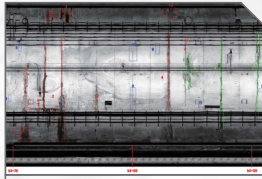


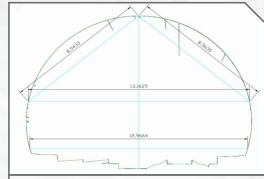
## CASE STUDY



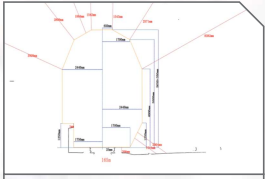
full inspection  
@ Guangzhou Metro Line 4  
(tunnel clearance, diseases, etc.)



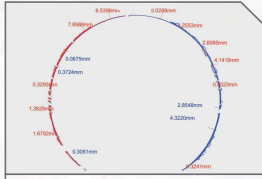
disease inspection  
@ Shenzhen Metro Line 11  
(2-way completed in 1 hour)



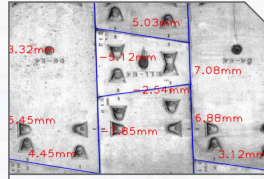
sectional inspection  
@ Hunan High-speed Railway  
(comparison with historical data)



platform gauge inspection  
@ Guangzhou Metro Line 3  
(1.8 km/h, results done on site)



segment faulting inspection  
@ Shenzhen Metro Line 2  
(sectional data display)



segment faulting inspection  
@ Guangzhou Metro Line 1  
(faulting display in orthophoto)

## SPECIFICATION

### System Performance

current version: 5th generation (1st generation since 2016)  
ground control: Bluetooth 2.0 for hardware datalink  
trolley gear: 2WD, 2-direction movements (forward and reverse)  
trolley speed: max. 3.6 km/h, with adaptive cruise control function  
scanning resolution: 0.5/1/2/3/5 mm optional  
system overall accuracy:  $\pm 2$  mm  
distance measurement accuracy:  $\pm 1$  mm  
angle measurement accuracy:  $\pm 0.009^\circ$   
output format: .doc (report); .tiff (orthophoto); .bin/.e57/.txt (point cloud)  
application range: underground rail tunnels during operation and maintenance stage

### Physical

trolley dimension (LxWxH): 1600x550x350 mm  
net weight: 25kg (w/o scanner)  
packaging dimension (LxWxH): 750x430x370 mm/case  
packaging weight: 41kg (w/o scanner), 2 cases  
scanner interfacing: Faro series (as default)

### Inbuilt Computer Configuration

HDD: 1 TB  
RAM: 32 GB  
data export: USB 2.0, 2 ports available

### Electrical

power supply: lithium battery group, 44800mAh in total, 16.8V  
power endurance: max. 8 hours (after fully charged)

### Environmental

operating temperature:  $-10^\circ\text{C} \sim +50^\circ\text{C}$   
humidity: 80%, non-condensing

### Software Installation Requirement

CPU: Intel Core i7 or above  
RAM: 32 GB or above  
GPU: Nvidia GTX 960 or above

Note: all information above is subject to change without any prior notice.

**SOUTH**  
Target your success

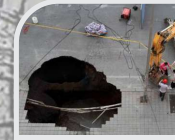
E-mail: [mail@southsurvey.com](mailto:mail@southsurvey.com) [solutions@southsurvey.com](mailto:solutions@southsurvey.com)  
<http://www.southinstrument.com> <http://www.southsurvey.com>

f t i y i n  
SOUTH Surveying & Mapping

**SOUTH**  
Target your success

## AUTOMATED TUNNEL SCANNING & DETECTION SYSTEM MS100

A Tunnel Safeguard Exclusively Engineered for Rail Authorities



**0** blind spot in computer vision

**1** stop from survey to report

**2** mm system overall accuracy

**3** hours to submit for one-km mission

**4** types of deliverable available

"This system package was specifically made to provide A One-stop Solution of underground rail tunnel scanning and detection for those metro or high-speed rail authorities. The scientific and revolutionized methodology featuring abundant outputs and amazing efficiency would definitely become your modern choice of tunnel safeguard. For example, for routine inspection of 1km metro tunnel, you may obtain plenty of data outcomes just within a few hours!"

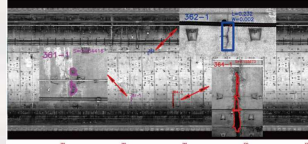
Engr. Hongwei Huang, a Chinese specialist dedicated to precise measurement technology for nearly 15 years.



