

PROTEUS

Original Instruction Manual

Version L



This instruction manual is applicable to the PROTEUS™ inspection system.

A standard system and available options are covered by this document. Depending on your system configuration you may lack some of the features mentioned in this document.

Disclaimer

Hardware and software mentioned in this document are subject to continuous development and improvement. Consequently, there may be minor difference between the information in the document and the performance or design of the product. Specifications, dimensions and other statements in this document are subject to change without prior notice.

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Warranty

Limited Warranty

Congratulations on the purchase of your new Proteus™ Inspection System. Our products are the result of many years experience and continuous developments. Conscientious manufacturing and checking are essential objectives in our company. Nevertheless failures cannot be excluded totally. If this occurs, you are covered by our generous warranty. Please consider that even the best products can only be durable and work properly with the correct handling and maintenance.

Extent of the Limited Warranty

Minicam warrants that your equipment will be in good working condition and free of defects in material and/or workmanship for a period of one year. If failure occurs, which is provable due to a defect in material and/or workmanship, we will remedy it free of charge during the warranty period. We reserve the right, at our option, to repair the equipment or to replace the whole unit or the faulty parts, or to refund the then current value of the equipment, if we are unable to repair or replace the unit. The warranty is a return to base warranty and we are not liable for any shipping costs.

Conditions of the Limited Warranty

Disassembling the camera, coiler, control unit or any part of the system, without approval of the manufacturer, is forbidden! Non-compliance of this direction will result in the loss of the warranty. The beginning of the warranty period is the date of delivery. This limited warranty does not cover damage due to improper treatment of the system, inadequate maintenance, alteration, repair, normal wear and tear or external causes like lightning, fire or frost. The warranty does not cover wear and tear parts like front camera lenses, O-rings, cable, push rod, rod rollers etc. If you require warranty service please return the system with the original invoice to your dealer or the nearest Minicam Service Centre. Equipment returned **must** be consigned carriage paid. We will **not** be liable for carriage costs.

Warranty Limitations

Our responsibility under this warranty is limited to repair, replacement or refund, as set forth above. Minicam is not responsible for direct, special, incidental or consequential damages resulting from any breach of warranty including lost profits, downtime, goodwill, damage to or replacement of equipment and/or property.

Text Conventions

Danger, Caution and Note

In this user manual the following symbols are used:



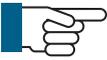
DANGER!

Danger means a potentially dangerous situation that can cause death or severe bodily injury. The icon identifies the type of risk.



CAUTION!

Caution means that the system or equipment can be damaged or data lost. The icon identifies the type of risk.



NOTE!

Notes are used to convey throughout this manual important information or guidance for system use.

Bold Font

Bold font is used for important words (For example: This **must not** be done in reverse order).

Lists

Lists are marked as follows:

- Item 1
- Item 2

Procedures that must be performed in a specific order appear in numbered lists like this:

- 1 Perform this step first.
- 2 Perform this step second.

Menu Selections

When describing control unit operation, sequential menu selections are described in the following format:

Setup > Camera > Enable Backeye Camera > OK

This example describes pressing the Setup  key and selecting the Camera and Backeye options, and finally pressing the OK key.

Product Description

The inspection system PROTEUS™ is a modular system designed for, but not limited to, inspecting pipeline systems. Using a variety of colour cameras, optional modules and accessories, the PROTEUS™ platform offers everything needed for professional pipeline inspection.

The comprehensive list of modules and accessories allow inspection of pipes equal to and greater than 150mm diameter. Different wheel sets allow the crawlers to be centred in pipe sizes from 150mm to 1000mm. The Auxiliary Light with Backeye Camera provides additional forward illumination and a colour rear view camera with illumination to aid manoeuvring the crawler in reverse. The system uses a control unit with twin joysticks, keyboard, and reporting software developed in-house by Minicam.

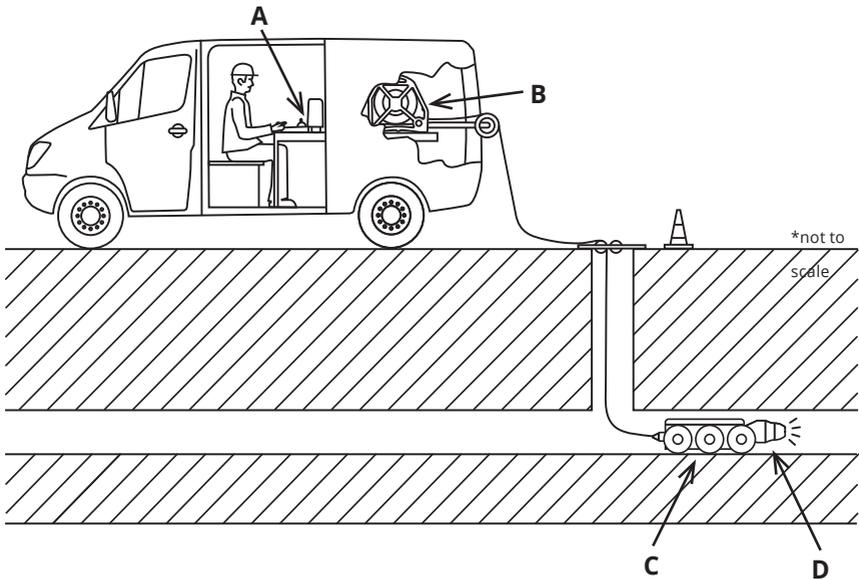
Built using high quality materials and state of the art technology the PROTEUS™ inspection system is a robust and powerful tool for use in harsh environments.

System Overview

The PROTEUS™ inspection system consists of the following main components:

- Control Unit (A)
- Cable Reel (B)
- Crawler (C)
- Camera (D)

A typical configuration is shown in this illustration:



Warnings, Safety Measures and Care

Please read the safety measures closely and observe them. They preserve your own safety, the safety of co-workers as well as the prevention of damage to the PROTEUS™ inspection system and its components.



CAUTION!

The operator of the PROTEUS™ inspection system **must** be trained by either Minicam or one of its authorised representatives before using the system.



CAUTION!

Despite all of the safety functions built into the system, the operator is not exonerated in any way from his/her duty of care. Thus the user alone is responsible for any damage caused as a result of misuse.



CAUTION!

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



DANGER!

Risk of deadly injuries from electrical current!

The mains plug and or IEC connector of the PSU is the supply isolation device and must be easily accessible.



DANGER!

Risk of deadly injuries from electrical current!

- The power supply for the crawler can generate a high voltage which can be considered hazardous, however this supply cannot be switched on unless all parts of the system are connected. Consequently this supply is not accessible, and as soon as any connection is exposed or disconnected the power supply will automatically shut off.
- This hazardous voltage may be exposed if the control unit, cable reel or crawler is opened while the system is operational. Therefore the modules of the system should only be opened by a Minicam Service Centre.

- There are no user serviceable components within any module in the system.



DANGER!

Risk of deadly injuries from electrical current!

Only use an appropriately rated and approved cord set in accordance with the regulation of the country in which this system is used.



DANGER!

Risk of deadly injuries from electrical current!

Although the cable reel and crawler could be used in wet environments the **external PSU is for indoor use only** (as marked on its label) and must not be used in wet areas.



DANGER!

Risk of deadly injuries from electrical current!

Only the power supply supplied as part of the PROTEUS™ inspection system can be used and should **NOT** be replaced by any other.

Before first use

Please notice the following sources of risk for serious or deadly injuries:



CAUTION!

Risk of deadly injuries from electrical current!

- Ensure that no fluids can enter the control panel or penetrate the housing of the cable reel. In case this happens, immediately disconnect the power supply and inform the appropriately trained staff or Minicam Service Centre.
- Ensure that the electrical connection cables are intact and that they cannot be bent or crushed. If you find cable damage, immediately disconnect the power supply and inform the appropriately trained staff or Minicam Service Centre.
- Work on the electronics, which are not covered in this document, **shall only** be carried out by trained specialist staff or a Minicam Service Centre.
- Maintenance and repair work, which is not covered in this document, shall only be carried out by trained specialist staff at a Minicam Service Centre.



CAUTION!

Risk of serious injuries by falling crawler!

When preparing the system for operation pay attention to the crawler position, that it is not too close to the manhole. When testing the driving function, the crawler might fall into the manhole. Any person in the manhole may suffer serious injuries.

CAUTION!

Hazard of infection and contamination of fresh water!

Never alternate the use of the inspection system for inspections in wastewater and freshwater! Even a thorough cleaning of the system will not ensure sufficient protection against contamination. For inspections in wastewater and freshwater use a separate inspection system for each.

Bacteria can lead to an infection. All individuals employed for the work must be advised of the hazards and must be instructed in the required safety measures.



CAUTION!

Explosion hazard!

Do not use the inspection system in pipelines which might have contained explosive substances, such as gas or solvents. If this kind of application should be required, contact Minicam to obtain information on system components destined for this purpose.



CAUTION!

Suffocation hazard!

Before and while lowering the crawler into the pipe system it is necessary to perform a safety test with a certified gas detector.

Safety Measures

The staff assigned to tasks involving the PROTEUS™ inspection system must have read and understood this user manual completely before the start of the work. This applies equally to the staff who only work on the inspection system infrequently, e.g. for maintenance, repair or retrofitting work.



NOTE!

The operator of this inspection system is obliged to ensure a safe and hazard-free operation. This may be achieved by the following measures:

- Making the user manual available on the site of the use of the inspection system at all times.
- Check lists for maintenance and care.
- Regular reviews of the safety and hazard conditions



NOTE!

Safety of persons!

The staff for operation, maintenance and upgrading must have specialist expertise or be instructed by competent individuals. Competent individuals must have adequate knowledge of the PROTEUS™ inspection system based on technical training and experience. They must be familiar with the relevant work safety regulations and accident prevention rules to an extent that they are capable of judging the inspection system operational safety.

They **must**:

- Observe the operating manual for the workplace.
- Observe the relevant work safety regulations and accident prevention rules.
- Seek instruction for the handling of hazardous substances.
- Adhere to the safety information described in this user manual.

- The operator **must** wear safety equipment that is appropriate to the survey being performed (such as goggles, gloves, safety shoes, etc).



NOTE!

Avoid physical damage!

The operator of the PROTEUS™ inspection system is responsible for the following aspects:

- Only use the inspection system for work that is appropriate to the specifications
- Observe the operational requirements for this inspection as described in this user manual.
- Keep the system clean. Observe the individual cleaning instructions for this purpose.

Maintenance

To ensure the maximum service life of the PROTEUS™ inspection system the individual modules and accessories belonging to the system have to be independently maintained and kept clean. Moving parts, in particular, can have improved operational life by frequent professional cleaning after inspections. Also, the risk to the operator of infection can be significantly reduced by using a cleaned system.

Take notice of the following comments on general maintenance:

- Keep the entire system clean and clean the system directly after each inspection.
- Thoroughly wash down the parts of the system that have come into contact with moisture and then dry them with a clean and dry cloth.
- Keep all electrical connections and contacts free of dirt, grease and moisture at all times.
- Never bend the cable of the system and avoid knots.
- Clean the cable with a rag when retracting.
- Regularly grease all exposed O-rings using O-ring lubricant as required in the maintenance instruction.
- Use only suitable display cleaners for cleaning the display as required in the maintenance instruction.
- Use only clean and dust free cloths for cleaning the display.
- Use water for cleaning without the addition of cleaning agents or solvents.

For detailed maintenance instructions for individual modules and accessories please read the comments in the description for each module. The specific maintenance work steps will also be explained.



NOTE!

The operator of the system is responsible for the proper disposal! See information on page 192 on the return of equipment at the end of the useful life.

Cleaning

To minimise down time and subsequent repairs it is necessary to keep your PROTEUS™ inspection system clean. Please follow the instructions below to help avoid disruption.



CAUTION!

Risk of fatal injuries caused by electrical current!

Ensure that no fluids can enter the control panel or penetrate the housing of the cable reel. If this happens, immediately disconnect the power supply and inform the Minicam Service Centre.



CAUTION!

Risk of fatal injuries caused by electrical current!

For all cleaning and maintenance work disconnect the system from the power supply.

General cleaning work



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.

- Clean the crawler and camera with water after the first inspection. Only after this should you loosen electrical connections.
- Immediately fit the protective caps after removing electrical connections.
- Check O-rings for damage and replace if necessary and grease regularly with O-ring lubricant.



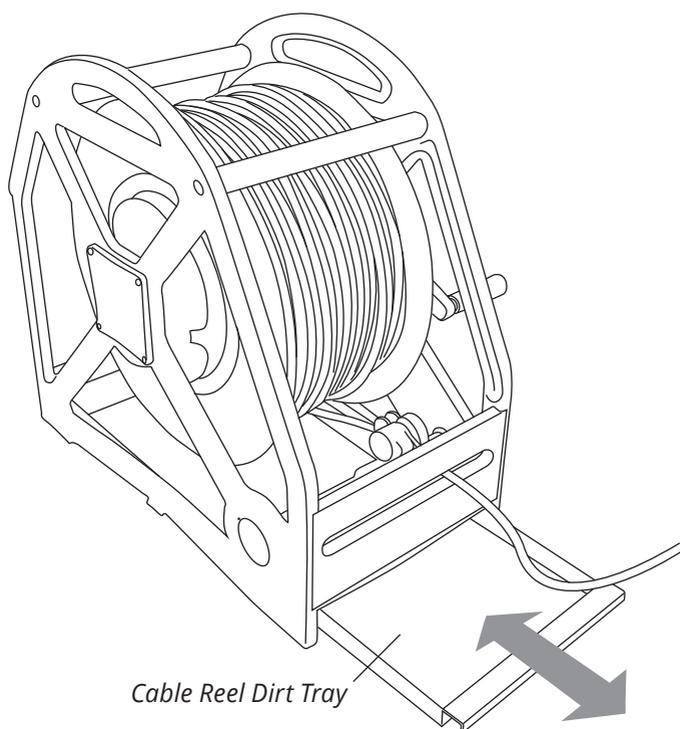
IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

- Clean the cable reel and control unit with a damp cloth.
- Only clean the camera and light lenses with a specific lens cleaning cloth to prevent scratches.

Removal and Fitting of the Cable Reel Dirt Tray

After use, dirt and water will have collected in the cable reel. A tray is built into the bottom of the cable reel to collect this, which can be removed for cleaning.



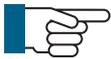
- 1 Pull out the tray.
- 2 Remove dirt, water and debris.
- 3 Push the tray back into position.

Checking Plug and Socket Connections

To ensure reliable operation it is important that the electrical connections are not damaged and are kept clean and dry. It is important to check before and after each use of the inspection system.

- Check the contacts on the camera back plate.
- Check the contacts on the crawler camera connector (with care).
- Check the contacts on the crawler cable connector.
- Check the contacts on the cable reel connector.
- Check the contacts on the control unit.
- Check the contacts on the auxiliary module.

Clean dirt and moisture from the pins and connectors using an electronic contact cleaner aerosol.



NOTE!

- Disconnect the power supply from the system.
- Check the O-rings for damage and replace if necessary.
- Grease the O-rings if necessary using O-ring lubricant.



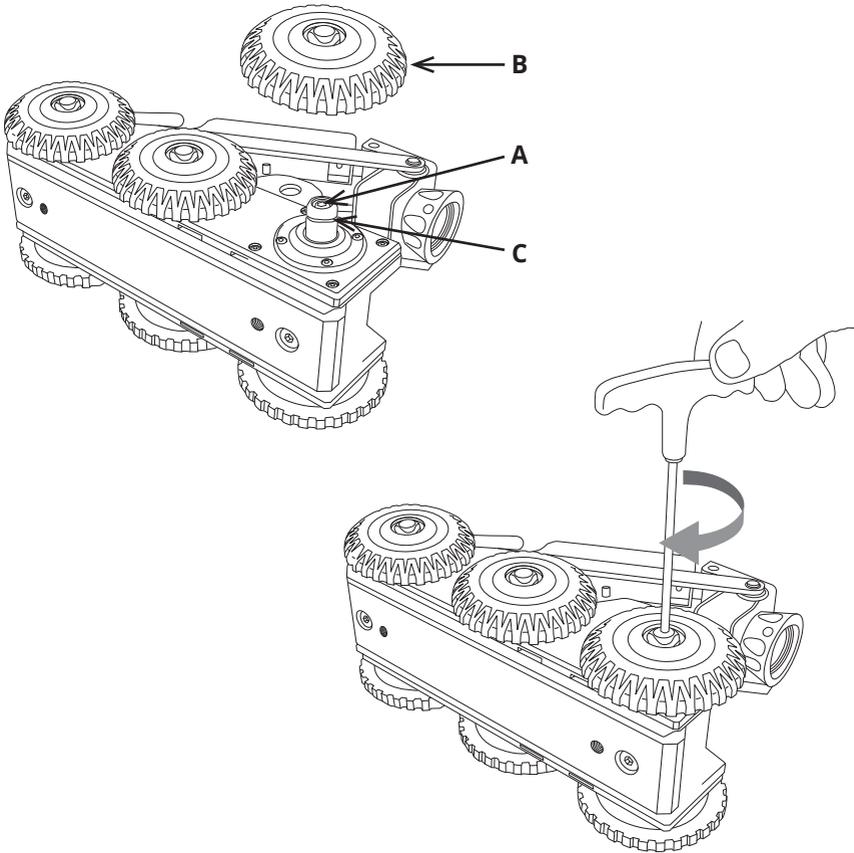
IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

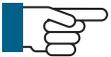
Connecting the PROTEUS™ Inspection System

Fitting and removal of crawler wheels

- 1 Ensure the quick release wheel retainer (A) is aligned with the axle (C).
- 2 Slide wheel (B) on to the crawler axle (C).



- 3 Turn the wheel retainer bolt clockwise to lock the wheel onto the axle.

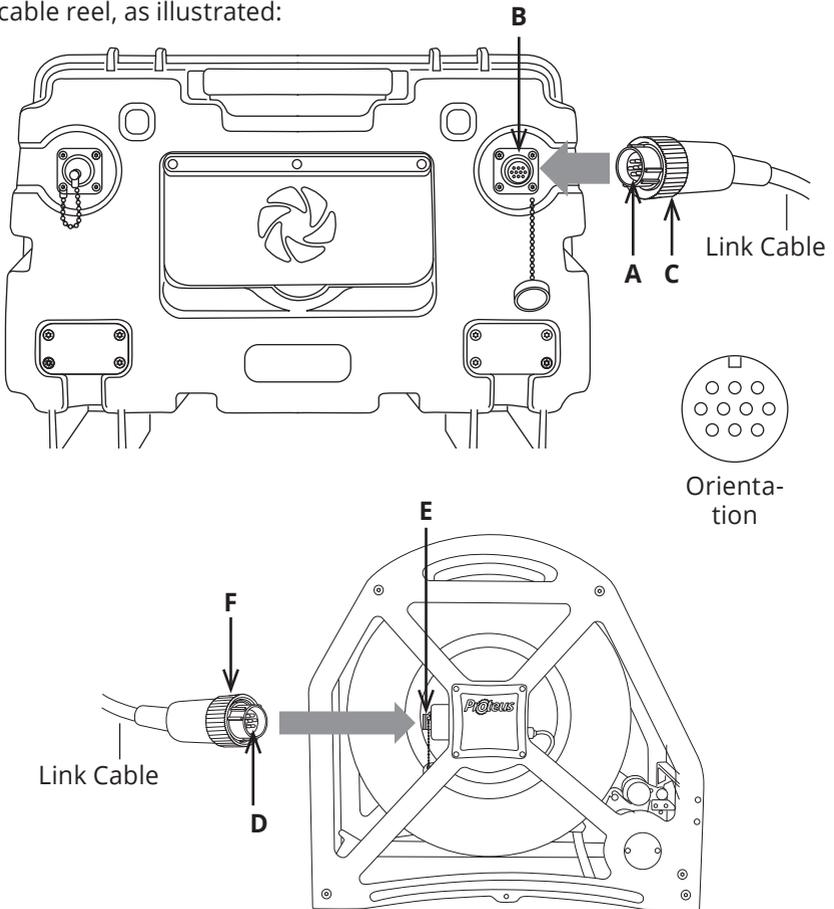


NOTE!

To remove the wheel turn the retainers bolt anti-clockwise, ensure that the retainer is aligned with the wheel axle, and slide the wheel off the crawler axle.

Connection of Cabling between Control Unit and Cable Reel

Connect the link cable to the back of the control unit and to the side of the cable reel, as illustrated:



- 1 Plug the male plug (A) of the link cable into the back of the control unit (B). Notice the orientation of the plugs. Secure in place with locking ring (C).
- 2 Plug the female plug (D) of the link cable into the side of the cable reel (E). Notice the orientation of the plugs. Secure in place with locking ring (F).

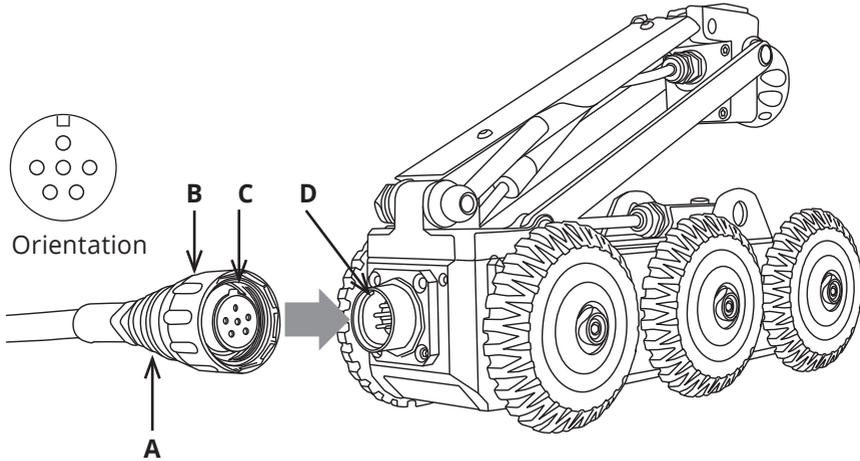


NOTE!

To remove the connectors turn the retaining ring anti-clockwise.

Connection of Cabling between Cable Reel and Crawler

Connect the cable reel cable to the back of the crawler as illustrated:



- 1 Plug the cable end connector (**A**) into the crawler connector (**D**). Notice the orientation of the socket (**C**).
- 2 Turn the retaining ring (**B**) clockwise, as viewed from the cable, to lock the cable end connector into the socket (**D**). The retaining ring is not able to unscrew itself during use if cleaned and maintained correctly.



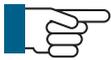
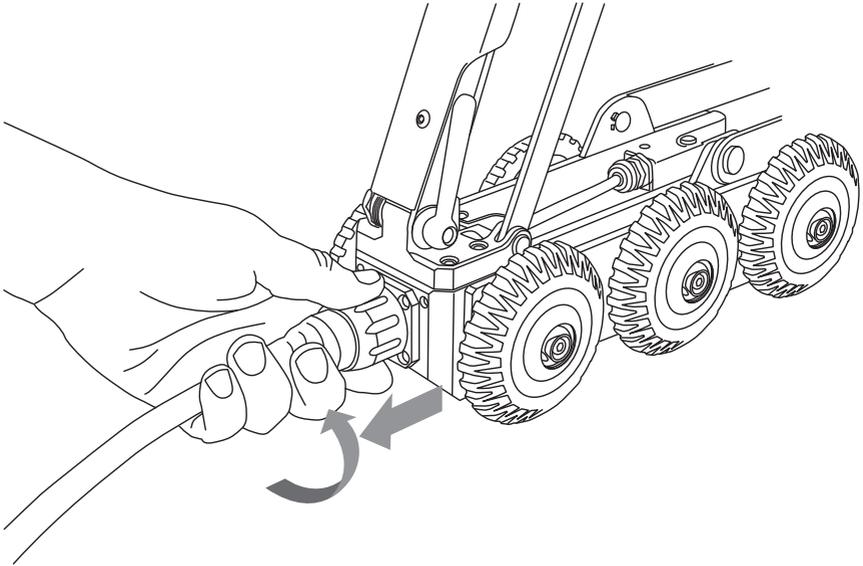
IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Disconnecting Cabling between Cable Reel and Crawler

Disconnect the cable reel cable from the back of the crawler as illustrated:

- 1 To unscrew the retaining ring you must pull the ring away from the crawler body before rotating anti-clockwise.



NOTE!

Always fit the protective caps when the crawler, camera or auxiliary module are not in use to protect from damage, ingress of dirt and moisture.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

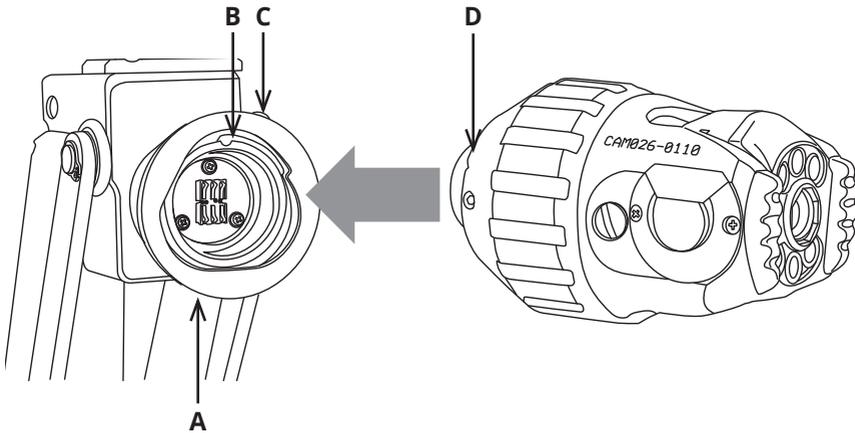
Connection of Camera to Crawler



NOTE!

Ensure that power to the crawler is switched **OFF** before connecting or disconnecting the camera by using the **ALL-STOP** button on the CCU. A red light will illuminate next to this button when power to the crawler is OFF.

Connect the camera to the crawler as illustrated:



- 1 Ensure the connections are free of debris, dirt and moisture.
- 2 Ensure the locking ring (A) is rotated fully clockwise, as viewed in the diagram.
- 3 Notice the orientation of the camera (D). Orientation pin on camera locates here (B). Fit the camera.
- 4 Turn the retaining ring (A) anti-clockwise, as viewed in the diagram, to lock the camera onto the crawler.
- 5 Turn the grub screw (C) to lock the retaining ring in position using 3mm Allen Key.
- 6 Removal is the opposite of fitting.



NOTE!

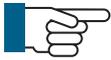
Grub screw has a mushroom head and cannot be fully removed. **DO NOT OVERTIGHTEN!**



NOTE!

Always fit the protective caps when the crawler, camera or auxiliary module are not in use to protect from damage, ingress of dirt and moisture.

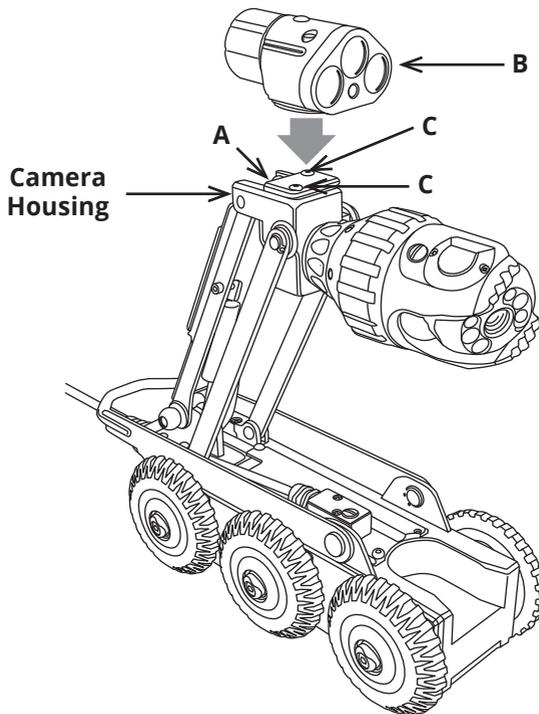
Connection of Auxiliary Module to Crawler



NOTE!

