FOCUS H2

In-Car Video System

Installation Guide

Document Revision: 1.7

Contents

1. Introduction

This document is intended for use with Safe Fleet FOCUS H2 In-Car Video System and contains instructions for using the Safe Fleet FOCUS H2.

Safe Fleet manufactures state-of-the-art mobile data computers and digital video recording equipment for use in the public safety, utility and military community. In addition to innovative mobile computing devices and digital video technology, Safe Fleet employs the latest communication, database, and storage technologies to deliver complete and scalable solutions to our customers, regardless of the size of the agency.

> **🛇 DISCLAIMER**
>
> Due to variations in vehicles, agency equipment requirements, and the placement of existing equipment, every installation in a public safety vehicle is unique.
>
> The information contained herein is subject to change without notice. Safe Fleet reserves the right to make changes to this product, has no obligation to update or keep current the information contained within, and assumes no responsibility for any errors or omissions that may be present in this document.

1.1 Purpose

The H2 is a high definition (1080p) in-car video recorder intended for the law enforcement market. Additionally, the H2 is designed to allow for Edge computing. The design recognizes the significant benefit that can be gained by law enforcement with real-time analytics that don't rely on a high bandwidth connection back to the cloud. This document describes the overall hardware design/capabilities and the intended and desired structure and function of the software/firmware.

2. Installing FOCUS H2 In-car Video System

2.1 Package Contents

FOCUS H2 CPU
P/N: FOCUS-12-01

Front Camera
P/N: FOCUS-15-06-C-02

Rear Camera
P/N: FOCUS-15-03-U-02

H2 Monitor
P/N: FOCUS-12-02

GPS
P/N: FOCUS-04-14

Power Harness
P/N: FOCUS-04-03

Monitor Extension Cable
P/N: FOCUS-06-01-C
Front Camera
Extension Cable
P/N: FOCUS-05-03-C
Rear Camera
Extension Cable
P/N: FOCUS-05-11-C

I/O Cable
P/N: FOCUS-04-04

Drive Key & Removable
Drive
P/N: FOCUS-04-06
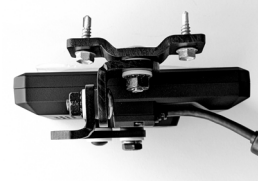
2.2 Mounting Parts List

| CPU mount
P/N: FOCUS-04-02 | Front camera mount
P/N: FOCUS-05-14 | Rear camera mount
P/N: FOCUS-05-09 | Monitor mount
(universal mount)
P/N: FOCUS-06-05 |

> **ℹ NOTE: CPU Mount**
>
> CPU mount includes carriage bolts which should be used instead of self-drilling screws when possible.
> There are two mounting options: forward holes and mid holes for the CPU in the bracket.

> **ℹ NOTE: Monitor Mount**
>
> The universal monitor mount is used when installing the monitor on the center console or on vehicle that does not have a vehicle specific mount. (Vehicle specific mounts are available for 2020+ Ford Explorer Utility, 2018-2020 Tahoe, and 2021+ Tahoe).

2.3 Mounting the FOCUS H2 CPU

The following images show the front and the back of the FOCUS H2 CPU respectively.

To mount the CPU, follow these steps:

1. Choose a dry location with air flow.
2. Fasten the CPU mounting bracket to the vehicle. There are two ways to fasten the CPU mounting bracket depending whether a rack is present for installation.

a. If a rack is present, fasten the CPU mounting bracket to the rack with 4 x 1/4"-20 carriage bolts and nuts.

b. If a rack is not present, fasten the CPU mounting bracket to the vehicle with 4x #10 self-tapping screws.

3. Once the CPU mounting bracket is fixed to the vehicle, utilize the provided 4 x #10-32 screws to fasten the CPU to the bracket as shown in the pictures below.


