



VGA RESOLUTION WIRELESS ARTICULATING PROBE

USER'S MANUAL



P18HPART

Please read this manual carefully and thoroughly before using this product.

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INTRODUCTION

Thank you for purchasing General Tools & Instruments' (General's) P18HPART VGA Resolution Wireless Articulating Probe. Please read this manual carefully and thoroughly before using the probe.

The P18HPART is the 1-meter long version of a high-performance, wireless, camera-tipped articulating probe that captures video and still images at VGA (640 x 480 pixel) resolution. Inside its controller is a transmitter that makes the probe compatible with the DCS1800 Wireless Recording Video Borescope console. Working together, the two components are called a DCS18HPART system.

The P18HPART's five super-bright LEDs make it particularly suitable for inspecting dark environments and viewing parts and structures within them. The articulation function is provided by a wheel on the probe controller for remotely adjusting the angle of the probe tip while it is within a tight space in order to inspect targets outside the camera's nominal field of view.

KEY FEATURES

- Five super-bright white LEDs (three forward-facing and two side-facing) support capture of 640 x 480 pixel (VGA) resolution video and still images
- 0.23 in. (6mm) diameter probe goes deep into tight spaces
- Probe neck articulates 155° up and 155° down with radius of 50 ± 5 mm
- Light boost, anti-reflection and 90° image rotation buttons on probe controller
- Superior optics tailored for close-focus viewing from 0.25 in. to 12 in. (6.4 to 300mm) over 60° (diagonal) field of view
- 0.9 in. (23mm) long stainless steel camera head is immune to bathroom toilet cleaner, unleaded gasoline, diesel fuel, brake/transmission fluid and machine oil
- Probe resists water, oil and dust to IP67 standard
- Includes 70° mirrored viewing tip

SAFETY INSTRUCTION

CAUTION! Do not use the P18HPART to inspect ducts or areas known or suspected to contain live electric wiring

WHAT'S IN THE CASE

The VGA Resolution Wireless Articulating Probe comes in a hard plastic case inside a cardboard box along with a 70° mirrored viewing tip and this user's manual.

PRODUCT OVERVIEW

Fig. 1 shows the controls and key structures of the P18HPART. Familiarize yourself with their names and functions before moving on to the Setup Instructions and Operating Instructions.

Fig. 1. The controls and key structures of the P18HPART

1. Soft metal probe
2. Flexible-obedient, remote-controlled neck

3. Stainless steel camera head with three forward-facing LEDs and two side-facing LEDs

4. Stainless steel accessory alignment ring

5. Black metal thread protector ring

6. Red rubber lens cap

7. Articulation angle control wheel

8. Control wheel locking lever

9. Light boost button

10. 90° rotation button

11. Anti-reflection button

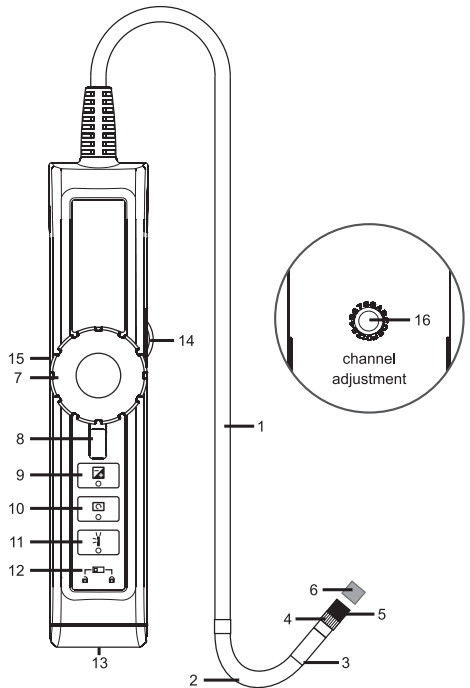
12. Button lock/unlock switch

13. Mini-USB charging jack

14. Power switch/brightness adjustment thumbwheel

15. Probe battery status LED

16. Channel selector switch (on back)



SETUP INSTRUCTIONS

CHARGE PROBE BATTERY

You can use the P18HPART “right out of the box” before fully charging its battery by docking the probe with the DCS1800 console and charging the batteries of both components at the same time. The Setup Instructions section of your DCS1800 or DCS1800ART user’s manual shows how to dock the probe and where to plug in the included AC adapter and charging cable.

