

DrainCam

DRAINCAM USER'S MANUAL



DrainCam Mini ST 5500
DrainCam ST 5700



SUBTECH
DESIGN & MANUFACTURING INC

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CAUTION!



General Safety Precautions

People who use hand and power tools and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors or gases, must be equipped with the appropriate personal protective equipment (e.g., safety goggles, gloves, appropriate safety footwear Ect.). The work area should be kept as clean and dry as possible to prevent accidental slips. All electrical connections for these tools must be suitable for the type of tool and working conditions (wet, dusty, Flammable vapors).

Power Tool Precautions

Power tools can be hazardous when improperly used. The following general precautions should be observed by power tool users:

- Operate electric tools within their design limitations.
- Use gloves and appropriate safety footwear when using electric tools.
- Store electric tools in a dry place when not in use.
- Do not use electric tools in damp or wet locations unless they are approved to for that purpose.
- Keep work areas well lighted when operating electric tools.
- Ensure that cords from electric tools do not present a tripping hazard.
- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from a receptacle.
- Keep cords and hoses away from heat, oil and sharp edges.
- Disconnect tools when not in use., before servicing or cleaning and when changing accessories.
- Keep all people not involved with the work at a safe distance away from the work area.
- Maintain tools with care. Tools should be kept clean for best performance.
- Follow instructions in the user's manual for changing accessories.
- Be sure to keep good footing and maintain good balance when operating power tools.
- The proper apparel should be worn. Loose clothing, ties, hair or jewelry can become caught in moving parts.
- Remove all damaged electric tools from use and tag them "DO NOT USE".
- Turn off the power when not in use.

Five Basic safety rules can help

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job.
- Examine each tool for damage before use and do not use damaged tools.
- Operate tools according to the manufacture's instructions.
- Provide and properly use the correct protective equipment.

Contents & Accessories

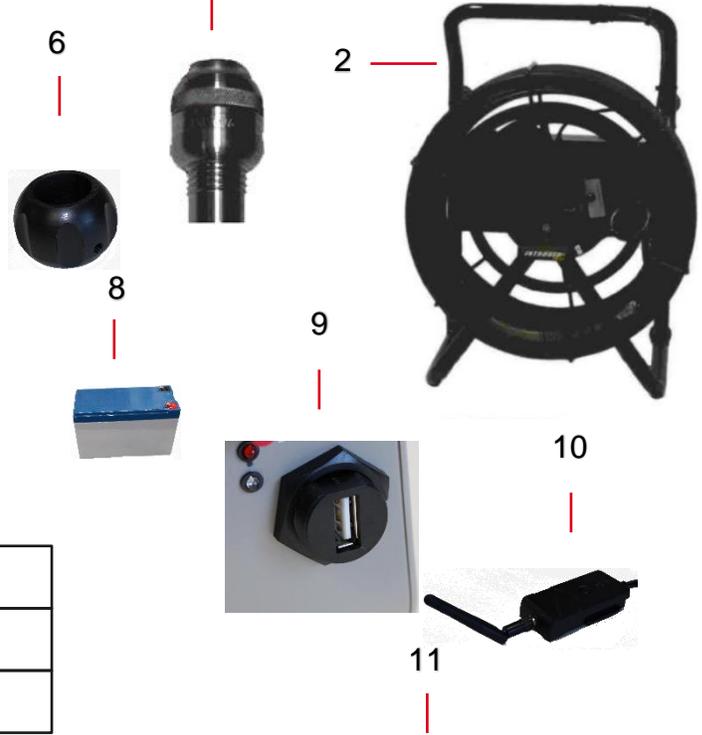
Standard Equipment

1. DrainCam Display
2. Cart & Reel
3. User's Manual
4. AC Adapter *
5. Display Mounting Hardware
6. Skid
7. Camera



Optional Equipment

8. Rechargeable Battery
9. USB Recorder
10. WIFI
11. Self Leveling Camera

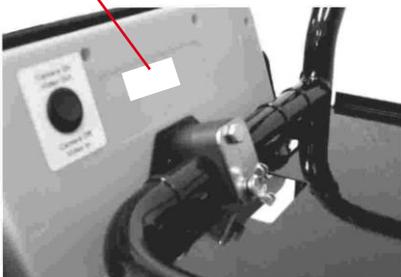


Please record your serial numbers!

