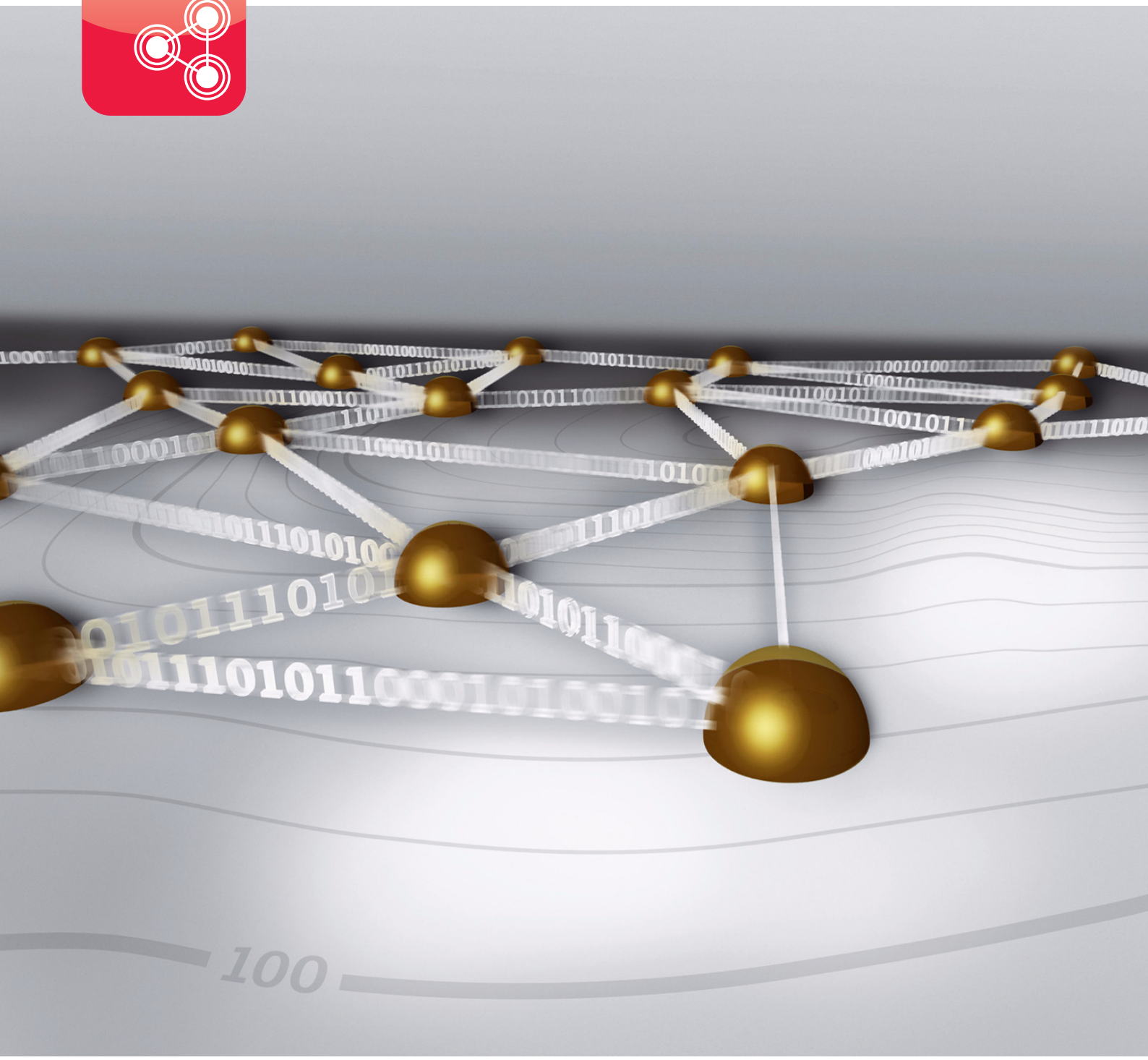
Leica GNSS Networks and Reference Stations

Equipment List

Leica Reference Networks



- when it has to be **right**

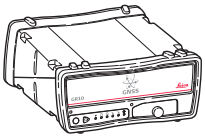
Leica Geosystems

Table of Contents

GNSS Receivers

1 GR10 GNSS Receiver

1.1 GR10 Receivers



774 409	**GR10 Basic**	L1/L2 GPS reference receiver, 1Hz logging and streaming, 120 channels, external oscillator input and ethernet connectivity. Includes L2C/L2P tracking in parallel.
777 848	**GR10 Performance**	L1/L2 GPS reference receiver, 1Hz logging and streaming, 120 channels, external oscillator input and ethernet connectivity. Includes L2C/L2P tracking in parallel. Includes as standard the RINEX, FTP Push and Multi-Client options.
778 849	**GR10 Professional**	L1/L2/L5 GPS/GLONASS/Galileo reference receiver, 1Hz logging and streaming, 120 channels, external oscillator input and ethernet connectivity. Includes L2C/L2P tracking in parallel. Includes as standard the RINEX, FTP Push, Multi-Client, GPS L5, GLONASS and Galileo options.

	GR10 Basic	GR10 Performance	GR10 Professional
Supported GNSS Systems			
GPS L1 & L2 (including L2C)	●	●	●
GPS L5	○	○	●
GLONASS L1 & L2	○	○	●
Galileo E1/E5a/E5b/AltBoC	○	○	●
Position update & data recording			
1Hz logging and streaming	●	●	●
2-20Hz logging and streaming	○	○	○
50Hz logging and streaming	○	○	○
RINEX logging	○	●	●
Additional features			
FTP Push	○	●	●
Extended Formats	○	○	○
Multi-Clients	○	●	●
Wake Up	○	○	○

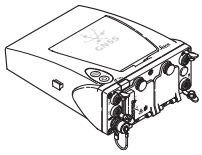
● Standard
○ Optional

1.2 Purchasable Options for GR10

774 411	**GRL100**	GPS_L5 option for the GR GNSS receiver.
774 422	**GRL101**	GLONASS_L1+L2 option for GR GNSS receiver.
774 424	**GRL103**	Galileo_L1_E5ab_AltBOC option for GR GNSS receiver.
774 428	**GRL107**	RINEX option for GR GNSS receiver.
774 432	**GRL111**	FTP Push option for GR GNSS receiver.
774 429	**GRL108**	Extended Formats option for GR GNSS receiver. Includes BINEX / CMR / CMR+
774 430	**GRL109**	2-20Hz logging and streaming option for GR GNSS receiver.
774 431	**GRL110**	50Hz logging and streaming option for GR GNSS receiver. ☞ Requires GRL109.
774 436	**GRL115**	Multi-Client option for GR GNSS receiver.
778 851	**GRL116**	Wake-Up option for GR GNSS receiver.

2 GRX1200+ Series

2.1 GRX1200+ Receivers



766 730	**GRX1200+**	Triple frequency GPS reference receiver, professional, with event input, PPS output, external oscillator input and ethernet connectivity. Includes L2C. ☞ Requires separate software option for full time GPS L5.
766 733	**GRX1200+ GNSS**	GPS/GLONASS/Galileo triple frequency reference station receiver, professional, with event input, PPS output, extern. oscillator input and ethernet connectivity. Includes L2C. ☞ Requires separate software options for full time GPS L5/GLONASS and Galileo.

