

Leica Viva TS16 Equipment List



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Total Station

1 TS16

1.1 Models




	TS16 M	TS16 A	TS16 G	TS16 P	TS16 I
Angle measurement	●	●	●	●	●
Distance measurement to prism	●	●	●	●	●
Distance measurement to any surface (reflectorless)	●	●	●	●	●
Motorised	●	●	●	●	●
AutoHeight (automatic Instrument height)	●	●	●	●	●
Automatic Target Aiming (ATRplus)	-	●	●	●	●
Lock mode	-	●	●	●	●
DynamicLock	-	-	-	○	○
PowerSearch (PS)	-	-	-	●	●
Overview Camera	-	-	-	-	●
Laser Guide (GUS74)	-	-	●	-	-
RS232, USB and SD card interface	●	●	●	●	●
WLAN	●	●	●	●	●
Bluetooth	●	●	●	●	●
Internal Flash Memory (2 GB)	●	●	●	●	●
Hotshoe interface for RadioHandle	●	●	●	●	●
Guide Light (EGL)	●	●	-	●	●
LOC8	○	○	○	○	○
AutoPole AP20 H	○	○	○	○	○
AutoPole AP20 ID	-	-	-	○	○
AutoPole AP20 T	-	○	○	○	○
AutoPole AP20	-	-	-	○	○
CS20 Field controller connection	○	○	○	○	○
CS30 Tablet connection	○	○	○	○	○
CS35 Tablet connection	○	○	○	○	○
SmartStation GS16 GNSS receiver	○	○	○	○	○

- Standard
- Optional
- Not available

1.2 Angular Accuracies

		1" Accuracy	2" Accuracy	3" Accuracy	5" Accuracy
TS16 M	PinPoint R500	917 463	917 464	917 465	917 466
	PinPoint R1000	917 458	917 460	917 461	917 462
TS16 A	PinPoint R500	917 454	917 455	917 456	917 457
	PinPoint R1000	917 450	917 451	917 452	917 453
TS16 G	PinPoint R30	917 467	917 468	917 469	
	PinPoint R1000	917 470	917 471	917 472	
TS16 P	PinPoint R500	917 446	917 447	917 448	917 449
	PinPoint R1000	917 442	917 443	917 444	917 445
TS16 I	PinPoint R500	917 434	917 435	917 436	917 437
	PinPoint R1000	917 429	917 430	917 431	917 432

 All TS16 models are delivered with one 5" WVGA colour touch screen, Quick Guide, documentation USB card (833 146) and container GVP725 (817 058).

Additional Options & Accessories

2 Additional Options for Total Station


2.1 Hardware Options



879 378	GTS49	Full keyboard for 2nd face on TS16 models with Autoheight, fitted. Contains 840 313 KDU
874 451	GTS46	LOC8 theft deterrence and location device for automated total stations, fitted.

2.2 TS16 I Camera Calibration





793 861	Overview camera calibration workflow. Article ensures the predelivery logistics for the calibration of the overview camera of the Leica Viva TPS.  3rd party fees for instrument calibration and licensing of software are not included.
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2.3 Calibration and Producer Certificates



812 535	Calibration Certificate "Gold", Angle
812 536	Calibration Certificate "Gold", A + Dist IR
812 539	Calibration Certificate "Gold", A + Dist, IR&RL
812 542	Calibration Certificate "Silver", Angle
812 543	Calibration Certificate "Silver", A + Dist, IR
812 544	Calibration Certificate "Silver", A + Dist, IR&R

-  Calibration Certificate "Blue" (812 541) is always included in initial order (myWorld download).
-  For Service Calibration Certificates see Standard Service Products (SSPs) document.

3 Leica Captivate Apps & Software Options

3.1 Leica Captivate Software for TS


827 646

Leica Captivate Measure & Stake for TS/MS.

3.2 Apps included in Leica Captivate for TS (827 646)

Measure includes: <ul style="list-style-type: none">• Measure• Code points• Automatically measure points• Remote Heights• Target Offset calculations
Setup includes: <ul style="list-style-type: none">• Get station coordinates from GNSS, from Job or enter manually• Orientation by known Azimuth• Orientation by known Backsight• Orientation & Height transfer to up to 10 target points• Resection up to 10 target points• Resection Helmert• Orientation to Line• Orientate to Object
Stake points includes: <ul style="list-style-type: none">• Navigate to point using various methods: from and behind instrument, point, base line, arrow, North• Quality control - checking of coordinate differences before storing• Automatically select next closest point• Graphical selection of point from map• Edit heights and offset heights of points• Acoustic beep getting faster when getting closer to point
COGO includes: <ul style="list-style-type: none">• Inverse• Traverse• Intersections• Angle calculations• Line & arc calculations• Bearing & distance calculations• Shift, Rotate, Scale (manual & matching points)• Triangle calculations• Rectangle
Determine coordinate system: <ul style="list-style-type: none">• 1 step, 2 step, 3D Transformation• All common projections
Alignment Editor: <ul style="list-style-type: none">• Horizontal alignments• Vertical alignments• Cross sections• Chainage equations
Control Data: <ul style="list-style-type: none">• Create points and lines
Data import: ASCII, XML, DXF, DTM, alignments
Data export: ASCII, Custom, DXF, XML, Style Sheets, FBK, RW5, RAW and local formats



3.3 Optional Apps for Leica Captivate for TS

 The following apps require a valid license key.

834 221	Athletics
827 650	Area Division
827 651	Stake DTM
827 648	Measure and Stake to Line
827 649	Measure to Plane / Grid
827 653	Check and Stake Road
827 654	Check and Stake Tunnel
827 655	Check and Stake Rail
827 658	Sets of Angles

827 652	Volume Calculation
827 656	Hidden Point
827 657	Traverse
827 659	QuickVolume

3.4 Local applications for Leica Captivate for TS

834 218	Offset+
834 224	Zenith Line
834 227	Quick Setup
834 229	Auto Setup
834 230	Remote Monitoring
834 255	Piling
836 522	Machine Control Guidance
839 678	Inspect Surfaces
836 669	Tunnel Profile Generator
846 826	TPS Survey Streaming
850 622	ESRI Shapefile Exporter
834 226	Set Orientation
847 944	Inspect Road  Requires 839 678 Inspect Surfaces.
847 945	Inspect Tunnel  Requires 839 678 Inspect Surfaces.
847 952	Inventory (Mtl)
865 657	Compaction Control
867 331	Stakeout Auto Points
869 755	Structural Steel

3.5 Optional Licences for Leica Captivate for TS

901 400	DynamicLock for TS16P and TS16I
827 662	Leica Exchange
903 372	ConX 1y
903 373	ConX 2y
903 374	ConX 3y
923 922	BricSys 24/7 1y
923 925	BricSys 24/7 2y
923 928	BricSys 24/7 3y

Accessories for Total Station

4 Power Supply


4.1 Internal Batteries



733 270	GEB221	Lithium-Ion battery, 7.4V/4.4Ah, rechargeable. To be used with TS13/TS16.
793 973	GEB222	Lithium-Ion battery, 7.4V/6Ah, rechargeable. To be used with TS13/TS16.

4.2 External Batteries



905 305	GEB373	External universal battery, Li Ion, 13V, 289 Wh, rechargeable.
807 696	GEV270	Power supply unit for TPS/GNSS/DNA. For indoor use only. Input 100-240VAC to output 13.2VDC, with connection for power cables.  Requires a GEV52 or GEV187 cable for Viva TS.

4.3 Battery Chargers



799 185	GKL311	Single-bay Charger Professional 3000. Charger for one Li-Ion battery (GEB211, GEB212, GEB221, GEB222, GEB241, GEB242, GEB321, GEB331 and GEB361), including AC/DC adaptor and cigarette lighter cable.
799 187	GKL341	Multi-bay Charger Professional 5000. Charges up to 4 batteries (GEB211, GEB212, GEB221, GEB222, GEB241, GEB242, GEB321, GEB331 and GEB361), including power cable
734 389	GDC221	Car adapter for the GKL341 charger. Allows the use of the GKL341 with a cigarette lighter; 12V/24V DC/DC converter. Can also be used to power CS15 field controller directly from a cigarette lighter.
774 437	GEV242	Charger for GEB371 / GEB373 external battery.

