

Leica Nova TPS MS50, TS50 and TM50 Equipment List



- when it has to be **right**

Leica
Geosystems

Table of Contents

MultiStation and Total Stations		5
1	MultiStation	5
1.1	Models	5
1.2	Angular Accuracies	5
2	Total Stations	6
2.1	Models	6
2.2	Angular Accuracies	6
Additional Options & Accessories		7
3	Additional Options	7
3.1	Second Keyboard	7
3.2	Calibration and Producer Certificates	7
3.3	Camera Calibration	7
4	SmartWorx Viva Application Programs & Software Options	8
4.1	SmartWorx Viva Software	8
4.2	Applications included in SmartWorx Viva	8
4.3	SmartWorx Viva Application Software Packages	9
4.4	Optional Applications for SmartWorx Viva	9
4.5	Optional Licences for Smartworx Viva	9
Accessories		10
5	Power Supply	10
5.1	Internal Battery	10
5.2	External Power Supply	10
5.3	Battery Chargers	10
6	Data Storage and Data Transfer	10
6.1	Memory Devices	10
6.2	Card Reader	10
7	Connectivity	11
7.1	Connector Types	11
7.2	Cables	11
8	Optical Accessories	11
8.1	Eyepiece	11
8.2	Autocollimation Set	11
8.3	Objective	12
9	Instrument Height Meter	12
10	Tribrachs	12
11	Tripods	12
12	Reflector Poles	12
12.1	Standard Poles	12
12.2	Hidden Point Pole	12
12.3	Mini Pole	13
13	Reflector Carriers	13
14	Reflectors	13
14.1	Circular Reflectors	13
14.2	360° Reflectors	13
14.3	Precision Reflectors	13
14.4	Mini Reflectors	13
14.5	Reflector Tapes	13
15	Additional Containers	14

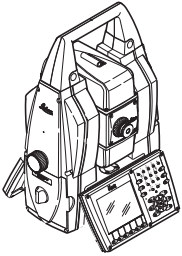
Remote Control	15
16 Remote Control	15
16.1 Remote Control Sets	15
16.2 CS10 Radio Field Controller	15
16.3 CS15 Field Controller with Communication Cap	15
16.4 Connector Modules for CS10/CS15	15
17 SmartWorx Viva Software and Application Programs	16
17.1 SmartWorx Viva Software for CS10/CS15	16
17.2 Applications included in SmartWorx Viva for CS10/CS15	16
17.3 SmartWorx Viva Application Software Packages for CS10/CS15	17
17.4 Optional Applications for SmartWorx Viva for CS10/CS15	17
17.5 Optional Licences for CS10/CS15 Controller	18
17.6 SmartWorx Viva PC Software	18
Accessories for Remote Control	19
18 Accessories for Remote Control	19
18.1 Internal Batteries	19
18.2 Memory Devices	19
18.3 Card Reader & Adapter	19
18.4 Docking Station	19
18.5 Pen and Display foils	19
18.6 Additional Power Accessories	20
18.7 Pole Accessories for CS10/CS15 Field Controller	20
18.8 Softbags and Hand Strap for CS10/CS15 Field Controller	20
18.9 RH15/RH16 RadioHandle	20
18.10 TCPS29 Modems	20
18.11 TCPS Accessories	21
18.12 Cables for CS10/CS15 Field Controller and TCPS Radio Modems	21
SmartPole & SmartStation	22
19 SmartStation & SmartPole Setup using GS15 GNSS Receiver	22
19.1 GS15 GNSS Receiver	22
19.2 SmartAntenna Adapter	22
19.3 Additional GS15 Receiver Options	23
19.4 RTK Modems	23
19.5 External RTK Antennas	24
19.6 Memory Devices	24
19.7 Card Reader	24
19.8 Power Supply	24
20 SmartStation & Smartpole Setup using a GS14 GNSS Receiver	25
20.1 GS14 GNSS Receiver	25
20.2 SmartAntenna Adapter	25
20.3 Additional GS14 Receiver Options	25
20.4 RTK Modems	26
20.5 External RTK Antennas	26
20.6 Memory Devices for GS14 Receiver	26
20.7 Card Reader	26
20.8 Power Supply	26
21 SmartStation & Smartpole Setup using a GS12 GNSS Receiver	27
21.1 GS12 GNSS Receiver	27
21.2 SmartAntenna Adapter	27
21.3 Additional CS Options for GS12 GNSS SmartPole Setup	27
21.4 Additional TS Options for GS12 SmartStation Setup	27
21.5 Power Supply	27
22 SmartStation using a GS08plus GNSS Receiver	28
22.1 GS08plus GNSS Receiver	28
22.2 SmartAntenna Adapter	28
22.3 Additional TS Options for GS08plus SmartStation Setup	28
22.4 Additional GS08plus Options for GS08plus GNSS receiver	28
22.5 Power Supply	28

Care Packages	29
23 Customer Care Packages	29
Trademarks & Technical Data	30
24 Trademarks	30
25 Technical Data	30
Suggested Equipment Setups	31
26 Scanning using a 3D MultiStation	31
27 Conventional Surveying	32
27.1 Two Person Surveying using a Leica Nova TPS	32
27.2 Robotic Surveying using a Leica Nova TPS	33
28 Monitoring	34
29 SmartPole Surveying	35
29.1 SmartPole using the GS12 GNSS Receiver	35
29.2 SmartPole using the GS14 GNSS Receiver	36
29.3 SmartPole using the GS15 GNSS Receiver	37
30 SmartStation	38
30.1 SmartStation using the GS08plus GNSS Receiver	38
30.2 SmartStation using the GS12 GNSS Receiver	39
30.3 SmartStation using the GS14 GNSS Receiver	40
30.4 SmartStation using the GS15 GNSS Receiver	41

MultiStation and Total Stations

1 MultiStation

1.1 Models



	MS50
Angle measurement	●
Distance measurement to prism	●
Distance measurement to any surface (R1000)	-
Long Range distance measurement to any surface (R2000)	●
High speed 1000Hz EDM	●
Motorised	●
Automatic Target Recognition (ATR)	●
Long Range Automatic Target Recognition (ATR)	-
Lock mode	●
PowerSearch (PS)	●
Guide Light (EGL)	●
Servofocus	●
Autofocus	●
5 Megapixel imaging	●
Overview Camera	●
Telescope Camera	●
WLAN	●
Bluetooth	●
RS232/USB interface	●
1GB internal flash memory	●
Hotshoe Interface for RadioHandle	●
SmartStation GS15 GNSS receiver	○
SmartStation GS14 GNSS receiver	○
SmartStation GS12 GNSS receiver	○
SmartStation GS08plus GNSS receiver	○
CS10 radio field controller	○
CS15 field controller with communication cap	○

- Standard
- Optional
- Not available

1.2 Angular Accuracies

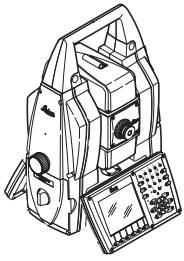
	MS50
1" (0.3mgon)	805 088



MS50 MultiStations are delivered with two full VGA colour touch screens, standard applications, Quick Guide, Documentation USB Card and upright container GVP648.

2 Total Stations

2.1 Models





	TS50 I	TM50	TM50 I
Angle measurement	●	●	●
Distance measurement to prism	●	●	●
Distance measurement to any surface (R1000)	●	●	●
Long Range distance measurement to any surface (R2000)	-	-	-
High speed 1000Hz EDM	-	-	-
Motorised	●	●	●
Automatic Target Recognition (ATR)	●	-	-
Long Range Automatic Target Recognition (ATR)	-	●	●
Lock mode	●	-	-
PowerSearch (PS)	●	-	-
Guide Light (EGL)	●	-	-
Servofocus	●	●	●
Autofocus	●	-	●
5 Megapixel imaging	●	-	●
Overview Camera	●	-	●
Telescope Camera	●	-	●
WLAN	●	●	●
Bluetooth	●	●	●
RS232/USB interface	●	●	●
1GB internal flash memory	●	●	●
Hotshoe Interface for RadioHandle	●	●	●
SmartStation GS15 GNSS receiver	○	○	○
SmartStation GS14 GNSS receiver	○	○	○
SmartStation GS12 GNSS receiver	○	○	○
SmartStation GS08plus GNSS receiver	○	○	○
CS10 radio field controller	○	○	○
CS15 field controller with communication cap	○	○	○

- Standard
- Optional
- Not available

2.2 Angular Accuracies

	TS50 I	TM50	TM50 I
0.5" (0.15mgon)	805 087	805 082	805 085
1" (0.3mgon)	-	805 084	805 086

 TS50 Total Stations are delivered with two full VGA colour touch screens, standard applications, Quick Guide, Documentation USB Card and upright container GVP648.

 TM50/TM50 I Total Stations are delivered with one full VGA colour touch screen, standard applications, Quick Guide, Documentation USB Card and upright container GVP648.

Additional Options & Accessories

3 Additional Options

3.1 Second Keyboard





805 089	GTS35	2nd keyboard with full VGA colour touch screen, for TM50/TM50 I Total Stations, for telescope position 2, fitted.
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3.2 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.

3.3 Camera Calibration



793 861	Overview Camera calibration workflow. Article ensures the predelivery logistics for the calibration of the Overview Camera of the Leica Nova TPS.  3rd party fees for instrument calibration and licensing of software are not included.
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4 SmartWorx Viva Application Programs & Software Options


4.1 SmartWorx Viva Software

807 728	Leica Nova and Leica Viva TPS Documentation USB Card.
781 305	TS SmartWorx Viva licence key.

4.2 Applications included in SmartWorx Viva

	TS Smart-Worx Viva
Survey includes: <ul style="list-style-type: none"> • Survey • Code points • Auto points recording • Remote Heights • Target Offset calculations 	<ul style="list-style-type: none"> ● ● ● ● ●
Setup includes: <ul style="list-style-type: none"> • Get station coordinates from GPS, 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 	<ul style="list-style-type: none"> ● ● ● ● ● ● ●
Stakeout includes: <ul style="list-style-type: none"> • Navigate to point using various methods: North, point, to and from Total Station • Quality control - checking of coordinate differences before storing • Automatic selection of next closest point to stake • Graphical selection of point from map • Edit heights and offset heights of points • Acoustic "reversing beep" when getting closer to point 	<ul style="list-style-type: none"> ● ● ● ● ● ●
COGO includes: <ul style="list-style-type: none"> • Inverse • Traverse • Intersections • Line calculations • Arc calculations • Angle and curve calculator • Shift, Rotate & Scale (manual) • Shift, Rotate & Scale (match Points) 	<ul style="list-style-type: none"> ● ● ● ● ● ● ● ●
Determine coordinate system: <ul style="list-style-type: none"> • 1 step, 2 step, 3D Transformation • All common projections 	<ul style="list-style-type: none"> ● ●
Alignment Editor: <ul style="list-style-type: none"> • Horizontal alignments • Vertical alignments • Cross sections • Chainage equations 	<ul style="list-style-type: none"> ● ● ● ●
Data import: ASCII, DXF	●
Data export: Custom ASCII, DXF, LandXML, FBK, RW5, RAW	●
<ul style="list-style-type: none"> ● All options and functionality available 	




4.3 SmartWorx Viva Application Software Packages

		TS Smart-Worx Viva
781 311	Worksite+ includes: <ul style="list-style-type: none"> • TS DTM Stakeout application (781 326) • TS Reference Line application (781 322) • TS Surface & Volumes application (781 327) 	● ● ●
781 309	Survey+ includes: <ul style="list-style-type: none"> • TS Reference Plane and Grid Scanning (781 323) • TS Cross Section (781 325) • TS Traverse (781 333) • TS Sets of Angles (781 334) • TS Hidden Point (781 332)  Requires Art. No. 781 305 TS SmartWorx Viva.	● ● ● ● ●
● All options and functionality available		

4.4 Optional Applications for SmartWorx Viva

		TS Smart-Worx Viva
781 331	TS Athletics	●
781 324	TS COGO Area Division  Requires COGO application.	●
781 326	TS DTM Stakeout  Requires Stakeout application.	●
781 336	TS Monitoring  Requires Sets of Angles application.	●
781 322	TS Reference Line  Requires Stakeout application.	●
781 323	TS Reference Plane and Grid Scanning	●
781 328	TS RoadRunner	●
781 330	TS RoadRunner Rail	●
781 329	TS RoadRunner Tunnel	●
781 343	TS RoadRunner Importer	●
781 334	TS Sets of Angles	●
781 325	TS Cross Section	●
781 327	TS Surface and Volumes	●
781 332	TS Hidden Point	●
781 333	TS Traverse	●
807 763	TS QuickVolume	●
● All options and functionality available		

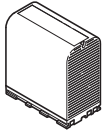
4.5 Optional Licences for Smartworx Viva

781 346	TS Imaging Licence.  Licence key enables extended imaging functionality on Nova TPS instruments.
	Additional Nova TPS software options for GS12 SmartStation setups can be found in the GS12 chapter 21.4.
	Additional Nova TPS software options for GS08plus SmartStation setups can be found in the GS08plus chapter 22.3.

