Super Cell
Alarm System

By Haute Solutions

(www.haute-solutions.com)

SIM7600 (4G): 2022-06-08

What is the "Super Cell" Alarm System:

The Super Cell Alarm System is a unique alarm system designed specifically for owners who want a continuous method to monitor the status of their equipment as well as its current geographic location (via GPS). The Super Cell is constantly on, monitoring your vehicle, and waiting for commands via SMS. The Super Cell has 4 separate input triggers and 4 separate output relays. Each trigger and relay can be configured independently with respect to priority and function. The Alarm will report its status and GPS location at any time (even if NOT currently triggered). If the Alarm is tripped, it can control 4 separate outputs (i.e. Siren On, Brakes On, Marker Lights Flashing, Interior Lights On) and send SMS updates (inc GPS location) at specified intervals.

Unique capabilities of the Super Cell:

- The Super Cell Alarm is completely configurable via simple SMS text messages. Any phone that supports text messaging can configure the Super Cell. (No proprietary Apps required! No O/S limitations!)

- The Super Cell Alarm will notify all recipients (up to 5) when the alarm is tripped via simple SMS messages. This will even include the name of the specific trigger which was tripped (i.e "Door Switch", "Trailer Motion" , etc) This is ideal for vehicles which are stored remotely, or in an isolated location, with no one to watch them. Providing multiple SMS notification contacts helps ensure the closest individual can respond. Any phone that supports text messaging can receive Super Cell alert messages. (No proprietary Apps required! No O/S limitations!). (GSM/SMS function can be disabled).

- The Super Cell will provide real-time GPS Location information within the SMS alert messages. It will continue to send real-time GPS Vehicle Location updates on a user defined interval (every 5 min, 10 min, etc). GPS location is not only provided in raw Latitude and Longitude coordinates, but a custom clickable link is also included in each SMS message. Clicking this URL will automatically bring up a graphical map which pin points the real-time location of the vehicle. This is ideal for real-time tracking of a stolen vehicle. (GPS Function can be disabled).

- The Super Cell will provide GPS location on request (even if the alarm is not currently tripped). You can ask for the status and location of your vehicle at any time!

- The Super Cell continually monitors the battery supply voltage. It will send out an SMS message if the supply voltage gets low. If you leave your vehicle unattended for long periods, the Super Cell will send you an SMS message when the battery needs charging.

- There are no monthly fees required to use the Super Cell Alarm. You may use a GSM compatible SIM card from the provider with a service plan of your choice. There are multiple GSM cellular providers who offer pay-as-you-go service and do not charge a monthly fee. In fact, you can even use the Super Cell as a standalone alarm system without any GSM service at all.

- Similarly, the Super Cell does not require any subscription service to monitor the status or location of your vehicle. It communicates directly with your cell phone via SMS text messages.

- The Super Cell will automatically send out a STATUS SMS message on the first day of each month. This will not only help confirm the alarm is operational but also serves as a keep-alive message for some prepaid cellular providers which require minimal usage.

- Once activated/tripped, the Super Cell will also act as an SMS communication hub for all users on the Notification List. An SMS Recipient can reply with a simple SMS reply back to the Super Cell and it will forward that message to everyone on the Notification List. This is useful if one recipient wishes to inform all others that he/she will be investigating the issue or perhaps tripped the alarm by mistake.

- The Super Cell has 3 independent triggers. Each trigger can be independently configured with respect to priority, output relay control, and reset time. Triggers can also be independently configured to activate based on a negative input (switch to ground) or a positive input (switch to +12V). You choose what to wire to your triggers, what priority they should be given, what outputs they should activate, and how long they should take to reset!

- The Super Cell has 4 independent 12V output relays. Each output can be independently configured to turn on, flash, or even be disabled. You may want to turn on your siren circuit, but flash your marker lights when the alarm is tripped. You choose what to wire to your output relays and how they should be controlled!

- The Super Cell may be configured as a "Silent Alarm" if desired. Maybe you want to sound the siren and flash the lights if the door is opened. However, you might also want to signal a silent alarm if the trailer is hooked up and moved. This will allow you to continue to get SMS alerts with GPS info to track the vehicle location without alerting the vandals who will try to disable an alarm. By using the trigger priority feature, you can decide which triggers provide a visual/audible alert and which triggers dictate a more stealthy approach to notification.

- The Super Cell alarm may even be used as a GPS tracking device if no alarm function is desired. The Super Cell will return real time GPS location information on demand regardless of Alarm functionality.

- The Super Cell is password protected. Only users who have validated their cell phone numbers with the password can control the alarm and receive notifications. Once your cell number is validated you will not need to authenticate again.

- The Super Cell can be configured for multiple levels of functionality: as a standalone alarm (requiring no GSM or GPS functionality), for simple SMS Text Alert capability, with full SMS Text Alerts which contain real-time GPS location information, or even as a simple GPS tracking device. Start simple and add functionality as desired. No change in the core hardware or software is required.

- Maybe best of all, the Super Cell is based on Open Source Hardware (Arduino) and we have released the firmware under Open Source licensing. Haute Solutions will maintain the firmware source code on our web site for public access. The Alarm System is easy to update and program (using a free toolset and a common USB cable). Individual customers can download the firmware source code to make changes to the core functions if so desired. Haute Solution encourages all users of the product to upload any variations in the firmware code so we can make this alternate firmware available to the entire owner community (in the spirit of Open Source). The source code, however, may NOT be used or modified for use in any commercial products other than the Super Cell Alarm.

Accessories required for specific Super Cell Alarm functionality:

Depending on how you wish to install, configure, and operate the alarm, you will likely want to consider some additional accessories:

		Configuration				
		Local Alarm	Full Functionality	Silent Alarm (With GPS)	Silent Alarm (Without GPS)	GPS Tracker
Function	Lights/Siren	Enabled	Enabled	Disabled	Disabled	Disabled
	GSM/SMS	Disabled	Enabled	Enabled	Enabled	Enabled
	GPS	Disabled	Enabled	Enabled	Disabled	Enabled
Accessories	Keylock Switch	Yes	Yes	Yes	Yes	Yes
	Arm/Disarm Relay	Opt	Opt	Opt	Opt	Opt
	Door Switches	Opt	Opt	Opt	Opt	No
	Vibration Sensor	Opt	Opt	Opt	Opt	No
	PIR Motion Sensor	Opt	Opt	Opt	Opt	No
	SIM Card	No	Yes	Yes	Yes	Yes
	Siren	Yes	Yes	No	No	No
	GPS Antenna	No	Yes	Yes	No	Yes
	GSM Antenna	No	Yes	Yes	Yes	Yes

Notes:

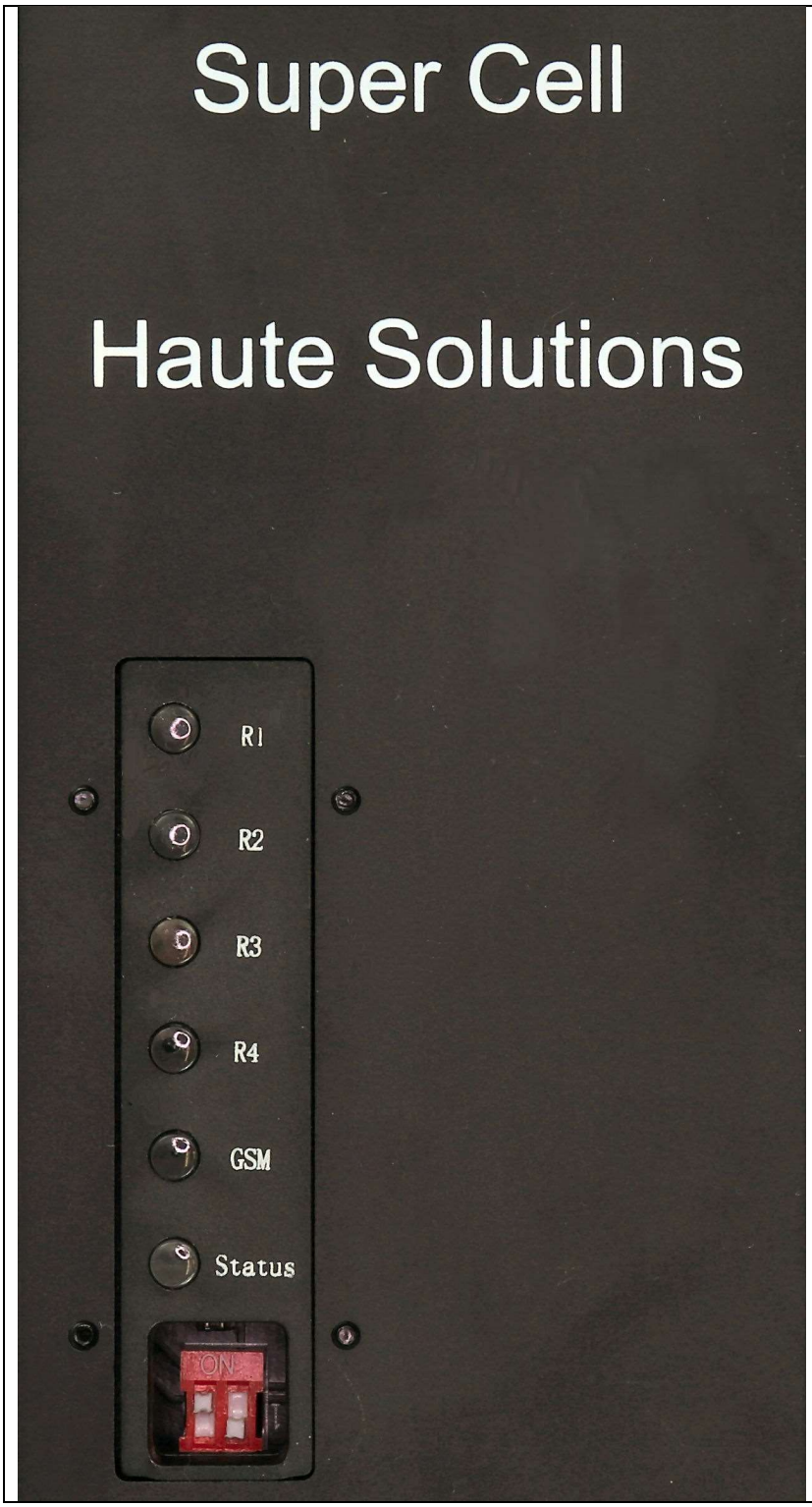
1. A Keylock Switch is recommended for all installations. Although a GSM enabled alarm can be Armed/Disarmed via SMS commands, or an optional wireless arm/disarm remote, it is always advisable to have a positive method to enable/disable the alarm if in areas with poor cellular signal.

