

R120 Android Robotic Total Station

August 2024



R120 – Main features



The R120 features an angular accuracy of 1" (2" available) and an electronic distance measurement (EDM) accuracy of 1 mm + 1 ppm. It operates effectively up to 1000 m in reflectorless mode and boasts a rapid rotation speed of 60° per second.



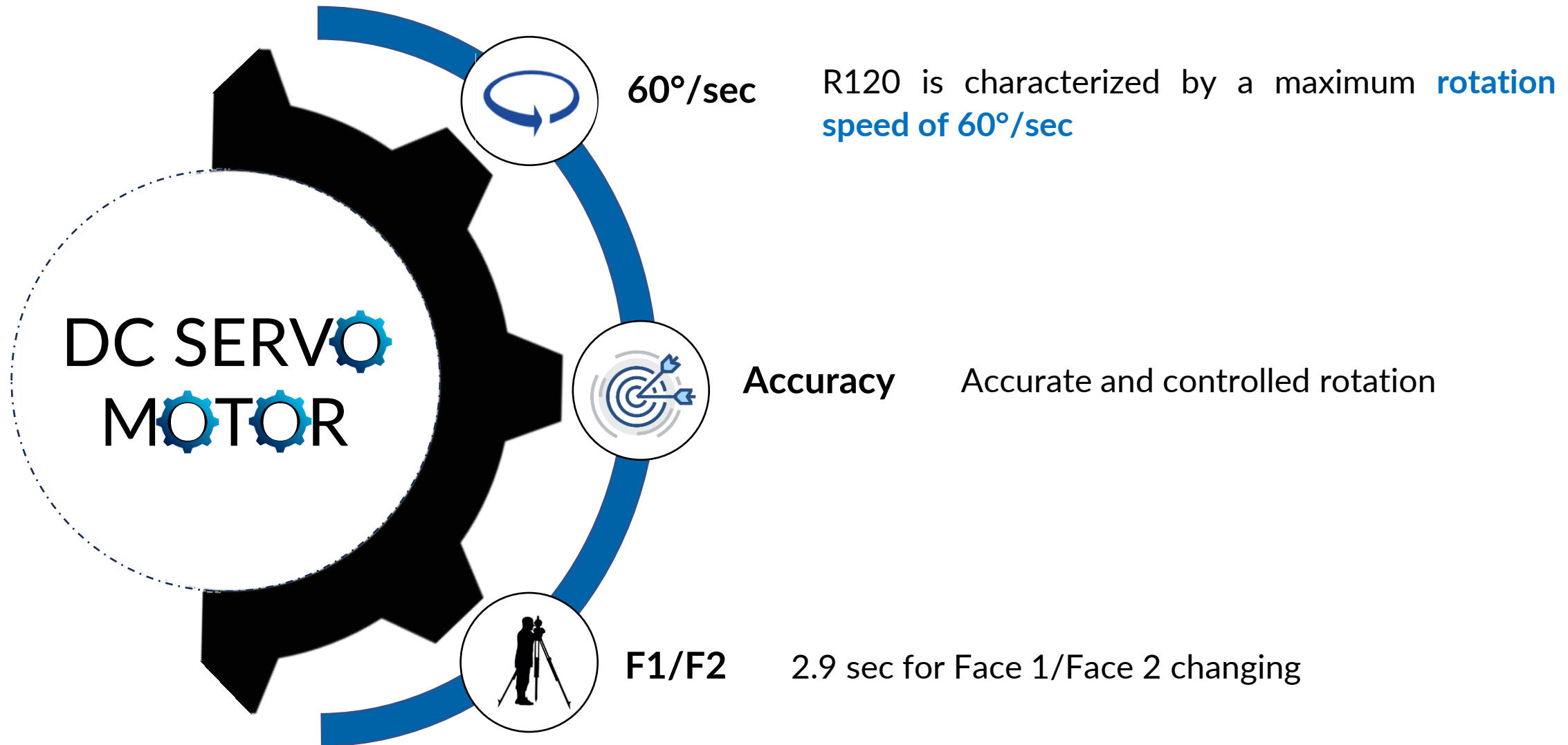
Equipped with a 5.5-inch color touch screen and powered by the Android operating system, the R120 offers a user-friendly interface. The onboard Cube-a software allows operators to seamlessly integrate GNSS tasks with surveys conducted using the total station.



Communication and data transfer between the station and the controller are facilitated via a Bluetooth connection, while the integrated modem enables internet connectivity for sending and receiving topographic data.



R120 – DC Servo Motors



R120 – APC



R120 total station is designed with **Automatic Prism Centering** technology.



