

## **Singapore Geotechnical Instrumentation - Monitoring Market - Industry Trends and Forecast to 2031**

Market Report | 2024-03-01 | 131 pages | Data Bridge Market Research

### **AVAILABLE LICENSES:**

- Single User License \$3500.00
- Corporate Users License \$4200.00

### **Report description:**

Singapore geotechnical instrumentation - monitoring market is expected to reach USD 40,855.79 thousand by 2031 from USD 29,413.60 thousand in 2023, growing with a CAGR of 4.3% in the forecast period of 2024 to 2031.

### Market Segmentation

Singapore Geotechnical Instrumentation - Monitoring Market, By Offering (Hardware, Software, Services), Structure (Tunnels & Bridges, Buildings & Utilities, Dams, Road/Rails, Metros, Nuclear Power Plant, and Others), Networking Technology (Wired, Wireless), Technique (Deformation of Ground & Structure Observation, Data Management & Monitoring System, Monitoring Service for Construction, Water Observation, Tilt & Surface Settlement), End-User (Building and Infrastructure, Mining, Oil & Gas, Energy & Power, Manufacturing, Government, Aerospace, Agriculture, and Others) - Industry Trends and Forecast to 2031

### Overview of Singapore Geotechnical Instrumentation - Monitoring Market Dynamics

#### Drivers

- Rising infrastructure investments and urbanization
- Rise in demand for real-time monitoring
- Rising Demand of data collection and analysis
- Increasing focus on safety and sustainability

#### Restraints

- High installation and monitoring cost of geotechnical instrumentation - monitoring systems
- Stringent laws and regulations in Singapore market

#### Opportunities

- Technological advancements in geotechnical instrumentation - monitoring technology
- Strategic partnership and collaboration for geotechnical instrumentation - monitoring
- Development of AI, IoT, ML, cloud-based data management solutions

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

## Market Players

Some of the major market player operating in the Singapore geotechnical instrumentation - monitoring market are:

- Geomotion Singapore
- CAST Laboratories Pte Ltd.
- KH Instrumentation Pte Ltd.
- Geoscan Pte Ltd.
- GEONAMICS (S) PTE LTD.
- SENSINGTECH PTE. LTD.
- Applus+
- Exponent, Inc.
- GEO-Instruments
- Fugro
- GEOKON
- Monitoring Solution Providers Pte Ltd.
- GeoSIG Ltd
- RST Instruments Ltd.
- SERCEL
- TRITECH ENGINEERING & TESTING (SINGAPORE) PTE LTD
- Worldsensing.
- Encardio Rite
- CSC Holdings Limited.

## Table of Contents:

TABLE OF CONTENTS	
1 INTRODUCTION	14
1.1 OBJECTIVES OF THE STUDY	14
1.2 MARKET DEFINITION	14
1.3 OVERVIEW OF SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET	14
1.4 CURRENCY AND PRICING	16
1.5 LIMITATIONS	16
1.6 MARKETS COVERED	17
2 MARKET SEGMENTATION	20
2.1 MARKETS COVERED	20
2.2 GEOGRAPHICAL SCOPE	21
2.3 YEARS CONSIDERED FOR THE STUDY	21
2.4 DBMR TRIPOD DATA VALIDATION MODEL	22
2.5 PRIMARY INTERVIEWS WITH KEY OPINION LEADERS	25
2.6 DBMR MARKET POSITION GRID	26
2.7 MARKET END-USER COVERAGE GRID	28
2.8 MULTIVARIATE MODELLING	29
2.9 OFFERING TYPE TIMELINE CURVE	29
2.10 SECONDARY SOURCES	30
2.11 ASSUMPTIONS	30
3 EXECUTIVE SUMMARY	31

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: [support@scotts-international.com](mailto:support@scotts-international.com)

[www.scotts-international.com](http://www.scotts-international.com)