2. At least one type of trigger (Door Switch, Vibration, PIR Motion, etc) is required for use as an alarm.

3. Although a direct connect GSM antenna is included with the Super Cell (primarily for testing), an externally mounted antenna is recommended for optimum cellular reception.

Introduction to the Super Cell Alarm:

Configuration switches and status lights can be seen and accessed from the front of the alarm enclosure.



Here is a close-up of the status lights and configuration switches.

R1 LED: This LED will illuminate whenever the Output Relay #1 is providing power to the attached device(s).

R2 LED: This LED will illuminate whenever the Output Relay #2 is providing power to the attached device(s).

R3 LED: This LED will illuminate whenever the Output Relay #3 is providing power to the attached device(s).

R4 LED: This LED will illuminate whenever the Output Relay #4 is providing power to the attached device(s).

GSM LED: This LED is used to indicate the status of the GSM (cellular) functionality. More information is provided in the troubleshooting section of this document.

STATUS LED: This LED is used to indicate the overall status of the device. More information is provided in the troubleshooting section of this document.

The following DIP Switches can be accessed by removing the plastic cover:

DIP SWITCH 1 (Left): ON = GSM Function Enabled, OFF = GSM Function Disabled.

DIP SWITCH 2 (Right): OFF = Normal, ON = Factory Reset

Here is a close-up of the audio and antenna ports on the side of the enclosure. The Speaker and Mic ports are reserved for future expansion and are not currently in use. There is also a connector for a GSM (cellular) and GPS antenna.

On the other end of the enclosure we have the USB port used for programming and updating the alarm.

Preparing for GSM/Cellular Functionality:

If you wish to enable GSM service on the Super Cell, you will need to establish an account with a GSM Carrier and obtain a SIM card. Since the traffic requirements are very low for this device, we recommend a "Pay as you go" type cell service for the device. There are several Cellular providers which offer a very cost effective "Pay as you go" service without any monthly fee. The SIM7600 based Super Cell is a Multi-Band 4G GSM device optimized supporting cellular frequencies world-wide

If you decide to enable GSM services on the device, you can obtain a SIM card from any 4G GSM provider. The Super Cell requires the middle size "Micro" SIM card. Not the larger "Standard" SIM or the smaller "Nano" SIM card (as used by some Apple devices).

The registration process for each GSM carrier will be slightly different. However, you must register with your provider in order to obtain a SIM card and have a unique phone number associated with your Super Cell.

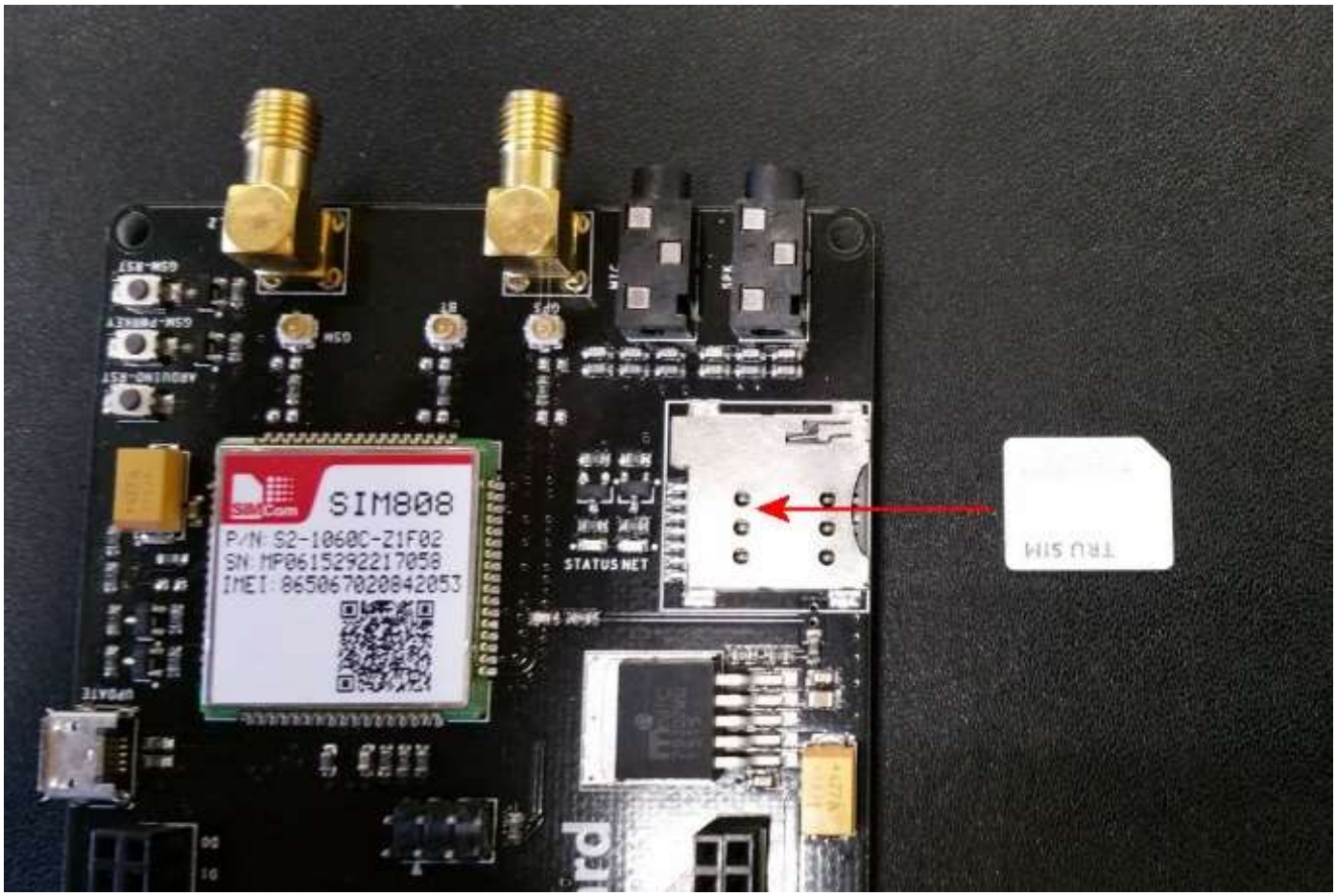
Please note that the Firmware in the Super Cell will automatically forward any inbound SMS messages from unknown sources to everyone on the "Notification" list when an SMS message arrives from an "unknown" source. You may find this useful as some service providers (T-Mobile for instance) will require that you enter a validation code sent to your device in order to complete Pre-Paid Account Registration. If this is the case, just make sure the Super Cell is powered up, and that your cell number is already on the Notification list, when the SMS message arrives. (Notification List is discussed later in the documentation).

If you have an unlocked GSM cell phone, you may wish to temporarily install your SIM card into your phone to ensure that service has been properly established by your provider prior to installing the SIM into the alarm system. Send/Receive a few SMS text messages to confirm SIM registration and activation if you have the opportunity to do this.

SIM Card Installation/Removal: In order to install/replace the SIM card in the Super Cell, you will need to remove the alarm housing. It will be easiest to do this BEFORE you install the alarm

Disassembling the Alarm Housing: Unscrew all 6 screws on the sides and bottom near the end with the antenna connectors. You will also have to remove 4 screws on the sides of the enclosure near the harness end of the enclosure. (You DO NOT need to remove the 2 screws on the bottom of the enclosure near the harness end). Please note that there are 2 different types of screws and that they should be re-installed appropriately. There are 8 course threaded screws which screw into the plastic end caps, and there are 2 fine threaded screws which screw into the metal baseplate. Also note that 2 of the course threaded screws must be accessed from the underside of the base plate. Once all 10 screws are removed, pull the antenna end cap outward and set aside. Tilt the enclosure upwards from the antenna end to about 45 degrees and then pull the cover off to the open side. (Be careful not to drag the clear "light pipes" across the upper circuit board). Reassembly is the reverse process of this process.

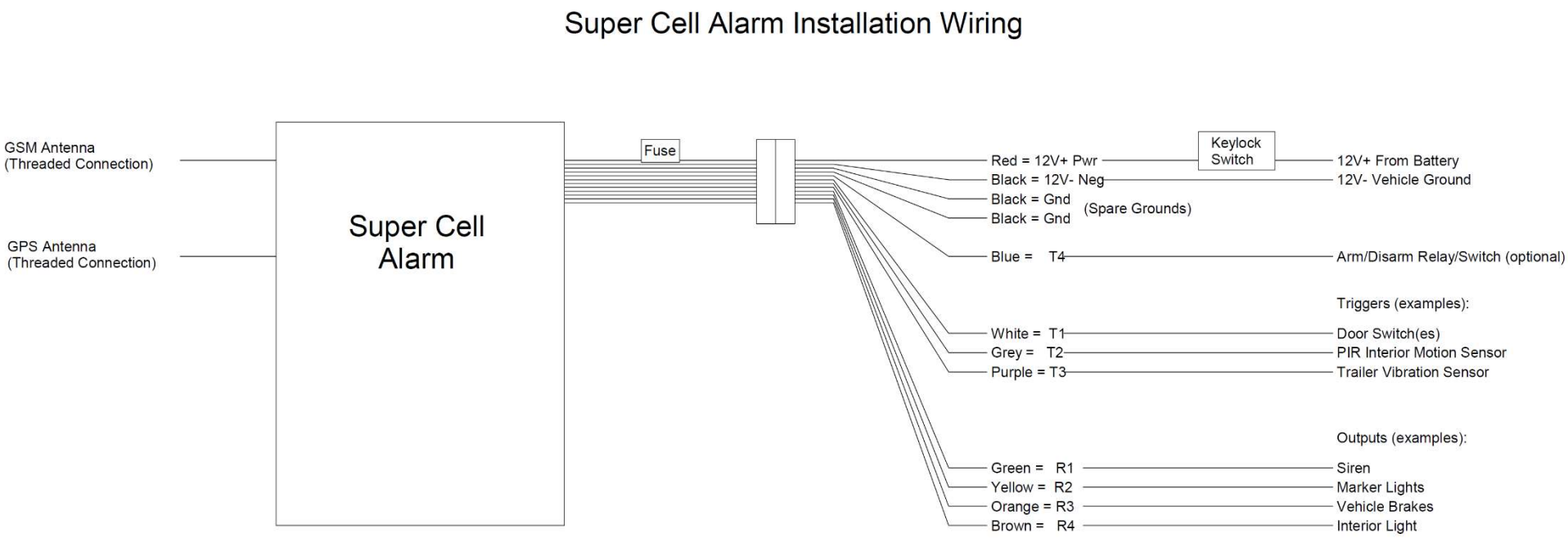
Once the housing is open, you will then have easy access to the SIM card slot on the side of the bottom board. Push the SIM card fully into the slot until it clicks in place. Note that it is possible to install the SIM card into the holder in the WRONG orientation. Please refer to the photo below to ensure the SIM card is installed properly.



