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Product Guide

Orion 4 Channel Monitor - MQTT

Contents

Introduction

1.1 The Orion 4 Channel Monitor

The RCS Orion 4 Channel monitor has been designed as a cost effective solution to allow the monitoring of temperature sensors and other transducers which, due to location, have until now been considered too costly to integrate into main site monitoring regimes.

The Orion 4 Channel monitor is easily integrated with RCS or other third party systems. Ethernet connectivity is standard, with a Wi-Fi option available when the installation of a wired network is either not feasible or not cost effective.

The Orion 4 Channel Monitor provides the ability to:-

- Monitor four analogue channels of either temperature, voltage or current
- Ability to mix and match the four channels. e.g.:
    - Channel 1 = PT1000 Temperature sensor
    - Channel 2 = PT1000 Temperature sensor
    - Channel 3 = 0-10vdc Humidity sensor
    - Channel 4 = 4-20mA Pressure transducer
- Monitor two digital inputs for items such as compressor faults, door open states etc.
- Monitor pulse inputs from energy meters etc via the digital inputs
- Allow users to set individual channel alarm set points, confirmation periods and defrost recovery periods.
- Allow users to enter freeform text to identify the monitor unit E.G. “Frozen Pizza Cabinet”

- Allow users to enter freeform text to identify each channel and each alarm E.G. “Air On 1”
- Retain on-board data logs, thus removing any compliance issues if a network issue occurs.

Subsequent pages of this document detail all aspects of configuring the Orion 4 Channel monitor exactly to your requirements.

1.2 Configuration

The Orion 4 Channel monitor is simply configured by connecting a CAT5 patch cable between the Ethernet port of the unit and a laptop / PC with a static IP address in the range of 192.168.0.xxx.

Once the laptop / PC is configured, a web browser session can be started and the user can navigate to the default IP address of the Orion 4 Channel monitor which is 192.168.0.101. (Type - http://192.168.0.101)

The web pages that will be displayed allow the user to fully configure all IP settings and specify the configuration of the four analogue and two digital inputs.

Once this has been completed the Orion 4 Channel monitor is ready to be installed.

1.3 LED Status Information

Power LED (Green) – This indicator will be illuminated constantly when the 5Vdc power supply is present.

System status LED (Tri-Colour) – This indicator is green when not connected as a client, red when connected as a client and is sending its message and amber when it is connected as a client and is listening only.

1.4 Ordering Information

Part No.	Product Name	Description
OM0111	Orion 4 Ch Monitor	Channels 1-4 = Temperature, digital inputs standard, IP Comms
OM0211	Orion 4 Ch Monitor	Channels 1-3 =Temperature, Channel 4 = 4-20Ma, digital inputs standard, IP Comms
OM0311	Orion 4 Ch Monitor	Channels 1-2 =Temperature, Channels 3-4 = 4-20Ma, digital inputs standard, IP Comms
OM0411	Orion 4 Ch Monitor	Channel 1 =Temperature, Channels 2-4 = 4-20Ma, digital inputs standard, IP Comms
OM0511	Orion 4 Ch Monitor	Channels 1-4 = 4-20Ma, digital inputs standard, IP Comms
OM0611	Orion 4 Ch Monitor	Channels 1-3 =Temperature, Channel 4 = 0-10Vdc, digital inputs standard, IP Comms
OM0711	Orion 4 Ch Monitor	Channels 1-2 =Temperature, Channels 3-4 = 0-10Vdc, digital inputs standard, IP Comms
OM0811	Orion 4 Ch Monitor	Channel 1 =Temperature, Channels 2-4 = 0-10Vdc, digital inputs standard, IP Comms
OM0911	Orion 4 Ch Monitor	Channels 1-4 = 0-10Vdc, digital inputs standard, IP Comms
OM1011	Orion 4 Ch Monitor	Channels 1-3 =Temperature, Channel 4 = 0-6Vdc, digital inputs standard, IP Comms
OM1111	Orion 4 Ch Monitor	Channels 1-2 =Temperature, Channels 3-4 = 0-6Vdc, digital inputs standard, IP Comms
OM1211	Orion 4 Ch Monitor	Channel 1 =Temperature, Channels 2-4 = 0-6Vdc, digital inputs standard, IP Comms
OM1311	Orion 4 Ch Monitor	Channels 1-4 = 0-6Vdc, digital inputs standard, IP Comms
OM1411	Orion 4 Ch Monitor	Channels 1-3 =Temperature, Channel 4 = 0-5Vdc, digital inputs standard, IP Comms
OM1511	Orion 4 Ch Monitor	Channels 1-2 =Temperature, Channels 3-4 = 0-5Vdc, digital inputs standard, IP Comms
OM1611	Orion 4 Ch Monitor	Channel 1 =Temperature, Channels 2-4 = 0-5Vdc, digital inputs standard, IP Comms
OM1711	Orion 4 Ch Monitor	Channels 1-4 = 0-5Vdc, digital inputs standard, IP Comms
OM1811	Orion 4 Ch Monitor	Channels 1-3 =Temperature, Channel 4 = 0-20Ma, digital inputs standard, IP Comms
OM1911	Orion 4 Ch Monitor	Channels 1-2 =Temperature, Channels 3-4 = 0-20Ma, digital inputs standard, IP Comms
OM2011	Orion 4 Ch Monitor	Channel 1 =Temperature, Channels 2-4 = 0-20Ma, digital inputs standard, IP Comms
OM2111	Orion 4 Ch Monitor	Channels 1-4 = 4-20Ma, digital inputs standard, IP Comms

