Geodetic Monitoring System
Equipment List

- when it has to be **right**

Leica Geosystems

Overview

GeoMoS Modules

GeoMoS Maintenance

Monitoring Systems

Sensors

Power supply

Cables

For transmitting data

Accessories

GeoMoS Modules

GeoMoS - Geodetic Monitoring System Applications:

Landslide monitoring
Dangerous slopes
Open pit mines
Settlement Areas
Dams
Volcanoes
Dams
Bridges

High rise buildings
Historical buildings
Large structures
Foundations
Roads
Airports
Tunnels
Ski lifts
...and all required Automatic Surveys

GeoMoS comprises the following modules:

LEICA GeoMoS Versions		User Versions		Demo Version (1 year)
Article Name		GeoMoS Monitor	GeoMoS Analyzer	GeoMoS Demo
Article Number (SAP)		758 749	723 366	724 933
CD-ROM included	723 367	●	●	●
USB Dongle (default)	734 713	●	●	●
Parallel Dongle (optional)	734 712	o	o	o
Sensor License	758 750	o	–	●
Monitor Option 1 (TPS computation)	758 751	o	–	●
Monitor Option 2 (Limit checks and Messaging)	758 752	o	–	●
Analyzer Option 1 (TPS Post-Processing)	758 753	–	o	●

Legend	
●	included: automatically, not removable
o	optional
–	not available

Software protection keys

734 712 Software protection key (parallel)
734 713 Software protection key (USB)

1.1 GeoMoS Monitor (758 749)

Leica GeoMoS makes use of the Microsoft SQL database. With Leica GeoMoS the free version Microsoft SQL Server 2005 Express is provided and will be installed, if no SQL server is available.

Connection to sensors (serial or TCP/IP) with valid **Sensor Licenses**
Project management
User levels
Learn points
Manual stand point coordinate determination with Free Station, Distance Intersection or GPS Update
Automatic measurements with various options
Blunder tolerance checks on raw data
Information about the current system and measurement status
Calculation of GPS displacements and daily average results
Automatic database export
SQL Server 2005 Express database included

GeoMoS Monitor is the monitoring software for the normal use of the customer. The customer can collect and store data. Additional options can be added later.

A number of options are available for use together with GeoMoS Monitor:

758 751	GeoMoS Monitor Option 1 (TPS computation)
758 752	GeoMoS Monitor Option 2 (Limit checks and Messaging)

Note: Sensors can only connected to GeoMoS Monitor, if the required amount of sensor licenses has been ordered also. Refer to the section "1.2 Sensor License" for more detail.

1.1.1 GeoMoS Monitor Option 1 (758 751)

TPS computation	Automatic total station stand point setup with different methods (Free Station, Distance Intersection or GPS Update) Calculation of any total station results including coordinates, displacements, profiles, distance reduction Calculation of any total station correction with Free Station, Distance Intersection, Orientation, PPM and Vz Correction groups Calculation of daily average results for total stations

1.1.2 GeoMoS Monitor Option 2 (758 752)

Limit checks and Messaging	Automatic computation of limit checks Multiple levels of limit checks (yellow, orange, red) Limit Level 1, 2 and 3 can be assigned independent actions Four different types of limit check computation (absolute, short time, long time and regression) Allows emails and SMS to be sent, applications to be run, the database to be queried and digital outputs to be set when defined messages are generated by the system

1.2 Sensor License (758 750)

The sensor license concept means that the software scales with the number and type of sensors you have connected. Additional sensor licenses can easily be added later should your needs change.

For each sensor you need to order a special amount of Sensor Licenses (Art. No. 758 750). The required amount of sensor licenses per sensor is listed below:

* Sensor License	Amount required per sensor
TPS Sensor	30
GPS Sensor	10
Connection to a GPS Spider Site Server with all Spider Positioning Products	10
Connection to a GPS Spider Site Server with all Spider Post Processing Products	10
Nivel200 Sensor	3
Digital Level	3
Temperature / Pressure Sensor	1

Note that each sensor requires sensor licenses even though the sensor is connected with a bus system to GeoMoS.

For more information about connectable sensors offering with GeoMoS Monitor please contact your local Leica Geosystems organization or distribution partner.

1.3 GeoMoS Analyzer (723 366)

Leica GeoMoS makes use of the Microsoft SQL database. With Leica GeoMoS the free version Microsoft SQL Server 2005 Express is provided and will be installed, if no SQL server is available.

Graphical and numerical visualization of results
More than one installation of Analyzer may access the data and do analysis simultaneously
Project management
User levels
Outlier detection algorithm
Set results invalid/valid
Enter comments
Customizable graphics
Customizable reports with filter and search mechanism
Manual database import and export
Export to other systems e.g. ASCII, DXF and BMP
SQL Server 2005 Express database included

For online analysis using GeoMoS Analyzer at a remote location there needs to be continual connection between GeoMoS Monitor and GeoMoS Analyzer computers.

A number of options are available for use together with GeoMoS Monitor:

758 753 GeoMoS Analyzer Option 1 (TPS Post-Processing)

1.3.2 GeoMoS Analyzer Option 1 (758 753)

Re-processing of the coordinate system, distance reduction, meteo model and all values modified in the Data Editor
Data Editor to modify additive constants, reflector heights, temperature and pressure
Re-processing of the profile directions, instrument height and null coordinate together with GeoMoS Monitor

1.4 GeoMoS Demo (724 933)

Note: GeoMoS Demo is only for demonstration purposes to sell the product. GeoMoS Demo is not for commercial sale. GeoMoS Demo has the same functionality as GeoMoS Monitor and GeoMoS Analyzer but cannot be used for permanent monitoring (automatic measurement will only run for a limited time).

GeoMoS Maintenance

2.1 Customer Care Packages (CCP)

A powerful and competent worldwide service and support network backs up LEICA GeoMoS. Customer Care Packages (CCPs) provide you access to a world-class support & service infrastructure and ensure your systems are being kept up to date.

A wide selection of comprehensive Customer Care Packages 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.

The Customer Care Packages articles are available worldwide and can be ordered for end-users together with new software.

Select CCP

6000933	1 year GeoMoS Basic CCP
6000934	2 year GeoMoS Basic CCP
6000935	3 year GeoMoS Basic CCP

Select CCP for Distribution Partner

6000936	1 year GeoMoS Distr. Basic CCP
6000937	2 year GeoMoS Distr. Basic CCP
6000938	3 year GeoMoS Distr. Basic CCP

2.2 Other Services

The following services are available on request at daily rates.

Training at customer site
Installation support
Customizing

Information on article numbers are available on request.

Monitoring systems

3.1 Overview

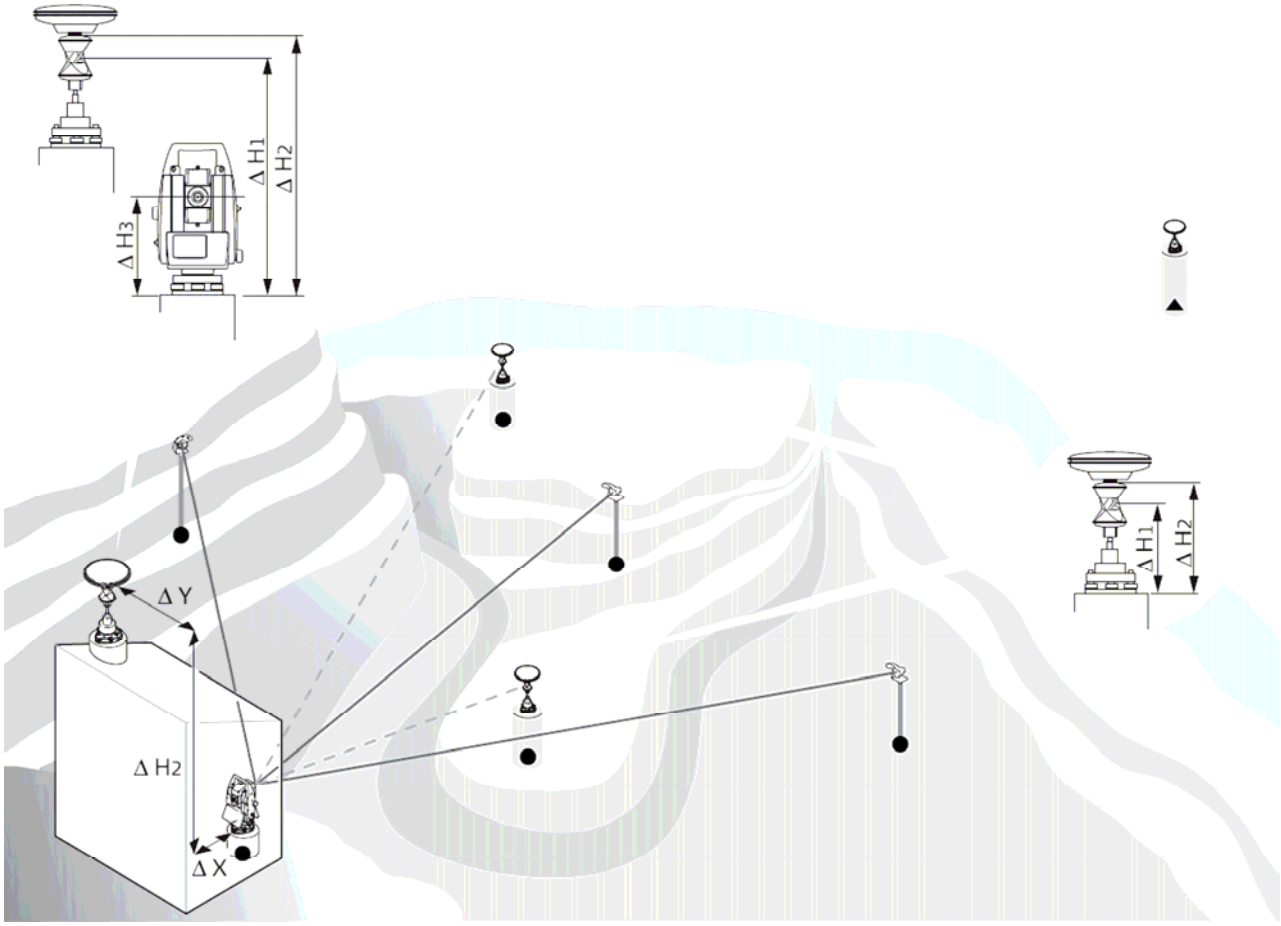
Each monitoring project has specific measurement and accuracy requirements. If you are going to prepare a monitoring project or plan to offer a quotation for a monitoring tender, the following five sections have to considered:

