360° SURROUND VIEW CAMERA SYSTEM

Installation Guide and User Manual

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Specifications and details are subject to change without prior notice.
Patent Pending

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Introduction

Rosco's Safe-T-Scope 360™ provides drivers with 360° aerial visibility to cover blind zones around the vehicle. The system combines views from four cameras placed at the front, rear, and sides of the vehicle to give an aerial view of the vehicle and all immediate surroundings. The system can combine this 360° aerial view with direct views from individual cameras based on operating conditions. The system supports nine different camera display configurations. These views can be automatically triggered by a variety of inputs from the vehicle. For example, when the vehicle is in reverse gear, the overhead 360° view can be combined with the direct view from the rear camera, giving the driver unparalleled vision where they need it most. In addition to displaying this video to the driver, the system can be set to output video directly to a video recorder, such as the Rosco Dual-Vision® XC4 DV440.

IMPORTANT

If you have a problem printing this document, please download and install the latest version of Adobe Reader.

Components List and Description

ITEM	QTY PER KIT	PART NO.	DESCRIPTION	Picture
1	1	STSK360ECU	ECU (Electronic Control Unit)	
2	4	STSC360	CAMERA, 6-PIN, COMPOSITE VIDEO OUT.	
3	1	STSK360VHAR	VIDEO I/O HARNESS, 4 IN, 4 OUT	
4	2	STSH357	VIDEO OUTPUT HARNESS, 4-PIN STD FEM	
5	1	STSH358	VIDEO OUTPUT HARNESS, RCA	
6	1	STSK360PHAR	POWER INPUT AND TRIGGER HARNESS	
7	2	STSH359	CAMERA EXTENSION HARNESS, 6-PIN, 15 M	
8	1	STSH360	POWER/CHANNEL BUTTON HARNESS	
9	1	STSH361	CAMERA EXTENSION HARNESS, 6-PIN, 9 M	
10	1	STSH362	CAMERA EXTENSION HARNESS, 6-PIN, 18 M	

Features

- Nine different viewing configurations (see Page Display22)
- Customizable Automatic Triggering Options
    - System can be set to display a particular viewing configuration when a particular trigger is received. See "Triggering" section on Page 21
- Manual Operation
    - Power/channel button harness included
    - Manually activate system via power button
    - Cycle through nine viewing configurations via channel button
- Video Output Options (Discussed in detail in Video Harness Detail section on Page 9)
    - CVBS: Main output, only active when system is triggered
    - CVBS-RV: Secondary output, always on, useful for recording

Hardware

Cameras (STSC360)

- Never tamper with camera housings. Camera housings are sealed to prevent moisture and dust intrusion.
- All four included cameras are identical and can serve as front, rear, or side cameras.

ECU (STSK360ECU)

- *NEVER* adjust DIP switches labeled "SW" on rear of ECU.
- ECU is EMI shielded – *DO NOT tamper with housing*.
- 3.5 mm IR Port is NOT USED.
- *DO NOT* remove rubber gasket from Calibration port unless performing calibration (See page 12)

Cable Harnesses (STSK360PHAR/VHAR)

- Minimum bend radius for all cables is two inches (2").
- Loom all extension harnesses, especially those for the front camera.
- For detailed information on Power Harness (STSK360PHAR) see "Power Harness Detail" section, Page 11.
- For detailed information on Video Harness (STSK360VHAR) see "Video Harness Detail" section, Page 9.

Installation

General Guidelines

- Please read the entirety of this manual before beginning installation.
- Double-check all measurements before drilling any holes or making any other vehicle modifications.
- Each vehicle has its own system and features. Please refer to your vehicle's manual for details.
- Turn the ignition key off while installing the cables and device.
- Make sure to connect Ground wire first!
- Select a secure, protected location for the ECU module.
- Remove fuse from fuse holder during installation. Replacing fuse should be the last step.
- Keep protective films in place during installation to prevent scratches, especially on monitor.
- Use caution when removing and replacing vehicle interior panels.
- Read wiring diagrams carefully before connecting wires.
- Gather and prepare all tools prior to installation.
- Minimum cable bend radius is two inches (2").
- For ease of installation and repair, it is recommended to use a fused power terminal block.
- *DO NOT* attempt to clean ECU with any liquids
- *DO NOT* attempt to disassemble, repair, or modify the products.
- *DO NOT* adjust DIP switches on ECU labeled "SW."
- Mount ECU in a location that is not exposed under normal use conditions. Inside the driver's switch panel is an acceptable location.
- *DO NOT* attempt to remove or modify ECU housing. ECU housing is coated to block EMF, any tampering could compromise performance.
- Make sure to mount ECU in such a way that calibration port is accessible.
- Make sure ECU has ample clearance on all sides (except bottom) to allow proper airflow for cooling. Bottom of ECU can be mounted flush to a surface.

MONITOR NOT INCLUDED
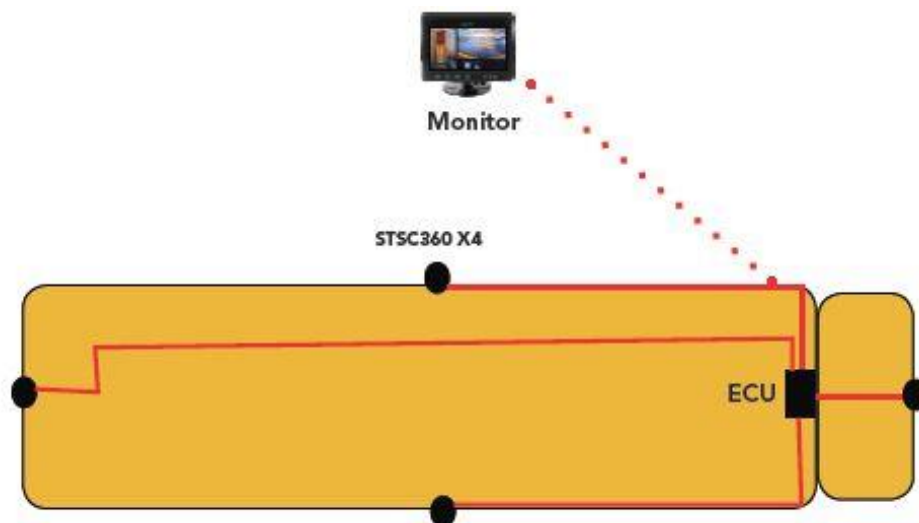
Camera Installation

- *DO NOT* attempt to disassemble camera housings. They are sealed to limit water and dust intrusion. Warranty & IP69k Rating become void if camera is opened.
- *PRIOR* to placing the cameras on the vehicle, the calibration mats should be placed at the front and rear bumpers of the vehicle. Each camera should be mounted in the highest practical location possible on each of the 4 sides of the vehicle.

