

Leica Nova MS60, TS60 and TM60 Equipment List

Nova



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MultiStation and Total Stations

1 MultiStation

1.1 Models



	MS60
Angle measurement	●
Distance measurement to prism	●
Distance measurement to any surface (R1000)	-
Long Range distance measurement to any surface (R2000)	●
30000 Hz Scanning EDM	●
Horizontal and Vertical Scan	●
AutoHeight	●
Motorised	●
Automatic Target Recognition (ATRplus)	●
Lock mode	●
PowerSearch (PS)	●
Guide Light (EGL)	●
Servofocus	●
Autofocus	●
5 Megapixel imaging	●
Overview Camera	●
Telescope Camera	●
WLAN	●
Bluetooth	●
RS232/USB interface	●
2 GB internal flash memory	●
Hotshoe Interface for RadioHandle	●
SmartStation GS16 GNSS receiver	○
LOC8	○
CS20 Field Controller (with internal TS communication module)	○
CS20 with CTR20 TS communication expansion pack	○
CS35 Tablet (with internal Bluetooth v4.0)	○

- Standard
- Optional
- Not available

1.2 Angular Accuracies

	MS60
1" (0.3mgon)	898 871



MS60 MultiStations are delivered with two 5" WVGA colour touch screens, Quick Guide, documentation USB card (833 146) and upright container GVP727 (817 060).

2 Total Stations

2.1 Models



	TS60 I	TM60	TM60 I
Angle measurement	●	●	●
Distance measurement to prism	●	●	●
Distance measurement to any surface (R1000)	●	●	●
Long Range distance measurement to any surface (R2000)	-	-	-
30000 Hz Scanning EDM	-	-	-
Horizontal and Vertical Scan	-	-	-
Motorised	●	●	●
Automatic Target Recognition (ATRplus)	●	-	-
Long Range Automatic Target Recognition (ATRplus)	-	●	●
Lock mode	●	-	-
PowerSearch (PS)	●	-	-
Guide Light (EGL)	●	-	-
Servofocus	●	●	●
Autofocus	●	-	●
5 Megapixel imaging	●	-	●
Overview Camera	●	-	●
Telescope Camera	●	-	●
WLAN	●	●	●
Bluetooth	●	●	●
RS232/USB interface	●	●	●
2 GB internal flash memory	●	●	●
Hotshoe Interface for RadioHandle	●	●	●
SmartStation GS16 GNSS receiver	○	○	○
LOC8	○	○	○
CS20 Field Controller (with internal TS communication module)	○	○	○
CS20 with CTR20 TS communication expansion pack	○	○	○
CS35 Tablet (with internal Bluetooth v4.0)	○	○	○

- Standard
- Optional
- Not available

2.2 Angular Accuracies

	TS60 I	TM60	TM60 I
0.5" (0.15mgon)	898 868	822 425	822 427
1" (0.3mgon)	-	822 426	822 428



TS60 Total Stations are delivered with two 5" WVGA colour touch screens, Quick Guide, documentation USB card (833 146) and upright container GVP726 (817 059).



TM60 and TM60 I Total Stations are delivered with one 5" WVGA colour touch screens, Quick Guide, documentation USB card (833 146) and upright container GVP726 (817 059).

Additional Options & Accessories

3 Additional Options

3.1 Second Keyboard



879 378	GTS49	2nd keyboard with full VGA colour touch screen, for TM60/TM60 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.

3.4 Hardware Options

874 451	GTS46	LOC8 theft deterrence and location device for automated TS (TM60), fitted.
914 944	GTS46	LOC8 theft deterrence and location device for automated TS (TS60/MS60), fitted.
		 The option can be ordered free of charge and is replacing the second face keyboard.

4 Leica Captivate Apps & Software Options

4.1 Leica Captivate Software for TS/MS

827 646	Leica Captivate Measure & Stake for TS/MS.
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4.2 Apps included in Leica Captivate for TS/MS (827 646)

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 • 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 • Rectangle
	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

4.3 Optional Apps for Leica Captivate for TS/MS

 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
834 229	Auto Setup
834 230	Remote Monitoring
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.

4.4 Optional Licences for Leica Captivate for TS/MS

827 661	Leica Active Assist
827 662	Leica Exchange
903 372	ConX 1y
903 373	ConX 2y
903 374	ConX 3y

Accessories

5 Power Supply

5.1 Internal Batteries



793 975	GEB242	Lithium-Ion battery, 14.8V/5.8Ah, rechargeable, for Leica Nova TPS.
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5.2 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 GEV219, GEV220 or GEV261 cable for Nova instruments.

5.3 Battery Chargers



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

6 Data Storage and Data Transfer

6.1 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.

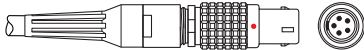
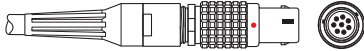
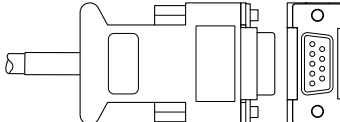
6.2 Card Reader



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 female.
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 5-pin), 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.
60100179		Height Meter set including GHM007 Instrument height meter and GHT196 Distance holder for height meter.

10 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.

11 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.

12 Reflector Poles

12.1 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 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.

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.  Additional GMP111 Mini prim (641 615) required for complete Hidden Point pole set with two prisms.
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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.
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.

14 Reflectors

14.1 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.
362 823	GZT4	Target plate, for GPH1.

14.2 360° Reflectors



754 384	GRZ122	360° reflector with 5/8" thread adapter for mounting of GPS antenna.
639 985	GRZ4	360° reflector.
644 327	GRZ101	360° mini prism with 1/4" thread fitting. Not supported by PowerSearch.
756 637	MPR122	360° reflector with 5/8" thread adapter and 5/8" screw nut.
742 006	GAD103	Adapter for attaching GRZ101 to all poles with Leica Geosystems stub.

14.3 Precision Reflectors



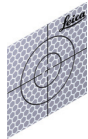
555 631	GPH1P	Single-prism precision reflector.
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14.4 Mini Reflectors



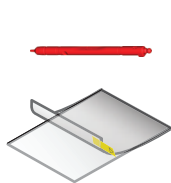
641 662	GMP101	Mini prism, incl. bubble, target plate and spike, in bag, also suitable for GLS11/GLS12 and GRT144 (same height as GPH1, additive constant +17.5mm).
641 762	GMP104	Mini prism, with L-bar, for fixed installations.

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.