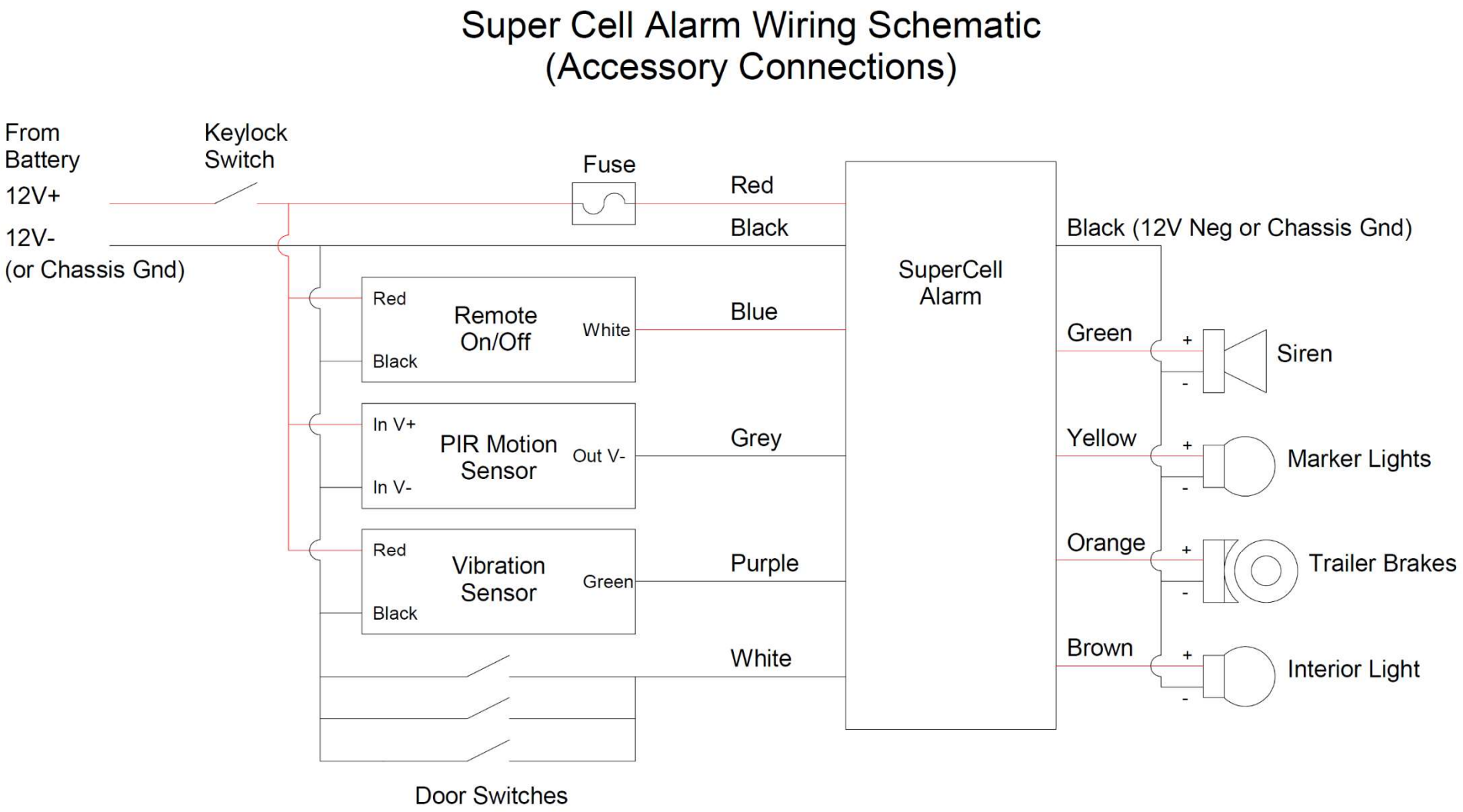
(The upper board has been removed in the photo to aid in clarity. We do not recommend separating the two boards as it is quite easy to misalign the upper board during reinstallation. Note that this is an older PCB in the photo although the SIM Card Orientation is identical.)

Once the SIM card is installed/replaced, assembly is simply the reverse of disassembly. Be careful to slide the enclosure cover in place onto the harness end cap at an angle so as not to disturb the "light pipes" during re-assembly. Once the enclosure cover is fully re-seated onto the base, re-attach the antenna end cap and carefully re-install the screws.

Installing the Super Cell Alarm (Wiring): Here is a basic wiring diagram for the Super Cell Alarm:



Accessory Wiring: Here is a schematic which shows specific terminal/wiring assignments: Note that this diagram reflects the alarm using the default factory configuration and illustrates connections for specific optional accessories.



Wire Color	Wire Designator	Function
Red	12V+	12V Pos from Battery
Black	12V-	12V Neg from Battery
Black	GND	Spare Ground (For Sensors)
Black	GND	Spare Ground (For Sensors)
Blue	AD	Arm/Disarm Relay/Switch (Input)
White	T1	Trigger 1 (Input): Factory Default = Door Switch
Grey	T2	Trigger 2 (Input): Factory Default = PIR Motion
Purple	T3	Trigger 3 (Input): Factory Default = Trailer Motion
Green	R1	Output 1 (12V): Factory Default = Siren
Yellow	R2	Output 2 (12V): Factory Default = Marker Lights
Orange	R3	Output 3 (12V): Factory Default = Electric Brakes
Brown	R4	Output 4 (12V): Factory Default = Interior Light

(Note that all Black Wires are a common ground and interchangeable)

12V Power (12V+, 12V-): The Super Cell requires a 12V battery source for power. This power is used to operate the alarm as well as provide power to the Output Circuits.

KEYLOCK Switch: Although the alarm can be Armed/Disarmed via text messages, an externally accessible keylock switch should be installed to allow alarm control in absence of a good cellular signal. This switch should be an externally accessible SPST (Single Pole Single Throw) key operated switch with a simple OPEN/CLOSED function. Additionally, if any sensors require 12V power, you may wish to also power them from the keylock switch. This way, the entire alarm and all sensors can be enabled/disabled from the keylock.

GSM Antenna: While the included GSM antenna (connected directly to the alarm itself) may be sufficient to send/receive SMS messages inside the trailer, an externally mounted GSM (Cell Phone) Antenna will generally provide better signal transmission/reception. It is recommended you consider an external GSM antenna for best performance.

GPS Antenna: You must install an external GPS antenna on the roof of the vehicle if you wish to use the real-time GPS Locator capability. GPS requires an unobstructed view of the sky. If you do not wish to install an external GPS antenna on your vehicle, or maybe just want to do it at a later time, simply configure the “UseGPS” parameter as “No” to disable GPS functionality.

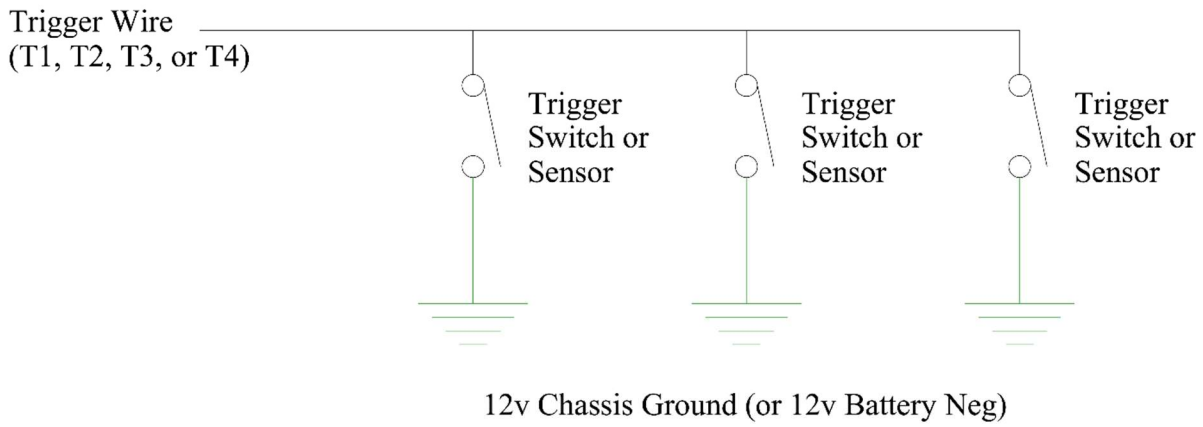
Arm/Disarm Relay or Switch (AD): The AD wire is optionally connected to a remote control relay or switch. It is not required to be used but can be employed to provide an alternate method of arming/disarming the alarm. A relay controlled by a wireless keychain remote can be used for this purpose. (See section on “Arming/Disarming the Alarm” for more info).

Relay Outputs (R1, R2, and R3, and R4): The Relay Output wires provide 12V positive power to your accessories (Siren, lights, brakes, etc). Each output circuit (R1, R2, R3, or R4) can be configured independently (via SMS command) to provide constant power, Flash On/Off, or simply be disabled.

Trigger Circuits (T1, T2, and T3): The Super Cell uses an “Open Loop” trigger system. An Open Loop alarm system is designed to have all triggers/switches in an OPEN state until an event is triggered. The Super Cell may use any type of trigger switch which is maintained in an OPEN configuration until tripped. To trip the alarm, the trigger switch should CLOSE the trigger circuit. For example: When a door is fully shut on your vehicle, the trigger switch should keep the circuit OPEN. When the door is opened, the switch should CLOSE the trigger circuit. The Super Cell may use any trigger switch designed for use in an Open Loop System including Door, Window, Reed, Motion, and Vibration switches.