1. Sensors	▪ TPS Sensors, prisms and mounting ▪ GPS Sensors, antennas and mounting ▪ Inclination Sensors, shelters and mounting ▪ Meteo Sensors, mounting ▪ Other Sensors
2. PC and Software	Robust PC with serial ports and GeoMoS, GPS Spider or GNSS QC.
3. Power	Reliable power source with backup ▪ direct power or ▪ separate units or ▪ solar panels
4. Communication	Cables, radio modems
5. Miscellaneous	▪ Measurement hut to protect the total station and PC from the elements for example rain, sun, dust, snow ▪ Pillars and monumentation ▪ Climate control system (avoid temperature expansion, moisture, condensation and uneven heating of the instrument) ▪ Security ▪ Access (physical and remote)

Combine Leica software, geodetic, geotechnical and meteorological sensors to match the needs of your monitoring challenge. Basic examples are given in the next section to provide an idea of monitoring setups and options.

GeoMoS is an integrated solution that supports total station, GPS, levels and geotechnical sensors for an overall understanding of structural movements.

In large monitoring projects total stations and GPS receivers can be combined in many different ways to match the requirements and use a stable reference. The diagram below shows various possibilities.



Legend	▲	Stable reference point
	●	Unstable monitoring point
	Δ H, Δ X, Δ Y	Offsets to be set in GeoMoS

Total station with co-located GPS sensor

- A GPS antenna can be mounted on the top of the measurement hut and applied to the total station stand point with a three-dimensional offset.
- To orientate the system, a GPS antenna inside the unstable area is used to update the reference point.
- The GPS antenna needs a reference station so that baselines can be computed.

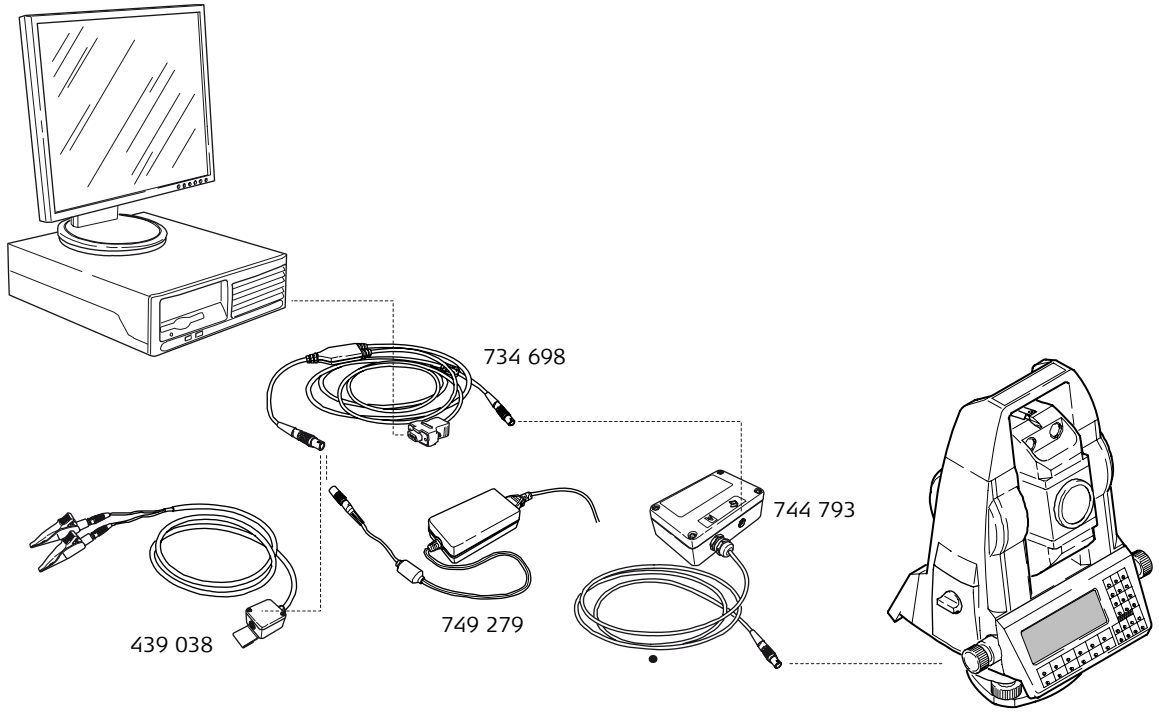
Reference points with co-located GPS sensors

- A total station stand point can be measured and calculated with a free station or distance intersection to reference points inside the unstable area.
- A GPS antenna can be mounted on the top of the prism and applied to the point with a height offset.
- The GPS antenna needs a reference station so that baselines can be computed.

Reference station

- A GPS antenna can be mounted in a stable area as a reference station. The reference station should be as close as possible (< 3km) to the monitoring area so that the baselines can be computed with the highest accuracy.

3.2 Setup of a Total Station with direct serial



664 662 TPS Sensor (TCA 2003)
744 793 Switchbox with cable 2.0m for TPS/1000/ 1100/1200 and GeoMoS. Supports cold boot for TPS (important 24/7 hours/day monitoring)
734 698 GEV187, Y-cable, connects TPS to PC (9-pin RS232 serial) and external battery, 2.0m.

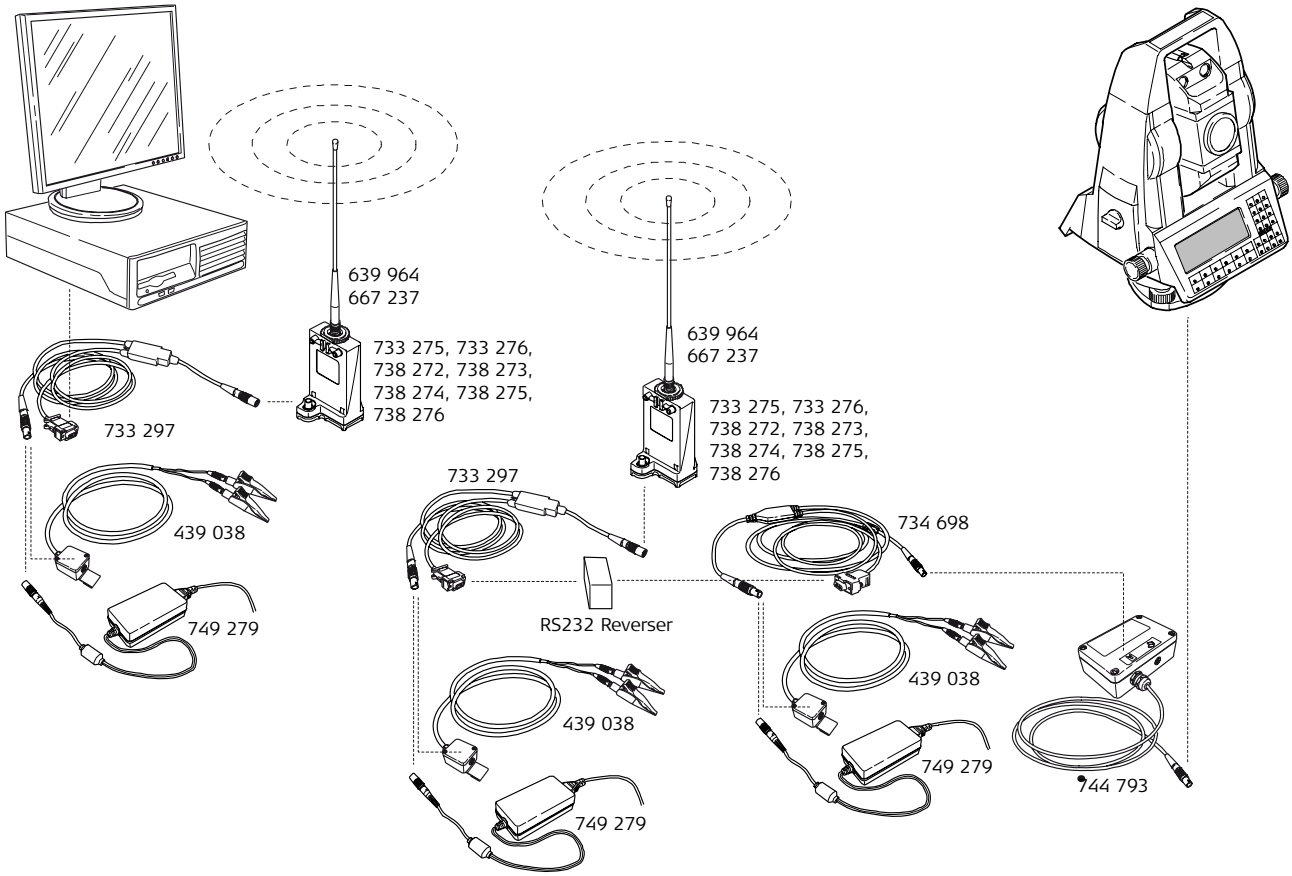
Select Power

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

3.3 Remote Setup of a Total Station with Radio (GFU14)



664 662 TPS Sensor (TCA 2003)
744 793 Switchbox with cable 2.0m for TPS/1000/ 1100/1200 and GeoMoS. Supports cold boot for TPS (important 24/7 hours/day monitoring)
734 698 GEV187, Y-cable, connects TPS to PC (9-pin RS232 serial) and external battery, 2.0m.
733 297 GEV171, 1.8m cable to program, the Satelline 3AS radio modem inside the GFU14 housing.
RS232 Reverser

