GemOne®

EN

Sapphire V2SC Cameras

Procedure Manual

Version 1.2 - May 2024

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1 - Safety Precautions

Read the following safety precautions before installation or operation.

Abnormal Conditions
Should the V2SC display or cameras become hot, start to emit smoke, or a strange odor; immediately turn the power off and contact GemOne. Continued usage is dangerous and may result in fire or electrical shock.

LCD Screen
Never apply heavy pressure on the V2SC display or subject it to strong impact. Doing so may crack the screen or LCD panel glass, resulting in personal injury or major damage to the device.

Power Supply
Do not use the Sapphire V2SC with any voltage other than that specified. Avoid situations that can cause damage to the power cable.

2 - Introduction

Purpose

This document is to be used as a guide to install cameras with the Sapphire V2SC display. It can be fitted onto various types of equipment, whether they are internal combustion or electric.

Scope

This document is to be used by a trained and authorized person(s) with the necessary PPE as a guide for the installation, operation, and management of the Sapphire V2SC and cameras. This document provides information on the components of the Sapphire V2SC camera kits, installation procedure, configuration, and general useability.

3 - Kit Components

Mast View Camera Kit or Rear View Camera Kit

Mast or Rear View Camera

Camera Cable

Camera Extension Cable

512GB SD Card

Mast View & Rear View Camera Kit

Mast View & Rear View Camera

Camera Cable

2 x Camera Extension Cable

512GB SD Card

Fork View Camera Kit

Fork View Camera (Varies)
& Carriage Mount

Camera Cable

Camera Extension Cable

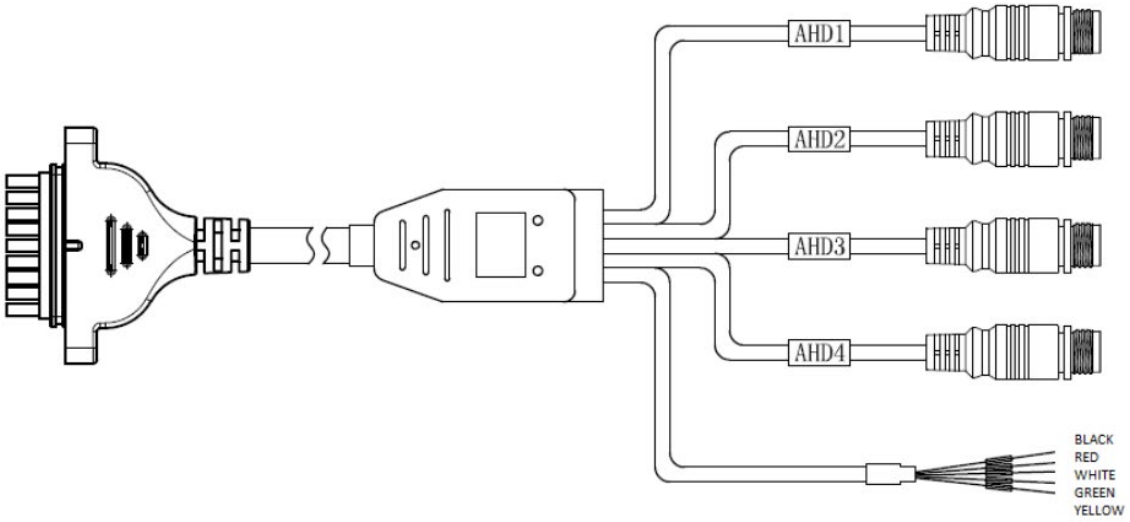
512GB SD Card

1 x Coil Cable Cable

1 x Conversion Cable

4 - Component Information

Camera Cable



There are four camera connectors labelled AHD1, AHD2, AHD3, and AHD4. The cable supports up to four cameras and utilize M12 quick connect connectors.

Input Triggers

There are five wires that control automatic camera feed triggering. If voltage is applied to the input, it will trigger the feed. If voltage is removed, the feed will revert to the previous screen.

There is a maximum voltage of 55V for the input tiggers.
DO NOT exceed 55V for the input voltage.
Trigger range:
0-5V = OFF
5-55V = ON

- **Black wire** = camera input GND
- **Red wire** = input 1 to trigger AHD1
- **White wire** = input 2 to trigger AHD2
- **Green wire** = input 3 to trigger AHD3
- **Yellow wire** = input 4 to trigger AHD4

The GND wire is optional and is not always mandatory for inputs to trigger. It is only required if the triggering circuit is on a different GND to the Sapphire V2SC device.