> ❗ CAUTION: Be Careful...
>
> Be careful not to damage the vehicle's fuel tank with the self-tapping screws.
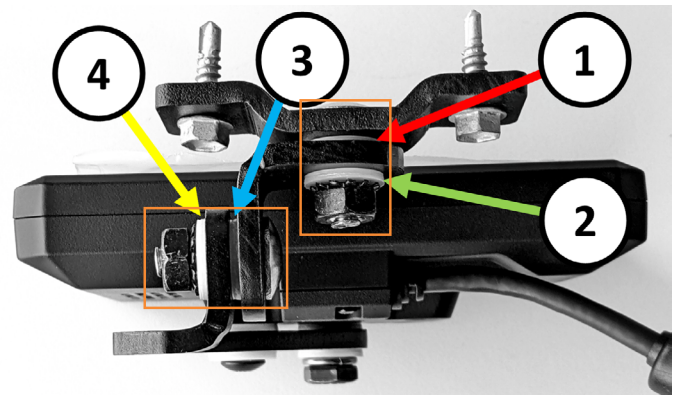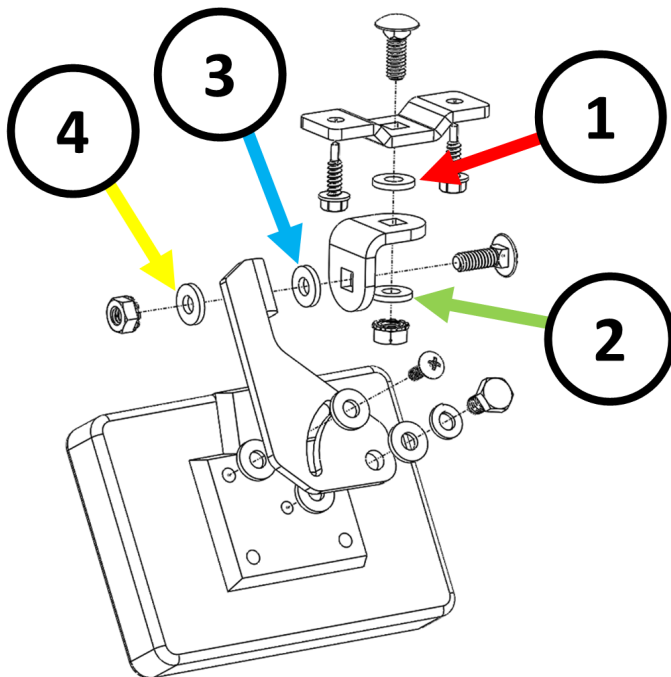
2.4 Mounting the Monitor

To mount the FOCUS H2 monitor, follow these steps:

1. Attach the Swivel mount backing plate to the back of the FOCUS H2 monitor. Secure it via the center hole with a 1/4"-20 screw, 2 flat washers, and a split lock washer, and secure via the top-left hole with a #8-32 screw and 2 flat washers as shown in the figure below.
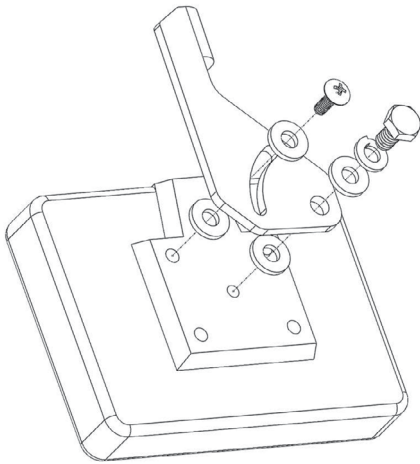
2. Assemble the Swivel mount base and the angle plate with a carriage bolt, 2 flat washers (Label 1 & 2), and a lock nut as shown in the figure below. Then, secure the mount base and angle plate assembly to the backing plate in Step 1 using a carriage bolt, 2 flat washers (Label 3 & 4), and a lock nut.


3. Mount the monitor assembly to the vehicle using 2 self-tapping screws, and adjust the monitor to the desired position.

2.5 Mounting the Front Camera

To mount the front camera, follow these steps:

1. Install the flat plate by removing the visor clip and placing the plate around the hole. Mark and drill pilot holes first to make the self-drilling screws easier to install. Once this is mounted firmly, replace the visor clip.
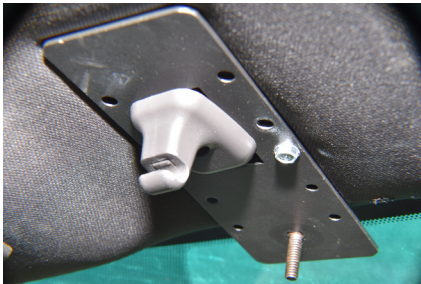
2. Install the carriage bolt through the front center hole pointing down as shown in the image above. Do not install a washer between the carriage bolt head and the flat plate.

