

Installation Assistant Utility

(IAU)

User Guide

Revision 1.4

March 5, 2014

System controllers *

Site name

Site address

User name

[Discover / refresh](#) [Add manually](#)

Assigned controllers -

Type	MAC	SN	Comm. Address	Status
New session Load session Save session				
Erase system test results Detail view Report test results				
Finish testing				

Table of Contents

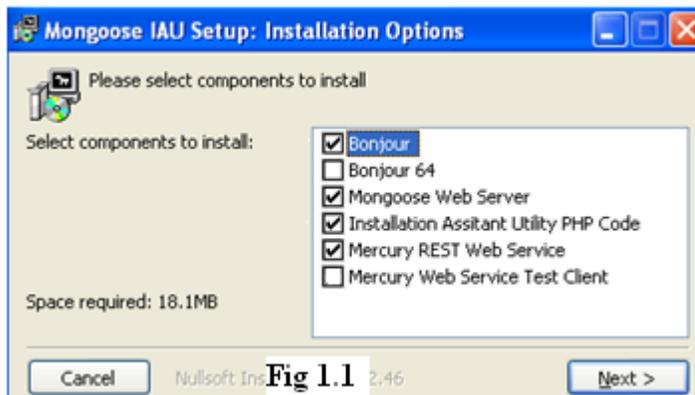
Installation _____	3
Accessing the Installation Assistant Utility _____	4
Controller Page _____	7
Downstream Device Discovery _____	9
Testing Inputs _____	14
Testing Outputs _____	15
Testing Readers _____	17
Advanced _____	19
Security _____	22
Icon Legend _____	26

IAU - INSTALLATION

The Mercury Installation Assistant Utility (IAU) is to be installed on a computer that will be connected to the same network as the Mercury controller(s).

Note: it is assumed that the entire Mercury_IAU bundle containing the Mercury Web Service and the Mongoose Web Server are all installed on the same machine.

The Installation Utility consists of multiple parts that must all be installed in order to function properly. The executable (file name: Mercury_IAU) is a bundled installer containing all of the services shown in Fig 1.1 below. You must install Bonjour (32-bit version) or Bonjour 64 (64-bit version) along with all of the other required items (shown checked). Installation of this bundle requires just over 18 MB of space.



Selecting *Next* will run through each item's individual installer scripts. The Mongoose Web Server and Mercury Web Service will create nested directories in the C: drive as long as all the default entries are left in place through the install. Also, a start menu entry is created for the Mercury Installation Assistant Utility (Fig 1.2). Here the installer/tester can stop and restart either of the two separate web services in case of a server crash as well editing the configurations for each service.