2.2 Purchasable Options for GRX1200+

751 225	**GSW567**	GLONASS option for GRX1200 GG Pro and GRX1200+ GNSS receiver. Without the GLONASS option, GLONASS is only enabled on Wednesdays.
766 734	**GSW684**	Galileo option for the GRX1200+ GNSS receiver.
768 855	**GSW707**	GPS L5 option for the GRX1200+ GNSS and GRX1200+ receiver.
6002845		Multi-GNSS Signal Bundle for the GRX1200+ GNSS receiver, consists of GLONASS option, Galileo option and the GPS L5 option.
752 215	**GSW578**	FTP Push and RINEX option for GRX1200 Pro Series and GRX1200+ Series. For onboard RINEX conversion and scheduled FTP Push of raw data and RINEX files.
752 216	**GSW579**	Campaign option for GRX1200 Series. Static raw data logging can be configured and started in the field with the CS09 controller. Without this option, the GRX web interface or GNSS Spider are needed for raw data logging.
755 277	**GSW601**	RTK Multiplexer Option GRX1200 Pro Series and GRX1200+ Series. Allows up to 10 rover connections from the LAN/WAN to an RTK Stream from a single sensor NET port. Without this option only one rover at a time can connect to a sensor NET port transmitting RTK corrections.

The receivers types GX1210, GX1220, GX1230 require the following firmware option for operation with GNSS Spider:

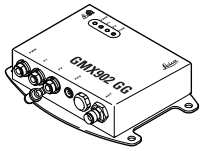
737 643	**GSW421**	GPS1200 extended OWI/LB2 remote control: Allows full sensor steering and communication via OWI/LB2 commands.

2.3 Receiver Conversion for GRX1200+

758 420	**GSW619**	Receiver Upgrade from GRX1200 Pro to GRX1200 GG Pro incl. permanent GLONASS functionality. ☞ This option is only available for GRX1200 Pro receivers with serial numbers between 355001 and 360000. No upgrade from GRX1200 Pro to GRX1200 GG Pro is available for receivers outside of this range of serial numbers. For all GRX1200 Pro and GRX1200 GG Pro receivers an upgrade to GRX1200+ is possible and needs to be done by service..
766 735	**GSW685**	Receiver Upgrade from GRX1200+ to GRX1200+ GNSS. ☞ For full time GLONASS, Galileo and GPS L5 functionality, the respective software options need to be ordered additionally. ☞ Upgrades for non GRX1200+ receivers (i.e. GRX1200 Pro, GRX1200 GG Pro) to GRX1200+ GNSS receivers need to be done by service.

3 GMX900 Series

3.1 GMX901 and GMX902 Receivers



773 974	**GMX902 GNSS**	GPS/GLONASS/Galileo multi frequency receiver
758 600	**GMX902 GG**	GPS/GLONASS dual frequency receiver
755 231	**GMX901**	GPS single frequency smart antenna

3.2 Extended Warranty for GMX900 Receivers

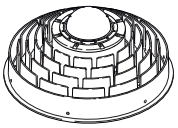
GMX902 GG and GMX902 GNSS	
89332	1 year extended warranty for GMX902 GG/GNSS.
5301720	2 year extended warranty for GMX902 GG/GNSS
5301721	Additional 1 year GMX902 GG/GNSS Warranty Extension
GMX901	
5301722	1 year extended warranty for GMX901
5301723	2 year extended warranty for GMX901
5301724	Additional 1 year GMX901 Warranty Extension

GNSS Antennas and Antenna Cables

Select the antenna for the receiver. All antennas have a 5/8" thread. For set-ups on carriers with stub, a screw-to-stub adapter is needed for the antenna.

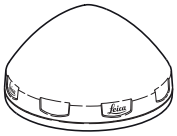
4 GNSS Antennas

4.1 Choke Ring Geodetic Reference Station Antenna



765 733	**AR25**	GNSS choke ring antenna for GPS/GLONASS/Galileo/Compass receivers. Includes Galileo E6 and L-Band signals. Dorne-Margolin antenna element.
765 734	**GVP653**	Weather-protection radome for AR25 GNSS choke ring antenna.

4.2 Geodetic Reference Station Antenna



773 758	**AR10**	GNSS reference station antenna for GPS/GLONASS/Galileo/Compass receivers. Includes Galileo E6 and L-Band signals. Built-in ground plane and integrated radome..

4.3 Compact Geodetic Antenna

770 701	**AS10**	GPS/GLONASS/Galileo triple frequency surveying antenna.

4.4 Screw-to-Stub Adapter for GNSS Antennas

667 217	**GAD31**	Screw-to-stub adapter for fitting GPS antenna on carriers with stub and poles with stub.

4.5 Extended Warranty for Antennas

AR10	
5303389	1 yr AR10 Extended Warranty
5303390	2 yr AR10 Extended Warranty
5303391	Additional 1 yr AR10 Extended Warranty
AR25	
5302680	1 yr AR25 Extended Warranty
5302681	2 yr AR25 Extended Warranty
5302682	Additional 1 yr AR25 Extended Warranty

5 Antenna Cables

Short cables		
667 200	**GEV141**	1.2m antenna cable.
667 201	**GEV142**	1.6m extension for antenna cable.
724 969	**GEV194**	1.8m antenna cable.
Medium cables		
636 959	**GEV120**	2.8m antenna cable.
632 372	**GEV119**	10m antenna cable.
Extra Long cables		
632 390	**GEV108**	30m antenna cable.
664 813	**GEV134**	50m antenna cable.
713 483		70m antenna cable.

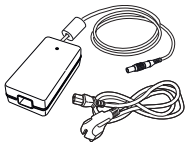
6 Antenna calibration service

For any antenna	
5002610	Antenna calibration service (GPS only).
5002611	Antenna calibration service (GPS+GLONASS).

Power Supply, Data Logging and Transfer

7 Power Supply Equipment

7.1 Mains Power Supply



Power supply for GR10, GRX1200+, GMX902		
774 437	**GEV242**	Power supply for GR10 receiver, for indoor use only, input 100V-240VAC 50-60HZ, output 24VDC, cable with 5-pin Lemo to connect to receiver. Standard mains/line cable select from following list.
722 409		Power supply unit for GRX1200+, GR10 or GMX902 receiver, for indoor use only, input 100V-240VAC 50-60HZ, output 12VDC, cable with 5-pin Lemo to connect to receiver. Standard mains/line cable select from following list.
Power cords for power supply unit 774 437 and 722 409		
731 772		1.5m power cable. Allows receiver to be externally powered via the power jack. **Usable in the US.**
731 773		1.5m power cable. Allows receiver to be externally powered via the power jack. **Usable in the EU.**
734 232		1.5m power cable. Allows receiver to be externally powered via the power jack. **Usable in the UK.**
734 233		1.5m power cable. Allows receiver to be externally powered via the power jack. **Usable in Australia.**
738 586		1.5m power cable. Allows receiver to be externally powered via the power jack. **Usable in Switzerland.**

7.2 Power Cables

Cables to connect battery, car battery or alternate power supply		
722 411		Cable with protection fuse to connect 12V power source to GRX1200+, GR10 or GMX902 receiver. Open ended to Lemo-1, 5 pin, male.
439 038	**GEV71**	4m car battery cable, connects battery cables Lemo-1, 5 pin, female to 12V car battery. ☞ GRX1200+, GR10 and GMX902 receivers require 560 130 in addition.
560 130	**GEV97**	Power cable, 1.8m, connects GRX1200+ or GR10 receiver to external GEB171 battery. Lemo-1, 5 pin, male to Lemo-1, 5 pin, male.
636 972		0.5m cable, connects external battery GEB171 to GRX1200+, GR10 or GMX902 receiver. Lemo-1, 5 pin, male to Lemo-1, 5 pin, male.
Y-cable to connect two power supplies		
733 298	**GEV172**	Power cable, 2.8m, connects GRX1200+ or GR10 receiver to 2 external GEB171 batteries or two 722409 power supplies. ☞ For GR10 this cable should only be used to connect any combination of 722 409 power supply or external batteries. To connect one 774 437 power supply, use the 774 438 Y cable.
774 438	**GEV243**	Y Cable, 2.8m, connects GR10 to 774 437 GR10 power supply and external battery. One Lemo-1, 5 pin male connector, two Lemo-1,5 pin female connectors or 722 409 power supply.

