

# Stress Monitoring System

TLC ENGINEERING SOLUTIONS (Pty) Ltd

# 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

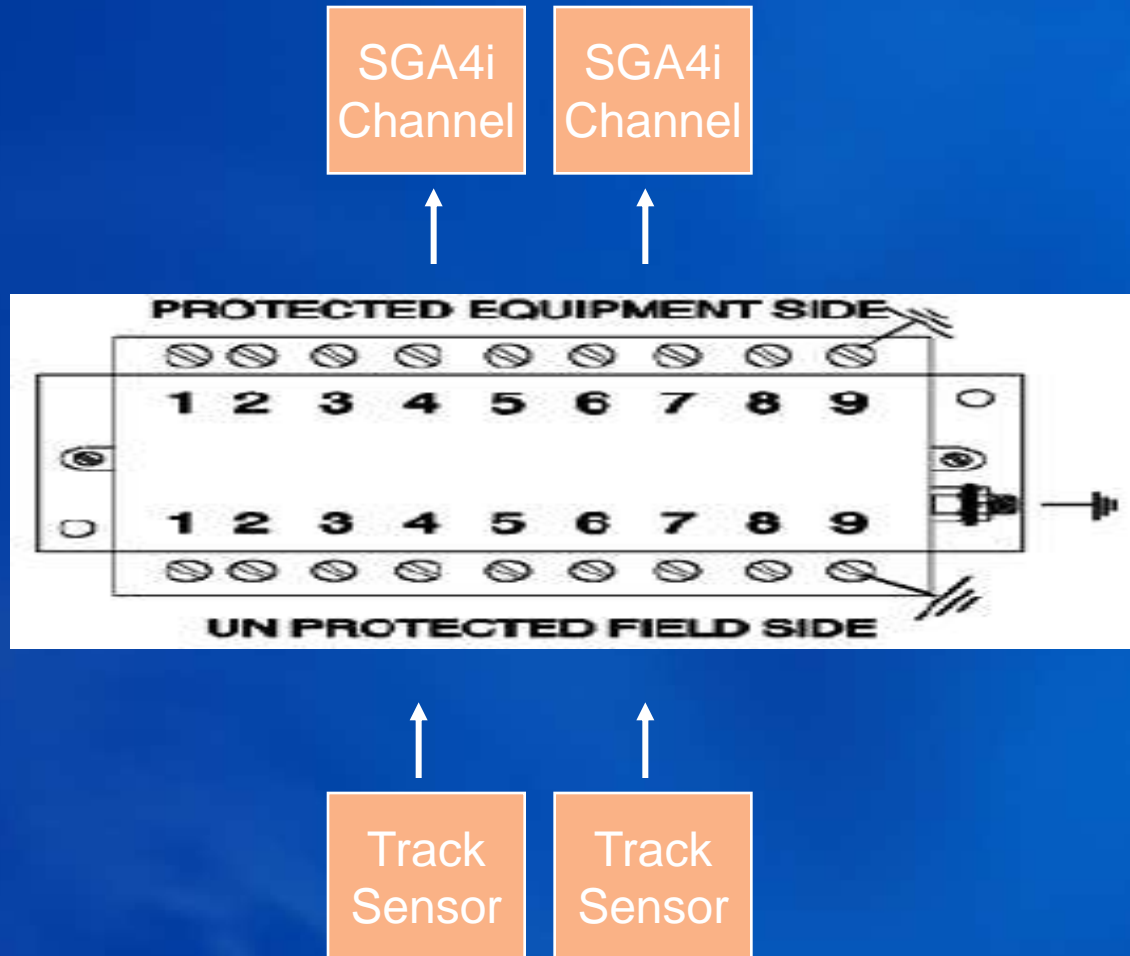
- Protect load cells against longitudinal surges in the rails which cause breakdown of the insulation between strain gauges and rail. Breakdown of this insulation would provide a surge with a path to earth through strain gauges, cables and amplifiers.
- The amplifiers are individually protected against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

