



Carlson
BREAK NEW GROUND

Washington data collector - manual

Carlson Software Inc.

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1 Customer information

1.1 Dear customer

Carlson's Washington data collector is designed to be easy to operate. However, we would ask you to take the time to read these operating instructions carefully before using the equipment. Keep the manual with the instrument at all times.

For any feedback or comments, or if there are questions about the Washington which are beyond the scope of this manual, contact the product support department at Carlson Software, or your local Carlson representative.

See Carlson's website for information on your local Carlson representative or Carlson-approved service center: **www.carlsonsw.com/about-us**.

When contacting Carlson for support, to ensure the best service, make a note of your equipment's serial number. This can be found on a label on the back of the Washington (see Figure 3).

1.2 Carlson office contacts

Carlson's main offices, where your Washington equipment is designed, built and supported, are outlined below.

Carlson Software Inc Head office, production and service	Carlson LMD Engineering, production and service	Carlson EMEA BV Sales, support and logistics
Carlson Software Inc. 33 East Second Street, Maysville, KY 41056, USA.	Halifax House, Tockwith, York, YO26 7QP, United Kingdom.	Markerkant 1338, 1314 AN Almere, The Netherlands.
+1 (606) 564-5028 info@carlsonsw.com	+44 (0)1423 369240 lasermeasurement@carlsonsw.com	+31 36 750 178 EMEA@carlsonsw.com

Carlson Software Australia Pty Ltd Sales, service and support	Carlson Software Inc. Sales, service and support
43 Stubbs Street, Kensington, Victoria 3031, Australia.	6683 Fourth Line Road, North Gower, Ontario, K0A 2T0, Canada.
+61 3 9021 0681 apacsales@carlsonsw.com	+1 606-564-5028 lasermeasurement@carlsonsw.com

1.3 User manual

It is important that you read this manual carefully before using the Washington.

This manual has been compiled with care. However, should you discover any errors, we would be grateful if you could contact Carlson directly. The information in this document is subject to change without notice.

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1.3.1 Manual version

The document number of this manual is PD-2307-8040-J, compiled in October 2026.

Updates incorporated into manual PD-2307-8040-J:

- Updated eSIM information (section 3.8).
- Added company addresses (section 1.2).

Manual PD-2307-8040-I:

- Updated safety & regulatory information for equipment compliance.

2 Getting started

2.1 The Washington data collector

The Washington is a powerful data collector which has been designed and manufactured by Carlson Software. It has been built to meet the specific needs of field surveyors, especially those using Carlson's **SurvPC** and **Gama** GNSS engine, both of which are optimized to run on the Washington.

The Washington replaces Carlson's previous data collector the Surveyor 2.



Figure 1 The Washington in the field

The Washington features a full Qwerty keyboard, internal GNSS receiver, long range Bluetooth®, Wi-Fi, an eSIM and USB and serial connectors.

The unit is highly ruggedized to cope with the rough conditions it is expected to encounter in the field. Hot-swappable batteries provide sufficient battery life to run the data collector for a long day before any recharging is required.

The Washington integrates seamlessly with Carlson field hardware such as CRx robotic total stations, and Viking and BRx7 GNSS units. Data can be output straight to Carlson's office software products such as **Carlson Office**, **Precision 3D** and **Carlson Mining**, as well as to a host of industry-standard packages.

2.2 First use of the Washington

This section provides a quick guide to using the Washington for the first time.

2.2.1 Insert batteries

The battery cover is in the base of the unit.

Squeeze together the latches on the battery cover to remove it from the Washington.

Slide one of the supplied removable batteries into the Washington, leaving the battery tab in an accessible position for future removal.

Replace the battery cover, making sure it clicks into place.



2.2.2 Charge the Washington

There is an internal battery in the Washington, in addition to the removable battery.

Plug the 12 V power supply into the Washington's side port.

The **Power** key flashes while charging is in progress. The battery charges fully in less than three hours.

The internal battery is charged together with the removable battery that is present in the battery compartment.

A full charge can give up to 8.5 hours of use.

The internal battery allows the removable batteries to be hot-swapped in the field to further extend the use.



2.2.3 Power up the Washington

The **Power** key is in the bottom right of the keyboard.

Press the **Power** key to turn ON the Washington. The **Power** key lights up while the unit is powered.

Press the **Power** key again to display the menu to turn the Washington OFF, or to send the unit to sleep.



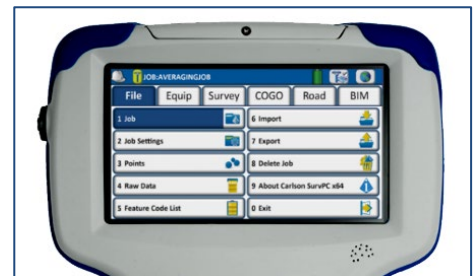
2.2.4 Navigating around the Washington

Interact with the Washington through the touchscreen or via the keyboard.

A finger can be used with the touchscreen, but a stylus is supplied with the Washington and usually gives a more accurate way of selecting items on-screen.

Use the physical keyboard for data entry.

The arrow keys and tab keys offer a method of navigating around the Windows environment and **SurvPC**.



2.2.5 SurvPC and field work

Washington offers a standard Windows environment.

SurvPC is pre-installed on the Washington. To launch the software, press the **Carlson** key in the middle of the keyboard.



To assist your field work with the Washington, the unit incorporates:

- A long-range Bluetooth® module to enable robust comms with your total station.
- A camera for record keeping in **SurvPC**.
- A bright, clear 5" screen.
- A physical keyboard.
- An eSIM for external connections through the cell phone network.
- A GNSS receiver, powered by Carlson's **Gama** RTK engine. Register the **Gama** app and connect a GNSS antenna to the TNC connector on the back of the Washington to activate fast, reliable, and accurate GNSS results in the field.



Subsequent sections of this manual give full details of all the hardware elements of the Washington.

3 The Washington data collector hardware

3.1 Construction

The component parts of the Washington unit are described in the sections below.



Figure 2 The Washington front view



Figure 3 The Washington back view

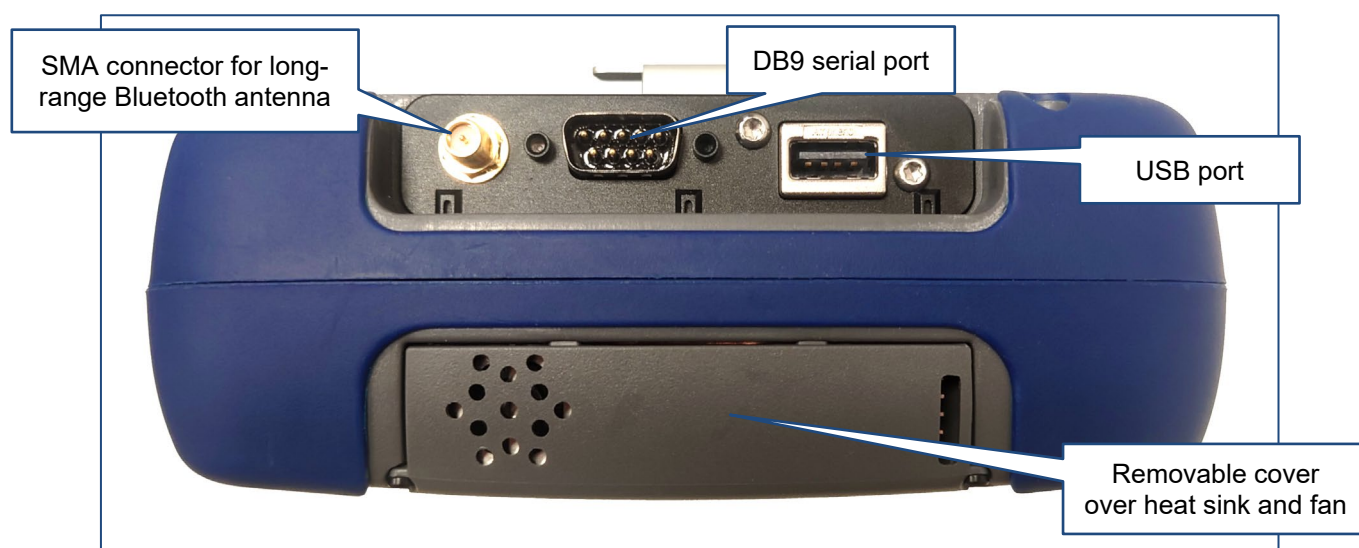


Figure 4 The Washington top view



Figure 5 The Washington bottom view

3.2 Screen

The 5" Washington touchscreen supports standard touchscreen gestures within Windows and any supported software. Tap to select; double tap to open; tap and hold to open a context menu; tap and drag to move items; pinch or expand to change the size of a view.

The touchscreen is optimized for finger input. Windows settings allow adjustment of touch sensitivity. There is no alignment process required for capacitive screens.

A capacitive stylus can be used as a more accurate alternative to a finger.

Display brightness can be adjusted using the **Function** key in combination with the **Up** or **Down** arrow keys, or from within standard Windows display settings.

The touchscreen can be disabled and enabled in the Washington Toolbox application. The touchscreen can also be enabled by pressing the **Function** key and **Backspace**. Disabling the touchscreen is useful for cleaning the screen, for avoiding accidental input, or when using the Washington in the rain.

The touchscreen is extremely scratch resistant, so a screen protector is not included with the Washington. However, if you decide to apply one for additional toughness, refer to the installation instructions included with your purchased protector.

3.3 Ports

The Washington incorporates the following hardware ports on the top panel:

- **SMA connector:** for the supplied long-range Bluetooth® antenna.
- **9-pin D-type (DB9) serial connector:** to interface with external serial-based peripherals.
- **USB-A connector:** to interface with USB drives and cables.

In addition, on the back of the Washington:

- **TNC connector:** to connect to a GNSS antenna.

Rubber covers are supplied to protect the ports when they are not in use.