8 Data Storage and Data Transfer

Select the data recording medium. The normal medium is SD card for the GR10 and CF card for the GRX1200+ series. At least one memory card is needed for each receiver.

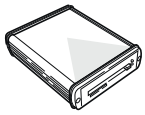
For direct data transfer from SD or CF cards, use the card slot available on many PCs. If no card slot is fitted, a card reader will be needed.

8.1 Memory Devices

SD Cards		
767 856	**MSD1000**	SD memory card 1GB for GR10 receiver.
776 232	**MSD04**	SD memory card 4GB for GR10 receiver.

CF Cards		
733 257	**MCF256**	CompactFlash card 256MB for GRX1200+ receiver.
745 995	**MCF1000**	CompactFlash card 1GB for GRX1200+ receiver.
772 567	**MCF8000**	CompactFlash card 8GB for GRX1200+ receiver.

8.2 Card Reader



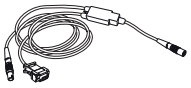
767 895	**MCR7**	Card reader for SD/CF cards.

8.3 Data Transfer Cables

Essential cables, at least one should be ordered for each GNSS receiver

Serial cables		
733 280	**GEV160**	Serial data transfer cable, 2.8m, connects GRX1200+, GR10, GMX902 or CS09 to PC for data transfer, firmware upload etc. Lemo 8 to 9 pin RS232 serial connector.
733 282	**GEV162**	Serial data transfer cable, 2.8m, connects GRX1200+ receiver RX Controller Port to PC for data transfer, firmware upload etc. Lemo to 9 pin RS232 serial connector.

Modem cables		
563 809	**GEV113**	2.8m Modem cable. Connects GRX1200+ receiver Ports 1, 2 and 3, GR10 or GMX902 to modem (Lemo 8 pin to 9 pin RS232 male serial connector).
Network cable		
733 290	**GEV168**	5.0m network cable. Connects GRX1200+ or GR10 receiver with Ethernet LAN / RJ45 (ruggedised connector to GNSS receiver).



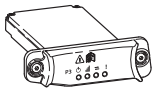
Antenna communication cables		
750 073	**GEV212**	Interface Cable, 5m, GMX901 to unterminated, connects GMX901 to a custom installation.

RTK/DGPS Modems and Antennas

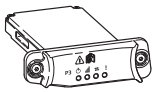
Use a suitable radio. The choice of radio may depend on radios used at rover units. Set up the radio antenna as high as possible.

9 Slot-in Devices

For use with GR10 for transmitting RTK or DGPS corrections.



Satelline radio modules		
776 233	**SLR1-2**	Satelline TA11 403-470 MHz TXO radio. RTK transmitting only UHF radio module to be easily plugged into the GR10 receiver.
6002544		Configuration tool kit for programming Satelline 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.



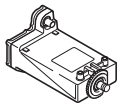
Mobile phone modules		
776 236	**SLG1-2**	5-Band (850/900/1800/1900/2100 Mhz) Telit 3G GSM/GPRS/UMTS module. Provides full flexibilty due to 5-band technology, supports all GSM, GPRS, EDGE and UMTS network providers. Can easily plugged into the GR10 receiver.

External high power radios such as Satelline Epic Pro (10, 35W), Pacific Crest (2, 35W) or GFU radios can be used for RTK communication instead of the slot-in RTK modems.

10 External Serial Devices

For use with GRX1200+ or GR10 for transmitting RTK or DGPS corrections. To connect a GFU device to GR10 requires the 733 288 cable.

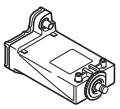
10.1 Satelline Radio Modems



Satelline modems		
733 275	**GFU14-0**	Satelline 3AS radio modem (433.525MHz, 25.0kHz channel spacing, 0.5W) already intergrated into housing, fits on side of GRX1200+ receiver.
733 276	**GFU14-1**	Satelline 3AS radio modem (406.425MHz, 25.0kHz channel spacing, 1.0W) already intergrated into housing, fits on side of GRX1200+ receiver.
738 272	**GFU14-2**	Satelline 3AS radio modem (445.000MHz, 12.5kHz channel spacing, 1.0W) already intergrated into housing, fits on side of GRX1200+ receiver.
738 273	**GFU14-3**	Satelline 3AS radio modem (443.000MHz, 12.5kHz channel spacing, 1.0W) already intergrated into housing, fits on side of GRX1200+ receiver.
738 274	**GFU14-4**	Satelline 3AS radio modem (440.550MHz, 25.0kHz channel spacing, 0.5W) already intergrated into housing, fits on side of GRX1200+ receiver.
738 275	**GFU14-5**	Satelline 3AS radio modem (458.150MHz, 12.5kHz channel spacing, 1.0W) already intergrated into housing, fits on side of GRX1200+ receiver.
738 276	**GFU14-6**	Satelline 3AS radio modem (439.8625MHz, 12.5kHz channel spacing, 1.0W) already intergrated into housing, fits on side of GRX1200+ receiver.
753 928	**GFU14-7**	Satelline 3AS radio modem (464.5000MHz, 25.0kHz channel spacing, 1.0W) already intergrated into housing, fits on side of GRX1200+ receiver.
756 623	**GFU14-8**	Satelline 3AS radio modem (458.6000MHz, 25.0kHz channel spacing, 0.5W) already intergrated into housing, fits on side of GRX1200+ receiver.
Cables for Satelline modems		
639 968	**GEV125**	1.8m, 15 pin RS232 to 8 pin LEMO. Cable for Satelline radios without GFU housing to be connected to GNSS receiver.

10.2 Pacific Crest Radio Modems

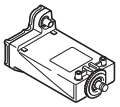
Pacific Crest radio modems must be ordered directly from your local Pacific Crest office or representative.



PDL receive only modems built into the Leica GFU radio housing with 12.5 or 25kHz channel spacing within the following frequency bands are available:

- 410 - 430MHz
- 430 - 450MHz
- 450 - 470MHz
- 223 - 235MHz

10.3 Mobile Phones



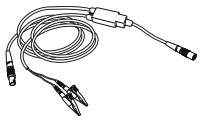
750 242	**GFU24**	Housing with Siemens MC75 GSM/GPRS module (Quad-Band GSM 850/900/1800/1900MHz), fits on side of GRX1200+ receiver.
750 243	**GFU25**	CDMA cellular phone for Canada, Multitech MTMMC-C-N12 for Bell mobility network, integrated into housing, fits on side of GRX1200+ receiver.
744 754	**GFU19**	US CDMA cellular phone Multitech MTMMC-C-N3 for Verizon network, integrated into housing, fits on side of GRX1200+ receiver.

11 External RTK Antennas

11.1 External RTK Antennas

Gainflex radio antennas		
639 964	**GAT1**	Gainflex radio antenna (frequence range 400-435MHz).
667 243	**GAT2**	Gainflex radio antenna (frequence range 435-470MHz).
Antennas for mobiles phones		
667 237	**GAT3**	Antenna for 900/1800MHz mobile network.
734 756	**GAT5**	Antenna for US mobile network (850/1900MHz).

