

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.

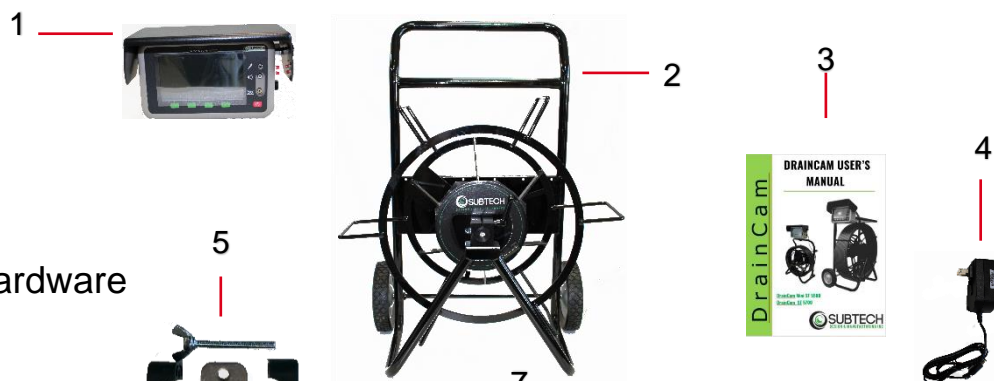
Five Basic safety rules can help

- 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. 18v Battery Receptacle
9. USB Recorder
10. WIFI
11. Self Leveling Camera

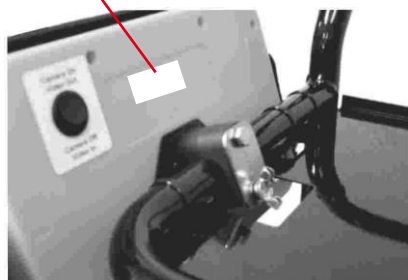


Please record your serial numbers!

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 try 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 Installation:

The 18 volt battery receptacle uses an M18 style Milwaukee battery (**Battery & charger not included**).

The receptacle plugs into the rear of the reel.



The A/C adapter now plugs into the rear of the LCD monitor



The 18 volt battery should last for 3-4 hrs. A low battery alert will come across the screen when the battery is low. The unit will shut off if the battery is too low. The battery must either be exchanged for a fresh battery or used with AC operation. The battery must be charged with an 18V battery charger, the unit will not charge the battery. Units upgraded from 12Volt to 18Volt can no longer use the 12 volt battery. Doing so will damage the LCD command Module.

DO NOT LEAVE BATTERY PLUGGED IN- DISCHARGE OF BATTERY WILL OCCUR & FIRE HAZARD

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.

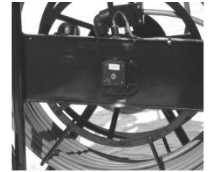
Adjust display angle and sun screen to desired viewing position.

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

DrainCam

Multi-Level Softkey Menu System

The Intruder's functions can be accessed from the 4 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.

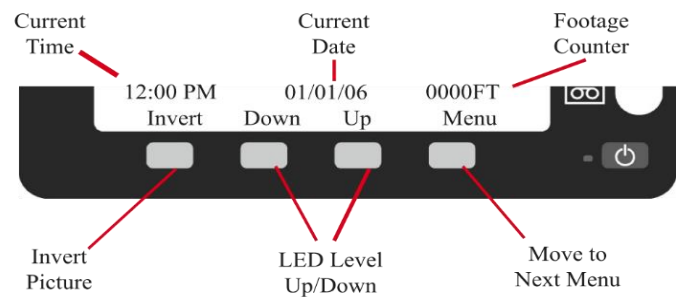
874 Hz – turns on the 874 Hz transmitter. Used for precise location of camera head with optional locator.

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.

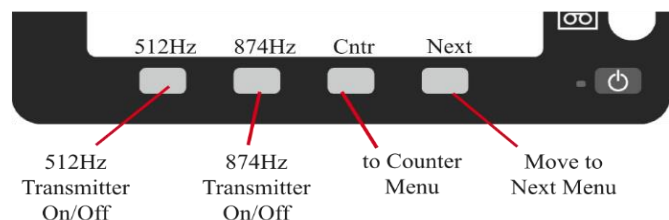
Cntr – go to the Counter menu.