3.4 Keypad

The Washington features a sealed, backlit keyboard with a full QWERTY layout and numeric keypad. Some keys are programmable, and several combinations provide shortcuts to system functions.

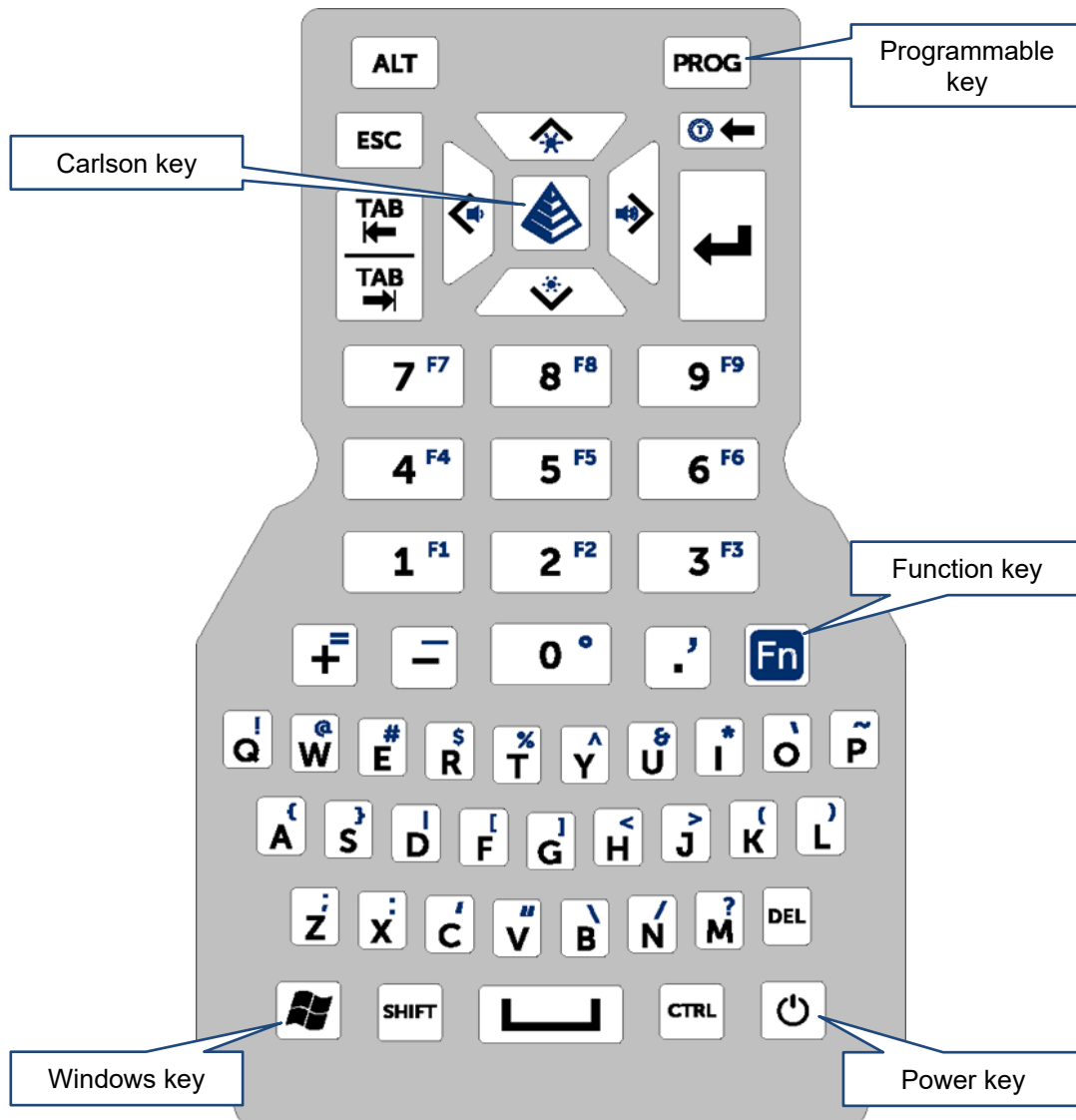


Figure 6 The Washington keyboard

3.4.1 The Power key

Press the **Power** key to turn the Washington ON.

Click the **Power** key to open the power options. The **Power** menu appears. Select from:

- **Power off:** turn the unit OFF.
- **Sleep:** send the unit into sleep mode. Press any key, or the touchscreen, to wake up the Washington.
- **Restart:** to reboot the unit.
- **Cancel:** to resume using the unit.

To skip the **Power** menu on the touchscreen, hold down the **Power** key for 5 seconds. The Washington powers OFF.

The **Power** key flashes in various sequences to indicate the power status. See section 3.5.3 for details.

The **Power** key flashes in various sequences to indicate Washington hardware faults. See section 6.1 for details.

3.4.2 The Carlson key

The **Carlson** key is identified by Carlson's pyramid logo. Press the **Carlson** key to open **SurvPC**.

3.4.3 The Function key

Most keys have an alternative function indicated in blue on the face of the key.

To activate this alternative function, Press the **Function** key once. The **Function** key light turns ON to indicate that it is active. Press the relevant key on the keyboard to activate the alternative function. The **Function** key light automatically turns OFF to show it is now inactive.

Press the **Function** key twice to fix it in active mode. It will stay in active mode until it is pressed again.

3.4.4 The SHIFT key

The **SHIFT** key is a modifier key on the keyboard, used to type capital letters and other alternate characters.

To activate the modifier, Press the **SHIFT** key once. The **SHIFT** key light turns ON to indicate that it is active. Press the required key on the keyboard. The **SHIFT** key light automatically turns OFF to show it is now inactive.

Press the **SHIFT** key twice to fix it in active mode. It will stay in active mode until it is pressed again.

3.4.5 The PROG key

The **PROG** key can be programmed to activate a commonly used function on the Washington.

Use the **Washington Toolbox** application to program this key: see section 5.3.

3.4.6 Standard Windows functions

In addition to the keys above, the keyboard functions as a normal Windows keyboard. For example:

- The **CTRL** and **ALT** keys activate standard alternative functions.
- Press the **SHIFT** key first and then the **ALT** key to activate standard Windows SHIFT + ALT functions.
- Hold down the **CTRL**, **ALT** and **DEL** keys to open Windows Task Manager.
- The **Windows** key opens the Windows taskbar.
- **Windows** key held down with another key activates standard Windows shortcuts. For example, hold down the **Windows** key with the **E** key to open Windows Explorer.

3.4.7 Table of key functions

A full explanation of key functions is listed below. The primary function is shown in the column two, followed by the result when combined with the **SHIFT** key (column three) and the **Function** key (column four).

		Press and release	SHIFT + key press	Function + key press
Carlson		Run SurvPC		
ESC		Escape		
TAB left		Left tab		
TAB right		Right tab		
Up Arrow		Move up cursor		Turn brightness up
Left Arrow		Move left cursor		Turn volume down
Right Arrow		Move right cursor		Turn volume up
Down Arrow		Move Down cursor		Turn brightness down
Back Space		Backspace (delete left of cursor)		Enable touchscreen
Enter		Enter (return)		
1		1		F1
2		2		F2
3		3		F3
4		4		F4
5		5		F5
6		6		F6
7		7		F7
8		8		F8
9		9		F9
ALT		ALT command	ALT + SHIFT command	
+		+		=
-		- (minus)		_ (underscore)
0		0		° (degree)
.		. (period)		, (comma)

Press and release		SHIFT + key press	Function + key press
Function	 Function command (one key press) Lock Function command (two key presses) Release function lock (third key press)	Note: pressing Function key while in SHIFT lock state disables the SHIFT action and enables Function action.	
A	a	A	{
B	b	B	\
C	c	C	' (apostrophe)
D	d	D	
E	e	E	#
F	f	F	[
G	g	G	]
H	h	H	<
I	i	I	* (asterisk)
J	j	J	>
K	k	K	(
L	l	L	)
M	m	M	?
N	n	N	/
O	o	O	` (grave accent)
P	p	P	~
Q	q	Q	!
R	r	R	\$
S	s	S	}
T	t	T	%
U	u	U	&
V	v	V	"
W	w	W	@
X	x	X	:
Y	y	Y	^
Z	z	Z	;
DEL	Delete (delete right of cursor)		
Windows	 Windows Taskbar / Menu		

	Press and release	SHIFT + key press	Function + key press
SHIFT	SHIFT command (one key press) CAPS LOCK (two key presses) Release CAPS LOCK (third key press)	Highlight with left and right arrows.	Note: pressing SHIFT key while in Function lock state disables the Function action and enables SHIFT action.
SPACE 	Space		
CTRL	CTRL command		
Power 	Power menu Power Off (hold for > 5s) Hardware power cycle (hold for >20s)		

3.5 Batteries and power

An internal battery is contained within the Washington. This battery is rated at 7.2 V / 28.12 Wh. The internal battery is fixed in place and cannot be removed by the user.

In addition to the internal battery, two separate removable batteries are supplied as part of the Washington kit (see section 4.1.1).

The internal battery allows the two removable batteries to be 'hot-swapped': i.e. they can be swapped over without powering down the Washington. The internal battery must have sufficient charge to enable the hot-swap.

The internal battery takes over from the removable battery when the removable battery power level drops below 5%.

3.5.1 Changing removable batteries

A battery cover on the bottom of the Washington holds the removable battery in place.

To load a removable battery into the Washington:

- Squeeze together the latches on the battery cover and remove it from the Washington.



Figure 7 Squeeze latches together to release the battery cover

- Align the battery the correct way with respect to the contacts and the groove along the length of the battery.
- Slide the battery into place, ensuring the contacts are properly seated.
- Push firmly until you hear an audible click, indicating the battery is securely docked.
- Confirm that the battery tab is accessible for future removal.
- Replace the battery cover.

To remove the battery, use the tab to pull it firmly from the battery housing.

