

Trimble T70 Rugged Controller

User Guide

Model Number: 136500
Version 1.0
Revision A
October 2025

Legal information

Trimble Inc.

trimble.com

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Release notice

This is the October 2025 release (Revision A) of the Trimble T70 controller documentation.

Recycling information

You should dispose of the device and accessories properly according to local laws and regulations. Because the device contains electronic components, it must be disposed of separately from household waste. When the device reaches its end of life, contact your local Trimble dealer to learn about disposal and recycling options for your area.

Recycling in Europe



The symbol above means that according to local laws and regulations your product and/or its battery shall be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of your product and/or its battery at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For information about recycling Trimble WEEE (Waste Electrical and Electronic Equipment) products that run on electrical power go to <https://www.trimble.com/en/our-commitment/responsible-business/product-compliance/environmental-compliance>.

The ERFC Netherlands will recycle on behalf of Trimble Distributors, conforming to the European Union's WEEE Directive 2002/96/EC, any WEEE supplied to the market by Trimble Inc., their partners and/or subsidiaries.

Taiwan – Battery Recycling Requirements



The product contains a Lithium-ion battery. Taiwanese regulations require that waste batteries are recycled.

廢電池請回收

Frequency table

Components	Frequency (MHz)	Antenna type	Brand	Main	Aux.
WLAN	2400 to 2483.5	PIFA	Pulse	1.07 dBi	0.30 dBi
WLAN	5150 to 5350, 5470 to 5725, 5725 to 5850	PIFA	Pulse	2.08/3.66/3.50 dBi	1.79/0.4/2.21 dBi
Bluetooth	2402 to 2483.5	PIFA	Pulse	1.07 dBi	0.30 dBi
WWAN	617 to 960, 1452 to 1650, 1710 to 2690 3300 to 5000	PIFA	Pulse	0.7/2.1/ 3.5/1.8 dBi	-0.30/1.1/ 3.4/ 3.1 dBi

Regional compliance

Australia and New Zealand



This product conforms with the regulatory requirements of the Australian Communications and Media Authority (ACMA) Telecommunications, Radiocommunications and EMC Labelling Notices, thus satisfying the requirements for RCM marking and sale within Australia and New Zealand.

Europe



This Trimble product has been tested and found to comply with all requirements for CE Marking and sale within the European Economic Area (EEA). The device has Bluetooth and wireless LAN approval and satisfies the requirements for the RED 2014/53/EU. These requirements provide reasonable protection against harmful interference when the equipment is operated appropriately in a residential or commercial environment.

European declaration of conformity

Manufacturer's Name: Trimble Inc.

Manufacturer's Address: 10368 Westmoor Drive, Westminster, CO 80021, USA

Trimble declares, under our sole responsibility, that the product:

Product Name: T70

Model Number: 163500

.. has been determined to be in compliance with RED 2014/53/EU, 2014/35/EU (Low Voltage Directive), 2014/30/EU (EMC Directive), and amendments of the European Union.

Importer of Record

Trimble European Regional Fulfillment Center

Logistics Manager

Trimble Europe B.V. & Trimble International B.V.

Industrieweg 187a

5683 CC Best
The Netherlands

Trimble EC

Trimble Germany
Am Prime Parc 11
65479 Raunheim
Germany



CAUTION - Only approved accessories may be used with this equipment. In general, all cables must be high quality, shielded, correctly terminated and normally restricted to two meters in length. Power supplies approved for this product employ special provisions to avoid radio interference and should not be altered or substituted. Unapproved modifications or operations beyond or in conflict with these instructions for use may void authorization by the authorities to operate the equipment.

Canada

IC ID:5817A-136500

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Industry Canada rules.

Les changements et modifications non expressément approuvés par le fabricant ou le détenteur de cet équipement peuvent annuler votre droit à utiliser cet appareil en vertu des règles d'Industrie Canada.

Antenna Statement

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Licence exempt

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This Category II radio communication device complies with Industry Canada Standard RSS-310.

Ce dispositif de radiocommunication de catégorie II respecte la norme CNR-310 d'Industrie Canada.

IMPORTANT NOTE: IC Radiation Exposure Statement

This EUT is compliant with SAR for general population/uncontrolled exposure limits in IC RSS-102 and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528. This equipment should be installed and operated with minimum distance 0.5 cm between the radiator & your body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. The County Code Selection feature is disabled for products marketed in the US/Canada.

IC SAR warning

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has been evaluated for and shown compliant with the IC Specific Absorption Rate ("SAR") limits when installed in specific host products operated in portable exposure conditions.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industrie Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a été évalué et démontré conforme aux limites SAR (Specific Absorption Rate – Taux d'absorption spécifique) d'IC lorsqu'il est installé dans des produits hôtes particuliers qui fonctionnent dans des conditions d'exposition à des appareils portables.

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

U.S.

FCC ID: S9E-136500

Federal Communication Commission (FCC) Interference Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

The radios in this device have been designed and manufactured to not exceed stipulated emission limits for exposure to radio frequency (RF) energy as required by the Federal Communications Commission of the U.S. Government 47 C.F.R. § 2.1091 and 2.1093.

Operation on the 5.15-5.25GHz frequency band is restricted to indoor use only. The FCC requires indoor use for the 5.15-5.25GHz band to reduce the potential for harmful interference to co-channel Mobile Satellite Systems. Therefore, it will only transmit on the 5.25-5.35 GHz, 5.47-5.725 GHz and 5.725 –5.850 GHz band when associated with an access point (AP).

CE

a. Caution:

- Risk of explosion if battery replaced by an incorrect type or way.
- Batteries should only be removed by a trained technician that Trimble authorized to avoid battery damage or impact on the data integrity.
- Dispose of used batteries according to the instructions.

b. Make sure the temperature for the adapter while charging is within 0 to 40 °C (32 to 104 °F).

Limited Warranty Terms and Conditions

Product Limited Warranty

Subject to the terms and conditions set forth herein, Trimble Inc. ("Trimble") warrants that for a period of two (2) years from date of purchase this Trimble product (the "Product") will substantially conform to Trimble's publicly available specifications for the Product and that the hardware and any storage media components of the Product will be substantially free from defects in materials and workmanship.

Product Software

Product software, whether built into hardware circuitry as firmware, provided as a standalone computer software product, embedded in flash memory, or stored on magnetic or other media, is licensed solely for use with or as an integral part of the Product and is not sold. The terms of the end user license agreement, as included below, govern the use of the Product Software, including any differing limited warranty terms, exclusions and limitations, which shall control over the terms and conditions set forth in the limited Product warranty.

Warranty Remedies

If the Trimble Product fails during the warranty period for reasons covered by this limited warranty and you notify Trimble of such failure during the warranty period, Trimble will repair OR replace the nonconforming Product with new,

equivalent to new, or reconditioned parts or Product, OR refund the Product purchase price paid by you, at Trimble's option, upon your return of the Product in accordance with Trimble's product return procedures then in effect.

How to Obtain Warranty Service

To obtain warranty service for the Product, it is recommended you contact your Trimble dealer. Alternatively, you may contact Trimble to request warranty service by emailing Repair_Services@Trimble.com. Please be prepared to provide:

- your name, address, and telephone numbers;
- product name, part number and serial number;
- proof of purchase;
- an explanation of the problem.

The customer service representative may need additional information from you depending on the nature of the problem.

Warranty Exclusions and Disclaimer

This Product limited warranty shall only apply in the event and to the extent that (i) the Product is properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with Trimble's applicable operator's manual and specifications, and; (ii) the Product is not modified or misused. This Product limited warranty shall not apply to, and Trimble shall not be responsible for, defects or performance problems resulting from (i) the combination or utilization of the Product with hardware or software products, information, data, systems, interfaces, or devices not made, supplied, or specified by Trimble; (ii) the operation of the Product under any specification other than, or in addition to, Trimble's standard specifications for its products; (iii) the unauthorized installation, modification, or use of the Product; (iv) damage caused by: accident, lightning or other electrical discharge, fresh or salt water immersion or spray (outside of Product specifications); or exposure to environmental conditions for which the Product is not intended; (v) normal wear and tear on consumable parts (e.g., batteries); or (vi) cosmetic damage. Trimble does not warrant or guarantee the results obtained through the use of the Product or Software, or that software components will operate error free.

NOTICE REGARDING PRODUCTS EQUIPPED WITH TECHNOLOGY CAPABLE OF TRACKING SATELLITE SIGNALS FROM SATELLITE BASED AUGMENTATION SYSTEMS (SBAS) (WAAS, EGNOS, GAGAN, MSAS AND LUCH), OMNISTAR, BEIDOU, GPS, GALILEO OR GLONASS SATELLITES, OR FROM IALA BEACON SOURCES: TRIMBLE IS NOT RESPONSIBLE FOR THE OPERATION OR FAILURE OF OPERATION OF ANY SATELLITE BASED POSITIONING SYSTEM OR THE AVAILABILITY OF ANY SATELLITE BASED POSITIONING SIGNALS.

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NOTE: THE ABOVE TRIMBLE LIMITED WARRANTY PROVISIONS WILL NOT APPLY TO PRODUCTS PURCHASED IN THOSE JURISDICTIONS (E.G., MEMBER STATES OF THE EUROPEAN ECONOMIC AREA) IN WHICH PRODUCT WARRANTIES ARE THE RESPONSIBILITY OF THE LOCAL DEALER FROM WHOM THE PRODUCTS ARE ACQUIRED. IN SUCH A CASE, PLEASE CONTACT YOUR TRIMBLE DEALER FOR APPLICABLE WARRANTY INFORMATION.

Official Language

THE OFFICIAL LANGUAGE OF THESE TERMS AND CONDITIONS IS ENGLISH. IN THE EVENT OF A CONFLICT BETWEEN ENGLISH AND OTHER LANGUAGE VERSIONS, THE ENGLISH LANGUAGE SHALL CONTROL

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Safety information

Read this guide for important safety and health information and the terms of the Limited Warranty that apply to the Trimble® T70 controller that you have purchased. Failure to follow instructions and properly set up, use, and care for this product can increase the risk of serious injury or death, or damage the device or devices.

Battery safety

Lithium-Ion batteries are classified by the U. S. Federal Government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries contain recyclable materials and are accepted for recycling. Dispose of used batteries in accordance with local regulations.

WARNING – Non-approved batteries will not function in the device. Use only the battery for the system for which it was specified. Only use the battery with a charging system that has been qualified with the system per this standard. Use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazard.

WARNING – There are no user-serviceable parts in the batteries. Do not disassemble or open, crush, bend or deform, puncture, or shred the battery. Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard. Do not expose to temperatures above +70 °C (+158 °F).

WARNING – Improper battery use may result in a fire, explosion, or other hazard.

- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Avoid dropping the device or battery. If dropped, especially on a hard surface, and the user suspects damage to the battery, take it to a service center for inspection.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
- Battery usage by children should be supervised.