14.6 Pen and Screen Protections 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.

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.
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 GVP721/722/723/725/728/729/735.
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.
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

16 Remote Control - CS20 Field Controller

16.1 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.

16.2 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).

17 Leica Captivate Software and Apps - CS20 Field Controller

17.1 Leica Captivate Software for CS20 Field Controller

827 698	Leica Captivate - Measure and Stake for CS20.
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17.2 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 • Orientation to Line • 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 • Rectangle
	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
	3rd party total station control: • Topcon total station control • Nikon total station control • SOKKIA total station control

17.3 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

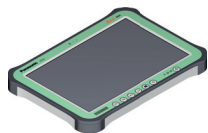
827 700	Measure to Plane / Grid
827 704	Check and Stake Road
827 705	Check and Stake Tunnel
827 706	Check and Stake Rail
827 711	Sets of Angles
827 703	Volume Calculation
827 708	Hidden Point
827 709	Traverse
827 712	QuickVolume
834 305	Auto Setup
839 679	Inspect Surfaces
836 670	Tunnel Profile Generator
834 301	Set Orientation
834 230	Remote Monitoring
846 827	TPS Survey Streaming
848 372	Inspect Road  Requires 839 679 Inspect surfaces.
848 374	Inspect Tunnel  Requires 839 679 Inspect surfaces.
850 623	ESRI Shapefile Exporter

17.4 Optional Licences for Leica Captivate for CS20 Field Controller

827 714	Active Assist
827 715	Leica Exchange
903 367	ConX 1y
903 369	ConX 2y
903 370	ConX 3y

18 CS35 Tablet

18.1 CS35 Tablet



875 363	CS35-1 EU RU	CS35-1 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 (4.2Ah), AC/DC adaptor and 8MP camera with flash.
875 364	CS35-2 US CA	CS35-2 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 (4.2Ah), AC/DC adaptor and 8MP camera with flash.
875 365	CS35-3 AUS NZ	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 (4.2Ah), AC/DC adaptor and 8MP camera with flash.

 All CS35 Tablets are delivered with stylus, tether, one GEB235 Lithium-Ion battery (10.8 V/4.1 Ah, rechargeable) and country specific AC/DC adaptor.

18.2 CTR35 Long-range Radio Device

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

19 Leica Captivate Software and Apps - CS35 Tablet

19.1 Leica Captivate Software for CS35 Tablet

827 719	Leica Captivate - Measure and Stake for CS35.
---------	---

19.2 Apps included in Leica Captivate for CS35 Tablet

 The following apps are included in Leica Captivate for CS35 (827 719).

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
- 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
	3rd party total station control: • Topcon total station control • Nikon total station control • SOKKIA total station control

19.3 Optional Applications for Leica Captivate for CS35 Tablet

 The following apps require a valid license key

827 722	Area Division
834 683	Athletics
834 691	Auto Setup
827 723	Stake DTM
827 720	Measure and Stake to Line
827 721	Measure to Plane / Grid
827 725	Check and Stake Road
827 726	Check and Stake Tunnel
827 727	Check and Stake Rail
827 730	Sets of Angles
827 724	Volume Calculation
827 728	Hidden Point
827 729	Traverse
827 731	QuickVolume
839 681	Inspect Surfaces
836 671	Tunnel Profile Generator
834 688	Set Orientation
848 371	Remote Monitoring
846 828	TPS Survey Streaming
848 373	Inspect Road  Requires 839 681 Inspect Surfaces.
848 375	Inspect Tunnel  Requires 839 681 Inspect Surfaces.
850 624	ESRI Shapefile Exporter

19.4 Optional Licences for Leica Captivate for CS35 Tablet

827 734	Leica Exchange
889 053	ADSK BIM360 Docs
889 056	ADSK BIM360 1y
903 363	ConX 1y
903 365	ConX 2y
903 366	ConX 3y

Accessories for Field Controller

20 Accessories for CS20 Field Controller

20.1 Internal Batteries



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



799 185	GKL311	Single-bay Charger Professional 3000. Charger for one Li-Ion battery (GEB211, GEB212, GEB221, GEB222, GEB241, GEB242, GEB331 and GEB361), including AC/DC adaptor and cigarette lighter cable.
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799 187	GKL341	Multi-bay Charger Professional 5000. Charges up to 4 batteries (GEB211, GEB212, GEB221, GEB222, GEB241, GEB242, GEB331 and GEB361), including power cable
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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.
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20.3 Memory Devices



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

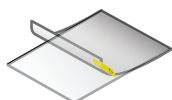


767 895	MCR7	Card reader for SD/CF cards.
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20.5 Pen and Screen Protections Foils



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.
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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.

20.6 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.
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20.7 Pole Accessories



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.

20.8 Utility Hook and Hand Strap



Utility hook

807 245	GHT68	Utility hook for CS20 field controller for attaching to belt or tripod.
845 832	GHT70	Holder for attaching a CS35 to a tripod with attached GHT78 tablet holder.

Hand strap

807 158	GHT67	Hand strap for CS20 field controller.
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21 Accessories for CS35 Tablet

21.1 Internal Batteries



832 119	GEB235	Lithium-Ion battery, 10.8 V/4.1 Ah, rechargeable, for CS35 Tablet.
832 120	GEB236	Lithium-Ion battery, 10.8 V/8.7 Ah, rechargeable, for CS35 Tablet.

 All CS35 Tablets are delivered with one GEB235 Lithium-Ion battery (10.8 V/4.1 Ah, rechargeable).

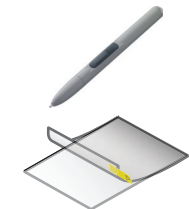
21.2 Battery Chargers



832 118	GKL235	Charger for CS35 batteries GEB235 and GEB236. Country specific AC/DC adaptor (GEV280-x) not included.
832 113	GEV280-1	AC/DC adaptor, EU. Power Supply for CS35 Tablet.
8321 14	GEV280-2	AC/DC adaptor, UK. Power Supply for CS35 Tablet.
832 115	GEV280-3	AC/DC adaptor, US. Power Supply for CS35 Tablet.
832 116	GEV280-4	AC/DC adaptor, AUS. Power Supply for CS35 Tablet.
832 117	GEV280-5	AC/DC adaptor, CH. Power Supply for CS35 Tablet.
842 648	GEV280-6	AC/DC adaptor, JP, Power Supply for CS35 Tablet.

 Country specific AC/DC adaptor (GEV280-x) is delivered with CS35 Tablet.