3.5.2 Battery charging

The internal battery is charged by plugging the 12 V power supply into the Washington's side port (see section 4.1.2). Any removable battery that is present in the Washington starts to charge at the same time.

While the batteries are charging, the **Power** key flashes on and off once a second.

Power OFF the Washington to achieve the maximum charging speeds shown below. If the unit is powered ON, charge times will increase depending on load.

The removable batteries can also be charged in the external battery charger cradle.

Batteries	80% charge time	Full charge time
Internal battery only	< 2.0 hours	2.5 hours
Internal + removable battery in Washington	< 3 hours	4 hours
Removable battery in external battery charger		3 hours

3.5.3 Run times

Typical run times for the Washington are shown below.

Batteries	Min and max run times depending on load	
Internal battery only	2.5 hours	3 hours
Internal + removable batteries	6.5 hours	8.5 hours

All run times are dependent on a number of factors including:

- Age of the battery and the number of charge cycles.
- The ambient temperature.
- The amount of processing being carried out using installed Windows software.
- The amount of use of the camera, cellular, Wi-Fi and audio functions.
- The brightness of the screen.

To extend the battery life, you may adopt some of the methods below:

- Put the Washington into **Sleep** mode after a set interval.
- Dim the screen brightness.
- Disable radios when not in use. This includes the Bluetooth®, Wi-Fi and Cell connections. Turn radios off from the **Washington Toolbox** application, or press **Start > Settings > Connections > Wireless Manager**.
- Avoid using the camera.

3.5.4 Battery warnings

The Washington power warnings take into account the levels of the internal battery and the removable battery.

The hot-swap feature depends on the internal battery. Therefore, if the internal battery has too low a charge, a hot-swap is not possible.

Low battery combinations are indicated by the power key displaying a flashing sequence, and also by on-screen warnings through **SurvPC**.

The table below displays the various combinations of internal and removable battery charge, and the behavior of the Washington in response. In this table, battery levels are considered to be:

- **OK:** when the charge level is above 10%.
- **Low:** when the level is between 6-10%.
- **Critical:** when the level is below 6%.

Internal battery level	Removable battery level	Power key	On-screen warning	Boot up possible?
<=10%	Not fitted	Double Flash for 3 sec when pressed.	Unit will shut down in 60 sec.	No
<4%	<4%	Double Flash for 3 sec when pressed.	Unit will shut down in 60 sec.	No
<6%	<=10%	Fast Flash.	Hot-swap unavailable. Battery Low.	Yes
<6%	>10%	Fast Flash for 1 sec, every 10 sec.	Hot-swap unavailable.	Yes
<=10%	<=10%	Solid Blue.	Hot-swap advised.	Yes
<=10%	>10%	Solid Blue.	None.	Yes
>10%	<=10%	Solid Blue.	Hot-swap advised.	Yes
>10%	>10%	Solid Blue.	None	Yes

3.6 Bluetooth®

The Washington incorporates a standard Bluetooth® v.5.1 module. This can be used to connect to Windows peripherals for short-range applications of up to 32 ft (10m).

This Bluetooth® module can be accessed using the standard Windows Bluetooth® interface. Turning the Bluetooth® ON / OFF in the Windows interface only affects the standard Bluetooth® module in the Washington.

In addition, the Washington incorporates a long-range Bluetooth® module.

In **Windows Device Manager**, the two Bluetooth® devices are shown as:

- **Bluetooth® Device (RFCOMM Protocol TDI):** the long-range module, only accessible via **SurvPC**.
- **Intel Wireless Bluetooth®:** the standard module, accessible via the Windows Bluetooth® interface.

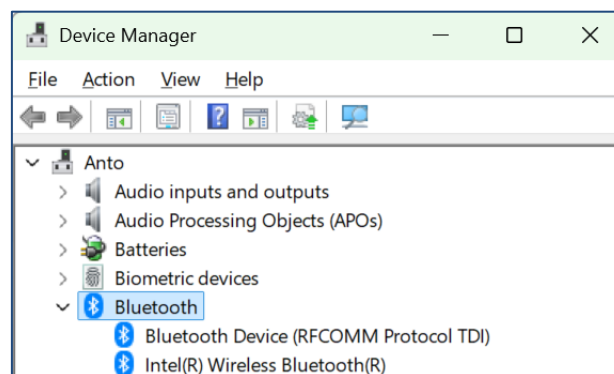


Figure 8 Windows Device Manager > Bluetooth

3.6.1 Long-range Bluetooth® module

The long-range Bluetooth® module is intended for use with a robotic total station. In this case the operator is mapping terrain by carrying a pole with a survey prism at significant distances from the total station. The long-range Bluetooth® module enables a separation of up to 1000 ft (305 m) from the paired total station. This is dependent on there being a clear line-of sight between the two devices.

For the long-range Bluetooth® to maintain connection to the maximum distance, the long-range Bluetooth® antenna must be used: see section 4.1.4. Screw the antenna onto the SMA connector on the top panel of the Washington.

When working close to the maximum connection range, the orientation of the Washington with respect to the paired total station may become critical. Aim to maintain a line-of-site between the Washington and the total station at all times. If the connection is lost, it may be necessary to walk closer to the total station in order to re-establish the link.

The long-range Bluetooth® module is only accessible via the **SurvPC** interface.

3.7 GNSS module

A GNSS receiver is incorporated within the Washington.

The multi-band GNSS high precision receiver is designed to be used with Carlson's **Gama** RTK engine. **Gama** delivers the best-in-class performance of any tested RTK system.

In order for the GNSS module to provide positional data, a GNSS antenna must be connected to the TNC connector on the back of the Washington. See section 4.2.1.

As with all GNSS operations, the antenna must be elevated to provide as clear a view of the sky as possible. Obstructions such as trees and walls will reduce the view of the sky, and thus the number of satellites that can be used in the positional solution.

Carlson can supply appropriate GNSS antennas and cabling that can be used with the Washington. See section 4.2.1 for further details.

Interaction with **Gama** is through a pre-installed application that runs on the Washington.

A license for **Gama** must be purchased, and a registration code entered, before it can be used.

See section 5.5 for further details.

3.8 Cellular modem

The Washington uses a pre-installed eSIM for cellular connection. The eSIM is setup for use with the FloLive service. There is no physical SIM card slot. Micro SIM adapters are not supported.

By default, the eSIM is locked to RTK Mobile. RTK Mobile connects to all major U.S. carriers.

To activate the eSIM, navigate to: **rtkmobile.com/sim**

On this page, enter your Integrated Circuit Card Identification number (ICCID). The ICCID is a unique code that acts as an ID for the internal eSIM card. Your ICCID is displayed on the serial number sticker on the back of the Washington. See section 3.12.



Figure 9 RTK Mobile SIM activation page

The **Washington Toolbox** can be used to verify cellular connectivity or check the IMEI. See section 5.3 for further details.

3.9 Fan and cooling

To prevent the Washington from overheating, a fan and heat sink are located on the top side of the Washington. A removable cover protects the fan and heat sink.

When used within the stated temperature limits, the Washington will use the fan to protect the hardware and keep it running.

In extreme circumstances, when the core temperature exceeds its maximum or minimum limits, Windows may display a temperature warning and, ultimately, shut down. In such cases, move the Washington to a more suitable ambient temperature and, if necessary, allow its temperature to fully adjust before powering ON.

Do not block the ventilation holes in the fan cover during use.

The fan cover can be removed for cleaning and maintenance: see Figure 10. The cover is held in place with two Phillips screws.

If the Washington has been operating in very dusty conditions, or if the unit seems to be unusually hot after use, remove the cover and gently clean the fan and heat sink with a soft brush. An air jet can be used to blow dust from the fan.



Figure 10 The Washington with the fan cover removed

3.10 Audio

The Washington incorporates a built-in speaker and microphone. These are used for system sounds and audio recording within supported applications.

Adjust the volume using the **Function** key in combination with the **Left** and **Right** arrow keys. Alternatively, use the standard Windows volume interface.

Audio settings can be adjusted through **Windows Settings > System > Sound**.

3.11 Camera

A 13MP camera is incorporated into the back of the Washington.

The camera is designed for use within the installed **SurvPC** software.

3.12 Serial number

Each Washington has a serial number sticker which displays the unique serial number and the date of manufacture.



Figure 11 The Washington serial number sticker

Also displayed on the serial number sticker is the ICCID. This is a unique code that acts as an ID for the internal eSIM card.

3.13 Compliance sticker

A second sticker on the back of the Washington displays the part number and further product information.



Figure 12 The Washington compliance sticker

4 Washington data collector accessories

The Washington is supplied with a set of accessories which provide everything that is needed to use the unit effectively in the field.

This section details the full range of accessories that constitute a Washington kit.

Note that the technology is constantly evolving and improving, and so some components described below may not accompany every Washington, or may differ in some way.

Replacement or spare items are available to purchase from Carlson Software. All Carlson part numbers related to the Washington are listed in section 9.

4.1 Standard Washington accessories

4.1.1 Batteries

The Washington is supplied with two removable lithium-ion batteries. The batteries are rated at 7.2 V / 49 Wh.

