

ATMA2

## Operating Procedure Manual



## **ATMA2 User Manual**

**Rev: 2.0**

### **Before Start up**

1. Wireless e-stop must be on or the e-stop override switch must be flipped for the vehicle to move the ATMA
2. Navigate the vehicle out to the testing area
3. Shut down both vehicles, the lead vehicle computer comes on with ignition (no breakers) so you will have to wait for it to shut down (can watch internal display to see when computer is off) before start up procedure

### **Start up**

There are two computers in the ATMA systems, a GPU in the lead vehicle and another GPU in the follow vehicle. Controlling the startup order of these devices helps ensure the system is completely connected prior to automation engagement. The start order is Lead GPU and then Follow GPU.

### **First Step**

1. Flip the power switch for the ATMA in-cabin hardware located against the bench seat, illuminated red (image 9)
2. Wait for the wireless modem (silver box on the dash with antenna) to boot up (it will flash for about a minute or two until it will have 4G illuminated and a signal strength indicated)

### **Lead**

1. Connect the USB power adapter to the vehicle cigarette lighter port.
2. Start/Turn on the Lead Vehicle (Tahoe)
3. Turn on lead tablet HMI
  - a. Hold power button on side of tablet.
  - b. Press *continue* when it asks about the charger.
4. Swipe up to log in. Password=das
5. Open ATMA GUI, bottom most tile on home screen
6. Turn on Wireless ESTOP (image 5) by holding the black button beside the antenna for a few seconds, red light should come on in the center of the red mushroom button
  - a. Keep close by as this is for ESTOP events to the Follow Vehicle.
7. Ensure that the GPU display is showing the forward camera view

## Follow

1. Make sure all 4 breakers are closed. Image 3, Image 4
2. Plug in both USB Power adapters into cigarette lighters for Tablet HMI and GPU Display
3. Turn on Follow Vehicle (ATMA-Truck)
  - a. Turn key to ignition
  - b. Wait for the "ignition heat" light to go off (1-5 seconds)
  - c. Crank engine
4. Ensure both automation keys are turned on. (They should be on and can be left on after shutdown) Image 6
  - a. Far Right key is for automation mode
  - b. Far Left Key is to apply power to our system
5. Turn on tablet HMI same as the lead and open ATMA GUI
6. When ready, make sure all mushroom buttons, Wireless ESTOP (image 5), in-cab disable automation button (Image 6), and 4 outside ESTOPS on bed (image 8) are all depressed (not pressed) by twisting them to ensure release.
7. Ensure that the GPU display is showing the forward camera view
8. Once completing these steps both vehicles should be powered on and the systems ready to go.

## Operation

1. Drive vehicles for at least 5 minutes (incorporating turns and/or lane changes if possible) after start-up in non-automated mode to acquire GPS signal and calibrate IMUs. The tablet GUI should display "non-automated" at the top after the 5 minutes, if this is not the case, shut down both vehicles and restart the start-up sequence.
2. Align both vehicles such that their headings are nearly identical and come to a stop with 75-125 ft in between the two vehicles.
3. \*All of the following operations in reference to the GUI should be carried out by the lead vehicle, the follow vehicle should never touch their tablet GUI, it is for awareness only.\*
  - a. Click "begin initialization"
  - b. Click "engage automation"
4. At this point, "automation ready" should be displayed on the top of both tablets and the safety driver can release control of the follow vehicle, it will hold itself stationary
5. The lead vehicle should drive forward a couple feet or until object detection warning is no longer present and then click "start follow", then immediately begin driving slowly forward along the intended path. The tablet should show the following distance increasing and a blue border with "following" up top should appear. Once the set distance is achieved, the follow vehicle should start moving to keep that following distance, it will initially play catch up as the following distance is usually overshoot to begin.