2 Setting up the Orion 4 Channel Monitor

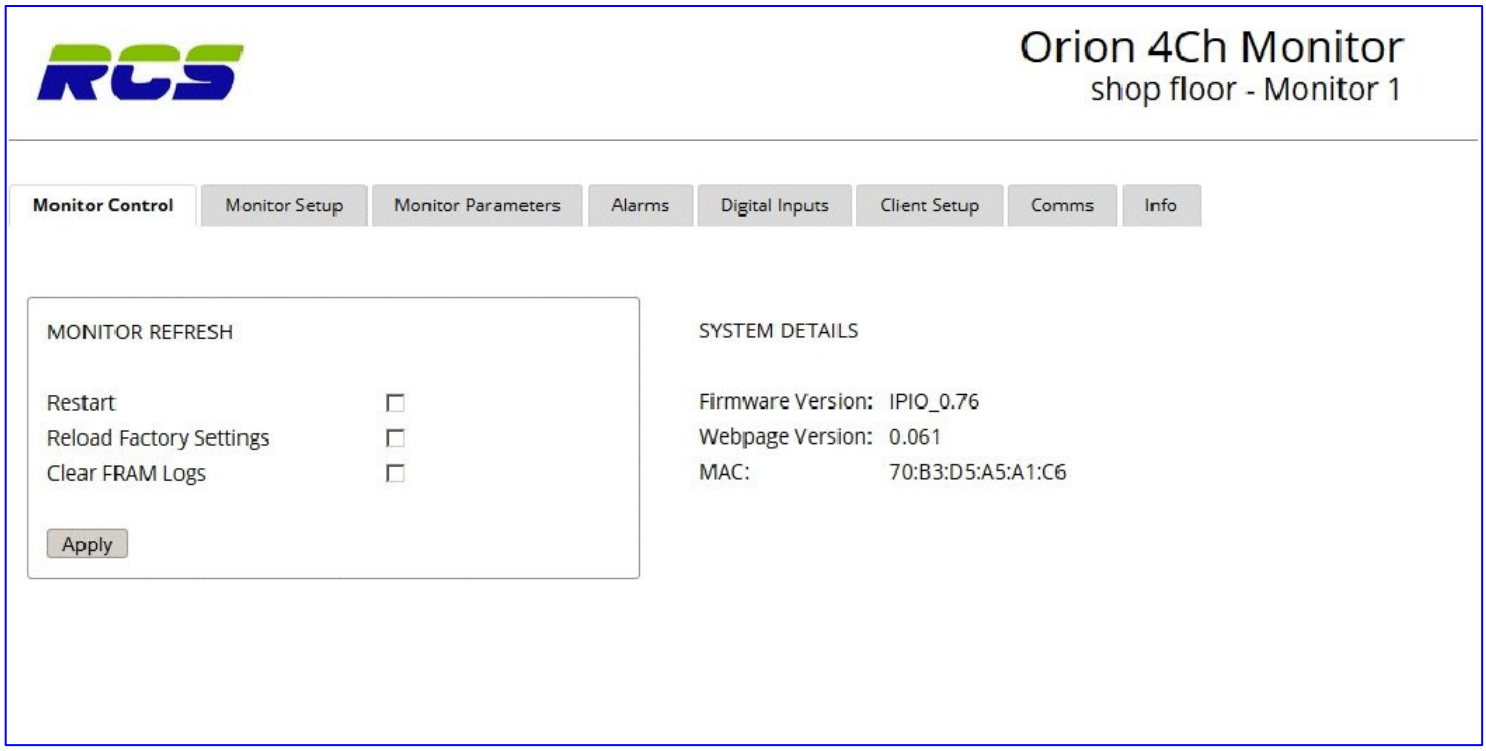
2.1 User Instructions

The Orion 4 Channel monitor has a default IP address of 192.168.0.101. The user can ensure that this address is loaded by pressing the setup button on the side of the Orion 4 Channel monitor on power up for 5 seconds.

Please follow the procedure listed below to be presented with the first Orion 4 Channel Monitor configuration page. (fig. 1)

1. Connect a CAT5 patch lead into the Ethernet port of the Orion Monitor.
2. Connect the CAT5 patch lead into the Ethernet port of the laptop / PC which will be used to configure the GP Gateway.
3. Ensure that the laptop / PC is assigned a static IP address within the range of 192.168.0.*xxx* . NOTE - care should be taken to ensure that this IP address doesn't clash with any existing devices resident on the network.
4. Power the Orion 4 Channel monitor off and on whilst holding the setup button in.
5. A standard web browser session can now be started on the laptop / PC. Type the default IP address of 192.168.0.101 into the browser address bar to display the first Orion 4 Channel Monitor setup screen (fig. 1)

2.2 Fig 1 - Screen Shot of the Monitor Control Page



3 Configuration

The pages that are presented are designed to be very user friendly and provide all configuration options in a tabular format. Each aspect of the Orion configuration is contained within its own tab. Each page provides an "Apply" button which must be clicked when the user has completed the configuration on that page before moving to any subsequent pages.

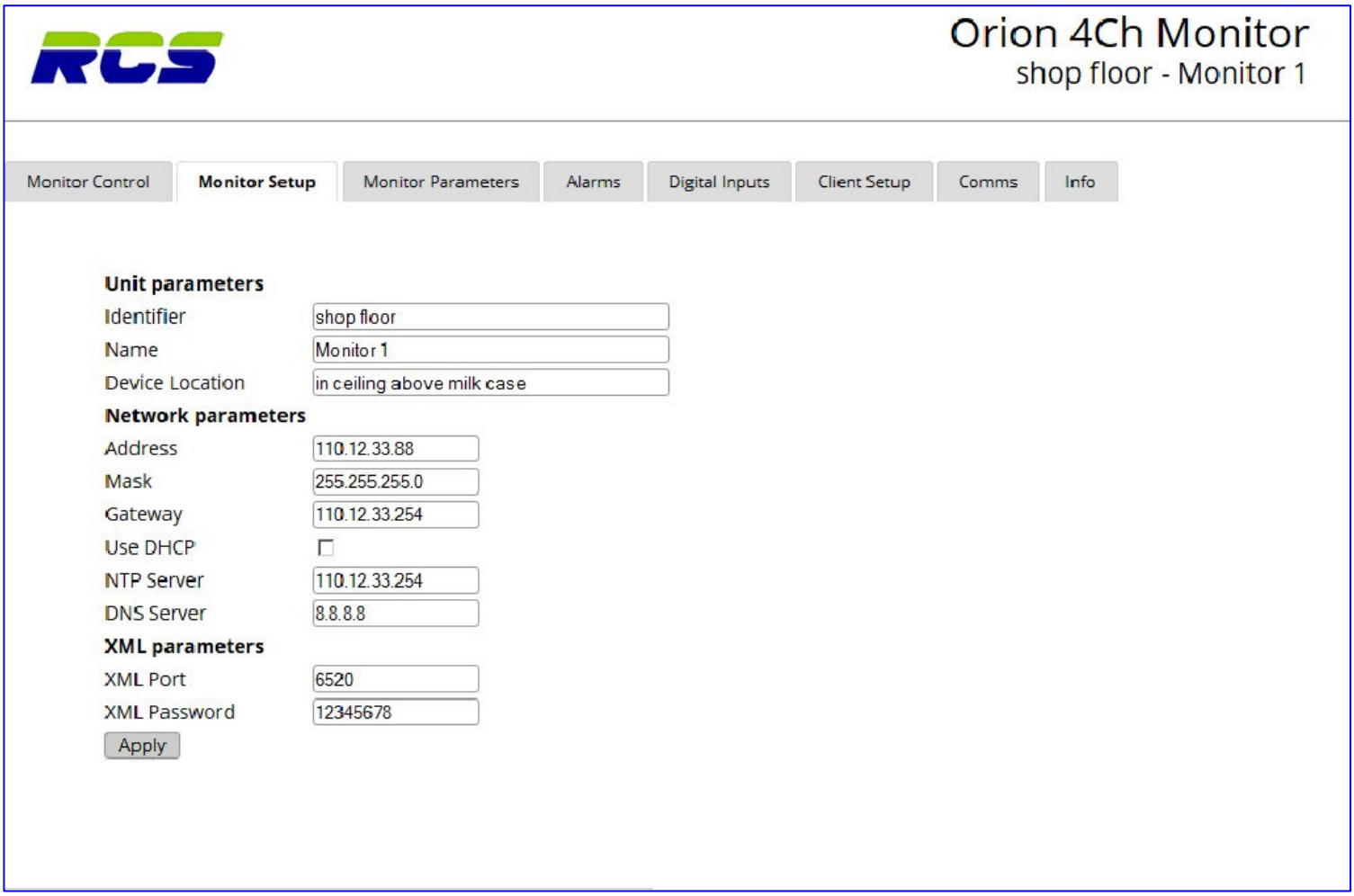
The first tab to be displayed will be "Monitor Control" (Fig 1) containing the following options / information:-