5 Data Storage and Data Transfer

5.1 Memory Devices



767 856	MSD1000	SD memory card 1GB for Leica Viva TPS and Leica Nova instruments and CS20 field controller, industrial grade.
789 139	MSD08	SD memory card 8GB for Leica Viva TPS and Leica Nova instruments and CS20 field controller, industrial grade.
765 199	MS1	USB memory stick, 1GB, for Leica Viva TPS and Leica Nova instruments and CS20 field controller, industrial grade.

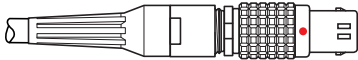







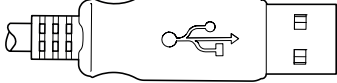

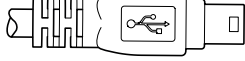

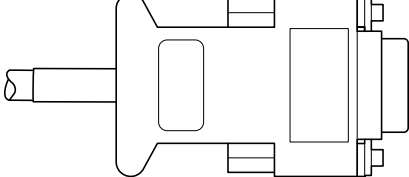
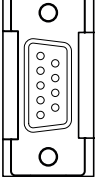
5.2 Card Reader



767 895	MCR7	Card reader for SD/CF cards.
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6 Connectivity

6.1 Connector Types

Name	Used on		
Lemo0 5-pin	Leica Viva TPS		
Lemo1 5-pin	Battery / External power		
Lemo1 8-pin	Leica Viva field controllers / Leica Nova TPS		
Lemo1 8-pin	External TS radios		
USB A	PC / Laptop		
USB Mini	Leica Viva TPS		
9-pin RS232 serial	PC / Laptop		

6.2 Cables



409 678	GEV52	Battery cable, connects Leica Viva Total Stations or DNA Lemo0 5-pin to external battery connector Lemo 1 5-pin.
439 038	GEV71	Car battery cable, connects 12V car battery connector to Lemo1 5-pin female.
563 625	GEV102	Serial data cable for communication to PC, connects Lemo0 5-pin (instrument) to PC (9-pin RS232 serial), 2m.
734 698	GEV187	Serial data Y-cable, connects Lemo0 5-pin connector to PC (9-pin RS232 serial) and external battery (Lemo1 5pin), 2m.
756 367	GEV217	Serial data cable for communication between Leica Viva Total Stations and CS10/CS15, connects Lemo0 5-pin to Lemo1 8-pin, 1.8m.
764 700	GEV223	Data transfer cable connecting TS to PC, USB Mini connector to USB A.
806 093	GEV267	Serial data transfer cable, converter cable USB A to Lemo0 5-pin, connects PC to Leica Viva Total Stations, PC driver included on CD.
707 525	GK1	Lemo Canon converter 30°, for PC (Lemo 0 5-pin to RS232) to be used with GEV186 cable.
734 697	GEV186	Serial data Y-cable for TS robotic setup, Lemo1 5-pin (battery) to Lemo0 5-pin (instrument) and Lemo1 8-pin (external TS radio).

7 Optical Accessories

7.1 Eyepiece



377 802	FOK53	Magnification eyepiece, additional eyepiece for increasing telescope magnification to 42x. ☞ Modification in a workshop necessary.
793 979	GFZ3	Diagonal eyepiece for telescope with bayonet connection.
376 236	GOK6	Eyepiece for steep sights, with joint allowing variable sighting angle.

7.2 Autocollimation Set



199 899	GOA2	Autocollimation eyepiece.
394 787	GEB62	Plug-in lamp, with cable for autocollimation eyepiece.
394 792	GEB63	Battery box for autocollimation eyepiece and eyepiece lamp.

7.3 Objective



743 504	GVO13	Objective solar filter for TPS instruments.
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8 Instrument Height Meter



667 718	GHM007	Instrument height meter.
722 045	GHT196	Distance holder for height meter.
60100179		Height Meter set including GHM007 Instrument height meter and GHT196 Distance holder for height meter.

9 Tribrachs



777 508	GDF321	Tribrachs Series 5000, without optical plummet.
777 509	GDF322	Tribrachs Series 5000, with optical plummet.
842 061	GDF311	Tribrachs Series 3000, without optical plummet.
842 062	GDF312	Tribrachs Series 3000, with optical plummet.

10 Tripods



296 632	GST20	Heavy duty tripod, with side clamp screws, carrying strap and plumb bob.
394 752	GST20-9	Heavy duty tripod, with side clamp screws and carrying strap.
667 301	GST120-9	Heavy duty tripod, self-closing, with side clamp screws and carrying strap.
332 200	GST4	Tripod-star, for setting up tripods on hard and slippery surfaces.

11 Reflector Poles

11.1 Standard Poles with stub




754 391	GLS12	Reflector pole, telescopic to 2.00m with circular bubble, cm graduations.
754 389	GLS12F	Reflector pole, telescopic to 2.00m with circular bubble, ft graduations.
766 359	GLS31	Reflector carbon-fibre pole with circular bubble and twist lock. Snap-locks at 2.00m, 1.80m and 1.50m for GPS (GNSS) antennas with GAD31 adapter or GRZ122 reflector (SmartPole setup).
913 901	GLS51	Telescopic carbon-fibre pole with stub interface, supports AP20 AutoPole product. With circular bubble, twist lock and dedicated snap-lock positions. Minimum length 1.34m, extendable to target height 2.20m, printed scale on extendable and lower tube, graduation in cm.
913 902	GLS51F	Telescopic carbon-fibre pole with stub interface, supports AP20 AutoPole product. With circular bubble, twist lock and dedicated snap-lock positions. Minimum length 4.5 ft, extendable to target height 7.0 ft, printed scale on extendable and lower tube, graduation in ft.
385 500	GLS11	Reflector pole, telescopic, with circular bubble, cm and ft graduation, extends to 2.15m.
667 309	GLS111	Reflector pole, with bull's-eye bubble, cm/ft graduation, extends to 2.60m, with red/white 0.20m graduations.
667 310	GLS112	Reflector pole, with bull's-eye bubble, cm/ft graduation, extends to 3.65m, with red/white 0.20m graduations.
555 720	GSR2	Dual-strut support for GLS11 plumbing pole.
667 319	GSR111	Dual-strut support for all GLS.
403 428	GZW12	Extension 1m long, for reflector pole GLS11 and carriers.

11.2 Standard Poles with 5/8" screw




913 899	CRP4	Telescopic carbon-fibre pole with 5/8" screw thread interface, supports AP20 AutoPole product. With upright circular bubble and upside-down circular bubble, twist lock and dedicated snap-lock positions. Minimum length 1.37m, extendable to target height 2.20m, printed scale both on extendable tube and lower tube, graduation in cm.
913 900	CRP5	Telescopic carbon-fibre pole with 5/8" screw thread interface, supports AP20 AutoPole product. With upright circular bubble and upside-down circular bubble, twist lock and dedicated snap-lock positions. Minimum length 4.55 ft, extendable to target height 7.0 ft, printed scale both on extendable tube and lower tube, graduation in ft.

 CRP4 and CRP5 only support MPR122 360° reflector with 5/8" screw adapter.

11.3 Hidden Point Pole



742 329	GMP112	Hidden Point pole extension for GMP111 (mini prism pole set). Includes mini prism with holder and 30cm adapter pole.  Additional GMP111 Mini prim (641 615) required for complete Hidden Point pole set with two prisms.
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11.4 Mini Pole



403 427	GLS14	Mini reflector pole, (prism/target 20cm over point), with circular bubble.
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12 Reflector Carriers



667 313	GRT144	Carrier with stub.
874 838	SNLL321	Precision carrier, with longitudinal bubble and zenith-nadir laser plummet.
428 340	GZR3	Precision carrier, with longitudinal bubble and optical plummet.
725 566	GZR103	Carrier, with longitudinal bubble and optical plummet, for reflectors and GPS antenna.
667 217	GAD31	Screw-to-stub adapter for fitting GPS antenna on carriers with stub and poles with stub.

13 Reflectors

13.1 Circular Reflectors



641 617	GPR121	Circular prism, with metal holder and target plate.
362 830	GPR1	Circular prism, in black housing.
362 820	GPH1	Single-prism holder.
400 080	GPH3	Three-prism holder.
362 823	GZT4	Target plate, for GPH1.

