Integrated Monitoring and Control System
iMAC2 Controller Web Interface Manual

Version: 1, May 2016
Designed and manufactured in Australia by Ampcontrol Pty Ltd
WARNING!  
The **warning** symbol highlights a potential risk of **injury or death**.
Please share these warnings with other operators.

CAUTION!  
The **caution** symbol highlights a potential risk of **damage to equipment**.
Please share these cautions with other operators.

NOTE  
The **note** symbol highlights **key information**.
Please share these notes with other operators.

ENVIRO  
The **enviro** (environmental) symbol highlights areas which may have an impact on the surrounding **fauna and/or flora**.
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Before You Begin

Thank you for purchasing the Ampcontrol iMAC System.

WARNING!

In the interests of safety and correct equipment operation, please take the time to read and understand the content in this manual.

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1 DOCUMENT SCOPE

1.1 Document Scope
This document is intended to provide a detailed explanation of the iMAC2 Controller’s Web Interface that is accessible via the Controller’s Ethernet port.

This document is not intended to provide information on the operation of the overall iMAC System, individual modules or instruction on programming the iMAC2 Controller or modules. Please refer the relevant supplementary documents for this information.

1.2 Supplementary Documents
The iMAC2 Controller Web Interface Manual is intended to be read in conjunction with the following documents:

1.2.1 System Documentation
- IMACB009 iMAC2 System User Manual
- IMACB010 iMAC2 Controller Ethernet Communications Manual
- IMACB153 iMAC Controller Serial Communications Manual
- IMACB094 iMAC System Installation Requirements
- IMACB155 iMAC SIL Emergency Stop Qualification
- IMACB005 iMAC Module Programming Manual

1.2.2 Module Documentation
- IMACB003 iMAC RO4 Module Technical Datasheet
- IMACB018 iMAC LPU Module Technical Datasheet
- IMACB020 iMAC DI8 Module Technical Datasheet
- IMACB045 iMAC IIM Module Technical Datasheet
- IMACB046 iMAC DI4 Module Technical Datasheet
- IMACB047 iMAC EOL/MEOL Module Technical Datasheet
- IMACB060 iMAC LED4 Module Technical Datasheet
- IMACB061 iMAC SSW Module Technical Datasheet
- IMACB062 iMAC SQM Module Technical Datasheet
- IMACB066 iMAC AIM Module Technical Datasheet
- IMACB067 iMAC RTD1 Module Technical Datasheet
- IMACB141 iMAC ARM Module Technical Datasheet
- IMACB142 iMAC CRM Module Technical Datasheet
- IMACB143 iMAC EMM Module Technical Datasheet
- IMACB144 iMAC GRM Module Technical Datasheet
- IMACB146 iMAC IRK Keypad Technical Datasheet
- IMACB147 iMAC PIM Module Technical Datasheet
- IMACB148 iMAC SIM-G Module Technical Datasheet
- IMACB149 iMAC SIM-G2 Module Technical Datasheet
- IMACB150 iMAC SIM-T Module Technical Datasheet
- IMACB151 iMAC MLB Barrier Technical Datasheet
- IMACB152 iMAC SLB Barrier Technical Datasheet
- IMACB154 iMAC SIM-P Module Technical Datasheet
2 INTRODUCTION & OVERVIEW

The iMAC2 Web Interface allows the user to remotely access the information stored within the iMAC2 Controller. This includes live data, event and data logs, Controller settings and module information.

The ease of remote access to the detailed information within the iMAC2 Controller vastly improves the process of system fault finding. In particular, it allows Ampcontrol Service Personnel remote access to the iMAC equipment, providing the opportunity for off-site remote support.

The following sections of this document will explain the use of the individual facets of the iMAC2 Web Interface. Each of these sections relates to an individual view in the Web Interface. These views are selected using the tabs down the left side of the web interface home page.

The selectable views available from the Web Interface home page are:

- Live Resistance (default)
- Live Data
- Data Logs
- Event Log
- Controller Info
- Controller Settings
- Controller Mimic
- Download Logs
- About

The interface has a number of features that are common to all views. These are identified in Figure 2.1 by numbered circles. Items identified by these numbered circles are explained in further detail in the following sub-sections.

---

**Figure 2.1: iMAC2 Controller Web Interface Layout – Overview**
2.1 Connecting to the iMAC2 Web Interface

In order to connect to the iMAC2 Controller’s Web Interface, the user must type the IP address of the Controller that they wish to connect to into their computer’s web browser’s address bar. To view the Web Interface, the computer that is accessing the Controller must be connected to the same network that the Controller is connected to.

The iMAC2 Web Interface has been designed to operate on the Google Chrome web browser and this is the browser that is recommended to be used when viewing the iMAC2 Web Interface.

2.2 Item 1: Tab Selection Panel

The Tab Selection Panel allows the user to switch between the different views in the iMAC2 Web Interface. To move between tabs, simply mouse over the desired tab and click the left mouse button.

2.3 Item 2: Selected Tab

The name of the tab that is currently selected is displayed here.

2.4 Item 3: Tab Viewing Area

This area of the Web Interface will display the information that is relevant to the tab that has been selected. The area outside of this zone will remain constant.

2.5 Item 4: Name of the Controller

The iMAC2 Controller can be given a tag name using the “Name” setting in the Controller Settings tab. The units tag name is displayed here and will also be displayed on the top of any reports that are exported from the Web Interface.

To allow accurate record tracking, it is advised to ensure that the name of the iMAC2 Controller is unique to the installation site.

2.6 Item 5: IP Address | Controller Temperature | Unit Date and Time

This area of the Web Interface displays:

- The IP Address of the iMAC2 Controller
- The temperature that the iMAC2 Controller is currently operating at
- The date and time, as per the iMAC2 Controller’s Real Time Clock (RTC)
2.7 Item 6: iMAC2 Controller Status Indicators

The iMAC2 Controller Status Indicators display the status of the Web Interface’s network connection to the Controller, the status of the CR output relay and the status of the AR output relay.

Table 1: Web Interface Status Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Colour</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>Green (Flashing)</td>
<td>Browser connection to the iMAC2 Controller’s Web Interface Server is healthy.</td>
</tr>
<tr>
<td></td>
<td>Red (Flashing)</td>
<td>Browser is either not connected to the iMAC2 Controller’s Web Interface or the web interface is currently busy. The information in the Web Interface will not update whilst this indicator is red.</td>
</tr>
<tr>
<td>CR</td>
<td>Green</td>
<td>iMAC2 Controller’s CR relay is closed (energised)</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>iMAC2 Controller’s CR relay is open (de-energised)</td>
</tr>
<tr>
<td>AR</td>
<td>Green</td>
<td>iMAC2 Controller’s AR relay is closed (energised)</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>iMAC2 Controller’s AR relay is open (de-energised)</td>
</tr>
</tbody>
</table>

2.8 Item 7: Help Button

Clicking on the Help Button will open a pop-up window that will provide information on the elements that appear within the Tab Viewing Area. The content displayed in the Help pop-up window varies depending on the selected tab.
3 LIVE RESISTANCE TAB

The Live Resistance tab allows the user to view a graphical representation of the module resistances since the iMAC2 Controller was last powered-up. The Live Resistance tab is split into two separate views that can be navigated between using the buttons located in Area 1 of Figure 3.1.

