



User's Manual

ScanMaster Field

Preface

Thank you for using the TOPCON ScanMaster Field (collectively, "Software"). To get the best use of the Software, read carefully the On-line Instruction Manual of the Software (the "Manual").

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OVER VIEW

ScanMaster Field is used as controller for GLS in the field and needs to be installed onto a tablet PC (VilivS5) for use. Created project can be opened PC ScanMaster directly. Please copy files to PC.

PLATFORM REQUIREMENT

This software was tested in all of operations and functions on the tablet PC Viliv S5.

OS REQUIREMENT

Required Windows XP SP2 higher or Windows 7.

GLS FIRMWARE REQUIREMENT

- ✓ GLS-1000: Required Version 1.09 or higher.
- ✓ GLS-1500: Required Version 2.02 or higher.

PC SCANMASTER REQUIREMENT

Please use ScanMaster version 2.2 or higher.

CONNECT VILIV TO GLS

There are 2 ways, WLAN connection and USB connection. Operating via WLAN connection can be unstable in circumstance with bad reception of WLAN signal. USB connection enables stable and smoother operation.

FUNCTIONS

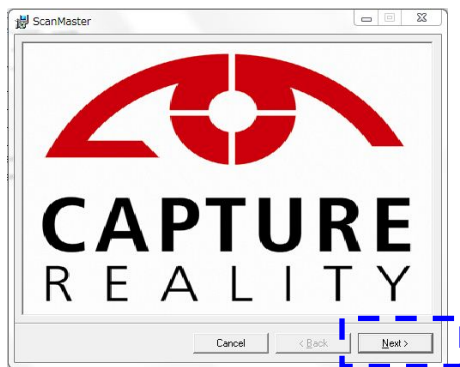
- ✓ Project Management
- ✓ Scan Position Management
- ✓ OCC/BS Settings
- ✓ Region Scan
- ✓ Create Panoramic Image
- ✓ Target Scan
- ✓ Import Point Coordinates
- ✓ 2D/3D View

TO INSTALL SCANMASTER FIELD

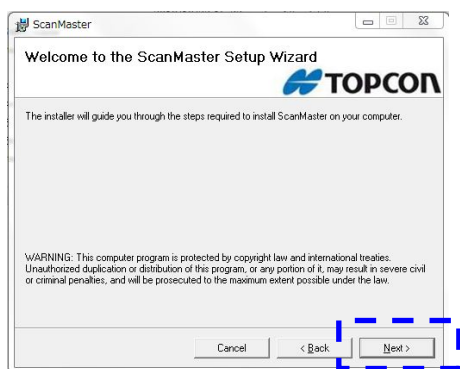
1. Copy folder "ScanMaster Field" to tablet PC and double click "Setup.exe"



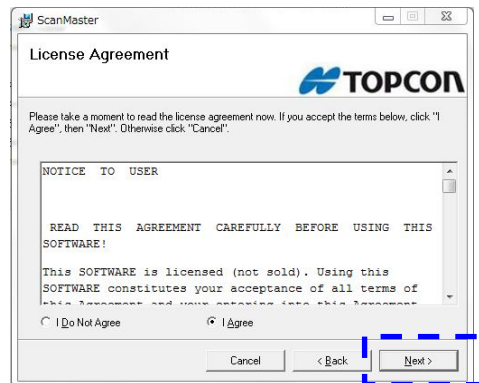
2. Click "Next" button.



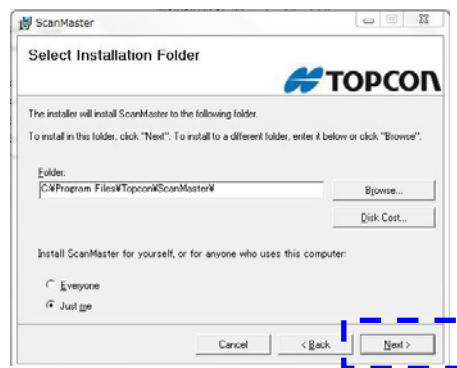
3. Click "Next" button.



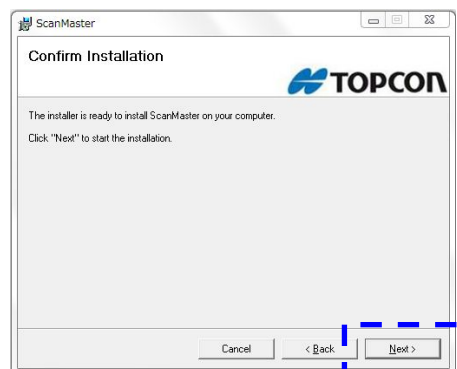
4. Click "Next" button.



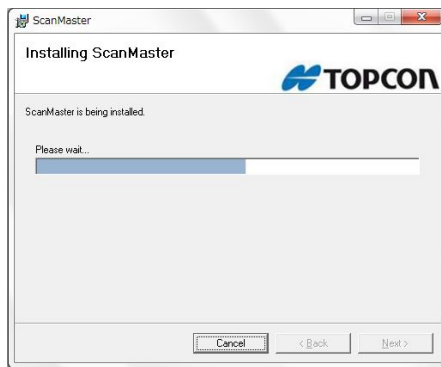
5. Confirm license agreement and check ON "I Agree". Then "Next" button will be enabled. Click "Next" button



6. Click "Next" button.



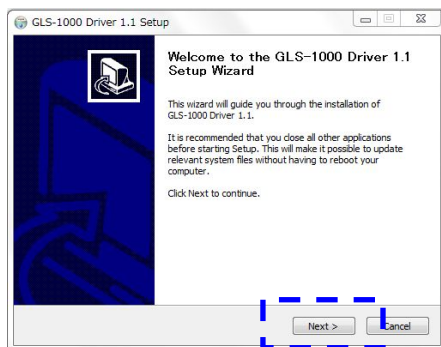
7. Following display will appear. Please wait a few minutes.



