

SIERA.AI S3 Installation Instructions

Rev 2.1

You MUST use a certified technician to install SIERA.AI products. Using non-certified personnel for installation will immediately void your warranty.

SIERA.AI provides these instructions for a correct and speedy install of your S3 devices. Please follow each step in these instructions to ensure proper installation of your S3 devices.

Rev Number	Revised by	Approved by	Revision Notes
1.0	Joseph Barrow	Saurav Agarwal	first release
2.0	Himansh Zadoo	Vernon Peeler	Added rhino dc converter
2.1	Himansh Zado	Saurav Agarwal	Added Lind converter

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Hardware

Here is a list of the hardware that should be part of your installation package.

1. Gateway (black box with attached touchscreen, this is the main unit)



2. Large double ball arm (used to mount the gateway to the vehicle body)



3. Camera sensor (detects people and objects). You may have more than one depending on the number of sensors purchased.

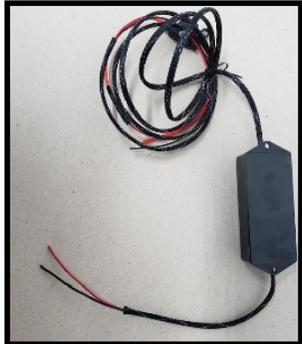


4. Small keyed double bar arm (used to mount the camera). You may have more than one depending on the number of sensors purchased.



5. Fused power cable



<p>6. DC DC Power converter. It can be either one of RHINO or LIND as shown in the figure</p>	 <p>The top image shows a black rectangular DC DC Power converter labeled 'RHINO'. The label includes 'WATSON/INTELECT', 'Input: 12-24VDC', 'Output: 120V/2A', 'PSE12-DC24-60', and 'C.E. F.M. Electronics'. It has terminals for 'on/off', '+Vin', '-Vin', '+Vout', and '-Vout'. The bottom image shows a black rectangular DC DC Power converter labeled 'LIND'.</p>
<p>7. Inrush Filter (Needed only in case RHINO DC DC power converter is shipped)</p>	 <p>The image shows a small, dark, rectangular inrush filter component with several colored wires (red, black, blue, green) attached to it.</p>
<p>8. Large ball mount (used to mount gateway to vehicle)</p>	 <p>The image shows a large, black, spherical ball mount component mounted on a black plastic base with two mounting holes.</p>

<p>9. Small ball mount (used to mount camera sensor to vehicle). You may have more than one depending on the number of sensors purchased.</p>	
<p>10. Power cable pigtail</p>	

Installing S3 To Your Vehicle

Follow these steps to install the S3 hardware to your vehicle.