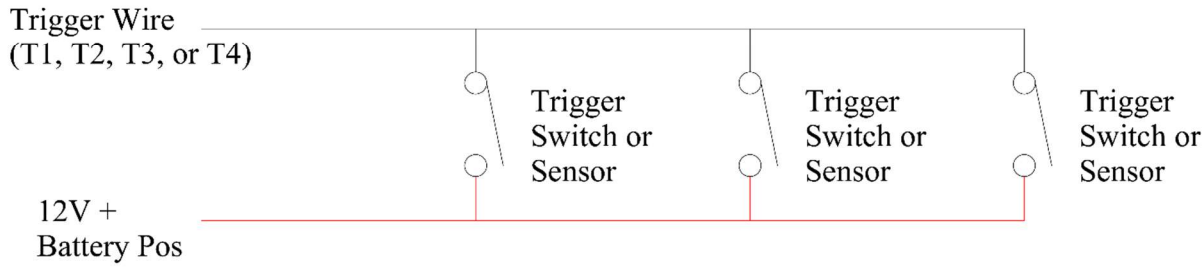
By default, the Super Cell is configured to use any Switch or Sensor which completes the circuit to the vehicle ground (NEGATIVE Ground Trigger). However, individual trigger circuits can be manually re-configured (via jumpers) to use switches or sensors which supply a 12V+ signal when tripped if desired (POSITIVE Trigger). (See the Trigger Configuration Notes which follow on how to change a Trigger for Negative or Positive operation).

Negative Ground Trigger



- NEGATIVE TRIGGER: A Negative Trigger will be activated if the trigger wiring is sent to vehicle ground (or 12V negative battery connection). The trigger switches or sensors should complete the trigger circuit to the vehicle ground (or 12V -) when the alarm is to be triggered.

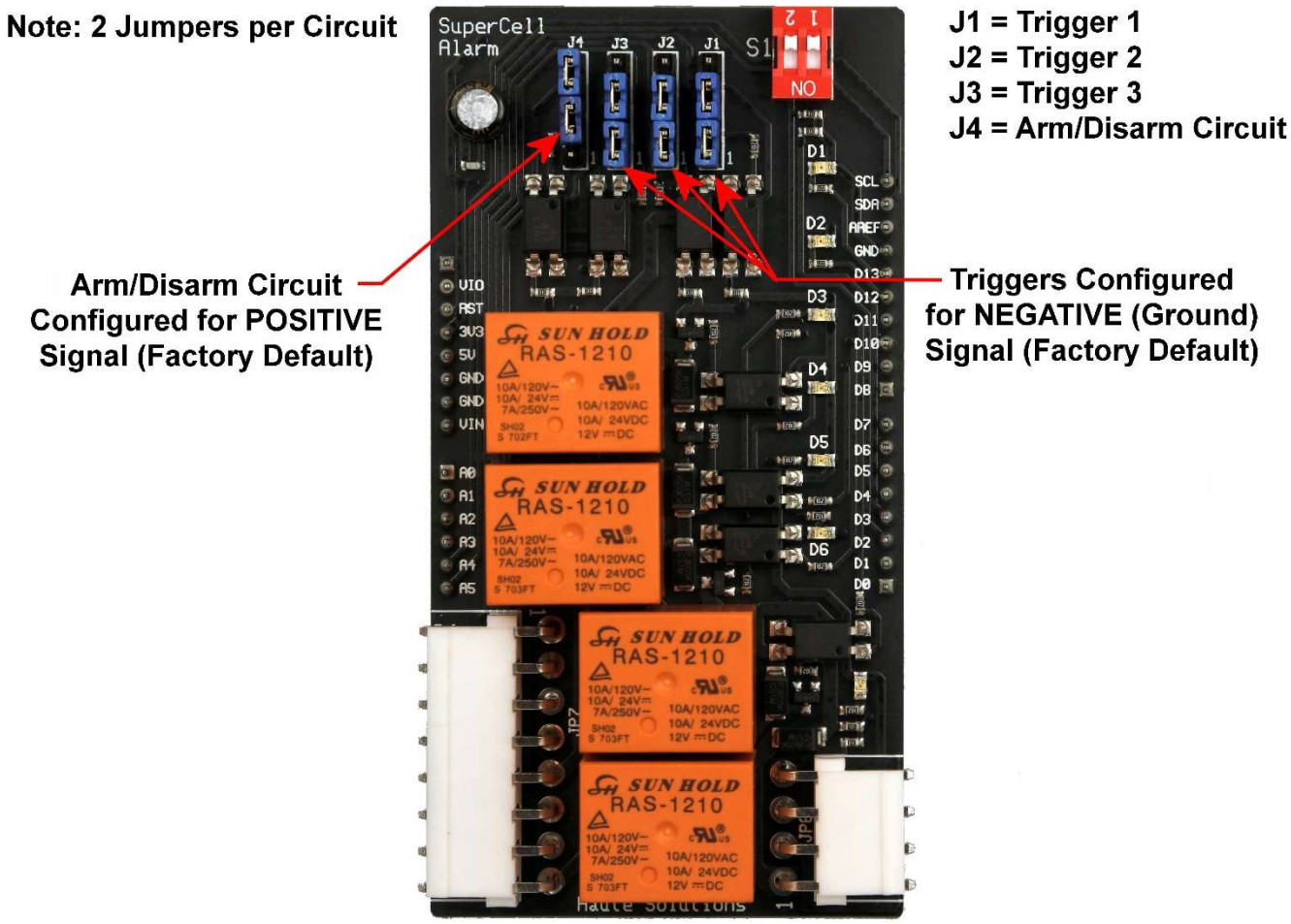
Positive Battery Trigger



- POSITIVE TRIGGER: A Positive Trigger will be activated if the trigger wiring is connected to a 12V positive voltage source. The trigger switches or sensors should complete the trigger circuit to a live vehicle battery circuit (or 12V +) when the alarm is to be triggered.

Triggers are configured by default as Negative Triggers. If you wish to change one or more triggers for Positive Trigger operation, then the alarm housing must be opened and the corresponding trigger configuration jumpers relocated as appropriate. (Detailed notes on how to open the Alarm Housing can be found in the section which discusses SIM Insertion and Removal).

The following photo illustrates the appropriate jumper configuration for Positive vs Negative Trigger configuration:



Determining if a Sensor Requires a Negative or Positive Trigger: Once you have selected a sensor, you may have to determine if it is providing a Negative or Positive signal when it is activated. If the documentation for the sensor is not sufficiently clear, you may have to determine this for yourself. Fortunately, you can do this with a simple multi-meter. Most active sensors have 3 to 4 wiring connections. Two of those connections are typically used to power the sensor (12V+ and 12V-). It's how the OTHER one or two wires/connections are being used which might take a bit of testing. (Please note that the following info is provided in an effort to be helpful and Haute Solutions assumes no responsibility for any damage which may occur if a sensor is tested, configured, or connected improperly).

Negative Voltage Control (Common Positive): These are actually pretty common. (That's why we factory configure the Super Cell to use a Negative Trigger). You will find that there is full continuity between the positive power terminal and the positive output terminal on the sensor at all times. The positive output terminal will show a 12V+ signal whenever the sensor is powered (even if it is NOT tripped). This type of sensor simply connects the 12V- power input terminal to the 12V- output terminal whenever it is tripped. Simply run the 12V- output terminal on the sensor to a Negative Trigger circuit and it should work fine. (The 12V+ output terminal on the sensor does not need to be connected at all).

Positive Voltage Control (Common Negative): You will find that there is full continuity between the negative power terminal and the negative output terminal on the sensor at all times. The negative output terminal will show a 12V- signal whenever the sensor is powered (even if it is NOT tripped). This type of sensor simply connects the 12V+ power input terminal to the 12V+ output terminal whenever it is tripped. To use this sensor you should run a wire from the 12V+ output terminal on the sensor to a Trigger circuit configured as a Positive Trigger. You will need to manually reconfigure the desired trigger circuit to operate as a positive trigger via jumpers inside the alarm. (The 12V- output terminal on the sensor does not need to be connected at all).

Isolated Relay: These sensors simply provide two terminals which are otherwise isolated and only connect to each other when the sensor is tripped. A multimeter will show no continuity between the two terminals when the sensor is off and full continuity when the sensor is tripped. It will also NOT show a Positive or Negative voltage (from the power supply) on either terminal regardless if the sensor is tripped or not. Just connect one of these isolated terminals to the vehicle ground and the other terminal to a Negative Trigger circuit and it should work fine.

Factory Configuration

The SuperCell Alarm is an extremely flexible device. It can be configured in many different ways. However, if you do not wish to learn all the details regarding the many options for this alarm, you can use the Factory Default Configuration. (If you want to understand all the configuration options which are possible with this alarm, please skip ahead to the "Advanced Configuration" section of this document).

Factory Configuration: Using the factory Default Configuration:

- You do not need to modify the configuration of any Triggers
- You do not need to modify the configuration of any Outputs
- Attach your sensors and switches to the appropriate trigger as listed in the below table. All sensors/switches should function or be configured as a Negative Trigger (see previous ection). You do not need to use all the triggers. In fact, you can use just a single trigger if so desired. However, the alarm will "report" which trigger was tripped when the alarm is activated.
    - Trigger 1 = T1 = White Wire = Door Switches
    - Trigger 2 = T2 = Grey Wire = PIR Motion Sensor
    - Trigger 3 = T3 = Purple Wire = Trailer Vibration Sensor
- If you have one, attach your Siren to Output 1. This will chirp when arming/disarming.
    - Output 1 = R1 = Green Wire
- If you want to connect them, attach your Marker Lights (and or anything which you want to **flash**) to Output 2. This will flash when arming/disarming.
    - Output 2 = R2 = Yellow Wire
- If you want to use them, attach your Brake Circuit (and or anything you want to **stay on steady**) to Output 3
    - Output 3 = R3 = Orange Wire
- If you have the optional Arm/Disarm remote wireless remote, connect it to the Arm/Disarm Circuit
    - Arm/Disarm Circuit = AD = Blue Wire
- The Alarm will reset after 5 minutes of switch/sensor inactivity
- (A table showing the configuration details can be seen in the "Advanced Configuration" section of this document)

Standalone Operation of the Super Cell (GSM Disabled):

Although most people will want to use the Super Cell with full GSM and GPS functionality, it is possible to install the alarm to operate in complete isolation (as a traditional Alarm). If you DO NOT have a SIM card or DO NOT wish to enable GSM connectivity, simply place the S1 (GSM) dip switch into the OFF position. To enable full GSM/SMS connectivity, place the S1 (GSM) dip switch into the ON position.

- S1/GSM ON = GSM/SMS Enabled (Full GSM/SMS Connectivity. Requires Active SIM Card)
- S1/GSM OFF = GSM Disabled (Traditional Alarm. No SMS Configuration or Messaging, No GPS.)

ARMED: The alarm will automatically be armed 10 seconds after it is powered on. This will give some time for sensors to stabilize before the alarm enters the armed state. (Infrared motion sensors typically need some time to stabilize). You must use a Keylock Switch to control Alarm operation (arming/disarming) if you want to run the alarm in a standalone/isolated configuration.

