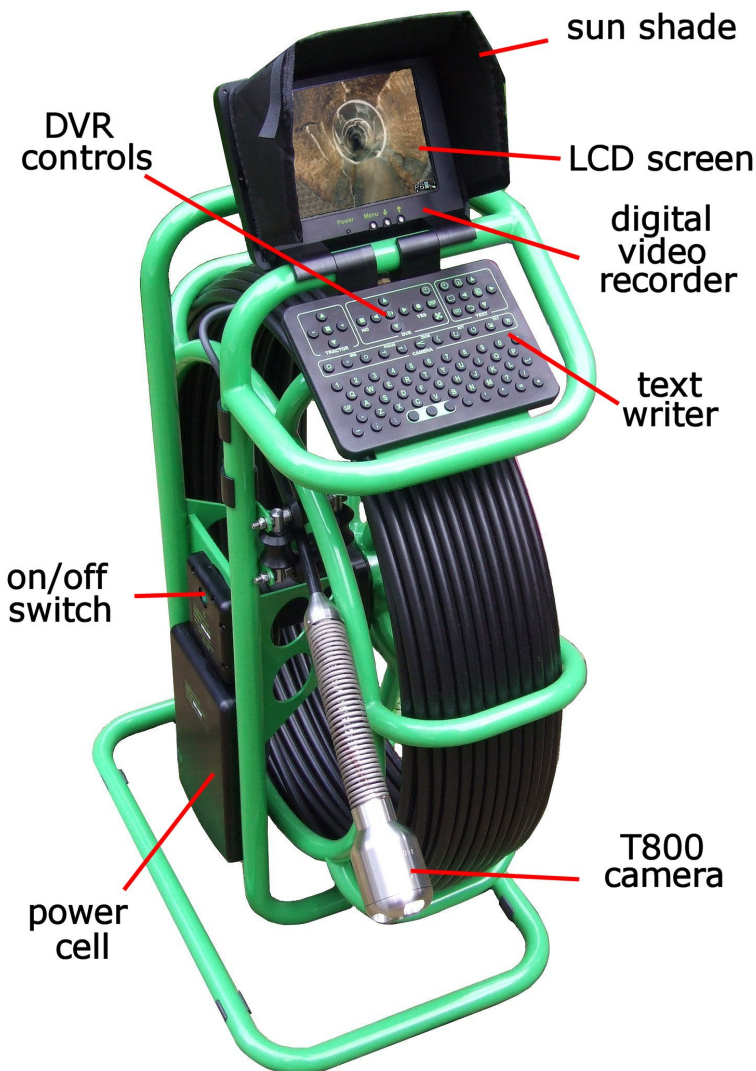


OPERATING INSTRUCTIONS—T804 SYSTEM



These instructions are for SD-Card models (2018 and later)

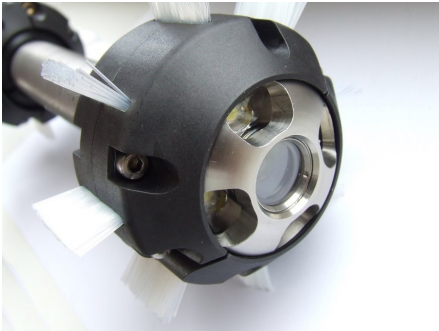
QUICK START GUIDE



1) Slot Power Cell into frame and push upwards to lock in place



2) Fit camera to Rod Termination



3) Fit Brush Skid set



4) Remove the SD card cover by pulling the lanyard upwards and then away from the unit



5) Fit SD Card with label upwards - it will click into place. Refit cover



6) Switch unit ON - You are ready for surveying

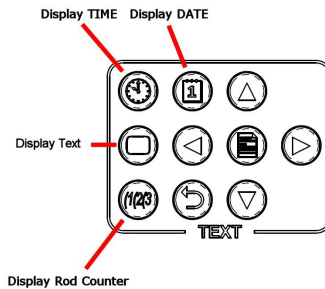


QUICK START GUIDE - TEXTWRITER + DVR

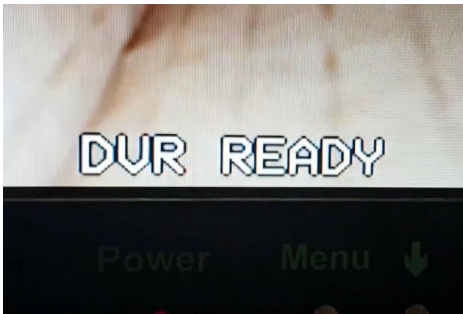


1) The Textwriter starts with the Rod Counter, Time & Date and the Text from Page 1 displayed

TEXTWRITER CONTROL KEYS



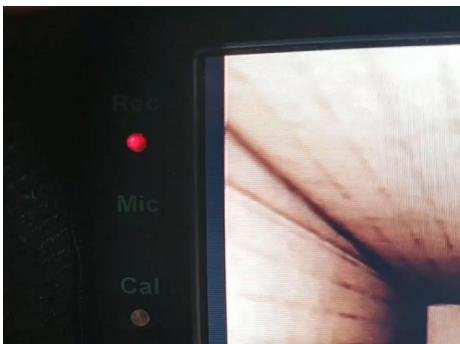
2) Use the keys shown here to hide or display the Rod Counter, Time & Date and the Text



3) After 15 seconds from switch-on the 'DVR READY' message shows



4) Press RECORD (YES) to start a recording



5) Ensure the LED is flashing to show a successful recording



6) Press STOP (NO) to stop the recording when finished.

