TOPCON

GLS-2000

CAPTURE REALITY

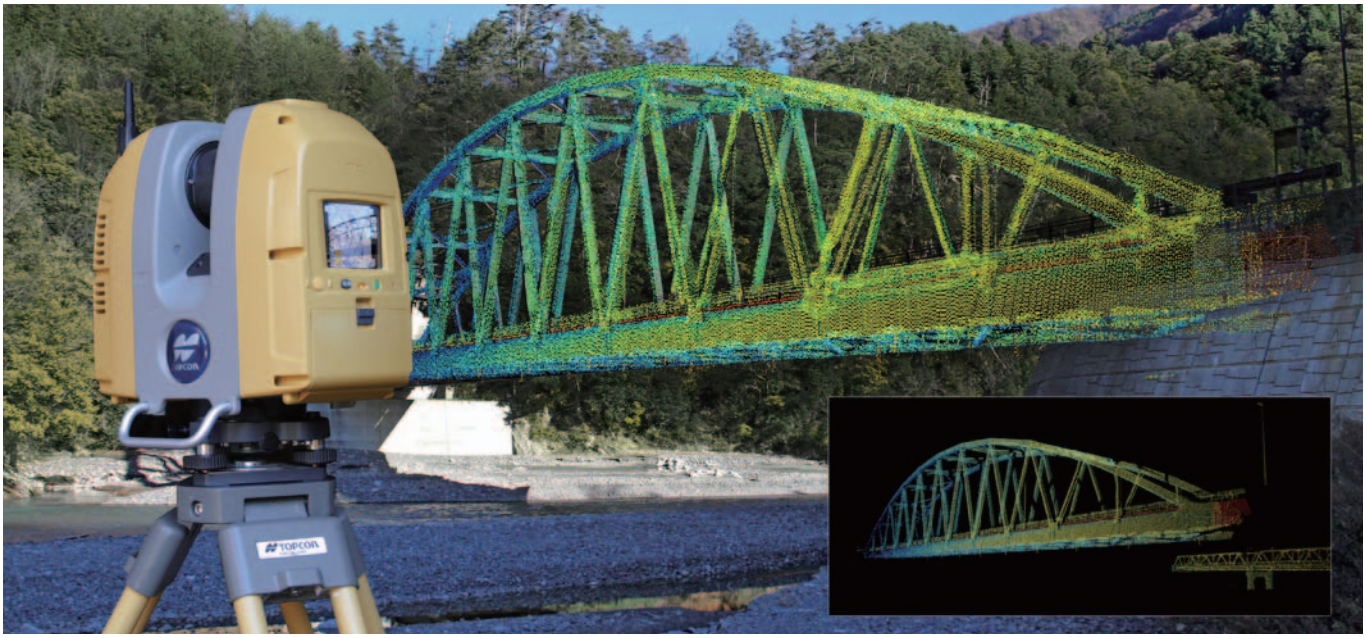
3D Laser Scanner

Multiple Range Laser Scanner for Wide Range of Applications

Three models are selectable for different applications by the measuring ranges

- Speedy, precise scanning with variable range settings
- "Precise Scan Technology II" providing high quality point cloud data with reduced noise
- Full-dome scanning range
- World's first "Direct Height Measurement"
- Easy and accurate registration methods
- Onboard software with intuitive and easy operation

High Speed, Accuracy, Measuring Range are Enhanced and Balanced for the Highest Efficiency.



Improved Speed through Measuring Process

TOF measurement with improved speed

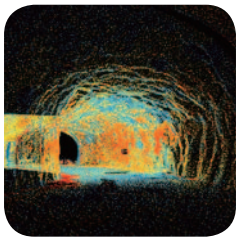
TOF measurement, with quality data with less noise, is further enhanced with ultra high-speed direct sampling technology, resulting in quick and accurate measurement.

Point interval at 10m distance	Measuring time*
25mm	approx 55 sec
12.5mm	approx 1 min 50 sec
6.3mm	approx 6 min 55 sec

*High speed mode

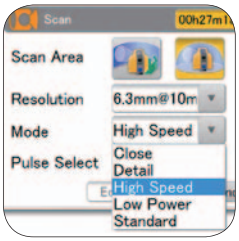
Realizing high-speed scanning in all work steps

With the GLS-2000, true high-speed laser scanning is realized. The GLS-2000 can provide stress-free measurement throughout an entire project with increased productivity and high efficiency.