Accessories

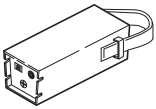
5 Power Supply


5.1 Internal Battery



793 975	GEB242	Lithium-Ion battery, 14.8V/5.8Ah, rechargeable, for Leica Nova TPS.
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5.2 External Power Supply



727 367	GEV270	External universal battery, NiMH, 12V/9Ah, rechargeable.
807 696	GEV270	External power supply unit. To connect all Leica TPS to mains power (220V to 13.2V).  Requires a GEV219, GEV220, GEV236 or GEV261 cable.

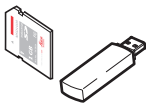
5.3 Battery Chargers



733 271	GKL221	Charger, to be used with up to two charging adapters GDI221 or GDI222, charger cable and net adapter included.
733 323	GDI221	Adapter for GKL221 for charging 2 Li-Ion batteries GEB221, GEB222, GEB211, GEB212 or GEB242.
734 389	GDC221	Car adapter for the GKL221 charger. Allows the use of the GKL221 with a cigarette lighter; 12V/24V DC/DC converter. Can also be used to power CS10/CS15 field controller directly from a cigarette lighter.
785 703	GKL32	Charger, 230V, 50/60Hz, charges one battery with 5-pin charging socket, also usable for GEB171.

6 Data Storage and Data Transfer

6.1 Memory Devices



767 856	MSD1000	SD memory card 1GB for Leica Nova and Leica Viva TPS instruments and CS10/CS15 field controller.
789 139	MSD08	SD memory card 8GB for Leica Nova and Leica Viva TPS instruments and CS10/CS15 field controller.
765 199	MS1	USB memory stick, 1GB, for Leica Nova and Leica Viva TPS instruments and CS10/CS15 field controller, industrial grade.

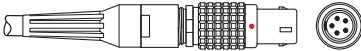



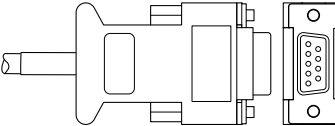
6.2 Card Reader



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

7.1 Connector Types

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

7.2 Cables





439 038	GEV71	Car battery cable, connects 12V car battery connector to Lemo1 5-pin.
733 282	GEV162	Serial data cable for communication to PC, connects Lemo1 8-pin to 9-pin RS232 serial.
733 283	GEV163	Serial data cable for communication between TS and CS , connects Lemo1 8-pin to Lemo1 8-pin.
758 469	GEV219	Power cable between TS and battery , Lemo1 5-pin to Lemo1 8-pin.
759 257	GEV220	Serial data Y-cable, connects Lemo1 8-pin connector to PC (9-pin RS232 serial) and external battery (Lemo1 5pin), 2m.
767 899	GEV234	USB data cable for communication to PC, Lemo1 8-pin to USB A connector.
771 057	GEV236	Serial data Y-cable for TS robotic setup, Lemo1 5-pin (battery) to Lemo1 8-pin (instrument) and Lemo1 8-pin (external TS radio).
772 807	GEV237	USB data cable for communication between TS and CS, Lemo1 8-pin to USB connector, Lemo1 8-pin (TS) to Lemo1 8-pin (CS).
793 364	GEV261	USB data X-cable for communication to PC, connects Lemo1 8-pin to PC USB A connector (USB data) and PC 9-pin RS232 connector (serial data) and external battery (Lemo1 5-pin).
806 095	GEV269	Serial data transfer cable, converter cable USB A to Lemo1 8-pin, connects TS to PC, PC driver included on CD.

8 Optical Accessories

8.1 Eyepiece



377 802	FOK53	Magnification eyepiece, additional eyepiece for increasing telescope magnification to 42x.  Modification in a workshop necessary.
308 838	FOK53	Magnification eyepiece, additional eyepiece for increasing telescope magnification to 42x.  Modification ex factory. Can only be ordered with a new instrument.
793 979	GFZ3	Diagonal eyepiece for telescope with bayonet connection.
376 236	GOK6	Eyepiece for steep sights, with joint allowing variable sighting angle.

8.2 Autocollimation Set



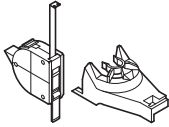
199 899	GOA2	Autocollimation eyepiece.
394 787	GEB62	Plug-in lamp, with cable for autocollimation eyepiece.
394 792	GEB63	Battery box for autocollimation eyepiece and eyepiece lamp.

8.3 Objective



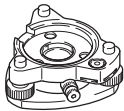
743 504	GVO13	Objective solar filter for TPS instruments.
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9 Instrument Height Meter



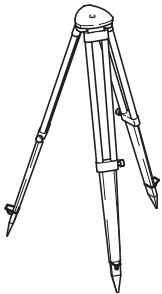
667 718	GHM007	Instrument height meter.
722 045	GHT196	Distance holder for height meter.

10 Tribachs



777 508	GDF321	Tribach, without optical plummet.
777 509	GDF322	Tribach, with optical plummet.
748 888	GDF111-1	Tribach, without optical plummet, pale green.
798 181	GDF112-1	Tribach, with optical plummet.

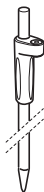
11 Tripods



296 632	GST20	Tripod, telescopic, with accessories (plumb bob, carrying strap and side clamp screws), with pouch.
394 752	GST20-9	Tripod, telescopic, with accessories.
667 301	GST120-9	Tripod, telescopic, selfclosing, with accessories.
332 200	GST4	Tripod-star, for setting up tripods on hard and slippery surfaces.

12 Reflector Poles

12.1 Standard Poles

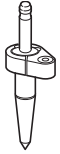


385 500	GLS11	Reflector pole, telescopic, with circular bubble, cm and ft graduation, extends to 2.15m.
754 391	GLS12	Reflector pole, telescopic to 2.00m with circular bubble, cm graduations.
754 389	GLS12F	Reflector pole, telescopic to 2.00m with circular bubble, ft graduations.
752 292	GLS30	Telescopic carbon GNSS pole with 5/8" screw. Snap locks at 1.80m and 2.00m. Includes circular bubble.
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).
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.

12.2 Hidden Point Pole

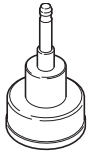
742 329	GMP112	Hidden Point pole extension for GMP111 (mini prism pole set). Includes mini prism with holder and 30cm adapter pole.
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12.3 Mini Pole



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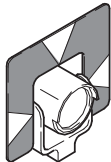
13 Reflector Carriers



667 313	GRT144	Carrier with stub, pale green.
667 316	SNLL121	Precision carrier, with plate level and zenith-nadir laser plummet.
428 340	GZR3	Precision carrier, with plate level and optical plummet.
725 566	GZR103	Carrier, with plate level and optical plummet, for reflectors and GPS antenna, pale green.
667 217	GAD31	Screw-to-stub adapter for fitting GPS antenna on carriers with stub and poles with stub.

14 Reflectors

14.1 Circular Reflectors



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

14.2 360° Reflectors



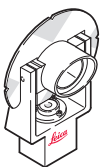
639 985	GRZ4	360° reflector.
644 327	GRZ101	360° mini prism with 1/4" thread fitting. Not supported by PowerSearch.
754 384	GRZ122	360° reflector with 5/8" thread adapter for mounting of GPS antenna.
742 006	GAD103	Adapter for attaching GRZ101 to all poles with Leica Geosystems stub.

14.3 Precision Reflectors



555 631	GPH1P	Single-prism precision reflector.
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14.4 Mini Reflectors



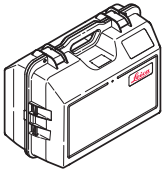
641 662	GMP101	Mini prism, incl. bubble, target plate and spike, in bag, also suitable for GLS11/GLS12 and GRT144 (same height as GPH1, additive constant +17.5mm).
641 762	GMP104	Mini prism, with L-bar, for fixed installations.

14.5 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.

15 Additional Containers



767 828	GVP642	Hard container for CS10/CS15 field controller, GS15 SmartAntenna and corresponding SmartStation SmartPole accessories.
667 451	GVP609	Container for 2 circular prisms GPR111/121, 2 carriers/laser plummet and 2 tribrachs.
791 696	GVP660	Small-sized hard container for TPS Robotic Pole Setup. Fits CS15 with CTR16 attached and all necessary pole accessories.
744 501	GDZ66	Backstraps (2) for all hard container.
727 589	GVP102	Soft bag with shoulder strap, for prism station, consist of tribrach, prism carrier or laser plummet and prism.
782 384	GVP656	Hard container for GS08plus/GS12/GS14 SmartAntenna, CS10/CS15 field controller and accessories for a SmartPole setup and SmartStation setup.

Remote Control

16 Remote Control

16.1 Remote Control Sets


Advanced Remote Control Set with integrated radio		
6003611		Advanced CS10 Set for Leica Nova and Leica Viva TPS, consisting of CS10 radio field controller (810 857) with integrated TPS radio modem, CBC01 Lemo connector modul and CS SmartWorx Viva licence key (767 909), GHT62 pole holder with GHT63 pole clamp, RH15 RadioHandle, 2 GEB212 battery and container.
Advanced Remote Control Set with communication cap		
6006517		Advanced CS15 Set for Leica Nova and Leica Viva TPS, consisting of CS15 field controller (810 855), CBC01 Lemo connector modul and CS SmartWorx Viva licence key (767 909), CTR16 communication cap, GHT62 pole holder with GHT63 pole clamp, RH16 RadioHandle, 2 GEB212 battery and container.
Professional Remote Control Set with communication cap		
6006518		Professional CS15 Set for Leica Nova and Leica Viva TPS, consisting of CS15 UMTS field controller (810 856), CBC01 Lemo connector modul and CS SmartWorx Viva licence key (767 909), CTR16 communication cap, GHT62 pole holder with GHT63 pole clamp, RH16 RadioHandle, 2 GEB212 batteries and container.

