



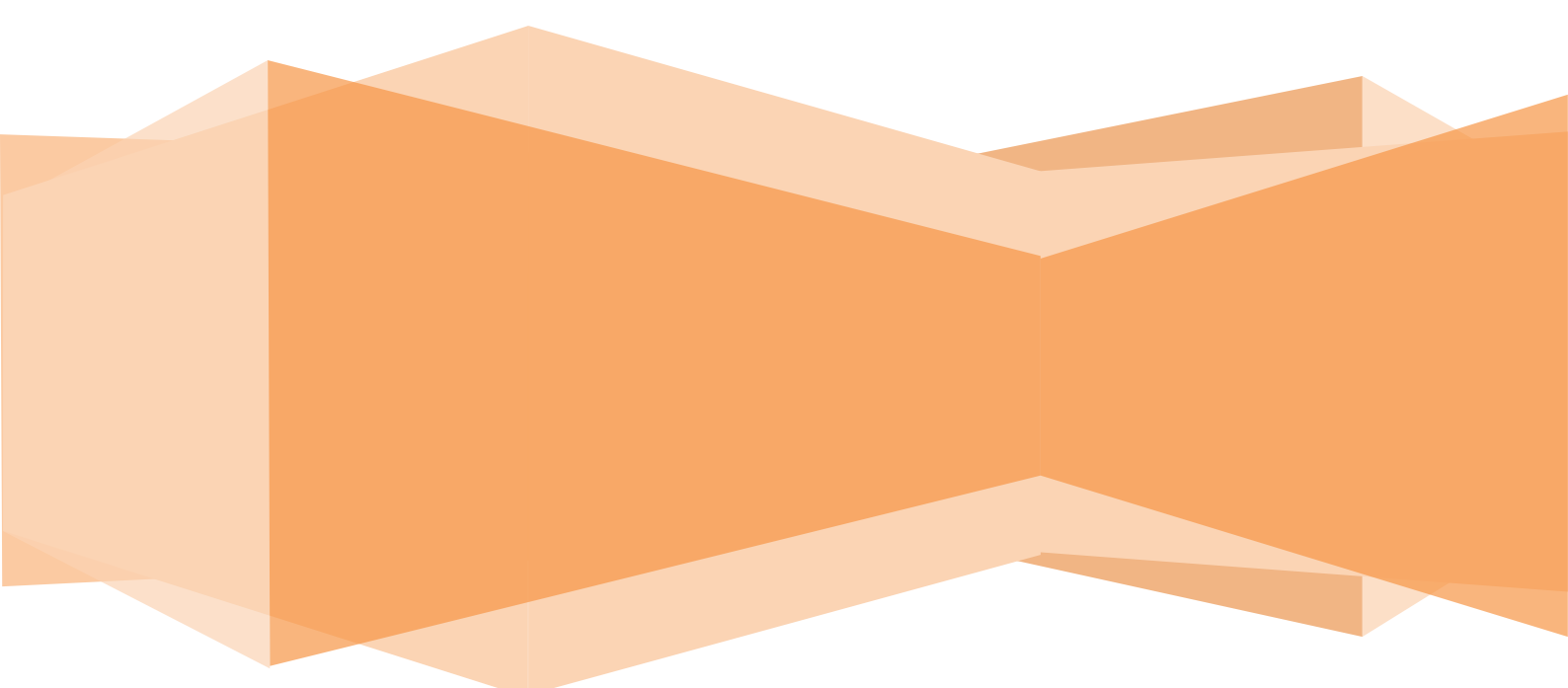
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REAL TIME DATA ACQUISITION SYSTEM FOR STUCTURAL HEALTH MONITORING INFRASTRUCTURE

LAB VIEW BASED SOLUTION



About the project:

To build a data acquisition system to measure multiple strains, vibration, voltage & displacement from various modules, to achieve synchronized data logging with high sampling rate.

Using National Instruments Lab VIEW, PXI RT & WSN Module, these measurements are made using wired & wireless communication for all the types of measurement.