3.1 Monitor Refresh

If either the "restart", "Reload Factory Settings" or Clear FRAM logs boxes are checked and "Apply" is subsequently clicked these actions will immediately take effect, and the Orion 4 Channel Monitor will restart.

The unit's firmware version, Webpage revision and MAC address information is also provided on the Monitor Control tab.

3.2 Fig 2 - Screen Shot of the Monitor Setup Page



The second tab is "Monitor Setup" (Fig 2) containing the following options / information:-

3.3 Unit Parameters

Identifier = Fixture number of the device that the monitor is attached to. This value will appear as the id attribute of the Unit element in the XML report. E.G.. if set to “123.4” then <Unit name="Frozen Pizza Cabinet" id="123.4">.

Name = Fixture type E.G. “Frozen Pizza Cabinet” or “Multi Deck Dairy Cabinet” etc. This value will appear as the value of the name attribute in the Unit element in the XML report e.g. if set to "Frozen Pizza Cabinet" then <Unit name="Frozen Pizza Cabinet" id="123.4">.

Device Location = A free form text field where the user can enter a useful description of the Orion monitors physical location within the store E.G. “In ceiling above sandwich case” This serves as an aid for any future service calls.

3.4 Network Parameters

To assign the Orion 4 Channel Monitor a static IP address simply click into the desired field and type the required address. If the “use DHCP” field is checked, the Orion 4 Channel monitor will automatically request an IP address from the network DHCP server. Please note:- If DHCP has been selected and the user subsequently wishes to re-enter the configuration page this can be achieved by following the same steps as defined at the start of this document. Any changes should be followed by clicking the “Apply” button to save the changes. This action will cause the Orion 4 Channel monitor to restart.

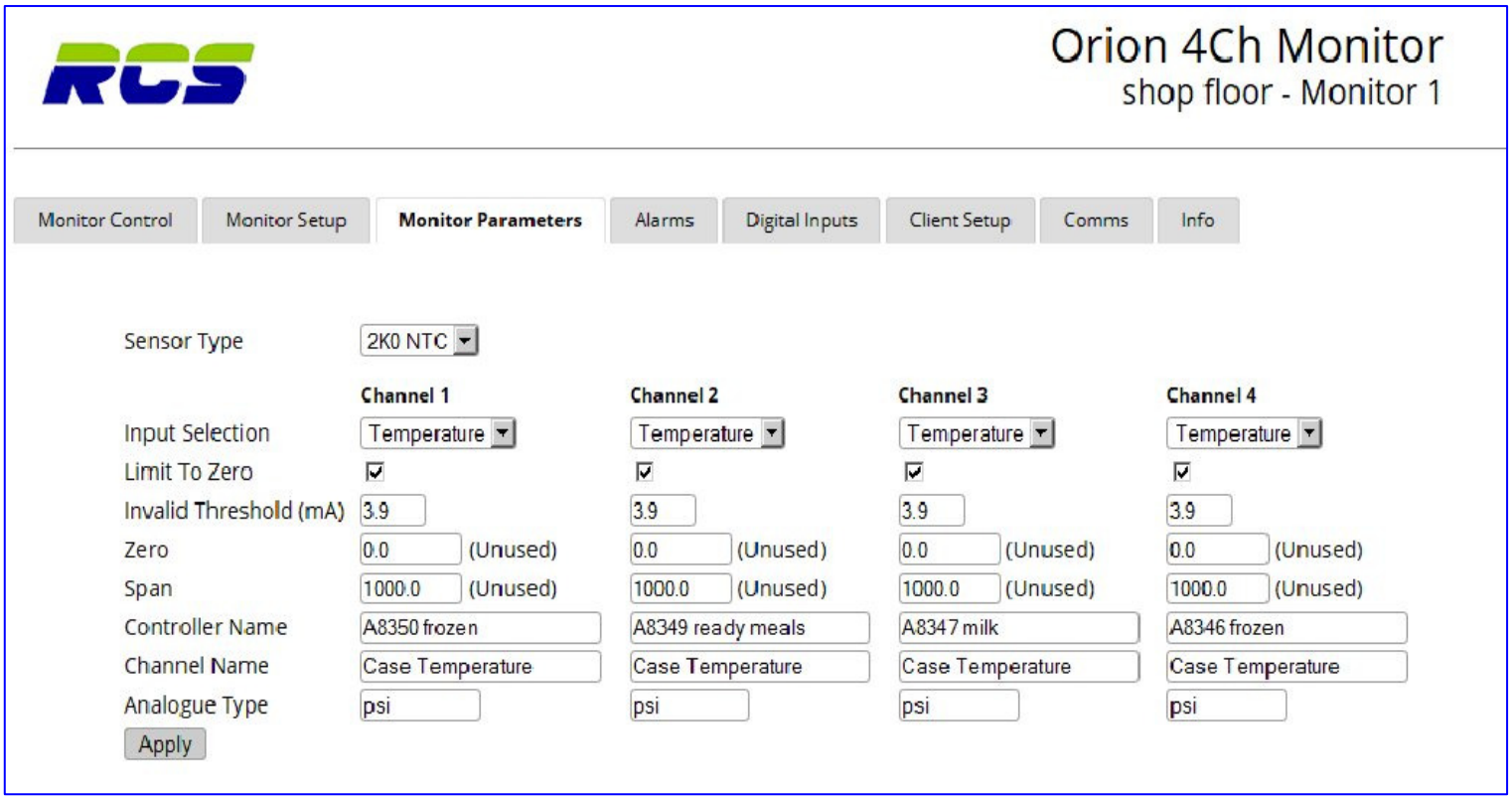
Ensure that the correct network mask, gateway IP address and NTP server IP address are all entered. This information if not known can be requested from your network administrator.