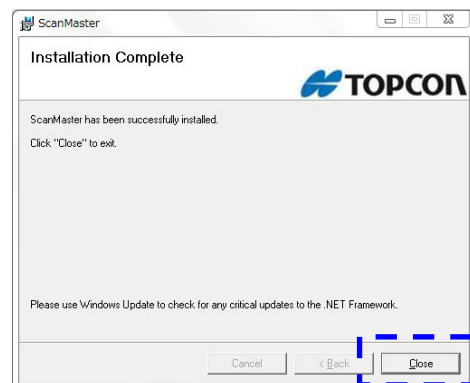
10. Click "Finish" button. Screen "7" is displayed



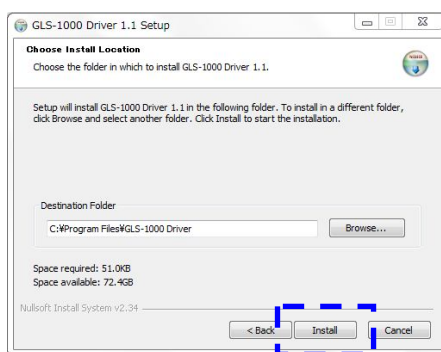
8. Following display will appear. Click "Next" button.



11. Click "Close" button.



9. Click "Install" button.



12. Following icon will be added on desktop of tablet PC.



SCREENS

MAIN SCREEN

This is MAIN screen of ScanMaster Field.

Buttons:

#1: **NEW (PROJECTS)**: Create a new project.

#2: **LIST (PROJECTS)**: Select and edit to existing projects.

Please refer to also "Func 5. Project Management".

#3: **NEW (SCAN POSITIONS)**: Create a new scan position.

#4: **LIST (SCAN POSITIONS)**: Select and edit existing scan position.

Please refer to also "Func 6. Scan Position Management".

#5: **OCC & BS**: Set occupied point and back sight point.

#6: **RESULTS**: Check back sight accuracy by difference between back sight point coordinate and target scan result.

#7: **NEW (SCAN & IMAGES)**: Create a new scan and take panoramic image of specified region.

#8: **LIST (SCAN & IMAGES)**: Check and edit to existing region (scan and panoramic image).

#9: **NEW (TARGETS)**: Create a new target scan.

#10: **LIST (TARGETS)**: Check and edit to existing target scan.

#11: **NEW (OBSERVATION)**: Create a new target scan.

#12: **LIST (OBSERVATION)**: Check and edit to existing point.

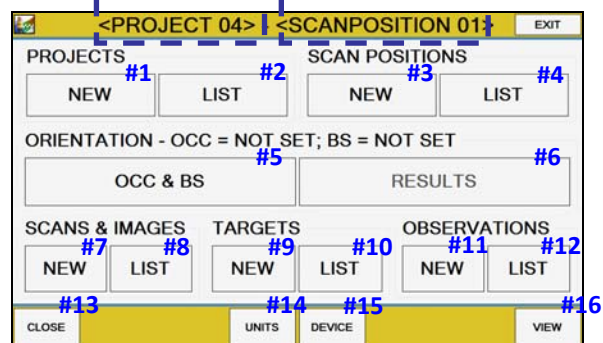
#13: **CLOSE**: Close current project.

#14: **UNITS**: Change project unit. See also "Func 1. Set System Unit".

#15: **DEVICE**: Check GLS status. See also "Func 2", "Func 3" and "Video Screen" of "Screens".

#16: **VIEW**: Show the last captured data. See also "Sphere Screen" and "Cube Screen".

Current project name Current scan position name



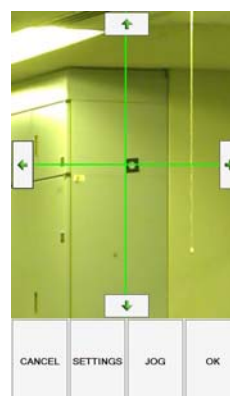
VIDEO SCREEN

Video screen is shown when set scan region, target scan and observation. USB connection is faster than WLAN connection for getting higher video frame rate.

Some buttons differ due to current status.

Arrow button is used for turning to aiming direction. Also by clicking on the video, GLS turns to clicked direction.

SETTING button is used for video setting. Please see also "Func 5. Change Video Quality And Zoom".



When click **JOG** button, video disappears, then jog dial of GLS is enabled to aim with peepsight.

SPHERE SCREEN

This **SPHERE** screen is used for setting region of capturing scans, images, target scans, observations and checking the results. Some buttons are not displayed due to current status.

Buttons:

DISPLAY: Show/Hide display items. See also "Func17 Show/Hide Display Item".

EXTENTS: Show overall range of data.

SWIVEL: Set to Swivel mode.

ZOOM: Set to Zoom mode.

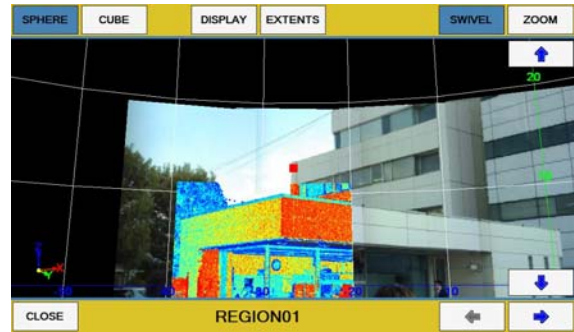
Up and Down Arrow button: Zoom up and down.

Left and Right Arrow button: Change display to next region of same scan position.

SPHERE: Change display to Sphere view. Data are shown by the viewpoint of scanner.

CUBE: Change display to Cube view. Data can be rotated in display.

CLOSE: Close this screen.



CUBE SCREEN

This **CUBE** screen is used for checking scan result.

Buttons:

DISPLAY: Show/Hide display items. See also "Func17 Show/Hide Display Item".