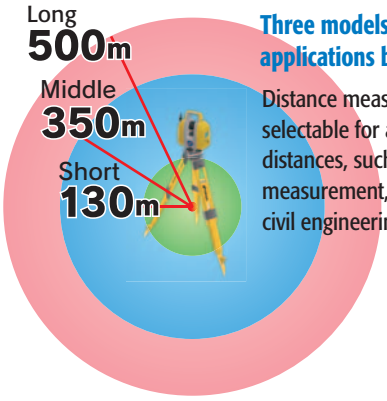
Precise Scan Technology II

The quality of point cloud data is further improved with the "Precise Scan Technology II" which provides much less noise and high precision and therefore clean up work of data in the post processing can be greatly reduced.



5 types of measurement mode supported

The GLS-2000 provides a wide range of measuring modes to accommodate different job site demands to achieve accurate measurement and increased productivity regardless of site conditions.

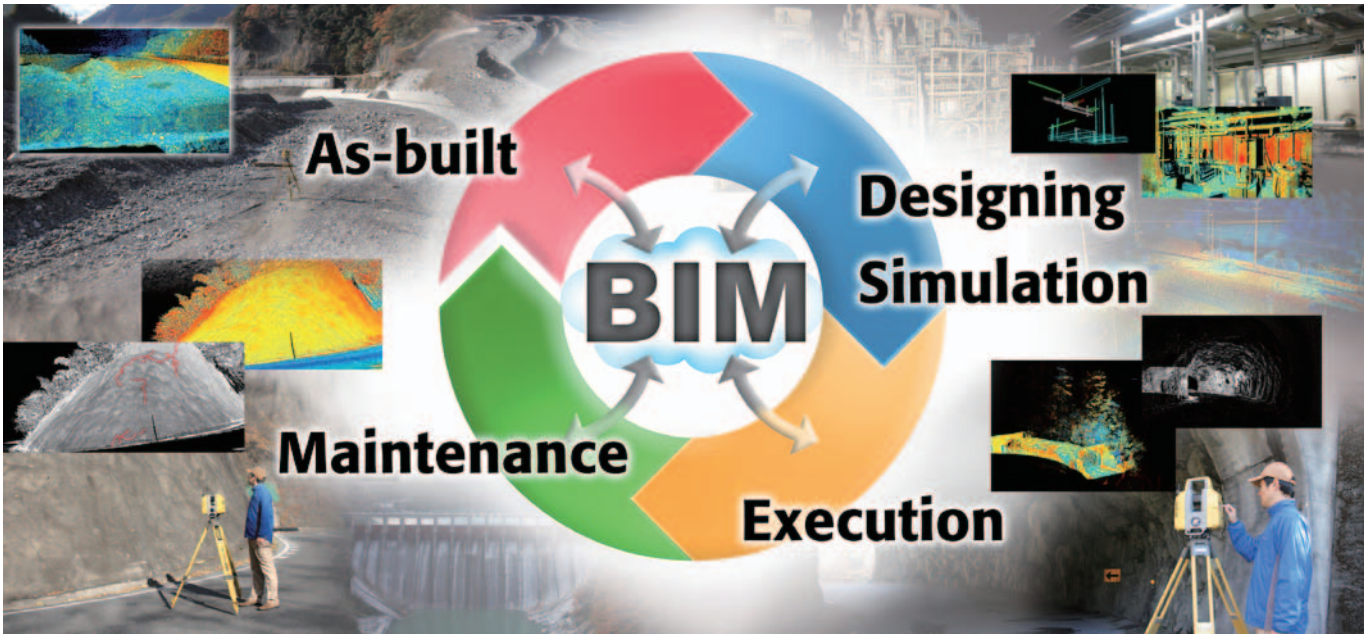


Three models are selectable for different applications by the measuring ranges

Distance measuring range is adequately selectable for applications from short distances, such as facility or interior measurement, to as-build measurement in civil engineering sites and for larger structures.

GLS-2000

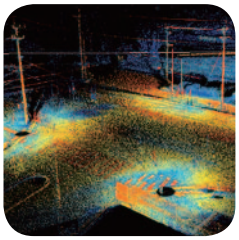
Covering All BIM Applications



Unique Functions: Supports simple, secure and safety in scanning applications

Selectable laser class (Class 3R/ Class 1)

Depending on the job site conditions, the measurement mode with different laser output power can be selected between Class 3R and Class 1 which provides eye safe measurement.



Supporting various registration methods

Various registration methods are supported and can be chosen depending on site conditions for speedy, simplified and precise registration.