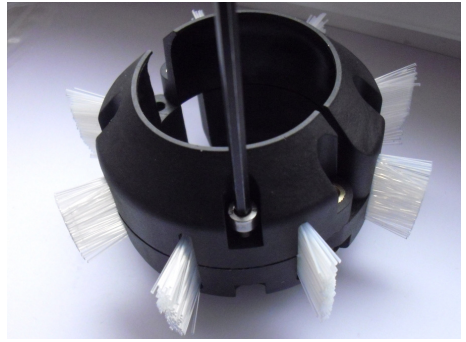
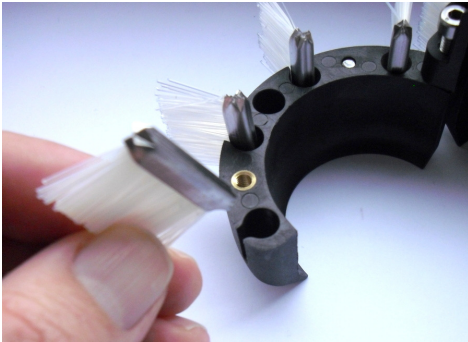


FITTING BRUSH SKID SET

Fitting Brush Skids

The T800 and T812 must always be used with the full skid set, whether or not the brushes are fitted. Using the system without skids may damage the camera.

The Troglotech skids can be adjusted from 3" (no brushes fitted), through 4" to 6" by selecting from the two brush sizes.



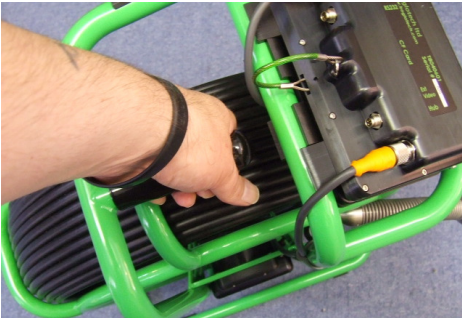
END OF DAY PROCEDURE



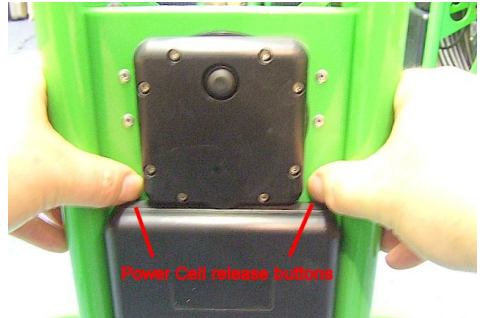
1) Press STOP (NO) if a recording is in progress and then Switch unit OFF



2) Fold the sunshade flat, swivel Control Unit flat against keyboard



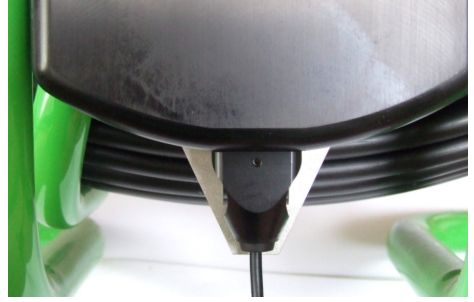
3) Fully apply the brake. The T804 is ready for transportation



4) Remove Power Cell by pressing both buttons and lowering the Power Cell



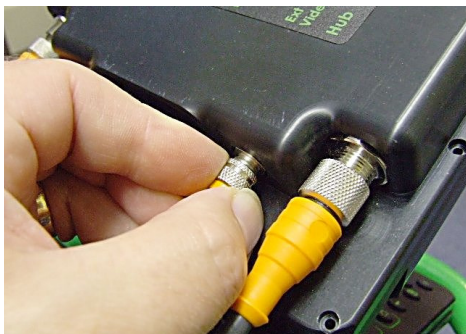
5) Connect the Mains Charger. Charging will take 4—6 Hours.



6) The Power Cell can be charged whilst fitted to the frame if preferred
DO NOT OPERATE DURING CHARGE



USING THE WIFI ACCESSORY

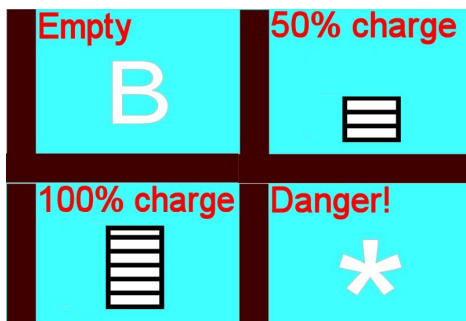


Connect the optional WiFi accessory to the Ext Video socket and clip the unit to the frame.



As soon as the T804 is switched on it will start transmitting a WiFi signal. See WiFi Manual for more information

POWER



The T804 has an On-Screen display on all models to show the current Power Cell charge. The display will inform you if charging is required by flashing the 'B' symbol. This symbol will also be shown during recording if charging is required. The T804 can be powered by the optional 12V lead from a vehicle cigar socket. If the '*' symbol appears the voltage is too high and may cause damage, disconnect immediately



When using the optional 12V lead the Power Cell will be charged at the same time as the T804 is operated. The rate of charge is dependant on the vehicle's battery condition, the Power Cell has a charge processor that will not allow the T804 to completely drain the vehicle battery. Full charge of the Power Cell from a 12V supply requires that the engine is running. We recommend the Mains Charger is used over-night for a complete charge.