# Lightning Modules



Example only -Actual site unit may differ

# Lightning Module Connection



# 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

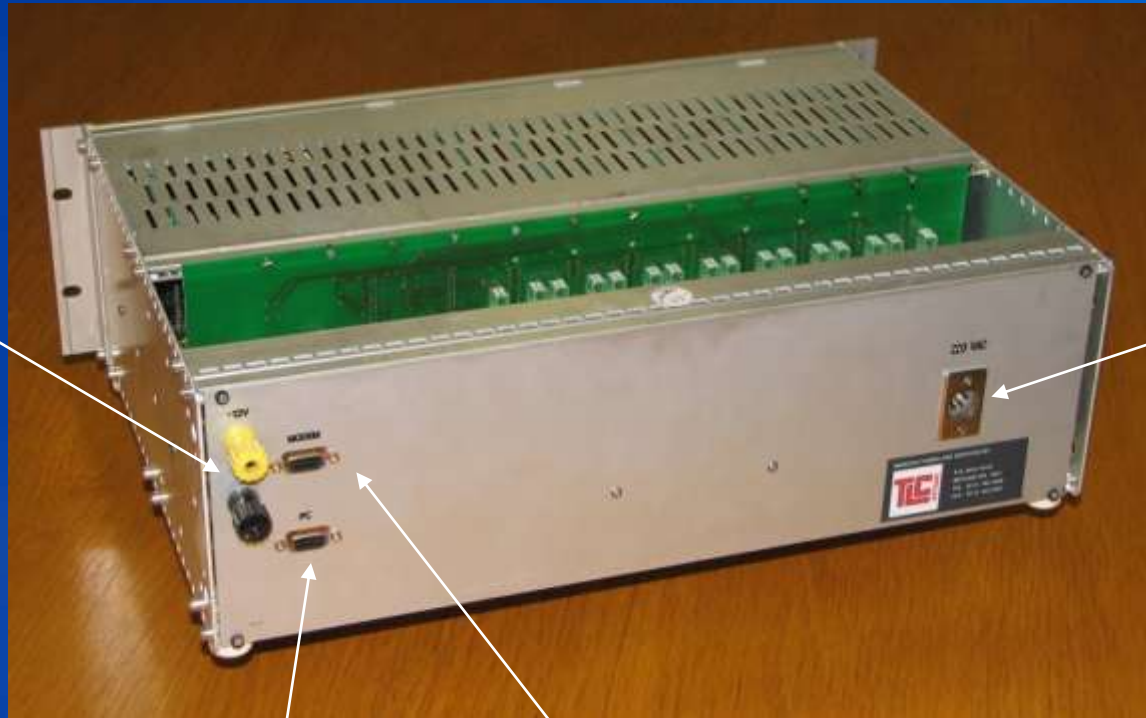


User Interface

Channel Cards

# SGA32 Rear View

Battery  
Power  
Input  
(Option)