EXTENTS: Show overall range of data.

PAN: Set to Pan mode.

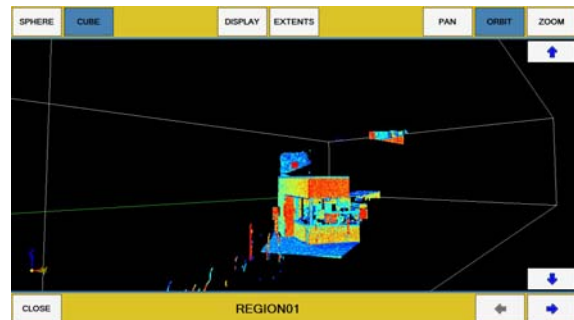
ORBIT: Set to Orbit mode.

ZOOM: Set to Zoom mode.

Up and Down Arrow button: Zoom up and down.

Left and Right Arrow button: Change display to next region of same scan position.

CLOSE: Close this screen.



1. START UP

Double-click “*ScanMaster Field*” icon on desktop. The screen that is shown first differs by the status of the last work.

Pattern1: No project exists (ex. The first time of start-up)

- (1) **CREATE PROJECT** screen (1-1) will be displayed firstly. Input project name and click **OK**.
- (2) **CREATE SCAN POSITION** screen (1-2) will be displayed. Input name and click **OK** button.
- (3) **MAIN** screen (1-3) will be displayed.

Pattern2: The last project with no scan position exists

- (1) **CREATE SCAN POSITION** screen (1-2) will be displayed. Input name and click **OK** button.
- (2) **Main** screen (Figure1-3) will be displayed.
Current project is set lasted project automatically.

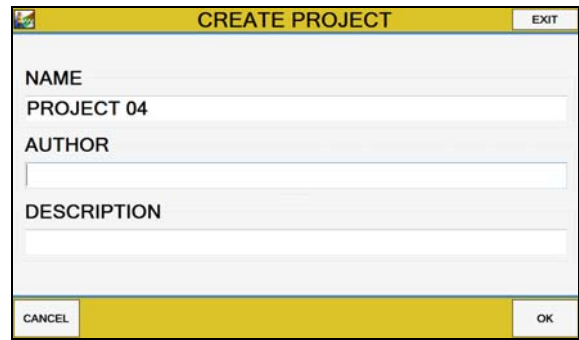
Pattern3: The last project with scan positions exists

- (1) **MAIN** screen (Figure1-3) will be displayed directly.
Current project and scan position is set lasted one automatically.

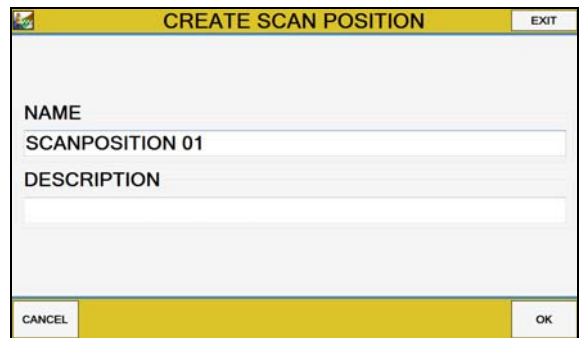
AUTHOR and **DESCRIPTION** are acceptable also in blank.

To change project and scan position, please refer to “Func 5 Project Management” and “Func 6 Scan Position Management”.

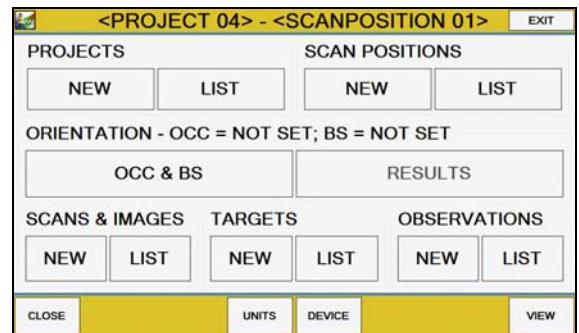
Project files are saved to under the directory “Documents\ScanMasterFieldProjects”. To open from PC ScanMaster, please copy all files under this directory to PC.



1-1. **CREATE PROJECT** Screen



1-2. **CREATE SCAN POSITION** screen

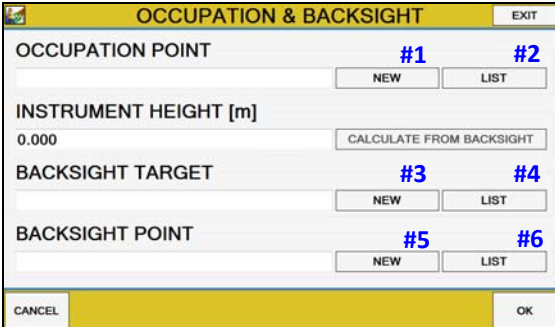


1-3. **MAIN** Screen

2. OCC & BS SETTING (ENABLE SKIP)

If this procedure is skipped, occupation point is set as (X,Y,Z)=(0,0,0), instrument height is set to 0 and zero position of azimuth is set to the front of scanner.

- (1) Click **OCC & BS** button on **MAIN** screen.
- (2) **OCCUPATION & BACKSIGHT** screen (2-1) will be displayed.



2-1. **OCCUPATION & BACKSIGHT** Screen

2-1. OCCUPATION POINT SETTING

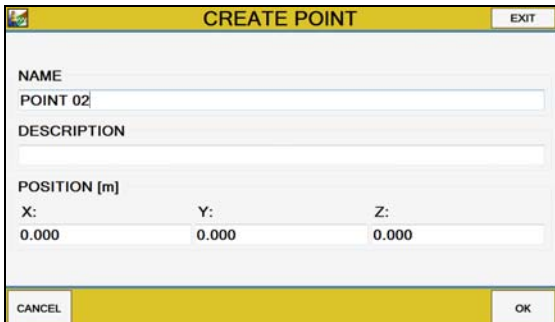
Set occupation point name. Following three ways can be done.

