DataWeb 4008

Chapter 1 - System Setup

The following pages describe the general setup of the instrument and includes details for configuring:-

- Instrument Name
- Sample Rate
- Date
- Time
- Autorange
- Number Format
- Digital Alarm Status D4
- Temperature Units
- Admin Password
- User Password
- View Password

All parameters are selected by Select "Configure System" button
Select "System Setup" from the pull down list.
Select the parameter to be configured.

After any configuration changes ensure that the **Apply** button is pressed to confirm the new details within the instrument.

INSTRUMENT NAME

Assign instrument name: Alpha numeric chars x 40

SAMPLE RATE

This parameter defines the sample rate per channel for the transmission of data across a network. The sample rate can be set different to the data logger rates.
Options: **1,2,5,10,20,50, 100 Hz**

DATE

Assigns the date for the instrument real time clock:
Format **dd/mm/yy** -- where **dd** = day **mm** = month **yy** = year

TIME

This parameter assigns the time of the instrument in 24-hr format.
Format: **HH: MM: SS** where **HH** = Hour (0-23) **MM** = Minutes (0-59) **SS** = Seconds (0-59)

AUTORANGE

Allows the instrument to automatically assign all of the analog input channel ranges. For optimum accuracy each channel should be manually selected.
Options: **Enabled/Disabled**

NUMBER FORMAT

Allows the data displays to show results to a set number of decimal places or significant figures.
Options: **2-6 Decimal places**. **2-6 Significant figures**.

DIGITAL ALARM STATUS D4

Used to send digital output port 4 into a high level upon detection of an alarm condition. The port name and status tag names are configured like any other port.
Options: **Enabled/Disabled**.

TEMPERATURE UNITS

Enables the thermocouple data to be presented in units **Degrees Celsius**, **Kelvin**, **Fahrenheit**.

ADMIN PASSWORD

Password entry that allows all instrument features to be configured.
Options: 12 X alphanumeric char.

USER PASSWORD

Password entry that allows all instrument features to be configured except it prevents any changes to the password protection system.
Options: 12 X alphanumeric char.

VIEW PASSWORD

Password entry that is restricted to allow data to be viewed or download only. No configuration, parameter changes or file deletions allowed.

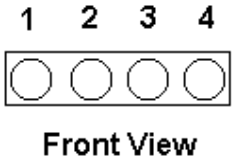
Chapter 2 - Sensor Interfacing

Features

- Voltage Input - Direct Readings
- Current Loops - (0-20mA) (4-20mA)
- Over Voltage Measurements

For connecting temperature sensors see details on Temperature monitoring on Page 34

VOLTAGE INPUT - DIRECT READINGS



Select "direct" processing option to see results in Volts

For voltage reading connect the input between pins 2 and 3

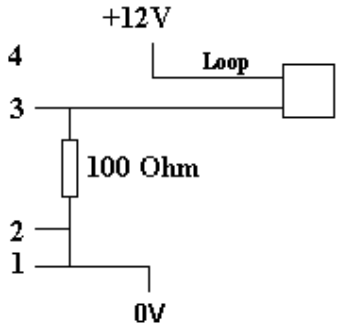
For Single Ended inputs connect together pins 1 & 2 and apply signal to channel 3

1 = 0V
2 = -Vin
3 = +Vin
4 = +Ext

For low level signals - Thermocouples and low voltages connect pins 1 and 2 together even if using a differential input

CURRENT LOOP - (0-20mA) (4-20mA)

The same configuration as used for 0-20mA and 4-20mA powered current loops



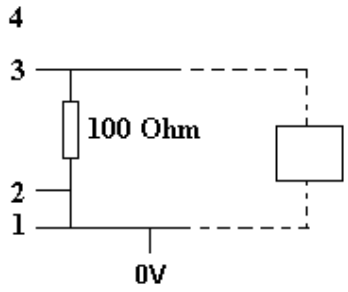
For each current loop signal ensure that a precision 100-Ohm sensor resistor is installed.

The 12V-loop supply must be provided by an external source

Set Analog Range = 2.5V

Process Option: Scaled current

NON POWERED CURRENT LOOPS



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

Set Analog Range = 2.5V

Process Option: Scaled current

For this application the sensor provides the current loop excitation.

Pin 4 (Excitation) - not used

For direct 0-20mA and 4-20mA inputs (non-powered) select the Current-Scale Input processing option to observe data.

Note. When configuring the Current - Scale input processing option

A = 0 (0mA) (0.004 = 4mA)
B = 0.02 (20mA)

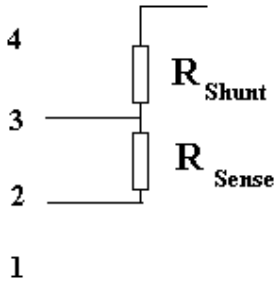
For loop values with different limits simply adjust the configuration parameters to suit. The instrument is not limited to 0-20mA inputs.

It is possible under operating conditions that the input current loop levels can fall below the 4-mA limit. Should this happen then the engineering results may show a negative value depending upon how the channel is configured.