16.2 CS10 Radio Field Controller



810 857	CS10 Radio Field Controller	CS10 Radio Field Controller. Ruggedized WinCE field controller with full VGA colour touch screen, 1GB NAND flash memory, 512MB SDRAM, CF/SD card slot and 2MP camera. Includes Bluetooth, internal WLAN module, internal TPS radio module, numeric keypad, stylus. Available with either Lemo connector (CBC01) or DSUB connector module (CBC02).
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16.3 CS15 Field Controller with Communication Cap

 Communication between CS15 field controller and Leica Nova and Leica Viva TPS with RH16 attached requires a CTR16 communication cap attached to the field controller.

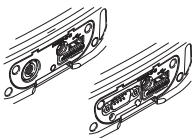




810 856	CS15 3.5G Field Controller	CS15 3.5G Field Controller. Ruggedized WinCE field controller with full VGA touch display, 1GB NAND Flash Memory, 512MB SDRAM, CF/SD card slot and 2MP camera. Includes Bluetooth, internal WLAN module, 3.5G GSM/UMTS module, QWERTY keypad, stylus. Available with either Lemo connector (CBC01) or DSUB connector module (CBC02).
810 855	CS15 Field Controller	CS15 Field Controller. Ruggedized WinCE field controller with full VGA touch display, 1GB NAND flash memory, 512MB SDRAM, CF/SD card slot and 2MP camera. Includes Bluetooth, QWERTY keypad, stylus. Available with either Lemo connector (CBC01) or DSUB connector module (CBC02).



Communication Cap		
788 855	CTR16	Communication Cap with integrated Bluetooth module and antenna for CS15 field controller. Used to establish radio connection between CS15 field controller and Leica Nova and Leica Viva TPS equipped with RH16. Frequency range 2402 - 2480MHz.

16.4 Connector Modules for CS10/CS15



767 874	CBC01	Lemo connector module with power jack, Lemo (USB and Serial) and USB A host for CS10 and CS15 field controller.  Can only be ordered with CS10/CS15 field controller.
767 875	CBC02	DSUB connector module with power jack, DSUB 9-pin, USB A host and USB mini AB for CS10 and CS15 field controller.  Can only be ordered with CS10/CS15 field controller.

17 SmartWorx Viva Software and Application Programs


17.1 SmartWorx Viva Software for CS10/CS15

807 728	Leica Nova and Leica Viva TPS Documentation USB Card.
767 910	CS SmartWorx Viva LT licence key.
788 859	CS SmartWorx Viva LT extended settings licence key.
788 860	CS SmartWorx Viva LT extended applications licence key.
767 909	CS SmartWorx Viva licence key.
767 911	CS SmartWorx Viva LT to CS SmartWorx Viva upgrade option.





17.2 Applications included in SmartWorx Viva for CS10/CS15

	CS Smart- Worx Viva	CS Smart- Worx Viva LT
Survey includes:		
• Survey	●	●
• Code points	●	●
• Auto points recording	●	○
• Remote Heights	●	-
• Target Offset calculations	●	●
Setup includes:		
• Get station coordinates from GPS, 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	●	●
Stakeout includes:		
• Navigate to point using various methods: North, point, to and from Total Station	●	○
• Quality control - checking of coordinate differences before storing	●	-
• Automatic selection of next closest point to stake	●	-
• Graphical selection of point from map	●	●
• Edit heights and offset heights of points	●	-
• Acoustic "reversing beep" when getting closer to point	●	-
COGO includes:		
• Inverse	●	●
• Traverse	●	●
• Intersections	●	●
• Line calculations	●	●
• Arc calculations	●	●
• Angle and curve calculator	●	-
• Shift, Rotate & Scale (manual)	●	●
• Shift, Rotate & Scale (match Points)	●	●
Determine coordinate system:		
• 1 step, 2 step, 3D Transformation	●	●
• All common projections	●	●
Alignment Editor:		
• Horizontal alignments	●	●
• Vertical alignments	●	●
• Cross sections	●	●
• Chainage equations	●	●
Data import: ASCII, DXF	●	●
Data export: Custom ASCII, DXF, LandXML, FBK, RW5, RAW	●	●
<p>● All options and functionality available ○ Limited options and functionality - Not available</p>		

17.3 SmartWorx Viva Application Software Packages for CS10/CS15


		CS Smart-Worx Viva	CS Smart-Worx Viva LT
767 913	Worksite+ includes: <ul style="list-style-type: none"> • CS DTM Stakeout application (767 919) • CS Reference Line application (767 915) • CS Surface & Volumes application (767 920) 	● ● ●	● ○ ●
767 912	Survey+ includes: <ul style="list-style-type: none"> • CS Reference Plane and Grid Scanning (767 916) • CS Cross Section (767 918) • CS Traverse (767 927) • CS Sets of Angles (767 929) • CS Hidden Point (767 926) <p> Requires Art. No. 767 909 CS SmartWorx Viva.</p>	● ● ● ● ●	- - - - -
<p>● All options and functionality available ○ Limited options and functionality - Not available</p>			

17.4 Optional Applications for SmartWorx Viva for CS10/CS15

		CS Smart-Worx Viva	CS Smart-Worx Viva LT
767 917	CS COGO Area Division  Requires COGO application.	●	●
767 919	CS DTM Stakeout  Requires Stakeout application.	●	●
767 931	CS Monitoring  Requires Sets of Angles application.	●	-
767 915	CS Reference Line  Requires Stakeout application.	●	○
767 916	CS Reference Plane and Grid Scanning	●	-
767 921	CS RoadRunner	●	○
767 923	CS RoadRunner Rail	●	-
767 922	CS RoadRunner Tunnel	●	-
777 645	CS RoadRunner Importer	●	●
767 929	CS Sets of Angles	●	-
767 918	CS Cross Section	●	-
767 920	CS Surface and Volumes	●	●
767 926	CS TPS Hidden Point	●	-
767 927	CS Traverse	●	-
807 770	CS QuickVolume	●	●
<p>● All options and functionality available ○ Limited options and functionality - Not available</p>			

17.5 Optional Licences for CS10/CS15 Controller

781 486	CS Imaging Licence. Licence key allows to link a TS image to a CS database object.
779 474	Topcon total station control licence.
782 287	Nikon total station control licence.
782 286	SOKKIA total station control licence.

 Additional CS software options for GS12 SmartPole setups can be found in the GS12 chapter 21.3.

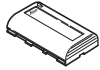
17.6 SmartWorx Viva PC Software

773 894	SmartWorx Viva PC Software. Licence Key to run the SmartWorx Viva software on a PC.
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Accessories for Remote Control

18 Accessories for Remote Control

18.1 Internal Batteries



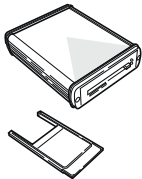
772 806	GEB212	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS10/CS15 field controller and GS14, GS15, GS12 or GS08plus receiver.
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18.2 Memory Devices



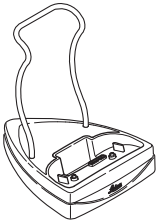
767 856	MSD1000	SD memory card 1GB for Leica Nova and Leica Viva TPS instruments and controller.
789 139	MSD08	SD memory card 8GB for Leica Nova and Leica Viva TPS instruments and controller.
733 257	MCF256	CompactFlash card 256MB for CS10/CS15 field controller.
745 995	MCF1000	CompactFlash card 1GB for CS10/CS15 field controller.
765 199	MS1	USB memory stick 1GB for Leica Nova and Leica Viva TPS instruments and controller.

18.3 Card Reader & Adapter



767 895	MCR7	Card reader for SD/CF cards.
733 258	MCFAD1	CompactFlash PC card adapter.

18.4 Docking Station



767 906	CCS01	Docking station for CS10 and CS15 field controller for charging and data transfer to PC, includes: GEV223 (USB A to USB mini data transfer cable).
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18.5 Pen and Display foils

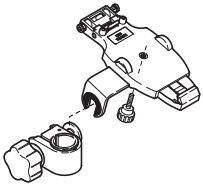


Extra pen		
781 521	GDZ69	Extra pen with allen key for CS10 and CS15 field controller.
Display Protection Foil set		
767 907	SPF01	Screen protection foil set for Leica Viva field controller.

18.6 Additional Power Accessories

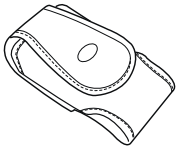
767 900	GEV235	1.5m power cable. Allows CS10/CS15 controller to be externally powered via the power jack. Usable in the EU.
773 753	GEV235-1	1.5m power cable. Allows CS10/CS15 controller to be externally powered via the power jack. Usable in the US.
773 754	GEV235-2	1.5m power cable. Allows CS10/CS15 controller to be externally powered via the power jack. Usable in Japan.
773 755	GEV235-3	1.5m power cable. Allows CS10/CS15 controller to be externally powered via the power jack. Usable in the UK.
773 756	GEV235-4	1.5m power cable. Allows CS10/CS15 controller to be externally powered via the power jack. Usable in Australia.
734 389	GDC221	Car adapter for the GKL221 charger. Allows the use of the GKL221 with a cigarette lighter; 12V/24V DC/DC converter. Can also be used to power CS10/CS15 field controller directly from a cigarette lighter.

18.7 Pole Accessories for CS10/CS15 Field Controller



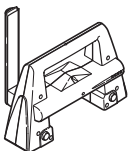
767 879	GHT62	Pole holder base plate for CS10 and CS15 field controller.
767 880	GHT63	Clamp arrangement for attaching the GHT62 to all poles.

18.8 Softbags and Hand Strap for CS10/CS15 Field Controller



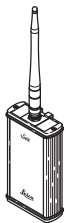
Soft bags		
767 904	GVP643	Soft bag for CS10 field controller for transportation and protection against dirt. Including belt loop.
767 905	GVP644	Soft bag for CS15 field controller for transportation and protection against dirt. Including belt loop.
Hand strap		
767 877	GHT61	Hand strap for CS10/CS15 field controller with utility hook for attaching to belt or tripod.

18.9 RH15/RH16 RadioHandle



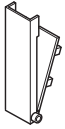
RH15		
772 300	RH15	Radio Handle with integrated radio modem and radio antenna. Used as radio modem for Leica Nova and Leica Viva TPS instruments together with CS10/CS15 radio field controller (frequency range 2402 - 2452MHz).
RH16		
788 853	RH16	Radio Handle with integrated bluetooth module and radio antenna. Used as radio modem for Leica Nova and Leica Viva TPS instruments. Establishes communication to CS15 field controller equipped with CTR16 or TCPS29 attached to PC (frequency range 2402 - 2480MHz).

18.10 TCPS29 Modems



788 854	TCPS29	Bluetooth radio modem with antenna and user manual. Used as external radio modem for Leica Nova and Leica Viva TPS instruments or PC (frequency range 2402 - 2480MHz).
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18.11 TCPS Accessories



734 163	GHT43	Adapter for mounting TCPS radio module on GST20/GST120 tripod.
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18.12 Cables for CS10/CS15 Field Controller and TCPS Radio Modems



For an overview of the different connector types, refer to chapter 7.1.