11.2 External RTK Antenna Cables



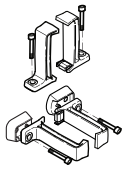
Cables for connecting Radio Modem to Gainflex Radio Antenna		
667 200	**GEV141**	1.2m antenna cable.
636 959	**GEV120**	2.8m antenna cable.
632 372	**GEV119**	10m antenna cable.
667 201	**GEV142**	1.6m extension for antenna cable.
Special cables for external radios		
762 026	**GEV221**	Y-cable, connects Satelline 3AS Epic Pro (10W) to GRX1200+ receiver and 12V car battery.
733 297	**GEV171**	1.8m Y-cable to program the Satelline 3AS radio modem inside the GFU14 housing.
GFU Connection cable		
733 288	**GEV167**	0.5m, connects System 500 GFU housing to GRX1200+ receiver.
767 897	**GEV232**	Length 2.8 m, Allows Sytem1200 GFU housings to be connected to a GRX1200+ or GR10 receiver.
767 898	**GEV233**	Length 0.8 m, Allows Sytem1200 GFU housings to be connected to a GRX1200+ or GR10 receiver.
Modem cables		
563 809		2.8m Modem cable. Connects GRX1200+ receiver Ports 1, 2 and 3 or GR10, to modem (Lemo 8 Pin to RS232 9 Pin male).
736 915	**GEV191**	2.8m Modem cable. Connects GRX1200+ receiver RX Controller Port to modem (Lemo 8 Pin to RS232 9 Pin male).

11.3 Accessories to Set-up Gainflex Radio Antenna on Telescopic Rod

667 228	**GAD32**	Telescopic rod with 5/8" screw. Fits in base 667 236 and minipack 667 137.
667 220	**GAD34**	Arm 3cm long, screws on telescopic rod. Gainflex antenna fits on arm. Antenna cable connects to arm.
667 236	**GHT36**	Base with 5/8" screw, for setting up telescopic rod on tripod.
734 388	**GAD46**	Double arm adapter, screws on telescopic rod. Allows to connect up to 2 mobile phone/radio antennas and up to 2 antenna cables on arm.
779 108	**GEV246**	Wall mounting bracket. Fits antenna cable to Gainflex antenna.

Accessories for Permanent Installations

12 Holder and Mounting Kits for GR10 and GRX1200+



Holder for fixed mounting of GRX1200+ receiver		
742 005	**GHT53**	Holder for GRX1200+ receiver. For attaching the receiver to wall bench, table. etc..
Mounting kits for GR10 receiver		
774 439	**GEV249**	Rack Mount Kit for GR10 receiver. For fitting the receiver to standard IT rack (requires 2 U in the rack).
774 440	**GEV250**	Wall Mount Kit for GR10 receiver. For attaching the receiver to a wall bench, table or cabinet.
Adjustable Tilt Monument Mount		
2072-33	**SECO 2072-33**	**Adjustable Tilt Monument Mount.** Stainless steel adapter with brass 5/8 x 11 adapted. Can be levelled by three adjusting screws with a tilt range of +/- 7 degrees. Adjustable in azimuth to permit orientation of the antenna to north. ☞ This is a third party product of SECO Manufacturing Company Incorporated.

13 Cables for PPS Output, Event Input, External Frequency Input

667 744	**GEV150**	PPS output cable for GRX1200+ or GMX902 receiver, 2m long, connects the receiver time mark output to another device with BNC connector.
403 448	**GEV42**	2m cable, connects GRX1200+ receiver event input to another device with BNC connector.
733 293	**GEV169**	2m cable, connects GRX1200+ or GR10 receiver with External Oscillator device.

14 External Devices and Accessories

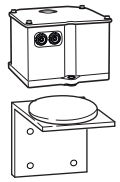
External meteo and tilt sensors can be connected to the GRX1200+ and GR10 receivers for various reference station and monitoring applications.

☞ Please contact your local Leica Geosystems dealer for recommended third party devices and accessories.

14.1 Meteorology Sensor

		Third party metrology sensor for temperature, pressure and humidity with cable to GNSS receiver on request. Information on supported meteo sensors is available from Leica Geosystems.

14.2 Tilt Sensor

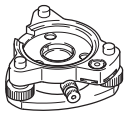


576 198	**NIVEL210**	Inclination sensor with RS232 interface.
749 916	**GEV209**	Cable, connects NIVEL210 to GRX1200+, GR10, 1.8m.
749 031	**GHT59**	Wall mounting kit for NIVEL200 series. Refer to the Structural Monitoring Equipment List for further Nivel accessories.
		Third party tilt sensor with cable to GRX1200+. Information on supported tilt sensors is available on request.

Accessories for Campaign Use

15 Mounting for Campaign Use

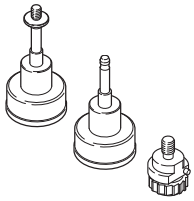
15.1 Tribrachs for Mounting GNSS Antennas



667 304	**GDF121**	Tribrach, without optical plummet, pale green.
667 307	**GDF122**	Tribrach, with optical plummet, pale green.
667 308	**GDF112**	Tribrach, with optical plummet, pale green/red.

☞ Tribrach with optical plummet is needed for GRT144 and GRT146 carriers. Tribrach without optical plummet is needed for SNLL laser plummet carrier.

15.2 Carriers for Mounting GNSS Antennas



Carriers with 5/8" screw		
667 216	**GRT146**	Carrier with 5/8" screw, GNSS antenna screws on directly.
Carriers with stub		
667 313	**GRT144**	Carrier with stub, pale green.
667 217	**GAD31**	Screw-to-stub adapter for fitting GPS antenna on carriers with stub and poles with stub.
SNLL Carriers		
667 216	**SNLL121**	Sensor nadir laser plummet, pale green, with user manual.

☞ The GRT146 carrier has a 5/8" screw. The GNSS antenna screws on directly.
The GRT144 and SNLL carriers have a stub fitting. The GNSS antenna must be fitted with a screw-to-stub adapter for setting-up on these carriers.

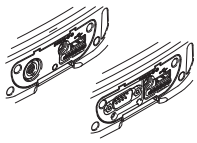
16 GNSS/GIS Field Controller for Campaign Use

Display and keyboard for GNSS receiver. Typically not needed for receiver connected to PC with GNSS Spider Software or receiver with web interface (GRX1200+ and GR10) connected to LAN.

16.1 GNSS/GIS Field Controller for GR10

Field Controller		
771 874	**CS10 GIS Field Controller**	**CS10 GIS Field Controller.** Ruggedized WinCE GNSS/GIS Handheld including: 1GB NAND Flash Memory, 512MB SDRAM, Bluetooth, Numeric keypad, Charging Cable, Stylus.
771 877	**CS15 GIS Field Controller**	**CS15 GIS Field Controller.** Ruggedized WinCE handheld including: 1GB NAND Flash Memory, 512MB SDRAM, Bluetooth, QWERTY keypad, Charging Cable, Stylus.
Extra pen		
767 876	**GDZ68**	Extra pen with screw driver for CS10 and CS15 field controller.
Anti-glare display foils		
767 907	**SPF01**	Anti-glare display foils for CS10 and CS15 field controller.