13.2 Precision Reflectors



555 631	GPH1P	Single-prism precision reflector.
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13.3 360° Reflectors with stub adapter



754 384	GRZ122	360° reflector with 5/8" thread adapter for mounting of GNSS antenna.
639 985	GRZ4	360° reflector.
644 327	GRZ101	360° mini prism with 1/4" thread fitting. Not supported by PowerSearch.
742 006	GAD103	Adapter for attaching GRZ101 to all poles with Leica Geosystems stub.

13.4 360° Reflectors with 5/8" screw adapter



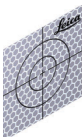
756 637	MPR122	360° reflector with 5/8" thread adapter for mounting of GNSS antenna and 5/8" screw nut.
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13.5 Mini Reflectors



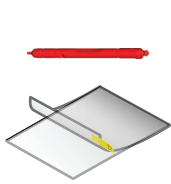
641 662	GMP101	Mini prism, incl. bubble, target plate and spike, in bag, also suitable for GLS11/GLS12 and GRT144 (same height as GPH1, additive constant +17.5mm).
641 762	GMP104	Mini prism, with L-bar, for fixed installations.

13.6 Reflector Tapes



763 532	GZM29	Reflective tape, 20x20mm for short range, pack of 20 pieces.
763 533	GZM30	Reflective tape, 40x40mm for medium range, pack of 20 pieces.
763 534	GZM31	Reflective tape, 60x60mm for long range, pack of 20 pieces.

14 Pen and Screen Protection Foils



Extra pen

813 914	GDZ71	Pen with tether clip interface for CS20 field controller and TS16/MS60/TS60 instruments.
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Screen Protection Foil set

813 781	SPF05	5" WVGA screen protection foils for CS20 field controller and TS16/MS60/TS60 instruments.
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15 Additional Containers & Accessories for Containers



727 589	GVP102	Soft bag with shoulder strap, for prism station, consist of tribrach, prism carrier or laser plummet and prism.
833 516	GVP716	Backpack carrying systems for all large TPS and GNSS containers.
833 517	GVP717	Sidebag for container GVP721/722/723/725/728/729/735.
833 518	GVP718	Basic backstrap for container GVP721/722/723/725/728/729/735.
833 519	GVP719	Shoulderstrap for container GVP721/722/723/725/728/729/735.
914 930	GVP738	Hard container for 2 prisms, 2 carriers/laser plummets, 2 tribrachs, CS10, CS15, CS20, CS30, CS35 and AP20. All CS fits with attached holder.
937 437	GVP740	Hard container for SmartAntenna, CS Field Controller and accessories for a SmartPole and SmartStation setup.
937 438	GVP741	Small-sized hard container for 360° prism and controller for TS Robotic Pole setup.
961 156	GVP747	Hard container, for CS20, CS30 and CS35 field controller including attached holders, 360° prisms and AP20.

Remote Control

16 CS20 Field Controller



876 476	CS20 Basic Field Controller	CS20 Field Controller. Ruggedized field controller with 5" WVGA touch display, 4GB eMMC Flash Memory, 2GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, QWERTY keypad, stylus.
876 477	CS20 LTE Field Controller	CS20 LTE Field Controller. Ruggedized field controller with 5" WVGA touch display, 4GB eMMC Flash Memory, 2GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, 4G GSM/UMTS/LTE module, internal TS communication module, QWERTY keypad, stylus.
876 478	CS20 LTE Disto Field Controller	CS20 LTE Disto Field Controller. Ruggedized field controller with 5" WVGA touch display, 4GB eMMC Flash Memory, 2GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, 4G GSM/UMTS/LTE module, internal TS communication module, integrated Disto-Lasermeter QWERTY keypad, stylus.
876 479	CS20 LTE Field Controller (US, CA)	CS20 LTE Field Controller US/CA. Ruggedized field controller with 5" WVGA touch display, 4GB eMMC Flash Memory, 2GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, 4G GSM/UMTS/LTE module, internal TS communication module, QWERTY keypad, stylus.
876 480	CS20 LTE Disto Field Controller (US, CA)	CS20 LTE Disto Field Controller US/CA. Ruggedized field controller with 5" WVGA touch display, 4GB eMMC Flash Memory, 2GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, 4G GSM/UMTS/LTE module, internal TS communication module, integrated Disto-Lasermeter QWERTY keypad, stylus.

16.1 CTR20 TS Communication Expansion Pack




Not available in EU countries due to EN 300 328 V.1.8.1.



Recommended only for robotic applications systematically exceeding ranges beyond 400 m.



6010023		CTR20 expansion pack set TS communication expansion pack set including CTR20 module and GAT25 radio antenna.
808 038	CTR20	CTR20 TS communication expansion pack CTR20 TS communication expansion pack with integrated radio module for CS20 3.75G field controller variants. Used to establish long range radio connection between CS20 3.75G field controller and TS Total Stations equipped with RH16. GAT25 radio antenna not included (frequency range 2402 - 2480 MHz).  Requires a GAT25 radio antenna.
812 027	GAT25	GAT25 radio antenna for CTR20 module Radio antenna for CTR20 long range TS communication module (frequency range 2402 - 2480 MHz).

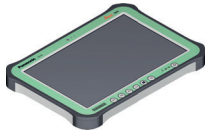
17 CS30 Tablet




925 660	CS30 LTE	CS30 LTE Tablet Ruggedized Win10 LTSC 64-bit Tablet Computer including: 7" touch-widescreen, 64 GB eMMC hard drive, 4 GB RAM, WLAN 802.11 b/g/n/a/ac, 3G/4G Integrated Mobile Broadband module, Bluetooth v4.2, 8MP rear camera with flash, 1x GEV228 Power Supply unit, 1x GDZ80 Capacitive Stylus. Captivate pre-loaded.
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18 CS35 Tablet

18.1 CS35 Tablet




875 363	CS35-1	CS35-1 10" Tablet, EU, RU Ruggedized Win10 64-bit Tablet Computer including: 10" touch-widescreen, 256 GB SSD hard drive, 8 GB SDRAM, WLAN 802.11 b/g/n/a/ac, 4G Integrated Mobile Broadband module, Bluetooth v4.1, Stylus, 1x Battery (4.1Ah), AC/DC adaptor and 8MP rear camera with flash.
875 364	CS35-2	CS35-2 10" Tablet, US, CA Ruggedized Win10 64-bit Tablet Computer including: 10" touch-widescreen, 256 GB SSD hard drive, 8 GB SDRAM, WLAN 802.11 b/g/n/a/ac, 4G Integrated Mobile Broadband module, Bluetooth v4.1, Stylus, 1x Battery (4.1Ah), AC/DC adaptor and 8MP rear camera with flash.
875 365	CS35-3	CS35-3 Tablet, AUS NZ Ruggedized Win10 64-bit Tablet Computer including: 10" touch-widescreen, 256 GB SSD hard drive, 8 GB SDRAM, WLAN 802.11 b/g/n/a/ac, 4G Integrated Mobile Broadband module, Bluetooth v4.1, Stylus, 1x Battery (4.1Ah), AC/DC adaptor and 8MP rear camera with flash.


 All CS35 Tablets are delivered with stylus, tether, one GEB235 Lithium-Ion battery (11.1 V/4.1 Ah, rechargeable) and country specific AC/DC adaptor.

18.2 CTR35 Long-range Bluetooth Device



844 474	CTR35	Long-range Bluetooth device for CS35.
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 Recommended only for robotic applications requiring extended range.

 Please refer to the Leica Captivate Controller Equipment list for CS20 / CS30 and CS35 related options and accessories.

Accessories for Remote Control

19 RadioHandles and TCPS Modem

19.1 RadioHandles



818 467 **RH17** RadioHandle with integrated long range Bluetooth module and radio antenna. Used as radio modem for Leica Viva TPS and Leica Nova instruments. Establishes communication to CS20/CS35 or CS15 field controller equipped with CTR16/17 or external radio modem TCPS29/30 attached to PC. Frequency range 2402 - 2480 MHz.

Fulfills EN 300 328 V.1.8.1.



922 840 **RH18** RadioHandle with two integrated Bluetooth modules and radio antenna. Supports Bluetooth low energy for AP20 AutoPole with Tilt Compensation. Used as radio modem for Leica total stations running Leica Captivate field software. Establishes communication to field controller CS20/30/35 or with/without CTR20/30/35 Bluetooth stick or external radio modem TCPS29/TCPS30. Frequency range 2402 - 2480 MHz.

fulfils EN 300 328 V.1.8.1.