Power supply safety

WARNING – Use only AC and vehicle adapters intended for the device. Other external power sources may damage your product and void the warranty.

- Ensure the input voltage on the adapter matches the voltage in your location. Ensure the adapter has prongs compatible with your outlets.
- The AC power supply is designed for indoor use only. Avoid using the AC power supply in wet areas.
- Unplug the power supply from power when not in use.
- Do not short the output connector.

Touchscreen glass

CAUTION – The touchscreen on this device is made of glass. This glass could break if the device is dropped on a hard surface or receives a significant impact. If the glass chips or cracks, do not touch or attempt to remove the broken glass. Cracked or chipped glass due to misuse or abuse is not covered under the product's limited warranty.

Service safety

WARNING – Do not attempt to take apart, open, service, or modify the product, accessories, or power supply. Doing so could present the risk of electric shock or other hazard. Any evidence of any attempt to open and/or modify this device, including any peeling, puncturing, or removal of any of the labels, will void the Limited Warranty.

Safe environments of use

WARNING – Areas with potentially explosive atmospheres are often, but not always, posted and can include fueling areas, such as below decks on boats, fuel or chemical transfer or storage facilities, or areas where the air contains chemicals or particles, such as grain dust, or metal powders. When you are in such an area, turn off your mobile device, and do not remove or install battery chargers, AC adapters, or any other accessory. In such areas, sparks can occur and cause an explosion or fire.

Hearing damage

WARNING – To prevent possible hearing damage, do not listen to high volumes for long periods.

Distraction

WARNING – Using the device in some circumstances can distract you and may cause a dangerous situation. Observe rules that prohibit or restrict the use of mobile devices (for example, avoid operating the device while driving a vehicle).

Telecommunications & Internet Association (TIA)

Hearing Aids: Some digital wireless devices may interfere with some hearing aids. In the event of such interference, you may want to consult your service provider, or call the customer service line to discuss alternatives.

Pacemakers and Other Medical Devices: The Health Industry Manufacturers Association recommends a minimum separation of six inches be maintained between a handheld wireless device and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research. Persons with pacemakers should use the ear opposite the pacemaker to minimize the potential for interference. If you have any reason to suspect that interference is taking place, turn the device OFF immediately.

If you use any other personal medical device, consult the manufacturer of your device to determine if they are adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

Turn the device OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Specific Absorption Rate (SAR)

This device complies with FCC and CE standards when used as designed.

Caring for your device

Cleaning

Turn off the device, and disconnect it from external power. Use a soft, dampened cloth with either water or a diluted mild detergent. If a mild detergent is used, ensure all soap residue is removed. Do not use chemical cleaners.

Touchscreen care

The T70 controller is extremely rugged, and is designed to withstand extreme conditions and harsh treatment, however taking proper care of the touchscreen will prolong the life and ensure optimal display performance of the touchscreen of this product. Excessive or prolonged exposure to abrasives, oil, dust, chemicals, and ultraviolet light can affect the performance of your touchscreen over time.

To help protect the screen:

- **Clean it frequently.** Use a soft, lint-free cloth to wipe the screen. You can dampen the cloth with water or an eyeglass cleaner. If the display is very dirty, it can be washed off under a gently running tap.

WARNING – Make sure that all ports and doors are fully closed, and that the device is not connected to an external power supply. Do not use chemical or abrasive cleaners.

- **Keep it covered when not in use.** Store the T70 controller in a carry case or pouch while you are in transit or not using it.
- **Keep it out of the sun when not in use.** Do not store the T70 controller in direct sunlight for a long time unnecessarily. Ultraviolet light and excessive heat from sun-loading heat can damage the display.
- **Use proper touchscreen tools.** Use either fingers or the T70 controller's stylus, or other devices specifically designed for use with capacitive touchscreens to operate the touchscreen of this device. The use of ballpoint pens, metal tools or other sharp objects to operate the touchscreen may scratch and/or damage the surface of the touchscreen.
- **Avoid drops, tumbles, and abrasives.** The T70 controller is designed to resist damage for drops up to 122 cm (4 feet). However, you should protect the display from impact, pressure, and abrasive substances that can scratch it or crack it. The device should not be dropped unnecessarily. Use the screen protectors to keep the touchscreen clean and protected, following the instructions provided on the screen protector packaging.

Battery care

Use and storage temperature: Lithium-ion batteries are sensitive to high temperatures, so keep the device's batteries out of direct sun for long periods, and do not leave batteries in a hot car, especially on a

dashboard in full sun or other environments where temperatures can exceed +70 °C (+158 °F). Battery life can be shortened if stored or operated outside of these temperature ranges. Recommended storage temperature is at room temperature (~ +20 °C / +68 °F). When you are using the device or charging the batteries, it is normal for the device and batteries to get warm.

If the interior temperature of the device exceeds normal operating temperatures (for example, in a hot car or in direct sunlight for extended periods of time), you may experience the following as it attempts to regulate its temperature automatically:

- The device stops charging.
- If the device cannot regulate its internal temperature, it may go into a Sleep state until it cools.

Move the device to a cooler location out of direct sunlight and wait a few minutes before trying to use the device again.

Lithium-ion batteries naturally degrade over time, but their lifespan and overall health can be significantly extended with proper charging and usage care.

Charging: Recharge the battery any time; the battery does not need to be empty or low before you recharge it. However, it is best to let the battery run to below 10 percent at least once a month before you recharge it. Battery recharging is supported at temperatures between 0 °C and +45 °C (+32 °F and +113 °F). Use only the manufacturer designated charging accessories to recharge the batteries.

Other environmental conditions: The batteries are sealed from water and dust, and are tested for protection from drops from heights up to 1.22 m (4.00 ft). However to prolong the life of the battery, dry it off with a cloth if it becomes wet, do not intentionally submerge the battery, and take care to avoid unnecessary drops, mechanical shocks, and vibrations.

The T70 controller is designed to work in ambient temperatures between -20 °C and +60 °C (-4 °F and +140 °F) and to be stored in temperatures between -30 °C and +70 °C (-22 °F and +158 °F). Avoid exposing the device to dramatic changes in temperature or humidity.

Trimble T70 Introduction

This user guide describes how to configure and use the Trimble® T70 controller powered by the Android™ operating system. The information in this guide supplements the information in the Quick Start Guide. Even if you have used other Trimble handheld field computers or controllers before, Trimble recommends that you spend some time reading this guide to learn about the special features of the product.

WARNING – Before you use this product, make sure that you have read and understood all safety requirements. Failure to follow these safety instructions could result in fire, electric shock, or other injury, or damage to the device and/or other property. For more information refer to [Safety information](#), page 11 of this guide.

Operating system, firmware, and BIOS downloads

To download the latest operating system, firmware, BIOS, and driver packages for your device, go to mcs.trimble.com.

On the downloads portal, you will also find brief release notes and installation instructions.

Configuration options

The T70 controller is powered by the Android operating system, and is available with a world wide WWAN. See your local Trimble dealer for information.

In the box

A standard pack-out has the following items:

- T70 controller
- Tempered glass screen protector
- Stylus with tether
- Handstrap
- USB-C to USB-C cable

- Soft cover carry case
- QR code card - quick start guide

Replacement and spare or optional accessories

WARNING – Only approved accessories should be used with this product. Failure to use approved accessories could result in fire, electric shock, or other injury, or damage to the handheld computer and/or other property. For more information refer to [Safety information, page 11](#).

A wide range of replacement and optional accessories is available to purchase for the T70 controller, including:

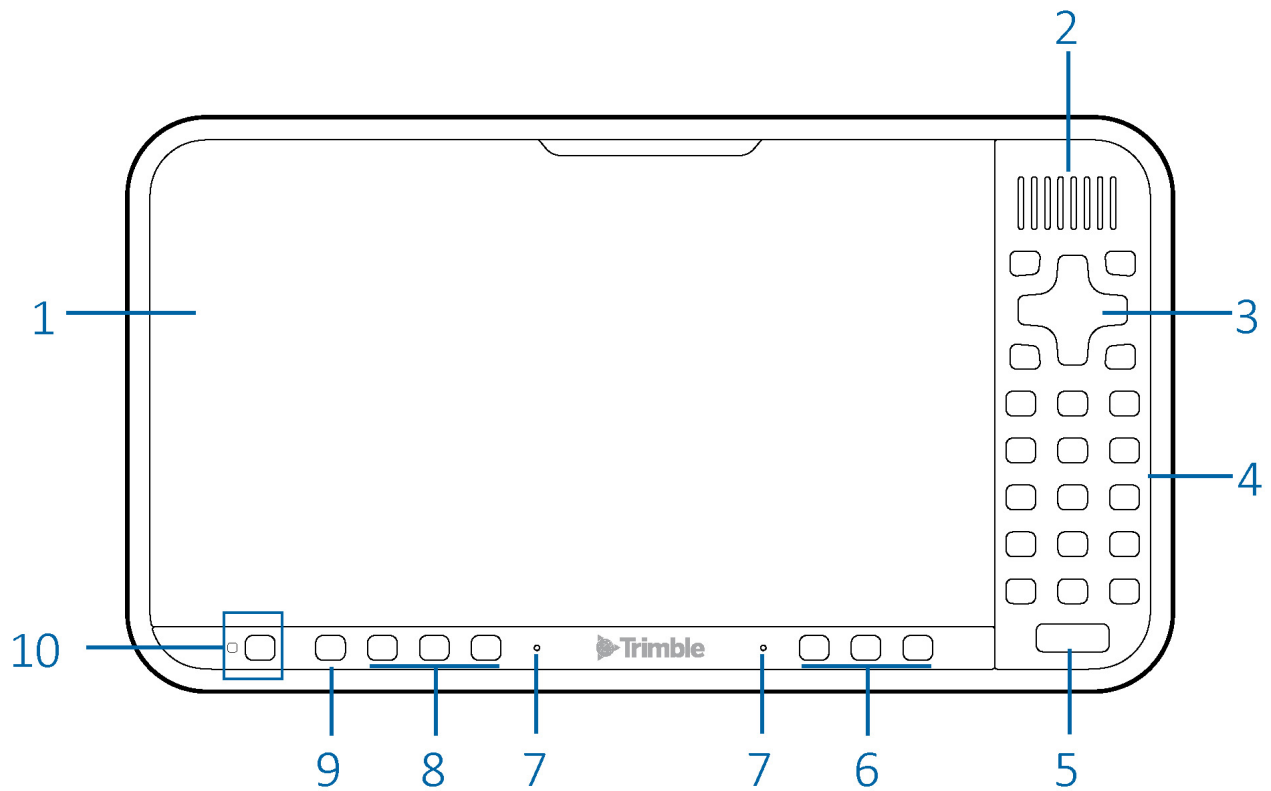
- Handstrap
- Pole Mount
- Robotic Cradle with Empower Support
- AC Adapter with regional plugs
- International cord
- Stylus with Tether

