

## Basic Configuration Package

### **Scanner Basic Configuration for RIEGL VZ-400**

Part-No. HW-VZ400-01-000-00

#### **3D Laser Scanner RIEGL VZ-400**

(Part-No. HW-VZ400-00-000-00)

- laser transmitter & receiver front end
- motorized mirror scanning mechanism
- signal processing electronics with echo digitization and online waveform analysis
- Human-Machine Interface (HMI) with high-resolution
- 3,5" TFT color display (320 x 240 pixels) and keypad
- 32 GByte flash memory for data storage, internal
- GPS receiver (L1), integrated (with antenna)
- inclination sensors (2 axes), integrated
- laser plummet, integrated
- internal power supply electronics, input voltage 11 - 32 V DC

Detailed specifications and laser classification according to the latest datasheet *RIEGL VZ-400*.



#### ***Electrical Interfaces, integrated***

- LAN interface 10/100/1000 MBit/s within rotating head
- LAN interface 10/100 MBit/s within base
- integrated WLAN interface with two different lengths of rod antennas
- USB 2.0 for external storage devices (USB flash drives, external HDD)
- USB 2.0 for connecting the optional digital camera
- connector for GPS antenna
- two connectors for external power supply
- connector for serial interface and external GPS synchronization pulse (1PPS)
- interface and connector for external GNSS receiver

#### ***Mechanical Interfaces, integrated***

- W5/8" standard tripod mounting thread
- high precision mounting pads for camera mount on top
- 3x M6 mounting threads, depth 8mm at bottom

### **Cables**

- TCP/IP cable M12-M12, 3 m  
(Part-No. HW-GP-03-000-00)
- TCP/IP cable M12-RJ45, 0.3 m  
(Part-No. HW-GP-03-002-00)
- TCP/IP cable M12-RJ45 cross over, 0.3 m  
(Part-No. HW-GP-03-003-00)
- Serial data and PPS cable to GPS receiver, 3 m  
(Part-No. HW-VZXX-03-000-00)
- Power supply cable, 2 pole / 7 pole, 3 m  
(Part-No. HW-VXX-03-011-00)
- Adapter cable, 1 m, from power supply cable to banana plugs  
(Part-No. HW-GP-03-004-00)
- Adapter cable, 1 m, from power supply cable to cigarette lighter plug  
(Part-No. HW-GP-03-005-00)
- Debug-cable, 2m, only for service purposes  
(Part-No. HW-VXX-03-002-00)
- Cable for external GNSS, Lemo (6 pole) to SUB-D and BNC, length 270mm, BNC cable length 270mm  
(Part-No. HW-VZXX-03-006-00)

### **Set of Protection Caps for VZxx instruments**

(Part-No. HW-VZXX-06-002-00)

### **Retroreflectors**

- 100 pcs. of flat circular retroreflectors, white, diameter 50 mm  
(Part-No. HW-GP-06-002-00)

### **RiSCAN PRO Viewer, Acquisition & Processing Software**

(Part-No. SW-GP-07-000-00)

For detailed description of main functions see RiSCAN PRO datasheet.

- The companion software package to the *RIEGL* Terrestrial Laser Scanner series
- Using a well-documented tree structure for comfortable access and clarity
- Project oriented, XML file format
- For operating systems WINDOWS XP (recommended), WINDOWS 2000 SP2 or above includes:
  - RiSCAN PRO Viewer License for visualizing of already acquired RiSCAN PRO projects and simple data evaluation
  - RiSCAN PRO Acquisition License for *RIEGL* scanner configuration and data acquisition, global scan data registration, viewing and export of merged, filtered point clouds
  - RiSCAN PRO Processing Single User License (Dongle) for advanced data processing and evaluation of already acquired RiSCAN PRO projects

***RiSCAN PRO Standard Software Maintenance for 12 months***

(Part-No. ST-GP-06-000-00)

- Free software updates
- E-mail and telephone support

***User Manual (in English language)***

"Technical Documentation & Operating Instructions"

including, among other things, instructions for: Safety, Installation, Operation, etc.