OVER VOLTAGE MEASUREMENTS

In order to measure input signals outside the direct range of the instrument, 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 are not used

Using Ohms Law Voltage

Rsense = 2.5V -- I = 2mA

Voltage Rshunt = 24 - 2.5 = 21.5V

Resistance Rsense = 2.5/0.002 = 1.2K

VRshunt / V Rsense = R Shunt / R Sense

So R shunt = 21.5/2.5* 1250 = 10750 Ohm

Chapter 3 - Data Logging

The DataWeb can act as a data logger as well as an Ethernet data acquisition unit. There are 2 separate data loggers built into the DataWeb, a continuous data logger (General Logger) that stores data at a user 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 and can be independently configured.

Features:-

- General Logger
- Specification
- Trigger Modes
- Logging Interval
- Buffer Modes
- Alarm Activation
- Digital Trigger Activation

The following features are used to define the event logger operations. This logger can be set to record data upon detection of a pre-defined event:-

- Event Logger (Flash) Memory
- Specification
- Trigger Modes
- Logging Interval
- Channel
- Minimum Trigger Level
- Maximum Trigger Level
- Pre-trigger readings
- Logger Record Format

GENERAL LOGGER

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

SPECIFICATION

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

The maximum logging period over which the DataWeb can stores data is 1 month or 30 days when in circular buffer mode. This is regardless to the set logging period. The number of data files has precedence to the amount of data being recorded.

TRIGGER MODES

Options:

General Logger: Disabled/Triggered/Continuous

Disabled: No data to be recorded at any time

Triggered: Data to be recorded only upon an analog signal alert/alarm condition on any channel or digital input trigger signal. The digital trigger is always channel 0.

Continuous: Data is recorded continuously at the pre-set sample rate regardless of any alert or alarm or trigger signals.

LOGGING INTERVAL

Interval: Integer n between 1 and 3600 where n represents a sample rate in seconds.

Examples:-

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 1,000,000 records have been stored then the oldest records is overwritten by the newest record. 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 any one time is 30. The oldest file will be removed and a new file created when a date change occurs regardless of the number of records stored.

One-shot: Data is recorded until 1,000,000 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 for storing data upon alarm condition detection.

Alarm Activation: Enabled/Disabled

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

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

Digital Activation

Defines the digital trigger operations to start data logging.

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

Options: Disabled/TTL High/TTL Low

Disabled: No trigger operations from Channel 0
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 <0.7V

Event Logger - Flash Memory

The event logger runs simultaneously to the General Logger. All recorded data is stored onto permanent (Flash) memory.

Specification

Maximum number of records: 1,000,000
Maximum sample rate: 10Hz
Data filename: eventlog.csv

Options:-

Event Logger: Disabled/Triggered/Continuous

Disabled: No data recording operations

Triggered: Only acquires data when the specified analog channel is outside defined Max and Min Limits.

Continuous: Acquires data regardless of the specified maximum and minimum alarm conditions. Instrument stops logging data when the data file is full.

Interval: Pre-set logging period in seconds are: 0.1s, 1s, 10s, 60s, 600s (10 min), 3600s (1 hr)

The following parameters defined the channel and conditions to be monitored in order that the event logger will store data.

Channel: *Integer 0 - 7.* Selects the analog channel for alert/alarm condition detection
Min: Minimum level upon which the analog input must drop before the event data is recorded
Max: Maximum level upon which the analog input must exceed before event data is recorded

Pre-trig: Number of records appended to the log file prior to the event being recorded. Readings 10..300

Post-trig: Number of records appended to the log file after the event has been detected and alarm condition is cleared. Readings 10..300.

Logger Record Format

Each individual file contains a 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, Alarm Status

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

Chapter 4 - Modem/mobile Phone Configuration

This chapter details the setup and configuration of a modem/mobile phones used as data links for the DataWeb.

Features

- Modem
- Remote Operations (Modem or WAP mobile)
- Accessing the DataWeb via a Telephone
- Modem & Dial-in/Dial-out configuration
- Setting the Instrument Dial-in IP Addresses
- Telephone Ring Setting
- Setting the Dial-In Access Parameters
- Setting the Dial-Out ISP Parameters
- Windows Operating System - Dial-up TCP/IP Settings
- Windows 2000 Dial-In Account TCP/IP Settings
- Setup For Wavecom GSM Modem

MODEM

A Hayes compatible modem is required when communicating with the DataWeb. Any speed modem can be used but a 33.6 or 56KBd or WAP enabled mobile phone are recommended.

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 and the instrument is now ready to answer dial-up connections.

The software to control an external modem or WAP mobile telephone is contained within the instrument and operates automatically upon detecting a telephone request. The instrument automatically sets the server IP address of the host PC being used for dial-in operations.

If a problem occurs with the dial-in request and the phone is disconnected then the instrument automatically resets the modem after 10 minutes. The DataWeb software automatically detects the dial-in modem parity and start/stop bits and adjusts the answering modem automatically.

REMOTE OPERATIONS (MODEM OR WAP MOBILE)

To operate a mobile phone/modem with the DataWeb

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 DataWeb is installed.

ACCESSING THE DATAWEB VIA A TELEPHONE

1. Using any standard modem on your PC, access "Dial-up networking" and enter the telephone number of the instrument. Make a dial-up connection to the DataWeb.

2. The DataWeb 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.

3. Use the Modem Configuration - No. of rings setting to assign the number of times the phone should ring before the DataWeb answers and makes the data connection.

MODEM & DIAL-IN/DIAL-OUT CONFIGURATION

The DataWeb operates like any other ISP (Internet Service Provider) even when used as dial-up logger. To configure the DataWeb to carry out dial-up operations then:-

Select Configure System button ⟶ Modem Baud Rate

To set the modem dial-out baud rate Baudrate - 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 DataWeb. Default baud rate setting is 19200.