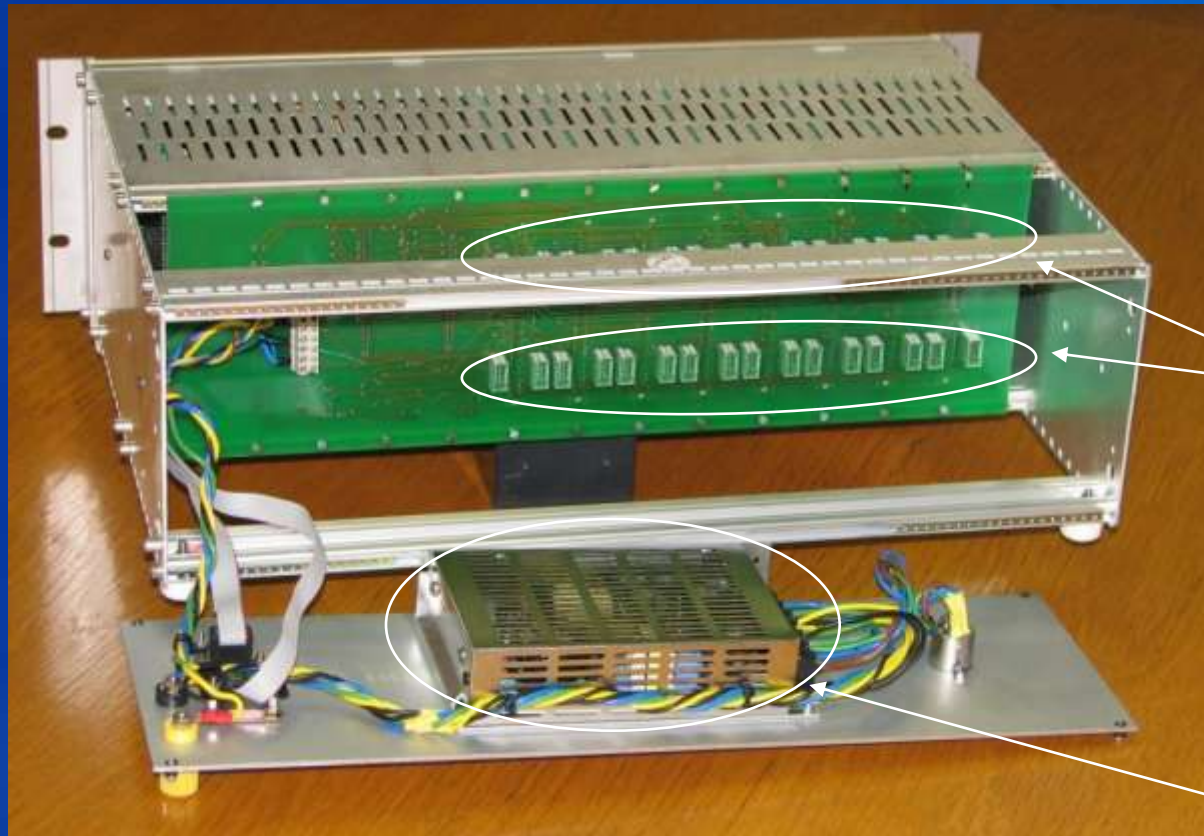


Mains  
Power  
Supply  
Input

PC  
Connection

Modem  
Connection

# SGA32 Channel Connections



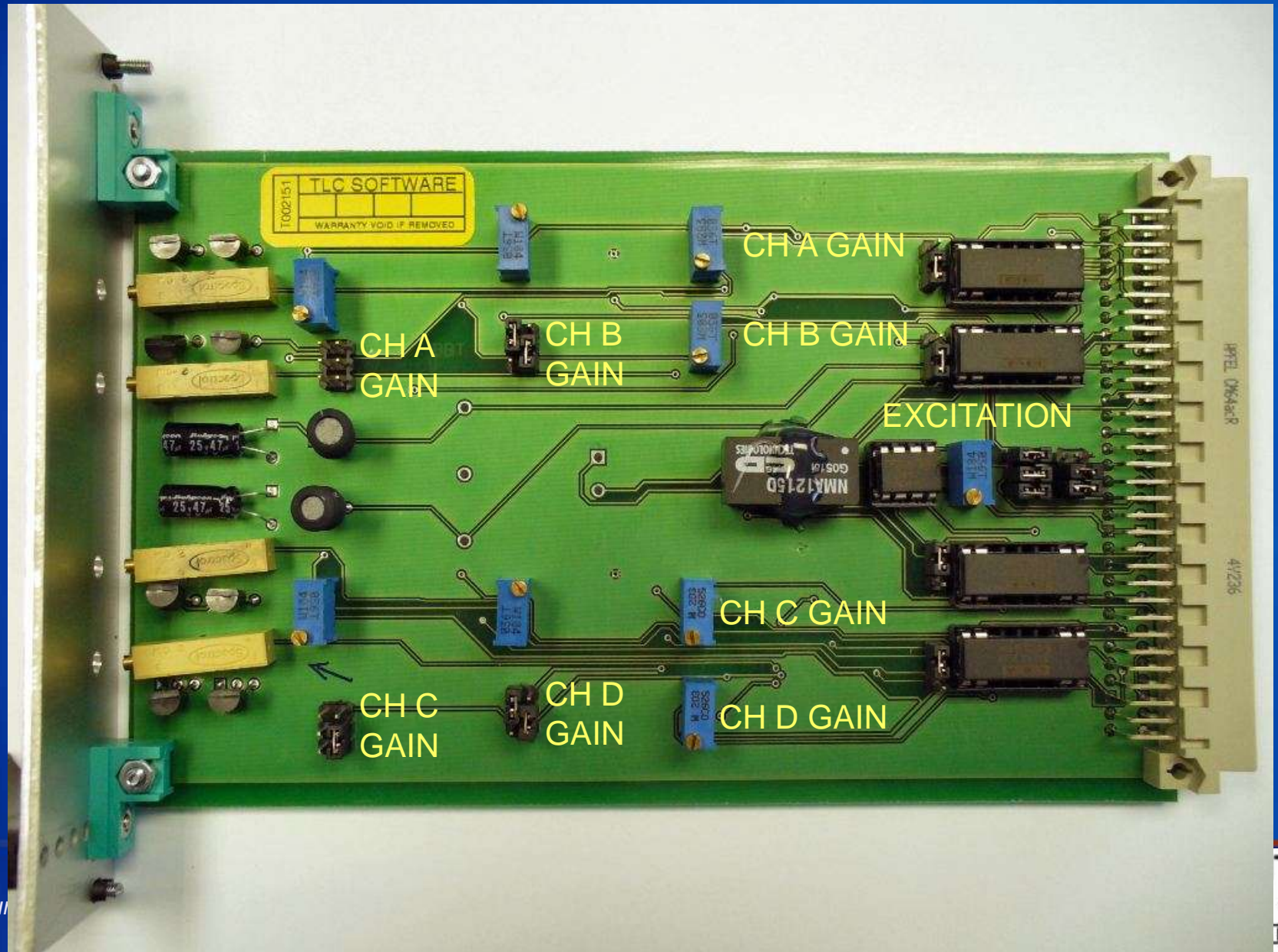
Channel Inputs

Mains  
Power  
Supply

# SGA4i Strain Gauge Amplifiers

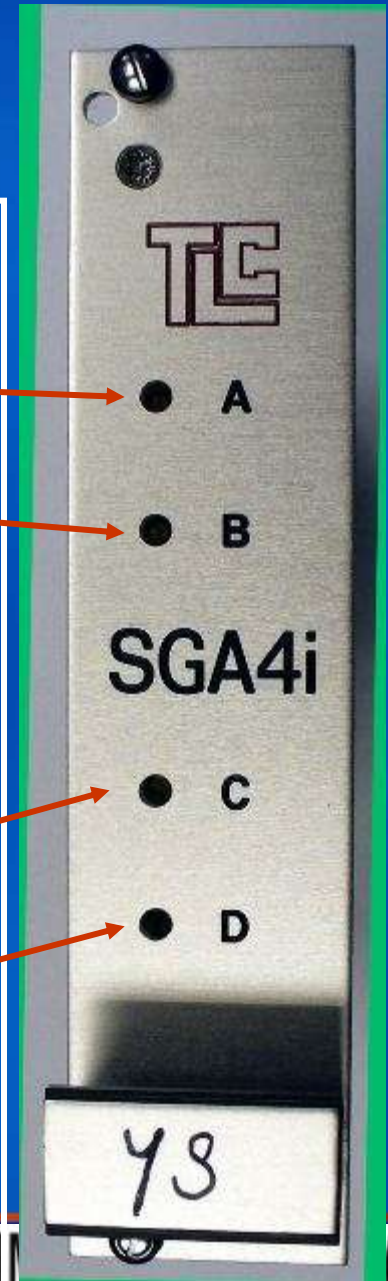
- 4 channels per card
- Full bridge strain
- Jumper adjustable gain X10, x100, x1000
- Fine gain adjustment with a trimpot
- Offset adjustment through the front panel
- Fixed frequency anti-aliasing filter

# 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
- $\pm 10$  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