Next – go to the third level menu.

Main Menu



Second Level Menu



Counter Menu Functions

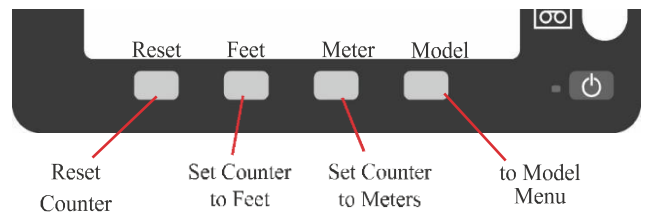
Reset - Resets the counter to 0.

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

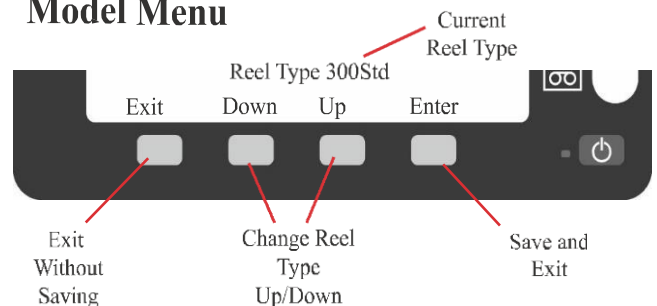
This setting is set at the factory- Changing the reel type may alter the functions of the unit

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.

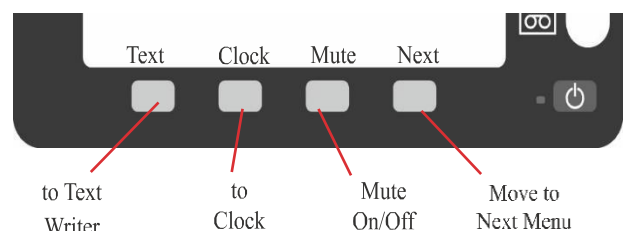
Clock- go to the clock menu.

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

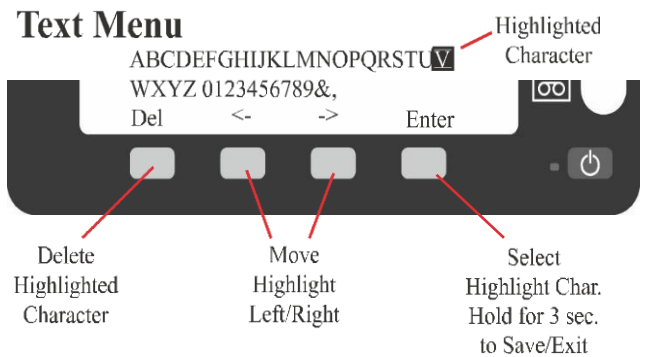


Text Menu Functions

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.



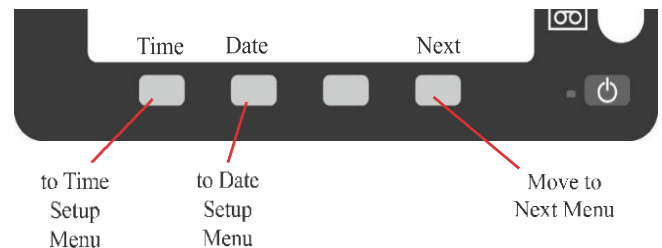
Clock Menu Functions

Time- go to the Time menu.

Date- go to the Date menu.

Next- returns to the Main Menu.

Clock



Time Menu Functions

->- moves to the next column.

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

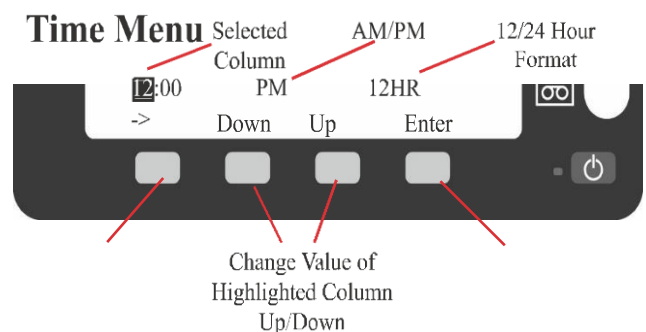
12:- select the hour.