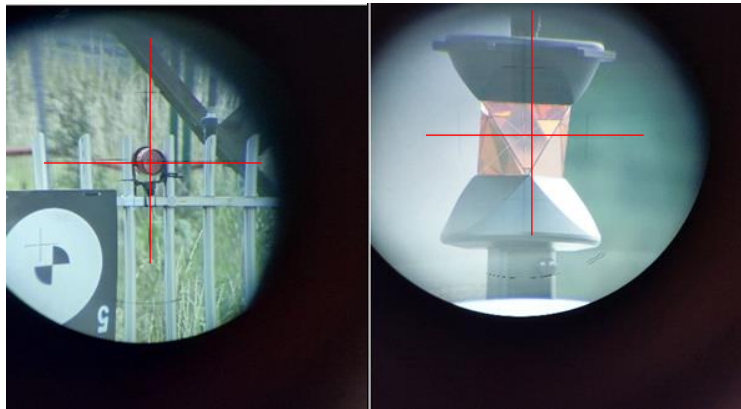
Prism Centering and Search



Signal Analysis



Prism Management



Aiming and centering the prism as accurately as possible, correcting imperfect centering of the instrument with APC

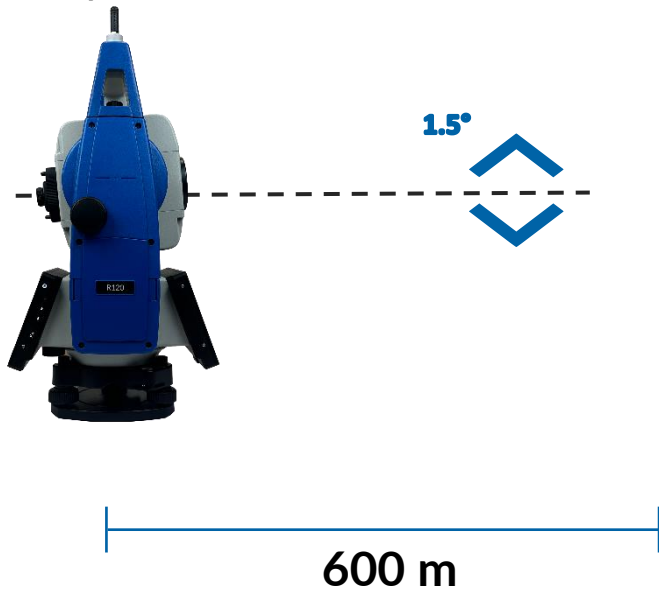
Precisely aim and center the prism up to **1000** meters with the APC

R120 – Prism Search

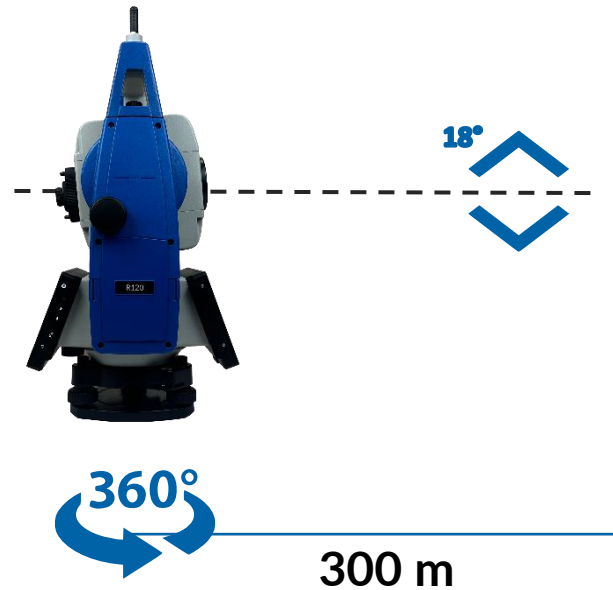
In R120 Total Station, the user can choose from several methods for finding the prism in the survey area