Way 1: Direct input point name

Input point name to edit box. The point must have a unique name. If an existing name is used, the **OK** button will be colored red and be disabled.

Way 2: Create New Point

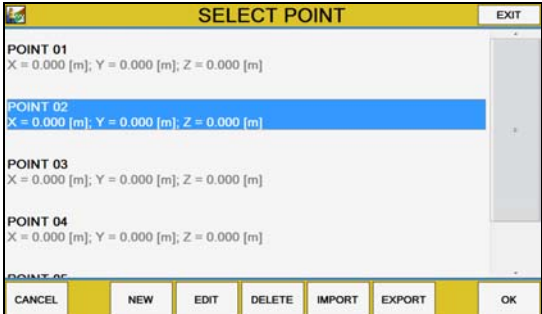
- (1) Click **NEW** button (#1) on **OCCUPATION & BACKSIGHT** screen.
- (2) **CREATE POINT** screen (2-2) will be displayed.
- (3) Input point name and position coordinate.
- (4) Click **OK** button.



2-2. **CREATE POINT** Screen

Way 3: From List

- (1) Click **LIST** button (#2) on **OCCUPATION & BACKSIGHT** screen.
- (2) **SELECT POINT** screen (2-3) will be displayed.
- (3) Select a point data and Click **OK** button.



2-3. **SELECT POINT** Screen

2-2. INSTRUMENT HEIGHT SETTING

Set instrument height. Following two ways can be done.

Way 1: Direct input value

Input value to edit box.

Way 2: Calculate from backsight

Click **CALCULATE FROM BACKSIGHT** button on **OCCUPATION & BACKSIGHT** screen (2-1).

2-3. SELECT TARGET FOR BACKSIGHT DIRECTION

Set target for defining backsight angle.

Way 1: Create New Target Scan And Set it

- (1) Click **NEW** button (#3) on **OCCUPATION & BACKSIGHT** screen (2-1).
- (2) **CREATE TARGET** screen will be displayed. Input target name and click **NEXT** button.
- (3) **VIDEO** screen will be displayed. Aim to target direction and click **OK** button.

Please refer to also "4. Target Scanning"

Way 2: From List

- (1) Click **LIST** button (#4) on **OCCUPATION & BACKSIGHT** screen (2-1).
- (2) **SELECT TARGET** screen will be displayed. Select a target and click **OK** button.

2-4. SELECT POINT FOR BACKSIGHT COORDINATE

Set target for defining backsight angle.

Way 1: Create New Target Scan And Set it

- (1) Click **NEW** button (#5) on **OCCUPATION & BACKSIGHT** screen (2-1).
- (2) **CREATE POINT** screen will be displayed. Input point information and click **OK** button. For details of **CREATE POINT** function, please refer to "FUNC 7 Create New Point".

Way 2: From List

- (1) Click **LIST** button (#6) on **OCCUPATION & BACKSIGHT** screen (2-1).
- (2) **SELECT POINT** screen will be displayed. Select a target and click **OK** button.

2-5. APPLY SETTING PARAMETERS

Click **OK** button on **OCCUPATION & BACKSIGHT** screen (2-1).

3. REGION SCANNING

- (1) Click **NEW** button of **SCANS & IMAGES** on **MAIN** screen.
- (2) **CREATE SCAN AND IMAGES** screen (3-1) will be displayed.
- (3) Input region name and select a scan task from **SCAN ONLY**, **IMAGES ONLY** and **SCAN+IMAGES**.
- (4) Click **NEXT** button.
- (5) **SELECT AREA** screen (3-2) will be displayed.
- (6) Set a scan area. There are four ways to do that.

Way 1: From Video

- (1) Click **AIM VIDEO + JOG** button.
- (2) **VIDEO** screen (3-3) will be displayed.
- (3) Aim a point on video screen, then click **LEFT**, **RIGHT**, **TOP** or **BOTTOM** button.
- (4) When finished setting 4 angles of the region, Click **OK** button.

Please refer to also “**VIDEO** screen” of “**SCREENS**”.

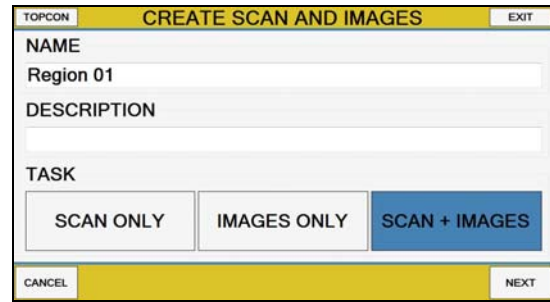
Way 2: From Jog Dial

- (1) Click **AIM VIDEO + JOG** button.
- (2) **VIDEO** screen will be displayed.
- (3) Click **JOG** button. Video will be hidden.
- (4) Aim a point by peepsight of scanner, then click **LEFT**, **RIGHT**, **TOP** or **BOTTOM** button .
- (5) When finished setting 4 angles of the region, Click **OK** button.

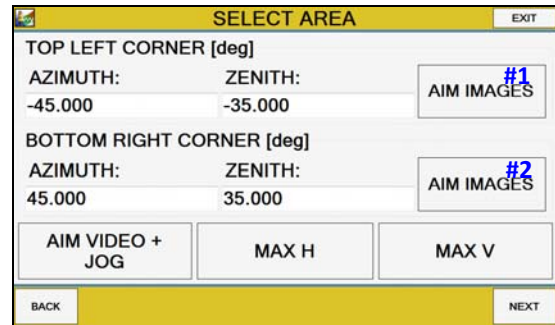
Way 3: From Panoramic Image

If there is no panoramic image from current scan position, only spherical grid is shown. Please refer to also “**Sphere Screen**” of “**Screens**”.