21.3 Pen and Screen Protection Foils



Pen

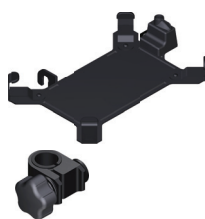
832 121	GDZ75	Digitiser Pen for CS35 Tablet.
851 539	GDZ76	Digitiser Pen for CS35 Tablet, MK4 models.
832 122	GHT77	Tether to tie GDZ75 Digitiser Pen to CS35 Tablet.

Screen Protection Foil set

832 126	SPF06	Screen protection foils for CS35 Tablet.
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 All CS35 Tablets are delivered with one GDZ75 Digitiser Pen and a GHT77 Tether.

21.4 Pole & Tripod Accessories



832 127	GHT78	Tablet holder for attaching a CS35 Tablet 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.
845 832	GHT70	Clamp arrangement for attaching the GHT66 and GHT78 to all tripods.

21.5 Hand Strap



833 343	GHT79	Hand strap for CS35 Tablet. Including 4 high corner guards.
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22 RadioHandles and TCPS Modems

22.1 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/CS35 or CS15 field controller equipped with CTR16/17 or external radio modem TCPS29/30 attached to PC. 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/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.

22.2 TCPS Modems



788 854	TCPS29	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.  Not available in EU countries due to EN 300 328 V.1.8.1.
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.

22.3 TCPS Accessories



734 163	GHT43	Adapter for mounting TCPS radio module on GST20/GST120 tripod.
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22.4 Cables for TCPS Radio Modems

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

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.

SmartPole & SmartStation

23 SmartStation & Smartpole Setup using a GS16 GNSS Receiver

23.1 GS16 GNSS Receiver



851 142	GS16	Leica GS16 Basic SmartAntenna *
843 496	GS16	Leica GS16 3.75G Basic SmartAntenna *
838 033	GS16	Leica GS16 3.75G Performance SmartAntenna
838 037	GS16	Leica GS16 3.75G Unlimited SmartAntenna
843 497	GS16	Leica GS16 3.75G & UHF Basic SmartAntenna *
838 034	GS16	Leica GS16 3.75G & UHF Performance SmartAntenna
838 035	GS16	Leica GS16 3.75G & UHF Performance SmartAntenna (NAFTA)
838 036	GS16	Leica GS16 3.75G & UHF Performance SmartAntenna (JP)
869 397	GS16	Leica GS16 3.75G & UHF900 Performance *
838 039	GS16	Leica GS16 3.75G & UHF Unlimited SmartAntenna

* Available in selected countries only.

	Leica GS16 Basic *	Leica GS16 Performance	Leica GS16 Unlimited
Supported GNSS Systems			
Multi-frequency (L2, L5, L-band)	○	●	●
GLONASS	○	○	●
Galileo	○	○	●
BeiDou	○	○	●
QZSS	○	○	●
RTK performance			
DGPS	○	●	●
RTK unlimited	○	●	●
Network RTK	○	●	●
SmartLink fill	○	○	●
SmartLink	○	○	○
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

23.2 SmartAntenna Adapter



767 802	GAD110	SmartAntenna adapter to mount GS15 and GS16 SmartAntenna. BT module to connect the TS to the GS15 and GS16 GNSS receiver is standard on all Leica Viva TPS and Leica Nova instruments.
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Please refer to the Leica Viva GNSS Equipment list for GS16 related options and accessories.

24 SmartPole using GS18 GNSS Receiver

24.1 GS18 I GNSS Receiver



864 379	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
864 382	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)
864 386	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 (L2, L5, L-band)	○	●	●
GLONASS	○	○	●
Galileo	○	○	●
BeiDou	○	○	●
QZSS	○	○	●
RTK performance			
DGPS	○	●	●
RTK unlimited	○	●	●
Network RTK	○	●	●
SmartLink fill	○	○	●
SmartLink	○	○	○
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

24.2 GS18 T GNSS Receiver



855 299	GS18	Leica GS18 T LTE Basic SmartAntenna *
855 300	GS18	Leica GS18 T LTE Performance SmartAntenna
855 301	GS18	Leica GS18 T LTE Unlimited SmartAntenna
855 302	GS18	Leica GS18 T LTE & UHF Basic 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)
855 305	GS18	Leica GS18 T LTE & UHF Unlimited SmartAntenna

* Available in selected countries only.

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

● Standard

○ Optional

Care Packages

25 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

26 Trademarks

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27 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, ATRplus and PowerSearch):