Make sure that the white background of the pattern is visible between vehicle body and the closest edge of the triangles.

- Front and rear cameras should be placed as close to center line of vehicle as possible. An offset of up to 6" is acceptable, but not recommended.
- All cameras must be angled so that the vehicle is barely visible. If there is too much of the vehicle body in image, the system cannot be calibrated.

- Side cameras should be mounted as close to the horizontal center of vehicle as possible, & **MUST** be mounted symmetrically to one another. Side cameras should be placed as high as possible.
- If the cameras must be moved off-center due to an obstruction, an offset of up to 10% of the vehicle's overall length is acceptable; & it is preferred to move the cameras toward the **FRONT** of the vehicle.
- After installation and wiring, use the provided button harness (STSH360) to check the images from the SIDE cameras. The image should cover at least 3 feet beyond front and rear bumper.
- When viewing images from cameras, the bottom of the image should contain approximately 10% of the vehicle body and/or bumper.

- For front camera placement, if engine bay extends from front of vehicle, then ideal camera placement is on the hood or grill. Mounting at the roofline will create a "blind spot" directly in front of the vehicle. See below image for illustration.

RECOMMENDED:

NOT RECOMMENDED:

General Wiring Guidelines

- Make sure red wire from STSH360PHAR is secured to the vehicle fuse block at a terminal which will be at zero-voltage state when the vehicle ignition key is OFF. A typical location on a fuse block would be the ACC port for cigarette-lighter power. Zero-voltage state should be verified using a voltmeter prior to installation.
- Please refer to vehicle manual and fuse block diagram to identify best location for power, ignition, and ground wire connection points.
- *DO NOT* insert a fuse into Battery or Ignition fuse holders until system is fully installed.
- It is essential that appropriate external 3-Amp fuses be used for Battery and Ignition wires on STSH360PHAR.
- If passing front camera cable through the fire wall, be sure to seal any holes in fire wall.
- Use caution when working around vehicle engine. Be aware of hot components. Take care to properly shield all cables from any hot components.
- *DO NOT* install front camera harness near rotating components.
- Always make sure vehicle engine is OFF when installing front camera.
- Tape/cap any unused wires.
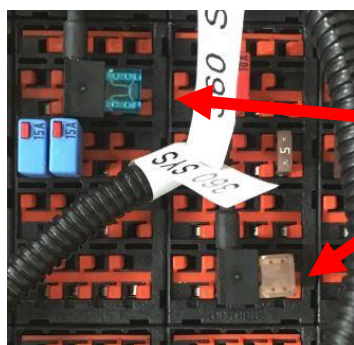
EXAMPLE:
Fuse Holder/Add-a-Fuse for Ignition and Battery connections

EXAMPLE:
Ground Wire Ring Terminal connected to the vehicle chassis ground

Wiring Overview
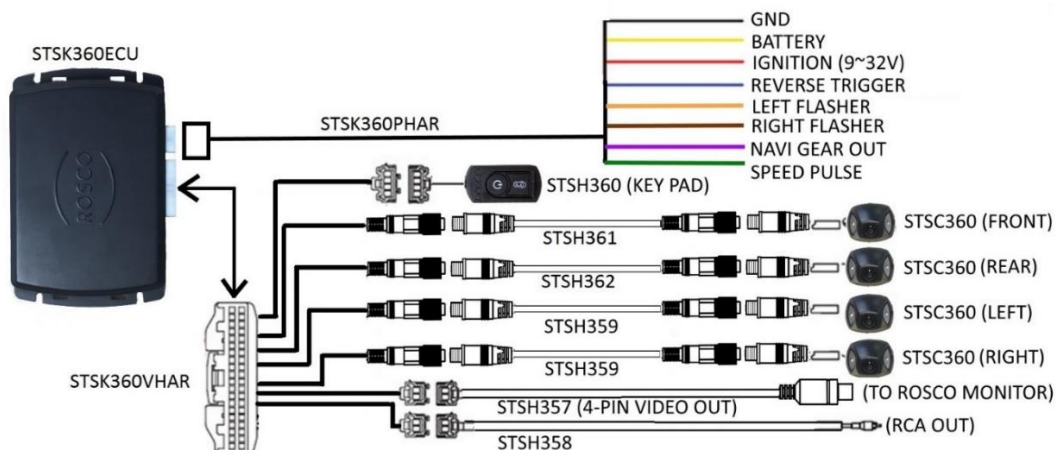
- See the following sections for more detail on STSH360PHAR and STSH360VHAR
- See section "Application Notes" on Page 28 for detailed system drawings that include a monitor

.

Video Harness Detail (STSK360VHAR)
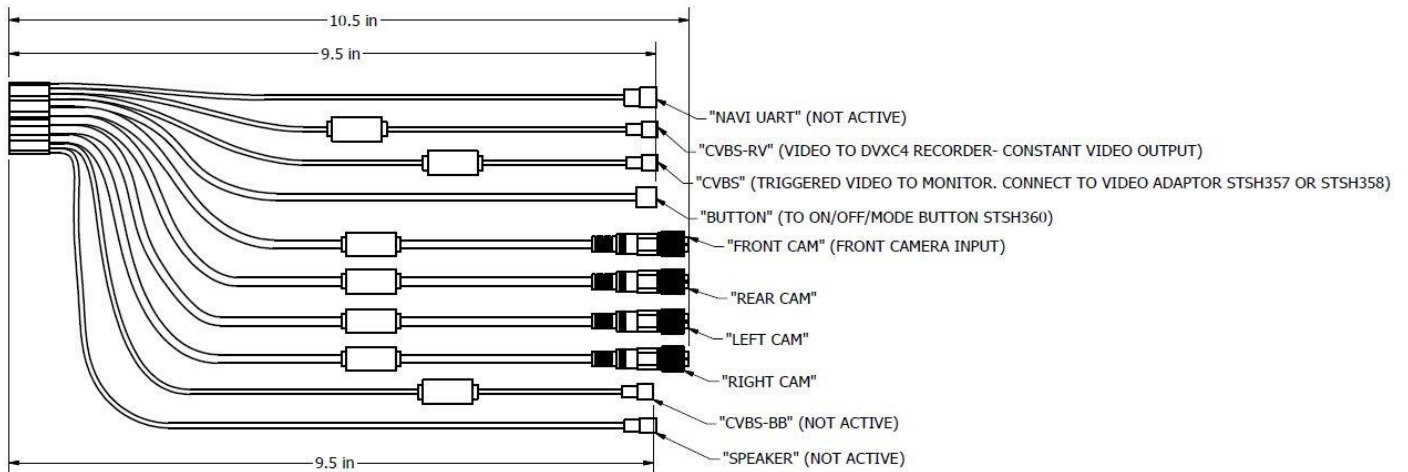
- Names from this diagram are printed on the side of corresponding cables in STSK360VHAR.
- CVBS is triggered video output. This output is ONLY active if the system has been triggered.
- CVBS is a triggered output intended for connection to a monitor. For a list of compatible Rosco monitors, see Page 27.
- CVBS-RV can be used for video recording. Rosco DV440 or any other compatible video recorder can be connected to this output for video recording. This output is not triggered-it is always active.
- CVBS and CVBS-RV outputs can be connected to either 4-PIN video out (STSH357) OR RCA out (STSH358).
- "NAVI UART," "CVBS-BB," and "SPEAKER" outputs are NOT USED.