Ensure that power to the crawler is switched OFF before connecting or disconnecting the auxiliary module by using the ALL-STOP button on the CCU. A red light will illuminate next to this button when power to the crawler is OFF.

Connect the auxiliary module, ALB300, to the crawler as illustrated:



- 1 Remove the protective cap screws (C)
- 2 Remove protective cap (A)
- 3 Fit auxiliary module to crawler. Notice the orientation as shown in the diagram
- 4 Fasten 2 x M4 x 45mm screws with 2 x M4 anti-vibration washers to fix the auxiliary module (B) onto the camera housing.



NOTE!

Always fit the protective caps when the crawler, camera or auxiliary module are not in use to protect from ingress of dirt and moisture.

Pressurising the PROTEUS™ inspection system

Before use it may be necessary to pressurise the crawler, camera and auxiliary module. The pressure within each of the modules must be checked before the inspection begins.



NOTE!

The internal pressure of each pressurised module may vary. Refer to the specific module technical specification for correct pressure information. The control unit displays the internal pressure reading for each of the pressurised modules when the system power is ON.



CAUTION!

Use a pressure reducing valve when pressuring a module. **Never** attempt to connect the gas bottle directly to a system module.

Check list for adjusting internal pressure of modules

- 1 Connect the crawler to the control unit and apply power.
- 2 Unscrew the pressure valve protective cap.
- 3 Screw on the valve connection adaptor.
- 4 Fill the module with CO₂ or Nitrogen while monitoring the pressure on the control unit.
- 5 When the pressure reading indicates that internal pressure is correct, stop filling the module.
- 6 Remove the valve connection adaptor.
- 7 Refit the protection cap.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Instructions for Pressurising the CRP300 Crawler

- 1 Connect the PROTEUS™ inspection system and apply power.
- 2 Unscrew the pressure valve protection cap (B) and screw on the pressure valve connection adaptor (A).
- 3 Set the pressure regulator for the CO₂ or Nitrogen to 10 PSI.
- 4 Ensure the crawler pressure is within the acceptable range by checking the pressure gauge on the control unit. An example is shown below. Refer to the CCU section of this manual on specific instructions on how to access the pressure gauges.
- 5 Remove the pressure valve connection adaptor (A).
- 6 Refit the pressure valve protection cap (B).

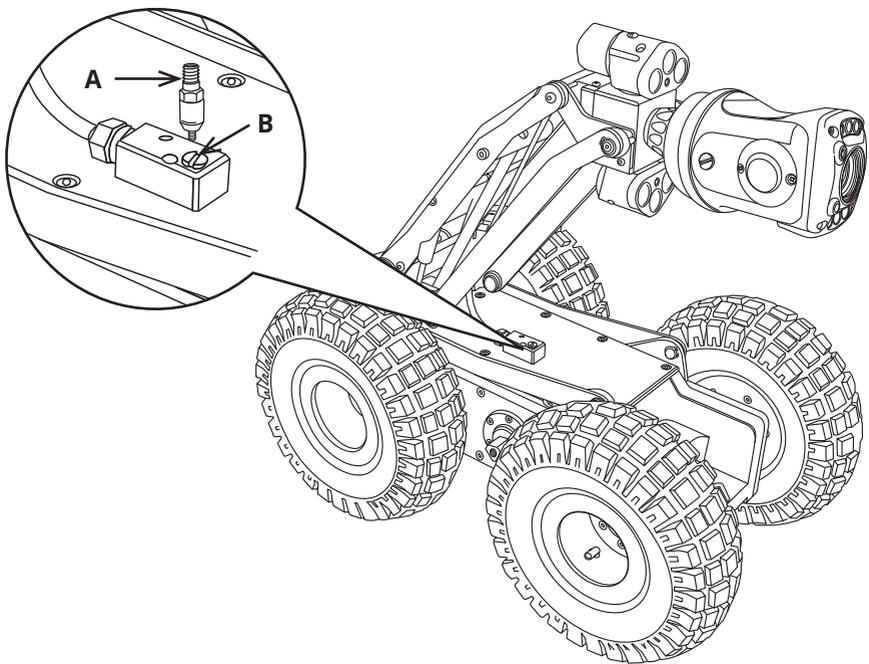


Image shows an example of the control unit crawler pressure gauge:

Instructions for Pressurising the CPL150S Crawler

- 1 Connect the Proteus™ Lite inspection system and apply power.
- 2 Unscrew the pressure valve protection cap (A) and screw on the pressure valve connection adaptor (B).
- 3 Set the pressure regulator for the CO₂ or Nitrogen to 10 PSI.
- 4 Ensure the crawler pressure is within the acceptable range by checking the pressure gauge on the control unit. An example is shown below. Refer to the CCU section of this manual on specific instructions on how to access the pressure gauges.
- 5 Remove the pressure valve connection adaptor (B).
- 6 Refit the pressure valve protection cap (A).

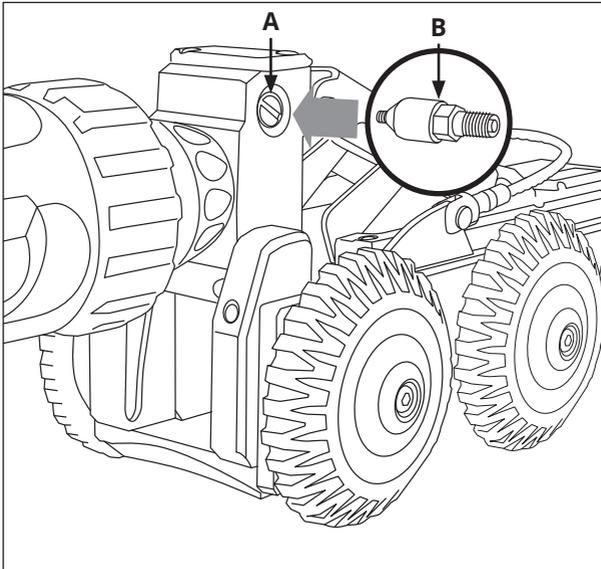


Image shows an example of the control unit crawler pressure gauge:

Instructions for Pressurising the CRP140 Crawler

- 1 Connect the PROTEUS™ inspection system and apply power.
- 2 Unscrew the pressure valve protection cap (B) and screw on the pressure valve connection adaptor (A).
- 3 Set the pressure regulator for the CO₂ or Nitrogen to 10 PSI.
- 4 Ensure the crawler pressure is within the acceptable range by checking the pressure gauge on the control unit. An example is shown below. Refer to the CCU section of this manual on specific instructions on how to access the pressure gauges.
- 5 Remove the pressure valve connection adaptor (A).
- 6 Refit the pressure valve protection cap (B).

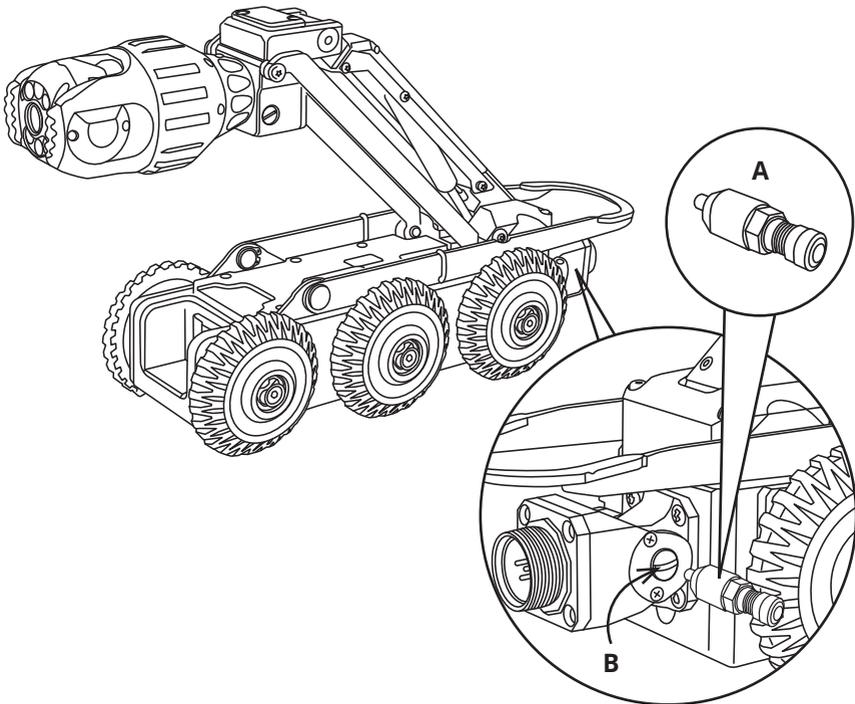


Image shows an example of the control unit crawler pressure gauge:

Instructions for Pressurising the CRP90 Crawler

- 1 Connect the PROTEUS™ inspection system and apply power.
- 2 Unscrew the pressure valve protection cap (B) and screw on the pressure valve connection adaptor (A).
- 3 Set the pressure regulator for the CO₂ or Nitrogen to 10 PSI.
- 4 Ensure the crawler pressure is within the acceptable range by checking the pressure gauge on the control unit. An example is shown below. Refer to the CCU section of this manual on specific instructions on how to access the pressure gauges.
- 5 Remove the pressure valve connection adaptor (A).
- 6 Refit the pressure valve protection cap (B).

Pressure valve located at the rear of the crawler

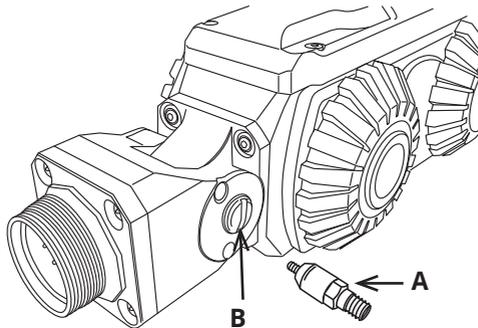
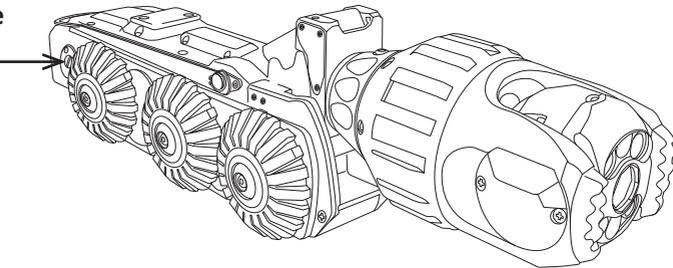


Image shows an example of the control unit crawler pressure gauge:

Instructions for Pressurising the CAM026/26L

- 1 Connect the PROTEUS™ inspection system and apply power.
- 2 Unscrew the pressure valve protection cap (B) and screw on the pressure valve connection adaptor (A).
- 3 Set the pressure regulator for the CO₂ or Nitrogen to 5 PSI.
- 4 Ensure the crawler pressure is within the acceptable range by checking the pressure gauge on the control unit. An example is shown below. Refer to the CCU section of this manual on specific instructions on how to access the pressure gauges.
- 5 Remove the pressure valve connection adaptor (A).
- 6 Refit the pressure valve protection cap (B).

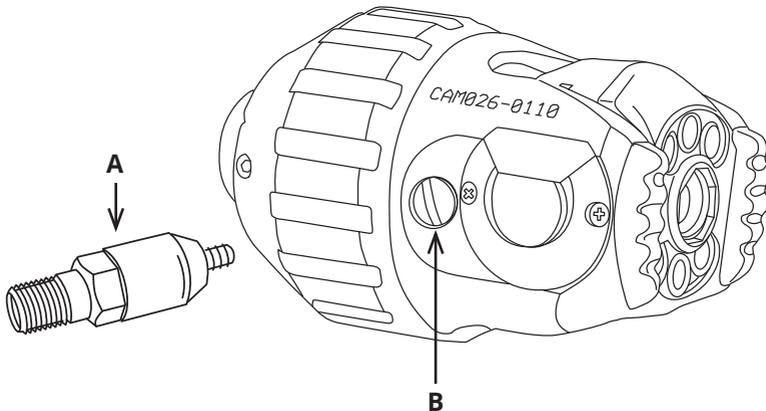


Image shows an example of the control unit camera pressure gauge:

Testing the system

Test the system before use to make sure the system performs correctly.

CAUTION!

Risk of serious injuries by falling crawler!



During the testing of the system make sure that the crawler is not positioned too close to the open manhole! When testing the driving functions the crawler may fall into the manhole. Any person in the manhole may suffer serious injuries.

CAUTION!

Risk of disorientation and temporary blindness!

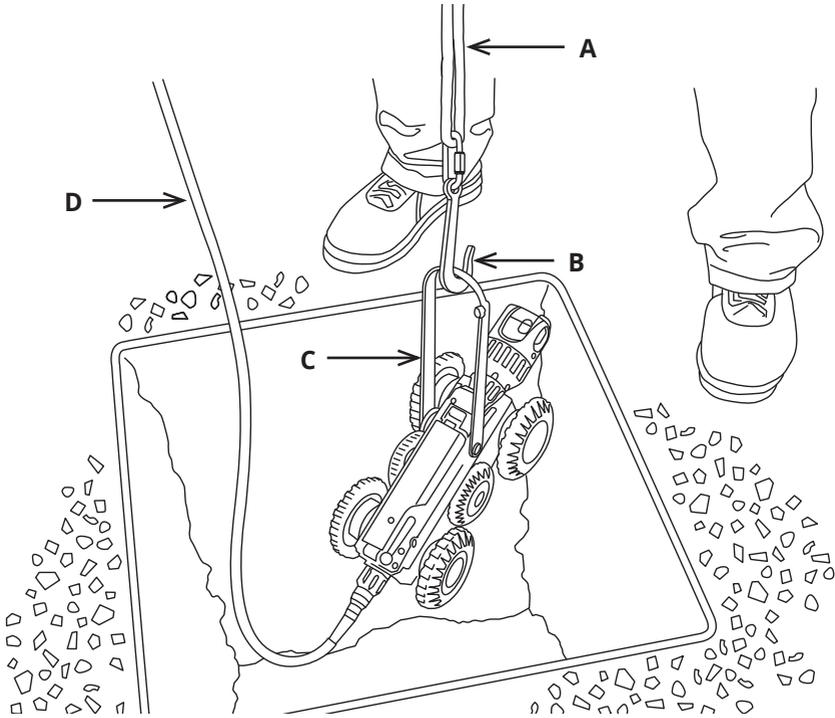


The illumination on the PROTEUS™ inspection system use high power LED lighting with narrow angle secondary optics. During the testing and use of the system **never** look directly at the camera or auxiliary module illumination. When checking the illumination use a low power setting and view from an angle greater than 50° from the centre of the module.

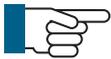
Check the following system functions:

- 1 Control function of the crawler using the left joystick:
 - i Drive forwards and backwards.
 - ii Steer left and right.
- 2 Control function of the camera using the right joystick (If Pan and Rotate camera head):
 - i Rotation left and right.
 - ii Pan up and down.
- 3 Lighting control of camera head and auxiliary module (if fitted):
 - i Turn the light intensity up and down.
- 4 Check function of the rear view camera and rear lights (if auxiliary module is fitted):
 - i Press the Backeye button.
Camera view will change to rear view.
 - ii Turn the light intensity up and down.
 - iii Press the Backeye button again. Camera view will revert to forward view.

Lowering the Crawler into the Manhole



- 1 Lower the crawler into the manhole using the rope (A) with hook (B) on the lowering device (C).
- 2 Balance the crawler by means of the crawler cable (D) so that it does not contact the manhole.
- 3 Detach the hook (B) from the crawler lowering device (C).



NOTE!

To retrieve the crawler from the manhole use the rope (A) and hook (B) to attach to the crawler lowering device (C). Lift the crawler out of the manhole, balancing the crawler by using the crawler cable (D).

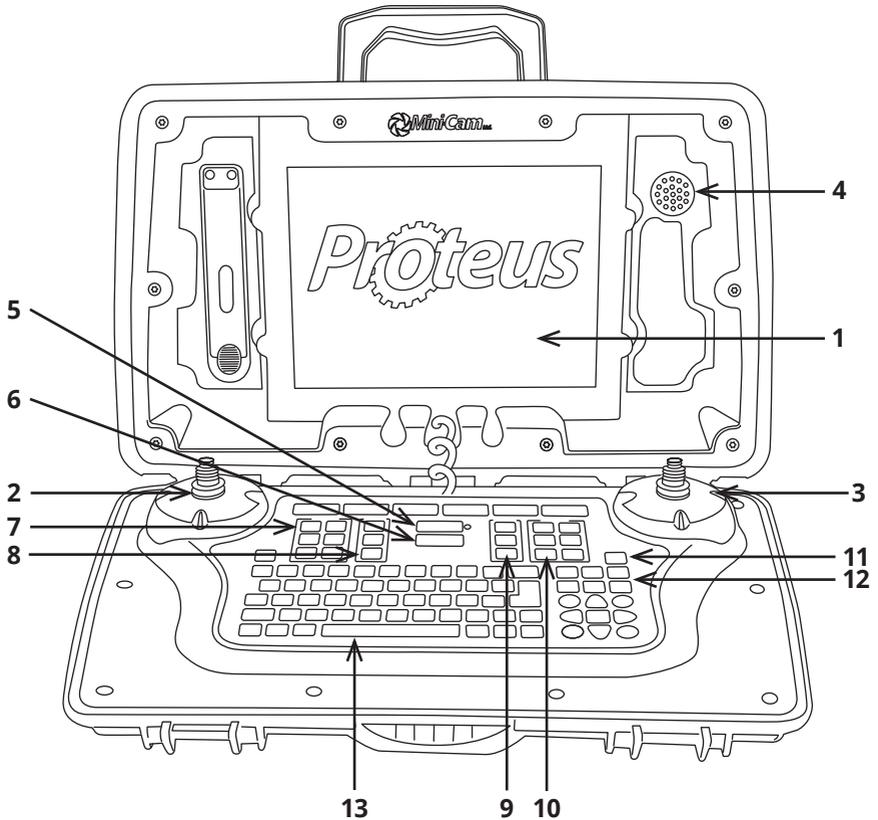
CCU208 - Control Unit

The control unit CCU208 is a robust and portable control unit for the PROTEUS™ system. It controls the functions and reports the status of the attached modules. It has the following features:

- Scalable internal solid state storage (32GB minimum)
- Data transfer via USB and SD card
- Daylight readable display (1024x768 pixels)
- Video recording in MPEG-4 AVC/H.264 formats
- Pictures saved in JPG format
- Customisable colour on screen text overlay
- Video output of live video with on-screen text
- Ergonomic design
- IP54 rated

The control unit CCU208 enables the operator to record video and photographic surveys, generate survey reports, and export the data via USB or SD card. The control unit can generate on screen text that is overlaid onto the recorded video in various colours and positions, allowing easy customisation.

CCU Overview



1 Daylight viewable screen 1024 x 768 pixels

2 Left joystick for crawler control

3 Right joystick for camera control

4 Speaker

5 ON/OFF button

6 ALL STOP button

7 Crawler function keys

8 Survey Function keys

9 Media function keys

10 Camera function keys

11 Snapshot key

12 Recording and playback keys

13 Keyboard

ON/OFF button



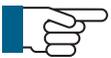
Used to turn the control unit ON and OFF. This button **does not** enable power to the crawler. By design, the control unit will power on but power is not automatically applied to the crawler. A green light next to this button indicates that the CCU is powered on.

ALL STOP button



Used to enable / disable power to the crawler. When power to the crawler is disabled a red light next to this button is illuminated.

- When the control unit is powered ON this key must be pressed to enable power to the crawler.
- When the crawler is powered ON, pressing this key will disable power to the crawler.
- The ALL STOP button can be used in case of emergency, to stop the crawler and disable the power

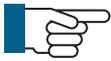


NOTE!

The ALL STOP button **must** be pressed to disable the power to the crawler before disconnecting any part of the system.

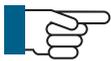
Power ON sequence

- 1 With the system power OFF, connect all system components: Cable reel, crawler, camera
- 2 Press ON/OFF button to power the control unit ON.
- 3 Read and acknowledge the on-screen prompt.
- 4 Press the ALL STOP button.
- 5 If the control unit detects a crawler connected, the system will fully power up. The red light next to the ALL STOP button will turn off. Video will be displayed and crawler/camera status information will be displayed on the right hand side of the screen.



NOTE!

If the control unit does not detect a crawler connected, the system will not fully power up. The control unit will sound an audible beep several times and the red light next to the ALL STOP button will be illuminated. If this should happen, first check all connections on the system are made correctly. If the problem persists then contact the Minicam Service Centre or Accredited Minicam Partner in your country.

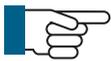


NOTE!

Details of the nearest Minicam Service Centre and Accredited Minicam Partners world-wide are made available on the website www.minicam.co.uk

Power OFF sequence

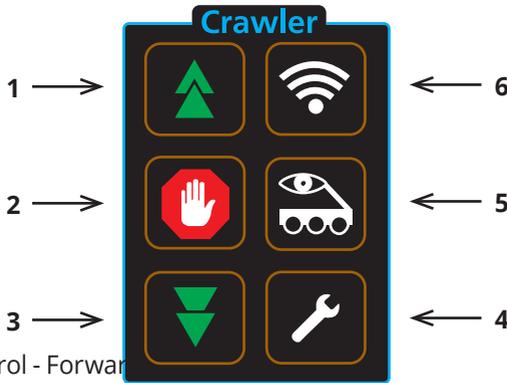
- 1 Press the ALL STOP button. The red light next to this button will illuminate.
- 2 Press the ON/OFF button and press OK to confirm.
- 3 The control unit will now power down.
- 4 The system can now be disconnected.



NOTE!

Always fit the protective caps when the crawler, camera or auxiliary module is not in use to protect from ingress of dirt and moisture.

Crawler function keys



1 Cruise control - Forward

- a Each press increases speed until maximum speed is reached.
- b When the crawler is reversing, each press slows the crawler speed.

2 Stop

- a Crawler stops moving. Power is still enabled.

3 Cruise control - Reverse

- a Each press increases speed in reverse until maximum speed is reached.
- b When the crawler is travelling forward each press slows the crawler speed.

4 Crawler settings

- a Select the correct wheel size attached to the crawler for accurate speed display.
- b CRP300 Elevator options
- c Inclination
- d CRP300 Clutch Control (Manual)

5 Backeye

- a Switch between forward and rear view cameras.

6 Sonde

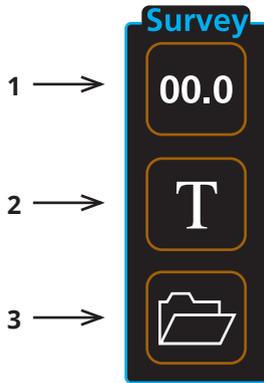
- a Enable or disable sonde function.
- b Choose transmission frequency.

NOTE!



Moving the crawler joystick during *Cruise mode* will cancel the cruise control function. The operator will now have manual control.

Survey function keys



1 Meterage

- a Change meterage manually.
- b Change position of meterage on the screen

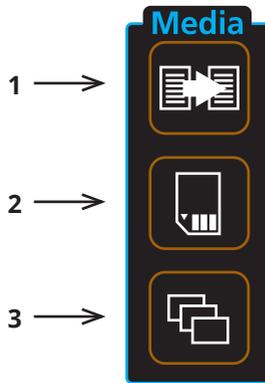
2 Text

- a Change text colour

3 Survey Folder

- a Start *ProPipe* or *WinCan* survey.

Media function keys



1 Copy

a Copy files from one media source to another

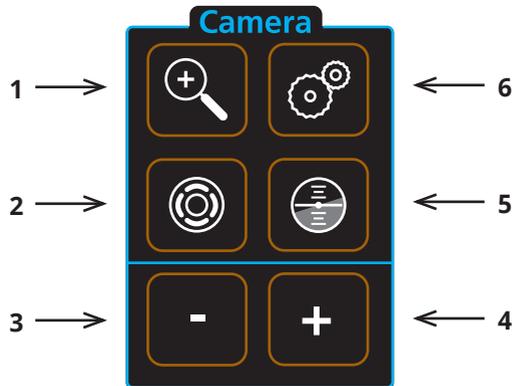
2 Storage media

a Choose storage media – Internal/USB/SD card

3 Gallery

a Browse surveys, videos and pictures

Camera function keys



1 Digital Zoom

2 Camera Illumination

3 Focus-

4 Focus+

5 Camera Home

a Automatically move camera to home position
(CAM026 only)

6 Camera Settings

Snapshot key

Press this key to take a JPG image of the live video or video during playback



Recording and Playback keys

These keys control the recording and playback of video files



QWERTY keys

These keys allow the user to enter text for onscreen text or survey comments

Pressurising Operation Mode

The pressurisation operations of the CCU and the inspection equipment are only active when the inspection equipment is powered on.

During Pressurising Operation Mode the CCU monitors and displays an indication of the inspection equipment pressure, allowing the user to pressurise the inspection equipment.

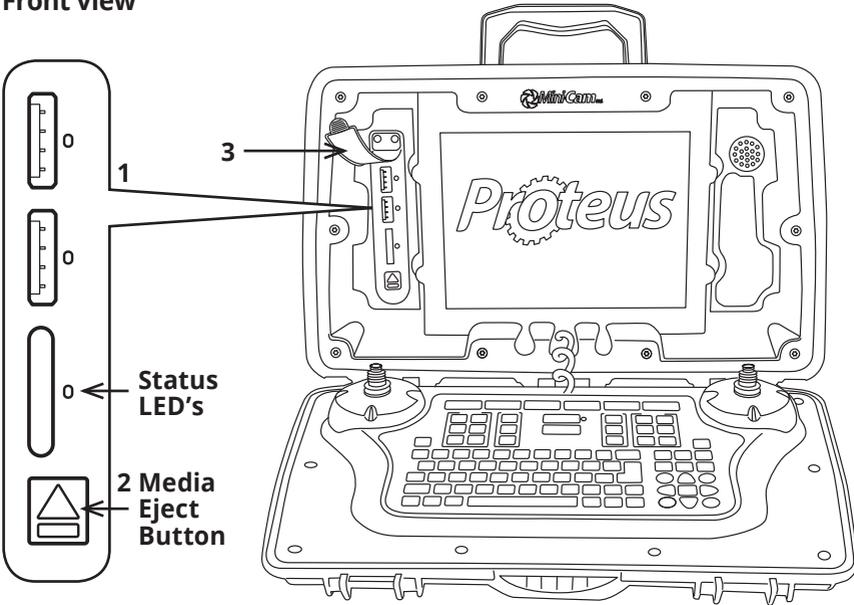
To access the Pressurisation Operation Mode press the HELP key and select the module you want to pressurise.



Image shows an example screenshot for the camera

Connections and Descriptions

Front view



1 External media – USB and SD card slots

a External media status LED's.

- Blue – Media is plugged in but is not in use.
- Orange blinking – Media is currently selected and in use.
- Green – Media is safe to remove from the control unit.
- Red – Media is plugged in but is faulty.

2 External media eject button

a Press this button for 1 second and release. This will instruct the control unit that you wish to unmount the external storage media. When the LED status indicators are green it is safe to remove the media.