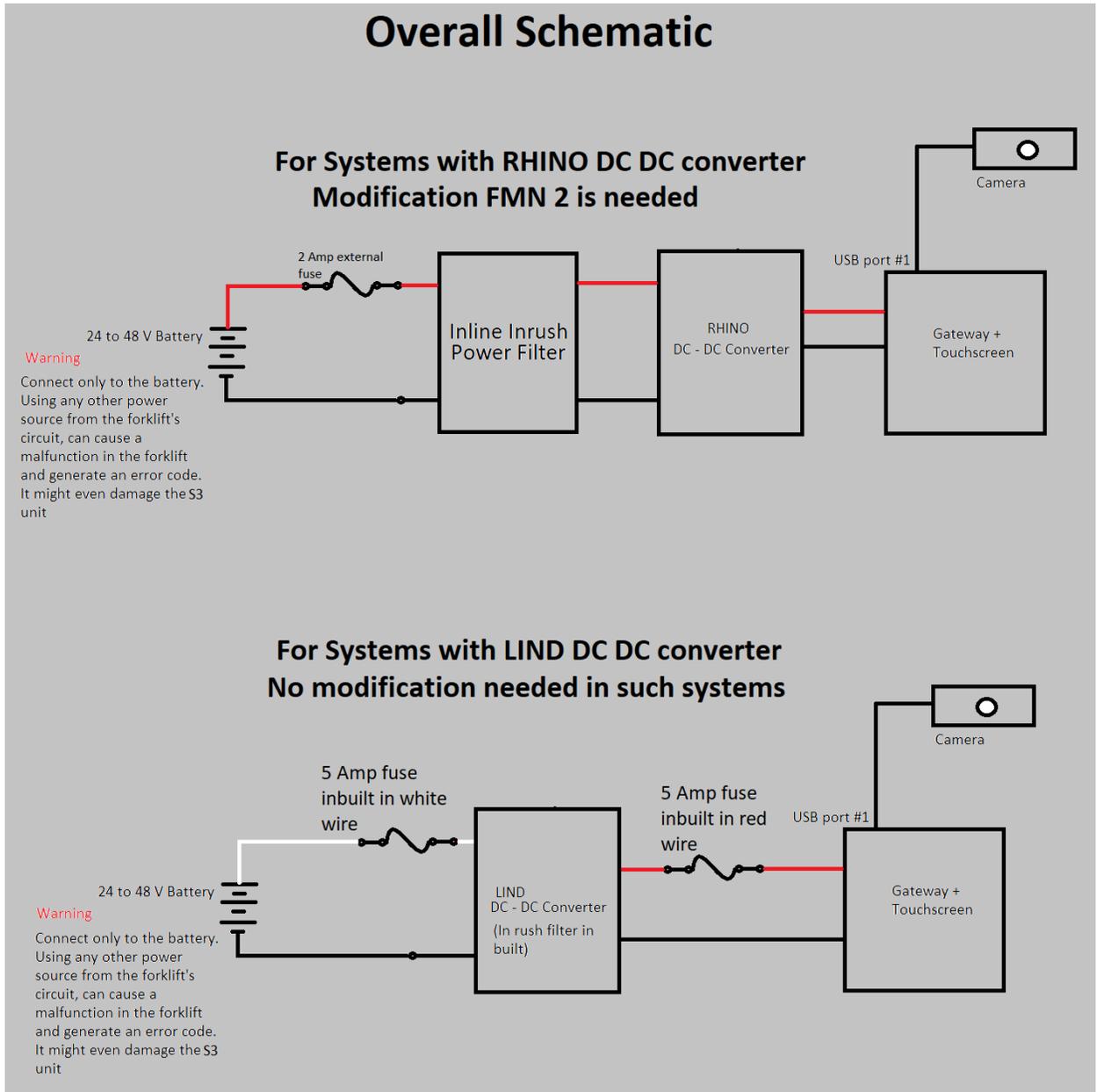
1. Remove each item from the box and inspect for any damages.
 - a. If you find damage to your shipment, please contact our support hotline at support@siera.ai or call 512-817-0702.
2. Inspect your vehicle and decide where to install the ball mounts.
 - a. The large ball mount is for the Gateway (black box) and the smaller ball mount is for the camera (vision sensor).
 - b. The Gateway will be installed in the front area of the operator's compartment and the camera will be installed in the back on the overhead guard.
 - c. Ensure that these mount locations do not block the operator's field of vision or headroom.
3. Install the large double ball arm onto the large ball mount loosely.
 - a. The large ball mount should be installed in the operator cabin such that the gateway is easily accessible to an operator to use the touchscreen.
4. Install the small double ball arm onto the small ball mount loosely.
 - a. The small ball mount is to be installed on the overhead guard of the cabin such that the camera can easily see and does not obstruct the operator's field of view.

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- b. Ensure that the camera mount is not installed close to a blue light or any other bright light source.
5. Attach the Gateway to the large double ball arm and position it where it can be seen but is not in the way of the operator. Tighten the double ball arm until it is snug and holding the Gateway in position.
6. Attach the camera sensor to the small double ball arm.
 - a. Ensure that the camera is installed right-side up by confirming that the camera cable comes out of the left side of the camera.
 - b. Tighten using the key for the keyed double ballarm.
7. Route the camera (sensor) cable up back to the Gateway and carefully plug it into the first USB port on the Gateway. Any excess cable should be loosely spooled up out of the way and the cable tied down fastened to the forklift
8. Next is the power connections. The power should be drawn directly from the positive and negative terminals of the place from where the forklift connects to the battery. It has been observed that taking power from some other known DC source in the forklift's circuitry might result in problems in forklift operation. Please make sure that we draw the power directly from the battery contacts of the forklift.
9. Please check the manufacturer of DC-DC converter. If it's LIND then an inrush filter is not needed. Proceed to step 10 in case it's RHINO or some other manufacturer.
10. Install the fuse holder in the wire taken from the positive contact in the forklift which connects to battery positive.
11. Connect the red wire from the input of the inrush filter with the other end of the fuse holder and black wire from the input of the inrush filter with the contact which connects to battery battery negative.
12. Connect the output of the in rush filter with the RHINO DC DC converter.
13. In case the DC DC Converter manufacturer is LIND then make direct connections without the inrush filter as shown in the "Over-all Schematic".