3.5 XML Parameters

The values within the “XML Port” and “XML Password” are automatically populated on power up. Care should be taken if the user wishes to change these values from the defaults. Any changes should be followed by clicking the “Apply” button to save the changes. This action will cause the Orion 4 Channel Monitor to restart

Once the user has configured all necessary parameters on Monitor Setup tab click the “Apply” button to save the new configuration before moving to the next tab.

3.6 Fig 3 - Screen Shot of the Monitor Parameters Page



The third tab is "Monitor Parameters" (Fig 3) containing the following options / information:-

3.7 Monitoring Parameters

Sensor Type = This drop down box allows the user to select which senor type is being used. The default value is 2K0 NTC type. Other options available are – PT1000, 5K NTC, 10K NTC, and 2K2 NTC. Please note that sensor types cannot be mixed on a single monitor.

Channel 1-4 Input Selection = This drop down box allows the user to select which input type the monitor expects to see on each of the 4 channels. The default value is Temperature for each channel. Other options available are 0-20mA, 4-20mA, 0-5Vdc, 0-6Vdc, 0-10Vdc and Disable. Please note that input types can be mixed on a single monitor, The Disable option will prevent any data logging and alarms from being generated for that particular channel.

Limit To Zero = This simple "Tick" box only applies if the user has selected the 4-20mA input type for any of the four channels. If ticked for the relevant channel the value at the bottom of the range I.E. 4mA will be limited to what the user has configured within the "Channel 1-4 Zero" field (see below). As an example if ticked and the channel 1-4 zero field is set at 1 then the monitor would return a value of 1 PPM (if used for leak detection) at the bottom of the detectors scale I.E. 4mA. This parameter is available to users to prevent meaningless values such as -5 PPM being returned.

Channel 1-4 Invalid Threshold = This parameter also only applies if the user has selected 4-20mA as the input type for a particular channel. Within this field for the relevant channel, the user can define the value at which the Orion monitor will return "Invalid" via XML and thus indicate that the connected transmitter is either faulty of has become disconnected from the unit.

Channel 1-4 Zero = When channel 1-4 input selection is set as anything other than temperature this is the value that the Orion 4 Channel monitor will return when the electrical input is at the bottom of its stated range. E.G. for a 0-6Vdc transmitter this is the value returned at 0Vdc.

Channel 1-4 Span = When channel 1-4 input selection is set as anything other than temperature this is the value that the Orion 4 Channel monitor will return when the electrical input is at the top of its stated range. E.G. for a 0-6Vdc transmitter this is the value returned at 6Vdc. When the electrical input is between the top and bottom of its range the value returned by the Orion 4 Channel monitor will be computed by linear interpolation between the values set in Channel 1-4 Zero and Channel 1-4 Span.

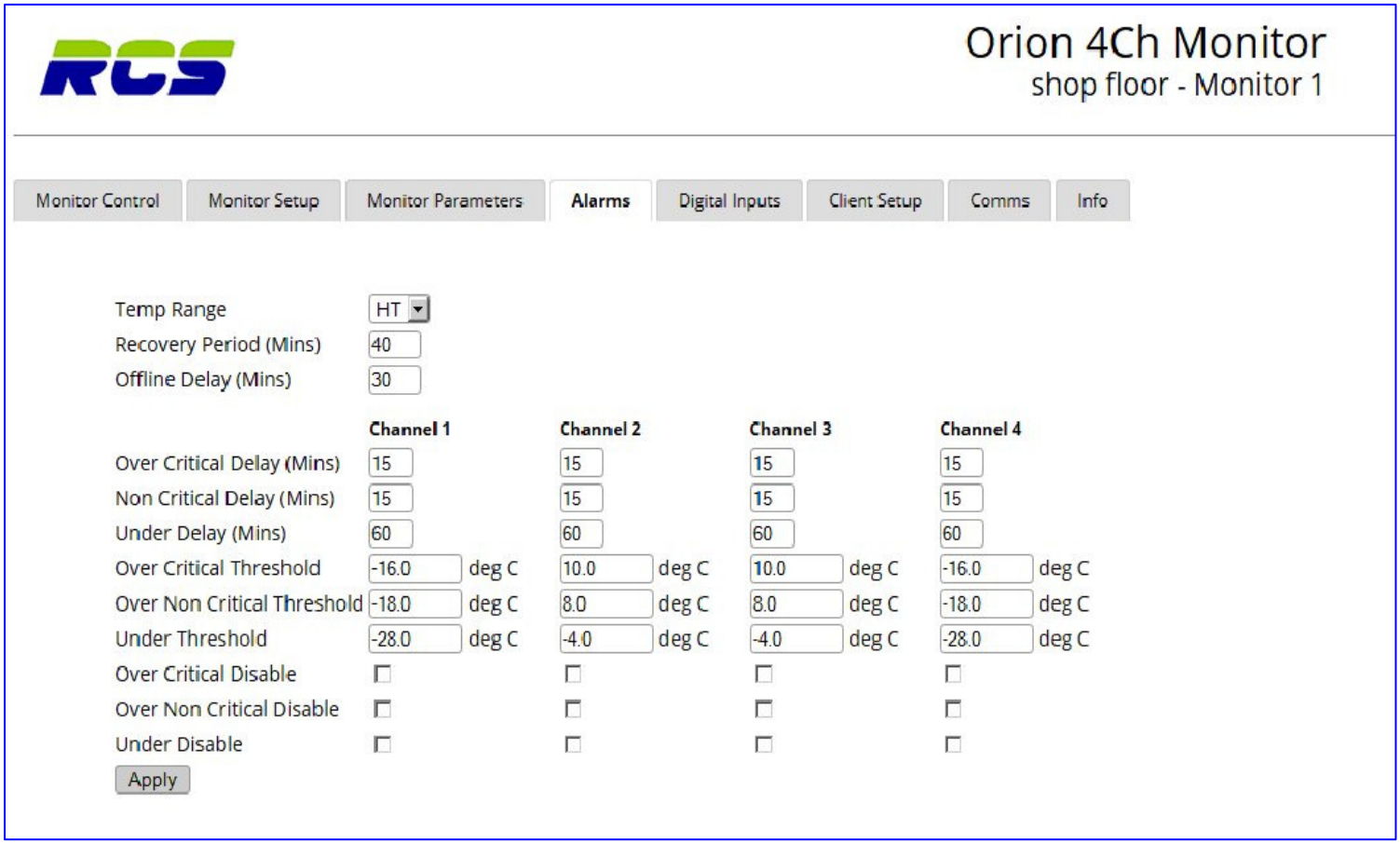
Controller 1-4 Name = This field is free form text and allows the user to assign an individual name to each of the four cahnnels. E.G. Asset A8350 Ice Cream, A8347 Roll in Milk