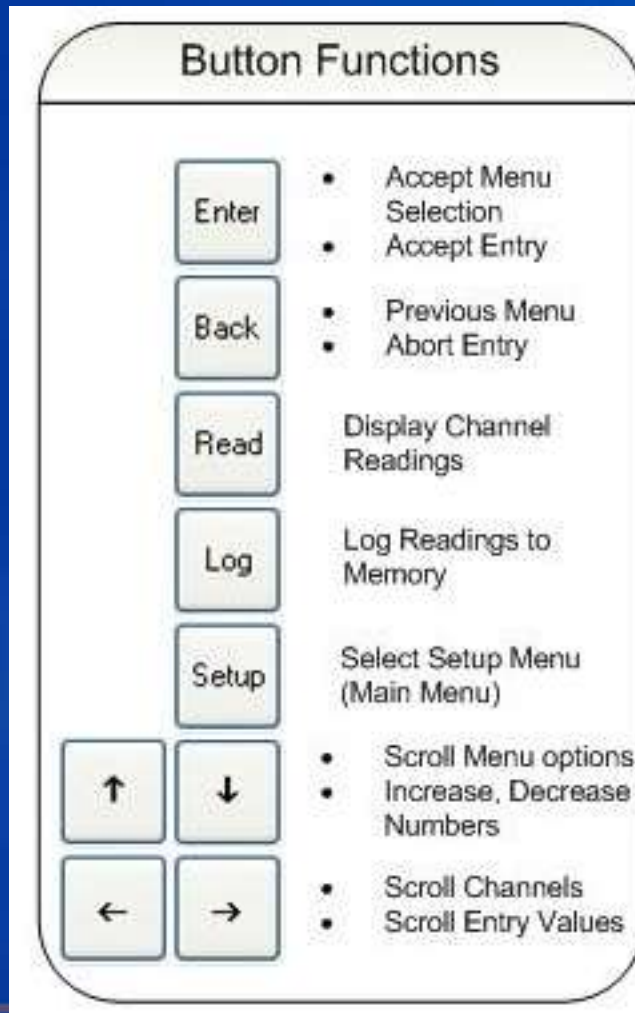
# User Interface

- 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

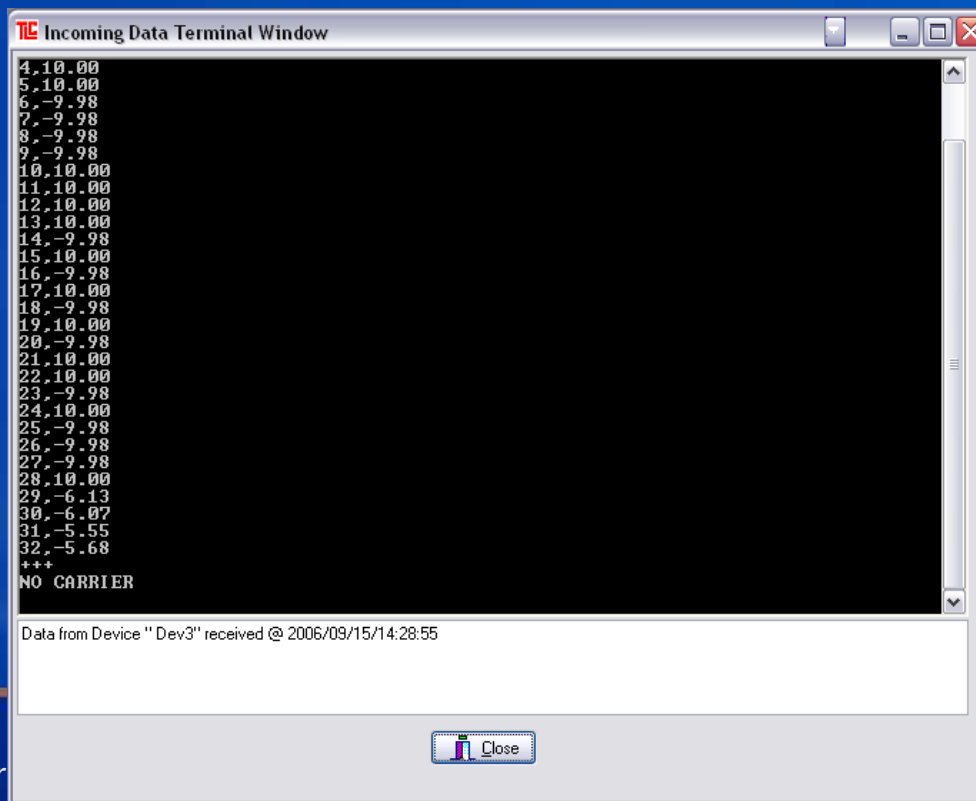
- **READ** – display channel data with calibration factors

