1. Introduction -- Firmware 3998 and above

The NDACS 6000 is an affordable general purpose Ethernet data acquisition and logger unit that supplies a simple solution to many industrial tasks. Compliant to IEEE 802.3 Ethernet standards, the NDACS 6000 can be directly connected to many industry standard networks and operates like any other network device. The instrument can also be connected directly to an external modem/mobile WAP phone for remote stand-alone operations.

Access to data and observations of real-time results can be carried out using computer system supporting TCP/IP protocol. This can be via PCs, workstations or main frames.

2. Safety Rules

This instrument has been tested according to the following EC directive 89/336/EEC (EMC of Nov 1992, Electromagnetic Capability). To ensure the best operation of the instrument you must follow the operations described in this manual. Failure to do so may result in the damage of your system.

1. *Features*

Compliant to IEEE802.3 10Base-T standards.
Plug-and-go simple and flexible installation
2 X Independent Data Logger operations – 13,000 records/logger
LED Indicators for monitoring network health
24 Bit ADC operations – 16 million counts
100 Hz/channel operation
Auto-calibration of the analogue inputs
Real-time clock
RS232 Communication port
Integrated Web Server
E-mail Alarm System
On-line Manual – Web page format
Network Upgradeable Software
4 Digital Inputs, 4 Digital Outputs

3. Specifications

Power	9-24V DC at 3W max load 5.08 mm 2 pin Weidermuller connector
Dimensions	Approx: 120 X 222 x 33 mm
Weight	Approx: 1.2 Kg
Temperature	0 to 60 Deg C
Flash Memory	13,000 Records
RAM Memory	13,000 Records

4. Package Contents

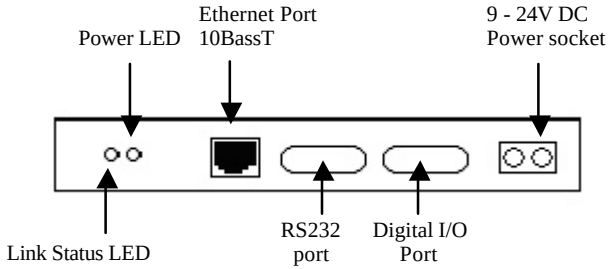
The package contains:

NDACS 6000 logger unit
Driver software CD
This manual

5. Hardware

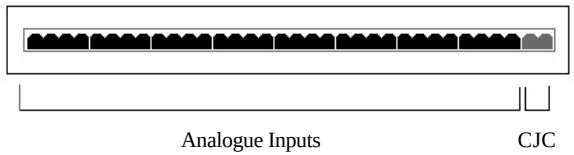
The instrument components are shown in figures 1 2 & 3.

Rear Panel

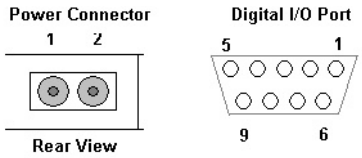


Power LED indicates power applied to unit.
Link status LED illuminates when a network connection is complete and flashes when data is transmitted.

Front Panel



Power Connector & Digital Port



Pin 1 = 0V Pin 2 = 9 – 24V DC

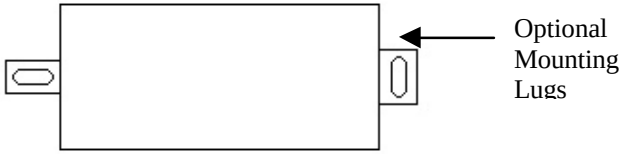
Pin	Description
1	Input Dig0
2	Input Dig1
3	Input Dig2
4	Input Dig3
5	GND
6	Output Dig 4
7	Output Dig 5
8	Output Dig 6
9	Output Dig 7

6. Installation

The instrument can be placed on a flat surface or mounted to a wall or metallic surface or partition. Please comply with the following steps for proper installation.

Desktop Installation

?? Carefully remove the NDACS 6000 from its packaging
?? Place instrument on a flat surface.



The rubber feet on the bottom of the unit provide space for ventilation and cushion the instrument from vibrations.

Wall Mounting Installation

The NDACS 6000 can be installed directly onto a wall or bulkhead when supplied with a case with mounting lugs. Care should be taken to ensure that adequate ventilation be available around the instrument for best results.

(a) Carefully remove the NDACS 6000 from the packaging
(b) Place the unit onto the bulkhead or wall and mark the mounting holes. Use 6mm bolts to mount the instrument to the wall through the lugs.

7. Connection Directly to a PC

The instrument can be directly connected to a laptop or PC for local data acquisition operations using the 10baseT Ethernet port or using the RS232 serial ports built into the instrument.

?? To connect the instrument directly to an Ethernet port on a PC, simply use a standard UTP cross over cable (Universal Twisted Pair) to link the 10baseT port on the instrument to the Ethernet port on a PC.

?? Using a web browser enter the IP address of the instrument. e.g. http://10.10.2.130

Each instrument is accessed and operated directly using its unique IP address. Upon application the IP address within a

web browser then the instruments web pages appear on your screen.

8. Power Supply

Connect the instrument to an external 9-24V DC 500 mA power supply with a 2.5mm cable diameter 2 pin screw terminal Weidermuller connector. On powering the unit the instruments Power Status LED will illuminate.

9. Operations

To activate the NDACS 6000 simply connect power to the instrument. Once power is connected to the unit then data recording operations may commence. To observe data it is important that the instrument must connected to an external communication network. This may be via the RS232 (serial port) or 10BaseT Ethernet port.

Stand-alone Operations.

The NDACS 6000 can be deployed and accessed remotely via a land line telephone/mobile WAP phone or simply installed to collect data for download into a PC.

Ensure that a modem/mobile telephone is connected to a serial port on the instrument in order to enable dial-up operations to take place.

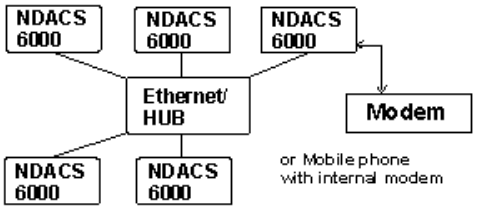
NDACS serial port Pin-out

1 = NC 2 = Rx 3 = Tx 4 = NC 5 = Gnd
6 = NC 7 = RTS 8 = CTS 9 = NC

Multi-instrument Stand-alone Operations

For applications where a number of instruments need to be deployed together then each instrument should be connected to a separate port on the network hub.

To access data or to reconfigure the instruments it is only required to connect a modem to instrument serial port, and from this instrument all other units can be accessed.



Network Operations - Ethernet

The NDACS 6000 can be directly connected to a 10BaseT or 100BaseT Ethernet network via a hub/switch. You must ensure that each instrument has it's own unique IP address.

10. Configuring the NDACS using a web browser

All of the instruments operations can be configured a web browser. Keynes Controls recommend that the Microsoft Internet Explorer 5.0 or greater be used.

Assigning Configuration Parameters

The ***Apply*** button must be pressed after each configuration parameter change to ensure that the new values are registered within the instrument. All new parameters are echoed to the main screen.

Selecting Instrument For Configuration

To configure an instrument

Enter the IP address of system into web browser.

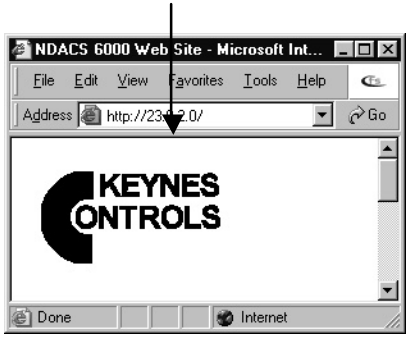
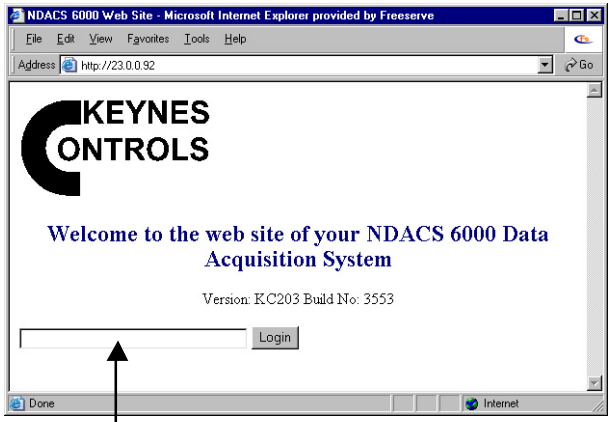


Fig 6

The main instrument (default) web page will appear.

2) Enter instrument password

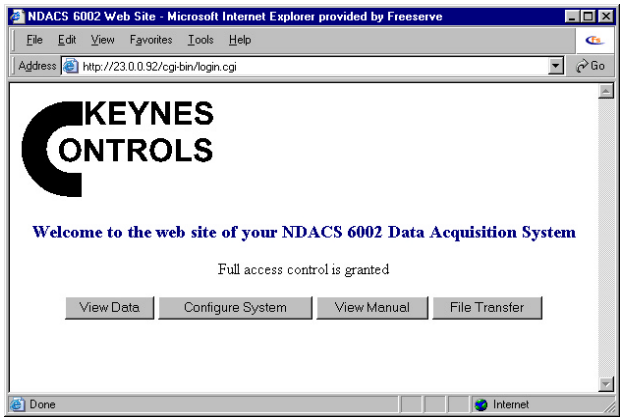
Default Password Level 1 = "**full**" -- Lower case



Enter Password

Configuring the instrument

At the main web page select the ***Configure System*** button.



