

Stress Monitoring System

Motswedi TLC Software (Pty) Ltd

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Specifications

- 19" 3U equipment chassis
- 8 x 4 channel plug-in full bridge strain cards
- Full gain and offset adjustment
- Microprocessor based data logger (10 bits A/D) or PC based digitiser (option)
- Memory for up to 128 000 readings
- Interface for RS232 modem
- Universal 100-240V power supply or 12V DC (option)



**STRAIN GAUGE AMPLIFIERS
&
DATA ACQUISITION SYSTEM**



**SITE
MODEM**



**LIGHTNING
PROTECTION**



**OFFICE
MODEM**



**TRACK
SENSORS**



**DATA
CENTRE**



Stain Sensor



- Encapsulated strain sensor attached to the equipment



- Cover plate to prevent physical damage

Lightning Protection

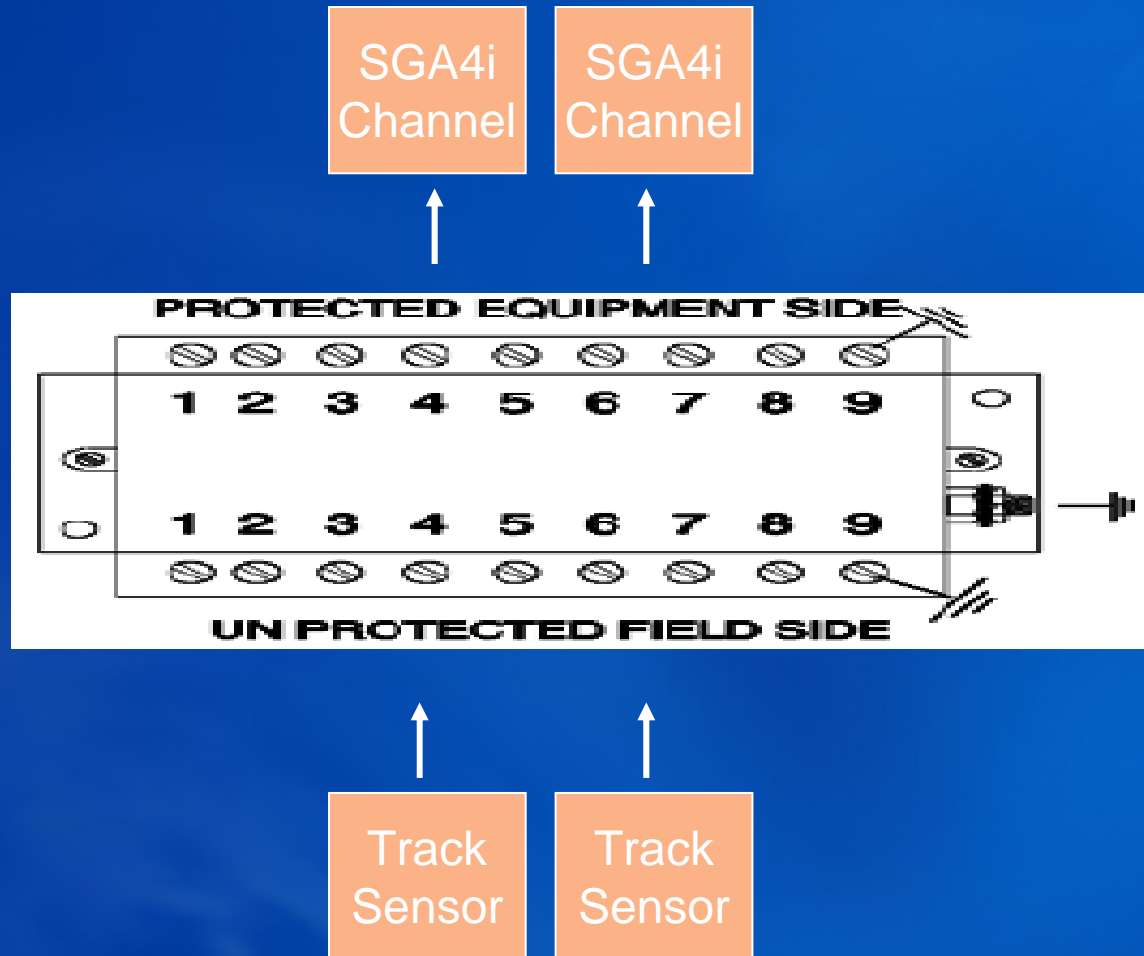
- Protect load cells against longitudinal surges in the rails which cause breakdown of the insulation between strain gauges and rail. Breakdown of this insulation would provide a surge with a path to earth through strain gauges, cables and amplifiers.
- The amplifiers are individually protected against lightning-induced surges propagated from the load cells.

