

PROTEUS

Automatic Cable Reel ACR350 / ACR500

(including VGP350/ VGP500)

Original Instruction Manual

Version C



PLEASE NOTE

For the purpose of this Original Instruction Manual

Proteus™ ACR (Automatic Cable Reel) will be referred
to using the abbreviation ACR

Proteus™ RJP (Joystick Remote Control) will be referred
to using the abbreviation RJP

Proteus™ Control Unit will be referred to as CCU

Both sizes of cable reel will be referred to generically as ACR.
The instructions in this manual are for use with ACR350 *and* ACR500.

This instruction manual is applicable to the ACR Automatic Cable Reel.

A standard cable reel and available options are covered by 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 Proteus™ ACR (Automatic Cable Reel). 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.

System Overview

Developed for use in a CCTV inspection van, the Proteus™ ACR is fitted with 350/500 metres of high strength, *Kevlar* reinforced inspection cable. Ultra-smooth operation is provided by the powerful, three phase motor and cable layering mechanism, specially designed for uninterrupted, tangle free pay-out and re-winding. A rigid, clear safety screen and protective cover prevents contact with the cable whilst coiling, and for additional safety there is an instant motor stop button.

The ACR will be factory mounted in the inspection van, on to the (VGP350/500) Van Guide Pulley.

Operation is controlled using the hand held RJP Bluetooth® Joystick Remote Control (*included*) which is also capable of controlling camera and crawler functions, or use the ACR control panel buttons in conjunction with the dedicated keys and intuitive on-screen display on the Proteus™ VCU.

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



NOTE!

Have the system regularly serviced by a Minicam Authorised Service Centre.

EC Declaration of Conformity

CE Declaration

We Minicam. Unit 4 Yew Tree Way, Stonecross Park, Golborne, Warrington, WA3 3JD hereby declare that the product Proteus™ AC350/ACR500 to which this declaration refers is in compliance with the following standards or standardizing documents:

EN61000-6-4: 2007 + A1: 2011	Electromagnetic compatibility (EMC) Part 6-4: Generic standards - Emissions for industrial environment.
EN61000-6-2: 2005	Electromagnetic compatibility (EMC) Part 6-2 Generic standards: Immunity for industrial environment.
EN 300 328 V2.1.1	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
EN61010-1:2010	Safety requirements for electrical equipment for measurement, control, and laboratory use.
EHSR MSD	Essential Health and Safety Requirements of Machinery Safety Directive

The following are the stipulated operating and environmental conditions for said compliance:

Residential, business, commercial, small-company and light industrial environments.

This declaration is based on test report(s) of the relevant EMC testing laboratory.

Warnings and Safety Measures

The staff assigned to tasks involving the ACR 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 the ACR is obliged to ensure a safe and hazard-free operation. This will be achieved by the following measures:

- Making the user manual available on the site of the use of the ACR 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 ACR Automatic Cable Reel 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 original instruction manual..
- The operator must wear safety equipment that is appropriate to the survey being performed (such as goggles, gloves, ear protection and safety shoes, etc).

Warnings and Safety Measures

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 ACR Automatic Cable Reel and its components.



CAUTION!

The operator must ensure that the Automatic Cable Reel is used in a safe environment.



CAUTION!

Do not expose the ACR to water or liquids. The ACR has an Environmental Protection rating of IP45.



CAUTION!

The ACR **must not** be operated if anything appears to be damaged, defective, hot or erroneous.



CAUTION!

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



CAUTION!

Do not place objects on or near to the hot parts of the ACR. Always allow sufficient air circulation around the ACR.



DANGER!

Explosion Hazard!

The ACR Automatic Cable Reel is **not** suitable for explosive environments.



DANGER!

Risk of deadly injuries from electrical current!

The ACR Automatic Cable Reel can generate a high voltage which can be considered hazardous. This hazardous voltage may be exposed if the automatic cable reel is opened while the system is operational. Therefore the ACR Automatic Cable Reel should only be opened by a Minicam Service Centre.

- There are no user serviceable parts or components within the ACR.



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!

The ACR can be used in wet environments that **do not** exceed the Environmental Protection IP45 rating.

Before First Use

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



CAUTION!

Risk of serious injuries by a moving cable reel!

Ensure that the ACR is securely bolted to a stable platform, capable of withstanding the forces of the ACR in operation.



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 cable reel!

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.

Warnings and Safety Measures

NOTE!

Avoid physical damage!

The operator of the Proteus™ ACR 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 system as described in this user manual.
- Keep the system clean. Observe the individual cleaning instructions for this purpose.

Personal Safety

Please read these personal 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 ACR.



CAUTION!

To ACR is extremely heavy, and is too large for one person to carry alone. A multi-person lift is required when handling.



CAUTION!

Ensure there is adequate lighting in the area where the ACR is being operated, to ensure all controls and the cable can be seen.



CAUTION!

To prevent against body entrapment, avoid wearing loose clothing or jewellery, and check same before and during use of the ACR.



CAUTION!

Keep clear of the cable reel at all times during use, and continuously check that the cable is unobstructed.



CAUTION!

Ensure animals and children are kept a safe distance away from the cable reel when in use.



CAUTION!

Do not use the ACR near other equipment that may be sensitive to electrical interference, such as a Pacemaker.



IMPORTANT!

Risk of damage to hearing!

Operators with sensitive hearing may consider ear protection.

Personal Safety



CAUTION!

Keep cable clear at all times and continuously check cable is clear.



CAUTION!

After powering off, leave the system for 5 seconds to completely power itself down.



CAUTION!

Supervise the ACR at all times.



CAUTION!

The speed of the ACR winding and crawler can be set by the operator – they must set speeds only to what they are comfortable with.



CAUTION!

If in a two or more person team, stay in regular contact with teammates.

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 cable reel clean after each inspection.
- Thoroughly wipe the parts of the cable reel 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 rewinding, ensuring to keep a safe distance from the ACR
- Use water for cleaning without the addition of cleaning agents. or solvents.

For detailed maintenance instructions for crawler, control unit 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 of the ACR. See information on page 77 regarding the return of equipment at the end of the useful life.



IMPORTANT!

Keep all electrical connections and contacts free of dirt, grease and moisture at all times

Cleaning

To minimise down time and subsequent repairs it is necessary to keep your ACR Automatic Cable Reel 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 or penetrate the housing of the ACR. 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.



CAUTION!

High-pressure cleaners must not be used. It can cause considerable damage to the ACR and RJP Joystick remote Control.

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.

- Wipe clean the cable reel housing and lid using a damp (not wet) cloth, then dry using a dry cloth. Only after this should you loosen electrical connections.
- Immediately fit the protective caps after removing electrical connections.

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 ACR.



- Check the contacts on the cable reel back plate.
- Check the contacts on the crawler camera connector.
- 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.



IMPORTANT!