19.2 TCPS Modem



818 469 **TCPS30** Bluetooth radio modem with antenna. Used as external radio modem for Leica Viva TPS and Leica Nova instruments or PCs. Frequency range 2402 - 2480 MHz.

Fulfills EN 300 328 V.1.8.1.

19.3 TCPS Accessories



734 163 **GHT43** Adapter for mounting TCPS radio module on GST20/GST120 tripod.

19.4 Cables for TCPS Radio Modem

For an overview of the different connector types, refer to chapter 6.1.

734 697 **GEV186** Serial data Y-cable for TS Robotic setup, Lemo1 5-pin (battery) to Lemo0 5-pin (instrument) and Lemo1 8-pin (external TCPS radio).

707 525 **GK1** Lemo Converter 30° for PC (9-pin RS232 serial).

Use GK1 in combination with GEV186 to connect TCPS with PC for configuration or communication.

771 057 **GEV236** Y-cable Lemo1 8-pin (CS20 Field Controller) to Lemo1 5-pin (battery) and Lemo1 8-pin (external TCPS radio), 1.8 m.

20 AP20 AutoPole

20.1 Models



922 835	AP20 H	AutoPole AP20 H with PoleHeight module ensures to automatically detect and apply target height to paired field SW.
922 836	AP20 ID	AutoPole AP20 ID with TargetID module ensures to find and measure your target, wirelessly connected to your automated total station.
922 837	AP20 T	AutoPole AP20 T with PoleHeight and Tilt Compensation module ensures to automatically detect and apply target height and to compensate a tilted pole alignment, wirelessly connected to your automated total station.
922 838	AP20	AutoPole AP20 with PoleHeight, TargetID and Tilt compensation module ensures to detect and apply target height, to find and measure your target and to compensate a tilted pole alignment, wirelessly connected to your automated total station.



AP20 AutoPole can only be attached to GLS51 / GLS51F / CRP4 / CRP5 Reflector Poles



AP20 T and AP20 require 922 840 RH18 on total station side to support Tilt Compensation.

20.2 Internal Battery



898 414	GEB321	Lithium-Ion battery, 7.2V/3.35Ah, rechargeable. To be used with AP20 AutoPole.
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20.3 Reflector poles for AP20



913 901	GLS51	Telescopic carbon-fibre pole with stub interface, supports AP20 AutoPole product. With circular bubble, twist lock and dedicated snap-lock positions. Minimum length 1.34m, extendable to target height 2.20m, printed scale on extendable and lower tube, graduation in cm.
913 902	GLS51F	Telescopic carbon-fibre pole with stub interface, supports AP20 AutoPole product. With circular bubble, twist lock and dedicated snap-lock positions. Minimum length 4.5 ft, extendable to target height 7.0 ft, printed scale on extendable and lower tube, graduation in ft.
913 899	CRP4	Telescopic carbon-fibre pole with 5/8" screw thread interface, supports AP20 AutoPole product. With upright circular bubble and upside-down circular bubble, twist lock and dedicated snap-lock positions. Minimum length 1.37m, extendable to target height 2.20m, printed scale both on extendable tube and lower tube, graduation in cm.
913 900	CRP5	Telescopic carbon-fibre pole with 5/8" screw thread interface, supports AP20 AutoPole product. With upright circular bubble and upside-down circular bubble, twist lock and dedicated snap-lock positions. Minimum length 4.55 ft, extendable to target height 7.0 ft, printed scale both on extendable tube and lower tube, graduation in ft.

SmartPole & SmartStation

21 SmartStation & Smartpole Setup using a GS16 GNSS Receiver

21.1 GS16 GNSS Receiver



851 142	GS16	Leica GS16 Basic SmartAntenna EG *
947 069	GS16	Leica GS16 Basic SmartAntenna *
939 764	GS16	Leica GS16 UHF Basic SmartAntenna *
939 763	GS16	Leica GS16 UHF Regional SmartAntenna *
939 767	GS16	Leica GS16 UHF Performance SmartAntenna
939 768	GS16	Leica GS16 UHF Unlimited SmartAntenna


* Available in selected countries only.

	Leica GS16 Basic *	Leica GS16 Regional *	Leica GS16 Performance	Leica GS16 Unlimited
Supported GNSS Systems				
Multi-frequency (L1, L2, L5, L-band)	●	●	●	●
GLONASS	○	○	○	●
Galileo	○	○	○	●
BeiDou	○	○	○	●
QZSS	○	○	○	●
RTK performance				
DGPS	●	●	●	●
RTK unlimited	○	●	●	●
Network RTK	○	●	●	●
SmartLink fill	○	○	○	●
SmartLink	○	○	○	○
Interference mitigation	○	○	○	○
Position update & data recording				
20 Hz positioning	●	●	●	●
Raw data logging	●	●	●	●
RINEX logging	○	○	○	●
NMEA out	○	○	○	●
Additional features				
RTK Reference Station functionality	○	●	●	●
No country limitation	●	○	●	●

● Standard
○ Optional

21.2 SmartAntenna Adapter



767 802	GAD110	SmartAntenna adapter to mount GS16 SmartAntenna.  BT module to connect the TS to the GS16 GNSS receiver is standard on all Leica Viva TPS and Leica Nova instruments.
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 Please refer to the Leica Captivate GNSS Equipment list for GS16 related options and accessories.

22 SmartPole using GS18 GNSS Receiver

22.1 GS18 I GNSS Receiver



949 985	GS18	Leica GS18 I LTE Basic SmartAntenna *
864 380	GS18	Leica GS18 I LTE Performance SmartAntenna
864 381	GS18	Leica GS18 I LTE Unlimited SmartAntenna
949 986	GS18	Leica GS18 I LTE & UHF Basic SmartAntenna *
864 383	GS18	Leica GS18 I LTE & UHF Performance SmartAntenna
864 384	GS18	Leica GS18 I LTE & UHF Performance SmartAntenna (NAFTA)
879 671	GS18	Leica GS18 I LTE & UHF Performance SmartAntenna (JP)
864 385	GS18	Leica GS18 I LTE & UHF900 Performance SmartAntenna *
864 386	GS18	Leica GS18 I LTE & UHF Unlimited SmartAntenna

* Available in selected countries only.

	Leica GS18 I Basic *	Leica GS18 I Performance	Leica GS18 I Unlimited
Supported GNSS Systems			
Multi-frequency (L1, L2, L5, L-band)	●	●	●
GLONASS	○	○	●
Galileo	○	○	●
BeiDou	○	○	●
QZSS	○	○	●
RTK performance			
DGPS	●	●	●
RTK unlimited	○	●	●
Network RTK	○	●	●
SmartLink fill	○	○	●
SmartLink	○	○	○
Interference mitigation	○	○	○
Position update & data recording			
20 Hz positioning	●	●	●
Raw data logging	●	●	●
RINEX logging	○	○	●
NMEA out	○	○	●
Additional features			
Tilt compensation	●	●	●
Image point measurement	●	●	●
RTK Reference Station functionality	○	●	●

● Standard
○ Optional

22.2 GS18 T GNSS Receiver



949 983	GS18	Leica GS18 T LTE Basic SmartAntenna *
899 218	GS18	Leica GS18 T LTE Regional SmartAntenna *
855 300	GS18	Leica GS18 T LTE Performance SmartAntenna
855 301	GS18	Leica GS18 T LTE Unlimited SmartAntenna
949 984	GS18	Leica GS18 T LTE & UHF Basic SmartAntenna *
899 220	GS18	Leica GS18 T LTE & UHF Regional SmartAntenna *
855 303	GS18	Leica GS18 T LTE & UHF Performance SmartAntenna
855 304	GS18	Leica GS18 T LTE & UHF Performance SmartAntenna (NAFTA)
865 980	GS18	Leica GS18 T LTE & UHF Performance SmartAntenna (JP)
945 113	GS18	Leica GS18 T LTE & UHF900 Performance SmartAntenna *
855 305	GS18	Leica GS18 T LTE & UHF Unlimited SmartAntenna

* Available in selected countries only.

