Leica TS13
Equipment List

- when it has to be **right**

Leica
Geosystems

Table of Contents

Total Station

1 TS13

1.1 Models

	TS13
Angle measurement	●
Distance measurement to prism	●
Distance measurement to any surface (reflectorless)	●
Motorised	●
Automatic Target Aiming (ATR)	●
Lock mode	○
SpeedSearch	○
RS232, USB and SD card interface	●
WLAN	●
Bluetooth	●
Internal Flash Memory (2 GB)	●
Hotshoe interface for RadioHandle	○
Guide Light (EGL)	●
CS20 Field Controller **(with internal TS communication module)**	○
CS20 with CTR20 TS communication expansion pack	○
Keyboard display unit	○

● Standard
○ Optional

1.2 Angular Accuracies

		1" Accuracy	2" Accuracy	3" Accuracy	5" Accuracy
TS13	**PinPoint R500**	870 379	870 380	870 381	870 382
	PinPoint R1000	870 375	870 376	870 377	870 378

☞ All TS13 models are delivered with Quick Guide, documentation USB card (833 146) and container GVP725 (817 058).

☞ The TS13 basic models are equipped with a 4 button keyboard unit without a display.

Additional Options & Accessories

2 Additional Options for Total Station

2.1 Hardware Options

872 220	**GTS45**	1st face keyboard with full 5" WVGA colour touch screen, for TS13 instrument, for telescope position 1, fitted.
870 391	**GTS45**	2nd keyboard with full 5" WVGA colour touch screen, for TS13 instrument, for telescope position 2, fitted.
870 392	**TOP1**	TS13 option to enable prism lock
870 393	**TOP2**	TS13 robotic option enabling SpeedSearch and Radio Handle interface

2.2 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 Leica Captivate Apps & Software Options

☞ The following software articles can only be ordered, if the hardware option 872 220 (1st face keyboard) has been ordered.

3.1 Leica Captivate Software for TS

827 646	Leica Captivate Measure & Stakeout TS/MS.

3.2 Apps included in Leica Captivate for TS

Measure includes:
- Measure
- Code points
- Automatically measure points
- Remote Heights
- Target Offset calculations

Setup includes:
- 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

Stake points includes:
- 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:
	• Inverse
	• Traverse
	• Intersections
	• Angle calculations
	• Line & arc calculations
	• Bearing & distance calculations
	• Shift, Rotate, Scale (manual & matching points)
	• Triangle calculations
	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, 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

834 221	**Athletics**
827 650	**Area Division**
	☞ Requires COGO app.
827 651	**Stake DTM**
	☞ Requires Stake app.
827 648	**Measure and Stake to Line**
	☞ Requires Stake app.
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**
834 229	**Auto Setup**
839 678	**Inspect surfaces**
836 669	**Tunnel Profile Generator**

3.4 Optional Licences for Leica Captivate for TS

827 661	**Leica Active Assist**
827 662	**Leica Exchange**

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 TS11/TS13/TS15/TS16.
	793 973	**GEB222**	Lithium-Ion battery, 7.4V/6Ah, chargeable. To be used with TS11/TS13/TS15/TS16.

4.2 External Batteries

	818 916	**GEB371**	External universal battery, Li-Ion, 13 V, 250 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 and GEB331), 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 and GEB331), 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 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 CS10/CS15 field controller, industrial grade.
	789 139	**MSD08**	SD memory card 8GB for Leica Viva TPS and Leica Nova instruments and CS10/CS15 field controller, industrial grade.
	765 199	**MS1**	USB memory stick, 1GB, for Leica Viva TPS and Leica Nova instruments and CS10/CS15 field controller, industrial grade.
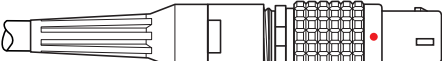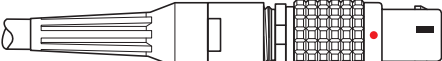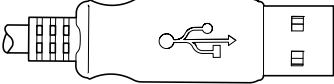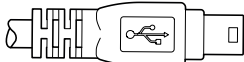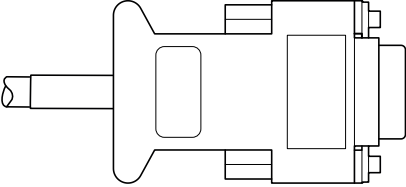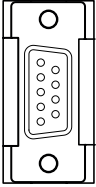
5.2 Card Reader

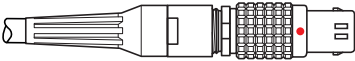|	767 895	**MCR7**	Card reader for SD/CF cards.