Keep all electrical connections and contacts free of dirt, grease and moisture at all times

VGP350/500

Van Guide Pulley

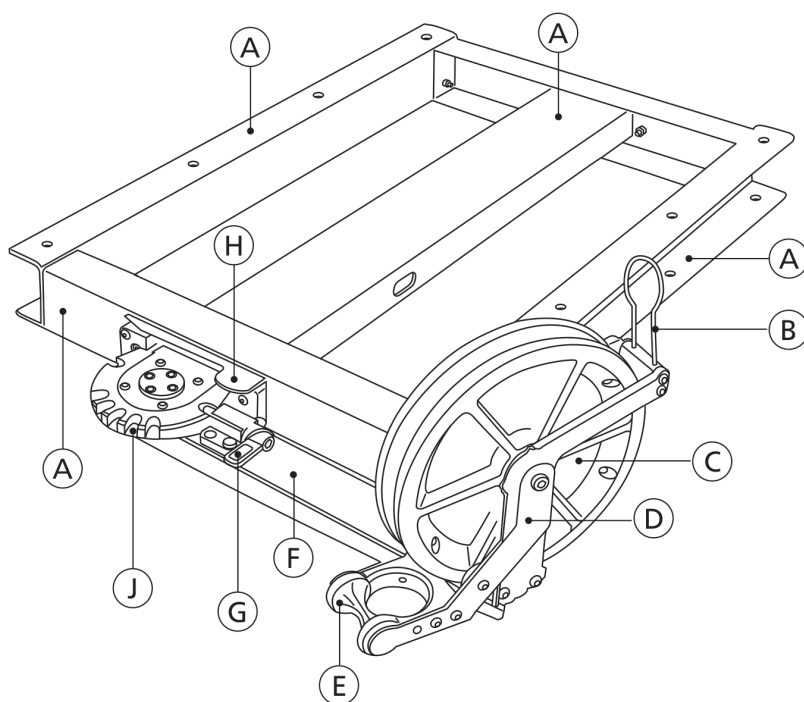
Product Overview

The ACR will be factory mounted in the inspection van, on to the (VGP350/500) Van Guide Pulley. The van guide pulley is fully adjustable to suit all requirements. The arm can be locked into any one of seven angled positions. The length of the pulley arm can be extended in three 125mm increments, to provide a maximum length of 375mm.

The illustrations on the following pages in this section show the VGP500. The instructions in this section apply to both the VGP500 and the VGP350.

Parts and Descriptions

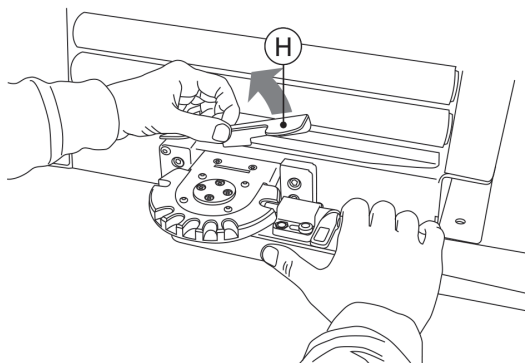
Reduces friction and provides additional guidance for the cable when paying out and rewinding. For use with Minicam Proteus™ 350metre and 500metre ACR (Automatic Cable Reel).



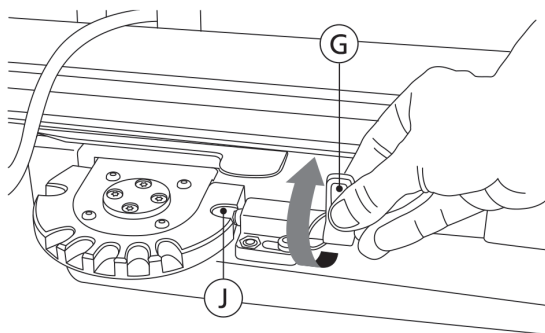
- A** Mounting frame
- B** Cable guide
- C** Pulley wheel
- D** Cable guide arm
- E** Cable guide roller

- F** Pulley arm
- G** Arm angle lock
- H** Arm extension lock
- J** Locator wheel

Adjusting the Pulley Arm

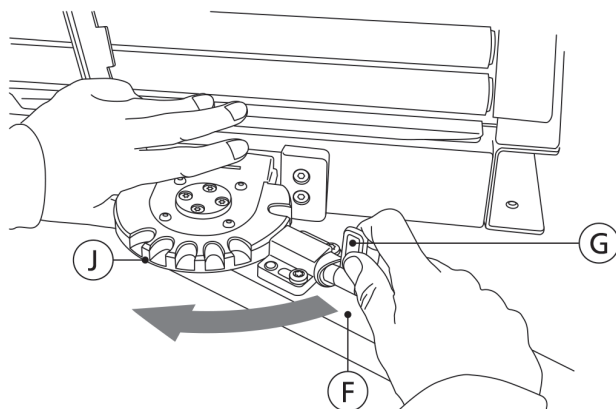


- 1 Lift the Arm Extension Lock (**H**) upwards.

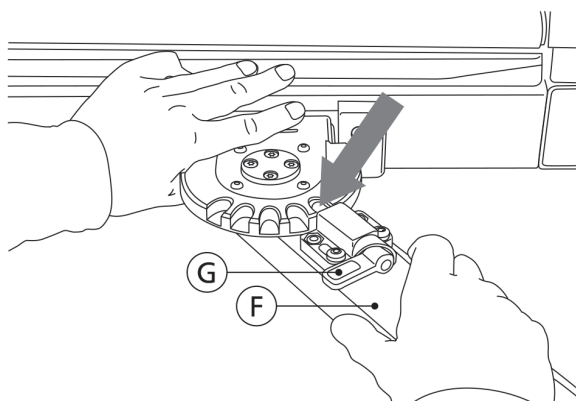


- 2 Lift the Arm Angle Lock (**G**), the in-built swivel action of the lock will release it from the home position on the Locator Wheel (**J**). Keep hold of the Arm Angle Lock (**G**).

Adjusting the Pulley Arm

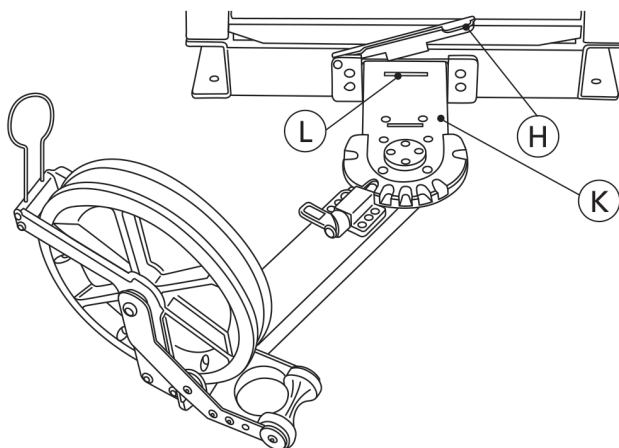


- 3 Keeping hold of the Arm Angle Lock (G). Swing out the Pulley Arm (F) to the desired locator on the Locator Wheel (J).

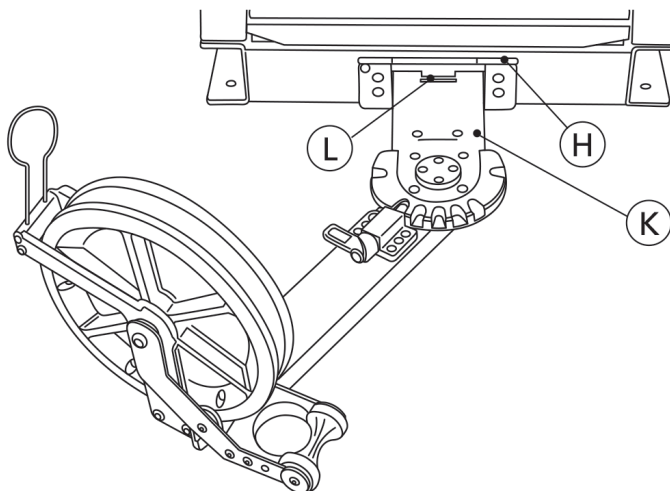


- 4 Align the Arm Angle Lock (G) to the desired locator, then release the spring loaded Arm Angle Lock (G) to secure the Pulley Arm (F) at the desired angle.