16.2 Connector Modules for CS10/CS15 Field Controller

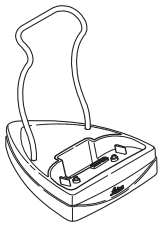


767 874	**CBC01**	Lemo connector module with power jack, Lemo (USB and Serial) and USB A host for CS10 and CS15 field controller. ☞ Can only be ordered with CS10/CS15 field controller.
767 875	**CBC02**	DSUB connector module with power jack, DSUB 9-pin, USB A host and USB mini AB for CS10 and CS15 field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

16.3 Internal Batteries for CS10/CS15 Field Controller

733 269	**GEB211**	Lithium-Ion battery, 7.4V/2.2Ah, rechargeable. To be used with CS10/CS15 field controller or GS15 receiver.
772 806	**GEB212**	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS10/CS15 field controller or GS15 receiver.

16.4 Docking Station for CS10/CS15 Field Controller



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).

16.5 Additional Power Accessories for CS10/CS15 Field Controller

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.

17 CS09 Field Controller for Campaign Use

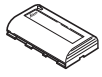
17.1 CS09 Field Controller for GRX1200+

Field Controller		
769 647	**CS09**	WinCE CS09 Controller with colour display, touch screen, CF card slot, alphanumeric key board, stylus for touch screen and user manual.

17.2 Data Transfer Cables for CS09 Field Controller

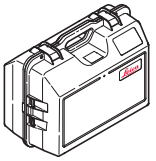
767 895	**GEV163**	1.8m controller cable connecting CS09 field controller to all System 1200 receivers.
733 258	**GEV164**	1m cable, connecting the CS09 field controller to all System 1200 receivers.

17.3 Internal Batteries for CS09 Field Controller



733 269	**GEB211**	Lithium-Ion battery, 7.4V/2.2Ah, rechargeable. To be used with CS09 field controller or GS15 receiver.
772 806	**GEB212**	Lithium-Ion battery, 7.4V/2.6Ah, rechargeable. To be used with CS09 field controller or GS15 receiver.

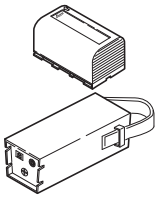
17.4 Hard Container and Hand Strap for CS09 Field Controller



Hard Container		
733 267	**GVP623**	Hard container for GRX1200+ receivers, AS10 antenna, CS09 controller series, cables and accessories. Not needed for GRX1200+ receiver at reference station.
Hand strap		
733 266	**GHT41**	Hand strap for CS09 controller with utility hook for attaching to belt or tripod.

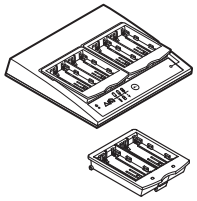
18 Power Supply for Campaign Use

18.1 Batteries for Campaign Use



Internal Battery for GRX1200+		
733 270	**GEB221**	Lithium-Ion battery, 7.4V/4.4Ah, rechargeable. To be used with GRX1200+ receiver.
Battery for GRX1200+ and GR10		
727 367	**GEB171**	External universal battery, NiMH, 12V/9Ah, rechargeable.

18.2 Battery Chargers for Campaign Use



733 271	**GKL221**	Charger, to be used with up to two charging adapters GDI221 or GDI222, charger cable and net adapter included. To charge GEB221 and GEB171 batteries.
733 323	**GDI221**	Adapter for GKL221 for charging 2 Li-Ion batteries GEB241, GEB221, GEB211 or GEB212.
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.

Software

With every software, comprehensive Customer Care Packages (CCPs) are available and strongly recommended. CCPs bundle software maintenance and customer support. For more details see section Active Customer Care below.

19 Software Protection Keys (Dongle) for Protected Options

734 712	Software protection key (parallel) for single user licence.
734 713	Software protection key (USB) for single user licence.

20 Leica GNSS Spider Software

20.1 Leica GNSS Spider Software

Leica GNSS Spider makes use of the Microsoft SQL database. With Leica GNSS Spider the free version Microsoft SQL Server (Express) is provided and will be installed, if no SQL server is available.

A software protection key (dongle) must be ordered separately for protected options.

740 244	**Leica GNSS Spider** GNSS Reference Station Software, general license, with documentation. Supports full receiver control and configuration, manual downloads and firmware upgrade. Not protected.

20.2 Leica GNSS Spider – Site Server, Protected Options

File Product Service Options	
744 904	**Spider, File Products Service (FPS) option** Provides automated data download and management for multiple sites with automated RINEX conversion, quality control, event logging, FTP transfer for distributing Spider product files on the Internet. Option includes one (1) site/sensor license. For more site/sensor licenses for a Spider FPS, order one or more Spider, FPS Additional Site License as required.
734 613	**Spider, FPS Additional Site License** Required for each GNSS site/sensor that shall be used with Spider File Product Service in addition to the default one (1) site/sensor, which is included as standard.
Other Site Server Options	
734 614	**Spider, Event E-mail & Messaging Option** For managing and distribution of GNSS Spider event information via e-mail and/or network messaging.
744 908	**Spider RT-Product Service for Site Server not related to site licences** Provides output of RTK data for all connected sites, that are capable of streaming their GNSS raw observation to the Site server. Supported real time message formats are standard RTCM (V2.x, V3.0) and proprietary formats (Leica, CMR, CMR+), through various communication channels (Serial, Modem or TCP/IP). This option is not required if RT-products shall be created and output through the Spider Network Server Advanced RT-Proxy Service (744 915).
744 912	**Spider, Positioning Site license** Required for each GNSS site/sensor that shall be used for the Spider position processing. A minimum of two (2) of these licenses is needed for Positioning. ☞ Positioning Site Licences are cumulative between Real-Time and Post-Processing Positioning Products. For example, to use 10 sites simultaneously in both Real-Time and Post-Processing Products requires 20 Positioning Site Licences. There is no limit to the number of Positioning Products (baselines) that may be configured if the number of sites used (including reference and rover sites) does not exceed the number of Positioning Site Licences.

20.3 Leica GNSS Spider - Network Server, Protected Options

Leica GNSS SpiderNET, Options for Network RTK	
744 913	**SpiderNET, Option for GPS Network RTK/DGPS** Provides real-time GPS network processing and error estimation with an advanced network processing algorithm. A basic RT-Proxy server for real time network correction outputs, inlcuding Leica MAX, in standard RTCM V3.1 (Network messages) format and individualised network RTK & DGPS corrections; and Leica i-MAX, in standard (Leica, CMR, CMR+, RTCM V2.3, 3.0/3.1) baseline message formats. Supports various communication channels (Serial, Modem or TCP/IP). Includes support for up to five sites to be assigned in network processing. For each additional site one SpiderNET Additional Site License (744 914) is needed.
744 914	**SpiderNET, Additional Site License** Required for each site that shall be assigned in SpiderNET Network server processing in addition to the default five (5) sites/sensors that are included in the SpiderNET, Option for GPS Network RTK (744 913).
762 472	**SpiderNET, GLONASS network processing extension** Provides real-time GLONASS network processing and error estimation with advanced network processing algorithm. ☞ Requires the SpiderNET, Option for GPS Network RTK (744 913).
766 766	**SpiderNET, Extension for legacy Network RTK methods** Provides in addition to MAX and i-MAX the following legacy methods for Network RTK: • FKP (Area Correction Parameters) • Virtual Reference Station ☞ Requires the SpiderNET, Option for GPS Network RTK (744 913).
Other Network Server Options, not related to site licenses	
744 915	**Spider, Advanced RT-Proxy Service option** Provides advanced distribution of real time single site or network corrections with automatic nearest site or cell selection based on rover location. Includes also support for RTCM transformation data messages and Ntrip Caster&Server functionality. Supported real time formats are standard RTCM (V2.x, V3.x) or proprietary (Leica, CMR, CMR+) real time message formats, through various communication channels (Serial, Modem, Access Router or TCP/IP). Can be used with SpiderNET, Option for Network RTK (744 913). Can also be used with GNSS Spider Site server, instead of Spider, RT-Product Service (744 908).
744 916	**Spider Business Center Option** For advanced real-time user access management with authentication, authorisation and accouting support, plus real time user auditing and creation of user activity logs. Web front end supports online service products and subscription mangement. Can be used together with SpiderNET, Option for Network RTK (744 913) or Advanced RT-Proxy Service Option (744 915). Recommended option if Advanced RT-Proxy Server NTRIP Caster functionality is used.
744 917	**Spider, Re-Processing** Provides full re-processing functionality for GNSS Spider (Site server) and SpiderNET (Network server) from raw RINEX or Leica binary raw data files (simulated sites). This option does not require any of the other GNSS Spider protected options.
Leica GNSS Spider Upgrades	
734 616	**GNSS Spider Site Server Upgrade from ControlStation** Full upgrade from existing ControlStation licence. Includes GNSS Spider Site Server File Product Service option with one site licence.
734 617	**GNSS Spider Site Server Upgrade from CRNet Lite** Full upgrade from existing CRNet Lite licence. Includes already purchased number of CRNet site licences, GNSS Spider Site Server File Product Service and Event E-mail & Messaging options.