ACCESSING THE INSTALLATION ASSISTANT UTILITY

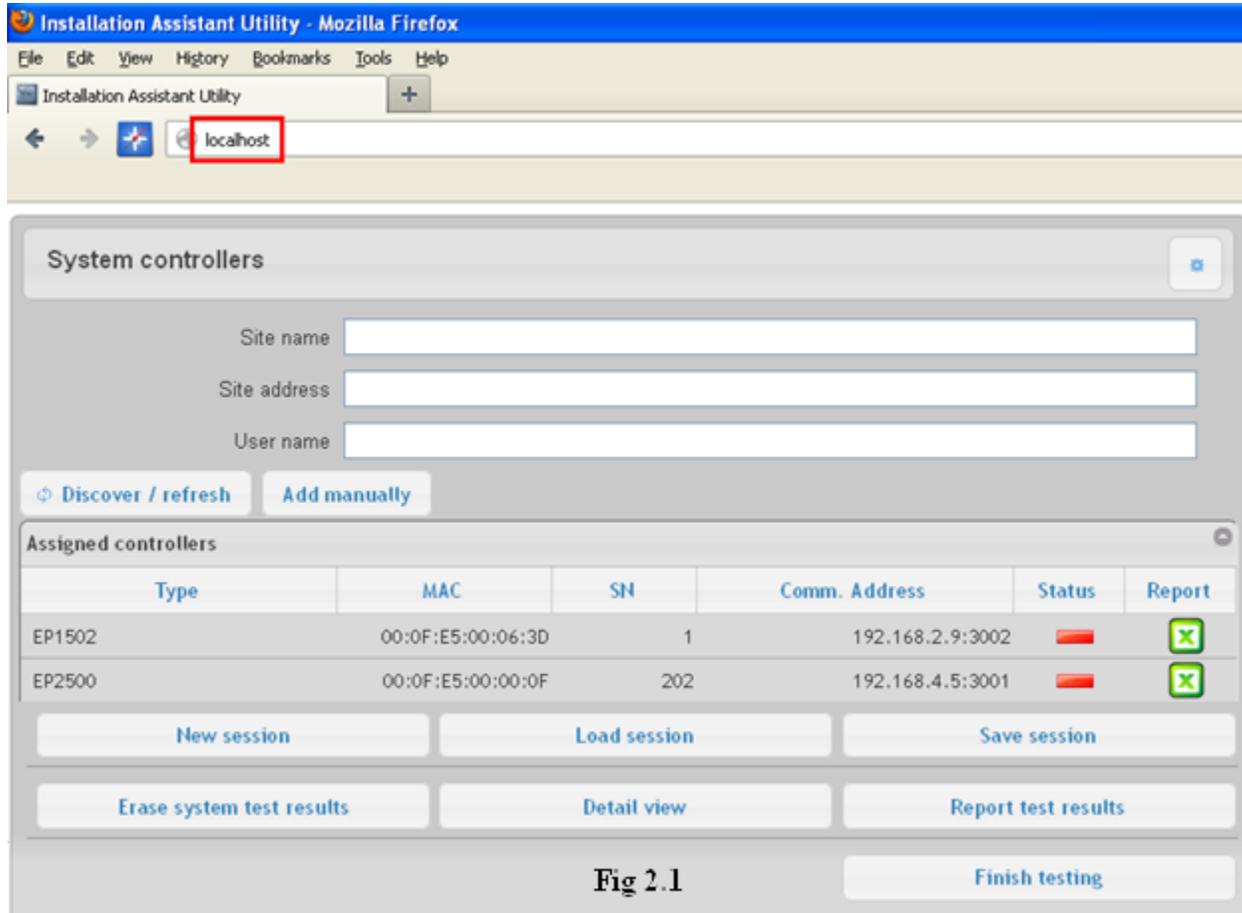


Fig 2.1

A web browser (such as Internet Explorer or Safari) is used to connect to the IAU server by directing the browser to *localhost* (noted in Fig 2.1 above) or to the machine's own IP address/host name. At the top of the IAU main page, the installer/tester can add a description of the installation site next to "Site Name" as well as noting the street address next to "Site Address" and the name of the installer/tester next to "User name."

Note: Any testing done *BEFORE* entering a User name will not show the user name in the "Verified by" column of the report.

The parts of the System Controllers page are described in the following table:

	<p>The “Discover/refresh” button automatically detects Mercury intelligent controllers on the network that have discovery enabled.</p>
	<p>The “Add manually” button generates a form allowing the installer/tester to manually add a controller by entering the controller’s host name or IP address (underlined in red in Fig 2.2 below). The installer must also specify the controller model using the drop down menu at the top of the form.</p>
	<p>The “Status” column has an icon next to each detected controller signifying the test status for that controller. Initially, the icon will show this red line for “not yet tested.” The other possible conditional icons are listed in the Icon Legend at the end of this document.</p>
	<p>This green button in the “Report” column allows an installer/tester to export the test results for that individual controller to an Excel file. Reports are automatically generated for each controller by the IAU.</p>
	<p>Selecting the “New session” button clears all previous data gathered or entered for the individual controller and restarts the IAU.</p>
 	<p>The “Load” and “Save” buttons allow the installer/tester to pause and resume a test session without losing the data and test results.</p>
	<p>“Erase system test results” clears all the previously gathered test data. It does not reset the controller or restart the IAU.</p>
	<p>Selecting “Detail view” allows an expanded view of all the controllers, along with their attached IOs and readers.</p>
	<p>Selecting “Report test results” allows the installer/tester to export the test results for ALL controllers into an Excel spreadsheet.</p>
	<p>Selecting “Finish testing” disconnects the currently connected controller from the IAU.</p>
	<p>This gear icon located at the top of the screen on the System controllers title bar, opens up the configuration page (shown in Fig 2.3 below). Here the installer/tester configures, if necessary, the IP address of the machine remotely running the web service, set the local time zone, set the default baud rate, and/or adjust the connection timeout time.</p>

To connect to a controller, simply click your selection from the discovery list or manually add it. A progress bar will appear showing the connection progress before bringing you to the controller’s page.

Note: All controllers must have DIP Switch 1 set as well as no other active connections in order for the IAU to successfully connect.