Extending the Pulley Arm

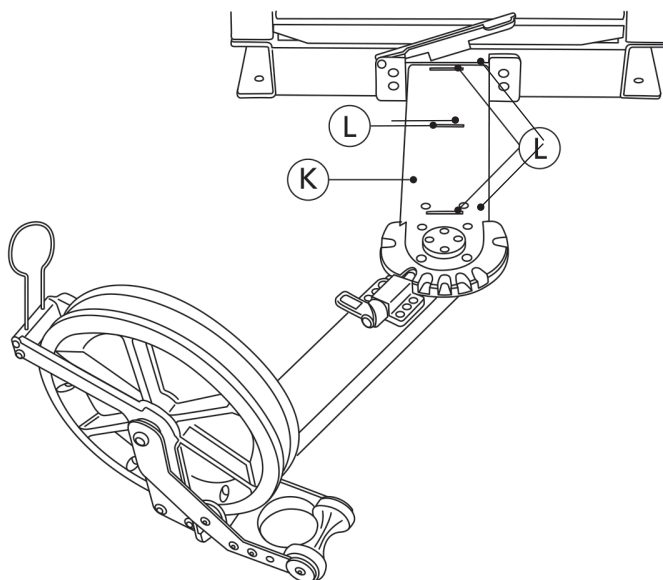


- 1 Raise the Arm Extension Lock (**H**), then carefully pull out the Extension Arm (**K**) to the required Increment Slot (**L**).



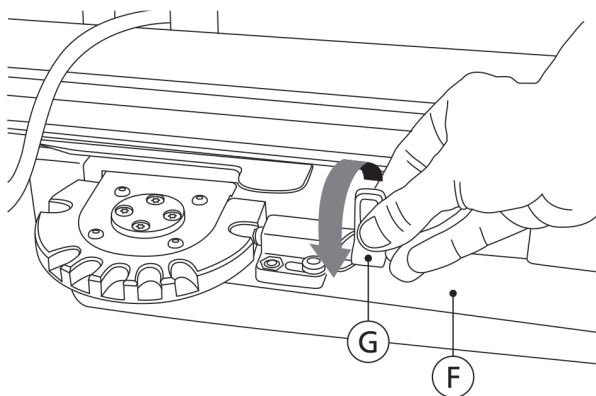
- 2 Lower the Arm Extension Lock (**H**) into the Increment Slot (**L**), to secure the Extension Arm (**K**).

Fully Extending the Pulley Arm



- 1 The van guide pulley Extension Arm (K) can be extended in three 125mm increments (L), to provide a maximum working length of 375mm.

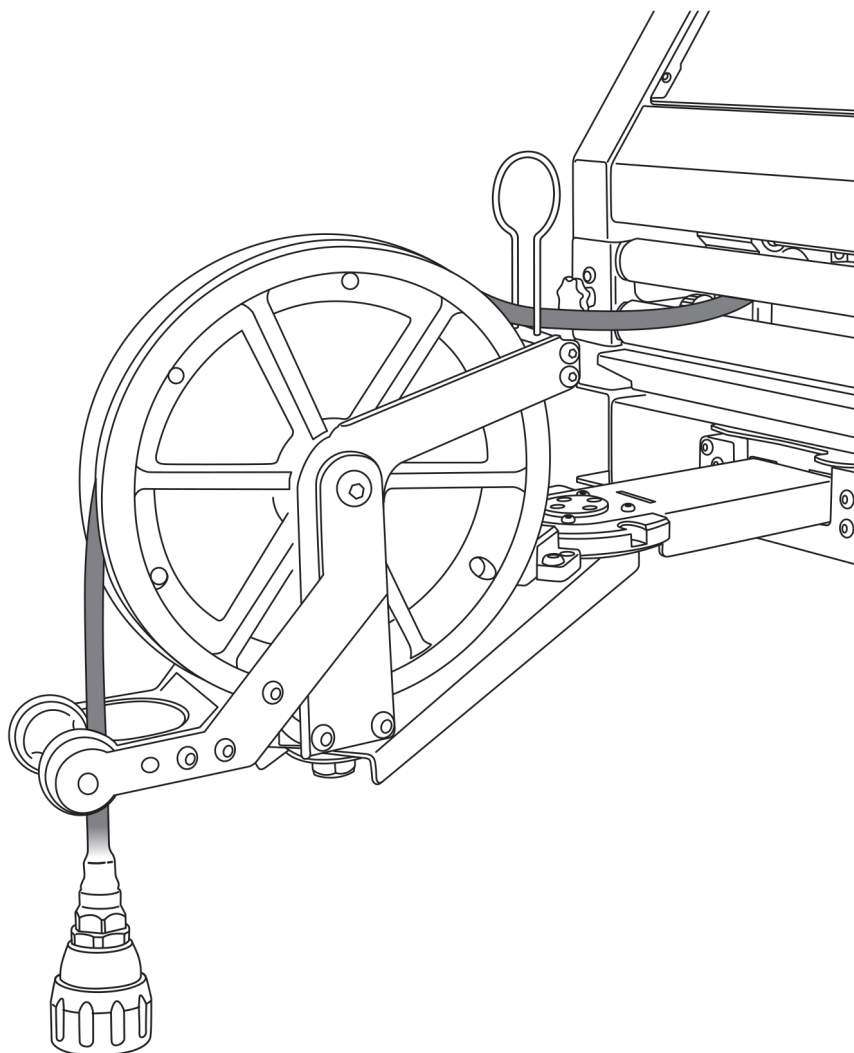
Locking the Pulley Arm



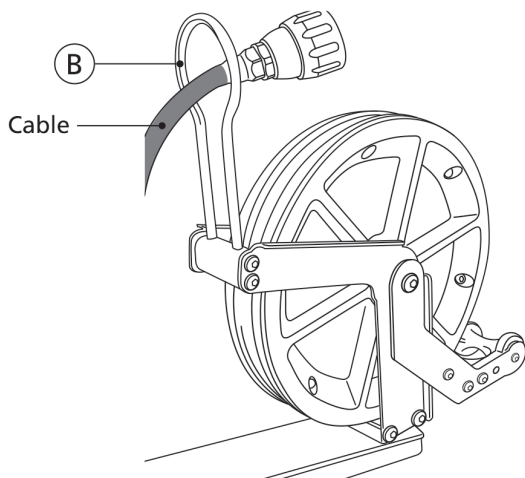
- 5** After using the van guide pulley, for safety reasons and storage convenience, the Pulley Arm (**F**) should be returned to the home position, and the Arm Angle Lock (**G**) turned anti-clockwise to secure the Pulley Arm (**F**) and prevent movement during transit.

Routing Cable on the Pulley Wheel

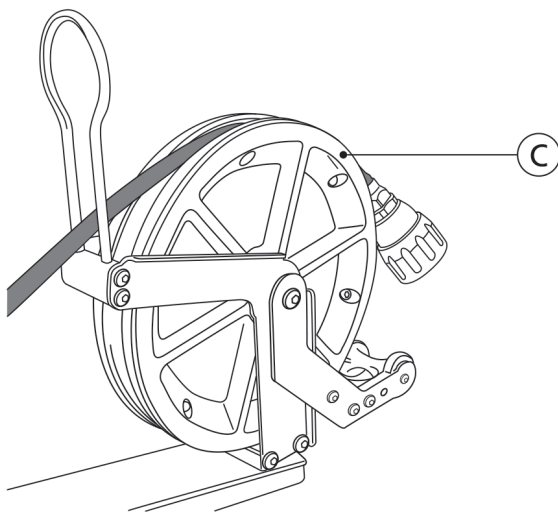
Before use of the ACR, the cable must be correctly routed from the reel, through the van guide pulley and then connected to the crawler.