Channel 1-4 Name = This field allows the user to define what name / label is associated with each of the four channels. This is free form text where the user has a maximum of 40 characters available. This name will appear in the XML returned by the Orion 4 Channel monitor for that particular channel and also as a prefix to any alarms and parameters relevant to that channel.

Channel 1-4 Analogue Type = When channel 1-4 input selection is set as anything other than temperature this is the string that the Orion 4 Channel monitor will return in the "Units" field of the XML. As examples the user could choose to enter PSI, Bar, PPM, Kwh or %. This is free form text where the user has a maximum of 40 characters available.

Once the user has configured all necessary parameters on Monitor Parameter tab click the "Apply" button to save the new configuration before moving to the next tab.

3.8 Fig 4 - Screen Shot of the Alarms Page



The fourth tab is "Alarms" (Fig 4) containing the following options / information:-

3.9 Alarm Parameters

Temp Range = This drop down box simply allows the user to select either LT or HT default settings. By doing so the temperature setpoints, alarm delays etc. will be populated for each channel accordingly. These default settings can if necessary be overwritten later.

Recovery Period = This parameter, which applies to both digital inputs simultaneously allows the user to define another level of alarm delay in addition to the previously stated “Channel 1-4 Alarm Delays”. An example would be if the digital inputs are being used to indicate a defrost state. The value of the recovery period would have to expire in addition to the value of the critical and non critical alarm delays before the Orion 4 Channel monitor would indicate an alarm. The value is entered in minutes and has a default of 40 with a settable range between 0-120.

Offline Delay = This delay allows the user to define a time period before a faulty or disconnected sensor on any of the four channels is reported as an alarm. The value is entered in minutes and has a default of 30

Channel 1-4 Over Critical Delay = This is the period for which an individual channels measured value must be continually above the relevant critical alarm threshold before the Orion 4 Channel monitor reports an alarm. The value is entered in minutes and has a default of 15 with a settable range between 0-240.

Channel 1-4 Over Non Critical Delay = This is the period for which an individual channels measured value must be continually above the relevant non critical alarm threshold before the Orion 4 Channel monitor reports an alarm. The value is entered in minutes and has a default of 15 with a settable range between 0-240

Channel 1-4 Under Delay = This is the period for which an individual channels measured value must be continually below the relevant under alarm threshold before the Orion 4 Channel monitor reports an alarm. The value is entered in minutes and has a default of 60 with a settable range between 0-240

Channel 1-4 Over Critical Threshold = This is the value for which an individual channels measured value must be continually above for the period of the over critical alarm delay period before the Orion 4 Channel monitor reports a critical over alarm. Please note this is only relevant if the associated channels CRITICAL disable box is NOT ticked. The HT default for this parameter is 10.0 deg C and the LT IS -16.0 Deg C.

Channel 1-4 Over Non-Critical Threshold = This is the value for which an individual channels measured value must be continually above for the period of the over non critical alarm delay period before the Orion 4 Channel monitor reports a non critical over alarm. Please note this is only relevant if the associated channels NON CRITICAL disable box is NOT ticked. The HT default for this parameter is 8.0 deg C and the LT IS -18.0 Deg C.

Channel 1-4 Under Alarm Threshold = This is the value for which an individual channels measured value must be continually below for the period of the under alarm delay period before the Orion 4 Channel monitor reports an under alarm. Please note this is only relevant if the associated channels UNDER Alarm disable box is NOT ticked. The HT default for this parameter is -4.0 deg C and the LT IS -28.0 Deg C.

Channel 1-4 Over Critical Alarm Disable = These simple tick boxes allows the user to disable individual channels over critical alarms. If ticked the Orion 4 Channel monitor will suppress the relevant channels over critical alarm and not return the associated parameters via XML. The default is for all channels is unticked, (Enabled)

Channel 1-4 Over Non Critical Alarm Disable = These simple tick boxes allows the user to disable individual channels over non critical alarms. If ticked the Orion 4 Channel monitor will suppress the relevant channels over non critical alarm and not return the associated parameters via XML. The default is for all channels is unticked, (Enabled)

Channel 1-4 Under Alarm Disable = These simple tick boxes allows the user to disable individual channels under alarms. If ticked the Orion 4 Channel monitor will suppress the relevant channels under alarm and not return the associated parameters via XML. The default is for all channels is unticked. (Enabled)

Once the user has configured all necessary parameters on Alarms tab click the “Apply” button to save the new configuration before moving to the next tab.

3.10 Fig 5 - Screen Shot of the Digital Inputs Page

The fifth tab is “Digital Inputs” (Fig 5) containing the following options / information:-

3.11 Digital Input Parameters

Pulse Counting Period = If the usage of either digital input (1 and / or 2) is set to “pulse count” then this is the period in minutes over which pulses are counted. The default value is 3600

Digital Input 1-2 Name = This field allows the user to define what name / label is associated with each of the 2 digital inputs. This is free form text where the user has a maximum of 40 characters available. This name will appear in the XML returned by the Orion 4 Channel monitor for that particular digital input and also as a prefix to any alarms and parameters relevant to that digital input.

Digital 1-2 Usage = This drop down list allows the user to select the basic usage of each digital input (1 and / or 2) The following options are available:-

- None = Digital input states ignored
- Standard = Digital inputs operate normally according to the other relevant defining parameters set by the user.
- Suppress Over = All over alarm events are ignored whilst the digital input is asserted.
- Suppress Under = All under alarm events are ignored whilst the digital input is asserted.
- Suppress Both = All over and under alarm events are ignored whilst the digital input is asserted.
- Accumulate = The relevant digital input is used to count pulses according to the other relevant defining parameters set by the user.

