

Rausch mc-Series Operation Manual

APPLICABLE FOR THE MC15, MC30, MC50, MC80, MC30 DUO,
MC50 DUO

RAUSCHUSA



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2. System Setup

2.1 Reel Setup

All systems are designed to be operated from the upright position, see figure 3.1.a. On some models, the monitor can be positioned with a flexible ball mount so that it is visible when the unit is laid on its side for greater stability and control of the cable payout (see figure 3.1.b).



Figure 3.1.a – minCam system in upright position



Figure 3.1.b – minCam system on its side

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.

2.2 Monitor Setup

There are two different monitor mounts: the ball-joint mount and the platform mount.

2.2.1 Positioning the ball joint mount

1. Loosen the pivot screw where the connects to the cable reel (see figure 3.1.c).
2. Spin the monitor into a viewing position.
3. Tighten the pivot screw to secure into place.

2.2.2 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.



Figure 3.1.c – pivot screw controls swivel of monitor.

On systems without a keyboard, the monitor lid functions as a sunshield. Systems with a keyboard include a collapsible sunshield which fastens around the screen via magnets. \

2.3 Camera Setup


The mc-Series cameras are removable and interchangeable. To disconnect the camera from the cable, hold the connector with one hand where the camera connects to the cable, and twist the camera head. To reconnect a camera, reverse the procedure. The KK18, KK29/SL and KK55/SL cameras are interchangeable with the mc15, mc30/duo, mc50/duo and mc80 systems.

3. Controlling the System

3.1 mc-Series Control Unit

The control unit is the core of the push camera system. Figure 3.a is the face plate of the mc15, mc30/duo, mc50/duo, & mc80.

3.1.1 Power on

1. Verify that the camera head is connected correctly.
2. Turn the light regulator to the middle position.
3. Press the  switch.

3.1.2 Battery Indicator

The 5 LED lights show the current battery status.

Red: Charging

Green: 25%, 50%, 75%, or 100% battery life remaining.


3.1.3 Controlling LED Brightness





The black potentiometer dial enables continuous LED brightness regulation.

Turn Left (counter-clockwise): turn lights off


Turn Right (clockwise): turn lights on, up to 100% brightness

3.1.4 Using Distance Counter

The  button toggles between three different video overlays on the monitor:

- Display both "date" and "distance counter" (See Figure 4.3.a)
 - Display only "distance counter"
 - Distance counter display off
-
- Set the counter to 0: Press  and  at the same time.
 - Advance the counter: Press 
 - Decrease the counter: Press 

3.1.5 Control Sonde / Location Transmitter

The  button powers the sonde on and off.

While the location transmitter is enabled, no camera feed is provided. The screen will display a black picture (figure 4.3.a)

3.1.6 AC/DC Power

The DC car charger and the AC power cord provided go into their corresponding outlets.

3.1.7 Duo Camera Toggle

For the mc30 Duo and mc50 Duo, there is a camera toggle switch on the left of the control panel face plate to swap the video feed between the inner and outer reel.

Always power off the system before pressing the camera toggle switch.



Figure 4.a – mc50 Duo Control Unit

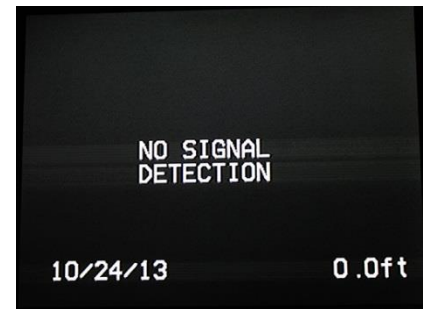


Figure 5.3.a – Date overlay, distance counter overlay and "Sonde on" screenshot (detection).

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



3.2.2 TFT5R Monitor Layout

SD Port



Open Folder

Remote Power

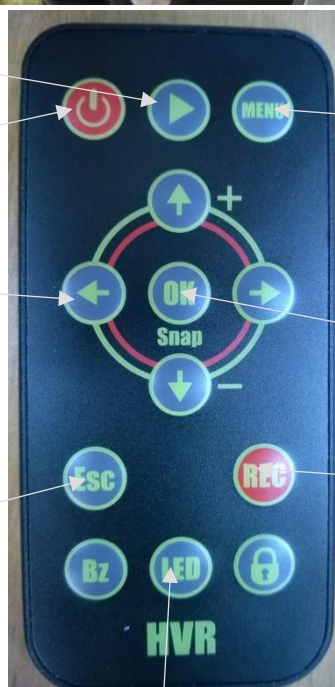
Arrow Controls

Exit / Back / Pause Video

Settings

Photo / Select

Start / Stop Video



Toggle

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

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

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.

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.



Figure 7.2.1.a – Red square designates recording now



Figure 7.2.1.b – Red pause emblem designates recording paused



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

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

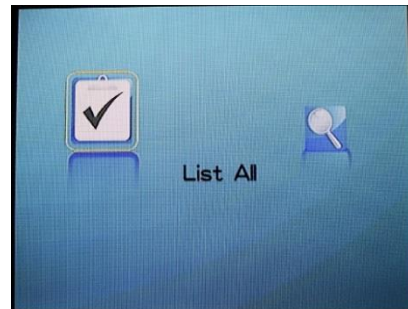




Figure 7.4.b – File Menu

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)

Videos are further organized into two subfolders: DATE and HOUR

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

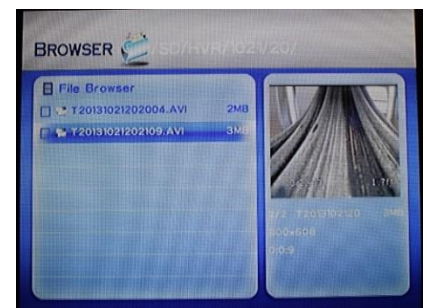
Use  ,  to go to prior or next file.