: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.



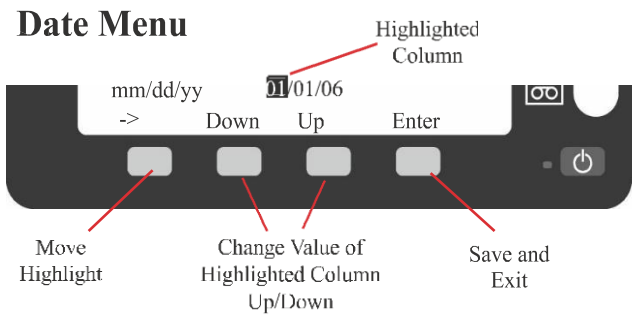
Date Menu Functions

->- 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.



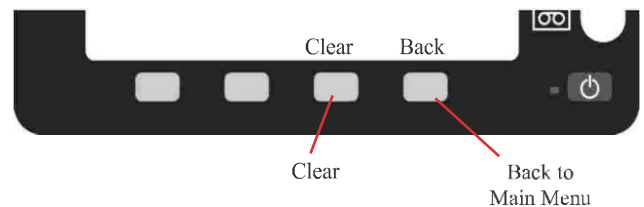
Fourth Level Menu

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.



Video /Audio Recording

(External recording option NO LONGER IN USE.)



USB Recording

A 4Gb drive will hold approx.. 4 hrs 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 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. PLEASE VERIFY RECORDING BEFORE LEAVING JOB.**

` **An adapter is available to view the USB recording from your phone. (Not available on all phone models) Ask for details.**

` **A microphone may be used for Voice over recording.**

` **A good quality flashdrive should be used.**

` **Flashdrives must be formatted to FAT 32 (most are this format from factory)**

WIFI- Screen Mirror

The WIFI feature (available option) is to mirror the screen. Useful for allowing client to screenshare, and useful for rooftop without taking the entire cart.

- WiFi transmission, support iPhone, iPad, and Android phone
- Transmission distance with no obstacle more than 150meters
- The client terminal shall support Android 2.2 or above, and iOS shall support Version 4.3 or above

Operations for Android system client


❓Installation APP software:


1. GOOGLE PLAY store.
2. Search "WIFI" software, and download BE SURE DEVELOPER IS ; Kezhen Zeng
3. Install the APP software
4. The WIFI is always on



5.) NOTE: If you are currently connected to the internet via WIFI you will need to disconnect and choose WIFI to connect.

❓Connection WIFI:

1. Go to the WIFI settings on the phone. Click WIFI to connect to.
2. The initial SSID of the device is "**WIFI**", then type in the password of the device(default password: 12345678).

3. Click  APP icon on your phone. The screen should now be mirrored.

4. The  WIFI button on the LCD box is to reset the WIFI. This only is necessary if the connection will not setup or if another phone is used, or to change the factory SSID or Password.



Press this  icon to enter into the settings menu. You can change the default factory SSID and password of the wifi camera tool, and clicking  will

show whether the change is successful, and clicking to cancel the new SSID set.
NOTICE:




- User could press the RESET button of the transmitter to renew the default factory SSID and password.

Operations for iOS Applesystem client:

1. Go to the Apple APP store.
2. Search "**WIFI**AV" software, and download. Be sure the developer is ; Kezhen Zeng
3. Install the APP
4. The WIFI  is always on
- 5.) **NOTE:** If  you are currently connected to the internet via WIFI you will need to disconnect and choose WIFI**AV** to connect.

Connection WIFI:

1. Go to the WIFI settings on the phone. Click WIFI**AV** to connect to.
2. The initial SSID of the device is "**WIFI**AV", of the device(default password: 12345678).  then type in the password

3. Click APP icon on your phone. The screen should now be mirrored.
NOTE: Record and screenshot icons in the APP are not active for our use.