3. There are 2 operating options for the end user to choose from:
    Pan/Tilt option: In order for the end user to be able to aim the camera, it allows panning and tilting of the camera when the kit is assembled as Section (a) below. One set of white plastic washers are installed in a way to allow right/left panning. The other set of white plastic washers are installed in way that allows forward/backward tilting.
    Fixed option: Fix the position of the camera during installation as Section (b) below so that it cannot be moved by the end user.

    a. To mount the front camera using the **Pan/Tilt** option:

        i. Install the hanging bracket with a set of white plastic washers, a split washer, and a locking nut to the carriage bolt installed in Step 2 as shown in the figure below.
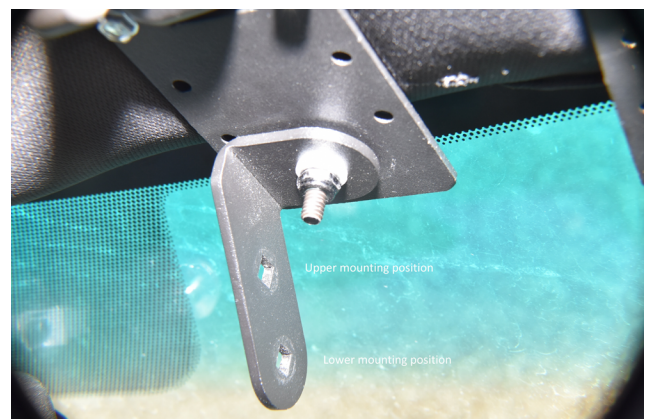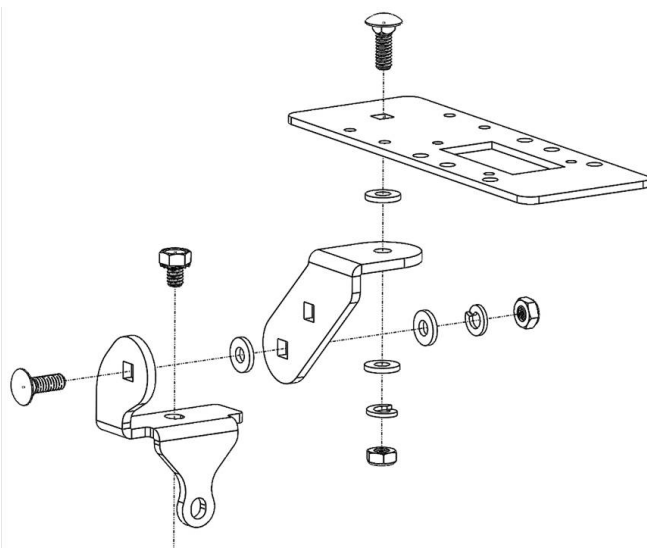
    ii.   Install the camera mount by inserting a carriage bolt into the hanging bracket with a set of white plastic washers, a split washer, and a locking nut as shown in the figure above.
Notice that there are upper and lower mounting positions to choose from, depending on the agency's mounting policy.

  b.   To mount the front camera using the **Fixed** option:

    i.   Insert a tooth lock washer and the hanging bracket to the carriage bolt installed in Step 2, followed by a locking nut as shown in the figure below.