SD Card

All SD cards must be formatted in a specific way so it can be read by the V2SC device and also computers. There is a 512GB capacity and it is estimated to have 11 days of footage.

Once the SD card is full, it will overwrite older files.

A prompt can be configured on the app to notify the operator on the V2SC display that the SD card is approaching full capacity. See sections below for more information.

5 - Camera Connection

Preparation

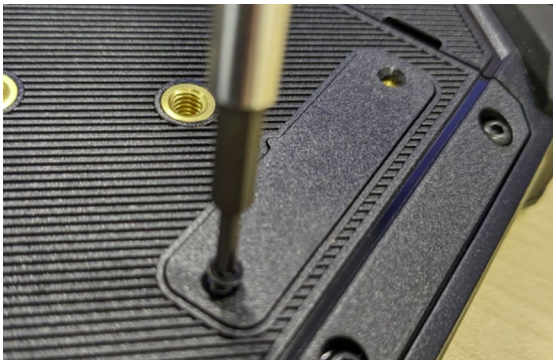
Ensure the Sapphire V2SC display is completely off before removing the cap and connecting the camera cable.

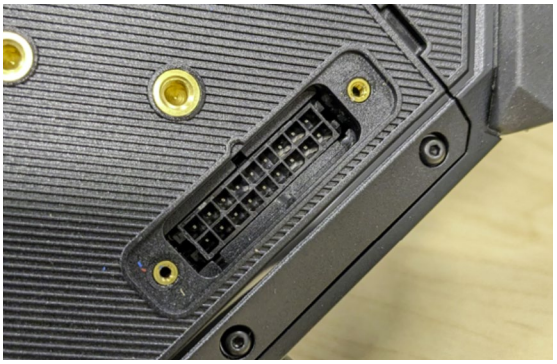
Removing the Cap

There is a cap at the back of the V2SC display that covers the camera connector. This will need to be removed before the camera cable can be connected.

There are two screws securing the cap to the display.

Remove these screws using a small phillips head screwdriver and then pry off the cap.





Connecting the Cable

There is an aligning tab for the connector so it can only be connected in one orientation. Align the cable, connect the connector, and then secure the cable using the screws.

Inserting the SD Card

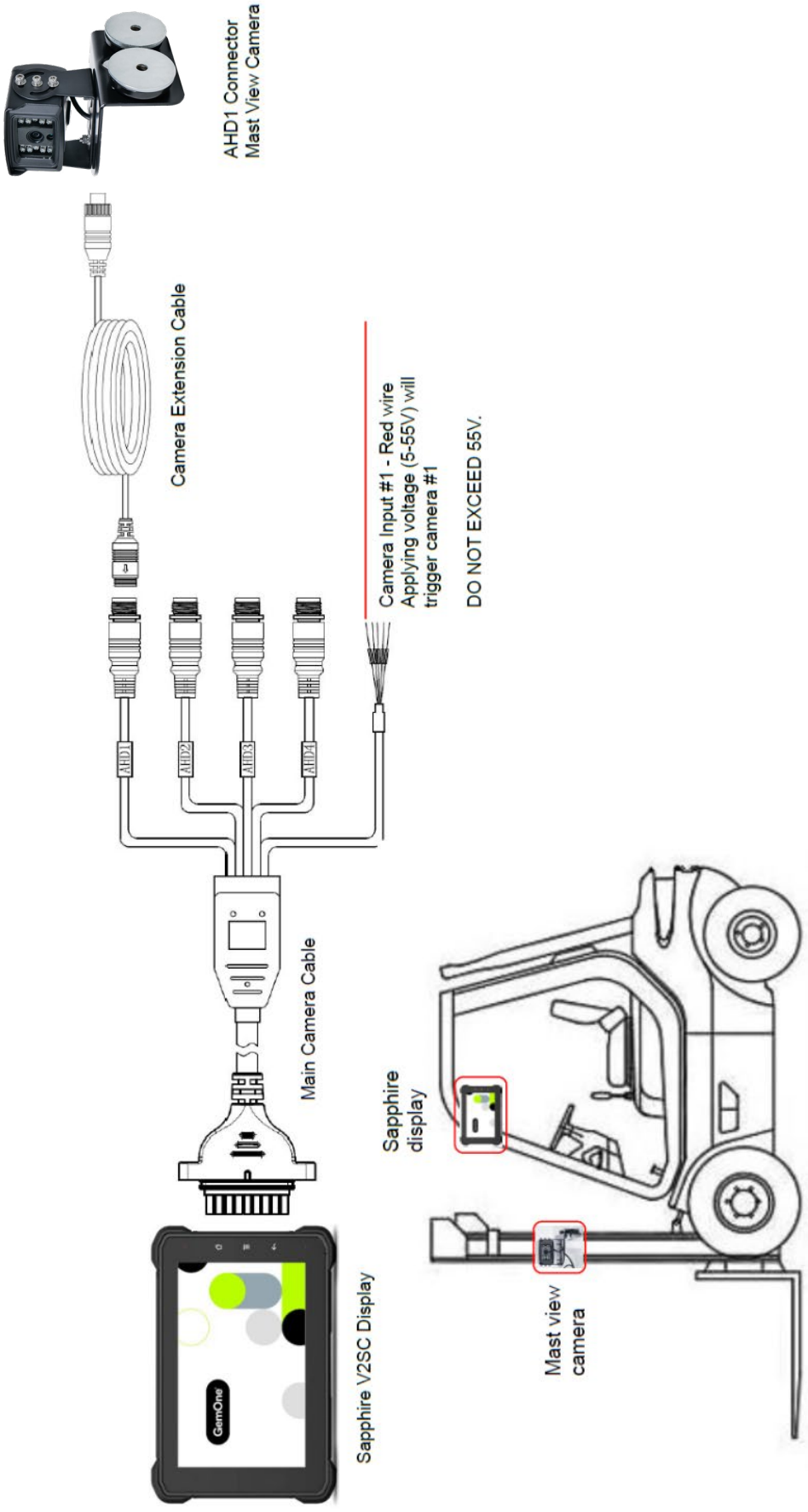
There is a small cap on the right hand side of the Sapphire V2SC that covers the SD card slot. Remove this cap by undoing the small screw and then insert the SD card. The SD card will click in place once secured.