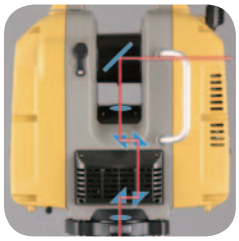
- Tie-point
- Traverse
- Shape matching

Full-dome scanning

The instrument provides a 360° horizontal and 270° scanning measurement, capturing point clouds of objects that are difficult to measure, such as, building interiors, under bridge spans, towers, etc.

Dual camera

Equipped with dual camera, 170° wide angle camera (5megapixels) and 8.9° narrow angle camera (5megapixels) which is arranged in coaxial with the measuring axis. The wide-angle camera obtains images at high speed.



World's First Direct Instrument Height Measurement

The GLS-2000 has an exclusive function that accurately measures the instrument height with a one-touch operation, enabling accurate point cloud measurement.

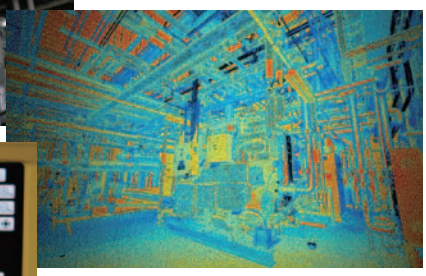
Easy and intuitive on-board control software

With the on-board control software, the scanning can be simply started with one-touch of button.
Together with color graphical display, scanning operation can be intuitively proceeded.

GLS-2000 Stretches the Boundaries of Your Survey Technology

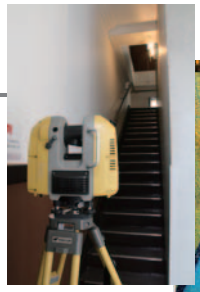
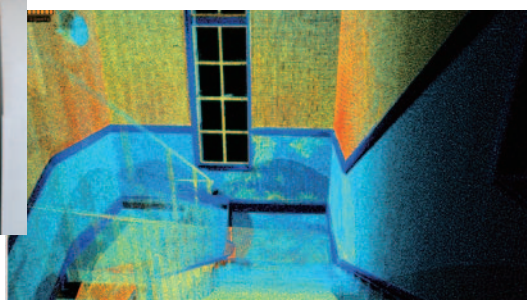
Facilities

Preliminary investigation and inspection is an indispensable process for factory renovation or relocation of factory equipment. GLS-2000 quickly measures and collects precise 3D point clouds without interrupting factory operation. High-density 3D point clouds can be widely utilized for generating schematics and simulation of piping or equipment installation.
GLS-2000 can be operated safely even in areas where laser emission power is restricted; simply choose the low power (Class 1) mode.

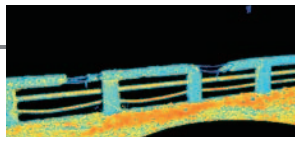

BIM (Building Information Modeling)

The laser scanning is an ideal solution for measuring the shape of the land and the 3D as-built survey in building construction site. Design drawing can be created based on the 3D point clouds with ease.
As-built 3D data of the completed structure can be utilized to streamline the future maintenance of the structure.

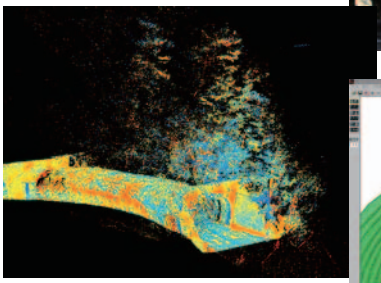
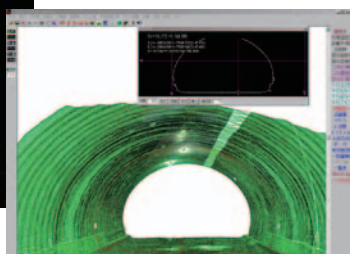
Large Structure

The scanned data of large structures allow for early detection of deteriorated areas to be maintained or reinforced. 3D data can be utilized for measurements of size and geometry, as well as volume calculations of necessary materials.
Periodic monitoring is one of the most effective methods to prevent collapse of structures.



Tunnel

GLS-2000 captures 3D data of inner surfaces of tunnels quickly and efficiently. Even the most complex surface, at curves or junction points, profiles can be modeled without difficulty. Monitoring deformation of tunnel wall is an essential measure to prevent collapse of tunnels both under construction and in operation.