Select Radio Modem

733 275 GFU14-0, Satelline 3AS radio modem (433.525 MHz, 25.0 kHz channel spacing, 0.5 W)
733 276 GFU14-1, Satelline 3AS radio modem (406.425 MHz, 25.0 kHz channel spacing, 1.0 W)
738 272 GFU14-2, Satelline 3AS radio modem (445.000 MHz, 12.5 kHz channel spacing, 1.0 W)
738 273 GFU14-3, Satelline 3AS radio modem (443.000 MHz, 12.5 kHz channel spacing, 1.0 W)
738 274 GFU14-4, Satelline 3AS radio modem (440.550 MHz, 25.0 kHz channel spacing, 0.5 W)
738 275 GFU14-5, Satelline 3AS radio modem (458.150 MHz, 12.5 kHz channel spacing, 0.5 W)
738 276 GFU14-6, Satelline 3AS radio modem (439.8625 MHz, 12.5 kHz channel spacing, 1.0 W)

Select Radio Antenna

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

Select Power

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

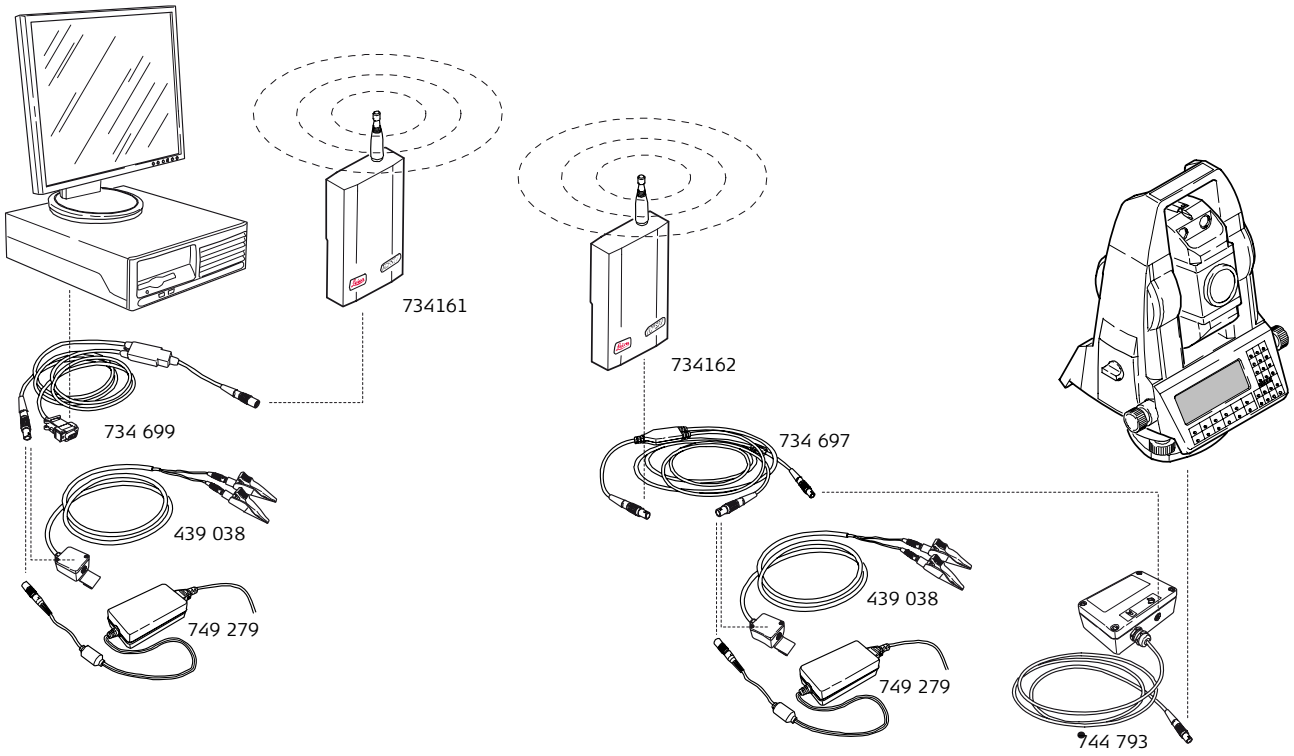
Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

RS232 Reverser

Please order the RS232 Reverser local.
Specification: Pin 2 <-> Pin 3
Pin 3 <-> Pin 2

3.4 Remote Setup of a Total Station with Radio (TCPS27)



664 662 TPS Sensor (TCA 2003)
744 793 Switchbox with cable 2.0m for TPS/1000/ 1100/1200 and GeoMoS. Supports cold boot for TPS (important 24/7 hours/day monitoring)
734 697 GEV186, Y-cable, connects TCPS27 to TPS1200 and external battery, 1.8m.
734 699 GEV188, Y-cable, connects TCPS27 to PC (9-pin RS232 serial) and external battery, 1.8m.
734 161 TCPS27 B, radio modem (base), with antenna, user manual. Used as radio modem for TPS1200 (frequency range 2400 - 2483 Mhz).
734 162 TCPS27 R, radio modem (remote), with antenna, user manual. Used as external radio for PC (frequency range 2400 - 2483 MHz).

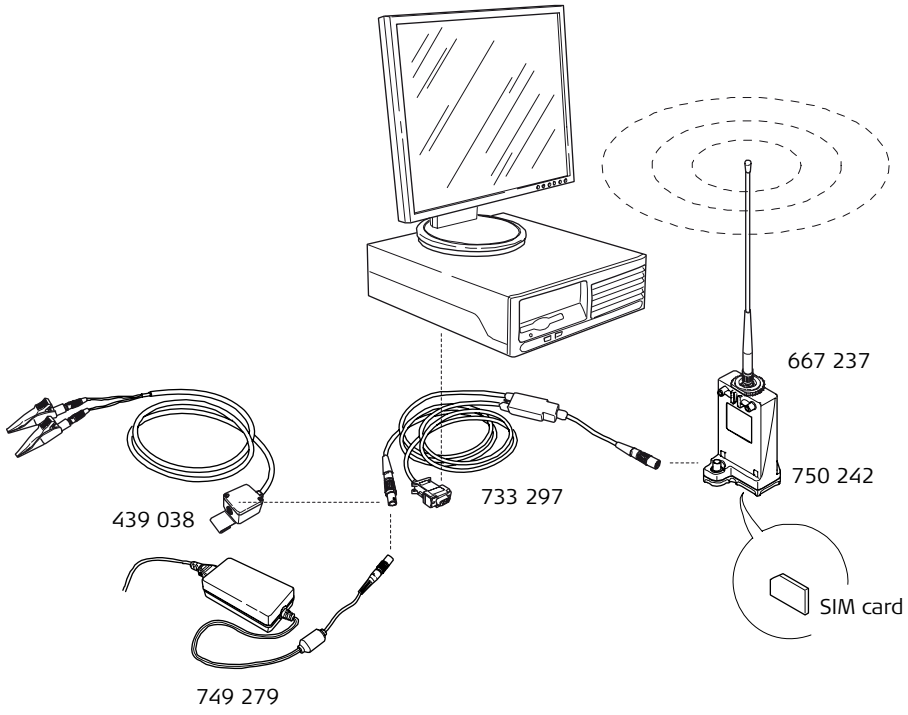
Select Power

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

3.5 Setup of a MC75



750 242 GFU24, Housing with Siemens MC75 GSM/GPRS Module (Quad-Band GSM 850/900/1800/1900 MHz).
667 237 Antenna for 900/1800 MHz mobile network.
733 297 GEV171, 1.8m cable to program, the Satelline 3AS radio modem inside the GFU14 housing. Also used to connect GFU24 to PC.