# REVOLUTIONARY SOLUTION. ABUNDANT OUTPUTS. AMAZING EFFICIENCY.

## INTRODUCTION

To guarantee the operational safety, it's a must to inspect rail tunnel health conditions at regular intervals, otherwise the structural deformation and tunnel diseases might result in safety hazards and incalculable losses. MS100 was particularly designed to deal with those existing headaches (see below) and serve as a perfect trouble-shooter for the industry.



## HEADACHES & REMEDIES



typically short stoppage time  
harsh underground environment  
movements restricted much  
comparably low efficiency  
long time to wait for results  
limited outputs for reference

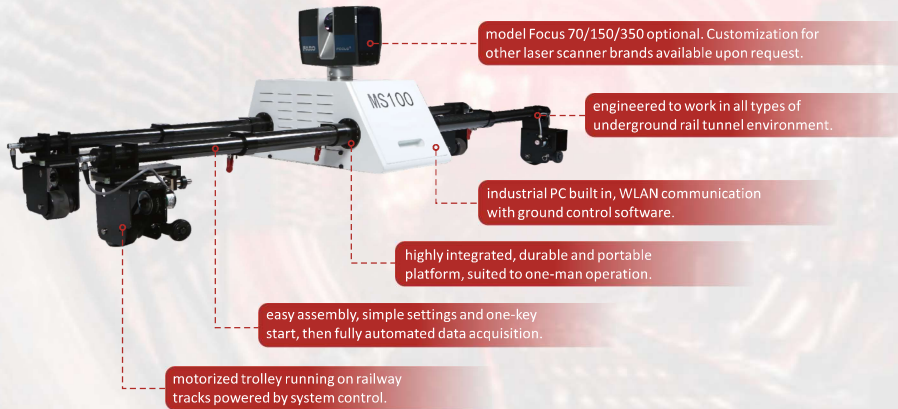
- 👉 automated scanning working mode
- 👉 big data captured by 3D laser scanning
- 👉 motorized trolley running on rail tracks
- 👉 cutting-edge mechanical and digitized solution
- 👉 data acquisition and process in one stop
- 👉 abundant analysis reports available



## SYSTEM COMPONENTS

MS100 includes 3 major components:

- ① TrolleyAuto (with industrial PC built in);
- ② All-in-One software Tunnel Scan&Go;
- ③ Faro laser scanner.



## JOB ENVIRONMENTS



bored tunnel



shield tunnel



open-cut to shield structure part



open-cut structure station

## ALL-IN-ONE SOFTWARE

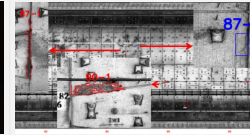
The All-in-One software Tunnel Scan&Go is the core of the system, which plays a vital role in the whole process. It enables the users to conduct automated scanning, data analysis, intelligent detection, report export, etc. and features largely in an A-to-Z solution. The deliverables include circular orthophoto, 3D point cloud, structural data analysis and detected inwall defects.



## SOFTWARE FEATURES



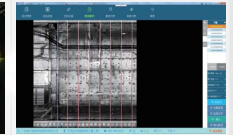
realtime outputting to show basic results on site



high identification capability of problematic portions up to 90%

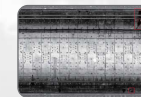


quick results, ready for immediate response

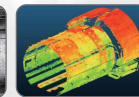


independent R&D, customizations available

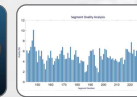
## OUTPUTS DISPLAY



high-resolution circular orthophoto



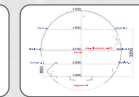
3D point cloud analysis



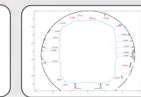
segment ovality analysis



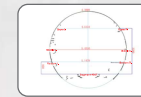
segment faulting analysis



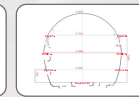
tunnel clearance analysis



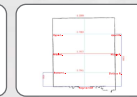
tunnel gauge analysis



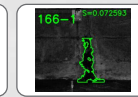
shield tunnel sectional data



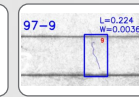
bored tunnel sectional data



metro station sectional data



detected water seepage



detected inwall crack



detected concrete peeling

## RESULTS COMPARISON

example	photo taken by iPhone	software display	
		scanned result on site	computed & detected result
1			
2			