Routing Cable on the Pulley Wheel

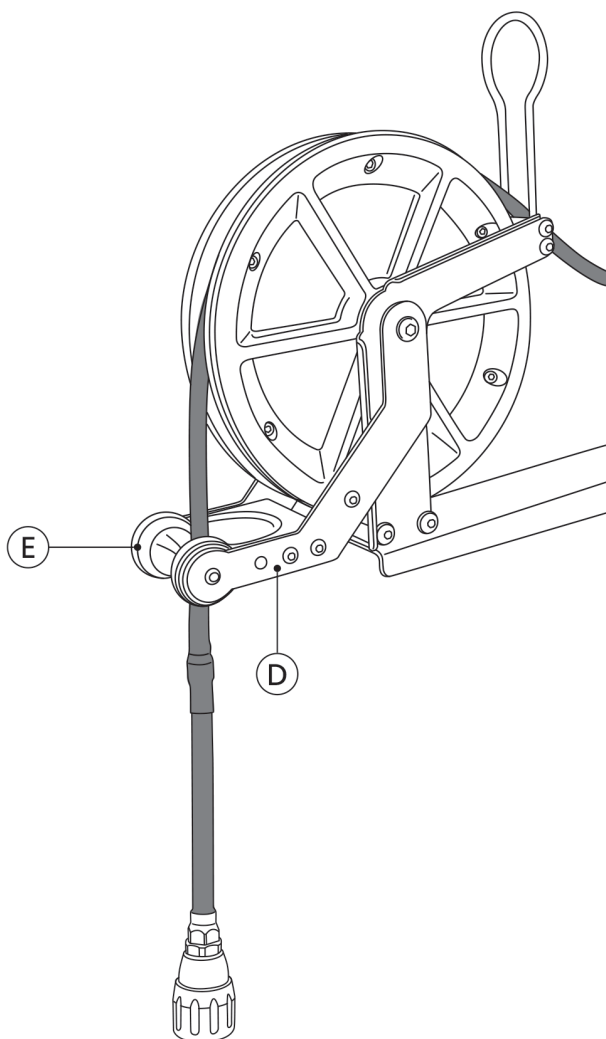


- 1 Route the crawler connector end of the cable from the reel, through the Cable Guide (**B**).



- 2 Guide the cable into the recess around the Pulley Wheel (**C**).

Routing Cable on the Pulley Wheel



- 3 Guide the crawler connector end of the cable through the fork of the Cable Guide Arm (D) to rest against the Cable Guide Roller (E).

Technical Specifications

VGP350 - Van Guide Pulley	
Product Code	VGP350
Frame Dimensions	66 x 38.7 x 7cm (L x W x H)
Dimensions inc Arm (Retracted)	77 x 38.7 x 7cm (L x W x H)
Dimensions inc Arm (Fully Extended)	144 x 38.7 x 7cm (L x W x H)
Weight	10.9kg (24lbs)
Construction	Stainless Steel

VGP500 - Van Guide Pulley	
Product Code	VGP500
Frame Dimensions	66 x 47.5 x 7cm (L x W x H)
Dimensions inc Arm (Retracted)	77 x 47.5 x 7cm (L x W x H)
Dimensions inc Arm (Fully Extended)	144 x 47.5 x 7cm (L x W x H)
Weight	15kg (33lbs)
Construction	Stainless Steel

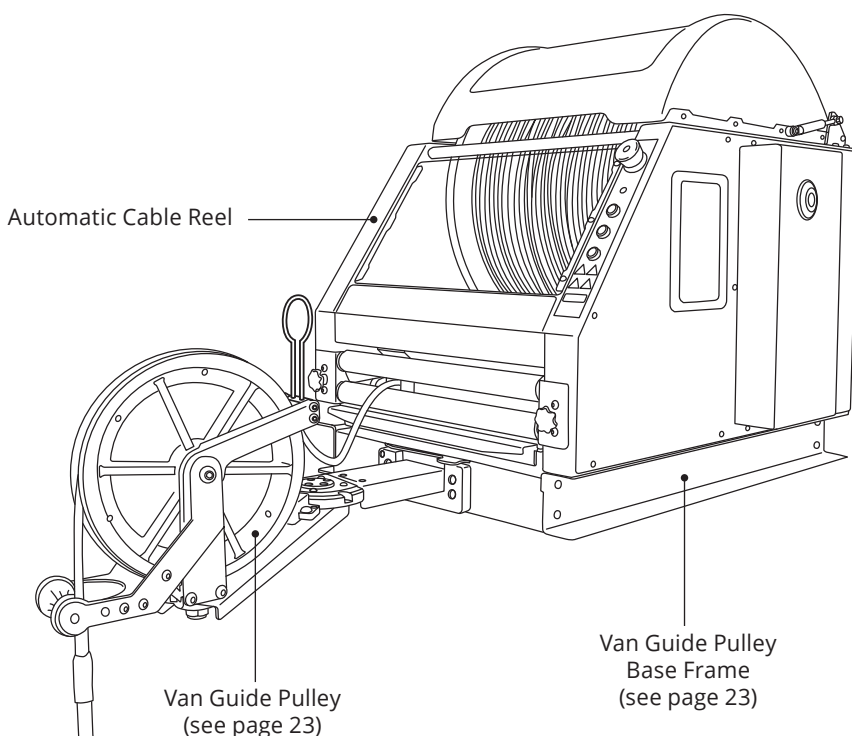
ACR350/500

Automatic Cable Reel

Product Overview

Developed for use in a CCTV inspection van, the Proteus™ ACR is fitted with 350/500 metres of high strength, *Kevlar* reinforced inspection cable. Ultra-smooth operation is provided by the powerful, three phase motor and cable layering mechanism, specially designed for uninterrupted, tangle free pay-out and re-winding. A rigid, clear safety screen and metal lid prevents contact with the cable whilst coiling, and for additional safety there's an instant motor stop button.

The ACR will be factory mounted in the inspection van, on to the (VGP350/500) Van Guide Pulley.



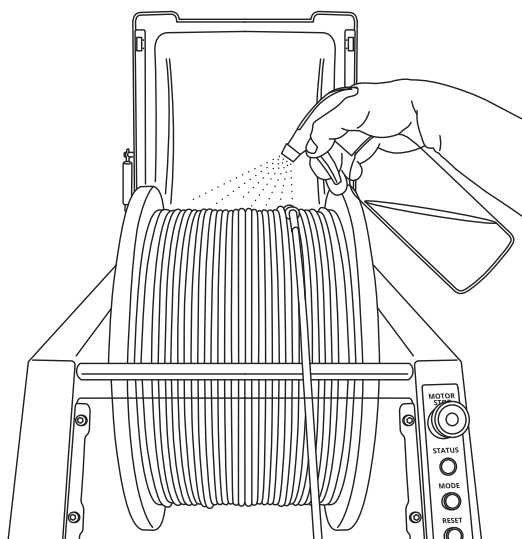


IMPORTANT!

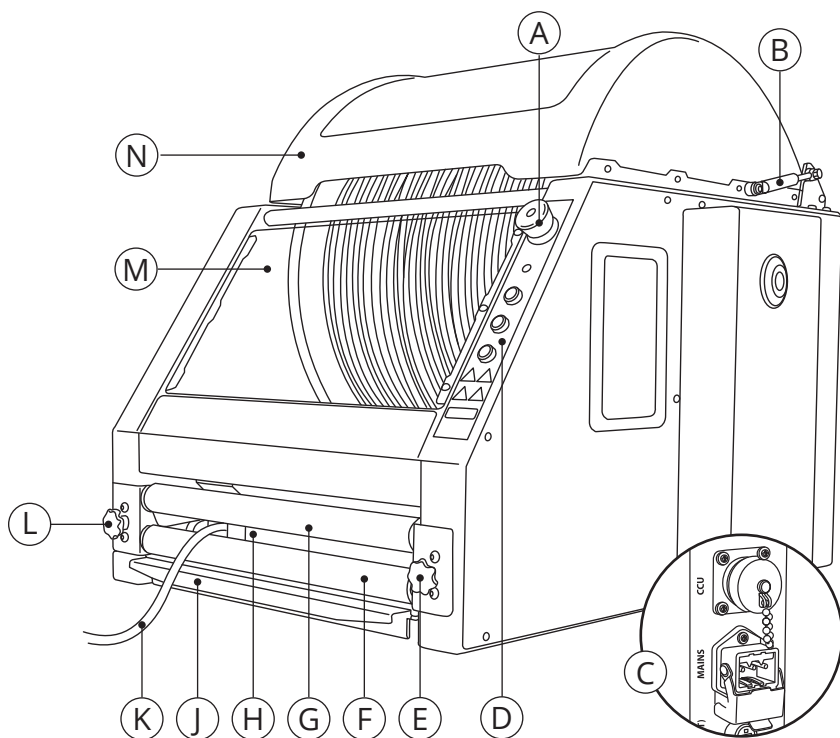
When the cable is new, we strongly advise that the operator of the ACR lubricates the cable with a mild soap and water solution, applied using a spray mist bottle as shown below.