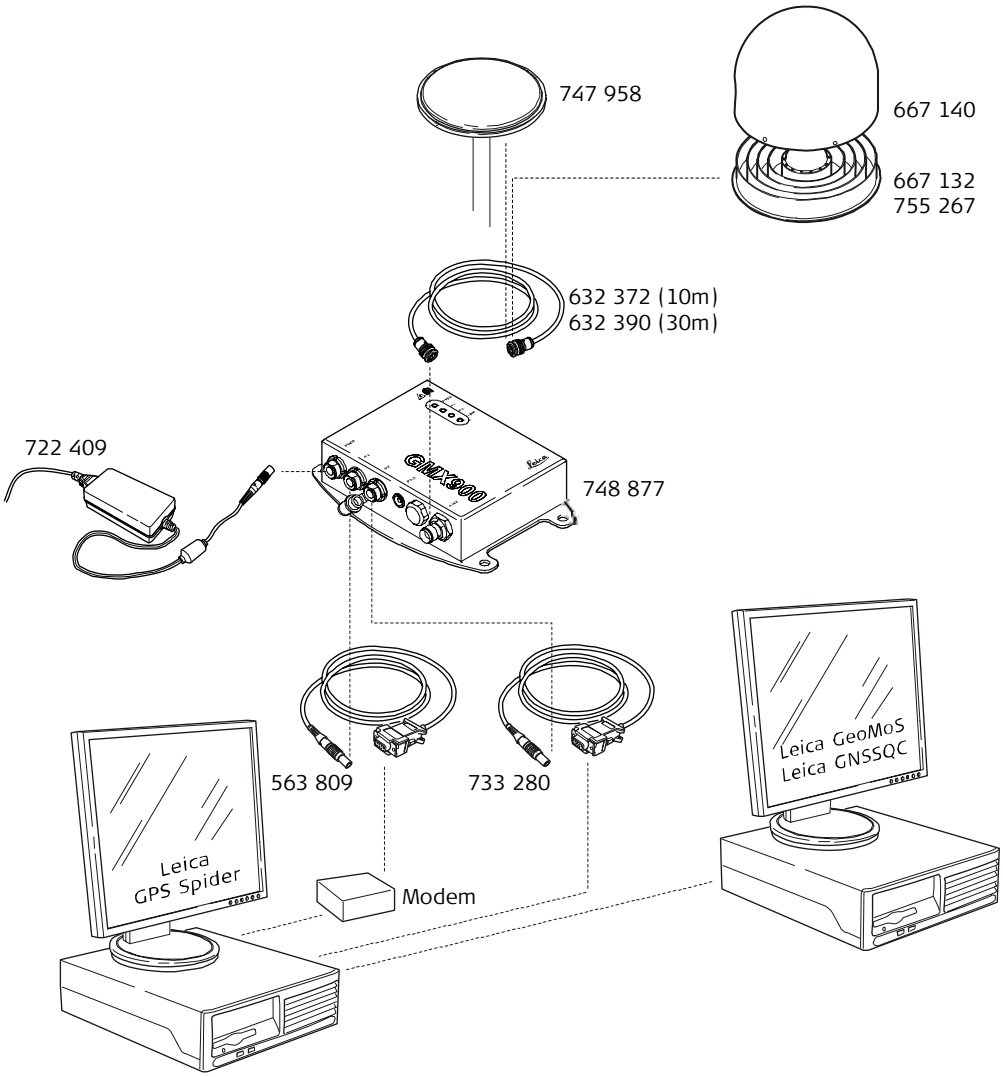
Select Power

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

3.6 Setup of real-time GPS with GMX902 Sensors



Receiver

748 877 GMX902, GPS Dual Frequency Receiver for Monitoring Applications

Select Antenna

747 958 AX1202 GG, Dual Frequency Antenna for GX1230 GG and GRX 1200 GG Pro Receiver

667 132 AT504, dual-frequency choke-ring antenna for GPS receivers. Dorne Margolin, JPL design. Conforms to IGS 'type T' specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.

755 267 AT504 GG, GPS/GLONASS dual-frequency choke-ring antenna for GPS/GLONASS receivers. Dorne-Margolin antenna element, JPL design. Conforms to IGS "Typ T" specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.

667 140 GVP601, Weather-protection radome for AT504 choke ring antenna.

Select Antenna Cables

632 372 Antenna cable, 10 m

632 390 Antenna cable, 30 m

Select Power

722 409 Power supply unit for GPS receiver, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to GPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 722 409:

731 722 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, US-Version.
731 773 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, EU-Version.
734 232 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, UK-Version.
734 233 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, AUS-Version.
738 586 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, CH-Version.

To connect battery, car battery or alternate power supply to GPS receiver:

722 411 Cable with protection fuse to connect 12V power supply to GPS receiver
439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
560 130 1.8m cable, connects GEB171 external battery to GPS receiver
636 972 0.5m cable, connects GEB171 external battery to GPS receiver

To connect two independent external power supplies:

733 298 GEV172, 2.8m Y-cable, connects GPS Receiver with two external power supplies.

Select Communication between Sensors and Spider

733 280 GEV160, 2.8m Data transfer cable. Connects GPS1200 receiver Ports 1, 2 and 3, RX1220 or GMX902 to PC for data transfer, firmware upload etc. Lemo 8 Pin to 9 pin RS232 female serial connector.
563 809 GEV113, 2.8m Modem cable. Connects GPS receiver Ports 1, 2 and 3 to modem. Lemo 8 Pin to 9 Pin RS232 male serial connector.

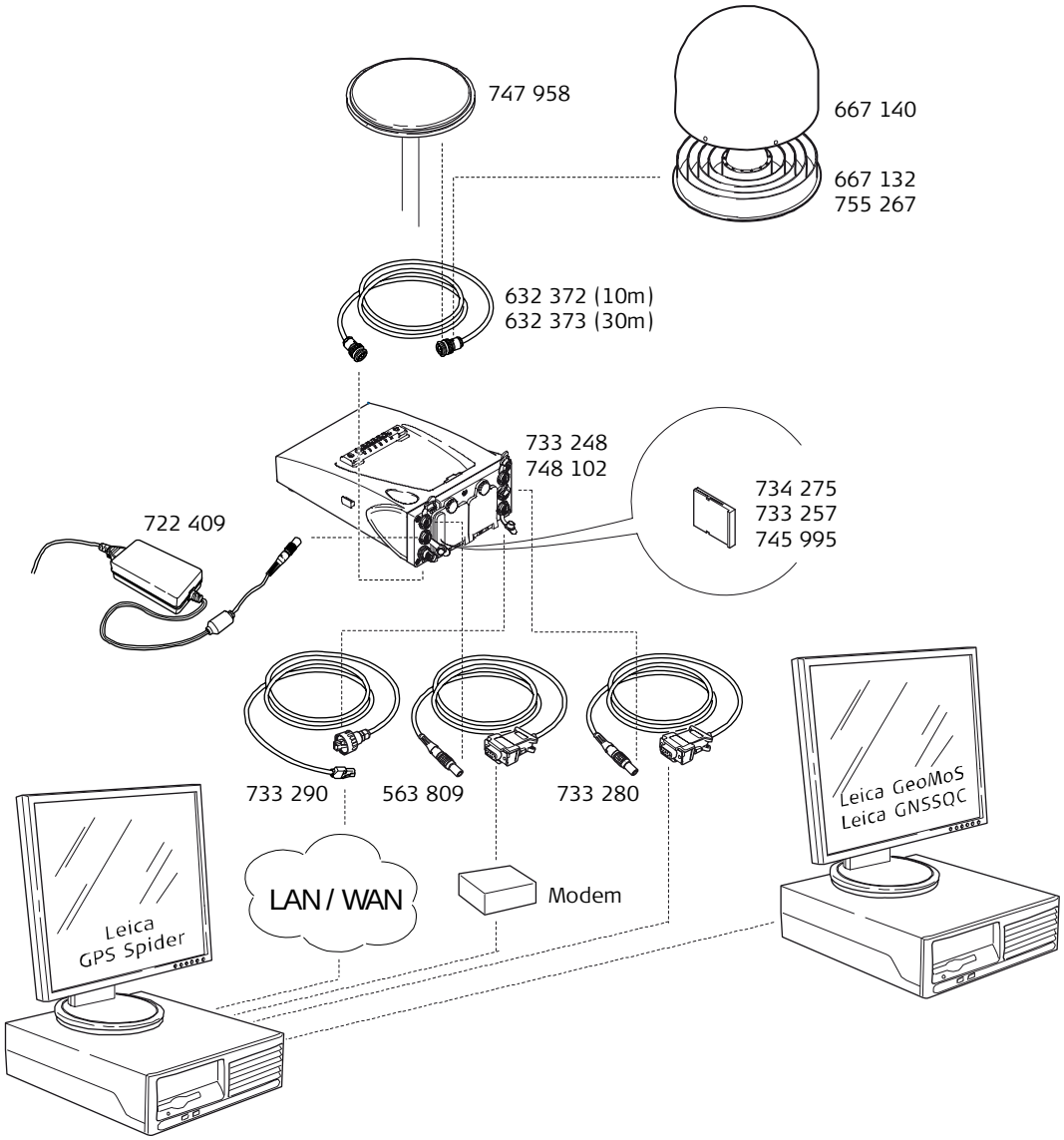
Select Software

GeoMoS Professional	Refer to “1 GeoMoS Modules”
Leica GPS Spider	Refer to “4.2.4 GPS Spider”
Leica GNSS QC	Refer to “4.2.5 GNSS QC”

Note: If you connect more then one GPS to GeoMoS to use the GPS sensors for monitoring we recommend GPS connection to the Leica Spider software. GeoMoS supports an interface to Leica GPS Spider v2.1 software (order GPS Spider and accessories separately)

• Regional and local Leica support specialists will help you selecting the optimal equipment configuration.

3.7 Setup of post processing GPS with GRX1200Pro Sensors



Receiver

733 248 GRX1200Pro, Permanent GPS Dual Frequency Reference Station Receiver, Professional, with Event Input, PPS Output, Extern. Frequency Input and Ethernet connectivity

748 102 GRX1200 GG Pro, GPS/GLONASS Dual Frequency Reference Station Receiver, Professional, with Event Input, PPS Output, Extern. Oscillator Input and Ethernet connectivity. Includes L2C. GLONASS is enabled every Wednesday. Can be upgraded to a full-time GPS/GLONASS receiver with GSW 567

Purchasable Options

751 225 GSW567, GLONASS option for GRX 1200 GG Pro. Without the GLONASS option, GLONASS is only enabled on Wednesdays.

Select CompactFlash Card

733 275 MCF64, CompactFlash card 64MB.
733 257 MCF256, CompactFlash card 256MB.
745 995 MCF1000, CompactFlash card 1GB.

Select Antenna

747 958	AX1202 GG, Dual Frequency Antenna for GX1230 GG and GRX 1200 GG Pro Receiver
667 132	AT504, dual-frequency choke-ring antenna for GPS receivers. Dorne Margolin, JPL design. Conforms to IGS 'type T' specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.
755 267	AT504 GG, GPS/GLONASS dual-frequency choke-ring antenna for GPS/GLONASS receivers. Dorne-Margolin antenna element, JPL design. Conforms to IGS "Typ T" specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.
667 140	GVP601, Weather-protection radome for AT504 choke ring antenna.

Select Antenna Cables

632 372	Antenna cable, 10 m
632 390	Antenna cable, 30 m

Select Power

722 409	Power supply unit for GPS receiver, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to GPS. Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 722 409:

731 722	Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, US-Version.
731 773	Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, EU-Version.
734 232	Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, UK-Version.
734 233	Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, AUS-Version.
738 586	Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, CH-Version.

To connect battery, car battery or alternate power supply to GPS receiver:

722 411	Cable with protection fuse to connect 12V power supply to GPS receiver
439 038	GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
560 130	1.8m cable, connects GEB171 external battery to GPS receiver
636 972	0.5m cable, connects GEB171 external battery to GPS receiver

To connect two independent external power supplies:

733 298	GEV172, 2.8m Y-cable, connects GPS Receiver with two external power supplies.