Power Harness Detail (STSK360PHAR)
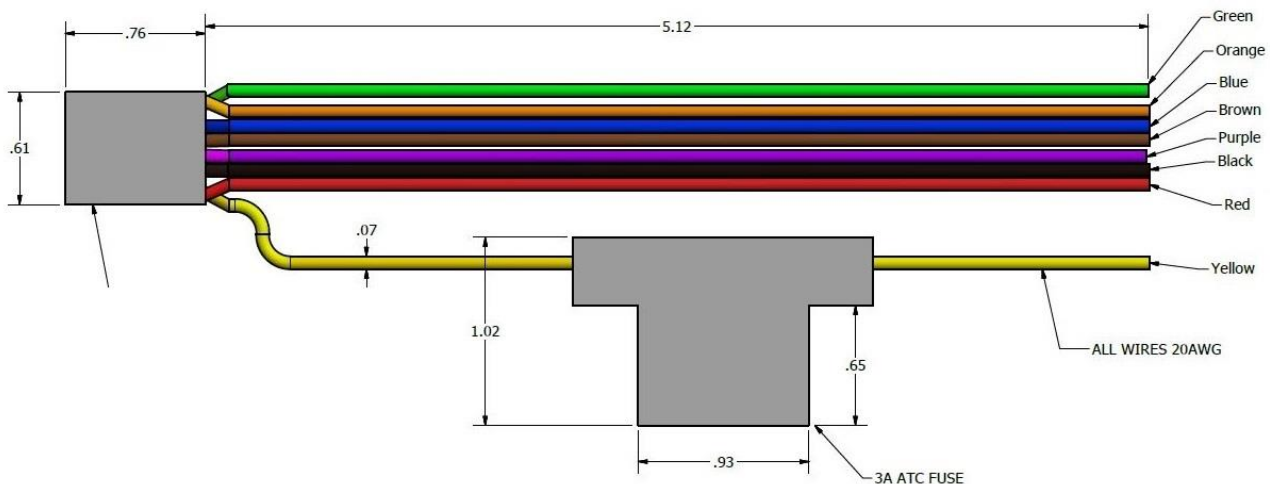
Color	Description	Details
Black	Ground	Connect to vehicle ground, such as a clean part of vehicle chassis.
Yellow	Battery	Connect to 9-32V constant power. Be sure to fuse connection with 3-Amp fuse.
Red	Ignition	Connect to vehicle fuse block at a location that is zero-voltage when vehicle ignition is off. Be sure to verify this with a multimeter. Fuse connection with a 3-Amp fuse.
Blue	Reverse	Trigger wire for reverse trigger. Requires 12V signal for activation.
Orange	Left Flasher	Trigger wire for left flasher. Requires 12V signal for activation.
Brown	Right Flasher	Trigger wire for right flasher. Requires 12V signal for activation.
Purple	Navi Gear Out	Output activation trigger. = used to trigger monitor. This wire carries a 12V signal anytime video is outputed on CVBS (see Video Harness Detail on previous page).
Green	Speed Pulse	Optional analog vehicle speed signal input.

Connecting a Monitor

- Use STSH358 for RCA output.
- Use STSH357 for 4-pin video output.
- For information on compatible Rosco brand monitors, see "Optional Hardware/Software/Spare Parts" section on Page 27.
- For detailed application note with monitor installation, see section "Application notes" on Page 28.

Once installed, the system must be calibrated for optimal performance.

Calibration can be performed with the assistance of a trained Rosco engineer or by a trained Rosco technician. Customer calibration requires STSK361 calibration kit and the remote assistance of a trained Rosco engineer.

Calibration Using the STSK361 Calibration Kit (SOLD SEPARATELY)

Components List and Description

1	1	STSA1012	CALIBRATION PATTERNS FOR STSK360 (2 MATS INCLUDED)	
2	1	STSA1013	CALIBRATION MODULE KIT	SEE LIST BELOW
2.1	1	STSA1017	PRELOADED SD CARD	
2.2	1	STSA1014	CALIBRATION MODULE	
2.3	2	STSH366	RIBBON CABLE FOR CALIBRATION MODULE (2 INCLUDED)	

In addition, the following components are necessary:
- PC with Windows XP or later or Mac with OSX 10.0 or later.
- SD card reader (DV123 or equivalent) or computer with SD card slot.
- Optional: Four (4) markers (pylons/cones, FMVSS cylinders, etc.)

Overview

- The calibration is performed by first capturing a single image from each of 4 cameras mounted on the vehicle.
- The calibration images require calibration patterns with 1.5-meter triangles on either side.
- By analyzing the triangles in the various images, a calibration file is created by a certified Rosco engineer using proprietary software.

- An SD card is used to collect the images from the Electronic Control Unit (ECU) of the STSK360 system as well as to move the calibration file from the computer to the ECU.
- Once images are collected by the end user, they are to be delivered to a Rosco engineer. The engineer will perform calibration and then provide a complete calibration file to be uploaded to the ECU via SD Card and calibration module.

