hinged and fixed brackets.

3 Installation

Compact Mount (CM) products are designed to rest on a flat surface or to be mounted onto a flat surface, such as a wall. To mount the CM product, use six 6-32 Phillips pan head screws (included) to attach the removable mounting brackets (included) to the sides of the product. The attached power strip available with CM-1115(20)-RT18 and CM-1115(20)-RT24 is designed to rest on a flat surface or to be mounted along the side of a standard equipment rack.

Versatile Rear Mount (VM) products are designed to be mounted vertically, either to a flat surface or spanning the rear of a standard equipment rack. Use eight 6-32 Phillips pan head screws (included) to attach the removable mounting brackets (included) to the sides of the product. It is recommended to attach the hinged mounting bracket to the side of the product closest to the input power cord.

3.1 Physical Dimensions

	Base Unit			Attached Power Strip				
Model	Width	Depth	Height	Weight	Width	Length	Height	Weight
CM-1115(20)-RT	4.95"	9.50"	5.66"	8.5 lb.	NA	NA	NA	NA
CM-1115(20)-RT18	4.95"	9.50"	5.66"	8.5 lb.	1.625"	48"	1.5"	5.8 lb.
CM-1115(20)-RT24	4.95"	9.50"	5.66"	8.5 lb.	1.625"	62"	1.5"	4.8 lb.
VM-1115(20)-RT	17.41"	10.63"	1.73"	11 lb.	NA	NA	NA	NA









3.2 120 Volt Connections

Connect power to the unit by plugging the cord into a 120V AC, 15/20 amp wall or floor receptacle. Do not plug the unit into a re-locatable power tap.

The various receptacle configurations are detailed in the following tables. Each receptacle is rated for a maximum load of 15 Amps, but the total load must not exceed 15 Amps (20 Amps for 20A products).



	VM-1115-RT	VM-II2D-RT
Advanced Series Mode®	/	/
CouVs®	/	/
SurgeX ICE®	/	/
EMI/RFI Filter	/	/
Power Configuration	15A / 12OV	20A / 120V
Outlets	8 Outlets (6 switched, 2 always on)	8 Outlets (6 switched, 2 always on)
11 Year Warranty	/	/





3.3 Remote Control Connections

Remote control connections are wired to the green 7-pin plug-in Phoenix terminal block on the rear of the unit next to the power cord. The terminal block is shipped with a jumper wire between pins 1 & 2 so that the unit can be used without a remote control connection. If you will be using remote control you will first need to remove this jumper wire. You can unplug the terminal block to make connections and after you have made the connections to the terminal block, plug it back into the connector on the rear of the unit. Never solder (tin) wires before inserting into a terminal block – solder cold flows and you will eventually have loose connections!

The connections are shown below:



3.3.1 Control Inputs

The Space Saver products can be controlled by a DC voltage in the range 5V to 30V, by a contact closure (such as a relay), by a switch (latching), or by another SurgeX product such as the SEQ. Switches with gold contacts are recommended for the best long-term reliability.

- a) <u>DC Voltage:</u> The unit will power up when the voltage is present, and power down when there is no voltage. Connect the positive wire to Pin 2 (Applied Voltage +), and the negative wire to Pin 3 (Applied Voltage -). The positive and negative connections must be made with the correct polarity for proper operation.
- b) <u>Contact Closure/Latching Switch:</u> The unit will power up when the contacts are closed, and power down when the contacts are open. Connect the two wires from the contacts or switch to Pin 1 (Contact Closure) and Pin 2 (Contact Closure / Applied Voltage +).

3.3.2 External LED Connections

The CM and VM Space Saver products are able to drive external LEDs or other signaling devices through their 12V DC output, which can provide up to 10mA of current. External LEDs connected in this way will be On when the unit's AC receptacles are On, and Off when they are Off. When connecting LEDs to the 12V output, a series resistor is required. For example, many LEDs work well with 10mA of current, so a 1K Ω resistor is usually a good choice. If more than one LED is required, then use a separate series resistor for each LED. For example, two external LEDs, each with a 2k Ω series resistor, could be powered from one unit at 5mA each.