	Leica GS18 T Basic *	Leica GS18 T Regional *	Leica GS18 T Performance	Leica GS18 T Unlimited
Supported GNSS Systems				
Multi-frequency (L1, L2, L5, L-band)	●	●	●	●
GLONASS	○	○	○	●
Galileo	○	○	○	●
BeiDou	○	○	○	●
QZSS	○	○	○	●
RTK performance				
DGPS	●	●	●	●
RTK unlimited	○	●	●	●
Network RTK	○	●	●	●
SmartLink fill	○	○	○	●
SmartLink	○	○	○	○
Interference mitigation	○	○	○	○
Position update & data recording				
20 Hz positioning	●	●	●	●
Raw data logging	●	●	●	●
RINEX logging	○	○	○	●
NMEA out	○	○	○	●
Additional features				
Tilt compensation	●	●	●	●
RTK Reference Station functionality	○	●	●	●
No country limitation	●	○	●	●

● Standard
○ Optional

22.3 GS18 GNSS Receiver



939 670	GS18	Leica GS18 LTE Basic SmartAntenna *
939 669	GS18	Leica GS18 LTE Regional SmartAntenna *
939 671	GS18	Leica GS18 LTE Performance SmartAntenna
939 672	GS18	Leica GS18 LTE Unlimited SmartAntenna
939 674	GS18	Leica GS18 LTE & UHF Basic SmartAntenna *
939 673	GS18	Leica GS18 LTE & UHF Regional SmartAntenna *
939 675	GS18	Leica GS18 LTE & UHF Performance SmartAntenna
939 677	GS18	Leica GS18 LTE & UHF Performance SmartAntenna (NAFTA)
939 679	GS18	Leica GS18 LTE & UHF Performance SmartAntenna (JP)
939 678	GS18	Leica GS18 LTE & UHF900 Performance SmartAntenna *
939 676	GS18	Leica GS18 LTE & UHF Unlimited SmartAntenna

* Available in selected countries only.

	Leica GS18 Basic *	Leica GS18 Regional *	Leica GS18 Performance	Leica GS18 Unlimited
Supported GNSS Systems				
Multi-frequency (L1, L2, L5, L-band)	●	●	●	●
GLONASS	○	○	○	●
Galileo	○	○	○	●
BeiDou	○	○	○	●
QZSS	○	○	○	●
RTK performance				
DGPS	●	●	●	●
RTK unlimited	○	●	●	●
Network RTK	○	●	●	●
SmartLink fill	○	○	○	●
SmartLink	○	○	○	○
Interference mitigation	○	○	○	○
Position update & data recording				
20 Hz positioning	●	●	●	●
Raw data logging	●	●	●	●
RINEX logging	○	○	○	●
NMEA out	○	○	○	●
Additional features				
RTK Reference Station functionality	○	●	●	●
No country limitation	●	○	●	●

● Standard
○ Optional



Please refer to the Leica Captivate GNSS Equipment list for GS18 related options and accessories

Care Packages

23 Customer Care Packages



A wide selection of comprehensive Customer Care Packages (CCPs) is available bundling Hardware Maintenance, Software Maintenance, Customer Support and Extended Warranty.

For more information about the CCP offering in your country please contact your local Leica Geosystems organization or distribution partner.

Trademarks & Technical Data

24 Trademarks

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25 Technical Data

Guide light (EGL):

LED class 1 in accordance with IEC 60825-1 resp. EN 60825-1

Distance meter (Prism), ATRplus and PowerSearch:

Laser class 1 in accordance with IEC 60825-1 resp. EN 60825-1

Laser plummet:

Laser class 2 in accordance with IEC 60825-1 resp. EN 60825-1

Distance meter (Non-Prism):

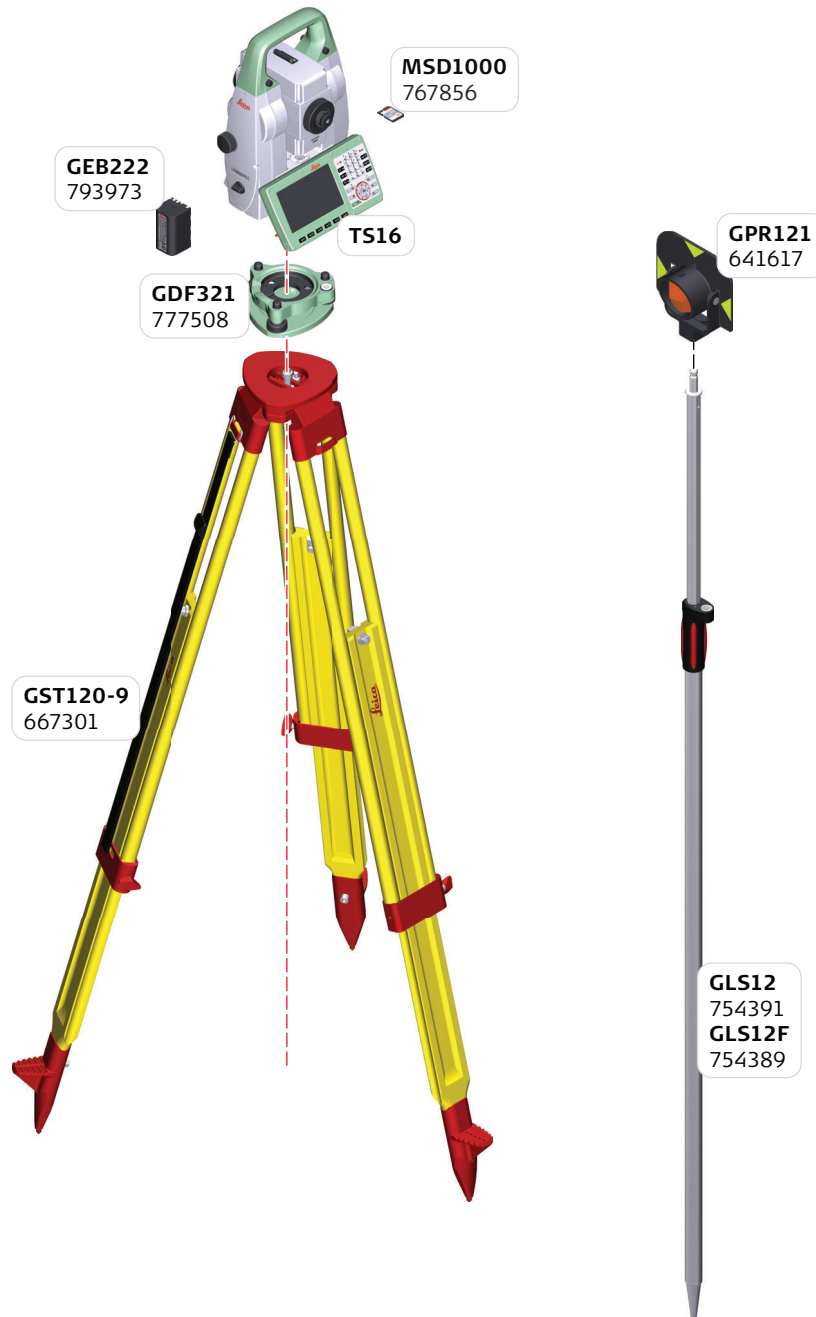
Laser class 3R in accordance with IEC 60825-1 resp. EN 60825-1