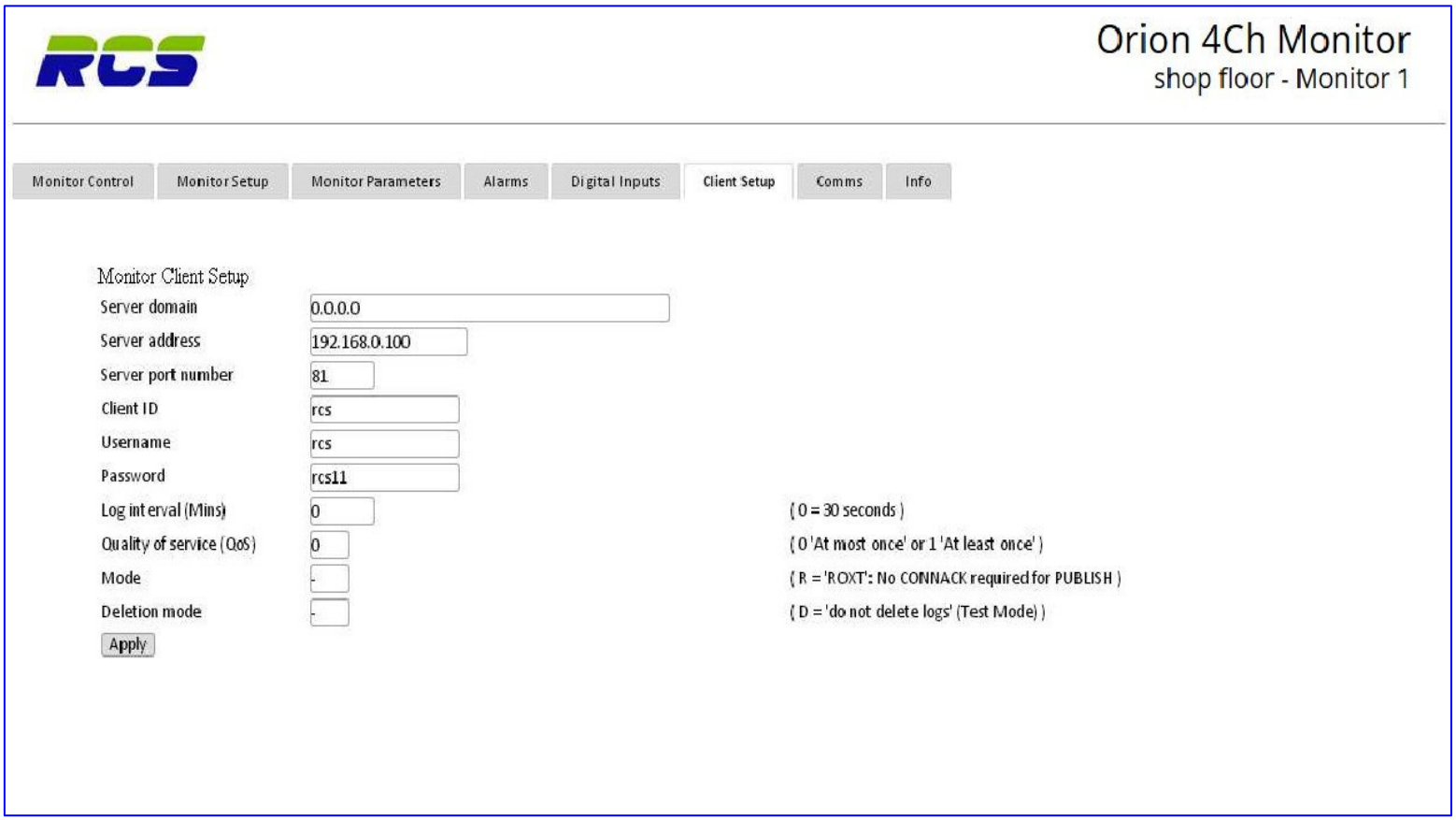
Digital Input 1-2 Invert = Simple tick box that allows the user to swap the logic of each digital input. Default state is asserted when contact is closed. If ticked the Orion 4 Channel monitor assumes that the input is asserted when open.

Digital Input 1-2 Asserted String = This is free form text where the user has a maximum of 12 characters available. This name will appear in the XML returned by the Orion 4 Channel monitor for that particular digital input when asserted. An example would be if the digital input Name was set to Door State, this might be "Door Open"

Digital Input 1-2 Deasserted String = This is free form text where the user has a maximum of 12 characters available. This name will appear in the XML returned by the Orion 4 Channel monitor for that particular digital input when deasserted. An example would be if the digital input Name was set to Door State, this might be "Door Closed"

Once the user has configured all necessary parameters on Digital Inputs tab click the "Apply" button to save the new configuration before moving to the next tab.