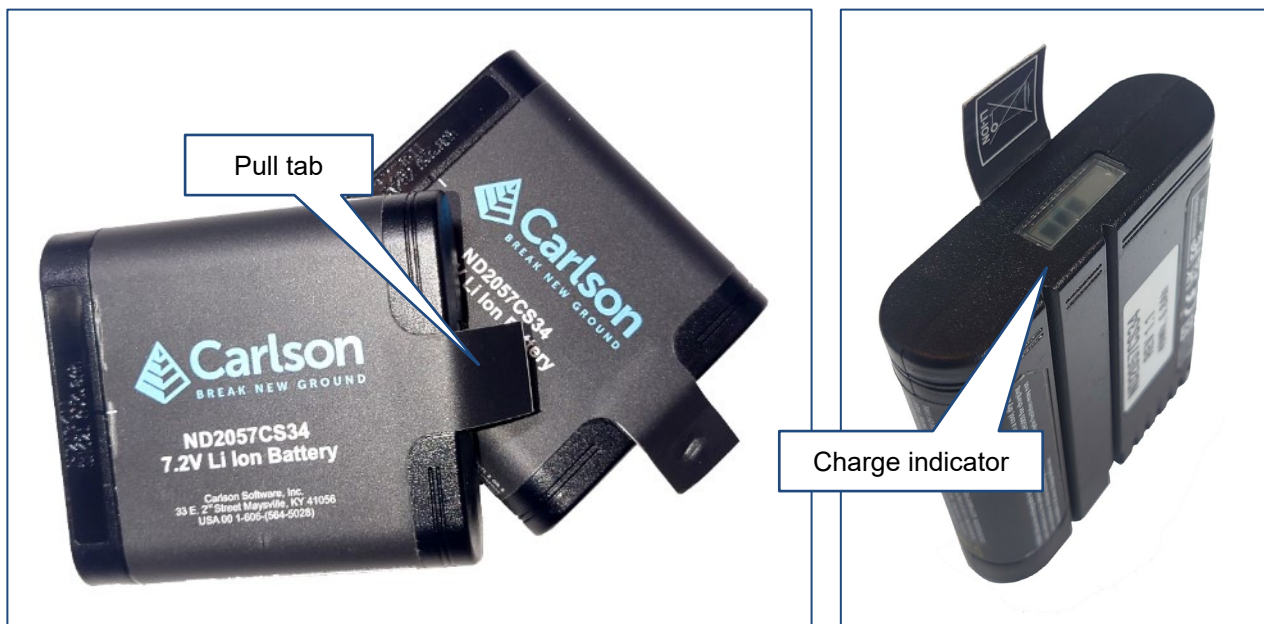


Figure 13 Removable 7.2V batteries

An LCD display on the top of the battery indicates the current charge of the battery. Five bars indicate a fully charged battery. A switch on the charging cradle runs a battery calibration sequence to ensure this charge indicator is accurate (see section 4.1.2).

Each battery incorporates a pull tab to assist with removal. Pull the tab gently to eject the battery.

Note that a fixed, internal battery is also contained within the Washington (see section 3.5). This internal battery allows the two supplied batteries to be 'hot-swappable': i.e. they can be swapped over without powering down the Washington.

Fully charged batteries can give up to 8.5 hours of use of the Washington.

4.1.2 Battery chargers

Accessories are supplied to allow the Washington batteries to be charged inside the unit, or externally in a cradle.

A 12 V power supply is supplied to charge the Washington's internal battery together with any removable battery that is present in the battery compartment. Connect the C7 cable to the 12 V power supply.

Plug the 12 V power supply into the Washington's side port. The power key flashes while charging is in progress. The internal battery and any removable battery that is present in the Washington charge together.



Figure 14 12 V power supply and the Washington

The Washington should only be charged using the 12 V PSU and mains cord provided by Carlson.

Charging should take place indoors at an ambient temperature range of 32°F to 104°F (0°C to 40°C).

A 24 V power supply with battery charging cradle is supplied to charge the removable batteries outside of the Washington.

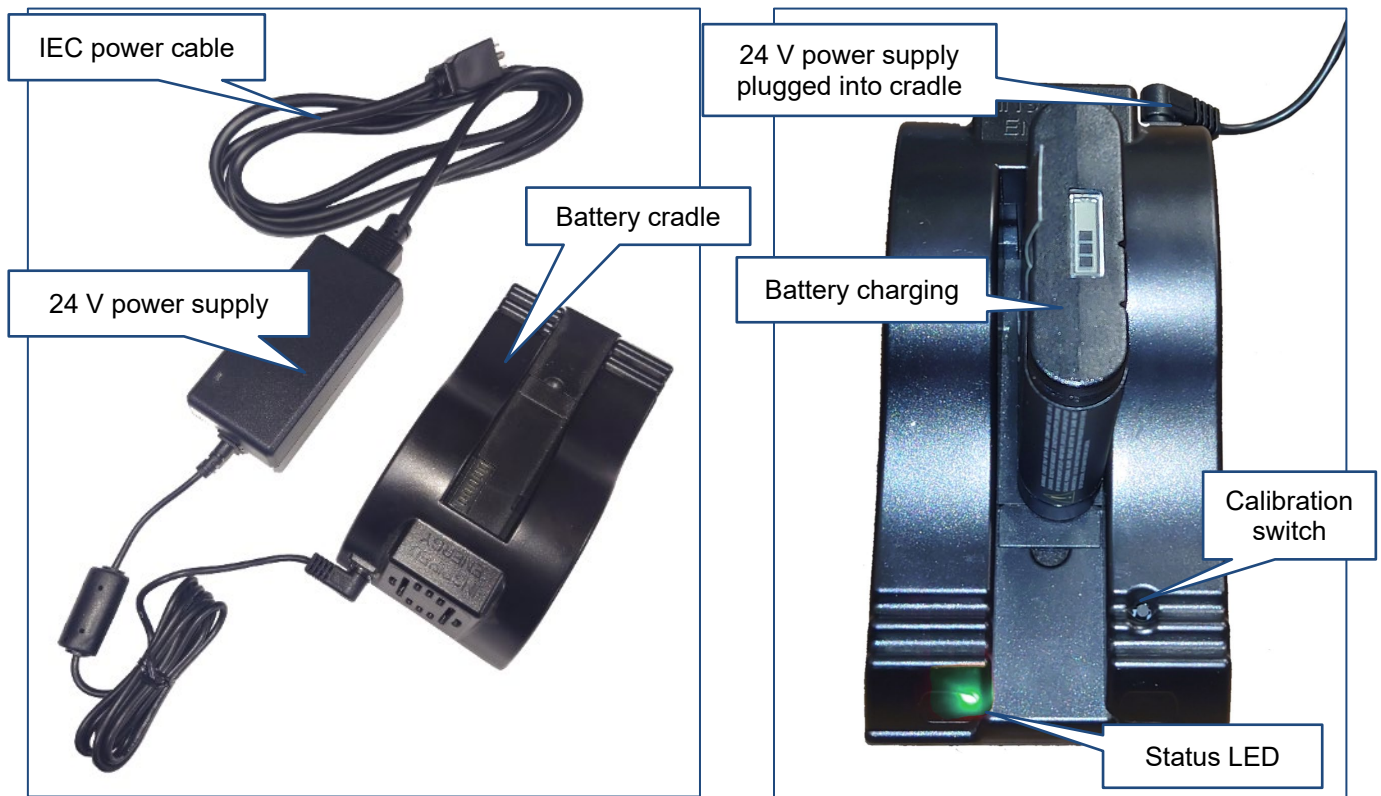


Figure 15 24 V power supply and battery cradle

Connect an IEC cable to the 24 V power supply. Plug the 24 V power supply into the battery cradle. Slot a battery into the cradle, ensuring that the contacts mate securely.

An LED in the cradle displays the current status of the battery. With the cradle powered ON and a battery slotted into the cradle the LED appears within 5 seconds. If no LED appears, check that the power is ON and that the battery is correctly seated in the cradle.

LED indicator	Status
Green flashing	Charging
Green solid	Charging complete
Red solid	Battery fault
Red flashing	Requesting calibration
Blue flashing	Calibrating
Blue solid	Calibrating complete

A button on the cradle begins a calibration cycle to ensure that the LCD charge indicator on the battery is accurate. With the battery in the cradle, press the switch. The charger runs through a full charge/discharge learning cycle to recalibrate the charge indicator on the battery. This calibration lasts approximately 24 hours.



The connectors on the two power supplies cannot be plugged into the wrong socket on the Washington or charging cradle. However, check that the correct power supply is being used. Using the wrong voltage power supply can result in charging failure, or device malfunction. Always verify the voltage before connecting a power supply.

The 24 V power supply is only for plugging into in the cradle to charge external batteries. The 12 V power supply is only for plugging directly into the Washington.

4.1.3 Pole mount

A pole clamp and Washington clamp are provided to allow the Washington to be mounted onto a typical survey pole with a GNSS receiver or prism attached to the top.



Figure 16 Pole mount and the Washington clamp (left) and mounted on a survey pole (right)

The pole clamp fits onto a survey pole. The Washington clamp fits into the pole clamp using a quick release connector.

4.1.4 Long-range Bluetooth® antenna

To enable the full range of the long-range Bluetooth® module in the Washington, attach the supplied external antenna to the SMA connector on the top of the data collector.



Figure 17 LR Bluetooth® antenna (left) and attached to the Washington (right)

The antenna is not required when using only the standard Bluetooth® v.5.1 module. If the long-range Bluetooth® is used without the antenna, the achievable distance will be significantly reduced.

4.1.5 Transit case

All components of the Washington kit are contained within a dedicated transit case. The case ensures the equipment is protected from shocks and vibrations.



Figure 18 The Washington transit case

When the lid is closed and the latches are snapped in place, the case is both dust-tight and water-tight (IP67).

Always pack the Washington and accessories into the transit case for storage and transportation.

Clean and dry the Washington and accessories prior to packing them in the transit case.

4.1.6 Stylus

A conductive stylus is included with the Washington.

Most off-the-shelf conductive styluses can be used with the Washington touchscreen.

Touchscreen settings can be set through standard Windows applications.

4.1.7 Screen cleaning cloth

A microfiber screen cleaning cloth is included with the Washington to clean the touchscreen.



Figure 19 Screen cleaning cloth

Use the cloth regularly to keep the touchscreen free of smudges, dust and general debris.

Any off-the-shelf, dry, lint-free microfiber cloth can be used for this purpose.

4.2 Optional Washington data collector accessories

4.2.1 GNSS antennas

Carlson can supply GNSS antennas and cabling to complement the Washington and make use of the embedded **Gama** engine.

The exact models being offered at any time may change.

Currently the antenna that is supplied by Carlson is the **Tallysman TW3972XF**. This is an extended-filter, triple-band GNSS antenna.