Before You Get Started

- If possible, it is best to collect calibration images inside.
- If calibrating outside, calibration is best performed when it is not raining, but not in direct sunlight (slight overcast is best).
- For best possible calibration, ground under and around vehicle should be level and even.
- For best possible calibration, area around vehicle should be clear of obstruction for at least 12 feet in all directions.
- DO NOT MAKE ANY ADJUSTMENTS TO CAMERA PLACEMENT AFTER CALIBRATION. If camera placement is changed, calibration is no longer valid.
- NEVER press the "R" or "M" buttons on the Calibration Module.
- NEVER adjust DIP switches on ECU.
- If SD card has a lock switch, make sure that switch is in the "unlocked" position

Setting Up

- Park vehicle in an area with a minimum of 12 feet of clearance on all sides.
- Arrange calibration patterns in front and rear of vehicle.
  - Patterns should be parallel to front and rear bumpers of vehicle.
  - Triangle side (line) should be parallel to bumpers, angle should point AWAY from front and rear of vehicle (see image on next page)
  - Bottom edge of pattern should be aligned with bumper of vehicle or tip of camera (whichever protrudes further).
  - Measure distance between patterns on either side of vehicle to ensure patterns are parallel to one another. A difference equal to 2% of overall vehicle length is acceptable.
  - Place weights on patterns to keep them in place. Long poles (such as conduit pipe) may be placed through loops along edge of patterns or weights may be placed on white parts of pattern. Do not allow weights to interfere with edges of triangles or boxes on patterns.
  - Make sure patterns are free of wrinkles and that edges of triangles appear straight.
  - If it is necessary that a certain area be visible on the 360 system (e.g. 10' perimeter in all directions), then place an object (pylon, cone, FMVSS cylinder, chair, etc.) at the required distance in all directions. It is critical that any such object DOES NOT interfere with calibration patterns.

CENTER PATTERN.
POSITION EDGE OF PATTERN
AS CLOSE AS POSSIBLE TO
VEHICLE FRONT/REAR.

VEHICLE AS SEEN FROM ABOVE
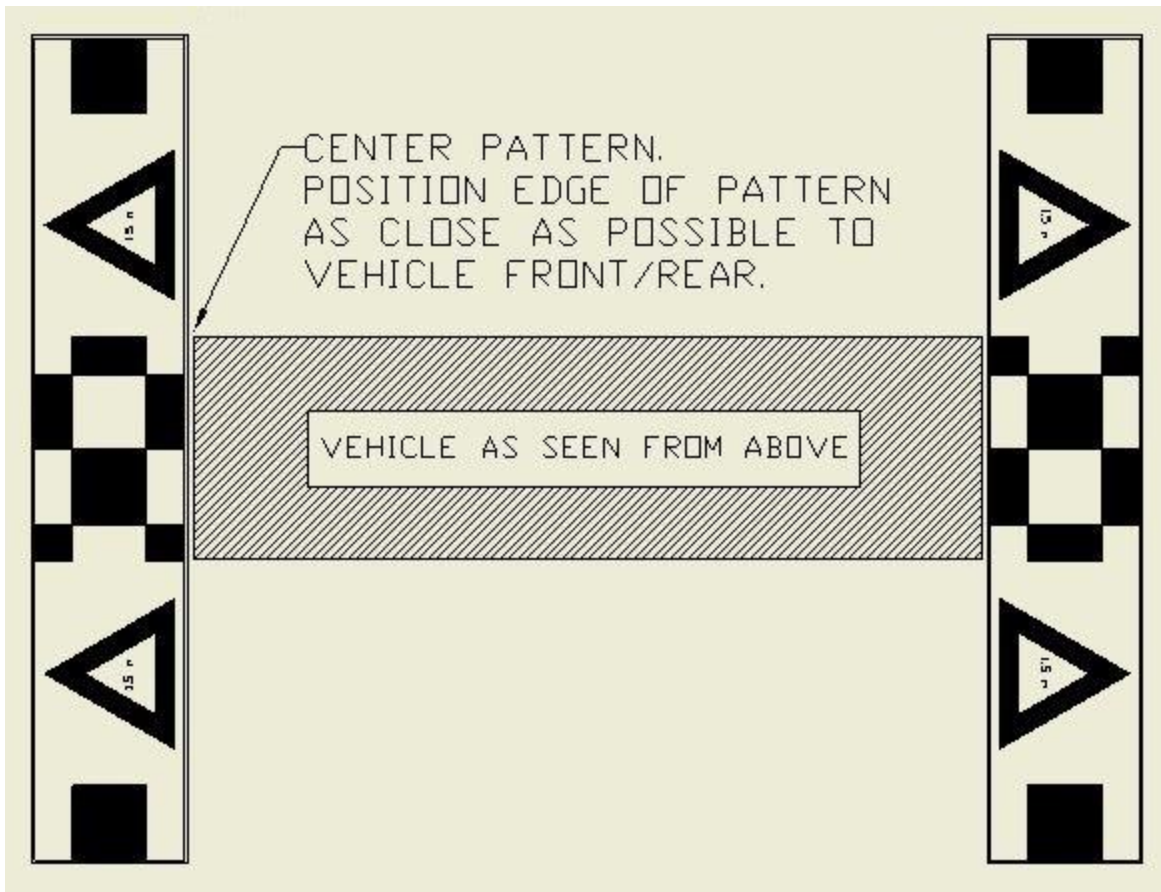
Image Capture Procedure

- Insert SD card into card reader/PC and open it.
  NOTE: If using a SD card not provided by Rosco, please ensure that it it formatted to the FAT32 data standard. This can be done by right clicking on the SD card when plugged into your computer, and selecting the "Format" option:
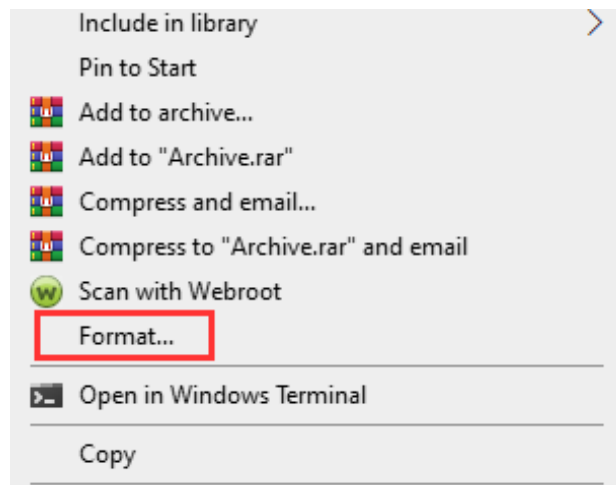
Afterwards, select the FAT32 option from the "File System" drop down menu, and then click format.