The Configuration Window will now appear on your screen. It is at this window that all the configuration options can be set.

A pull down menu is used to select the options:

Info: *Part No, Serial No, Manu date, Ethernet Address*
System setup: *Instrument Name, Sample rate Records/block, Date, Time. Auto Range, Digits, Digital Alarm Status, Temp Units, Password 1 ,2,3*
Network: *Action, IP Address, Subnet mask, Gateway.*
Modem: *Dial_up Baudrate, Dial_in Rings, Dial-in Local IP, Dial-in Remote IP (PC), Dial-in User, Dial-in Password, Dial-Out Tel No., Dial_out User (ISP), Dial_out Password (ISP)*
System Calibration: *Calibration factors for each analogue range.*
Auto Reporting*: Instrument E-mail address, Bootup Message Active, Bootup message, IsAlive Mode, IsAlive Time of Day, IsAlive day of week/month, IsAlive e-mail subject,*

General Logger ? ?Records/Daily/Weekly/Monthly

Event Logger ? Records/Daily/Weekly/Monthly

E-mail Setup *: E-mail Mode, SMTP IP, E-mail Address, Alert Address, Alert Message, Alarm Address, Alarm Message. Timeout (Min)*

Logger Setup : *General Logger, Interval, Buffer Mode, Alarm/Alert activation, TTL Channel 0 Activation, Event Logger, Interval (Seconds), Trig Channel, Min, Max, Pre-trig, Post Trig*

Channel 0-8: *Range, Type, Cal factors A.. F.*

Setting The IP Address

1. Select the Configure System Button.

2. Select **Network** option from the Configuration menu pull-down list.

3. Select IP Address.

4. Enter the new IP Address, Subnet Mask and Gateway settings.

5. Select *test* option

   It is now possible to test the instrument at the new IP address. The new address is not stored permanently and will go back to original setting after a power off.

Now test the instrument at the new IP address. The PC used to test the new IP address may now have to be reconfigured to see the new IP address. It is possible that upon making the address change that the instrument appears not to respond until the correct IP setting in the test PC is configured.

Important Note.

Should the NDACS have been incorrectly configured then simply powering off the unit will reset the IP address back to its initial setting.

6. Examine the instrument at the new IP address.

   This is undertaken by examining the instrument Web pages within a browser. Enter the new IP address into a web browser URL (Address) and wait until the instrument pages are displayed.

7. Select ***Burn*** option. The new IP address is permanently stored into the instrument. It is now safe to power off the instrument.

8. Select the *Default* option

11. Problems Changing the IP address

Instrument does not seem to respond when new IP address is entered.

Check that PC used to configure the instrument can see the new IP address and that the subnet mask is correctly set.

On powering off the instrument the unit fails respond at the new address.

1. Ensure that the *Burn* option has been set when changing the address.

2. Ensure that the subnet mask for both the instrument and PC have been correctly configured, so that data from the NDACS can be seen by the PC.

If unsure then set default Subnet Mask setting to 255.0.0.0

12. Configuring the Analogue Inputs

To configure an analogue input channel using the browser.

1. Select the **Configure System** button to view the "Configuration" Window.
2. Select the Analogue Channel to configure from the pull down menu. Channel_0 .. Channel..7

The following menu will appear in the Configuration Window.

Name.	Default Name
Range.	5V
Type.	Direct
Alarm/Alaert Active.	Disabled
Cal A.	0.000
Cal B.	0.000
Cal C.	0.000
Cal D.	0.000
Cal E.	0.000
Cal F.	0.000

Each analogue input channel can be independently configured for any input range and sensor type,

Selection Of the Analogue Input Range.

Select the **Range** option – A pull down menu appears at the bottom of the Configuration Window with a list of possible analogue input range options.

Select **Apply** Button to confirm any configuration changes.

For Thermocouple operations – 50 mV is the recommended range. Refer to On-line manual for configuration parameters.

For Thermistor operations - 2.5V is recommended.

Setting the Channel Input Type

1. Select the channel you wont to configure.
2. Select the "Type" menu item.

A pull down menu list appears at the bottom of the ***Configuration*** Window adjacent to the Apply Button. Simply select the desired input type.

Select the ***Apply*** button to confirm the choice.

13. Process Options – Calibration Factors

The following list shows the calibration factors that must be applied to the various sensor types in order to ensure the values shown are in the correct range and engineering units.

Process Options	Calibration Factors	Unit
Direct	No Calibration factors	Volts
Linear	**Y = A + B.t** **A**=offset **B**= Scale	User Defined
Thermocouple	A = Temp Offset	Deg °C
2 Wire RTD	A = Excit. Voltage B = Resistor/RTD ratio C = Lead Resistance	Deg °C
3 Wire RTD	A = Excit. Voltage B = Resistor/RTD ratio	Deg °C
RDF (PT100)	A = Excit. Voltage B = Resistor/RTD ratio C = Cable Resistance D = DEF parameter	Deg °C
Strain Gauge	A = Excitation Voltage B = Bridge Offset Voltage C = Gauge Factor	Micro Strain
Thermistor	A = Excitation Voltage B = Sensor Resistance @ T_0 Typically 10K ? ???????? C = Sense Resistor = 10K ? D = Temperature T_0 E = Beta Value (typical 3988) F = Offset (Correction Factor)	Deg °C Internal CJC
Current	A = Sense Resistor B = 0.004 C=0.02 D= Range for 4 mA input E= Range for 20 mA input	User Defined
	Operates the same as Linear	
Threshold	A = Threshold Voltage	% Time/minute
Valve Position	A = Sense resistors B= low current setting C= High Current Setting D =Offset E= Gain	% open 0-100

Example of 4-20 mA input signal representing -50 to 200 Barr pressure with 100 Ohm Sense resistor.

A = 100 (sense resistor) B = 0.004, C = 0.02, D = -50 E= 200.

14. System Calibration

The instrunment is supplied factory calibrated.

To examine the system calibration factors:

1. Select **Config System** Button.
2. Select ***System Calibration*** from the pull down menu.

A list of calibration factors for each of the analogue input ranges is displayed. The parameters are factory set and should not be adjusted.

Adjusting Calibration Factors.

The instrument is factory calibrated for optimum results.
Qualified personnel should only undertake making changes to the calibration factors. If in doubt on the calibration, please return your unit to the supplier.
To adjust a ***Calibration Factor*** select the range to be adjusted from the list on the System Calibration page. A pull down menu will appear adjacent to the Apply button and will display the Calibration Factor to be changed.

Enter the new Calibration Factor and press ***Apply*** to confirm changes.

15. Range Settings For Thermocouple Measurements

In order to obtain results over the full thermocouple ranges using the instrument, set the input ranges be set for the different sensor options:

Thermocouple

B:	0 - 1810	Deg °C	25mV
C:			
E:	-220 - +650	Deg °C	100mV
	651 - 990	Deg °C	250mV
J:	-200 - +860	Deg °C	100mV
	861 - 1190	Deg °C	250mV
K:	-240 - +1290	Deg °C	100mV
	1291 - 1360	Deg °C	250mV
N:	-240 - +1290	Deg °C	100mV
R:	-40 - +1760	Deg °C	100mV
S:	-40 - +1760	Deg °C	100mV
T:	-240 - +350	Deg °C	100mV

Thermistor

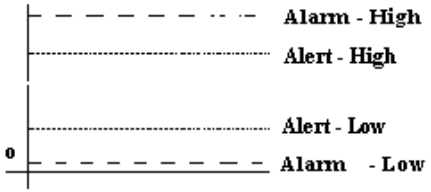
Setting for CJC required for thermocouple measurements

Range: 2.5V - Default setting for sensor and CJC.
A = Excitation Voltage - as measured between pins 1 & 4
B = Sensor resistance at T_{25} - Typically 10,000.00
C = Sense resistor = 10,000 (10 k?) -- fixed for CJC
D = temperature T_{25} = 25. Typically 25 Deg C
E = Sensor Beta Value – Typically 3988
F = Offset correction factor (optional)

Note. For external sensors connected to channels 0 - 7 other sense resistors can be fitted. Values should be chosen to minimise any self heating effects. Values > 1K? should be used.

16. Setting Analogue Channel Alarm levels

The instrument has two independent alarm monitoring systems that can be used to record data upon the detection of an event exceeding a pre-set level, and to send a warning e-mail alarm message to an operator. The alarm system can be independently configured for each analogue input.



Alarm System Configuration parameters are:

Alert Low:	Alarm Low:
Alert High:	Alarm High:

Each alarm setting can accept the input represented as a floating point number in engineering units

User Alarm Display

When an alarm condition has been exceeded, the View Data Window highlights the alarm condition adjacent to the analogue input that caused the condition.

Example. To monitor for a alarm condition on Channel 5 for alarm levels between 50 Deg and 500 Deg C and Alert levels between 200 Deg and 400 Deg C for type K thermocouple and send an e-mail alarm across a LAN with SMTP IP = 212.95.12.34

Select Channel 5 - Configuration Page

Type: J Type Thermocouple.