## **RIEGL Software Packages / Modules**

**RiSCAN PRO Processing Network Server License**

Part-No. SW-GP-02-003-00

Includes 10 licenses for RiSCAN PRO Processing, administrated by a network server program.

Licenses can be allocated to single processing computers in the same network. Checking out single licenses to USB dongles is possible. 2 dongles added to scope of delivery.

Single User License mandatory.

**License RiSCAN PRO / RiPROFILE Plugin Camera Module**

Part-No. SW-GP-02-000-00

Enables automatic acquisition of calibrated and orientated images via USB or IEEE 1394 "firewire".

**License RiSCAN PRO Plugin Multi Station Adjustment Module**

Part-No. SW-GP-02-001-00

- Advanced registration based on overlapping point clouds
- Advanced registration and adjustment based on tie points, control points
- Advanced registration and adjustment based on additional plane information

## **RIEGL Option(s)**

### **SCAN SYNC Scanner Rotation Synchronization for V-Line Laser Scanners**

Part-No. FW-VXX-02-000-00

for synchronizing scan lines to external timing signal

- Synchronization of the data acquisition of a single laser scanner or several laser scanners to an external event pulse, typically the PPS-signal of a GPS receiver, whereas this event pulse can be fed to other units of a data acquisition system for synchronized operation (e.g. a camera is triggered with start of a scan line).
- Increasing the data acquisition speed by operating several laser scanners, as in some data acquisition systems the acquisition speed of a single laser scanner may be not sufficient. Operating several laser scanners scanning the same angular range requires the scanners to be synchronized to achieve a well-defined scan pattern and to avoid interference between the scanners.

Please note:

For upgrading of already delivered instruments please provide the instrument's serial number to allow checking of feasibility and estimating of costs.

### **VZ-xx Standalone - Reflector Search and Fine-Scanning**

Part-No. FW-VZXX-02-000-00

Applicable for standalone operation with the *RIEGL* VZ-xx scanner, without the need of a PC running RiSCAN PRO, by means of the scanner's integrated Human Machine Interface, HMI (LCD screen and key pad).

Identifies all available reflector targets and ignores incorrect ones due to user defined rules and intelligent processing. Automatic fine-scanning of valid reflectors for obtaining accurate reflector position as a basis for global registration.

Please note:

For firmware upgrade please provide the instrument's serial number to allow checking of feasibility and estimating of costs.

### **Waveform Data Output**

Part-No. FW-VZXX-02-001-00

Gives access to waveform data samples of target echoes for advanced investigations on multi target situations.

### **Digital Compass, integrated**

**Part-No. FW-VZ400-02-000-00**

For accurate north-determination of the direction for polar alignment of the Scanner's Own Coordinate System (SOCS) in vertical setup position.

Based on measurements of the magnetic field and detailed information of the internal GPS receiver, the scanner calculates accurate northing. Automatic Registration of multiple scan positions is aided by this functionality. Accessible via RiSCAN PRO or HMI-Interface.

Please note:

For upgrading of already delivered instruments please provide the instrument's serial number to allow checking of feasibility and estimating of costs.

## **Recommended Accessories**

### **AC Power Supply Unit for VZ-xx**

**Part-No. HW-VZXX-04-000-00**

for RIEGL VZ-xx, 100 - 240 V AC, 50 - 60 Hz

- for direct operation of the scanner from main power supply and simultaneously charging of a mounted add-on rechargeable battery or
- for direct charging of an unmounted add-on rechargeable battery

### **Add-on Rechargeable Battery**

**Part-No. HW-VZXX-04-001-00**

Optional add-on rechargeable battery pack (high power high capacity NiMH cells), compact slim disc design, short-circuit-proof and protected connection pins, rechargeable during standard scan operation via external power supply, integrated micro-controller based charging electronics, easily pluggable to base of the laser scanner by central locking screw, DC voltage source (11-32 V DC) sufficient for recharging, 2.13 kg weight, 60.5 mm height, 21.6 V, 4.5 Ah.

