Pan/Tilt Push Camera Operation Manual

APPLICABLE FOR THE MINCAM360

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2. System Setup

2.1 Reel Setup

All systems are designed to be operated from the upright position, see figure 2.1.a.

The cable should rest on the inside of the cable guide. On some models, the guide is at the top of the reel, so the cable is ''under'' the guide. On others, the guide is at the bottom of the reel, so the cable is ''above'' the guide.

Figure 2.1.a – minCam system in upright position

2.2 Monitor Setup

2.2.1 Positioning the platform mount

1. Grasp the rubber ball and loosen to free the platform mount.
2. Raise the platform into position and tighten the rubber ball to secure into place.
3. Underneath the platform is a knob to lock the monitor swivel – loosen and tighten to rotate the monitor.

Systems with a keyboard include a collapsible sunshield which fastens around the screen via magnets.

2.3 Camera Setup

The SK50 camera is removable. To disconnect the camera from the cable, hold the camera with one hand and twist the connector loose. To reconnect a camera, reverse the procedure.

The SK50 camera must be pressurized with nitrogen for leak prevention. To display the current internal camera pressure on the TFT8R monitor, press Shift+F1 until the pressure status is displayed in the top left corner of the screen. The camera should be pressurized to 0.8 bar / 11.6 psi.

To pressurize the camera, disconnect the camera and attach the nitrogen filling adapter included in the accessory case. Connect the inlet nitrogen source and pressurize to 11.6 psi. Disconnect the adapter and reconnect the camera. Confirm with the software that the camera has been pressurized.

3. Controlling the System

3.1 minCam360 Control Unit

3.1.1 minCam360 Face Plate

The control unit is the core of the minCam video camera system. Figure 4.a is the control unit of the mC50.

3.1.2 minCam360 Bluetooth Remote Control

The remote control is stored in the monitor case. While positioned in the case, the remote control charges wirelessly via induction, and the charging status is indicated by the red LED.

The system can be operated by leaving the remote control in the case.

To use the remote control, first it needs to be turned on (green LED) by pressing

The remote control will work as soon as the Bluetooth connection is made – a solid blue LED. The blue LED is blinking while searching for a connection.

For rotation, pan, and tilt of camera, move the joystick to the desired direction.

The remote shuts down if not used for 10 minutes.

3.1.3 SK50 Camera Controls

3.1.3.1 Focus

The minCam360 has automatic mechanical focus.

3.1.3.2 Zoom

The minCam360 zoom goes from default to zoomed in by pressing the zoom keys.

Controlled by: or

3.1.3.3 Lighting

The SK50 lights move with the pan function of the camera lens. The light intensity can be adjusted using the buttons on the remote, control unit, or via a command on the keyboard. There are 8 steps of lighting.

Controlled by: or

Pressing the button turns on all 10 LEDs to maximum level.

3.1.3.4 Fine tuning camera sensor module

Fine tuning enables custom camera sensor settings for extreme surroundings.

Brightness: and or

Color: and or

AGC: and or

Mirror Image: and or

Restarting the system resets all camera sensor adjustments to the original parameters.

3.1.3.5 Sonde (location transmitter)

After activating the sonde, the frequency is shown in the middle of the bottom line.

1 Press:	512 Hz active
2 Press:	33 kHz active
3 Press:	640 Hz active
Controlled by:	

3.1.3.6 SK50 Camera internal pressure

The camera head is nitrogen-pressurized for leak prevention. The camera should have 0.8 bar / 11.6 psi.

Refill the camera head with nitrogen when there is a decrease in camera head pressure by attaching the included filling adapter to your nitrogen filling device. There is an on-screen indicator accessed via the keyboard (Shift + F1).

3.2 Video Monitor Setup

By default, the live camera feed is sent to the monitor directly with 4:3 picture format. (See figure 7.1.a)

To record video, the live camera feed must first be passed through the SD card.

This is controlled by the "Toggle Button".

A green light is lit on the button when "Direct Feed" is chosen.

Pressing the toggle button alternates between:

- "Direct Feed" to the monitor, or
- "Pass Through" feed through the SD card.

When Toggle has been pressed, two black bars appear on the left and right of the screen and information about the current video recording settings appear in grey boxes (See Figure 7.1.b).

Always ensure the video is set to "Pass through" before recording video.

Figure 7.1.a – "Direct Feed" camera signal to monitor

Figure 7.1.b – toggle "Pass Through" to enable video recording

3.2.1 TFT8R Monitor Layout

3.3 Record Video Footage

The video button starts/stops recording video:

This button is used to pause the video:

3.3.1 Start Recording Video

Press the "Video" button to start recording.