Select Communication between Sensors and Spider

733 280	GEV160, 2.8m Data transfer cable. Connects GPS1200 receiver Ports 1, 2 and 3, RX1220 or GMX902 to PC for data transfer, firmware upload etc. Lemo 8 Pin to 9 pin RS232 female serial connector.
563 809	GEV113, 2.8m Modem cable. Connects GPS receiver Ports 1, 2 and 3 to modem. Lemo 8 Pin to 9 Pin RS232 male serial connector.
733 290	GEV168, 5.0m cable, connecting GPS Receiver with Ethernet LAN / RJ45

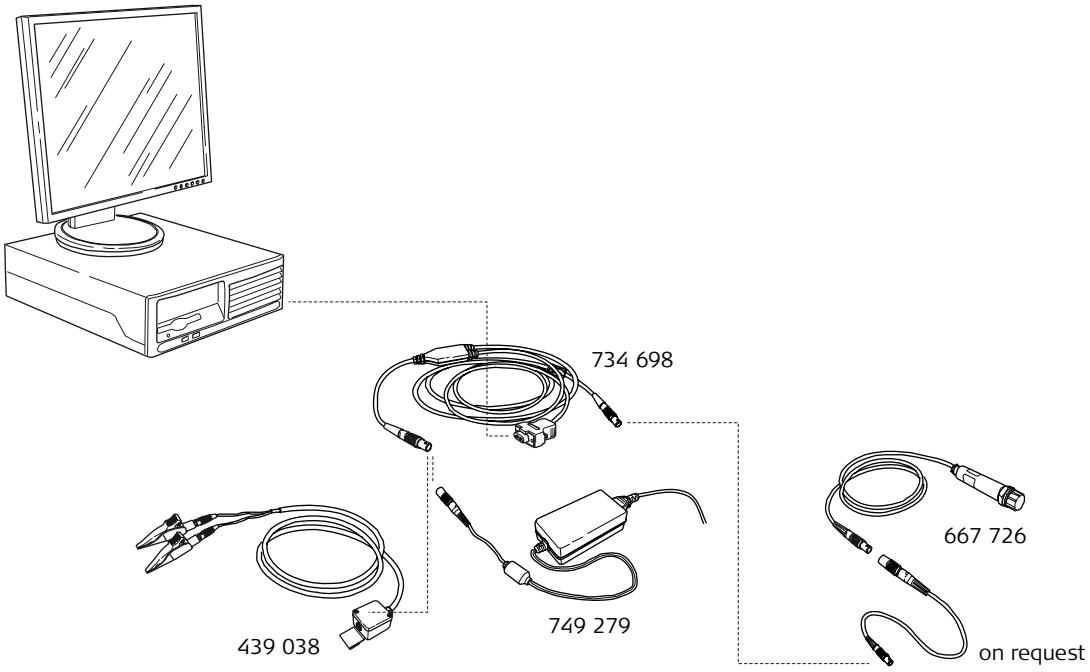
Select Software

GeoMoS Professional	Refer to “1 GeoMoS Modules”
Leica GPS Spider	Refer to “4.2.4 GPS Spider”
Leica GNSS QC	Refer to “4.2.5 GNSS QC”

Note: If you connect more then one GPS to GeoMoS to use the GPS sensors for monitoring we recommend GPS connection to the Leica Spider software. GeoMoS supports an interface to Leica GPS Spider v2.1 software (order GPS Spider and accessories separately)

- Regional and local Leica support specialists will help you selecting the optimal equipment configuration.

3.8 Setup of a Meteo Sensor



667 726 DTM meteo sensor, combined pressure and temperature sensor 2m cable with Lemo1 plug. (other lengths of cable on request).
734 698 GEV187, Y-cable, connects TPS to PC (9-pin RS232 serial) and external battery, 2.0m.
On request Cable Lemo-1 (female) to Lemo-0 (female)

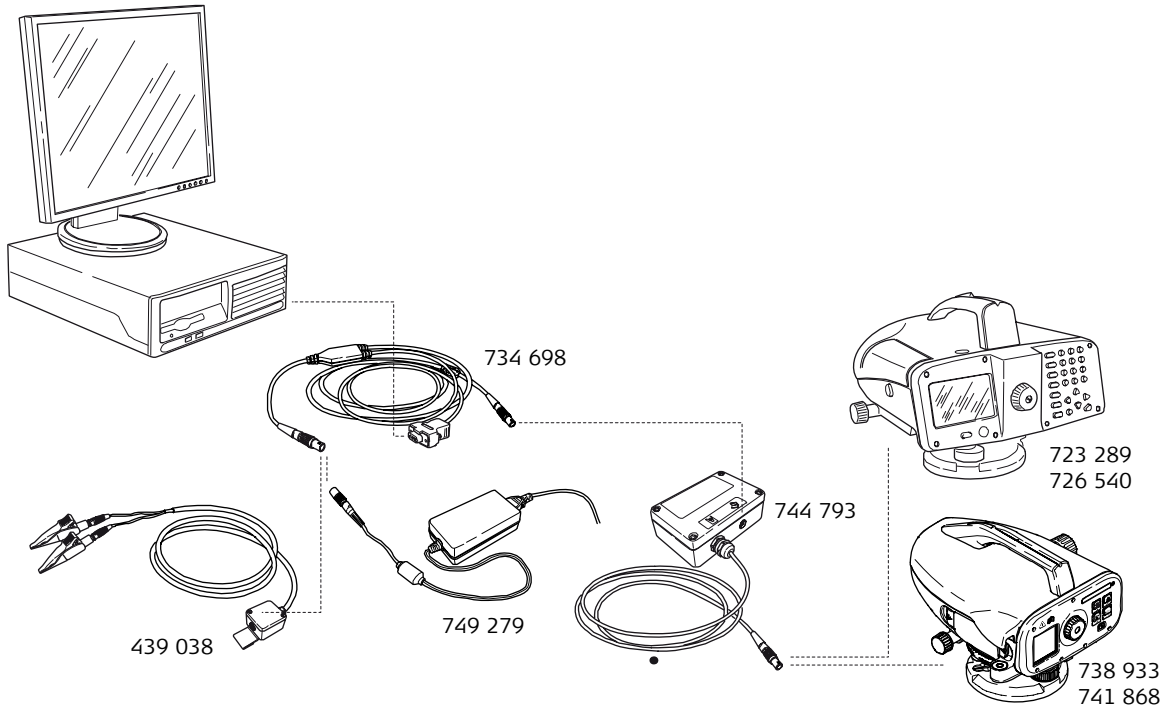
Select Power

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

731 722 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, US-Version.
731 773 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, EU-Version.
734 232 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, UK-Version.
734 233 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, AUS-Version.
738 586 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, CH-Version.

3.9 Setup of a Level



Select Level

723 289 DNA03, 0.3mm, precision digital level, magnetically-damped compensator, with user manual and container.
726 540 DNA10, 0.9mm, digital level, magnetically-damped compensator, with user manual and container.
738 933 SPRINTER 100M, 2.0mm, electronic level, with RS232 interface & internal memory, with user manual, 4 pcs AA dry cells and container.
741 868 SPRINTER 200M, 1.5mm, electronic level, with RS232 interface & internal memory, with user manual, 4 pcs AA dry cells and container.

744 793 Switchbox with cable 2.0m for TPS/1000/ 1100/1200 and GeoMoS. Supports cold boot for TPS (important 24/7 hours/day monitoring)
734 698 GEV187, Y-cable, connects TPS to PC (9-pin RS232 serial) and external battery, 2.0m.

Select Power

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

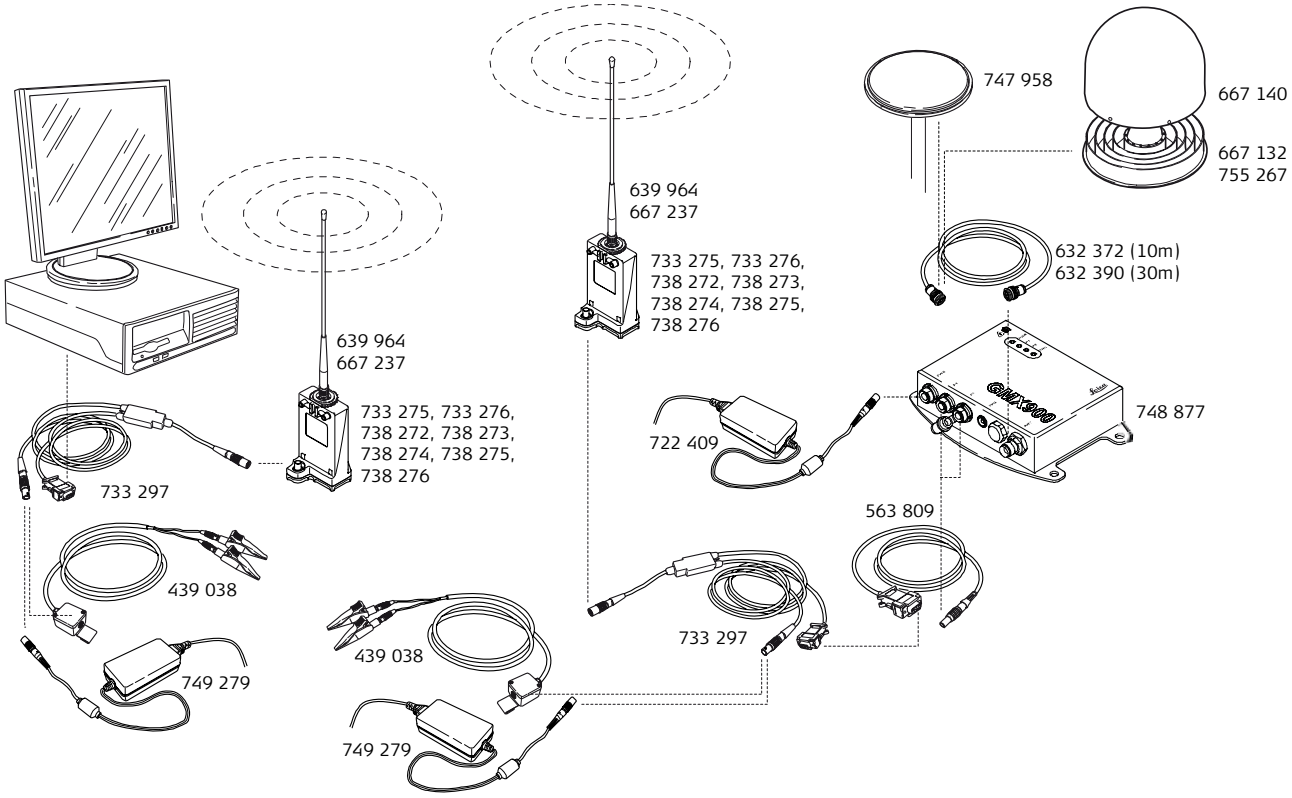
Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

Select Staff

Refer to “4.2.2 DNA Staffs” and “4.2.3 Sprinter Staffs”.