Display
Camera
Reel

Location of serial numbers:

Display - on back



Camera



Reel



Assembly

Mounting the Display Removal/Installation

Place 1 clamp half onto the black metal bracket on the back of the display.

Hold the display in place against the cart tray so that the half clamp is centered on the tube of the cart .

Place the other clamp half over the tube so that the holes line up.

Place the cover plate on the second clamp half so that the holes line up.

Insert the hex head bolt into the top hole and tighten.

Insert the wing head bolt into the lower hole and tighten.

Connect the interface cable from the cart to the 12 pin connector on the display.



Proper clamp configuration

Skid Installation

Loosen set screws in skid being careful not to lose them if they come out.

Slip skid over camera head, push fully back.

Tighten set screws.



Battery Removal & Installation

Remove 2 screws from top of battery box.

Carefully angle back battery box until its bottom tabs can be lifted off of the cart and top will clear.

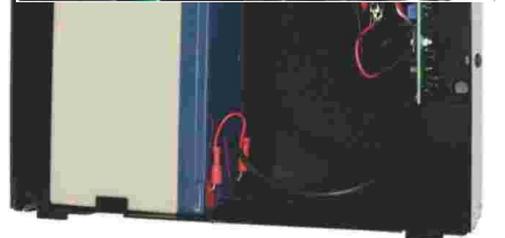
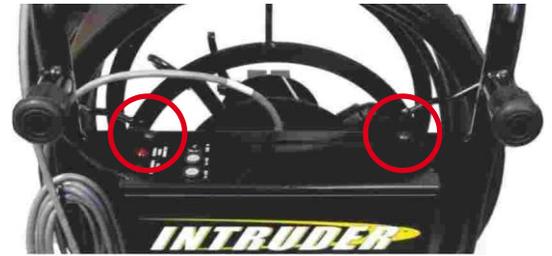
Disconnect 12 volt connection at hub.

Disconnect positive and negative wires at the battery.

Remove battery retaining bracket screw.

Remove battery.

Install new battery in reverse order.



Basic Operation (Quick Start)

Position the DrainCam within a few feet of the pipe opening. The unit may be operated in either the vertical or horizontal position.

Connect the included AC adapter to the hubpower input jack. Connect the other end of the AC adapter to a 110 volt AC outlet.

Adjust display angle and sun screen to desired viewing position.

Push the green button on the display to turn the unit on.

Insert camera into pipe and adjust LED light level with the UP and DOWN soft keys to desired level.

Using the push cable, slowly push the camera down the pipe until the problem is found, or to the desired location.

Use the distance counter and pipe direction to get estimate of the location of the camera. For a more precise location, turn on the transmitter (512 Hz or 874Hz) and locate using a compatible location system.



Set up and Operation

Multi-Level Softkey Menu System

The DrainCam functions can be accessed from the 4 yellow soft keys on the front panel.

Main Menu Functions

Invert – Inverts the picture (turns it upside down) and also removes the text from the screen. Return to normal (non-inverted) picture by pressing any key.

Down and Up – control the brightness of the cameras LED lights. During adjustment, a bar graph will display showing current power level of LEDs. Adjust to user preference.

Menu – go to the second level menu.