As soon as you start recording, a red square appears in the upper left edge. See Figure 7.2.1.a

Figure 7.2.1.a – Red square designates recording now

3.3.2 Pause Video Recording

Press the "Pause" button to pause the video.

As soon as you press pause, the red square changes to the pause symbol. See Figure 7.2.1.b

Figure 7.2.1.b – Red pause emblem designates recording paused

3.3.3 Stop Recording Video

Press the "Video" button again to stop recording.

3.3.4 Take a Picture

Press the camera button to store a picture:

While the picture is stored, a yellow square is displayed in the middle of the screen. (See Figure 5.3.a)

Taking a picture while recording video will stop the video stream for about 2 seconds.

Figure 7.3.a – Yellow square appears when storing a photo.

3.3.5 Recording Audio

The "Push-to-Talk" button above the microphone controls the audio input. Audio is recorded directly to the video file.

- Press the button to set in to turn on audio recording. The button is flush.
- Press the button to pop out to turn off audio recording.

The system does not feature built-in speakers, so audio playback is only available when accessing the video files from a computer.

3.3.6 Screen Adjustment

Pressing the "Toggle Button" while recording video will switch to direct camera feed.

This removes the black bars from the side.

Although you no longer see the red square, you are still recording.

3.4 File Management

Filename is stored as: "YYYYMMDDhhmmss"

Year Month Day Hour Minute Second

Pictures have the extension *.BMP

Videos have the extension *.avi

Accessing Files: *Important: the file menu will not open when the "Toggle" is set to "Direct Feed".*

1. Press the folder button to enter the File Menu:
2. Use the arrow keys to choose between the two options:
   - Search by date and time (see figure 5.4.a)
   - View All, to open all files (see figure 5.4.b)

Figure 7.4.a – Search Function

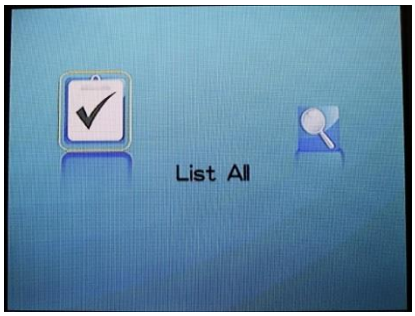


Figure 7.4.b – File Menu

3. Press this button to "SELECT":
4. Press this button to "GO BACK":

3.4.1 Review videos

Videos are stored in the HVR folder in the file browser.

1. Enter the File Menu:
2. Choose "View All"
3. Choose folder "HVR" (See figure 7.4.1.a)

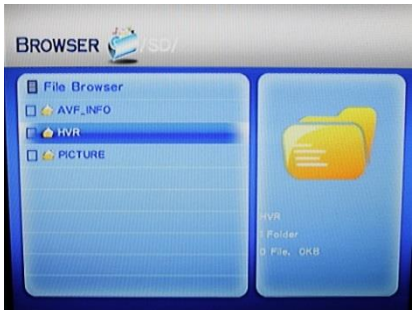


Figure 7.4.1.a – HVR Folder

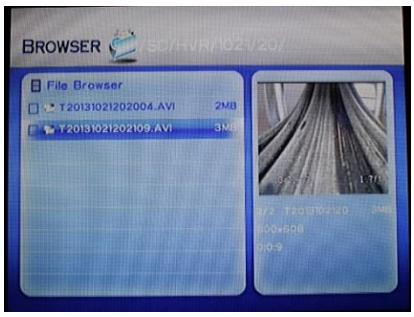
Videos are further organized into two subfolders: DATE and HOUR

4. Choose "DATE"
5. Choose "HOUR"

Use , to go to prior or next file.

Hit "SELECT" to choose:

6. Choose the video you wish to view and hit Select. (See figure 7.4.1.b)



3.4.2 Review photos

Photos are stored in the PICTURE folder in the file browser.

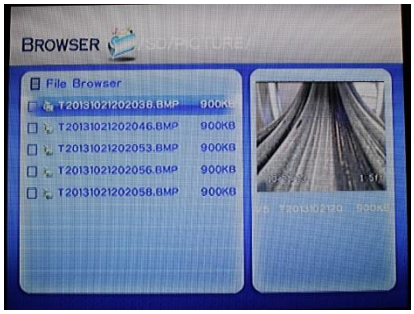


Figure 7.4.2.a – Photo *.BMP Files

1. Enter the File Menu:
2. Choose "View All"
3. Choose folder "PICTURE"

   Use , to go to prior or next picture.