Cable adapters

734 389	GDC221	Car lighter to power jack for CS10/CS15 field controller.
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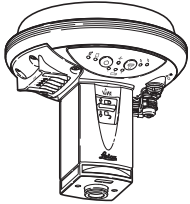
Cables

764 700	GEV223	Data transfer cable connecting TS to PC, USB A to USB Mini connector.
767 899	GEV234	USB data cable for communication to PC, Lemo1 8-pin to USB A connector.
771 057	GEV236	Serial data Y-cable for TS robotic setup, Lemo1 5-pin (battery) to Lemo1 8-pin (instrument) and Lemo1 8-pin (external TS radio).
772 807	GEV237	USB data cable for communication between TS and CS, Lemo1 8-pin to USB connector, Lemo1 8-pin (TS) to Lemo1 8-pin (CS).
793 364	GEV261	USB data X-cable for communication to PC, connects Lemo1 8-pin to PC USB A connector (USB data) and PC 9-pin RS232 connector (serial data) and external battery (Lemo1 5-pin).

SmartPole & SmartStation

19 SmartStation & SmartPole Setup using GS15 GNSS Receiver

19.1 GS15 GNSS Receiver

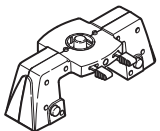



771 501	GS15	Leica GS15 Single Frequency SmartAntenna
771 503	GS15	Leica GS15 Performance SmartAntenna
771 504	GS15	Leica GS15 Professional SmartAntenna
813 741	GS15	Leica GS15 Unlimited SmartAntenna

	Leica GS15 Single Frequency	Leica GS15 Performance	Leica GS15 Professional	Leica GS15 Unlimited
Supported GNSS Systems				
GPS L2	○	●	●	●
GPS L5	○	○	●	●
GLONASS	○	○	●	●
Galileo	○	○	●	●
BeiDou	○	○	○	●
RTK performance				
DGPS	○	●	●	●
RTK unlimited	○	●	●	●
Network RTK	○	●	●	●
Leica Lite RTK	○	○	●	●
SmartLink (L-band)	○	○	○	●
Position update & data recording				
5 Hz positioning	●	●	●	●
20 Hz positioning	○	●	●	●
Raw data logging	●	●	●	●
RINEX logging	○	○	●	●
NMEA out	○	○	●	●
Additional features				
RTK Reference Station functionality	○	●	●	●

- Standard
- Optional

19.2 SmartAntenna Adapter

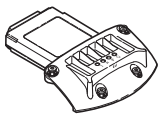



767 802	GAD110	SmartAntenna adapter to mount GS08plus, GS14 and GS15 SmartAntenna.  BT module to connect the TS to the GS08plus, GS14 and GS15 GNSS receiver is standard on all Leica Nova and Leica Viva TPS instruments.
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19.3 Additional GS15 Receiver Options

GNSS Software options		
771 500	LOP19	GPS L2 option, enables GPS L2 and GPS L2C tracking on a GS10, GS15 or GS25 receiver.
767 804	LOP1	GPS L5 option, enables GPS L5 tracking on a GS10, GS15 or GS25 receiver.
767 805	LOP2	GLONASS option, enables GLONASS tracking on a GS10, GS15 or GS25 receiver.
767 806	LOP3	Galileo option, enables Galileo tracking on a GS10, GS15 or GS25 receiver.
807 862	LOP38	BeiDou option, enables BeiDou tracking on GS10, GS15 or GS25 receiver.
Position update and data recording options		
767 807	LOP4	5Hz option, enables to compute positions with an update rate up to 5Hz.
767 808	LOP5	20Hz option, enables to compute positions with an update rate up to 20Hz.
767 809	LOP6	Upgrade option from 5Hz to 20Hz. (LOP4 to LOP5)
767 810	LOP7	Raw data option, allows logging of GNSS raw data on a GS10, GS14, GS15 or GS25 receiver or on a CS10/CS15 field controller.
767 811	LOP8	RINEX option, allows logging of RINEX data on a GS10, GS14, GS15 or GS25 receiver.
767 818	LOP15	NMEA out option, enables NMEA to be streamed from GS10, GS14, GS15 or GS25 receivers.
RTK performance options		
771 497	LOP16	DGPS option for GS10, GS14, GS15 or GS25 receivers, enables the receiver to compute a DGPS position.
767 813	LOP10	Unlimited RTK option, enables RTK positions to be computed from a single base station with no limit of distance.
767 815	LOP12	Unlimited RTK and Network RTK, enables RTK position to be computed from a single base station and within a RTK network.
767 817	LOP14	Upgrade option for GS10, GS14, GS15 or GS25 receivers from RTK unlimited only to RTK unlimited including RTK Network. (LOP10 to LOP12)
771 971	LOP20	Leica Lite option, to receive GS09 RTK data on GS10, GS14, GS15 or GS25 receivers.
5306241		SmartLink option, enables Veripos L-band tracking on GS10, GS15 or GS25 receivers for 2 years.
Other options		
767 816	LOP13	RTK Reference station option, allows a GS10, GS14, GS15 or GS25 receiver to transmit RTK data.

19.4 RTK Modems



Satellite radio modules		
781 646	SLR5	Satellite M3-TR1 403-470 MHz RX/TX radio. RTK receive and transmit UHF radio module to be easily plugged into the GS15 GNSS receiver.
Pacific Crest radio modules		
767 821	SLR3-1	Pacific Crest ADL RX/TX radio 390-430Mhz. RTK receive and transmit UHF radio module to be easily plugged into the GS15 GNSS receiver.
767 822	SLR3-2	Pacific Crest ADL RX/TX radio 430-470Mhz. RTK receive and transmit UHF radio module to be easily plugged into the GS15 GNSS receiver.
Radio programming tool kit		
6002544		Configuration tool kit for programming Satelline and Pacific Crest SLR RTK radio modules; includes programming cable GEV231 and configuration software CD ROM.  SLR radios will be delivered pre-configured according to country-specific radio regulations. In countries where radios need to be configured locally, the configuration tool kit is to be used.
Mobile phone modules		
767 823	SLG1	5-Band (850/900/1800/1900/2100MHz) Telit GSM/GPRS/UMTS module. Provides full flexibility due to 5-band technology and is globally compatible to all GSM, GPRS, EDGE and UMTS network providers. Can be easily plugged into the GS15 GNSS receiver.

774 689	SLG2	4-Band (850/900/1800/1900MHz) Siemens MC75i GSM/GPRS module. Universal 4-band technology supports GSM, GPRS, and EDGE network providers. Can be easily plugged into the GS15 GNSS receiver.
767 824	SLC1	Dual band Telit CDMA 1xRTT module for US. Supports Sprint (US) network provider and can be easily plugged into the GS15 GNSS receiver.

19.5 External RTK Antennas



The GS15 receiver is equipped with internal GSM/GPRS/UMTS antenna and internal UHF antenna as standard. In areas of poor GSM/GPRS/UMTS or UHF reception, the use of an external RTK antenna may improve reception.



RTK antenna arm

767 790	GAD108	Arm to mount external UHF/GSM antenna to GS15 SmartAntenna, useful in areas of poor radio or GSM network reception.
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Gainflex radio antennas

639 964	GAT1	Gainflex radio antenna (frequency range 400-435MHz).
667 243	GAT2	Gainflex radio antenna (frequency range 435-470MHz).



Antennas for mobiles phones

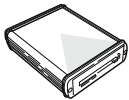
782 500	GAT18	Multiband GSM/UMTS Antenna for 850/1900MHz, for 900/1800MHz and for 2100MHz mobile networks.
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19.6 Memory Devices



767 856	MSD1000	SD memory card 1GB for Leica Nova and Leica Viva TPS instruments and controller.
789 139	MSD08	SD memory card 8GB for Leica Nova and Leica Viva TPS instruments and controller.

19.7 Card Reader



767 895	MCR7	Card reader for SD/CF cards.
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19.8 Power Supply



772 806	GEB212	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS10/CS15 field controller and GS14, GS15, GS12 or GS08plus receiver.
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20 SmartStation & Smartpole Setup using a GS14 GNSS Receiver

20.1 GS14 GNSS Receiver

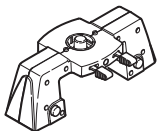



795 971	GS14	2G Single Frequency SmartAntenna
795 974	GS14	2G Performance SmartAntenna
795 975	GS14	2G Professional SmartAntenna
807 524	GS14	3.75G Single Frequency SmartAntenna
807 525	GS14	3.75G Performance SmartAntenna
807 526	GS14	3.75G Professional SmartAntenna
807 527	GS14	3.75G & UHF Single Frequency SmartAntenna
807 528	GS14	3.75G & UHF Performance SmartAntenna
807 529	GS14	3.75G & UHF Professional SmartAntenna
807 530	GS14	3.75G & UHF Single Frequency SmartAntenna (US/CAN)
807 531	GS14	3.75G & UHF Performance SmartAntenna (US/CAN)
807 532	GS14	3.75G & UHF Professional SmartAntenna (US/CAN)

	Leica GS14 Single Frequency	Leica GS14 Performance	Leica GS14 Professional
Supported GNSS Systems			
GPS L2	○	●	●
GLONASS	○	○	●
Galileo	○	○	●
RTK performance			
DGPS	○	●	●
RTK unlimited	○	●	●
Network RTK	○	●	●
Leica Lite RTK	○	○	●
Position update & data recording			
5 Hz positioning	●	●	●
20 Hz positioning	○	●	●
Raw data logging	●	●	●
RINEX logging	○	○	●
NMEA out	○	○	●
Additional features			
RTK Reference Station functionality	○	●	●

● Standard
○ Optional

20.2 SmartAntenna Adapter



767 802	GAD110	SmartAntenna adapter to mount GS08plus/GS14/GS15 SmartAntenna.  BT module to connect the TS to the GS08plus/GS14/GS15 GNSS receiver is standard on all Leica Nova and Leica Viva TPS instruments.
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20.3 Additional GS14 Receiver Options

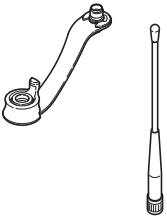
GNSS software options		
805 197	LOP35	GS14 GPS L2 option, enables GPS L2 and GPS L2C tracking on a GS14 receiver.
795 981	LOP29	GS14 GLONASS option, enables GLONASS on a GS14 receiver.
795 982	LOP30	GS14 Galileo option, enables Galileo on a GS14 receiver.
Position rate and data recording options		
795 983	LOP31	GS14 20Hz option, enables to compute positions with an update rate up to 20Hz on a GS14 receiver.
767 810	LOP7	Raw data option, allows logging of GNSS raw data on a GS10, GS14, GS15 or GS25 receiver or on a CS10/CS15 field controller.

767 811	LOP8	RINEX option, allows logging of RINEX data on a GS10, GS14, GS15 or GS25 receiver.
767 818	LOP15	NMEA out option, enables NMEA to be streamed from GS10, GS14, GS15 or GS25 receivers.
RTK related options		
771 497	LOP16	DGPS option for GS10, GS14, GS15 or GS25 receivers, enables the receiver to compute a DGPS position.
767 813	LOP10	Unlimited RTK option, enables RTK positions to be computed from a single base station with no limit of distance.
767 815	LOP12	Unlimited RTK and Network RTK, enables RTK position to be computed from a single base station and within a RTK network.
767 817	LOP14	Upgrade option for GS10, GS14, GS15 or GS25 receivers from RTK unlimited only to RTK unlimited including RTK Network. (LOP10 to LOP12)
771 971	LOP20	Leica Lite option, to receive GS09 RTK data on GS10, GS14, GS15 or GS25 receivers.
Other options		
767 816	LOP13	RTK Reference station option, allows a GS10, GS14, GS15 or GS25 receiver to transmit RTK data.