    ii.   Insert a carriage bolt into the camera mount, followed by a tooth lock washer, the hanging bracket, and a locking nut as shown in the figure below.
Notice that there are upper and lower mounting positions to choose from, depending on the agency's mounting policy.
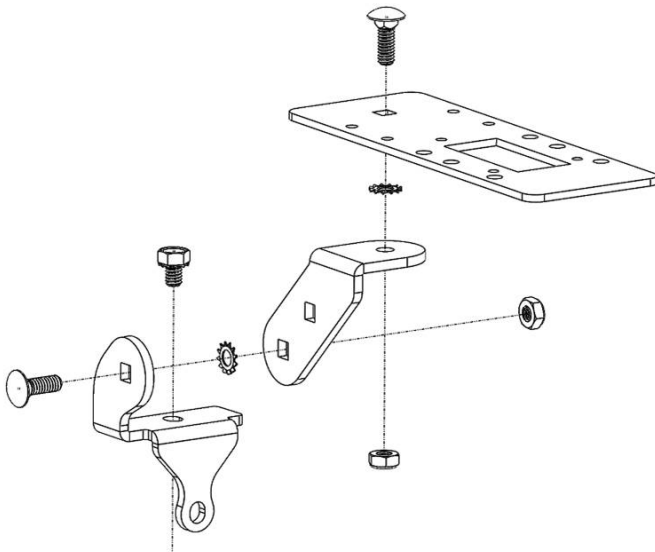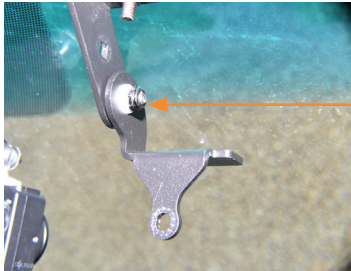
> **ⓘ NOTE: Upper and Lower Mounting Holes**
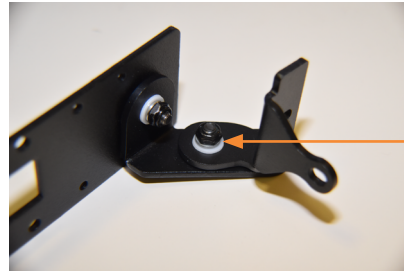>
> There are upper and lower mounting positions to choose from, depending on the agency's mounting policy.
>
>
>
> Lower mounting position
>
> Upper mounting position

4. With the star washer bolt, mount the camera to the bracket and properly position the camera.

5. Make sure to zip tie the camera cable out of the way, but allow enough slack to move the camera if needed.

2.6 Mounting the Rear Camera

Hardware provided for rear camera installation:

(2) self-drilling screws, mounting plate, camera mount, hex head screw with lock washer, and pan head screw
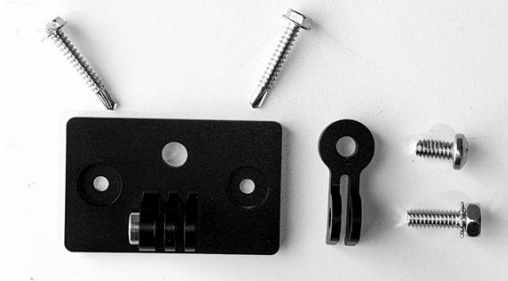
To mount the rear camera, follow these steps:

1. Make sure the rear camera is orientated correctly. The part number sticker should face up. Bolt the camera mount to the rear of the camera using the pan head screw. Make sure the camera mount is on the bottom of the camera.

2. Mount the plate on the cage using the (2) self-drilling screws. Make sure the mounting section is on the bottom of the plate.

3. Using the hex head screw with lock washer, connect the camera to the mounting plate. Position the camera and tighten the screw.

4. Hide the cable above the headliner or towards the front of the cage.

2.7 Wiring the FOCUS H2

2.7.1 Using the Power Harness for Wiring the CPU

To wire the FOCUS H2 using the Power Harness, follow these steps:

1. Attach the BLACK wire of the POWER HARNESS to ground.
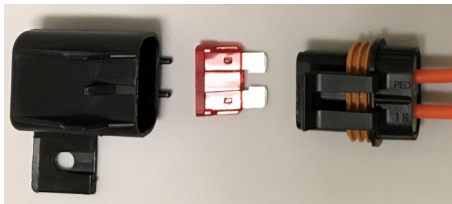

2. Take the inline fuse holder and release the clasp on the holder to remove the fuse.

3. Securely attach one end of the fuse holder wire to the RED wire.
4. Connect the other end of the fuse holder wire to the positive terminal of the battery.
5. Reattach the fuse, and fix the fuse holder firmly into place.
6. From the power harness, run the YELLOW wire along the dash, and finally, connect it to an ignition source.
7. Connect the Power Harness to the power pigtail on the CPU.