There are a number of controls that enable the user to inspect certain parts of these resistance graphs. These are explained in Section 3.3.

3.1 EOL | MEOL | Shunt View (Live Resistance Tab)

The EOL | MEOL | Shunt View is the default view and it will be displayed whenever the Live Resistance Tab is clicked on. This view displays two separate graphs. The top graph displays the EOL and MEOL resistances (if present). The bottom graph displays the Shunt Resistance of the iMAC L1 fieldbus.

![iMAC2 Controller Web Interface Layout – Live Resistance Tab (EOL | MEOL | Shunt)](image)

**Figure 3.1:** iMAC2 Controller Web Interface Layout – Live Resistance Tab (EOL | MEOL | Shunt)

### 3.1.1 Item 1: Resistance View Selection

The user is able to switch between the two Live Resistance view options using the pushbuttons depicted in Item 1. To view the EOL | MEOL | Shunt View, click the EOL | MEOL | Shunt Resistance button. To view the Module View, click the Module Resistance button.

### 3.1.2 Item 2: Live Update Button

The two views of the Resistance tab will continually update whilst the “Live Update” button is set to “ON”. If the “Live Update” button is set to off, the graph data will not update.

The “Live Update” function will automatically be switched off when the user pans or zooms on a displayed graph. To enable this function again, it is necessary to click on the “Live Update” button.
3.1.3 Item 3: EOL | MEOL Resistance Graph

The EOL | MEOL Resistance graph displays the cable loop resistance to the iMAC End of Line (EOL) module and the iMAC Monitoring End of Line (MEOL) module – provided these modules are connected to the system. In a typical 3-wire fieldbus installation, the EOL resistance reading will read 47Ω higher than the MEOL resistance reading. The EOL resistance reading is displayed as an orange line. The MEOL resistance reading is displayed as a red line.

It is possible to view the precise average resistance values displayed at a certain part of the graph by hovering the mouse cursor over the desired time. A dot will appear on the graph at the point under the cursor and the corresponding time and resistance values will appear in the legend display box in the upper right corner of the graph.

3.1.4 Item 4: Shunt Resistance Graph

The Shunt Resistance graph displays the iMAC L1 Fieldbus shunt resistance as measured between the controllers L1+ and L1- terminals. The Shunt resistance reading is displayed as an orange line.

It is possible to view the precise average Shunt Resistance values displayed at a certain part of the graph by hovering the cursor over the desired time. A dot will appear on the graph at the point under the cursor and the corresponding time and resistance values will appear in the legend display box in the upper right corner of the graph.

3.1.5 Item 5: Graph Scaling

In addition to the graph controls explained in Sections 3.3, the user is also able to adjust the time and magnitude scaling on the resistance graphs using the drop down boxes in Area 5.

The EOL/MEOL Max drop down box adjusts the magnitude scaling of the EOL | MEOL Resistance Graph. If this box is set to Auto, then the magnitude scaling will be automatic, based upon the highest magnitude displayed in that time period. The options available in the EOL/MEOL Max drop down box are:

- Auto
- 250Ω
- 500Ω
- 1kΩ

The Shunt Max drop down box adjusts the magnitude scaling of the Shunt Resistance Graph. If this box is set to Auto, then the magnitude scaling will be automatic, based upon the highest magnitude displayed in that time period. The options available in the Shunt Max drop down box are:

- Auto
- 2kΩ
- 5kΩ
- 10kΩ
- 20kΩ

The Display Period drop down box adjusts the length of time that is on the displayed graphs. The maximum time period that can be graphed on the iMAC2 Web Interface is 24 hours. Note that only values that have been measured since the iMAC2 Controller was last powered up will be able to be displayed on the resistance graphs. The options available in the Display Period drop down box are:

- 1 Hour
- 4 Hours
- 12 Hours
- 24 Hours
3.1.6 Graph Display Function
The live resistance graphs are made up of 360 data points, each data point is the average of a number of samples. For each averaged sample set, the maximum and minimum samples are retained and displayed in the shaded area above and below the average data point respectively. Resistance samples occur every 100ms, the number of samples averaged per data point for the 1 hour, 4 hour, 12 hour and 24 hour display periods are 100, 400, 1200 and 2400 respectively.

3.2 Module View (Live Resistance Tab)
The Module View displays two separate graphs. The top graph displays the instantaneous loop resistance of all modules that are currently connected to the iMAC L1 fieldbus. The bottom graph displays a graphical representation of the currently selected module over time.

![Image of iMAC2 Controller Web Interface Layout – Live Resistance Tab (Module)](image)

**Figure 3.2: iMAC2 Controller Web Interface Layout – Live Resistance Tab (Module)**

3.2.1 Item 1: Resistance View Selection
The user is able to switch between the two Live Resistance view options using the pushbuttons depicted in Item 1. To view the EOL | MEOL | Shunt View, click the EOL | MEOL | Shunt Resistance button. To view the Module View, click the Module Resistance button.

3.2.2 Item 2: Live Update Button
The two views of the Resistance tab will continually update whilst the “Live Update” button is set to “ON”. If the “Live Update” button is set to off, the graph data will not update. The “Live Update” function will automatically be switched off when the user pans or zooms on a displayed graph. To enable this function again, it is necessary to click on the “Live Update” button.
3.2.3 Item 3: Module Resistance Graph

The Module Resistance bar graph displays the instantaneous cable loop resistance reading for all modules installed on the iMAC L1 fieldbus. Each individual bar represents the cable loop resistance to an individual module. The resistances are displayed in order of iMAC Fieldbus Address along the x-axis.

The colour of the resistance bar indicates the online / offline / clash status of the module:
- If the resistance bar for the module is green, this indicates that the module at this Address is online and responding to the iMAC2 Controller.
- If the resistance bar for the module is orange, this indicates that the module at this Address is clashing with another module at the same address.
- If the resistance bar is red, this means that the iMAC2 Controller has lost communication with the module at this Address. The magnitude of the bar will remain at the last measured cable loop resistance for that module.

**NOTE**

The iMAC2 Web Interface will only show the loop resistances (in red) for modules that have gone offline since the iMAC2 Controller was powered up. If the Controller is powered down and re-energised, only the resistance values for the modules that are online will be displayed on the Module Resistance Graph.

It is possible to view the precise resistance values displayed at a certain Address by hovering the cursor over the desired Address. A dot will appear on the graph at the top of the resistance bar under the cursor and the corresponding Address and resistance values will appear in the legend display box in the upper right corner of the graph.

3.2.4 Item 4: Module n Resistance Graph

The Module Resistance graph displays the historical cable loop resistance for the module Address n that has been selected from the Module Resistance Bar Graph. An Address is selected by hovering the cursor over the desired bar graph Address and left clicking. The historical loop resistance reading for this Address is displayed as an orange line on the Module n Resistance Graph (where n=1, or 2, or 3, …, or 255)

It is possible to view the precise resistance values displayed at a certain part of the graph by hovering the cursor over the desired time. A dot will appear on the graph at the point under the cursor and the corresponding time and resistance values will appear in the legend display box in the upper right corner of the graph.
3.2.5 Item 5: Graph Scaling

In addition to the graph controls that are explained in Section 3.3, the user is also able to adjust the time and magnitude scaling on the module resistance graphs using the drop down boxes in Area 5.