CONTROL UNIT DISPLAY



The LCD brightness, contrast and colour can be adjusted using the 'Menu' and 'Select' buttons

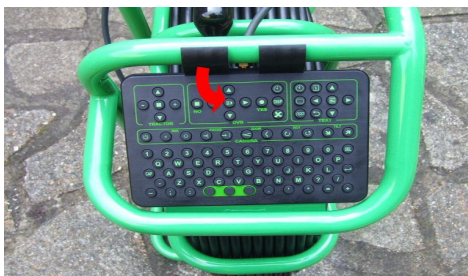


Brightness, Contrast and Colour can be adjusted to suit the conditions.

SIDE OPERATION



1) Disconnect both cables, remove Control Unit from frame



2) Remove Keyboard from frame



3) Lay the T804 on its side, fit Keyboard and then Control unit above the Hub



4) Connect Keyboard lead and Link Cable, use the clips to position Link Cable safely. Ready for operation.



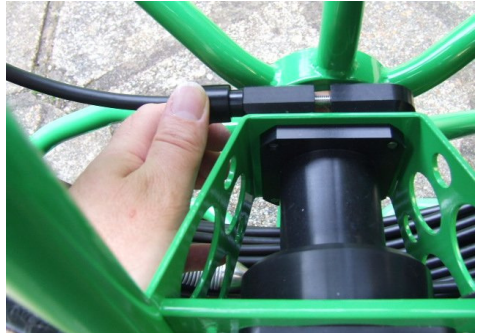
USING THE ROD COUNTER



The Rod Counter can be operated in Imperial (feet and 10ths of feet) or Metric mode (Metres and 10ths of Metres). To switch between the two modes press the 'C' key when the Textwriter is in VIEW mode, the display will change from (') - Imperial to (m) Metric.

If a relative measurement needs to be made between two points during a survey, press the Rod Counter. The Rod Counter will now count up or down from the point where the button was pressed to give a relative measurement.

Version 4 software automatically calibrates the counter and allows the counter to count in reverse if the T804 is switched ON when the rod is already extended - previous versions will not count in reverse in this situation

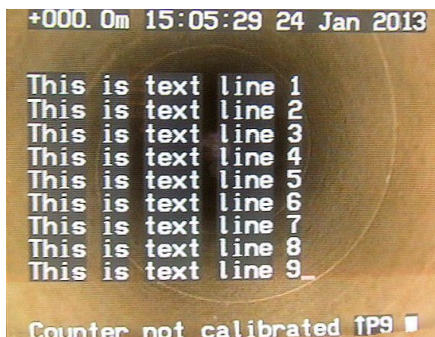


Making accurate measurements. As the Rod Counter relies on the rotation of the coiler it is important that the coiler brake is set correctly. When letting Rod out from the T804, the coiler may not rotate freely if the brake is set too fiercely. Ensure that the brake is set so that the coiler allows rod to be removed smoothly but does not allow the coiler to free wheel. Layering the rod neatly on the coiler increases the accuracy and is always good practice.

Measurements will not be accurate if the calibration routine is performed when the camera termination is not next to the Rod Guide. This does not have to be critically accurate; a leeway of a few inches is acceptable.

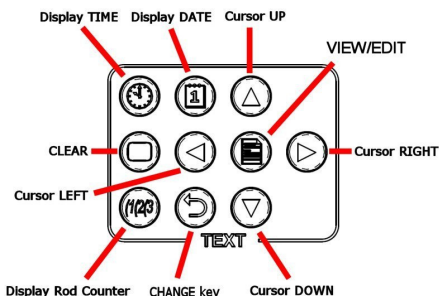


USING THE TEXTWRITER-BASICS

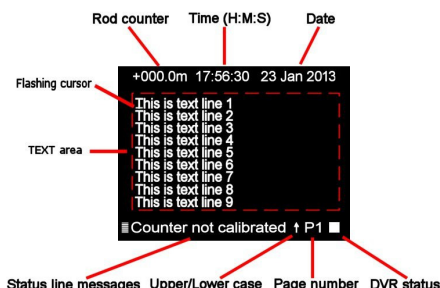


The Textwriter starts with the Rod Counter, Time & Date and the Text from Page 1 displayed




TEXTWRITER CONTROL KEYS





Use the keys shown here to hide or display the Rod Counter, Time & Date and the Text



The '**Status line messages**' area is used for giving the operator information such as 'Calibrate Counter' and 'Counter Calibrated'. This area is also used to send messages to the operator when using the Text Writer.

The 'Rod Counter', 'Time' and 'Date' can be displayed or hidden using the    keys. These toggle the display.

The position of these displays is fixed and cannot be altered, they always appear on the top line in the same order.



The **VIEW/EDIT**  key is used when Text needs to be altered, this button toggles between EDIT and VIEW modes. The Text can be cleared from the screen by using the **CLEAR** button, this toggles between Text and No Text modes. 