4 PREMIUM INSIGHTS	33
4.1 CASE STUDY	34
4.2 PATENT ANALYSIS	37
4.3 VALUE CHAIN ANALYSIS	39
4.4 COMPANY COMPARITIVE ANALYSIS	42
4.5 TECHNOLOGICAL TRENDS	43
4.6 REGULATORY STANDARDS	45
5 MARKET OVERVIEW	46
5.1 DRIVERS	48
5.1.1 RISING INFRASTRUCTURE INVESTMENTS AND URBANIZATION	48
5.1.2 RISE IN DEMAND FOR REAL-TIME MONITORING	49
5.1.3 RISING DEMAND OF DATA COLLECTION AND ANALYSIS	50
5.1.4 INCREASING FOCUS ON SAFETY AND SUSTAINABILITY	51?
5.2 RESTRAINTS	52
5.2.1 HIGH INSTALLATION AND MONITORING COST OF GEOTECHNICAL INSTRUMENTATION - MONITORING SYSTEMS	52
5.2.2 STRINGENT LAWS AND REGULATIONS IN SINGAPORE MARKET	53
5.3 OPPORTUNITIES	53
5.3.1 TECHNOLOGICAL ADVANCEMENTS IN GEOTECHNICAL INSTRUMENTATION - MONITORING TECHNOLOGY	53
5.3.2 STRATEGIC PARTNERSHIP AND COLLABORATION FOR GEOTECHNICAL INSTRUMENTATION - MONITORING	54
5.3.3 DEVELOPMENT OF AI, IOT, ML, CLOUD-BASED DATA MANAGEMENT SOLUTIONS	55
5.4 CHALLENGES	57
5.4.1 LACK OF SKILLED LABOR FOR GEOTECHNICAL INSTRUMENTATION - MONITORING	57
5.4.2 CYBER SECURITY AND DATA BREACH ISSUES	58
6 SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET, BY OFFERING	59
6.1 OVERVIEW	60
6.2 HARDWARE	61
6.2.1 PIEZOMETERS	62
6.2.1.1 OPENSTANDPIPE PIEZOMETERS	62
6.2.1.2 VIBRATING WIRE STRAIN GAUGE PIEZOMETERS	62
6.2.1.3 PNEUMATIC PIEZOMETERS	62
6.2.1.4 BONDED RESISTANCE STRAIN GAGE PIEZOMETERS	62
6.2.1.5 OTHERS	62
6.2.2 INCLINOMETERS	63
6.2.3 BY PRODUCT TYPE	63
6.2.3.1 GPRS/GSM TRANSMISSION INCLINOMETERS	63
6.2.3.2 DIGITAL INCLINOMETERS	63
6.2.3.3 INCLINOMETERS WITH RF TRANSMISSIONS	63
6.2.4 BY TYPE	64
6.2.4.1 MANUAL	64
6.2.4.2 AUTOMATIC	64
6.2.5 SETTLEMENT	64
6.2.5.1 PRECISION LIQUID SETTLEMENT SYSTEM	64
6.2.5.2 SETTLEMENT PLATE	65
6.2.5.3 MAGNETIC SETTLEMENT SYSTEM	65
6.2.5.4 DATA ACQUISITION SYSTEM (DAS)	65
6.2.6 SENSORS	65
6.2.7 DATA LOGGERS	65?

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: [support@scotts-international.com](mailto:support@scotts-international.com)

[www.scotts-international.com](http://www.scotts-international.com)