Alert Low: 200 Alert High: 400
Alarm Low: 50 Alarm High: 500

E-mail Mode: Ethernet SMTP IP: 212.95.12.34

The instrument will now monitor the temperature on Channel 5 and automatically report if an error condition has occurred across a LAN.

Alarm System – View Data Screen Only

The alarm system only changes the channel condition colour on the instruments results screen to indicate if a specified channel has gone outside pre-set bounds and is also used to show an operator which channel or channels has been used to record data. Any channel going into alarm condition can be used to activate the loggers.

Normal Condition – No Alarm – Clear (White) background
Alert Condition – Channel Display background yellow
Alarm Condition - Channel Display background Red

Example. To create an automatic report for a alarm condition on Channel 2 and to store the alarm data permanently when a temperature on a thermocouple exceeds 120 Deg low and 200 Deg C high for type K thermocouple. The system to send alarm conditioned data as an attachment on an e-mail when operating on a remote dial up network remote. Data to be sent at 08:30 AM every day with server SMTP IP = 212.95.12.34

Select Channel 2 - *Configuration Page*

Type: K Type Thermocouple.
Alarm/Alert Active: Enabled.

Alarm Low: 120 **Alarm High**: 200

Select – *Auto Reporting Page*

Flash Logger
Report Active: *Enabled*
hh:mm:ss/Integer *08:30:00*

Instrument E-mail Setup: *Dial-up*
SMTP IP: *212.95.12.34*
User E-mail Address: user_name@e-mailaddress.com

Where user_name@e-mailaddress.com is the address of the operator who is to receive the data.

Logger Setup

Event Logger *Triggered*
Interval (Seconds) *60* (log rate)
Trig Channel *2*
Min *120*
Max *200*
Pre Trig Readings *0.0*
Post TrigReadings *0.0*

The instrument will now monitor the temperature on Channel 2 and automatically log and report alarm condition data via modem dial-up account to a user. The results screen will change on channel 2 from green background to a red background upon the signal going into alarm condition.

17. Auto Report Features

The image below shows the Auto Reporting set-up page.

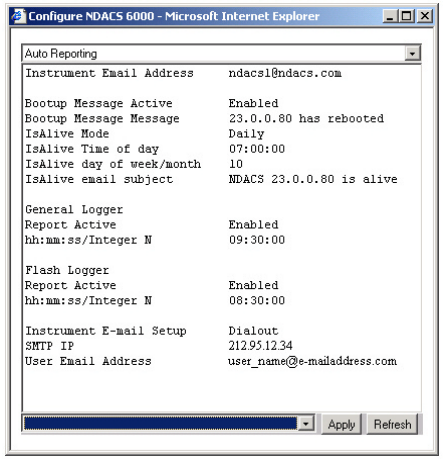
The Bootup, General Logger, Flash Logger and IsAlive E-mail messages utilise the same address for messages sent to an operator.

The e-mail alarm system utilises its own independent e-mail address for alarm messages at alarm_message@alarm-address.com

18. Limitations on the Auto-Reporting Operations

The auto-reporting operations will accurately send data at the specified time and date, however, the instrument currently does not take into consideration the specified sample rate of the instrument.

Should a sample rate be set such that the data is stored very fast but the auto reporting date is set to occur in frequently, then all the current recorded data up to the maximum number of records will be sent regardless to the fact the unit may have actually stopped logging.



Auto Report- Recommended Sample Rates

General Logger

60 Seconds (1 reading per minute) = 4 ½ days data
120 Seconds = 9 days data
600 Seconds = 31 days data

Event Logger

60 Seconds (1 reading per minute) = 4 ½ days data
600 Seconds = 31 days data

The Automatic Reporting System enables the following operations:

Boot-up Message Reports
IsAlive Reports
General Logger (RAM) Data Reports
Flash memory (Permanent) Data Reports

User E-mail Address

user_name@e-mailaddress.com represents any suitably defined Internet E-mail address. This is the address up on which the recorded data is sent via a local server of ISP mailing system.

Maximum Address Characters = 80

Multiple E-mail address entries can be entered as long as each entry is separated by a semi-colon for example

User1@address1;User2@address2;User3@address3

Will be a valid e-mail address for 3 individual users who require to receive the same instrument message.

Boot-up Reports

The NDACS can be configured to send a message to the user at e-mail address user_name@e-mailaddress.com of a maximum of 80 characters indicating that the system has just rebooted. The reboot message e-mail can be configured for LAN/Intranet and dial-up systems.

The feature is ideal for remote systems, such as those on a company Intranet or remote outstations widely distributed from an operator, as a received reboot message can indicate that there is a power supply problem.

Bootup Message ? ?Enabled/Disabled

IsAlive Reports

For remote systems and data downloaded by remote servers at pre-set intervals, then it can be important that a user be informed at regular periods that the instruments are still operational.

The NDACS can be configured to send a User Defined ImAlive e-mail message at

- A preset time each day
- At a specified time on a day in a week.
- At a specified time on a day in the month.

regular periods to the operator at e-mail address user_name@e-mailaddress.com. The report period can be daily, weekly or monthly at a preset time in the day.

General Logger – Auto Reports

The auto reporting system for the general logger can be set to report by e-mail to address user_name@e-mailaddress.com. The same e-mail address is used to report data for both the general as well as Event Logger.

1) A specified number of records.
2) At a specified time each day
3) At a specified time on a day in a week.
4) At a specified time on a day in the month.

The General Logger runs autonomously to the Event logger and can be set to report data at a different time interval and data recording rate.

Options: Records/Daily/Every Week/Every Month/Disabled

The logger can be left to record continuously or in a triggered mode. When running continuously the unit can report after each successive batch of data is recorded and in triggered mode after a specified number of records have exceeded the trigger conditions.

The logger features are ideal for continuous data recording at regular periods or to watch for a preset event then to automatically notify an operator that the event has occurred. This logger is best run using its circular data buffer mode when reporting data continuously.

The e-mail attachment file format is comma separated variables and is directly compatible with Excel and similar spread sheets and Excel HTTP web page plug-ins.

Example 1 – Auto report to be sent at 07:30 AM each day.

User Email Address: user_name@e-mailaddress.com
Which is the address to where data is sent.

Select Auto Report – Configuration Page

General Logger
Report Mode: Daily
Report Time Of Day: 07:30:00

Example 2 – Auto Report to be sent on Thursday each week at 2.00 PM.

General Logger
Report Mode: Weekly
Report Time Of Day: 14:00:00
Report Day Of Week/Month: 4

Note.
0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday
4 = Thursday 5 = Friday 6 = Saturday

Example 3 – Auto Report sent on the 17 th day of each month at 6:30 PM

General Logger

Report Mode: Monthly
Report Time Of Day: 18:30:00
Report Day Of Week/Month: 17

Event Logger - Auto Reports

The auto reporting system for the Event logger can be set to report by e-mail to address user_name@e-mailaddress.com at

1) A specified number of records.
2) At a specified time each day.
3) At a specified time on a day in a week.
4) At a specified time on a day in the month.

Options: Records/Daily/Every Week/Every Month/Disabled

The logger can be left to record data until full or in a triggered mode. When running continuously the unit can report after each successive batch of data is recorded and in triggered mode after some records have exceeded the trigger conditions.

The Event logger data is stored permanently even when power to the unit is switched off and is best suited to store alarm condition data and report the occurrences after a preset number of events has occurred.

The e-mail attachment file format is comma separated variables and is directly compatible with Excel and similar spread sheets and Excel HTTP web page plug-ins.

Examples

Use the same as described general logger.

19. Modem

Use a Hayes compatible modem when communicating with your NDACS 6000. Any speed modem can be used 33.6 or 56KBd or mobile phone.

Using a standard modem interface cable connect the 9 pin D connector to the serial port on the instrument. Plug the modem into the telephone port. You are now ready to use NDACS 6000 for remote operations.

The software to control an external modem or one fitted inside a mobile telephone and used to assign the default IP addresses for the NDACS and host PC using Dial-up TCP/IP operations, is stored with in the instrument and activated only upon receiving a connection request by a modem. This is an automatic operation.

The NDACS resets the telephone link after 10 minutes if an unscheduled disconnection occurs. If the communication link is disconnected correctly then the reset operation is immediate.

20. Remote Operations by Telephone (Mobile or Land line)

The NDACS 6000 can be interrogated using a telephone link for remote field applications. The telephone link can be a standard landline or mobile phone, the operation of the software is the same now matter which type of comms link is being used. The instrument is an intelligent device and contains all software required to drive most types of mobile phone utilising an internal Hayes compatible modem.

The modem software embedded within the NDACS 6000 supports dial-up comms only. No facility has yet been provided to enable the NDACS to dial-out.

To operate a mobile phone with the NDACS 6000

1. Ensure that mobile phone has the data link enabled and supports Hayes compatible modem command set.
2. Ensure that the modem lead connecting mobile phone or modem to the serial port of the NDACS is installed

Accessing The NDACS System Via A Telephone

1. Using any standard modem on your PC enter the telephone number of the mobile phone and dial up your system. Make a dial-up connection to your instrument.

2. The NDACS will automatically detect a call on the phone and setup the comms link. The system should respond to indicate that a comms link is running. The messages reported with vary depending on the comms package being used.