Second Level Menu Functions

512 Hz – turns on the 512 Hz transmitter. Used for precise location of camera head with optional locator.

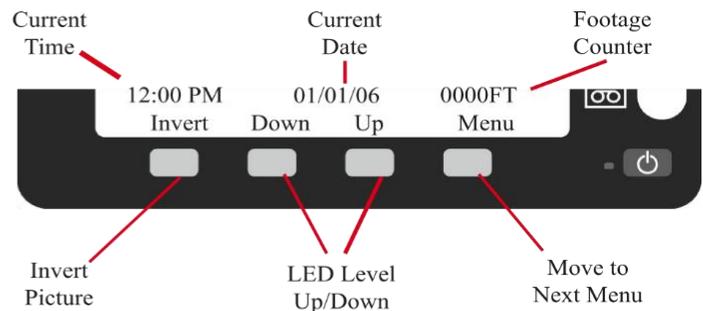
874 Hz – turns on the 874 Hz transmitter. Used for precise location of camera head with optional locator.

Note: When either frequency is selected, the frequency will flash on the screen to let you know that it is on. You should turn off the transmitters when not in use, as they can contribute to picture interference and lessen battery life.

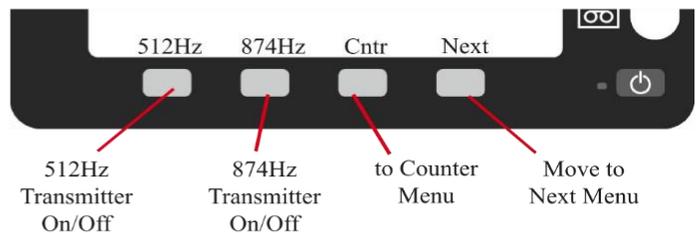
Cntr – go to the Counter menu.

Next – go to the third level menu.

Main Menu



Second Level Menu



Counter Menu Functions

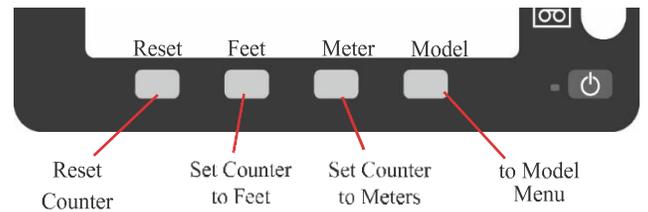
Reset - Resets the counter to 0.

Feet – Sets the unit of distance measurement to feet.

Meter – Sets the unit of distance measurement to meters.

Model – Go to the model menu level

Counter Menu



Model Menu Function

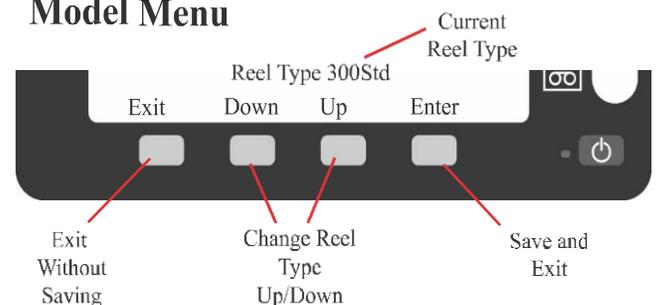
This setting is set at the factory- Changing the reel type may alter the functions of the unit

Exit – exit without saving to main menu.

Down and Up- changes the current reel type.

Enter- saves the selected reel type and exits to Main Menu.

Model Menu



Third Level Menu Functions

Text- go to the text menu.

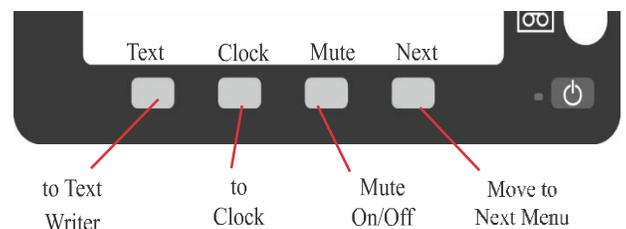
Clock- go to the clock menu.

Mute- mutes the microphone (if connected-certain models)

Output on the audio output line. Mute will flash on the display if this feature is enabled. To turn mute off, select it again from this menu.

Next- go to the fourth level menu.