SETTING THE INSTRUMENT DIAL-IN IP ADDRESSES

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

Local IP: IP Address that the instrument uses when operating across a modem via a dial-in connection.

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

The Local IP address does not need to be set to the same IP address used by the instrument for LAN operations as shown in the Network settings.

Example: Set the IP address of DATAWEBS to 10.32.100.80 and on accepting a dial-up connection ensure that the host PC is set to 10.32.100.84.

The settings are:
Local IP 10.32.100.80
Remote IP (PC) 10.32.100.84

On successful connection to the instrument, open the web browser and enter 10.32.100.80 on the host PC.

TELEPHONE RING SETTING

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

Rings **n** where **n** = integer 0 - 6 (0=detect 1st ring)

Note. The dial-in IP address can be set differently to the instrument IP address for added security.

SETTING THE DIAL-IN ACCESS PARAMETERS

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

Dial-in Username: 20 Alphanumeric Characters
Dial-in Password**:** 20 Alphanumeric Characters

The Username and Password details have to be set-up within the host PC dial-up account and are the same as those set within the instrument. These parameters must be set before dial-up operations can be used with the instrument

SETTING THE DIAL-OUT ISP PARAMETERS

The following parameters need to be assigned before the Dial-out E-mail alarm system can be used.

Dial-out Tel No.: Telephone number for ISP (Internet Service Provider) dial-in account
Dial-out User (ISP): Username for the ISP dial-in account.
Dial-out Password (ISP): Password for ISP Dial-in account.

WINDOWS OPERATING SYSTEM - DIAL-UP TCP/IP SETTINGS

In order to dial into a DataWeb instrument the following TCP/IP settings must be assigned to the Dial-up Networking Accounts For Windows 98

1) Select Windows Explorer - Using this software
2) Select Dial-Up Network
3) Select Dial-Up Network Account File
4) Select Properties - Select file with right hand mouse button
5) Select Server Types
6) Ensure that the parameters

Server Assigned IP Address - Selected Server assigned named server address - Selected

WINDOWS 2000 DIAL-IN ACCOUNT TCP/IP SETTINGS

1) Select Control Panel ⟶ Network & Dial-Up Connections
2) Select Dial-Up account
3) Select Properties
4) Networking ⟶ Internet Protocol [TCP/IP]

Ensure that Obtain an IP Address Automatically - Selected
Obtain DNS Server Address Automatically - Selected

SETUP FOR WAVECOM GSM MODEM

The following parameters need to be assigned within Wavecom GSM modem in order to operate with the instrument.

ATS0=0 Set to no auto-answer (DataWeb answers) AT+IPR=0 Set auto-baud rate (was set to 9600 only) AT&W Write configuration to eprom

Chapter 5 - Analog Channels

This chapter details the configuration of the analog input channels including the setting of the alarms. Each analog input channel can be independently configured for any input range and sensor type.

Features

- Channel Parameters
- Channel Sensor Type
- Activating Analog Alarm Operations
- Analog Channel Input Range
- Setting Analog Channel Alert/Alarm Levels
- User Alarm Display

To configure an analog input channel using the browser.

1. Select the Configure System button, the configuration window will appear.
2. Select the Analog Channel to configure from the pull down menu. Channel_0.. Channel..7

CHANNEL PARAMETERS

The following channel configuration parameters will be displayed:

Name: Defines Channel name - 15 Char
Range: Analog input, Voltage range, 10V, 2.5V, 1V, 0.25V, 100 mV, 25mV
Type: Direct, Linear, Thermocouple, PT100, Thermistor, Threshold, RDF (LN2 RTD), 2 Wire RTD, 3 Wire TRD strain.
Alert/Alarm Active: Enabled/Disabled - Activates alarm monitoring on selected analog channel

Calib A:
Calib B:
Calib C:
Calib D:
Calib E:

Where Calib A..E are the user defined configuration parameters for the different processing options.

SETTING THE CHANNEL SENSOR TYPE

Select Channel to be configured - Channels 0..7 and CJC
Select Type: Direct, Linear, Thermocouple, PT100, Thermistor, 3 Wire RTD, Strain Gauge

Press Apply button to confirm choice.

For analog alarm operations.

Alert/Alarm Active: Enabled/Disabled.

Enabled: This activates the alarm level operations

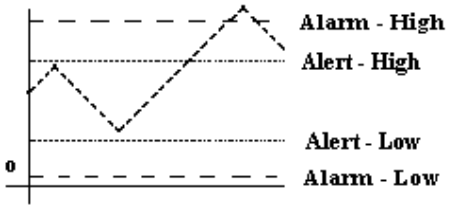
The following additional menu items appear and are used to define the alarm level conditions:

Alert Low: -999.00000
Alert High: 999.000
Alarm Low: -999.0000
Alarm High: 999.0000

Change the alarm level parameters to suit the application.

SETTING ANALOG CHANNEL ALERT/ALARM LEVELS

The DataWeb has two independent alert/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 and change the status of digital channel 4. The alarm system can be independently configured for each analog input.



The picture above shows how the alarm settings are configured.

Each alert and alarm setting can accept the input parameters represented as a floating-point number in engineering units.