When the Text Writer is in **EDIT mode** the 'Upper case/Lower case' symbol appears at the bottom of the screen next to the Page number and the cursor will flash in the TEXT area. When the Text Writer is in the **VIEW mode** the 'Upper case/Lower case' symbol will disappear and the cursor will not be shown in the TEXT area. The picture above shows that the Text Writer is in EDIT mode. If the Text Writer was in VIEW mode the 'Upper/Lower case' arrow would not be shown. **V4 only -The lower status line will show 'Textwriter VIEW mode' and 'Textwriter EDIT mode'**





USING THE TEXTWRITER-EDITING

There are 9 pages that are available to display text. The pages are useful for storing text that is often used such as your Companies Name and Address. To display a certain page of text put the Text Writer in VIEW mode (Upper/Lower case symbol NOT displayed). **Press keys 1 through 9 to display that page**, or:

Pressing the  button will increase the page number and display that page. Pressing the  button will decrease the page number and display that page.


Both buttons loop the page number, from 9 to 1 and from 1 to 9 respectively.



If no text needs to be displayed press the 'CLEAR'  button, this will remove the text from the screen (but will not delete it from memory), it will also remove the 'Upper/Lower case' indicator and the Page Number display.

Pressing the 'CLEAR'  button again will display the text contained on the current page and the Page Number display on the bottom of the screen. The Text Writer will be in VIEW mode.

To edit text first choose a PAGE you want to edit as explained in the previous section. Put the Text Writer in 'EDIT' mode as explained above, the 'Upper/Lower case symbol will be displayed in EDIT mode and the Page number will be displayed to the right of the symbol. You are ready to edit text.

Pressing any of the alphanumeric keys will now write to the screen. Each letter you type is automatically saved so if power is removed you will not lose any work.

If you want to change to lower case press the 'CAP'  button once.

To create spaces press the 'SPACE' button.   

If you want to jump to the next line press the 'ENTER' button. 

Use the    and  cursor buttons to move the cursor around the screen.


The cursor will jump from bottom to top, left to right and visa-versa when the extremes of the TEXT area are reached.



Press the 'EDIT'  key to **remove the cursor from the screen** when you have finished typing to put the Text Writer in VIEW mode.


NOTE SW Version 4 will show messages in the lower status line to indicate Textwriter EDIT and VIEW modes



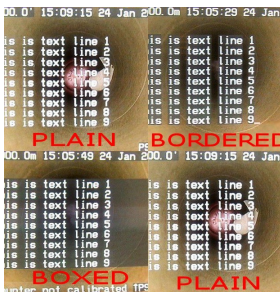
TEXTWRITER-VARIOUS FUNCTIONS

To delete single characters, for instance when a mistake is made while typing, press the 'DELETE'  key while in EDIT mode. The DELETE key will delete the character that is displayed above the flashing cursor. As the cursor moves when a character is typed you will have to press the DELETE key twice, once to move the cursor back to the character and once again to delete that character. Each press of the DELETE key deletes the character above the cursor AND moves the cursor back by one position. Use the cursor buttons to move the cursor around the screen to select any character that needs deleting.






Whole pages of text can be deleted, for instance when a new survey is started and the page contains old information. To **delete a whole page of text** put the Text Writer in VIEW mode (no 'Upper/Lower case' arrow displayed) and use the   buttons or 1-9 keys to display the page of text you want to delete.


Then press the  key once. The lower part of the screen will now display the message 'DELETE PAGE? Y or N'. Pressing the 'Y' key will now delete the current page of text. Pressing any other key will NOT delete the page of text.



Display Modes:




The Text Writer can display the TEXT area in three different modes as shown in the first three pictures.


To switch between the display modes, select **VIEW mode** using the 'EDIT' key and then use the   keys to switch between the three  modes. The display   modes loop between **PLAIN**, **BORDERED**, **BOXED** and then back to **PLAIN** again

To set the Time and Date press the 'CHANGE'  key once.

The Hours display will turn black and the TEXT area will be cleared. The HOURS value can now be changed, use the   buttons to increase or decrease the hours value.

Once the HOURS are correct press the 'CHANGE'  key once, this locks the new value. The MINUTES value can now be changed.

Use the same procedure for MINUTES, DAYS, MONTHS and YEARS.

A final press of the 'CHANGE'  key will display the text again.

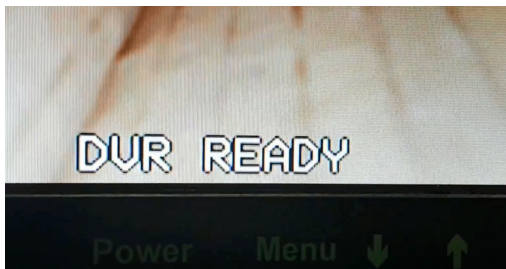
NOTE SW Version 4 will show 'Time and Date Edit' during clock setting



T804 SD-CARD DVR - QUICK START

Switch on and RECORD

Lift the display to the upright position and switch the T804 ON. Wait for the 'DVR READY' message (15 seconds from switch-on).



Press the **RECORD** button on the keyboard (marked 'YES') to RECORD

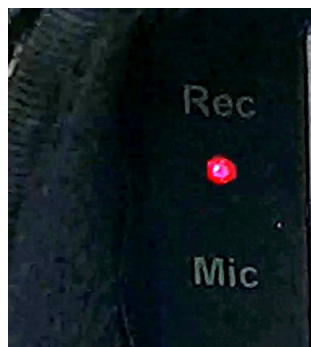
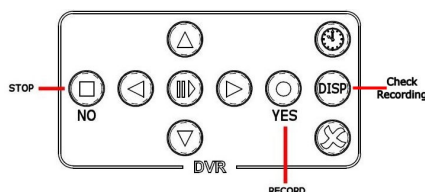
The DVR will start to record immediately, the STATUS LED will flash RED, and after 12 seconds the screen will display the message '**DVR RE-CORDING OK**'.