> **ⓘ NOTE: Connecting the Power Connector**
>
> When connecting the power connector, line up the arrows on each connector to point to each other.

2.7.2 Wiring the Monitor

To wire the monitor, follow these steps:

1. Lay out the monitor extension cable (black) from the monitor location to the CPU.
2. Connect the monitor pigtail to the monitor extension cable.
3. Connect the monitor extension to the port on the back of the CPU labeled **LCD**. To connect the extension securely, thread up and thread down the connectors at the base of the plugs.

Connect the monitor extension cable (black) here

> **ℹ NOTE: Orientation**
>
> For proper orientation make sure the top flat side of the connector is facing up.

2.7.3 Wiring the Front Camera

To wire the front camera, follow these steps:

1. Run the camera extension cable (brown) from the front camera location to the CPU.

2. Connect the camera pigtail to the camera extension cable.

3. Connect the camera extension to the port on the back of the CPU labeled **CAM 1**. To connect the extension securely, thread up and thread down the connectors at the base of the plugs.

Connect the camera extension cable (brown) here

> **ℹ NOTE: Orientation**
>
> For proper orientation make sure the top flat side of the connector is facing up.

2.7.4 Wiring the Rear Camera

To wire the rear camera, follow these steps:

1. Run the camera extension cable (red) from the rear camera location to the CPU.

2. Connect the camera pigtail to the camera extension cable.

3. Connect the camera extension to the port on the back of the CPU labeled **CAM 2**. To connect the extension securely, thread up and thread down the connectors at the base of the plugs.

Connect the camera extension cable (red) here

> **ⓘ NOTE: Orientation**
>
> For proper orientation make sure the top flat side of the connector is facing up.

2.7.5 Connecting the I/O Cable

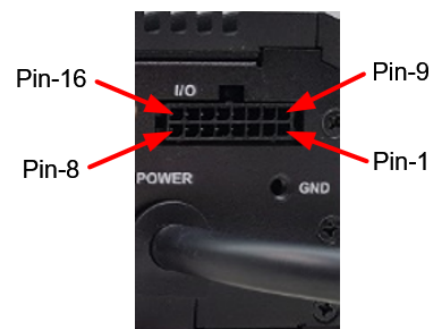To connect the I/O cable, follow these steps:

1. Connect the I/O cable to the port on the CPU labeled I/O.

2. Attach the Black wire with the Yellow Stripe to a 12V output signal from the lightbar.

> **ⓘ NOTE: Digital Inputs & Outputs**
>
> Digital Inputs and outputs are configured in the Command Center Back office.

CPU Back Panel

Pin-16   Pin-9

Pin-8   Pin-1

I/O Port

Input and Output Descriptions

Pin #	Connector	Function	Color
1	DI - 1 Input	Lightbar	Black / yellow stripe
2	DI - 2 Input	Brake	Black / white stripe
3	DI - 3 Input	Spare (Recommended: Door)	Black / blue stripe
4	DI - 4 Input	Spare (Recommended: Gun Lock)	Black / green stripe
5	DI - 5 Input	Spare (Recommended: Siren)	Black / red stripe
6	DI - 6 Input	Spare	Black / orange stripe
7	DO - 1 +	Output (NC) +	Black / brown stripe
8	DO - 1 -	Output - Load	Black / gray stripe
9	N/C	Gnd	N/A
10	N/C	Gnd	N/A
11	N/C	Gnd	N/A
12	N/C	Gnd	N/A
13	N/C	Gnd	N/A
14	N/C	Gnd	N/A
15	DO - 2 +	Output (NC) +	Black / violet stripe
16	DO - 2 -	Output - Load	Black / pink stripe

NOTE: DI & DO Port Function

DI Port Function:

Electrical Current Limitation: < 5mA

Electrical Operating Voltage: 8~12V

DO Port Function:

Electrical Current Limitation: < 2A

Electrical Operating Voltage: 0~24V

16 PIN Molex
DIO WIRE HARNESS

Configurable Trigger
Inputs 1 - 6 (+12vdc)

9   1

LIGHT BAR SIGNAL

BRAKE

DOOR

GUN LOCK

SIREN

SPARE

DO - 2 + (NC)