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	
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.

7 Optical Accessories

7.1 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.

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.

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

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).
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 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.

11.3 Mini Pole

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

12 Reflector Carriers

667 313	**GRT144**	Carrier with stub.
667 316	**SNLL121**	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.

13.2 360° Reflectors

| 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.

13.3 Precision Reflectors

555 631	**GPH1P**	Single-prism precision reflector.

13.4 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.

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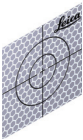
763 532	**GZM29**	Reflective tape, 20x20mm for short range, pack of 20 pieces.
763 533	**GZM30**	Reflective tape, 40x40mm for medium range, pack of 20 pieces.
763 534	**GZM31**	Reflective tape, 60x60mm for long range, pack of 20 pieces.

13.6 Pen and Screen Protection Foils

Extra pen		
813 914	**GDZ71**	Pen with tether clip interface for CS20 field controller and TS16/MS60/TS60 instruments.
Screen Protection Foil set		
813 781	**SPF05**	5" WVGA screen protection foils for CS20 field controller and TS16/MS60/TS60 instruments.
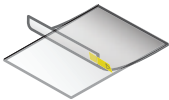
14 Additional Containers

727 589	**GVP102**	Soft bag with shoulder strap, for prism station, consist of tribrach, prism carrier or laser plummet and prism.
667 451	**GVP609**	Container for 2 circular prisms GPR111/121, 2 carriers/laser plummets and 2 tribrachs.
833 516	**GVP716**	Backpack carrying systems for all large TPS and GNSS containers.
833 517	**GVP717**	Sidebag for container GVP721/722/723/725.
833 518	**GVP718**	Basic backstrap for container GVP721/722/723/725.
833 519	**GVP719**	Shoulderstrap for container GVP721/722/723/725.
817 055	**GVP722**	Hard container for SmartAntenna, CS Field Controller and accessories for a SmartPole and SmartStation setup.
817 057	**GVP724**	Small-sized hard container for 360° prism and controller for TS Robotic Pole setup.

Remote Control

15 Remote Control - CS20 Field Controller

15.1 CS20 Field Controller

	823 164	**CS20**	**CS20 Field Controller** Ruggedized WinEC7 field controller with 5" WVGA touch display, 2 GB eMMC Flash Memory, 1 GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, QWERTY keypad, stylus.
	823 165	**CS20 3.75G**	**CS20 3.75G Field Controller** Ruggedized WinEC7 field controller with 5" WVGA touch display, 2 GB eMMC Flash Memory, 1 GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, 3.75G GSM/UMTS module, internal TS communication module, QWERTY keypad, stylus.
	823 169	**CS20 3.75G Disto**	**CS20 3.75G Disto Field Controller** Ruggedized WinEC7 field controller with 5" WVGA touch display, 2 GB eMMC Flash Memory, 1 GB SDRAM, SD card slot, 5MP camera and LED flash. Includes internal Bluetooth/WLAN module, 3.75G GSM/UMTS module, internal TS communication module, integrated Disto-Lasermeter, QWERTY keypad, stylus.

15.2 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).

16 Leica Captivate Software and Apps - CS20 Field Controller

16.1 Leica Captivate Software for CS20 Field Controller

827 698	Leica Captivate - Measure and Stake for CS20.

16.2 Apps included in Leica Captivate for CS20 Field Controller

☞ The following apps are included in Leica Captivate for CS20 (827 698).