Example. To monitor for an alarm condition on Channel 7 and change the colour of the digits text box to either yellow (Alert) between 250°C and 410°C, or Red (Alarm) between 50°C and 650° for type J thermocouple. An e-mail of each state will be sent across a LAN with SMTP IP = 10.32.100.92

Select **Channel 7** - Configuration Page

Type: J Type Thermocouple.
Alert Low: 250
Alert High: 410
Alarm Low: 50
Alarm High: 650
E-mail Mode: Ethernet
SMTP IP: 10.32.100.92

The instrument will now monitor the temperature on Channel 7 and change the colour the data display box either yellow (alert) or red (alarm) and automatically report an error when the alarm conditions have been exceeded by an E-mail across a LAN.

Note. The DataWeb will only send an alert or alarm e-mail if suitably configured to do so. This operation requires the instrument to be set regarding the E-mail mail server address.

SELECT THE ANALOG INPUT RANGE

Select the Range option - A pull down menu appears at the bottom of the Configuration Window with a list of possible analog input range options. If Autorange is selected in the Setup menu then manually selected ranges are not possible.

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

For Thermocouple operations - 250 mV is the recommended range.
For Thermistor operations - 2.5V is the recommended.

USER ALARM DISPLAY

When an alarm condition has been exceeded, the View Data Window highlights the alert (Yellow) or alarm (Red) condition in the box of the analog input that caused the condition

ANALOG CHANNEL CONFIGURATION WITH ALARM SETTINGS

The analog channels have 3 modes of operation when operating with analog alarm settings which are Normal, Alert and Alarm. The channel text boxes change colour to indicate the current alarm level conditions. When an Alert or Alarm level is detected the DATAWEBS can be configured to send 2 different e-mail alarms.

Normal Operation

This occurs when the analog channels are running within the bounds of the alarm level settings.

Background colour of each analog channel results box is set to green.

Alert Operation

This operation occurs when an analog channel signal exceeds the Alert level boundary alarm conditions and is within the Alarm level alarm conditions. Background colour of the corresponding channel box is set to Yellow.

Alarm Operation

This operation occurs when an analog channel signal exceeds the Alarm level boundary conditions. Background colour of the corresponding channel box is set to red.

Chapter 6 - Digital I/O Ports

This chapter details the instructions to be followed to configure the digital I/O within the DataWeb.

Features

- Number of Ports
- Configuring the Digital Input Port
- Assigning Digital Input Port Title for Data Display
- Channel Configuration
- Configuring the Digital Output Port
- Assigning Digital Output Port Title for Data Display
- Digital Alarm Status Port
- Port - Electrical Specifications

NUMBER OF PORTS

The DATAWEBS contains 8 digital I/O ports configured as 4 inputs and 4 outputs.

Ports 0-3 - Digital Input
Port 1 can be configured as a digital trigger causing data to be logged when set.

Ports 4 - 7 - Digital Output
Port 4 automatically goes high on any alert/alarm condition being set.

CONFIGURING THE DIGITAL INPUT PORT

The following instructions define the configuration of the digital input port. Each input can be individually configured and assigned status tag names.

1) Select "Configure System" button
2) Select Digital Input

ASSIGNING DIGITAL INPUT PORT TITLE

3) Select "Digital Input Title". Assign the Port title that will appear on the View Data window. Select Apply to confirm the title.

CHANNEL CONFIGURATION

Each digital input port has a Tag name that is used to define its name within the instrument. The Tag name allows a port to be assigned a description that allows the port levels to be defined.

A digital input can report only two levels High & Low. A status tag name can be applied to each level to assign an engineering unit to the signal levels.

Each Port

Input 0 Tag Name	Dig0
Input 0 Low	Status Tag name for level 0
Input 0 High	Status Tag name for level 1

Example. Digital Input channel 1 configured to use channel name Pump 1 indicating status Stopped when digital input level is low and Running when the input is high:

Input 0 Tag Name	Pump 1
Input 0 Low	Stopped
Input 0 High	Running

CONFIGURING THE DIGITAL OUTPUT PORT

1) Select "**Configure System**" button
2) Select Digital Output

It is possible to configure the output port title.

ASSIGNING DIGITAL OUTPUT PORT TITLE

Each digital output port has a Tag name that is used to define its name within the instrument. A digital output can only be set to either of two levels, High and Low. These represent the 0 and 1 logic levels. A status tag name can be applied to each level to assign an engineering meaning to the signal levels.

Example:

Input 4 Tag Name	Flood Pump 1
Input 4 Low	Off
Input 4 High	On

Will show on the View Data Window

Flood Pump 1 = Off	when output is low
Flood Pump 1 = On	when output is high

DIGITAL ALARM STATUS PORT

Digital Output Port 4 goes into a high level state on detecting any analog alert/alarm condition.

The port Tag and Status level names can be set in a similar manner to the output ports and are displayed when the alarm conditions are detected.

PORT - ELECTRICAL SPECIFICATION

The digital ports operate to the standard TTL specification therefore:

Logical level 0 (low) -- 0 to 0.8V
Logical level 1 (high) -- 2.4 to 5V
Maximum load 20 mA per channel.

Chapter 7 - Data Recording

The following chapter details the procedure to be followed to download stored files from within the DataWeb.