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



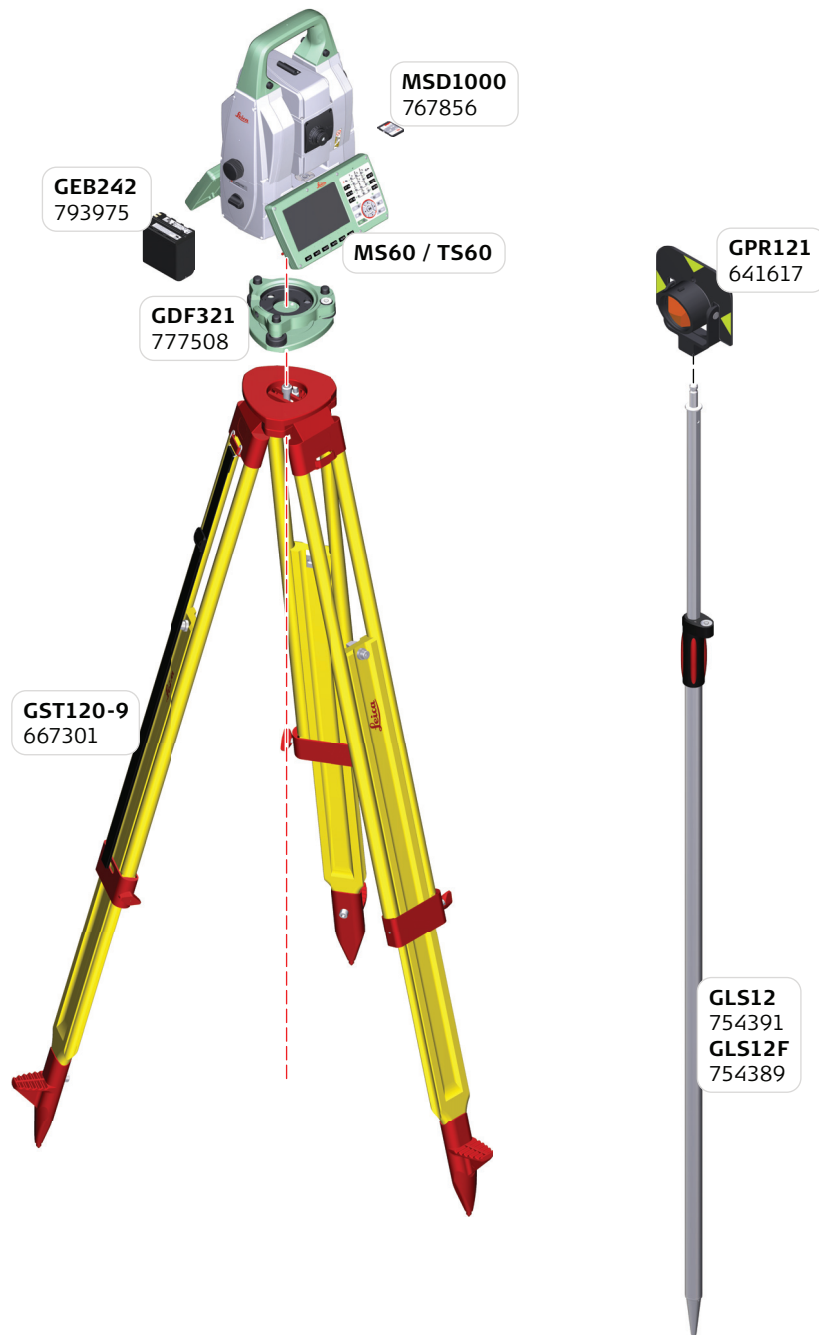
Suggested Equipment Setups

28 Scanning using a MultiStation

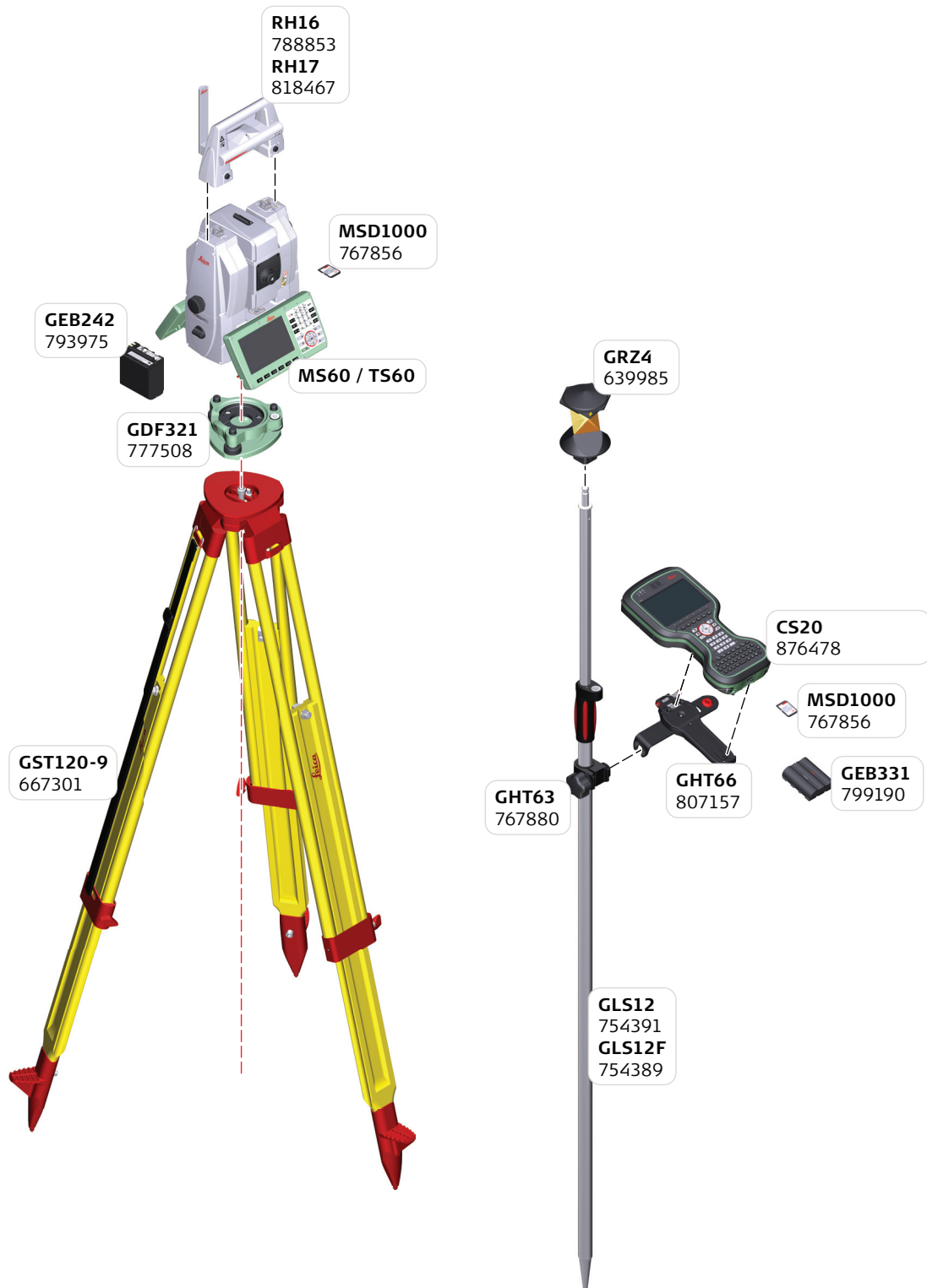


29 Conventional Surveying

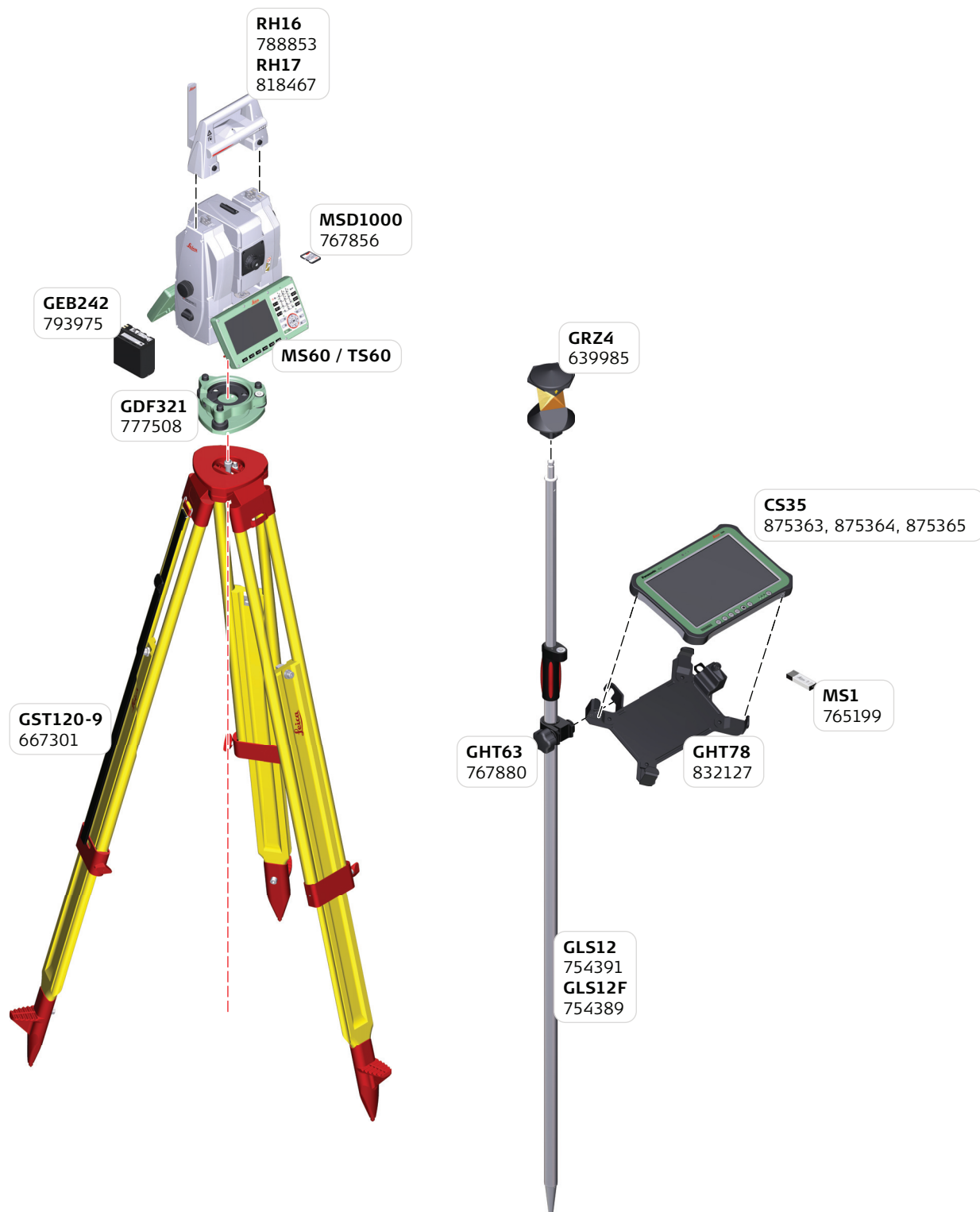
29.1 Two Person Surveying using a Leica Nova TPS