- Verify that SD card has "ovNS" folder on root. Verify that "ovNS" folder contains "cmd" folder and "Image" folder. Verify that "cmd" folder has "capture.cmd" file (NOTE: the capture.cmd file will be 0 bytes in size). SD Card > ovNS > cmd > capture.cmd. Make sure that NO OTHER files are in the "cmd" folder. This file will tell the ECU to enter image capture mode.
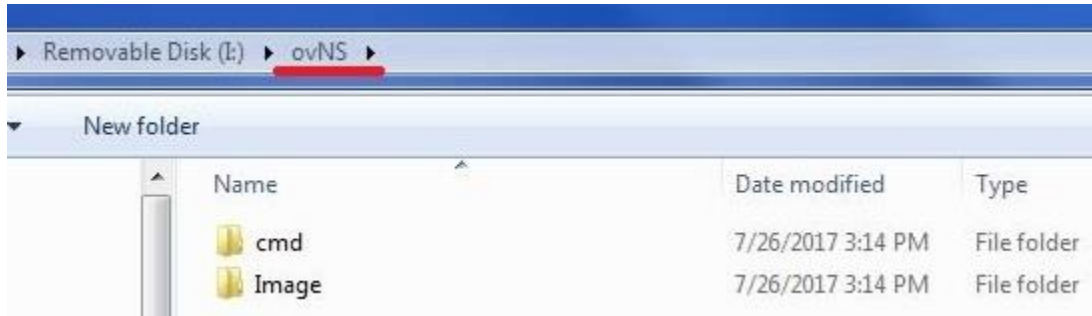
- Remove cover from port marked "CALIBRATION" on ECU.
- With vehicle ignition OFF, connect Calibration Module to the calibration port of the ECU via the STSH366 Ribbon Cable. Carefully line up the flanges on the connectors to the slots at the top of the CALIBRATION port and CALIBRATION module.
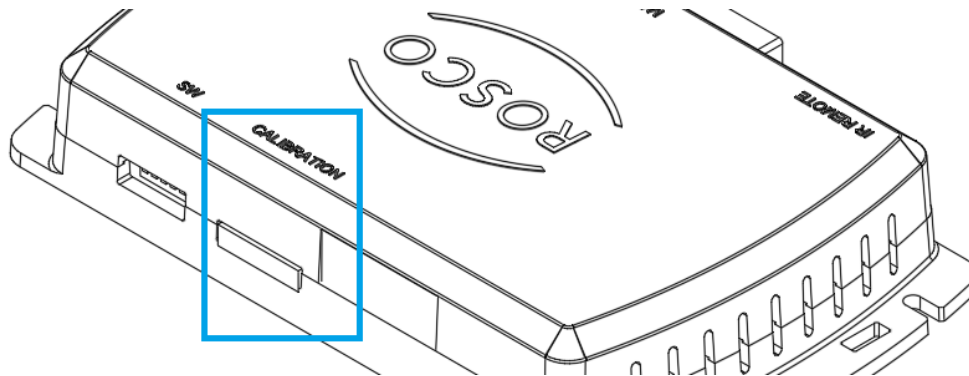
- Make sure all vehicle doors are closed.
- Turn on vehicle.

- Insert SD card (STSA1017) into Calibration Module (STSA1014).

A banner will appear at the top of the display (see below). If banner does not appear, check connections between calibration module and ECU. Also check that SD card has been properly inserted.
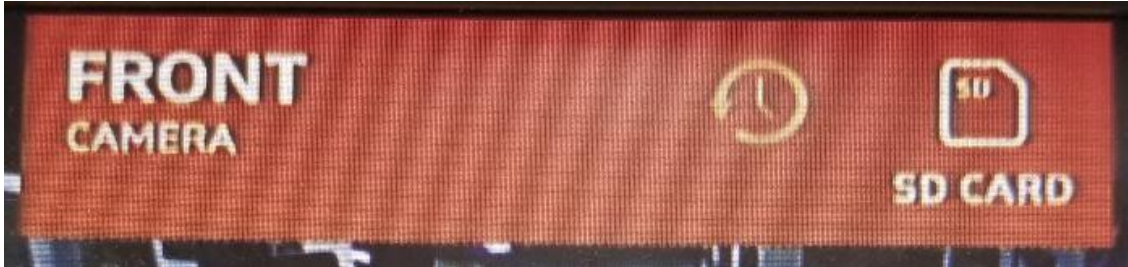
- Press the vehicle icon button on the wired remote (See image below) to cycle through all four camera views. Ensure that triangles are fully visible in ALL images. Make sure that nothing obstructs triangle images (side mirrors, doors, side stop arm, weights on pattern, etc.). Make sure that several inches of clearance can be seen between the edge of the triangles and the edge of the vehicle. If necessary, adjust placement of calibration pattern, and repeat this step again.

Figure 1-Front Camera View

Figure 2-Rear Camera View

Figure 3- Right Camera View

Figure 4-Left Camera View

- Once pattern placement has been verified, press, and hold the vehicle icon on the wired remote. The display will show "Saving Camera image…" Release the button. Wait several minutes until image capture is complete.

- Wait until "Finish to Save image (OK)" and "Safe to pull out SD card" are displayed. Push in SD card to remove it from calibration module. Disconnect calibration module from ECU. Vehicle ignition can now be shut off.
- Insert SD card into card reader or computer SD card slot.
- Open SD card on computer
  - Verify that "Image" folder has 4 images (front.bmp, left.bmp, rear.bmp, and right.bmp).
  - Open the 4 images
  - Verify that two triangles are fully visible in each image.
  - If additional markers were used, verify that they are visible as well.
  - Verify that edge of vehicle and/or bumper are at least partially visible in all images.
- Share images with a certified Rosco Engineer:
  - Contact Rosco Tech Support at techsupport@roscovision.com or (718) 526-2601 to create a calibration request.