Trimble Empower modules

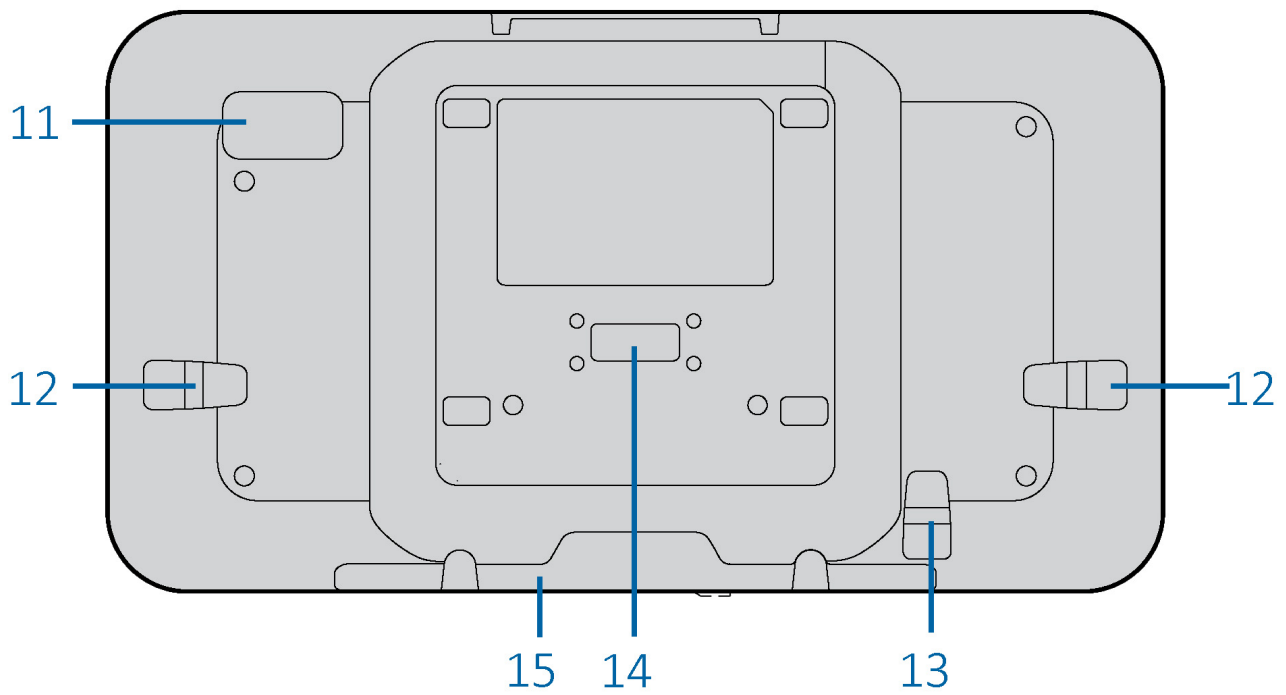
The following Empower modules are also available:

- EM120 2.4GHz Module
- EM140 2.4GHz BLR (Bluetooth Long-range Robotic) Module
- EM940 EM940 Dual Band GNSS RCV Radio EMPOWER Module
- EM450 UHF Band GNSS RCV Radio EMPOWER Module

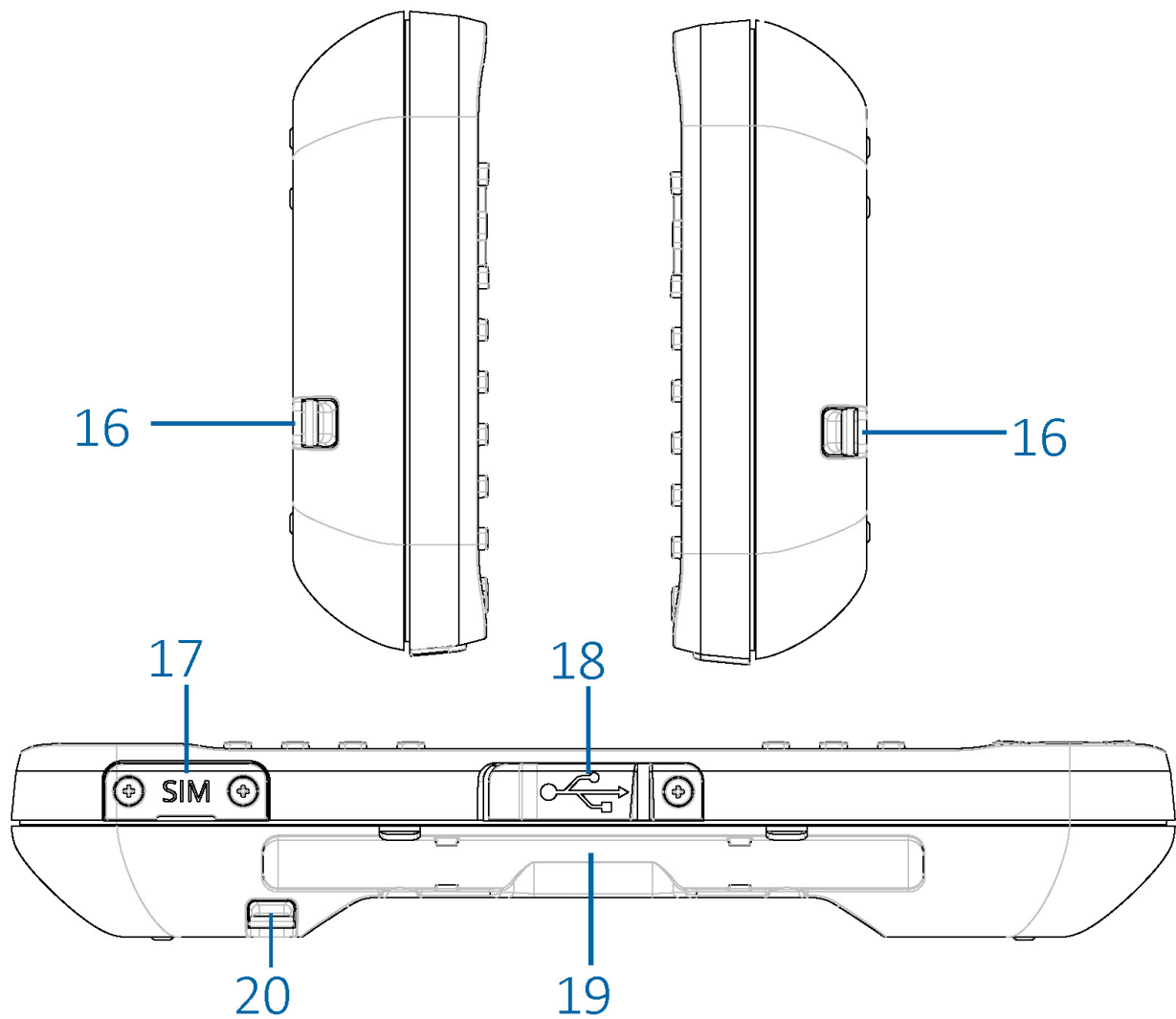
Parts of the T70 controller



1	Touchscreen	6	Android keys
2	Speaker	7	Microphone – left / right
3	Directional pad	8	Programmable function keys
4	Keypad	9	Function key
5	Enter key	10	Power key and LED



11	Camera and flash	14	Empower bay pin location
12	Handstrap tether point	15	Stylus bay
13	Stylus tether point		



16	Handstrap tether points	19	Stylus bay
17	SIM card slot	20	Stylus tether point
18	USB connector / charging port		

Product specifications

Operating System	Android 15
Processor	Qualcomm QCS6490
RAM	LPD4X 8GB
User storage (SSD)	UFS 128GB
Display	6" landscape (2160x1080) 900nits Projected Capacitive Multi- touch Display
Battery & Power	Internal 1S4P Li-Ion 12800mAh/3.635V nominal capacity
I/O	USB 3.0 Type C x 1 (Charging, DisplayPort, USB Data Transfer) Expansion port 12P x 1 Nano SIMC Card Slot x 1
Audio	Dual Digital Mic. Array, 1 x Mono speaker, 1W peak output rating, 200Hz~20KHz
Bluetooth	5.4
Wi-Fi	802.11 a/b/g/n/ac/ax
Mobile broadband / WWAN	Worldwide LTE 4G in regions where it is available, and compatible with 3G networks. Nano SIM card
GNSS	Integrated Sierra Wireless EM7590
Camera	Rear Camera: 13MP auto-focus with LED Flash
Sensors	Temperature Sensor, E-compass, Accelerometer, Gyroscope, Ambient Light Sensor, Proximity Sensor
Environmental	IEC: Independently tested and certified for: Water and Dust Ingress Protection: IP68 MIL-STD-810H. Independently tested and certified for: Operating temperature: -20°C to +60°C Storage temperature: -30 °C to +70 °C MIL-STD-810H, 507.6 Procedure II, 95 %RH, temperature cycle +30°C to +60°C. Transit Drop: 1.22 m drop on to plywood

Getting started: basic operation

This section explains some basic features to get you started using your T70 controller.

When you start your device for the first time, the Android operating system takes you through some basic setup steps; follow the instructions on the screen.

For more details on setting up and using the Android operating system, see [Using the Android operating system, page 33](#) or go to the [Android 10 website](#).

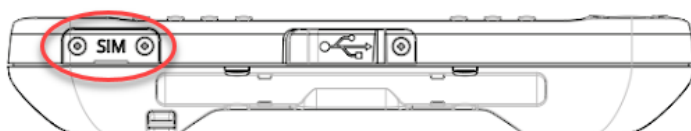
Inserting a SIM card

To use cellular data, you will need a NanoSIM card and a data plan from your local cellular service provider to use this feature. See [Working with mobile broadband, page 1](#) for more information.

CAUTION – The SIM card door can be damaged if handled carelessly. Take care not to twist or warp the door when opening or closing it.

1. If the device is on, turn it off; tap **Power/ Shut down**.
2. Unscrew the SIM bay door, and insert the SIM card into its slot.

TIP – Use the small screwdriver that is integrated in the stylus.



3. Close the SIM bay door and screw it back into place to seal it.

Attaching the handstrap

Attach the handstrap to the left or the right side of the device, according to your personal preference. To ensure a good fit:

1. Take the loose end of the tether cord and push it through the left or right hand strap tether point.
2. Feed the stylus through the loop and pull tight.

Tethering the stylus

Attach the stylus to the device to prevent accidentally dropping the stylus. The stylus is supplied with one end of the tether cord pre-looped to the stylus. You can attach the stylus to the left or the right side of the device. To tether the stylus to the device:

1. Take the loose end of the tether cord and push it through the left or right stylus tether point.
2. Feed the stylus through the loop and pull tight.

Place the stylus in the stylus dock on the bottom of the device to store it when not in use.