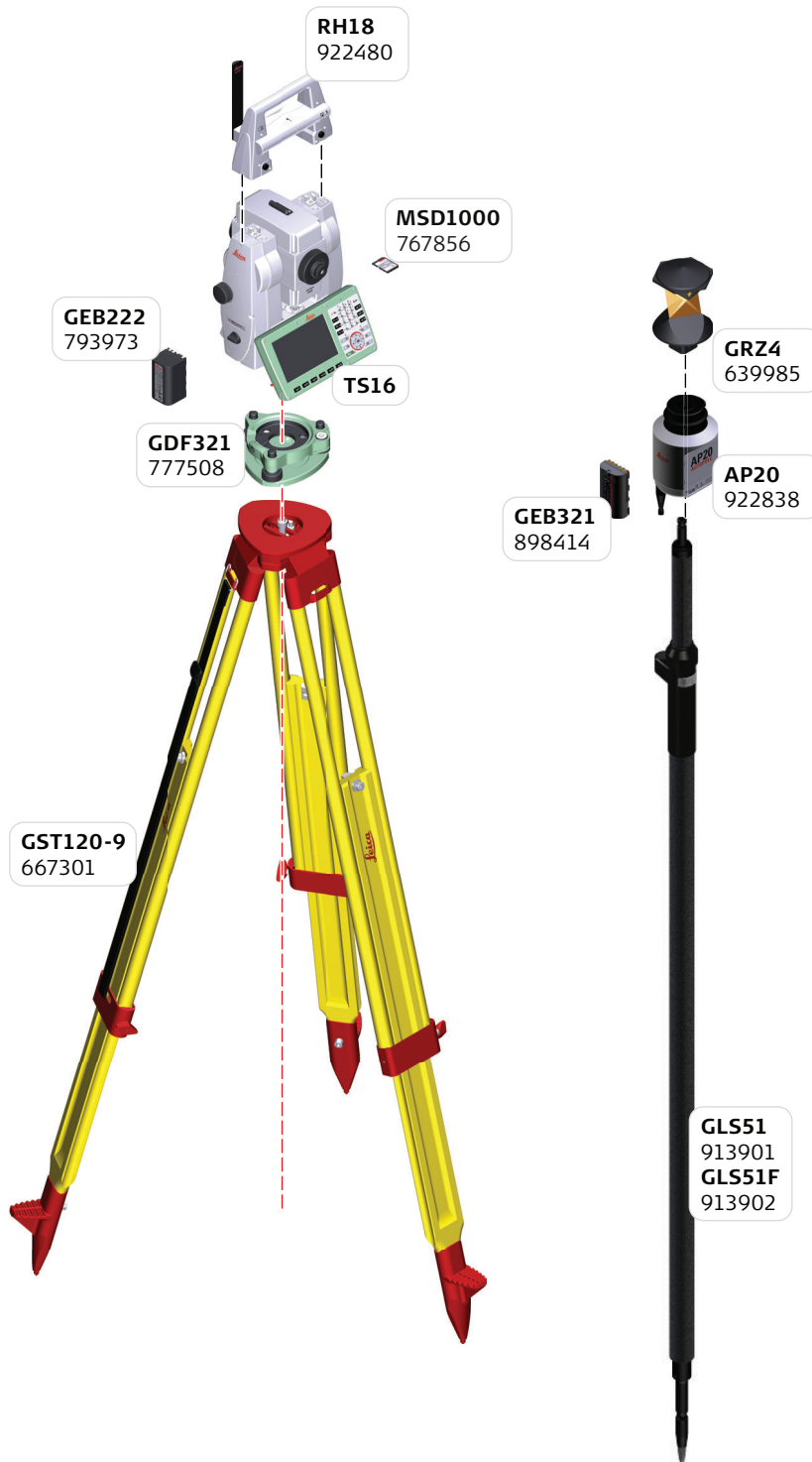
Suggested Equipment Setups

26 Conventional Surveying

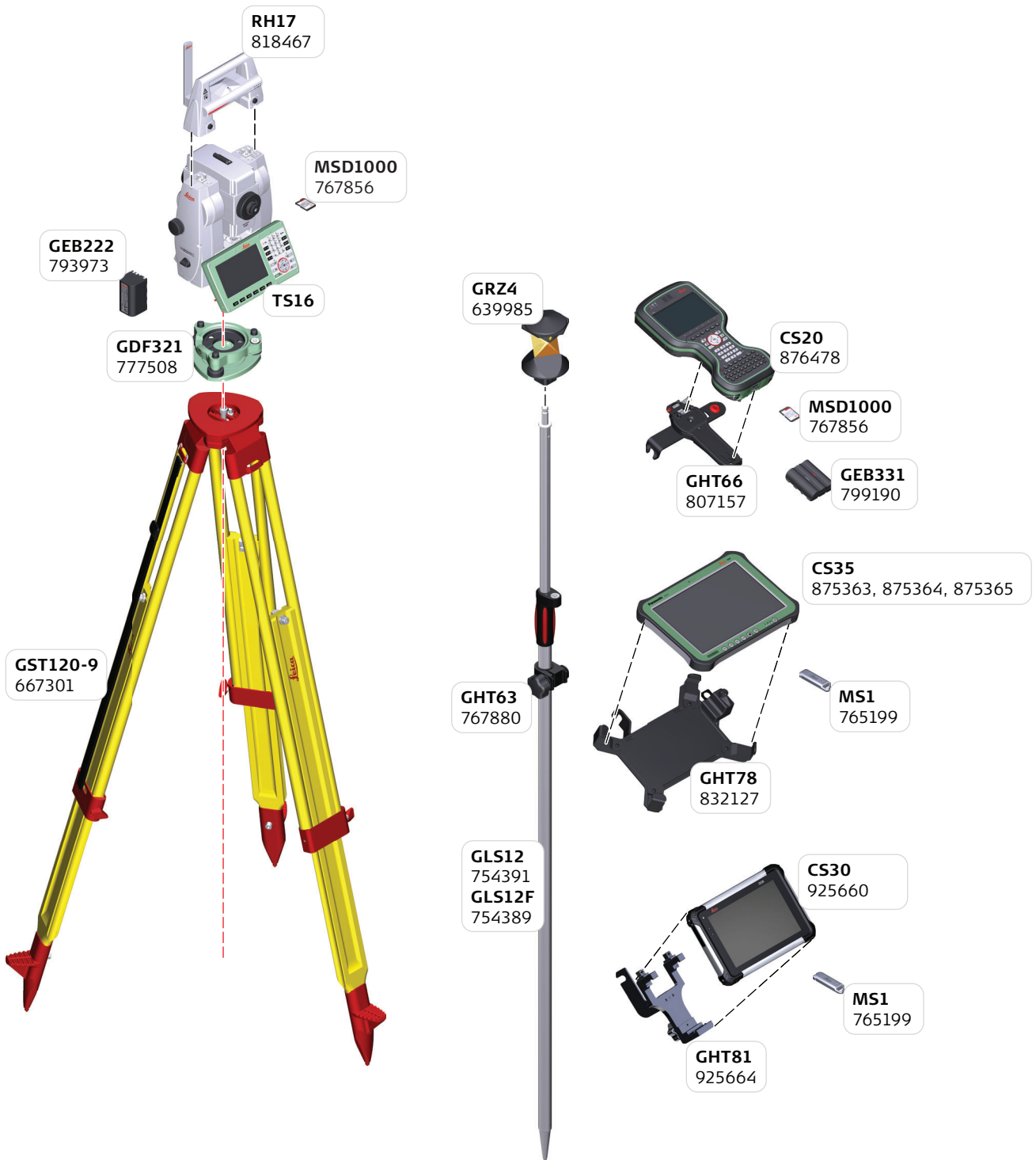
26.1 Two Person Surveying using a TS16 Total Station