3.10 Setup of a GMX902 Sensor with Radio (GFU-14)



Receiver

748 877 GMX902, GPS Dual Frequency Receiver for Monitoring Applications

Select Antenna

747 958 AX1202 GG, Dual Frequency Antenna for GX1230 GG and GRX 1200 GG Pro Receiver
667 132 AT504, dual-frequency choke-ring antenna for GPS receivers. Dorne Margolin, JPL design. Conforms to IGS 'type T' specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.
755 267 AT504 GG, GPS/GLONASS dual-frequency choke-ring antenna for GPS/GLONASS receivers. Dorne-Margolin antenna element, JPL design. Conforms to IGS "Typ T" specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.
667 140 GVP601, Weather-protection radome for AT504 choke ring antenna.

Select Antenna Cables

632 372 Antenna cable, 10 m
632 390 Antenna cable, 30 m

Select Power for GPS receiver

722 409 Power supply unit for GPS receiver, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to GPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 722 409:

731 722 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, US-Version.
731 773 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, EU-Version.
734 232 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, UK-Version.
734 233 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, AUS-Version.

738 586 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, CH-Version.

Select Radio Modem

733 275 GFU14-0, Satelline 3AS radio modem (433.525 MHz, 25.0 kHz channel spacing, 0.5 W)
733 276 GFU14-1, Satelline 3AS radio modem (406.425 MHz, 25.0 kHz channel spacing, 1.0 W)
738 272 GFU14-2, Satelline 3AS radio modem (445.000 MHz, 12.5 kHz channel spacing, 1.0 W)
738 273 GFU14-3, Satelline 3AS radio modem (443.000 MHz, 12.5 kHz channel spacing, 1.0 W)
738 274 GFU14-4, Satelline 3AS radio modem (440.550 MHz, 25.0 kHz channel spacing, 0.5 W)
738 275 GFU14-5, Satelline 3AS radio modem (458.150 MHz, 12.5 kHz channel spacing, 0.5 W)
738 276 GFU14-6, Satelline 3AS radio modem (439.8625 MHz, 12.5 kHz channel spacing, 1.0 W)

Select Radio Antenna

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

Select Power for Radio Modem

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

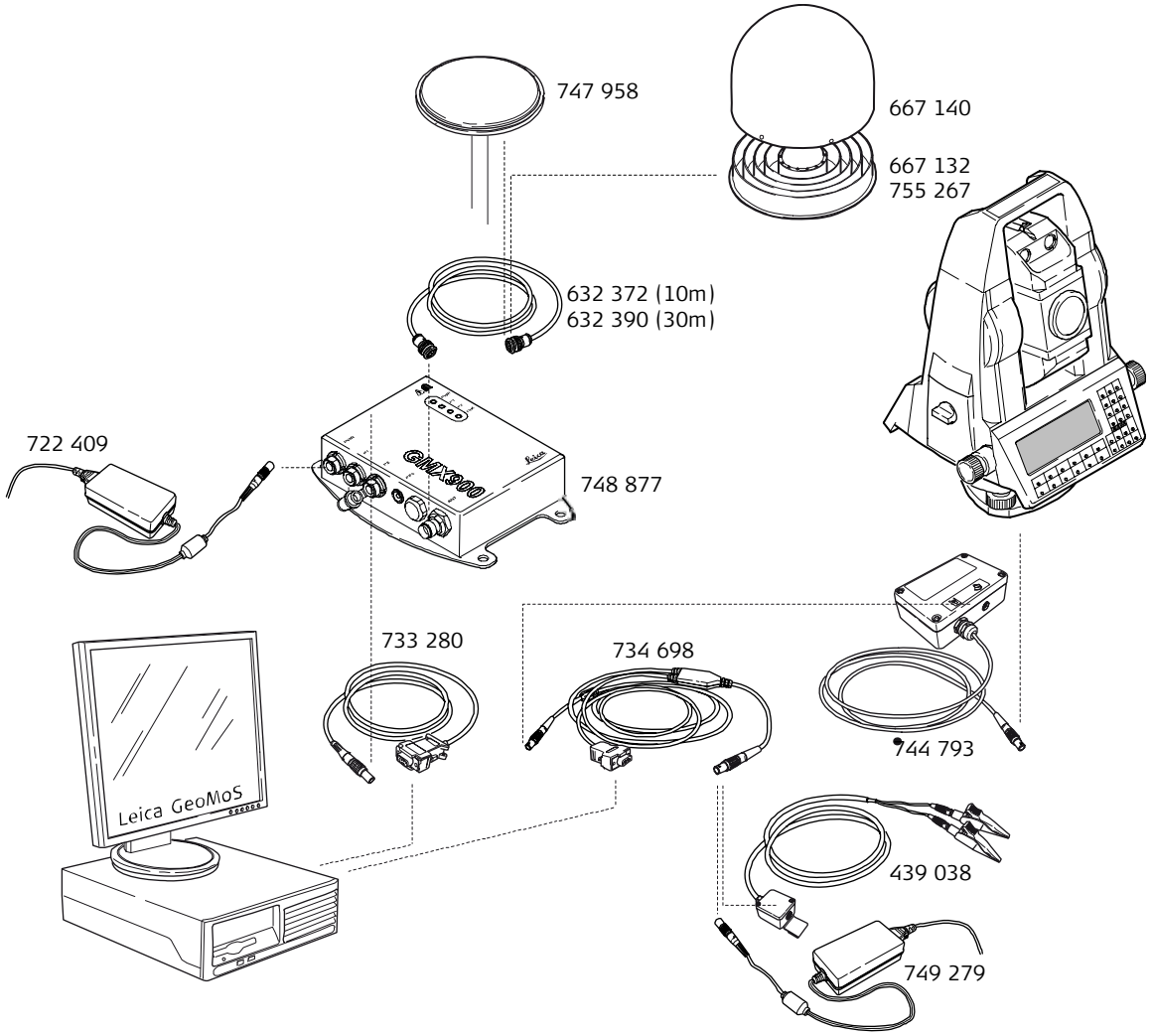
Select Communication Cables

563 809 GEV113, 2.8m Modem cable. Connects GPS receiver Ports 1, 2 and 3 to modem. Lemo 8 Pin to 9 Pin RS232 male serial connector.
733 297 GEV171, 1.8m cable to program, the Satelline 3AS radio modem inside the GFU14 housing

Select Software

GeoMoS Professional	Refer to “1 GeoMoS Modules”
Leica GPS Spider	Refer to “4.2.4 GPS Spider”
Leica GNSS QC	Refer to “4.2.5 GNSS QC”

3.11 Setup of a GPS Sensor co-located with a Total Station



Total Station

664 662 TPS Sensor (TCA 2003)
744 793 Switchbox with cable 2.0m for TPS/1000/ 1100/1200 and GeoMoS. Supports cold boot for TPS (important 24/7 hours/day monitoring)
734 698 GEV187, Y-cable, connects TPS to PC (9-pin RS232 serial) and external battery, 2.0m.

Select Power for Total Station

439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver to 12V car battery.
749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to TPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

731 722 Power Cord, US-Version.
731 773 Power Cord, EU-Version.
734 232 Power Cord, UK-Version.
734 233 Power Cord, AUS-Version.
738 586 Power Cord, CH-Version.

Receiver

748 877 GMX902, GPS Dual Frequency Receiver for Monitoring Applications

Communication Cable

733 280 GEV160, 2.8m Data transfer cable. Connects GPS1200 receiver Ports 1, 2 and 3, RX1220 or GMX902 to PC for data transfer, firmware upload etc. Lemo 8 Pin to 9 pin RS232 female serial connector.

Select Antenna

747 958 AX1202 GG, Dual Frequency Antenna for GX1230 GG and GRX 1200 GG Pro Receiver
667 132 AT504, dual-frequency choke-ring antenna for GPS receivers. Dorne Margolin, JPL design. Conforms to IGS 'type T' specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.
755 267 AT504 GG, GPS/GLONASS dual-frequency choke-ring antenna for GPS/GLONASS receivers. Dorne-Margolin antenna element, JPL design. Conforms to IGS "Typ T" specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.
667 140 GVP601, Weather-protection radome for AT504 choke ring antenna.

Select Antenna Cables

632 372 Antenna cable, 10 m
632 390 Antenna cable, 30 m

Select Power for GPS receiver

722 409 Power supply unit for GPS receiver, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect to GPS.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 722 409:

731 722 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, US-Version.
731 773 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, EU-Version.
734 232 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, UK-Version.
734 233 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, AUS-Version.
738 586 Power Cord for Dual Bay Charger GKL24 or GPS Power supply unit, CH-Version.

Sensors

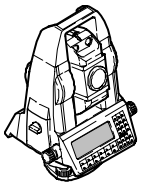
4.1 TPS Sensors

4.1.1 Supported Sensors

Leica TPS 1000 Series
Leica TPS 1100 Series
Leica TPS 1200 Series

Note: Only automated TPS can be used with GeoMoS. Instruments with ATR are recommended.