29.2 Robotic Surveying using a Leica Nova TPS and CS20 Field Controller

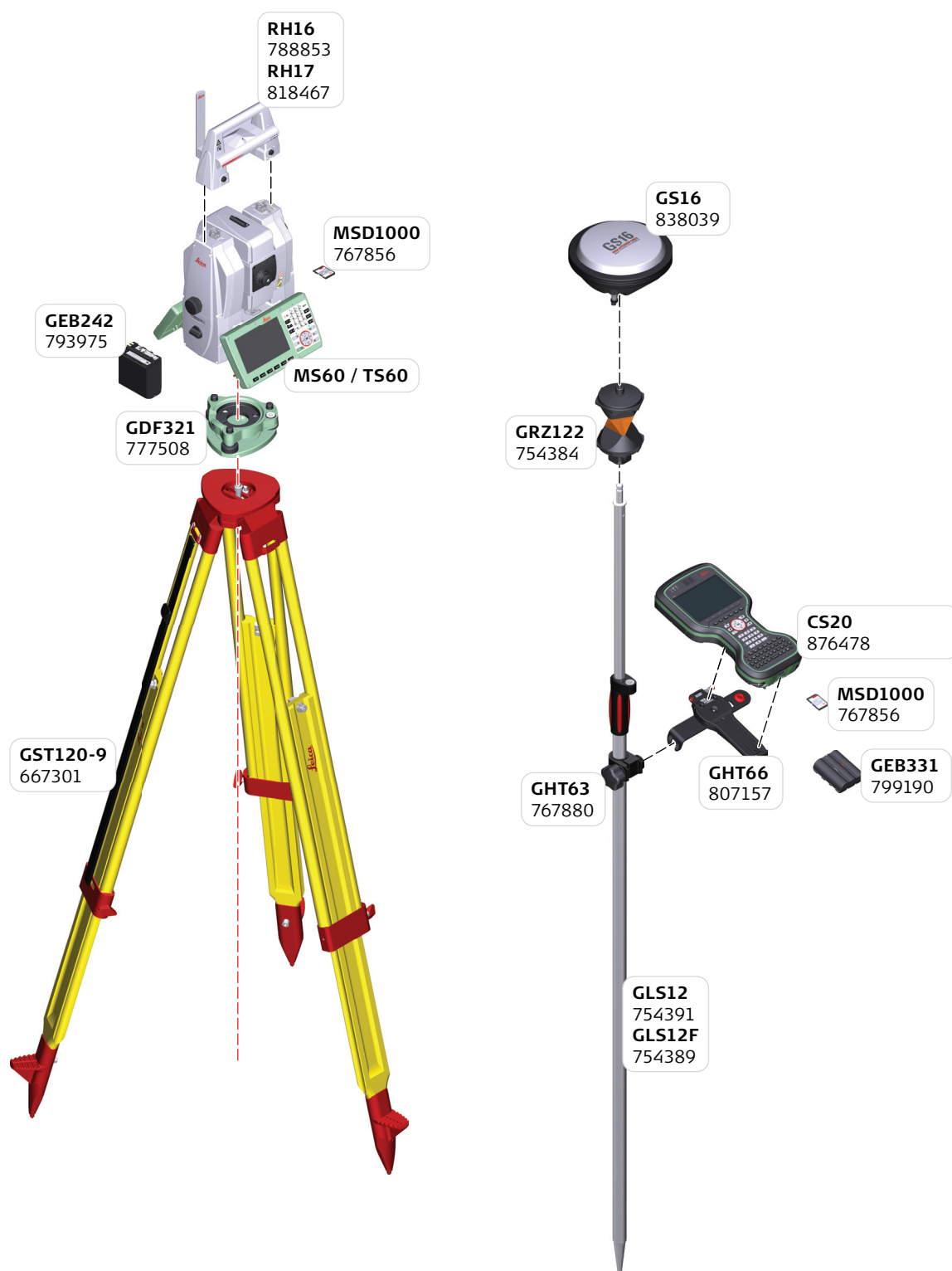


29.3 Robotic Surveying using a Leica Nova TPS and CS35 Tablet



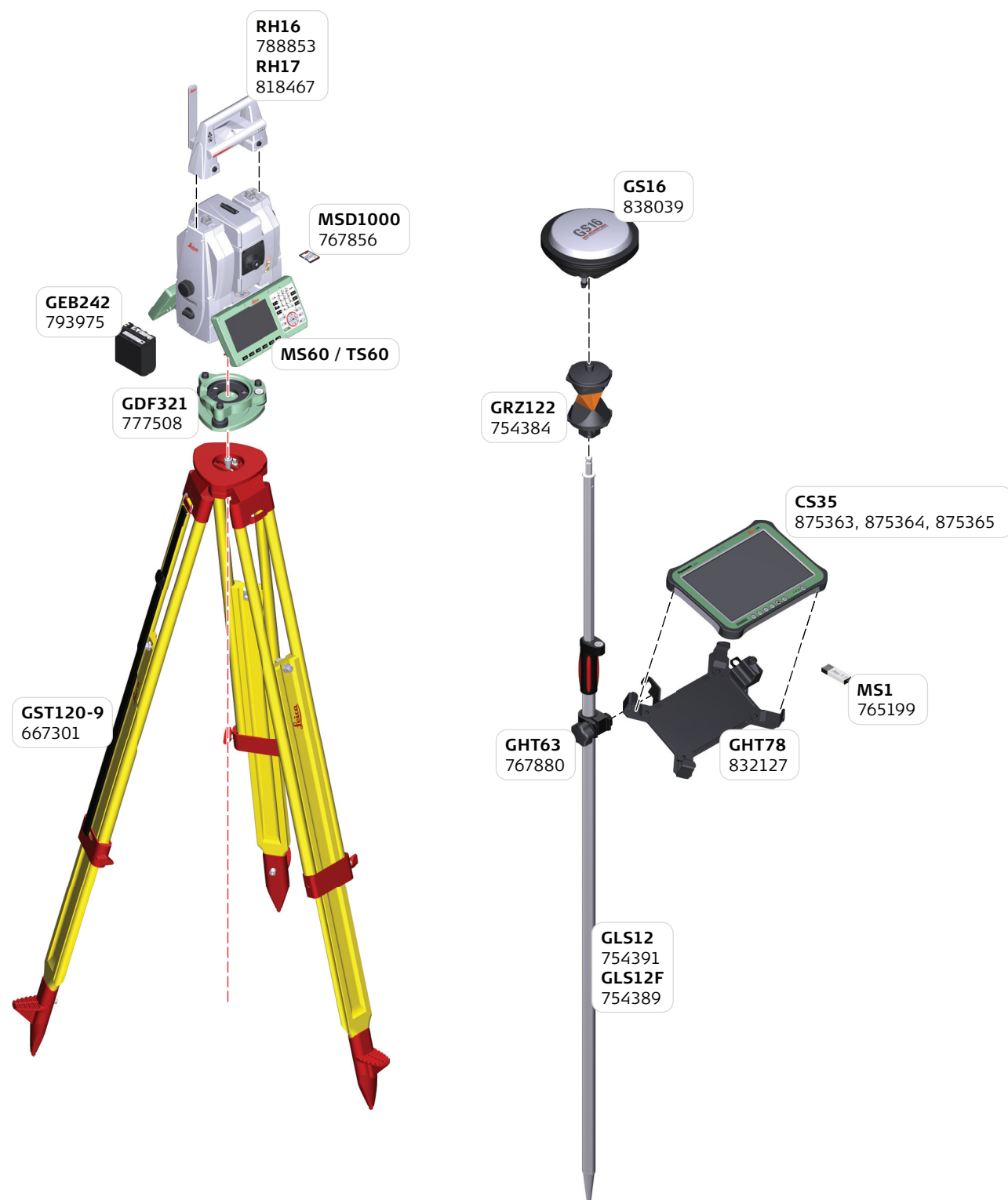