Third Level Menu

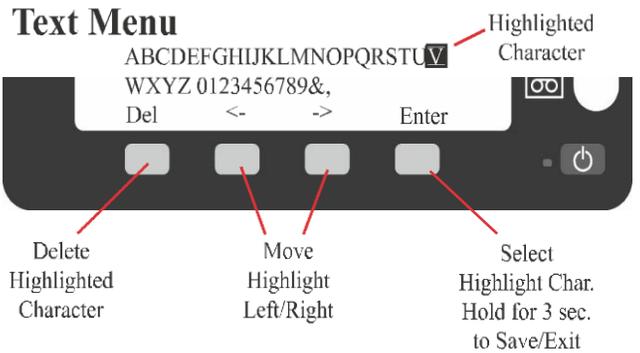


Text Menu Functions

DEL- deletes the currently highlighted character.

<and>- moves the cursor to select characters.

Enter- pressing enter momentarily adds the character to the current text string on the display. Press and hold enter for approximately 3 seconds to save and exit the text writer.

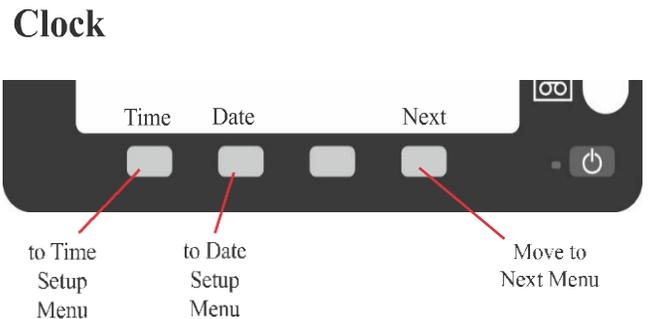


Clock Menu Functions

Time- go to the Time menu.

Date- go to the Date menu.

Next- returns to the Main Menu.



Time Menu Functions

->- moves to the next column.

Down and Up- Allows you to increment the currently selected column value up or down.

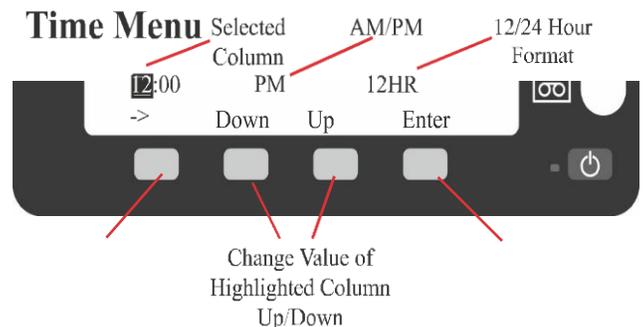
12:- select the hour.

:00- select the minute.

AM -or PM- select AM or PM.

12HR or 24HR- select the desired time format.

Enter- save the displayed time information and return to the main menu.



Date Menu Functions

->- moves to the next column.

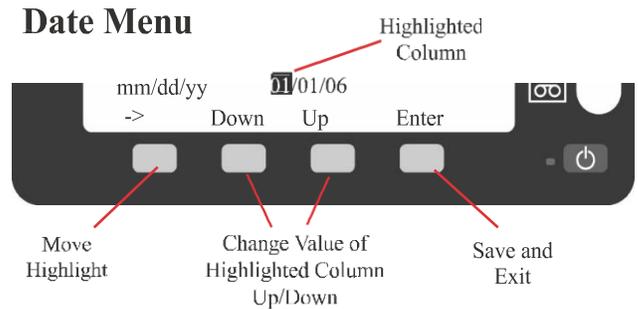
Down and Up- Allows you to increment the currently selected column value up or down.

01/xx/xx- select the month

xx/01/xx- select the day

xx-/xx/01- select the year

Enter- Saves the currently displayed date information and return to the Main Menu.



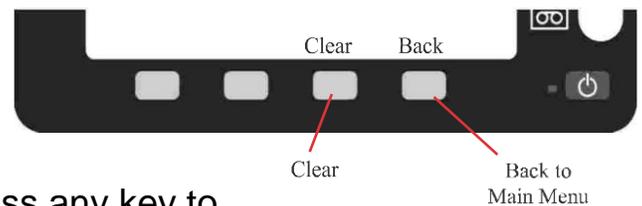
Fourth Level Menu Functions

Clear- clears the screen of all text and menu information allowing you

to view only the video feed from the camera. Press any key to return to Main Menu.