The customer CSIR (Council of Scientific & Industrial Research) is the premier industrial R&D organization owned by Government of India. CSIR's 37 laboratories not only knit India into a giant network that impacts and add quality to the life of each and every Indian but CSIR is also party to the prestigious Global Research Alliance.

Solutions Offered:

NI PXI RT

NI SCXI

NI WSN Gateway & Measurement node

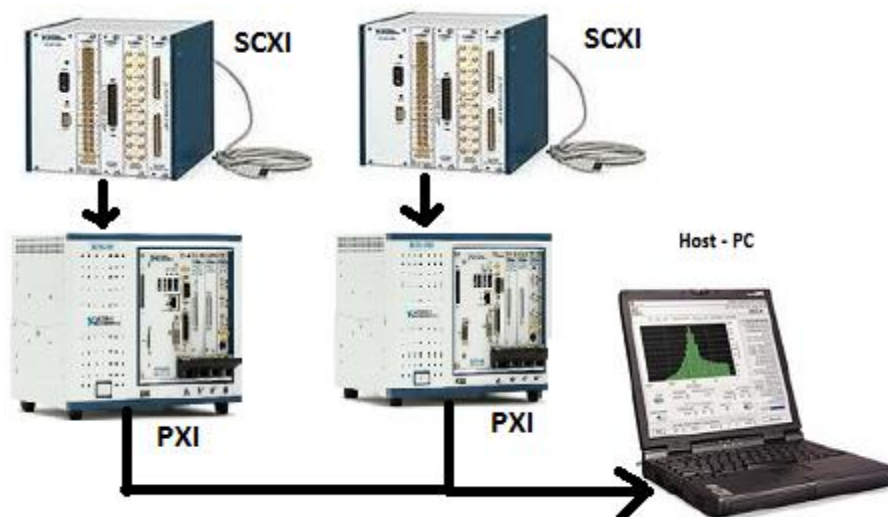
Scope of Mayuras:

- Labview programming
- Communication module integration
- DAQ software development.

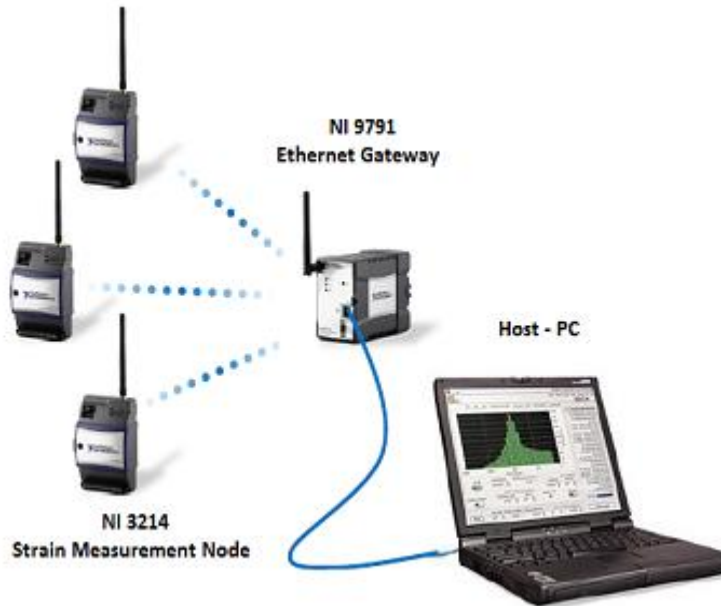
Features:

- The Real Time Data Acquisition System
- Remote bridge monitoring with two embedded data acquisition system, NI WSN module and a remote control PC.
- Different types of sensors such as vibrating wire strain gauge, fiber optic sensors for the measurement of strain, displacement, vibration & voltage.
- Wireless and wired DAQ system with high reliability.
- Multiple options for user with 2 control PC for different bridge communication and Single control PC for single bridge communication of embedded DAQ system

System Architecture:



a. Wired system Architecture



b. Wireless System Architecture

Screens of Software application:

Wired application:

The below screen is the settings screen for strain measurement & varying screens have been developed for other types of measurements.