Lightning Modules



Example only -Actual site unit may differ

Lightning Module Connection

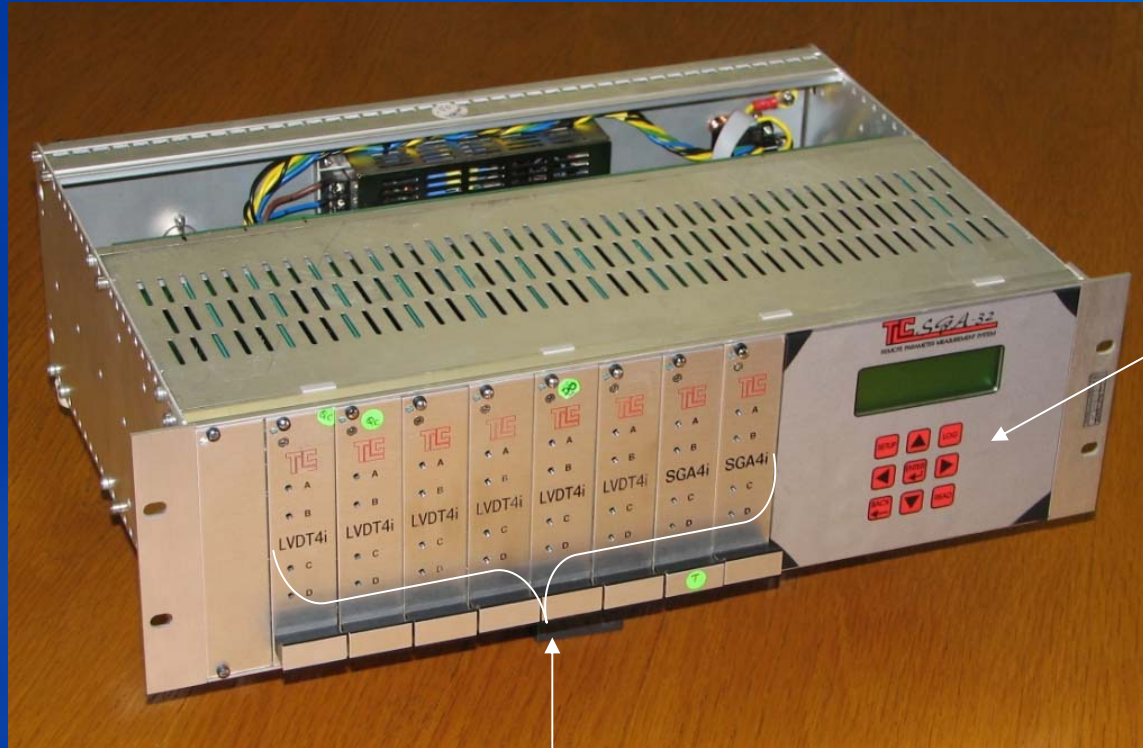


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SGA32 19" RACK

- 19" 3U Chassis Tray
- Accommodates up to 8 x 4 channel Strain (SGA4i) or LVDT (LVDT4i)
- Data acquisition Card for 32 or 64 channels
- User interface display and keyboard
- Internal Backplane for plug-in convenience
- Internal world voltage range power supply (100 – 250V ac 50/60Hz)

SGA32 Rack Front View



User Interface

Channel Cards

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SGA32 Rear View

Battery
Power
Input
(Option)