# 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

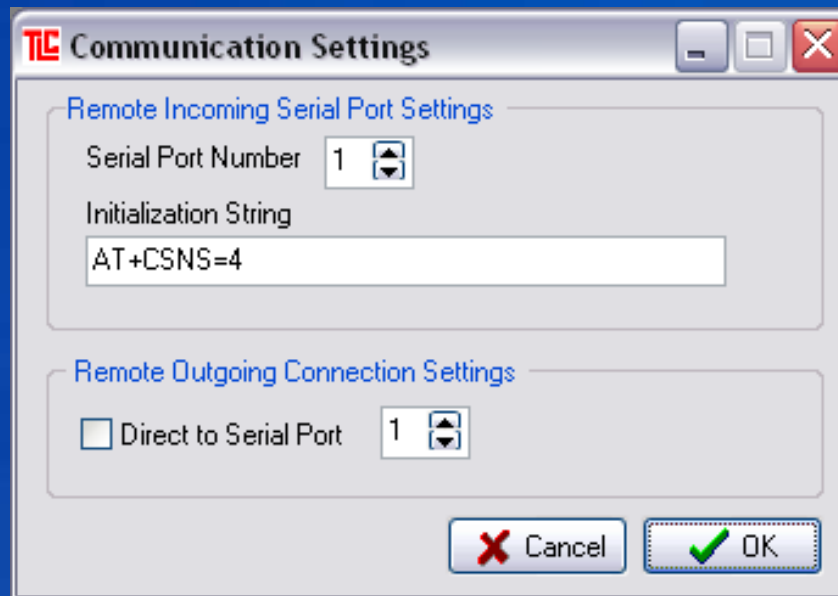
# View Remote Data

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



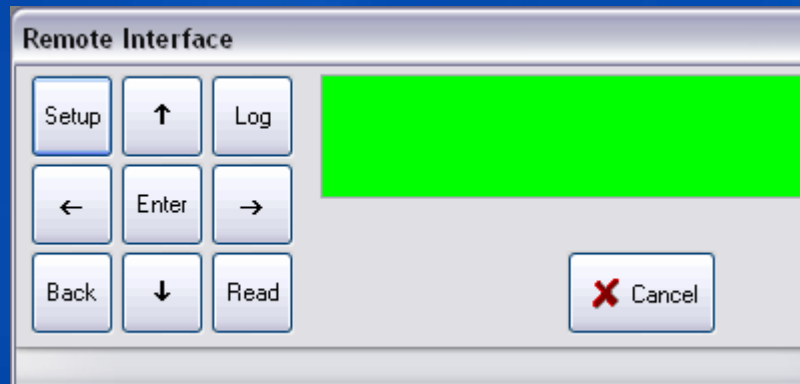
# Setup Communications

- Set up communications and modem information



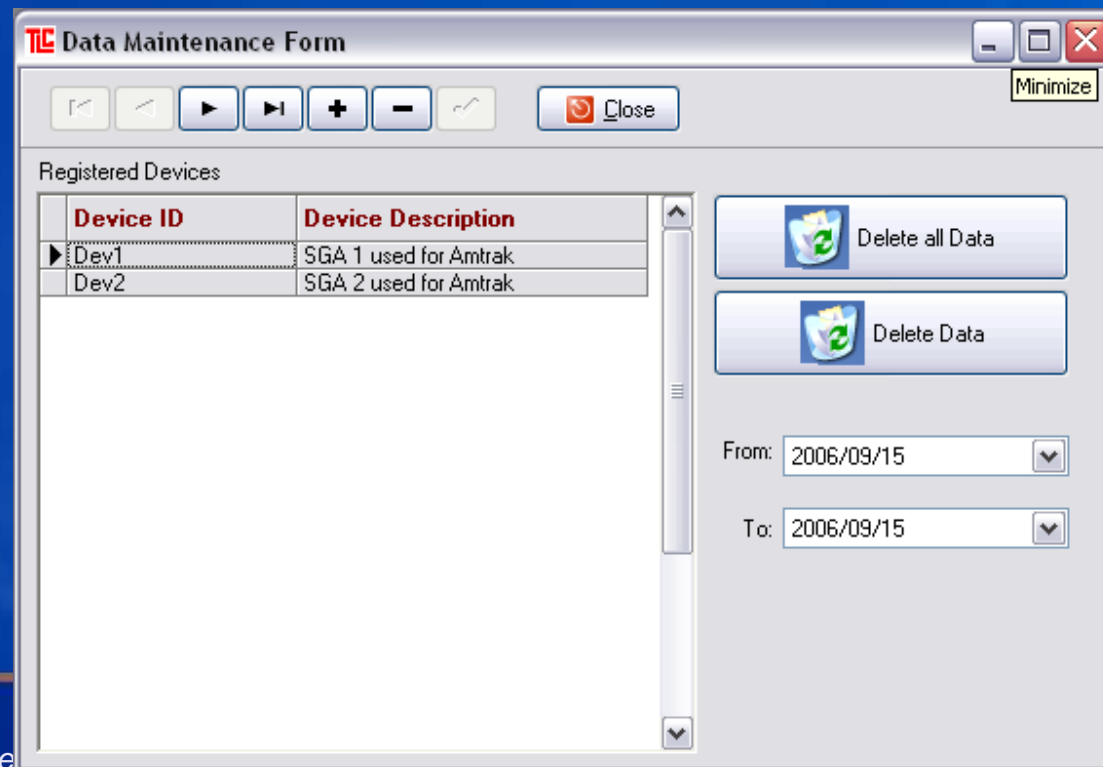