Configure Strain Channels

Strain Channel Configuration-PXI1

12:37:12 06 Apr, 2013

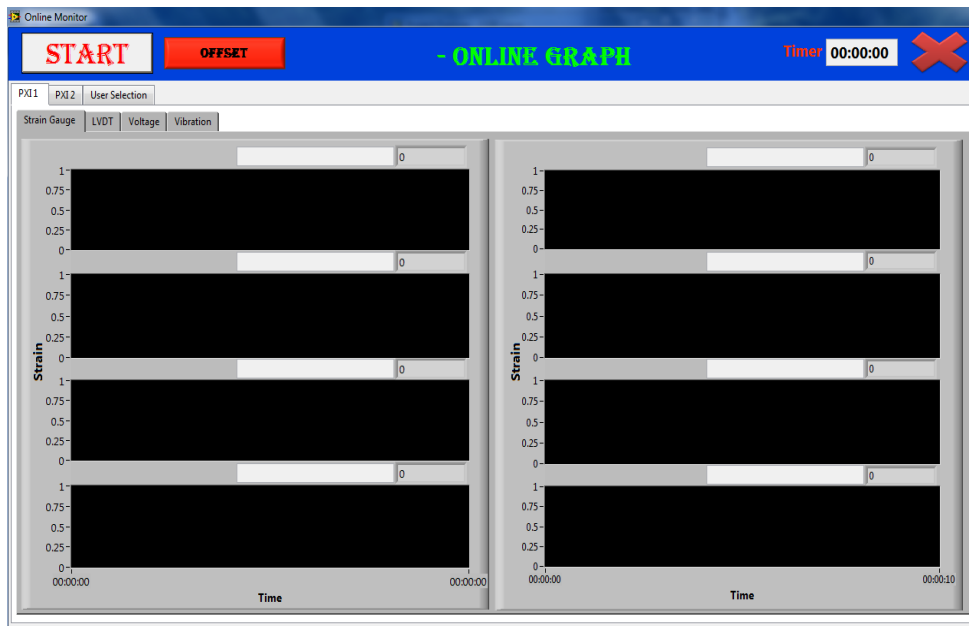
Parameter Name	SCXI Module	Channel No.	Bridge Configuration	Exc.source	Exc.Value	Min EU	Max EU
Strain	SCXI Mod 01	1	Full Bridge 1	Internal	2	-5000	5000
Parameter Name	SCXI Module	Channel Number	Bridge Configuration	Voltage Exc.Source	Excitation value	Min EU	Max EU
Strain	SCXI Mod 01	1	Full Bridge 1	Internal	2.0	-5000	5000

Parameter Name	Shunt cal.	Gage Res.	GageFactor	Poisson's Ratio	Low Pass Filter	Lower Limit	Upper Limit	Lead Res.	Eng. Unit
Strain	Yes	350 ohm	2	0.3	10 Hz	-5000	5000	0 ohm	me
Parameter Name	Shunt Cal.	Gage Res.	GageFactor	Poisson's Ratio	Low Pass Filter	Lower Limit	Upper Limit	Lead Res.	Eng. unit
Strain	Yes	350	2	0.30	10	-5000	5000	0	me

Add
 Delete
 Edit
 Update
 Cancel Edit
 Save
 Exit

Sampling Rate: 1000 S/s

The below screen is the online graph screen, for viewing the acquired data



Wireless application:

Settings screen

WSN NODE CONFIGURATION 16:29:43 02 Sep, 2013

Test - STRAIN SETTINGS

SCHEDULE NAME	NODE	CHANNEL NAME	CHANNEL CONFIGURATION	GAGE RESISTANCE	GAGE FACTOR	POISON RATIO	SHUNT CALIB
Schedule 1	WSN NODE 1	CH 4	FULL BRIDGE TYPE II	350 Ohms	2.110	0.3000	NO
Schedule 2	WSN NODE 1	CH 2	QUATER BRIDGE TYPE I	350 Ohms	2.11	0.30	NO
	WSN NODE 1	CH 4	FULL BRIDGE TYPE II	350 Ohms	2.11	0.30	NO

Sampling Rate: 50 Samples/sec Waveform Interval: 00:00:05 HH:MM:SS

Online Monitor screen