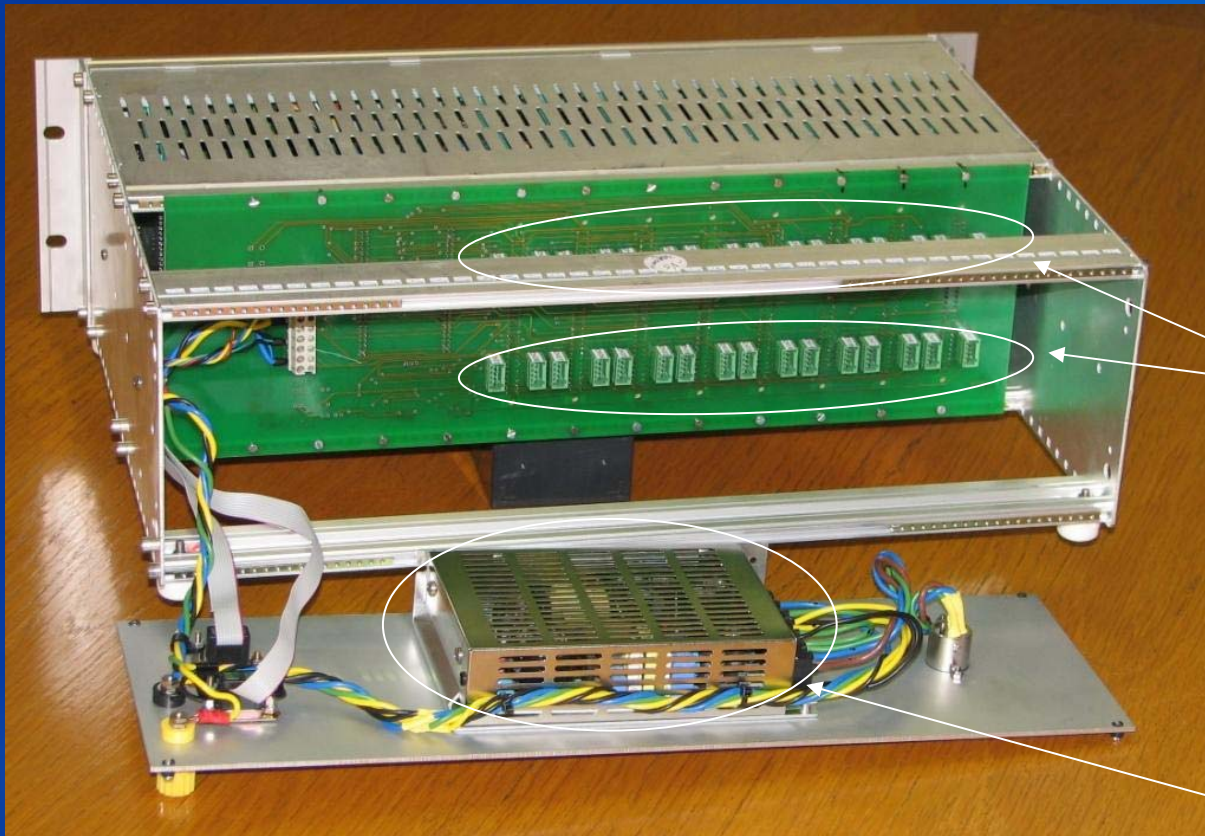
Mains
Power
Supply
Input

PC
Connection

Modem
Connection

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SGA32 Channel Connections



Channel Inputs

Mains
Power
Supply

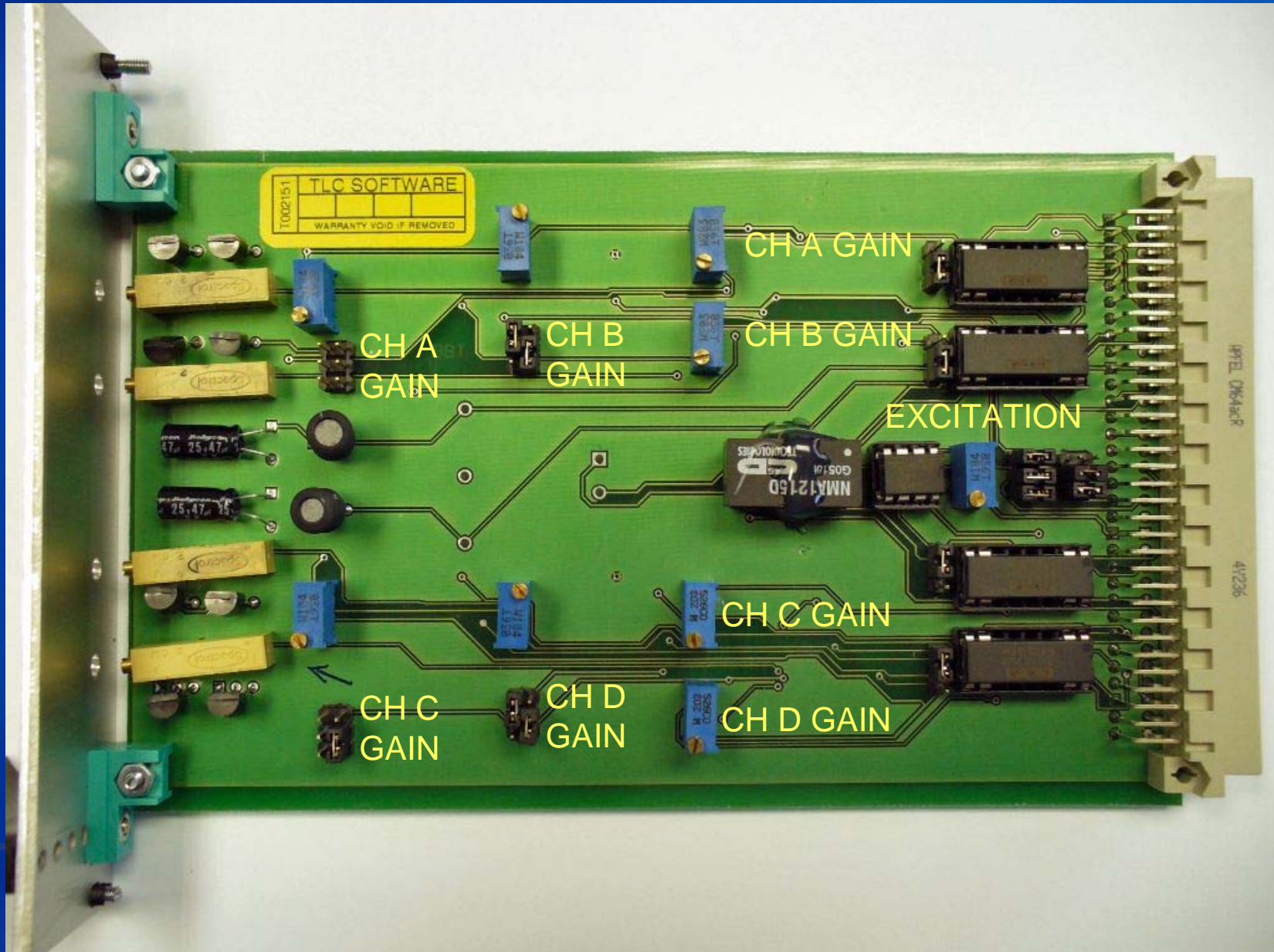
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SGA4i Strain Gauge Amplifiers

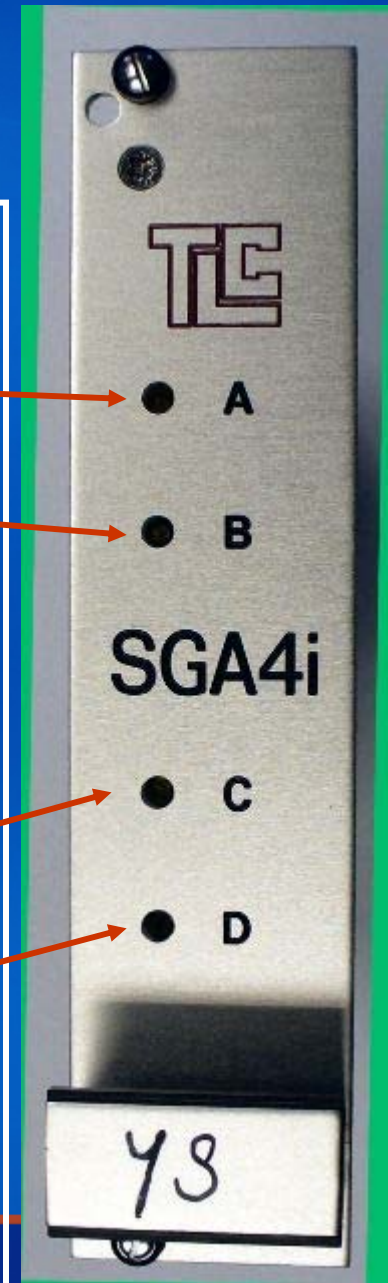
- 4 channels per card
- Full bridge strain
- Jumper adjustable gain X10, x100, x1000
- Fine gain adjustment with a trimpot
- Offset adjustment through the front panel
- Fixed frequency anti-aliasing filter

SGA4i PCB Top Side



PCB Front Panel

- Front Panel Adjustment of offset
- A is first channel (1,5,9...)
- B is second channel (2,6,10...)
- C is third channel (3,7,11...)
- D is fourth channel (4,8,12...)