The lubricating procedure helps reduce friction on the outer coating, and improves the free running of the cable during payout and re-winding, it also helps prevent bunching and looping of the cable.

It is advisable to regularly carry out the lubricating procedure, particularly for the first few uses of the cable, or until the cable has bedded in.



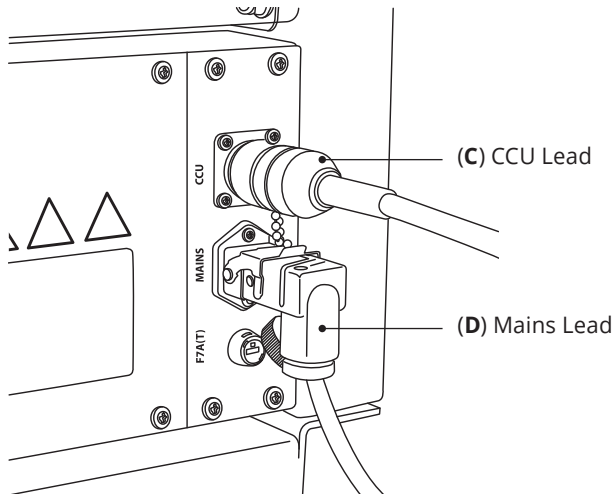
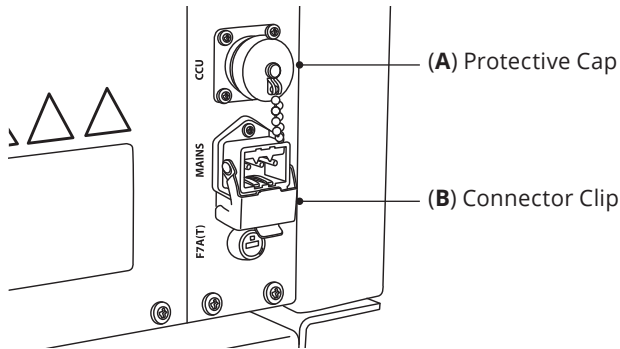
Parts and Descriptions



- | | |
|---|--|
| A Motor Stop Button | H Meterage Assembly |
| B Pneumatic Arm | J Removable Drip Tray |
| C Connections (<i>at rear</i>) (see page 39) | K Cable |
| D Buttons Panel (see page 41) | L Roller Retention Knob |
| E Roller Retention Knob | M Clear Rigid Protection Screen |
| F Bottom Roller | N Cover |
| G Top Roller | |

Connections

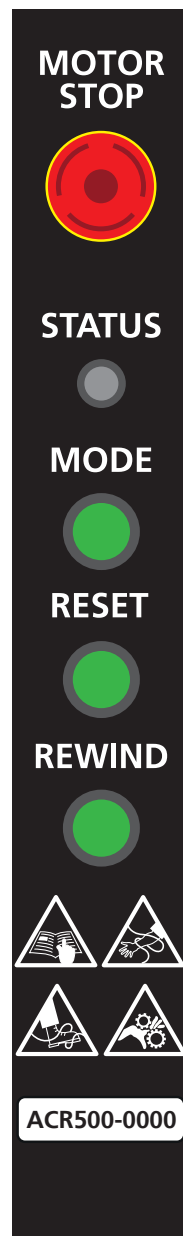
Power cord supplied. The CCU connection at the rear of the ACR has a screw-on cap **(A)** to protect against dirt, grease and moisture. The mains connector has a clip **(B)** to secure the lead.



- 2 Remove the protective cap **(A)** and attach the CCU Lead **(C)**.
- 3 Lift the Connector Clip **(B)** upwards, insert the Mains Lead **(D)**, then push the clip downwards to securely lock the connector.

ACR Buttons

Button	Function
MOTOR STOP	Stops the reel operations until button is depressed.
STATUS	Displays selected mode
MODE	Circulates through the available modes.
RESET	Resets the blocked state.
REWIND	Rewinds the cable with constant speed until the button is released.


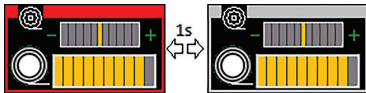


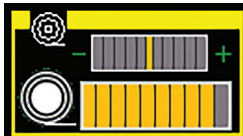









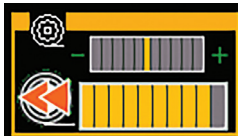


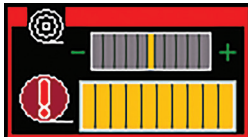




Modes

The ACR is capable of rewinding and paying out the cable for up to 350/500m. The user can put the ACR into different modes to perform specific types of tasks. By default, the ACR will start in Assist Disabled mode, which means before ACR can be used a desirable mode needs to be selected. See the table below for available modes.

For RJP (Remote Joystick Controller) instructions, page 63.

Mode	Description	Selecting the Mode	Deselecting the Mode	
Assist Disabled	ACR is in a locked mode. Automatic actions are not performed.	CCU Menu ACR Mode Button. Remote Joystick Crawler Only selected.	CCU Menu, ACR Mode Button. Remote Joystick Crawler and Cable Reel selected.	
Assist Pay-out	ACR monitoring the tension of the cable. Pay-out automatically starts when cable pulled.	CCU Menu ACR Mode Button. Remote control connected in stand alone mode.	CCU Menu, ACR Mode Button. Remote control disconnected in stand alone mode.	
Assist Fully	ACR monitoring the tension of the cabled using tension bar and the speed of the crawler going backwards. Rewind takes priority over pay-out.	CCU Menu ACR Mode Button. Remote Joystick Crawler and Cable reel selected.	CCU Menu, ACR Mode Button. Remote Joystick Crawler Only selected.	
Continuous Rewind	ACR continuously rewinding with a constant cable speed until a mode change.	CCU Menu.	CCU Menu, CCU Rewind Button, Remote Control Rewind, ACR Rewind button, ACR Mode Button. Remote control connected.	
Rewind	ACR continuously rewinding with a constant cable speed until a mode change. Mode is changed as soon as the Rewind button is being released.	CCU Menu, CCU Rewind Button, Remote Control Rewind, ACR Rewind button.	Rewind Button Released.	
Blocked	ACR is in a blocked mode. Automatic actions are not performed.	Motor Stop button, LID, Hardware Fault, End of Cable.	Reset button when source of the blockage is removed.	

	Indication on Status LED	Indication on CCU Status Display	Indication in Cable Menu	
	 Blinking Red		 Assist Disabled	
	 Solid Yellow		 Assist Payout	
	 Solid Green		 Assist Fully	
	 Blinking Orange		 Rewind continuously	 Rewinding
	 Solid Orange		 Rewind	
	 Solid Red		 Motor Stop Engaged	 Reset

Adjusting Payout Speed Limit

When ACR operates in the modes which allow automatic payout (Assist Pay-out Assist Fully) the payout speed can be limited. Payout speed limit can be used to:

- Prevent cable loops forming when cable is pulled manually and suddenly stopped.
- Deploy borehole camera.
- Doesn't need adjusting for normal crawler operations. This setting can be changed from the CCU cable menu by pressing up/down keyboard keys.