21 Leica SpiderQC Software

Leica SpiderQC is a stand-alone software for quality control and analysis of GNSS reference station data. It may run alongside Leica GNSS Spider or other reference station software.

☞ A software protection key (dongle) must be ordered separately.

21.1 Leica SpiderQC Software

749 319	**GSW549**	**Leica SpiderQC** For data analysis and quality control of GNSS reference station data. Dongle protected.

21.2 Leica SpiderQC Options

751 824	**GSW576**	**SpiderQC, Advanced Coordinate Analysis option** High speed calculation and graphing of displacement, messaging and limit checks for real time NMEA and GNSS Spider Post Processing coordinate data. Dongle protected.
762 826	**GSW624**	**SpiderQC, Advanced Network Analysis option** For analysis of ionosphere and troposphere error from a GNSS Spider Network. Dongle protected. Requires Leica GNSS Spider v3.0 or later with Network RTK. This option only works together with Leica GNSS Spider v.3.0 or later with SpiderNet option (744 913).
759 039	**GSW623**	**SpiderQC, Advanced Data Analysis option** Zero, single, double and triple difference residual analysis of GNSS code and phase data. Dongle protected.
749 320	**GSW550**	**SpiderQC, Automatic Quality Check option** Automatic processing of data from a GNSS reference station network including web page generation, graphs, reports and email messaging. Includes one site licence. Dongle protected.
749 321	**GSW551**	**SpiderQC, Additional site license for Automatic Processing option** Up to 256 additional site licences may be configured. Dongle protected.

22 Leica SpiderWeb Software

Leica SpiderWeb is a web-server-based advanced solution for convenient distribution of GNSS reference data over the Internet.

☞ A hardware protection key must be ordered separately.

22.1 Leica SpiderWeb Software

751 352	**Leica SpiderWeb Basic License, Software with documentation** Without protection key runs as SpiderWeb Lite version to support complete web server configuration, site management and data access via link to a FTP server. ☞ Without user access management.

22.2 Leica SpiderWeb Protected Options

764 662	**SpiderWeb, RINEX Job Service** Enables automated, user specific and job based RINEX Service. Includes advanced user management and one SpiderWeb site license. For more site licenses order one or more Leica SpiderWeb additional site license (751 353) as required.
751 353	**Leica SpiderWeb additional site license** Required for each additional site that shall be used with SpiderWeb, RINEX Job service option (764 662) in addition to the default one site, which is included.
764 663	**SpiderWeb, Extension for Virtual RINEX** Enables creation of Virtual RINEX data based on a GNSS Spider network processing solution. ☞ Requires SpiderWeb, RINEX Job service option (764 662).
755 125	**Leica SpiderWeb SpiderQC Option** Recommended with SpiderWeb, RINEX Job service option (764 662). ☞ Requires following SpiderQC Options on the same software protection key: • 749 319 Leica SpiderQC Software with documentation. • 749 320 SpiderQC, Automatic Processing option. 1x per each SpiderWeb Site: • 749 321 SpiderQC, Additional site license.
755 126	**Leica SpiderWeb Option for automated Coordinate Computation Service** ☞ Requires SpiderWeb, RINEX Job service option (764 662). ☞ Requires also the following LGO Options on same software protection key: • 734 719 L1/L2 data-processing for GPS • 734 720 RINEX Import for GPS • 734 725 Design & Adjustment 3D Following LGO options can also be added: • 752 697 Glonass data-processing for LGO, protected option. Can only be ordered in addition to L1/L2 data-processing option for GPS (734 719) • 734 724 Datum & Map transformation, protected option.

Services for GNSS Networks and Reference Stations

23 Leica CrossCheck

Leica CrossCheck is a web based service for GPS/GNSS reference network coordinate calculation, integrity monitoring and deformation monitoring.

Two types of services are offered:

- **Single Computation Service**
- **Monitoring Service**

In both services, engineers from Leica Geosystems use the Bernese GPS Software v5.0 (or later) to process the customer's data. The processing strategy is optimized to provide highest possible accuracy.

Billing
- The initial setup fee will be invoiced after sending the entitlement number.
- The Single Computation Service will be invoiced once the service has been completed.
- The Monitoring Service will be invoiced quarterly at the end of the period, if not cancelled.

Service Change Requests
The amount of Quarterly Subscription Per Site of the Leica CrossCheck Monitoring Service can be changed at a month's notice for the next billing period. An administration fee (5002120) is incurred each time the number of points is increased or decreased.

Cancellation
- The Leica CrossCheck Monitoring Service can be cancelled with a month's notice for the next quarter.
- The cancellation notice must be given in written form.

23.1 Single Computation Service

The Single Computation Service enables customers to obtain high accuracy coordinates for their reference station network without the need to invest in specialist GNSS processing expertise, software or IT infrastructure. The site coordinates are computed in the customer's chosen datum. A PDF report with site coordinates and accuracies is provided via email to the customer.

The Single Computation Service consists of a base fee and a per site fee.

5002093	CrossCheck Coordinate Service Base Fee
5002076	CrossCheck Coordinate Service Site Fee

23.2 Monitoring Service

The Monitoring Service provides for detection and warning of antenna movements in near real time for networks of GNSS reference stations or monitoring sites. Site coordinates are calculated at a user defined interval. The solution is tailored to the needs of the customers network/project, including the processing interval, processing strategy, coordinate datum, limit checks and content of the secure online web service. An email messaging service is offered to provide warning when a significant movement occurs.

The Monitoring Service consists of a one-time setup fee and then a quarterly subscription comprised of a base fee and a per site fee.

5002094	CrossCheck Monitoring Setup Fee
5302771	CrossCheck Quarterly Subscription Base Fee
5302772	CrossCheck Quarterly Subscription Per Site
5002120	Administration Fee

24 Active Customer Care

A powerful and competent worldwide service and support network backs up Leica Geosystems Networked Reference Station solutions.
Leica Geosystems' customers benefit from service and support that spans time zones and geography. Our Active Customer Care program has packages to suit your needs, whether you use our simplest distance measuring device or the most sophisticated integrated solution. Active Customer Care is a true partnership - it's our commitment to continue to provide the level of support and collaboration you have come to expect when you put your trust in Leica Geosystems.

True Global Coverage
Leica Geosystems has the most comprehensive service and support network in the world.