30 SmartPole Surveying

30.1 SmartPole using the GS16 GNSS Receiver and CS20 Field Controller



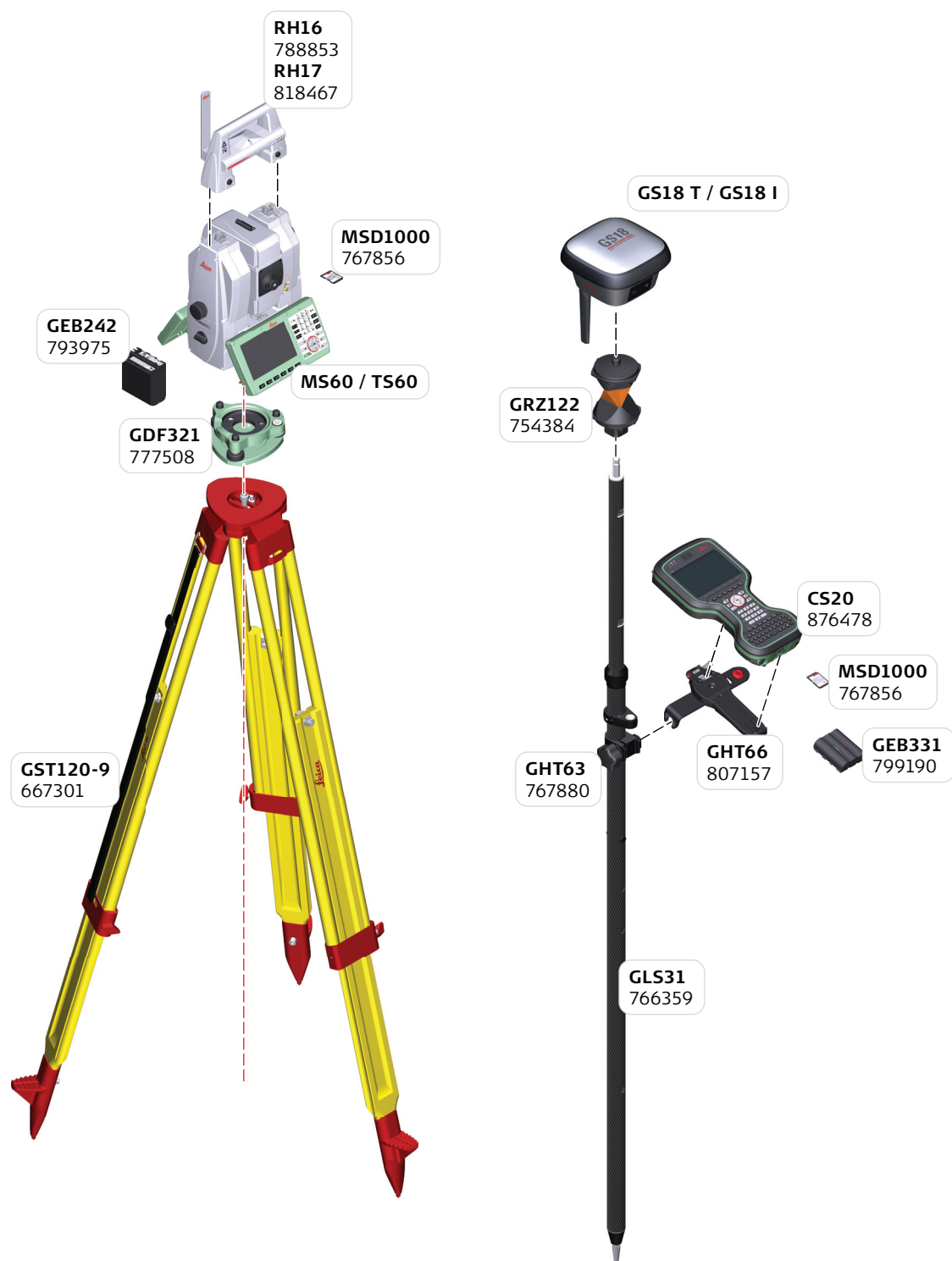
For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipment.