# Remote Connection

- View data and change settings on remote datalogger



# Delete Data from the Database

- Delete all or selected data from the database



# 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

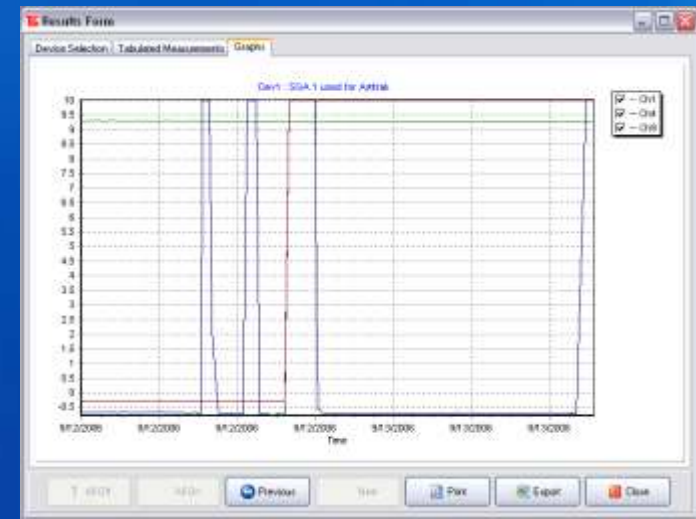
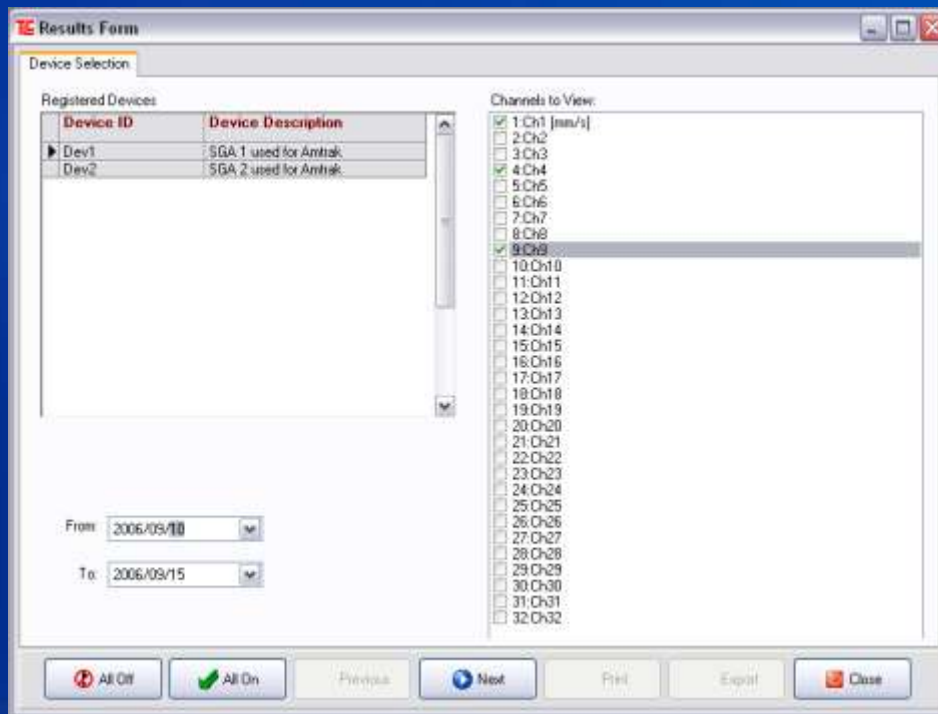
Telephone Number  
12345671