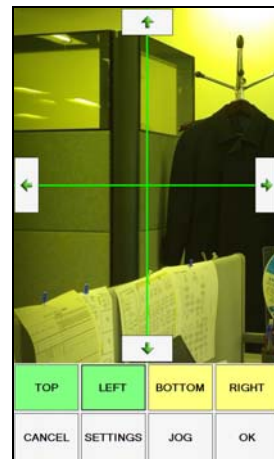
- (1) Click **AIM IMAGES** button (#1) on **SELECT AREA** screen (3-2).
- (2) Set the red square at the center of screen to Top-left corner of scan region.
- (3) Click **OK** button. GLS will turn to specified direction and it returns to **SELECT AREA** screen (3-2).
- (4) Click **AIM IMAGES** button (#2) on **SELECT AREA** screen (3-2).
- (5) Set the red square at the center of screen to Bottom-right corner of scan region.



3-1. **CREATE SCAN AND IMAGES** Screen



3-2. **SELECT AREA** Screen



3-3. **VIDEO** Screen



3-4. **JOG** Screen

- (6) Click **OK** button. GLS will turn to specified direction and it returns to **SELECT AREA** screen (3-2).

Way 4: Direct input

Input angle to edit box **AZIMUTH** and **ZENITH**.

- (7) Click **NEXT** on **SELECT AREA** screen (3-2).
- (8) **SELECT SCAN RESOLUTION** screen (3-5) will be displayed.
- (9) Set scan resolution by following three ways.

Way 1: By Distance

- (1) Select **DISTANCE** button.
- (2) Input horizontal and vertical resolution as distances in a surface at the specified range to surface.
- (3) Input distance to object. The range can be measured with GLS by pressing **GET** button.

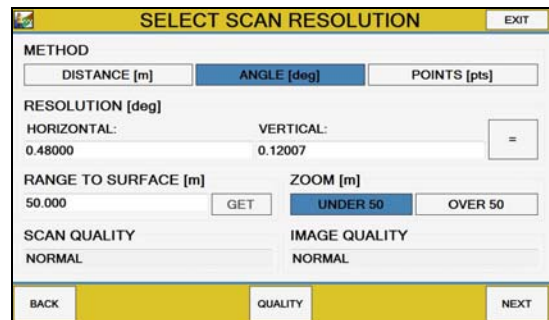
Way 2 : By Angle

- (1) Select **ANGLE** button.
- (2) Input horizontal and vertical resolution as angles.

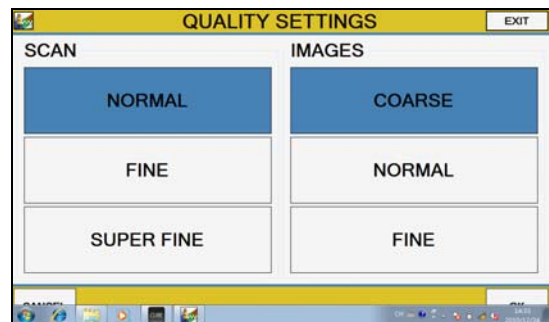
Way 3 : By Points

- (1) Select **POINTS** button.
- (2) Input horizontal and vertical resolution as numbers of points.

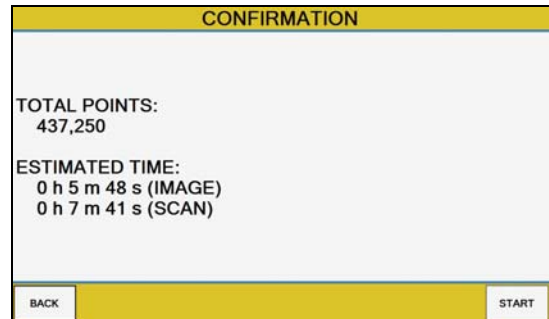
- (10) Select zoom type from **UNDER 50** and **OVER 50**.
- (11) If want to change **SCAN QUALITY** and **IMAGE QUALITY**, Click **QUALITY** button. **QUALITY** screen (3-6) will be displayed. Set type of those and click **OK** button.
- (12) Click **NEXT** button on **SELECT SCAN RESOLUTION** screen (3-5).
- (13) **CONFIRMATION** screen will be displayed.
- (14) Click **START** button. **SPHERE** screen (3-8) will be displayed and the scan will start. For details of **SPHERE** screen, see also "Sphere Screen" of "Screens".