3.12 Fig 6 - Screen Shot of the Client Setup Page



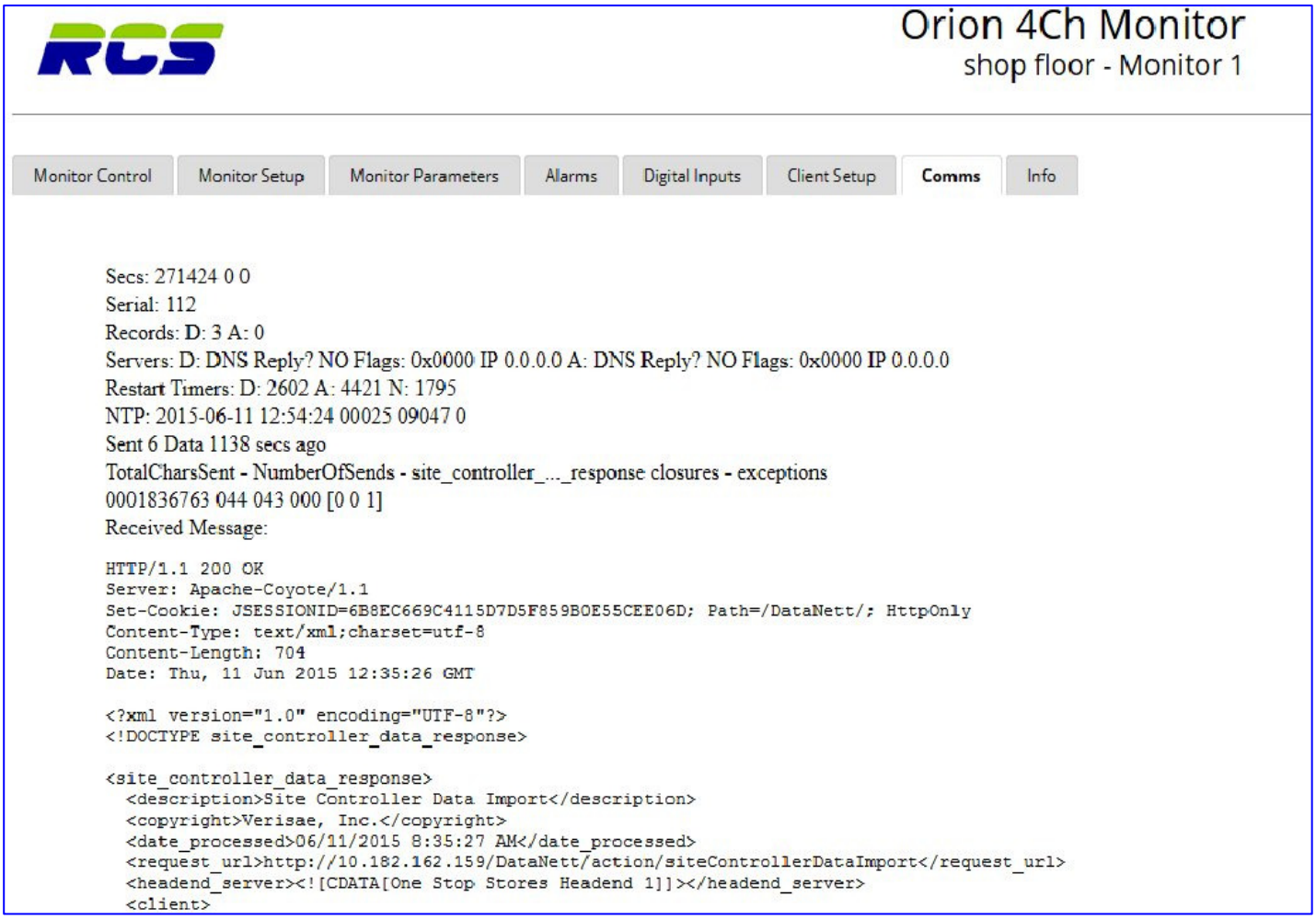
The sixth tab is "Client Setup" (Fig 6) containing the following options / information:-

3.13 Client Parameters

The Client Setup page of configuration (Page 6) allows the user to define all necessary parameters for the Orion monitor to directly communicate to the remote monitoring bureau servers.

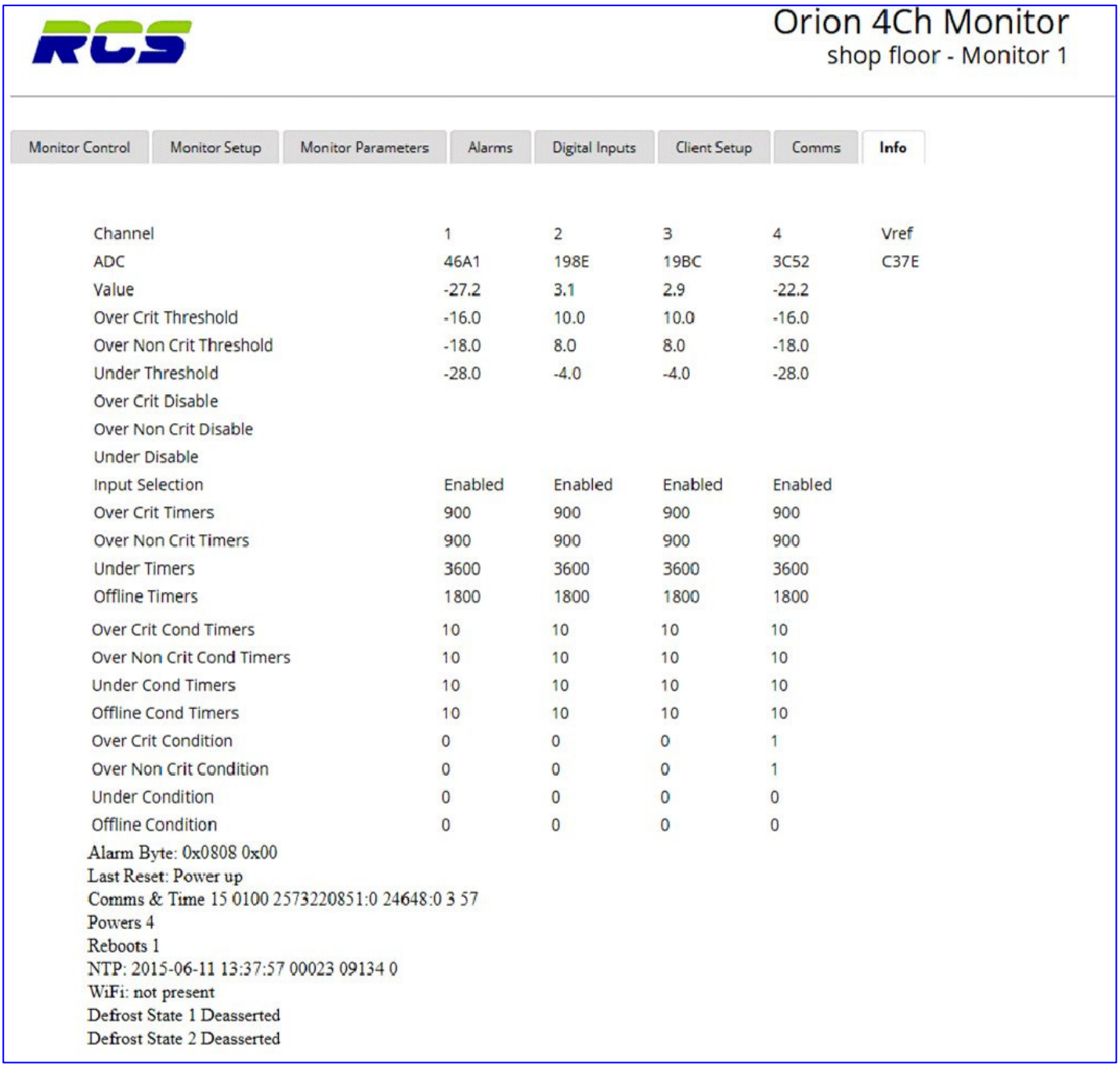
Great care should be taken to ensure each field within this page is correctly entered in accordance with the instructions provided by your chosen bureau provider.