CHIRP: The alarm will "chirp" Outputs 1 and 2 when armed (1 chirp) and disarmed (2 chirps)

TRIGGERS: Anyone of the three triggers will trip the alarm

OUTPUTS: Outputs 1, 2, and 4 will turn on steady and Output 3 will flash

RESET: The alarm will reset in 5 minutes

SMS NOTIFICATION: No SMS Notification is possible if GSM is disabled.

CONFIGURATION OPTIONS: All configuration options require two-way SMS messaging. If you are using the alarm in "Isolated Mode" (GSM Disabled) then no further configuration is available (without direct firmware modification). The default configuration options are set as follows when the alarm is isolated:

Although the Super Cell alarm has virtually an infinite amount of configuration possibilities, GSM connectivity is required to modify the factory default configuration. However, even with the factory configuration, you can decide how your alarm functions by choosing carefully which triggers you use and which outputs are connected to your chosen devices (siren, lights, etc). The names identified in the factory default configuration are only suggestions. More than one sensor/switch can be connected to a single trigger. More than one device may be connected to an individual output circuit.

SMS Operation of the Super Cell (GSM Enabled):

Normally, most users will want to take advantage of the SMS communications capability of the Super Cell Alarm to enable remote notification, control, and configuration of the alarm. You will need to activate and install a SIM card to use these functions.

Even if you do not desire to change the factory default configuration, you will need to understand how the alarm authorizes users for control and notification purposes:

Master Caller and the Notification List (Authorized Callers):

Notification List: The Super Cell uses a Notification List to send messages. All numbers in the Notification List are sent SMS Messages not only when an alarm condition is triggered, but also whenever the alarm is powered up, armed, disarmed, or reset. All numbers in the Notification List will also receive a message if a message comes in to the alarm from an unknown source. Furthermore, all numbers in the Notification List will receive a message if a non-command message comes in to the alarm from an authorized source (another number in the Notification List). This is useful if you need to get an SMS message forwarded to you from your GSM provider or if you wish to reply to alarm notifications for all other users to see. The Super Cell supports up to 5 cellular Callers for SMS alarm notification. (If you want more let us know!)

Authorized Callers/Users: The Super Cell uses caller ID to identify a Caller. Any Caller which is listed on the Notification List is automatically authorized to issue most command and control commands to the Super Cell. However, only the "Master Caller" can issue security sensitive commands which set the device password, manually add cell numbers to the notification list, and clear the Notification List.

Master Caller: When you first take the Super Cell out of the box, the Notification List is entirely empty. Once you power up the Super Cell, the first cell phone to send a text message to the Super Cell will automatically be added as the first number on the notification list. The first caller is automatically designated as the Master Caller. You may have up to 5 numbers in the SMS Notification List, but only the first one is automatically populated. Only the Master Caller can set the device password, manually add callers, or clear the Notification list.

You will want to initially configure the Super Cell from the same phone you want to be designated as the "Master Caller". The easiest way to initially establish your cell phone as the first notification number is to simply send a valid configuration command ("STATUS") to the alarm immediately after it first powers up. To add additional numbers to the Notification List use the "NOTIFY:" command. To display all numbers in the Notification List, use the "SHOWNOTIFY" command. To clear ALL numbers from the Notify List use the "CLEARNOTIFY" command. (Don't forget to add your phone again!) The Master Caller can be re-established at any time by clearing the Notification List. Anyone with physical access to the alarm can also clear the Notification List by Factory Resetting the device (via DIP Switch).

Adding Callers: Additional Callers can be added to the Notification List using one of two methods:

- The Master Caller can add users to the List by using the "NOTIFY:" command and specifying the associated cell number.
- Users can add themselves to the Notification List if a device password has been set. The Master Caller can set the device password using the "PWD:" command. Users may then send a text message, containing only the device password, to add themselves to the Notification List.

A maximum of 5 numbers for SMS Notification can be accepted. The Super Cell will tell you if you try and add more than five numbers. If you need to change the numbers on the list the Master Caller can delete the list ("CLEARNOTIFY") and start over.

First Time Operation

Installing the Super Cell:

1. Obtain and register a SIM card to obtain a cell number for the Super Cell
2. Open the Super Cell enclosure and install the SIM card
3. Plan your Trigger and Output Configuration using the included worksheets (If not Using Factory Config)
4. Determine your Trigger and Output Configuration Commands (If not Using Factory Config)
5. Mount the Super Cell in your vehicle
6. Install the Keylock (on/off) Switch
7. Attach all Power, Antenna, Trigger, Output, and optional Arm/Disarm relay wires to the Super Cell

Configuring the Super Cell:

1. Turn on the Super Cell for the first time
2. Wait for the STATUS and GSM LEDs to illuminate (may take a minute or so)
3. The STATUS LED should be lit steady to indicate the Alarm is Disarmed
4. The GSM LED should be displaying a 2-flash blink code to indicate that there are no users on the Notification List
5. Send a simple "STATUS" command from your Master Cell Phone to the cell number of the alarm
6. The GSM LED should now be lit steady to indicate you have at least one caller in the Notification List
7. Confirm you have received a "STATUS" reply.
8. Reply with a "SHOWNOTIFY" command to the alarm to confirm you are now the Master Caller
9. Issue your desired configuration commands one by one to configure your alarm (See Configuration Commands Table above. Note that GPS functionality is NOT enabled by default!) Here is a minimal list of commands for first time configuration:
   - AlarmID:
   - UseGPS:
   - Pwd:
10. If you wish to change your Output and Trigger configuration from the factory default, you should also consider these commands:
    - Triggers:
    - Outputs:
    - Chirp:
11. Reply with "STATUS", "SHOWTRIGGERS", and "SHOWOUTPUTS" commands to confirm your configuration
12. Provide the device cell number and password to additional users if you wish them to add themselves to the Notification/Authorization List

Testing the Super Cell:

1. Secure the vehicle (Close all doors, etc)
2. Turn the Keylock to the ON position
3. Arm the alarm if not already configured to auto-arm. Send the SMS Command "ARM" or use the optional Wireless Arm/Disarm Remote. You should hear a chirp to confirm the alarm is armed.
4. Wait to ensure that the alarm HAS NOT been activated
5. Open a door or otherwise trip an alarm trigger switch
6. Confirm that the alarm HAS been activated
7. Turn the Keylock OFF, issue a "DISARM" or "RESET" Command, or use the optional wireless remote to disarm the alarm.

Arming/Disarming the Super Cell

There are THREE basic methods which can be used to arm/disarm the Super Cell Alarm:

- Key Lock: You can turn the alarm completely on/off using the keylock switch. This is your failsafe method of always being able to turn on/off the alarm via physical access. If you move your vehicle into an area of poor cellular reception you may not be able to arm or disarm the alarm via text messages. You also typically only need to disarm your alarm if you are going to enter or move your vehicle and have physical access.
- SMS Command: You can issue SMS commands to "ARM" or "DISARM" the alarm (if it is powered on). You can do this from anywhere in the world!
- Optional Remote Control: You can use the optional wireless remote control to arm/disarm the alarm (if it is powered on). This is convenient if you want to have a single wireless remote on your keychain to easily arm/disarm the alarm from close proximity.

The alarm will CHIRP once when Armed and CHIRP twice when Disarmed.

The arming state is persistent and will be remembered even if you turn off the alarm (using the key lock switch). If the alarm was armed when you turned it off, it will be armed when it is powered back up.

As the SMS Command and Optional Wireless remote COULD be in potentially be in conflict, the following should be noted:

- An SMS Command ("ARM"/"DISARM") ALWAYS take positive control when issued.
- The Optional Remote Control will only take control when it "changes state". IOW: you MAY have to press "ON" before you can press "OFF" if an SMS Command has taken control. Alternatively, you MAY have to press "OFF" before you can press "ON" for similar reasons.
- If you ALWAYS use one method or the other (SMS or Wireless Remote) there should be no confusion.
- The alarm will CHIRP once when arming and CHIRP twice when disarming. If you are using the Optional Remote always listen for the chirp to confirm the operation. If you DO NOT hear a chirp, try using the "other" button on the remote and wait for a chirp, then press the "desired" button again (and what for the chirp). You will likely have to wait about 10 seconds between alternating between the buttons so the alarm has time to send the arm/disarm message to all authenticated users. Unless this is the first press of a Remote Button, always wait for the confirming chirp. AGAIN: This should not be an issue unless you are using BOTH SMS commands and the Optional Remote to arm/disarm the alarm!

Resetting the Super Cell:

If the alarm is triggered, you can perform a normal RESET of the alarm using the "RESET" command. This will NOT disarm the alarm, but rather silence/discontinue any alarm activation and leave the alarm in the "armed" state.

Troubleshooting

1. Test the alarm without GSM (cellular) function enabled. Turn off the alarm with the keylock. Turn the GSM DIP Switch OFF to set the alarm in isolated mode. Turn the alarm back on (keylock) and try tripping one of the triggers (doors, motion, etc). Does the alarm function as expected when isolated? Do the appropriate Outputs activate with each Trigger? Do the Outputs Function as expected? Do the Trigger Priorities work as expected? Do the Triggers Reset as expected?

2. The status LED on the alarm tracks the basic functionality of the alarm itself. Once you turn on the alarm it may take a minute or so for the device to fully come on line. (It waits for the GSM chipset to attach to the network unless the GSM function is disabled). Once the alarm is fully online, the STATUS LED should indicate the status of the device. If the STATUS LED is flashing, the following flash codes can be used to assist in troubleshooting the status of the alarm:

    - **Steady On = Alarm is Disarmed**
    - **Steady Flashing = Alarm is Armed**
    - **2 Flashes = Low Supply Voltage:** Although the Super Cell alarm draws very little power, if you power your alarm for an extended period without charging the battery, the alarm and sensors may eventually drain the battery. If the alarm detects that the battery voltage has dropped significantly, it will send all users on the Notification list a message and start flashing the Status LED to indicate this condition. (Did you know that Haute Solutions also makes a similar alarm for vehicles which may sit idle for long periods that draws ABSOLUTELY NO POWER unless tripped? This is the “Sleeper Cell” Alarm!)