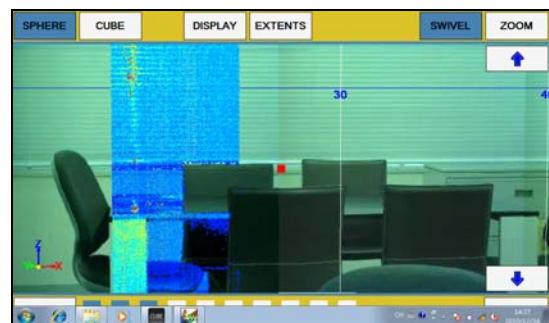
3-5. **SELECT SCAN RESOLUTION** Screen



3-6. **QUALITY SETTINGS** Screen



3-7. **CONFIRMATION** Screen



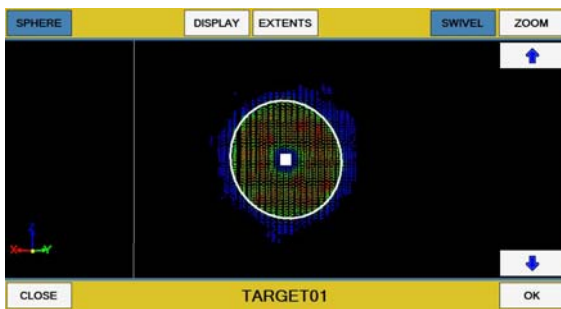
3-8. **SPHERE** Screen

4. TARGET SCANNING

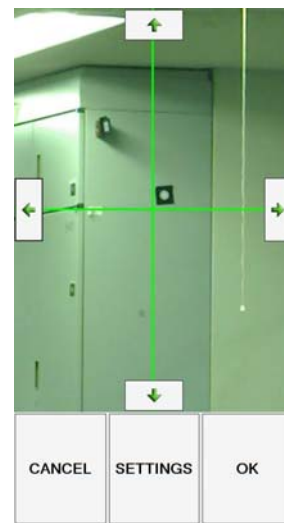
- (1) Click **NEW** button of **TARGETS** on **MAIN** screen.
- (2) **CREATE TARGET** screen will be displayed.
- (3) Input target name, rod height and search radius.
- (4) Click **NEXT** button.
- (5) **VIDEO** screen (4-2) will be displayed. Aim to target by video or jog dial.
- (6) Click **OK** button.
- (7) **SPHERE** screen (4-3) will be displayed and the target scan will start. For details of **SPHERE** screen, please refer also “Sphere Screen” of “Screens”.

TOPCON		CREATE TARGET	EXIT
NAME			
TARGET01			
DESCRIPTION			
ROD HEIGHT [m]			
1.000			
SEARCH RADIUS [deg]			
2.000			
CANCEL			NEXT

4-1. **CREATE TARGET** Screen



4-3. **SHERE** Screen



4-2. **VIDEO** Screen

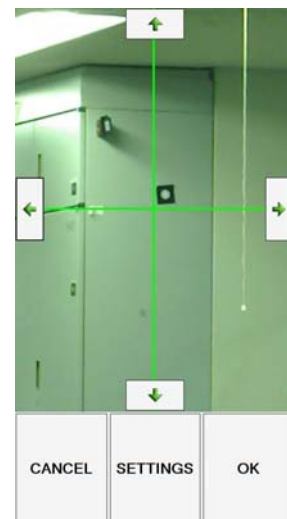
5. OBSERVATION

- (1) Click **NEW** button of **OBSERVATIONS** on **MAIN** screen.
- (2) **CREATE POINT** screen will be displayed.
- (3) Input point name.
- (4) Click **OBSERVED** button. Screen is changed to “5-2. **CREATE POINT (OBSERVED)** screen”.
- (5) Click **NEW** button.
- (6) **CREATE TARGET** screen (5-3) will be displayed. Input target name and click **NEXT** button.
- (7) **VIDEO** screen (5-4) will be displayed. Aim to target by video or jog dial.
- (8) Click **OK** button.
- (9) **SPHERE** screen (5-5) will be displayed and the target scan will start. For details of **SPHERE** screen, please refer to also “Sphere Screen” of “Screens”.

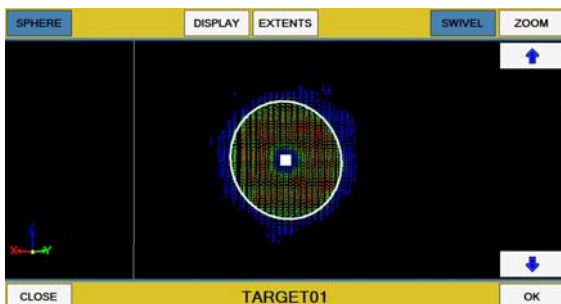
5-1. **CREATE POINT** Screen

5-2. **CREATE POINT(OBSERVED)** Screen

5-3. **CREATE TARGET** Screen



5-4. **VIDEO** Screen

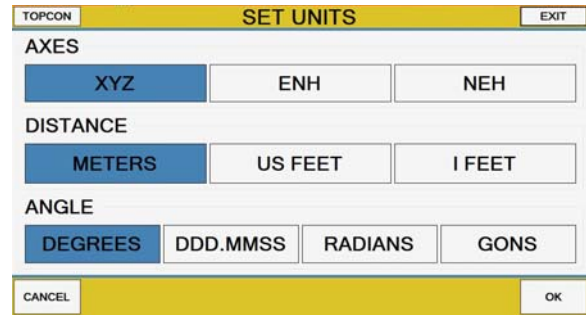


5-5. **SPHERE** Screen

OTHER FUNCTIONS

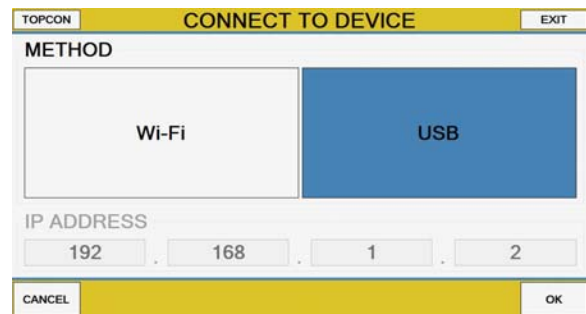
FUNC 1. SET SYSTEM UNIT

- (1) Click **UNIT** button from **MAIN** screen.
- (2) **SET UNITS** screen will be displayed.
- (3) Select units on each item.
- (4) Click **OK**.



FUNC 2. CONNECT TO GLS

- (1) Click **DEVICE** button from **MAIN** screen.
- (2) **DEVICE** screen will be displayed.
- (3) Make sure GLS power is on.
- (4) Click **CONNECTION** button on **DEVICE** screen.
- (5) **CONNECT TO DEVICE** screen will be displayed.
- (6) Select the way of connection from WLAN and USB.



Way 1: WLAN

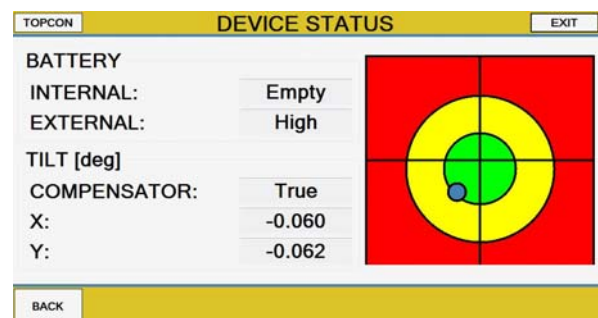
Firstly, a wireless connection between PC and GLS needs to be established. After that, input IP-address to **IP ADDRESS** of GLS on **CONNECT TO DEVICE** screen and click **OK** button. The IP-address requires to be same with the setting of GLS.