Back- return to the Main Menu.

Fourth Level Menu



Video /Audio Recording

(External recording option- DVR,DVD ECT.)

When the desired picture is on the DrainCam LCD that you wish to record:

Using a standard RCA video cable, connect one end to the DrainCam LCD video out jack (indicated by video tape symbol) to video input on the recording device.

For audio recording, a powered microphone must be connected to the DrainCam display audio in jack (indicated by a microphone symbol). **MODELS EQUIPPED WITH USB RECORDING CAN ONLY RECORD WITH THE BUILT IN RECORDER**



Connect audio out jack of the DrainCam display (indicated by speaker symbol) to audio input of recording device using a standard RCA audio cable.

Follow manufacturers instruction for recording of input signals from a video camera to selected recording device.

Video Input/Output Selection

The video input/output selection switch is located on the back of the DrainCam display. The selector switch is normally set to video out / camera on (with the switch pushed in at the top) allowing normal camera viewing on the display and simultaneous video output on the front panel RCA video jack.



Note: with camera on and external signal coming into the front panel, the 2 signals will combine and give a distorted image on the LCD.

When switched to video in / camera off (with the switch pushed in at the bottom), the camera is powered off and video on the LCD is displayed from the input signal on the front panel RCA video jack.

Note: with no signal on the front panel RCA, the screen will be black. *If monitor has no picture insure this button was not switched.*

Locating the Camera

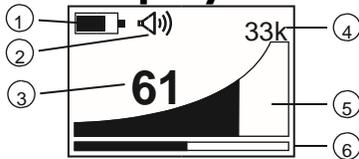
Sonde frequencies available are:

- 50/60Hz
- 512Hz
- 640Hz
- 33 kHz

Note: Other frequencies are available upon request.

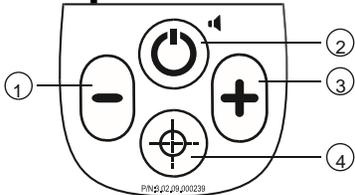


Receiver Display Functions



1	Battery Level Indicator
2	Speaker Level Indicator
3	Percentage Signal Level
4	Selected Sonde Frequency
5	Signal Level Indicator
6	Sensitivity Setting Indicator

Receiver Operational Controls



1	Sensitivity Control (reduce sensitivity)	Increment sensitivity down, or auto scale down to 60% if off scale. When in frequency select menu use this button to scroll backwards through available frequencies.
2	On/Off Control	Long press to switch on/off. Short press to change speaker volume.
3	Sensitivity Control (increase sensitivity)	Increment sensitivity up, or auto scale to 60% if off scale. When in frequency select menu use this button to scroll forwards through available frequencies.
4	Depth Measurement / Frequency Selection	Short press to initiate depth measurement. Long press to enter frequency select menu then short press to exit menu.

Changing Batteries

1. A low battery is indicated by the icon of the receiver display.
2. To replace the batteries, unscrew the end cap on the handle end of the VM-540.
3. Remove and replace BOTH batteries with fresh 1.5V alkaline AA (LR6).
4. Replace end cap.



Service Center Information

If the equipment does not function properly, replace the batteries as described above. If the equipment still malfunctions, contact the Subtech Mfg. Inc. Service department.

Disclaimer: Product and accessory specification and availability information is subject to change without prior notice

Power Mode Operation

Switch on the receiver by pressing the ON/OFF pushbutton. Allow the unit a few seconds to switch on. The frequency selected is shown on the display. If this is not the desired locate frequency (ie 50 or 60Hz) change as instructed below.



