

Products: TS30, TM30, TPS1200, GPS1200, RX1250

From: System 1200 Product Management

Date: January 2011



DVD ROM: Leica SmartWorx DVD (Art. No. 755806)

Version: SmartWorx v8.10

Download:  @Leica Geosystems

These Release Notes contain important information about the new SmartWorx v8.10 software that can be loaded onto all models of TS30, TM30, TPS1200, GPS1200 and RX1250 instruments.

This firmware is protected and can only be loaded onto instruments with valid firmware (software) Maintenance date.

Software	Version	Maintenance Date
SmartWorx	8.10	23 October 2009

If the Maintenance End date of the used instrument is on/after the 23 October 2009, then this firmware can be loaded.

If the Maintenance End date is no longer valid, then please contact your local Leica Representative to learn about Customer Care Packages (CCPs) that include software maintenance so that you can benefit from the latest software improvements.



To check Maintenance End date please start your sensor and access the **STATUS/System Information** panel. On the **Firmware** page the Maintenance End date, is displayed. The new Firmware can be loaded if the date shown is the 23rd October 2009 or later.

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## Please do take your time to read these Release Notes!

These Release Notes contain information about the new functionality within the firmware, new loadable application programs and improvements to existing loadable application programs.

For information about how to obtain and load the firmware and loadable applications please refer to "System1200 SmartWorx upload instructions.doc" on the DVD.

For a summary of all the latest individual firmware components please refer to "System1200 SmartWorx v8.10 summary of latest firmware components.doc" on the DVD.

## General Firmware Improvements for TPS/GNSS instruments

### Support of GS12 SmartStation

The GS12 is a GNSS dual frequency sensor that can be used as SmartStation antenna for TS30/TM30 and TPS1200.



### Support of GFU27/28 devices

#### GFU27

The GFU27 is a RX/TX Satellite radio (similar to the Viva SLR5) in a GFU housing suitable for use with GX1200, GS09 and SmartStation setup.

#### GFU28

The GFU28 is a Telit, 5 band 3.5G modem (similar to the Viva SLG1) in a GFU housing. It can be used with GX1200, GS09 and SmartStation setup.

Name	Type
PacificCrest PDL	Pac Crest PDL
PacificCrest RFM	Pac Crest RFM96W
Sate1 TR1 (GFU27)	Sate1 3AS/3ASd
Satellite 2ASx	Sate1 2ASx
Satellite 2ASxe	Sate1 2ASxE
Satellite 3AS	Sate1 3AS/3ASd
TFR-300L	IFX-300L

Name	Type
Siemens S25/S35i	GSM
Siemens TC35	GSM
Sony Ericsson	GSM
TDMA	TDMA
Telit GSH (GFU28)	UMTS
US Robotics 56K	Modem
Wavecom M1200	GSM

### Support of Disto A8

The new Disto A8 has been added to the device list for hidden point measurement.



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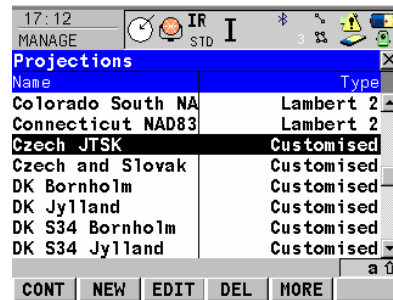
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### New projection for the Czech coordinate system S-JTSK

The new factory default projection Czech JTSK for the new Czech coordinate system S-JTSK is integrated into SmartWorx version 8.10.



### Height information from RTCM v3 RTK messages

SmartWorx Version 8.10 now supports the height residuals received in RTCM v3.x messages 1023 & 1024. All height residuals are treated as geoid separation values and are written into a geoid (.gem) file. As the rover moves, the RTK network provider will send additional residuals when required, and over time (and space) the geoid file is dynamically updated, and therefore will slowly grow. This Geoid file can also be imported and used in LGO.

### New boot process for angle measurement system of TS30 / TM30

With System1200 Firmware Version 8.10 the startup process of the TS30 / TM30 angle measurement system has been improved. From this version onwards 100% of all booting cycles after switching on the instrument will be completed successfully.