Modem & Dial-in/Dial-out Configuration

The NDACS 6000 operates like any other ISP (Internet service provider) even when used as dial-up logger. To Configure the NDACS to carry out dial-up operations then

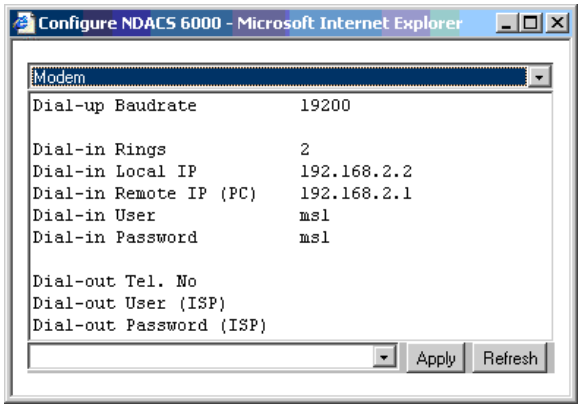
Select Configure NDACS ? ?Modem

The following Window will appear:

Baud Rate

To set the modem dial-out baud rate

Baud rate - 1200,2400,4800,9600,19200,38400,57600, 115200



Most modern Hayes compatible modems automatically detect the connection baud rate, data bit size and parity and adjust the internal settings automatically. There is no requirement to set these parameters within the NDACS. Default baud rate setting is 19200.

Setting The Instruments Dial-in IP Addresses

To set the IP address that the instrument uses when accessed by dial-in connection.

Local IP -- IP Address that unit assumes when operating across a modem via a dial-in connection

Remote IP (PC) -- This the IP address that the login PC is set to upon making a dial-in connection to the NDACS

Example -- Set the IP address of NDACS to 10.12.14.210 on accepting a dial-up connection and the host PC to 10.12.14.217.

Local IP 10.12.14.210
Remote IP (PC) 10.12.14.217

To see instrument data simply enter 10.12.14.210 into a web browser on the host PC

Telephone Ring Setting

The following parameter assigns the number of rings that the NDACS should allow before accepting a dial-in connection.

Rings n where n = integer 0 - 10

Setting the Dial-in Access Parameters

In order to dial-into the NDACS the user must assign a User name and Password. This action ensures that only authorised access is allowed

Dial-in User -- 20 Alpha numeric Character

Dial-in Password --- 20 Alpha numeric Chars

User and Password details have to be setup on host PC dial-up account.

21. Dial-out-ISP Configuration for E-mail Data Reporting.

In order that the dial-out E-mail alarm system should work then the NDACS has to be configured to connect to an ISP dial-up account system. In order that the instrument can undertake this task the following parameters need to be configured:

Dial-out Tel No. -- Modem telephone number for ISP
Dial-out User (ISP) -- User name for ISP account
Dial-out Password -- Password for dial-up ISP account

IMPORTANT NOTE

The NDACS must be configured to connect to a Internet Service Provider dial-up account or dial-up account for the Network server before any e-mail alarms can be sent.

22. Observing data via a Mobile Phone – Single Instrument.

To observe real-time data:

1. Dial the modem/mobile phone connected to your NDACS 6000

2. To access data from the instrument connected to the modem enter the instrument Local IP address into a web browser:

   The Local IP address must be used for the instrument connected to the modem no matter what IP address has been preset into the unit. This operation is needed to ensure that the NDACS web server operates like any other ISP.

e.g. To access data on an instrument with IP address http://23.56.3.11 connected to a modem via its serial port enter command: http:// "Local IP Address"

   Therefore to examine data from the instrument in a web browser once the comms link is operating.

2. Select ***View Data***

You will now be observing data on your browser that is being presented via the on board web server just like any observing information from any

other ISP supplier. To observe recorded information you must first download the data onto your computer system.

23. Observing Real-time Data from multiple instruments via a telephone link.

To observe real-time data from the instrument directly connected to the modem – regardless to its preset IP address and any other number of instruments connected together on a network, then enter:

Local IP address for instrument connected to modem into a web browser URL

Select **View** Data button from Main Web page. See Page 2.

to access data from any other instrument on the network simply enter the units preset IP address into a browser (as above) and select the View Data Button. It is possible to leave individual instruments data displays active but close all other web pages so that data can be viewed continuously from all instruments.

24. Downloading Data from multiple instruments via a telephone link - DOS Command Prompt.

It is possible to download data and configure any number of instruments deployed on a remote network via a single modem/telphone connection:

Establish a dial-up connection to the NDACS. The instrument automatically detects the call and controls the modem. The NDACS does not have a carrier detect input and therefore, can only detect a session termination if this operation has been carried out normally i.e. by the host computer logging off. If the NDACS become disconnected during a data transfer operation then the unit will reset the modem after 10 minutes.

The NDACS can act as a modem-to-Ethernet gateway so long as all the instruments on the network share the same network address. The software operations are the same no matter what type of communications link is being used, be it via mobile phone or connection to a server.

Example: 4 instruments with IP addresses 23.0.53.2, 23.0.8.93, 23.0.4.2 and 23.0.0.22 on a single network with a mobile phone modem connected to unit with IP address 23.0.8.93.

Once connection is made via the telephone link to NDACS with IP address 23.0.8.98 then issue command:
FTP 23.0.0.2 to get data from instrument with IP 23.0.8.98

The Default IP address of the instrument used for **dial-up connection** is always set to **23.0.0.2** no matter which IP address has been initially entered into the instrument.

To access data from each other unit then simply issue FTP command with correct instrument IP address, for example:

FTP 23.0.53.2 to get data from instrument with IP 23.053.2
FTP 23.0.4.2 to get data from instrument with IP 23.0.4.2

Use the **get** command to download data from the units and store to hard disk on a PC.

Note. FTP is a standard Windows operating system function. It is accessed from the DOS shell. You can use FTP from any other computer system, from workstations to mainframes as long as they support TCP/IP and have FTP software.

To configure any instrument select the "Configure" button from the units web page and make alterations. It is only possible to configure single instruments in turn. This limitation is used to ensure there is no confusion as to which instrument is being changed.

25. Downloading Stored Data Files - DOS Command Prompt.

The operation of downloading data from the NDACS is the same operation no matter what type of communications link is being used. The comms link can be via Ethernet or telephone.

1. At a DOS command prompt issue command:

ftp xx.yy.zz.aa
where xx.yy.zz.aa is the ip address of the instrument whose data is to be downloaded.

The instrument responds:

Connected to xx.yy.zz.aa
Hi there! This is afonftpd.
User (xx.yy.zz.aa: none)):
Hi. No need to login. I'm an anonymous FTP server.

Listing Files that have been logged within NDACS

At the DOS command prompt type:

Dir

System responds:
200 .OKAY
I'm looking through the directory. Trying to connect. …..

Finished transferring 44 bytes.
44 bytes received in 0.11 secs 0.4Kbytes/sec

Note – transfer rate depending upon modem speed

A list of data files will be shown on the screen.

Transferring data from NDACS to PC

At the DOS command prompt type:

get *filename.csv* where filename is the time stamped data file stored by the logger.

System responds:

OK 200.
ISO Warning. You are using ASCII! Trying to connect

Finished transferring AA.BB bytes.
AA.BB bytes received in XX.YY seconds 0.87 Kbytes/sec

e.g 521 bytes received in 0.67 seconds 0.87 Kbytes/sec

Deleting Data Files

FTP > delete filename.csv will remove the data file.

The data downloading can also be undertaken directly using the instrument web pages. See Downloading Data, Section 22 on page 7.

26. Logger File Format

The data file format is Comma Separated Variable

ddmmyyrr.csv (time stamp file dd=day mm=month yyrr=year)

e.g. 21102001.csv 21st October 2001 = date on file.

Data files can be read directly into products such as Microsoft Excel.

27. Logger Record Format

Each individual file contains header as the very first record. This header shows the column titles and instrument name.

Each individual record contains the following information:

Date, yy-mm-dd, hr:mm:ss, Chan-0,…,Chan-7,Dig Out 7-4, Dig In 3-0

All data is stored as a comma separated variables text file. Where the comma is not the desired parameter then the local default variable will be used.

28. File Download from within Web Browser

The following instructions detail how information can be downloaded from the NDACS. It is possible for some versions of the Windows operating system to present slightly different displays to those shown below:

Upon selecting the "File Download" button all the data files that are currently stored within the NDACS will be displayed. The table of files will be similar to that shown below:

eventlog.csv	FTP	HTTP
21062002.csv	FTP	HTTP
22062002.csv	FTP	HTTP
23062002.csv	FTP	HTTP

The NDACS supports two separate procedures for automatically downloading the data files, they are:

HTTP - Hypertext Transfer Protocol and

FTP - File Transfer Protocol.

Data Transfer by HTTP

Both the HTTP and FTP data download options enable data to be loaded into and examined within the EXCEL spreadsheet.

The operator can examine data directly within an Excel formatted web page or by first saving data to disk for later analysis.

The instructions for data downloading are common for both the FTP and HTTP operations.