3 External media protection cover

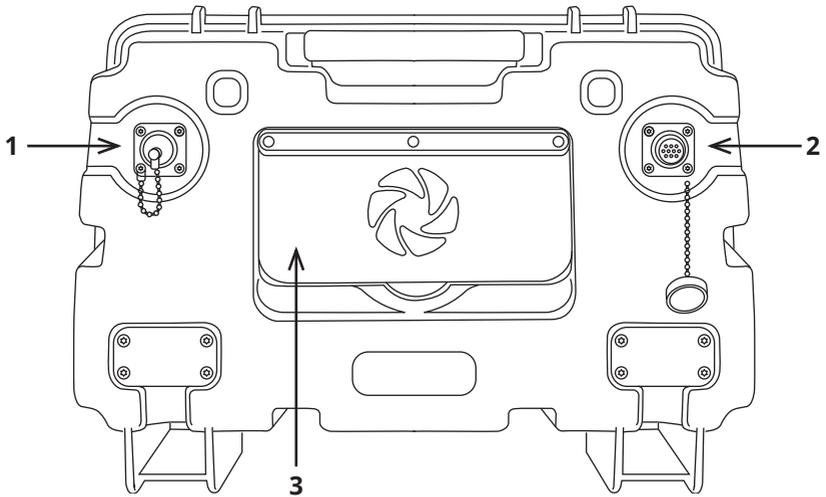
a To protect the connectors from dirt and moisture.



NOTE!

Always fit the external media protection cover (3) into position to protect from ingress of dirt and moisture.

Rear view



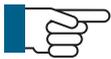
1 External Power Input (24VDC)

- a This provides power for the crawler and charges the control unit internal battery.

2 Connection to Cable Reel

3 Expansion Slot Protection Cover

- a To protect the expansion slot from ingress of dirt and moisture.

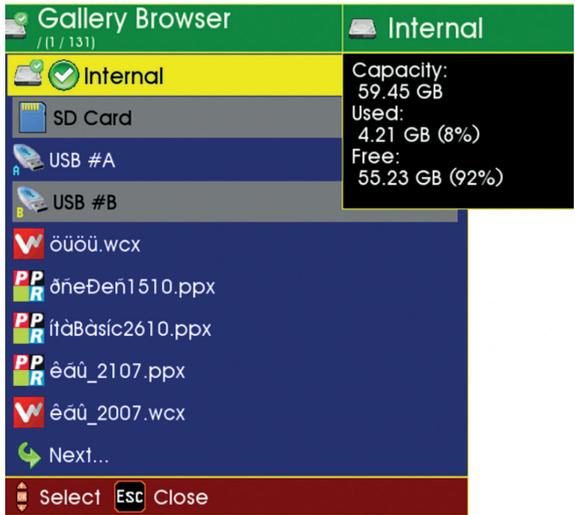


NOTE!

Always fit the expansion slot protection cover (3) into position to protect from ingress of dirt and moisture.

Media Transfer

Select a media to browse, either Internal, USB, or SD

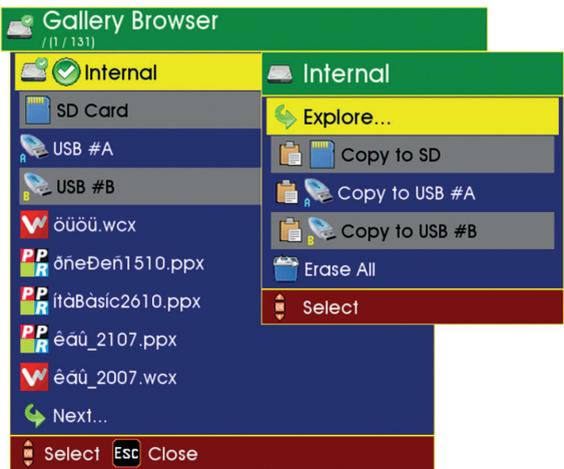


The screen shows information about the highlighted media.

To choose a different media to view:

- Highlight the media you want to view and press OK.

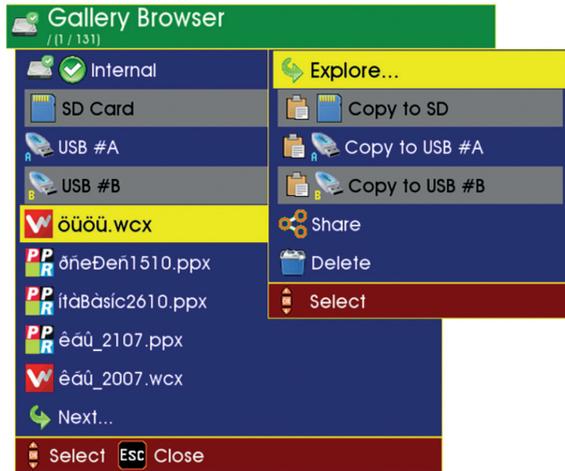
Explore the contents of a media



With a media highlighted, press OK. Then a submenu appears where you can choose what you want to do with this media.

- You can explore the projects and files that are on it
- You can copy all the projects and files from it onto another media
- You can erase it completely.

Explore the contents of a project

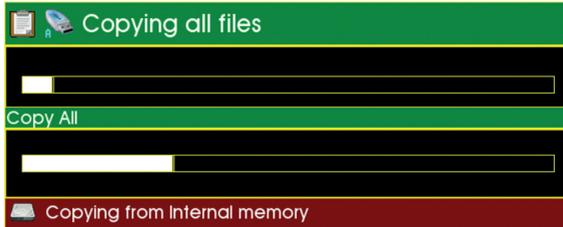


With a project or file highlighted, press OK. Then a submenu appears where you can choose what you want to do with this project or file:

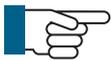
- If you have highlighted a project, you can then explore the files inside that project.
- If you have highlighted a file, you can play it (if a video) or view it (if a photo).
- You can copy the project or file to another media, eg. to USB or SD card memory.
- You can delete it.

continued on next page

While the project is being copied to the USB, progress bars are shown



When file copying has finished



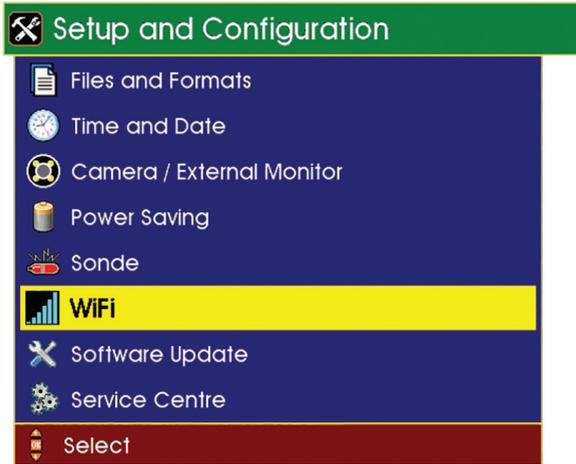
NOTE!

If you have copied to a media such as a USB or SD card, and you then want to remove the media, you **MUST** press the eject button and wait for the GREEN LED to show, else data could be lost.

WiFi Module

Your Proteus system is enabled with a WiFi module to connect your CCU to a local, company network to allow an easy file transfer between the system and your office or local computer. It improves the speed of reporting without the need of exchanging SD cards or USB sticks.

- 1 Select WiFi from the Setup and Configuration drop-down menu.



- 2 A menu will be displayed giving options to connect to WiFi.



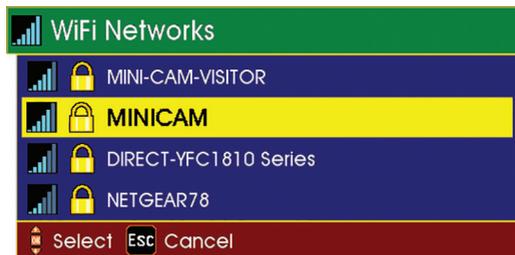
3 Select **Stored** F3 (Yellow Key) to view stored network URLs (addresses).



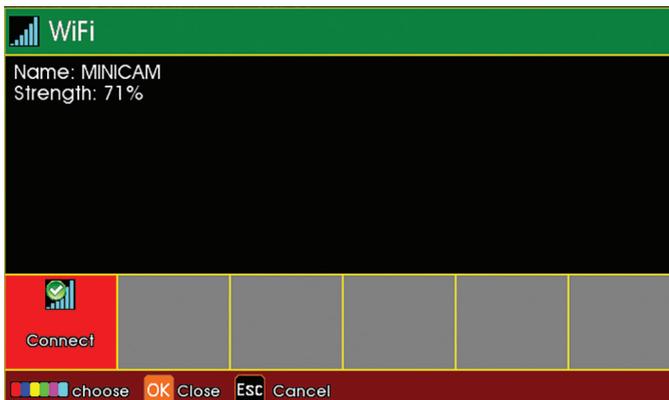
4 Select Find WiFi... F1 (Red Key) to search for available networks.



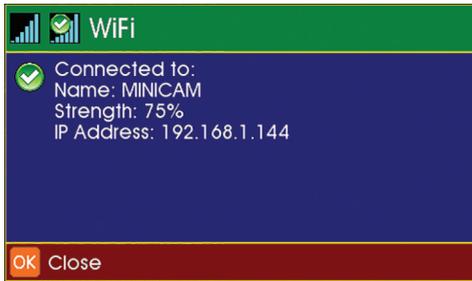
5 Select the required network from the menu.



6 Select Connect F1 (Red Key) to connect to the selected network (you will have to type a WiFi password in if required).



- 7 Status screens will display the connection progress, followed by connection confirmation, signal strength and IP Address.



- 8 The main display screen shows the WiFi status icon at the bottom right-hand side of the sidebar.

WiFi NOT CONNECTED

Red cross indicates no signal



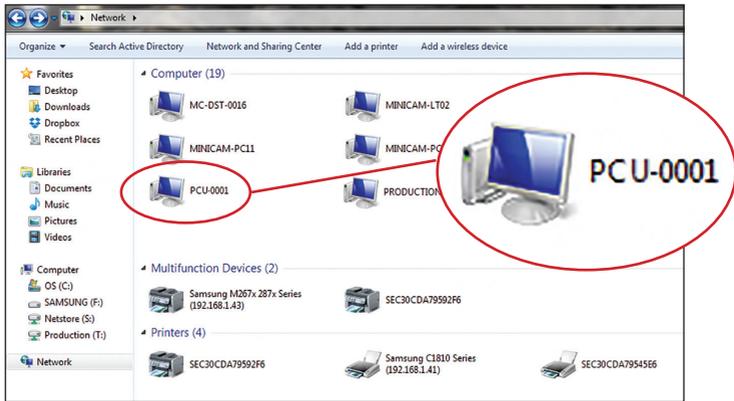
WiFi CONNECTED

Vertical blue coloured bars indicate signal strength

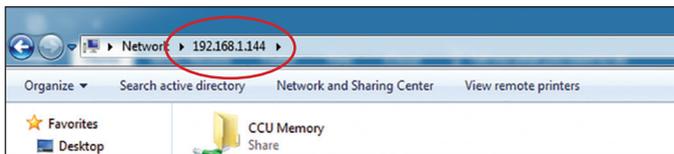


Connecting to your PC

Using *Explorer* in *Windows*® OS, the CCU may appear under the **Network Neighbourhood**. You can access your files directly.



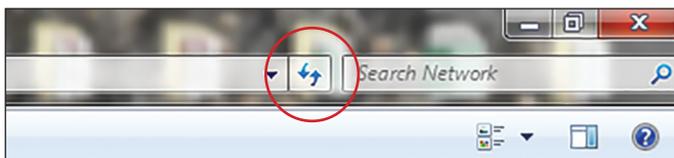
Alternatively, use the search bar in *Explorer* by typing \\ followed by the IP Address shown on your Proteus (Example - \\192.168.1.144)



This will then connect you to your Proteus control unit which will display a folder named CCU Memory. Double click on this folder to access all files currently on that control unit. You then can open any file to view video footage or still images and ProPIPE Reports or alternatively you can save them onto your PC.



NOTE: If the CCU is not displayed after the first search, try searching again by hitting the **Refresh** button on the menu bar



File Sharing



NOTE: To share the files over email or WincanWeb internet access is needed. Please connect to a Wifi with an internet connection before sharing files.

Email

- 1 Use the Gallery Browser  to select a file to be sent.
- 2 Navigate to the desired file, press OK and select the Share  option.
The Email option is only available for a single file, directories cannot be sent by email.
- 3 From the menu select the Email option. A text box with all the necessary data inputs fields will be displayed.
- 4 Enter Address, CC Address, Subject and Body text then press OK. The CCU will start the sending process. A message will be displayed with the sending progress, which will display Sent when the email has been dispatched.



NOTE: The most recent Address, CC Address and Subject are stored over the power cycle.



NOTE: The file to be shared over the email cannot exceed 10MB

WincanWeb

If the user has a *WincanWeb* account he can use it to upload *Wincan* Embedded projects.

- 1 Use the Gallery Browser  to select a WinCan project to be sent.
- 2 Navigate to a WinCan project, press OK.
- 3 Select the Share  option.
- 4 From the menu select the WincanWeb option. A text box with all the necessary data inputs fields will be displayed.

- 5 Enter Login and Password, then press OK. The WinCanWeb will start the sending process. A message will be displayed with the sending progress, which will display Sent when the upload has finished.



NOTE: To share using WincanWeb, WinCan catalogues must be installed on the CCU.



NOTE: Login and password are stored over the power down.

Share Status

The user can clear the status window displayed after the share process has been started and an appropriate form filled, without interrupting file sharing.

The share icon  will be visible in the right bottom corner until the Email or WincanWeb has finished sending. The progress can be also seen in the Share Status which can be accessed after pressing Gallery Browser



. It will also inform the user in the case of a sending failure, which may happen if the internet connection has been interrupted or services are temporarily unavailable.



NOTE: To successfully share files, the CCU needs to remain on and connected to the internet until the sharing has finished.

Information and Care

Cleaning

Ensure that the control unit is thoroughly cleaned after each inspection. Use a damp rag when cleaning. Ensure the connectors are free from dirt and moisture. Always fit the dust caps immediately after disconnecting the control unit from the rest of the system.

Maintenance

Ensure that all screw threads and connections are free from dirt.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the control unit, crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



CAUTION!

The control unit is rated to IP54 providing that the external media and expansion slot covers are fitted in place.



CAUTION!

It must be noted that although the cable reel and crawler are for use in wet environments the control unit is for indoor use but may also be used outdoor in very light rain. The external PSU is for indoor use only as marked on its label.

Technical Details - CCU208

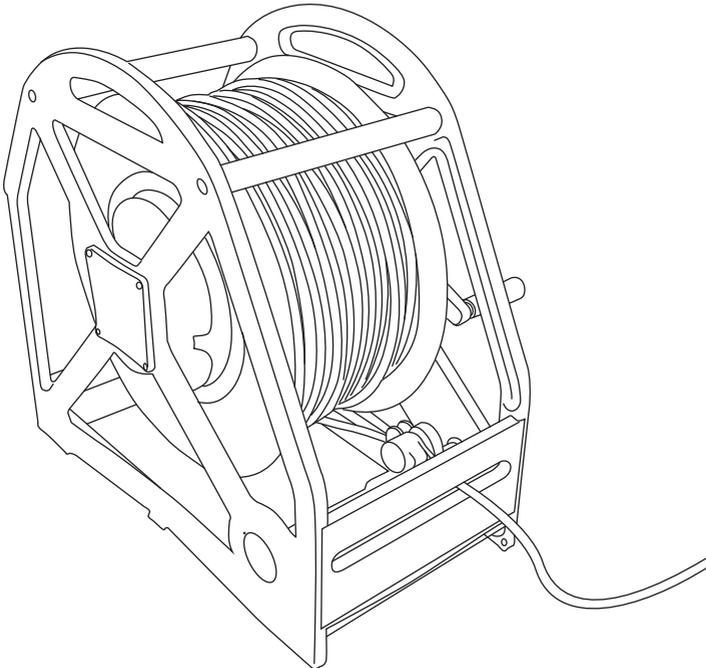
Product ID:	CCU208
Dimensions:	430 x 280 x 150mm (L x W x D)
Power Consumption:	30W (standalone)
Weight:	5.5Kg (12.12lb)
Temperature Range:	-10°C ~ +40° C
Environmental Protection:	IP54

RMP100 / RMP200 / RMP300 - Manual Cable Reel

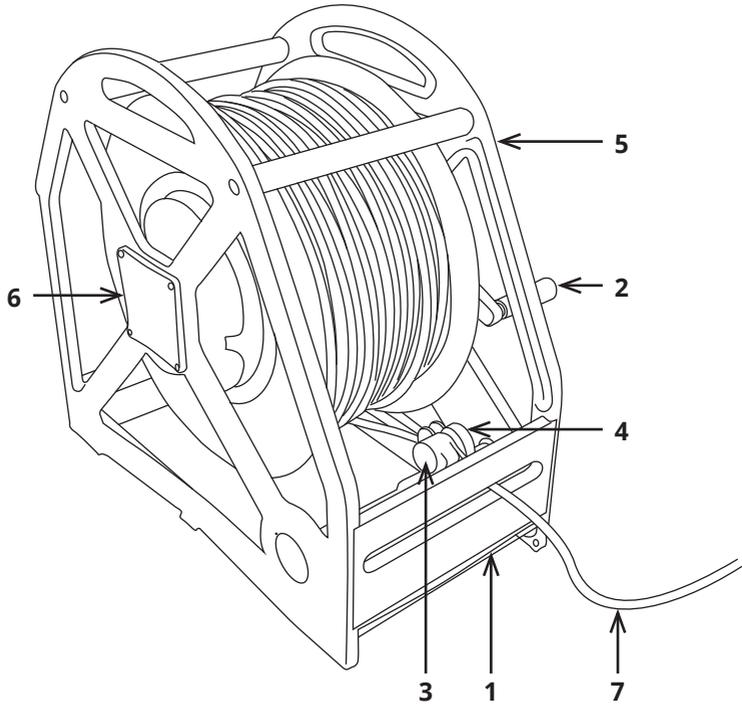
The manual cable reels on the PROTEUS™ inspection system are available with either 100m, 200m or 300m of cable. They have the following features:

- Up to 300m of cable
- Cable layering mechanism
- Meterage wheel
- Manual winding arm
- Friction brake

The manual cable reel is suitable for installation in a vehicle and also for use stand alone for portable applications.



Connections and Descriptions



- 1 Dirt tray
- 2 Winding arm and handle
- 3 Cable layering mechanism
- 4 Meterage wheel
- 5 Friction brake
- 6 Connection to control unit
- 7 Connection to crawler

Information and Care



CAUTION!

Risk of injury to persons!

Due to the weight of the cable reel, it **must** be lifted by two persons.

Cleaning

Ensure that the cable is thoroughly cleaned after each inspection. Use a wet cloth when winding the cable back onto the drum. Ensure the connector for the crawler is free from dirt and moisture. Always fit the dust caps immediately after disconnecting the cable reel from the system. Empty the dirt tray when required.

Maintenance

Ensure that all screw threads and connections are free from dirt.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

tem

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

damage

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Technical Details - RMP100

Product ID:	RMP100
Dimensions:	530 x 210 x 520mm (L x W x D)
Power Consumption:	1W
Weight:	20Kg (44.09lb)
Temperature Range:	-20°C ~ +50° C
Environmental Protection:	IP54

Technical Details - RMP200

Product ID:	RMP200
Dimensions:	530 x 280 x 520mm (L x W x D)
Power Consumption:	1W
Weight:	28Kg (61.73lb)
Temperature Range:	-20°C ~ +50° C
Environmental Protection:	IP54

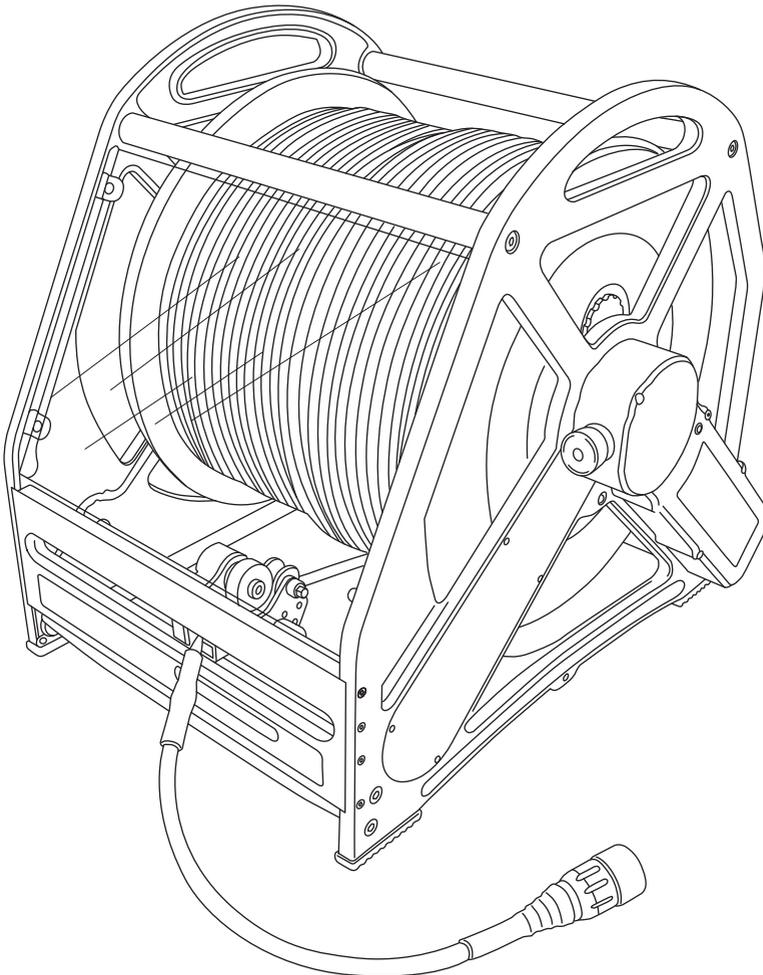
Technical Details - RMP300

Product ID:	RMP300
Dimensions:	530 x 390 x 520mm (L x W x D)
Power Consumption:	1W
Weight:	39Kg (85.98lb)
Temperature Range:	-20°C ~ +50° C
Environmental Protection:	IP54

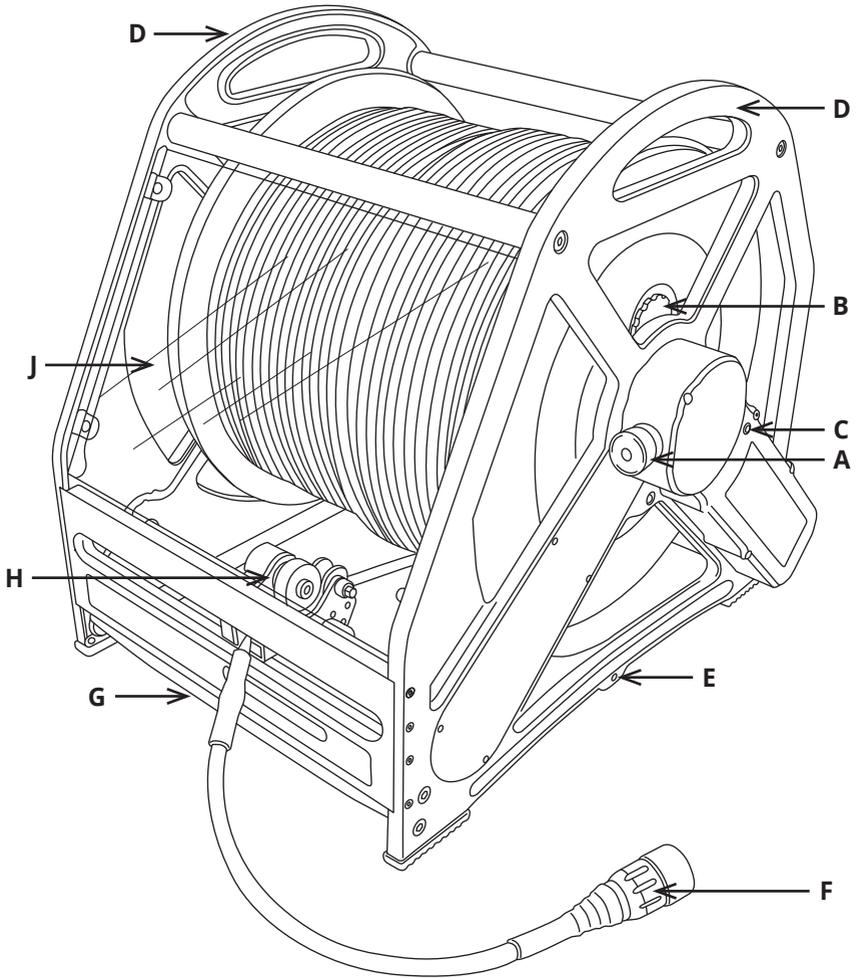
RAP200-RAP300 – Motorised Cable Reel

Proteus Motorised Cable Reel RAP200 AND RAP300 are designed to allow for easy one-man operation in remote locations. Both RAP200 AND RAP300 feature a powerful 3 phase DC motor and cable layering mechanism for uninterrupted, tangle-free winding and re-winding of the Kevlar reinforced inspection cable.

A rigid clear safety screen prevents contact with the cable whilst winding. In the event of an emergency, the reel also features an emergency stop button.



Parts and Descriptions



A Emergency stop button.

B Friction adjustment.

C Status LED.

D Lifting handle

E Vehicle/Portable Trolley Fixing.

F Cable End Connector.

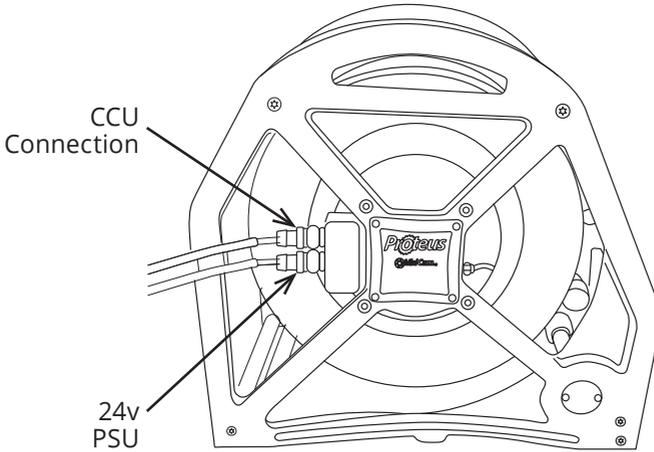
G Removable Drip Tray.

H Cable Layering Mechanism and Meterage Counter.

J Clear Rigid Protection Screen.

Connections

The motorised cable reel requires its own 24v power supply:



Using Motorised Cable Reel RAP200-RAP300

By default the motorised cable reel is in Automatic mode when powered on. The motorised cable reel contains a motor which can run forwards, reverse or stop.

When the motor is stopped. the cable drum cannot move.

Automatic Mode

In **Automatic** mode, the motorised cable reel controls the pay out assist or rewinding of the cable by itself. Normally this is based upon what direction the crawler is travelling.

Manual Mode

In **Manual** mode, you can control the paying out or rewinding of the cable yourself. This allows you to drive the crawler forward or reverse without the cable reel motor moving.

Paying Out

When running forwards, the motorised cable reel motor **does not** feed

cable out, but it does allow cable to be 'pulled' from the drum. Either the crawler pulls the cable when you drive it forwards, or you can manually pull the cable yourself.