6 - Mounting Cameras

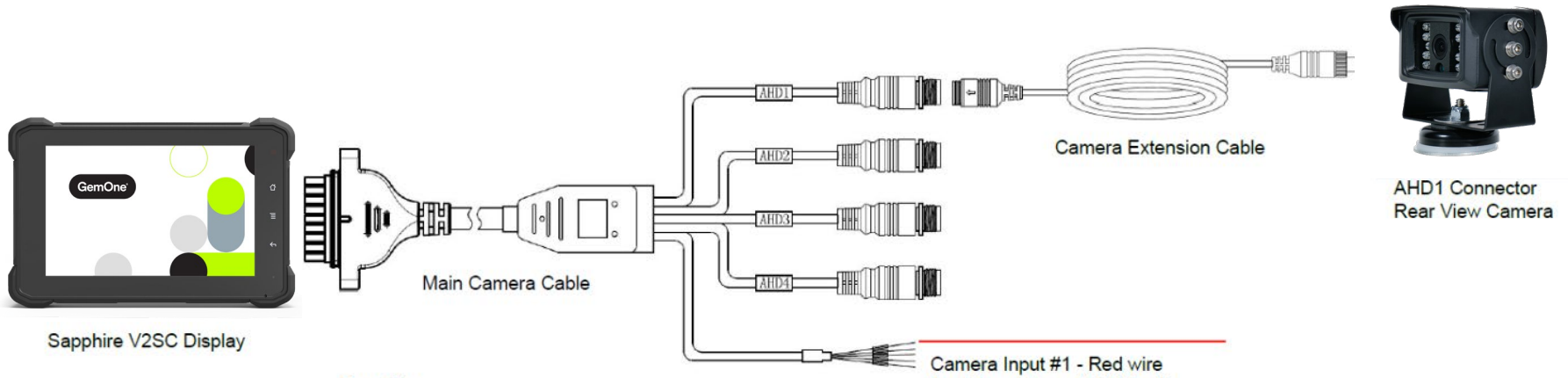
There are magnetic mounts attached to the cameras and will attach to metal. This removes the need to drill holes on the equipment to mount the cameras.