29. Download Data From the NDACS Prior to Examination on a Hard Disk.

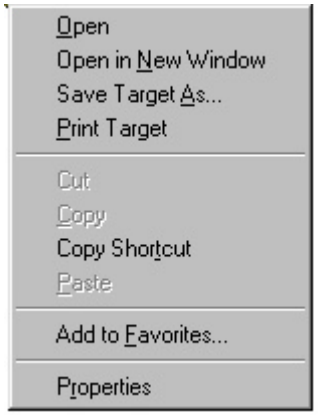
HTTP - File Transfer Operations

The following instructions detail how to download data from the NDACS to hard disk prior to any data analysis.

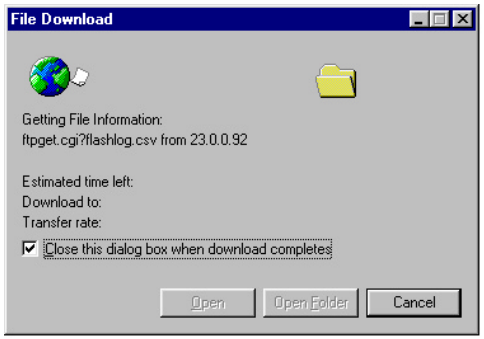
To view the data files directly into an Excel format web page

1. Move the mouse pointer above the HTTP URL for the file to be examined

2. Activate the Right Hand Mouse button and select the "Save Target As" option.



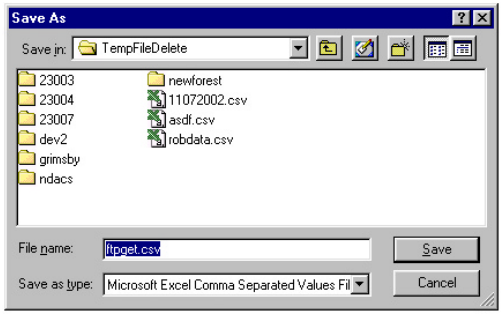
A window similar to that below will appear indicating that data is being transferred.



Depending upon the size of the file, the download operation can take from a few seconds to approximately 1 minute complete.

On some Intranet applications a firewall may prevent the data transfer. If this action occurs then contact the network manager for details on how to set-up this operation.

The "Save As" Window will appear and prompt the user for a filename.



3. Enter the filename to be used to store the instrument data.

Filenames

Note. It is advised that the filename extension .csv be used, as this file extension will enable the logged information to be loaded directly into the Excel spreadsheet.

On completing the download operation, an Excel format web page will be displayed.

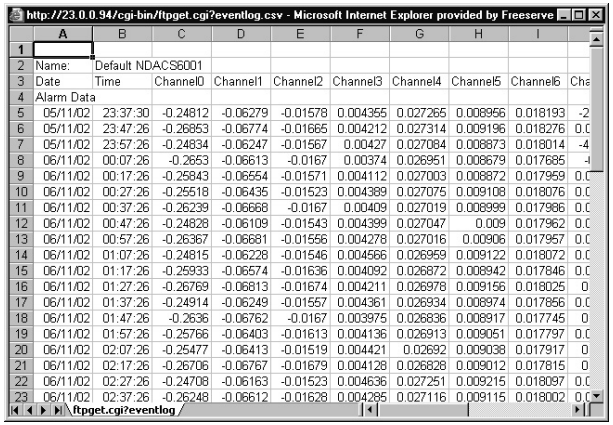


Figure 1 Excel Spreadsheet

30. Reviewing Data Within an Excel Format Web Page

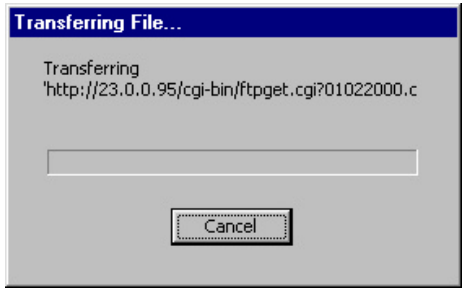
It is possible to display data directly into Excel prior from the NDACS with a shortcut. This Excel display will have to be saved to the hard disk should any changes to the data be made.

It is not possible to manipulate the data with in the NDACS with any data analysis application.

1. Move the mouse pointer above the HTTP URL for the file to be examined

2. Activate the Right Hand Mouse button and select the "Open in new Window" option.

The following Window will appear.



Depending upon the size of the file, the download operation can take from a few seconds to approximately 1 minute complete.

The Excel format results window similar to that shown in figure (4) will appear.

31. Web Page - Data Transfer By FTP

The file transfer operations provided by FTP web page operations provide basically the same functions as those already described for HTTP.

It is advised that data be first transferred from the NDACS to the hard disk of the Host PC prior to any analysis.

1. Move the mouse pointer above the HTTP URL for the file to be examined

2. Activate the Right Hand Mouse button and select the "Save Target As" option.

The "Save As" Window will appear. Enter the filename to be used to archive data to the hard disk.

The "File Download" Window, see Fig 2 will be displayed while data is be stored to the Host PC har4d disk.

3. Open the Archived data file within Excel and undertake analysis tasks.

32. Configuring Multiple Instruments Via Mobile Phone

It is possible to configure multiple instruments connected together on a remote network via a mobile telephone.

Software Options

1. Ensure that a comms link to remote instruments is installed and operating. This can be via a mobile or landline telephone.

2. The IP address of the instrument connected to the modem is set by default to 23.0.0.2. Any further instruments connected together on a network are accessed using their set IP address. Once the dial-up TCP/IP link is established the PC (Host computer) has its default IP address set to 23.0.0.1. The setting of the default (Host) IP address is undertaken in the same way as if linking to any other ISP service even though the site you are looking at is an NDACS 6000.

3. Once communication is made to the modem, enter IP address of the instrument to be configured. The standard configuration web page will be displayed ***(see fig 3 page 2***).

33. Web Page File Deletion

It is possible to delete all the stored data files using commands within the on board web pages.

Deleting Event Logger (Flash - Permanent Data)

1. Select "File Transfer Button "

2. Select "Clear Event Logger"

All data stored within the Event logger will be erased. The file will still appear on the File Transfer page but will no longer contain any information.

Deleting General Logger - RAM Data files

1. Select "File Transfer " button.

2. Select "Clear General Logger" button.

All the general logger files (that is all files stored in RAM memory) are deleted and also by simply powering off the unit.

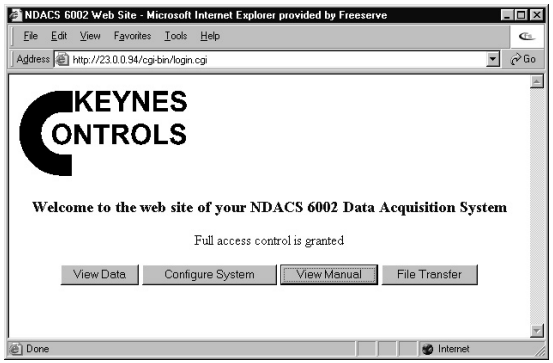
34. On-line Manual

The NDACS 6000 contains an internal on-line manual that details all the processing options and circuit connections that can be made with the instrument.

To access the on-line manual you must:

1. Enter IP address of chosen instrument into your browser.

The default instrument web page will appear.



2. Select the ***View Manual*** button.

The Main Manual web page appears listing the options available for examination.
Options are:

System Setup	*Analogue Channels*
Process Options	*Sensor Interfacing*
Digital I/I Ports	*E-mail Alarm System*
Data Logging	*Data Recording*
Ethernet/LAN Settings	*Modem Comms*
Connector Pin-outs	*Temperature Monitoring*

To examine any of the web pages simply select the one of the above option. A new page will appear displaying the chosen information

35. Data Logger Options

The NDACS 6000 can act as a data logger as well as a Ethernet data acquisition unit. There are 2 separate data loggers built into the NDACS 6000. A continuous data logger that stores data at a set rate to a series of time stamped files and an event logger, that stores data to a permanent

(Flash) memory file. Both data logger programs run simultaneously with each other.

General Logger

This data logger stores data to a series of time stamped files at a pre-set rate. All data is lost when the unit be powered off.

Specification

Maximum number of records: 13,000
Maximum number of individual log files: 30
Maximum sample rate: 1 Hz

The maximum logging period over which the NDACS 6000 can store data is 1 month or 30 days. This is regardless to the set logging period. The number of data files has precedence to the amount of data being recorded.

Options:

General Logger: Disabled/Triggered/Continuous

Disabled: No data to be recorded at any time.

Triggered: Data to be recorded only upon an analogue signal alarm condition or digital input trigger signal. The digital trigger is channel 0.

Continuous: Data is recorded continuously at the pre-set sample rate regardless to any alarm or trigger signals.
The following options detail how the data storage operates.

Interval: Integer n 1:6000 where n represents a delay in seconds.

Example. Logging rate of 1 record per seconds - Interval = 1
Logging rate of 1 record per minute - Interval = 60
Logging rate of 1 record per hour - Interval = 3600.

Buffer: Circular/One-shot

Circular: The data buffer operates in a circular manner such that after 13,000 records have been stored then the oldest data is overwritten by the newest information. New time stamped data files are automatically created should a change in date occur.

If the sample rate is low then the maximum number of individual data files that can be stored at anyone time is 30. Old files will be removed as new data is recorded when a date change occurs regardless to the number of records stored.

One-shot Data is recorded until 13,000 records are acquired or 30 time stamped files have been created. All new data acquisition operations will be ignored. This mode of operation is best suited to storing data upon alarm condition detection.