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

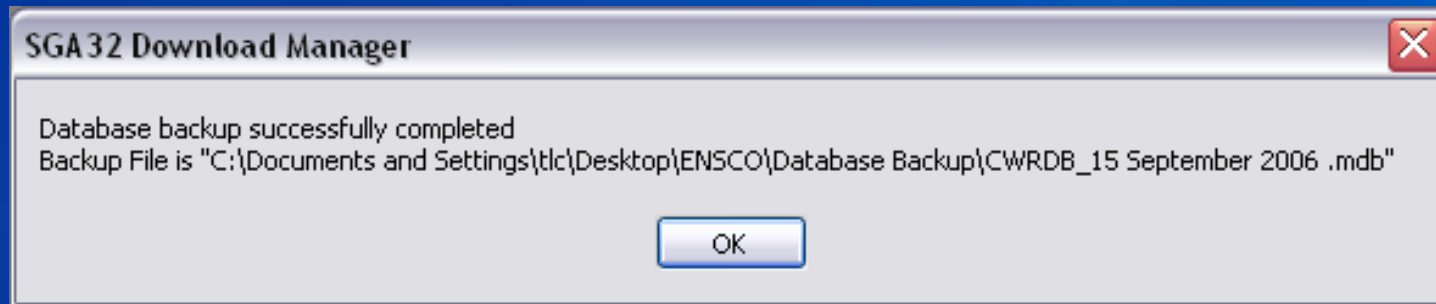


The screenshot shows the 'Results Form' application window with the 'Tabular Measurements' tab selected. The table displays a list of measurements with columns for 'Heading', 'Time', 'Ch1', 'Ch4', and 'Ch9'.

Heading	Time	Ch1	Ch4	Ch9
000-09-12 09:20:00	9.200	0.000	0.000	0.000
000-09-12 09:20:04	9.204	0.000	0.000	0.000
000-09-12 09:20:08	9.208	0.000	0.000	0.000
000-09-12 09:20:12	9.212	0.000	0.000	0.000
000-09-12 09:20:16	9.216	0.000	0.000	0.000
000-09-12 09:20:20	9.220	0.000	0.000	0.000
000-09-12 09:20:24	9.224	0.000	0.000	0.000
000-09-12 09:20:28	9.228	0.000	0.000	0.000
000-09-12 09:20:32	9.232	0.000	0.000	0.000
000-09-12 09:20:36	9.236	0.000	0.000	0.000
000-09-12 09:20:40	9.240	0.000	0.000	0.000
000-09-12 09:20:44	9.244	0.000	0.000	0.000
000-09-12 09:20:48	9.248	0.000	0.000	0.000
000-09-12 09:20:52	9.252	0.000	0.000	0.000
000-09-12 09:20:56	9.256	0.000	0.000	0.000
000-09-12 09:21:00	9.260	0.000	0.000	0.000
000-09-12 09:21:04	9.264	0.000	0.000	0.000
000-09-12 09:21:08	9.268	0.000	0.000	0.000
000-09-12 09:21:12	9.272	0.000	0.000	0.000
000-09-12 09:21:16	9.276	0.000	0.000	0.000
000-09-12 09:21:20	9.280	0.000	0.000	0.000
000-09-12 09:21:24	9.284	0.000	0.000	0.000
000-09-12 09:21:28	9.288	0.000	0.000	0.000
000-09-12 09:21:32	9.292	0.000	0.000	0.000
000-09-12 09:21:36	9.296	0.000	0.000	0.000
000-09-12 09:21:40	9.300	0.000	0.000	0.000
000-09-12 09:21:44	9.304	0.000	0.000	0.000
000-09-12 09:21:48	9.308	0.000	0.000	0.000
000-09-12 09:21:52	9.312	0.000	0.000	0.000
000-09-12 09:21:56	9.316	0.000	0.000	0.000
000-09-12 09:22:00	9.320	0.000	0.000	0.000

# 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

For more information contact:

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