Installing a screen protector

The T70 controller is fitted with a chemically strengthened glass touchscreen, which is highly resistant to abrasion and impact damage. However to ensure maximum protection, it is recommended that you use a Trimble-approved toughened glass T70 controller screen protector.

To install a screen protector:

1. Place the device on a clean, flat surface. Make sure your hands are clean.
2. Clean the touchscreen with the supplied alcohol wipe.
3. Polish and dry the screen with the lint-free cleaning cloth supplied.
4. Remove any dust specs with the supplied dust sticker.
5. Remove the protective film from the screen protector.
6. Align the screen protector with the top of the glass display.
7. Carefully lay the screen protector down on the screen. If you make a mistake and the glass looks off-center, you can gently lift the screen protector up and realign it. Then, once the protector is on the screen, give it a soft press in the center and allow the adhesive surface to grip to the screen naturally.

TIP – You can place the screen protector in place and fix it on the upper side with adhesive strips to the housing. This will keep the screen protector aligned when sticking it on.

8. If there are any bubbles remaining, use the cloth provided to gently smooth them toward the edges of the screen protector.

For more information on where to purchase the correct screen protector for your device, contact your local Trimble dealer.

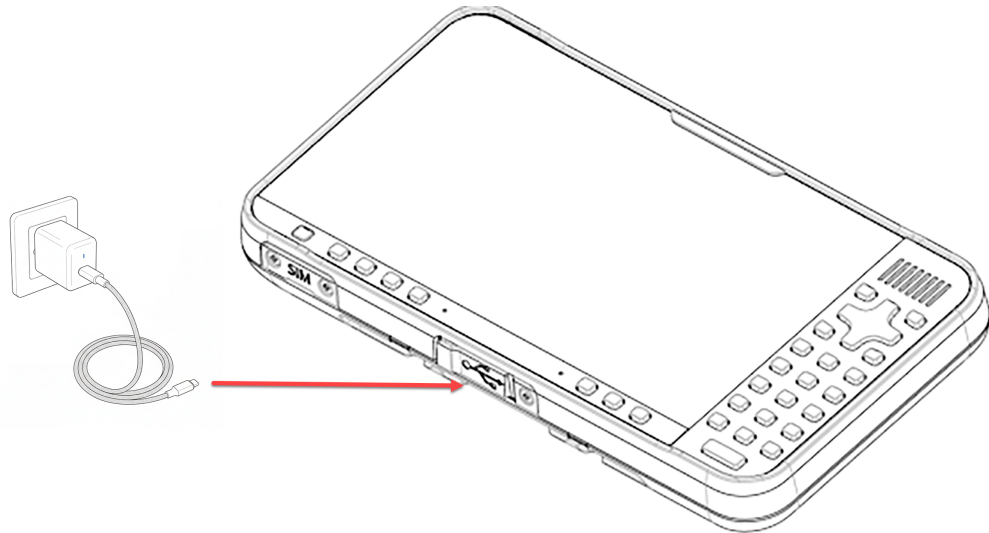
Charging and power modes

It takes approximately 4 hours to charge the T70 controller battery from an empty state. It may take longer if you are using your device for power-intensive activities, for example using GNSS or processing a lot of data

while you are charging it.

Charging the battery in the device

1. Connect the appropriate international plug adapter for your region to the USB-C cord supplied with the controller.
2. Connect the USB-C cable to the charging port on the controller.
3. Plug the power supply into an electrical outlet.



Checking the battery charge level

You can check the battery level:

- When the device is off and is plugged in — when you press the power key, the battery icon appears on the screen and indicates the power charge level, and indicates whether the device is charging by showing the battery gauge filling up.
- When the device is off (and is not connected to mains power) — when you press the power key, the battery icon appears on the screen and indicates the power charge level. The battery icon is colored to indicate the level of charge, and the charge level is displayed in text.
- When the device is on and in screensaver mode — press the power key to indicate the power status in the top right of the screen. A lightning bolt icon appears in the battery icon to indicate if the device is charging.
- On the Desktop taskbar when the device is unlocked and the screen is on. The battery status appears in the top right side of the screen, showing the charging and battery status. Swipe down from the top of the screen to display the battery percentage.
- By navigating to **Settings / Battery**.

LED charging status

The charging status is shown with an LED located next to the power key on the bottom left of the device.

-  Red: charging error. It can take the device approximately 30 seconds to recognize a bad battery and indicate a charging error.
-  Orange: T70 controller is charging.
-  Green: T70 controller is fully charged.
-  Green - Flashing: T70 controller is in Sleep state.

Turning the device on

To turn on the device, press the **Power** key. The Trimble logo appears. Swipe up on the touchscreen to open the device screen or to enter a PIN or password if one has been programmed on the device.

Saving battery power

To save battery power, set the screen to turn off when you haven't used it for a length of time. This state enables the device to resume quickly when you want to start working again.

To further save battery power, set the device to go into Sleep state when you haven't used it for a length of time. Sleep state saves your work and turns off the device. When you start up the device again, you are back where you left off.

To set the screen turn-off time and the Sleep state time, go to **Settings / Display / Screen timeout**.

Waking and unlocking the device

If the screen is not on, the device could be either in Sleep mode, or it could be fully powered Off.

To wake the device or turn the device on, briefly press the **Power** key.

Depending on your security settings, your device may be locked. To unlock it, swipe up on the screen then enter your PIN, password, or pattern if required.

Restarting / rebooting the device

To reboot the device, press-hold the **Power** key until the **Power** menu appears, then tap **Restart**.

Turning off the device

To turn off the device, do one of the following:

- press-hold the **Power** key until the **Power** menu appears, then tap **Power Off**.
- swipe down twice from the top of the screen, then tap the **Power** icon in the bottom right corner of the screen. On the **Power** menu tap **Power Off**.

For information on customizing power management features, see [Charging and power modes, page 23](#).

Making your battery last longer

The Android operating system includes a number of features to help you get the maximum run time out of your battery. Here are some practical suggestions that you can do to maximize the operating time of the battery:

- **Use Battery Saver mode** to help the device's battery last longer when it is running low. This mode turns off or restricts background activity, some visual effects and other high-power features to extend battery life. To turn on **Battery Saver** mode:
 - a. Swipe down from the top of the screen to access **Quick Settings**.
 - b. Tap **Battery Saver**, then tap **Turn On**.

When **Battery Saver** mode is on, the battery icon in the **Status** bar is red.

NOTE – The **Battery Saver Quick Settings** button may not be on the first **Home** screen, so swipe left to access it.

NOTE – Battery Saver turns off automatically when your device is charging.

NOTE – - Battery Saver does not stop position data coming through from location services.

- **Keep Battery optimization on.** To have apps use your device's battery only when they need to, keep **Battery optimization** on for all apps. **Battery optimization** is on by default. You can also set **Battery optimization** on individual applications.

To specify battery optimization for any apps, go to **Settings / Battery / Battery usage**. Tap on any app in the list to view options.

NOTE – If you haven't had any apps running, no apps will be listed here.

Under **MANAGE BATTERY USAGE**, you can view or select **Background restriction** and **Battery optimization**.

- **Background restriction.** To save battery charge, tap **Background restriction** and then select **RESTRICT**. This stops the app from using battery charge in the background. Note that this may cause apps to work improperly and cause delayed notifications.
- **Battery optimization.** Most apps will have the **Optimizing battery use** setting enabled by default. Tap this option to view apps that are not optimized. Select **All apps** from the dropdown next to **NOT OPTIMIZED** to view all apps. Select an app from the list to turn **Battery optimization** on or off. Turning off is not recommended, as it may drain the battery more quickly as the app will no longer be restricted from using background battery.

- **Stretch a low battery's power.** To help a dying battery last until you can charge it, first turn on **Battery saver** mode. Often, battery saver is all you'll need for a low battery's power to last until you can get to a charger. Stretch your remaining battery power with temporary changes to your settings/usage.

TIP – Turn the features back on when you have charged the battery.

- **Avoid high-drain activities;** for example, heavy screen use, heavy data processing.
- **Turn off the wireless radios** when not using them to limit connectivity; for example, turn on Airplane mode, turn off Bluetooth. See [Using wireless networks, page 40](#).
- **Limit location data;** for example, turn on GPS battery saving mode, turn off Location services.
- **Limit automatic syncing;** for example, turn off auto-sync for your Google account, turn off auto-sync for certain Google apps.
- **Unplug USB devices.** Many USB devices use power just by being connected. If you use a USB flash drive, unplug it when you are not using it.
- **Turn off Empower modules** if you will not be using them for a prolonged period.
- **Decrease the display brightness** to the lowest comfortable level. See [Display settings: adjusting the backlight, page 29](#) for more information.
- **Turn off screen rotation.** See [Display settings: rotation lock, page 30](#) for more information.
- If you don't work in low light settings, **disable the keypad backlight.** Go to **Settings / System / Languages & input / Physical keyboard / Built-in Keyboard**. Tap the slider next to **Enable** to disable the keyboard backlight.
You can also adjust the brightness of the keyboard backlight by moving the **Backlight brightness** slider left or right.
- **Turn off the device** when you are not using it.
- **Reduce the length of time before the operating system turns off the display.** To further save battery power, ensure the device settings are configured to turn off the screen when you haven't used it for a length of time.

Using the touchscreen

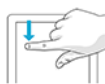
Your T70 controller can be easily operated with the touchscreen (using your fingers, a stylus, or a glove), or an onscreen keypad.

Use the Touch Control app on the device to select or switch between any of the touchscreen input methods.

The touchscreen on the T70 controller works reliably in wet conditions when a glass screen protector is fitted (see [Installing a screen protector, page 23](#)) and you are using Finger mode. Keep the surface clear of excessive build-up of water; tilt the tablet to drain away excess water, or wipe it away with a soft cloth.

The table below describes the main touchscreen input gestures and functions supported on this device.

Tap 	Tap once on something.	Opens/executes the action of what you tap on. To enter text, tap where you want to type. If you have enabled an onscreen keypad, it will display. By default, entering text is done using the physical keyboard.
Press- hold 	Press-hold your finger or the stylus down for a few seconds.	Shows a menu with options related to what you're doing (like right-clicking with a mouse). On the pop-up menu that appears, tap the action you want to perform.
Double-tap 	Double-tap on something.	Tap quickly twice on a webpage, map, or other screen to zoom. Double-tapping after pinching to zoom in some apps, such as Browser, reflows a column of text to fit the width of the screen.
Slide / swipe 	Slide / swipe your finger or the stylus across the screen.	Scrolls through what's on the screen. Quickly move your finger across the surface of the screen, without pausing when you first touch it, to scroll a page or a list up or down. Scrolls vertically or horizontally. Swipe a Home screen left or right to see your other Home screens.
Drag 	Drag your finger or the stylus across the screen.	Hold your finger or the stylus on an item for a moment and then, without lifting your finger/the stylus, move across the screen until you reach the target position. • Drag in a list to select multiple items. • Drag items on the screen to reposition them.
Pinch / stretch 	Pinch your thumb and forefinger together or move them apart.	Zooms in or out of a website, map, or picture.
Rotate 	Put two or more fingers on an item and then turn your hand.	Rotate the screen left or right in apps that support it, such as Maps.
Swipe left or right 	Swipe left or right on the screen.	Left swipe opens Google search. Right swipe opens other Home screens.
Swipe from top	Swipe down from the top of the screen	Displays Quick Settings and Notifications. Swipe up to close Quick Settings and Notifications.