20.4 RTK Modems

The GS14 3.75G models are equipped with an internal modem and integrated antenna for RTK Rover and RTK Base usage. For UHF RTK Rover or Base usage external radio modems can be connected. The GS14 UHF models are equipped with internal modem and internal UHF radio for RTK Rover and RTK Base usage. The UHF modem requires an external RTK antenna.

20.5 External RTK Antennas



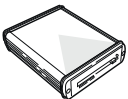
Adapter		
RTK antenna arm		
767 790	GAD108	Arm to mount external UHF antenna to GS14 SmartAntenna.
Gainflex radio antennas		
639 964	GAT1	Gainflex radio antenna (frequency range 400-435 MHz).
667 243	GAT2	Gainflex radio antenna (frequency range 435-470 MHz).

20.6 Memory Devices for GS14 Receiver



795 993	MMSD01	microSD card 1GB for GS14 receiver, includes SD card adapter.
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20.7 Card Reader



767 895	MCR7	Card reader for SD/CF cards.
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20.8 Power Supply



772 806	GEB212	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS10/CS15 field controller and GS14, GS15, GS12 or GS08plus receivers.
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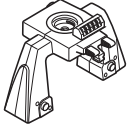
21 SmartStation & Smartpole Setup using a GS12 GNSS Receiver

21.1 GS12 GNSS Receiver



782 288	GS12	GS12 GNSS receiver, Geodetic 120 channels GNSS receiver, includes: GPS L1+L2, 1 Hz position rate, easily upgradeable with TS/GS12 or CS/GS12 options (e.g. GLONASS, Galileo, GPS L5, Network Licence, Raw data logging).
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21.2 SmartAntenna Adapter



741 965	GAD104	GS12 SmartAntenna Adapter. Required to attach a GS12 GNSS Antenna onto a Leica Nova and Leica Viva TPS instrument.
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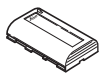
21.3 Additional CS Options for GS12 GNSS SmartPole Setup

782 278	GSW949	CS/GS12 GLONASS option.
782 279	GSW950	CS/GS12 GPS L5 option.
782 280	GSW951	CS/GS12 Galileo option.
782 281	GSW952	CS/GS12 20Hz option, enables 0.05sec (20 Hz) position and display update rate.
782 282	GSW953	CS/GS12 MDB raw data logging option.
782 283	GSW954	CS/GS12 RINEX raw data logging option.
782 284	GSW955	CS/GS12 RTK Rover option, includes unlimited baseline and reference network access.
782 285	GSW956	CS/GS12 Leica Lite RTK option, enables GS12 to receive Leica Lite RTK messages.

21.4 Additional TS Options for GS12 SmartStation Setup

782 615	GSW964	TS/GS12 GLONASS option.
782 617	GSW965	TS/GS12 L5 option.
782 618	GSW966	TS/GS12 Galileo option.
782 620	GSW968	TS/GS12 MDB raw data logging option.
782 621	GSW969	TS/GS12 RINEX raw data logging option.
782 622	GSW970	TS/GS12 RTK Rover option, includes unlimited baseline and reference network access.
782 623	GSW971	TS/GS12 Leica Lite RTK option, enables GS12 to receive Leica Lite RTK messages.

21.5 Power Supply



772 806	GEB212	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS10/CS15 field controller and GS14, GS15, GS12 or GS08plus receiver.
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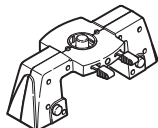
22 SmartStation using a GS08plus GNSS Receiver


22.1 GS08plus GNSS Receiver



798 257	GS08plus	GS08plus GPS/GLONASS Dual Frequency SmartAntenna.
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22.2 SmartAntenna Adapter




767 802	GAD110	SmartAntenna adapter to mount GS08plus, GS14 and GS15 SmartAntenna.  BT module to connect the TS to the GS08plus, GS14 and GS15 GNSS receiver is standard on all Leica Nova and Leica Viva TPS instruments.
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791 829	GAD113	Adapter for fitting the GS08plus to SmartAntenna adapter GAD110.
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22.3 Additional TS Options for GS08plus SmartStation Setup

 GS08plus related receiver options are license keys to be set on all Leica Viva TPS and Leica Nova instruments.

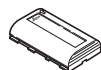
710 187	GSW968	TS/GS08plus MDB raw data logging option.
710 189	GSW969	TS/GS08plus RINEX raw data logging option.
804 553	GSW970	TS/GS08plus RTK Rover option, includes unlimited baseline and reference network access.
710 197	GSW971	TS/GS08plus Leica Lite RTK option, enables GS08plus to receive Leica Lite RTK messages.

22.4 Additional GS08plus Options for GS08plus GNSS receiver

GNSS Software options

791 827	LOP27	GS08plus GLONASS option.
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22.5 Power Supply



772 806	GEB212	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS10/CS15 field controller and GS14, GS15, GS12 or GS08plus receiver.
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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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Other trademarks and trade names are those of their respective owners.

25 Technical Data

Laser plummet:

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

Guide light (EGL):

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

Distance meter (Prism):

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

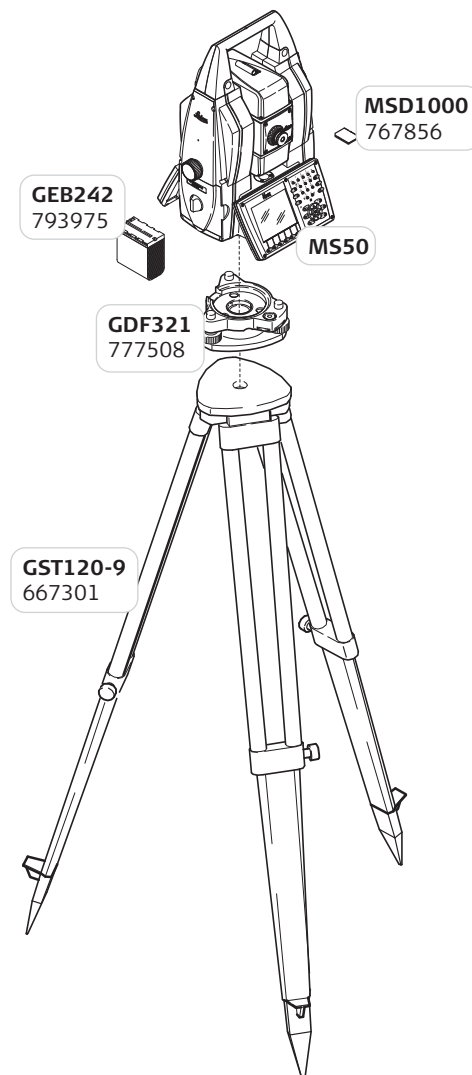
Distance meter (Non-Prism):