Measure includes:
- Measure
- Code points
- Automatically measure points
- Remote Heights
- Target Offset calculations

Setup includes:
- 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
- Orientate to object

Stake points includes:
- 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:
- Inverse
- Traverse
- Intersections
- Angle calculations
- Line & arc calculations
- Bearing & distance calculations
- Shift, Rotate, Scale (manual & matching points)
- Triangle calculations

Determine coordinate system:
- 1 step, 2 step, 3D Transformation
- All common projections

Alignment Editor:
- Horizontal alignments
- Vertical alignments
- Cross sections
- Chainage equations

Control data:
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

16.3 Optional Apps for Leica Captivate for CS20 Field Controller

The following apps require a valid license key.

834 296	**Athletics**
827 701	**Area Division**
827 702	**Stake DTM**
827 699	**Measure and Stake to Line**
827 700	**Measure to Plane / Grid**
827 704	**Check and Stake Road**
827 705	**Check and Stake Tunnel**
827 706	**Check and Stake Rail**
827 711	**Sets of Angles**
827 703	**Volume Calculation**
827 708	**Hidden Point**
827 709	**Traverse**
827 712	**QuickVolume**
834 305	**Auto Setup**
839 679	**Inspect Surfaces**
836 670	**Tunnel Profile Generator**

16.4 Optional Licences for Leica Captivate for CS20 Field Controller

827 714	**Active Assist**
827 715	**Leica Exchange**

Accessories for Remote Control

17 Accessories for Remote Control - CS20 Field Controller

17.1 Internal Batteries

	799 190	**GEB331**	Li-Ion battery, 11.1 V / 2.8 Ah, rechargeable, for CS20.

17.2 Battery Chargers

	799 185	**GKL311**	Single-bay Charger Professional 3000. Charger for one Li-Ion battery (GEB211, GEB212, GEB221, GEB222, GEB241, GEB242 and GEB331), 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 and GEB331), 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.

17.3 Memory Devices

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

17.4 Card Reader & Adapter

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

17.5 Pen and Screen Protections Foils

	Pen		
	813 914	**GDZ71**	Pen with tether clip interface for CS20 field controller and TS16/MS60/TS60 instruments.
	813 582	**GHT76**	Tether to connect GDZ71 Pen to CS20 field controller.
	Screen Protection Foil set		
	813 781	**SPF05**	5" WVGA screen protection foils for CS20 field controller and TS16/MS60/TS60 instruments.
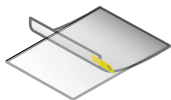
17.6 Additional Power Accessories

	822 787	**GEV276**	Power supply unit for CS20, for indoor use only. Input 100-240 VAC to output 15.0 VDC, 40 W.

17.7 Pole Accessories for CS20 Field Controller

	807 157	**GHT66**	Holder attaching a CS20 with a GHT63 clamp to a pole. GHT63 is not included.
	767 880	**GHT63**	Clamp arrangement for attaching the GHT66 and GHT78 to all poles.

17.8 Utility Hook and Hand Strap for CS20 Field Controller

Utility hook

807 245	**GHT68**	Utility hook for CS20 field controller for attaching to belt or tripod.
845 832	**GHT70**	Clamp arrangement for attaching the GHT66 and GHT78 to all tripods.

Hand strap

807 158	**GHT67**	Hand strap for CS20 field controller.

18 RadioHandles

788 853	**RH16**	RadioHandle with integrated Bluetooth module and radio antenna. Used as radio modem for Leica Viva TPS and Leica Nova instruments. Establishes communication to CS20 controller. Frequency range 2402 - 2480 MHz.
		☞ Not available in EU countries due to EN 300 328 V.1.8.1.
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 controller. Frequency range 2402 - 2480 MHz.
		☞ Fulfils EN 300 328 V.1.8.1.

Care Packages

19 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

20 Trademarks

The *Bluetooth*® word mark and logos are owned by Bluetooth SIG, Inc. and any use of such marks by Leica Geosystems AG is under license.
SD and microSD are trademarks of the SD-3C, LLC.
Other trademarks and trade names are those of their respective owners.