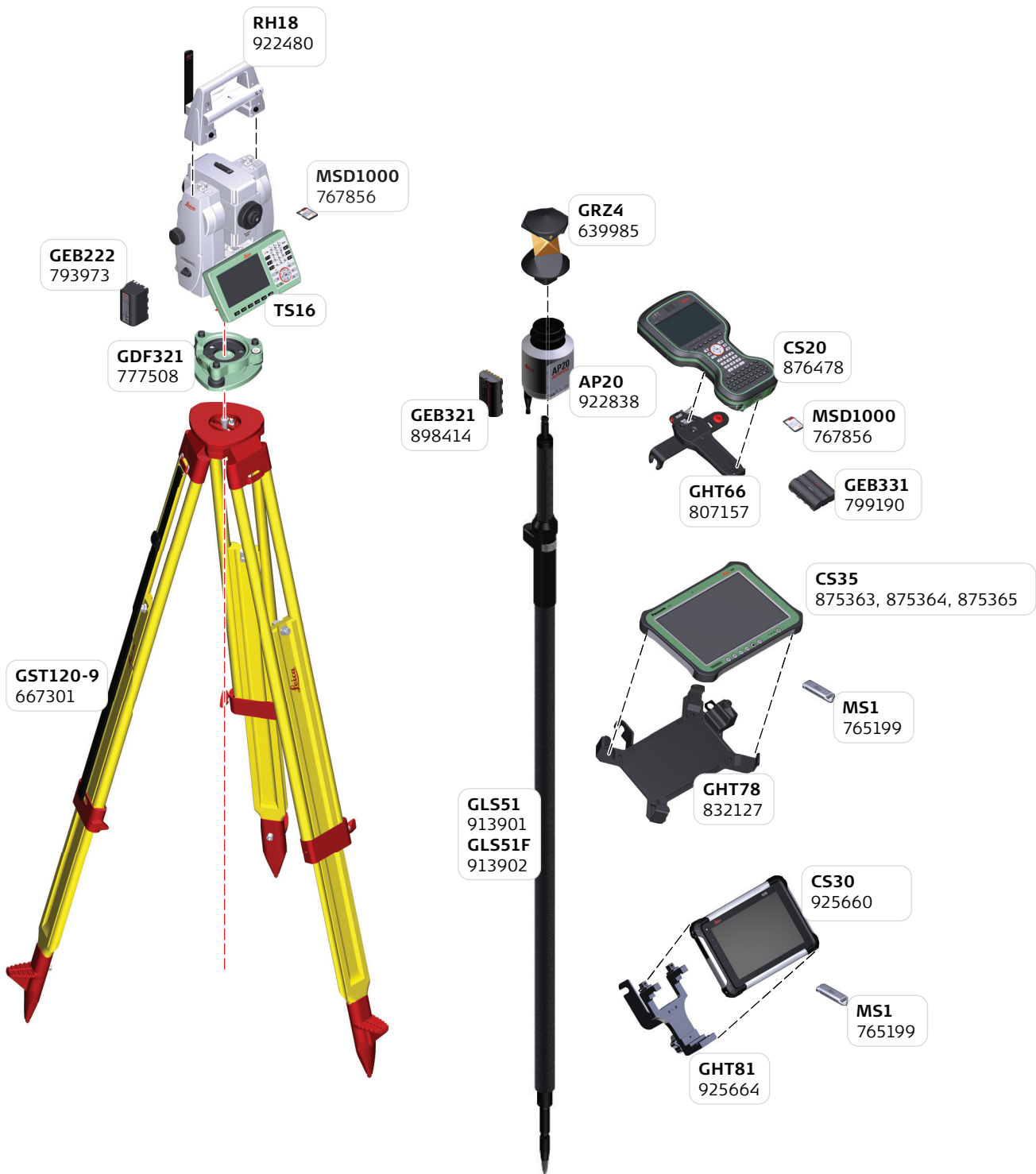
26.2 Two Person Surveying using a TS16 and AP20