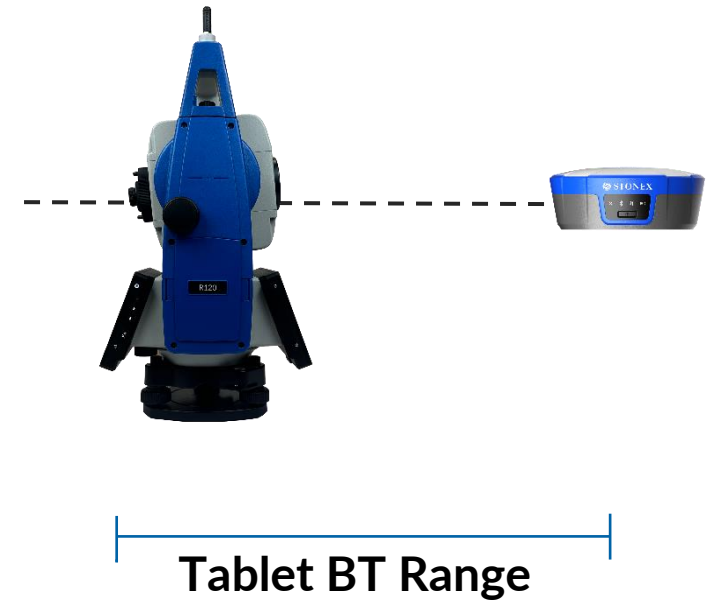
Search for the prism in a predefined window with APC



Fast and accurate prism search from any angle



Quick prism search using GNSS receiver



R120 – Prism Lock & Track

-  R120 can lock and track the prism from **5 meters to 600 meters**
 -  Prism tracking in difficult surveying conditions, thanks to **Predicted Position Algorithm**
Predicted position and a series of actions after prediction can be set by the user to re-lock the prism again easily and automatically.
- Distance update in tracking mode is about **4-5 counts/sec**

Technical Specification

R120 - Technical Specifications

ANGLE MEASUREMENT	R120 1" 1000 m	R120 2" 800 m
Accuracy	1"	2"
Reading system	Absolute, continuous, four-quadrant	
Display Resolution	0.1"	1"
Angle Units	DEG 360°/GON 400/MIL 6.400	

TELESCOPE	R120 1" 1000 m	R120 2" 800 m
Magnification/ Field of view	30x /1° 30'	
Minimum focus distance	1.2 m	
Objective aperture	Ø 45 mm (EDM: 50 mm)	
Laser pointer	Red laser dot	



R120 - Technical Specifications

DISTANCE MEASUREMENT RANGE	R120 1" 1000 m	R120 2" 800 m
Standard mode prism	3.500 m	
Reflectorless	1.000 m	800 m

MEASUREMENT TIME	R120 1" 1000 m	R120 2" 800 m
Prism (Track/Single)	0.1 / 0.3 sec	
Reflectorless	0.3 - 3 sec	

DISTANCE MEASUREMENT ACCURACY	R120 1" 1000 m	R120 2" 800 m
Standard mode prism	$\pm 1 \text{ mm} + 1 \text{ ppm}$	
Reflectorless	$D < 500 \text{ m: } \pm 2 \text{ mm} + 2 \text{ ppm}$ $D > 500 \text{ m: } \pm 5 \text{ mm} + 2 \text{ ppm}$	



R120 - Technical Specifications

MOTORIZATION		R120 1" 1000 m / R120 2" 800 m
Technology		DC motor
Max rotation speed		60°/sec
Rotation time F1/F2		2.9 sec
APC	Centering range	3 – 1000 m
	Time	3 – 5 sec
	Search range	3 – 600 m
	AIM accuracy	± 1 mm @ 100 m
Fast360	Search range	3 - 300 m
	Search time	Typically 90°: 3.5 sec
	Angle	H: 360° V: ±18°



R120 - Technical Specifications

OTHER SPECIFICATIONS	R120 1" 1000 m	R120 2" 800 m
CPU	MT6762	
Display	5.5-inch, TFT LCD screen, 720 x 1280 px (2 displays)	
Keyboard	13 keys	
OS	Android 11	
Memory	RAM: 4GB, ROM: 64GB	
Interface	RS232 USB Type-C (OTG) Micro SIM TF Card	
Laser plummet	Red laser dot, 635 nm	



R120 - Technical Specifications

POWER	R120 1" 1000 m	R120 2" 800 m
Battery Voltage/Capacity	Li-ion rechargeable battery, 5400mAh	
Operating time	4 hours	
Battery charger	110/220V, charging time 4h	

PHYSICAL SPECIFICATION	R120 1" 1000 m	R120 2" 800 m
Dimensions	217 x 198 x 378 mm (without antenna)	
Weight including battery and tribrach	7 Kg	
IP	IP55	
Operating Temperature	-20°C to +50°C (-4°F to 122°F)	



Android & Cube-a

R120 – Android Operating System



R120 is characterized by the **Android Operating System On-Board**



Android Operative System Functions

Screen Illumination, Change Language, Change Font Dimension, Web Internet Connection, Screen Lock...

Android Default Apps

Settings, Calculator, Clock, File Manager, Anydesk...