Press the **STOP** button (marked 'NO') to stop recording

While recording you can press the **DISP** button to show the recording progress. Press **DISP** again to return to the live picture.

The picture to the right shows the STATUS LED - this should rapidly FLASH RED when recording

Only change the SD Card when the T804 is switched **OFF**



Error Messages:

If the SD card is faulty, not fitted correctly or damaged, when a recording is started you will get an error message in the centre of the screen for 8 seconds. After 12 seconds messages at the bottom of the screen will show DVR FLASH CARD ERROR - CARD FULL OR MISSING - PRESS DISP TO CHECK. Pressing the DISP key will show the error as reported by the DVR. **Switch the system OFF, replace the SD card and re-start the system**

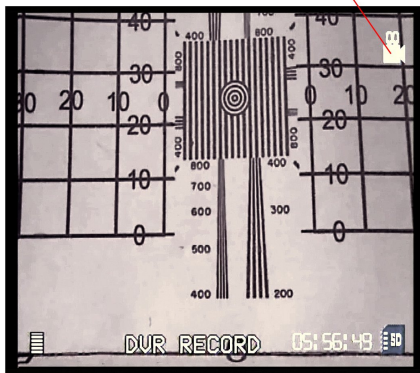
T804 SD-CARD DVR - SNAPSHOTS

Take a SNAPSHOT:

A SNAPSHOT can be taken by pressing the RIGHT ARROW key as shown below.



SNAPSHOT ICON



The screen will momentarily show a 'RECORD' message and the SNAPSHOT ICON will be shown in the top-right of the picture as shown below. After 1 second the screen will return to the live picture and READY will be momentarily displayed.

The snapshot will be saved on the SD card in a JPEG format

T804 SD-CARD DVR - OTHER FUNCTIONS

Take a SNAPSHOT while RECORDING:

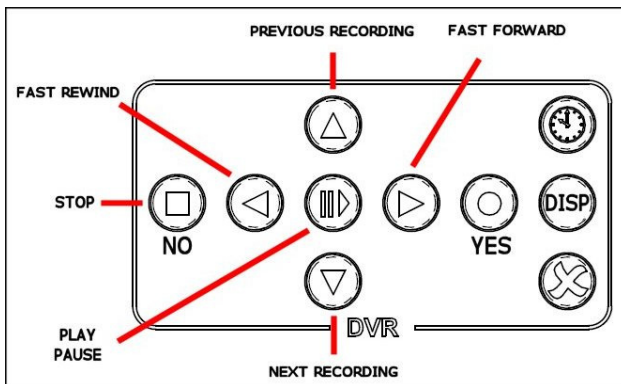
A SNAPSHOT can be taken when making a recording using exactly the same process. Pressing the RIGHT ARROW key as shown above, this will terminate the current recording, take a snapshot and then start a new recording.



T804 SD-CARD DVR - OTHER FUNCTIONS

PLAYING your recordings:

After recording, the video or snapshot can be checked by pressing the PLAY button .



The screen will momentarily show 'DVR PLAY MODE' and the last video or snapshot will be shown. Use the 'Fast Forward' and 'Fast Re-wind' buttons if required (these have no function when a snapshot is shown).

Whilst playing you can use the 'Previous Recording' and 'Next Recording' buttons to play any other recordings and snapshots that are already on the SD card.

The files contained on the card are momentarily displayed as shown on the right - a video will show 'asf' and a snapshot will show 'jpg' on the list.

	File Name	Date	Start Time
MP	00000119	2018/07/05	15:28:50
MP	00000120	2018/07/05	15:28:54
MP	00000121	2018/07/05	15:28:58
MP	00000122	2018/07/05	15:29:04
MP	00000123	2018/07/05	15:29:18
MP	00000124	2018/07/05	15:29:24
MP	00000125	2018/07/05	15:29:28
MP	00000126	2018/07/05	15:29:32
Page 008/008			

Pressing 'PLAY' again will pause the video

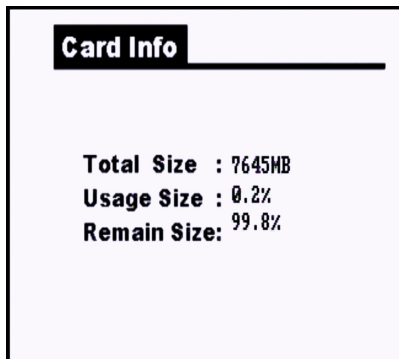
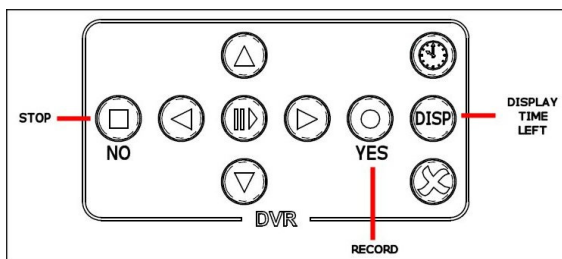
Press 'Stop' to stop playing