30.2 SmartPole using the GS16 GNSS Receiver and CS35 Tablet



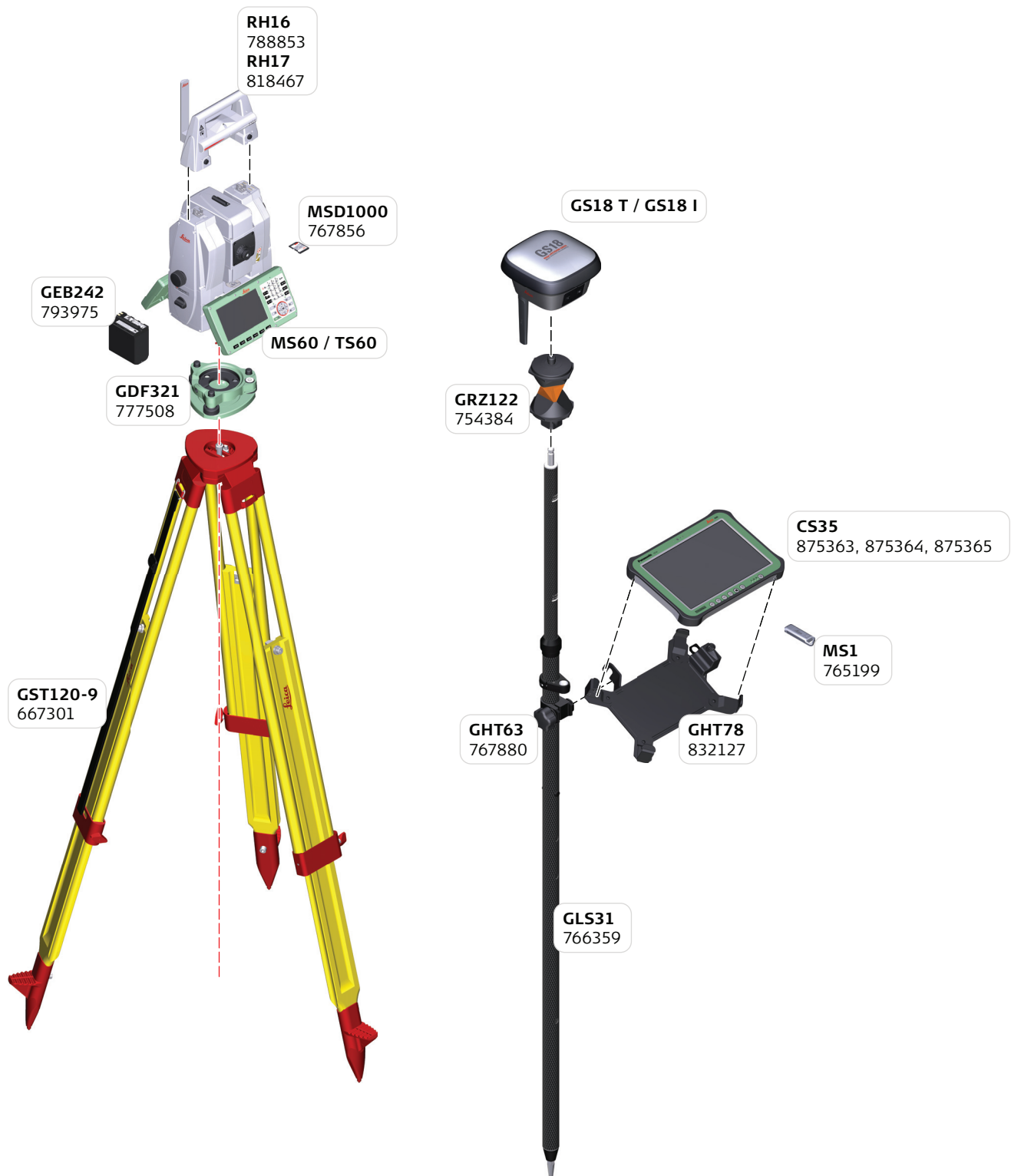
For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipment.