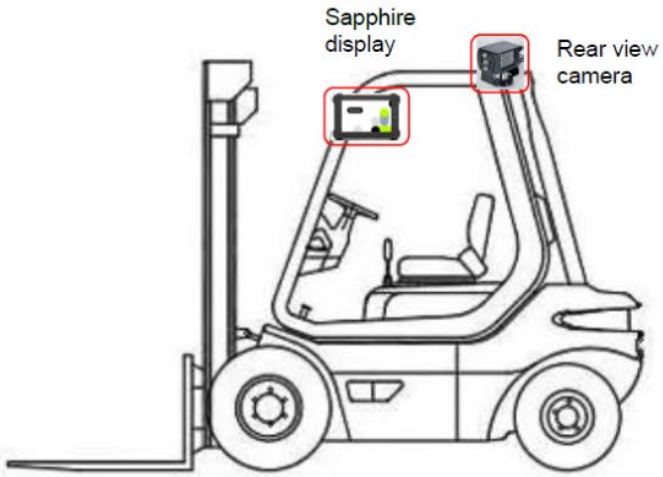
Use caution when mounting the cameras. The magnets will violently attach to the metal surface when brought close. Avoid putting fingers between the magnet and any metal surface.

7 - Mast View Camera Overview

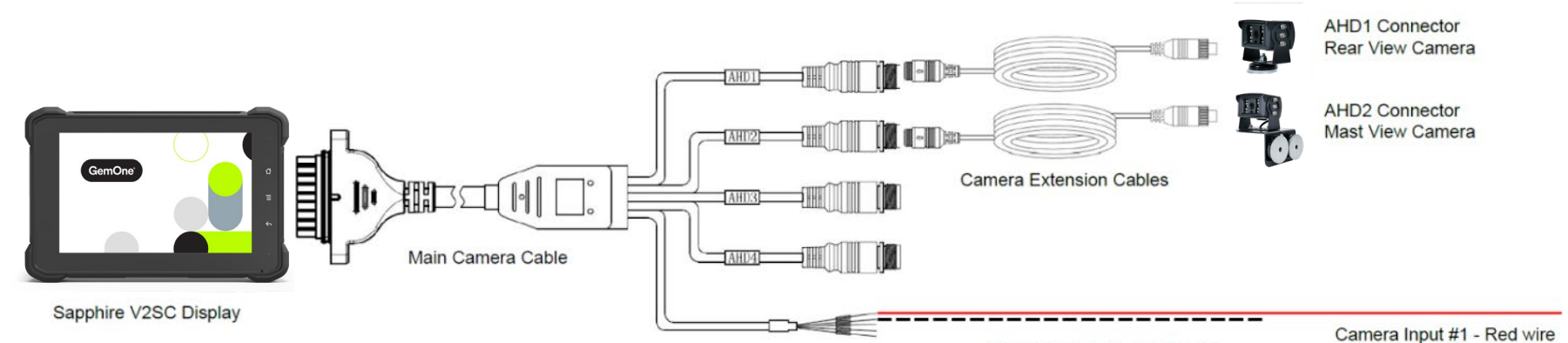


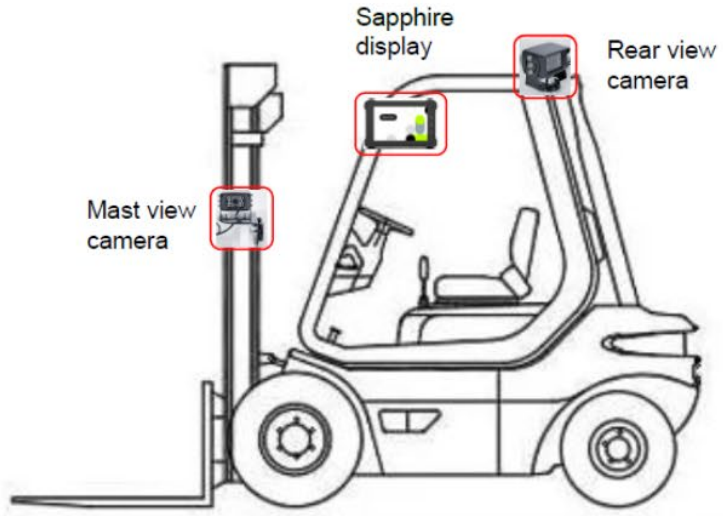
8 - Rear View Camera Overview



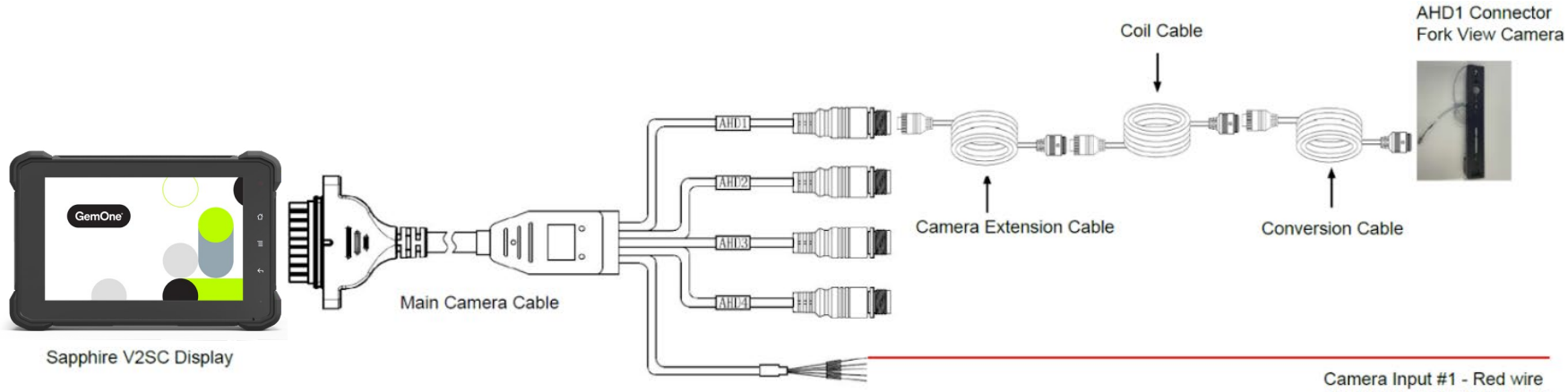


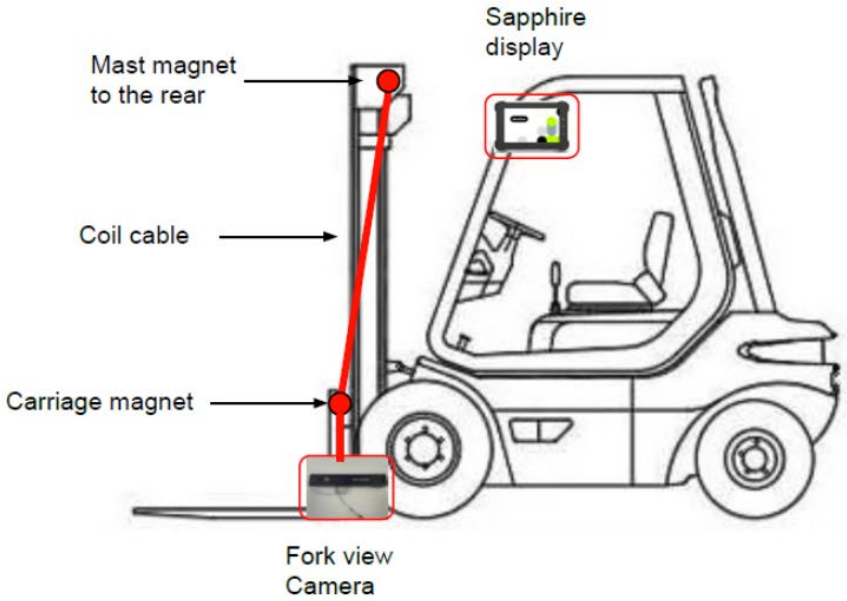
9 - Mast View & Rear View Camera Overview





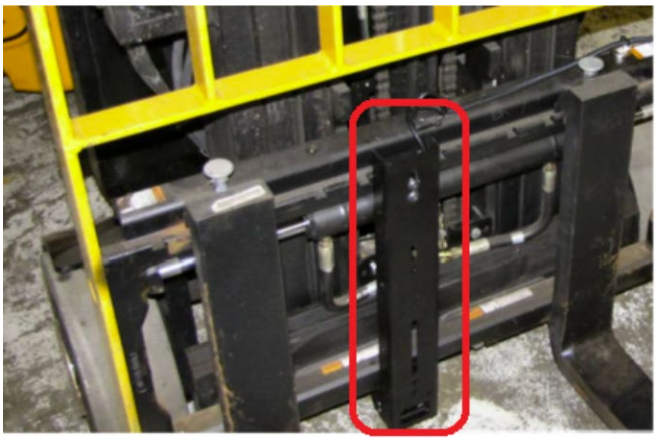
10 - Fork View Camera Overview

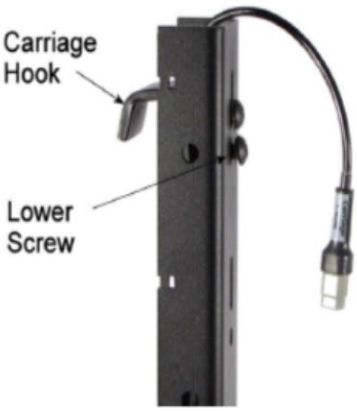




11 - Fork View Camera Installation

Installation Procedure





1. The fork view camera mounts all class 2A, 3A, and 4A hook type carriages much like a fork
2. Hang the fork view camera approximately in the centre of the fork carriage and fork notch
3. Slide the camera over from the notch to engage the lower hooks
4. The fork view camera will be secured by tightening the carriage hook screws up at the top of the camera