4. Choose the picture you wish to view. (See figure 7.4.2.a)
5. Hit "SELECT" to choose:

3.4.3 Delete files

To delete a photo or video file from a SD-card (Figure 7.4.3.a):

Figure 7.4.3.a – Deleting a file

1. Use , to choose a file.
2. Press the "Menu Button" to open the shell menu:
3. Use , to select "Delete" in the menu.
4. Hit "SELECT" and "YES":

3.5 Settings Menu

Open the Settings Menu by pressing the "Menu Button" from the "Pass Through" video recording feed. *The menu will not open when Toggle is set to "Direct Feed."*

The menu has 3 settings:

1. Microphone Default: 9 dB
   - *Mute microphone setting*
2. Storage Card Default: Full Stop
   - *Erase all files from SD card*
3. System
   - *Set Date/Time*
   - *Choose language*
   - *Status Display* *On / Hide Info Box / Off*

4. Keyboard Text Generator

Each on-screen text page has 12 lines and 26 characters per line. The title line appears at the very top of the screen. There are two Status Lines which show different inputs on-screen, which can be controlled by the user. One is at the top, below the title. The other is at the very bottom of the screen.

10 text pages can be saved. To load a saved page, hold Alt and type a 2-digit number (ex. 04) up to 10. 100 fixed text lines can be saved. To insert a fixed line at the cursor, hold Ctrl and type a 3-digit number (ex. 034) up to 100.

Warning: While recording video, all actions on the screen are recorded, including making and fixing mistakes while typing or changing menu settings.

4.1 Essential Instruction

4.1.1 Set distance counter

Ctrl + F1 opens up the menu for setting the value on distance counter.

F8 sets the distance counter to 0.

4.1.2 Set date & time

Ctrl + F3 opens the date menu.

Ctrl + F4 opens the time menu.

4.1.3 Typing

By default, the keyboard is enabled, so that whichever key you press will appear on the screen.

F5 turns the on-screen cursor on/off.

Ctrl + F6 allows you to change the title text.

4.1.4 Troubleshooting

By default, the date, distance counter, title, and zoom level status are displayed.

If no text-overlay is shown, the overlay may have been turned off: ***Press F7.***

If the date is showing but nothing happens when you type, the text editor may be turned off. ***Press F6.***

4.2 Basic Commands:

F1 – Help

F2 – Title Line Show/Hide

F3 – Top Status Line Show/Hide

F4 – Bottom Status Line Show/Hide

F5 – Cursor On/Off

F6 – Text Editor On/Off

F7 – Overlay On/Off

F8 – Set Distance Counter to 0

NOTE:
F7 = Fn + F1
F8 = Fn + F2
F9 = Fn + F3
F10 = Fn + F4
F11 = Fn + F5
F12 = Fn + F6

4.3 Display Options:

Status information can be displayed on the status lines. The following functions toggle the information displayed in each status line.

Shift + F1 – Top Left status display: Horizontal rotation (HR) in degrees / Internal pressure in bar

Shift + F3 – Top Right status display: Tilt (T) in degrees / camera temperature in Celsius

Shift + F4 – Bottom Left status display: Inclination in degrees / Date

Shift + F5 – Bottom Center status display: Time / Sonde frequency (if on)

Shift + F6 – Bottom Right status display: Meter

Alt + F1 – Top Left Show/Hide

Alt + F2 – Top Center Show/Hide (Zoom level)

Alt + F3 – Top Right Show/Hide

Alt + F4 – Bottom Left Show/Hide

Alt + F5 – Bottom Center Show/Hide

Alt + F6 – Bottom Right Show/Hide

4.4 Input Control:

Options for adjusting information displayed on the text overlay.

Ctrl + F1 – Set distance counter

Ctrl + F3 – Set date

Ctrl + F4 – Set time

Ctrl + F6 – Edit title line text

Ctrl + F7 – Save text page, up to 10

Ctrl + F8 – Save fixed text line, up to 100 (comments)

Ctrl + F9 – Load saved text page

Ctrl + F10 – Insert fixed text line at cursor

Ctrl + Insert – Browse list of all fixed text lines with Up/Down; insert by hitting enter

Alt + Insert – Browse list of all saved text pages with Up/Down; load by hitting enter

Backspace – Backspace delete

Del – Delete selected character

Shift + Del – Delete from cursor to end of line

Ctrl + Del – Delete complete line

Alt + Del – Delete entire page text area

Alt + 01-10 – Load saved text page

Alt + 001-100 – Insert fixed text line at cursor

5. minCam Camera Centering Kits

The various center guide kits position the camera in the middle of the pipe.

5.1 SK50 Center Guide (greater than 3")

The SK50 plastic center guide is a two-piece installation. Leave the golden 58mm spacer on the camera.