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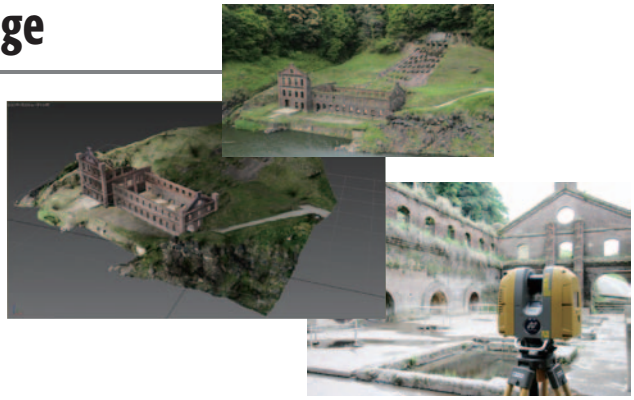
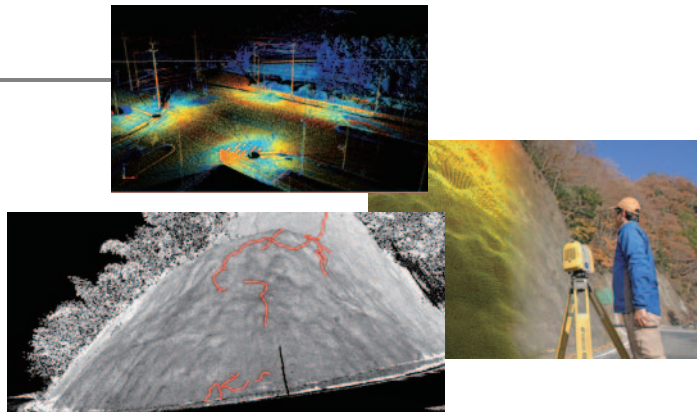
Historical Architecture / Cultural Heritage

In most cases, design schematics or drawings are not preserved for historical architecture and cultural heritage. Capturing 3D data by laser scanning is one of the most effective methods to measure these objects or artifacts without any damage to the objects.
GLS-2000 obtains precise 3D point cloud data that not only replicates the objects' appearance but also material texture of the scanned objects.
Schematic drawings can be created based on the 3D data for future maintenance or restoration works as well as for archiving and viewing.



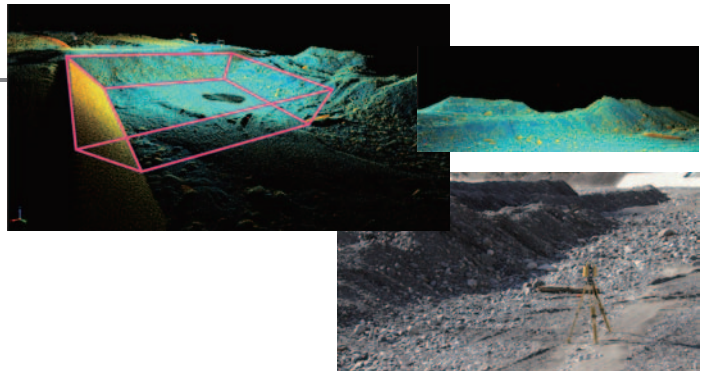
Road Surface, Slope Face Profile

GLS-2000 scans road surface shapes and slope face shapes with exceptional ease and speed.
The scanned data allows the sensing of ruts and bumps of road surface and can be utilized for maintenance management.
Also the 3D data allows the effective and efficient detection of landslide mass in disaster area and deterioration of the slope face such as distortion or cracks.



Volume Measurement

Volume measurement is indispensable for land preparation, open-pit and underground mining, waste landfills and sediment control facilities. GLS-2000 allows the operators heightened sense of safety by eliminating the need for working in an area occupied by heavy machines or in areas where access is dangerous. With 3D point clouds, a cross-section survey can be performed at any given points. High density point clouds allow for accurate calculations of volume and geometry that no other technology can offer.



Maximum range at reflectivity

Reflectivity	9%	18%	90%
Short	**40m** (Detail)	**90m** (High Speed / Low Power)	**130m** (High Speed / Low Power)
Middle	**40m** (Detail)	**150m** (Standard)	**350m** (Standard)
Long	**40m** (Detail)	**210m** (Standard)	**500m** (Standard)

Reference object to be measured

Range Mode	Reference object to be measured
Detail	High Definition Objects, Archaeological Sites, Historical Building, etc.
High Speed	High Definition Objects, Archaeological Sites, Historical Building, etc.
Low Power	Accident Investigation, Disasters, Short Timeframe Projects
Standard	Heavy Pedestrian Area, Laser Limitation Areas
Close	Objects difficult to measure*