If there is no fork notch, remove the lower screw and lift carriage hook to fit over the carriage.

5. Wire the camera by connecting the fork view camera pigtail to the carriage end of the coil cable
6. Mounting magnets in the installation kit may be used to secure the cable on the carriage where is not it is not practical to use a cable tie
7. Tie off the camera cabling securely but take care not to pinch or cut the cable by pulling the cable ties too tight
8. Tighten carriage hook screws as needed, lower screw first, then the top screw to secure the camera to the carriage

Coil Cable Mounting

Mast End: Coil Cable Mounting

Identify the mast end of the coil cable and mount on the upper, rear stationary part of the mast. This location creates an offset from front to back which allows the coil cable to operate without tangling on itself.

Fork Carriage End: Coil Cable Mounting

Mount the fork carriage end magnet to the carriage or load backrest. Desirable locations are:

1. As far outboard of the mast mounting as possible but within the outside dimensions of the equipment
2. Have no possible entanglements while in operation

By mounting the coil cable offset front to back and from inside to outside, it will operate without tangling upon itself.

The fork carriage mount operates with the coil exiting in a downward direction from the magnet. When the cable is fully extended (forks high overhead), the coil is extended from its mount, down towards the mast magnet mount.

Testing Operation

Test operation of the coil cable by carefully raising and lowering the forks through the range of operation. Follow all normal safety procedures while moving the forks.

Make adjustments to the placement of coil cable if needed for proper operation.

Act immediately if the coil cable starts to twist and tangle on itself at any time. Disconnect the connector on one end, lift that end of the coil cable off the surface and uncoil the coil cable to remove the twist. Remount and re-connect the coil cable. Check for proper operation. Coil cables may do this when very new or if they have been over stretched.

12 - Camera Application

General Information

Cameras on the V2SC can be accessed via the camera app. This is accessible after logging into the Sapphire V2SC device and can be found on the top right corner of the display. There are two types of views:

1. **Driver view** - only allows for viewing of cameras
2. **Supervisor view** - allows for viewing, playing back footage, and also changing settings

Application Settings

Mast & Rear View Cameras

1. Log into Sapphire using a supervisor code and then touch the camera icon
2. A capacity reminder for the SD card can be set. This will prompt the operator when the SD card has reached a certain capacity. The percentage value can be adjusted and an option to remind the operator once or continuously can be set up.

a. Capacity reminder enable = whether or not the prompt will appear when the SD card is getting full
b. Percentage value = how much of the SD card needs to be filled before the prompt appears
c. Reminder once = activate this to only remind the operator once

The SD card will still be overwritten if this prompt is not enabled.

3. Touch the settings button and then configure the amount of cameras depending on the type of camera kits to be installed.

   Change the Preview Number to suit the amount of cameras.

a. **One camera:**
   Either one mast camera, one rear view camera, or one fork view camera - configure the preview number to one

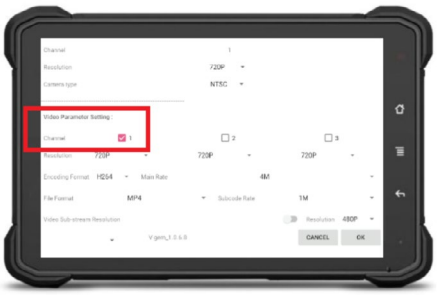
b. **Two cameras:**
   typically one mast view and one rear view camera. Configure the preview number to two

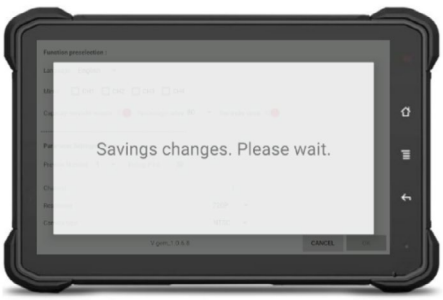
c. **Three cameras:**
   typically one fork view, one mast view, and one rear view. Configure preview number to three

d. **Four cameras:**
   typically one fork view, one mast view, and two rear view. Configure the preview number to four

The resolution and camera type must be set to **720p** and **NTSC** for mast view and rear view cameras.