Operating time @ typical operating conditions:

VZ-400: approx. 2 h @ 20°C ambient temperature

VZ-1000: approx. 1 h 20 min @ 20°C ambient temperature



Note:

This rechargeable battery (NiMH) is considered to be a "dry cell" battery and is unregulated for transportation by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA), the International Maritime Organization (IMO) and the US Department of Transportation (DOT).

**Rechargeable NiMH Battery for External Power Supply**

Part-No. HW-GP-04-000-00

13.2 V, 18 Ah, with fuse, weight 3.55 kg

**Automatic Charger for External NiMH Battery**

Part-No. HW-GP-04-001-00

100 - 240 V AC, short circuit proof, weight 0.4 kg

**Adapter Cable, from 12 V PbGel battery to 7 pole power supply cable, 1m**

Part-No. HW-GP-03-006-00

with "quick action" battery pole connectors

**Adapter Cable, from 12 V PbGel battery (crocodile) to 7 pole power supply cable, 1m**

Part-No. HW-GP-03-007-00

with "crocodile" battery pole connectors

**Scanner Carrying Case "SMALL" for VZ-xx**

Part-No. HW-VZXX-05-000-00

with 4 hinged handgrips and wheels, splash-proof, foam lined to fit shape of RIEGL VZ-xx and cables.

Dimensions: 560 x 455 x 265 mm.

**Scanner Carrying Case "LARGE" for VZ-400**

Part-No. HW-VZ400-05-000-00

with 4 hinged handgrips and wheels, splash-proof, foam lined to fit shape of RIEGL VZ-400, scanner mount for

manual tilt and cables. Dimensions: 628 x 497 x 303 mm.

**Camera Carrying Case "SMALL", VZ-xx**

Part-No. HW-VZXX-05-001-00

Splash-proof, foam-lined to fit shape of camera NIKON D300(s), NIKON D700, NIKON D600 or NIKON D800, up to 2 lenses (one of the lenses mounted on camera), camera mount with mounted GPS antenna, and camera accessories.

Dimensions: 406 x 330 x 174 mm

**Camera Carrying Case "LARGE", VZ-xx**

Part-No. HW-VZXX-05-002-00

Splash-proof, foam-lined to fit shape of camera NIKON D300(s), NIKON D700, NIKON D600 or NIKON D800, up to 6 lenses (one of the lenses mounted on camera), camera mount with mounted GPS antenna, and camera accessories.

Dimensions: 525 x 428 x 206 mm

**Lens Adapter & Protection Tube for NIKON Lens AF D 14/2.8 NIKKOR for use with VZ-XX Camera Mount**

Part-No. HW-CAM-10-024-00

**Lens Adapter & Protection Tube for NIKON Lens AF D 20/2.8 NIKKOR for use with VZ-xx Camera Mount**

Part-No. HW-CAM-10-028-00

**Lens Adapter & Protection Tube for NIKON Lens AF 50 f/1.8D NIKKOR for use with VZ-xx Camera Mount**

Part-No. HW-CAM-10-023-00

**Lens Adapter & Protection Tube for NIKON Lens AF D 85/1.8 NIKKOR for use with VZ-xx Camera Mount**

Part-No. HW-CAM-10-032-00

**Mounting Adapters for external GNSS Receiver for VZ-xxx**

Part-No. HW-VZXX-06-030-00

Set of adapters for mounting a customer-specific GNSS receiver, with 5/8`` screw connector.

**Stable, Professional Tripod**

Part-No. HW-GP-06-000-00

**Adapter Plate for Tripod Mounting**

Part-No. HW-VZXX-06-009-00

**Tripod Star for Smooth Surfaces**

Part-No. HW-GP-06-001-00

**Adjustable Tribraich, ready for laser plummet**

Part-No. HW-VZXX-06-010-00

Adjustable tribraich, ready for laser plummet, extra stable quality, with bubble level, for mounting the *RIEGL* scanner on a tripod.