NOTE

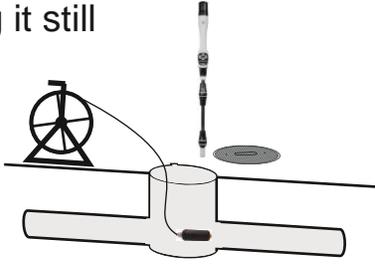
The battery condition is indicated on battery icon. Replace batteries if necessary. See Changing Batteries Section.

Changing the Locate Frequency

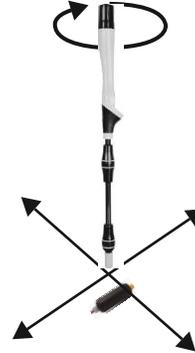
Press and hold the depth measurement/frequency selection pushbutton until the frequency menu is entered. The display will show the present frequency selected in large numeric's in the center of the screen. Use the "+" or "-" pushbuttons to select the desired frequency. Press the depth measurement/frequency selection pushbutton to re-enter the locate screen.

Be sure the LCD frequency is set to 512 and position the locator within the pipe access chamber

leaving it still visible.



Hold the locator above the Camera head at ground level. Adjust the sensitivity of the locator by pressing the “+” or “-” pushbuttons to keep the signal on scale. Rotate the receiver until the maximum signal is detected.



NOTE



Moving the locator further left and right will result in detecting smaller “ghost” signals either side of the main one. This is normal. Always be sure to locate all three peaks when locating the position of the camera as the ghost signals are not directly over the camera. The largest one is the true position.

Moving forward and back across the camera will not detect ghost signals.

USB Recording

4Gb drive will hold approx.. 4 hrs of of video.

Please note; Each time the record button is pressed a new record file is created. Voice over narration can be done with a battery powered microphone. A self powered USB hard disk can be plugged in place of a thumb drive to record up to 2 TB of Video!

` The USB drive can be installed to the LCD at anytime, with unit on or off makes no difference

`Insert the drive into the USB port on the display

` Wait up to 1 minute for Video line discovery (blue light blinks)

`GREEN light comes on – recorder is now ready to record, recording may start as long as green light is solid

` Press RED button to record, RED record light should come on solid (Recording)

`Press Record button again to stop recording

`Video playback cannot be seen on the LCD, the USB drive must be read from another source.

` A powered microphone may be used for Voiceover recording but a bypass cord is necessary.

Specifications

	<u>Standard Camera</u>	<u>Mini Camera</u>
Line Capacity	3"-12" (7cm to 30cm)	2"-6"
Max Distance	400 ft. (121m)	200 ft. (61m)
Operating Depth	350 ft. (150 psi)	350 ft. (150 psi)
Resolution	330(H) x 400(V)	420TVL
Pixels	512(H)x492(V)	512(H) x 492(V)
Sensitivity	0.3 Lux	0.3 Lux
Lighting	28 White LED's	16 White LED's
Camera Dimensions	1.6"X 1.4 (41mmx36mm)	1.3" x 1.5" (33mm x 38mm)
Push-Rod Diameter	.48" (12mm)	.37" (9mm)
Video Format	NTSC	NTSC
Power	110v/60hz AC, 12v DC	110v/60hz AC, 12v DC
Operating Temperature	14F to 122F/ -10C to 50C	14F to 122F/ -10C to 50C

Troubleshooting Guide

Unit will not power on

Check that AC adapter/battery is connected
Check battery fuses
Check cable connections

Bad Video

Check that Video In/Out switch is set to "in" with input on video connector

LED's working, but no picture

Check that Video In/Out switch is set to out
Check that LED's are not set to dim

LED's not working and no picture

Check that reel is connected at hub

Blue Screen

Check that cable is connected on back of display

Snowy/Streaked Video

Check battery charge

Service & Repair

For Service or repair, the unit should be returned to an authorized repair center or the factory. If you have any questions regarding service or repair, or for the name and address of your nearest repair center please contact;

Subtech Manufacturing Inc.

Repair Department

3221 Liberty Square Parkway
Turlock, CA 95380

Phone: 209-668-5840

Toll Free: 877-754-3435

Email: subtechmfg@gmail.com