SGA32 Data Acquisition

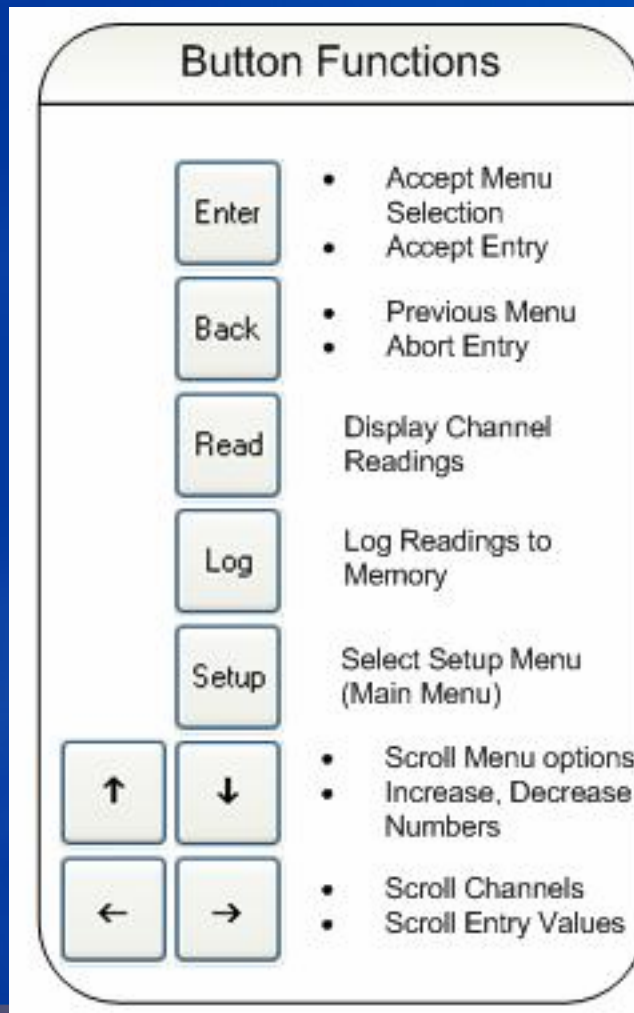
- 4-64 Channels
- ± 10 Volt Input
- 10 bit (1/1024) resolution
- 128 000 Reading Storage
- 1 reading per channel per second or slower
- RS232 Interface for Modem and PC
- Keyboard and Screen Interface

User Interface

- 4 line 20 Character LCD Display
- Keypad for setup and diagnostics



User Interface Keypad



SGA32 User Interface Menu

- **SETUP** - set up the datalogger

- Communications (Enter telephone number)
- Voltmeter (Display channel voltage)
- Logger Setup (Set up sample rate)
- Calibration (Enter gain and offset)

TLC SGA-32
(Reading Channels)
You may select:
SETUP / LOG / READ

- **LOG** – log data to remote data centre or memory

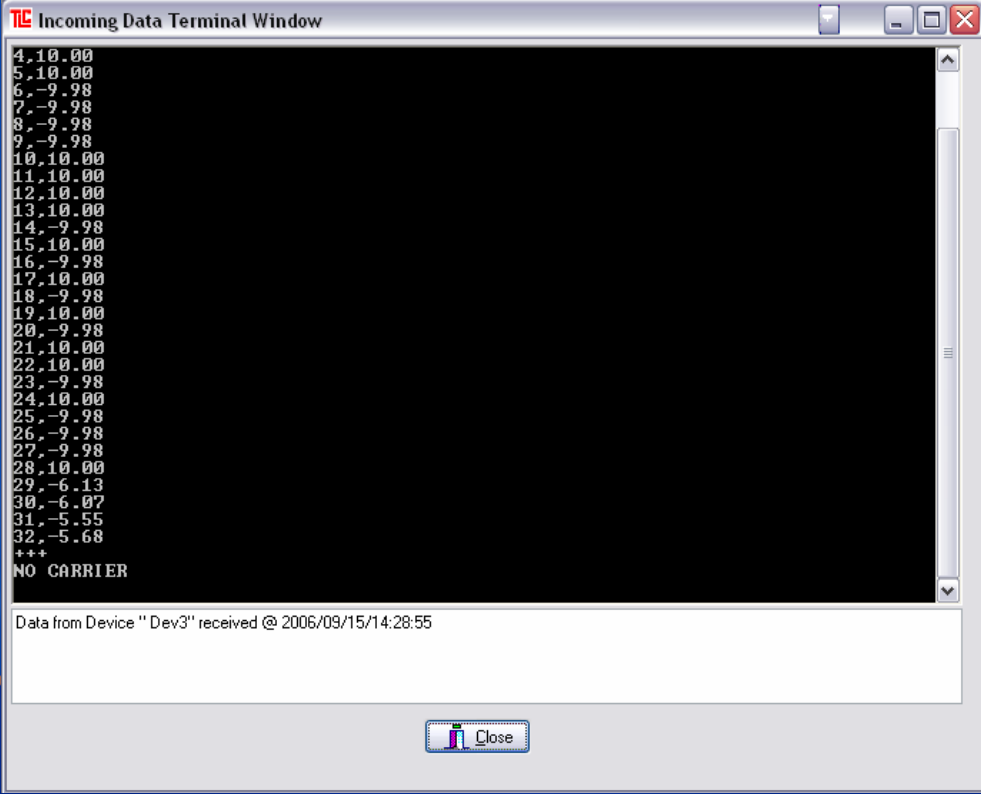
- **READ** – display channel data with calibration factors