3. The GSM LED on the alarm tracks GSM (cellular) functionality. In order to test GSM functionality ensure the GMS DIP Switch is turned on when the alarm is powered up. It may take a minute or so for the alarm to lock onto and register with the cellular network. Once the alarm is registered on the network and functioning properly, the GSM LED should be lit steady. If the GSM LED is off or flashing, the codes can be used to assist in troubleshooting the GSM status of the alarm:

    - **Steady Off = GSM Off (Disabled)**
    - **Steady On = GSM Service Connected (Normal)**
    - **Continuous Flash = GSM Searching (No Signal:** This generally indicates that the alarm cannot connect to the cellular network. This is usually caused by lack of cellular coverage, a bad antenna connection, or even an unregistered SIM card. Confirm your antenna is connected and working properly. Try relocating your alarm to a better coverage area. Try installing the SIM card in an unlocked GSM cell phone and check coverage.
    - **2 Flashes = Empty Notification List:** This is normal for an alarm “fresh out of the box”. The alarm is simply waiting for your cell phone to send it a text message to start the configuration process. No need to power off the alarm. Just send it a text message (i.e. “STATUS”) and the light should come on steady.
    - **3 Flashes = SIM Not Detected:** Either a SIM card is not inserted or it is inserted incorrectly. Turn the CONFIG switch off. The alarm should power down. Insert or reorient the SIM card properly (see photo in this document).

4. If you think it might have been possible for an “outside” message to have gotten into your alarm and automatically authorized itself in the first position, just factory reset the alarm as indicated below. The only time you might have this happen is when you first insert a new SIM card and the cell network sends you a welcome or authorization message before you can send your first text the device. In that case, the welcome message could automatically authorize itself as the first caller. If in doubt, just send Factory Reset the device and start over.

5. Factory Resetting the Super Cell: If you wish to reset the device to its factory configuration (including clearing the Notification List and resetting all Triggers and Outputs), you can turn off the alarm (using the keylock), remove the little dip switch cover on the top of the alarm, set DIPSwitch #2 to the ON position, and then turn the Alarm back on. Once the alarm completes its boot sequence (Status LED will illuminate), you can power the alarm back OFF and then put DIPSwitch #2 back into the normal OFF position.

Super Cell Commands

The Super Cell is fully configured and operated via SMS Text messages using simple text commands. No "App" is required and any phone which supports SMS messaging can control and configure the alarm (regardless of phone O/S).

The phone number of your Super Cell Alarm System is determined at the time your SIM card is registered or your account is established. Each alarm will have its own unique phone number. Do not lose this phone number. This is the number to which you will send SMS configuration and control messages and from which you will receive SMS Alerts.

You can also send a "HELP" command to the Super Cell for a very short message which lists the available commands.

The following is a set of Configuration Options (above) and their respective commands and parameters which can be provided. Each configuration command is a single word followed by a colon (":"), a space, and the desired parameter. A full "Status" message is always sent back after a command is accepted to indicate the current setting of all configuration parameters. If an invalid or mis-typed command is specified the alarm will respond with a "What?" message. Please note that commands are NOT case sensitive.

Configuration Commands: All configuration commands are persistent and will be remembered after the alarm is turned off. Note that commands which require parameters will have a colon immediately after the command name to separate it from the parameter.

AlarmID: The name of the Alarm to be displayed in the SMS Alert Message. The factory default value is "Trailer". Useful if you have multiple vehicles and want each alarm to be uniquely identified. Example: "AlarmID: Blue Trailer"

ArmDelay: If the alarm is configured to auto arm when powering up (see ARM command), this provides the ability to provide a delay so sensors (also powered from the keylock) can stabilize before the system arms itself. Example: "ArmDelay: 10"

UseGPS: Enable/Disable the built-in GPS. GPS should be disabled if you have not installed an externally mounted GPS antenna. If you enable the GPS function without an antenna, SMS alerts will be delayed as the alarm attempts unsuccessfully to locate a satellite fix. Example: "UseGPS: YES"

SMSInterval: This command defines the interval (minutes) between SMS messages. For Example: A setting of "15" would continue to send SMS status messages (including GPS location if enabled) every 15 minutes (or until the Alarm is reset). Example: "SMSInterval: 15"

Triggers: This command is used to configure the Trigger circuits which activate the Alarm. Each of the four Triggers can be independently configured. The command is constructed as follows:

Trigger:{num},{pri},{outputs},{reset},{name}

Where:	{num} =	Trigger number to configure
	{pri} =	Priority to assign to Trigger (Higher priority Triggers can take "control")
	{outputs} =	Outputs to activate if this Trigger is tripped
	{reset} =	Time {minutes} to reset alarm if this Trigger is "in control"
	{name} =	Friendly name of the Trigger (for reports and alerts)

Example: "Trigger:1,1,1234,5,Door Switch"

ShowTriggers: Request an SMS message with current configuration information for all Triggers. Example: "ShowTriggers"

Outputs: This command is used to configure the Output Relay circuits which power the various signaling devices which can be attached to the alarm. Each of the four Outputs can be independently configured. The command is constructed as follows:

Output:{num},{function},{name}

Where: {num} = Output number to configure

{function} = Function to perform if activated (0=Off, 1=On, 2=Flash)

{name} = Friendly name of the Output (for reports and alerts)

Example: "Output:1,1,Siren"

ShowOutputs: Request an SMS message with current configuration information for all Output Relays. Example: "ShowOutputs"

Chirp: Use this command to specify which Outputs will "chirp" when armed (1 chirp) or disarmed (2 chirps). Example: "Chirp:12"

Pwd: This will establish a Master Password for the Alarm. If a Master Password is NOT set, the Master Caller will have to manually specify additional Authorized Callers (by cell phone number). Once a Master Password is established, callers can then self-authenticate (if they know the password). Only the Master Caller can set a Master Password. Example: "Pwd:secret"

{Password}: Callers should send the Master Password as a single-word text message in order to become authorized. Example: "secret"

Notify: This command will add a cell number to the SMS notification list. Only the Master Caller can add a number to the notification list. Note that all numbers on the Notification list are also considered Authorized Callers. When specifying numbers to be added to the Notification list always include a plus sign ("+") and the country code (USA = "1") as a prefix to the number. Do not include any dashes, parenthesis, letters, or spaces in the number. For example:

- To add the following USA number to the Notification List: 262-555-1212
- Example: "NOTIFY: +12625551212"

ShowNotify: Request an SMS message with the full list of Authorized Users on the Notification List. Example: "ShowNotify"

ClearNotify: Clear the Notification List (including the Master Caller) and start over. Only the Master Caller can clear the Notification List. Example: "ClearNotify"

VMin: Sets the battery low voltage alert to the specified value. By default, the low voltage threshold is set to approximately 11.0 volts. Example: "VMin:10.5"

Help: Request a series of SMS Messages containing helpful command information. Example: "Help"

Operational Commands: Operational Commands are used to operate and control the alarm once it is configured.

Arm: Arm the Alarm. Arming is persistent state. If the alarm is armed and then turned off (via keylock), it will automatically re-arm itself when it is turned back on. All Callers on the Notification List will be alerted when the alarm is Armed. Example: "Arm"

Disarm: Disarm the alarm. All Callers on the Notification List will be alerted when the alarm is Disarmed. Example: "Disarm"

Reset: Reset the alarm. This will deactivate any currently activated Triggers and Outputs but leave the alarm Armed (if currently Armed). All Callers on the Notification List will be alerted when the alarm is Reset. Example: "Reset"

Status: Request an SMS Message which displays the status of the Alarm. This basically identifies the current state of the alarm (Armed, Disarmed, Tripped, Signal Strength, Battery Voltage, etc). Example: "Status"

Config: Request an SMS Message which displays brief configuration information about the Alarm. This includes the GPS Configuration, Arm Delay, SMS Interval, and VMin. Example: "Config"

GPSLoc: Request an SMS message which contains the current GPS location (Lat/Long) of the vehicle. This message will also include a clickable hyperlink which will show a map with the graphical location of the vehicle. Example: "GPSLoc"

Super Cell Configuration Command Summary				
Option	Command	Parameter(s)	Notes	Example
Alarm ID	AlarmID:	{string}	19 Chars Max	AlarmID: John's Trailer
Auto-Alarm Delay	AlarmDelay:	{number}	Number of Seconds	ArmDelay: 10
GPS On/Off	UseGPS:	YES or NO		UseGPS: YES
SMS Alert Interval	SMSInterval:	{number}	Number of Minutes	SMSInterval: 15
Trigger Configuration	Trigger:	{num},{pri},{outputs},{reset},{name}		Trigger:1,1,1234,5,Door Switch
Show Trigger Configuration	ShowTriggers			ShowTriggers
Output Relay Configuration	Output:	{num},{function},{name}		Output:1,1,Siren
Show Output Configuration	ShowOutput			ShowOutput
Set Outputs which Chirp	Chirp:	{Outputs to chirp}		Chirp:12
Set Device Password	Pwd:			Pwd: secret
Request Notification/Authorization	{password}			Secret
Add Notification Number	Notify:	{SMS Number}	Inc "+1" for USA	Notify: +12625551212
Show Notification List	ShowNotify			ShowNotify
Clear Notification List	ClearNotify			ClearNotify
Set Low Voltage Threshold for Alert	VMin:	{volts}	Default = 11.0	VMin:11.0
Request Help	Help			Help

Super Cell Operational Command Summary				
Option	Command	Parameter(s)	Notes	Example
Arm Alarm	Arm			Arm
Disarm Alarm	Disarm			Disarm
Reset Alarm	Reset			Reset
Request Alarm Status	Status			Status
Request Alarm Config Info	Config			Config
Request GPS Location	GPSLoc			GPSLoc
Request Help	Help			Help

*NOTE: Commands are NOT case sensitive

Advanced Configuration

Trigger and Output Configuration Options: How you decide to configure your Triggers and Outputs can definitely effect your wiring plan. Once you understand the Trigger and Output configuration options, it will be relatively easy to wire the alarm to meet your requirements. The Super Cell alarm is extremely flexible as it has virtually an infinite number of configuration options.

OUTPUTS and TRIGGERS are configured independently for maximum flexibility.

OUTPUTS: Outputs define the circuits which provide power to your accessories (siren, marker lights, brakes, etc). It should be noted that not all Triggers are required to activate all Outputs when they are tripped! Each Trigger can selectively choose which Outputs to activate when tripped!

- Function: Outputs are configured to define their functionality. Outputs can be configured to turn on steady, flash, or do nothing when they are "activated".
- Name: Outputs have "names". Names don't really have any functional purpose but are referenced in configuration reports as a reminder of which device(s) you have connected to them.

TRIGGERS: Triggers are the inputs which detect when an alarm condition occurs which "trips" the alarm.