A survey pole is required to mount the Tallysman antenna.

A cable is required to run between the SMA connector on the antenna, and the TNC connector on the Washington.



Figure 20 Typical GNSS antenna supplied by Carlson.

Contact Carlson for further information about these products, or if you require information about help sourcing your own antenna.

4.2.2 Survey pole

An extendable survey pole to mount a survey prism or GNSS antenna and to affix the Washington via the pole mount and clamp.



Figure 21 Survey pole

4.2.3 Additional survey equipment

Contact Carlson for information on other surveying equipment and accessories such as prisms, tripods, GNSS receivers, drones and total stations.

All equipment supplied by Carlson is ruggedized, thoroughly field-proven and fits neatly into Carlson's integrated hardware and software solutions.

5 Software



5.1 Windows

The Washington boots directly into the Windows 10 IoT home screen. From here, users can access installed applications, system settings, and file management tools.

All system functions are accessed through standard Windows menus.

Note that the operating system is provided in English by default.

5.2 Washington Setup



Figure 22 Washington Setup desktop icon

The **Washington Setup** application is preloaded on the Washington. When run, the app reaches out via an internet connection to download and install the most recent version of the **Washington Toolbox**.

5.3 Washington Toolbox

The **Washington Toolbox** application is pre-loaded on the Washington.



Figure 23 The Washington Toolbox desktop icon

Tap the desktop icon to open the **Washington Toolbox**.

The **Washington Toolbox** provides information about your data collector and enables easy configuration of the battery, screen, and Wi-Fi and cellular connections.

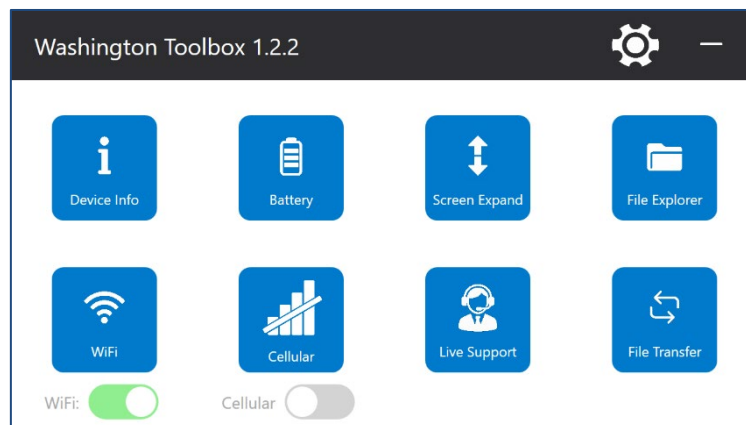


Figure 24 Windows Toolbox software

The tools available are:

- **Device Info:** displays basic information about the Washington unit, including model, serial number and software version.
- **Battery:** shows current battery levels and charging status for both internal and external batteries.
- **Screen expand:** enlarges the display area or toggles the full-screen mode for easier viewing.
- **File Explorer:** opens Windows File Explorer to browse files stored on the device or on an external drive.
- **Wi-Fi:** manage Wi-Fi settings.
- **Cellular:** manages mobile data connections and SIM card settings.
- **Live support:** opens a support interface for contacting technical assistance or accessing help resources.
- **File transfer:** provides options for transferring files via USB cable, thumb drive, or other supported methods.
- **PROG button:** tap the **Settings** icon to designate the **PROG** button to perform a task or open an app.

5.4 SurvPC

SurvPC software is pre-installed on the Washington.

SurvPC is delivered pre-registered and can therefore be used straight out of the box.

Launch **SurvPC** by pressing the **Carlson** key.

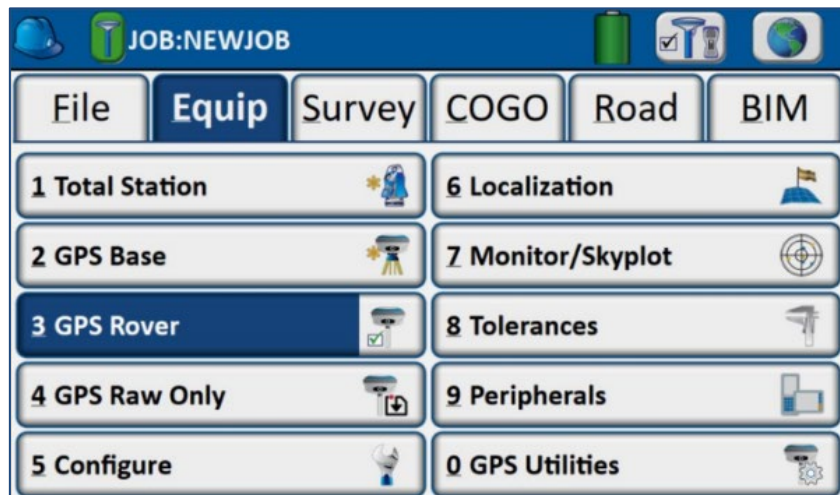


Figure 25 SurvPC software

From inside **SurvPC**, press the **Carlson** key again to access the Hotlist.

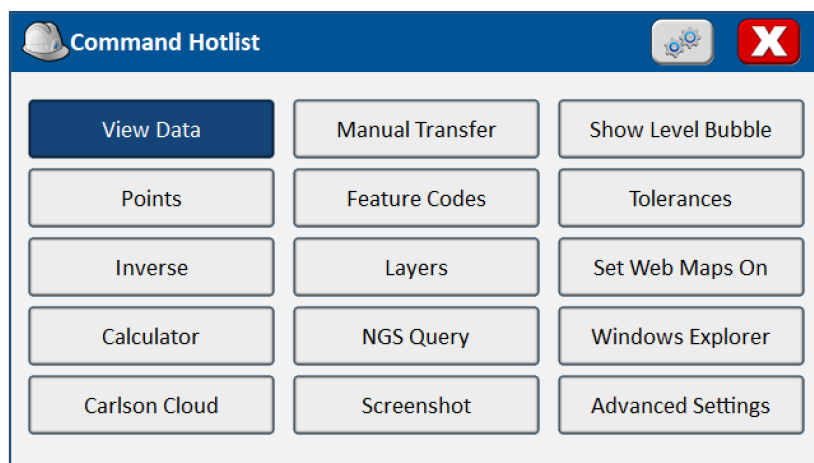


Figure 26 SurvPC command hotlist

See the dedicated **SurvPC** manual for further information on this software. This is available through **SurvPC**. Tap the helmet icon in the top left corner, then **Help > Browse manual**.

The **SurvPC** manual is also available for download from Carlson's website: see www.carlsonsw.com/support.

5.5 Gama

The Washington uses Carlson's **Gama** RTK engine to deliver high-precision GNSS positioning. **Gama** is a modern RTK engine designed to provide fast, reliable, and accurate results in the field.

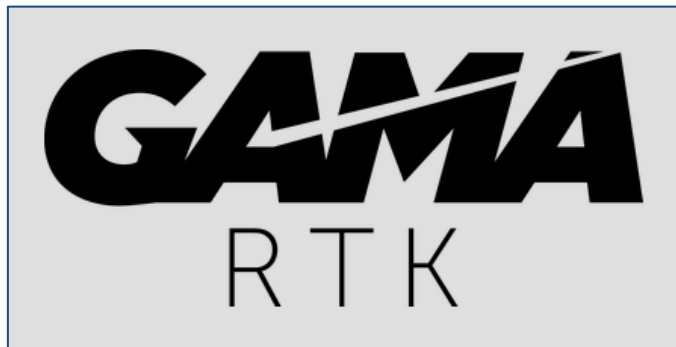


Figure 27 Gama RTK engine software

A **Gama** application is preinstalled on the Washington. Before using GNSS features on the Washington, the **Gama** RTK engine must be registered. This one-time process activates the GNSS module and enables full functionality, including RTK corrections and data logging.

When running, **Gama** continuously processes satellite signals from the GPS, GLONASS, Galileo, and BeiDou constellations. It calculates real-time position data and supports both rover and base station modes. Correction data can be received through NTRIP, UHF radio, or direct IP connections.

Users interact with **Gama** through an application that runs on the Washington. The application allows full control over GNSS settings, satellite tracking, data logging, and system diagnostics. **Gama** ensures the Washington provides dependable GNSS performance in a wide range of environments.

A separate GNSS antenna is required to receive signals from GNSS satellites. Carlson can supply suitable antennas as an optional accessory to the Washington.

5.5.1 Registering Gama

To begin registration, you must have your **Gama** serial number and an active internet connection.

From the **Gama** home screen, go to **Admin > Registration**.

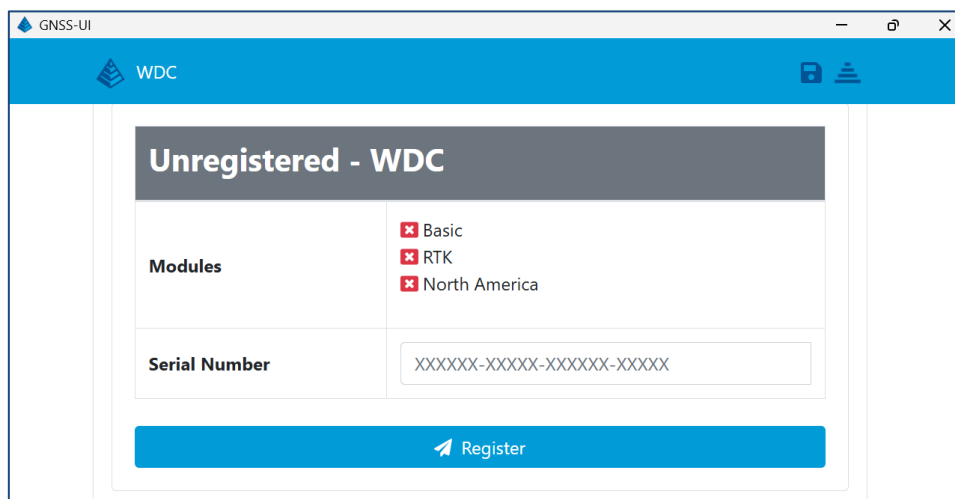


Figure 28 Registering Gama - i

Enter the serial number into the **Serial number** text box.