Calibration Upload Procedure

- Once Rosco engineers receive the necessary calibration images, they will perform software calibration and return a complete calibration suite. All necessary files will be within a folder called "ovNS."
- Reformat SD card. Copy and paste the new "ovNS" folder from Rosco engineer to root of SD card.
- This new "ovNS" folder will contain the full calibration suite ("cmd," "Config," "data," "image," and "param" folders).
- DO NOT MAKE ANY CHANGES TO ANY FOLDERS OR THEIR CONTENTS.
- With vehicle power off, carefully connect the Calibration Module to the port marked "CALIBRATION" on the ECU.
- Power on the vehicle.
- A banner will appear at the top of the display and prompt the user to insert an SD card (see below image).
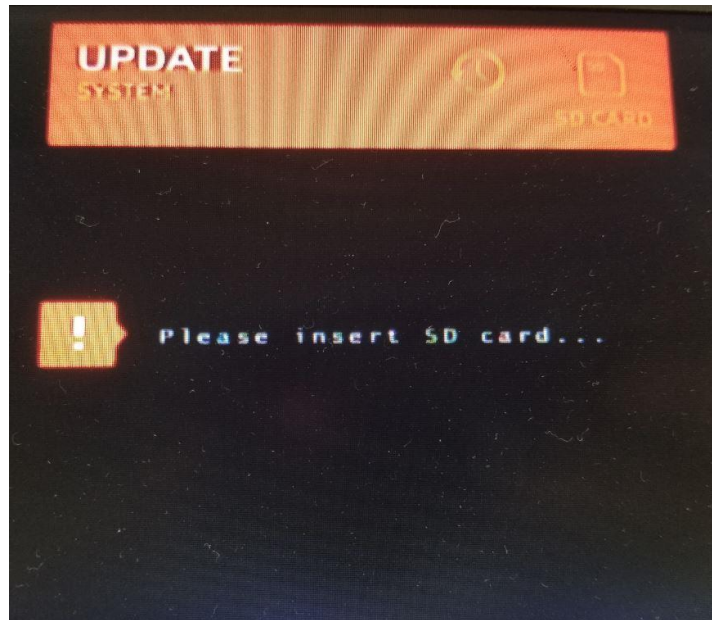
- When prompted, insert SD card into the Calibration Module.
- A series of progress bars will appear indicating the status of the calibration upload.
- When calibration upload is complete, monitor will display the following:
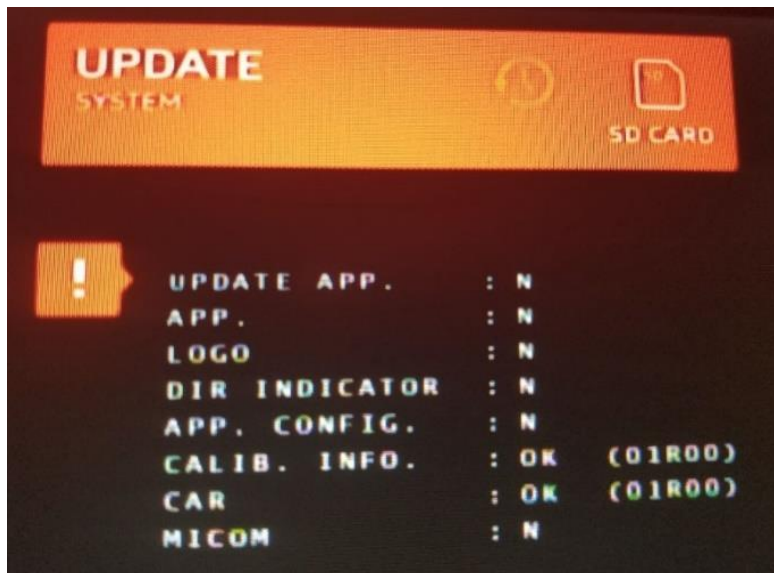
- Notice that "CALIB. INFO." AND "CAR" are marked "OK."
- Remove SD card.
- Turn vehicle ignition off. Calibration is now complete.

Calibration Reuse

- For vehicles with the same body dimensions, it is possible to re-use the same calibration, HOWEVER, it is essential that great care be taken to duplicate camera placement on all vehicles. Cameras can be offset by up to 0.5" without affecting calibration. Additionally, camera mounting angle must not deviate more than 4° from original camera placement. When possible, use mounting jigs or templates to ensure repeatable camera placement

Device Operation

General Information

- This system is meant to supplement vehicle mirrors and other vision aids, *NOT* to replace them.
- Always be aware of all surroundings when operating a vehicle.

Power/Channel Button Harness

- The system can be manually triggered using the included Power/Control Button harness.
- Car Icon Button cycles through 9 views shown on Page 22. Note that system triggering (see next section) will override manual view selection via Car Icon Button.
- Power/Setup button turns on/off CVBS output-it does NOT affect CVBS-RV output. CVBS-RV output is always on.

Triggering

- Once system is installed and set up, triggering will occur automatically.
- Default triggers are reverse gear, right turn signal, and left turn signal. With this configuration, emergency lights can trigger a fourth state.
- Default or custom triggers should be specified upon purchase-the ECU will come pre-set with any required custom triggers.
- Blue trigger wire (reverse trigger) is the highest priority trigger. Orange (left flasher) or Brown (right flasher) will always be overridden by Blue.
- Orange (left flasher) PLUS Brown (right flasher) will trigger "emergency light" scenario. This trigger can be independently programmed to any of the 9 available views.
- If you do not plan to use the default trigger configuration, triggering from door switches or other sources is possible.
- See Wiring Overview section (Page 9) for detailed information on trigger wire installation and options.

Display

- Display can show one of nine views depending on settings and active trigger. See Features section, see below for options.
- Icon at bottom identifies which view is active. Blue shaded area represents the views actively displayed.

Top and Front		Front and Left Direct	
Top and rear		Front and Right Direct	
Top and Sides		Rear and Left Direct Views	
Front Focus		Rear and Right Direct Views	
Rear Focus			

Technical Specifications

SYSTEM SPECIFICATIONS

Individual Camera Resolution	640 x 480
Camera Field of View	174.41^0 (H), 115.45^0 (V)
Operating Temperature	-30^0 C to $+75^0$ C
Storage Temperature	-40^0 C to $+85^0$ C
Max Operating Humidity	$+40^0$ C, 95%, 48 Hr
Max Storage Humidity	$+40^0$ C, 95%, 48 Hr
Max Vibration	4.4G, 10-100 Hz
Operating Voltage	9-32 V
ECU Video Input	NTSC, 4 Channels
ECU Video Output	NTSC, CVBS 2CH
ECU Dimensions	4.3" W x 7" L x 1.25" H
Standard Compliance FCC	Part 15, Subpart B, Class B
Operating Current @12.8 VDC	750mA

Optional Hardware/Software/Spare Parts

Rosco Sales Part Number	Description
	Monitors
STSM251	7" Dash- or headliner-mounted monitor w/ 2-channel harness
STSM254	7" Dash- or headliner-mounted monitor w/ 1-channel harness
STSM630	6" x 30" Interior Mirror / 7" Monitor Assembly - Standard Mount
STSM530	7" x 16.2" Interior Mirror / 7" Monitor Assembly – Standard Mount
STSM530D	7" x 16.2" Interior Convex Mirror / 7" Monitor Assembly – Standard Mount
STSM1030	10.5" x 31" Interior Mirror / 7" Monitor Assembly – Standard Mount
	Recorder
DV440	Dual-Vision XC4
	Harnesses
STSH309	16.5' Camera extension harness
STSH310	60' Camera extension harness
	Other
BAS1517	10^0 Side camera mounting wedge