The following options detail the actions to be followed upon detection of any of the pre-set analogue channel alarm conditions.

Alarm Activation: Enabled/Disabled

Disabled: No action upon alarm condition detection, however, the data will display will show those channels that are in alarm condition

Enabled: Upon any analogue channel alarm condition being detected then data will be recorded. Once the alarm condition is cancelled ten any future readings are ignored.

Digital Activation

Defines the digital trigger operations.

Digital input channel 0 can be used to trigger the data acquisition operations.

***Options*: Disabled/TTL High/TTL Low**
Disabled: No trigger operations from the input port.
TTL High: Store data only when digital input is high.
TTL Low: Store data only when digital input is low.

The trigger levels are:
TTL High > 2.0 V TTL Low < 0.7 V

36. Event Logger (Permanent Data Storage)

The event logger runs simultaneously to the Continuous Logger but only records information when a preset condition is identified. All recorded data is stored into permanent (Flash) memory.

Specification

Maximum number of records: 13,000
Maximum sample rate: 10 Hz

Data File name: **eventlog.csv**

Options:

Event Logger: Enabled/Disabled

Enabled: Monitors for a specific event and only acquires data when that event is observed.
Disabled: Prevents data logging operations.

Interval: Pre-set logging period in seconds are:
0.1s, 1s, 10s, 60s

Channel: Integer 0 - 7. Selects channel for alarm condition detection.

Min: Minimum level upon which the analogue input must drop before event data is recorded.

Max: Maximum level upon which the analogue input must exceed before event data is recorded.

Pre-trig: Number of records appended to the log file prior to the event being recorded.

Post-trig: Number of records appended to the log file after the event has been detected and alarm condition is cleared.

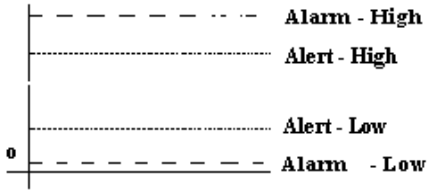
Example. Channel 5 recording at 10 Hz, Max level 0.3V or Min level -0.6V with 20 pre-trigger records and 50 post-trigger records. Data stored to flashlog file.

Event Logger: Enabled. **Interval** = 0.1
Channel: 5 **Min**: -0.6V
Max: 0.3V **Pre-trig**: 20 **Post-trig**: 50

37. E-mail Alarm System

The NDACS contains and E-mail alarm system that can be used to automatically notify a user that a specific alarm condition has occurred. The system operates across:

Local Intranet/Area network
External modem
WAP enabled mobile phone.



The alarm system allows a dual band of operation as shown in the figure above. When an analogue signal exceeds any of the pre-set alarm band limits then an e-mail alarm can be sent to an operator.

The following parameters are used to set-up the communications for the alarm system.

To set the alarm level see Setting Analogue Channel Alarm levels, Section 16. Page 4.

E-mail Mode**: Disabled/Ethernet/Dial-out**

SMTP IP: SMTP server address.

E-mail address: *name@name.com*

The E-mail address of the instrument can be user defined. This is the address that an opeator observes on receipt of a message from the instrument e.g. nadacs@NDACS.com

Alarm 1 Address: name@name.com

E-mail address for the recipient of the Alarm 1 message

Example. To send an alarm message to a user with e-mail address *user@testcentre.com*

Alarm Address: user@testcentre.com

Alarm 1 message: Alpha-numeric X 120

Multiple E-mail address entries can be entered as long as each entry is separated by a semi-colon for example

User1@address1;User2@address2;User3@address3

Timeout (Mins): Integer 1-6000.

Note. For 1 hour timeout period set Timout = 60.

The *Timeout* parameter assigns the time difference between successive Alarm e-mails sent to the User as long as the analogue signal stays within the alarm condition boundary. An alarm can be sent for each analogue channel.

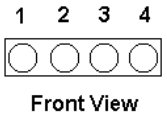
38. Limitations On The E-mail Alarm System

The E-mail alarm system is currently limited to operate from a single instrument when connected to a dial-up network. Should multiple instruments be deployed then only the unit connected to the Modem or WAP mobile phone can send an alarm message.

For units deployed on a Intranet or LAN then all systems will send E-mail alarm messages.

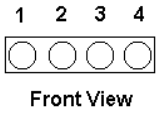
39. Analogue Input Ports

Each analogue port has a differential input:



1 0V
2 –Vin
3 +Vin
4 +Ext

40. Voltage Input – Direct Reading



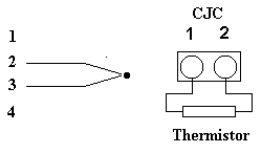
Select ***Direct*** processing option to see results in Volts.

For voltage reading simple connect the input between pins 2 and 3.

For single ended inputs connect together pins 1 & 2 and applied signal to pin 3.

41. Thermocouple (temperature) Measurement

For each thermocouple input the processing option must be selected for the specified channel in the ***Configuration Menu***.



Ensure that a 10K ohm CJC thermistor is installed in channel 8 and this sensor is correctly configured.

Use a 10K Ohm Precision thermistor R-C matched device for CJC (Cold Junction Compensator).

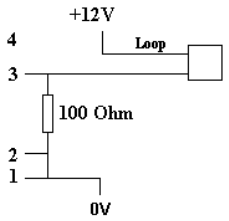
42. CJC – Cold Junction Compensator

Connect 10K Ohm thermistor directly into the only 2 port connector on the front of the unit.
Typical setup values are: A = Excitation Voltage (2.5) B = Sensor Resistance at T_0 (10,000) C = Sense Resistor - fixed (10,000), D = Temperature T_0 (25) E = Sensor Beta Value (3988). F = offset (optional)

Note. F= Offset can be set to correct local conditions and remains active for all ranges.

Set CJC Channel to range = 2.5V

43. Powered Current Loop



For each current loop signal ensure that a precision 100 Ohm sensor resistor is installed.

The 12V supply must be provided externally.

Select ***Current-Scale Input*** processing option.

For direct 4-20 mA inputs (non-powered) select the ***Current-Scale Input*** processing option.

Set Analogue Range = **2.5V**

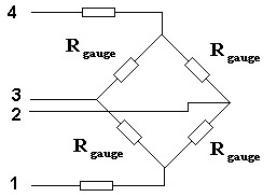
44. Strain Gauge & Load Cell Measurements

Bridge completion resistors have to be fitted to the analogue ports to enable these measurements to be made.

Only use gauges > 120 Ohm.

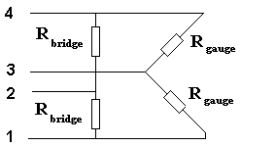
Select ***Strain Gauge*** Process option.

Analogue port range = 25 mV.



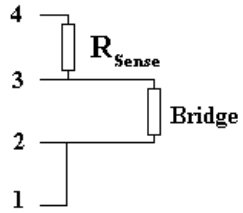
Full Bridge Measurements

Use - Original Gauge Factor X 4



Half Bridge

Use - Original Gauge Factor X 2



Quarter Bridge

Use - Original Gauge Factor

Balancing Strain Gauge Bridge

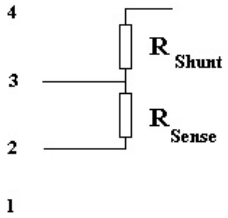
Use the Voltage Offset parameter within the Strain Gauge processing option to zero the balance bridge.

Over Voltage Measurements

In order to measure input signals outside the direct range of the NDACS then a potential divider circuit is required to adjust the input signal into a range that can be measured.

Example. Circuit required to monitor a 24V input signal and reduce the signal to operate on the 2.5V range.

Set the input current to 2 mA



Pins 4 and 1 not used.

Using Ohms Law

Voltage R_{Sense} = 2.5V I = 2 mA
Voltage R_{Shunt} = 24 - 2.5 = 21.5V

Resitance R_{Sense} = 2.5/0.002 = 1.2K
V_{Rshunt} / V_{Rsense} = R_{Shunt} / R_{Sense}

So R_{Shunt} = 21.5/2.5 * 1250 = 10750 Ohm

In practice R_{Sense} = 1.2 K Ohm and R_{Shunt} = 12 K Ohm

In practise other drive currents different to the 2 mA can be used but allowance for this change must made in the calculations.

This circuit will allow AC and DC signals to be measured.

Windows Driver Software

The NDACS 6000 is supplied with a standard Windows driver called Podmng (Pod Manager). The driver is also used as a standard interface to any third party applications such as HP-VEE and Dasylab. The Podmng software is used primarily to set-up the instruments and as an initial data analysis and diagnostic tool.

The driver supports **Windows 98,NT, and 2000** operating systems.

Driver Filename & Directory Location

The driver software is installed into the Windows system directory of your operating system by default.

For Windows 98

C:\windows\system**netpod.dll**

For Windows 2000 & NT

C:\winnt\system**netpod.dll**

The Podmng software supports connection to Ethernet local area networks and modem/mobile connections simultaneously.

45. Local Area Network Connections

Windows 2000, NT. Select

Control Panel ? ?Network and Dial-up Connection
? ?Local Area Connection

Ensure that the Internet Protocol (TCP/IP) option is selected.