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



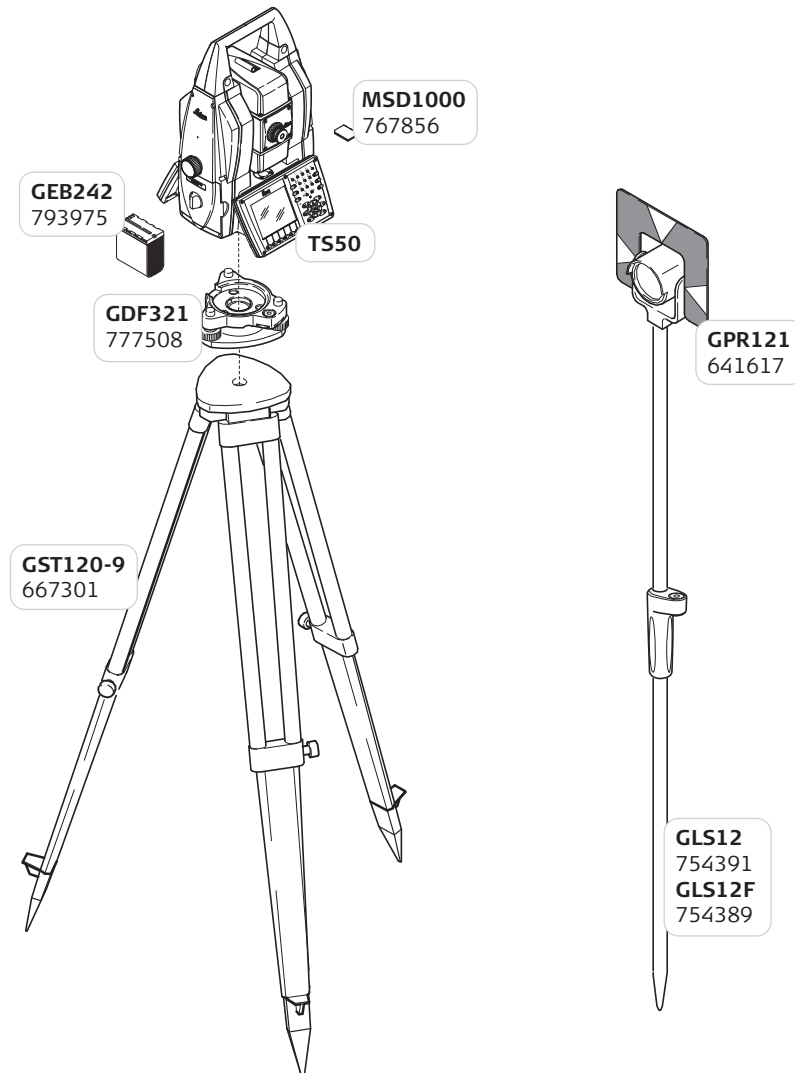
Suggested Equipment Setups

26 Scanning using a 3D MultiStation

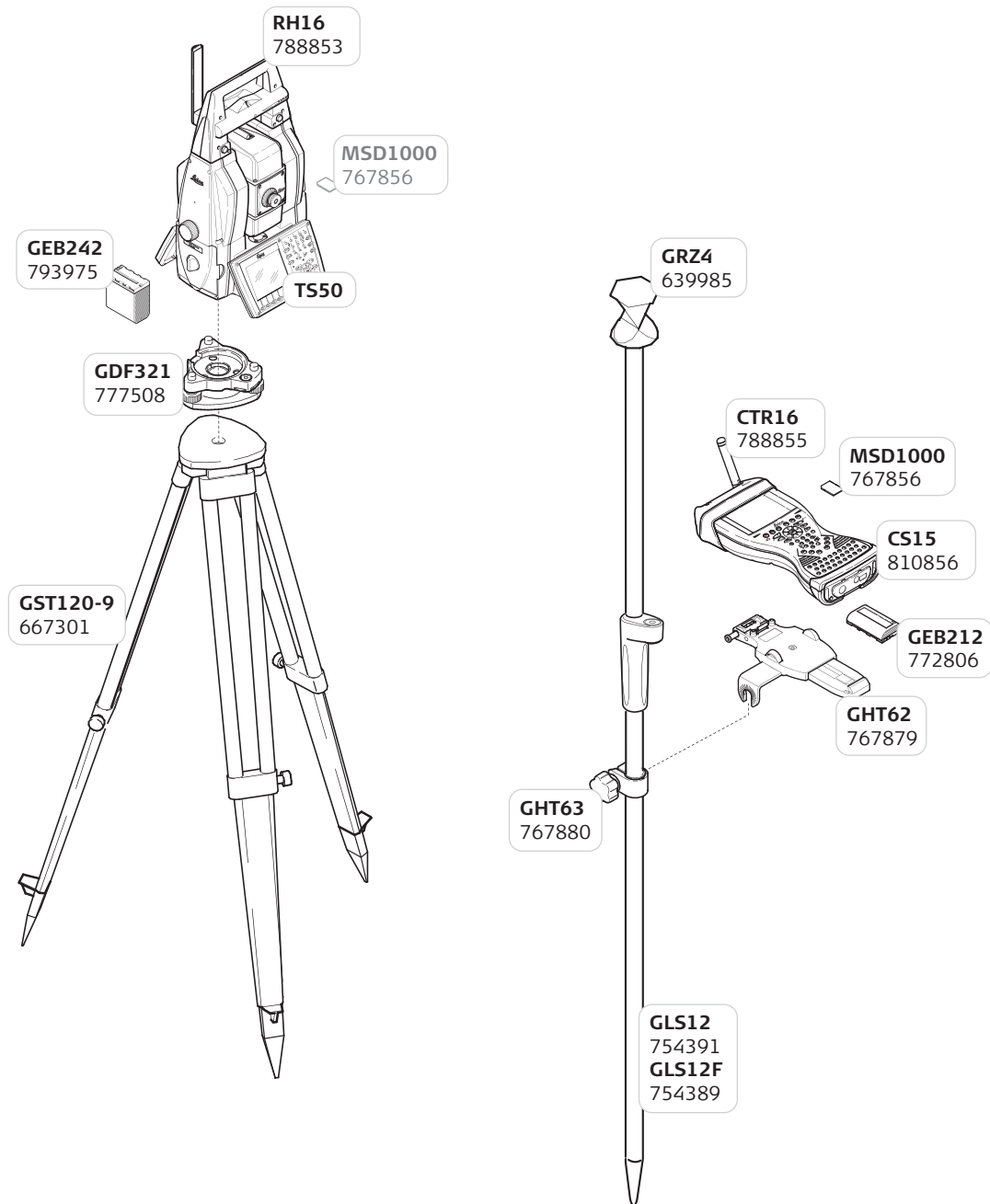


27 Conventional Surveying

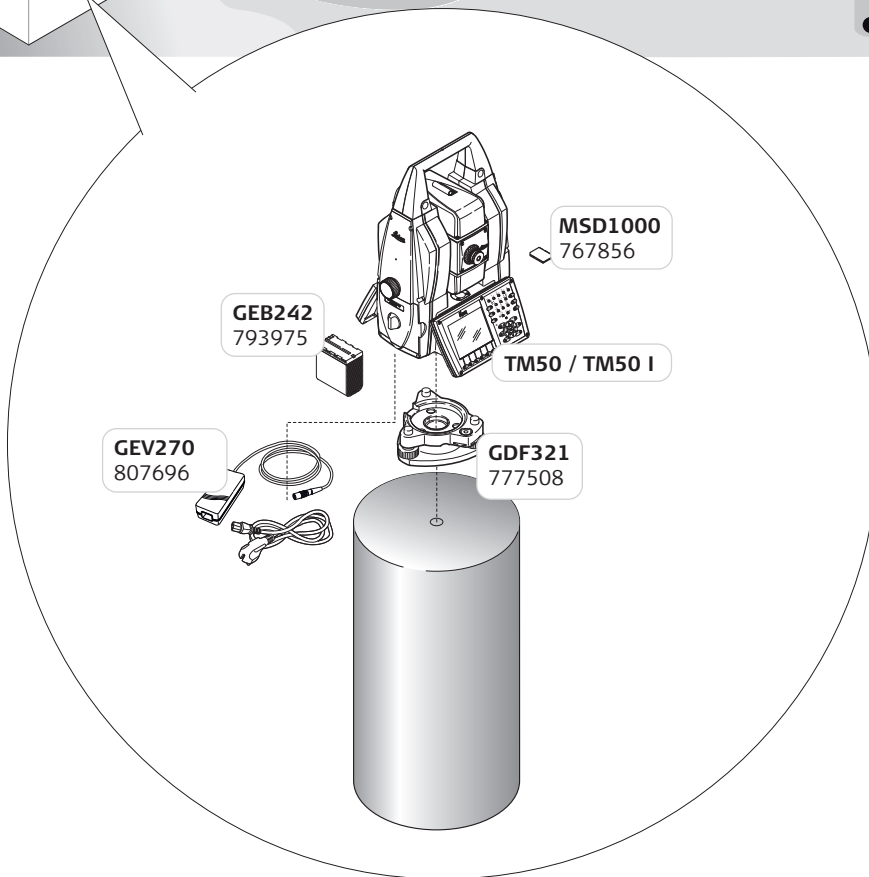
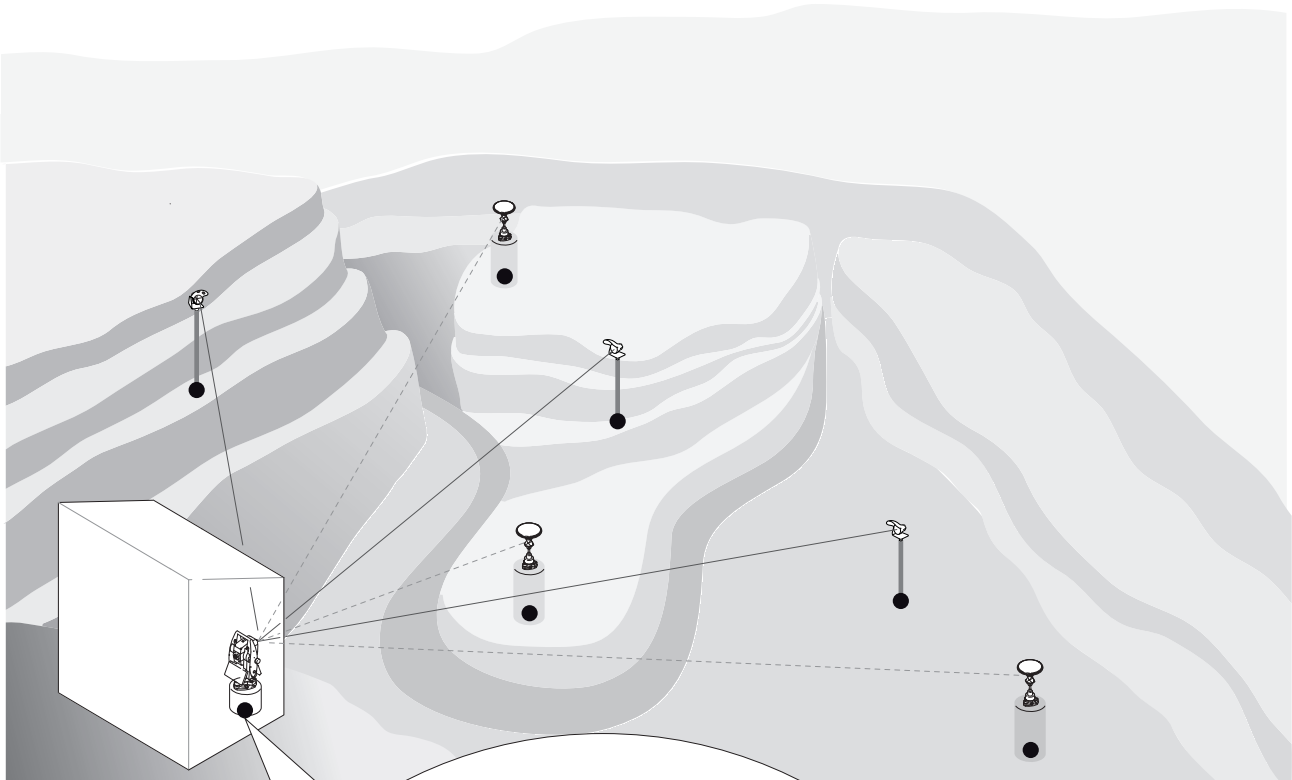
27.1 Two Person Surveying using a Leica Nova TPS