SGA Download Manager

- PC Based application to receive data from SGA32 remote system
- Features
 - Communication Settings
 - View incoming data terminal window
 - Establish remote connection with device to view data or change settings on the remote system
 - Delete selected data from the database
 - Create/Edit devices in the database
 - View/print/export data for selected devices
 - Backup Database

View Remote Data

- Option to see data coming in live from the remote system



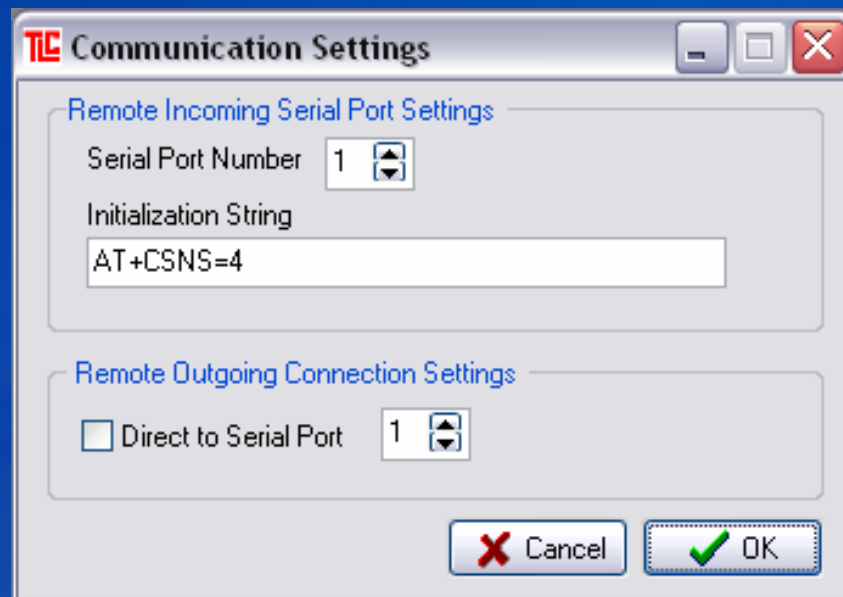
```
TC Incoming Data Terminal Window
4.10.00
5.10.00
6.-9.98
7.-9.98
8.-9.98
9.-9.98
10.10.00
11.10.00
12.10.00
13.10.00
14.-9.98
15.10.00
16.-9.98
17.10.00
18.-9.98
19.10.00
20.-9.98
21.10.00
22.10.00
23.-9.98
24.10.00
25.-9.98
26.-9.98
27.-9.98
28.10.00
29.-6.13
30.-6.07
31.-5.55
32.-5.68
+++
NO CARRIER

Data from Device "Dev3" received @ 2006/09/15/14:28:55

Close
```

