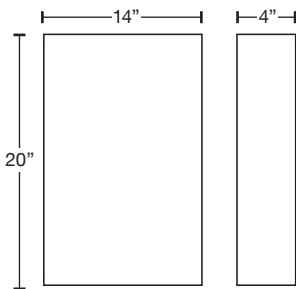


**SAK-2-100MS-M**

**SAK-2-100MSD-M-100**



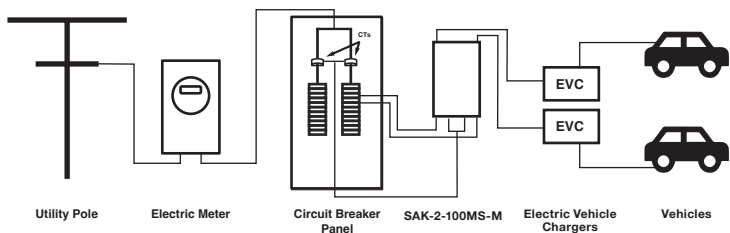
### Features

- Manages loads of 2 EV chargers up to 100A each
- Can be installed on any main or sub panel up to 400A to add managed loads up to 100A continuous.
- Adapts to any application using the precision field adjustable set points. These maximize access to the added load and prevent looping.
- Field adjustable set points include: panel overload amperage, overload inrush cutoff delay, restore amperage threshold, load restore delay time and line-loss compensation adjustment for CTs. Controller LCD displays actual real-time amperage on panel.
- Controller is self-powered from line voltage. External power supply not required. Can control 120VAC single pole or 208–240VAC double pole circuits.
- Prevents overloading and saves costly upgrades to panel and/or electrical infrastructure.
- Utilizes a magnetic latching relay for long-term reliability, and box-lug in and out terminals for ease of installation.
- Comes standard with 250A split core CTs. 100A and 500A split core CTs are available at additional cost.
- 2 year warranty
- Comes standard in NEMA 1 enclosure (NEMA 3R option also available)
- SAK-2-100MSD-M-100 features two 100A internal disconnects

### Load Watch - Power Manager

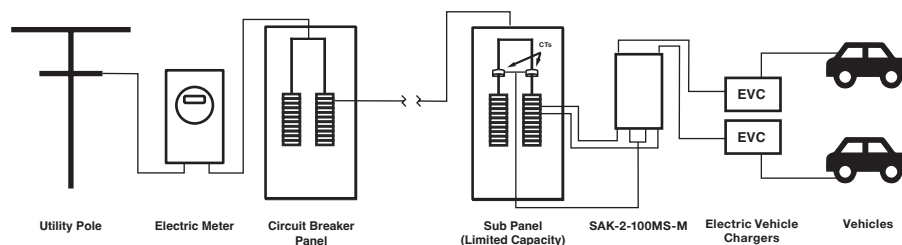
Allows 2 loads up to 100A to be added to any main service panel or sub panel that is at risk of overload, or will become overloaded, when a new load is introduced. The onboard intelligent micro-controller monitors the load on the existing panel and only allows the added load access to the panel when capacity is available. SAK-2-100MS-M installation requires two open breakers or quad breaker. SAK-2-100MSD-M-100 comes with two 100A internal disconnects.

### Diagrams



**PROBLEM:** Main circuit panel does not have capacity to add EVC and trips main breaker when EVC is active.

**SOLUTION:** Install SAK-2-100MS-M in between EVC and main panel. Load management device will ensure panel is never overloaded by EVC or any controlled load connected to SAK-2-100MS-M.



**PROBLEM:** New load is required downstream of main panel. The remote sub panel is near capacity. It is not cost-effective to run new circuit from main panel.

**SOLUTION:** Install SAK-2-100MS-M in between EVC and sub panel. Load management device will ensure sub panel is never overloaded by EVC or any controlled load connected to SAK-2-100MS-M.

## Installation and Programming Instructions

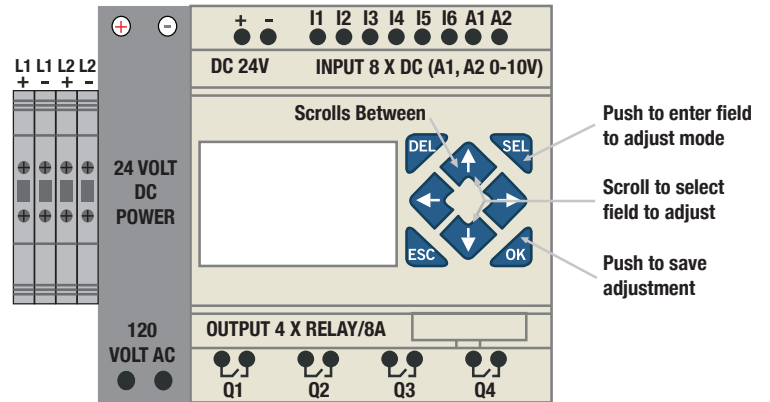
### Theory of operation

After DR01 times out the program will look at the value of Utility Full Load (DR02) to determine the maximum amps available. A comparator circuit will look at the anticipated load of Relay1 (DR03) and the Utility Actual Cur reading, (this will always be determined by the higher of the 1-3 CT inputs).