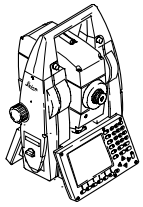
TCA2003 and TCA1800 instruments are recommended.



664 662 TCA2003, 0.5"(0.15mgon) automatic precision total station, with laser plummet, 2 control panels, accessories, user manual and container.

667 016 TCA1800, 1"(0.3mgon) automatic total station with laser plummet, 2 control panels, accessories, user manual and container.

TCA1201M instruments are recommended for long-range monitoring (>1000m)



748 872 TCA1201M, total station with long-range EDM for monitoring, automatic target recognition, laser plummet, 1 keyboard with touch screen, electronic guide light EGL, standard applications, user manual, and container.

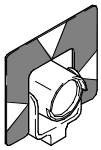
Customer Care Packages

A wide selection of comprehensive Customer Care Packages 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.

4.1.2 Supported Reflectors

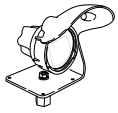
The number of prisms needed is dependent on the project.

Circular reflector



641 617 Circular prism GPR121 PRO, with holder and target plate

Monitoring prisms

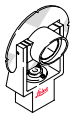


726 295	GPR112 Monitoring-Mining Prism, with M8 internal threat in the back for direct mounting and 5/8" adapter.
726 296	GHT112 Mounting set for GPR112 with M8 and 5/8" internal thread adapters, suitable for direct fixing systems on nearly every surface, prism is adjustable and fixable in two axes.
727 406	GDZ112, rain shelter for Monitoring Mining Prism GPR112. Full availability of the prism even in rainy conditions. The rain shelter protects the prism front against rain drops and dust which is washed out from of the air by rain.

Precision reflector

555 631	Single-prism precision reflector GPH1P.

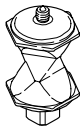
Mini prism for short distances



641 662	Mini prism GMP101, incl. bubble, target plate and spike, in bag, also suitable for GLS11 and GRT44 (same height as GPH1, additive constant +17.5mm)
641 762	Mini prism GMP104, with L-bar, for fixed installations.

360° Reflectors

639 985	GRZ4 360° Reflector.
667 399	GRZ121 360° Reflector PRO.



754 384	Reflector with 5/8" thread adapter for mounting of GPS antenna.

4.1.3 Tribrachs

443 603	Tribrach GDF21 for TPS1000 Series, without optical plummet, light green.
667 304	Tribrach GDF121 PRO for TPS1200 Series, without optical plummet, pale green.

4.1.4 Other TPS Accessories

For additional information see:

740 623	Leica System 2000 Brochure.
738 605	Leica TPS1200 Series Equipment List
752 136	Leica Accessories Equipment List

• Regional and local Leica support specialists will help you selecting the optimal equipment configuration.

4.2 GPS Sensors

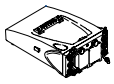
4.2.1 Supported Sensors

Leica GPS System 500
Leica GPS System 1200
Leica GMX902

For details see Equipments lists System 500/1200 and Equipment list for GPS Networks and Reference Stations.

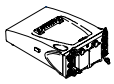
Note: The particular of model of that GPS that is recommended depends on how the sensor connection is made to GeoMoS. If the GPS is to be directly connected to GeoMoS (computation done on the sensor), RTK rover GPS must be used. If the position computation is to be done by Leica GPS Spider (recommended) then reference station GPS should be used.

GPS Sensors for Direct Connection to GeoMoS (RTK GPS)

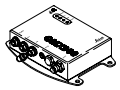


733 245 GX1230, Geodetic GPS Dual Frequency RTK Receiver.
747 956 GX1230 GG, Geodetic GPS Dual Frequency RTK Receiver with GLONASS option

GPS Sensors for Connection via GPS Spider (Reference Station GPS)



744 589 GRX1200 Lite, Permanent GPS Dual Frequency Reference Station Receiver for RTK-only with TX1200 total stations with ATX1230 smart antenna.
733 246 GRX1200 Classic, Permanent GPS Dual Frequency Reference Station Receiver.
733 248 GRX1200 Pro, Permament GPS Dual Frequency Reference Station Receiver, Professional, with Event Input, PPS Output, Extern. Oscillator Input and Ethernet connectivitiy.
748 102 GRX1200 GG Pro, GPS/GLONASS Dual Frequency Reference Station Receiver, Professional, with Event Input, PPS Output, Extern. Oscillator Input and Ethernet connectivity. Includes L2C. GLONASS is enabled every Wednesday. Can be upgraded to a full-time GPS/GLONASS receiver with GSW 567.



748 877 GMX902, GPS Dual Frequency Receiver for Monitoring Applications.

Purchasable Options

751 225 GSW567, GLONASS option for GRX 1200 GG Pro. Without the GLONASS option, GLONASS is only enabled on Wednesdays.

Customer Care Packages

A wide selection of comprehensive Customer Care Packages 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.

4.2.2 Antennas

747 958 AX1202 GG, Dual Frequency Antenna for GX1230 GG and GRX 1200 GG Pro Receiver

667 132 AT504, dual-frequency choke-ring antenna for GPS receivers. Dorne Margolin, JPL design. Conforms to IGS 'type T' specification for GPS antennas. For GX1220 / 1230, GRX1200 and GMX902 Receivers.

755 267	AT504 GG, GPS/GLONASS dual-frequency choke-ring antenna for GPS/GLONASS receivers. Dorne Margolin antenna element, JPL design. Conforms to IGS 'type T' specification for GPS antennas.
667 140	GVP601, Weather-protection radome for AT504 choke ring antenna.

4.2.3 GPS Accessories

667 200	Antenna cable, 1.2 m
636 959	Antenna cable, 2.8 m
632 372	Antenna cable, 10.0 m
632 390	Antenna cable, 30.0 m
664 813	Antenna cable, 50.0 m
713 483	Antenna cable, 70.0 m

733 275	MCF64, CompactFlash card 64MB.
733 257	MCF256, CompactFlash card 256MB.
745 995	MCF1000, CompactFlash card 1GB.

For detailed description and article numbers see Equipment lists for System 1200 and Equipment list for GPS Networks and Reference Stations.

4.2.4 GPS Spider

All active Positioning Products and Post Processing Products configured in GPS Spider with the Send To option set to GeoMoS can be used in GeoMoS. Thus many GPS sensors maybe connected using a single entry in the GeoMoS Sensor Manager.

Required Options for Real Time Monitoring

740 244	Leica GPS Spider, GPS Reference Station Software, general license, with documentation. Supports full receiver control and configuration, manual downloads and firmware upgrade. Not protected.
744 912	GPS Spider, Positioning Site license. Required for each GPS site/sensor that shall be used for the GPS Spider position processing. A minimum of two (2) of these licenses are needed for positioning.

Required Options for Post Processed Monitoring

740 244	Leica GPS Spider, GPS Reference Station Software, general license, with documentation. Supports full receiver control and configuration, manual downloads and firmware upgrade. Not protected.
744 912	GPS Spider, Positioning Site license. Required for each GPS site/sensor that shall be used for the GPS Spider position processing. A minimum of two (2) of these licenses is needed for positioning.
744 904	GPS 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 GPS Spider product files on the Internet. Option includes one (1) site/sensor license. For more site/sensor licenses for a GPS Spider FPS, order one or more "GPS Spider, FPS Additional Site License" as required.
734 613	GPS Spider, FPS Additional Site License. Required for each GPS site/sensor that shall be used with GPS Spider File Product Service in addition to the default one (1) site/sensor, which is included as standard.

Note: For both real time and post processed monitoring simply double the number of Positioning Site licenses.

For additional information see:

745 972	Equipment list “For GPS Networks and Reference Stations”

4.2.5 GNSS QC

GNSS QC can be used as an alternative to GeoMoS as a low cost analyzer for use together with GPS Spider for GPS-only monitoring. The Advanced Coordinate Analysis option includes support for 20Hz real time NMEA data, Spider post processing data, profiling, limit checks and messaging. GNSS QC can be also used for site selection and quality checking of the raw GPS data.

Required Options for Analysis of Real Time and Post Processed Positioning Data from Spider

749 319	Leica GNSS QC, GPS Reference Station software with documentation. For data analysis and quality control of GPS reference station data. Dongle protected.
751 824	GNSS QC, Advanced Coordinate Analysis option. High speed calculation and graphing of displacement, messaging and limit checks for real time NMEA and GPS Spider Post Processing coordinate data. Dongle protected.

For additional information see:

745 972	Equipment list “For GPS Networks and Reference Stations”

4.3 Levels

4.3.1 Supported Sensors

723 289 DNA03, 0.3mm, precision digital level, magnetically-damped compensator, with user manual and container.

726 540 DNA10, 0.9mm, digital level, magnetically-damped compensator, with user manual and container.

738 933 SPRINTER 100M, 2.0mm, electronic level, with RS232 interface & internal memory, with user manual, 4 pcs AA dry cells and container.

741 868 SPRINTER 200M, 1.5mm, electronic level, with RS232 interface & internal memory, with user manual, 4 pcs AA dry cells and container.

Customer Care Packages

A wide selection of comprehensive Customer Care Packages 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.

4.3.2 DNA Staffs

560 271 Invar bar code levelling staff GPCL3, 3m, with circular level.

560 274 Invar bar code levelling staff GPCL3, 3m, with circular level, with expansion coefficient certificate and length calibration certificate.

563 659 Invar bar code levelling staff GPCL2, 2m, with circular level.

632 313 Industrial bar code levelling staff GWCL92, 92 cm, invar staff with circular bubble and 2 interchangeable bases.

563 733 Invar bar code scale GWCL60, 60 cm

522 794 Dual face levelling staff GKNL4M, 4m, 3 sections, code/cm-graduation, with handles and circular bubble, in transport bag

522 793 Dual face levelling staff GKNL4F, 13.3ft, 3 sections, code/ft graduation, with handles and circular bubble, in transport bag

667 113 Telescopic levelling staff GTL4C, 4m, aluminium, bar code/mm-graduation, with bull`s-eye bubble, in transport bag

4.3.3 Sprinter Staffs

741 882 GSS111, Dual face telescopic levelling staff, 5m, 4 sections, SPRINTER barcode / E-Scale cm-graduation, with circular bubble, in transport bag (Standard version).