Your **Gama** engine is now registered and ready to use.

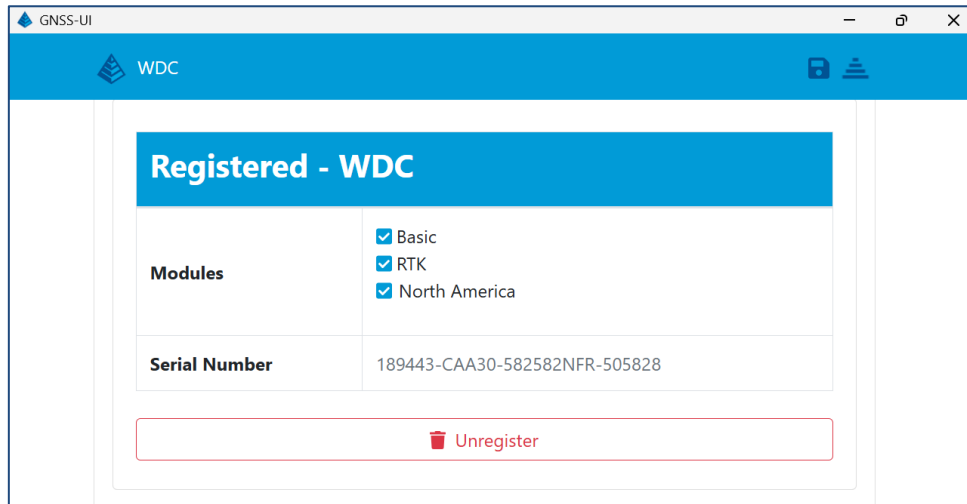


Figure 29 Registering Gama - ii

To swap the **Gama** registration to a different device, press the **Unregister** button. You may then proceed to re-register the application on another device using the same serial number.

5.5.2 Updating Gama

Check to see if there is an update available. Updates can be applied automatically through the application.

Go to **Admin > Update**. Tap **Check for Updates**.

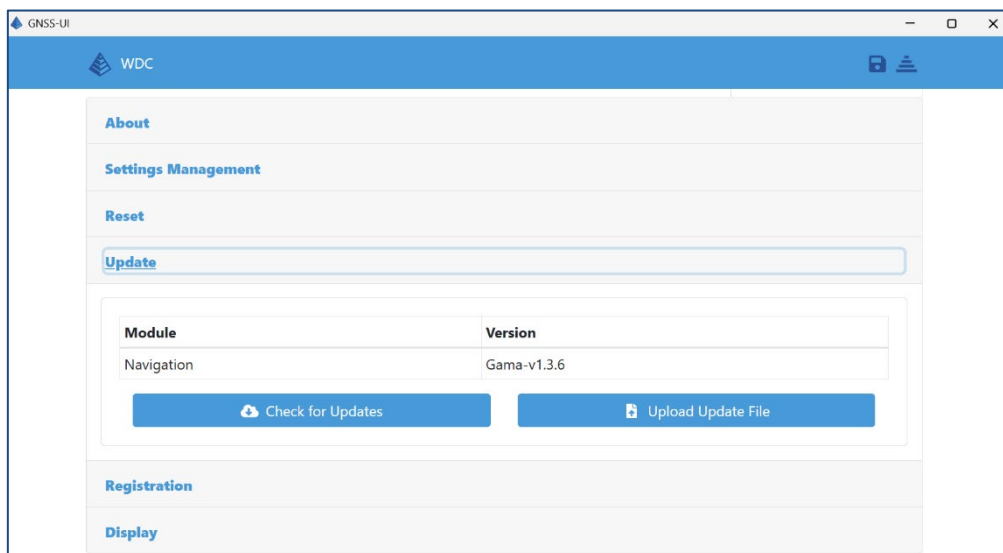


Figure 30 Updating Gama

5.5.3 Accessing the Gama manual

See the dedicated **Gama** manual for further information on this software. This is available through the **Gama** app: **Admin > About > User manual**.

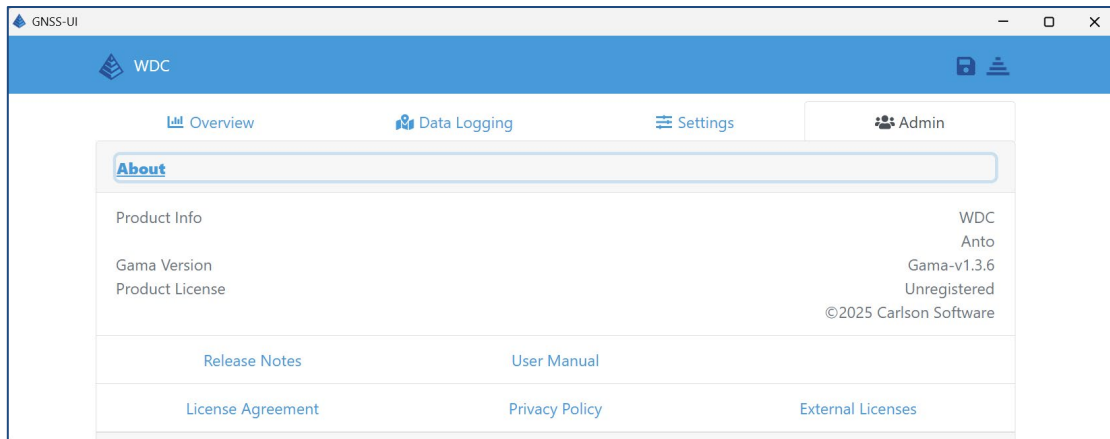


Figure 31 Accessing the Gama manual

Registration is not required to view the manual.

6 Troubleshooting

Some of the most common support questions relating to the Washington are outlined below. If you experience any problems with your hardware or software, check the list to find the cause and action, and also a reference to the relevant section in this manual.

It is strongly advised that, should any fault occur which is not listed, or if the recommended action does not rectify the fault, you should contact Carlson.

INSTRUMENT DOES NOT POWER ON		
Cause	Remedy	Reference in manual
No removable battery is present and the internal battery is flat.	Insert a removable battery. Use the 12 V power supply to charge up the removable battery and the internal battery.	3.5 Batteries and power 4.1.1 Batteries 4.1.2 Battery chargers
Both the removable battery and the internal battery are flat.	Use the 12 V power supply to charge up the removable battery and the internal battery.	3.5 Batteries and power 4.1.2 Battery chargers
Hardware fault.	Contact Carlson support.	1.2 Carlson office contacts
WASHINGTON DIES WHEN HOT-SWAPPING BATTERIES		
Cause	Remedy	Reference in manual
The internal battery level is too low to allow hot-swapping.	Use the 12 V power supply to ensure the internal battery is fully charged prior to going into the field.	3.5 Batteries and power 4.1.2 Battery chargers
BATTERY LIFE IS SHORTER THAN EXPECTED		
Cause	Remedy	Reference in manual
The batteries are not fully charged.	Ensure batteries are fully charged prior to going into the field.	4.1.2 Battery chargers
A faulty charger is not charging the batteries.	Check the 12 V power supply for charging batteries internally. The power button on the Washington flashes during charging. Check the 24 V power supply for charging batteries in the cradle. The cradle flashes during charging. Consult Carlson support. Consider a new battery charger.	3.5 Batteries and power 4.1.2 Battery chargers 1.2 Carlson office contacts 9 Carlson part numbers
The Washington is operating in very cold temperatures which can reduce the battery life.	Keep the batteries and the Washington as warm as the circumstances allow. Pack additional spare batteries to allow hot-swapping in the field.	3.5 Batteries and power 4.1.1 Batteries
The more processing that is carried out on the Washington, the shorter the battery life.	Pack additional spare batteries to allow hot-swapping in the field.	3.5 Batteries and power 4.1.1 Batteries
The removable batteries are aging. Battery life reduces as the batteries get older.	Consult Carlson support. Consider purchasing new batteries.	4.1.1 Batteries 9 Carlson part numbers

TOUCHSCREEN NOT WORKING AS EXPECTED		
Cause	Remedy	Reference in manual
The touchscreen has been turned OFF.	Use the Function key and Delete key to toggle the Touchscreen ON.	3.2 Screen
The wrong kind of stylus is being used.	Use a capacitive stylus as supplied by Carlson.	4.1.6 Stylus
Rain or dripping water on the screen is interfering with the touchscreen functionality.	If water is interfering with the performance of the touchscreen, use the Function key and Delete key to toggle the Touchscreen OFF.	3.2 Screen
The touchscreen is too dirty to allow smooth use.	Clean the touchscreen.	3.2 Screen 7 Maintenance, care and disposal
LONG-RANGE BLUETOOTH® IS NOT WORKING OVER THE EXPECTED RANGE		
Cause	Remedy	Reference in manual
The long-range Bluetooth® antenna is not fitted.	Attach the supplied external antenna to the SMA connector on the top panel of the Washington.	4.1.4 Long-range Bluetooth® antenna
There is no 'line-of-sight' between the Washington and total station.	The maximum range of the long-range Bluetooth® module requires a clear line-of-sight between the Washington and the total station.	3.6.1 Long-range Bluetooth® module
The maximum range of the long-range Bluetooth module has been exceeded.	The maximum range, under the best conditions, is around 1000 ft.	3.6.1 Long-range Bluetooth® module
Lost Bluetooth® connection and cannot reconnect.	At distances near the maximum range of the long-range Bluetooth® you may need to move closer to the total station to reconnect.	3.6.1 Long-range Bluetooth® module
GNSS POSITIONING NOT AVAILABLE		
Cause	Remedy	Reference in manual
The Gama engine has not been activated.	Purchase a Gama license from Carlson and enter the serial number to activate it on the Washington.	5.5 Gama
The RTK Mobile eSIM has not been activated so no corrections are available.	Activate your eSIM using the ICCID number on the Washington serial number sticker.	3.8 Cellular modem
The Washington is operating outside of cell coverage, so no corrections are available.	Corrections from RTK Mobile are received through the cell network. Arrange another method of receiving corrections locally. Contact Carlson for support information.	1.2 Carlson office contacts
No GNSS antenna is fitted.	An external GNSS antenna must be connected to the Washington.	4.2.1 GNSS antennas
The GNSS antenna is not positioned correctly.	The GNSS antenna must have a clear view of the sky to receive data from satellites.	3.7 GNSS module