Alternatively, you can charge the probe’s battery separately through the same jack on the bottom of the probe (Fig. 1, Callout 13) used to charge a docked probe.

The table below correlates the color of the battery status LED on the side of the probe controller (Fig. 1, Callout 15) with the probe's battery charge.

COLOR	BATTERY STATUS	COMMENT
Green	in use	Working under full battery
Dark red	Low battery	Recharge battery when dark red light appears during use
Orange	Charging while in use	Charging while in use
Red	Charging with power off	Charging with power off
None	Full battery with power off	Light dims when battery is fully charged

SYNC CONSOLE AND PROBE

To communicate wirelessly, the P18HPART and the DCS1800 console must be operating on the same channel. Each component's channel selector switch is on the back of the unit.

Since there are only four available channels, the fastest way to sync the two components is to use a small, flat-blade screwdriver to move the channel selector switch of *either* component through all four possible positions. When probe video appears on the console with the probe detached, you have succeeded in syncing the two units.

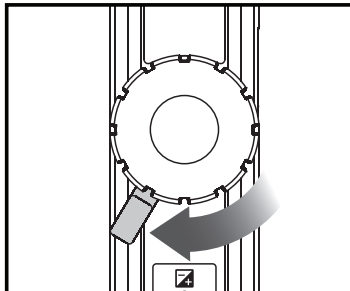
OPERATING INSTRUCTIONS

For general guidelines on using the probe as an inspection tool, refer to the Operating Instructions section of your DCS1800 or DCS1800ART user's manual.

Before attempting to articulate the probe, make sure that the lever below the articulation angle control wheel (Fig. 1, Callout 8) is pointing downward.

To bend the probe neck (Fig. 1, Callout 2) **and tip** to the left, turn the wheel clockwise. To bend the probe neck and tip to the right, turn the wheel counterclockwise.


To lock the wheel and the probe's articulation angle, move the lever below the wheel to the left (see figure above).



To adjust the intensity of the LEDs at the tip of the P18HPART, roll the thumbwheel on the side of the probe controller forward or back.

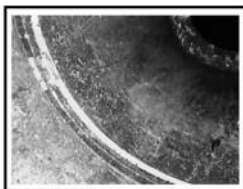
Remember to remove the red rubber lens cap from the tip of the probe before using it.

USING THE THREE CONTROL BUTTONS

To boost the intensity of the three LEDs normally providing camera lighting, press the  button. Doing so lights a red LED behind the button and improves the brightness of video and images, as shown below.





BEFORE BOOST





AFTER BOOST

This feature can help you cope with very low-light conditions. When recording with the boost feature activated, you must hold the probe very steady or your videos and images will be blurred.

To rotate the probe's field of view, use the  button. Pressing the button once backlights the button red and rotates the frame clockwise by 90°. Pressing it a second time rotates the frame by an additional 90°, in effect

turning the original view upside-down. Pressing the  button a third time rotates the field of view yet another 90°. Pressing the button a fourth time restores the original view and extinguishes the red button backlight.

To remove glare, reflections or spots from the field of view, use the  button. Pressing the button adds a red backlight to it, just like the other two buttons on the probe controller.

This anti-reflection feature of the P18HPART is most useful for eliminating reflections of the three forward-facing LEDs in the camera head from shiny surfaces. Note that pushing the  button extinguishes the three forward-facing LEDs and shifts responsibility for camera lighting to the two side-facing LEDs. The net effect, as shown in the two photos below, is a clearer and more-readable image.