27.2 Robotic Surveying using a Leica Nova TPS

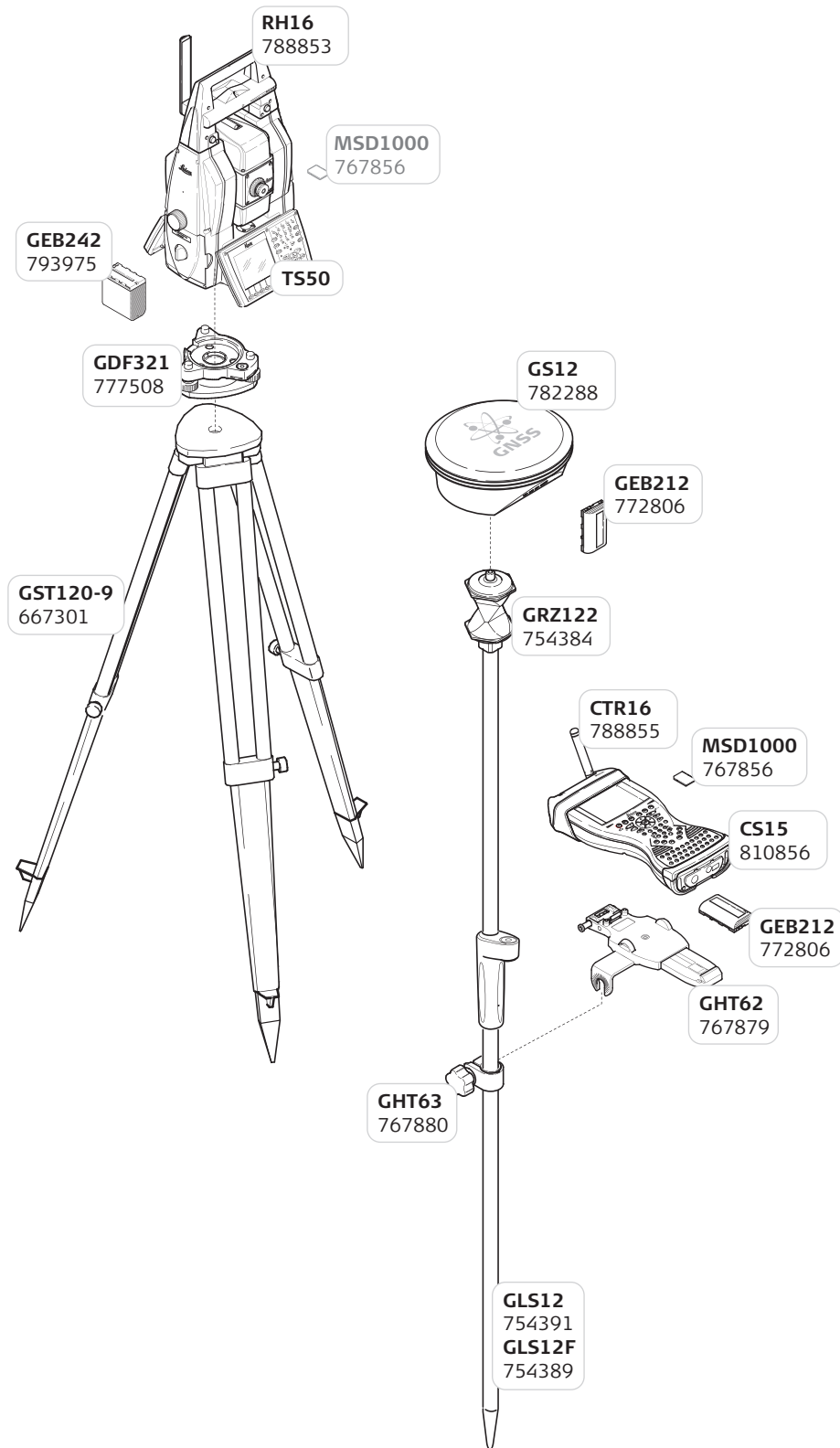



28 Monitoring




29 SmartPole Surveying

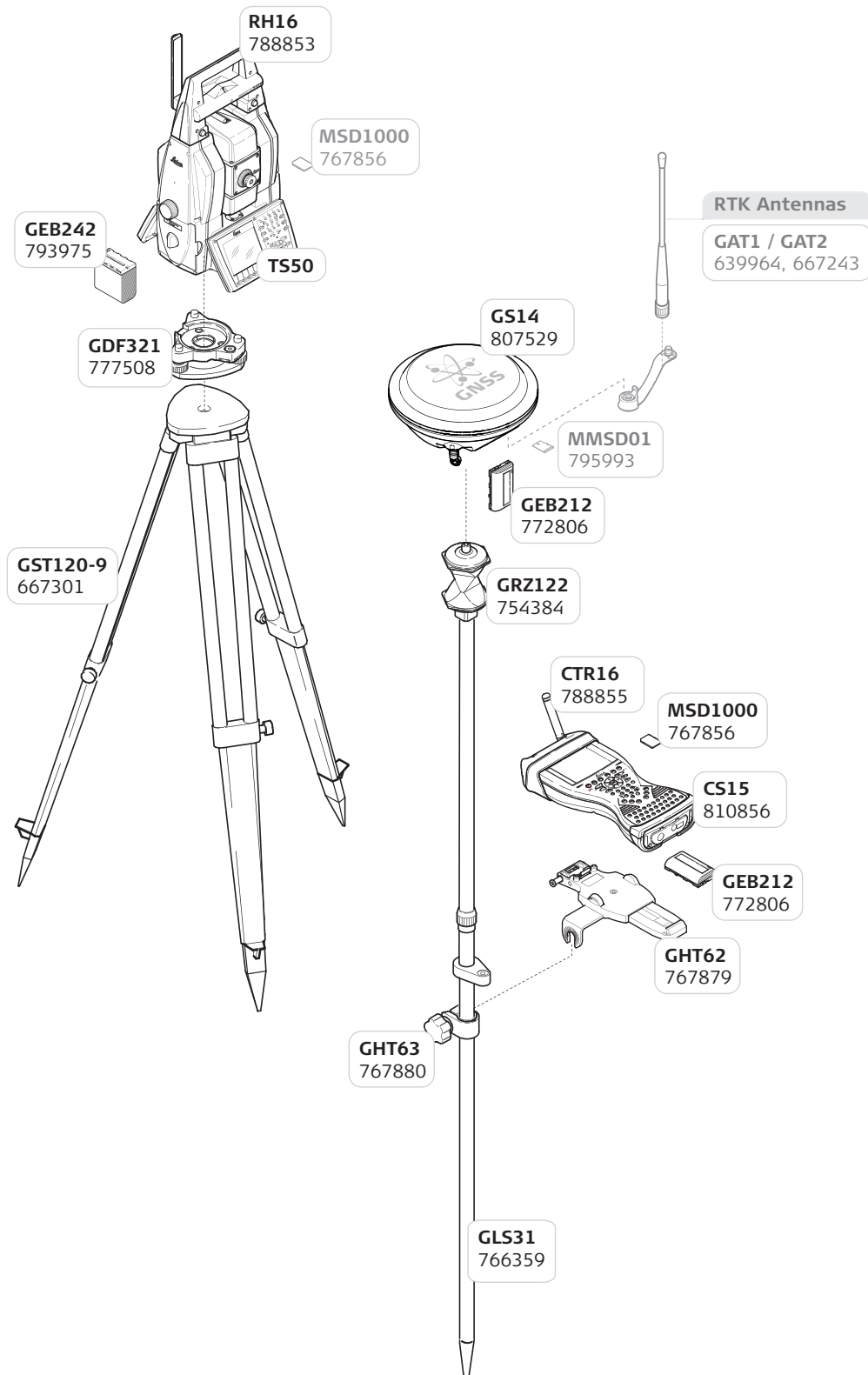
29.1 SmartPole using the GS12 GNSS Receiver



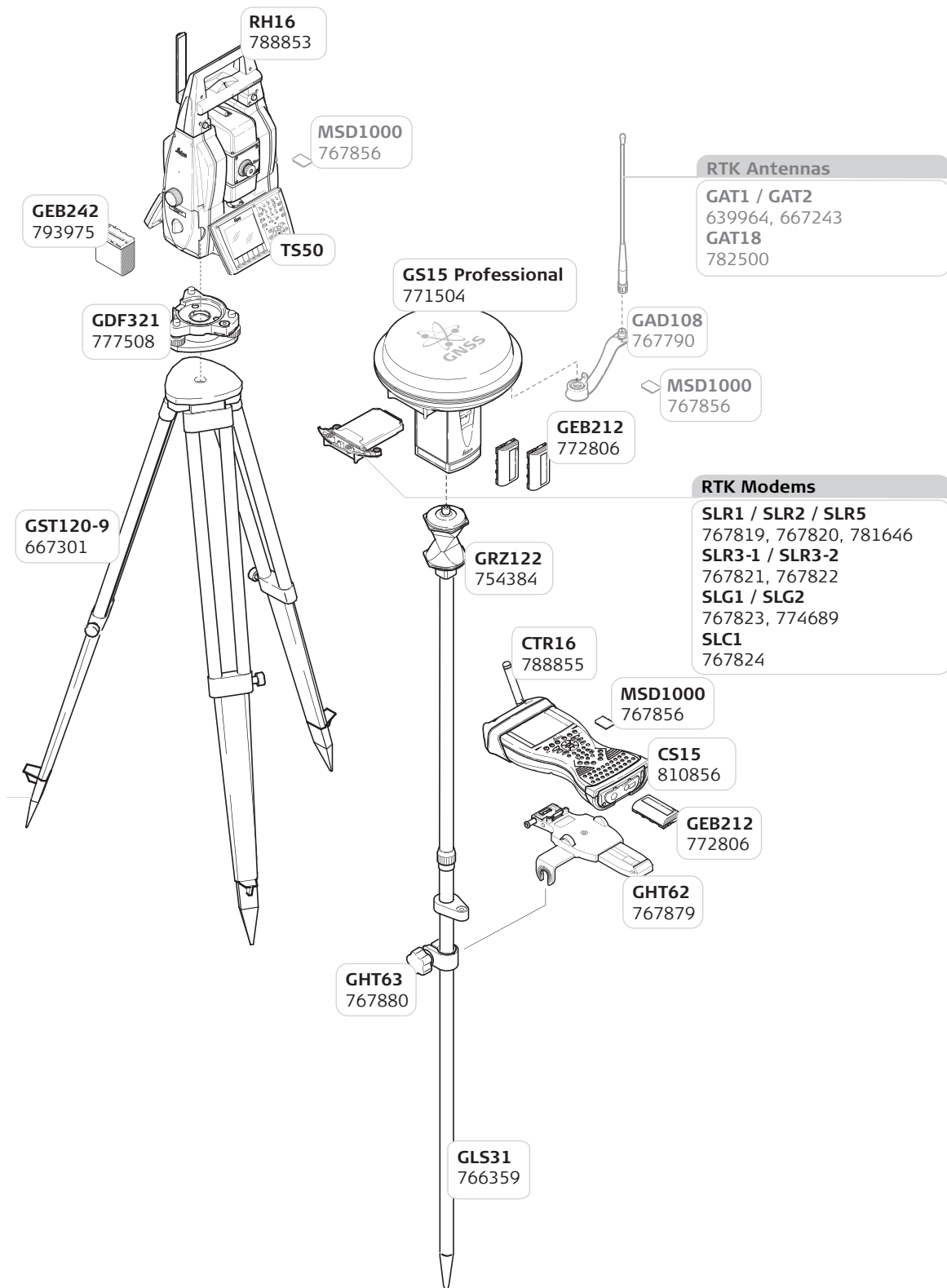
 SmartPole setup with GS12 GNSS receiver requires a Bluetooth mobile phone or CS15 UMTS field controller in order to receive RTK correction data.

 GFU RTK devices cannot be used for this SmartPole setup.