*The items which contains a lot of moisture or/and the items which has low reflectivity

PRIMARY FEATURES

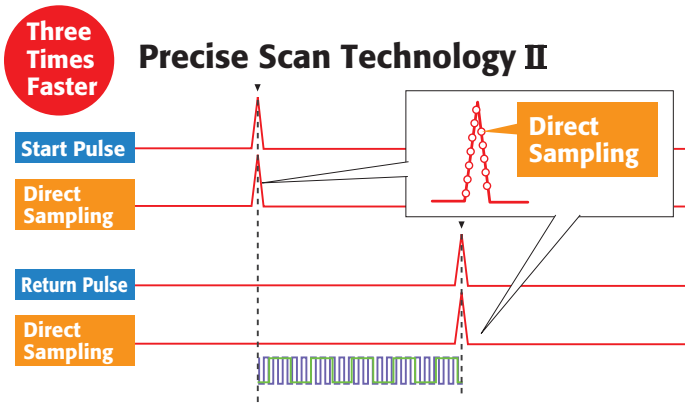
Precise Scan Technology II realizes highly accurate and high speed scanning

The GLS-2000 emits pulse signals three times faster than the previous model. This fast pulse signal has a clear signal wave form, and the signal timing can be detected more precisely in signal processing, which brings highly accurate measurement results.
The GLS-2000 also employs an ultra high-speed ADC (analog-digital converter) with a newly developed direct sampling technique, that enables the extraction of a clear signal wave which is used in the measurement process.

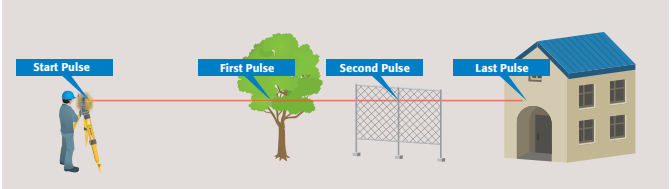

Previous method


Precise Scan Technology II

Precise Scan Technology II realizes high speed scanning with higher accuracy.



First pulse/ last pulse selection



Depending on the location of the objects (as illustrated), a single emitted pulse from the instrument may be reflected partially by front objects (tree and net fence in the illustration) and the object in the back (house), and received by the instrument as multiple reflected beams. The GLS-2000 can recognize the “first pulse” and “last pulse” under such situation and offers first/last pulse selection to be taken as measuring result.
This technology is quite effective, especially on job sites where there are trees or fencing in front of the object to be measured.

GLS-2000

Supporting various registration methods

The GLS-2000 can execute field work similar to that of total stations by supporting various registration methods.

	Tie Point	Traverse	Shape matching
Target Setting	Necessary (many)	Necessary (1 point)	Unnecesary
Localization	Possible	Possible	Unnecesary
Working Time	Long *	Quick	Quick
Regitration Accuracy	High	High	Standard

* Multiple target scanning is necessary

NEW Shape Matching Method

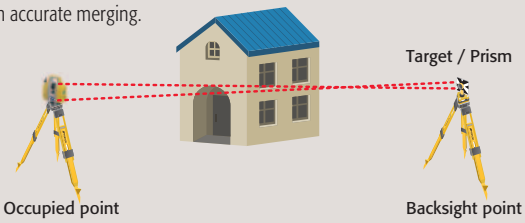
Simple

Effective for quick measurement.

Traverse Method

Simple | High accuracy

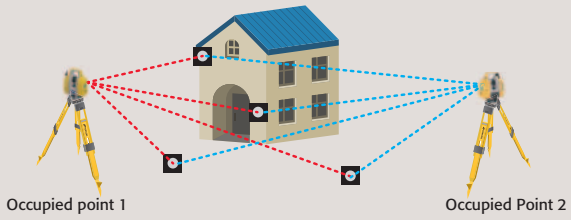
Effective for long distance measurement or the site with complicated object shape by high accurate merging.



Tie-point Method

High accuracy

Effective for accurate and secure merging of multiple scanned data.



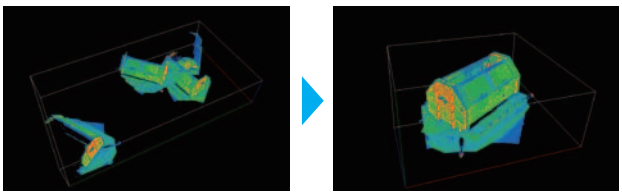
ScanMaster Office software bridging scan data and CAD

ScanMaster software provides exceptional processing power to prepare 3D data for CAD applications. Featuring an array of automated functions and instrument control capability, ScanMaster dramatically increases both office and field work efficiency.