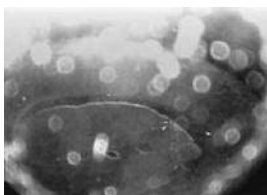


WITHOUT ANTI-REFLECTION

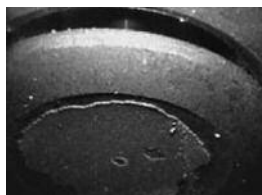


WITH ANTI-REFLECTION

You can also use the anti-reflection function to remove glare created by the P18HPART's mirrored viewing tip (see the next section of this manual for installation and alignment instructions). The pair of images below illustrates the net positive effect.



**MIRRORED VIEW
WITHOUT ANTI-GLARE**

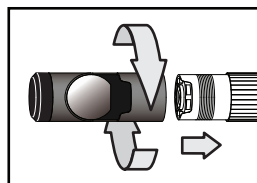
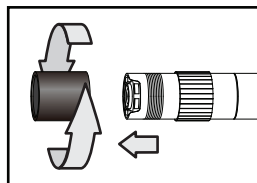


**MIRRORED VIEW
WITH ANTI-GLARE**

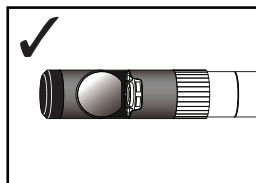
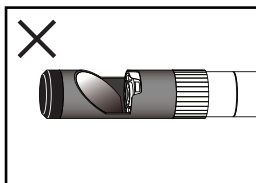
ATTACHING THE MIRRORED VIEWING TIP (OPTIONAL)

The only accessory included with the P18HPART is a 70° mirrored viewing tip. To attach it to the probe:

1. Pull off the red rubber lens cap (Fig. 1, Callout 6).
2. Unscrew and remove the black metal thread protector ring (Callout 5), as shown at right.
3. Turn the stainless steel accessory alignment ring (Callout 4) clockwise to move it away from the probe tip. Keep turning until the ring can travel no further.
4. Screw the mirrored viewing tip onto the camera head (Callout 3) by turning it clockwise, as shown at right. Keep turning until the viewing tip is as far from the probe tip as possible. In this position, it can rotate freely.



5. Press the V button to activate the two-side facing LEDs.
6. Slowly turn the mirrored viewing tip counterclockwise to move it toward the probe tip. Once the threads of the tip grip the camera head, continue turning only until the two LEDs are clearly visible through the gap in the tip's housing.
7. Secure the tip with the thumb and forefinger of one hand and use your other hand to turn the alignment ring clockwise. Keep turning the ring until its leading edge contacts the mirrored viewing tip, locking it in place. The pair of figures below illustrate the incorrect (left) and correct (right) orientation of the mirror with respect to the LEDs.



Remove the blue circular protective film from the mirror by pulling on its tab with a tweezers.

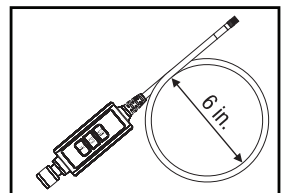
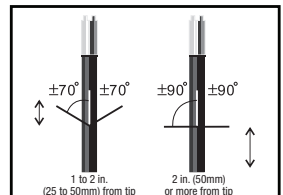
SPECIFICATIONS

Probe Type	Soft metal, with flexible-obedient remote-controlled neck
Probe Length	1m (3.3 ft.)
Camera Head Diameter, Type	0.23 in. (6mm), Stainless steel
Camera Head Diameter with Thread Protector	0.26 in. (6.5mm)
Camera Head Length	0.9 in. (23mm)
Camera Resolution	VGA (640 x 480 pixels)
Camera Depth of Field	0.25 to 12 in. (6.4 to 300mm)
Camera Field of View	60° (diagonal)
Camera Lighting	3 forward-facing LEDs + 2 side-facing LEDs
Wireless Frequency	Any of four channels centered on 2.4GHz
Wireless Range	33 ft. (10m)
Operating Temperature	-4° to 140°F (-20° to 60°C)
Dimensions of Probe Controller	5.47 x 1.38 x 1.26 in. (139 x 35 x 32mm)
Weight of Controller	7.76 oz. (220g)

OPERATING & MAINTENANCE TIPS

The probe is flexible to make it easy for you to inspect hard-to-reach areas. Never insert or bend it by force, and never over-bend any part of the probe. Specifically:

- Do not bend the last 1 to 2 inches (25 to 50mm) of the probe by more than 70°
- Do not bend the probe at any other point by more than 90°
- The probe's neck is a particularly sensitive area. Never apply heavy weights or forces to the neck. Never try to bend the neck by hand; use only the control wheel. Before storing the probe, straighten the neck.