Android Technical Apps

TServer, INST Settings, Cube-a

R120 – Android Operating System



Google Services onboard -> possibility to use the entire Google suits to support user working activity:



1. *E-Mail application*  
2. *Cloud Drive Services*   
3. *Maps* 
Google Maps
4. *Remote Control Application* 
5. *Other Applications* 

R120 – Cube-a

Cube-a software allows the R120 robotic total station to combine data from various sources, integrating them seamlessly and enabling comprehensive and detailed jobs in many applications.

Cube-a's advanced data management features enable the R120 to handle complex tasks efficiently, such as combining GPS data with local measurements to create highly accurate maps and models.

The software's robustness and flexibility also support the use of the R120 in various environments, from construction sites to environmental monitoring projects, ensuring that the data collected is reliable and consistent.



R120 – Configuration benefits

ON-BOARD

Motorized TS

- Work directly on the station
- Cube-a On-Board



REMOTE

Robotic TS

- No HW modifications needed
- Cube-a license on the controller
- BT range connection with UT12P -> 300 m



ONE-POLE

GNSS & TS

- Same software different sensors
- Mixed Survey
- Easy switch between GNSS & TS module



Configuration

R120 1"- Standard Configuration

PRODUCT CODE	DESCRIPTION
B20-220112	R120, Robotic TS, 1", 1000m, Endless, Android
	Tools bag
	Target sheet
	Battery
	Adapter + Cable EU and US
	Strap of carrying case
	Carrying case
	Silica gel
	Rain cover
	Targets
	Type-C & USB Converter
	Antenna BT long range
40-450668	Software Stonex Cube-a TS+GPS on board v6.x



R120 2"- Standard Configuration

PRODUCT CODE	DESCRIPTION
B20-220113	R120, Robotic TS, 2", 800m, Endless, Android
	Tools bag
	Target sheet
	Battery
	Adapter + Cable EU and US
	Strap of carrying case
	Carrying case
	Silica gel
	Rain cover
	Targets
	Type-C & USB Converter
	Antenna BT long range
40-450668	Software Stonex Cube-a TS+GPS on board v6.x



R120 – Suggested One-Pole solution

PRODUCT CODE	DESCRIPTION
B20-220112	R120, Robotic TS, 1", 1000m, Endless, Android
40-450668	Software Stonex Cube-a TS+GPS on board v6.x
30-600300	Tripod, wooden cm. 114-187 T.P.
30-040023	Prism 360° - P96
B10+150220	S880, GNSS, 1408Ch, IMU, 4G, Camera
30-350607	PG-260, Pole for GNSS, 2,60m, 2-section, Carbon fiber/allum, Telescopic
50-550740	S55, Controller, 5.5", 4G, Android
30-350734	S55, Bracket
40-450665	Software Stonex Cube-a GPS/TS v6.x
30-350089	SB-100, Soft bag for GNSS and controller



Marketing

R120 - Pictures



R120 - Brochure

R120 TECHNICAL FEATURES

ANGLE MEASUREMENT	
Accuracy	1" - 2"
Reading system	Absolute, continuous
Display Resolution	four-quadrant
Angle Units	DEG 360°/GON 400/MIL 6.400

TELESCOPE	
Magnification/Field of view	30x/1°30'
Tube length	154 mm
Minimum focus distance	1.2 m
Objective aperture	5 brightness levels adjustable
Objective aperture	Ø 45 mm (EDM: 50 mm)
Laser pointer ¹	Red laser dot

TILT SENSOR	
Type	Dual axis, liquid photoelectric sensor
Compensation range/accuracy	±4°

DISTANCE MEASUREMENT RANGE ²	
Standard prism mode	3,500 m
Reflectorless ³	1,000 m (800 m for 2" version)

DISTANCE MEASUREMENT ACCURACY	
Standard prism mode	±1 mm + 1 ppm
Reflectorless	±1.5 mm + 2 ppm ±1.5 mm + 2 ppm

MEASUREMENT TIME	
Standard prism mode (Tracking/Pre-aim)	0.1 / 0.3 sec
Reflectorless	0.3 - 3 sec

DISTANCE MEASUREMENT	
Distance Unit	m/US ft/INT ft
Display Resolution	1mm

MOTORIZATION	
Technology	DC Servo Motor
Max rotation speed	40°/s
Rotation time F1/F2	2.9 sec

APC	
Centering range	3 - 1000 m
Time	3 - 5 sec
Search range	3 - 600 m
AIM accuracy ⁴	±1 mm @ 100 m
Search range	3 - 300 m
Search time	Typically 10" - 3.5 s
Angle ⁴	11: 360° V, ±18°
Lock range	3 - 600 m

1 A built-in range-finder product equipped with a Class II laser has a hazardous distance of 1,000 meters (3,300 feet). Beyond this distance, the laser intensity is reduced to Class II.
2 Standard conditions, clear, with no haze or overcast. Range and accuracy depend on atmospheric conditions.
3 With Kodak Grey Card White Side (90% reflectivity).
4 For a 64 mm round prism.