- 6.2.8 EXTENSOMETERS 65
  - 6.2.8.1 BOREHOLE EXTENSOMETERS 66
  - 6.2.8.2 THE VIBRATING WIRE INLINE EXTENSOMETER 66
  - 6.2.8.3 MAGNETIC EXTENSOMETER 66
- 6.2.9 TILT METERS 66
  - 6.2.9.1 PORTABLE TILT METER 66
  - 6.2.9.2 INBUILT TILT SENSOR 66
  - 6.2.9.3 DIGITAL TILT METER 67
  - 6.2.9.4 ANALOG TILT METER 67
  - 6.2.9.5 TILT METER WITH GPRS/GSM TRANSMISSION 67
- 6.2.10 STRAIN GAUGES & STRAIN METERS 67
- 6.2.11 GEODETIC TARGET & SURVEY MARKERS 67
  - 6.2.11.1 BI REFLEX TARGETS 67
  - 6.2.11.2 PRISM TARGETS 67
- 6.2.12 EARTH PRESSURE CELLS 68
- 6.2.13 CRACK METERS & JOINT METERS 68
- 6.2.14 OTHERS 68
- 6.3 SOFTWARE 68
- 6.4 SERVICES 68
  - 6.4.1 BY TYPE 68
    - 6.4.1.1 DESIGN 68
    - 6.4.1.2 CONSULTING 69
    - 6.4.1.3 INSTALLATION & COMMISSIONING 69
    - 6.4.1.4 MAINTENANCE 69
  - 6.4.2 BY MODE 69
    - 6.4.2.1 ONLINE 69
    - 6.4.2.2 OFFLINE 69
- 7 SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET, BY STRUCTURE 70
  - 7.1 OVERVIEW 71
  - 7.2 TUNNELS & BRIDGES 72
  - 7.3 BUILDINGS & UTILITIES 72
  - 7.4 DAMS 72
  - 7.5 ROAD/RAILS 72
  - 7.6 METROS 72
  - 7.7 NUCLEAR POWER PLANT 73
  - 7.8 OTHERS 73
- 8 SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET, BY NETWORKING TECHNOLOGY 74
  - 8.1 OVERVIEW 75
  - 8.2 WIRED 76
  - 8.3 WIRELESS 76
- 9 SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET, BY TECHNIQUE 77
  - 9.1 OVERVIEW 78
  - 9.2 DEFORMATION OF GROUND & STRUCTURE OBSERVATION 79
    - 9.2.1 BY TYPE 79
      - 9.2.1.1 ROCK & SOIL STRESS MANAGEMENT 79
      - 9.2.1.2 VERTICAL DEFORMATION MONITORING 80
      - 9.2.1.3 LATERAL DEFORMATION MONITORING 80

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: [support@scotts-international.com](mailto:support@scotts-international.com)

[www.scotts-international.com](http://www.scotts-international.com)

- 9.2.1.4 LOAD CONDITION ASSESSMENT 80
- 9.2.1.5 OTHERS 80
- 9.3 DATA MANAGEMENT & MONITORING SYSTEM 80
- 9.3.1 BY TYPE 80
- 9.3.1.1 DATA AUTOMATIC LOGGING & REAL TIME MONITORING SYSTEMS 80
- 9.3.1.2 REMOTE MONITORING SYSTEM 81
- 9.4 MONITORING SERVICE FOR CONSTRUCTION 81
- 9.4.1 BY TYPE 81
- 9.4.1.1 VIBRATION MONITORING 81
- 9.4.1.2 NOISE MONITORING 81
- 9.5 WATER OBSERVATION 82
- 9.5.1 BY TYPE 82
- 9.5.1.1 PORE WATER PRESSURE & MEASUREMENT 82
- 9.5.1.2 WATER LEVEL & SEEPAGE MONITORING 82
- 9.5.1.3 OTHERS 82
- 9.6 TILT & SURFACE SETTLEMENT 82
- 10 SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET, BY END USER 83
- 10.1 OVERVIEW 84
- 10.2 BUILDING & INFRASTRUCTURE 85
- 10.2.1 OFFERING 85
- 10.2.1.1 HARDWARE 85
- 10.2.1.2 SOFTWARE 85
- 10.2.1.3 SERVICES 86
- 10.3 MINING 86
- 10.3.1 OFFERING 86
- 10.3.1.1 HARDWARE 86
- 10.3.1.2 SOFTWARE 86
- 10.3.1.3 SERVICES 86
- 10.4 OIL & GAS 86
- 10.4.1 OFFERING 87
- 10.4.1.1 HARDWARE 87
- 10.4.1.2 SOFTWARE 87
- 10.4.1.3 SERVICES 87
- 10.5 ENERGY & POWER 88
- 10.5.1 OFFERING 88
- 10.5.1.1 HARDWARE 88
- 10.5.1.2 SOFTWARE 88
- 10.5.1.3 SERVICES 88
- 10.6 MANUFACTURING 89
- 10.6.1 OFFERING 89
- 10.6.1.1 HARDWARE 89
- 10.6.1.2 SOFTWARE 89
- 10.6.1.3 SERVICES 89
- 10.7 GOVERNMENT 90
- 10.7.1 OFFERING 90
- 10.7.1.1 HARDWARE 90
- 10.7.1.2 SOFTWARE 90