Hit "SELECT" to choose: 

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



Figure 7.4.1.a – HVR Folder




3.4.2 Review photos

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

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: 

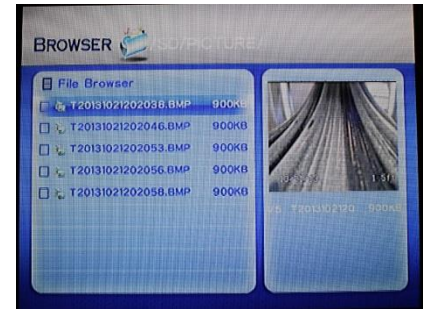







Figure 7.4.2.a – Photo *.BMP Files

3.4.3 Delete files

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

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": 



Figure 7.4.3.a – Deleting a file

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 (when available)

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 KK18

The KK18 plastic center guide is a two-piece installation.

1. Separate the threaded back piece from the guide.
2. Fit the opening in the back piece over the cable behind the springs (See figure 6.2.a) and slide forward to the back of the camera.
3. Place the guide over the camera head.
4. Re-thread the back piece to the guide.

5.2 KK13

The KK13 plastic center guide is a two-piece installation.

1. Separate the threaded back piece from the guide.
2. Fit the opening in the back piece over the cable behind the springs (See figure 6.2.a) and slide forward to the back of the camera.
3. Place the guide over the camera head.
4. Re-thread the back piece to the guide.

5.3 KK29SL

5.3.1 KK29SL Centering Brush Kit: 1 ¾" center guide, 3" brush, 4" brush, greater than 5" brush

All KK29SL centering accessories have a two-step installation procedure:

1. Slide the KK29 camera into the back of the guide.
2. Spin in the screws to hold the camera in place.



Figure 6.1.a – KK29 centering brushes

5.4 KK55SL

5.4.1 KK55SL Center Guide (*greater than 3"*)

The KK55 plastic center guide is a two-piece installation.

5. Separate the threaded back piece from the guide.
6. Fit the opening in the back piece over the cable behind the springs (See figure 6.2.a) and slide forward to the back of the camera.
7. Place the guide over the camera head.
8. Re-thread the back piece to the guide (See figure 6.2.b).

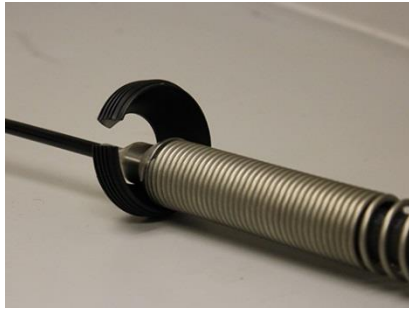


Figure 6.2.a – fit the back piece over the cable behind the springs.



Figure 6.2.b – KK55 3" Center Guide

5.4.2 KK55SL Roller Skids

All roller skids have a two-step installation procedure.

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 – KK55 5" Roller Skid



Figure 6.3.a – KK55 Large Roller Skid



Figure 6.3.a – KK55 12-20" Roller Skid
Note: Pictured is SK50, identical

5.4.2.1 Changing the Rollers

The exchange rolls are larger diameter wheels for the KK55 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 KK55 camera into the back of the skid.
4. Spin the screws to hold the camera in place on the bottom of the skid.



Figure 6.3.1.a – KK55 Roller Skid with larger wheels

6. Accessories

6.1 Trolley with Wheels

For mc50 and mc50 Duo

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. On all “mc-series” push systems it also provides power to the camera unit via the DC power 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
mc15	KK18 / 43.5 psi	100' of 5.5mm	TFT5R 5.6" LCD	Front-panel keyboard
mc30	KK29SL / 145 psi	100'/160' of 6.7mm	TFT5R 5.6" LCD	TFT8R, front-panel keyboard
mc50	KK55SL / 145 psi	200'/300' of 9.2mm	TFT8R 8.4" LCD	Monitor keyboard, trolley
mc80	KK55SL / 145 psi	400' of 11.2mm	TFT8R 8.4" LCD	Monitor keyboard
mc30 duo	KK13 / 14.5 psi KK29SL / 145 psi	50' of push-pull 100'/130' of 6.7mm	TFT5R 5.6" LCD	TFT8R, front-panel keyboard
mc50 duo	KK29SL / 145 psi KK55SL / 145 psi	65' of 6.7mm 200'/300' of 9.2mm	TFT8R 8.4" LCD	Monitor keyboard, trolley

All cameras are available with sonde. The KK18 and KK29/SL cameras integrate a plastic sonde in the middle of the spring.

All “mc-series” systems can use the KK18, KK29/SL and the KK55/SL cameras interchangeably.

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 KK55 are by special order.

New mc50, mc50 duo, and mc80 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
- Should there be any need of repair, please contact Rausch Electronics USA.