Rewinding

Adjusting the Motor Torque

When running in reverse, the motor rewinds the cable back onto the drum.

The motorised cable reel contains a powerful motor, which is capable of pulling the cable very tight, or even dragging the crawler backwards.

When the cable is rewinding, you can control the amount of power that the motor has, by adjusting its **Torque**. Torque only matters when rewinding.

You can use the keyboard keys to adjust the rewinding torque at any time when the drum is rewinding.



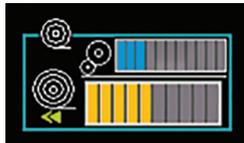
Decrease motor torque:

Each press decreases the torque.



Increase motor torque:

Each press increases the torque.



The blue coloured bar/s represent torque adjustment. This is only active during rewind.

The orange coloured bar/s represent how much cable is in the pipe

Motor Torque Value

The amount of torque needed depends upon the speed at which the crawler is reversing, the size of the crawler wheels, the amount of cable on the drum and the conditions in which the crawler is being used.

When the motor is rewinding, you should adjust the torque so that there is only a small amount of slack in the cable between the drum and the crawler, such that:

- You ensure the motor is winding up enough cable onto the drum so that the crawler does not run over the cable.
- You ensure the motor is *not* producing so much torque that the drum is dragging the crawler.

You may need to adjust the torque a few times during the rewind of a long length of cable.

With usage, you will gain some experience of the ideal settings for the torque.

Selecting the Crawler Wheel Size

The MCR needs to know the crawler wheel size so it can control the strength (torque) of the MCR motor correctly.

Selecting Wheel Size When Powering-On the Crawler

When you turn on the power to the crawler, the CCU will ask you to confirm the size of the wheels:

1. Press a coloured key to confirm the size of the crawler wheels.



With
CPL150
connected



With
CRP300
connected

2. Press the appropriate coloured **Function** key to select confirm the size of wheel.



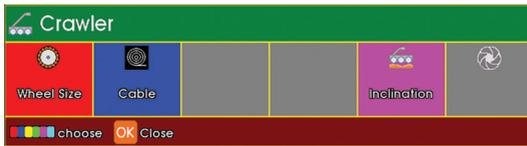
Selecting Wheel Size At Other Times

You can also select the wheel size using the **Crawler Settings**:

1. Press **Crawler Tools**:



The CCU will display the followings short keys



With
CPL150
connected



With
CRP300
connected

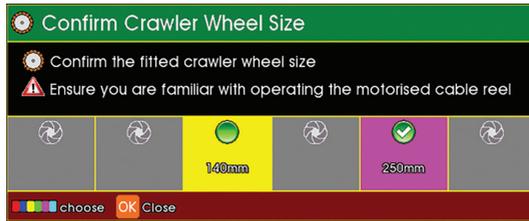
2. Press **Red Function** to select **Wheel Size**.



The CCU will ask you to confirm the size of the wheels:



With
CPL150
connected



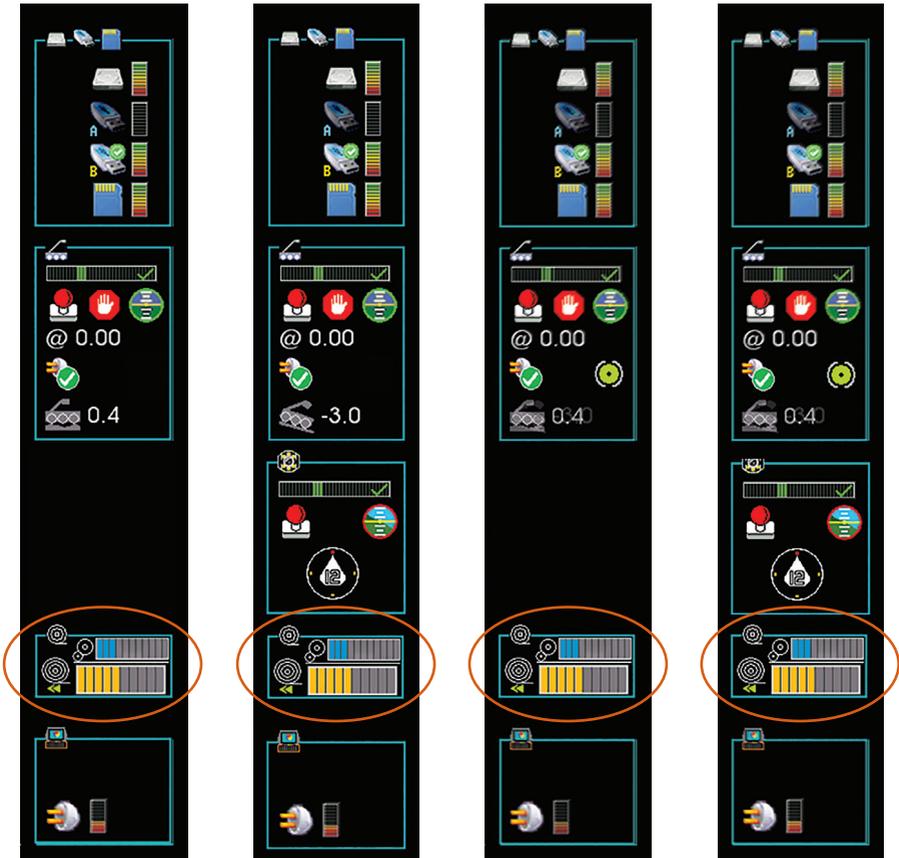
With
CRP300
connected

2. Press the appropriate coloured **Function** key to select confirm the size of wheel.



Status Display for the Motorised Cable Reel

The CCU screen displays the status of the motorised cable reel.



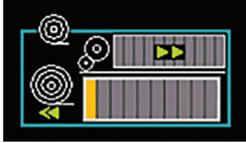
CPL150
connected
without camera

CPL150
connected
with camera

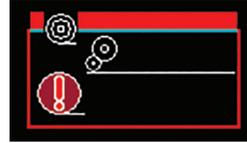
CRP300
connected
without camera

CRP300
connected
with camera

The motorised cable reel status box displays the appropriate icon for the operation being performed:



Status looks like this



...or if there is a problem looks like this



Automatic Paying Out and Rewinding

The MCR is automatically controlling the cable pay out and rewinding.



Paying Out

The MCR is paying out the cable to the crawler.



Rewinding

The MCR is rewinding the cable back onto the drum.



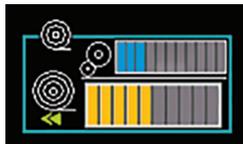
Lost Communication with CCU

The MCR has lost communications with the CCU. See Troubleshooting “Troubleshooting” on page 93.



Blockage

The MCR has stopped because of a blockage, or the Stop button is activated.



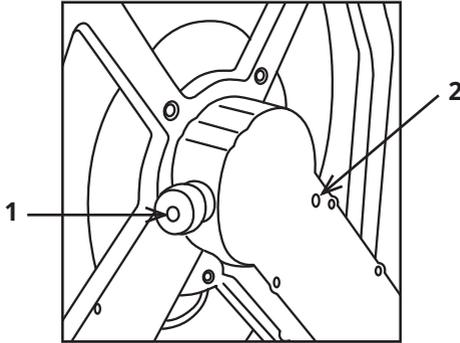
The blue coloured bar/s represent torque adjustment. This is only active during rewind.

The orange coloured bar/s represent how much cable is in the pipe

Status LED

The motorised cable reel has two LEDs to show status

- 1 Status LED on emergency stop button.
- 2 Status LED on motorised cable reel body.



LED on MCR Body



LED on MCR Stop Button



LED Flash once, the MCR is starting up, or the MCR is not communicating with the CCU.

Flashing LED, normal operation, the MCR is communicating with the CCU.

Flashing LED, the MCR has stopped because the cable is tangled or blocked. See "Cable Reel Blocked" on page 91.

Flashing LED, the MCR Stop button has been activated. See "Cable Reel Emergency Stop Button" on page 88

Solid LED, the MCR Stop button was activated, and the CCU needs to reset it. See "Cable Reel Emergency Stop Button" on page 88.

Controlling the Motorised Cable Reel

Control using the Keyboard Keys

There are 4 keys that control the motorised cable reel.



Rewind cable back onto the drum

Press once for a short rewind.
Press and hold to rewind until released.



Paying out cable to the crawler

Press once for a short feed.
Press and hold to feed until released.



Decrease motor torque

Each press decreases the torque.



Increase motor torque

Each press increases the torque.

To pay out or to rewind continuously, use the coloured keys. See **Using the Coloured Keys** page 84.

Control using the Coloured Keys

You can also select the cable settings and size using the **Crawler Settings**

1. Press **Crawler Tools**:



The CCU will display the followings short keys



With
CPL150
connected



With
CRP300
connected

2. Press **Blue Function** to select **Cable**.



The CCU will display the followings short keys.

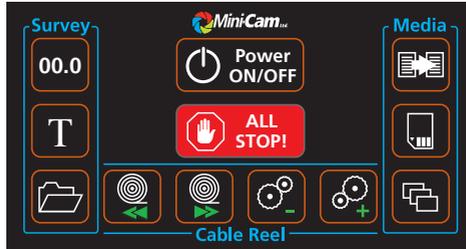


Cancel Continuous Pay out or Rewind

You can cancel continuous paying out or rewinding using either the keyboard keys or the coloured keys.

Cancel using the Keyboard Keys

Press either the **Pay Out** key or the **Rewind** key



Press *either* key once to cancel continuous paying out or rewinding, and to stop the motor. The motorised cable reel pay out and rewind then goes back to automatic mode.



Rewind



Pay Out

3. Then press the appropriately coloured key to select the required operation:

A red rounded rectangular button with the text "F1" in white.

To pay out cable to the crawler

Press F1 once for a short feed.
Press F1 and hold to feed until released.

A blue rounded rectangular button with the text "F2" in white.

To rewind cable back onto the drum

Press F2 once for a short rewind.
Press F2 and hold to rewind until released.

A yellow rounded rectangular button with the text "F3" in black.

To pay out continuously

Press F3 once to feed cable to the crawler continuously.

A green rounded rectangular button with the text "F4" in white.

To rewind continuously

Press F4 once to rewind the cable continuously.

A pink rounded rectangular button with the text "F5" in white.

To wind with crawler

Each press of F5 decreases the torque.

A light blue rounded rectangular button with the text "F6" in white.

To wind manually

Each press of F6 increases the torque.

4. Press **OK** when you have finished. If the motorised cable reel is continuously paying out or rewinding, it will continue to do so.

An orange rounded rectangular button with the text "OK" in white.

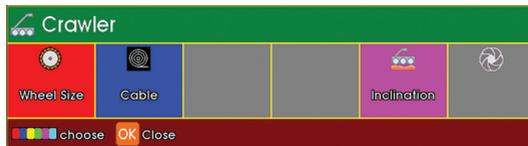
Cancel using the Coloured Keys

You can also cancel continuous pay out and rewind using the **Crawler Settings**:



1. Press **Crawler Tools**:

The CCU will display the followings short keys



With
CPL150
connected



With
CRP300
connected

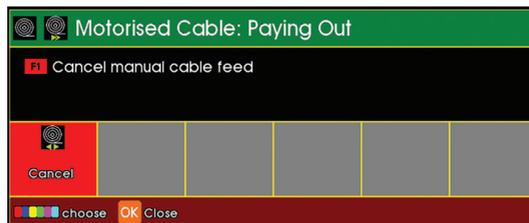
2. Press **Blue Function** to select **Cable**

F2

3. Press **Red Function** to revert to **Automatic** operation

F1

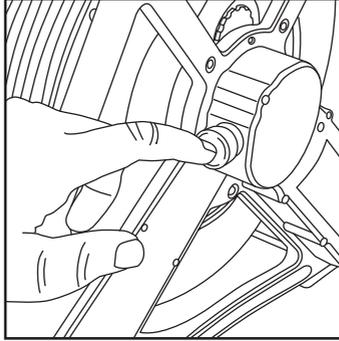
The CCU will display the followings short keys



4. Press once to cancel continuous paying out or rewinding, and to stop the motor. The MCR pay out and rewind then goes back to Automatic mode.

Cable Reel Emergency Stop Button

Press the Cable Reel Stop Button at any time to cut the motor drive. If the crawler is moving at that time, the crawler will also stop.



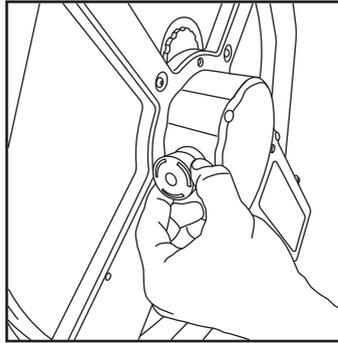
The Control Unit (CCU) will show that the Emergency Stop Button has been activated.



You can't control the cable reel or the crawler until the stop condition has been cleared.

Clearing the Emergency Stop Condition

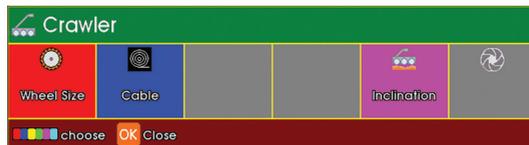
1. First ensure that it is safe to clear the Emergency Stop condition!
2. Turn the Emergency Stop button clock-wise, to reset it.



3. Press **Crawler Tools**:



The CCU will display the followings short keys



With
CPL150
connected

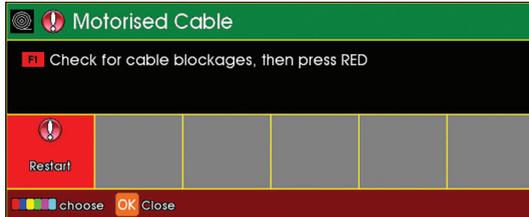


With
CRP300
connected

4. Press **Blue Function** to select **Cable**.



5. Press **Red Function** to select **Restart**. This will clear the Stop Condition and restart the motorised cable reel



Cable Reel Blocked

If the cable becomes blocked or tangled and can't move properly, the motorised cable reel will shut off the motor. If the crawler is moving at that time, the crawler will also stop.

The Control Unit (CCU) will show that the motor is shut off.



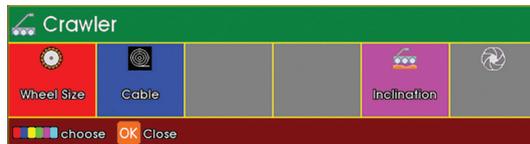
You can't control the cable reel or the crawler until the blockage condition has been cleared and reset.

Reset the Blocked Condition

1. Remove the cable blockage, and ensure that it is safe to reset the blocked condition!
2. Press **Crawler Tools**.



The CCU will display the followings short keys



With
CPL150
connected

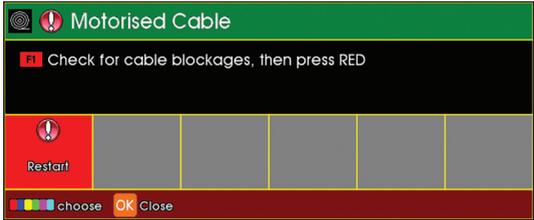


With
CRP300
connected

3. Press **Blue Function** to select **Cable**.



4. Press **Red Function** to select **Restart**. This will clear the Stop Condition and restart the motorised cable reel



Troubleshooting

First, refer to this document's section **Status Display for the Motorised Cable Reel** page 80 – this shows common indications telling you what's wrong.

Problem	Try this
Cable is getting tangled or run over by crawler when reversing.	<ol style="list-style-type: none">1. Check the CCU is using the correct wheel size, see section Selecting Crawler Wheel Size.2. Adjust the Torque, see section Rewinding.
Cable is very tight when crawler is reversing.	<ol style="list-style-type: none">1. Check the CCU is using the correct wheel size, see section Selecting the Crawler Wheel Size.2. Adjust the Torque, see section Rewinding.
No LEDs are on.	Check all cable fittings and that the CCU is powered on.

Information and Care



CAUTION!

Risk of injury to persons!

Due to the weight of the cable reel, it **must** be lifted by two persons.

Cleaning

Ensure that the cable is thoroughly cleaned after each inspection. Use a wet cloth when winding the cable back onto the drum. Ensure the connector for the crawler is free from dirt and moisture. Always fit the dust caps immediately after disconnecting the cable reel from the system. Empty the dirt tray when required.

Maintenance

Ensure that all screw threads and connections are free from dirt.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Safety

The MCR can start turning automatically! Keep loose clothing and your body away from the MCR moving parts

- Do not use the MCR if you are in any way unfamiliar with it's operation
- Ensure you have read and understand this Users Manual
- If you suspect any defect or damage of the MCR, do not use it
- Ensure the Emergency Stop button is functional

Technical Details - RAP200

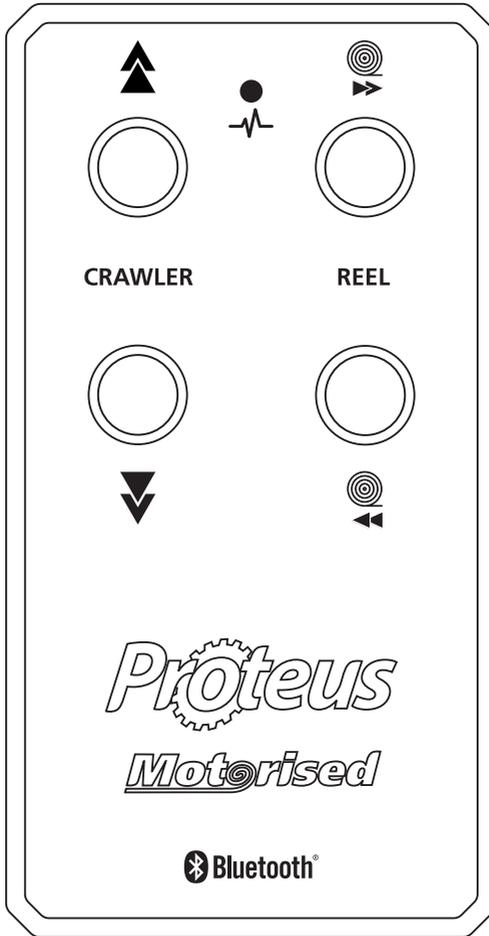
Product ID:	RAP200
Dimensions:	530 x 320 x 520mm (L x W x H)
Weight:	32.5Kg (00lb)
Cable Length:	200m
Power Supply:	24v
IP Rating:	IP54

Technical Details - RAP300

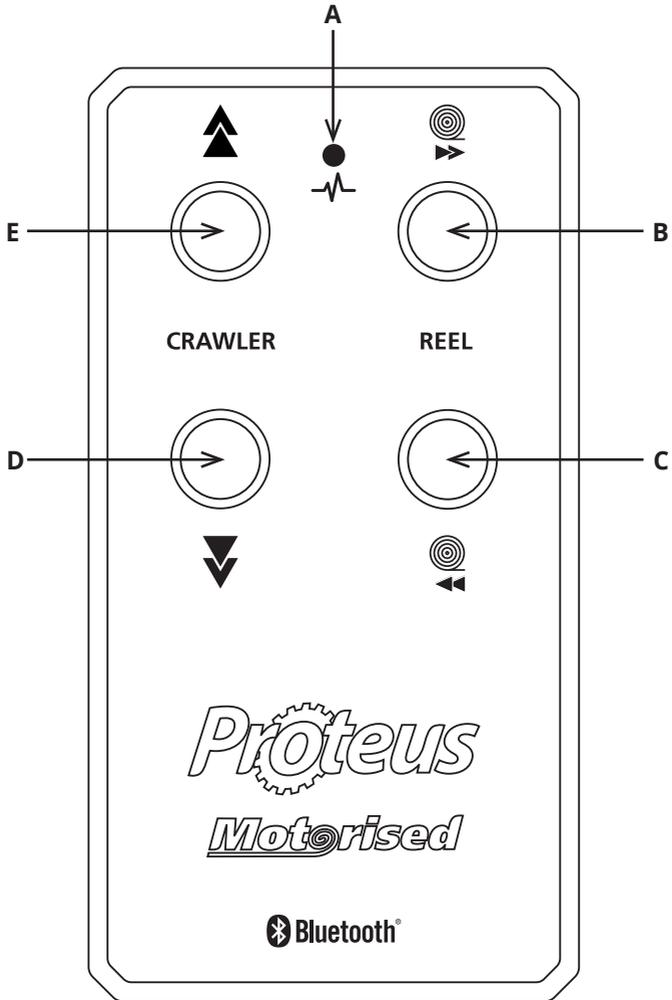
Product ID:	RAP300
Dimensions:	530 x 440 x 520mm (L x W x H)
Weight:	42.5Kg (00lb)
Cable Length:	300m
Power Supply:	24v
IP Rating:	IP54

RCP4 – 4 Button Remote Control

The four button Remote Control (RCP4) is used to control a Crawler and Motorised Cable Reel (MCR) remotely using Bluetooth® technology. The MCR can be controlled directly without the presence of the Control Unit (CCU) after the “pairing” process has been completed.



Parts and Descriptions



A Status LED.

B Reel Paying Out Button.

C Reel Rewind Button.

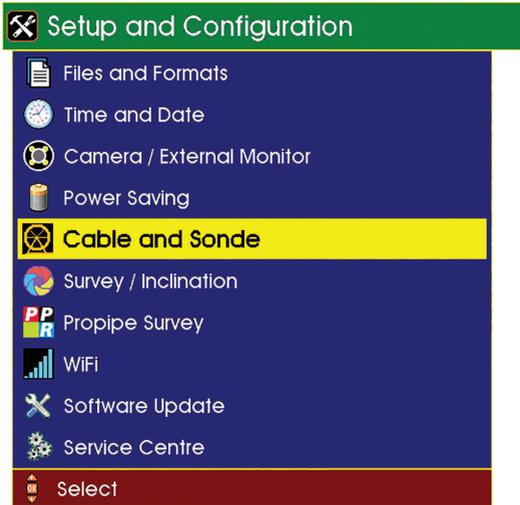
D Crawler Reverse Button.

E Crawler Forward Button.

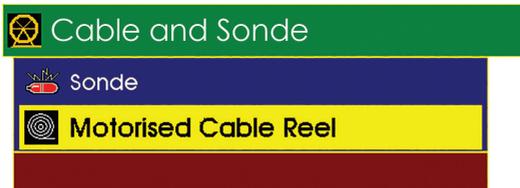
Pairing RCP4 with MCR

In order to pair the RCP4 with the Bluetooth® capable MCR, a CCU with software no older than revision 3.3.6 (date 06/09/2017) is needed.

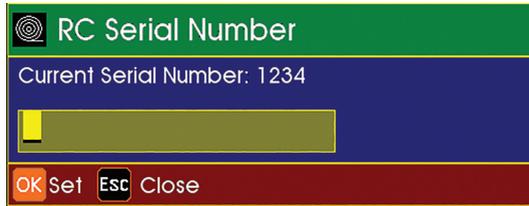
- 1 Select **Cable and Sonde** from the Setup and Configuration drop-down menu. If the menu is not visible then the CCU requires a software update.



- 2 Select **Motorised Cable Reel** from the list.



- 3 The RCP4 Control **Serial Number** has to be entered in the input box presented to the user.



The **Serial Number** can be found on the label attached to the back of the RCP4.



- 4 Press the **OK** button on CCU's keyboard.
- 5 After 2 seconds the **Current Serial Number** should indicate the recently entered serial number.

After completing these steps, the MCR is ready to operate with the RCP4. The process needs to be repeated only if a new RCP4 with a different serial number has to be used. Only one RCP4 can be paired with a specific MCR at one time.

Connecting RCP4

- 1 Switch the RCP4 **ON** by pressing any button. The RCP4 will make a beep sound and start flashing the green LED rapidly until it connects to the MCR. Once the connection is successful the LED will go solid for a second and then switch off.
- 2 If the green LED keeps flashing it indicates that the RCP4 is not able to connect to the MCR. Please make sure the pairing with the RCP4 has

been completed and the correct serial number has been entered (see step 3 above).

RCP4 Operational Range and Disconnection

The RCP4 will operate up to 5 metres from the MCR. If the path between the RCP4 and the MCR is obstructed, or it is further than 5 metres, the RCP4 will disconnect. Disconnection is indicated by a short bleep and flashing green LED. The RCP4 will immediately try to reconnect to the MCR, and if it succeeds the green LED will go solid for a second and then switch off.

Buttons

1 Crawler Buttons

- a** Press and hold the Crawler Forward button (**E**) to command the crawler to move forwards at a fixed speed. The MCR will pay-out the cable at the same time.
- b** Press and hold the **Crawler Reverse (D)** button to command the crawler to move backwards at a fixed speed. The MCR will pay-out the cable. The MCR *won't* rewind the cable, to make it easier to position the crawler using the RCP4.

2 MCR Buttons

- a** Press and hold the **Reel Paying-Out (B)** to command the motorised cable reel to pay-out the cable.
- b** Press and hold the **Reel Rewind (C)** to command the MCR to rewind the cable.

MCR Blocked and Emergency Stop Button Pressed

- a** The RCP4 will alert a user of the cable being blocked or the MCR Emergency Stop button being pressed, by flashing the red LED and bleeping twice per second.
- b** The user can press and hold both cable reel buttons (**B**) and (**C**) for 5 seconds to clear the alert. The Emergency Stop button has to be released first.

CCU and RCP4 interactions

The RCP4 and CCU cannot both operate the crawler or the MCR at the same time. If this happens a warning will be sounded on the RCP4 and the CCU, and they will both stop operating the MCR. The RCP4's red LED will also flash rapidly. The keys on both devices need to be released for at least 2 seconds before normal operation can continue.

RCP4 battery

The RCP4 is designed to operate on its internal battery for over 2 years. If the battery low level is detected by the RCP4 it will indicate this by flashing the red LED for 5 seconds and sounding a warning every time the RCP4 is switched on. At this point the user should contact their local Minicam service agent to arrange a battery replacement. When the battery level is critically low the RCP4 won't switch on after sounding the warning.

All Stop pressed

The crawler buttons (**D**) and (**E**) will stop operating the crawler, but the Reel buttons will still operate.



No CCU present

The crawler buttons (**D**) and (**E**) will stop operating the crawler, but the Reel buttons will still operate.

Information and Care

Cleaning

Ensure the remote control is kept free from dirt and moisture. Use a moist cloth with a mild detergent to wipe clean the outer casing, then dry with a soft cloth. Store the remote control in a dry place.

Proteus Crawlers CRP300/140/90 - CPL150S

All Proteus crawlers have the following features standard:

- Multi-frequency sonde location transmitter*
- Constant monitoring of the pitch and roll
- Inclination sensor*
- Constant monitoring of the internal pressure
- Optional auxiliary light module with Backeye camera
- Motorised Elevator^
- Optional performance wheels for specific conditions

All Proteus crawlers are pressure-tight up to 1Bar, and are suitable for inspections up to 10m water depth.