Observation

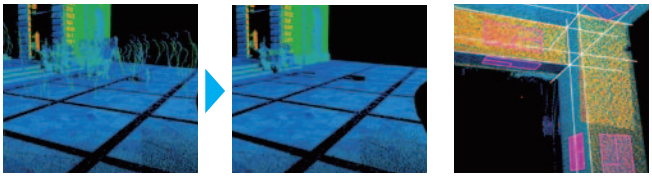
Registration

Registration (merging and unifying two groups of point clouds) is automatically performed by recognizing tie-point and/or surface shape of both point clouds.



Quick and Easy Noise Cleaning

Automated region extraction quickly separates the region and noise, dramatically increasing noise cleaning efficiency.



Data Output

The ScanMaster supports various data format, which contain TEXT, DWG, DXF and newly implemented ATSM E57. Those data is able to be used with your current CAD or software.

GLS-2000

TOPCON

SPECIFICATIONS

GLS-2000			
Type	**Short**	**Middle**	**Long**
Distance[*1]			
Detail (90% reflectivity)	**100m**	**100m**	**100m**
High Speed (90% reflectivity)	**130m**	**210m**	**210m**
Low Power (90% reflectivity)	**130m**	**210m**	**210m**
Standard (90% reflectivity)	**-**	**350m**	**500m**
Close Scan (9% reflectivity)	**40m**	**40m**	**40m**

Scanning Part				
Scan mode[*2]	Detail	High Speed	Low Power	Standard
Scan data rate (Maximum points per second)	120,000	120,000	48,000	60,000
Laser Class	Class 3R		Class 1	Class 3R
Laser	1064nm			
Scanning Density (Resolving Power)				
Spot Size(FWHM)	$\phi \leqq$4mm	$\phi \leqq$11mm		
	1 to 20m	1 to 150m		
Point Increment	Minimum 3.1mm (At 10m)			
Maximum Point Number	V:15,202 Pt/Line (270°) H:20,268 Pt/Line (360°)			
Field of View	V:270°/ H:360°			
Angle Accuracy	H: 6″ / V: 6″			
Distance Accuracy	3.5mm (σ)	3.5 mm (σ)	4.0mm (σ)	3.5mm (σ)
	At 1 to 90m	At 1 to 110m	At 1 to 110m	At 1 to 150m
Surface Accuracy	2.0mm (σ)			
	At 1 to 90m	At 1 to 110m	At 1 to 110m	At 1 to 150m
Height Measurement				
Measuring Range	0.3 to 2.0m			
Measuring Accuracy	3.0mm (Req. Special Target)			
Camera Part				
Field Angle	Wide : Diagonal 170°			
	Tele. : 8.9°(V) x 11.9°(H)			
Number of pixels	Both Wide & Tele. 5megapixels			
Tilt Sensor				
Type	Liquid 2-axis tilt-sensor			
Compensation Range	±6′			
Display Unit				
Type	TFT-LCD 3.5 VGA with touch-panel			
Others				
Laser Plummet	Spot Size ∅1mm (1m) / ∅4mm (1.5m)			
Imaging Plummet	Magnification range 1m			
Interface				
Card Slot	SD card (SDHC Class 6 or more)			
Power Supply				
Internal Battery	BDC70			
Capacity	5240mAh / 1pce × 4pcs			
Nominal Voltage	7.4V / 1pce x pcs			
Working Duration	2.5 hours (4pcs continuous scanning)			
Appearance				
Dimension	228(D)×293 (W)×412 (H) mm(With handle & Base)			
Inst height	226mm (From top of base to center of Miller)			
Weight	10kg (Include Base and Battery)			
Condition				
Operating Temperature	-5 to +45°C			
Storage Temperature	-20 to +60°C			
Water & Dust Registance	IP54 (JIS C0920, IEC 60529)			

*1: It will be different depends on the condition. *2: Specification of Close Scan mode is listed inside the catalog.

Standard Components

- GLS-2000
- Battery (BDC70) 4 pieces
- Battery Charger (CDC68A) 2 pieces
- Charging Cable (EDC113) 2 pieces
- Carrying case
- Silica gel
- Wiping cloth
- SD card
- SD card case
- Tooling kit
- Target sheet
- Centering target
- Instruction manual
- Warranty card

TOPCON

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