

StrainSmart[®] Data Acquisition Software

StrainSmart® is a ready-to-use, Windows®-based software package for acquiring, reducing, presenting, and storing measurement data from strain gages, strain-gage-based transducers, thermocouples, temperature sensors, LVDTs, potentiometers, piezoelectric sensors, and other commonly used transducers.

It is designed to function seamlessly with a variety of Micro-Measurements instrumentation hardware, including System 7000 and System 8000. A unique version of this software is used to operate System 9000, called StrainSmart[®] 9000; for details, see the datasheet at:

www.micro-measurements.com/doc?11383

DESCRIPTION

Ready-to-use StrainSmart® software makes test setup fast and easy for strain gages, strain-gage-based transducers, thermocouples, temperature sensors, LVDTs, potentiometers, piezoelectric sensors, and other commonly used transducers. Using the parameters input for sensors, materials, and instrumentation hardware, StrainSmart® automatically outputs the results of the test data in engineering units. Test setups and measurement data can also be permanently stored for offline display or for use in databases, word processors, and spreadsheets.

StrainSmart® has the capability to reduce data in both the time and frequency domains. FFT analysis may be elected for data acquired at scanning rates greater than 100 samples per second.

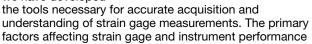
Accurate strain measurements require attention to the unique characteristics of the strain gage and measurement system-thermal output, temperature coefficient of gage factor, and transverse sensitivity of strain gages, as well as nonlinearity errors inherent in the Wheatstone bridge. StrainSmart® software takes these into account automatically.

All strain-gage bridges are scaled for the number of active bridge arms. Data from measurements with delta, rectangular, and tee rosettes can be reduced to principal strains and stresses, as well as the equivalent stresses for common failure mode criteria.

Fully reduced and corrected measurement data can be monitored online, and recorded at predetermined limits or at user-defined intervals.

THE STRAINSMART® ADVANTAGE

Strain gage technology is the stress/strain measurement technique most widely used around the world. Over the years, we have developed