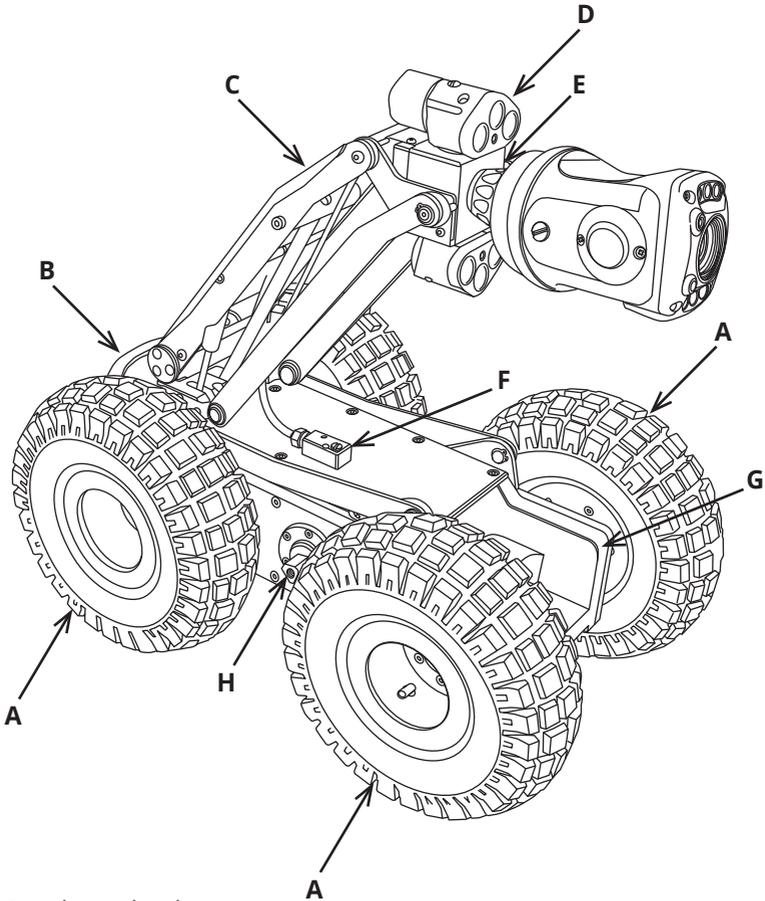
All six wheels of the crawler are driven by two motors ensuring that it is possible to move and steer the crawler on extremely difficult surfaces.

Suitable Pipe Diameters for Proteus Crawlers				
	CRP300	CPL150S	CRP140	CRP90
mm	300-1000mm	150-375mm	150-600mm	90-300mm
inches	12-40inches	6-15inches	6-24inches	3.5-12inches

* Available as an optional upgrade on CPL150.

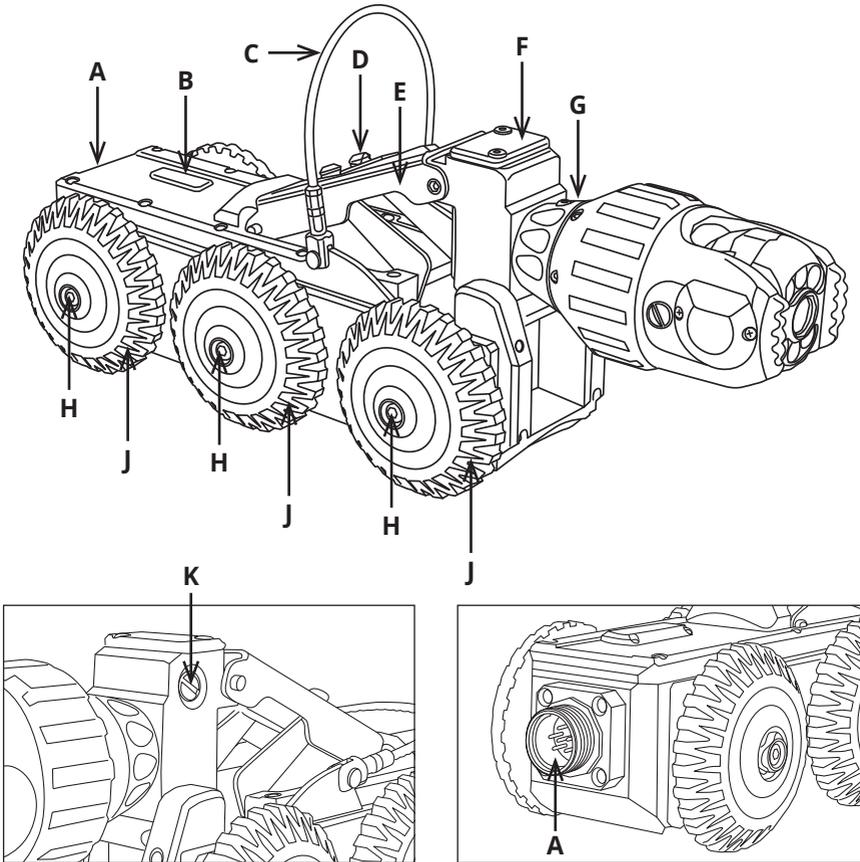
^ Except CPL150, which features a manually operated elevator.

CRP300 Connections and Descriptions



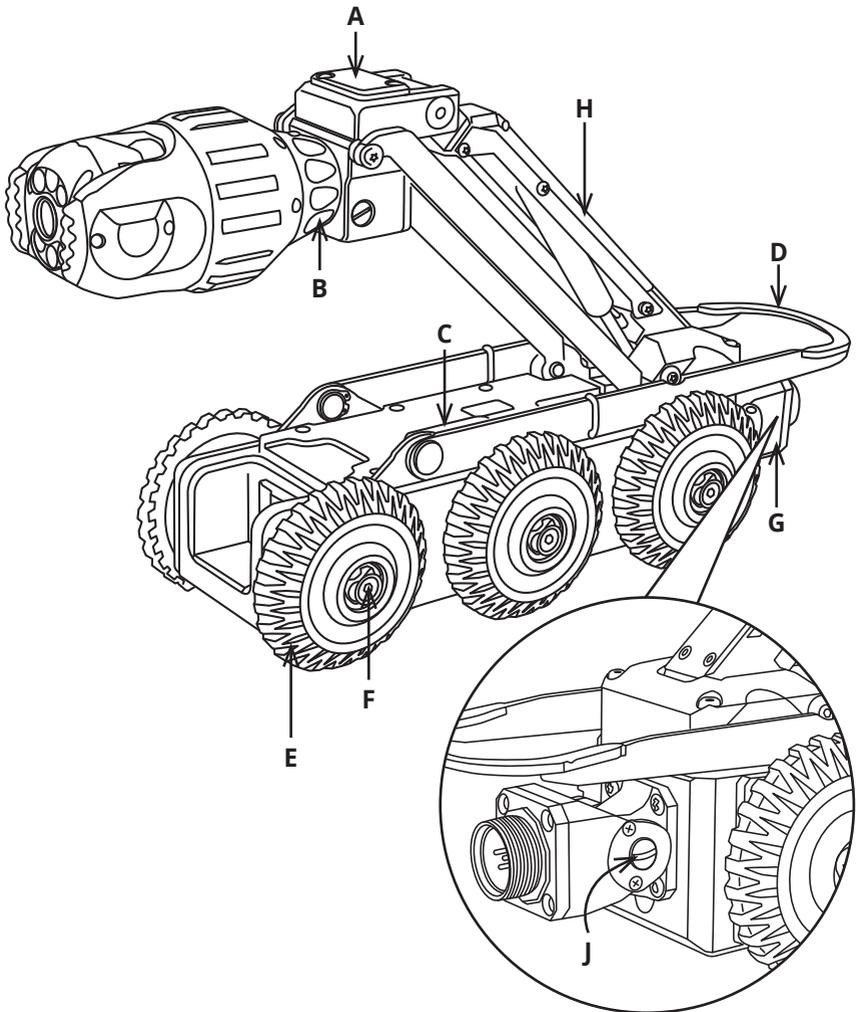
- A** Crawlers wheels
- B** Lowering device
- C** Elevation arm
- D** Auxiliary lights
- E** Connector for camera
- F** Pressurisation point
- G** Serial number location
- H** Crawler axle

CPL150S Connections and Descriptions



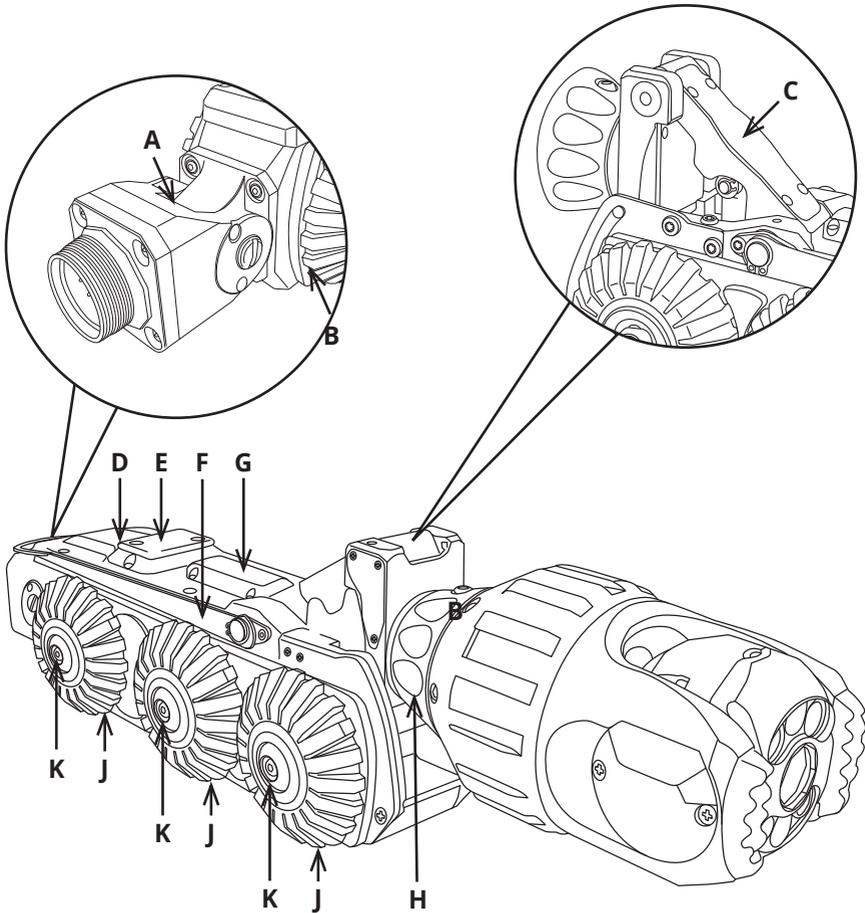
- A** Heavy duty rear connector
- B** Multi-frequency sonde
- C** Lowering handle
- D** Manual height adjusters
- E** Manual elevator
- F** Connection point for the auxiliary module
- G** Connector for the camera
- H** Quick release mechanism
- J** Crawler wheel
- K** Pressurisation Point

CRP140 Connections and Descriptions



- A** Connection point for the auxiliary module
- B** Connector for the camera
- C** Sonde
- D** Lowering device
- E** Crawler wheel
- F** Quick release mechanism
- G** Flexible rear connector
- H** Elevation arm
- J** Pressurisation Point

CRP90 Connections and Descriptions



- A** Flexible rear connector
- B** Pressurisation Point
- C** Motorised elevation arm
- D** Serial number location
- E** Connection point for the auxiliary module
- F** Lowering device
- G** Sonde
- H** Connector for the camera
- J** Crawler wheel
- K** Quick release mechanism

Technical Details - Proteus Crawlers

	CRP300	CPL150S	CRP140	CRP90
Pipe Diameter	300 - 1000mm 12 - 40in	150 - 375mm 6 - 15in	150 - 600mm 6 - 24in	90 - 225mm 3.5- 9in
Pressure Depth Rating	1 bar (14.50psi)	1 bar (14.50psi)	1 bar (14.50psi)	1 bar (14.50psi)
Built-in Elevator	Motorised	Manual	Motorised	Motorised
Quick Change Wheel Lock	4	4	4	4
Optional Large Wheels	3 size options	Multiple size options	Multiple size options	Multiple size options
Multi-Frequency Sonde Transmitter	4	4	4	4
Inclination Sensor	4	4	4	4
Heavy Duty Connector	4	4	-	-
Flexible Rear Connector	-	-	4	4
Power Consumption	200W	150W	TBC	TBC
Internal Pressure	0 to 500mBar	0 to 500mBar	0 to 500mBar	0 to 500mBar
Temperature Range:	-10°C ~ +50° C	-10°C ~ +50° C	-10°C ~ +50° C	-10°C ~ +50° C
Weight	32 kg (66lb)	9.25 kg (20.3lb)	11.50 kg (25.3lb)	4.5 kg (9.9lb)
Dimensions	470 x 233 x 195mm 18.5 x 9.1 x 7.6in	307 x 133 x 110mm 12 x 5.2 x 4.3in	386 x 133 x 108mm 15.1 x 5.2 x 4.2in	296 x 87 x 72mm 11.6 x 3.4 x 2.8in

Information and Care of Proteus Crawlers

Pressurisation

The crawler must always be correctly filled with CO₂ or Nitrogen. The control unit displays the internal pressure.

Cleaning

Ensure the crawler is thoroughly cleaned after each inspection. Ensure the connectors are free from dirt and moisture. Always fit the dust caps immediately after disconnecting the crawler from the system.

Crawler wheels

For inspection in various pipe systems always use the appropriate wheel combinations.

Maintenance

Ensure the all screw threads and connections are free from dirt.



CAUTION!

High-pressure cleaners must not be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents must not be used. These can damage the seals and other materials on the system.

Only clean water should be used.



CAUTION!

Risk of fatal injuries caused by electrical current!

For all cleaning and maintenance work disconnect the system from the power supply.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

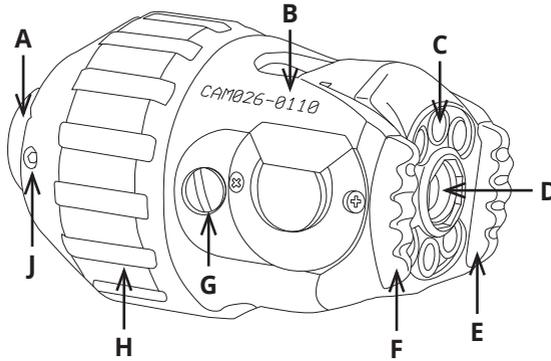
CAM026 – Pan & Rotate Camera

The camera module CAM026 provides a high resolution, colour, pan and rotate camera for the PROTEUS™ platform. It has the following features:

- High resolution colour CCD image sensor
- Powerful LED lighting with narrow beam width lenses
- Endless rotation range
- Panning range of +/- 135°
- Motorised focus control
- Internal pressure monitoring
- Impact resistant with user replaceable rubber protectors

The camera module is pressure-tight up to 500m bar. It is suitable for inspections up to 5m water depth.

Connections and Descriptions



- | | |
|---------------------------------|--------------------------------------|
| A Camera connector | F Rubber protector |
| B Serial number location | G Purge point |
| C LED illumination | H Protection skid |
| D Camera lens | J Protection skid screws (x6) |
| E Rubber protector | |

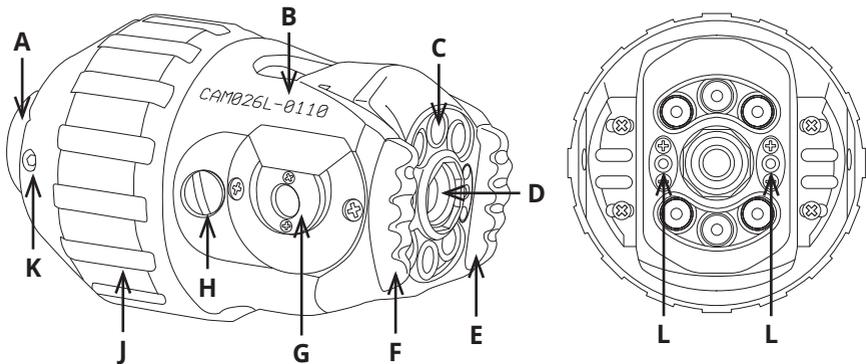
CAM026L – Pan & Rotate Laser Camera

The camera module CAM026L provides a high resolution, colour, pan, rotate and laser camera for the PROTEUS™ platform. It has the following features:

- High resolution colour CCD image sensor
- Powerful LED lighting with narrow beam width lenses
- Endless rotation range
- Panning range of +/- 135°
- Distance Sensor
- Aligned Lasers
- Motorised focus control
- Internal pressure monitoring
- Impact resistant with user replaceable rubber protectors

The camera module is pressure-tight up to 500m bar. It is suitable for inspections up to 5m water depth.

Connections and Descriptions



- | | |
|---------------------------------|--------------------------------------|
| A Camera connector | G Distance sensor |
| B Serial number location | H Purge point |
| C LED illumination | J Protection skid |
| D Camera lens | K Protection skid screws (x6) |
| E Rubber protector | L Aligned Laser |
| F Rubber protector | |

Information and Care

Pressurisation

The camera module must always be correctly filled with CO₂ or Nitrogen. The control unit displays the internal pressure.

Cleaning

Ensure the camera module is thoroughly cleaned after each inspection. Ensure the connector is free from dirt and moisture. Always fit the protective cap immediately after disconnecting the camera module from the system.

Maintenance

Ensure that all screw threads and connections are free from dirt. Replace the rubber protectors when worn or damaged.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Technical Details CAM026

Effective Pixels:	512 x 582
Resolution:	470 HTVL
Sensitivity:	< 1.0 lux
Aperture/Field of View:	F2.5 / 75°
Illumination Intensity:	Adjustable to 12.5k lux at 150mm
Pressure Depth Rating:	1 bar (14.50psi)
Dimensions:	120 x 74 x 74mm (L x W x H)
Weight:	860g

Technical Details CAM026L

Pipe Diameter Measurement Range:	90 – 600mm
Aligned Laser Spacing:	25mm
Camera Resolution:	470 HTVL
Sensitivity:	< 1.0 lux
Aperture/Field of View:	F2.5 / 75°
Maximum Illumination Intensity:	12.5k lux at 150mm
Pressure Depth Rating:	1 bar (14.50psi)
Dimensions:	120 x 74 x 74mm (L x W x H)
Weight:	860g

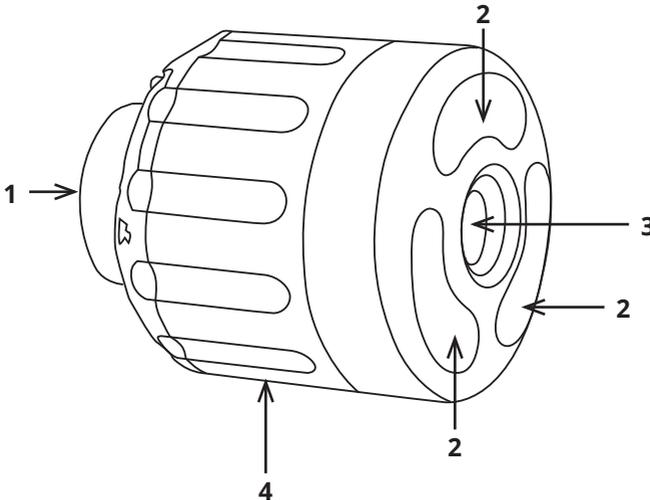
CAM027 – Axial Camera

The camera module CAM027 provides a high resolution, colour, axial camera for the PROTEUS™ inspection system. It has the following features:

- High resolution colour CCD image sensor
- Powerful LED lighting with narrow beam width lenses
- Motorised focus control

The camera module is not pressurised but is suitable for inspections up to 5m water depth.

Connections and Descriptions



- 1 Camera connector
- 2 LED illumination
- 3 Camera lens
- 4 Serial number location

Information and Care

Pressurisation

The camera module is not pressurised.

Cleaning

Ensure the camera module is thoroughly cleaned after each inspection. Ensure the connectors are free from dirt and moisture. Always fit the protective cap immediately after disconnecting the camera module from the system.

Maintenance

Ensure that the camera connector is free from dirt.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Technical Details CAM027

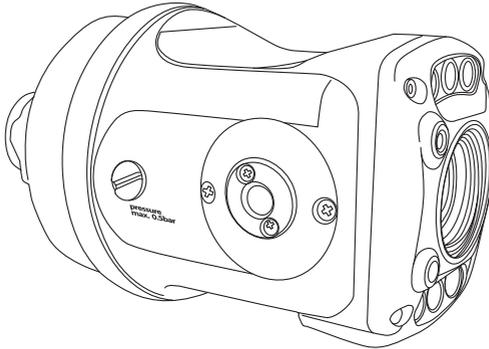
Product ID:	CAM027
Dimensions:	63 x 52 x 52mm (L x W x D)
Power Consumption:	7W
Weight:	0.25Kg (0.55lb)
Temperature Range:	-20°C ~ +50° C
Environmental Protection:	Pressure Tested IP68
Internal Pressure:	None

CAM028L – Pan, Rotate, Zoom & Laser Camera

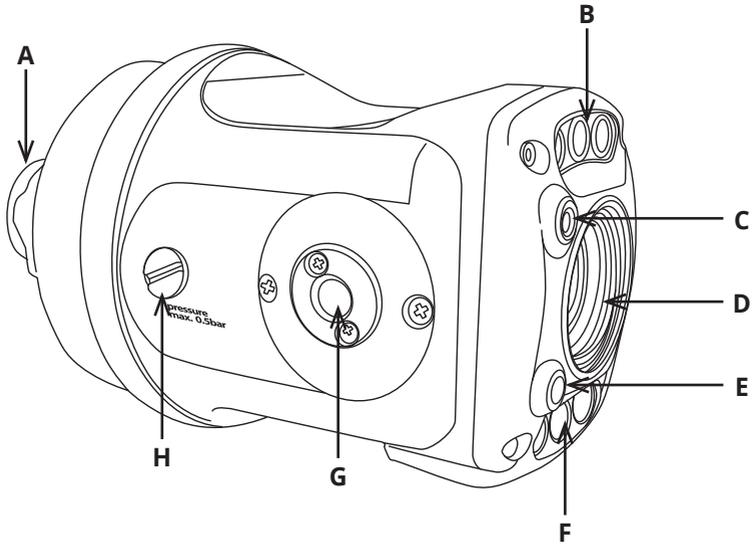
The camera module CAM028L provides a high resolution, colour, pan, rotate laser and zoom camera for the PROTEUS™ platform. It has the following features:

- High resolution colour CCD image sensor
- Powerful LED lighting with narrow beam width lenses
- Distance Sensor
- Aligned Lasers
- Endless rotation range
- Panning range of +/- 135°
- 10x optical 12x digital zoom
- Motorised focus control
- Internal pressure monitoring

The camera module is pressure-tight up to 1 bar.



Connections and Descriptions



- A Camera connector
- B LED illumination
- C Laser
- D Camera lens
- E Laser
- F LED illumination
- G Distance Sensor
- H Purge Point

Operation of the Dual Lasers

Connect the camera to the crawler and power up the CCU (page 46).

To turn the Dual Lasers On and Off

- 1 Press the **Camera Settings** key 
- 2 From the on-screen menu, select Lasers by pressing the  **F3** key.
- 2 To switch off the dual lasers press the  **F3** key.

Information and Care

Pressurisation

The camera module must always be correctly filled with CO₂ or Nitrogen. The control unit displays the internal pressure.

Cleaning

Ensure the camera module is thoroughly cleaned after each inspection. Ensure the connector is free from dirt and moisture. Always fit the protective cap immediately after disconnecting the camera module from the system.

Maintenance

Ensure that all screw threads and connections are free from dirt. Replace the rubber protectors when worn or damaged.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Technical Details CAM028L

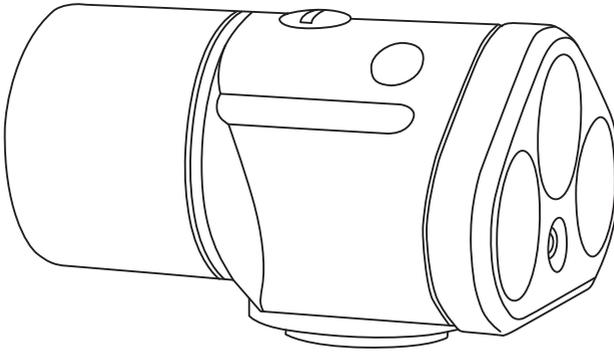
Pipe Diameter Measurement Range:	90 – 600mm
Aligned Laser Spacing:	30mm
Camera Resolution:	530 HTVL
Sensitivity:	< 1.0 lux
Aperture/Field of View:	F1.8 – F2.9 / 46° – 4.6°
Maximum Illumination Intensity:	12.5k lux at 150mm
Pressure Depth Rating:	1 bar (14.50psi)
Dimensions L x W x H:	143 x 80 x 80
Weight:	1148g

ALB300 - Auxiliary Module

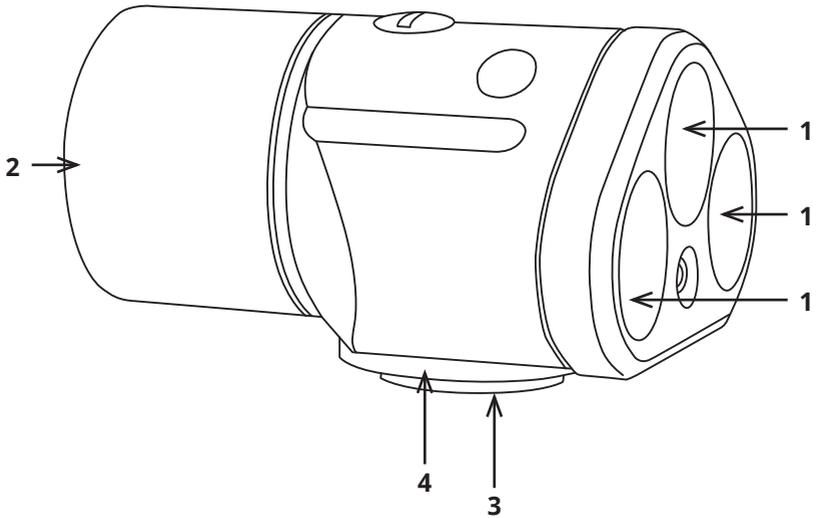
The auxiliary module ALB300 provides additional illumination for the forward view camera and a rear view, high resolution, colour, camera for the PROTEUS™ platform. It has the following features:

- High resolution colour CCD image sensor
- Powerful LED lighting with narrow beam width lenses

The auxiliary module is not pressurised but is suitable for inspections up to 5m water depth.



Connections and Descriptions



- 1 Forward LED illumination
- 2 Rear view camera
- 3 Connector
- 4 Serial number location

Information and Care

Pressurisation

The camera module is not pressurised.

Cleaning

Ensure the camera module is thoroughly cleaned after each inspection. Ensure the connectors are free from dirt and moisture. Always fit the protective cap immediately after disconnecting the camera module from the system.

Maintenance

Ensure that the camera connector is free from dirt.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Technical Details ALB300

Product ID:	ALB300
Dimensions:	84 x 68 x 50mm (L x W x D)
Power Consumption:	4W
Weight:	0.32Kg (0.70lb)
Temperature Range:	-20°C ~ +50° C
Environmental Protection:	Pressure Tested IP68
Internal Pressure:	None

PSP24 - External Power Supply Unit

The external PSU PSP24 provides power to the PROTEUS™ inspection system. It is required to charge the internal battery of the control unit, charge the external battery pack BPP24 and also to power the crawler.