CONNECTED PERIPHERALS NOT FUNCTIONING		
Cause	Remedy	Reference in manual
The correct drivers for your ports or for the peripherals are not present or have not been updated.	Run a Windows Update through Windows Settings. In Windows Device Manager check that all ports are present and enabled.	
Incorrect serial settings have been configured for the DB9 serial port connection.	Confirm the required baud rate. Check Windows Device Manager to establish the correct COM port is being used.	
WINDOWS BECOMES UNRESPONSIVE		
Cause	Remedy	Reference in manual
Windows issues.	Run a hardware power cycle.	6.1 Hardware error warnings
The hardware may need resetting.	Hold the Power key for 20 seconds until the screen goes dark. Contact Carlson if the symptom persists.	1.2 Carlson office contacts

6.1 Hardware error warnings

Some hardware errors are communicated through flashing sequences on the keyboard. These are outlined in the table below.

If the Washington becomes unresponsive, or applications stop working, a hardware power cycle may help restore normal function. Hold the **Power** key for 20 seconds until the screen goes dark. The device automatically restarts.

Note that a hardware power cycle closes all apps and may result in the loss of data.

If symptoms persist you should contact your local Carlson representative with information about the flashing sequence.

Key	Flashing sequence	Status	Action
Power key	1 double flash every 15 sec.	Something did not power off correctly.	Hold the power key for 20s to perform a hardware power cycle.
Power key	1 double flash every 1 sec.	The internal battery has some corrupted memory.	Hold the power key for 20s to perform a hardware power cycle. Contact Carlson if the symptom persists.
Power key	2 double flashes every 5 sec.	A communication issue with one of the batteries.	Try a different battery or hold the power key for 20s to perform a hardware power cycle.
Power key	3 double flashes every 5 sec.	One of the batteries is currently too hot.	Wait for the unit to cool down.
Power key	3 double flashes on boot up.	There is insufficient charge in the both batteries to power the unit.	Charge the unit or use an external battery with a greater charge.
Carlson key	3 double flashes on boot up.	The keyboard could not be configured correctly. The unit will power up but the keyboard will not work correctly.	Power cycle the unit. Contact Carlson if the symptom persists.
Carlson key	4 double flashes on boot up.	There is an internal power supply issue. The unit will power off.	Power cycle the unit. Contact Carlson if the symptom persists.
Carlson key	5 double flashes on boot up.	The internal USB hub could not be configured correctly. The unit will power off.	Power cycle the unit. Contact Carlson if the symptom persists.
Carlson key	6 double flashes on boot up.	The light sensor is not working correctly.	Power cycle the unit. Contact Carlson if the symptom persists.

7 Maintenance, care and disposal

7.1 General

Attempts to dismantle or repair the Washington and accessories can be hazardous and costly if attempted by untrained personnel. Unauthorized attempts to carry out maintenance work on the equipment will void all warranty cover. Maintenance carried out by the operator therefore, should be restricted to the cleaning and inspection of external surfaces, and operating controls.

In addition, you should carry out regular functional testing of the equipment.

Detect and report damage, malfunctions or poor performance to Carlson Software or a local Carlson Software representative.

7.2 Preventative maintenance

Avoid mechanical shock.

Inspect and check the Washington and all accessories for damage after each use.

The Washington is rated as IP65. This indicates that the unit is dustproof and protected against jets of water in any direction. The Washington can therefore withstand dust and water splashes, but is not fully waterproof for submersion.

Keep the battery compartment closed to ensure best environmental protection.

Do not block the ventilation holes in the fan cover during use of the Washington as this may cause the unit to become overheated.

Protect the touchscreen from impact, pressure, or abrasive substances that may damage it. To further protect the touchscreen, apply a screen protector.

If the Washington has been operating in very dusty conditions or if the unit seems to be unusually hot after use, remove the cover and gently clean the fan and heat sink with a soft brush. An air jet can be used to blow dust from the fan.

Use the supplied rubber covers to protect any ports which are not in use.

7.3 Cleaning

Always ensure that the Washington and accessories are thoroughly cleaned and dried before packing them in the appropriate transit case after a deployment.

Use the supplied microfiber screen cleaning cloth to clean the touchscreen. Use the cloth dry. However, for stubborn, sticky debris, dampen the cloth lightly with water. Squeeze out any excess moisture so the cloth is slightly damp, not wet. Gently wipe any problem areas with the damp cloth, then wipe your screen dry with a dry part of the cloth or let it air dry.

Pre-moistened screen wipes and dedicated cleaning spray may also be used to clean the touchscreen, if required. Avoid harsh cleansers and do not use tissues, paper towels, soft bristle brushes, or harsh cleaning solutions on the touchscreen. Cleansers that contain bleach, ammonia, hydrogen peroxide, or high concentrations of alcohol (above 70% isopropyl alcohol or 75% ethyl alcohol) can damage your screen.

Use clean water to remove mud, grit and other materials from the main body of the Washington after use.

Always make sure the battery cover is securely in place before using water on the Washington.

For further cleaning use a product such as Amberclens anti-static foam cleaner. If this is not available then use a generic, mild dishwashing liquid diluted in warm water (0.001%, i.e. 1 ml for every 1l of water). Do not use paint solvents or any other personal, laundry, or household cleaning detergents as they may contain chemicals that could corrode seals in the Washington. Apply the diluted detergent with a non-abrasive, lint-free cloth.

Rinse the unit with plain water after using a detergent.

Dry the Washington and accessories thoroughly after cleaning. Where possible, leave the unit unpacked until it is dry. In case it is packed before it has dried, the equipment should be unpacked at the earliest opportunity. Clean and dry the Washington kit, and the inside of the transit case, before repacking the equipment for storage.

Do not direct a high-pressure stream of water at the device to clean it. This action could break the seal, causing water to get inside the device and voiding the warranty.

7.4 Storing and transporting

Always store the Washington and accessories in the supplied transit case.

Dry all elements of the Washington thoroughly before storing.

Store within the stated temperature limits: see section 8.

Ensure all equipment is packed in the supplied transit cases prior to transportation.

Do not allow the equipment to slide around inside transport vehicles or containers. Secure all transit cases to prevent the possibility of shock or vibration during transport.

When the data collector is not being charged and is in Sleep mode, it draws a small amount of power. This power draw is used to maintain the memory (RAM) of the handheld in the same state it was when it was set to 'sleep'. Charge the Washington each night or weekend when it is in suspend mode. If the Washington is not charged while in sleep mode and the battery reaches a low charge, it automatically powers itself OFF to prevent further drain on the battery.

Data and programs are secure as long as they have been saved, even if the battery pack becomes discharged. The Washington does not depend on the battery to store data for extended periods.

For storing for less than two weeks:

- Close all applications.
- Plug the 12 V power supply into the Washington.

For storing for more than two weeks

- Charge the battery pack 30 to 50 percent.
- Close all running programs, and turn off the handheld.
- Remove the battery pack.
- Place the battery pack in a dry location.

7.5 Battery safety

This device is supplied with multiple lithium-ion rechargeable battery packs.

- To reduce the risk of fire or burns, do not disassemble, crush, puncture, short external contacts, or expose the battery packs to fire.
- Do not modify or remanufacture; attempt to insert foreign objects into the batteries; immerse or expose to water or other liquids; or expose to fire, explosion or other hazards.
- Only use the batteries for the system for which they are specified.
- Only use the batteries with a charging system that has been supplied with the system. Use of an unqualified battery, charger or power supply may present a risk of fire, explosion, leakage, or other hazard.
- Do not short circuit a battery or allow metallic conductive objects to contact battery terminals.
- Replace the battery only with another battery that has been qualified with the system.
- Use of an inappropriate battery may present a risk of fire, explosion, leakage or other hazard.
- Battery usage by children should be supervised.
- Avoid dropping the batteries. If the batteries are dropped, especially on a hard surface, and the user suspects damage, take it to a service center for inspection.
- Dispose of used batteries sensibly. Under no circumstances must the batteries (or instrument) be disposed of by burning. An explosion may occur.



All batteries contain highly reactive, poisonous and corrosive chemicals, which are hazardous if released due to physical damage. Should the battery, battery charger or power supply approach end-of-life, become non-functional or damaged, stop using it and request a replacement unit from a Carlson-approved source.

7.6 Disposal

When the Washington reaches the end of its life, it must not be disposed of with municipal waste. It is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. If you cannot find a location, contact Carlson Software technical support for information about disposal.

7.6.1 Disposal in the USA

The Li-Ion battery packs for your Washington are recyclable. Avoid placing them in with domestic waste or into the municipal waste system. To find the nearest battery recycling center in the USA, you can contact Call2Recycle at 1-877-723-1297.

7.6.2 Disposal in Europe (WEEE directive)



The use of this symbol on Carlson products and/or accompanying documentation indicates that the product should not be mixed with general household waste on disposal. It is the responsibility of the end user to dispose of this product at a designated collection point for waste electrical and electronic equipment (WEEE) to enable reuse or recycling. Correct disposal of this product will help to save valuable resources and prevent potential negative effects on the environment. For more information, please contact your local waste disposal service or Carlson representative.