The **All Max** drop down box adjusts the magnitude scaling of the Module Resistance Bar Graph. If this box is set to Auto, then the magnitude scaling will be automatic, based upon the Address with the largest loop resistance. The options available in the All Max drop down box are:

- Auto
- 250Ω
- 500Ω
- 1kΩ

The **Selected Max** drop down box adjusts the magnitude scaling of the Module n Resistance Graph. If this box is set to Auto, then the magnitude scaling will be automatic, based upon the highest magnitude displayed in that time period. The options available in the Shunt Max drop down box are:

- Auto
- 250Ω
- 500Ω
- 1kΩ

The **Display Period** drop down box adjusts the length of time that is displayed on the Module n Resistance Graph. This does not affect the Module Resistance Bar Graph. The maximum time period that can be graphed on the iMAC2 Web Interface is 24 hours. Note that only values that have been measured since the iMAC2 Controller was last powered up will be able to be displayed on the resistance graphs. The options available in the Display Period drop down box are:

- 1 Hour
- 4 Hours
- 12 Hours
- 24 Hours

3.3 Graph Mouse Controls (Common to Both Resistance Tab Views):

3.3.1 Zoom (Click + Drag)

The user is able to zoom in on a specific time period by holding the Shift key and clicking and dragging the mouse in a horizontal motion over the desired part of the graph. During Zooming, the “Live Update” feature of the graph will be turned off.

3.3.2 Pan (Shift + Click + Drag)

The user is able to pan around the graph by clicking on the desired graph and dragging the mouse. During Panning, the “Live Update” feature of the graph will be turned off.

3.3.3 Zoom Extents (Double Click)

Following any panning or zooming activity, it is possible to reset the graph to the standard view by double clicking on the graph space. However, this will not automatically turn the “Live Update” button back on. Alternatively, the desired Display Period can be re-selected using the drop down box which will reset to the desired display period and automatically turn “Live Update” back on.
4 LIVE DATA TAB

The Live Data tab allows the user to view the current contents of every register in the iMAC2 Controller’s Data Point Table. The data from each register is visible in decimal, hexadecimal and binary. Application (SLP) Software Tag Names for each register are also displayed, allowing the content of each register to be easily identified.

**Figure 4.1: iMAC2 Controller Web Interface Layout – Live Data Tab**

4.1 Item 1: Register Address

The Register Address for each row of live data is displayed in both decimal and hexadecimal. These register address correspond directly to the address in the iMAC2 Controller’s Data Point Table.
4.2 Item 2: Register Value

The Register Value for each Register Address is displayed in decimal, hexadecimal and binary. This value is the value that is currently being stored at the relevant address in the iMAC Data Point Table (live data).

The iMAC2 Web Interface offers bit decoding for the binary values that are displayed in the BIN column. In order to display the bit decoding, click on any row within the Live Data Table. For Data Registers where specific bits have significance e.g. the SystemStatus register, the Bit Decoding window will detail what each bit in the register corresponds with.

![NOTE]

The values that appear in the Bit Decoding Pop-up Window do not live update. If a value changes in the data register, click on the row again to refresh the content within the Bit Decoding window.

![Figure 4.2: Bit Decoding Pop-Up Window (Address 256, SystemStatus)]
4.3 Item 3: Tag Name

The Tag Name for each Register Address allows the user to easily identify each register within the iMAC Data Point Table. Available tag names are described in Table 2.

<table>
<thead>
<tr>
<th>Tag Type</th>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA{#}</td>
<td>0 to 255</td>
<td>Content of module data registers</td>
</tr>
<tr>
<td>SystemStatus</td>
<td>256</td>
<td>Content of System Status data register</td>
</tr>
<tr>
<td>STATUS{#}</td>
<td>257 to 511</td>
<td>Content of module status registers</td>
</tr>
<tr>
<td>EolSeriesRes</td>
<td>512</td>
<td>Content of EOL Module resistance register</td>
</tr>
<tr>
<td>RESIST{#}</td>
<td>513 to 767</td>
<td>Content of module resistance registers</td>
</tr>
<tr>
<td>EolShuntRes</td>
<td>768</td>
<td>Content of EOL Shunt resistance register</td>
</tr>
<tr>
<td>ERROR{#}</td>
<td>769 to 1023</td>
<td>Content of module error registers</td>
</tr>
<tr>
<td>SystemControl</td>
<td>1024</td>
<td>Content of SystemControl register</td>
</tr>
<tr>
<td>SysIdLeds</td>
<td>1025</td>
<td>Content of SysIdLeds register</td>
</tr>
<tr>
<td>EolSerNum</td>
<td>1028</td>
<td>Content of EolSerNum register</td>
</tr>
<tr>
<td>L1BlockJustDone</td>
<td>1030</td>
<td>Content of L1BlockJustDone register</td>
</tr>
<tr>
<td>LoopTimeSLP</td>
<td>1032</td>
<td>Content of LoopTimeSLP register</td>
</tr>
<tr>
<td>RollcallControl</td>
<td>1033</td>
<td>Content of RollcallControl register</td>
</tr>
<tr>
<td>RollcallAddress</td>
<td>1034</td>
<td>Content of RollcallAddress register</td>
</tr>
<tr>
<td>RollcallSerNum</td>
<td>1035</td>
<td>Content of RollcallSerNum register</td>
</tr>
<tr>
<td>RollcallModType</td>
<td>1036</td>
<td>Content of RollcallModType register</td>
</tr>
<tr>
<td>RollcallBlickNum</td>
<td>1037</td>
<td>Content of RollcallBlickNum register</td>
</tr>
<tr>
<td>RollcallParam1</td>
<td>1038</td>
<td>Content of RollcallParam1 register</td>
</tr>
<tr>
<td>RollcallParam2</td>
<td>1039</td>
<td>Content of RollcallParam2 register</td>
</tr>
<tr>
<td>RollcallParam3</td>
<td>1040</td>
<td>Content of RollcallParam3 register</td>
</tr>
<tr>
<td>RollcallParam4</td>
<td>1041</td>
<td>Content of RollcallParam4 register</td>
</tr>
<tr>
<td>KeyBoardOut</td>
<td>1042</td>
<td>Content of KeyBoardOut register</td>
</tr>
<tr>
<td>PageTransfer</td>
<td>1043</td>
<td>Content of PageTransfer register</td>
</tr>
<tr>
<td>EOLS_OC</td>
<td>1045</td>
<td>Content of EOLS_OC register</td>
</tr>
<tr>
<td>EOLS_Clash</td>
<td>1046</td>
<td>Content of EOLS_Clash register</td>
</tr>
<tr>
<td>GENBUF{#}</td>
<td>1152 to 1279</td>
<td>Content of General Buffer (Block 1) registers</td>
</tr>
<tr>
<td>Baud Rate/Protocol</td>
<td>1280</td>
<td>Content of Baud Rate/Protocol register</td>
</tr>
<tr>
<td>Stop Bits/Parity</td>
<td>1281</td>
<td>Content of Stop Bits/Parity register</td>
</tr>
<tr>
<td>Slave Addr/RS Mode</td>
<td>1282</td>
<td>Content of Slave Addr/RS Mode register</td>
</tr>
<tr>
<td>Signal ZERO Period</td>
<td>1283</td>
<td>Content of Signal ZERO Period register</td>
</tr>
<tr>
<td>Signal EXTEND Period</td>
<td>1284</td>
<td>Content of Signal EXTEND Period register</td>
</tr>
<tr>
<td>Signal SYNC Period</td>
<td>1285</td>
<td>Content of Signal SYNC Period register</td>
</tr>
<tr>
<td>Power ZERO Period</td>
<td>1286</td>
<td>Content of Power ZERO Period register</td>
</tr>
<tr>
<td>Power ONE Period</td>
<td>1287</td>
<td>Content of Power ONE Period register</td>
</tr>
<tr>
<td>Power SYNC Period</td>
<td>1288</td>
<td>Content of Power SYNC Period register</td>
</tr>
<tr>
<td>SLP Timer Time Base</td>
<td>1290</td>
<td>Content of SLP Timer Time Base register</td>
</tr>
<tr>
<td>SLP Max Number of Active Timers</td>
<td>1291</td>
<td>Content of SLP Max Number of Active Timers register</td>
</tr>
<tr>
<td>SLP Fault Register</td>
<td>1292</td>
<td>Content of SLP Fault Register</td>
</tr>
<tr>
<td>SLP Fault Address</td>
<td>1293</td>
<td>Content of SLP Fault Address register</td>
</tr>
<tr>
<td>NVM{0}</td>
<td>1312 to 1407</td>
<td>Content of User Non-volatile Memory registers</td>
</tr>
<tr>
<td>GENBUF2{#}</td>
<td>1408 to 1535</td>
<td>Content of General Buffer (Block 2) registers</td>
</tr>
</tbody>
</table>
4.4 Item 4: Scroll Bar
The content of every Address in the iMAC Data Point Table is displayed in the Live Data tab. In order to navigate through the Address range, use the scroll bar on the right hand side of the screen, or the scroll wheel of a mouse.