Specifications

OUTPUT	Minicam Part Number	PSP24
	Safety Model Number	GS280A24
	DC Voltage	24V
	Rated Current	11.67A
	Current Range	0~11.67A
	Rated Power	280W
	Voltage Tolerance	+/-3%
	Load Regulation	+/-3%
INPUT	Voltage Range	90~264VAC
	Frequency Range	47~63 Hz
	Efficiency (Type)	93%
	AC Current	3A 115VAC 1.5A 230VAC
ENVIRONMENT	Working Temp	-30°C ~ +60°C
	Working Humidity	20%~90% RH non-condensing
	Storage Temp	-40°C ~ +85°C
	Storage Humidity	10~95% RH
OTHER	Dimensions	220 x 92 x 46 (L x W x H)
	Weight	1.25Kg (2.75lb)



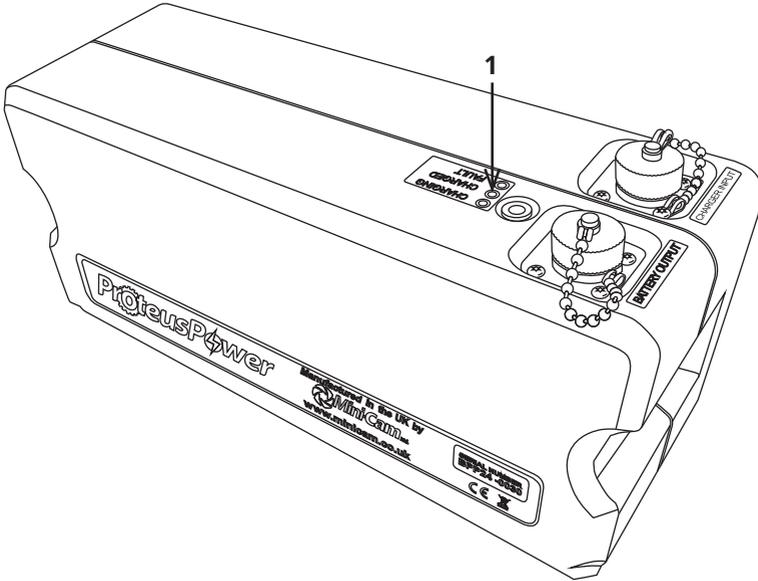
DANGER!

Risk of deadly injuries from electrical current!

Only the power supply supplied as part of the PROTEUS™ inspection system can be used and should **NOT** be replaced by any other.

BPP24 - External Battery Pack

The external battery pack BPP24 provides power to the PROTEUS™ inspection system when used in portable applications or where conventional mains power is not readily available. It uses the PSP24 external power supply unit to recharge.



1 A single, multi-colour, LED indicator located on the top of the BPP24 provides quick identification of status:

STATUS	COLOUR
CHARGING	AMBER
FULLY CHARGED	GREEN
FAULT	RED

Specifications

INPUT	<i>Input Voltage</i>	24DC
	<i>Charging Input Current</i>	3A
OUTPUT	<i>Output Voltage</i>	24DC
	<i>Maximum Output Current</i>	14A
OTHER	<i>Total Power</i>	347Wh
	<i>Capacity</i>	14Ah
	<i>Dimensions</i>	280 x 100 x 120 (L x W x H)
	<i>Weight</i>	3Kg (6.61lb)
ENVIRONMENT	<i>Working Temperature (Charging)</i>	0°C ~ +40°C
	<i>Working Temperature (Discharging)</i>	-10°C ~ +50°C
	<i>Storage Temperature</i>	-20°C ~ +85°C
	<i>Working Humidity</i>	20% ~ 90% RH non-condensing
	<i>Storage Humidity</i>	10% ~ 95% RH



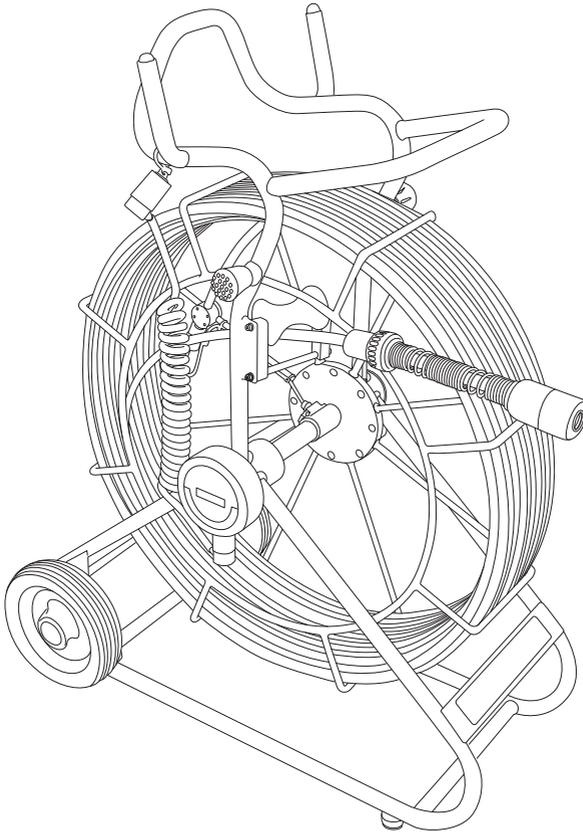
DANGER!

Risk of deadly injuries from electrical current!

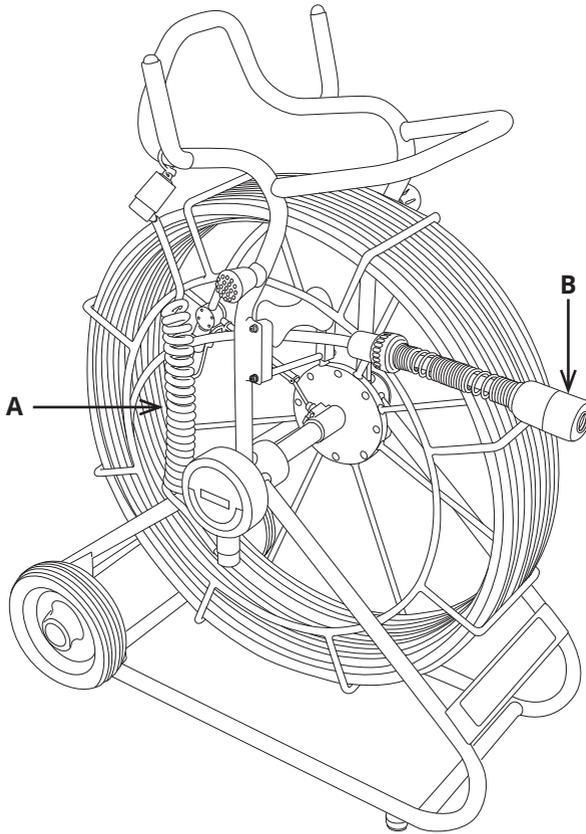
Only the external battery pack BPP24 supplied as part of the PROTEUS™ system can be used and should NOT be replaced by any other.

CCP60 - Compatible Coiler

The compatible coiler CCP60 provides a push camera solution to the PROTEUS™ inspection system when the application may prohibit the use of a crawler for inspection. It features an interchangeable camera head and connects directly to the CCU via the supplied 5m cable.



Connections and Descriptions



A Coiled Link cable (shown) or Extension Reel Cable (not shown) plugs directly into the CCU.

B Interchangeable camera head (CAM025 shown).

The interchangeable camera head allows the operator to use the **CAM026** pan and rotate camera instead of the supplied CAM025 self-levelling axial camera. This provides great flexibility to meet demanding inspection requirements.



NOTE!

The CCU can power the compatible coiler without the use of External Charger PSP24 or Proteus Battery Pack BPP24 .

Information and Care

Cleaning

Ensure that the cable is thoroughly cleaned after each inspection. Use a wet rag when winding the cable rod back onto the coiler. Ensure the connector for the coiler is free from dirt and moisture. Always fit the dust caps immediately after disconnecting the cable reel from the system.

Maintenance

Ensure that all screw threads and connections are free from dirt.



CAUTION!

High-pressure cleaners **must not** be used. It can cause considerable damage to the crawler, camera and other system components.

Cleaning agents or solvents **must not** be used. These can damage the seals and other materials on the system.

Only clean water should be used.



IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

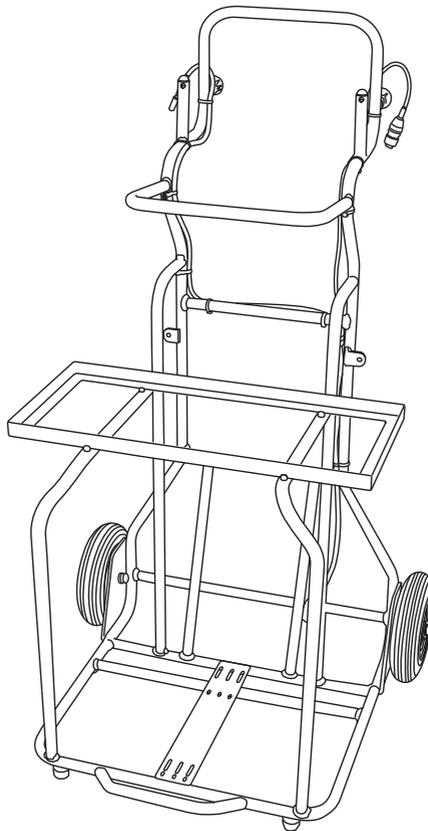
Technical Details - CCP60

Product ID:	CCP60
Dimensions:	890 x 360x 690mm (H x W x D)
Power Consumption:	17W
Weight (without CCU):	21.35Kg (47.1lb)
Temperature Range:	-20°C ~ +50° C
Environmental Protection - Camera:	IP68
Environmental Protection Coiler:	IP54
Internal Pressure:	None

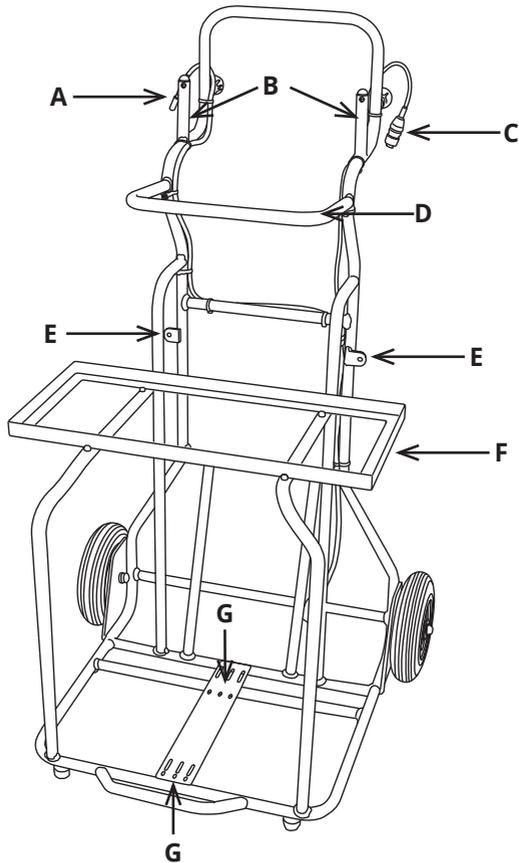
PTP01 – Portable Trolley

Portable Storage Trolley PTP01 is designed to allow for the mobile operation of the PROTEUS™ Inspection System in difficult to reach areas, such as inside

buildings, or other locations a distance away from your vehicle. The compact space-saving design accommodates the Digital Control Unit (not shown), Battery Pack (BPP24), Accessory Case and 100m Motorised Cable Reel (RMP100) or 200m Motorised Cable Reel (RMP200) or 200m Manual Cable Reel (RAP200), making the whole PROTEUS™ inspection system highly portable.



Connections and Descriptions



- A** Cable reel link cable for (Minicam Part No. LCP1.5).
- B** CCU location pins
- C** Battery pack link cable (Minicam Part No. ASS-002-974).
- D** Keyboard support.
- E** Battery pack fixing brackets.
- F** Accessory box tray.
- G** Cable reel (RMP100/RMP200/RAP200) fixing locations.

Equipping PTP01 Portable Storage Trolley

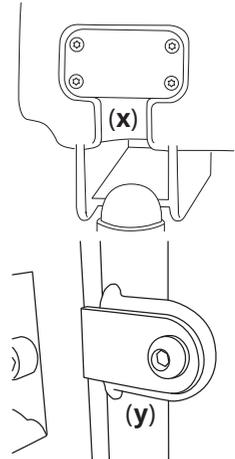
The PTP01 Portable Storage Trolley is delivered fully equipped* from the factory. Should you need to remove, then replace any of the equipment, please follow the instructions below.

Control Unit

- 1 Position the CCU by aligning the location apertures **(x)** on the back of the CCU over and down onto the CCU location pins **(B)**.

Battery Pack

- 1 Attach the fixing plates **(y)** to the back of the battery pack using the nuts and bolts provided.
- 2 Align the fixing plates to the fixing brackets **(E)**.
- 3 Secure the battery pack in place using the nuts and bolts provided.



Accessory Box

The accessory case supplied with your PROTEUS™ inspection system should be positioned into the accessory box tray **(F)**.

Cable Reel RMP100-RMP200

- 1 Position the cable reel onto the bottom section of the trolley.
- 2 Align the hole at the base of the brake side of the cable reel with the hole in the cable reel fixing bracket **(G)**. Align the hole at the base of the opposite side of the cable reel with the cable reel fixing bracket **(Gi)** for RMP100 or **(Gii)** for RMP200.
- 3 Secure the cable reel to the brackets using the nuts and bolts provided.

- See page 132 Portable Storage Trolley Equipped

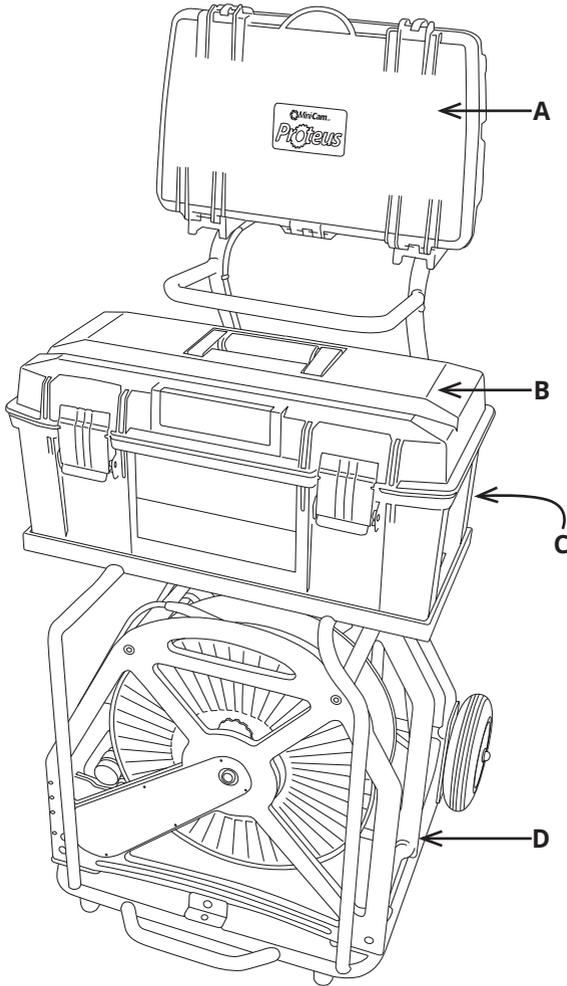
Information and Care

Maintenance

Ensure that trolley frame and wheels are free from debris and dirt.

**When purchased with a system*

PTP01 Portable Storage Trolley Equipped



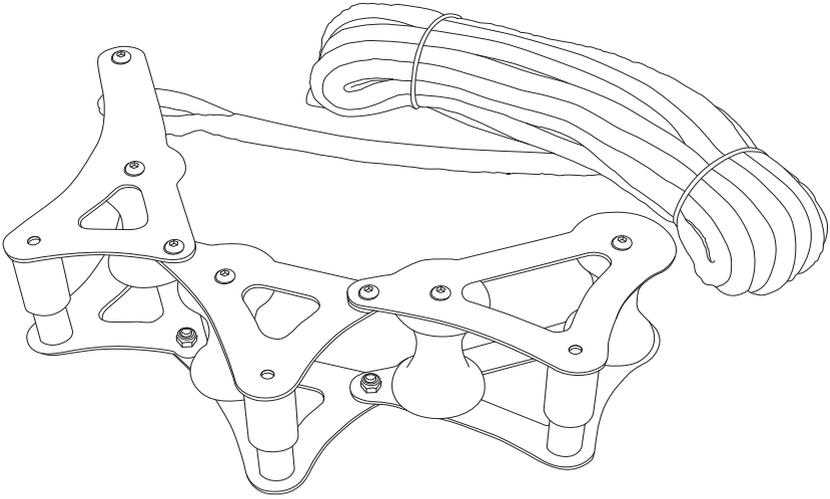
- A** Digital Control Unit
- B** Accessory Case
- C** Battery Pack (*behind Accessory Case*)
- D** Cable Reel

Technical Details - PTP01

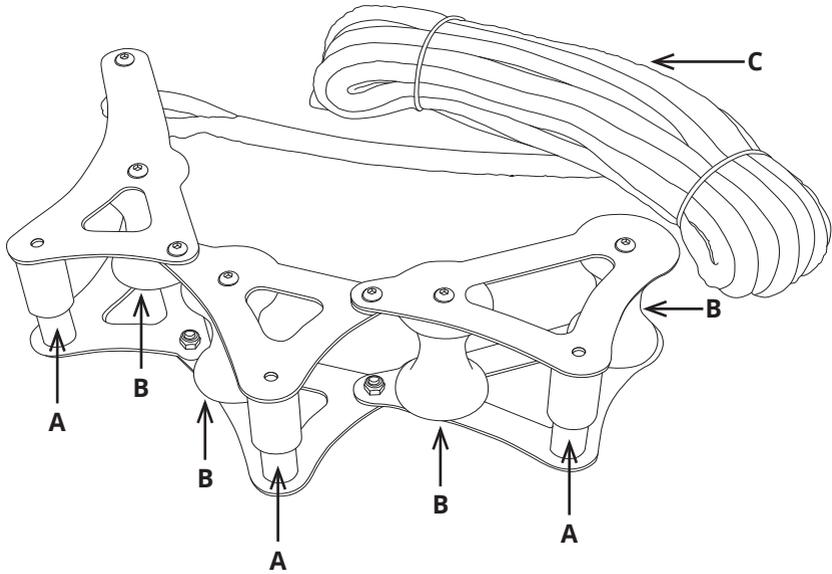
Product ID:	PTP01
Dimensions:	650 x 1150 x 720mm (Wx H x D)
Weight:	9.75Kg (21.5lb) Unladen

CGP01 – Cable Guide Pulley

The Cable Guide Pulley Reduces wear by preventing kinks and chaffing, and assists in the smooth guiding of the inspection cable during your survey. CGP01 comes complete with 12metres of heavy-duty reinforced rope and features a quick release mechanism for easy deployment.

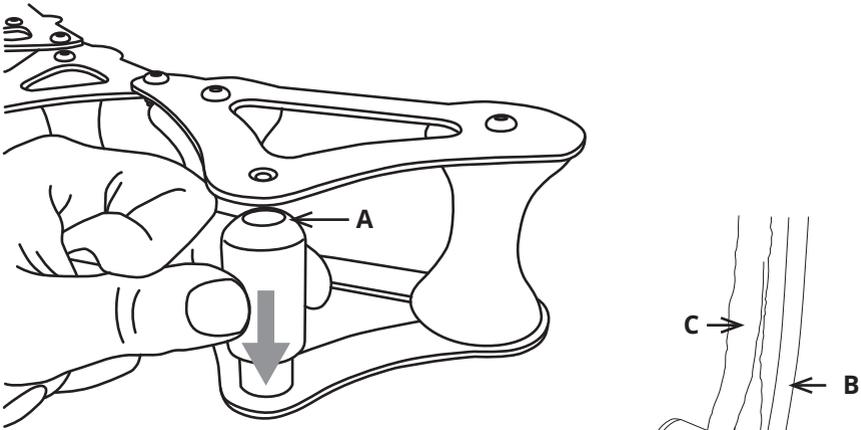


Parts and Descriptions



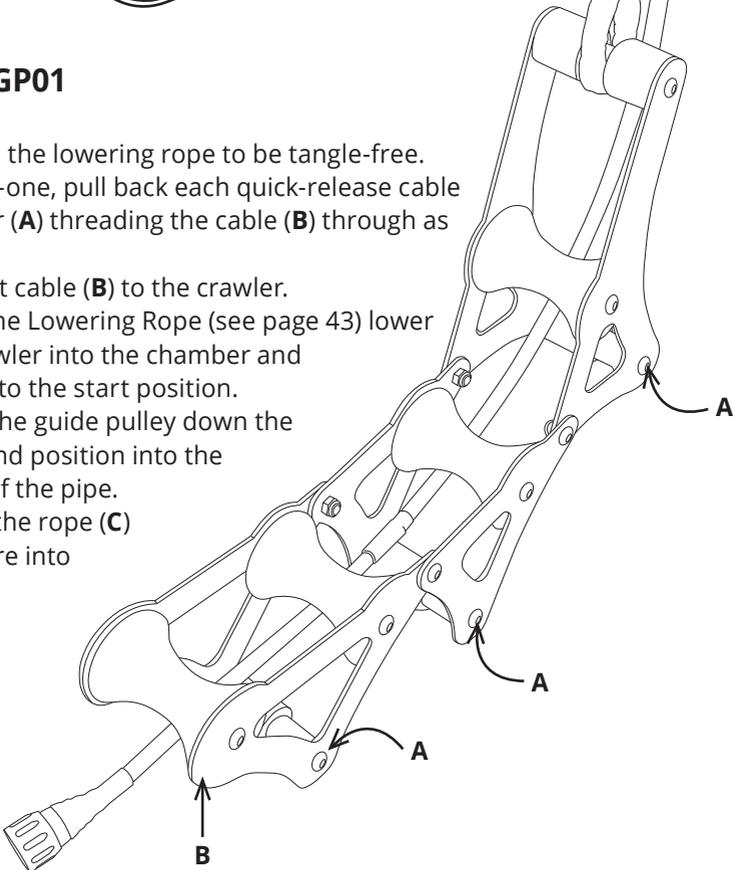
- A** Quick-release cable retainer..
- B** Roller.
- C** Rope.

Using CGP01 Cable Guide Pulley



Using CGP01

- 1 Unravel the lowering rope to be tangle-free.
- 2 One-by-one, pull back each quick-release cable retainer (A) threading the cable (B) through as you go.
- 3 Connect cable (B) to the crawler.
- 4 Using the Lowering Rope (see page 43) lower the crawler into the chamber and drive into the start position.
- 5 Lower the guide pulley down the cable and position into the invert of the pipe.
- 6 Tie-off the rope (C) to secure into place.



Information and Care

Maintenance

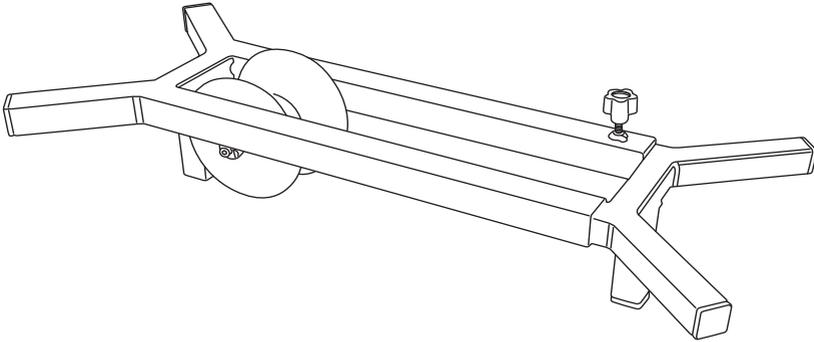
Ensure all parts are free from debris and dirt.

Technical Details - CGP01

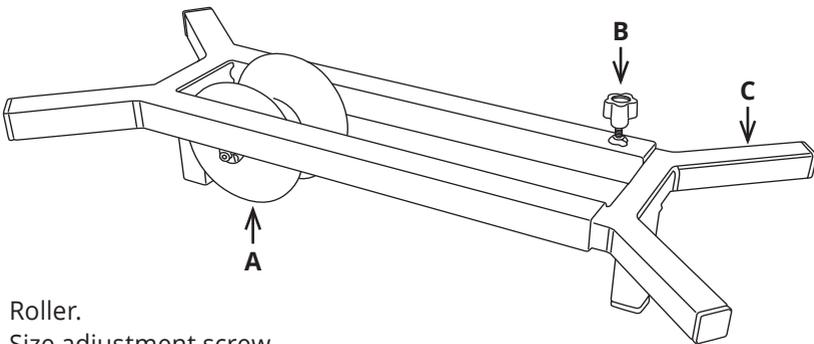
Product ID:	CGP01
Dimensions:	490 x 80 x 100mm (L x W x H)
Weight:	2.7Kg (5.9lb)

TRP01 – Manhole Top Roller

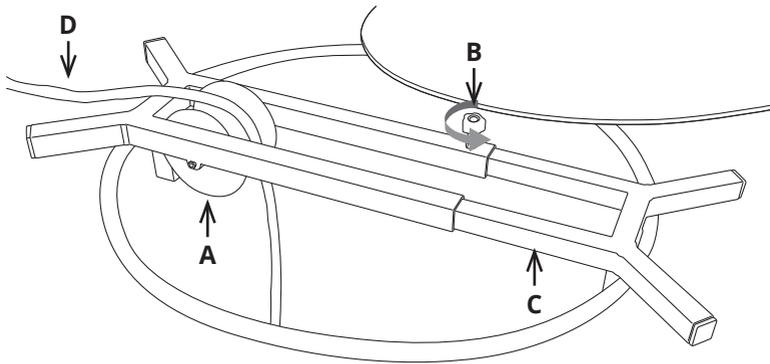
The Manhole Top Roller TRP01 reduces wear and tear of the inspection cable by preventing kinks and chaffing, and assists in the smooth guiding of the inspection cable during your survey. Fully adjustable to fit most manhole sizes.



Parts and Descriptions



- A** Roller.
- B** Size adjustment screw.
- C** Adjustable extension arm.



Using TRP01

- 1 Loosen the size adjustment screw (**B**) sufficiently to allow the extension arm (**C**) to be withdrawn and removed.
- 2 Guide the cable (**D**) over the roller (**A**) and replace the extension arm (**C**).
- 2 Position the Manhole Top Roller over the manhole, extending the extension arm (**C**) to fit the manhole opening.
- 3 Tighten the size adjustment screw (**B**) to secure the extension arm.

Information and Care

Maintenance

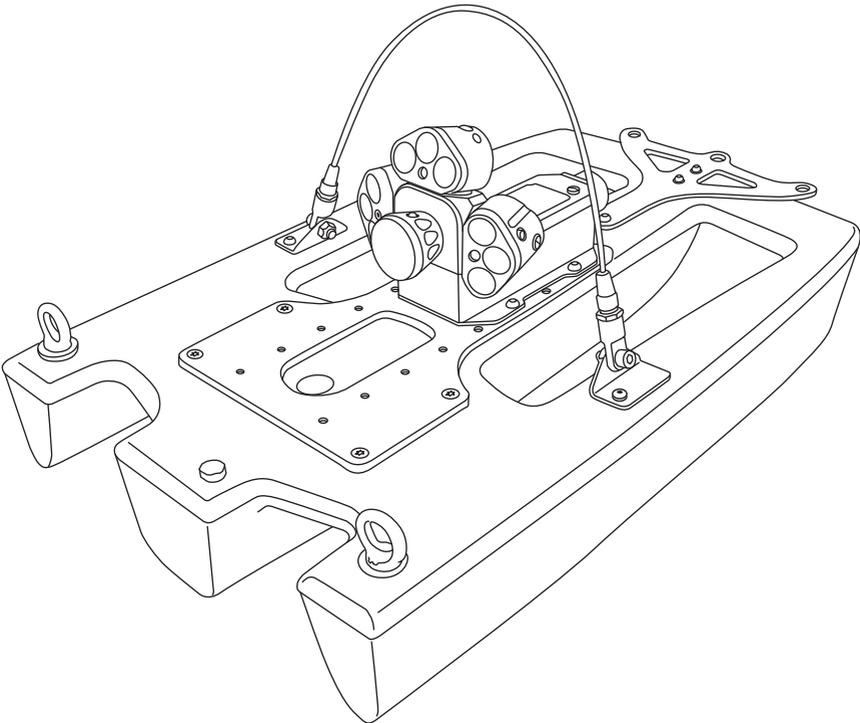
Ensure all parts are free from debris and dirt.