26.3 Robotic Surveying using a TS16 Total Station and Field Controller

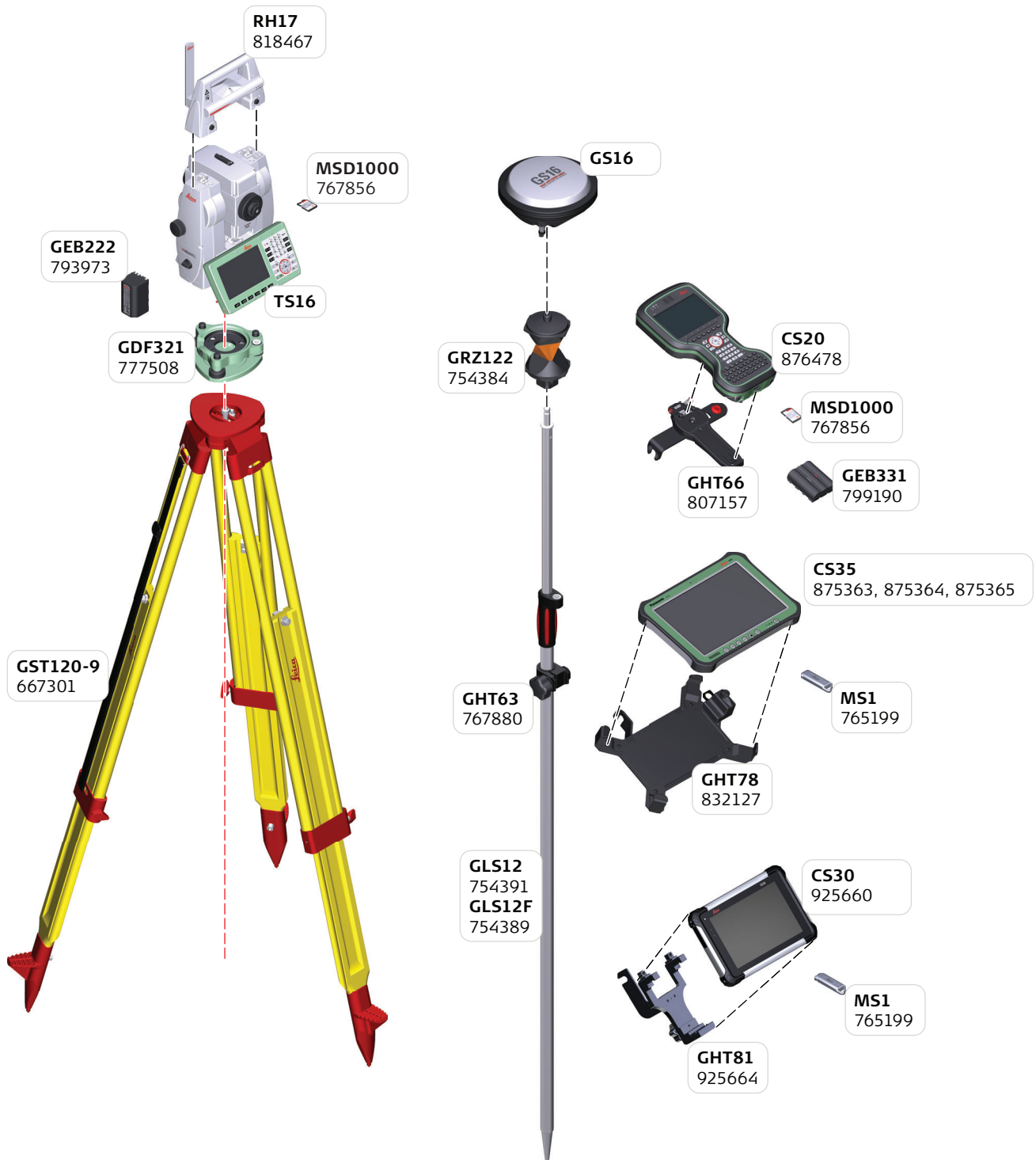



26.4 Robotic Surveying using a TS16, AP20 and Field Controller



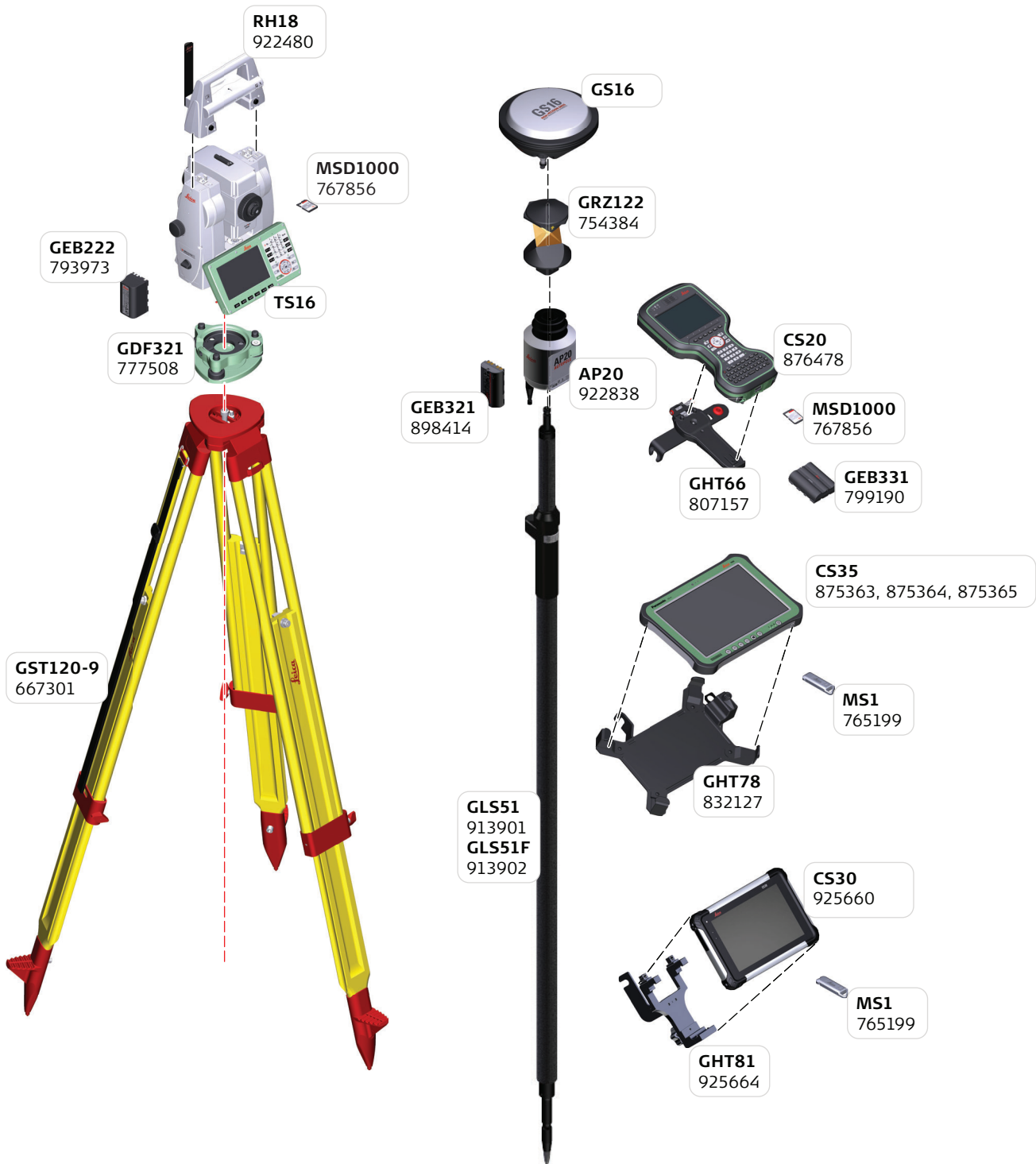
27 SmartPole Surveying

27.1 SmartPole using the GS16 GNSS Receiver and Field Controller



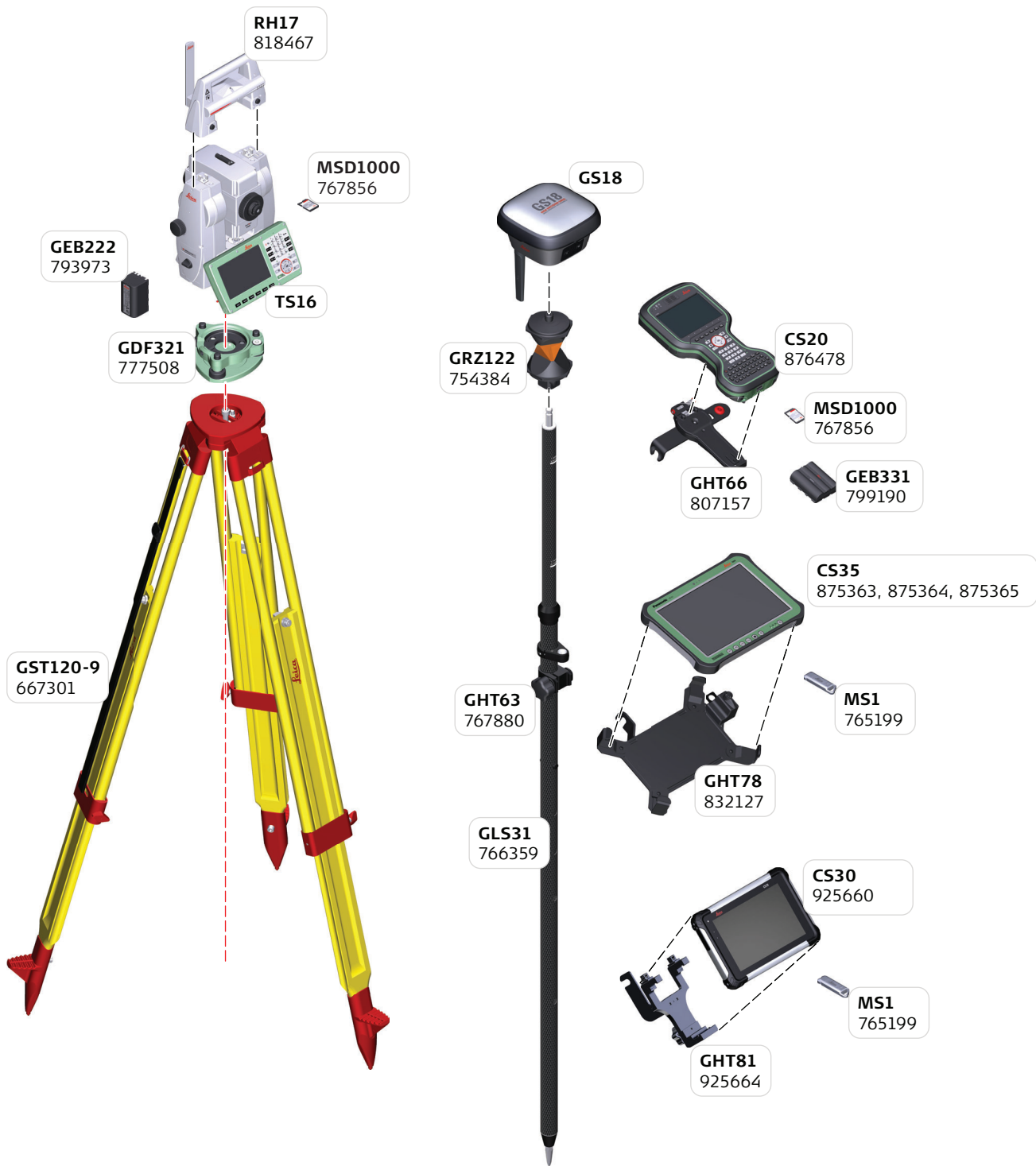
 For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipmentlist.


27.2 SmartPole using TS16, GS16, AP20 and Field Controller



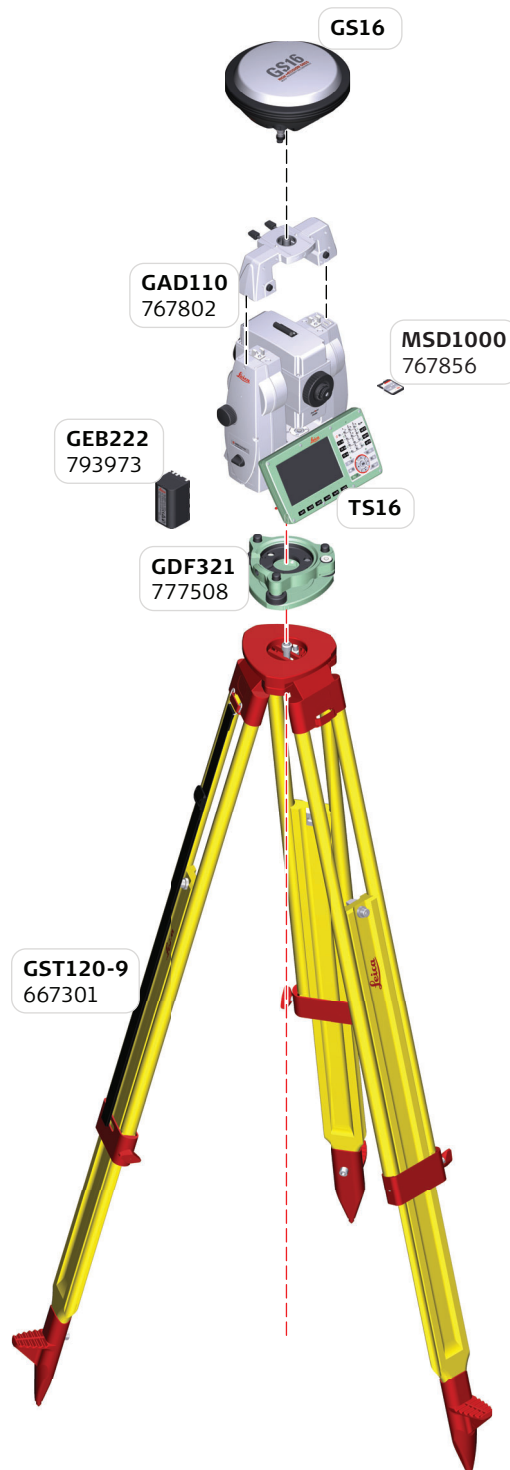
☞ For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipmentlist.


27.3 SmartPole using the GS18 GNSS Receiver and Field Controller



 For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipmentlist.

28 SmartStation using the GS16 GNSS Receiver



 For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipmentlist.

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837007 - 2.5.0en - VIII.21

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- when it has to be **right**

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