Seroors Materials	Overvels Assignments		-			
1		Data Acquis	ation			=
Mg Scan Sessons	Reduced Data	Scan	Record	Type of	Date	
	Descriptor	Service	Court	Analysis	Created	2
Calibrate		Transducer Text 1		Frequency Domain	6/2/1999 9 40 14 AM	
Colbrate		Franclucer Fest 1		Time Donian	6/2/1999 9:42:06 AM	- 11
Calbrate 2 Calbrate 2		Transducer Test 2 Transducer Test 2		Time Domain Frequency Domain	8/2/1999 9:50:41 AM 8/2/1999 9:52:21 AM	- 11
		Transducer Fell 2	1024	Frequency Domain	0/2/1999 9 54 19 AM	- 11
rials			5000	Time Domain	8/2/1999 10:24 52 AM	
Material Properties		Properties		Time Domain	8/2/1999 10 39 32 AM	
				Time Domain	0/2/1999 2 21 30 FM	
Descriptor Ritmon Al	ky (2024-T4) (US customary	(iten		Frequency Donain	8/2/1999 2 40 18 PM	
and the second se		and the second se		Time Domain	6/3/1999 9.27 43 AM	- 11
Elettic Modulus	1.062.7 05	🗶 (units)		Time Domain Time Domain	6/3/1999 3 16:00 PM 8/3/1999 3 24 41 PM	- 11
Poisson's Ratio	0.32 Yield Poi	ex. 0.000 pei		Frequency Domain	8/3/1399 3 31 21 PM	11
server 1				Time Domain	6/4/1999 11 05 03 AM	
	Important		1. EE	Time Domain	8/4/1999 4:00:20 PM	
For accurat	le sitian measurements, the m ion under the gage.	aterial must be honogeneous	j 👼	Time Domain	8/4/1999 4.04 09 PM	
in compton					E D	a 11
When reducing roself	Assignments					
						7-1
assumed to be isotrop		New Rectangular I	Rosette Assid	Inment		17
assumed to be isotrop range.		New Rectangular I				-
assumed to be isotrop		New Rectangular I		(harre())		2
assumed to be isotrop range.	Descriptor Placette	New Rectangular I		Charve(h) [GRID1GRID2	GRID3 .	ľ
assumed to be isotrop range.		New Rectangular I		Charve(h) [GRID1GRID2		2
assumed to be isotrop range.	Descriptor Placette			Charve(h) [GRID1GRID2	GRID3 .	1
assumed to be isotrop range.	Descriptor Plasette Example: Rosette	Channel Settings	-	Charrelli) GRID1 GRID2 3	GRID3	-
assumed to be isotrop range.	Descriptor Plassifie Example: Rosette Sensor (Pectangula	Channel Settings			GRID3	ľ
assumed to be isotrop range.	Descriptor Plasette Example: Rosette	Channel Settings		Charrelli) GRID1 GRID2 3	GRID3 .	1
assumed to be isotrop range.	Descriptor Plassifie Example: Rosette Sensor (Pectangula	Posete 11	ete High Level		6803 • 4 5	ľ
assumed to be isotrop range.	Descriptor Planette Exercite: Rosette Sensor (Pentangula Material (Julaninus J	Planet Settings Receive Reg (2024-14)(17 State Gage Themoco	ele HighLevel Cha	Charrets) GRID1 GRID2 3 CND1 GRID2 CND1 GRID2 CND1 GRID2 CND1 GRID2	6800 • • 5	2
assumed to be isotrop range.	Descriptor Provente Exemple: Roote Sensor (Rectanguta Material (Rooterguta Temperature Correction	Provent Settings Provents Bay COSH 1 (E) My COSH	ele HighLevel Cha	Charrels) GRID1 GRID2 2 UVD1 OI	4 5 3 5 5 Card: 4	Legend
assumed to be isotrop range.	Descriptor Planette Example: Rosette Sensor Planette Material Silvermun A Temporature Correction Themad Dubys The	An could be formed before the second before the	ele High Level Cha	Charrets) GRID1 GRID2 3 CND1 GRID2 CND1 GRID2 CND1 GRID2 CND1 GRID2	GRID3 = 4 5 5	Pies
assumed to be isotrop range.	Descriptor Provente Exemple: Roote Sensor (Rectanguta Material (Rooterguta Temperature Correction	An could be formed before the second before the	ele HighLevel Cha	Charrets) GRID1 GRID2 3 CND1 GRID2 CND1 GRID2 CND1 GRID2 CND1 GRID2	5 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Pow No C
assumed to be isotrop range.	Descriptor Planette Example: Rosette Sensor Planette Material Silvermun A Temporature Correction Themad Dubys The	An could be formed before the second before the	che Mightend Cha 4/10	Overretel GR01 GR02 3 CUOT GR02 anner ID: 1	(PRC) + 4 5 3 5 Card: 4	Pies
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	Private Private Reg 20231627 Stan Suga Minimotogin Min	che Mightend Cha 4/10	Charrels) GRID1 GRID2 3 CND1 GRID2 CND1 GRID2 CND1 GRID2 CND1 GRID2	(PRC) + 4 5 3 5 Card: 4	Pow No C
assumed to be isotrop range.	Descriptor Planette Example: Rosette Sensor Planette Material Silvermun A Temporature Correction Themad Dubys The	r foreit Ry 2021 (6) /7 Rescalar Marcana Marca	che Mightend Cha 4/10	Overetel GRID1 GRID2 2 CNOT 2 CNOT	(PRC) + 4 5 3 5 Card: 4	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	Private Private Reg 20231627 Stan Suga Minimotogin Min	ele MighLend Chai Chai	Charrelbi GRIDT GRIDZ CUOT CHAR ANNIEL Settling anner ID: 1 Type: Strain O Barge	(000) 1 4 5 S Card: 4 age Card	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r foreit Ry 2021 (6) /7 Rescalar Marcana Marca	che Mightend Cha 4/10	Overetel GRID1 GRID2 2 CNOT 2 CNOT	(PRC) + 4 5 3 5 Card: 4	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r foreit Ry 2021 (6) /7 Rescalar Marcana Marca	ele MighLend Chai Chai	Charrelbi GRIDT GRIDZ CUOT CHAR ANNIEL Settling anner ID: 1 Type: Strain O Barge	(000) 1 4 5 S Card: 4 age Card	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r foreit Ry 2021 (6) /7 Rescalar Marcana Marca	eh Hoji Level Char Char Card	Charrelbi GRIDT GRIDZ CUOT CHAR ANNIEL Settling anner ID: 1 Type: Strain O Barge	(000) 1 4 5 S Card: 4 age Card	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r foreit Ry 2021 (6) /7 Rescalar Marcana Marca	ele Mightend chai 4/10 Chai Chai Chai Chai Stu	Correctal GRID1 GRID2 GRID1 GRID2 GRID1 GRID2 G	sno> • • • • • • • • •	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r Runnt by Statistics Navestation Navest	en High Land Chai Card	Charrelbi anion price 2 charrelbi charre	(000) 1 4 5 S Card: 4 age Card	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r foreit Ry 2021 (6) /7 Rescalar Marcana Marca	che High Lewit Chai Chai Card	Overetal GRID1 GRID2 GRID1 GRID2 G	S Card: 4 iage Card	Pow No C
assumed to be isotrop range.	Descriptor Planethe Example: Roome Sensor (Perchangula Massial Falueran A Tempontum Connection Themail Output (The Graph Factor TC) (The	r Runnt by Statistics Navestation Navest	ele High Level Chair Chair Card Card	Correctal GRID1 GRID2 GRID1 GRID2 GRID1 GRID2 G	sno> • • • • • • • • •	Pow No C

are incorporated into our extensive selection of tech notes, application notes, instruction bulletins, and other technical publications that are recognized and used as the authoritative references for strain gage measurement by practitioners throughout the world. StrainSmart[®] software automatically applies the techniques and corrections covered by these publications to your test measurements.