Features

- File Download from within a Web Browser
- Data Transfer by HTTP
- Downloading data from the DataWeb to hard disk prior to examination
- Filenames
- We Page - Data transfer by FTP
- Web Page - File Deletion
- Deleting Event Logger (Flash - Permanent Data)
- Deleting General Logger - RAM Data files
- Downloading Data using DOS command shell
- transferring data from DataWeb to PC
- Deleting data files

It is possible to download and examine files directly within a web browser and to undertake this task remotely using the industry standard FTP (File Transfer Protocol) software available on many modern computer systems.

It is strongly recommended that in FTP mode that all files are stored to disk prior to examination.

Data transfer procedures available are:

FTP (File Transfer Protocol) - Standard data transfer program for all Windows Operating Systems.

HTTP (Hypertext Transfer Protocol) - Used to download data directly onto a hard disk or into a web page.

FILE DOWNLOAD FROM WITHIN A WEB BROWSER

The following instructions detail how data can be downloaded from the DataWeb using a web browser.

1) From the main instrument web page select the "File Download" button.

All the data files that are currently stored within the DataWeb will be displayed in a table similar to that shown overleaf:-

List Of Files:

Name	FTP Download	HTTP Download	Size
Event Log			
Eventlog.csv	**FTP**	**HTTP**	100,000 Records
General Log			
11092002.csv	**FTP**	**HTTP**	20,000 Records

Event Logger Records (total) = 100,000 (10% used) **Clear Event Log**

General Logger Records (total) = 20,000 (2% used) **Clear General Log**

DATA TRANSFER BY HTTP

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

An operator can also examine data directly within an Excel formatted web page or save data to disk for later analysis. Data can only be examined within an Excel formatted web page as long as the Internet Explorer Excel plug-in has been installed during the installation of the Microsoft Office software. The ability to see data in an Excel formatted web page is the responsibility of the software on the PC and not any software supplied with the instrument.

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

DOWNLOADING DATA FROM THE DATAWEB TO HARD DISK PRIOR TO EXAMINATION.

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

HTTP - File Transfer Operations

Ensure that the PC has the Excel plug-in for Internet Explorer installed. If the plug-in is not present then the DataWeb data files will be shown in a standard txt file 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 from the Window's list that appears.

Depending upon the size of the stored data file, the download operation can take from a few seconds to several minutes to 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. Data will now be stored permanently to the hard disk of the analysis PC. To examine the data simply open the new file like any other spreadsheet.

Filenames

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

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 transferred under FTP from the DATAWEBS should be first stored to the Host PC prior to any analysis.

1. Move the mouse pointer above the FTP 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. This Window is the same as any other "Save As Window" as displayed by any other applications package that stores files to the hard disk of a PC.

3. Enter the filename to be used to archive data to the hard disk. The "File Download" Window is displayed while data is be stored to the Host PC hard disk. To examine the data simply open the new file like any other spreadsheet.

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

WEB PAGE - FILE DELETION

It is possible to delete all the stored data files using commands within the on board web pages. This option cannot be achieved in the "View" password level.

DELETING EVENT LOGGER (FLASH - PERMANENT DATA)

The following instructions detail the deletion of the eventlog (flash data) file. The Eventlog.csv file is permanently stored and retained even if power is removed from the instrument.

1. Select "File Transfer" Button from the main instrument web page.
2. Select "Clear Event Log" URL

The number of records indicator adjacent to the Eventlog.csv filename is replaced with the identifier "**Erasing**" while data is being deleted. The file will still appear on the File Transfer page but will no longer contain any information.

DELETING GENERAL LOGGER - RAM DATA FILES

The following instructions detail the deletion of the General Logger (RAM data) files. These files are also deleted when power is removed from the instrument or the unit is reset.

1. Select "**File Transfer** " button.
2. Select "**Clear General Logger**" URL.

All the General Logger files will be deleted.

DOWNLOADING DATA USING DOS COMMAND SHELL

It is possible to download data for instruments deployed on a remote network via a single modem/WAP telephone connection and across a LAN, using a DOS command shell running the FTP transfer software on a Windows based PC, or command shell on any other computer supporting FTP.

Modem/WAP phone Data Connection

Establish a dial-up connection to the DataWeb. The instrument automatically detects telephone calls and sets up the modem. Start a DOS command prompt on a Windows PC or Command shell on any other computer.

LAN Data Connection

Start a **DOS** command prompt on the host PC. Ensure that the instruments to be downloaded can be accessed.

Downloading Stored Data Files

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

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 serve**r.**

Listing Files that have been logged within DataWeb

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 will vary depending upon modem speed

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

TRANSFERRING DATA FROM DATAWEB 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

Note. The ftp program when run from the command prompt stores data in the directory from where the command prompt was started. It is a good idea to create a separate directory for data storage.

Deleting Data Files

At the FTP command prompt:

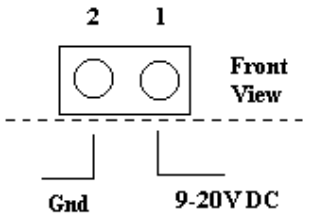
del *filename.csv* where filename.csv is the file to be cleared.

deleting the Eventlog.csv file only clears its contents. The file itself remains on the instrument and can then be reused.

Chapter 8 - Connector Pin-outs

This chapter shows the pin-outs for the ports used on the DataWeb 4008.

POWER



Pin	Function
1	+9-20 V nominal
2	Instrument ground

For best results, connect GND to chassis earth.

Generally the supply range can be from 9 to 20V DC, but check your manual for any hardware revision of the input supply specification.