29.2 SmartPole using the GS14 GNSS Receiver

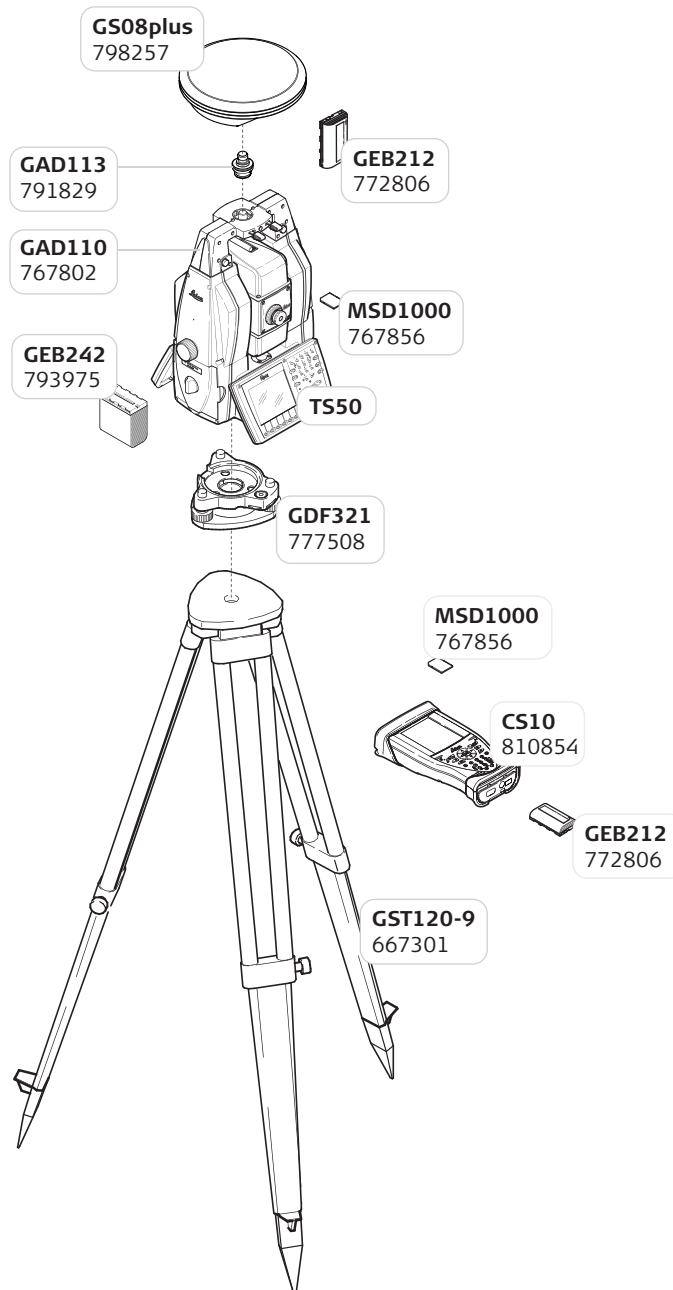




29.3 SmartPole using the GS15 GNSS Receiver



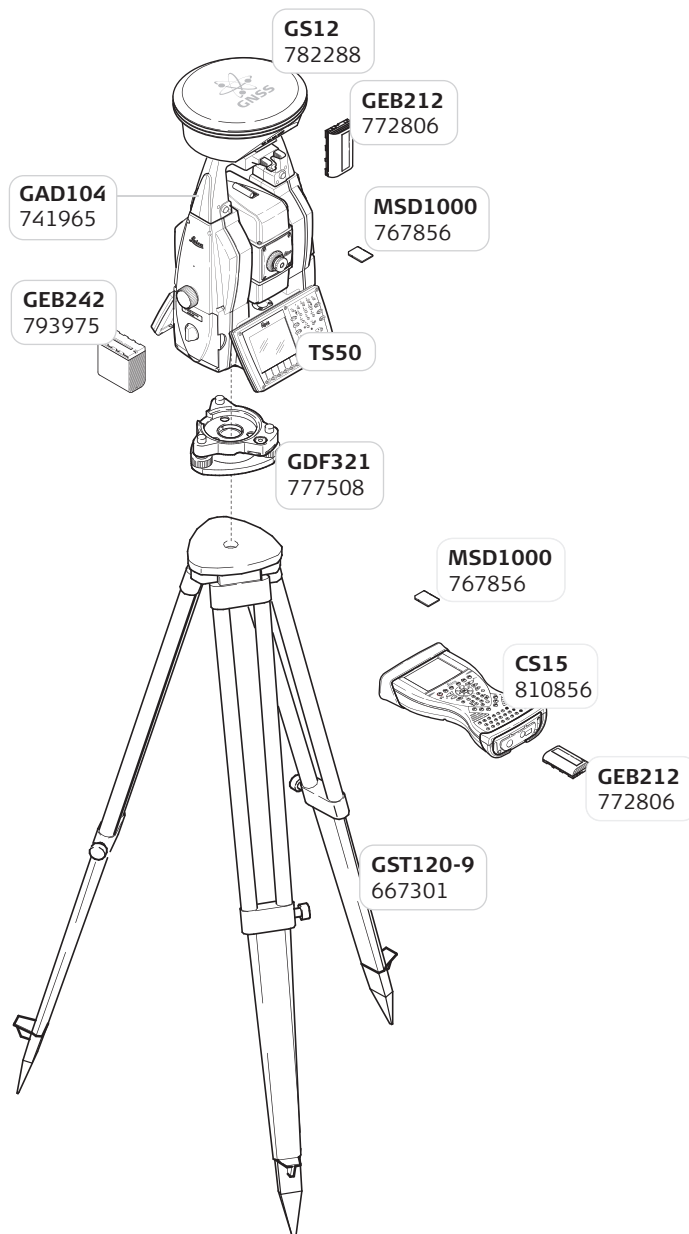
30 SmartStation

30.1 SmartStation using the GS08plus GNSS Receiver



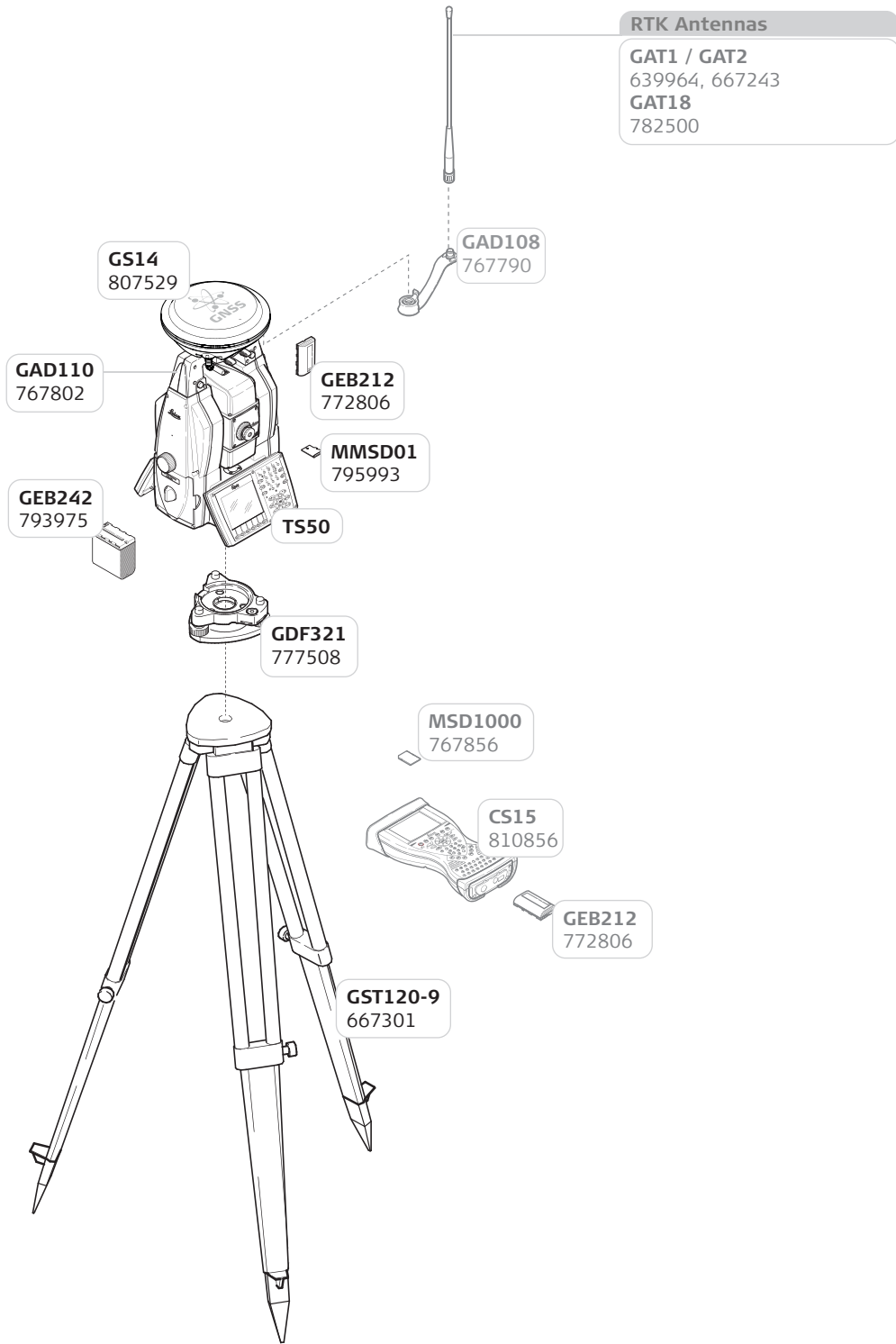
-  SmartStation setup with GS08plus GNSS receiver requires a Bluetooth mobile phone or CS10 3.5G field controller in order to receive RTK correction data.
-  GFU RTK devices cannot be used for this SmartStation setup.

30.2 SmartStation using the GS12 GNSS Receiver

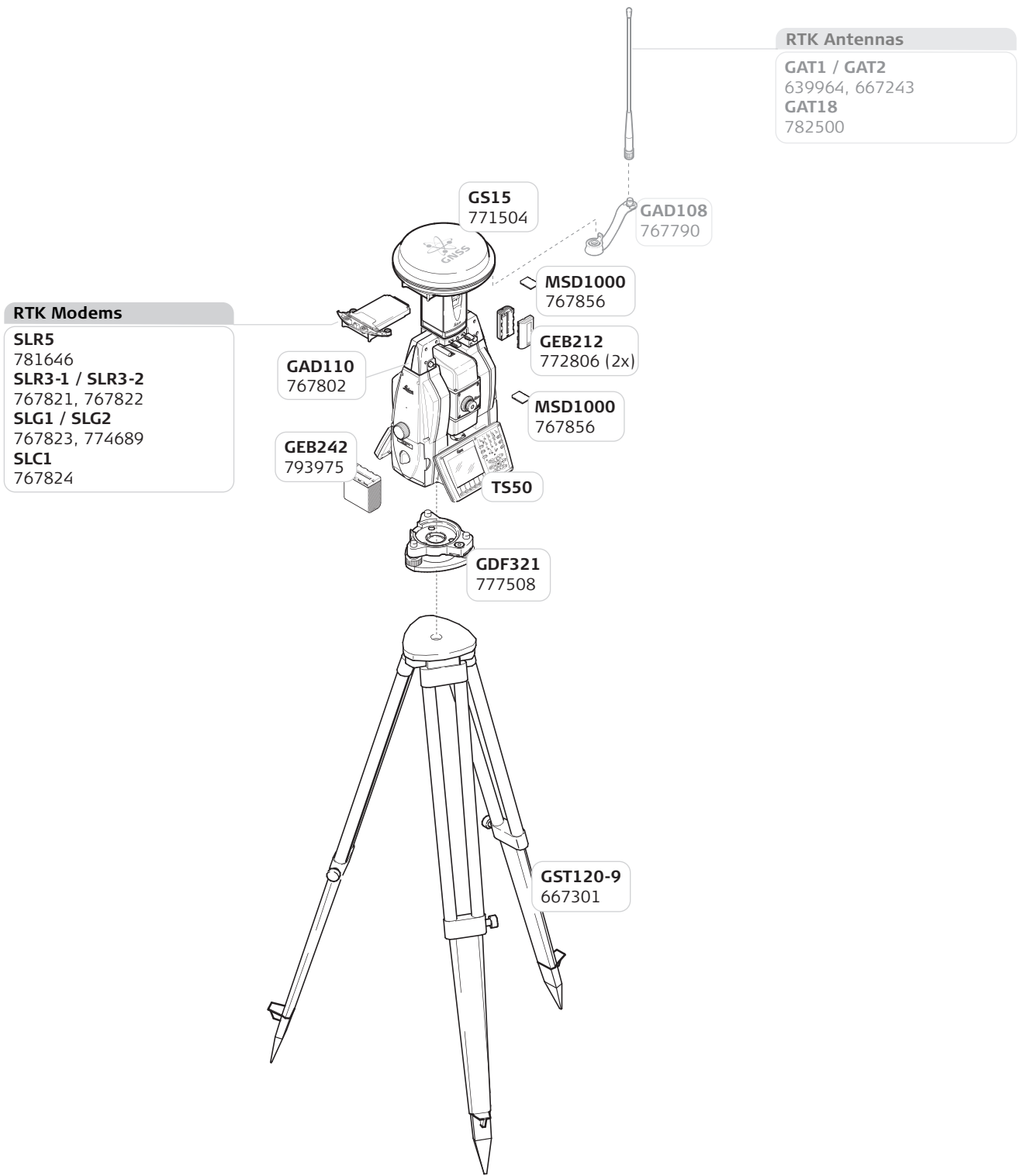


- ☞ SmartStation setup with GS12 GNSS receiver requires a Bluetooth mobile phone or CS10/CS15 UMTS field controller in order to receive RTK correction data.
- ☞ GFU RTK devices cannot be used for this SmartStation setup.

30.3 SmartStation using the GS14 GNSS Receiver



30.4 SmartStation using the GS15 GNSS Receiver



Whether measuring objects on a construction site or monitoring a dam or a bridge; whether capturing an accident scene with digital imaging or scanning a building façade – you need reliable and precise data. The Leica Nova solution perfectly integrates all these capabilities in one compact solution.

Leica Nova embodies 90 years of innovative thinking to develop outstanding technologies. A solution that gives you the benefits of not only being able to take faster, smarter decisions, but also better and more informed decisions regardless of the application. Leica Nova represents our commitment to precision, reliability and flexibility. Faster, Better, Smarter, Simpler are the key words that describe the benefits of the Leica Nova; a unique solution that covers the complete process from capturing and visualising data, to deciding and delivering.

Leica Nova is the new dimension in measuring technology – make the right decision.

When it has to be right.

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