4.5 Item 5: Search Bar
The Search Bar allows the user to search for a subset of registers within the iMAC Data Point Table. The search function is dynamic, meaning that each character typed into the search bar will update the displayed results. In order to clear the search, just delete the search terms in the search bar.

The search function searches all columns and results are displayed in numerical, ascending order of the Register Address.

Table 3: Live Data Tab – Useful Search Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>{#}</td>
<td>Will return all of the Tag Names of the searched number (#)</td>
</tr>
<tr>
<td>DATA</td>
<td>Will return all of the module data registers</td>
</tr>
<tr>
<td>STATUS</td>
<td>Will return all of the module status registers</td>
</tr>
<tr>
<td>RESIST</td>
<td>Will return all of the module resistance registers</td>
</tr>
<tr>
<td>ERROR</td>
<td>Will return all of the module error registers</td>
</tr>
</tbody>
</table>

4.6 Item 6: PDF Button
Clicking on the “PDF” button will open a system dialog box, allowing the user to save a pre-formatted PDF file of the data that is currently being displayed in the Live Data tab.

The search bar (Item 5) allows the user to search for desired registers and distil the output to display only relevant information. This subset of information can then be saved to a PDF file using the “PDF” button.

4.7 Item 7: CSV Button
Clicking on the “CSV” button will open a system dialog box, allowing the user to save a pre-formatted CSV file of the data that is currently being displayed in the Live Data tab.

The search bar (Item 5) allows the user to search for desired registers and distil the output to display only relevant information. This subset of information can then be saved to a CSV file using the “CSV” button.

4.8 Item 8: Print Button
Clicking on the “Print” button will open the browser’s Print Dialog Box, allowing the user to print a pre-formatted output of the data that is currently being displayed in the Live Data tab.

The search bar (Item 5) allows the user to search for desired registers and distil the output to display only relevant information. This subset of information can then be printed using the “Print” button.
5 DATA LOGS TAB

The **Data Logs** tab allows the user to view the data logs that are stored in the iMAC2 Controller. The iMAC2 Controller generates a data log entry every time the content in one of the registers within the iMAC Data Point Table changes. The user is able to view data for a particular module by selecting the Log Date and then selecting an iMAC Module Address to show. The content of the registers, both previous value and new value, can be viewed in decimal, hexadecimal or binary.

![iMAC2 Controller Web Interface Layout – Data Logs Tab](image)

**Figure 5.1: iMAC2 Controller Web Interface Layout – Data Logs Tab**

5.1 Item 1: Log Date

In order to view a data log, the desired date must first be selected using the Log Date selection tool. Clicking on the Log Date text box will display the Date Selection Window. Dates that have logs available for viewing will be highlighted in green.

![Log Date Selection Window](image)

**Figure 5.2: Log Date Selection Window**
5.2 Item 2: Show Selector
Once a Log Date has been selected using the Log Date Selection Window, the Show Selector drop down box will be enabled. In order to select a data log type to view, click on the drop down box. The data logs that are available for the chosen dates will then be displayed.

The user can chose to view individual module resistance logs, the Controller temperature data log, or all of the data log entries for the selected date. The individual module resistance logs are selectable using the modules address number.

5.3 Item 3: Value Format Selector
The user can choose to display the data log values in one of three formats:

- Decimal
- Hexadecimal (Hex)
- Binary

5.4 Item 4: Data Log Time Stamp Column
The Data Log Time Stamp column displays the time that the change in the identified register occurred. This time is taken from the Real Time Clock (RTC) in the iMAC2 Controller. The column resolution is in seconds, when multiple logs occur within the same time stamp second, the logs are shown in order of occurrence.

5.5 Item 5: Data Log Register Column
The Data Log Register Column displays the register that the change has occurred in. The register is identified using its tag name (Refer to Table 2).

5.6 Item 6: Data Log Previous Value Column
The Data Log Previous Value Column displays the value that was stored in the register prior to the change occurring. This value can be displayed in decimal, hexadecimal or binary format.

5.7 Item 7: Data Log New Value Column
The Data Log New Value Column displays the new value that was stored in the register after the change occurring. This value can be displayed in decimal, hexadecimal or binary format.

5.8 Item 8: Find Time Search Box
The Find Time Search Box allows the user to perform a search focussed on the Time column only. To perform a search, enter the search term into the Find Time Search Box and press the enter key.

5.9 Item 9: Find Register Search Box
The Find Register Search Box allows the user to perform a search focussed on the Register column only. To perform a search, enter the search term into the Find Register Search Box and press the enter key.

5.10 Item 10: Find Previous Search Box
The Find Previous Search Box allows the user to perform a search focussed on the Previous Value column only. To perform a search, enter the search term into the Find Previous Search Box and press the enter key.

5.11 Item 11: Find Current Search Box
The Find Current Search Box allows the user to perform a search focussed on the New Value column only. To perform a search, enter the search term into the Find Current Search Box and press enter key.
5.12 Item 12: Advanced Search Function
The advanced search function allows the user to perform an advanced search on the selected data log. Using this function, the user can navigate to specific events in the data log without the filtering that would occur if the search term was simply typed into the search box. This offers significant advantages as it allows the user to view the data log entries that occurred before and after an event.

For example, if the user wanted to view the data log entries that occurred shortly before a CR Open log entry, the user would select the “CR Open” search type and then click perform search. The interface will then commence searching through the data log looking for all occurrences of CR Open log entries. Once this search has been completed, if any CR Open events are present in the log, the number of occurrences is shown and the navigation pane will move to the first entry. In order to navigate between CR Open entries once this search has been completed, click either the Next or Previous buttons, which are located next to the Perform Search button.