21 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
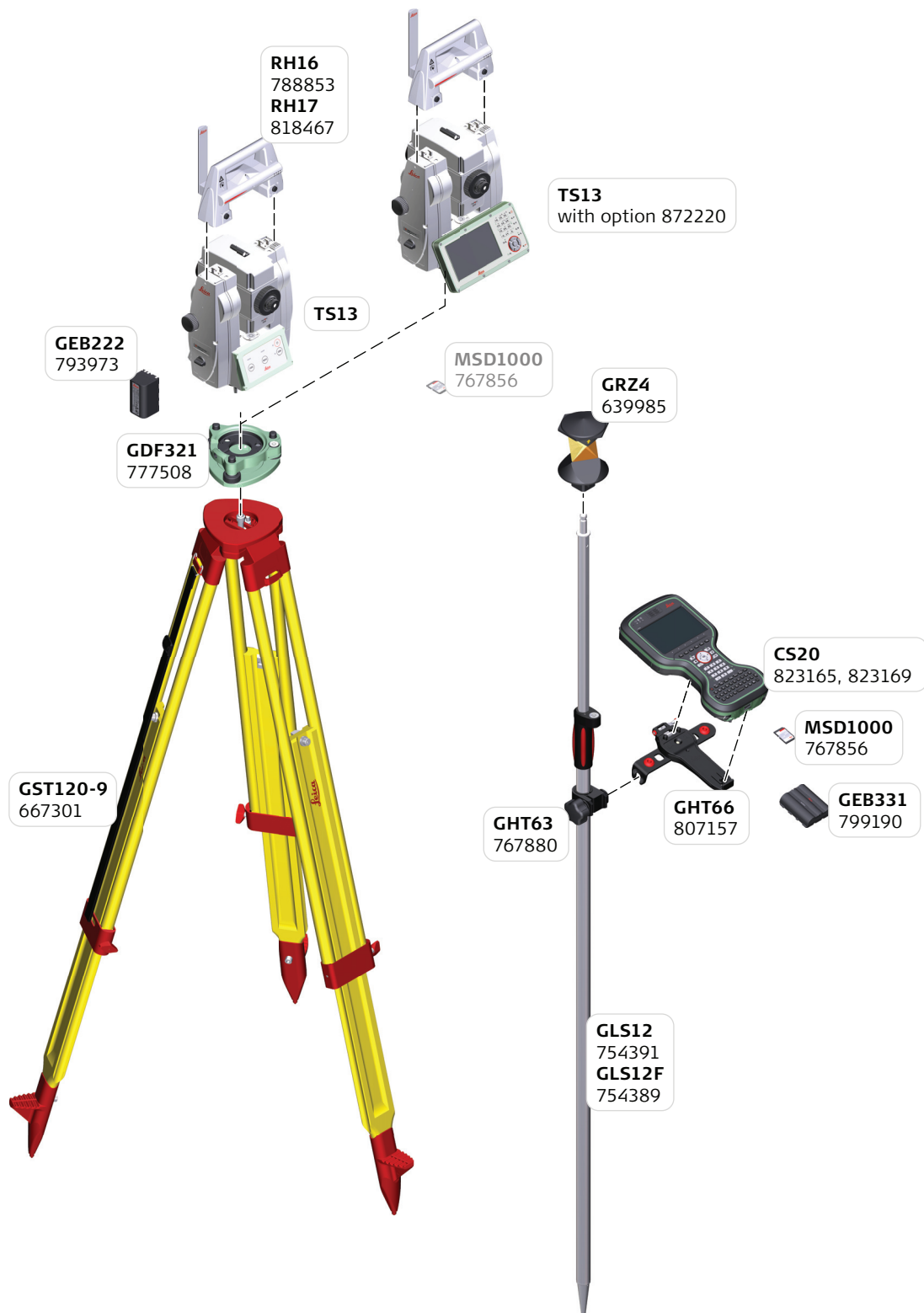
Suggested Equipment Setups

22 Conventional Surveying

22.1 Two Person Surveying using a TS13 Total Station

MSD1000
767856

GEB222
793973

TS13

GPR121
641617

GDF321
777508

GST120-9
667301

GLS12
754391
GLS12F
754389

22.2 Robotic Surveying using a TS13 Total Station and CS20 Field Controller

RH16
788853
RH17
818467

TS13
with option 872220

TS13

GEB222
793973

MSD1000
767856

GRZ4
639985

GDF321
777508

CS20
823165, 823169

MSD1000
767856

GST120-9
667301

GHT66
807157

GEB331
799190

GHT63
767880

GLS12
754391
GLS12F
754389

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