T804 SD-CARD DVR - OTHER FUNCTIONS

Check the SPACE left on an SD card:

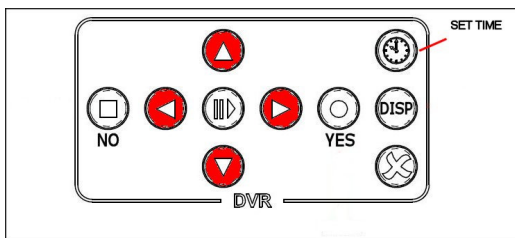
When the DVR is idle the remaining space on the card can be checked by pressing the 'DISP' button. The screen will show a 'DVR EDIT MODE' message while the DVR calculates the remaining space - after a few seconds the screen below will be shown indicating the remaining space on the card



T804 SD-CARD DVR - OTHER FUNCTIONS

Set DVR Time and Date:

When the DVR is idle the time and date can be set by pressing the 'SET TIME' button. The screen will show a 'DVR EDIT MODE' for a few seconds and then will show the time and date as shown below. Use the cursor keys (shown in red) to adjust the time and date and then press the 'EDIT TIME', 'YES' or 'NO' buttons to save the new settings and return to the READY screen.



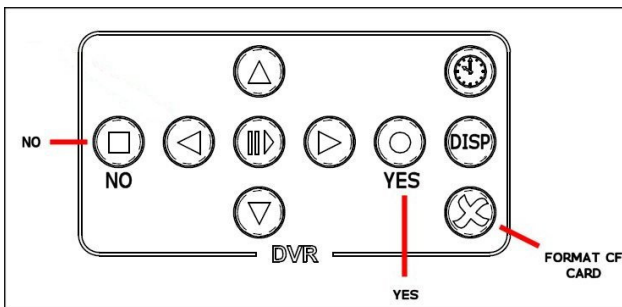
T804 SD-CARD DVR - OTHER FUNCTIONS

FORMAT an SD card:

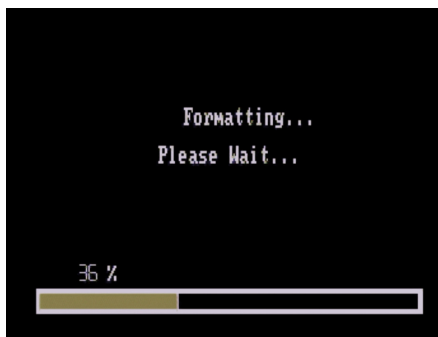
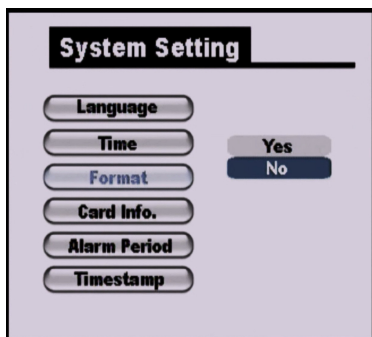
Formatting the SD card will delete all your recordings and snapshots so use this function with caution!

Press the 'FORMAT CARD' button once. The screen will show 'DVR EDIT MODE' at the bottom of the screen.

After a few seconds the screen will change to that shown below:



You now have the option of pressing 'YES' to format the card or 'NO' to return normal operation. If 'YES' is pressed the card will be formatted. This can take up to 2 minutes depending on the card size and speed.



When formatting is complete the screen will momentarily show 'Format OK' and the system will automatically return to normal operation after 2 minutes.

On smaller, faster cards, when 'Format OK' is shown you can press the 'NO' button to return to the normal screen.

FORMATTING ERASES ALL FILES ON THE SD CARD



T804 SD-CARD DVR - VOICE RECORDING

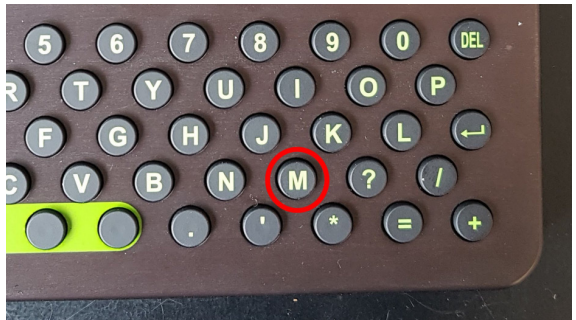
To record audio when making a recording:

You can record voice messages while recording. By default the microphone is switched OFF. To switch the microphone ON press the 'M' button on the Textwriter (in VIEW mode, no cursor on screen). To switch it OFF, press the 'M' button again. When the 'M' button is pressed the

status line will show the **OFF symbol**



Or the **ON symbol**



T804 SD-CARD DVR - SPECIFICATIONS

Recording Resolution
Recording Type
Snapshot
Maximum card size
Card Usage
Bitrate
SD Card Type
Environmental

D1 High Definition
MPEG4 (ASF)
JPEG (VGA)
32GB
1GB - 1.5GB per Hour
Variable
HDSO
Waterproof to IP67



PLAYING VIDEO/SNAPSHOTS ON A COMPUTER

Moving the video files to your computer

Many Laptop computers are supplied with a SD card-slot. In this situation the SD card can be simply copied to a new folder on your machine. The card is usually seen as a removable drive and will contain a number of folders.