Using the stylus

NOTE – Trimble recommends that you use the TrimbleT70 controller stylus accessory. There are many other capacitive touch styli available that will work with the T70 controller as long as they have a rubber tip; however the stylus available as an accessory is tuned for the T70 controller display and it fits into the stylus holder. Trimble offers no guarantee that other styli will work.

Go to **Settings / Display / Touch Panel Mode** to switch between Finger, Glove, and Stylus mode.

Using the stylus that comes with the device, you can take notes, draw, navigate, and mark up documents in your apps.

To make a selection, tap the screen once on the item you want to select.

To display a right-click menu, tap and hold an item on the screen, then tap the required menu item.

Using the on-screen keypad

You can type on the device using the touchscreen keypad.

- To access the onscreen keypad, tap in a text field.
- To hide the keypad, press the **Android Back** button.

Display settings: adjusting the backlight

The T70 controller is equipped with a high brightness outdoor readable display. You can easily increase the brightness of the display to increase the readability of the device in bright sunlight conditions, or turn down the brightness to help conserve battery power when working indoors or in dim conditions. You can also have the device automatically adjust the backlight power depending on the ambient light conditions.

Configuring Adaptive brightness

Adaptive brightness is on by default. It uses the ambient light sensor on the device's screen (see [Parts of the T70 controller, page 18](#)) to adjust your screen brightness depending on the amount of light around you.

To adjust the backlight settings, and turn Adaptive brightness off / on:

1. Open the **Settings** app.
2. Tap **Display**.
3. Tap the setting that you want to change.

Manually adjusting the backlight brightness

1. Swipe down from the **Status Bar** at the top edge of the screen to view the **Quick Settings** bar.
2. Slide the backlight slider left or right to adjust the brightness.

Display settings: rotation lock

The T70 controller is equipped with orientation sensors that can detect if your device is in portrait or landscape orientation. The operating system can automatically adjust the display to match your device orientation.

If Auto-rotate is on, the T70 controller is constantly monitoring the orientation of the device, and therefore uses more power. Trimble recommends leaving Auto-rotate off unless you have a specific need for it to be on.

1. Swipe down from the top of the screen to display **Quick Settings**.
2. Tap the Auto-rotate **Quick Settings** tile to toggle auto-rotate on or off.

Using the physical keypad



Back	Returns to the previous screen or activity.
Home	Opens the device's main home screen.
Overview (or Recents)	Shows a list of recently used apps, enabling you to quickly switch between them or close them.
App Menu	App-specific, this launches the menu for the active app. It performs the same function as the menu key that most apps have (giving options for help, about, exit, etc.) NOTE – It is supported in Trimble Access, but for 3rd party apps it may not do anything.
Volume keys	Use to adjust the device's speaker volume. Fn+8 Volume up. Fn+5 Volume down.
Display brightness	Use to adjust the display backlight brightness. Fn+7 Brighter; Fn+4 Dimmer. NOTE – You can also set the display brightness to adjust automatically when the ambient lighting conditions change. See Display settings: adjusting the backlight, page 29.
Keypad lock	Fn+“.”. Use to temporarily disable the keypad. This is a toggle function; the first “Fn + “.”” press locks the keypad, the second Fn + “.”” press unlocks the keypad. When the keypad lock is activated, a note will briefly display on the keypad, and an icon will appear in the top left of the screen to indicate the keypad is locked. If the keypad is locked, a green light will also appear above the “.” button.
Screen Lock	Fn+“-”. Used to temporarily disable the touchscreen to clean the display. This is a toggle function; the first “Fn + “-”” press locks the touchscreen, the second Fn + “-”” press unlocks the touchscreen. When the touchscreen lock is activated, a note will briefly display on the keypad, and an icon will appear in the top left of the screen to indicate the touchscreen is locked. If the touchscreen is locked, a green light will also appear above the “-” key.
Print screen	Print all or part of the screen to the clipboard.
Power key	Turn the device On / Off. Double tapping the power button activates the camera.
Function keys	F1-F3 and FN + F4-F9 These can be configured in the Trimble software according to your requirements. Refer to the Trimble software documentation.
Numeric keypad Enter key	

Switches the device to alpha mode. When in this mode pressing a key will cycle through the letters located above the number keys on the keypad. This is a toggle key, and pressing the alpha key will exit alpha mode. When in alpha mode, a green light will appear above the alpha key.

Using the programmable keys

There are three "F" keys on the front of the controller that you can assign actions or apps to. There are an additional six programmable keys that can be assigned using the secondary "FN" command (labeled F4 to F9).

There are four directional arrow keys on the front of the controller that by default are set to Up, Down, Left, and Right. You can assign other actions or apps to these directional keys.

To assign other actions to any of the keys, use the **Function Key Setting** app:

1. Open the **Function Key Setting** app.
2. On the left, tap the key you want to assign an action to.
3. Select the required option—**Open Application**, **Open Web Page**, **Special Key**, or **Other Action**.
4. In the field for the selected option, select or enter the required function / parameters.
5. Tap **Apply** then tap **Save**.

To discard your changes, tap **Cancel**.

Using the Android operating system

This section introduces some basic information on using the Android operating system on the T70 controller. For additional information, go to the [Android website](#).

Press the **Power** key to turn on the T70 controller. The Android operating system will guide you through the setup process.

The first time you use the T70 controller, you'll be prompted to set up a Wi-Fi network and a Google Account to use with your device.

- [Using Accounts, page 33](#)
- The Android interface
- Using the pre-installed Google apps and other apps

Using Accounts

You can sign up for a Google Account or use one that you already have. You already have a Google Account if you use an email address to sign in to any Google product, for example: Gmail, YouTube, Google Play, AdWords, Google Apps, or any other Google product.

When you sign in with your Google Account, you'll have access to everything associated with your Google Account, like Gmail, calendar, contacts, apps you've purchased on Google Play, and other data associated with that account. If you have multiple Google Accounts, you can add the others later.

WARNING – Make sure you remember the password you use to sign into your device or else you won't be able to access it. Even if you do a factory reset, you will be required to enter the password you used to sign into this device.

CAUTION – If you are using a company device, check with your company prior to adding personal accounts; your personal information may be accessible to others in your company if they use the same device.

Add a Google or other account

1. Open the **Settings** app.
2. Tap **Password & Accounts**.

3. Tap **Add account**.
4. Tap the type of account you want to add.
 - To add your Google Account, tap **Google**. When you sign in with a Google Account, the email, contacts, calendar events, and other data associated with that account automatically sync with your device.
 - To add a different personal account, tap **Personal (IMAP)** or **Personal (POP3)**. You'd generally choose these if you use an email program like Microsoft Outlook or Apple Mail.

TIP – Learn how to use IMAP or POP3 with Gmail.

5. Follow the on-screen instructions.
6. If you're adding accounts, you may need to enter your device's pattern, PIN, or password for security.

You can add more accounts by repeating the steps above.

Remove a Google or other account

1. Open the **Settings** app.
2. Tap **Password & Accounts**.
3. Tap the account you want to remove.
4. Tap **REMOVE ACCOUNT**.
5. If this is the only Google Account on the device, you'll need to enter your device's pattern, PIN, or password for security.

The Android interface

When you turn on your device, the main **Home** screen appears. The **Home** screen is the primary screen for accessing all of the T70 controller controller features on the device. You can add and customize **Home** screen (s) by adding app shortcuts and widgets (an at-a-glance view of the app's most important information) and customizing access to frequently used settings (**Quick Settings**). The main parts of the screen are:

[IMAGE NEEDED]

-
- 1 **Status bar** indicator icons are shown at the top of the display. The right side of the status bar shows the mobile signal strength, Wi-Fi signal strength, and how much battery charge is left. The left side shows the time and app notifications.

To access **Notifications** and **Quick Settings** (frequently used settings): swipe down from the top of the screen.

You can customize the **Quick Settings** tiles. See [Customize the Quick Settings tiles, page 36](#) below.

To quickly open all **Settings**, swipe down from the top of the screen a second time, then tap the **Settings** icon.
 - 2 **Home** screen. To move between **Home** screens if you have more than one, swipe left or right.

On the main **Home** screen, tap **Google** at the top of the screen or say OK Google (if Google Assistant voice activation is enabled) to search, send messages, ask for directions, or give other instructions. Otherwise, tap **Search**.
 - 3 Android **Back** key. Returns to the previous screen you were working in, even if it was in a different app (not supported by all Apps). Once you back up to the **Home** screen, you can't go back any further.
 - 4 Android **Home** key. Returns to the **Home** screen.
 - 5 Android **Overview** key. Opens thumbnails of apps you've worked with recently. To open an app, tap it. To remove (shut down) an app, swipe it up or down.
 - 6 **App shortcuts** to launch apps.
 - 7 **Widgets** (e.g. the Google search bar). You can add other widgets to your Home screens as required. Touch-hold on the Home screen until a menu appears, then tap **Widgets**. Touch-hold a widget from the list to place it on your Home screen.
-

Android navigation keys

The T70 controller includes Android navigation keys (**3, 4, 5**) on the physical keyboard, so they do not appear on the screen.

Status bar

The Status bar (**1**) shows different status icons for various functions and apps on the device. Common icons show the battery charge status, Wi-Fi signal and connection status, mobile broadband signal and connection status, and Bluetooth connection status.

Customize the Quick Settings tiles

You can customize the **Quick Settings** tiles to suit your needs.

1. Swipe down from the top of the screen to open **Quick Settings** tiles — giving you quick access to items that you frequently use.
2. Swipe down again from the top of the screen to show all **Quick Settings** options.

You may have **Quick Settings** tiles on more than one **Home** screen; small dots below the tiles indicate this. Swipe left/right to switch between the screens.

3. To change the order and add or remove **Quick Settings**, tap the  icon.
 - To rearrange the order of any **Quick Settings** tiles that you already have showing, touch-hold then and drag-drop the required tile to where you want it.
 - To add new **Quick Settings** tiles, scroll down on the screen, then touch-hold then and drag up and drop the required tile to where you want it in your **Quick Settings**.
4. Tap the Back arrow (top left of the screen) to exit Edit mode.

Apps screen

To see all apps that are pre-installed on the device and those that you downloaded from Google Play, swipe up on the **Home** screen to access the **Apps** screen.