☑

Internet Protocol (TCP/IP)

Ensure that the
Enter IP address and Subnet mask settings for your PC

For **Windows 98** Tab is selected

Interı

Control Panel ? ?Network
? ?TCP/IP *Adapter Name*
Select Properties Tab

Enter IP address and Subnet mask settings

Example. For an NDACS 6000 operating with IP address **10.12.14.165**

A typical set-up for a PC to operate will be

IP address: 10.26.32.100
Subnet Mask: 255.0.0.0

Or

IP address: 10.12.14.1
Subnet Mask: 255.0.0.0

The Gateway command need not be set for a dedicated instrument to PC connection, however for multi-network operations consult your network manager for this setting.

46. Dial-up Settings – Windows Operating Systems

For **Windows 2000**

Select

Control Panel ? ?Network and Dial-up Connection ? ??Dial-up Connection (modem) Type of Dial-up

Connect ***Instrument Name*** (screen will appear)
Enter the following:

User Name: **NDACS** (Default setting)
Password: **NDACS** (Default settings)
Dial**: Telephone number of modem/mobile phone.**

Select **Networking** Tab

Type of Dial-up server I am calling.

Windows 95/98/NT4/2000/XP, Internet

Ensure that the

☑

Tab is selected.

Using Windows 98 operating system

1. Select Network option within the **Control Panel**
2. Select the **Configuration** Tab. Ensure that TCP/IP? Dial-up Adapter is installed.
3. Select the **TCP/IP**? **Dial-up** option. Choose **IP Address** tab
4. Select **Obtain IP address Automatically** option.

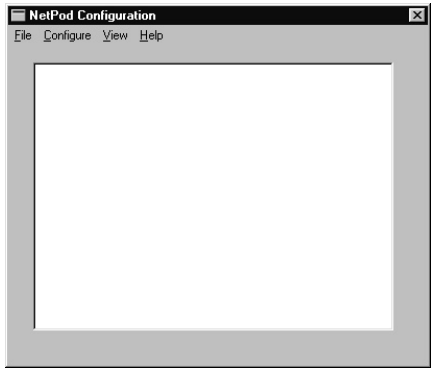
The Comms interface software automatically assigns the PC (Host) IP address in exactly the same manner as dialing into any other ISP.

Podmng Software – Default Window

Once the driver is installed. Select:

Start ? ?Programs ? ?NetPod Driver ? ?Pod Manager

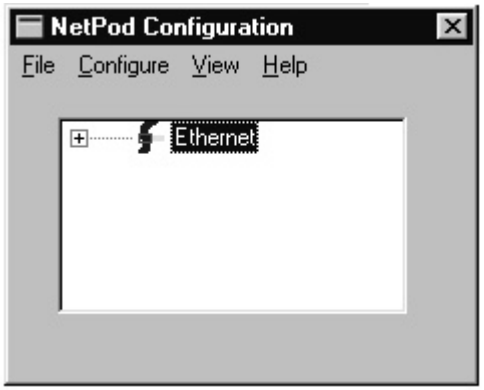
The default main driver window will appear.



Looking for instruments on a LAN

Select Configure ? Scan Network

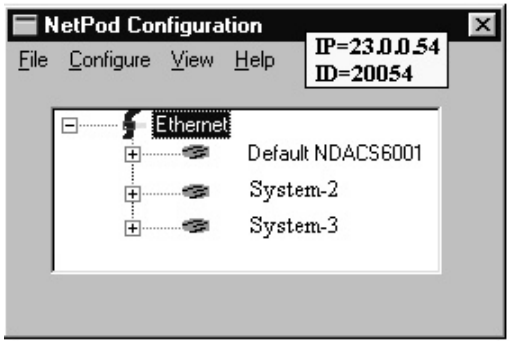
Any instrument whose IP address is set and accessible using the PC network will be displayed in the default Window.



Default Window - NDACS identified

If the PC is correctly configured and the NDACS IP addresses are accessible across the network then the main Podmng window will look the same as the one above.

Select the + symbol to see the list of instruments.



Default Window - List of Instruments

The image above shows how the Main driver window appears when multiple instruments have been identified.

The PodMng window appearance stays the same no matter if the comms link to the instruments is via a local Ethernet LAN or modem/mobile phone.

47. Locating Instrument IP address

Once the instruments have been identified within the PodMng software, simply move the mouse pointer over the instrument name and the IP address for the selected instrument is displayed, as shown in the figure above.

48. Setting Run-time mode

In order to access and observe data with the Podmng software then the instruments have to put into run mode.

The Podmng software can be put into run mode via the task bar icon or from the Main window.

49. Task bar icon operation

Select the Taskbar icon with mouse pointer.

Task bar Icon

Select **Run** from the menu **– taskbar icon is** green when in run mode and red when stopped.

Main Window Operations

Select File ? ?Run mode

The task bar icon changes from red to green when in **Run-mode.**

50. Instrument Offline Warning

When any instrument that is identified and passing data into the Podmng software fails i.e. network failure etc then the task bar icon flashed green with a red bar and bleeps. The unit has to be reset

51. Logging Data to Disk

The Podmng software contains a simple data logger

Select Configure ? ?Logging

Fill in data file details to have information stored to disk.

52. Multi-user Operations

If any changes to the instrument configurations are made using a web browser then these changes must be passed to the Podmng software.

Select: **Configure ? ?Scan Network**

All changes are passed automatically to every user on a network.

53. Passing Data to Podmng via Mobile phone or modem

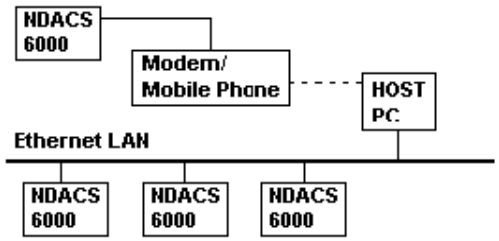
Make the connection to the remote instrument via a modem or mobile phone. From the Main driver window select:

Configure ? ?Connect NDACS?

Enter the IP address of the remote instrument.
The remote instrument name will appear in the Main window of the Podmng software. The maximum logging rate via a mobile phone is limited to the comms link speed. Currently only rates 10 Hz channel can be made but this depends on the comms link.

54. Examining Real-time Data

Using Podmng data can be examined in real-time for instruments connected together over a number of communication interfaces simultaneously. Remote instrument systems connected to a host PC via a modem or mobile phone and instruments connected simultaneously on an Ethernet LAN can be examined.



Ensure that instruments are identified to the driver. Use ***Scan Network*** (LAN) and/or ***Connect NDACS***.

Select File ? ?Run Mode ? ?View ? Text Processed
Data from each instrument is displayed in engineering Units

55. Digital I/O

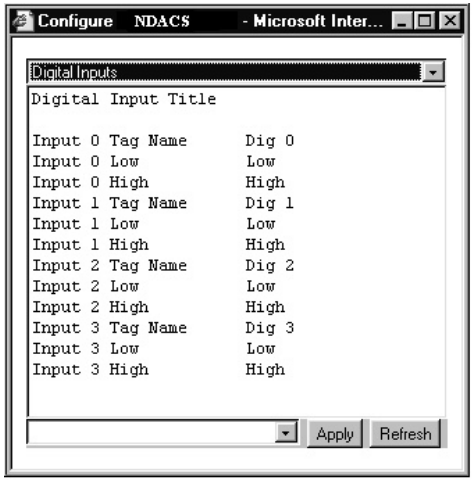
There are 4 digital input and 4 digital output ports on certain models of the NDACS data acquisition system. Digital input ports are channels 0..3. Digital input ports are channels 4..7.

Each digital port can be assigned a channel name and status level tag for both the high and low level. The status level tags are parameters that are used to indicate the meaning of the high and low levels of the digital ports. The digital output ports can have their output level assigned to user set level.

Digital Input Ports

Select Configure NDACS ? Digital Inputs

The following Window appears.



Each of the digital input channels are configured by a Channel Name and Status Level tag names. The Status Level tag names are used to assign an engineering meaning to the signal levels. The digital signals can only have 2 states high or low.

Assigning Digital Input Port Tag Names

Select the digital input to be configured

Input 0 Tag Name Alpha numeric char x 15

Example. Setting digital input port 3 to name Pump 1

Input 3 Tag Name Pump 1

The View Data Window reflects the changes to the digital inputs in real-time. As the input signal levels change then the specified Status Tag names are displayed.

Assigning Status Level Tag Name

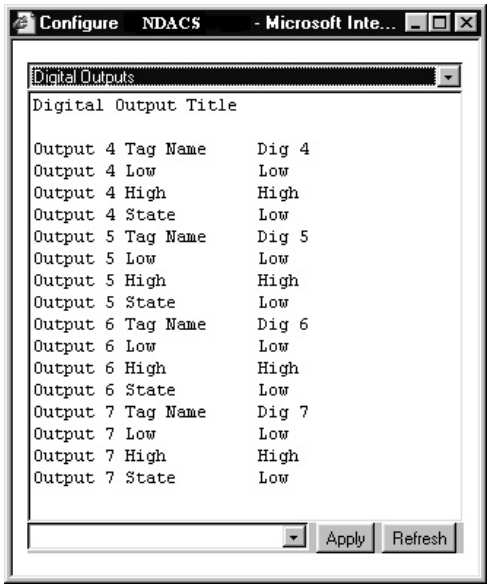
The digital input port can only report 2 levels, high and low. Status Level Tag names are available to assign a meaning to the input port levels.