In addition to set event type searches, it is also possible to perform custom searches that will search the data log for value changes specified by the user. There are two types of custom search, a Custom Bitchange search and a Custom Value search.

Types of Advances Search that can be performed are:
- Custom Bitchange
- Custom Value
- CR Open
- CR Close
- CR Change
- AR Open
- AR Close
- AR Change
- OnScan Set
- OnScan Clr
- OnScan Change
- L1Clash Set
- L1Clash Clr
- L1Clash Change
- L1Owned Set
- L1Owned Clr
- L1Owned Change
- L2Owned Set
- L2Owned Clr
- L2Owned Change
- SystemOwned Set
- SystemOwned Clr
- SystemOwned Change
- L2Clash Set
- L2Clash Clr
- L2Clash Change

5.13 Item 13: Data Log Entry Page Navigation
The Data Log Tab within the iMAC2 Web Interface will load a maximum of 10,000 entries onto one page. For data logs that contain greater than 10,000 entries, the log will be split into pages of 10,000 entries. It will be possible to navigate between these pages using the controls located at this location.

It is important to note that, although the log entries may be split across several pages, the search functionality will still perform its function on all of the entries in the data log.
5.14 Item 14: Search Bar
The Search Bar allows the user to perform a simple text search on all of the columns within the data log. The search function is dynamic, meaning that each character typed into the search bar will update the displayed results. In order to clear the search, just delete the search terms in the search bar.

5.15 Item 15: PDF Button
Clicking on the “PDF” button will open a system dialog box, allowing the user to save a pre-formatted PDF file of the data that is currently being displayed in the Data Logs tab.

The varying search functions within the Data Log tab allow the user to search for desired content and distil the output to display only relevant information. This subset of information can then be saved to a PDF file using the “PDF” button.

5.16 Item 16: CSV Button
Clicking on the “CSV” button will open a system dialog box, allowing the user to save a pre-formatted CSV file of the data that is currently being displayed in the Data Logs tab.

The varying search functions within the Data Log tab allow the user to search for desired content and distil the output to display only relevant information. This subset of information can then be saved to a CSV file using the “CSV” button.

5.17 Item 17: Print Button
Clicking on the “Print” button will open the browser’s Print Dialog Box, allowing the user to print a pre-formatted output of the data that is currently being displayed in the Live Data tab.

The varying search functions within the Data Log tab allow the user to search for desired content and distil the output to display only relevant information. This subset of information can then be printed using the “Print” button.

5.18 Previous and New Value Bit Comparison
In order to display a side-by-side bit comparison for previous and new values, click on any row within the Data Log Table. This is a handy tool for identifying exactly what register bit(s) changed.

![Bit decoding](image)

*Figure 5.3: Bit Comparison Pop-Up Window (SystemStatus)*
6 EVENT LOG TAB

The **Event Log** tab allows the user to view the iMAC2 Controller’s Event Log. A log entry is triggered each time the Controller detects one of the events detailed in Table 4: Event Log Tab – Event Triggers.

![Image of iMAC2 Controller Web Interface Layout – Event Log Tab](image)

**Figure 6.1: iMAC2 Controller Web Interface Layout – Event Log Tab**

6.1 **Item 1: Event Log**

The Event Log tab displays events that have an effect on the operation of the iMAC2 Controller. This table is an excellent source for identifying the factors that contributed to an iMAC2 Controller CR opening eg EOL Open Circuit condition. Hence it proves to be an effective fault finding tool.

All events are stored in chronological order and each event in the Event Log Table is time stamped using the value that is stored in the iMAC2 Controller’s Real Time Clock (RTC).

For a full list of the events that trigger an Event Log entry, refer to Table 4: Event Log Tab – Event Triggers.
### Table 4: Event Log Tab – Event Triggers

<table>
<thead>
<tr>
<th>Event Log String</th>
<th>Trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Powered Up</td>
<td>Logging processor comes online</td>
</tr>
<tr>
<td>System Powered Down</td>
<td>Logging processor finished shutting down</td>
</tr>
<tr>
<td>Unit Name changed</td>
<td>Unit name changed via web page</td>
</tr>
<tr>
<td>Network settings changed</td>
<td>Network settings changed via web page</td>
</tr>
<tr>
<td>Time changed by NTP Server</td>
<td>System clock altered to synchronise with NTP server</td>
</tr>
<tr>
<td>Unit code modified via Hex file upload</td>
<td>New firmware hex file successfully received via web page</td>
</tr>
<tr>
<td>Unable to read System Event Log</td>
<td>Logging processor file corruption / filesystem error</td>
</tr>
<tr>
<td>Real Time Clock oscillator/battery fault</td>
<td>Logging processor RTC not responsive or not updating</td>
</tr>
<tr>
<td>Unknown System Event</td>
<td>Data corruption, log version greater than firmware version</td>
</tr>
<tr>
<td>CR Closed</td>
<td>SystemStatus Register, Bit 8: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>CR Opened</td>
<td>SystemStatus Register, Bit 8: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>AR Closed</td>
<td>SystemStatus Register, Bit 9: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>AR Opened</td>
<td>SystemStatus Register, Bit 9: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>EOL Healthy</td>
<td>SystemStatus Register, Bit 10: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>EOL Not Healthy</td>
<td>SystemStatus Register, Bit 10: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>EOL Open Circuited</td>
<td>SystemStatus Register, Bit 11: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>EOL Not Open Circuited</td>
<td>SystemStatus Register, Bit 11: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>EOL Short Circuited</td>
<td>SystemStatus Register, Bit 12: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>EOL Not Short Circuited</td>
<td>SystemStatus Register, Bit 12: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>EOL Clash</td>
<td>SystemStatus Register, Bit 13: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>EOL Not Clash</td>
<td>SystemStatus Register, Bit 13: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>Sequence Down From L2 Received</td>
<td>SystemControl Register, Bit 2: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>Sequence Down From L2 Receive Ended</td>
<td>SystemControl Register, Bit 2: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>Sequence Up From L1 Received</td>
<td>SystemControl Register, Bit 3: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>Sequence Up From L1 Receive Ended</td>
<td>SystemControl Register, Bit 3: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>Sequence Up On L2 Transmitted</td>
<td>SystemControl Register, Bit 10: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>Sequence Up On L2 Transmit Ended</td>
<td>SystemControl Register, Bit 10: 1 &gt; 0 Transition</td>
</tr>
<tr>
<td>Sequence Down On L1 Transmitted</td>
<td>SystemControl Register, Bit 11: 0 &gt; 1 Transition</td>
</tr>
<tr>
<td>Sequence Down On L1 Transmit Ended</td>
<td>SystemControl Register, Bit 11: 1 &gt; 0 Transition</td>
</tr>
</tbody>
</table>

### 6.2 Item 2: PDF Button
Clicking on the “PDF” button will open a system dialog box, allowing the user to save a pre-formatted PDF file of the data that is currently being displayed in the Event Log tab.

### 6.3 Item 3: CSV Button
Clicking on the “CSV” button will open a system dialog box, allowing the user to save a pre-formatted CSV file of the data that is currently being displayed in the Event Log tab.

### 6.4 Item 4: Print Button
Clicking on the “Print” button will open the browser’s Print Dialog Box, allowing the user to print a pre-formatted output of the data that is currently being displayed in the Event Log tab.
7 CONTROLLER INFO TAB

The **Controller Info** tab allows the user to view the current status and configuration of the iMAC2 Controller. Information is grouped into 10 categories which are explained in the following subsections.