On the **Apps** screen:

- To open an app, tap its icon.
- To search apps, enter the name of the app you are looking for in the **Search apps** bar.
- To place an app icon on a **Home** screen, see [Adding apps to a Home screen, page 36](#).
- To get more apps, tap Play Store .
- To explore apps, swipe up and down from the **Apps** screen to view the full list of apps installed on your device.

Adding apps to a Home screen

1. From the **Home** screen (or any **Home** screen if you have more than one) open the **Apps** screen.
2. Swipe up or down to find the app you want.
3. Touch-hold the app, then slide the app icon to any **Home** screen and place it where you want it, and then lift your finger off the screen.

Removing an app, shortcut, widget or group from the Home screen

1. Touch-hold the item on the **Home** screen, and drag upwards. A menu appears.
2. Continue to hold and drag the item up to **Remove** at the top of the screen, then lift your finger off the screen.
3. The **Remove** option removes the shortcut off your **Home** screen but does not uninstall the app from the device.

To move an app icon from the primary **Home** screen to another **Home** screen, touch-hold it, then slide the app icon to another **Home** screen.

Uninstalling apps

1. Touch-hold the item on the **Home** screen until a menu appears. Lift your finger off the screen.
2. Do one of the following:
 - Tap **Uninstall** to uninstall the app from the device.
 - Tap **App info**. On the App info screen, select **UNINSTALL** to uninstall the app.

Using the pre-installed Google apps and other apps

The T70 controller comes with a range of useful pre-installed software. The following describes some important bundled applications and summarizes what they can be used for.

Google bundled apps



Play Store is a global online store to find, enjoy, and share your favorite apps, games, movies, music, and books on all your favorite devices.



Google The Google app keeps you in the know about the things you care about. Find quick answers, explore your interests, and get personalized updates in your Google feed. The more you use the Google app, the better it gets.



Google Chrome is a fast, easy to use, and secure web browser. Designed for Android, Chrome brings you personalized news articles, quick links to your favorite sites, downloads, and Google Search and Google Translate built-in. Enjoy the same Chrome web browser experience you love across all your devices.



Gmail is an easy to use email app that saves you time and keeps your messages safe. Get your messages instantly via push notifications, read and respond online and offline, and find any message quickly.



Google Maps allows you to navigate your world faster and easier with over 220 countries and territories mapped and hundreds of millions of businesses and places on the map. Get real-time GPS navigation, traffic, and transit info, and explore local neighborhoods by knowing where to eat, drink and go—no matter what part of the world you're in.



YouTube is the official app for Android devices which allows you to see what the world is watching—from the hottest music videos to what's trending in gaming, entertainment, news, and more. Subscribe to channels you love, share with friends, and watch on any device.



Google Drive is a cloud service safe place to back up and access all your files from any device. Easily invite others to view, edit, or leave comments on any of your files or folders. With Drive, you can safely store and access your files anywhere, quickly access recent and important files, search for files by name and content, share and set permissions for files and folders, view your content on the go while offline, receive notifications about important activity on your files, and use the device camera to scan paper documents.



YT Music is a music app that allows you to easily find what you're looking for and discover new music. Get playlists and recommendations served to you based on your context, tastes, and what's trending around you.



Google TV makes it easy to find and enjoy the entertainment you love in one place. With Google TV, you'll be able to browse movies and TV episodes across all of your streaming apps, see the latest releases, and create a watchlist shared across devices.



Meet is a simple, high-quality video chat application for everyone. With its easy one-tap interface, Google Meet gives users simple, high quality video communication that just works on any device, so they never miss a moment with the people who matter most.



Google Photos is the home for all your photos and videos, automatically organized and easy to find so you can share and save what matters.



Calculator provides simple and advanced mathematical functions.



Google Calendar is the official Google Calendar app to manage your schedule across multiple devices.



Clock combines all of the functionality you need.



Contacts is the official Google app that allows you to back up your contacts and sync them across all your devices. See each contact's email address, phone number, website, and other information at a glance.



Google Keep Notes can be used to take notes, including text, lists, images, and audio.



Messages is Google's official app for texting and can be used to send SMS text messages on to your contacts.



Recorder brings the power of search to audio recording. Meetings, lectures, band practices, family memories—anything you want to save and listen to later. Recorder automatically transcribes and labels what you record so you can easily find the parts that matter to you.

Other bundled apps

	Settings. Under Settings, you will find configuration settings for Wi-Fi, Bluetooth, VPN, cellular, sounds, notifications, display, security & privacy, language & keyboard settings, passwords & accounts, etc.
	Files is a file manager that you can use to view and open recent files, including images, videos, audio and downloads stored on the device or in Google Drive.
	Camera. The Camera app lets you take regular photos or video using the rear facing camera on the device.
	Trimble Empower Hub is a utility for management of Empower modules on the Trimble Empower enabled devices.
	Trimble Installation Manager for Android enables you to easily install and update supported Trimble software to supported devices running the Android platform.
	Trimble Data Manager is a file explorer application for Android devices, designed to streamline the process of transferring files from Windows desktops to Android devices.
	Music is a utility for managing songs, albums, artists and playlists stored on the device.
	Videos is a utility for videos stored on the device.

Getting more apps

You can get apps, games, digital content and popular office apps such as Google Docs, Sheets, and Slides for your device using Google Play Store. Google Play Store is pre-installed on your T70 controller.

1. Open **Apps** and tap Play Store .
2. Use Play to search and browse for content to download.

Using wireless networks

The T70 controller supports wireless connectivity; connect to wireless networks using the built-in Wi-Fi radio (also sometimes called Wireless LAN, WLAN, or 802.11), or the built-in mobile broadband data (also called Wireless WAN, WWAN, mobile data or cellular data) capability.

This section describes how to get online with the T70 controller using these wireless networking capabilities.

The T70 controller also has an NFC (Near Field Communications) antenna and module, designed for very short range radio communications with other NFC devices.

Working with Wi-Fi networks

Using Wi-Fi you can connect to a wireless network and browse the internet, download apps, send email messages, access online services, or access other computers and devices on your network.

Before you can send and receive data over Wi-Fi, you need to turn on Wi-Fi on the T70 controller and connect to a wireless network.

Accessing Wi-Fi settings and connecting to a network

You can access Wi-Fi settings and connect to a network from the following:

- From the **Apps** screen, open the **Settings**  app. Tap **Network & internet**, then tap **Internet** to open the **Internet** settings screen.
- From **Quick Settings** on a **Home** screen. Swipe down from the top of the screen to open **Quick Settings**. If the device is connected to Wi-Fi, the **Internet** Quick Settings tile shows a Wi-Fi icon with signal strength; if not connected, a globe icon with a question mark is shown. Tap the **Internet** Quick Settings tile to open the Internet pop-up dialog.
Tap **See All** at the bottom of the pop-up dialog to access the full list of available Wi-Fi networks.
- From **Quick Settings**, tap-hold the **Internet** Quick Settings tile to open the **Internet** setting screen.

From **Quick Settings** or the **Internet** settings screen:

- To turn Wi-Fi on if it is off, tap the slider to turn Wi-Fi on. A list of available networks displays.
If the network is secured and you need a password, a padlock icon displays next to the network.
- To connect to a network when Wi-Fi is on, tap the required network to connect to it. Follow the instructions on-screen to enter the password if one is required.

- To turn Wi-Fi off if it is on, tap the slider to turn Wi-Fi off.
- If Wi-Fi is on and you are connected to a network and want to connect to a different network, tap the network you want to connect to. Follow the instructions on-screen to enter the password if one is required.

See [The Android interface, page 34](#) for more information on the **Apps** and **Home** screens, and **Quick Settings**.

Once you are connected:

- **Connected** shows under the network name.
- The Wi-Fi network is a **Saved network**. When in range, your device automatically connects to it.

Disconnecting from a Wi-Fi network

At the top of the **Internet** screen, tap the **On/Off** switch to turn off Wi-Fi. Or, tap the network and tap **Disconnect**.

Forgetting a Wi-Fi network

If you do not want your device to automatically connect to a saved Wi-Fi network, you can forget that network.

To forget a wireless network so it no longer appears in your list of networks:

1. From the **Apps** screen, open the **Settings**  app.
2. Tap **Network & internet**.
3. Tap **Internet**.
4. At the top of the **Internet** screen, make sure the **On/Off** switch is On.
5. Tap the saved network you want to forget, then tap **Forget**.

Advanced Wi-Fi settings

To change the advanced Wi-Fi settings on your device:

1. On the **Internet** screen, scroll down past the available networks and tap **Network preferences**.
2. Tap an available setting option:
 - **Turn on Wi-Fi automatically.** Wi-Fi will turn on near high-quality saved networks, e.g. your home network.
 - **Notify for public networks.** Get a notification when your device finds a Wi-Fi network to which it can connect.

- **Install certificates.** Digital certificates can identify your device for many purposes, including VPN or Wi-Fi network access.
- **Wi-Fi Direct.** Let your device connect with other Wi-Fi Direct-capable devices without a network.

NOTE – For IMEI, IP Address, and MAC address, tap **About Device** in **Settings**.

Working with mobile broadband

The T70 controller has an integrated cellular modem enabling you to connect to a mobile broadband network. The T70 controller supports Worldwide 5G and LTE (where available), and is compatible with AT&T- and Verizon-certified 4G and 5G networks, PTCRB certified carriers, and other networks that support these certifications.

Before you can send and receive data over mobile broadband, you must have a SIM card in the device (see [Inserting a SIM card, page 22](#)). You must then turn on Cellular data on the T70 controller and configure the connection.

Using mobile data

You can adjust how your device uses mobile data by changing your cellular network settings.

Depending on your carrier and service plan, your device may connect automatically to your carrier's fastest available data network. Or you may need to choose settings and use a SIM card for a specific carrier.

To adjust cellular network settings:

1. From the **Apps** screen, open the **Settings**  app.
2. Tap **Network & internet**, then tap **Mobile plan**.
3. If there is no SIM card in the device, you are prompted to insert one and restart the device.
4. Adjust the settings as required:
 - **Mobile data.** Access data using mobile network.
 - **Roaming.** Let your device transmit data over other carriers' networks when you leave an area covered by your own carrier's networks.
 - **App Data** usage.

Locating the device's IMEI number

The IMEI number is a unique 15-digit number that identifies the cellular module installed on your device. Your mobile broadband operator may need to know the IMEI number of your device to register the device with the network and activate your mobile broadband data plan.

The IMEI number is printed on the serial number label located in the removable battery / SIM card compartment on the back of the device; see *Installing and removing the optional accessory battery pack* or *Inserting a SIM card (optional)* for instructions on removing the compartment cover.

Alternatively, to check the IMEI number in the operating system:

1. From the **Apps** screen, open the **Settings**  app.
2. Tap **About device**.
3. Tap **IMEI**.

If you cannot find the IMEI number for your device, or you do not have the device with you, contact your reseller.