DO - 2 - (LOAD)

DO -1 + (NC)

DO - 1 - (LOAD)

DO Relay Contacts
10 amp Max

DO Relay Contacts
10 amp Max

16   8
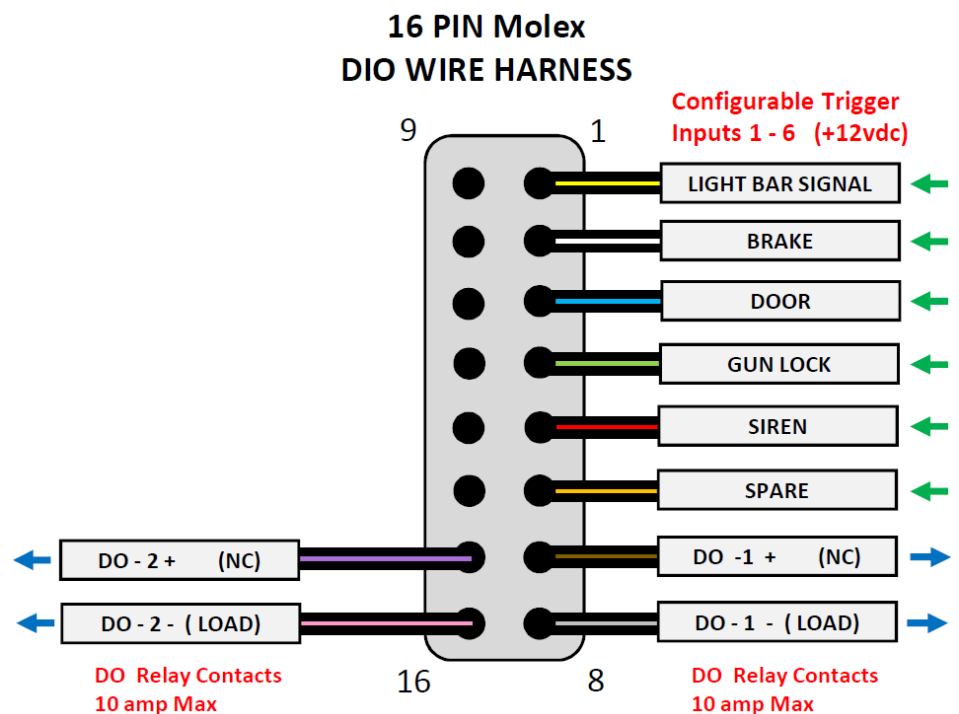
2.8 Connecting the Peripherals

This section describes how you can connect the peripherals of the FOCUS H2 In-car Video System.

2.8.1 Connecting the GPS

To wire the GPS, follow these steps:

1. The GPS receiver should be placed near a window with top of the GPS receiver in an upward-facing position to allow a better connection with the satellite.

2. Run the cable to the CPU.

3. On the CPU, find a USB port labeled "GPS".

4. Insert the USB connector in to this port.

> **ⓘ NOTE: Extension Cable**
>
> Each system comes with an extension cable. If the GPS cable is not long enough to reach the CPU, please use the extension cable and tape the connectors together to keep them from coming apart inside the panels after being installed.

2.8.2 Connecting the Wireless Microphone

Overview of the Wireless Microphone

1. WIRELESS MICROPHONE
2. BATTERY
3. MICROPHONE CHARGING UNIT
4. CAR CHARGING POWER CORD
5. WALL CHARGING POWER CORD
6. LAPEL MICROPHONE
7. LEATHER BELT POUCH

The H2 In-car video system supports up to two wireless microphones, in addition to the In-car microphone. To access the secondary receiver contacts, remove the cover located near the primary receiver.

When a recording on camera 1 is started, the wireless microphones are turned on. When camera 1 is stopped, the microphones are turned off.

The microphone has the following three buttons

- **Rec** – larger button on top
- **PB1** – smaller button on top. This is a programmable function button.
- **PB2** – side button. This is a programmable function button.

If there are two wireless microphones, their push buttons are given the same functions.