Motor Auto Rewind Speed

The rewind speed 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 rewind speed 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 rewind speed that the drum is dragging the crawler.

You may need to adjust the rewind speed 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 rewind speed.

Adjusting the Rewind Speed

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 the rewind speed.

Always use a speed that you are comfortable with.

You can use the keyboard keys to adjust the rewinding speed at any time.



Decrease auto rewind speed

Each press decreases the speed.



Increase auto rewind speed

Each press increases the speed.



The blue coloured bar/s represent rewind speed adjustment.

Selecting the Crawler Wheel Size

The ACR needs to know the crawler wheel size so it can control the speed of the rewind correctly.

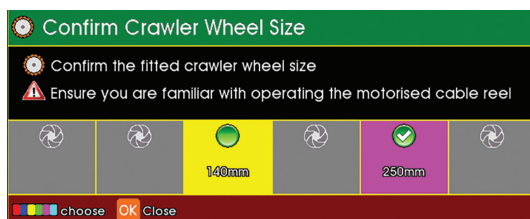
Selecting Wheel Size when Powering-On the Crawler

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 the 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.

F1

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



With
CPL150
connected

Status Display for the ACR






The ACR status box displays the appropriate icon for the operation being performed, see detailed table on page 42.



Status looks like this with the colour depending on the mode



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

Displaying cable movement direction		Idle The cable is not moving.
		Paying out The ACR is paying out the cable to the crawler.
		Rewinding The ACR is rewinding the cable back onto the drum.
Status		Lost communication with CCU The ACR has lost communications with the CCU. See Troubleshooting on page 60.
		Blockage The ACR has stopped because of a blockage, hardware fault, cable end or one of the Stop buttons is activated.



- a** The blue coloured bar/s represent rewind speed.
- b** The orange coloured bar/s represent an estimate of how much cable is on the drum.

Controlling the ACR

Controlling using the keyboard keys

There are 4 keys that control the motorised cable reel:



Rewind cable back onto the drum

Press one for a short rewind, or to stop continuous rewind.
Press and hold to rewind until released



Press to open ACR cable menu.



Decrease rewind speed

Each press decreases the rewind speed.



Increase rewind speed

Each press increases the rewind speed.

See Auto Rewinding
on page 39

Control using the Coloured Keys

You can also select the cable settings using the Crawler Settings:

1. Press Crawler Tools:



The CCU will display the following short keys:

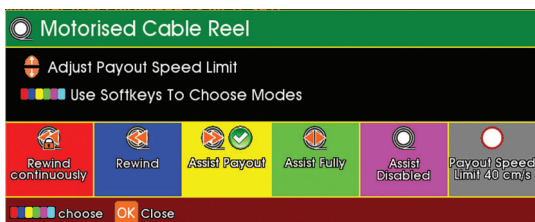


With
CRP300
connected












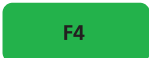




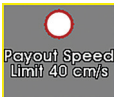
2. Press Blue Function to select Cable.



3. Example view of the cable menu:



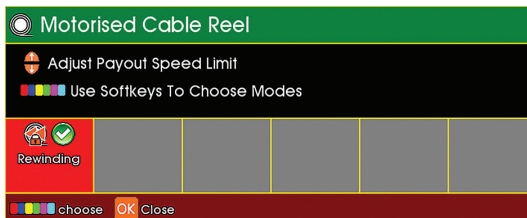
4. Then press the appropriately coloured key to select the required operation.

		Start rewinding continuously.
		Stop continuous rewind.
		Reset the blocked mode.
RELEASE MOTOR STOP		Motor Stop engaged alert.
		Rewind until hold.
		Switch to Assist Payout mode.
		Switch to Assist Payout mode.
		Switch to Assist Disabled mode
		Payout Speed Limit information. Use Up/Down Arrow keys to adjust it.

5. Press OK when you have finished. If continuous rewind is engaged it will continue after the menu is closed.

Stopping Continuous Rewind

6. When Continuous rewind is started, the CCU will display the following short keys:



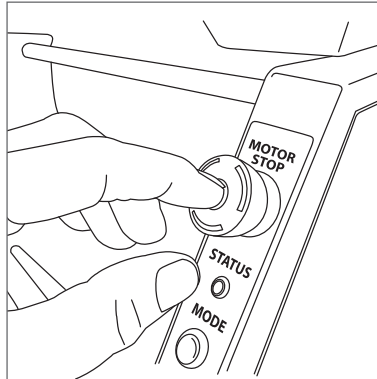
7. Press once to cancel rewind and to stop the motor. The ACR rewind then goes back to Assist Disabled mode. You can also use the Rewind key to cancel continuous rewind.



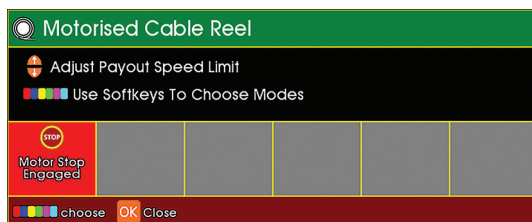
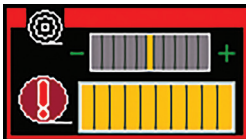
Rewind

ACR Motor STOP Button

Press the ACR Motor 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 Motor Stop Button has been activated.



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



NOTE!

Regularly check the operation of the motor stop and the cover lifted stop to ensure they are fully operational.

Powering Off

To power off the ACR, switch off at the mains socket and remove the plug.



CAUTION!

After powering off, leave the system for 5 seconds to completely power itself down.



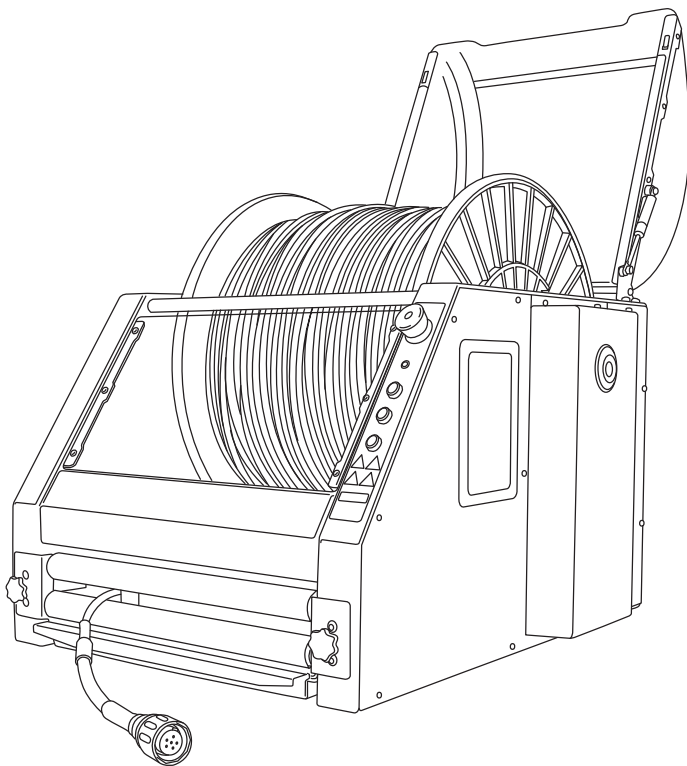
CAUTION!

Switch off power or engage Motor Stop button:

- whenever system is not in use
- before making mechanical changes (eg. wheels).
- before clearing a cable blockage

ACR Cover

If the cover on the ACR is open, the reel will engage Motor Stop, in the same way as the Motor Stop button.