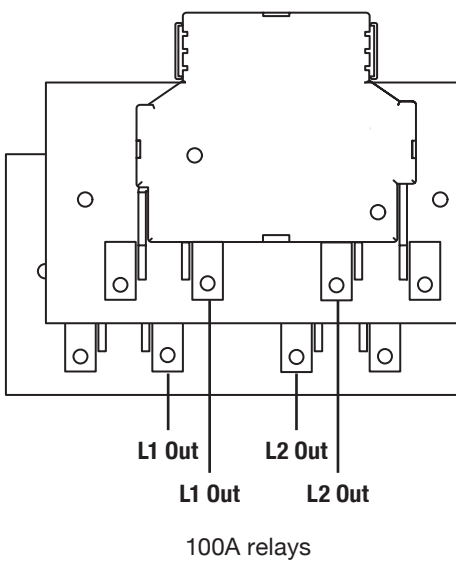
When capacity is available Relay1 will revert to the normal state and turn the load on. After the load is restored the program will pause for the number of seconds set by input setting stabilize time (DR0A). After the delay period the program will compare the UtilityActual Cur reading, with Utility Full Load (DR02) and the anticipated load of Relay2 (DR04), if the comparator program determined capacity is available, Relay2 will revert to its normal state turning on load 2. This sequence is repeated for relays 3-4, 3-8 or 3-12 depending on the controller model installed. When the anticipated load would exceed the generator capacity the load will not turn on and the program will stop at that load until capacity is available.

Any time the load exceeds 90% of Utility Full Load (DR02) the relays will begin to shed the loads from highest number relay (lowest Priority) to lowest number relay (relay 1 highest priority). The controller will shed relays 4, 3, 2, 1 individually until the overload is removed.

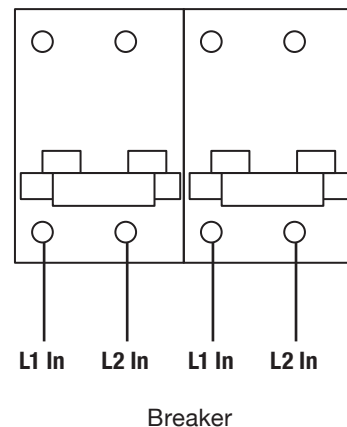
The program will then repeat the process restoring and removing loads based on the load priority and the available capacity of the generator.



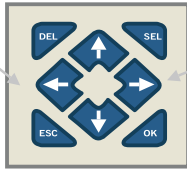
### Wiring Diagrams



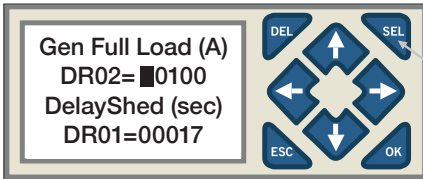
Output of breaker comes pre-wired to the relay input



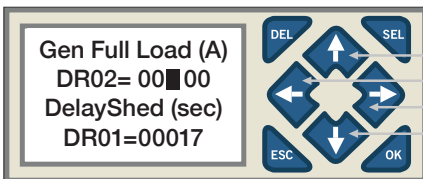
## Adjusting the Controller Variable Inputs Using the Front Panel Buttons (All Versions)



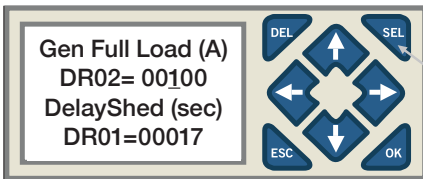
**Left and Right Arrow Key:** The left arrow key is used to scroll through all screens. Scroll to the screen you want to adjust and use the following key sequences to make the required adjustments. Note: hold button for 1-2 seconds to advance to the next screen.



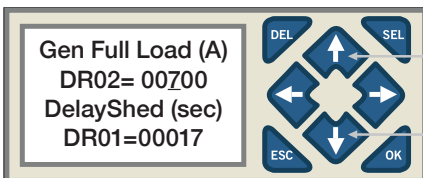
**Entering the Programming Mode:** The select key is used to enter the programming mode on any screen. After pressing the SEL key a flashing block cursor will appear.



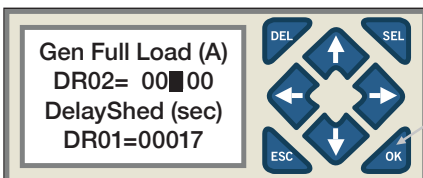
**Move Cursor to the Desired Adjustment:** Use the up, down, left and right keys to position the cursor on the digit to be adjusted.