741 883 GSS111-1, Dual face telescopic levelling staff, 5m (16.4ft), 4 sections, SPRINTER barcode / ft-graduation, with circular bubble, in transport bag, (Imperial version).

741 884 GSS112-3, Dual face telescopic levelling staff, 4m, 4 sections, SPRINTER barcode / E-Scale cm-graduation, with circular bubble, in transport bag (UK version).

741 885 GSS111-2, Dual face telescopic levelling staff, 5m, 4 sections, SPRINTER barcode / 5mm-graduation, with circular bubble, in transport bag (Japan version).

741 886 GSS112-5, Dual face telescopic levelling staff, 4m, 4 sections, SPRINTER barcode / 2mm-graduation, with circular bubble, in transport bag (Spain version).

746 613 GSS112, Dual face telescopic levelling staff, 4m, 4 sections, SPRINTER barcode / E-Scale cm-graduation, with circular bubble, in transport bag (Standard version).

746 614 GSS122-3, Dual face telescopic (Fibreglass) levelling staff, 4m, 4 sections, SPRINTER barcode / E-Scale cm-graduation, with circular bubble, in carry case (UK version).

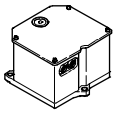
For additional information see:

752 136 Leica Accessories Equipment List

4.4 Other Sensors

4.4.1 Inclination Sensors

The Nivel20 and Nivel200 are a series of highly precise inclination sensors from Leica Geosystems. The following instruments are supported.



576 198	NIVEL210, inclination sensor with RS232 interface
576 199	NIVEL220, inclination sensor with RS485 interface

Other accessories

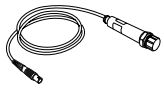
Inclination Sensors need to have mounting, shelters and cables.

Refer to “6 Cables” to connect a GMX902 sensor directly.

For additional information see:

749 597	"Leica Nivel210 and Nivel220 sensors Equipment List"

4.4.2 Meteo Sensors



667 726	STS DTM meteo sensor, combined pressure and temperature sensor, 2.0m cable with Lemo 1

Cables

On request	Cable Lemo-1 (female) to Lemo-0 (female)

Refer to “3.8 Setup a Meteo Sensor”.

Other accessories

Meteo Sensors need to have mountings and shelters.

Power supply

The PC and the sensors need to have a power supply. It depends on the project which power supply will be the best. An external battery could be used depending on the frequency of the measurements and of the accessibility of the measurement station to change batteries.

Note: The PC needs to have a permanent power supply. The power supply depends on the country where it is used.

5.1 Continuous 12V Power supply for GPS1200 and NIVEL sensors

A permanent 12V power supply is needed for sensors

722 409 Power supply unit, for indoor use only, input 100V-240VAC 50-60HZ, output 12VDC, cable with 5-pin Lemo.
Standard mains/line cable select from following list.

Select power cords for 12V power supply unit 722 409:

731 772	Power Cord for Dual Bay Charger GKL24 or Power supply unit, US-Version.
731 773	Power Cord for Dual Bay Charger GKL24 or Power supply unit, EU-Version.
734 232	Power Cord for Dual Bay Charger GKL24 or Power supply unit, UK-Version.
734 233	Power Cord for Dual Bay Charger GKL24 or Power supply unit, AUS-Version.
738 586	Power Cord for Dual Bay Charger GKL24 or Power supply unit, CH-Version.

5.2 Continuous 12V Power supply for TPS sensors

A permanent 12V power supply is needed for sensors

749 279 GEV208, Power supply unit for TPS 2003, for indoor use only, input 100V-240VAC 50-60HZ, output 12VCD, cable with 5-pin Lemo to connect power cables.
Standard mains/line cable select from the following list.

Select power cords for 12V power supply unit 749 279:

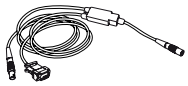
731 722	Power Cord, US-Version.
731 773	Power Cord, EU-Version.
734 232	Power Cord, UK-Version.
734 233	Power Cord, AUS-Version.
738 586	Power Cord, CH-Version.

Cables

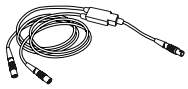
6.1 Power Cables

A permanent power supply is needed during the measurements.

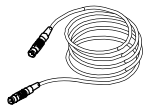
439 038 GEV71, 4m car battery cable, connects TPS or GPS receiver (Lemo-1, 5 pin, female) to 12V car battery. (Note, for TPS e.g. the additional cable 734 698 and for GPS the cable 560 130 or 636 972 is required.)



734 698 GEV187, Y-cable, connects TPS to PC (9-pin RS232 serial) and external battery, 2.0m.



733 298 GEV172, 2.8m Y-cable, connects GPS Receiver with two external power supplies.



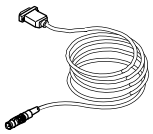
560 130 1.8m cable, connects GEB171 external battery to GPS1200 receiver. Lemo-1, 5 pin, male to Lemo-1, 5 pin, male.

636 972 0.5m cable, connects GEB171 external battery to GPS1200 receiver. Lemo-1, 5 pin, male to Lemo-1, 5 pin, male.

722 411 Cable with protection fuse to connect 12V power supply to GPS receiver.

6.2 Communication Cables

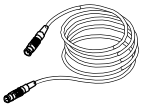
The communication between sensor and PC has to be permanently connected during the measurements.



733 280 GEV160, 2.8m Data transfer cable. Connects GPS1200 receiver Ports 1, 2 and 3, RX1220 or GMX902 to PC for data transfer, firmware upload etc. Lemo 8 to 9 pin RS232 female serial connector.

563 809 GEV113, 2.8m Modem cable. Connects GPS receiver Ports 1, 2 and 3 to modem. Lemo 8 Pin to 9 Pin RS232 male serial connector.

6.3 Communication / power cable between Nivel210 sensors and GPS1200



749 916 1.8m communication and connection cable, GEV209, Nivel210 to GPS1200

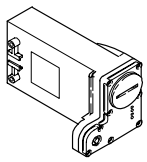
6.4 Antenna cables

667 200 Antenna cable, 1.2 m
636 959 Antenna cable, 2.8 m
632 372 Antenna cable, 10.0 m
632 390 Antenna cable, 30.0 m
664 813 Antenna cable, 50.0 m
713 483 Antenna cable, 70.0 m

For transmitting data

7.1 Satelline Radio Modem, Radio Antennas and Accessories

Satelline Radio Modems

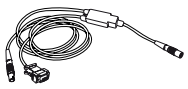


733 275	GFU14-0, Satelline 3AS radio modem (433.525 MHz, 25.0 kHz channel spacing, 0.5 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).
733 276	GFU14-1, Satelline 3AS radio modem (406.425 MHz, 25.0 kHz channel spacing, 1.0 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).
738 272	GFU14-2, Satelline 3AS radio modem (445.000 MHz, 12.5 kHz channel spacing, 1.0 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).
738 273	GFU14-3, Satelline 3AS radio modem (443.000 MHz, 12.5 kHz channel spacing, 1.0 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).
738 274	GFU14-4, Satelline 3AS radio modem (440.550 MHz, 25.0 kHz channel spacing, 0.5 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).
738 275	GFU14-5, Satelline 3AS radio modem (458.150 MHz, 12.5 kHz channel spacing, 1.0 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).
738 276	GFU14-6, Satelline 3AS radio modem (439.8625 MHz, 12.5 kHz channel spacing, 1.0 W) already integrated into housing, fits on side of GPS Receiver. (User manual and CE-Declaration of Conformity included).

Select according to frequency of radio modem

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

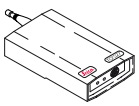
Programming Cable for Satelline Radio Modem



733 297	GEV171, 1.8m cable to program, the Satelline 3AS radio modem inside the GFU14 housing.

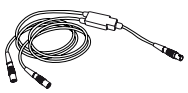
7.2 TCPS27 Radio Modem and Accessories

Satelline Radio Modems



734 161	TCPS27 B, radio modem (base), with antenna, user manual. Used as radio modem for TPS1200 (frequency range 2400 - 2483 Mhz).
734 162	TCPS27 R, radio modem (remote), with antenna, user manual. Used as external radio for PC (frequency range 2400 - 2483 MHz).

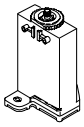
Cables for TCPS27 Radio Modems



734 697	GEV186, Y-cable, connects TCPS27 to TPS1200 and external battery, 1.8m.

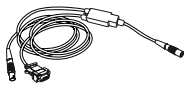
734 699	GEV188, Y-cable, connects TCPS27 to PC (9-pin RS232 serial) and external battery, 1.8m.

7.3 Mobile Phones and Accessories



750 242 GFU24, Housing with Siemens MC75 GSM/GPRS Module (Quad-Band GSM 850/900/1800/1900 MHz).

667 237 Antenna for 900/1800 MHz mobile network.



733 297 GEV171, 1.8m cable to program, the Satelline 3AS radio modem inside the GFU14 housing. Also used to connect GFU17 to PC.

Other Accessories

8.1 Switchbox

Essential tool for permanent monitoring, supports cold boot for TPS

744 793 Switchbox with a 2.0m cable for TPS1000/ TPS 1100/ TPS 1200 and GeoMoS.

Whether you monitor the movement of a volcanic slope, the structure of a long bridge or track the settlement of a dam; whether you measure, analyse and manage the structures of natural or man-made objects: the monitoring systems by Leica Geosystems provide you with the right solution for every application.

Our solutions provide reliable, precise data acquisition, advanced processing, sophisticated analysis and secure data transmission. Using standard interfaces, open architectures and scaleable platforms, the solutions are customizable to meet individual requirements – for permanent and temporary installations, for single sites and monitoring networks.

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