### New ATR measurement algorithm for TS30/TM30

Whenever highest accuracy demands have to be suited using automated measurements the EDM Precise Mode should be activated. From Version 8.10 onwards the EDM Precise mode is bundled with a new ATR measurement algorithm which can significantly increase the accuracy of automated measurements on TS30 and TM30 instruments.

### System Startup notification on TPS1200+ / TS30 / TM30

On TS30/TM30 and TPS1200+ with System1200 SmartWorx Version 8.10 installed a system startup notification string can be output once the boot process of the instrument is completed. If configured the instrument will send the new startup string after power OFF/ON over the serial interface and external control applications (e.g. GeoMoS) can recognize this string. By this measure the software receives clear information that the instrument is ready to operate.

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## General Improvements in applications

### Setup application

Previously, the height reduction in setup application was done if a distance measurement was taken. With SmartWorx version 8.10, the height reduction is also done for setups that don't include a distance measurement contributing to more precise setup calculation. Further improvements have been done in resection results having more than one solution.

### Survey application, Auto Points

If GSI Output is configured on TPS1200+, TS30 and TM30 equipped with internal memory and no CF card is inserted points measured in Auto Points will only be written to the GSI Output interface without storing them to the database. This change ensures a permanent high and constant data rate on the interface for instance in continuous measurement applications.

### Field to Office data transfer – Internal memory as data source

On TPS1200+, TS30 and TM30 equipped with internal memory the data transfer from field to office now supports the internal memory as data source in addition to the existing CF card data source.

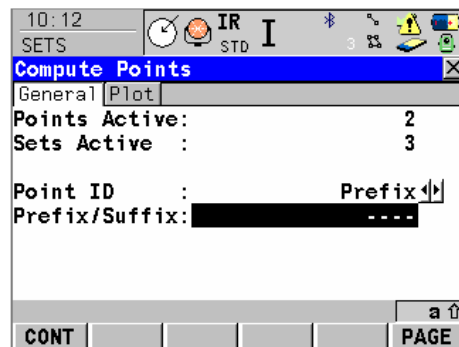
### Sets of Angles application

The Sets of Angles application has been improved with the following new functionality:

A backsight point used for setup can now also be part of the point list and taken for set measurement.

Once the sets of angles are completed and all measurements made then the resulting coordinates for each target point are computed. The way the resulting points are computed has been changed. The resulting points are now computed from all measured angle and distance results and are based on the mean angles and distances. The resulting computed points are then stored as control triplets. The averaging flag within the individual measurements is set to "No" which means no averaging triplet is computed.

Note, a prefix or suffix has to be added to the points.



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Using a control triplets for the resulting coordinates has the advantage that:

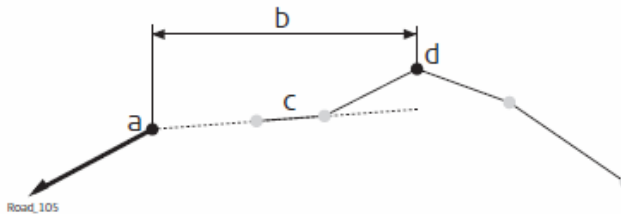
- they can be seen as highest point class in the point list if the filter is set to highest class.
- by adding a prefix/suffix to the control triplet, they are not used in further adjustments (e.g. in LGO). For further adjustments in LGO, the measurements are used.
- the resulting points can be distinguished by different naming (prefix/suffix) if same points measured several times.

### Road Runner application

#### Manual slope

An additional method to define manually a slope has been introduced.

The new method **Relative End slope** calculates the Hinge height on the endslope by using the hinge offset. For positive Hinge offset values the right end slope is used, for negative Hinge Offsets the left end grade is used to calculate automatically the Hinge Height on the slope grade.

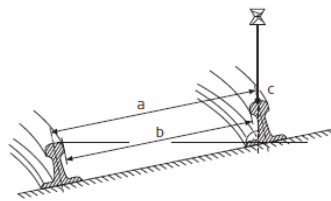


- a) Hinge point of manual slope
- b) Defined hinge offset (-)
- c) Most left cross slope of design
- d) Selected hinge reference

### RoadRunner Rail application

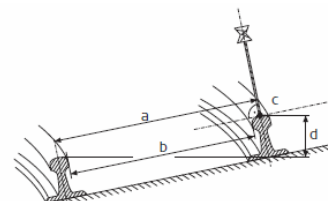
The Rail application support now also **fix mounted reflectors** on a **rail bar** (solar gauge).