Technical Details - TRP01

Product ID:	TRP01
Dimensions:	650 x 280 x 160mm (L x W x H)
Weight:	4.3Kg (9.4lb)

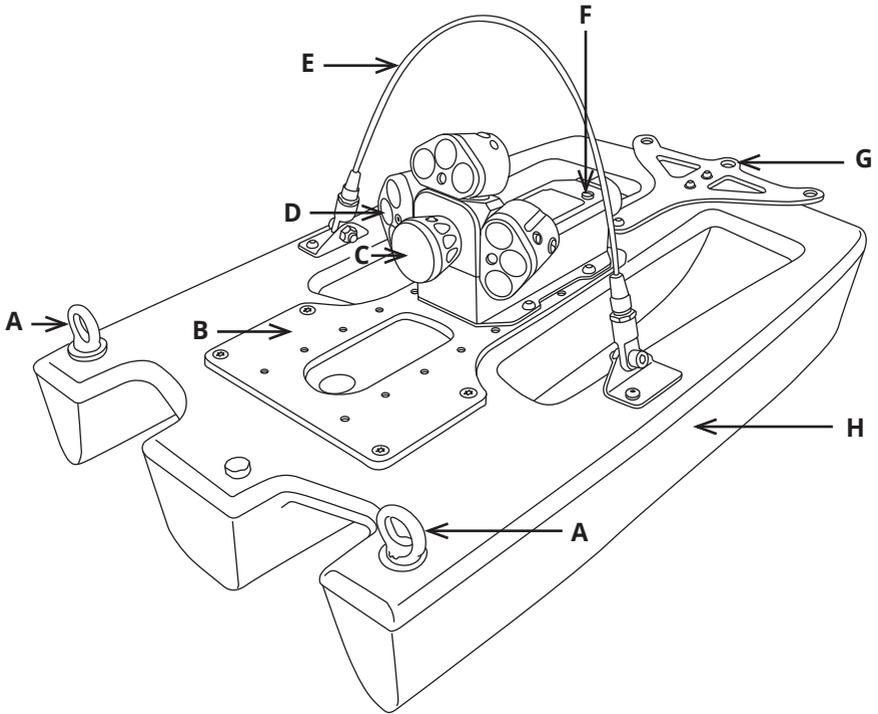
FRPO1 – Floatation Raft

Designed for use in large diameter high flow pipes in excess of 1000mm. The raft is small enough to be lowered down most common sizes* of manhole cover, eliminating the need for man-entry. Specifications of the FRPO1 comply with today's stringent health and safety policy requirements.



*from 600mm

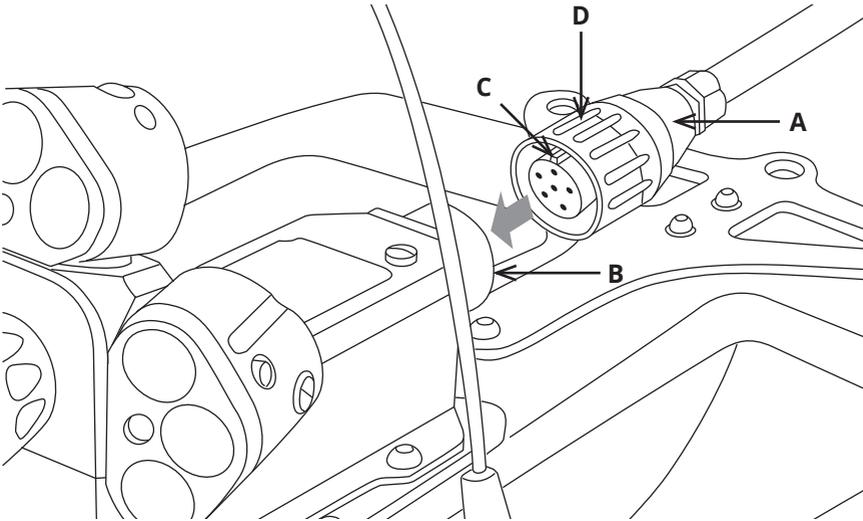
Parts and Descriptions



- A Guide Eyelet
- B Balance Plate
- C Camera Connector Protection Cap
- D LED Auxiliary Light Cluster
- E Lowering Loop
- F Pressure Valve Protection Cap
- G Strain Relief
- H Raft

Connection of Cabling between Cable Reel and Raft

Connect the cable reel cable to the back of the floatation raft as illustrated:



- 1 Plug the female plug of the cable reel (**A**) into the connector at the rear of the raft (**B**). Notice the orientation of the plug (**C**).
- 2 Turn the retaining ring (**D**) clockwise, as viewed from the cable, to lock the plug into the connector at the rear of the raft (**B**). The retaining ring is not able to unscrew itself during use, providing it is cleaned and maintained.



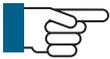
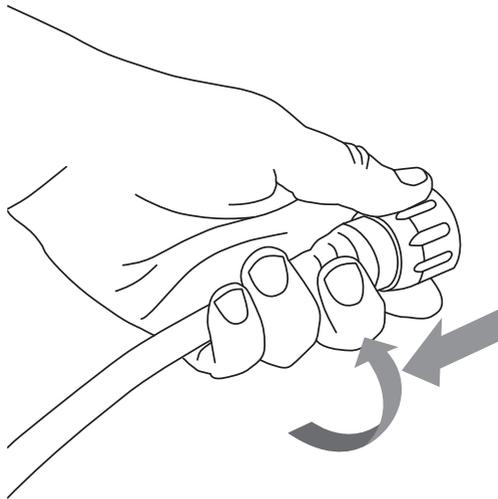
IMPORTANT!

KEEP ALL ELECTRICAL CONNECTIONS AND CONTACTS FREE OF DIRT, GREASE AND MOISTURE AT ALL TIMES.

Disconnecting Cabling between Cable Reel and Raft

Disconnect the cable reel cable from the back of the floatation raft as illustrated:

- 1 To unscrew the retaining ring you must pull the ring away from the body of the floatation raft before rotating anti-clockwise.

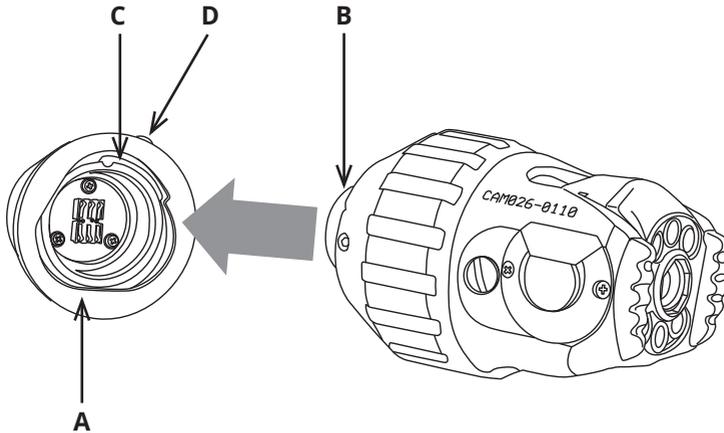


NOTE!

Always fit the protective caps when the raft or camera are not in use to protect from ingress of dirt and moisture.

Connection of Camera to Floatation Raft

Connect the camera to the floatation raft as illustrated:



- 1 Ensure the connections are free of debris, dirt and moisture.
- 2 Ensure the locking ring (**A**) is rotated fully clockwise, as viewed in the diagram.
- 3 Notice the orientation of the camera (**B**). Orientation pin locates here (**C**). Fit the camera.
- 4 Turn the locking ring (**A**) anti-clockwise, as viewed in the diagram, to lock the camera onto the raft.
- 5 Turn the grub screw (**D**) to lock the retaining ring in position using a 3mm Allen Key.
- 6 Removal is the opposite of fitting.



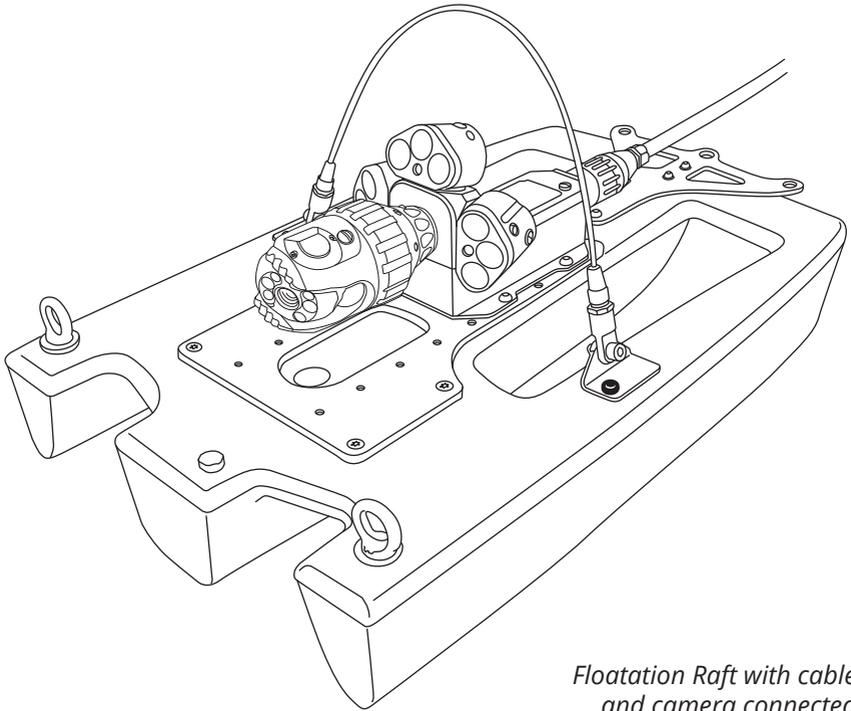
NOTE!

Grub screw has a mushroom head and cannot be fully removed. DO NOT OVERTIGHTEN!



NOTE!

Always fit the protective caps when the raft or camera are not in use to protect from ingress of dirt and moisture.



Floatation Raft with cable and camera connected

Information and Care

Maintenance

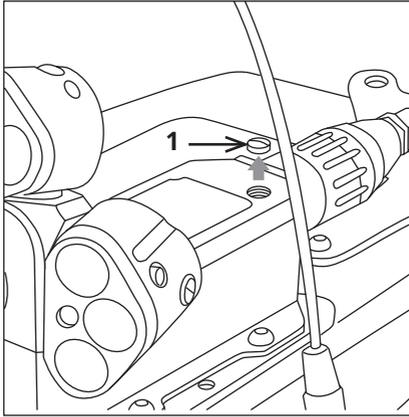
Ensure all parts are free from debris and dirt.

Technical Details - FRP01

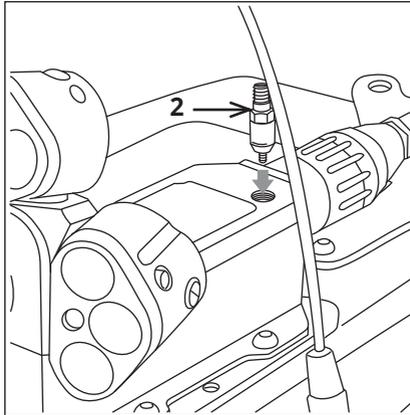
Product ID:	FRP01
Dimensions:	680 x 420 x 200mm (L x W x H)
Weight (without camera):	5.8Kg (12.7lb)
IP Rating:	IP68

Instructions for pressurising the FRP01 Floatation Raft

- 1 Connect the PROTEUS™ inspection system and apply power.
- 2 Unscrew the pressure valve protection cap (1)



- 3 Screw on the pressure valve (2).



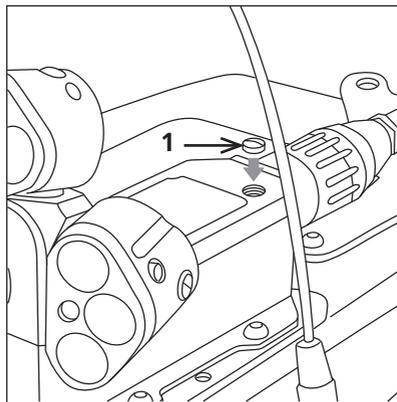
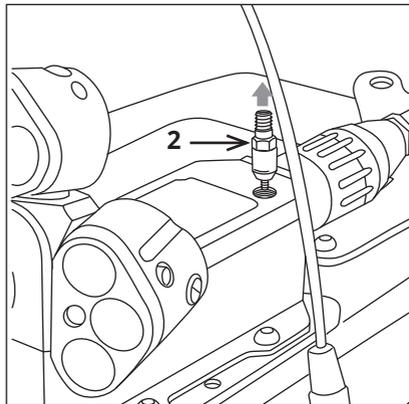
- 4 Set the pressure regulator for the CO₂ or nitrogen to 10 PSI.

- 5 Ensure the floatation raft pressure is within the acceptable range by checking the pressure gauge on the control unit. An example is shown below. Refer to the CCU section of this manual on specific instructions on how to access the pressure gauges.



Image shows an example of the control unit raft pressure gauge:

- 6 Remove the pressure valve (2).
- 7 Refit the pressure valve protection cap (1).



Inclination Logging & Reporting

For Proteus Crawlers

IMPORTANT - PLEASE NOTE

The inclination feature is for use only to show the estimated general trend of the pipe slope. Due to varying conditions such as pipe type, environments, vibration, sensor technologies, etc. Minicam cannot be held responsible for any inaccuracies or consequences arising from the use of the inclination feature, logged inclination data, or generated inclination reports.

Before commencing the Inclination Logging



NOTE!

Before commencing the inclination logging, follow the on-screen calibration instructions, ensuring this is done on a reasonably level, flat surface.



NOTE!

Inclination surveys are always best carried out **in reverse**, **after** completing your survey.

Inclination Sensing

Some Proteus crawlers are fitted with a sensor for inclination. The inclination measures the “slope” of the pipe as the crawler is driving along. The CCU, or a PC running suitable software applications (such as *WinCan*), can log the values of the crawler inclination during the survey. From the logged value, the CCU (or PC) can produce a graph showing the inclination slopes that the crawler experienced while driving along.

What inclination is for

Inclination is used to show the general trend in slopes within a pipe. It is not for accurate measurement, and can't accurately detect bumps such as pipe joints.

Mainly it is used to look for signs of where there might be dips or peaks in the pipe which could become water or silt traps.

Recommended Conditions for Inclination Logging

The quality of the inclination log depends upon many influences. When logging inclination, Minicam recommends the inclination is logged:

- in a clean pipe, so that the crawler does not lose traction
- when the crawler is reversing out of the pipe (to minimise shaking due to the crawler pulling on the cable)
- at a medium speed, without stopping the crawler, after the observation survey has been completed

It is possible to perform inclination logging when driving the crawler forwards, though if the crawler is regularly stopped and restarted, this will affect the inclination log quality.

Inclination Logging on the CCU

(If logging inclination using a PC application, please see the instruction manual for that application.)

Setting up the Crawler

Setting the Inclination Polarity

Some Proteus crawlers produce an inclination signal which works upside-down ('reversed'). For these crawlers you can tell the CCU to swap the signal around.

- When you lift the front of the crawler, the inclination values shown on the CCU screen should show POSITIVE values.
- When you lift the rear of the crawler, the inclination values shown on the CCU screen should show NEGATIVE values.

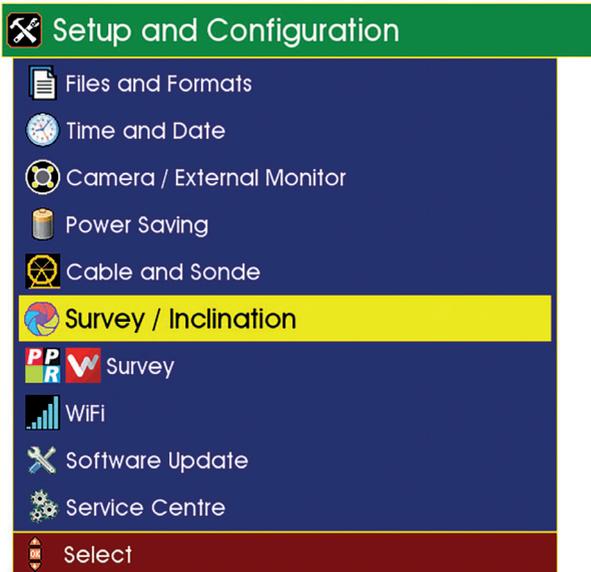
If you find that this is not true for your crawler, you may need to change the "Inclination Polarity".

- To change the Inclination Polarity, press  for Setup.
- Then select the menu item Survey / Inclination.
- Then the menu item Inclination Polarity.
- From there you can select Standard or Reversed, then press .

Inclination Zero Calibration

The inclination sensor on some Proteus crawlers should be 'calibrated', Minicam recommends that this is done before every inclination survey.

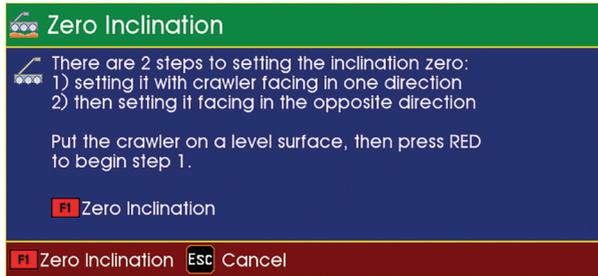
Power on your crawler, and press the Tools  key, then select “Survey / Inclination”.



If your crawler supports inclination zero calibration, you will see a menu item “Zero Inclination”. If it does not support inclination zero calibration, you can ignore the rest of this setup.



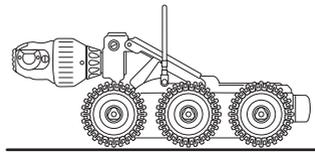
Select “Zero Inclination” and the first stage of the zero calibration begins:



There are two stages to performing the inclination zero calibration.

Stage 1

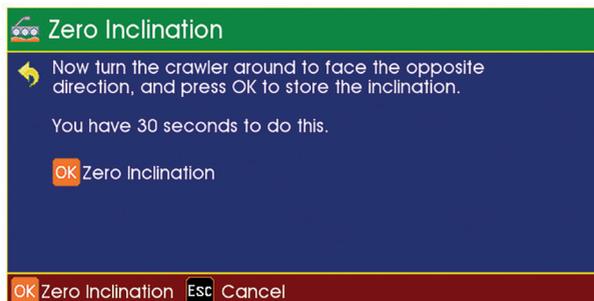
Place the crawler on a reasonably flat level surface (it does not need to be completely level).



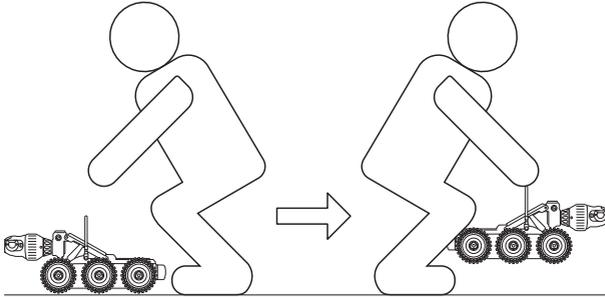
Now press the Red F1  key to perform the first stage of the calibration, and the CCU then moves on to Stage 2.

Stage 2

The CCU shows:



Pick up the crawler and turn it around through 180° so it faces in the opposite direction, and place it in the same place on the same reasonably flat level surface. **You have 30 seconds in which to do this.**



Press **OK** to complete the calibration.

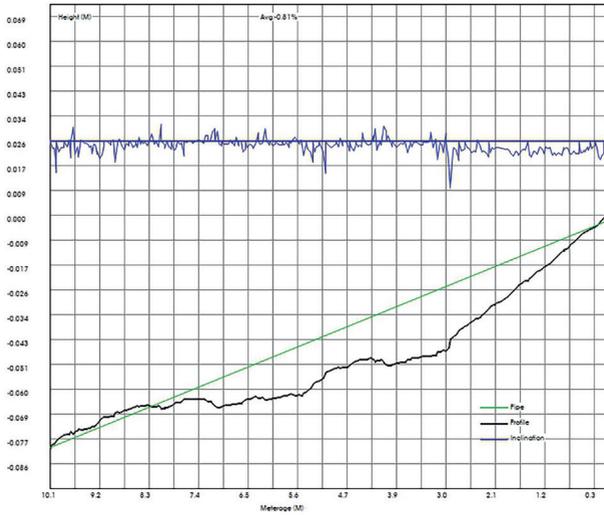
The inclination zero has then been calibrated, and the crawler is then ready for use.

Setting the Inclination Smoothing

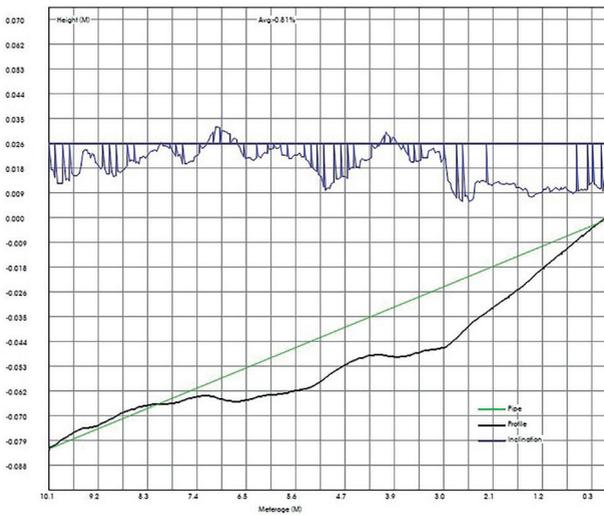
As the crawler drives along the pipe it encounters bumps, unevenness and vibrations which can affect the sensor readings that are logged. When this is subsequently plotted onto a graph, those inaccuracies can show as spikes and bumps on the graph lines.

You can choose whether to have the CCU apply a “smoothing” to the sensor readings, to help to flatten out the bumps, unevenness and vibrations. Then the plotted graphs will have much smoother lines. Normally you may wish to have smoothing enabled.

- To enable or disable Inclination Smoothing, press  for Setup.
- Then select the menu item Survey / Inclination.
- Then the menu item Inclination Smoothing.
- From there you can select Disable or Enable, then press **OK**.

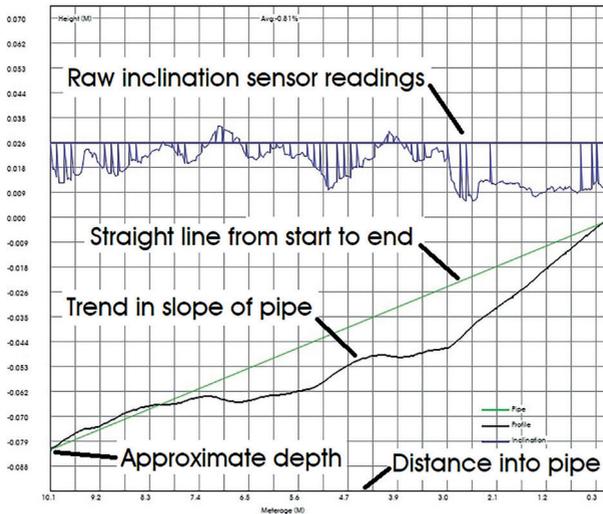


This graph was produced WITHOUT smoothing.



This graph was produced WITH smoothing.

Interpreting the Inclination Graph

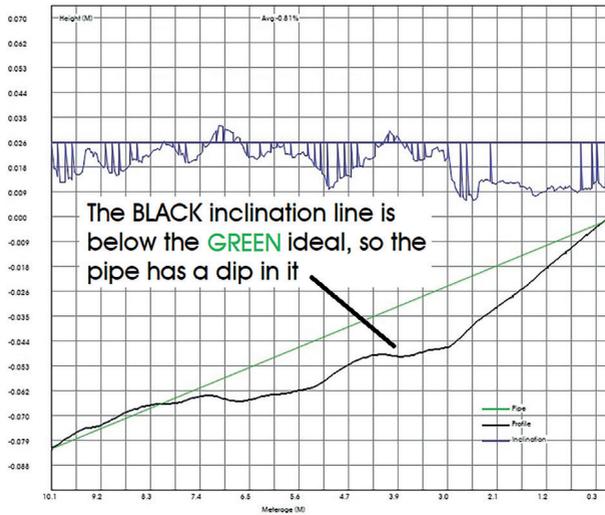


The **BLUE** line indicates raw sensor readings, normally you can ignore this line.

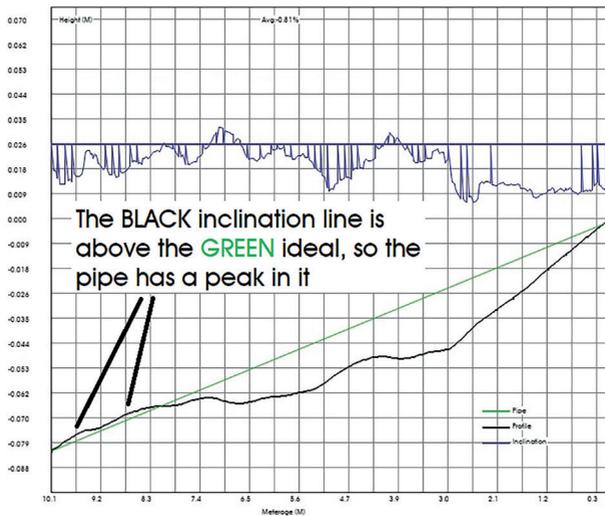
The **GREEN** line indicates an ideal straight line from the start depth to the end depth. A perfect pipe would be completely straight and flat and have no dips or bumps – in which case the **GREEN** line would represent the actual bottom of the perfect pipe.

The **BLACK** line is the slope of the pipe measured by the inclination. When the **BLACK** line goes below the **GREEN** line, it means the pipe has a **dip** in it. When the **BLACK** line goes above the **GREEN** line, it means the pipe has a **peak** in it.

A perfect pipe that had no dips or peaks would draw a **BLACK** inclination line directly over the top of the **GREEN** ideal straight line.



Here the BLACK line goes below the GREEN line, so it means the pipe has a dip in it.



Here the BLACK line goes above the GREEN line, so it means the pipe has a peak in it.



PRO PIPE+

**WinCan Embedded and ProPIPE+
Reporting Software
for Proteus™ and SOLOPro+ Systems**

Version B

Principle

WinCan Embedded and *ProPIPE+* on the *Proteus™* and *SOLOPro+* CCUs allows you to create and maintain your surveys collected together as “Projects”.

Within a Project you can have many separate “Sections”. For example, a “Project” might be a housing estate, and each street within that housing estate could be a “Section”.

Each Project is stored in it’s own Folder in memory. The Folder contains all the information about that Project’s Sections, and their videos, photos, and report documents.

You can:

- n Have as many Projects as you want.
- n Add Sections to Projects whenever you want.
- n Create, close, save, reopen, and edit previously created Projects.
- n Reopen and edit Section Surveys, even after you’ve finished the Survey.
- n Create PDF and RTF report documents in a choice of graphical or textual styles.
- n Export your Projects Folder onto a USB memory device for later viewing on a PC.
- n Import and merge together Sections from Projects made on other CCUs.
- n Import *WinCan* Projects into *WinCan VX* on the PC.
- n Upload files from *WinCan* Projects directly from the CCU to the *WinCanWeb* cloud.