The resolution and camera type must be set to **CVBS** and **NTSC** when using a camera conversion harness to convert an existing V2 camera accessory.



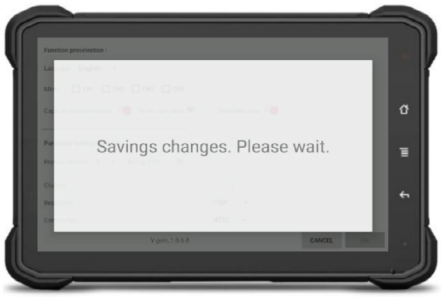


4. Tick the video parameter setting boxes to record footage.
   a. Tick channel 1 if only one camera is connected to AHD1
   b. Tick channel 2 as well if there are two cameras connected; one camera to AHD1 and another camera to AHD2

5. Press OK to save changes

Fork View Cameras

See section above for steps to get to this settings screen. When configuring the settings, set the resolution to CVBS and camera type to NTSC for fork view cameras.
Press OK to save changes once this has been set.

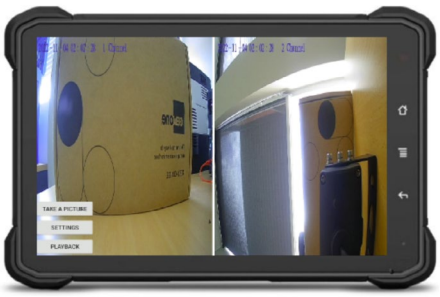


The resolution and camera type must be set to CVBS and NTSC for fork view cameras or it will not operate correctly.

Functions

Preview Number

Changing the preview number will determine how many camera feeds appear on the display. The example below has two selected so it shows two camera feeds.



Camera View

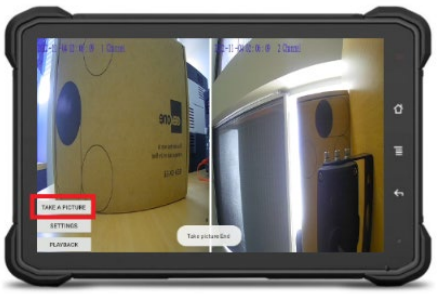
- Touching a camera feed will enlarge that video on the display.
  This can be done manually or by connecting the inputs from the camera harness.
  Refer to the camera input section above for more information.
- Touching the feed again will revert back to the previous screen.

Enlarging AHD1

Enlarging AHD2

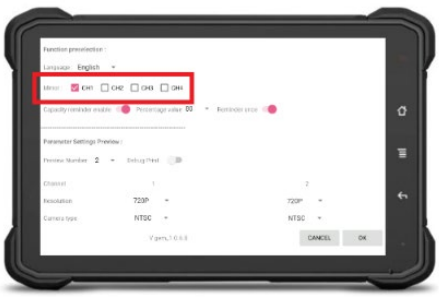
Take a picture

- This is only available for the supervisor view.
- Selecting TAKE A PICTURE will take pictures of all the active cameras and is dependent on the SD card being inserted and formatted correct. The display will say TAKE PICTURE END if a picture has been successfully taken



Mirror

- This will flip the image of the camera if selected. CH1 corresponds to AHD1, CH2 corresponds to AHD2, CH3 corresponds to AHD3, and CH4 corresponds to AHD4.
- The examples below show the difference between a normal and mirrored image.



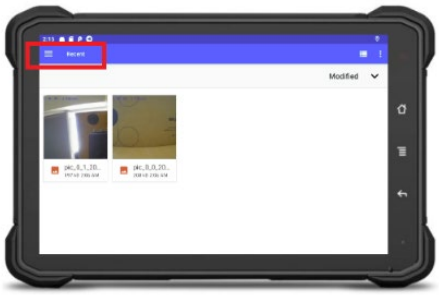
Normal Image

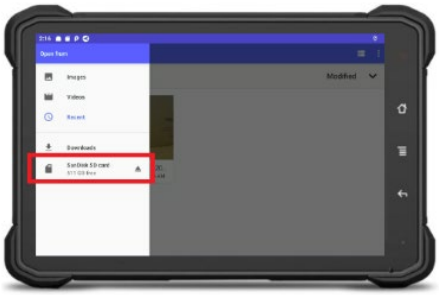
Mirrored Image

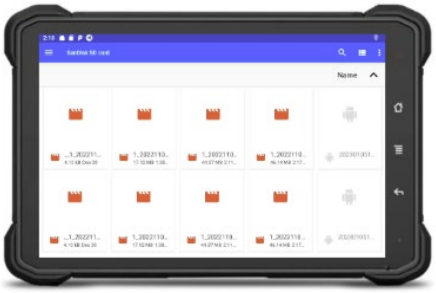
Playback

- This is only available for the supervisor.
- Footage and images can be viewed directly from the display.
  Touch the PLAYBACK button to bring up additional options.