![Controller Info Tab](image)

**Figure 7.1:** iMAC2 Controller Web Interface Layout – Controller Info Tab

### 7.1 Item 1: Inputs Status

This category contains the status of each of the Controller’s inputs, including the three digital inputs, set of four dipswitches and the rotary switch.

**Table 5: Controller Info Tab – Inputs Status**

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SwInput 1</td>
<td>Open, Closed</td>
<td>Status of the Controller’s Switch Input 1</td>
</tr>
<tr>
<td>SwInput 2</td>
<td>Open, Closed</td>
<td>Status of the Controller’s Switch Input 2</td>
</tr>
<tr>
<td>SwInput 3</td>
<td>Open, Closed</td>
<td>Status of the Controller’s Switch Input 3</td>
</tr>
<tr>
<td>Dip Switch</td>
<td>0000, 0001..., 1110, 1111</td>
<td>Position of the Controller’s Dip Switch Inputs. The most significant bit refers to position of the left-most switch (Dip Switch 1), and the least significant bit refers to the position of the right-most switch (Dip Switch 4). A ‘1’ indicates that the switch is in the “ON” position. A ‘0’ indicates that the switch is in the “OFF” position.</td>
</tr>
<tr>
<td>Rotary Switch</td>
<td>0, 1, 2..., 14, 15</td>
<td>Position of the Controller’s Rotary Switch Input</td>
</tr>
</tbody>
</table>
7.2 Item 2: End of Line Status
This category contains the status of End of Line module and Monitoring End of Line module (if applicable) that are connected to the iMAC2 Controller’s L1 fieldbus.

Table 6: Controller Info Tab – End of Line Status

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOL State</td>
<td>Ok, Open Circuit, Short Circuit</td>
<td>The status of the EOL module connected to the L1 Fieldbus (if connected)</td>
</tr>
<tr>
<td>EOL S/N</td>
<td>######</td>
<td>The serial number of the EOL module connected to the L1 Fieldbus</td>
</tr>
<tr>
<td>MEOL State</td>
<td>Ok, Offline</td>
<td>The status of the MEOL module connected to the L1 Fieldbus (if applicable)</td>
</tr>
<tr>
<td>MEOL S/N</td>
<td>######</td>
<td>The serial number of the MEOL module connected to the L1 Fieldbus</td>
</tr>
</tbody>
</table>

7.3 Item 3: Security Features Configuration
This category displays the security configuration of the iMAC2 Controller, including menu access levels and Modbus write permissions.

Table 7: Controller Info Tab – Security Features Configuration

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full System Menu</td>
<td>Enabled, Disabled</td>
<td>Displays the current configuration for access to the Full System Menu</td>
</tr>
<tr>
<td>Minimum System Menu</td>
<td>Enabled, Disabled</td>
<td>Displays the current configuration for access to the Minimum System Menu</td>
</tr>
<tr>
<td>Modbus Master Writes</td>
<td>Enabled, Disabled</td>
<td>Displays the current configuration for Modbus Master Data Point Table write permissions</td>
</tr>
<tr>
<td>Modbus Flash Write</td>
<td>Enabled, Disabled</td>
<td>Displays the current configuration for Modbus Master Flash write permissions</td>
</tr>
</tbody>
</table>

7.4 Item 4: Legacy Serial Coms Port Configuration
This category displays the configuration for the iMAC2 Controller’s legacy serial communications port.

Table 8: Controller Info Tab – Serial Communications Port Configuration

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Modbus Master, Modbus Slave, IP2 Protocol, L1 Maintenance, L2 Maintenance, None</td>
<td>Protocol that is currently configured for the Serial Communications Port</td>
</tr>
<tr>
<td>Slave Address</td>
<td>1-32</td>
<td>Slave address of the iMAC2 Controller</td>
</tr>
<tr>
<td>Baud Rate</td>
<td>600, 1200, 2400, 4800, 9600, 19200</td>
<td>Serial communications baud rate</td>
</tr>
<tr>
<td>Parity</td>
<td>None, Odd, Even</td>
<td>Serial communications parity</td>
</tr>
<tr>
<td>Stop Bits</td>
<td>1, 2</td>
<td>Serial communications stop bits</td>
</tr>
<tr>
<td>Mode</td>
<td>RS232, RS485</td>
<td>Serial communications mode</td>
</tr>
</tbody>
</table>
7.5 Item 5: Version Information
This category displays the version information for the iMAC2 Controller’s hardware, firmware and software.

Table 9: Controller Info Tab – Version Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bootloader</td>
<td>AMPCTRL_LPC17xx#.#.#</td>
<td>The iMAC2 Controller’s installed log CPU bootloader version (where $ are alphanumeric characters, # are integers)</td>
</tr>
<tr>
<td>Log CPU Software</td>
<td>iMAC LoggerT#.#####$</td>
<td>The iMAC2 Controller’s installed log CPU software version (where $ are alphanumeric characters, # are integers)</td>
</tr>
<tr>
<td>iMAC Hardware</td>
<td>H/W $$$$ V#.# MMM YY</td>
<td>The iMAC2 Controller’s legacy CPU hardware version (where $ are alphanumeric characters, # are integers, MMM is the month of release, YY is the year of release)</td>
</tr>
<tr>
<td>iMAC Firmware</td>
<td>F/W $$$$ V#.# MMM YY</td>
<td>The iMAC2 Controller’s installed legacy CPU firmware version (where $ are alphanumeric characters, # are integers, MMM is the month of release, YY is the year of release)</td>
</tr>
<tr>
<td>iMAC Software</td>
<td>S/W $$$$ V#.# MMM YY</td>
<td>The iMAC2 Controller’s installed legacy CPU software version (where $ are alphanumeric characters, # are integers, MMM is the month of release, YY is the year of release)</td>
</tr>
<tr>
<td>iMAC SLP</td>
<td>Application Dependent</td>
<td>The iMAC2 Controller’s installed application (SLP) software version Note: if the iMAC SLP version string has a backslash in it, it will appear as a forward slash.</td>
</tr>
</tbody>
</table>

7.6 Item 6: Outputs Status
This category displays the status of the iMAC2 Controller’s output relays and LEDs.

Table 10: Controller Info Tab – Output Status

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Relay (CR)</td>
<td>Open, Closed</td>
<td>State of the iMAC2 Controller’s Control Relay (CR).</td>
</tr>
<tr>
<td>Auxiliary Relay (AR)</td>
<td>Open, Closed</td>
<td>State of the iMAC2 Controller’s Auxiliary Relay (AR).</td>
</tr>
<tr>
<td>L1 LED</td>
<td>Off, On, Fast Flash, Slow Flash</td>
<td>State of the iMAC2 Controller’s L1 LED</td>
</tr>
<tr>
<td>L2 LED</td>
<td>Off, On, Fast Flash, Slow Flash</td>
<td>State of the iMAC2 Controller’s L2 LED</td>
</tr>
</tbody>
</table>
7.7 Item 7: SLP Status
This category displays the status of the iMAC2 Controller’s application (SLP) software.