#### Plumbline



- a) Superelevation base
- b) Nominal gauge
- c) Measured point (Easting, Northing, Height)

#### Perpendicular



- a) Superelevation base
- b) Nominal gauge
- c) Measured point (Easting, Northing, Height)
- d) Superelevation

If in the Rail configuration Reflector Ht: **<Perpendicular>** is set, Easting, Northing and Elevation of the measured point is calculated **using the design cant**, or if enabled, the manually cant.

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## RoadRunner Tunnel application

### Additional Jumbo Guidance Features

Previously in the Tunnel Configuration it was possible to set Jumbo Guidance: Yes/No. Now it is possible to set **Jumbo Guidance: None** or **Parallel to Alignment** or **Drill Pattern**.

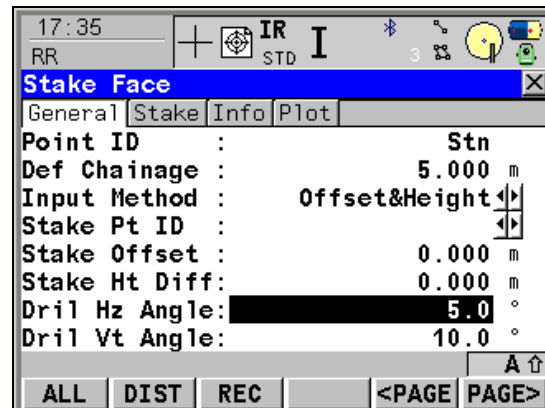
**Jumbo Guidance: None** is the same as the previous Jumbo Guidance:No (no jumbo guidance)

**Jumbo Guidance: Parallel to Alignment** is the same as the previous Jumbo Guidance: Yes (guides jumbo to drill parallel to the alignment).

**Jumbo Guidance: Drill Pattern** allows the jumbo to be guided into a position so that the drilling direction into the tunnel face is as the user defines (it does not have to be parallel to the alignment).

If enabled the user input fields **Dril HZ Angle** and **Dril Vt Angle** are available in the **Stake Face – General** tab:

Note: The horizontal and vertical drill direction 0deg/gon is along the alignment



Another benefit of using **Jumbo Guidance: Drill Pattern** is the **Apply drill pattern from: Measured Chainage** or **Defined Chainage** option in the define panel.

**Apply drill pattern from: Measured Chainage** applies the drill pattern to the measured change (this was done by default in the background previously).

**Apply drill pattern from: Defined Chainage** is used to ensure the same drill direction between two chainages. For example if an explosion does not explode as much material as needed after one blast, then the drilling direction as set at the original chainage (at the first blast) is used to intersect the measured surface (after the first blast) to define the next drilling point position and direction.

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## General Firmware Improvements for GNSS instruments

### New ME firmware 4.007

The new ME firmware version 4.007 contains a new, optimized method for clearing the GNSS Almanac.

Please note that the new ME 4.007 firmware must be loaded onto the GNSS receiver separately.

### GNSS RTK processing

In firmware version 8.10 enhancements have been made to further improve the GNSS RTK performance when working in heavy canopy environments.

### SmartRTK enhancement

SmartRTK has been further improved to fully utilise the base sensor information to enhance the GNSS RTK performance in firmware 8.10.

### NMEA improvement

In rare occasions an UTC time based inconsistency was seen in the NMEA output. This has been fixed in firmware version 8.10.

## General Firmware Improvements for GRX1200

### Added missing antennas to antenna management

The antennas AT503 LEIC, AT504 LEIS, AT504 GG, AR25.R4 LEIT and AR25.R4 SCIT, AR25.R4 Pillar are now available as default antennas on the GRX receivers.

Please note that you need to press "Restore default" after the firmware upgrade to see the new antennas.

### New meteo sensor Vaisala WXT520

The new meteo sensor Vaisala WXT520 is supported on the GRX from firmware Version 8.1 onwards. Besides the standard measurements, this receiver allows measuring and logging values for wind azimuth, wind speed, rain increment and hail indicator.

### Antenna management improvement

When creating a user defined antenna, "." And spaces are now allowed in the antenna name.

### FTP push improvements

The stability of the FTP push functionality has been improved.

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