STRAINSMART® SOFTWARE FEATURES

- Complete Windows®-based software designed for the experimental stress analyst
- Easy-to-use StrainSmart[®] Wizards for fast test setup and for data acquisition, reduction, and presentation
- Sensor-specific assignment of inputs (strain gages, thermocouples, etc.), as well as user-defined assignments for mathematical manipulation of measurement data
- One-touch autobalance
- Shunt calibration of strain-gage inputs
- Reduced data available offline as a database table, ASCII text, HTML or Microsoft Office™ (Word, Excel, Access) document, or online by OLE Automation connection to spreadsheets, word processors, LabView, and other third-party applications
- Online interactive Help system
- Test setup and commonly used parameters available for saving and reuse for subsequent testing

Windows and Office are trademarks of Microsoft.



Software for Stress Analysis Testing

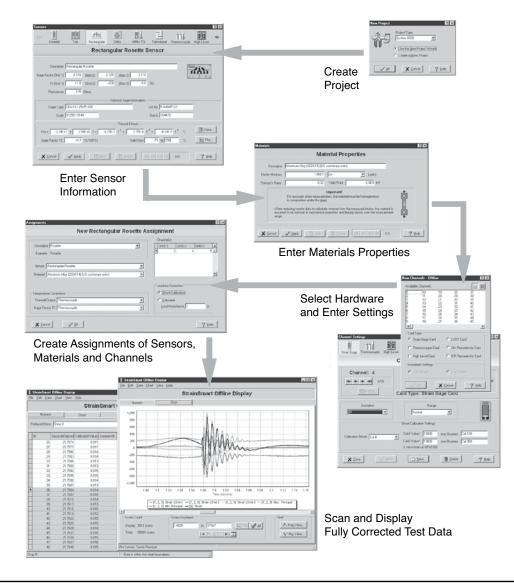
ACQUISITION/REDUCTION/PRESENTATION

- Data reduction for delta, rectangular, and tee rosettes, including the conversion of principal strains to stresses
- Calculation of equivalent stresses for common failure mode criteria
- Online monitoring of key channels and/or rosettes in fully reduced and corrected numeric and graphic formats
- Offline presentation of all reduced data in numeric and graphical formats
- FFT analysis
- Thermal output compensation
- Correction for temperature coefficient of gage factor
- Wheatstone bridge nonlinearity correction
- Transverse sensitivity correction
- Thermocouple linearization

- Scaling for number of active bridge arms
- Data storage for later analysis and processing
- · Record on limits or user-defined time intervals
- Automatic audit trail
- Self calibration
- Barcode input of strain gage datasheet information

MULTI-CHANNEL MEASUREMENTS

Through StrainSmart[®] software, the appropriate setup information is entered—gage factor, materials properties, transducer sensitivities, etc. Using these parameters, StrainSmart[®] automatically outputs the results of test data in engineering units. Setup information and measurement data can also be permanently retained for offline display or for export to databases, word processors, and spreadsheets.





Software for Stress Analysis Testing

SYSTEM 7000

- 10 to 2048 measurements per second per sensor
- Selectable digital filtering of measurement signals
- Time and frequency domain analysis
- Self calibration with internal calibration reference



SYSTEM 8000

- Eight software-selectable input channels
- Up to 16 scanners can be used concurrently
- Supported inputs include:
 - Strain gage (strain gauge) (quarter-, half-, and full-bridges)
 - Strain-gage-based transducer
 - High-level voltage signal
 - Thermocouples
- RJ45 input connectors for each input channel
- Scanning rates are 1000, 500, 200, 100, and 10 samples/second
- Compact size and ruggedized enclosure
- Ethernet network architecture
- Optional self-calibration functionality available







Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "VPG"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

The product specifications do not expand or otherwise modify VPG's terms and conditions of purchase, including but not limited to, the warranty expressed therein.

VPG makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. To the maximum extent permitted by applicable law, VPG disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on VPG's knowledge of typical requirements that are often placed on VPG products. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. You should ensure you have the current version of the relevant information by contacting VPG prior to performing installation or use of the product, such as on our website at vpgsensors.com.

No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of VPG.

The products shown herein are not designed for use in life-saving or life-sustaining applications unless otherwise expressly indicated. Customers using or selling VPG products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify VPG for any damages arising or resulting from such use or sale. Please contact authorized VPG personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Copyright Vishay Precision Group, Inc., 2014. All rights reserved.