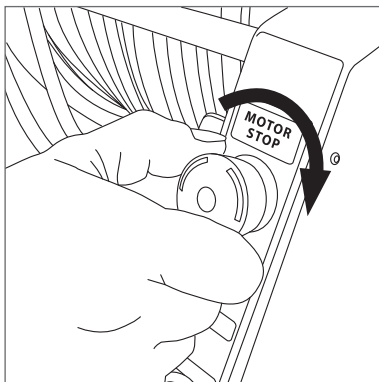


ACR with cover in fully opened position

Clearing the Motor Stop Condition

1. First ensure that it is safe to clear the Motor Stop condition!

- a Turn the Motor Stop clockwise, to reset it.
- b Close the lid.



- c Also refer to the VCU/VKU Instruction Manual for Motor Stop Button.

2. Press Crawler Tools.



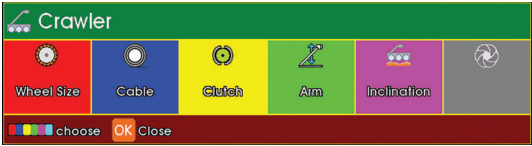
You can't control the cable reel or the crawler until the stop condition has been cleared.



With
CPL150
connected

continued on next page

continued from previous page

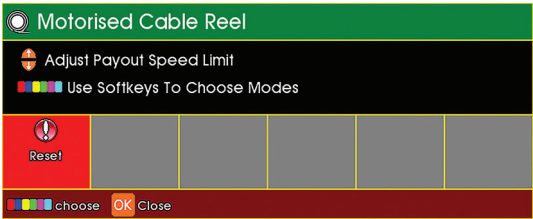


With
CRP300
connected

3. Press Blue Function to select Cable.

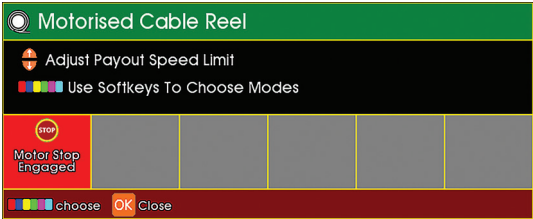


4. Press Red Function to select Reset.



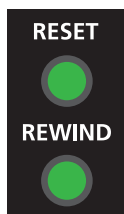
This will clear the stop condition and restart the ACR.

5. If the STOP condition is not cleared the menu will display the following dialogue.



End of the Cable Detection

The user should take care to stop paying out the cable before there is no cable remaining on the drum. Failing to do so will cause the ACR to go into blocked mode.



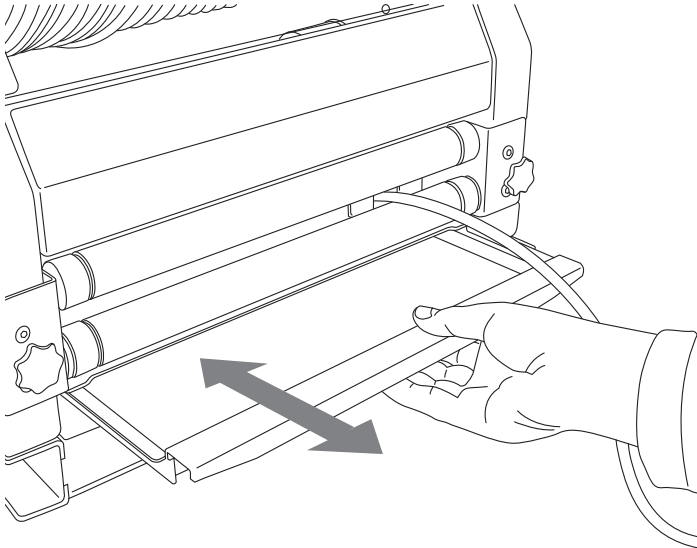
To recover from this condition, the Rewind Button needs to be held at the same time as the Reset Button is pressed. The user should hold the Rewind Button until enough cable has been wound back on the drum.

Removable Drip Tray

The ACR features an aluminium drip tray to collect moisture and small debris. The drip is removable to allow for emptying, cleaning and routine maintenance.

Removing and replacing the drip tray

- 1 Grip the front edge lip of the drip tray and pull to slide the tray outwards.
- 2 Carry out any necessary emptying and cleaning. Rinse the tray with water and wipe dry using a dry cloth.
- 3 Align the tray in side rails, then push the tray gently forward, until fully home.



Troubleshooting

Problem	Solution
Blocked mode doesn't clear or reappears constantly	Make sure Motor Stop button is not pressed and the lid is fully closed. Check if the cable can move freely both ways. Contact Minicam Service Department if the problem persists.
Rewind speed is not corresponding to the crawler speed	Make sure you have selected the right wheel size. Adjust the rewind speed using keyboard buttons. Contact Minicam Service Department if the problem persists.
Pay-out speed is not as expected.	Make sure that tension bar is not bent, obstructed by loose cable or any other objects. Check the payout speed limit adjustment. Contact Minicam Service Department if the problem persists.
Status LED changes colour very often	Tension bar needs calibration. Contact Minicam Service Department if the problem persists.
Internal cable blockage	Operator can't fix an internal cable blockage. Contact Minicam Service Department.

Technical Specifications

ACR350 - Automatic Cable Reel	
Product Code	ACR350
Power Supply	90-264 VAC
Power Consumption	600W
Temperature Range	-20°C ~ +50°C
Dimensions	660 x 390 x 562mm (L x W x H)
Weight	45kg (99lb)
Environmental Protection	IP45

ACR500 - Automatic Cable Reel	
Product Code	ACR500
Power Supply	90-264 VAC
Power Consumption	600W
Temperature Range	-20°C ~ +50°C
Dimensions (without VGP attached)	550 x 660 x 640mm (W x D x H)
Dimensions (with VGP retracted)	550 x 750 x 640mm (W x D x H)
Weight	55kg (121lb)
Environmental Protection	IP45

RJP

Joystick Remote Control

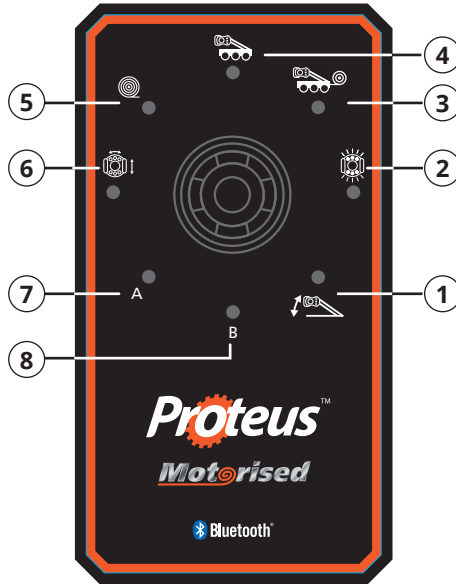
Product Overview

Operation of the ACR can be controlled using the hand-held RJP Bluetooth® Joystick Remote Control (*included*) which is also capable of controlling camera and crawler functions, The ACR can be controlled directly without the presence of the Control Unit (CCU) after the “pairing” process has been completed.

As an alternative method of control, you can use the ACR500/350 control panel buttons (see page 41) in conjunction with the dedicated keys and intuitive on-screen display on the Proteus™ CCU.

*For more information refer to table on page 42.