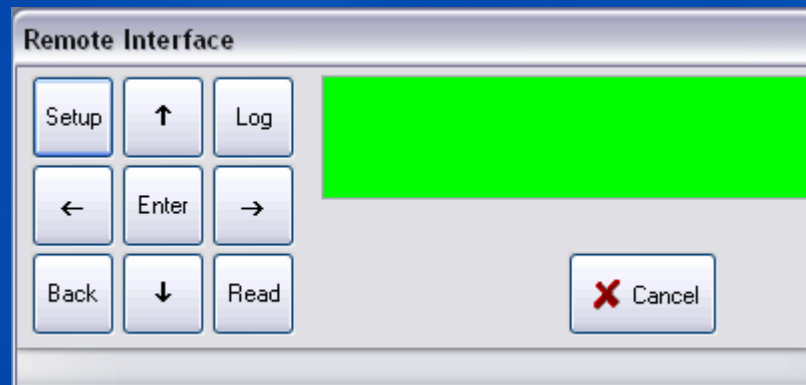
Setup Communications

- Set up communications and modem information



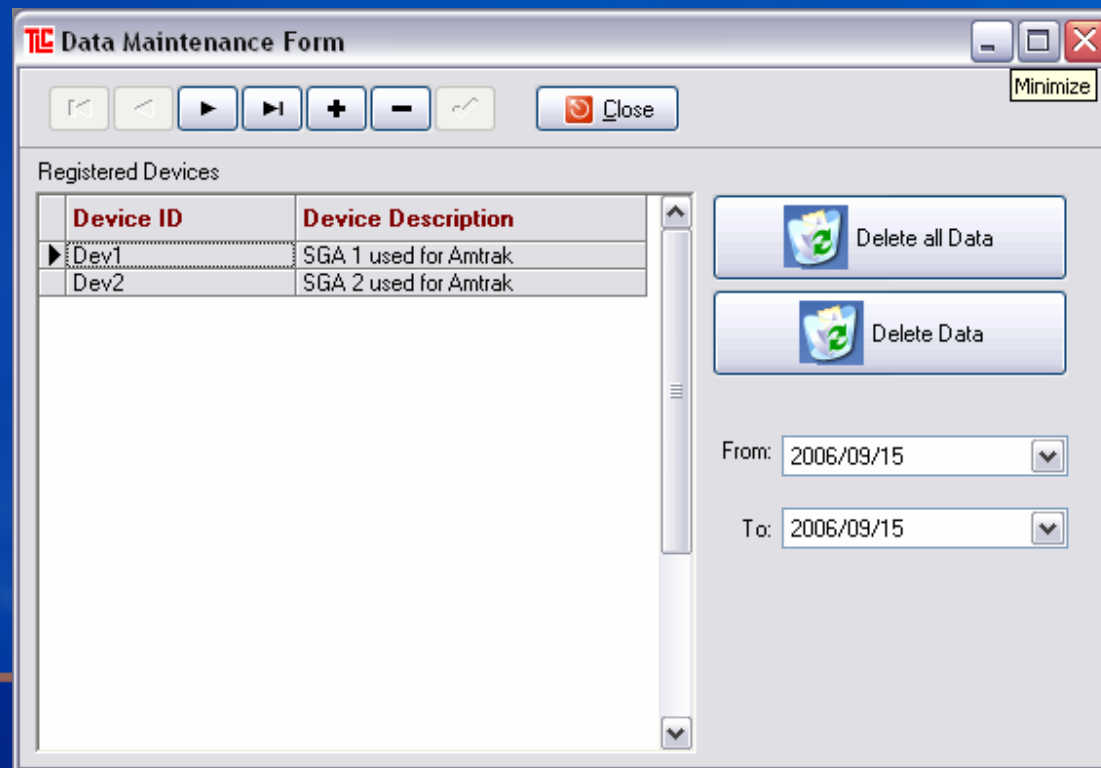
Remote Connection

- View data and change settings on remote datalogger



Delete Data from the Database

- Delete all or selected data from the database



The screenshot shows a software window titled "Data Maintenance Form". The window contains a table of "Registered Devices" and two buttons for deleting data. The table has two columns: "Device ID" and "Device Description". The first row is selected, showing "Dev1" and "SGA 1 used for Amtrak". The second row is "Dev2" and "SGA 2 used for Amtrak". To the right of the table are two buttons: "Delete all Data" and "Delete Data". Below these buttons are two date pickers labeled "From:" and "To:", both set to "2006/09/15".

Device ID	Device Description
Dev1	SGA 1 used for Amtrak
Dev2	SGA 2 used for Amtrak

Buttons: Delete all Data, Delete Data

From: 2006/09/15
To: 2006/09/15



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Create New Device

- Add new device to database & define channel settings

SGA Device Information

Device ID (Identifier sent from SGA32 Device)
Dev1

Device Description
SGA 1 used for Amtrak

Telephone Number
12345671

Ch #	Description	Channel Units
1	Ch1	mm/s
2	Ch2	
3	Ch3	
4	Ch4	
5	Ch5	
6	Ch6	
7	Ch7	
8	Ch8	
9	Ch9	

View Data

- Display, print or export data from the database

Results Form

Device Selection

Registered Devices

Device ID	Device Description
Dev1	SGA 1 used for Amtrak
Dev2	SGA 2 used for Amtrak