Locating the Camera

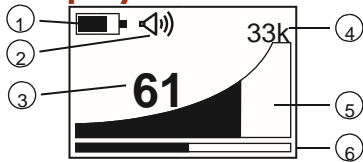
Sonde frequencies
available are:

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

Note: Other frequencies are available upon request.

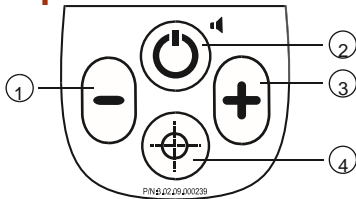


Receiver Display Functions



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

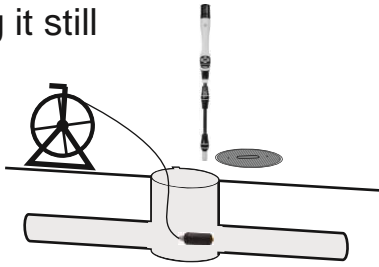
The battery condition is indicated on battery icon. Replace batteries if necessary. See Changing Batteries Section.

Changing the Locate Frequency

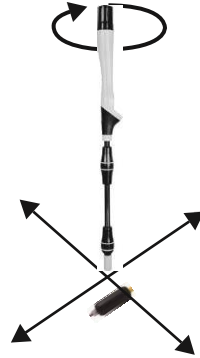
Press and hold the depth measurement/frequency selection pushbutton until the frequency menu is entered. The display will show the present frequency selected in large numeric's in the center of the screen. Use the "+" or "-" pushbuttons to select the desired frequency. Press the depth measurement/frequency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

Specifications

	Standard Camera	Mini Camera
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

Subtech Manufacturing Limited Warranty

WARRANTY COVERAGE

Subtech Manufacturing, Inc. ("Subtech") warrants this hardware product against defect in materials and workmanship for a period of ONE (1) YEAR from the date of original purchase for our Camera Systems, Leak Detectors, and Locators, and THIRTY (30) DAYS from date of original purchase for our Media Recording Devices (USB Recorder etc.). If a defect exists, at its option Subtech will repair the product at no charge, using new or refurbished replacement parts, or exchange product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product. A replacement product/part assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, and the replaced item becomes Subtech's property. Kinking or damage to the push rod is NOT covered by the warranty.

OBTAINING WARRANTY SERVICE

Please contact Subtech directly (contact information provided below) to arrange for repairs. Generally, the unit will need to be delivered to either Subtech or one of our Repair Centers for repair work. When you contact Subtech, you will be asked to furnish your name, address, telephone number, and proof of the original purchase (receipt), model and serial number of the product, and description of problem. You will be advised of where the unit needs to be sent for repair.

EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to products manufactured by or for Subtech. This Warranty does not apply: (a) to damage caused by accident, abuse, misuse, misapplication, or non-Subtech Products; (b) to damage caused by service performed by anyone who is not an authorized Subtech Repair Center; (c) to a product or a part that has been modified without the written permission of Subtech; or (d) if any Subtech serial number has been removed or defaced.

Using an A/C adapter other than the original or a replacement purchased through Subtech WILL void the warranty and may cause major system damage!

THIS WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. SUBTECH SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF Subtech CAN NOT LAWFULLY DISCLAIM IMPLIED WARRANTIES UNDER THIS LIMITED WARRANTY, ALL SUCH WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

No Subtech reseller, agent, or employee is authorized to make any modification, or extension, or addition to this warranty.

SUBTECH IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DOWNTIME, GOODWILL, DAMAGE TO OR REPLACEMENT OF EQUIPMENT AND PROPERTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages or exclusions or limitations on the duration of implied warranties or conditions, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary by state.

Please keep on file or in a safe place with your original receipt for warranty purposes

Date of purchase: _____

Serial Number(s'): _____

For warranty repair requests or to find the location of your nearest authorized Repair center, please call Subtech at (877) 754-3435 or (209) 668-5840.

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 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