Overall Schematic



WARNING: You MUST use the provided DC-DC converter for 24V/36V/48V vehicles to prevent electrical damage to the S3 device. For vehicles with battery voltage higher than 48V STOP and contact us as you will need a specialized DC converter.

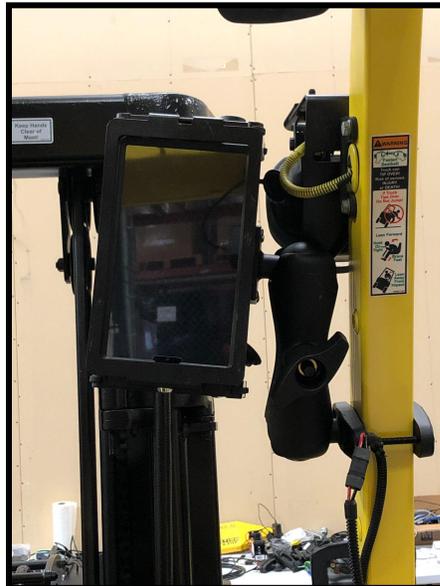
Please see the images below to verify that your installation is correct.

Camera correctly mounted to the cage. The camera is facing the rear of the forklift. The camera cable must be coming out of the left side of the camera body when looking at the camera lens.

WARNING: If the camera is mounted upside down then the device will show an error on the screen and may keep an error alarm at you.



The gateway mounted the sidebar of a vehicle cage.



For a single sensor system, the sensor must be plugged into the first connector port from the side opposite to the power port. See the image on the right.



Software Setup

The S3 device connects to its web server using a cellular connection, if you have poor cellular reception you may have trouble during this setup step. We recommend switching to WiFi on the S3 by using the touchscreen or installing a cellular signal booster to resolve this problem.

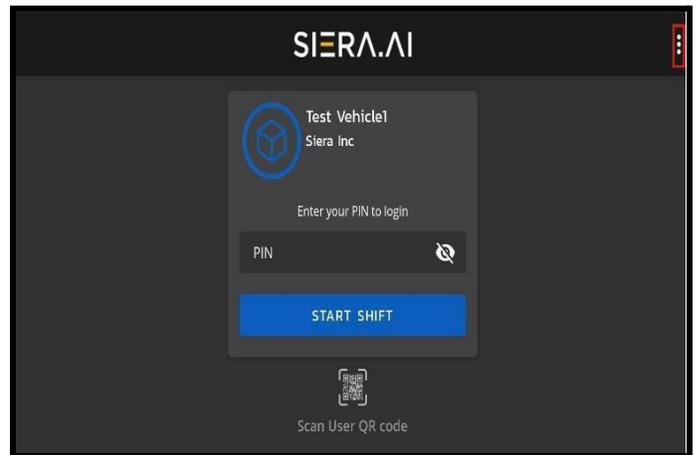
Before you proceed to do the software setup on your device. You must ensure that your online dashboard account is correctly configured.

Your online dashboard account must have the following setup:

1. At least one worksite should be added to represent your facility.
2. One or more vehicles (assets) must be added to the relevant worksite.
3. One or more operators are created for this worksite.

Note: If you do not have access to the online dashboard or are having trouble accessing it, please contact our support team.

1. Turn on the tablet and you should see the screen on the right. In the upper right hand corner you will see three dots (marked in red on the image), tap those three dots to go to the menu screen.



2. This screen will ask for your admin email address and password. If you do not know your admin email address and password. Contact your supervisor or contact our support hotline at support@siera.ai or call 512-817-0702.



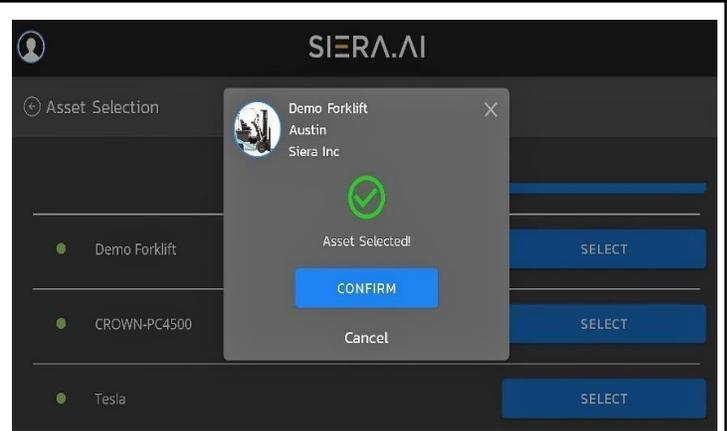
3. Enter your email and password and confirm. This will take you to the worksite selection screen. Find your worksite by scrolling and click "Select" for the correct worksite.