3.14 Fig 7 - Screen Shot of the Comms Page



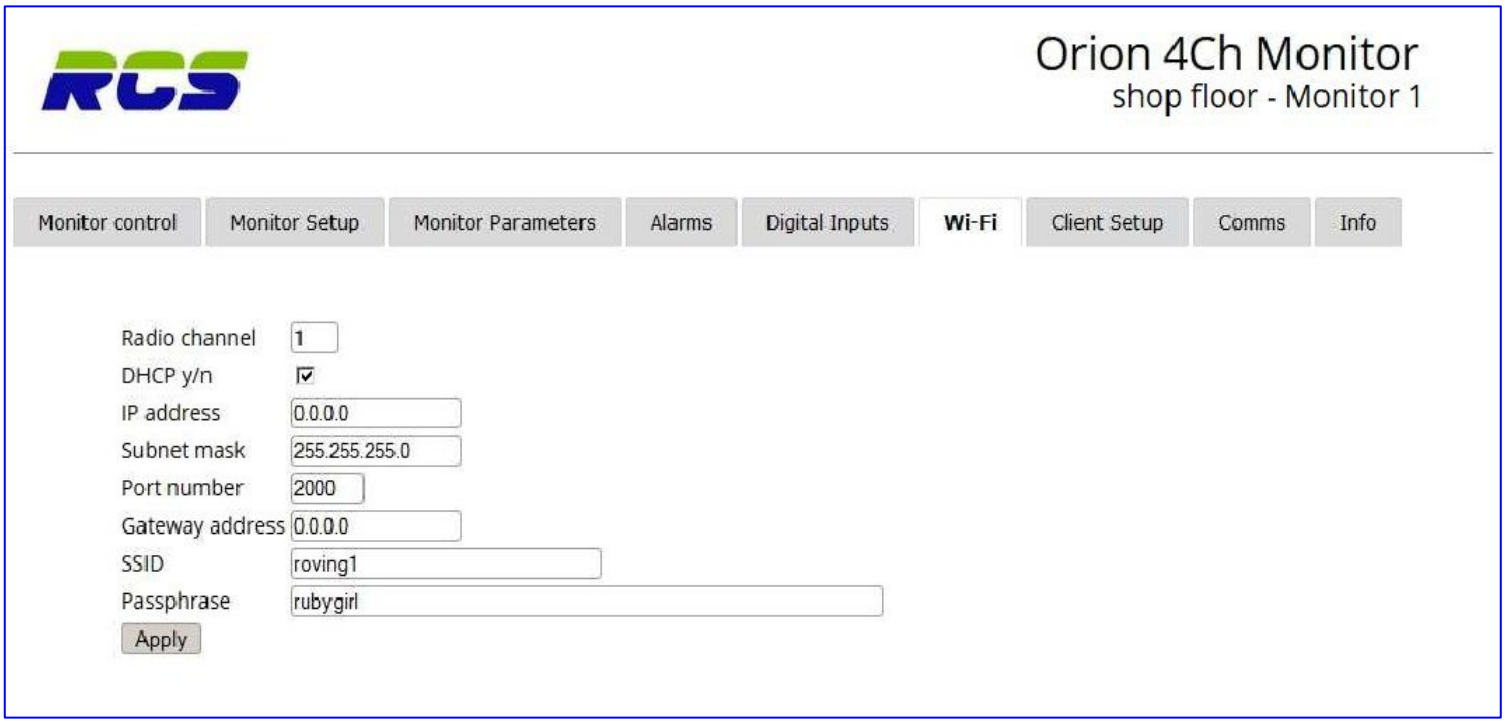
The seventh tab is “Comms” (Fig 7) This page provides useful information regarding the Orion Monitors communication to the remote bureau. You may be asked to provide this information in the event of communication problems.

3.15 Fig 8 - Screen Shot of the Info Page



The eighth tab is “Info” (Fig 8) This page provides at a glance useful information regarding the Orion Monitors analogue and digital input states, alarm thresholds and delay timers. This is particularly helpful when commissioning the monitor and the link to the remote bureau is yet to be established in allowing the user to confirm that temperature sensors for instance are correctly reporting.

3.16 Fig 9 - Screen Shot of the Wi-Fi Page



If the unit purchased is a standard (wired) Ethernet version (Not Wi-Fi) then the Wi-Fi page of the configuration will NOT be displayed as per Fig 9 above, Otherwise the following parameters are available. Please refer to your network administrator if unsure of any settings.

3.17 Wi-Fi Parameters

Radio Channel = This field allows the user to correctly define the Wi-Fi channel being used.

DHCP = Simple tick box that allows the user to select if the Wi-Fi IP address is automatically requested from the network DHCP server. The default setting is ticked

IP Address = This field allows the user to enter the IP address to be used for Wi-Fi communication.

Subnet Mask = This field allows the user to enter the network subnet mask associated with the Wi-Fi network.

Port Number = This field allows the user to define the port number being used by the Wi-Fi network.

Gateway Address = This field allows the user to enter the WI-Fi system gateway address.

SSID = This allows the user to enter the name of the Wi-Fi network to be used.

Passphrase = This field allows the user to enter the passcode for the selected SSID

4 Specification

Ethernet Interface:	10/100 Base-T.
External Power supply: (Supplied)	
	AC 240v 50/60Hz <0.2A
	DC 5V ± 5% <0.5A
EMC:	EN 55014-1:2006 A2
Weight:	85 Grams (Excluding PSU and WI-Fi anntenna)
Size:	110mm (L) x 57mm (W) x 26mm (D) – Inclusive of mounting flanges.
Ventilation:	No requirement for forced air cooling.
Operating temperature range:	+5 ˚C to +50 ˚C
Operating Humidity:	80% Maximum
Class 2 Insulation:	No protective earth is required.
Product Origin:	Designed and manufactured in the UK

Dimensions

5 Revision History

Revision	Date	Author	Amendments	Comments
First Draft (1.0)	01/07/2014	SRL	First Draft	Issued for internal review
2.0	22/06/2015	SRL	Part Codes updated, Photography amended New Screen Shots	Issued
3.0	14/12/2016	SRL	Screen shots amended Text amendments / Contact details	Issued

6 Disclaimer

To allow for design and specification improvements, the information contained within this document is subject to change at any time without prior notice. RCS Energy Management shall not be liable for any errors or omissions, for incidental or consequential damages either directly or indirectly resulting from the misuse of this product or associated document.

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