30.3 SmartPole using the GS18 GNSS Receiver and CS20 Field Controller



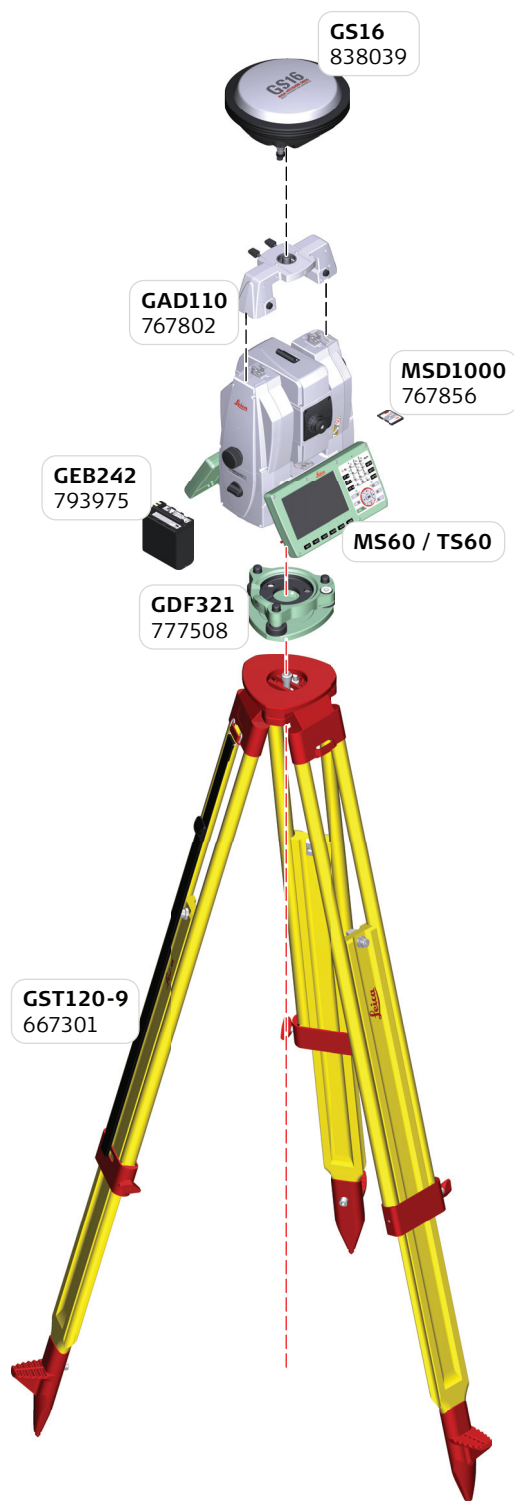
☞ For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipment.

30.4 SmartPole using the GS18 GNSS Receiver and CS35 Tablet



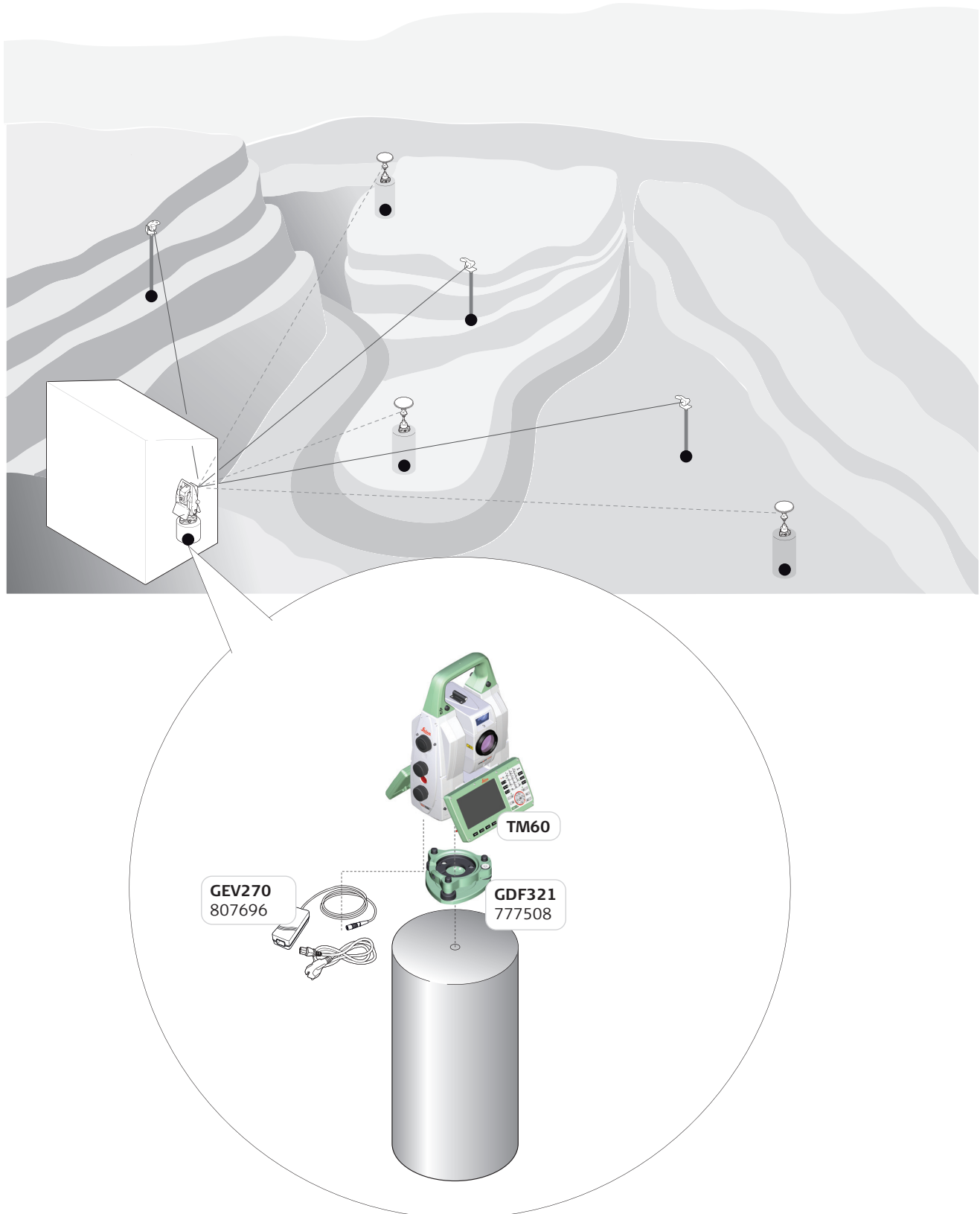
For GNSS antenna configuration (RTK Antennas and Modems / Radios) and GNSS accessories refer to Leica Captivate GNSS Equipment.

31 SmartStation using the GS16 GNSS Receiver



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

32 Monitoring



Revolutionising the world of measurement and survey for nearly 200 years, Leica Geosystems creates complete solutions for professionals across the planet. Known for premium products and innovative solution development, professionals in a diverse mix of industries, such as surveying and engineering, safety and security, building and construction, and power and plant, trust Leica Geosystems to capture, analyse and present smart geospatial data. With the highest-quality instruments, sophisticated software and trusted services, Leica Geosystems delivers value every day to those shaping the future of our world.

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