1. Separate the threaded back piece from the guide.
2. Fit the opening in the back piece over the cable behind the springs and slide to the back of the camera.
3. Place the guide over the camera head.
4. Re-thread the back piece to the guide (See figure 9.1.b).

Figure 9.2.a – fit the back piece over the cable behind the springs.

Figure 9.2.b – SK50 3" Center Guide

5.2 SK50 Roller Skid (greater than 5")

All roller skids have a two-step installation procedure. Leave the golden 58mm spacer on the camera.

1. Slide the KK55 camera into the back of the skid.
2. Spin the screws on the bottom of the skid to hold the camera in place.

Figure 6.3.a – SK50 5" Roller Skid

Figure 6.3.a – SK50 Large Roller Skid

Figure 6.3.a – SK60 12-20" Roller Skid

5.2.1 Changing the Rollers

The exchange rolls are larger diameter wheels for the SK50 Roller Skid. (Figure 6.3.1.a)

1. Use a 3mm hex screwdriver to remove the screws that mount the 5" rolls to the skid.
2. Mount the six 8" rolls using the supplied 3mm hex screws in place of each of the 5" rolls.
3. Slide the SK50 camera into the back of the skid.
4. Spin the screws to hold the camera in place on the bottom of the skid

Figure 9.3.1.a – SK50 8" Roller Skid

5.2.2 SK50 Roll-in-Device (RID) Steering Skid

To install the SK50 RID for steering through laterals, a careful procedure must be followed to work correctly.

1. Disconnect the SK50 camera from the 9.2mm cable.

2. Remove the spring assembly:
   a. Removing the 3 set screws at the base of the spring.

   b. Spin spring counter-clockwise to detach; slide off.

3. Remove the golden 58mm spacer.

4. Place the RID set pin in the small slot on the camera head.

5. Slide the RID roller skid on the camera.

6. Fasten the RID roller in place with the golden fastener.

7. Replace the spring.

8. Reattach the camera to the cable.

The SK50 RID steering skid will rotate with the camera. When it catches the set pin, the wheels of the skid will pull the camera to the left or the right to steer into laterals.

6. Accessories

6.1 Trolley with Wheels

For minCam360

The trolley accessory (E31907) is compatible with the large push camera systems and adds wheels to the camera systems.

Please refer to our website for a video walkthrough for attaching the trolley to the cable reel frame.

6.2 RAU9 to Push System Adapter

For all push systems.

This adapter connects the minCam push cameras to the RAU9 mainline cable of the Rausch CCTV inspection vehicles via the BNC video out port.

By connecting the push camera to the mainline cable, all video footage from the camera can be integrated directly into the inspection reporting software of the inspection vehicle.

6.3 Spare Cable Rods

For all push systems.

We stock spare cable rods of all push systems at the RauschUSA HQ in Chambersburg PA.

All cable rods can be replaced quickly in the field. The "mc-series" systems use the same termination on both ends, so the cable rod can be reversed to increase the service life of the cable.

All cable rods can be reterminated. Contact RauschUSA Service for more information.

7. System Configurations

System Name	Camera	Cable – Std. / Max.	Monitor	Upgrades
mincam360	SK50 / 87 psi	200'/300' of 9.2mm	TFT8R 8.4'' LCD	Trolley, RID Steering Skid

The SK50 features a standard tri-band selectable sonde for 33 KHz, 512 Hz and 640 Hz

New system purchases include the corresponding default center guides and roller skids as outlined on the website. The large pipe diameter roller skids for the SK50 are by special order.

New minCam360 systems include an accessory case which includes the default center guides and roller skids, carrying strap, sun visor, and spare O-rings.

8. Warnings & Care

This operation manual is to help you to get acquainted with this camera system. Information is subject to change without notice – please contact your sales representative or visit rauschusa.com for updated manual revisions.

- This camera system is made for optical pipe inspection. It is not made for medical inspection. Please use the camera system only for the predetermined functions.
- Do not alter or reconstruct this camera system.
- Do not open the camera system.
- Do not try to repair the camera system on your own.
- Protect the control unit from dirt and wetness
- Beware of moisture and extreme heat, especially for the monitor and control-unit.
- Damage, forced by inappropriate use or handling, will void the guarantee.

Maintenance

- Take care of the product. It can be harmed by mechanical impact.
- In order to avoid mud and dirt, use a cloth to clean the camera cable while recoiling
- Keep the lens clean (clean it with Q-tips)
- Do not clean the camera with high water pressure
- Do not clean the camera head with any alcohol or alcoholic suspensions
- Do not deposit heavy goods on the camera
- The camera cable might break if it is pushed/pulled too hard.
- Avoid extreme mechanical strain for the camera head.
- Do not use the inspection system if the camera cable is broken