Vehicle-Specific Kits & Instructions

- STSK360217BLLNV: Safe-T-Vision 360 kit for Navistar CE
- INS1173: Front Camera Mounting Instructions for Navistar CE
- INS1174: Rear Camera Mounting Instructions for Navistar CE
- INS1175: Side Camera Mounting Instructions for Navistar CE

System Overview:

Generic Installation with Monitor:

ECO#	REV
7439	1

REV	DESCRIPTION	DATE	DRAWN
1	INITIAL RELEASE	10/19/2017	john.polimeni

STSK360ECU TRIGGER CONFIGURATION

TRIGGER VALUE	CAMERA VIEW	NOTES
Default View	FRONT	Default view engaged by on/off button: "bird's eye" 360 view and front camera view only.
Rear Gear View	REAR	When shifting into reverse, the screen will show the "bird's eye" 360 view and rear camera only.
Rear Gear Delay Off	0	When activating either turn signal, the screen will show the "bird's eye" 360 view and side camera views only.
Left Turn Signal View	SIDE	
Left Turn Signal Delay Off	1	
Right Turn Signal View	FRONT	When opening the door, the screen will show the "bird's eye" 360 view and front camera view only. After closing the door, the screen will remain the same for 10 seconds.
Right Turn Signal Delay Off	10	If both the door is open and the turn signal is activated, the door view will override the turn signal view.
Emergency Signal View	FRONT	
Parking Guide	Off	

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	STSK360	SAFE-T-SCOPE 360 SURROUND VIEW SYSTEM, BASE KIT W HOUSINGS, ECU, 4-CAM
2	1	STSM251	SAFE-T-SCOPE, 7" COLOR LCD MONITOR KIT, 4 PIN/2 INPUT

ROSCO, INC

TITLE
APPLICATION NOTE FOR STSK360 AND STSM251

| DRAWN | john.polimeni | 1/31/2017 |
| CHECKED | | |

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SIZE	DWG NO	REV
C		1

SCALE — SHEET 1 OF 1

NOTES:
1. CABLE LENGTHS NOT DRAWN TO SCALE.
2. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.
3. STSK360 HARNESS WIRING:
   a. BLACK: GROUND
   b. RED: 12VDC IGNITION POWER
   c. YELLOW: 12VDC BATTERY POWER
   d. BLUE "REAR GEAR": REAR VIEW TRIGGER (PROGRAMMABLE TO ANY VIEW)
   e. ORANGE "LEFT FLASHER": LEFT & RIGHT VIEW TRIGGER (PROGRAMMABLE TO ANY VIEW)
   f. BROWN "RIGHT FLASHER": LEFT & RIGHT VIEW TRIGGER (PROGRAMMABLE TO ANY VIEW)
   g. PURPLE "NAVI GEAR OUT": TRIGGER OUT. CONNECT TO MONITOR WHITE WIRE.
   h. GREEN "SPEED PULSE": (DO NOT CONNECT)
4. CAMERA MOUNTING
   a. FRONT CAMERA: MOUNT CENTERED, FRONT OF THE HOOD/TOP OF GRILL FACING DOWN.
   b. REAR CAMERA: MOUNT CENTERED ON VERTICAL SURFACE. MOUNT AS HIGH AS POSSIBLE, FACING DOWN.
   c. SIDE CAMERAS: MOUNT ON VERTICAL SURFACE. MOUNT AS HIGH AS POSSIBLE, FACING DOWN. POSITIONING: CENTERED, OR AS FRONT AS THE REAR VIEW MIRRORS.
5. STSM251 MONITOR HARNESS WIRING:
   a. BLACK: GROUND
   b. RED: 12VDC IGNITION POWER
   c. WHITE: C2 TRIGGER. CONNECT TO STSK360 PURPLE WIRE.
   d. GREEN: C1 TRIGGER. (DO NOT CONNECT)

SEE NOTE 5 FOR WIRING

WHITE: C2 TRIGGER

PURPLE: TRIGGER OUT FROM STSK360 SYSTEM

"C2"

POWER/MODE BUTTON: MOUNT NEAR INSTRUMENT CLUSTER AND ENSURE EASY ACCESS BY DRIVER.

LEAVE THIS CALIBRATION PORT EASILY ACCESSIBLE AFTER INSTALLATION

SEE NOTE 3 FOR WIRING

"CVBS-RV" (NOT USED)
"NAVI UART" (NOT USED)
"CVBS"
CVBS-BB VIDEO OUT (NOT USED)
"SPEAKER" (NOT USED)

RCA VIDEO OUT CABLE (NOT USED)

LEAVE THIS IR REMOTE PORT EASILY ACCESIBLE AFTER INSTALLATION

PRIMER PEN FOR STSK360 BUTTON MOUNTING

15m
18m
9m

FRONT CAMERA (SEE NOTE 4)
REAR CAMERA (SEE NOTE 4)
LEFT CAMERA (SEE NOTE 4)
RIGHT CAMERA (SEE NOTE 4)

ROSCO

SEE SHEET 2 FOR WIRING NOTES
SEE STSK360 DRAWING FOR STSK360 SYSTEM INTERCONNECT

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	STSM254	SAFE-T-SCOPE, 7" COLOR LCD MONITOR KIT, 4 PIN/1 INPUT
2	1	STSK360	SAFE-T-SCOPE 360 SURROUND VIEW SYSTEM, BASE KIT W HOUSINGS, ECU, 4-CAM
3	1	DV440	DVXC4 ADVANCED, 4 CHANNEL HD PLUS WIFI AUTOMOTV VIDEO RECDR
4	1	STSH396	4PIN STD MALE TO "y" CONNECTOR 4PIN STD FEMALE.