To avoid permanently damaging the delicate wires and fiber optic cables inside the probe, never curl it into a circle with a diameter of less than 6 in. (150mm).

Never use the probe or camera head to modify surroundings or to clear pathways or clogged areas.

DO NOT try to rotate the articulation angle control wheel beyond its limits.

The camera head, LEDs and thread protector ring are waterproof, but not acid-proof or fire-proof. Do not touch acidic, corrosive or hot materials (see table below) or they will ruin the head.

Cover the camera-tipped end of the probe with the protective red rubber lens cap when not using it. Remember to remove the cap from the tip of the probe before using it again.

Unless you wish to install the 70° mirrored viewing tip, do not remove the thread protector ring (Fig. 1, Callout 5). Never use the probe without attaching either an accessory or the thread protector ring to it.

Never use the probe as a hammer or hook.

When inspecting a vehicle, shut off the engine. Metal and liquid under the hood may be hot. Do not get hot oil or gas on the camera head.

If condensation forms inside the camera lens, let it evaporate before using the probe again.

Do not try to disassemble any part of the probe. Doing so creates an electrical hazard, could damage the probe, and voids the limited warranty.

Do not use any corrosive liquid—such as alcohol—to clean the probe body or camera head. Use a cotton swab and a mild fluid detergent to clean the body and head.

P18HPART's Tolerance of Various Liquids

Liquid	Tolerant	Liquid	Tolerant	Liquid	Tolerant
Aviation fuel	Yes	Ethanol (CH ₃ CH ₂ OH)	Yes	Mr Muscle (for bathroom)	No
Hydraulic oil	Yes	Brine	Yes	Edible vegetable oil	Yes
Turbine oil	Yes	Engine oil	Yes	Urea (CH ₄ N ₂ O)	Yes
Antifreeze	Yes	Brake fluid	Yes	Insulating oil	Yes
Toluene (C ₇ H ₈)	No	Gasoline	Yes	SeaFoam	No
Ethyl acetate (C ₄ H ₈ O ₂)	No	Diesel fuel	Yes	Nitric Acid (HNO ₃)	No
Methyl ethyl ketone		Transmission fluid	Yes	Ammonia (NH ₄ OH)	No
(butanone) (C ₄ H ₈ O)	No	Mr Muscle (for glass)	Yes	Oil booster	Yes

WARRANTY INFORMATION

General Tools & Instruments' (General's) P18HPART VGA Resolution Wireless Articulating Probe is warranted to the original purchaser to be free from defects in material and workmanship for a period of one year. Subject to certain restrictions, General will repair or replace the probe if, after examination, the company determines it to be defective in material or workmanship. The warranty period begins on the date of purchase. You are encouraged to register your product online. General will extend your warranty an additional 60 days if you register at www.generaltools.com/ProductRegistry.

This warranty does not apply to damages that General determines to be from an attempted repair by non-authorized personnel or misuse, alterations, normal wear and tear, or accidental damage. The defective unit must be returned to General Tools & Instruments or to a General-authorized service center, freight prepaid and insured.

Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for purchase of this product. In no event shall General be liable for any incidental, special, consequential or punitive damages, or for any cost, attorneys' fees, expenses, or losses alleged to be a consequence of damage due to failure of, or defect in any product including, but not limited to, any claims for loss of profits.

Register now at www.generaltools.com/ProductRegistry to receive a 60-day extension to your warranty.

RETURN FOR REPAIR POLICY

Every effort has been made to provide you with a reliable product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service to obtain an RGA (Return Goods Authorization) number before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

General Tools & Instruments
80 White Street
New York, NY 10013
212-431-6100

Remember to include a copy of your proof of purchase, your return address, and your phone number and/or e-mail address.



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Specifications subject to change without notice

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