Connect each LED anode to "Remote LED +" through a resistor, and the cathodes to "Remote LED -".



3.3.3 Auxiliary Relay Contacts

The auxiliary relay contacts, Pins 6 & 7, provide a way to cascade units or to provide confirmation feedback to a central controller. When the switched receptacles are on, the aux relay contacts are closed. There is a 1 second delay before the aux relay closes, which allows time for the SurgeX Inrush Current Elimination (ICETM) circuit to operate. This short delay in combination with the SurgeX ICETM makes it unnecessary to sequence the power to several large loads (such as amplifiers) because of inrush current. SurgeX Space Saver products, when cascaded, can turn on a bank of large amplifiers with no inrush current, and therefore no risk of tripping a circuit breaker.

To cascade two or more Space Saver products, connect the aux relay contacts of one unit to the contact closure input of the next unit. To provide confirmation feedback, connect the aux relay contacts to an input on the central controller.

The relay contacts are rated for 1 amp at 30 V DC.

4 **LED Indicators** Self Test Power There are four LED indicators located on the front panel. Their function is as follows: **Over/Under Voltage** Remote Protection Self Test (Green): When illuminated, the surge protection circuitry is functioning correctly. When illuminated, the power switch is turned on, power is **Power (Red):** applied to the unit, and the AC voltage is within normal limits. **Over/Under Voltage** When illuminated, indicates that the AC voltage is either **Protection (Orange):** below 90V or above 145V. **Remote (Yellow):** When illuminated, indicates that the remote control is active and the rear switched receptacles are on.



5 <u>Specifications</u>

Operational Voltage Range:	90 to 150 Volts AC
Current rating:	15/20 Amps
Power Rating:	1,800/2,400 Watts
Maximum Load Inrush Energy:	1000 Joules total during power-up
Under-Voltage Shutdown:	90 V (resume at 100V)
Over-Voltage Shutdown:	145V (resume at 135V)
Surge Let-through Voltage:	Zero let-through Voltage for a 6000 Volt surge
Meets Federal Guidelines:	Grade A, Class 1, Mode 1 (CID A-A-55818)
EMI/RFI Filter, Normal Mode:	40 dB @ 100 KHz, 50dB @ 300 KHz, 50 dB @ 3 MHz,
	50 dB @ 30 MHz (50 Ohm load)
EMI/RFI Filter, Common Mode:	18dB @ 300 KHz, 30 dB @ 1 MHz, 50 dB @ 5 MHz,
	50 dB @ 20 MHz (50 Ohm load)
Maximum Applied Surge Voltage:	6,000 Volts *
Maximum Applied Surge Current:	Unlimited (due to current limiting) *
Maximum Applied Surge Energy:	Unlimited (due to current limiting) *
Endurance:	(C62.41-1991 category B3 pulses), 1 KV > 500,000; 3 KV > 10,000; 6 KV > 1000
Number of Outlets:	2, 8, 18, or 24; Model Dependent
Remote Control Voltage:	5 to 30 Volts DC
Remote Control Current Draw:	4 mA maximum
Contact Closure Max. Resistance:	100 Ohms
Auxiliary Relay Contact Rating:	30 Volts DC at 1 Amp
12 Volt Output Max. Current:	20 mA
Dimensions (no rack ears or feet):	Refer to Section 2.1 Physical Dimensions
Weight:	Refer to Section 2.1 Physical Dimensions
Temperature Range:	5C to 35C
Humidity Range:	5% to 95% R.H. Non-condensing

Agency Listings: ETL and cETL (UL 1449, Third Edition, Type 3 Surge Protective Device; UL 1283; CSA C22.2 No.8-M1986, R2004). Listed as base models SX-1115-RT, SX-1120-RT.

* 1.2 x 50 microsecond industry standard combination wave surge as per IEEE C62.41

CAUTION: Do not repeatedly turn a unit off-on-off-on with a heavy load connected. The ICETM circuitry absorbs the inrush energy each time the unit is turned on and may overheat if this is done too many times in a short period of time. Wait one minute between repeated turn-ons.

CAUTION: Do not install this device if there is not at least 10 meters (30 feet) or more between the electrical outlet and the electrical service panel.