Using NFC (Near Field Communications)

The T70 controller has an NFC (Near Field Communications) antenna and module.

The NFC antenna is meant for very short range radio communications with other NFC devices. The range is up to 4 cm (1.6 inches).

NFC in the T70 controller is used for automatically pairing to a Bluetooth device, accessing technical information like radio channels, and other tasks.

Trimble NFC systems do not support point of sale protocols.

To use NFC:

1. Access the section of the application software that supports NFC.
2. Align the T70 controller NFC antenna indicated by this icon  on the back of the device with the NFC antenna in the other device. Make sure the antennas are less than 4 cm apart and are approximately parallel to each other. If a connection does not occur, try holding the devices closer together.
3. Follow the instructions in the application software.

Trimble NFC systems conform with international standards and should work with non-Trimble devices.

However, it is the application software that dictates the interactions. The application decides what to do with the transmitted data.

Airplane mode

If you are traveling on an airplane, or don't need to use wireless functions on the T70 controller for a while, use Airplane mode to turn on or off all wireless radios with transmitting features built into the T70 controller, including Bluetooth, Wi-Fi, Cellular, or GNSS, as well as any wireless radios connected to the T70 controller such as Empower modules.

To turn Airplane mode on or off:

1. Swipe down from the top edge of the screen twice to open **Quick Settings** (see [The Android interface, page 34](#) for more information about Quick Settings).
2. Tap the Airplane mode icon to turn it on or off.

Working with GNSS

The T70 controller has a built-in 2 to 4 meter accuracy GNSS (Global Navigation Satellite System) receiver module, and an integrated antenna with automatic SBAS corrections.

The T70 controller supports most of the Trimble GNSS receivers. Refer to the documentation for the Trimble receiver you want to use, and check the specifications and connection options.

If you want to connect via Bluetooth make sure your receiver is capable of using current Bluetooth security; older receivers may not connect due to the security expectations of the Android operating system.

You cannot use an external antenna with the T70 controller's integrated GNSS receiver. For advanced GNSS setups, use a survey-grade receiver.

You cannot postprocess GNSS data from the internal receiver. If you want raw GNSS data for postprocessing, use an external GNSS receiver.

Using the compass

The compass can be accessed and used by any app that requests access to the compass. The compass is not designed for precise work, but can provide a general heading. Most apps allow for calibration using the method below, but not all will provide an accuracy indication like Google Maps does.

Some applications display Magnetic North and others will correct for declination to display True North. Some are automatic, some are set in settings. Depending on your location in the world, the declination can be 20° or more. Be aware of what settings your app is using to get accurate results.

Calibrating the compass

CAUTION – If an Empower module is installed or removed from the device, the compass must be recalibrated, or you may experience poor accuracy.

CAUTION – If the T70 controller is attached to the pole bracket, the compass must be recalibrated, or you may experience poor accuracy. If the T70 controller is then removed from the pole bracket, it must again be recalibrated.

A device that is exhibiting poor accuracy may have bad calibration data on the device. In most cases, this will be resolved after performing one to four calibrations (figure 8 motions) to clear out bad data and correctly calibrate the device. If the compass still appears inaccurate, more calibrations may improve this.

1. On the device, open the Google Maps app.
2. If the blue dot's beam is wide or pointing in the wrong direction, calibrate the compass.
3. Make a figure 8 until your compass is calibrated. You should only have to do this a few times.

The beam should become narrow and point in the right direction.

Be aware that local conditions, the presence of power lines and other electrical sources, or the proximity of large ferrous metal objects like vehicles can affect the output of the compass.

Using accessories and connecting to other devices

You can connect monitors, accessories, and other devices directly to your T70 controller using USB, or Bluetooth.

Connecting to USB accessories

The T70 controller has a USB type C port for connecting USB devices, such as a flash drive, scanner, printer, keyboard, or mouse. The T70 controller has built-in support for mass storage devices and human interface devices.

Other types of USB devices may require drivers.

To connect a USB device, plug the device cable into the USB (type C) port on the bottom of the T70 controller.

Connecting to Bluetooth accessories

The T70 controller has embedded Bluetooth wireless technology—a short-range wireless communication technology that allows wireless data transfer and communication between devices over a distance of up to 10 meters (30 feet).

To pair the T70 controller with a Bluetooth device, it must have a Bluetooth PIN. Some old Bluetooth devices do not require a PIN. For security, the T70 controller cannot connect to these older devices that do not require a PIN.

NOTE – To connect to a Bluetooth-enabled receiver with a PIN, if for any reason you cannot connect via Bluetooth, connect over Wi-Fi to configure the receiver. The IP address is in most cases 192.168.142.1. Refer to the documentation for the receiver for details and receiver specific settings.

A Bluetooth icon shows in the taskbar when Bluetooth is turned on.

Turning Bluetooth on or off

1. Swipe down from the top of the screen.
2. Tap the **Bluetooth** icon  to switch Bluetooth **On** or **Off**.

When Bluetooth is on, the Bluetooth button at the top of the screen is illuminated.

TIP – To save battery, turn off Bluetooth when you are not using it. Bluetooth is off when the device is in [Airplane mode](#).

Pairing and connecting a Bluetooth device with the T70 controller

Before you can transfer data or communicate between your T70 controller and another Bluetooth enabled device, you must pair the T70 controller and the device.

Step 1: Pair a Bluetooth accessory

1. Swipe down from the top of the screen.
2. Tap-hold Bluetooth .
3. Tap + **Pair new device**. A list of available Bluetooth devices that are within range is displayed.
4. Tap the name of the Bluetooth device you want to pair with your device.
5. Follow any on-screen instructions. If the pairing is successful, the T70 controller connects to the device.

TIP – If you are asked to enter a passcode or Bluetooth PIN, try entering 0000 or 1234 (the most common passcodes), or see the documentation that came with your Bluetooth device. Some old Bluetooth devices do not require a PIN.

NOTE – To connect to a Bluetooth-enabled receiver with a PIN, if for any reason you cannot connect via Bluetooth, connect over Wi-Fi to configure the receiver. The IP address is in most cases 192.168.142.1. Refer to the documentation for the receiver for details and receiver specific settings.

Step 2: Connect to a Bluetooth device

After pairing with a Bluetooth device, you can connect to it manually— for example, to switch devices or to reconnect after a device comes back in range.

1. Swipe down from the top of the screen.
2. Make sure Bluetooth is turned on.
3. Tap-hold Bluetooth .
4. In the list of paired devices, tap a paired but unconnected device.

When your device and the Bluetooth device are connected, the device shows as **Connected**.

Transferring files via Bluetooth

1. On the PC, click the Bluetooth icon in the tool tray and select **Receive a File**.
2. On the T70 controller, open the **Files** app, select the file you want to transfer, and tap , which gives options for sharing. Tap **Bluetooth**.
3. Select your PC in the list of Bluetooth devices, and the file will start to transfer.
4. On the PC, once the file transfer has finished, navigate to a location where you want the file saved.

Transferring data between your T70 controller and another computer

You can transfer data or files between your T70 controller and another device. There are a number of ways you can do this, including:

- using cloud-based file sync services, such as [Dropbox](#), [Microsoft OneDrive](#), [Google Drive](#) over Wi-Fi or 4G.
- via Wireless LAN; see [Working with Wi-Fi networks](#).
- using a USB (type C) memory stick; see [Connecting to USB accessories, page 47](#).

Using Empower modules

Empower modules can be used to extend or expand the basic capabilities of your device. Each Empower module can be installed, removed, or moved from one Empower-enabled device to another.

The T70 controller allows up to two Empower modules to be installed at a time.

The T70 controller allows one Empower module to be installed at a time.

For more information about using Empower modules, refer to the Empower module documentation.

Installing Empower modules

1. Make sure your device is turned off. For more information, see [Charging and power modes, page 23](#).
2. Hook the Empower module onto the back of the device, ensuring that the slots on the top of the device line up with those on the Empower module.
3. Tighten the 2 captive screws at the bottom of the Empower module using a Phillips #1 screwdriver. Do not overtighten the screws.
4. Turn on the device and start the Empower Hub. The Empower Hub is a centralized location for managing and monitoring your Empower modules.

NOTE – Some modules may require that additional drivers and / or supporting applications be installed before the base device recognizes the module.

Configuring and controlling a module with the Trimble Empower Hub application

The Empower Hub is a centralized location to control and manage Trimble Empower modules from one convenient, easy-to-use application. The Empower Hub comes pre-installed on the T70 controller and can be used to monitor module status and manage modules attached to your device, including:

- View module status information
- Enable and Disable connected modules
- Launch utilities to configure your module(s)
- Configure and launch applications associated with your modules
- Check for and install module firmware updates

Turn on the device and from the **Home** screen, swipe up to open the **Apps** screen. Tap on the Empower Hub icon to start the Empower Hub app.

For more information, refer to the module documentation.

TIP – To save battery power, turn off the Empower module if you will not be using it for a prolonged period.

Powering modules in the Empower Hub

Most Empower modules can be powered off. This can be useful if you are still using the device, but are not using the Empower module. All Empower modules draw some power, even when they are not being used. Power off the Empower module to help maximize battery life.

Application software can also power modules on and off. They will often power off a module if you stop using it in the current software configuration.

To power off the module in Empower Hub, tap the toggle switch at the top of the information screen.

1. Make sure your device is turned off. For more information, see [Charging and power modes, page 23](#).
2. Hook the Empower module onto the back of the device, ensuring that the slots on the top of the device line up with those on the Empower module.
3. Tighten the 2 captive screws at the bottom of the Empower module using a Phillips #1 screwdriver. Do not overtighten the screws.
4. Turn on the device and start the Empower Hub (found under Start / Empower / Empower Hub). The Empower Hub is a centralized location for managing and monitoring your Empower modules.

NOTE – Some modules do not require you to start the Empower Hub to manage the module. You may only need to use the Hub to turn the module off to save battery charge.

NOTE – Some modules may require that additional drivers and / or supporting applications be installed before the base device recognizes the module; contact your Trimble dealer for help.

Using the pole mount

An optional accessory for the T70 controller, the pole mount consists of two parts (sold separately):

- A custom cradle which the T70 controller fits in. The T70 controller has a magnetic connection to the pole cradle.
- A pole clamp. This can remain on the pole and still fit in a 4" tube, and has a friction twist grip to easily adjust the angle of the controller.

The cradle is designed to stay attached to the T70 controller semi-permanently; the controller can be comfortably carried and used in the hand even with the bracket installed.

The cradle easily attaches and detaches from the pole clamp for quick attachment and release.

You can set up the bracket for either left- or right-hand use by switching the mount stud from one side to the other.

Using the camera

The T70 controller is fitted with one rear facing 13MP autofocus camera with LED flash.