The use of this symbol on the batteries, packaging or accompanying documents indicates that used batteries should not be mixed with general household waste. Please dispose of the used batteries at a designated collection point. This will prevent potential negative effects on the environment and human health which could otherwise arise from inappropriate waste handling. Please contact your local authority or waste disposal service concerning the separate collection and disposal of batteries. All lithium and rechargeable batteries must be fully discharged or protected from short circuiting prior to disposal.

8 Washington Specifications

Performance	
Processor	Intel® Atom™ x7-E3950, 4x 1.6 GHz, 2MD L2 Cache
RAM	8GB DDR3L RAM
Storage	256 GB SSD 32 GB eMMC Flash
Physical	
Dimensions	11 x 6.3 x 2 in (280 x 160 x 50 mm) (H x W x D).
Weight	2.4 lbs, (1.1 kg) including Battery.
Build	Durable hardened plastic in a shear proof shock resistant design. Shock absorbing bumpers. Strong Chemical Resistance.
Display	5" Active viewing area. 720 * 1920 Landscape TFT-LCD.
Touchscreen	Projected Capacitive Touch Interface. Scratch Resistant, Chemically Toughened Touch Screen.
Keyboard	Full QWERTY and numeric keypad with adjustable backlit keys.
Environmental	
Environmental protection	IP65 waterproof and dustproof.
Operating temperature	-40°F to 113°F (-40°C to 45°C) *
Charging temperature	32°F to 104°F (0°C to 40°C).
Storage temperature	-4°F to 140°F (-20°C to 60°C).
Shock resistance	Can survive multiple drops from 1 m onto concrete.
Operating environment	Indoor / outdoor
Altitude	Up to 5000 m. **
Humidity	95% non-condensing.
Connectivity	
Standard Bluetooth®	v.5.1.
Long range Bluetooth®	v.2.0 + EDR wireless technology.
Wi-Fi	Wi-Fi Certified supports the 802.11ax standard.
Cellular	4G Cellular Modem Worldwide Frequencies.
Ports	
Serial	RS-232 9-pin D-type connector.
USB	USB A.
TNC	For GNSS antenna.
SMA	For long range Bluetooth® antenna.

Power	
Removable batteries	7.2 V / 49 Wh.
Internal battery	28.12 Wh. Allows removable batteries to be 'hot swappable'.
Battery life (internal battery plus removable battery)	Up to 8.5 hours. ***
Charge time (internal battery plus removable battery)	4 hours.
12 V Power supply	Input 100-240 Vac. Output 12 Vdc, 3 A.
Software	
Operating system	Windows 10 IOT Enterprise LTSC.
Washington control	Carlson's Washington Toolbox.
Installed survey package	SurvPC.
GNSS software	Gama GNSS (requires registration).
Camera	
Camera	13MP resolution with Autofocus.
GNSS	
GNSS receiver	Activated with Carlson's Gama engine. Multi-band GNSS high precision receiver. Multi-Constellation (GPS + GLONASS + Galileo + BeiDou + QZSS + SBAS). RTK: • Horizontal accuracy: 0.008m + 1 ppm • Vertical accuracy: 0.011m + 1ppm • Convergence time: < 10 sec • Initialization times: • Cold start → 24s • Reacquisition → 2s

* To operate below 32° F (0° C) unit must first be powered up.

After use below 32° F (0° C), equipment must be stored at a temperature > 32° F (0° C) for a period of 4 hours before charging.

** For battery charging, max altitude is 2000 m.

*** See caveats for battery use in section 3.5.

9 Carlson part numbers

When ordering additional units and accessories from Carlson, use the official Carlson part numbers shown below.

Equipment	Description	Manual reference	Part number
Washington system	Full Washington system including: • Washington unit • Two removable batteries • Internal battery power supply • External battery power supply and cradle • Bluetooth antenna • Pole mount • Clamp • Stylus • Screen cloth • Transit case		A-2307-0001
Washington unit	Data collector only.	3	A-2307-0010
Battery	7.2 V / 49 Wh lithium-ion removable battery.	4.1.1	P-2700-0004
Power supply for internal batteries	12 V power supply to charge batteries in the unit. Plugs directly into the Washington.	4.1.2	A-2307-0151
External battery charger	24 V battery power supply with battery cradle. For charging removable batteries outside of the unit.	4.1.2	P-2700-0016
Battery cover	Fits on the Washington to secure batteries in place.	3.5	A-2307-0102
Bluetooth® antenna	For use with the long-range Bluetooth® module. With an SMA connector.	4.1.4	P-9999-0194
Pole clamp	Clamps on to a survey pole. Interfaces with the Washington clamp (A-1119-0021).	4.1.3	A-1119-0020
Washington clamp	Clamps onto the Washington. Interfaces with the Pole clamp (A-1119-0020).	4.1.3	A-1119-0021
Stylus	Carlson conductive stylus / pen.	4.1.6	P-9999-0157
Screen cloth	Carlson screen-cleaning cloth.	4.1.7	M-1119-0106
Transit case	IP67 Peli case for the Washington and accessories.	4.1.5	M-2307-0270
Dust cover - DB9	Rubber protector for the DB9 serial port.	3.3	P-9999-0173
Dust cover - SMA	Rubber protector for the SMA connector.	3.3	P-9999-0175
Dust cover - USB	Rubber protector for the USB port.	3.3	P-9999-0174
Dust cover - TNC	Rubber protector for the connector.	3.3	M-0321-0163
GNSS antenna (Survey)	Survey grade GNSS antenna. Requires cable (8110.064.001 below)	4.2.1	8110.046.001
GNSS cable	41" (1.04 m) coaxial cable: TNC to SMA.	4.2.1	8110.064.001
Survey pole	To carry the Washington together with a survey prism or GNSS antenna.	4.2.2	8030.028.001

10 Product information and warranty

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Changes to Carlson products

Carlson reserves the right to improve, change or modify its products and documentation without incurring any obligation to make changes to equipment previously sold or distributed.

Carlson has made considerable efforts to ensure the content of this document is correct at the date of publication but makes no warranties or representations regarding the content. Carlson excludes liability, howsoever arising, for any inaccuracies in the document.

Services and Materials Provided Under Warranty

- Analysis of problem by service technician
- Labor and materials required to fix defective parts
- Functional analysis performed after repair
- Repair turnaround within 10 working days of receipt unless special circumstances exist
- Shipping costs to return device to customer

Warranty

Limited Product Warranty

Carlson Software (Carlson) warrants that the Washington handheld computer shall be free from defects in materials and workmanship, under normal intended use, for a period of 12 months from the date of shipment from the factory.

Carlson Software warrants any expansion packs (RTK GPS or Other) shall be free from defects in materials and workmanship, under normal intended use, for a period of 12 months from the date of shipment from the factory.

Carlson warrants that the following items shall be free from defects in materials and workmanship, under normal intended use, for a period of ninety (90) days from the date of shipment from the factory:

- battery packs,
- media containing the handheld computer programs,
- desktop computer programs,
- expansion packs, and any accessories.

Warranty Exclusions

This warranty shall not apply if:

- The product has been set up improperly or has been improperly installed or calibrated.
- The product is operated in a manner that is not in accordance with the user documentation and/or users guide.
- The product is used for a purpose other than for which it was designed.
- The product has been used in environmental conditions outside of those specified for the product.
- The product has been subject to any modification, alteration, or change by or on behalf of customer (except and unless modified, changed or altered by Carlson or under direct supervision of Carlson).
- The defect or malfunction results from misuse or accident.
- The serial number on the product has been tampered with or removed.
- The product has been opened or tampered with in any way.

Parts that are excessively worn are not covered under warranty. These may include, but are not limited to, the keyboard elastomer and switch matrix, hand straps and the touchscreen (if applicable).

This warranty is exclusive and Carlson will not assume and hereby expressly disclaims any further warranties, whether express or implied, including, without limitation, any warranty as to merchant-ability, fitness for a particular purpose, non-infringement or any warranties arising from the course of performance, dealing, or usage of trade.

Carlson makes no warranties that:

- Carlson's products will meet your requirements.
- The products will work in combination with any hardware or applications software products provided by third parties.
- The operation of its products will be uninterrupted or error free.
- All defects in the product will be corrected.

Carlson shall not be responsible for software, firmware, information, or memory data contained in, stored on, or integrated with any products returned to Carlson for repair, whether under warranty or not.

Remedy

In the event a defect in materials or workmanship is discovered and reported to Carlson or a Carlson certified repair center within the specified warranty period, Carlson will, at its option, repair the defect or replace the defective product.

Replacement products may be new or reconditioned. Carlson warrants any replaced or repaired product for a period of ninety (90) days from the date of return shipment, or through the end of the original warranty period, whichever is longer.

Limitations of Liability

To the fullest extent allowed by law, the obligation of Carlson shall be limited to the repair or replacement of the product. Carlson shall in no event be liable for special, incidental, or consequential, indirect, special or punitive damages of any kind, or for loss of revenue or profits, loss of business, loss of information or data, or other financial loss arising out of or in connection with the sale, installation, maintenance, use performance, failure, or interruption of any product. Any responsibility and/or liability of Carlson shall, in connection with a warranted product, be limited in the maximum amount to the original purchase price.

Governing Law

This warranty is governed by the laws of Kentucky, and excluding the United Nations Convention on Contracts for the International Sale of Goods. The courts of Kentucky shall have exclusive personal jurisdiction in case of any disputes arising out of or in connection with this warranty.

Safety

The Washington is a ruggedized field instrument designed for in-field survey data collection. It is essential that the unit and all accessories are operated in accordance with the instructions in this user manual.

Information to the equipment supplier/ installer

It is the equipment supplier's responsibility to ensure that the user is made aware of any hazards involved in any operations involving the Washington, including those mentioned in Carlson product literature.

FCC (USA only)

Information to the user (47CFR section 15.19)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Information to the user (47CFR section 15.21)

The user is cautioned that any changes or modifications not expressly approved by Carlson or authorized representative could void the user's authority to operate the equipment.

Information to the user (47CFR section 15.105)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.