The Video Files are contained in the folder: 'Drive:\MP_ROOT\TV' where 'Drive:' is the letter allocated to the CF card by your computer. The Video Files all have the extension '.ASF', the snapshots will have the extension '.JPG'

These files can be found on the SD card in the folder DCIM\100VIDEO

The video and snapshot files that are created by the T804 are compatible with all modern computers (PC and MAC) and don't require any special video players to be downloaded. On very old computers you may need our universal player which can be downloaded from here:

<http://www.troglotech-products.com/software/MP4/MP4.zip>

If your PC or Laptop does not have a SD card slot then the use of a Card Reader is recommended. This will be seen as an additional drive.

Please contact your Distributor for advice in your area



MAINTAINANCE

MAINTAINANCE—T804 SYSTEM

When the Rod is returned to the coiler ensure that most debris is removed, although the T804 is fully sealed to IP 67 the use of Jet Washers is strictly prohibited as the pressure can exceed acceptable limits. Keeping the Rod clean as it is returned to the coiler is the preferable method of keeping the T804 in good condition.

After each week's operation ensure that the Rod Guide is clear of debris, clean if necessary using warm water and a paintbrush to get into the inaccessible parts. Wipe down the enclosures with warm water and a mild detergent using a cloth. Perform cleaning operations with camera and accessories connected.

MAINTAINANCE—T800 CAMERA

It is best practice to leave the camera and skids fitted to the T804 system. If you need to remove the camera ensure that the Termination is clean before removal. When replacing the camera ensure that the threads are clean and that the 'O' rings are well lubricated with Silicone Grease. Never use solvents (such as Ambersil) to clean the termination as this will damage the o-rings. Keep the windows clean with a damp cloth and a small brush to remove debris from the front guard.

The Lens Window is the only user-replaceable part on the T800 camera, although the surface is extremely hard it may become scratched over a period of time and this will affect the picture quality. The replacement requires the purchase of a Lens Window Kit which includes the Quartz window and the sealing 'O' ring. Before attempting the replacement ensure that the camera is perfectly clean and there is no debris in the window aperture. Please see the T800 User Manual for lens window replacement.

MAINTAINANCE—T812 CAMERA

It is best practice to leave the camera and skids fitted to the T804 system. If you need to remove the camera ensure that the Termination is clean before removal. When replacing the camera ensure that the threads are clean and that the 'O' rings are well lubricated with Silicone Grease. Never use solvents (such as Ambersil) to clean the termination as this will damage the o-rings. Keep the windows clean with a damp cloth (microfiber cloths are best for this practice).

REPAIRS/SERVICING

The T804 has no user serviceable parts. Please refer to your Distributor for repairs and service.



ACCESSORIES

WiFi - Direct-To-Customer Reporting

The WiFi Accessory clips to the frame of the T804 System and transmits the live picture directly to any smart device.

This allows immediate sharing of pictures and video to the end customer. It also allows storage of the survey on the smart device.

The pictures and video are automatically uploaded to the any cloud such as Google Photo to be shared from any PC



T710 1" CAMERA AND 20M ROD

Extend the capabilities of your T804 system with the addition of the T710 1" camera and 20M (66 feet) of highly-flexible rod. This upgrade includes a smaller coiler cage that fits within the T804 coiler cage.

When a survey is required of small pipework, the T800 camera can be detached, and the free-end of the 20M rod can be connected to the termination. The 1" camera can now be passed through the rod-guide and the survey can begin. In some situations, the full 80M (262 feet) of rod can be utilised.



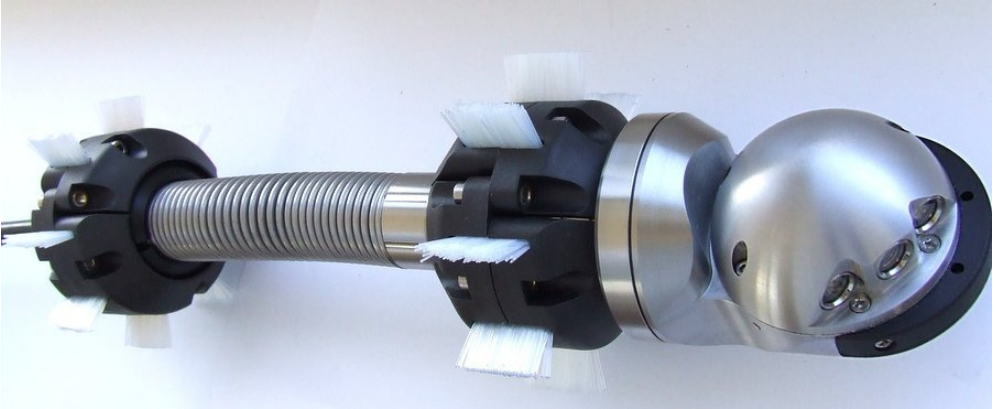
The T710 is the worlds most advanced 1" camera. We have utilised the very latest in CMOS sensor and LED technology to provide a camera that out-performs all 1" cameras and most larger cameras.

The rod is a new Troglotech design. It has a high resin-content fibreglass core that provides both flexibility and strength, the outer is highly wear-resistant and low-friction.



ACCESSORIES

T812 PAN AND TILT CAMERA



Our T812 Pan & Tilt camera is tough, machined from solid stainless steel, waterproof to IP68, 7 Bar, 100 psi and designed to operate on the T804 pushrod system.