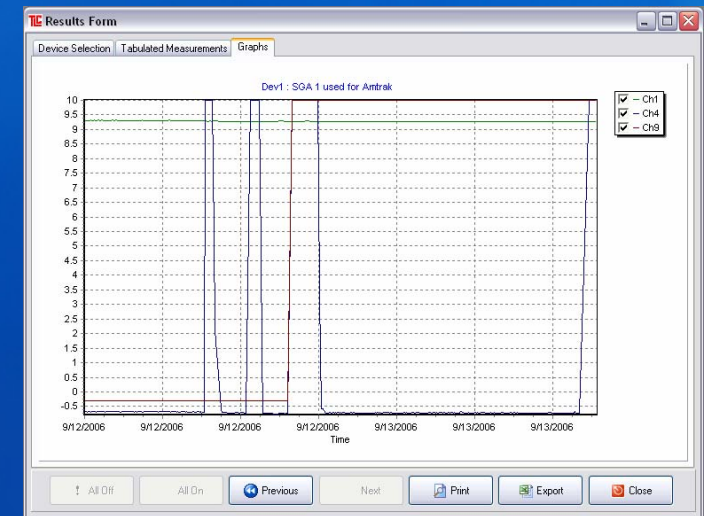
Channels to View:

- 1:Ch1 [mm/s]
- 2:Ch2
- 3:Ch3
- 4:Ch4
- 5:Ch5
- 6:Ch6
- 7:Ch7
- 8:Ch8
- 9:Ch9
- 10:Ch10
- 11:Ch11
- 12:Ch12
- 13:Ch13
- 14:Ch14
- 15:Ch15
- 16:Ch16
- 17:Ch17
- 18:Ch18
- 19:Ch19
- 20:Ch20
- 21:Ch21
- 22:Ch22
- 23:Ch23
- 24:Ch24
- 25:Ch25
- 26:Ch26
- 27:Ch27
- 28:Ch28
- 29:Ch29
- 30:Ch30
- 31:Ch31
- 32:Ch32

From: 2006/09/10

To: 2006/09/15

Buttons: All Off, All On, Previous, Next, Print, Export, Close



Results Form

Device Selection | **Tabulated Measurements** | Graphs

Reading Time	Ch1	Ch4	Ch9
2006-09-12 00:03:34	9.300	-0.660	-0.310
2006-09-12 00:08:34	9.300	-0.660	-0.310
2006-09-12 00:13:34	9.300	-0.700	-0.310
2006-09-12 00:18:37	9.300	-0.660	-0.310
2006-09-12 00:23:37	9.300	-0.660	-0.310
2006-09-12 00:28:39	9.300	-0.700	-0.310
2006-09-12 00:33:38	9.300	-0.660	-0.310
2006-09-12 00:38:39	9.300	-0.660	-0.310
2006-09-12 00:43:39	9.320	-0.660	-0.310
2006-09-12 00:48:41	9.300	-0.660	-0.310
2006-09-12 00:53:41	9.300	-0.700	-0.310
2006-09-12 00:58:44	9.300	-0.660	-0.310
2006-09-12 01:03:44	9.320	-0.660	-0.310
2006-09-12 01:08:45	9.300	-0.660	-0.310
2006-09-12 01:13:47	9.300	-0.660	-0.310
2006-09-12 01:18:46	9.320	-0.660	-0.310
2006-09-12 01:23:46	9.300	-0.620	-0.310
2006-09-12 01:28:48	9.300	-0.660	-0.310
2006-09-12 01:33:48	9.300	-0.700	-0.310
2006-09-12 01:38:49	9.300	-0.660	-0.310
2006-09-12 01:43:51	9.300	-0.660	-0.310
2006-09-12 01:48:51	9.300	-0.660	-0.310
2006-09-12 01:53:50	9.300	-0.660	-0.310
2006-09-12 01:58:53	9.300	-0.660	-0.310
2006-09-12 02:03:53	9.300	-0.660	-0.310
2006-09-12 02:08:55	9.320	-0.660	-0.310
2006-09-12 02:13:56	9.300	-0.660	-0.310
2006-09-12 02:18:56	9.300	-0.660	-0.310
2006-09-12 02:23:58	9.320	-0.620	-0.310
2006-09-12 02:28:50	9.300	-0.660	-0.310

Buttons: All Off, All On, Previous, Next, Print, Export, Close

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Backing Up the Database

- Back up data to a backup directory



Summary

- Stress monitoring system provides a comprehensive measurement facility from the sensor to the database
 - Adjust sensor gain, offset and excitation
 - Convert raw voltage to measurement value
 - Log data to remote PC or internal memory
 - Setup and view remote system from back office
 - Store data in a database
 - Simple data viewer and export facility
 - Option to provide comprehensive reporting facility

Contact Details

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