Way 2: USB

Make sure GLS and tablet PC are connected with USB cable, then click **OK** button. Once Windows fall in standby mode and came back, USB connection may not be recovered. In this case, please once unplug the USB cable, and plug it again. To avoid this problem, please change setting of "System standby" or "System hibernates" to longer from Start->Control Panel->Power Options. We recommend to use USB connection because of connection stability. WLAN connection can be unstable by network environment.

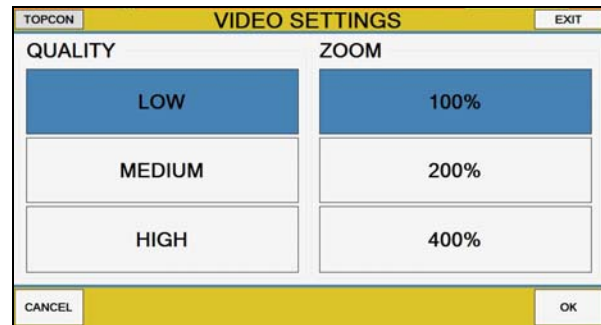
FUNC 3. CHECK BATTERY AND TILT STATUS

- (1) Click **DEVICE** button from **MAIN** screen.
- (2) **DEVICE** screen will be displayed.
- (3) Click **STATUS** button.
- (4) **DEVICE STATUS** screen will be displayed. If GLS is not connected, **CONNECT TO DEVICE** screen will be displayed.



FUNC 4. CHANGE VIDEO QUALITY AND ZOOM

- (1) Click **SETTING** button on **VIDEO** screen.
- (2) **VIDEO SETTINGS** screen will be displayed.
- (3) Select quality and zoom level.
- (4) Click **OK** button.



FUNC 5. PROJECT MANAGEMENT

- (1) Click **LIST** button of **PROJECTS** on **MAIN** screen.
- (2) **PROJECTS** screen will be displayed.

Buttons

BACK :

Go back to **MAIN** screen.

NEW :

Create new project.

EDIT :

Edit selected project. **PROJECT EDIT** screen will be displayed. Input new name and click OK.

DELETE :

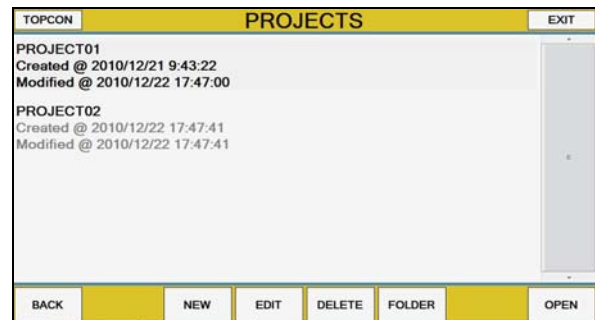
Delete selected project.

FOLDER :

Change directory to list projects that were stored in it.

OPEN :

Open selected project.



FUNC 6. SCAN POSITION MANAGEMENT

- (1) Click **LIST** button of **SCAN POSITIONS** on **MAIN** screen.
- (2) **SCAN POSITIONS** screen will be displayed.

Buttons

BACK :

Go back to **MAIN** screen.

NEW :

Create new scan position.

EDIT :

Edit selected scan position. **EDIT SCAN POSITION** screen will be displayed. Input new name and click OK.

DELETE :

Delete selected scan position.

OCCUPY :

Change current scan position to selected one.



FUNC 7. CREATE NEW POINT

Create a point by inputting name and XYZ coordinates manually.

- (1) Click **NEW** button on **OCCUPATION & BACKSIGHT** screen or Click **NEW** button of **OBSERVATION** on **MAIN** screen.
- (2) **CREATE POINT** screen will be displayed. (7-1 or 7-2)
- (3) Input point name and XYZ coordinates.
- (4) Click **OK** button.

7-1. **CREATE POINT** Screen

7-2. **CREATE POINT** Screen

FUNC 8. CREATE NEW POINT FROM TARGET SCAN DATA

Create a point from existing target data.

- (1) Click **NEW** button of **OBSERVATION** on **MAIN** screen.
- (2) **CREATE POINT** screen will be displayed. (8-1)
- (3) Click **OBSERVED** button on **CREATE POINT** screen (8-1). Screen is changed to "8-2. **CREATE POINT (OBSERVED)** screen".
- (4) Input exist target name or click LIST button to select from target list.

8-1. **CREATE POINT** Screen

8-2. **CREATE POINT (OBSERVED)** Screen

FUNC 9. EDIT POINT

- (1) Click **LIST** button of **OBSERVATION** on **MAIN** screen.
- (2) **POINTS** screen will be displayed.
- (3) Select a point from list and click **EDIT** button.
- (4) **EDIT POINT** screen will be displayed.
- (5) Change point name and click **OK** button.

FUNC 10. DELETE POINT

- (1) Click **LIST** button of **OBSERVATION** on **MAIN** screen.
- (2) **POINTS** screen will be displayed.
- (3) Select a point from list and click **DELETE** button.
- (4) **WARNING** screen will be displayed.
- (5) Click **OK** button.

FUNC 11. IMPORT POINT FROM FILE

- (1) Click **LIST** button of **OBSERVATION** on **MAIN** screen.
- (2) **POINTS** screen will be displayed.
- (3) Click **IMPORT** button. **IMPORT POINTS** (11-1) screen will be displayed.
- (4) Select types of separator and handling of name duplication.
- (5) Click **NEXT** button.
- (6) File Dialog will be displayed.
- (7) Select a file to import and click **OPEN** on File Dialog.
- (8) **IMPORT POINTS** screen (11-2) will be displayed.
- (9) In **Import** column, check points to be imported.
- (10) Click "**None-Click To Set**" to select data type for each column.
- (11) Click **OK** button.