If the worksite is not visible, login to the dashboard with your admin credentials and create a worksite.



4. Next, select the correct asset from the list that represents the vehicle to which you're installing the device. Find your asset by scrolling and click "Select" for the correct asset.

If the asset is not available, login to the dashboard with your admin credentials and create an asset.



5. Once you confirm the asset selection, You should see "Start Shift" on the screen. Put your operator pin and click "Start Shift". The system will move to the next screen to start your checklist.

If you do not know your operator pin, login to the dashboard and go to Manage > Users and locate the operator and see the pin.



6. Click the "Start Inspection"



7. After you finish the checklist, the screen will go to a picture of a forklift and you will be ready to work. This screen will show you pedestrian and obstacle alerts visibly.



Testing Proximity Alerts

Please note that by default, the S3 will ONLY alert if the vehicle is moving backwards (reverse). The S3 will NOT alert when it is stationary or moving forwards. If the camera sees both a person and an object in the detection zone, it will alert only for the person, as pedestrian safety is given a higher priority by the system.

Default detection settings:

1. Pedestrian up to 10 feet
2. Object (non-pedestrian) up to 5 feet

To test the alerts for S3, you may follow these steps (ensure safety of personnel at all times):

1. Pedestrian Alerts: With the vehicle moving slowly in reverse, have a person walk past the back camera at a safe distance.
 - a. The screen should light up with a symbol of pedestrian and the device should beep intermittently.
2. Object Alerts: With the vehicle moving slowly in reverse, back up towards a stack of pallets, pillar or wall.
 - a. The screen should light with a symbol of a box and the device should beep intermittently.

If you have trouble seeing alerts on the screen, this may be due to a bluetooth pairing issue between the tablet and the S3 gateway. Please contact support for assistance.

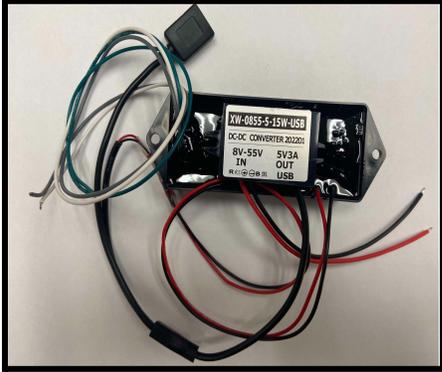
Propane Forklift Installation

For propane installation the procedure is very much the same but with some added steps. S3 Hardware will be hooked up just like in the above manual except the tablet will be removed from the Gateway and wiring instructions are slightly different as well as there are extra mounting and wiring procedures for the tablet.

Follow the above instructions for installing your S3 hardware (gateway mounts, gateway, camera mount,, and camera)

Hardware for Propane Installation

In your box should be the following hardware. If you find damage to the shipment please contact our support team at your earliest convenience.

<p>1x S2 Power Module (includes DC-DC power converter)</p>	
<p>1x Tripp Lite tablet charging cable</p>	

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<p>1x Tablet holder</p>	
<p>1x Regular tablet wall charger</p>	
<p>1x clamp base with ball</p>	

<p>1x Double ball socket arm</p>	
<p>1x Voltage Stabilizer</p>	

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Gateway Installation

1. When wiring your gateway you will need to hook up your battery positive to a switched on/off power source. (for example : keyswitch, propane lock off valve,)
2. From that point you will run your positive and negative leads to your voltage stabilizer. Attach your positive to the V+ in and your negative to the V- in of the stabilizer.
3. Next Attach an inline fuse to the V+ out on the voltage stabilizer then connect it to your Positive lead for the s3.
4. Your negative lead will be attached to the V- out of the voltage stabilizer.
5. Check to make sure that you only have power (battery voltage) when the key is on and attach your power cable to the s3
6. Gateway and camera should only be on when the key is turned on.

Tablet Installation

1. Install your clamp base on the unit in an area of the operator's compartment where it is accessible but will not obstruct the view of the operator when the tablet holder is installed.
2. Next install your DBL ball socket arm to the clamp base and the tablet holder mount adjust and tighten the socket arm to hold it in place (Make sure the tablet holder does not obstruct the operator's view or interfere with unit operation).
3. Install tablet into the tablet holder mount and lock it down.
4. Wiring
 - a. Attach a positive and negative wire directly to the positive and negative terminals of the battery