- 128 authorized Support & Service Centers
- Offices and Dealers covering every continent
- Customer Support and Information Hot Lines
- Transportation options to suit the most time critical requirements

Flexibility to meet your needs
Our range of service and support packages ensure we can satisfy your requirements.

- Service Levels range from routine maintenance to support for mission critical applications
- Web based service and support, allowing you to access our support organization when it suits you

First Class Training = First Class Productivity
Get your team up to speed with:

- Scheduled Training Courses
- Informative Seminars and Web Broadcasts
- Customized Training Courses
- Consultancy Services

Keep your Equipment up to date and in Top Condition

- Technical Service
- Repair
- All inclusive maintenance contracts
- Hardware and Software upgrades

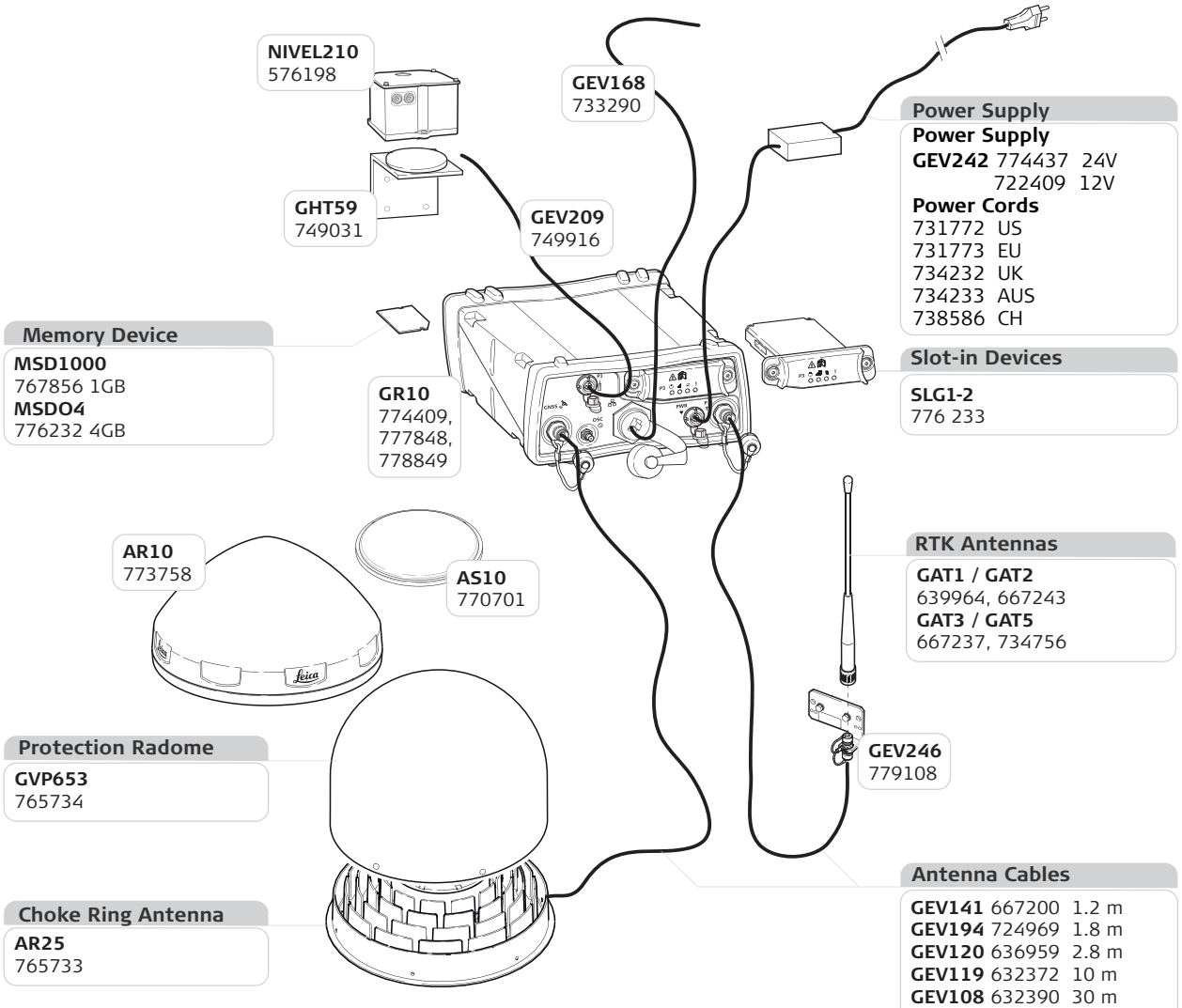
Because a true partnership delivers maximum productivity
Since 1921, Leica Geosystems' customers have trusted us to provide the most reliable, innovative, robust measuring solutions. Most importantly, these customers continue to work with Leica Geosystems because we provide truly exceptional support and service anywhere around the globe. We help their employees get up to speed, we support them during their learning curve and we make sure that their equipment is in top condition. Leica Geosystems solutions guarantee a new level of productivity.
We are proud to announce the Active Customer Care program - taking the Leica Geosystems service to an even greater new level.

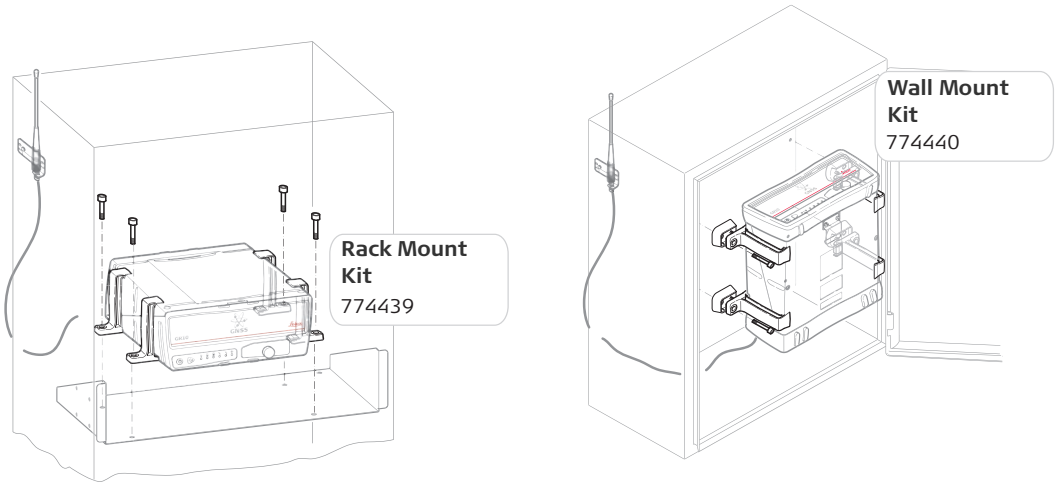
25 Customer Care Packages

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.