The camera does not need to be pressurised to attain its waterproof status, no need for pumps or Nitrogen purging, the camera is sealed at the factory and will retain sealing integrity through its life.

The camera head includes an auto-uprighting system that gives the operator a view that is akin to actually being inside the pipe being surveyed. A single button-push on the T804 sets the focus and points the camera directly forward making orientation during a survey immediate. The camera head can rotate and tilt through 360 degrees.

The camera also has the capability of measuring defects in pipework without the need for grids or lasers, the measurement can be made and saved during the live survey taking just a few seconds. This capability can be added at any time to the system when required.

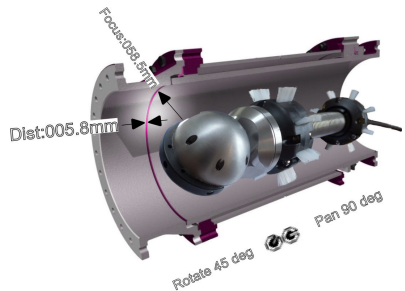


ACCESSORIES

Digital Lens Measurements

When the T804 system is fitted with Troglotech's T812 Pan & Tilt camera measurements of any artefact such as a cracked pipe or debris can be accurately measured and the information stored on the flash card along with the video survey.

The measurement method is extremely easy and takes just a few seconds to provide accurate results.



- Accurate measurements
- No lasers
- Quick and simple method
- Results saved with video file on flash card
- No post-survey processing
- Available on all T804 with T812 Pan & Tilt

Sondes

Troglotech produce in-line sondes for the T800, T812 and T710 cameras which can be utilised when operating with the Troglotech T804 digital pushrod system.

We produce sondes in all the standard frequencies:

512Hz

640Hz

8.192KHz

32.768KHz (High Power version now available)



Our powerful sondes allow you to accurately and reliably locate your T800 camera at depth. They are crystal-controlled and always give a powerful and precise signal to your requirements. They are compatible with most Locators.



ACCESSORIES

DC Lead:

To extend the operation time of the T804 system, the DC Lead can be used to both charge the power cell and operate the Troglprobe system at the same time. The DC Lead is 3 metres in length and has a cigar-lighter plug to connect to a vehicle with a 12V battery system.

The DC lead is especially useful for recharging the Power Cell while travelling between inspections. Each hours charge while travelling can provide up to three hours operation time without the need for any generator or external power supply.

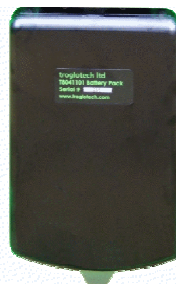


Extra Power Cell:

If up to eight-hours operation duration is insufficient and a 12V supply is not available, an additional power cell can be supplied. The Troglprobe power cell uses advanced lithium ion cells to provide dependable energy and the machined-from-solid enclosure provides IP67 full waterproofing.

The T804 power cell is clipped to the system frame and can be released and replaced in seconds. There are no leads to connect, the power cell has a captive waterproof connector that automatically mates with the hub.

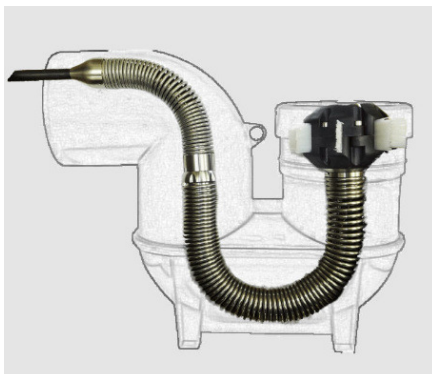
The power cell also contains battery-manager electronics to enable charging from a 12V DC source via the DC lead if mains electricity is not available. The Power Cell is exceptionally robust with an anodised finish.



Flexitail for awkward traps

Having problems getting through some of the new traps? We offer the Flexitail - which allows the camera to negotiate multiple tight bends with ease. The Flexitail can be used with the T800 Forward-View camera or the T812 Pan & Tilt camera.

The Flexitail is simply fitted to the T804 Troglprobe termination and the camera fitted to the other end..



SPECIFICATION AND REQUIREMENTS

SYSTEM INPUT VOLTAGE	10.8V – 14.6V
FRAME CONSTRUCTION	Powder coated Steel
ENCLOSURE CONSTRUCTION	Machined-from-solid Aluminium, Hard Anodised
DIMENSIONS	540mm x 643mm x 302mm
PUSHROD	5-Conductor Epoxy Glass core
TEMPERATURE	-20°C to +85°C (storage) 0°C to 50°C (operating)
SYSTEM WEIGHT	17KG
STANDARD ROD LENGTH	61M (200 feet)
BASE UNIT ENVIRONMENTAL	IP 67
LCD	5.6" High resolution, High brightness
POWER CELL CAPACITY	9600mAH
POWER CONSUMPTION	1.3A @ 12V (15.6W)
MISSION TIME	6 – 8 Hours from a single charge of the Power Cell
VIDEO OUTPUT / INPUT	Auto – Switching, Buffered, 1V p-p into 75 Ohms

ACCESSORIES

WARNING

The T804 is a battery-operated system, never operate the T804 when connected to a mains supply. The mains charger must never be operated on-site and is for indoor use only. Failure to comply to this warning may endanger lives

DEALER INFORMATION