NOTE – The device may be shipped with a protective film covering the camera and flash windows. Remove the film with a fingernail or the plastic stylus tip before first use to ensure proper focus and exposure of your photos and videos.

To take a photo or record a video:

1. Swipe up on the **Home** screen to access the Apps screen.
2. Tap the **Camera** app to start the camera.
 - By default, the app opens in Camera mode. Tap the Camera icon to take a photo.
 - To switch to Video mode, tap **Video**. Recording starts immediately.
 - Tap the Pause icon to pause / restart the video.
 - Tap the microphone icon on the left side of the screen to turn sound on or off.
 - Tap the Camera icon while in Video mode to take a photo.
 - Tap the Stop icon to end the recording and return to Camera mode.

To zoom in, move your thumb and forefinger apart on your screen. To zoom out, pinch your thumb and forefinger on your screen. You can also use the on-screen slider to zoom in / out.

To focus on and expose the subject of the photo, tap it on your screen.

To see the photos you've saved, tap the thumbnail image in the corner of the screen.

By default, your photos and videos are saved to the Photos app on the T70 controller; open this app from the Apps screen.

You can also look through your photos and videos from:

- the **Camera app**: tap an image thumbnail to open the photo. Swipe right or left to scroll through other photos / videos in your collection.
- the **Files app**: Images captured with the Camera app are automatically accessible in the Files app. Open the Files app from the Apps screen.

Enable the Camera app to access your location to geo-tag photos

1. In the Camera app, tap .

NOTE – if you have a Filter selected this menu is disabled.

2. In the **Settings** list, tap **GPS location** to toggle on/off as required.
3. To close the **Settings** screen and return to the Camera app, tap the back arrow (top left of the screen).

Changing camera settings

- Tap the camera **Flash** icon to toggle through Flash On, Flash Off, or Flash Auto.
- Tap the **Filter** icon on the left of the screen to select a filter for your photo.
- If no Filter is selected, tap the tap the ... menu to access settings for:
 - Automatic
 - HDR
 - Pro Mode. Pro Mode can be selected to provide more control over picture parameters such as f-stop, ISO, and White Balance directly from screen sliders.
 - More setting options — tap . From here you can set picture size, picture quality / resolution, storage location, a countdown timer, face detection, exposure, white balance, shutter sound, along with Video camera settings.

Using the pre-installed apps

The T70 controller comes with a range of useful pre-installed software.

Trimble Empower Hub

Control and manage Trimble Empower modules from one convenient, easy-to-use application. For more information, refer to the module documentation.

TIP – To save battery power, turn off Empower modules if you will not be using them for a prolonged period.

Touch Control app

Use the Touch Control app to switch between **Finger**, **Glove**, and **Stylus** mode. Launch the app from the taskbar.

If using in wet conditions, Trimble recommends that you always have a glass screen protector on the touchscreen (see [Installing a screen protector, page 23](#)) and use Finger mode.

Function Key Setting app

Use the Function Key Setting app to assign apps, web pages, or special key actions to the **F** keys and the directional arrow keys on the tablet computer.

See [Using the programmable keys, page 32](#) for more information.

Trimble Data Manager

Trimble Data Manager is a file explorer application for Android devices. Designed to streamline the process of transferring files from Windows desktops to Android devices, Trimble Data Manager solves the technical challenges faced when using USB for file transfers.

The application is automatically installed on your device, with updates released on the Google Play Store.

To learn more about the app, go to the [Trimble Field Systems Help Portal](#).

Troubleshooting

This section contains answers to some common troubleshooting questions. If you encounter problems when using the T70 controller, try the following troubleshooting tips to detect and solve the problem. If problems persist, contact your local distributor for support.

Further assistance and support with the Android operating system

For comprehensive online support, how-to guides, troubleshooting articles and related downloads for the Android operating system, go to the online [Android support pages](#).

Performance issues

Device is running slowly, restarts or crashes frequently

If your device is running slowly, keeps rebooting itself, or crashing without restarting, one of the steps below may fix the issue. After following the steps for each recommended solution, check whether it fixed your issue.

Check for Android updates

System updates can bring improvements that may fix your issue. To check for and install system updates:

1. Tap  to open the **Settings** app.
2. Scroll to the bottom and tap **System update**. The update status displays.
3. Follow any on-screen instructions.

Check storage and free up space

You may experience issues if the device's internal storage is full or almost full. The device can start having issues when less than 10% of storage is free.

To check how much storage the device has:

1. Tap  to open the **Settings** app.
2. Tap **Storage** to see how much storage is available.

To free up space that the device needs to work properly, remove unnecessary files and clear cached data.

Check for app updates

App updates can bring improvements that may fix your issue. To see and get updates for your apps:

1. Open **Google Play**.
2. At the top left, tap .
3. Tap **My apps & games**.
4. Apps with available updates are labeled **Update**. If an update is available, tap the app **Update**. If multiple updates are available, tap **Update all**.

Close apps that you are not using

Normally, you don't need to close apps; Android automatically manages the memory that apps use. But to completely shut down an app, including any background services that it may be using:

1. Tap  to open the **Settings** app.
2. Tap **Apps & notifications** then if required tap to expand the list of all apps.
3. Tap the app that you want to close then tap **Force stop**.
4. Tap **Force stop**.

TIP – To help identify apps that cause problems, make a list of which apps you have manually force-stopped.

Check if an app is causing the issue

The issue may be caused by an app that you downloaded. To see whether a downloaded app is causing the issue, you can reboot your device in safe mode. Safe mode temporarily disables all downloaded apps.

1. To reboot the device in safe mode and temporarily disable all downloaded apps, [follow the steps to turn on safe mode](#).
2. Once in safe mode, wait to see if the problem goes away.
 - **If the issue isn't resolved in safe mode**, a downloaded app is most likely not causing the issue. Restart the device and try other troubleshooting solutions. Restart the device and try other troubleshooting solutions.
 - **If the issue is resolved in safe mode**, a downloaded app is most likely causing the issue. To find out which app it is:

- a. Restart the device to exit safe mode.
- b. One by one, uninstall recently downloaded apps. After each removal, restart the device and check if the issue is resolved.
- c. When you have identified and removed the app that was causing the problem, you can reinstall the other apps that you removed.

Empower module issues

My field software doesn't recognize my Empower module

- Check module contacts and attachment
It is possible the contacts between the module and the device are dirty, or that the module is not attached correctly. Ensure that the module contacts are clean and that the screws are tightened correctly.
- Your field software is not configured to communicate with the Empower module
Check that your field software supports the Empower module directly and that the field software is configured to talk to the Empower module directly or through the correct COM port.

The Empower Hub doesn't show my module

- Check module contacts and attachment.
It is possible the contacts between the module and the device are dirty, or that the module is not attached correctly. Ensure that the module contacts are clean and that the screws are tightened correctly.
- Make sure the module is powered on using the toggle switch in the Empower Hub app.

Refer to the Trimble Empower modules documentation for more information.

Compass accuracy issues

You may need to re-calibrate the compass, especially if you have removed or [installed an Empower module](#) or optional accessory battery pack.

See [Using the compass, page 46](#) for more information.

Power and battery issues

Battery will not charge

- The battery is overheated, or too cold.

The battery will charge between 0 °C and +45 °C (+32 °F and +113 °F). If you have been using or storing the battery and/or device in a particularly hot or cold environment, the battery may be outside the safe charging temperature range. Sensors in the battery will prevent the battery from charging until its temperature returns to a normal level.

- The battery is not installed correctly.

If the battery is not installed correctly in the device or the battery charger, it may not have a proper connection and will not charge.

- The battery terminals are dirty or corroded.

If the terminals of the battery are dirty or corroded, it may not have a proper connection and will not charge.

Device will not start up

- The batteries do not have enough charge to power the device.

Press and hold the charge indicator button on each of the batteries. At least one charge LED must be lit up to indicate that a battery has enough power for the device to start on battery power. If no LEDs light up on a battery, attach the device to an external power source, or swap the batteries for charged batteries, then try again.

- The batteries are not correctly installed.

The device may not be receiving power from the batteries if they are not installed properly. Remove both the batteries, then replace them correctly.

Device suddenly turns off during use

- The device may have run out of power and gone into critical suspend mode.

If your battery charge level gets too low, the device will automatically go into a hibernate mode to prevent loss of data. Check the battery level by pressing and holding the battery level button on each of the batteries. If the battery charge is too low, connect the device to external power, or swap the batteries for a charged batteries.

If you regularly run out of battery power while in the field, consider carrying spare batteries with you. The device supports hot-swapping of the batteries. Swap one battery at a time; you must always have one battery with sufficient charge in the device while you remove a battery and replace it with another. If you remove both batteries, the device shuts down.

Restarting or resetting the operating system

If your device becomes unresponsive, and the troubleshooting guide does not resolve the problem, you need to restart or reset your device.

Restarting your (unresponsive) device

If your device is no longer responding to touchscreen or keypad input, you may need to force it to restart by removing power from the system.

CAUTION – Restarting the system by holding down the Power key removes power to the CPU. Any unsaved files and settings will be lost.

To force your device to restart:

1. Press-hold the Power key until the **Power Off** and **Restart** options appear on the screen.
2. Tap **Restart** to restart the device.

Resetting your device to factory default settings

If restarting your device does not resolve the issue that you are seeing, resetting it might help.

You can remove all data from your device by resetting it to factory settings.

WARNING – A factory reset wipes all data from the device. While any data stored in your Google Account will be restored, all apps and their associated data will be uninstalled.

WARNING – Your device is protected to prevent other people from using it if it's been reset to factory settings. After a factory reset, you'll need to enter your Google username and password associated with the device. If you don't have this information, you won't be able to finish the setup process and use the device at all after the factory reset.

Erasing your data may take some time, so make sure that you plug your device into a power source before you start.

1. Tap  to open the **Settings** app.
2. Tap **System**.
3. Tap **Reset options**, and then tap the reset option you want to use:
 - **Reset Wi-Fi, Mobile & Bluetooth**
 - **Reset app preferences**

- **Erase all data (factory reset).** Select this option to factory reset the device to the original state it was shipped in.
4. Follow the on-screen instructions for the option you selected. You may need to enter your unlock pattern, PIN, or password.
 5. When the device has finished erasing, you'll be prompted to go through the new device setup.

Operating system and software updates

Periodically, operating system and software application updates will be available for your device.

Software downloads and updates

The latest versions of software including drivers, firmware updates, and software utilities, are available at <https://mcs.trimble.com/> or through the Trimble Installation Manager app that is installed on your device. Additional material and information can be found at help.fieldsystems.trimble.com.

Repairing your device

Before you send your T70 controller for repair, check the troubleshooting guide in this document. If you can't solve the problem with troubleshooting, contact your local Trimble dealer for further support.

Repair of this product should only be performed by an authorized service provider. Any attempt to disassemble this product by a non-authorized service provider will void the warranty.

For more information, contact your local Trimble dealer.