	ECO#	REV	DESCRIPTION	DATE	AUTHOR	APPROVED
		A	INITIAL RELEASE	8/8/2017	john.polimeni	julian.serer
	7443	B	ADDED ITEM4 STSH396, EDITED STSK360 SYSTEM CONFIGURATION TABLE	10/23/2017	EMILY LIN	JOHN POLIMENI

ROSCO, INC
90-21 144TH PL.
JAMAICA NY 11435
(718)526-2601

TITLE: APP. NOTE FOR DV440, STSM254, STSK360

DRAWN john.polimeni 8/8/2017
CHECKED

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SIZE B

DWG NO

REV B

SCALE

SHEET 1 OF 2

DISABLE MONITOR BACKUP GRID
SEE NOTE 5 FOR WIRING
CVBS (DO NOT CONNECT)
"CVBS-RV"
SEE NOTE 3 FOR WIRING
SEE NOTE 4 FOR CAMERA PLACEMENT
ADHESIVE PRIMER
RCA ADAPTOR HARNESS (NOT USED)
SEE NOTE 6 FOR WIRING

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WIRING NOTES:

1. CABLE LENGTHS NOT DRAWN TO SCALE.

2. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.

3. STSK360PHAR HARNESS WIRING:
   a. BLACK: GROUND
   b. RED: 12VDC IGNITION POWER
   c. YELLOW: 12VDC BATTERY POWER
   d. BLUE "REAR GEAR": REVERSE LIGHT CIRCUIT
   e. ORANGE "LEFT FLASHER": LEFT TURN SIGNAL
   f. BROWN "RIGHT FLASHER": RIGHT TURN SIGNAL
   g. PURPLE "NAVI GEAR OUT": TO MONITOR HARNESS GREEN WIRE
   h. GREEN "SPEED PULSE": NOT CONNECTED

4. STSC360 CAMERA MOUNTING
   a. FRONT CAMERA: MOUNT CENTERED, FRONT OF THE HOOD/TOP OF GRILL FACING DOWN.
   b. REAR CAMERA: MOUNT CENTERED ON VERTICAL SURFACE. MOUNT AS HIGH AS POSSIBLE, FACING DOWN.
   c. SIDE CAMERAS: MOUNT ON VERTICAL SURFACE. MOUNT AS HIGH AS POSSIBLE, FACING DOWN. POSITIONING: CENTERED +/- 1 ft
   d. USE PROVIDED GASKETS WHEN MOUNTING CAMERA DIRECTLY ON VEHICLE BODY.

5. STSM254 MONITOR WIRING:
   a. BLACK: GROUND
   b. RED: 12VDC IGNITION POWER
   c. GREEN: TO STSK360 PURPLE WIRE

6. DV440 WIRING:
   a. BLACK: GROUND
   b. RED: 12VDC BATTERY POWER
   c. YELLOW: 12VDC IGNITION POWER

STSK360 SYSTEM CONFIGURATION

TRIGGER VALUE	CAMERA VIEW	NOTES
Default View	FRONT	Default view engaged by on/off button: "bird's eye" 360 view and front camera view only.
Rear Gear View	REAR	When shifting into reverse or activating hazards, the screen will show the "bird's eye" 360 view and rear camera only.
Rear Gear Delay Off	0	
Left Turn Signal View	FRONT + LEFT	When activating LEFT turn signal, the screen will show the front and left camera views.
Left Turn Signal Delay Off	2	
Right Turn Signal View	FRONT + RIGHT	When activating RIGHT turn signal, the screen will show the front and right camera views.
Right Turn Signal Delay Off	2	
Emergency Signal View	REAR	When shifting into reverse or activating hazards, the screen will show the "bird's eye" 360 view and rear camera only.
Parking Guide	On	

DV440 SD CONFIGURATION

PARAMETER	VALUE
--CHANNEL SETTINGS--	
CHANNEL 1	ENABLED, DEFAULT SETTINGS
CHANNEL 2	ENABLED, DEFAULT SETTINGS
CHANNEL 3	ENABLED, DEFAULT SETTINGS
CHANNEL 4	DISABLED
PARKING MODE	ENABLED, DEFAULT SETTINGS
--EVENT SETTINGS--	
LOCK EVENT FILES	DISABLED (DEFAULT)
SPEED EVENT	DISABLED
G-SENSOR	ALL DEFAULT

ROSCO, INC

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TITLE
APP. NOTE FOR DV440, STSM254, STSK360

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john.polimeni	
CHECKED	

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ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE SPECIFIED
ANGULAR TOLERANCES: ± 1.5

TOLERANCES X ± .01	TOLERANCES .XXX ±
TOLERANCES .XX ±	
0 - 5.99"	0.03
6.00"- 11.99"	0.05
12.00"-23.99"	0.06
24.00"-47.99"	0.08
48.00" & UP	0.12

0 - 5.99"	0.005
6.000"-11.999"	0.015
12.000-23.999	0.020
24.000-47.999	0.025
48.000" & UP	0.030

SIZE B	DWG NO	REV B
SCALE		SHEET 2 OF 2

Commercial Warranty

We warrant that all ROSCO mirror, camera, sun visor, and electronic vision products are free from defects in workmanship and materials for a period of ONE (1) YEAR from the date of receipt of the product. During the warranty period, we agree to provide a replacement for (or at our option, repair) the ROSCO product and/or any one or more component parts of a ROSCO product which malfunctions under normal use and service.

Upon discovering a defect, the customer must contact ROSCO for a return authorization and then must return the product, and/or component part, together with proof of date of receipt of the product, to ROSCO INC. 144-31 91st Ave. Jamaica, New York 11435. The customer and not ROSCO will be responsible for the payment of all removal, installation and transportation charges for return of defective products or components to ROSCO. Transportation charges for such return must be prepaid. The repaired or replaced equipment will be returned to the customer with transportation charges prepaid by ROSCO. Replacement (or repaired) products and/or component parts are warranted only for the unexpired term of the original warranty.

This warranty does not cover defects caused by neglect, misuse, incorrect application, incorrect installation, water damage, vehicle wash facilities, alteration or repair in any manner outside ROSCO's factory. Damage caused by the return shipment due to inadequate packaging or mishandling will not be covered. If the alleged defect is due to any of these causes, the customer will be advised of the findings and asked what action is to be taken. If ROSCO is requested to repair the product, a repair charge estimate will be prepared and the customer's written permission (purchase order, repair, etc.) will be necessary to proceed with the repair of the product and/or component part. Transportation charges for such returns will be the responsibility of the customer.

This warranty may not be expanded by oral representation, written sales information, and drawings or otherwise. Repair or replacement is the exclusive remedy for defective products under this warranty. This warranty is expressly in lieu of all other warranties, including any implied warranty of merchantability or any implied warranty of fitness for a particular purpose on any ROSCO product. ROSCO shall not be liable for any consequential or incidental damages for breach of any express or implied warranty on any ROSCO product.

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