- Priorities: Triggers have priorities. Priority 1 takes precedence over priority 2, etc. For example: If the alarm is tripped by a priority 2 trigger, another trigger with a HIGHER priority (1) will take control, while a lower priority trigger (3) will be ignored (until the alarm resets).
- Outputs: Each Trigger can decide which Output(s) it activates when it is "in control". Some triggers might selectively activate only a few Outputs, while other triggers may choose to activate a different set of Outputs (or all Outputs).
- Reset: Each Trigger has an independently definable reset period. The alarm reset period is dependent on which Trigger is currently "in control".
- Name: Triggers have "names". Names don't really have any functional purpose but are identified in the SMS Alert message when the Alarm is tripped. This way you will know specifically which sensor or switch was tripped if the alarm is activated. Names are also used in configuration reports as a reminder of which sensors or switches you have connected to them.

CHIRP: Quite simply, which Outputs should "Chirp" when the alarm is armed (1 chirp) or disarmed (2 chirps)

Decide how YOU want your alarm to operate: Unless you are operating the alarm in standalone mode (GSM Off), you can configure your alarm to operate pretty much anyway you want. (SMS Messaging is required to change the factory default configuration). It's even very likely that you will not have to use all the Triggers or Outputs to achieve your goal.

Make a list of the types of Sensors/Switches you want in your configuration. Will you be using Door Switches to detect entry, PIR (Passive Infrared Sensor) Motion Sensors to detect personnel movement, Vehicle Vibration Sensors to detect physical movement, or any other switches which meet your requirements? These Sensors/Switches will be connected to your Triggers.

Make a list of the devices you want to power from your alarm when it is tripped. Will you power a Siren, lock up the vehicle brakes, flash your marker lights, or operate some other 12v device when the alarm is tripped? Which of these devices will be powered steady and which will flash (alternate on and off)? These devices will be connected to your Outputs.

Now, which devices (Outputs) do you want to activate when a particular Sensor/Switch (Trigger) is tripped? Do you want ALL Outputs to be tripped when ANY Trigger is tripped? (That's pretty simple!) …or would you like to have a "silent alarm" (SMS notification only) when a particular Trigger is tripped (See the "Silent Alarm" Configuration Example)?

The "Factory Default" Configuration Example: This configuration lets you start with a very simple operational profile but also allows you to make SMS configuration changes later without requiring modifications to your physical wiring.

Factory Default Configuration					
Trigger Number	Trigger Priority	Trigger Outputs	Trigger Reset	Trigger Name	Configuration Command
1	1	1234	5	Door Switch	Trigger:1,1,1234,5,Door Switch
2	1	1234	5	PIR Motion	Trigger:2,1,1234,5,PIR Motion
3	1	1234	5	Trailer Motion	Trigger:3,1,1234,5,Trailer Motion
Output Number	Output Function			Output Name	Configuration Command
1	1 (On)			Siren	Output:1,1,Siren
2	2 (Flash)			Marker Lights	Output:2,2,Marker Lights
3	1 (On)			Brakes	Output:3,1,Brakes
4	1 (On)			Interior Light	Output:4,1,Interior Light
Function	Outputs				Configuration Command
Chirp	12				Chirp:12

The default names being used for our Triggers and Outputs are only suggestions but they help to illustrate the factory default configuration. In the factory default configuration:

- Attach/Wire each sensor/switch to a dedicated Trigger
- Attach/Wire each output device to a dedicated Output
- If you have the optional Arm/Disarm remote wireless remote, connect it to the Arm/Disarm Circuit (Arm/Disarm Circuit = AD = Blue Wire)
- All Triggers are given the Same Priority (1)
- All Triggers activate all Outputs (1234)
- All Triggers are set to Reset after the same time period (5 minutes)
- The Outputs which are connected to devices which require steady power are set to turn "on" (1)
- The Outputs which control flashing devices are set to "flash" (2)
- Outputs 1 and 2 will Chirp/Flash/Pulse when Arming/Disarming
- Names are set to match whatever sensors and devices you install (factory default names shown)
- You have maximum flexibility to change priorities, activations, and reset timeouts in the future

In any case, the Factory Default Configuration is only a starting point and not intended to meet everyone's requirements. Decide which sensors you want to use, which devices the alarm should power, and how the alarm should react under various situations. Then program your own configuration. (Remember, you only need to do this once!)

The associated SMS configuration commands are also presented in these tables for completeness. (You can find additional information about these configuration commands in the command reference section of this document).

A "Silent Alarm" Configuration Example: This configuration modifies the Factory Configuration of one of the Triggers (Trigger 3) to enable a continuous silent alarm if trailer motion is detected.

"Silent Alarm" Configuration					
Trigger Number	Trigger Priority	Trigger Outputs	Trigger Reset	Trigger Name	Configuration Command
1	2	1234	5	Door Switch	Trigger:1,2,1234,5,Door Switch
2	2	1234	5	PIR Motion	Trigger:2,2,1234,5,PIR Motion
3	1	3	0	Trailer Motion	Trigger:3,1,3,0,Trailer Motion
Output Number	Output Function			Output Name	Configuration Command
1	1 (On)			Siren	Output:1,1,Siren
2	2 (Flash)			Marker Lights	Output:2,2,Marker Lights
3	1 (On)			Brakes	Output:3,1,Brakes
4	1 (On)			Interior Light	Output:4,1,Interior Light
Function	Outputs				Configuration Command
Chirp	12				Chirp:12

If a Door Switch (T1) or a PIR Motion Sensor (T2) is tripped, the alarm will activate all four Outputs and then reset itself in 5 minutes (after the tripping event stops). (Since both of these Triggers are configured identically, they could even have been have been consolidated on a single Trigger Circuit).

However, if Trailer Motion (T3) is detected (via a Vibration Sensor), we are going to activate a "silent" alarm. In this example, if someone is trying to move our vehicle away, we may want to hide the fact that we have an alarm so they do not try to find it and disable it. This way, we can simply use the GPS location in our SMS messages to follow and locate the "stolen" vehicle without notifying the vandals. Note that the reset is also set never to expire so the alarm continues to send up SMS updates until we recover the vehicle! (Note that we do activate the brakes (R3) as we do not need to make it easy for them. You might decide that you don't even want to do this and set your Outputs to "0" instead of "3").

Furthermore, if Trailer Motion is initially detected (priority 1), then we don't have to worry about vandals opening the doors (Priority 2) interfering with our "silent" alarm.

For a Summary Example (in the above default configuration):

If Trigger 1 is tripped,

- Trigger 1 will be "in control"
- It will activate all Outputs (1,2,3, and 4)
- Outputs 1,2, and 4 will be on steady
- Output 3 will flash
- And the alarm will reset in 5 minutes

If Trigger 3 is then tripped,

- Trigger 3 will now be "in control" (higher priority)
- It will only activate Output 3
- All other Outputs (1,2, and 4) will be deactivated
- Output 3 will Flash
- The alarm will NOT reset (until the keylock is turned off).

Triggers and Outputs Work Sheet					
Trigger	Priority	Outputs (0 for None)	Reset (Mins)	Name	Configuration Command Trigger:{Number},{Priority},{Outputs},{Reset},{Name}
1					Trigger:1,
2					Trigger:2,
3					Trigger:3,
Output	Function (0=Off, 1=On, 2=Flash)			Name	Configuration Command Output:{Number},{Function},{Name}
1					Output:1,
2					Output:2,
3					Output:3,
4					Output:4,
Function	Outputs				Configuration Command
CHIRP					CHIRP:

Programming and Modification

Open Source Firmware:

Haute Solutions developed the software/firmware for the Super Cell completely from the ground up. We have also designed the hardware (both boards) used in the alarm system. Both the hardware and the software used in this device is completely and uniquely of our own design. We could have chosen to keep all of this proprietary, but we believe that products can improve with community participation. We also believe it is better to provide a really good product at a fair price, rather than an expensive proprietary product which requires continually reoccurring fees for proprietary services. We believe this cultivates happier customers. …and happy customers are loyal customers!

If you are so inclined, Haute Solutions provides the source code for the device at the Haute Solutions Website (www.haute-solutions.com). We could provide a direct link to the "Software Page" but we would rather have you look around a bit on the website. ;-) Currently, compilation of the firmware requires the base source, and also a GSMSMS library, both of which are developed and maintained by Haute Solutions. You can find these on our web site if you wish to modify the behavior and capabilities of YOUR alarm. This may not be a trivial endeavor unless you are a programmer, but it also might be a really interesting learning experience.

The firmware can be compiled and uploaded to the Super Cell using a free open source programming environment. Documentation which describes how to obtain the free programming environment, and the compilation/upload process, can be found on our web site.

This software is made available under the spirit of the Open Source License. This software is freely downloadable and modifiable for individual use only. It may not be downloaded and used or modified for inclusion in any other commercial products. This source code may only be used for non-commercial purposes and is intended only for use with the Super Cell Alarm product.

If you decide to download the software and make some modifications to our base functionality, all we ask is that you email us a copy of your updated code, with a brief explanation of your modifications, so we can make it available to other users in the Super Cell Alarm community. Sharing is good!

Programming the Super Cell Alarm:

The ability to update the firmware in the field can be very useful if you wish to download and upgrade the latest firmware without removing the device from its installed location. If you wish to upgrade the firmware without removing the device, you will need a Windows laptop. If you wish to use a Windows PC, you will need to remove the device from its installation location.

Although programming it is not required, advanced users may also wish to modify the capabilities or behavior of the device. This is easily supported, even encouraged, and the code has been made publicly available for download and modification. If you come up, and implement, an interesting modification, please upload the code so that other users may take advantage of the enhancements!

SOFTWARE Installation (Arduino IDE and GSM Library):

1. Download the latest Arduino development environment (*.EXE): http://arduino.cc/en/Main/Software

2. Install the Arduino Development Environment (*.EXE)

3. Download the latest "GSMSMS" Library from the Haute Solutions Super Cell Support Page (*.ZIP): http://www.haute-solutions.com/supercell

4. Extract the contents of the GSMSMS library archive (GSMSMS.ZIP) to your "Documents\Arduino\Libraries" folder. You should have a folder named GSMSMS with at least two files in it (GSMSMS.CPP and GSMSMS.h). (Every Arduino library MUST be located in its own dedicated folder under "Documents\Arduino\Libraries").

5. Download the latest Super Cell Alarm Firmware (SuperCell.ZIP) from the Haute Solutions Web Site (*.ZIP): http://www.haute-solutions.com/supercell

6. Create a folder named “SuperCell” under "Documents\Arduino".

7. Extract the contents of the SuperCell.ZIP archive to the "Documents\Arduino\SuperCell" folder you just created. (Every Arduino sketch/program (*.ino) MUST be located in its own dedicated folder which has the EXACT same name as the sketch itself).

8. Double click on the SuperCell.ino file which was just extracted and it should load automatically into the Arduino Development Environment.