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop Time</td>
<td>#ms</td>
<td>The period of time that the iMAC2 Controller is currently taking to loop through the application (SLP) code</td>
</tr>
<tr>
<td>Faults</td>
<td>None, Fatal SLP Fault, Stack Overflow, Stack Underflow, Address Out of Bounds, Illegal Command, Timer Parameter Fault Base/Num, TON No Timer Slots Delay, TOFF No Timer Slots Delay, L1 Period Overflow, L2 Period Overflow, L2 Loss of Sync</td>
<td>Application (SLP) software fault register status</td>
</tr>
<tr>
<td>Timebase</td>
<td>10msecs, 100msecs, 1secs, 10secs, 1min</td>
<td>The timebase used for all timers allocated in the installed version of the application (SLP) software</td>
</tr>
<tr>
<td>Timers</td>
<td>4, 5, 6, 7..., 15, 16</td>
<td>The number of timers that are allocated for use in the installed version of the application (SLP) software (min = 4, max = 16)</td>
</tr>
<tr>
<td>L1 Line Speed</td>
<td>300, 500, 750, 1000</td>
<td>The line speed that the iMAC2 Controller’s L1 Fieldbus port is currently configured to operate at</td>
</tr>
</tbody>
</table>

7.8 Item 8: Sequence Status
This category displays the status of the iMAC2 Controller’s Sequencing Bits.

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up Bit From L1</td>
<td>Not Receiving, Receiving</td>
<td>Status of the L1 Up Bit</td>
</tr>
<tr>
<td>Down Bit From L2</td>
<td>Not Receiving, Receiving</td>
<td>Status of the L2 Down Bit</td>
</tr>
<tr>
<td>Down Bit To L1</td>
<td>Not Transmitting, Transmitting</td>
<td>Status of the L1 Down Bit</td>
</tr>
<tr>
<td>Up Bit To L2</td>
<td>Not Transmitting, Transmitting</td>
<td>Status of the L2 Up Bit</td>
</tr>
</tbody>
</table>
7.9 Item 9: Ethernet Configuration
This category displays the configuration of the iMAC2 Controller’s Ethernet Port.

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC Address</td>
<td>###.###.###.###</td>
<td>The MAC address of the iMAC2 Controller</td>
</tr>
<tr>
<td>IP Address</td>
<td>###.###.###.###</td>
<td>The IP address that the iMAC2 Controller is currently configured to</td>
</tr>
<tr>
<td>IP Mask</td>
<td>###.###.###.###</td>
<td>The IP Mask that the iMAC2 Controller is currently configured to</td>
</tr>
<tr>
<td>IP Gateway</td>
<td>###.###.###.###</td>
<td>The IP Gateway that the iMAC2 Controller is currently configured to</td>
</tr>
</tbody>
</table>

7.10 Item 10: Hardware Status
This category displays the hardware status the iMAC2 Controller.

<table>
<thead>
<tr>
<th>Name</th>
<th>Possible Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Temperature</td>
<td>###.# °C</td>
<td>The temperature of the iMAC2 Controller</td>
</tr>
<tr>
<td>RTC Hardware Fault</td>
<td>No, Yes</td>
<td>Status of the Real Time Clock (No = Ok, Yes = Battery Fault)</td>
</tr>
</tbody>
</table>
8 MODULE INFO TAB

The Module Info tab allows the user to view the current status for all module Addresses detected on the iMAC L1 Fieldbus. Information for each Address is displayed in numerical order (by Address) in individual rows within the Module Info Table. The user is able to search for desired information using the search box on the page. This information is able to be exported in a number of file formats.

8.1 Item 1: View Dropdown Box

The View Dropdown Box allows the user to select the filter the displayed modules based upon the following categories:

- All
- Online
- Offline
- Clash
- System Owned
- Global

8.2 Item 2: Data Format Dropdown Box

The Data Format Dropdown Box allows the user to select the format in which the information in the Data column is displayed. The options are:

- Decimal
- Hexadecimal (Hex)
- Binary
8.3 Item 3: Reset User Offline/Clash Button
The Reset User Offline/Clash Button allows the user to reset the counters that appear in the User Offline and User Clash columns. The User counters increment at the same rate as the Offline Count and Clash Count columns. Resetting the User columns allows the user to determine the rate at which Modules at particular Addresses are accumulating Offline and Clash counts. This can be a handy fault finding tool.

8.4 Item 4: iMAC Address Column
This column displays the iMAC Fieldbus Module Address that this row of data is related to. The data in the Module Info tab is sorted by the iMAC Address.

8.5 Item 5: Status Columns
The Status Columns provide information on the status of the Module. The Status (Simple) column uses a colour system to provide a snapshot of the health of this particular module, whilst the Status (Advanced) column displays the content of the Address' Status Register.

The Status (Simple) coloured dots correspond to the following statuses:
- Green = Online and Healthy
- Red = Offline
- Orange = Clash
- Blue = System Owned
- Black or Grey = Global (Black = L1 owned, Grey = L2 owned)
- No fill = Not OnScan

It is possible to view the bit definitions for the Status (Advanced) column by left clicking on the desired binary grouping.

NOTE: The values that appear in the Bit Decoding Pop-up Window do not live update. If a value changes in the Status register, click on the row again to refresh the content within the Bit Decoding window.

8.6 Item 6: Data Column
The Data column displays the value stored in the Address’ Data register. This information is able to be displayed in decimal, hexadecimal, or binary.

8.7 Item 7: Resistance Column
The Resistance column displays the value stored in the Address’ Resistance register.

8.8 Item 8: Offline Count and Clash Count Columns
These columns display the current Offline and Clash values stored in the Address’ Error register.

8.9 Item 9: User Offline Count and User Clash Count Columns
These columns display the current values of the User Offline and User Clash counters for each Address. These counters are able to be reset by the user by clicking on the Reset User Offline/Clash Button.

8.10 Item 10: Scroll Bar
Every possible iMAC L1 Fieldbus Address is displayed in the Module Info tab. In order to navigate through the Address range, use the scroll bar on the right hand side of the screen.
8.11 Item 11: Module Status Summary
The Module Status Summary provides a snapshot of the total number of modules detected as either online, offline, or clashing. This provides a good indicator of the health of the system at a glance.

8.12 Item 12: Search Bar
The Search Bar allows the user to perform a simple text search on all of the columns within the Module Info tab. The search function is dynamic, meaning that each character typed into the search bar will update the displayed results. In order to clear the search, just delete the search terms in the search bar.

8.13 Item 13: PDF Button
Clicking on the “PDF” button will open a system dialog box, allowing the user to save a pre-formatted PDF file of the data that is currently being displayed in the Module Info tab.

The search function in the Module Info tab allows the user to search for desired content and distil the output to display only relevant information. This subset of information can then be saved to a PDF file using the “PDF” button.

8.14 Item 14: CSV Button
Clicking on the “CSV” button will open a system dialog box, allowing the user to save a pre-formatted CSV file of the data that is currently being displayed in the Module Info tab.

The search function in the Module Info tab allows the user to search for desired content and distil the output to display only relevant information. This subset of information can then be saved to a CSV file using the “CSV” button.

8.15 Item 15: Print Button
Clicking on the “Print” button will open the browser’s Print Dialog Box, allowing the user to print a pre-formatted output of the data that is currently being displayed in the Module Info tab.

The search function in the Module Info tab allows the user to search for desired content and distil the output to display only relevant information. This subset of information can then be printed using the “Print” button.
9 CONTROLLER SETTINGS TAB

The Controller Settings tab allows the user to alter the name of the iMAC2 Controller, the Ethernet Port settings and the Real Time Clock settings.