The power supply requires a rating of 3W. It is possible for the instrument status LEDs to illuminate but no data acquired and transmitted if the instrument supply is not of a suitable rating.

RS232

9 Pin D connector

Uses standard PC serial port pin-out configuration and can accept standard 9 pin modem cables for connecting to external modems and WAP mobile telephones.

Pin	Function
1	Not Used
2	RX
3	TX
4	Not Used
5	GND
6	Not Used
7	RTS
8	CTS
9	Not Used

Ethernet

Industry standard UTP/STP 10 Base-T Ethernet connections for connection into an Ethernet hub

Pin	Function
1	TX +
2	TX -
3	RX +
6	RX -

Analog inputs

Pin	Function
1	Gnd
2	Vin - (Diff)
3	Vin + (Diff)
4	Eout (2.5V)

Eout is nominally 2.5 volts and may be used for the sensor excitation supply. The maximum output current is 20mA/channel.

The +Vin and -Vin form the differential inputs for each analog input. Each analog input can be configured from 10V range to 25mV range to a resolution of less than 1 microvolt.

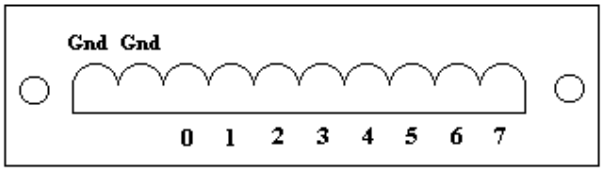
For best results, common mode noise should be reduced as far as possible by connecting one of the inputs to ground. Mains pick-up can severely reduce performance of the instrument.

Digital I/O Port

The following table shows the pin outs for the digital I/O ports.

Digital Input Port 0 can be used to trigger data acquisition operations and to send an alert/alarm e-mail

Digital Output Port 4 can be set to go into a high or low state on detection of an alert/alarm condition.



Ports 0-3 are digital inputs
Port 0 = Alarm/Alert Trigger input
Ports 4-7 are digital outputs
Port 4 - changes state upon an alert/alarm condition

Chapter 9 - Process Options

This chapter lists the analog channel process options available within the DataWeb.

The following list shows the configuration parameters 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	Configuration Parameters	Units
Direct	No Parameters	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
RTD	A= V Excitation B = Ratio(Sense Resistor/ PT 100 Resistance) @ 0 Deg C C = Lead Resistance	Deg °C
Thermistor (CJC)	A = Excitation Voltage B = Sense Resistor value (Typically 1 K Ohm) C = Sensor Resistance at T0 D = Temperature T0 E = Beta Value (typical 3898) F= Offset (Correction Factor)	Deg °C Typically R0 and T0 are the resistance of the sensor at 25 Deg C
Current Scaled	A = Sense Resistor B = low Input (typically 0 or 0.004) C = High Input *(typically 0.02) D = Engineering output for Low in level E = Engineering output for High in level	Engineering Units A = 0 for 0 mA input or 0.004 for 4 mA B = 0.020 for 20 mA input C = Engineering output for 0 or 4 mA D = Engineering output for 20 mA input
Threshold	A = Threshold Voltage A = Excitation Voltage	% Time/minute
Strain Gauge	B = Bridge Offset Voltage C = Gauge Factor	Micro Strain
Scaled Voltage	Voltage input scaled output in engineering units Use Current Scaled option with the following options A = Sense Resistance = 1 B = Low Voltage input C = High Voltage input D = Engineering Units output for Low input setting E = Engineering Units output for High input setting	Engineering Units

Example of 4-20 mA input signal representing -50 to 200 Bar pressure with a 100 Ohm Sense resistor will require.

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

Example of an inclinometer sensor output with null level (0 deg) @ 6V and 60mV/Deg output configured to show 0 to 2 degree movement.

Use Scaled Current process option

A = 1
B = 6.000 (output at 0 Deg)
C = 6.120 (output at 2 Deg)
D = 0 (Represents 0 level - null position)
E = 2

The DataWeb will display a result between 0 - 2 for input signals between 6.000 and 6.120V

Chapter 10 - Email Alarm System

This chapter details the communication settings for the E-mail alert/alarm system and are used for both local area network and dial-out modem operations. The alert/alarm E-mail system only operates as long as the SMTP (mail server) settings are correctly configured.

Features

- E-mail Alarm System
- Alarm Level Definition
- Mode of Operation
- Mail Server Address
- Instrument E-mail Address
- Analog Channel Alarm System
- Low Priority Alarm
- High Priority Alarm
- Time-out Period
- Limitations on the E-mail Alarm System

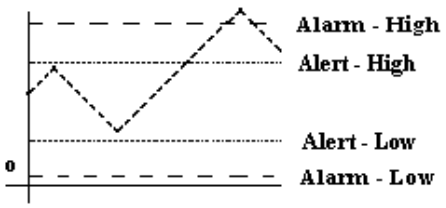
E-MAIL ALARM SYSTEM

The DataWeb has two independent E-mail alert/alarm systems that can be configured to operate on each analog input and used to automatically notify a user that a specific condition has been exceeded. The alarm system operates across:-

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

ALERT ALARM LEVEL DEFINITION

The alarm system allows two bands of operation as shown in the adjacent figure. When an analog signal exceeds any of the pre-set bands then an E-mail can be sent to a user defined address.



The E-mail alarms can be set when the analog channels are outside set boundary conditions or upon detection of a digital trigger signal on input channel 0.