Note: *RIEGL* scanner mounted on a tribraich to be used only in vertical position!

Due to reduced stability, usage of a tribraich may reduce measurement result quality.

**Adapter for Tribraich, ready for laser plummet**

Part-No. HW-GP-06-013-00

**Scanner Mount for Manual Tilt for VZ-xx**

Part-No. HW-VZXX-06-006-00

damped tilting mechanism, adjustable in steps of 15° up to 90°



**Shock-Absorbing Mount, SPM-Vxx (LARGE)**

Part-No. HW-VZXX-06-019-00

Made of stainless steel mounting plates and optimized shock-absorbing elements, prepared for being combined with a special adapter plate for mounting of an IMU sensor.

Dimensions of Shock-Absorbing Mount: 330x280x206 mm

***Dimensional drawings of IMU sensor are requested for checking of feasibility.***

**Shock-Absorbing Mount, SPM-Vxx (SMALL)**

Part-No. HW-VZXX-06-011-00

Made of stainless steel mounting plates and optimized shock-absorbing elements, prepared for being combined with a special adapter plate for mounting of an IMU sensor.

Dimensions of Shock-Absorbing Mount: 330x280x153 mm

***Dimensional drawings of IMU sensor are requested for checking of feasibility.***

**Adapterplate IMU (LARGE), for SPM-VXX**

Part-No. HW-VZXX-06-018-00

for mounting of the customer-specific IMU sensor to the shock-absorbing mount SPM-Vxx, e.g. IXSEA Landins 013-B02, IGI Ile, Applanix POS LV420

Dimensions of the Adapter Plate: 210x275 mm

***Dimensional drawings of IMU sensor are requested for checking of feasibility.***

**Adapterplate IMU (SMALL), for SPM-VXX**

Part-No. HW-VZXX-06-012-00

for mounting of the customer-specific IMU sensor to the shock-absorbing mount SPM-Vxx, e.g. IXSEA AIRINS, IGI Ile, Applanix POS LV420.

Dimensions of the Adapter Plate: 210x210 mm

***Dimensional drawings of IMU sensor are requested for checking of feasibility.***

### **High Precision Camera Mount for NIKON D800 for VZ-xx**

**Part-No. HW-VZXX-06-037-00**

Detachable, for high precision mounting of the camera, with connector for GPS antenna, power supplied via scanner, direct USB connection via spring contacts, and Compact Flash Card (SanDisk extreme IV, necessary for operation of the camera with the *RIEGL VZ-xx*)

### **High Precision Camera Mount for NIKON D600/D610 for VZ-xx**

**Part-No. HW-VZXX-06-040-00**

Detachable, for high precision mounting of the camera, with connector for GPS antenna, power supplied via scanner, direct USB connection via spring contacts, and Compact Flash Card (SanDisk extreme IV, necessary for operation of the camera with the *RIEGL VZ-xx*)

## **Additional Services**

### **Two-Day Training**

**Part-No. ST-GP-11-000-00**

Regarding the Hardware as well as the operating software RiSCAN PRO. The training will be held either at our site in Horn, Austria, or at your site (travelling and accommodation expenses to be added).

### **Intensified Additional Training**

**Part-No. ST-GP-11-001-00**

Covers advanced working with the scanner hardware as well as processing of the acquired data with RiSCAN PRO;

Price per 8 hours working day (travelling expenses to be added)

### **Digital Camera Calibration Service for up to three camera lenses**

**Part-No. ST-GP-11-002-00**

Provides complete set of camera calibration parameters for use in RiSCAN PRO including internal calibration, lens distortion parameters and mounting calibration parameters. Parameters are delivered within a RiSCAN PRO project. Calibration statistics included (available for camera-lens combinations as recommended by *RIEGL LMS*).