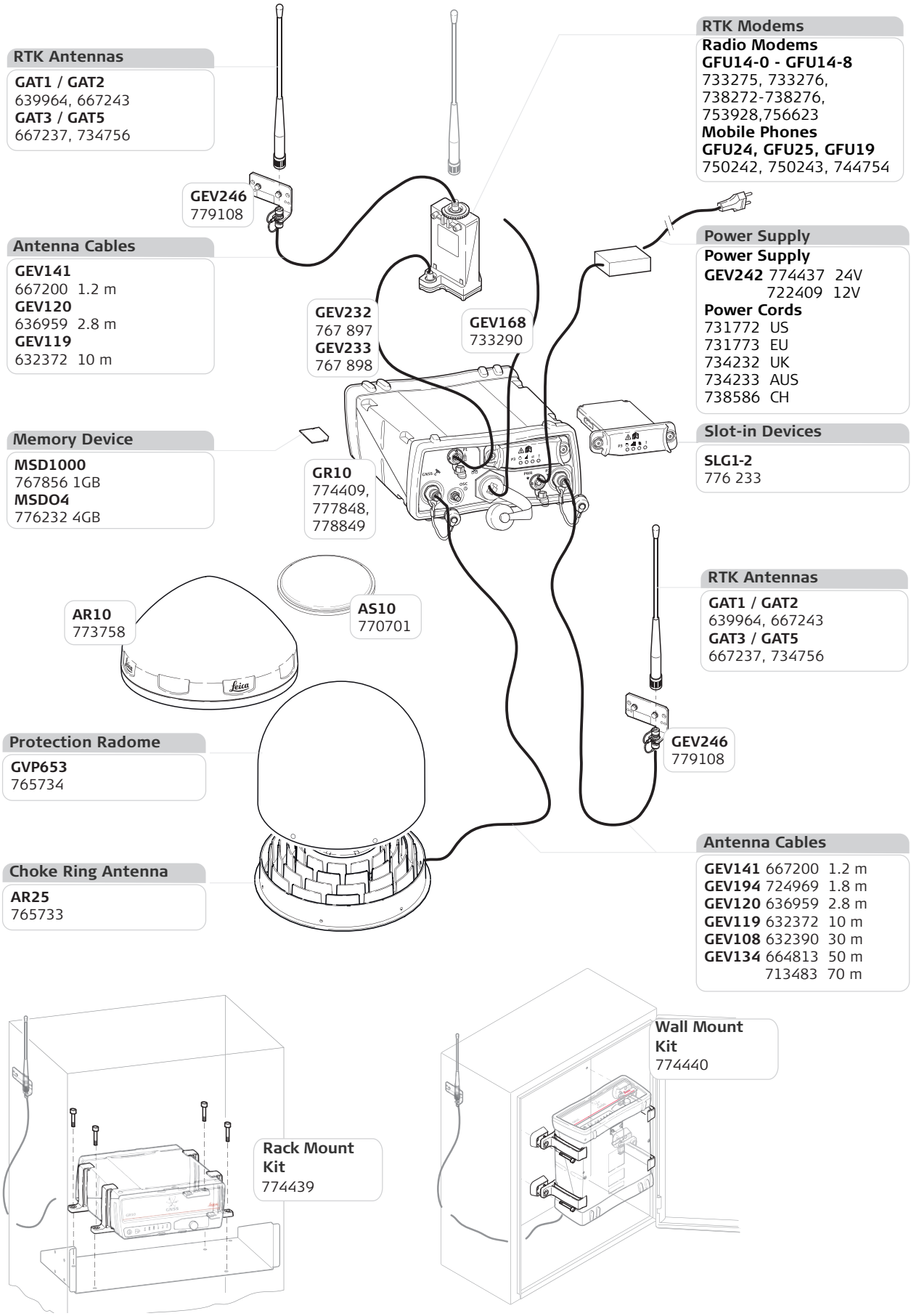
Suggested GNSS Setups

26 GR10 Network RTK

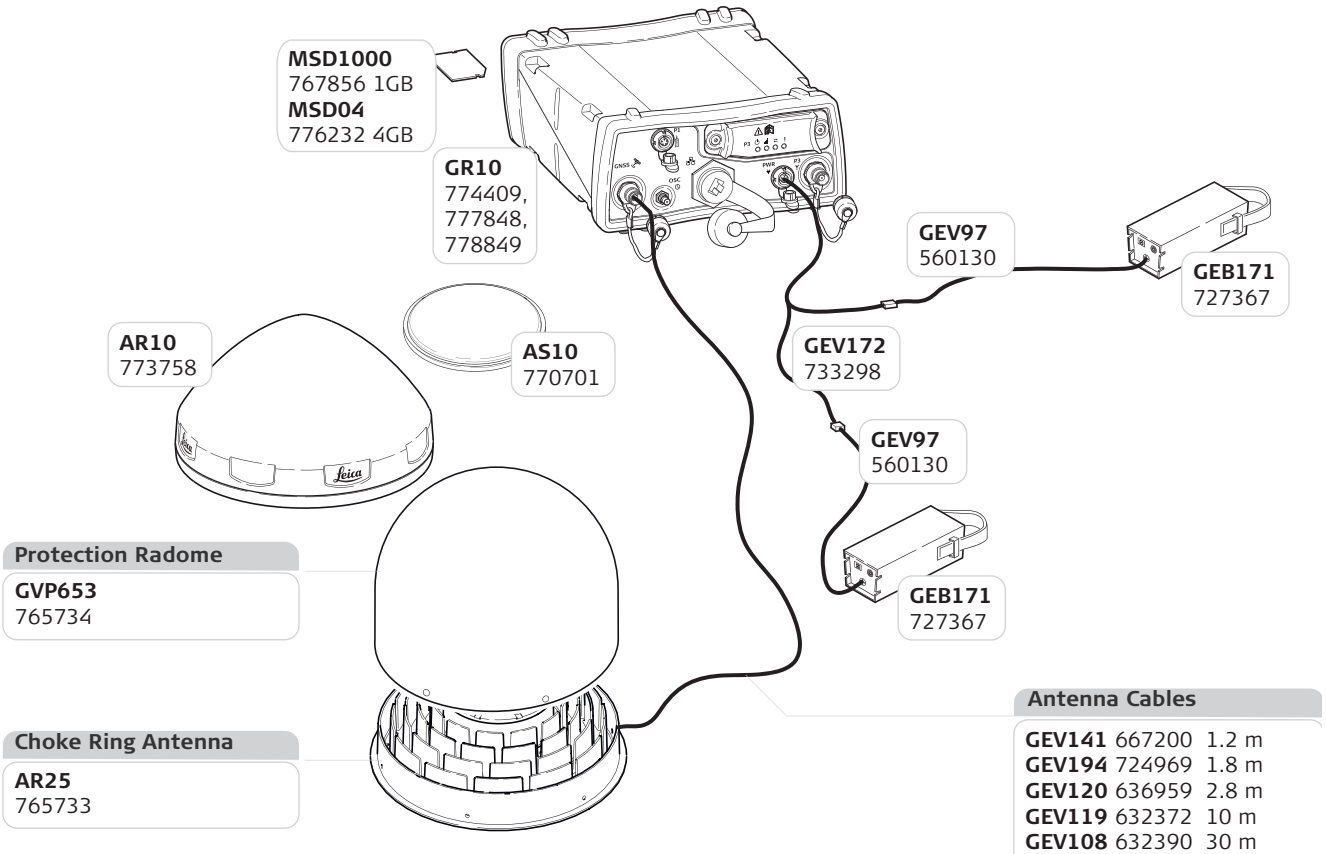




27 GR10 Single Base RTK - Direct RTK Transmission



28 GR10 Campaign - Dual Battery



Whether providing corrections from just a single reference station, or an extensive range of services from a nationwide RTK network - innovative reference station solutions from Leica Geosystems offer tailor-made yet scalable systems, designed for minimum operator interaction whilst providing maximum user benefit. In full compliance with international standards, Leica's proven and reliable solutions are based on the latest technology.

When it has to be right.

Swiss Technology
by Leica Geosystems

TQM
ISO 9001 / ISO 14001

Total Quality Management - our commitment to total customer satisfaction.

745972-2.0.0en - IX.10

Leica Geosystems AG
Heinrich-Wild-Strasse
CH-9435 Heerbrugg
Switzerland
Phone +41 71 727 31 31
www.leica-geosystems.com

- when it has to be **right**

Leica Geosystems