Basic Usage

The structure is:

- n You can have multiple Projects, each has it's own storage folder.
- n A Project can contain multiple Sections.
- n Each Section has Header Information and a Survey.
- n A Survey can have multiple Observations and Photos, and a Video recording.

The basic operating sequence is:

- n Select *WinCan* or *ProPIPE+* as your Project type.
- n Create a New Project or open an Existing Project.
- n Create a New Section in that Project, or open an existing Section.
- n Perform the Survey, first filling in the Header Information, then making Observations.
- n End the Survey.
- n Review and edit the Survey if you want to.
- n Create a report from a choice of different styles. You get an RTF report document and a PDF report document.
- n Export the Project to a USB memory device so you can view on the PC.
- n For *WinCan* Projects, these can be imported into *WinCan VX* on the PC.

Quick User Guide

Refer to this Quick User Guide when the CCU is directly available. The Quick Guide does not explain every screen, or key, or scenario, and relies on you physically seeing it operating on the CCU as you work through the guide.

In a separate section later in this document is a Detailed User Guide containing screenshots and more information.

Create a New Project

- n Press  then choose  or 
- n Press  to create a New Project.
- n Use  and  to select the survey standard.
- n Enter the Project Name and comments (use  to navigate between fields).
- n Press  to create the Project, then this New Project will be listed as available.

Choose Which Project to use

- n Use  and  to highlight the Project Name you require and then press . This then opens the Project for you to create your Sections.

Create a Section in the Project

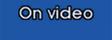
- n Press  then  to create a New Section.
- n Enter the Section Name and comments then press  to create the Section.
- n Your newly created Section will then appear in your Project.

Select the Project Section to use

- n Use  and  to highlight the Section name you require and press . This will then open the Section for you to enter the Section Header details.

Enter the Section Header Information

- n Enter all relevant Section Header information. Anything marked with a  is required information which needs to be entered to be able to proceed to next page. There may be several pages of Header Information.
- n If you would like to display any of the Header Information on the live video 'project bar text', press . This then displays the  and  keys for you to select the information you would like to display by highlighting the desired Header Information line

and pressing the relevant  and/or  key.

- n When all Header Information pages have been completed press .
- n Now you can enter some Text Comments which will appear in the final report document along with the observations.
- n After entering your comments press  to prepare for starting the Survey.
- n The screen will say "Ready for Survey" and informs you to press the  'Record' key when you want to begin. Press  now and this information box will disappear.
- n The screen will now display a live picture with your chosen Header Information showing on-screen.

Start Your Survey

- n Get your inspection equipment into position.
- n Start your recording by pressing the  key. A red recording symbol  will appear in the Status Box on the right of the screen which indicates your video recording and survey has begun. After a few seconds the on-screen video text will automatically disappear so that you can proceed with survey.

Create a New Observation

- n When you come to a point in your survey where you need to create a New Observation press  which will automatically pause the recording and show a Control Menu. Now you can either enter the Defect Code if you know it, or press to  select Survey Code Lookup which will give you a selection of Defect Category Folders to explore, then highlight the relevant Defect Code and press . Once you have entered or selected your Defect Code you fill in the information it asks for. Then press  to store the New Observation with *no photo* or press  to store *with a photo*.

- n Now you can continue your Survey. The system will automatically resume recording, and after a couple of seconds the observational text will disappear from the live picture.



NOTE!

If you move the camera before auto recording resumes you may notice a slight jump in the video playback!

- n Repeat these steps each time you wish to capture a new observation.

Review Your Survey

- n At any time, you can review the Observations in your survey. Press  and select Review Survey. This will show you each observation you have created with the meterage displayed along with the captured image.

End Your Survey

- n To end the survey press  then in the control menu that appears select End Survey and press  . You will be prompted to Confirm End Survey by pressing  .
- n A summary of the Section which has just been completed is then shown.
- n If multiple surveys are being performed immediately within the same Project, press  and then press  to create a New Section, then repeat everything, starting from that New Section's creation.
- n Otherwise you can just create a report for that section if you wish to.

Create Your Report Documents

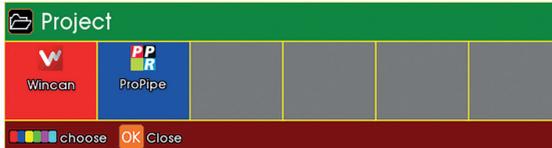
n To create an instant PDF report press . Then choose the style

of report that you want. The report is saved into the Project's folder along with the video and photos. You can copy the report onto a USB memory device using the Gallery Browser for later printing on a PC, or you can copy it to USB using the Project Export feature.

Detailed User Guide

Using Projects

Each Project is stored in it's own Folder in memory. The Folder contains all the information about that Project's Sections, and their videos, photos, and report documents.



Press the Projects  key, and the Project Type choice appears.

n Choose  or 

The Projects List appears

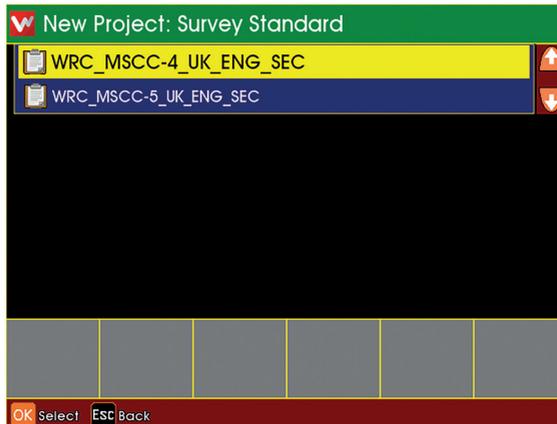


- n If you have any existing Projects, they will appear in the list.
- n If you have no existing Projects, the list will be empty

Choose New Project or an Existing Project

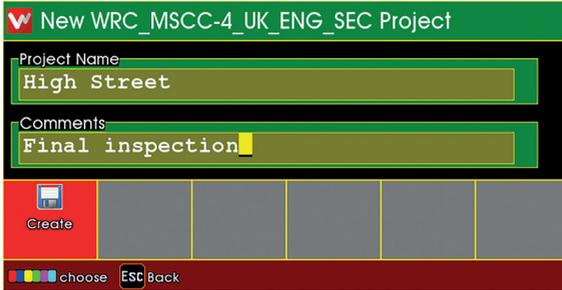
- To create a New Project, press  .
 - Or to open an existing Project, highlight it using the arrows  and then press  .
-

If you chose to create a New Project



- n Use the arrows  to select which Inspection Standard you wish to use, then press  .
- n Enter a Name for the Project.

- n You may also enter Comments for the Project of you wish.



- n Press  to create the Project.

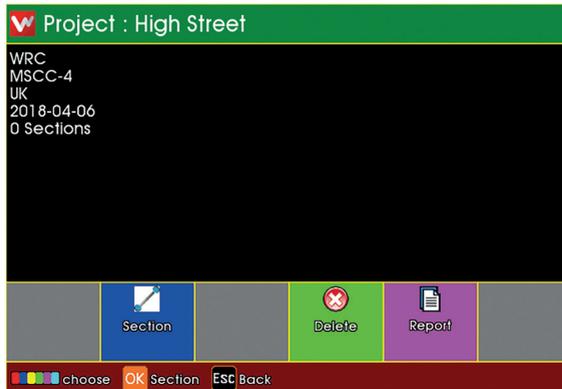
The Projects List appears

- n If you just created a New Project, it will appear in this list



- n Choose a Project to open
- n Highlight the Project using the arrows  and press .

The project is now opened



- n A summary of the Project is shown.
 - n A New Project will not yet have any Sections.
 - n An existing Project may already have Sections.
Press  to see existing Sections or create New Sections in the Project.
-

Using Project Sections

Each Project can contain either just one, or multiple Sections.

The list of Existing Sections is shown

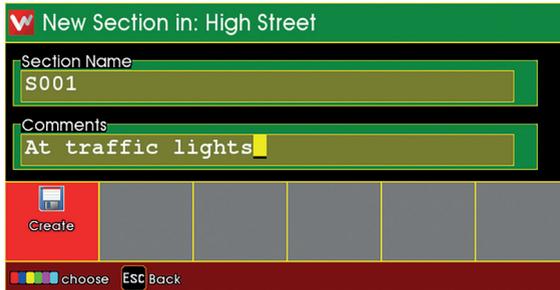


- n If the Project has any existing Sections, they will appear in the list.
- n If the Project has no existing Sections, the list will be empty.

You can choose to create a New Section in the Project, or open an Existing Section

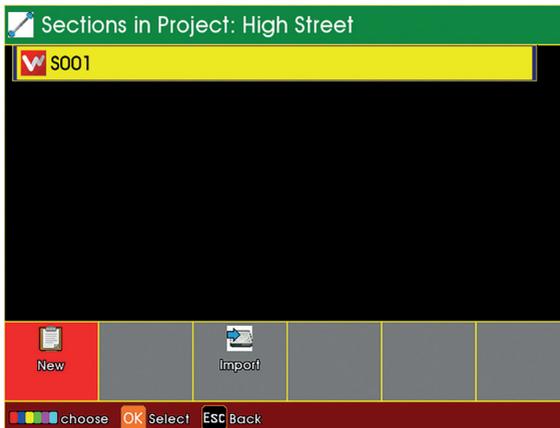
- n To create a New Section, press  .
- n Or to open an existing Section, highlight it using the arrows  and then press  .

If you chose to create a new section



- n Enter a name for the Section.
- n You may also enter comments for the Section of you wish.
- n Press  to create the Section.

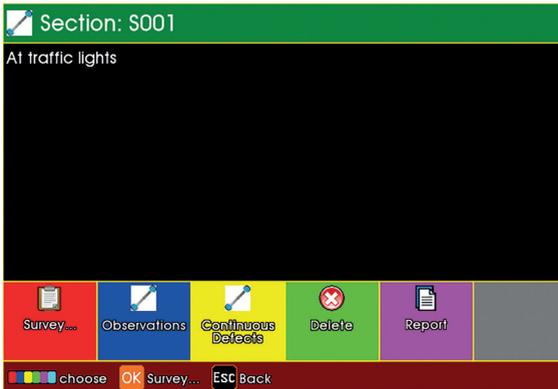
The Sections List appears



- n If you just created a New Section, it will appear in this list.
- n Choose a Section to open.
- n Highlight the Section using the arrows  and then press .

The Section is now opened

n A summary of the Section is shown.



If this is a New Section, you will need to perform the survey for the Section, so that you can create Survey Observations.

n Press  to begin performing the survey and create Observations.

If this is an Existing Section, it may already have had a survey performed for it, and will have existing Observations.

n Press  to review the existing Observations for this Section.

You can generate a Report Document for the survey Observations in this Section

n Press  to generate a Report Document

Preparing for the Survey

Entering Survey Header Information

If you chose to perform a survey for the Section:

The Survey Header Information appears

Section: S001 1/6

Job reference
Job001234

Location Code
FWY: A footway beside a road

Client
Council

Contractor's Job reference
CN5645

Name of Surveyor
Jim Smith

Street/Location
High Street

Save&Close Free Text More...

choose Symbols Select OK Store ESC Cancel

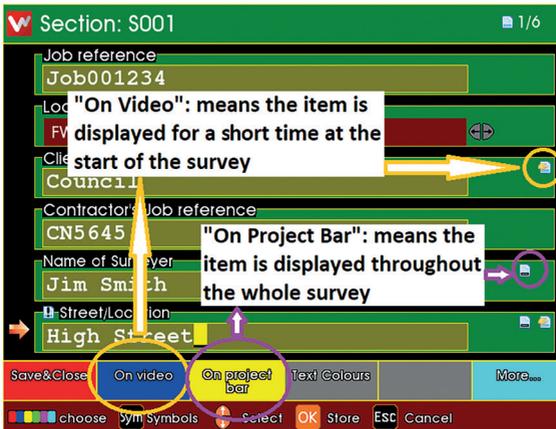
Means: Mandatory information that must be provided

- n Type in, or select, the appropriate information for the survey.
- n Anything marked with a  is mandatory information that must be provided.
- n There may be several pages of Header Information.

For each Header Information item, you can choose whether

- n it is displayed briefly onto the camera picture “On Video” at the start of the survey.
- n you would like it displayed constantly “On Project Bar” throughout the whole survey.

Press the **More...** key, and the choices of the coloured keys change.

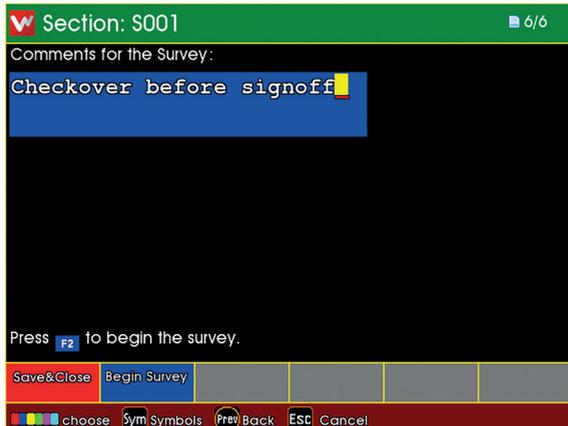


- n Press **On video** to toggle whether the Header Item is shown briefly at the start of the survey.
- n Press **On project bar** to toggle whether the Header Item is shown constantly throughout the survey.
- n Header Items can be both “On Video” and also “On Project Bar”.
- n There is a limit to the number of Header Items that can be selected simultaneously.



After entering all the Header Information, you can enter some comments for the Survey

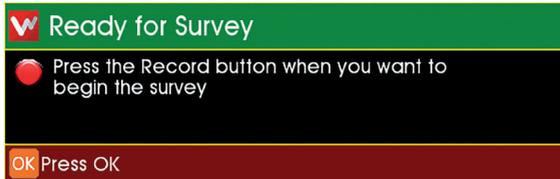
- n Type in some Survey Comments if you wish
- n Then press **Begin Survey** to prepare for performing the survey.



The system is now in Survey Standby, waiting for you to begin the survey.

n Video recording is ready, but is paused.

n Press the **OK** key, and position the inspection equipment ready for the survey.



Beginning the Survey

When you are ready to start video recording, press the  Record key.

- n Video recording starts.



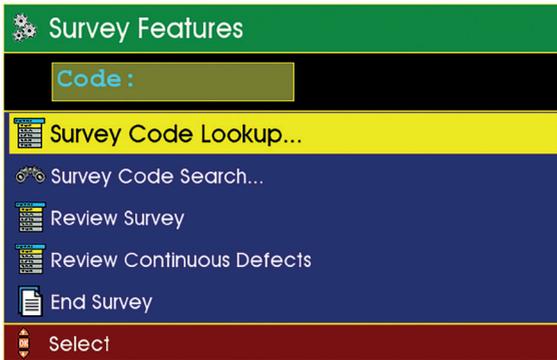
- n Your selected "On Video" Header Information text about the survey appears on the camera screen, and is recorded onto video.
- n After a short time, this information is removed.
- n You can now perform the inspection Survey.

Performing the Survey

Creating Defect Observations

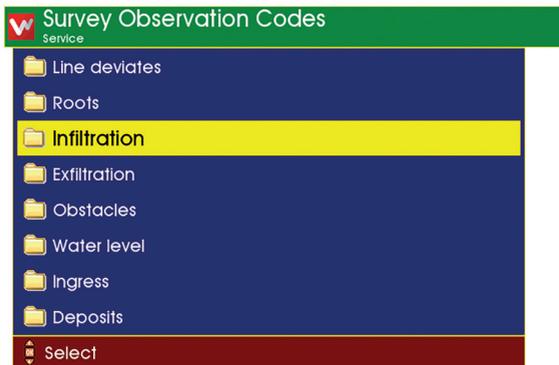
When you see a Defect, you can create an Observation for it.

Press the Projects  key, and the Survey Features menu appears.



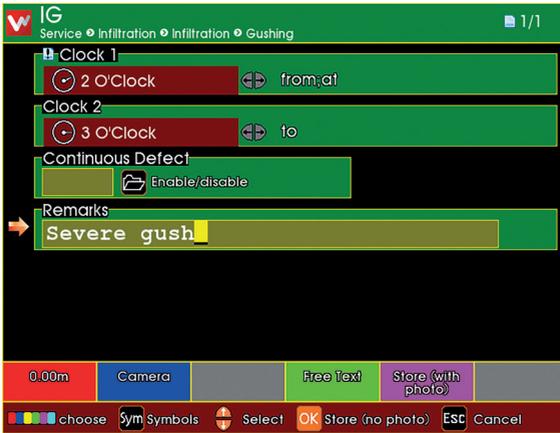
- n If you know the Defect Code, you can simply type it in.
- n If you don't know the code, you can search, or you can use the Lookup to find it.

If you chose to Lookup the Defect Code:
You see a list of the Defect Code categories



- n Use the arrows , **Esc**, and **OK** to browse the Defect Code categories to find the Defect Code that you require.
- n When you have found the Defect Code, press **OK**.

Enter the information for the Observation



- n Type in, or select, the appropriate information for the Observation.
- n Anything marked with a  is mandatory information that must be provided.
- n There may be more than one page of Observation Information.
- n When you have entered the information, you can store the Observation.
- n Press  to store without taking a photo.
- n Press  to take a photo then store.

If you chose to take a photo:

- n Your entered Observation Text information is shown on the camera screen

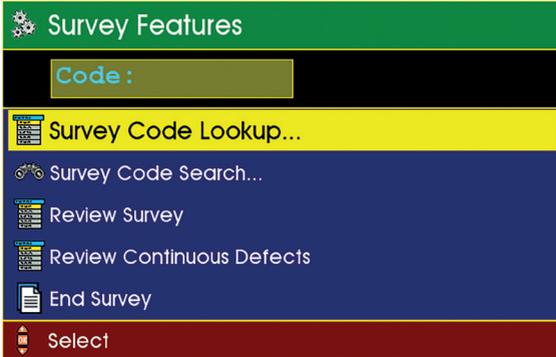


- n The system takes a photo, with this information on it.
- n After a short time, the information is removed.

Video recording then restarts automatically and you can now move on to find the next Defect.

Ending the Survey

Press the Projects  key, and the Survey Features menu appears.



n Select End Survey and press .



You are asked to confirm you do want to end the survey.

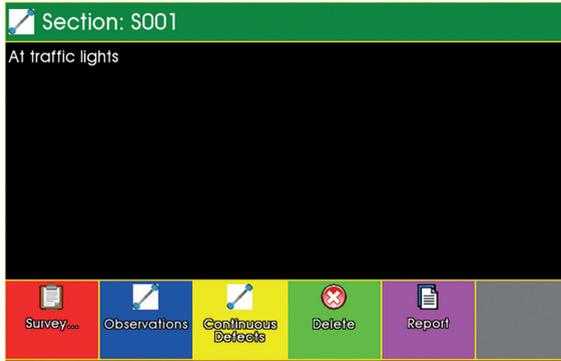
n Press  to confirm.

n Any other key cancels ending the survey.

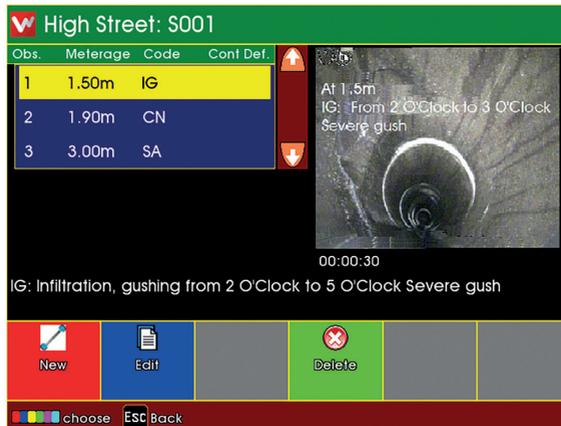
Reviewing the Survey

Viewing the Observations

When you have selected a Section, the Section Information is shown.



n Press  to Review the existing Observations for this Section.



The Section Observations are shown.

n Use the arrow keys  to select the Observation you are interested in. The screen shows the Observation information and the photo (if there is one).

n Press  if you want to Edit and change the selected Observation.

n Press  if you want to Delete the Observation (you will be asked to confirm the delete).

You can also create a New Observation, if one was missed when the Survey was being performed.

n Press  to create a New Observation.

Editing an Existing Observation

When you have selected the Observation to be edited, the Observation Information is shown.



n Make any changes as you desire.

n Press  to store your changes to that Observation.

Creating a New Observation

When you have chosen to create a New Observation



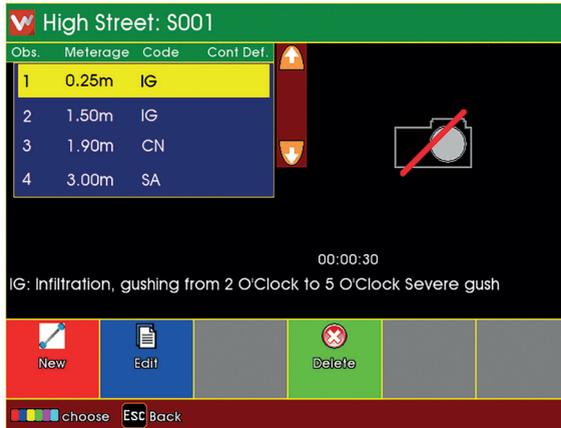
- n First select the Defect Code for that New Observation.
- n This is done in the same way as when the Survey was originally performed.
- n Either enter the Defect Code directly, or use Search, or use the Lookup.

When you have selected the Defect Code for the new Observation, the Observation Information is shown.



- n Enter the information as desired.
- n Press **OK** to store this as a New Observation.

Your New Observation now appears added into in the Review List of Observations.

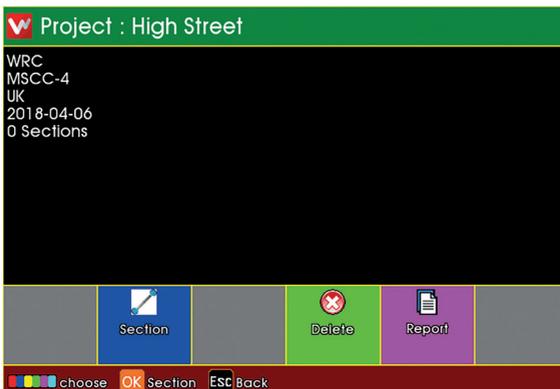


- n New created Observations don't have photos.
- n The Observations are sorted into ascending distance order.

Creating Reports

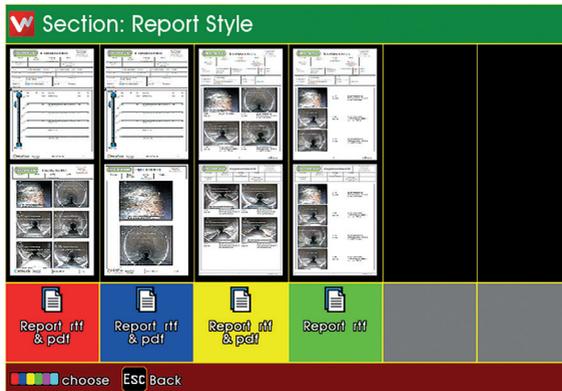
Creating Reports for the Whole Project

When you have selected and opened a Project, the Project Information is shown.



- n Press  to generate Report Documents for the whole Project.
- n Depending upon Project and Section complexity, this could take some minutes.

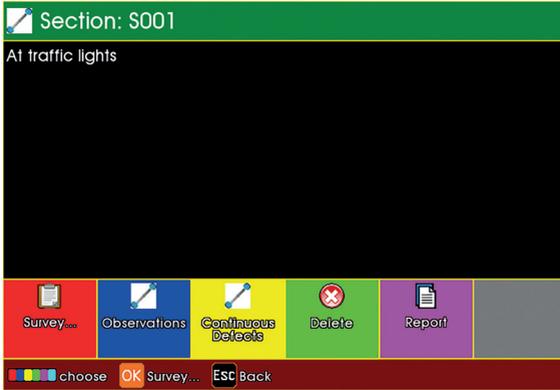
Previews of the various Report Styles are displayed.



- n Press the relevant coloured key to generate a report document of your chosen style.
- n Most reports are generated as both RTF and PDF documents.
- n The  style generates only RTF.
- n The report documents are stored into the Project's memory Folder, along with the Project's video and photo files.

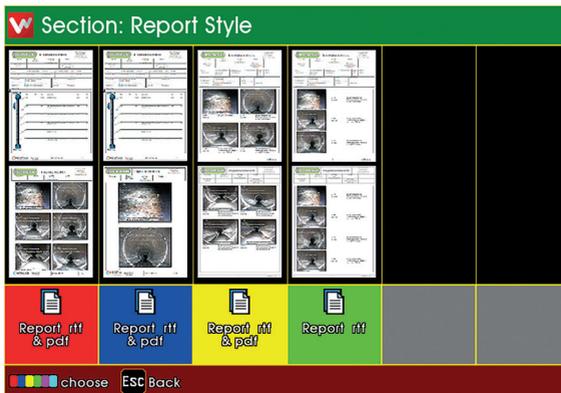
Creating Reports for a Selected Section

When you have selected a Section, the Section Information is shown.



- n Press  to generate Report Documents of this Section.

Previews of the various Report Styles are displayed.



- n Press the relevant coloured key to generate a report document of your chosen style
- n Most reports are generated as both RTF and PDF documents.

- n The  style generates only RTF.

- n The report documents are stored into the Project's memory Folder, along with the Project's video and photo files.

WEEE Statement

Under the European Union (“EU”) Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, products of “electrical and electronic equipment” cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment are obligated to take back such products at the end of their useful life. Minicam will comply with the product take back requirements at the end of life of Minicam products that are sold into the EU.

For disposal contact Minicam or the Minicam partner in your country.



Information on Disposal for Business Users

Your Proteus CCU is marked with the symbol shown above. It means that used electrical and electronic products should not be disposed of in with general household waste. Contact your Local Council who will advise on the correct recycling procedure to follow.

In the European Union

Please contact Minicam or you nearest Minicam Service Centre who will inform you about the take-back of the product. You may be charged for the cost arising from take-back and recycling. Small products (and small amounts) might be taken back by your local collection facilities.

For Spain: Please contact the established collection system of your local authority for take-back of your used product.

Countries outside the EU: If you wish to dispose of your Proteus CCU, please contact your local authorities and ask for the correct method of disposal.

Batteries

As a producer of industrial batteries under the Waste Batteries and Accumulators Regulations 2009, we Minicam produce Lithium Ion batteries. We are obliged to take back free of charge, waste industrial batteries supplied to an end user for treatment and recycling. We are required to do this in any calendar year we place new industrial batteries on the market. If any of our customers or in certain cases other end users, require us to take back industrial batteries, they should contact us at:

Minicam Limited
Raven Locks
Ravenscraig Road
Bolton
M38 9PU
United Kingdom

Tel: +44 (0)1942 270524
Email: info@minicam.co.uk
www.minicamgroup.com

We will agree the necessary arrangements for the return, proper treatment and recycling of the waste industrial batteries.

Product Serial Numbers

Enter your product serial numbers below for future reference:

PRODUCT	SERIAL NUMBER
<input type="text"/>	<input type="text"/>
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<input type="text"/>	<input type="text"/>
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Useful Information

UK Customers:

For service and repair contact Minicam

Tel: 01942 270524

Email: service@minicam.co.uk

International Customers:

For service and repair contact your local Minicam Approved Dealer



View Minicam "How To" videos on our YouTube Channel



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