Parts and Descriptions

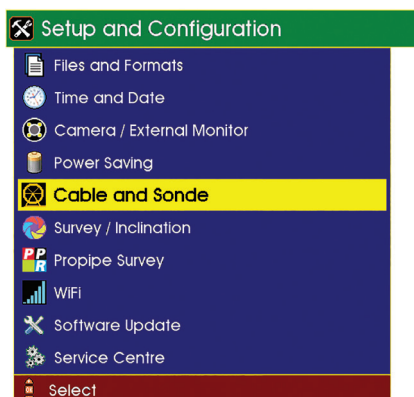


1	Crawler Arm	Raise / Lower
2	Illumination	Lights
3	Crawler with ACR	Crawler and Cable Reel
4	Crawler without ACR	Crawler ONLY
5	ACR	Motorised Cable Reel ONLY
6	Camera	Pan and Rotate
7	Function A	Camera Focus / Zoom
8	Function B	Unused

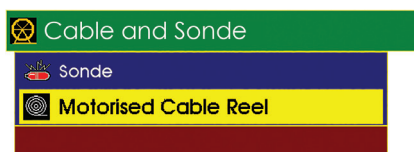
Pairing RJP with ACR

In order to pair the RJP with the Bluetooth® capable ACR, a CCU with software no older than Version 6.1.0 is required.

- 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 (see above).



- 2 Select Motorised Cable Reel from the list.



- 3 The RJP 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 RJP.



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

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

Connecting RJP

- 1 Switch the RJP ON by pressing the joystick button. The RJP will make a beep sound and start flashing the green LEDs rapidly until it connects to the ACR. Once the connection is successful, all the LEDs will go solid green for a second, and then switch off. Then the device will move to the Mode selection (see page 68).
- 2 If all the green LEDs keep flashing, it indicates that the RJP is not able to connect to the ACR. Please ensure that pairing with the RJP (page 5) has been completed and the correct serial number has been entered.
- 3 If the LEDs first flash red, this is an indication that the **battery is getting low**, normal operation will be allowed, but the unit should be recharged as soon as possible. If the battery is critically low, the LEDs will flash red, the unit will switch off and operation will not be allowed. The unit should be recharged.

RJP Operational Range and Disconnection

The RJP will operate up to 5 metres from the ACR. If the path between the RJP and the ACR is obstructed, or it is further than 5 metres, the RJP will disconnect. Disconnection is indicated by a short beep and all the LEDs flashing green. The RJP will immediately try to reconnect to the ACR, and if it succeeds the green LEDs will go solid for a second and then switch off. Then the device will continue with the previously selected mode if reconnected in less than 10 seconds.

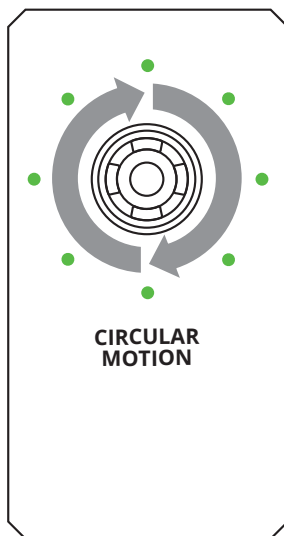
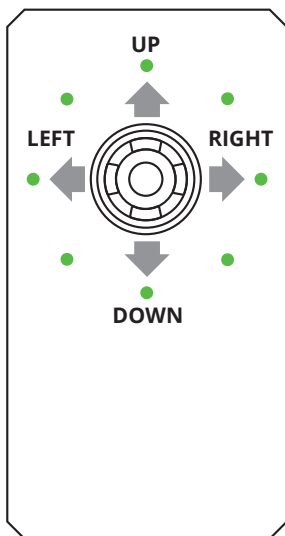
Mode Selection

After a successful connection to the ACR, RJP will display all the modes allowed on the CCU, by flashing their corresponding green LEDs. To select one of the available modes, user should directionally move the joystick (see example above) to the selected position and press the button or hold the joystick in place for 2 seconds. After the mode has been selected a short beep will be played and the corresponding LED will turn solid green, all other LEDs will turn off. The joystick will start operating the mode after it returns to the central position. To go back to the mode selection the joystick needs to be in the centre and the button held for 2 seconds until the beep is sounded.















Example
Using the joystick to
select ACR mode.




Joystick Positions and Movement





Modes


 Crawler Arm Mode Raise Lower	
Joystick Position	Function
 UP	ARM RAISE
 DOWN	ARM LOWER
 LEFT	UNUSED
 RIGHT	UNUSED
 BUTTON	ARM PARKED FULLY DOWN



 Illumination Mode Lights	
Joystick Position	Function
 UP	CAMERA, OR BACKEYE LIGHTS INCREASE
 DOWN	CAMERA, OR BACKEYE LIGHTS DECREASE
 LEFT	CRAWLER AUX LIGHTS DECREASE
 RIGHT	CRAWLER AUX LIGHTS INCREASE
 BUTTON	TOGGLE BETWEEN MAIN CAMERA / BACKEYE CAMERA

 Crawler with Auto ACR Crawler and Cable Reel	
Joystick Position	Function
	CRAWLER DIRECTION AND SPEED, WITH AUTOMATIC CONTROL OF ACR PAYOUT OR REWIND
 BUTTON	DISENGAGE CLUTCH






Modes

 Crawler without Auto ACR Crawler ONLY	
Joystick Position	Function
	CRAWLER DIRECTION AND SPEED, ACR CONSTANTLY PAYS OUT WHEN CRAWLER MOVEMENT IS REQUESTED
● BUTTON	DISENGAGE CLUTCH

 ACR (Motorised Cable Reel) Mode Cable Reel	
Joystick Position	Function
↑ UP	UNUSED
↓ DOWN	CABLE REWIND
← LEFT	UNUSED
→ RIGHT	UNUSED
● BUTTON	UNUSED

 Camera Mode Pan & Rotate	
Joystick Position	Function
	CAMERA DIRECTION
● BUTTON	CAMERA HOME

Modes

Function A Mode Camera Focus / Zoom		
Joystick Position		Function
 UP		ZOOM IN
 DOWN		ZOOM OUT
 LEFT		FOCUS OUT
 RIGHT		FOCUS IN
 BUTTON		UNUSED

Function B Mode (NOT IN USE)

ACR Only and ALL STOP!

In the instance when:

- ACR is operating without CCU, or
- on the CCU ALL STOP! is active, or
- no Crawler connected

the Joystick will default to the ACR mode. No other mode can be selected. Holding the button in the centre for 2 seconds will turn the Joystick off.

ACR Blocked and Motor Stop Button Pressed

- The RJP will alert a user of the cable being blocked or the ACR Motor Stop button being pressed, by flashing the LED (see page 65) red and bleeping twice per second.
- The user can move the joystick to the ACR Position and hold the button for 2 seconds. The Motor Stop button has to be released first.

CCU and RJP Interactions

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

Charging the Battery

When the joystick remote is being charged, for safety reasons it stops operating the crawler or ACR and starts displaying the battery state. The LEDs will show approximate state of the battery charge. If all the LEDs are lit it means 100%, if no LEDs are lit it is 0%. To start using the remote simply unplug it from the charger.



Please Note the battery cannot be charged in temperatures below freezing. Joystick will operate as normal if placed in charger, in conditions below freezing.

Useful Information

Product Serial Numbers

Enter your product serial numbers below, for future reference.

AUTOMATIC CABLE REEL	ACR-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
JOYSTICK REMOTE CONTROL	RJP-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
CABLE	CAP500-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
CABLE	CAP350-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Service and Repair

UK Customers:

For service and repair contact Minicam

Tel: +44 (0) 1942 270524

Email: service@minicam.co.uk

International Customers:

For service and repair contact your local Minicam Approved Dealer

To view Minicam How-To Videos visit our website:

www.minicam.co.uk/videos

Or visit our YouTube Channel:



MinicamTubeUK

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.



Information on Disposal for Business Users

The ACR 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 ACR, please contact your local authorities and ask for the correct method of disposal.

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

Batteries

As a producer of industrial batteries under the Waste Batteries and Accumulators Regulations 2009, we Minicam supply 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.



Minicam Ltd
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Email: info@minicam.co.uk
www.minicamgroup.com