9.1 Item 1: Unit Details

The tag name of the iMAC2 Controller can be modified within the Name field provided under the Unit Details heading.

The tag name of the Controller allows users to easily differentiate between multiple iMAC2 Controllers that may be installed on their site network. The tag name is displayed predominantly in the banner of every web interface page; it’s also shown predominantly on the top of any reports that are exported from the Web Interface.

To allow easy differentiation and accurate record tracking, it is advised to ensure that the name of the iMAC2 Controller is unique to the installation site.

To save changes to the Name of the Controller, click the Save Changes button (Item 4).

9.2 Item 2: Network Settings

The user can alter the settings of the iMAC2 Controller’s Ethernet port within the Network Settings section.

Dynamic Host Configuration Protocol (DHCP) can be selected to dynamically select the iMAC2 Controller’s network configuration parameters, or set manually to static parameters. For manual configuration, DHCP must be set to “No”.

If the user selects to manually configure the network parameters, they must configure the IP Address, IP
Mask and IP Gateway that the Controller is to use.

To save changes to the Controller’s network configuration, click the Save Changes button (Item 4).

9.3 Item 3: System Clock

The iMAC2 Controller has an on-board Real Time Clock (RTC) that can be configured from the System Clock section within the Controller settings tab.

The RTC can be manually set using the Date and Time fields, provided the “Use Network Time Protocol” setting is set to “No”.

The iMAC2 Controller supports Network Time Protocol (NTP), allowing the Controller to sync with the network’s time and date. To configure the NTP set the “Use Network Time Protocol” setting to “Yes”.

The NTP settings are “Timezone offset (relative to GMT)” and “NTP Address”. The “Timezone offset (relative to GMT)” setting is an integer value of the difference in time (in hours) between the iMAC2 Controller’s timezone and GMT. The “NTP Address” is the IP Address of the NTP server.

Once NTP settings have been configured, the Sync Time button can be pressed to test the NTP settings. The “NTP Status” field indicates the NTP status while the “Last NTP Sync Time” indicates the last time the iMAC2 Controller clock was synchronised to the NTP server.

9.4 Item 4: Discard / Save Changes Buttons

Changes that are made to settings on the Controller Settings tab are not implemented until the “Save Changes” button is pressed. If a mistake is made in the modification of the Controller Settings, the changes can be discarded by pressing the “Discard Changes” button.
10 CONTROLLER MIMIC TAB

The Controller Mimic tab displays a mimic of the Controller’s fascia. This allows the user to view the information that is currently being displayed on the iMAC2 Controller’s LCD screen in real time, as well as the status of the Controller’s L1 and L2 LEDs.

Figure 10.1: iMAC2 Controller Web Interface Layout – Controller Mimic Tab

The mimic keypad does not function directly as the web interface is not permitted to write directly to the iMAC2 Controllers memory (to preserve SIL ratings). However the mimic keypad can function indirectly (using an external Modbus Master device) provided both Ethernet and Serial communications port connections are made to the iMAC2 Controller.

When a mimic keypad button is left clicked with the mouse, the value of that key press is written into a memory buffer. The memory buffer can store up to 20 key presses. The number of key presses stored in the memory buffer at any time is displayed on web interface, shown at the left bottom of the mimic keypad graphic (Item 4). The head of the memory buffer (i.e. the value of oldest key press) can be read via a Master Modbus TCP/IP device. If the Master Modbus device also has a serial connection to the iMAC Controller’s serial port, the master device can read the key press value from the Modbus TCP/IP connection and write it back to the iMAC controller’s Modbus serial (RS232/485) port which will cause the key press to be executed.

The Modbus Ethernet TCP/IP mimic key press register can be found at Register Address 1616 (650h). This register contains the value of the oldest (unread) mimic key press. When this register is read, the value of the oldest key press is read, following each read of the register, the register automatically updates with the next oldest key press from the memory buffer, when all key presses have been read, the value of the register returns to zero.

The Modbus serial port register to which key press values can be written to for execution is Register Address 1042 (412h). Note: only a single key press can be written to this register at a time. The value of
this register will automatically return to zero once the key press has been executed by the iMAC Controller. When a value is written to this register, the register should be polled until the read value returns to zero. Once this register has returned to zero a new key press value can be written to the register.

A procedure for enabling the web interface mimic keypad function can be summarised as follows:

1. Connect a Master Modbus device to both the iMAC2 Controller’s Ethernet and Serial (RS232/RS485) ports.
2. Instruct the master device to routinely read iMAC Controller Modbus TCP/IP register address 1616 (650h).
3. If the read value is zero (i.e. there are no web interface mimic key presses in the buffer) then repeat from Step 2.
4. If the read value is non-zero (i.e. there is a valid web interface mimic key press in the buffer) then write the read value to the iMAC2 Controller’s Modbus Serial port register address 1042 (412h).
5. Now poll Modbus Serial port register address 1042 (412h) until the value read returns to zero (i.e. key press has been executed by iMAC2 controller) then repeat from Step 2.

10.1 Item 1: iMAC2 Controller Mimic Keypad

As described in the process above, the iMAC2 Controller Mimic Keypad can indirectly be used to implement keypress functions on the iMAC2 Controller. If implemented correctly, the user will be able to press a key on the Mimic Keypad and view the iMAC2 Controller’s response via the web interface Mimic Screen.

10.2 Item 2: iMAC2 Controller Mimic Screen

The iMAC2 Controller Mimic Screen displays the content of the iMAC2 Controller’s fascia screen. The display is automatically updated. The Mimic Screen function will operate independently of whether or not the Mimic Keypad function has been implemented.

This function allows the user of the web interface to walk an operator through a fault finding or programming sequence remotely, at a keypress by keypress basis.

10.3 Item 3: iMAC2 Controller Mimic LEDs

The iMAC2 Controller Mimic LEDs display the status of the L1 and L2 LEDs on the fascia of the iMAC2 Controller. LED status updates automatically.

10.4 Item 4: Keypad Press Memory Buffer Counter

The iMAC Keypad Press Memory Buffer Counter displays the number of keypresses that are currently stored in the Memory Buffer. Each time that a key is pressed on the Mimic Keypad it will be stored in the Memory Buffer until it is read via Modbus TCP/IP.

The Memory Buffer will store up to twenty (20) keypresses. Once the buffer is full, any further keypresses are ignored.
11 DOWNLOAD LOGS TAB

The iMAC2 Controller provides a logging system that records all of the data two seconds prior to and one second after the opening of either the CR or AR relay. The Download Logs tab allows the user to download these logs as a fault finding / investigative tool for use by Ampcontrol technicians.

![Download Logs Tab](image)

**Figure 11.1: iMAC2 Controller Web Interface Layout – Download Logs Tab**

11.1 Item 1: Log List

Click on the desired log button to download the corresponding log file.

**NOTE**

These CR and AR trip log files are binary files which can be downloaded and emailed to an authorised Ampcontrol Service Centre for support.

Fees and charges may apply for this service.
12 ABOUT TAB

The About tab displays the contact details for Ampcontrol Customer Service.

Figure 12.1: iMAC2 Controller Web Interface Layout – About Tab

12.1 Item 1: Customer Service Contact Details

The contact details for Ampcontrol Customer Service. For product support, please contact customer service using your preferred method of contact, email or telephone.