Image 3: Battery Breakers (2)



Image 4: 2 breakers underneath on bottom shelf in cabinet



Image 5: Wireless ESTOP



Image 6: Automation keys and Emergency Stop

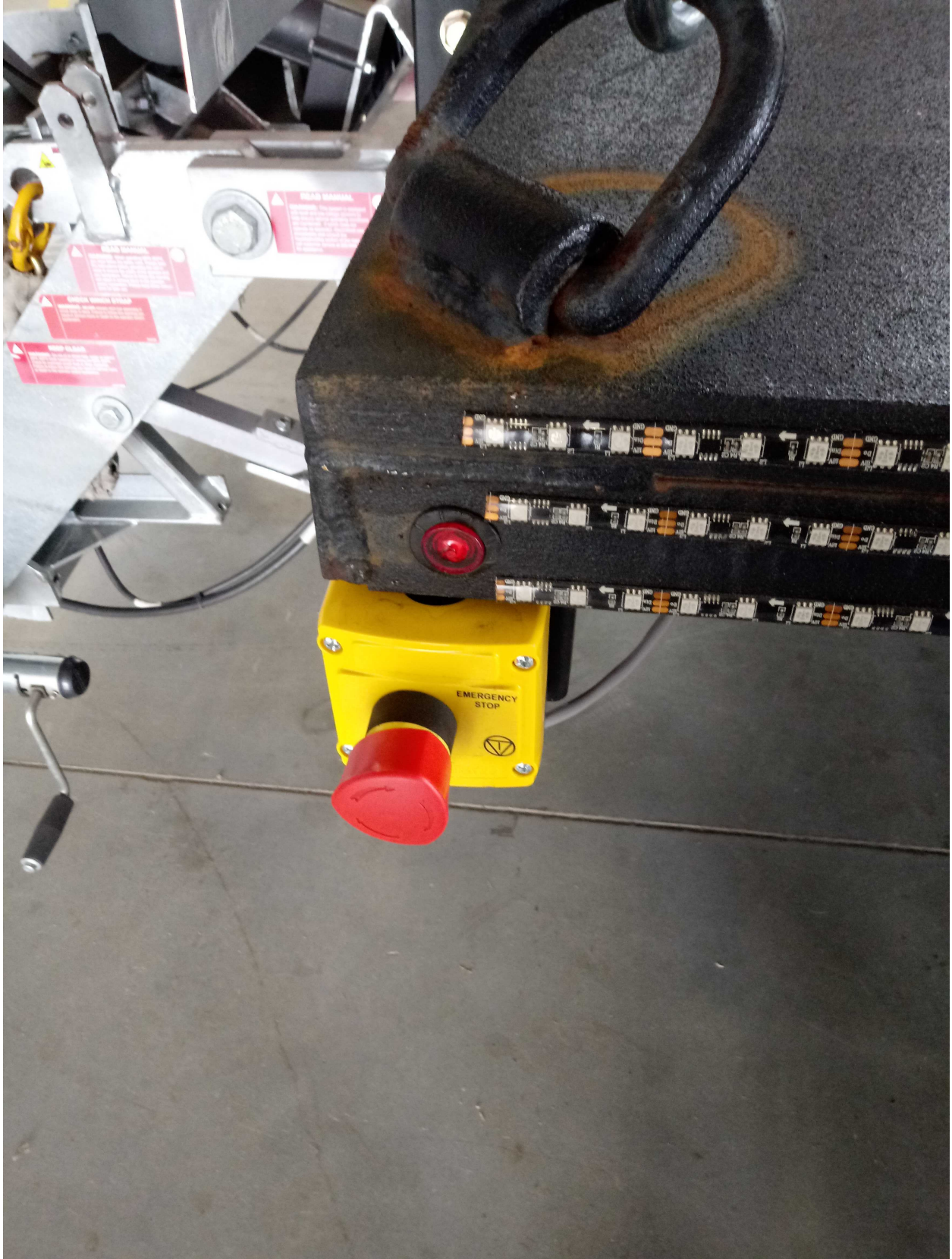


Image 8: One of Four ESTOPS on the bed





Image 9: Wireless modem and computer display power button (red)

## **Shut Down**

### **Follow First:**

1. Turn off the follow vehicle.
2. Wait for GPU shutdown ~2 minutes, fan will stop and yellow LEDS inside of GPU will turn off.
3. Turn both automation key switches off in cab. Image 6
4. Overnight shutdown:
  - a. Once the GPU fully shuts down pop all four breakers to fully cut power to the automated system.
5. Unplug tablet charger and hdmi screen power in the cab of the follow.

### **Lead Second:**

6. Power off Lead vehicle and wait for GPU to boot down, you may watch the HMI before unplugging it
7. Unplug the tablet charger
8. Turn off modem with the red in-cabin switch
9. Everything should now be powered off in both vehicles and you may open the breakers.