MODE OF OPERATION

E-mail Mode: **Disabled/Ethernet/Dial-out**
Disabled -- No E-mail alarms.
Ethernet -- E-mail alarms sent across Ethernet LAN/WAN/Intranet.
Dial-out-- E-mail alarm sent by modem through a dial-up ISP account.

MAIL SERVER ADDRESS

This parameter defines the E-mail server address for the local mail server. This parameter has to be set for E-mail operations across a LAN or dial-up modem. For dial-up operations contact the Internet Service Provider for the dial-up account in order to obtain this address.

SMTP IP: SMTP server address. (Mail server IP address)
Example. SMTP IP: 10.32.100.92 -- for mail server address of 10.32.100.92

INSTRUMENT E-MAIL ADDRESS

E-mail address: name@name.com

The E-mail address of the instrument can be user defined. e.g. pump@testcentre.com. Any recipient of an instrument E-mail alarm will see this address as the originator of the e-mail message.

ANALOG CHANNEL ALARM SYSTEM

There are two independent alert/alarm monitoring systems available for the analog inputs. Each system can have upper and lower levels configured and are used to send an alarm e-mail upon detection of the alarm condition.

Alert Condition

This is the lower priority alarm system and should be set for the inner bounds of the signal levels.
Alert Address: alert@recipient1.com -- E-mail address for the recipient of the Alert message.

Alert message: Alphanumeric x 80 -- text message that is sent within the alert e-mail to describe to the recipient the alert condition.
Example. To send an alert message to a user with e-mail address user@testcentre.com indicating that "Generator 2 temperature exceeds operating level".
Alert Address: user@testcentre.com
Alert message: "Generator 2 exceeds operating level"

Alarm Conditions

Alarm Address: alarm@recipient2.com
Alarm message: Alpha-numeric X 80 -- text message that is sent within alarm e-mail to describe to the recipient the alarm condition

The E-mail address for the recipient of an Alarm message can be different or the same as that used for Alert messages.

TIME-OUT PERIOD

The following parameter defines the time between the sending of successive alarm E-mails as long as the alarm condition remains.

Timeout (Mins): Integer 1-3600.

Note. For 1 hour timeout period set Timeout = 60. The Timeout parameter assigns the time difference between successive Alarm e-mails sent to the User as long as the analog signal stays within the alarm condition boundary. An alarm can be set for each analog channel.

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 E-mail alarms. For units deployed on an Intranet/LAN/WAN then all systems will send E-mail alarm messages.

Chapter 11 - Ethernet/LAN Settings

This chapter details the settings required to configure the DataWeb to operate across an Ethernet LAN.

Features

- Network Settings
- Setting the IP Address
- Problems changing the IP address
- Subnet Mask & Gateway Settings
- Web Browser Settings - Microsoft Internet Explorer 5 or greater

Note. After any configuration parameter change the "Apply" button must be selected to confirm the changes to the instrument.

NETWORK SETTINGS

The instrument is configured to operate in a similar manner to any other Ethernet device. The following parameters are used to define the network settings:

Operation:-- Default, Config, Test, Burn
IP address
Subnet Mask
Gateway

Default - setting when instrument transmitting data across a comms network.
Test - temporarily assigns the new instrument settings.
Burn - permanently stores the network settings into the instrument.

SETTING THE IP ADDRESS

The following instructions define how to set the instrument IP address for LAN operations.

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 being powered off.

Test the instrument at the new IP address. The PC used to test the new instrument IP address may itself have to be reconfigured to see the new IP address. Failure to ensure that the logging PC can identify the new IP address will prevent data acquisition operations.

After making any IP address changes it is important that all open instrument web pages accessed on the original IP address are closed and restarted at the new address.

Important Note: Should the DataWeb 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 operation is undertaken by examining the instrument Web pages within a browser. Enter the IP address of the instrument 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.

COMMON PROBLEMS CHANGING THE IP ADDRESS

1. Instrument does not seem to respond when new IP address is entered.
   Check that the PC used to configure the instrument can see the new IP address and that the subnet mask is correctly set.

2. If on powering off the instrument the unit fails respond at the new address.

   a) Ensure that the **Burn** option has been set when changing the IP address.

   b) Ensure that the subnet masks for both the instrument and PC have been correctly configured so that data from the DataWeb can be seen by the PC. If unsure then set the default Subnet Mask setting to 255.0.0.0

SUBNET MASK & GATEWAY SETTINGS - DIRECT CONNECTION TO A PC

For direct connection to a single instrument or when connecting a PC to a stand-alone network of instruments then set the instrument subnet mask to the default setting of the PC.

When configuring a series of instruments to run on a stand-alone network it is important that the subnet mask settings are such that each instrument can see data from all units. A default configuration for the instrument subnet mask is 255.0.0.0

WEB BROWSER SETTINGS - MICROSOFT INTERNET EXPLORER 5 OR GREATER.

Java must be enabled:-

Tools | **Internet** | **Advanced** | **Microsoft VM:**

All tick boxes under this heading should be ticked.

Java console enabled (requires restart) - active
Java logging enabled - active
JIT compiler for virtual machine enabled (requires restart) - active

On the **Windows 98** Operating System:
Sun java should be disabled in favour of Microsoft Java VM.
Netscape Navigator: To be advised.