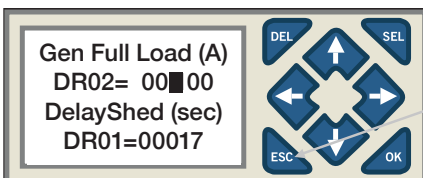
**Push the Select Key Again:** Press the select key again to enter the adjustment mode. The flashing block cursor will change to a flashing under-score.



**Adjust Value with Up-Down Keys:** Use the up, down keys to adjust the value of the setting. You can scroll left and right to adjust multiple digits in the same adjustment field.

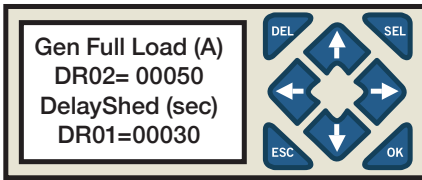


**Press the OK Key to Save:** Use the OK Key to save the adjustments made.



**Press The ESC Key To Exit Programming Mode:** Use ESC Key to exit the programming mode to enable scrolling between adjustment windows.

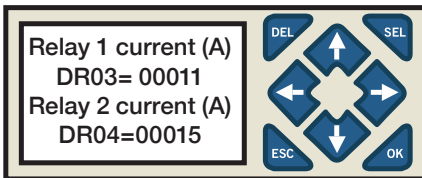
**Note: "Gen" in the program interface is the same as "Utility"**



Screen 01

**DR02 or Panel Cap for RV:** Adjust to generators maximum amperage output in whole Amps. Adjust for standard running amps not In-Rush current.

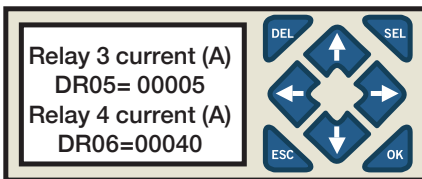
**DelayShed DR01:** Delay period in seconds from the generator start up until the 1st load will be considered for restoration. Set “Generator Full Load DR02” to same amperage as main breaker in panel.



Screen 02

**Relay #1 Current DR03:** Adjust to the estimated maximum amperage in whole amps for load #1.

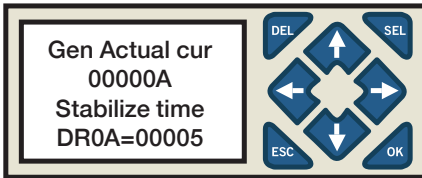
**Relay #2 Current DR04:** Adjust to the estimated maximum amperage draw in whole amps for load #2.



Screen 03

**Relay #3 Current DR05:** Adjust to the estimated maximum amperage draw in whole amps for load #3.

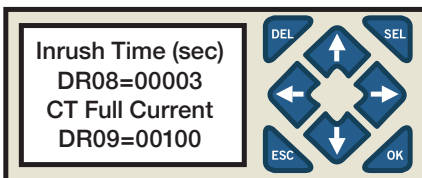
**Relay #4 Current DR06:** Adjust to the estimated maximum amperage draw in whole amps for load #4.



Screen 04

**Actual Real-Time Amps:** Generator/panel for EV amp load as measured by the controllers highest reading on either CT.

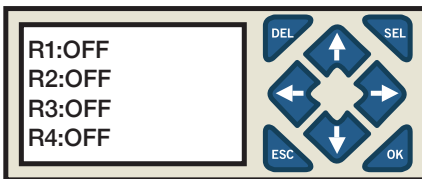
**Stabilize Time:** Adjust the time delay time in seconds between the individual turn on of Relays 2-4.



Screen 05

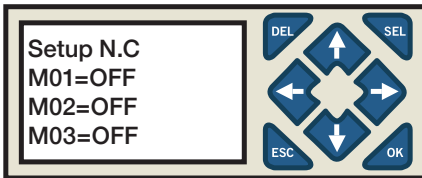
**Inrush Delay DR08:** Adjust allowable InRush delay time before load shedding will occur. Start at 3 seconds and adjust if needed.

**CT Full Current DR09:** For CTs with a 0-10VDC output set DR09 to maximum current rating of CT. For CTs with 0-5VDC output set DR09 to two times the value of the maximum current rating of the CT selected. Confirm calibration by placing an AMP probe on the generator feeds and comparing the reading to “Gen Actual Cur” reading. “Actual Real-Time Amps” is the average of the load panel amps realtime. Used to calibrate and confirm proper operation and set up.



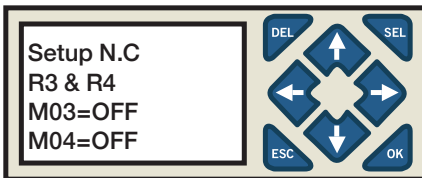
Screen 06

**Real Time State of relays 1-4 (Fixed reading, not adjustable).**



Screen 07

**Normally Open/Normally Closed Setup Relay 1 & 2:** See NO/NC setup procedures on page 8.



Screen 08

**Normally Open/Normally Closed Setup Relay 3 & 4:** See NO /NC setup procedures on page 8.

**Note: “Gen” in the program interface is the same as “Utility”**