- **Mute** – mutes the sound from the wmic. When mute is on, a button LED displays. When the mute is off the button LED is turned off.
- **Marker** – records the time when the button is pressed. This is the same as a bookmark.
- **TriggerCam2** – starts camera2.
- **Snapshot** –This is the same as the snapshot function on the live view screen.

Assembling the Microphone Unit

The microphone comes in a package, which also includes a battery, a wall charging unit, and an antenna. To use the microphone, you must first assemble it.

To assemble the microphone:

1. Remove the microphone, battery, antenna, and power adapter from the packaging.
2. Unscrew the lid of the battery compartment, and fit the battery inside.
3. Carefully fix the lid on to the battery compartment.
4. Thread the antenna inside the screw hole meant for this purpose. You should find the screw hole along the breadth of the microphone unit.
5. Use the charging unit to fully charge the microphone battery.

Installing the Microphone Receiver

The Microphone Receiver makes available the audio signal that is transmitted by the microphone.

Follow these steps to install the microphone receiver:

1. Install the microphone receiver as high as possible to clear the firewall. This will give the longest range for the body microphone. The microphone receiver antenna should not be too close the metallic structures such as the vehicle A-pillar, the roof, etc.
2. Install the backing plate first. Then, mount the microphone receiver on top of the backing plate.
3. Fix the backing plate and the microphone receiver together with the provided screws.

> **ⓘ NOTE: Mounting position of the microphone receiver**
>
> The microphone receiver will need to be accessible to the officer to sync the microphone.

Connecting the Microphone Receiver to the CPU

Follow these steps to connect the microphone receiver to the CPU.

To connect the microphone receiver to the CPU:

1. On the CPU, find the 15-pin port labeled "WMIC".

2. Insert the DB15 connector of the microphone cable into this port. Make sure the end with the red heat shrink is inserted into the CPU.

3. Connect the other end of the microphone cable to the microphone receiver.

Syncing the Wireless Microphone

In order to ensure that the microphone works with the microphone receiver, you must synchronize the microphone with the receiver. You can have as many microphones as you want, but for each microphone, you must have a separate receiver.

To sync the wireless microphone, follow these steps:

1. Verify your microphones are fully charged.

2. Power on the In-car Video System.

3. Touch the microphone contacts (located on the bottom of the wireless microphone unit) to the receiver's register contacts.
   A confirmation tone sounds indicating the receiver and microphone have synchronized frequencies. The microphone is now in Standby mode and ready for use.

4. If necessary, repeat these steps with additional microphones while ensuring each is synced to its own receiver.

> **ⓘ NOTE: Second Microphone**
>
> Syncing a second microphone to the same receiver will replace the first microphone.

2.8.3 Fixed Mount Antenna with Low Loss Cable (for Wireless Upload)

- This accessory should be mounted either on the trunk lid (at least one foot (1') away from the rear windshield), or on the roof of the vehicle (preferably forward of the light-bar), at least one foot (1') away from any other antenna or the light-bar.

- This antenna operates on the "line-of-sight" concept, and needs a clear path to locate the access point.

- The low loss cable should be routed as far away from any high frequency or high voltage equipment and their related cables and wiring as possible.

- Safe Fleet recommends routing this cable along the same route as the Safe Fleet color coded cables.

- This accessory will be plugged into the back of the CPU, near the pig-tails, utilizing a RP SMA Male connector.

Low Loss Antenna Cable

Low Profile Antenna

Securing Collar

O-ring
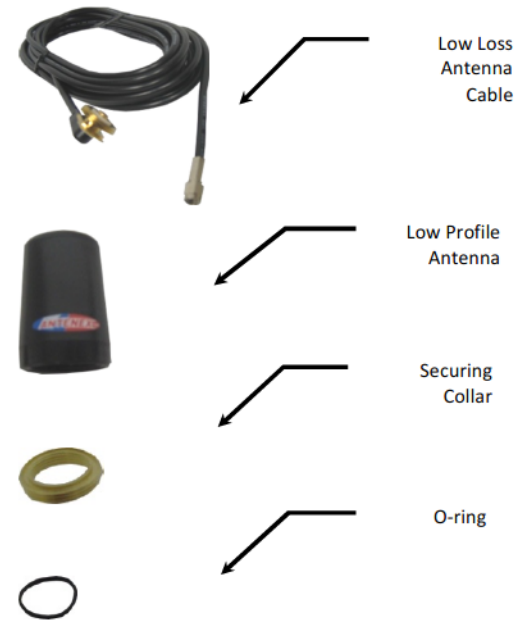
> **ⓘ NOTE: Number of antennas required**
>
> 2 antennas are required for proper wireless operation.