Example. Channel 2 Digital input port is to be used to report **ON** when a high level is detected and **OFF** when low a level detected for a signal from **Generator 2**.

Input 2 Tag Name Generator 2
Input 2 Low Off
Input 2 High On

Digital Output Ports

Select Configure NDACS ? Digital Outputs



The digital output ports are configured in exactly the same way as the digital inputs with the exception that the output levels can be set.

Assigning Digital Output Port Tag Names

The tag name is used to give an engineering meaning to the port.

Select the digital output to be configured

Output n Tag Name Alpha numeric char x 15 - n = 4..7

Example. Setting digital output port 5 to name

MachineRoom 3.

Output 5 Tag Name MachineRoom 3

The View Data Window automatically reflects the Tag name changes to the port titles in real-time.

Assigning Status Level Tag Name

An output port can only be set to any one of two levels, high and low. Status Level Tag names are available to assign a meaning to the port levels.

Example. Setting output port 6 to display status tag name **Off** when the output is low and **On** when the output is high with the initial port setting level being **high.**

Output 6 Low Off
Output 6 High On
Output 6 State High

Digital Alarm Conditions Operations

It is possible for output port 4 not to reflect a specified level should the port have been previously configured to alter state upon detection of an analogue alarm condition.

Output Port 4 can be set to change state upon detection of an alarm condition and this will take preference over any user settings.

56. Activating Instrument Web Pages from Podmng software

Upon scanning the network to identify the instruments connected on a LAN the instrument names are displayed in the Default main driver window (See page 12)

As long as the Podmng software is not in run mode i.e. the task bar icon is red, then simply

1) Move the mouse pointer above the instrument to be selected.

2) Activate the right mouse button to start the instrument web pages.

On some versions of the Windows operating systems the web pages may be activated by a single or double mouse click.

57. Data Link by Mobile Phone

For some mobile phone and modems that can connect to the mobile network a data link telephone number may be required prior to making a connection to the instrument.

Check the network supplier if a problem connecting to the instrument occurs

The mobile phone modem has to be Hayes compatible in order to work with the NDACS.

58. Configuring the NDACS to use a Dialup Internet Account

The following example shows how to configure the NDACS range of instruments to operate and send e-mail alarms and data files to users across the Internet using a dialup Internet account and modem.

The example uses the FreeUk dialup Internet service provider but the details shown will be very similar no matter which Service provider is used.

Use www.freeuk.com/dialup.php

Fill in the details required on the simple set-up screen.

Note during the set-up procedure the user asked to supply a User Name and Password details. Keep these details safe as they will be required to configure the instrument,

Allow the Free UK web server to send to your PC a new configuration file named "**Configure.ins**" but do not open or allow this file to be activated.

Using the **Wordpad** word processor open the file "**Configure.ins**" so it appears as a text file.

Configure.ins file content.

```
[Entry]
Entry_Name=FreeUK

[Server]
Type=PPP
SW_Compress=yes
PW_Encrypt=no
Negotiate_TCP/IP=yes

[TCP/IP]
Specify_IP_Address=no
Specify_Server_Address=yes
DNS_Address=212.126.144.2
DNS_Alt_Address=212.126.144.13
IP_Header_Compress=yes
Gateway_On_Remote=yes

[URL]
Home_Page=http://www.freeuk.net/
Search_Page=http://home.microsoft.com/access/alli
none.asp
Help_Page=http://support.freeuk.net/
AutoConfig=0

[Proxy]
HTTP_Proxy_Server=www-cache.freeuk.net:3128
FTP_Proxy_Server=
Gopher_Proxy_Server=
Secure_Proxy_Server=
Socks_Proxy_Server=
Use_Same_Proxy=0
Proxy_Enable=1
Proxy_Override=<local>;*.freeuk.com;*.freeuk.net

[User]
Name=ndacsuser
Password=ndacs

[Phone]
Dial_As_Is=no
Phone_Number=1264001
Area_Code=0845
Country_Code=44
Country_ID=44

[Internet_Mail]
Email_Address=ndacsuser@freeuk.com
Email_Name=Ian Thomas
POP_Server=pop.freeuk.net
```

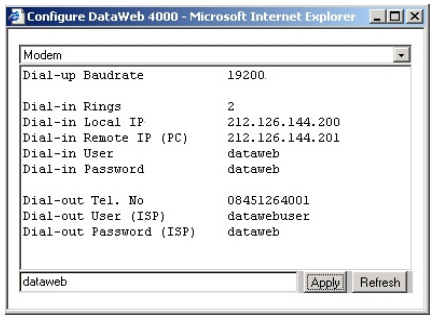
SMTP_Server=relay.freeuk.net
POP_Logon_Name=ndacsuser
POP_Logon_Password=ndacs

[Internet_News]
NNTP_Server=news.freeuk.net
Only the parameters highlighted are of actual use in the configuration of the instrument.

Setting Up the Instrument

Configure System ? **Modem**

Dial-out Tel . No = **08451264001**
Dial-out User (ISP) = **ndacsuser**
Dial-out Password (ISP) = **ndacs**



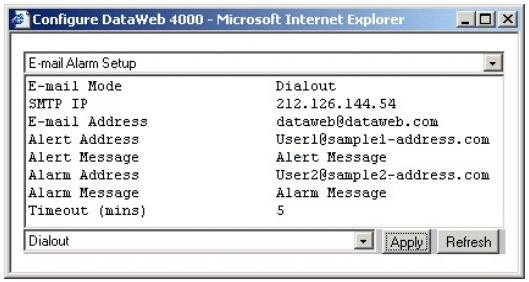
Set-up page for the modem.

IMPORTANT NOTE.

Dial-in local IP (ISP)
Dial-in Remote IP (ISP)

Parameters must also be set but the IP address can be any valid address.
These parameters are not mentioned in the file above and can be made up if required.

Configure System ? **E-mail Alarm**



E-mail Mode**: Dialout -** Instrument dials modem

SMTP Server = SMTP IP (Instrument) = relay.freeuk.net
= 212.126.144.54

Use command "**ping** relay.freeuk.net" at a DOS command prompt to see the actual SMTP IP address as used by the ndacs.

ping relay.freeuk.net -- Responds

ping relay.freeuk.net [ ] with 32 bytes of data.

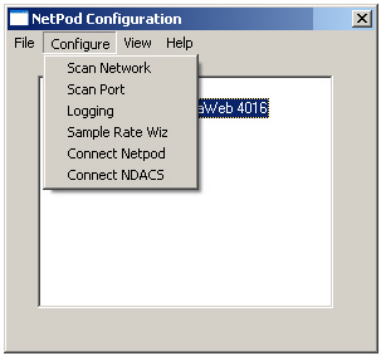
As long as the the above parameters are entered into the instrument it will send E-mail alarms and Auto Report data files as E-mail attachements.

59. Remote Data Connection

The Podmng software allows direct connection to remote instruments across a data link. The data link can be a dial-in modem, ISDN and ASDL data link or an instrument deployed on a suitable network.

The direct connection can be used to examine data from multiple instruments as long as suitable bandwidth on the network allows data to be communicated to the host PC.

Configure System ? **Connect NDACS**

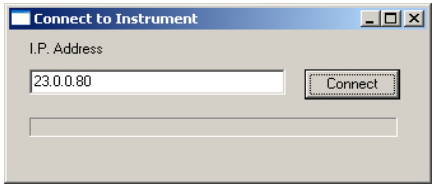


Select the Connect NDACS option on the **Configure Window**

For each remote instrument to be interrogated

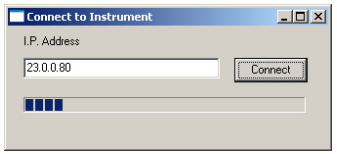
Select "**Connect NDACS"** from the pull down menu items

The following "Connect To Instrument" Window will appear



Enter the instrument IP address and select the "Connect" button.

The software will start integrating the data-link for the specified instrument data and the progress of the interrogation is indicated below:



When a successful connection is completed the specified instrument will appear in the main Window.

To observe data ensure that the driver is in **Run Mode.**

File ? **Run Mode**

Followed by **View** ? **Processed Data**

Green Flashing icon Run Mode

Red Icon - No Data Acquisition

Engineering units from each of the instruments is displayed on the screen.

60. Dial-in Data Connection

The maximum data rate of a dial-up connection to a single instrument should be 20 Hz.

For multiple instruments it is recommended that lower rates are used. It is possible to adjust the sample rate using the web browser.

61. Data Link Problems.

If the sample rate of the instrument is to high for the data link then the instruments can time out. The task bar icon will change from a flash green in Run Mode to green with a red bar. Reduce the sample rate and restart data acquisition operations.

62. Proxy Server Configuration

For access to the instruments across the Internet then ports 4244 and 4242 must be allowed with a Proxry server configuration. The ports must allow TCP and UDP communication protocols to take place.

Liability of Use

Keynes Controls does not warrant its products for use in aeroplanes or life support applications. Neither does Keynes Controls accept any liability for losses due to the failure of the instrument or inaccurate measurements.

Keynes Controls ensures that all system are operating within specifications and time of issue.