11-1. **IMPORT POINTS** Screen

Import	None - Click To Set	None - Click To Set	None - Click To Set	None - Click To Set
1	1.23	7.33	8.35	
2	4.43	8.63	11.35	
3	3.25	5.33	8.38	
4	2.83	8.33	6.45	

11-2. **IMPORT POINTS** Screen

FUNC 12. EXPORT POINT DATA TO FILE

- (1) Click **LIST** button of **OBSERVATIONS** on **MAIN** screen.
- (2) **POINTS** screen will be displayed.
- (3) Click **EXPORT** button.
- (4) File Dialog will be displayed.
- (5) Input file name of the file to be exported, and click **SAVE** button.

FUNC 13. DELETE TARGET

- (1) Click **LIST** button of **TARGETS** on **MAIN** screen.
- (2) **TARGETS** screen will be displayed.
- (3) Select a target and click **DELETE** button.
- (4) **WARNING** screen will be displayed.
- (5) Click **OK** button.

FUNC 14. EDIT TARGET

- (1) Click **LIST** button of **TARGETS** on **MAIN** screen.
- (2) **TARGETS** screen will be displayed.
- (3) Select a target and click **EDIT** button.
- (4) **EDIT TARGET** screen will be displayed.
- (5) Input new name and click **OK** button.

EDIT TARGET		EXIT
NAME	TARGET 09	
DESCRIPTION		
ROD HEIGHT [m]	0.000	
CANCEL	OK	

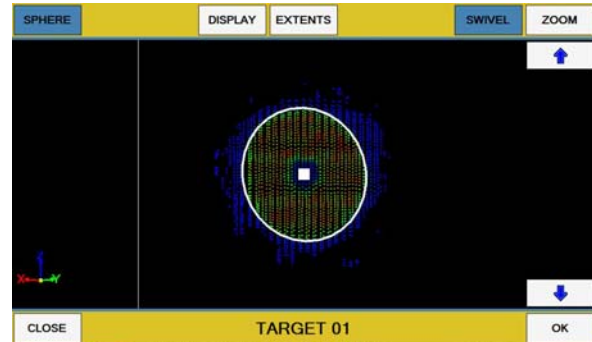
FUNC 15. TARGET INFORMATION

- (1) Click **LIST** button of **TARGETS** on **MAIN** screen.
- (2) **TARGETS** screen will be displayed.
- (3) Select a target and click **ETC** button.
- (4) **TARGET** screen will be displayed.
- (5) Check detailed information of the target.

TARGET - TARGET 09			EXIT
POSITION [m]			
X:	Y:	Z:	
-8.805	-10.385	1.040	
RELATIVE POSITION [m]			
X:	Y:	Z:	
-8.805	-10.385	1.040	
DIRECTION [deg]		RANGE [m]	
HORIZONTAL:	VERTICAL:		
-139.829	4.477	13.655	
BACK			

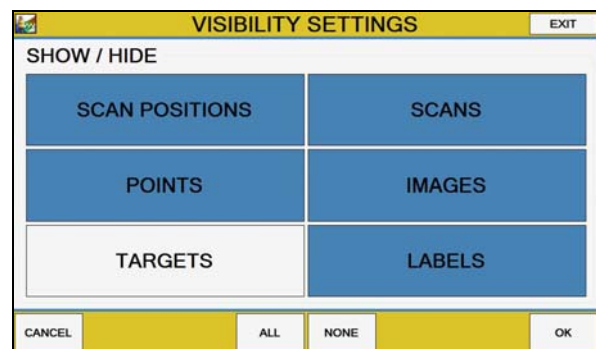
FUNC 16. CHECK TARGET

- (1) Click **LIST** button of **TARGETS** on **MAIN** screen.
- (2) **TARGETS** screen will be displayed.
- (3) Select a target and click **VIEW** button.
- (4) **TARGET** screen will be displayed.
- (5) Check detail of the target.



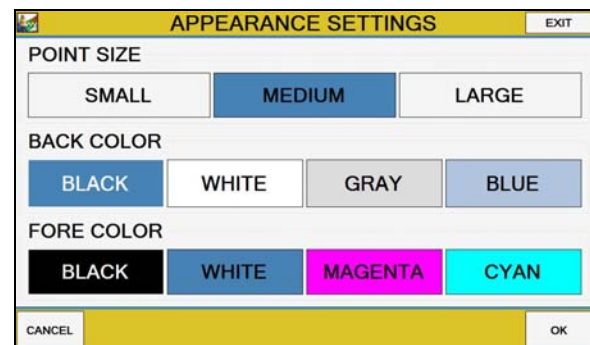
FUNC 17. SHOW/HIDE DISPLAY ITEM

- (1) Click **DISPLAY** button on **SPHERE** screen.
- (2) **DISPLAY SETTINGS** screen will be displayed.
- (3) Click **VISIBILITY** button on **DISPLAY SETTING** screen.
- (4) **VISIBILITY SETTING** screen will be displayed.
- (5) Select data types to be shown.
- (6) Click **OK** button.



FUNC 18. CHANGE APPEARANCE SETTINGS

- (1) Click **DISPLAY** button on **SPHERE** screen.
- (2) **DISPLAY SETTINGS** screen will be displayed.
- (3) Click **VISIBILITY** button on **DISPLAY SETTING** screen.
- (4) **APPEARANCE SETTING** screen will be displayed.
- (5) Select types for each item.
- (6) Click **OK** button.



FUNC 19. CHECK SOFTWARE VERSION

Click ScanMaster icon which is placed at the top-left of screen.

User's Manual

ScanMaster Field

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