PROBLEMS WITH PROXY SERVERS

It is possible when using some proxy server software that the main instrument web page can be observed but no data or configuration parameters are displayed. In order to enable instrument operations the web browser has to be configured to make a direct connection.

For Windows Explorer 5 and greater
1) Start Web Browser.
2) **Tools ® Internet Options ® Connections ® LAN Settings**
Proxy Server
Disable any options related to the Proxy Server

Chapter 12 - Temperature Monitoring

This chapter describes how to configure the DataWeb 4000 for temperature monitoring applications.

Features

- Thermocouples
- Thermistor & (CJC)
- Sensor Interface Circuit - Thermistor
- CJC Installation (Cold Junction Compensator)
- RTD - Resistive Temperature Device (PT100)
- Sensor Interface Circuit - 2 wire RTD
- Sensor Interface Circuit - 3 wire RTD --RDF Cryogenic Sensor

THERMOCOUPLE

The following table details the analog channel range settings to be used to obtain the most accurate readings over the specified sensor ranges.

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

Ensure that the correct sensor polarity is used such that +V = Pin 3 and -V = Pin 2. If the sensor is incorrectly installed then the DataWeb will show misleading results. The Thermocouple measurements will only operate correctly when a CJC Thermistor is installed.

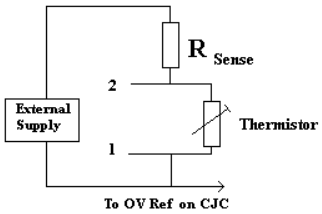
THERMISTOR & (CJC)

The DataWeb supports the direct connection of a range of thermistors to the analog input channels and also utilises a thermistor as the CJC (Cold Junction Compensator) for thermocouple measurements.

CJC Default Configuration - The default configuration for the CJC thermistor is

	Default settings for CJC.
A =	Excit Voltage (2.5) - Actual level measured between pins 1 & 4 analog input
B =	Sense resistor value - 1 KOhm or greater
C =	Sensor Resistance at T(0)
D =	Temperature T(0) --- T(0) typically 25 Deg/C
E =	Beta Value (typical 3988)
F =	Offset (Correction Factor)

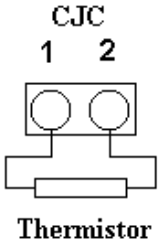
SENSOR INTERFACE CIRCUIT - THERMISTOR



The sense resistor should be the same resistance as the Thermistor and nominally taken as the resistance sensor at 25 Deg C. For 10 KW sensor use 10 KΩ precision resistor 0.1 % tolerance.

The External Reference negative supply connection and Thermistor lead connected to -Vin input of the Analoge Input have to be connected to the 0V Ref of the CJC for best results.

CJC INSTALLATION (COLD JUNCTION COMPENSATOR)



Install a 10 KOhm precision thermistor to act as the CJC

A CJC thermistor has to be fitted into the 2 pin terminal on the front of the instrument in order to measure thermocouple sensors. Note. Thermocouple measurements will not be correct without the CJC being fitted.

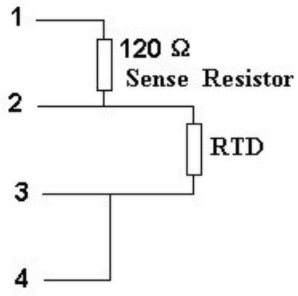
The recommended CJC thermistor is Farnell part number151-591 R-T Curve matched device The above configuration parameters are pre-set within the instrument. Should any other sensor be used then care must be taken to enter the correct parameters from the sensor data sheet.

The Offset parameter allows the CJC to be moved by a fixed amount. The offset value is in Deg/C. Example to remove 10 Deg/C from the CJC reading then Offset = -10

RTD - RESISTIVE TEMPERATURE DEVICE

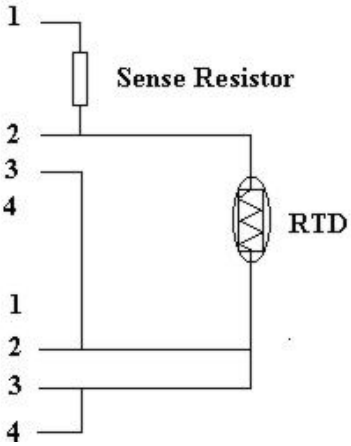
The DataWeb supports direct connection to standard 2 and 3 wire PT100 sensors and for Cryogenic applications the RDF (LN2) sensor. In order to minimise the self heating effects of the sensor a sense resistor of 1 K Ohm or greater should be used.

SENSOR INTERFACE CIRCUIT - 2 WIRE RTD



For 2 wire RTD measurements it is recommended that a 1 KW precision sense resistor be fitted. For higher accuracy readings then a lower value sense resistor can be used but care should be taken to minimise the self heating effects of the sensor. Sense resistor values of < 500 Ohms should be avoided where possible

SENSOR INTERFACE CIRCUIT - 3 WIRE RTD (PT 100) & RDF CRYOGENIC SENSOR



It is recommended that a **1 KW** sense resistor be used for standard RTD measurements. To improve the measurement accuracy a lower value sense resistance can be used but care should be taken to minimise the self heating effects.

The Cryogenic RDF sensor should be fitted as shown for the 3 wire RTD configuration. It is possible for this sensor to utilise a l00 Ohm precision sense resistor when measuring liquid Nitrogen or Oxygen as heating effects are negligible.

Ensure care is maintained measuring the lead resistances for these circuits.