9. Open the Tools Menu in the Arduino Development Environment, select the “Board” option, and choose “Arduino/Genuine Mega or Mega 2560”.

10. Click on the VERIFY toolbar icon (check button) in the Arduino IDE and confirm that the program will compile properly

11. If the program does NOT Verify (compile) properly check to ensure the GSMSMS library is properly installed

12. If the program Verifies (compiles) without error, all software, libraries, and code should now be properly installed!

Programming the HARDWARE (ESP324G):

1. The Super Cell Alarm DOES NOT need to be removed or disconnected in order to update or reprogram the firmware.

2. Disable the alarm by turning the security keylock to the off position.

3. DO NOT attach the USB cable to the device yet…

4. Open up the Arduino Development Environment on your laptop (or PC) if not already open. Go to the TOOLS menu and open the PORT option. Note the COM ports currently visible to your system (if any).

5. Now attach a "mini" USB cable between your laptop and the usb port accessible on the side of the device enclosure. (Note that the USB cable must have the larger "MINI" connector and not the smaller "MICRO" connector which is common to charge most modern cell phones).

6. If your computer asks for a USB driver, you should point it to the "C:\Program Files (x86)\Arduino\drivers" folder. Ensure the driver search is set to include sub-folders as well...

7. Go back to the Arduino Development Environment, open the TOOLS menu, and select the PORT option. You should now see a **new/additional** COM port listed. This should be the COM your Super Cell is using. Select the new COM port.

8. Load the SuperCell.ino project into the Arduino IDE (if not already done so).

9. Under TOOLS menu, set the BOARD type to "ESP32 Wrover Module" (if not already done so). If you do not find any ESP32 board options available, please select the "Board Manager" and scroll down to select "ESP32" to load them.

10. Click on the UPLOAD toolbar icon (right arrow button) in the Arduino IDE and confirm that the program compiles and uploads properly.

11. If the UPLOAD function does NOT work properly, check the following items:

    - Is the USB Driver installed properly? (Any USB devices NOT being loaded properly in your hardware manager?)

    - Does the COM Port selected in the IDE properly correspond to the USB port being used by the Super Cell Alarm?

    - Is the board properly selected in the IDE ("ESP32 Wrover Module")?

    - Is the GSMSMS Library properly installed?

12. If the UPLOAD function works properly, then all the software was properly installed, all the HARDWARE properly attached, all the configuration settings successful, and your Super Cell was successfully updated!

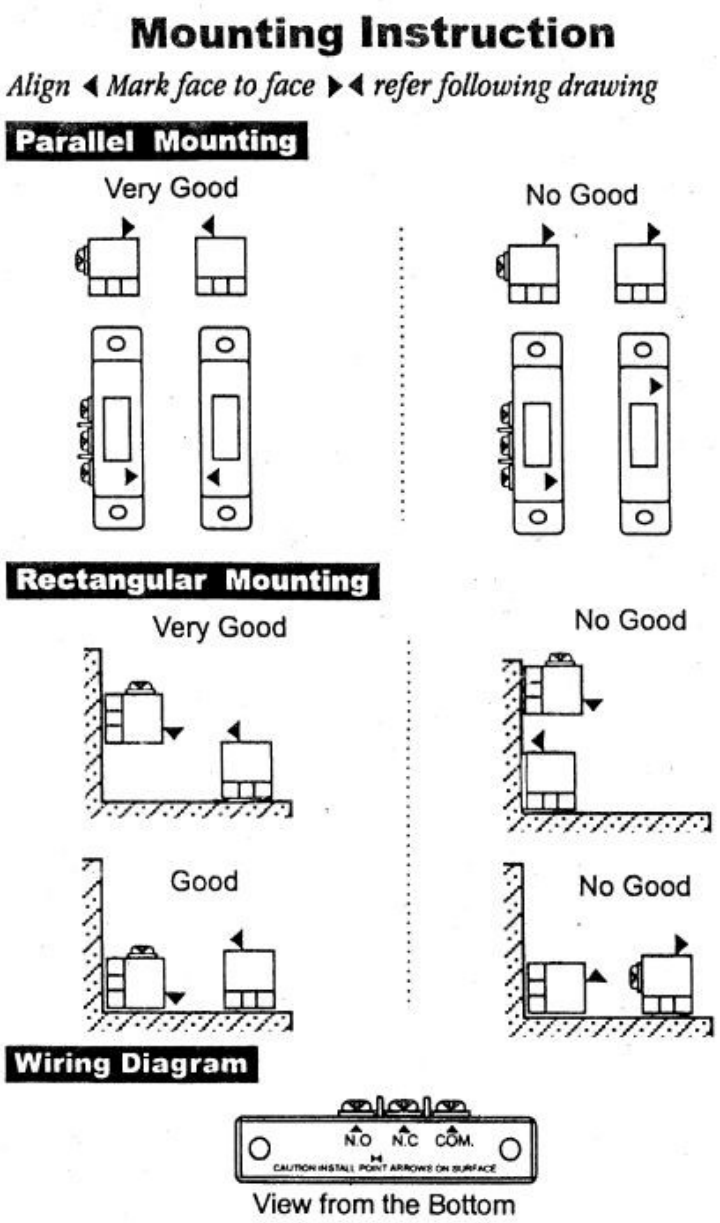
13. You can now modify the source code and program the device if you wish! (You can always flash it back!)

Magnetic Reed Switch Installation Notes:

Connect Trigger Wire to "NC" (Normally Closed) terminal and connect "COM" (Common) terminal to Ground. These switches will work with the factory default Negative Trigger configuration. Simply connect the desired Trigger wire to the NC terminal and then connect the COM terminal to a good chassis ground on your vehicle. If you are not able locate a good chassis ground, you can also run a wire from the COM terminal back to the negative terminal on your battery.

Terminals are labeled on the back side of the switch. If you already have your switch mounted, "NC" is the middle terminal and "COM" is the terminal on the same side as the little arrow molded onto the front of the switch.

(We want our circuit to be OPEN when our doors are closed with the magnet next to the switch. However, the switch manufacturer considers the "Normal" state to be when the magnet is NOT nearby. So we want to use "NC" such that the circuit is closed when the magnet is moved away from the switch (to its "normal" state).)



PIR (Passive Infra Red) Motion Sensor Installation Notes:

The PIR Sensor optionally provided with the SuperCell is most easily used as a Negative/Ground Trigger. This sensor is used to detect movement of personnel inside your vehicle. (If you are installing a different sensor which uses a Positive Trigger, then you should change the associated Trigger polarity jumper from the default configuration).

IN V- : Connect to Chassis Ground or Battery Negative (12V-)

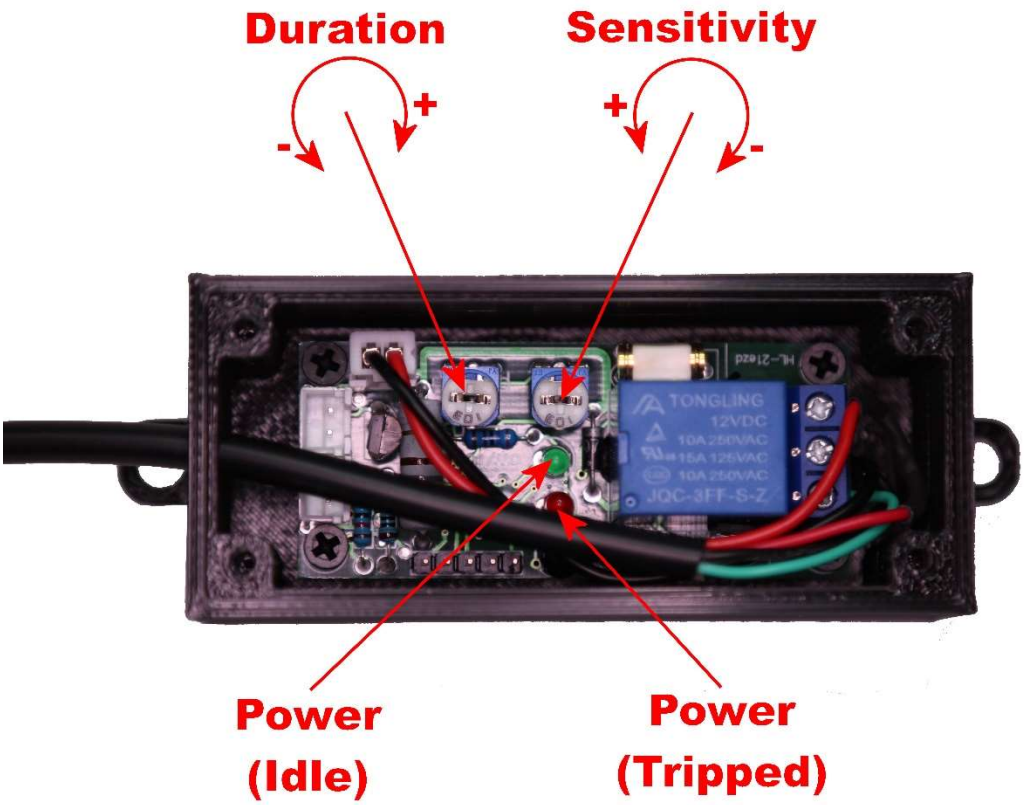
IN V+ : Connect to Battery Positive Power Supply (12V+)

OUT V- : Connect to SuperCell PIR Motion Trigger Circuit (Grey Wire)

OUT V+: {Not Used}

Vibration Sensor Installation Notes:

The Vibration Sensor optionally provided with the SuperCell is most easily used as a Negative/Ground Trigger. The Vibration Sensor is used to detect Movement of the Vehicle itself. (If you are installing a different sensor which uses a Positive Trigger, then you should change the associated Trigger polarity jumper from the default configuration).



Red Wire: Connect to Battery Positive Power Supply (12V+)

Black Wire: Connect to Chassis Ground or Battery Negative (12V-)

Green Wire: Connect to SuperCell Trailer Motion (Vibration) Trigger Circuit (Purple Wire)

You may want to temporarily connect the sensor on a bench in order to pre-set the duration/sensitivity of the sensor. Generally, turning BOTH pots fully Counter-Clockwise is a good place to start (low duration/high sensitivity)

Wireless Remote On/Off Control Installation Notes:

The Wireless Remote On/Off Relay optionally provided with the SuperCell provides a POSITIVE signal to enable/arm the alarm. (Device shown with housing removed for clarity)

Red Wire: Connect to Battery Positive Power Supply (12V+)

Black Wire: Connect to Chassis Ground or Battery Negative (12V-)

Yellow Wire: Connect to SuperCell Remote On/Off Circuit (Blue Wire)