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: [support@scotts-international.com](mailto:support@scotts-international.com)

[www.scotts-international.com](http://www.scotts-international.com)

- 10.7.1.3 SERVICES 90
- 10.8 AEROSPACE 91
  - 10.8.1 OFFERING 91
    - 10.8.1.1 HARDWARE 91
    - 10.8.1.2 SOFTWARE 91
    - 10.8.1.3 SERVICES 91
- 10.9 AGRICULTURE 92
  - 10.9.1 OFFERING 92
    - 10.9.1.1 HARDWARE 92
    - 10.9.1.2 SOFTWARE 92
    - 10.9.1.3 SERVICES 92
- 10.10 OTHERS 92?
- 11 SINGAPORE GEOTECHNICAL INSTRUMENTATION - MONITORING MARKET, COMPANY LANDSCAPE 93
- 11.1 COMPANY SHARE ANALYSIS: GLOBAL 93
- 12 SWOT ANALYSIS 94
- 13 COMPANY PROFILES 95
  - 13.1 SOIL INVESTIGATION PTE LTD. (A PART OF CSC HOLDINGS LIMITED) 95
    - 13.1.1 COMPANY SNAPSHOT 95
    - 13.1.2 SERVICE PORTFOLIO 95
    - 13.1.3 RECENT DEVELOPMENT 95
  - 13.2 CAST LABORATORIES PTE LTD. 96
    - 13.2.1 COMPANY SNAPSHOT 96
    - 13.2.2 SERVICE PORTFOLIO 96
    - 13.2.3 RECENT DEVELOPMENTS 97
  - 13.3 GEOSCAN PTE LTD. 98
    - 13.3.1 COMPANY SNAPSHOT 98
    - 13.3.2 SERVICES PORTFOLIO 98
    - 13.3.3 RECENT DEVELOPMENTS 99

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: [support@scotts-international.com](mailto:support@scotts-international.com)

[www.scotts-international.com](http://www.scotts-international.com)

**Singapore Geotechnical Instrumentation - Monitoring Market - Industry Trends and Forecast to 2031**

Market Report | 2024-03-01 | 131 pages | Data Bridge Market Research

To place an Order with Scotts International:

- Print this form
- Complete the relevant blank fields and sign
- Send as a scanned email to support@scott's-international.com

**ORDER FORM:**

Select license	License	Price
	Single User License	\$3500.00
	Corporate Users License	\$4200.00
		VAT
		Total

\*Please circle the relevant license option. For any questions please contact support@scott's-international.com or 0048 603 394 346.

\*\* VAT will be added at 23% for Polish based companies, individuals and EU based companies who are unable to provide a valid EU Vat Numbers.

Email*	<input type="text"/>	Phone*	<input type="text"/>
First Name*	<input type="text"/>	Last Name*	<input type="text"/>
Job title*	<input type="text"/>		
Company Name*	<input type="text"/>	EU Vat / Tax ID / NIP number*	<input type="text"/>
Address*	<input type="text"/>	City*	<input type="text"/>
Zip Code*	<input type="text"/>	Country*	<input type="text"/>
		Date	<input type="text" value="2026-03-07"/>
		Signature	<input type="text"/>

**Scotts International. EU Vat number: PL 6772247784**

tel. 0048 603 394 346 e-mail: support@scott's-international.com

www.scott's-international.com