3. Monitor Calibration

Upon bootup of the FOCUS H2 for the first time, it will ask for calibration of the monitor. Please follow the steps below for the monitor calibration procedure.

> **ⓘ NOTE: Monitor Compatibility**
>
> Please note that you could not connect a FOCUS H1 monitor back to a FOCUS H1 device of v2.x if it was connected and calibrated to a FOCUS H2 device.

1. Upon first bootup, the following calibration screen will pop up on the LCD.
    Tap the calibration targets (center of the red crosshair) as precisely as possible for all 4 corners.
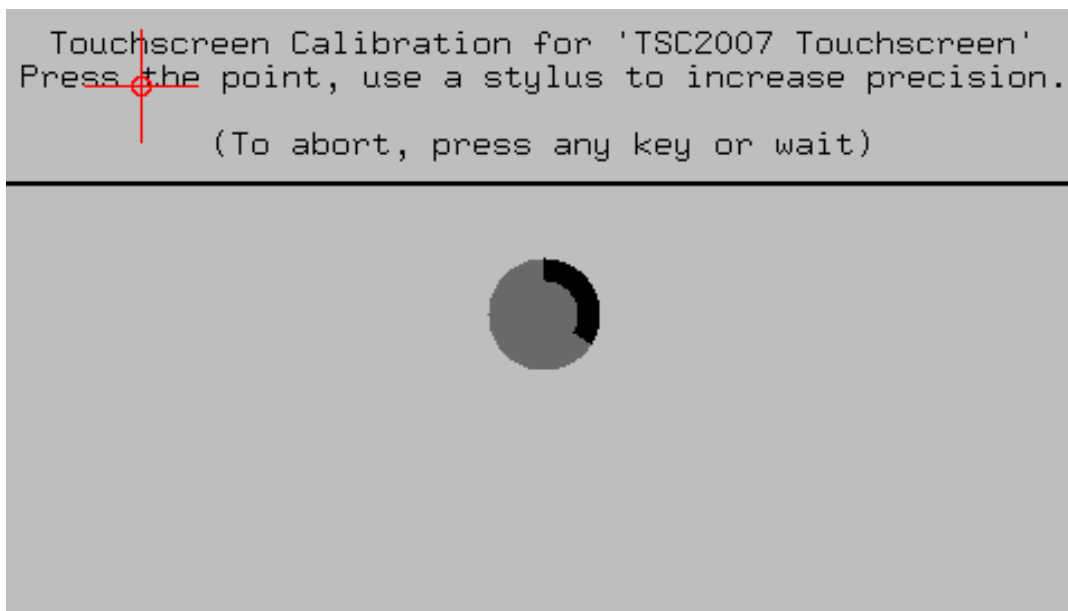
2. If the countdown circle timer for calibration times out, you will be redirected to the login screen uncalibrated.
    Please power cycle the FOCUS H2 device to go through the calibration process again.

3. If your screen is misaligned after calibration, please refer to the following article for recalibration:
    https://community.safefleet.net/kb_article/focus-h2-monitor-calibration/

4. CPU LED Indicators

The following table describes each of the FOCUS H2 CPU LED indicators:

LED Indicators	Color	Status
PWR	Amber	System powered ON
HDD	Green	Hard drive activity
REC	Red	Recording
STBY	Green	System is ready to power ON
IGN	Blue	Ignition ON
CB	Green	Car battery detected
UPS	Red	UPS battery in use (power disconnected)

> **ⓘ NOTE: Ignition Off**
>
> The IGN and STBY LED indicators are off when the ignition is off.

Service & Support

Documentation and Warranty

Additional copies of this guide along with other documentation and product warranty can be found on the Safe Fleet Community website: **https://community.safefleet.net**

Technical Support

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