Illustrations, descriptions and technical specifications are not binding and may change without notice. © Stonex 2014



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R120 Robotic Total Station

Android
Robotic Total Station



R120 Android Robotic Total Station

R120 is a robotic Android total station that provides exceptional precision with an angular accuracy of 1" (2" available) and an electronic distance measurement (EDM) accuracy of 1 mm + 1 ppm. It operates effectively up to 1,000 m (800 m for 2" version) in reflectorless mode and features a rotation speed of 40° per second. This instrument combines the capabilities of a robotic station with excellent cost-effectiveness.

The R120 is designed with a 5.5-inch color touch screen and runs on the Android operating system, making it user-friendly and similar in interface to a smartphone, which enhances data exchange capabilities. The onboard Cube-a software allows operators to seamlessly integrate GNSS tasks with surveys performed using the total station.

Communication and data transfer between the station and the controller are facilitated via a Bluetooth connection. Additionally, the R120 has an integrated modem, enabling the operator to connect to the internet and send and receive topographic data.



APC | AUTOMATIC PRISM CENTERING

The R120 total station is designed with Automatic Prism Centering (APC) technology that precisely aims and centers the prism up to 1,000 meters away. This allows for highly accurate distance measurements without the need for manual prism centering. The APC analyzes the received signal and can be configured by the user to automatically re-lock the prism if lost.



DC SERVO MOTOR

The R120 Robotic Total Station boasts maximum rotation speed of 40 degrees per second, ensuring accurate and controlled rotation. It can switch between Face 1 and Face 2 in just 2.9 seconds, enabling efficient and rapid measurements.



HIGH MEMORY CAPACITY

R120 has 4GB of RAM and 64GB of internal storage, providing a good balance of memory for multitasking and storing files.



LTE MODEM

R120 can fully utilize its 3M card and integrated modem. The operator can connect to the internet to send and receive topographic data.



ANDROID AND CUBE-A ON BOARD

The Android System multiplies the possibilities for operators who can have touch management of jobs and work with convenient background maps. Thanks to this operating system, it is possible to use the total station in a simple and intuitive way, as if it were a smartphone.



The R120 is equipped with the Android operating system and comes pre-installed with the powerful Cube-a program. This onboard software allows operators to easily integrate data from GNSS and surveys conducted with the total station. Communication and data exchange between the station and the controller (GNSS) is made simple with a Bluetooth connection. This means that with the total station, surveys carried out with GNSS, can be loaded through an external controller via Bluetooth. These surveys then can be completed within the total station. With Cube-a, users can navigate the program easily and efficiently, accessing all the classic functions of a total station while enjoying the added benefits of the Android operating system. This integration allows for seamless and streamlined workflows, saving time and effort while achieving the highest level of accuracy.

Fast360

The state-of-the-art robotic total station features a cutting-edge 360° prism search technology that allows users to locate their target quickly and accurately from any angle. This advanced capability enables surveys to be completed with greater speed and precision, all while enjoying the convenience of a fully automated system.

If the lock is lost, the total station, thanks to Fast360° technology, can quickly find the prism. This can be done through the Cube-a, simply by pressing a command, or by manually managing the search through an interface with joystick functionality.

R120 is designed with automatic prism centering technology that takes the guesswork out of surveying. With this advanced system, users can easily and quickly center their prism with minimal effort. Thanks to the total station's automatic centering feature, surveying processes can be streamlined and made more efficient. Users can simply position the total station near their target and let the system take care of the rest. The automatic prism centering technology will quickly and accurately locate the prism and center it for the most precise measurements possible.

OnePole

The OnePole Solution is a surveying system that combines the high accuracy of prism measurements with the ability to measure points that are not visible from the total station (TS) using GNSS technology. While a TS requires reference points that must be visible from the station, an RTK GPS receiver can quickly determine its position with centimeter-level accuracy using data from satellites. The OnePole Solution allows for the simultaneous use of TS and GNSS and can easily switch between the two with a simple tap on a button. Additionally, the system reduces prism search times through auto-aiming to the current GNSS position.



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