- Change the destination from Recent to SanDisk SD Card and then the saved files will appear



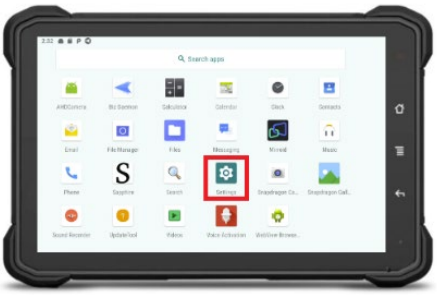


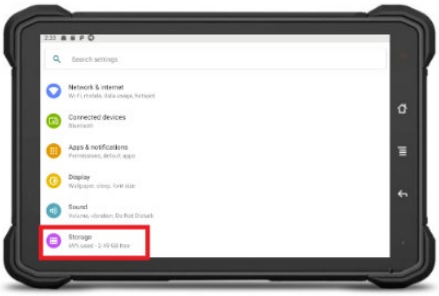


13 - Appendix A - SD CARD FORMAT

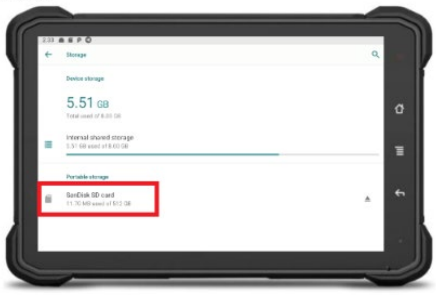
The SD card must be formatted by the tablet so it can be read by both the display and a laptop. This can be done by:

1. Open the camera app and then press the home button twice
2. Close all the apps and then it will go to the main display
3. Drag the screen up to bring up all the icons. Go into Settings
4. Go into storage

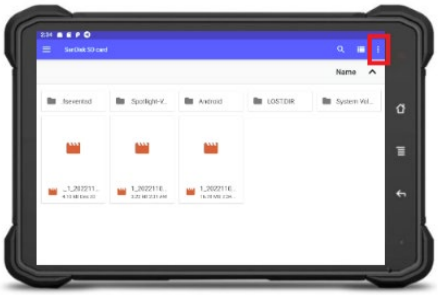




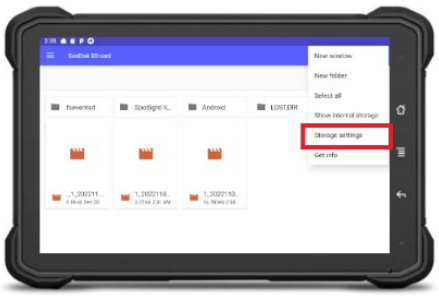
5. Select SanDisk



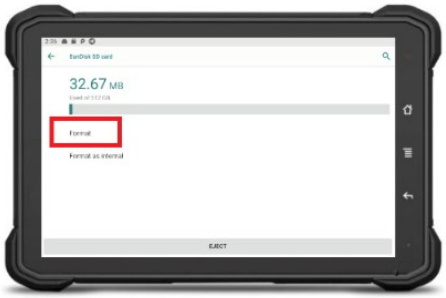
6. Select the 3 dots on the top right



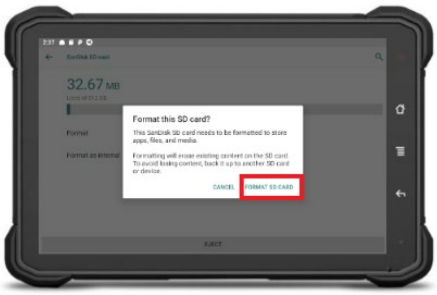
7. Select storage settings



8. Select Format



9. Format the SD card



10. Press Done

11. Press the home button to open up the sapphire app and then the process is complete.

14 - Support

In case of issues, questions or feedback, feel free to contact our support team.

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