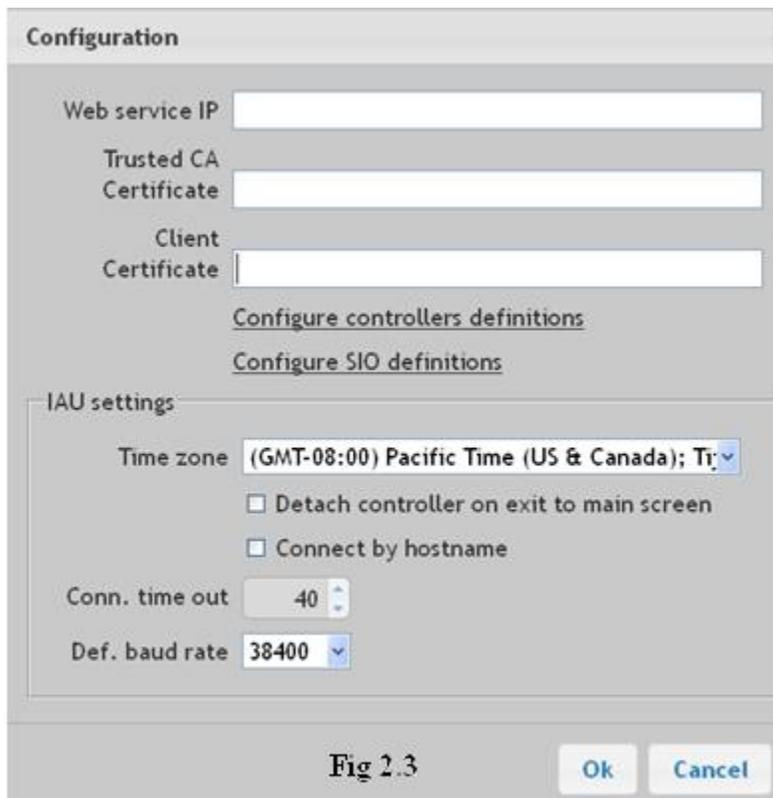


The 'Add Controller' dialog box contains the following fields and options:

- Type: EP1502 (dropdown menu)
- MAC: [text input field]
- Serial No.: [text input field]
- IP address: [text input field]
- Host: [text input field]

Buttons: Add

Fig 2.2



The 'Configuration' dialog box contains the following settings:

- Web service IP: [text input field]
- Trusted CA Certificate: [text input field]
- Client Certificate: [text input field]
- Configure controllers definitions: [text link]
- Configure SIO definitions: [text link]
- IAU settings:
 - Time zone: (GMT-08:00) Pacific Time (US & Canada); T1 (dropdown menu)
 - Detach controller on exit to main screen
 - Connect by hostname
 - Conn. time out: 40 (spin box)
 - Def. baud rate: 38400 (dropdown menu)

Buttons: Ok, Cancel

Fig 2.3

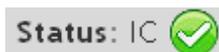
CONTROLLER PAGE

After connecting to a controller through either the discovery or adding manually, the installer/tester is brought to the controller main page (shown below in Fig 3.1). The controller type, IP address and serial number (SN) are always displayed on the title bar at the top of the screen. The example displayed in Fig 3.1 is an EP1502 controller with one onboard/internal IO as well as an available downstream RS-485 port.



Fig 3.1

The parts of the Controller page are described in the following table:

	<p>The connection status of the controller can be seen as either online or offline by looking at that status icon at the top right hand corner of the title bar (“IC” signifies an Intelligent Controller). The controller must be online (showing the green circle with check mark icon) before testing can begin.</p>
<p>Controller name <input type="text"/></p>	<p>The tester/installer can enter in a Controller name for easy identification in the generated reports.</p>
<p>Tamper status <input type="text"/></p> <p>Powerfail status <input type="text"/></p>	<p>The “Tamper” and “Powerfail” status of the attached controller will be displayed along with alerting of low battery condition. The conditions will display individual time stamps reflecting when they were tested.</p>

 Network settings	<p>The “Network settings” button links the installer/tester to the controller’s web configuration page.</p>
 Current firmware 1.17.3	<p>The attached controller’s current firmware version is displayed continuously. Selecting this button allows the installer to download new firmware to the controller.</p>
 Onboard I/O	<p>This button links to the controller’s onboard IO that is built into the controllers. (Onboard IOs are only available on the EP1501, EP1502 and EP4502)</p>
 RS 485 @TB3 Protocol: MSP1 Baud rate: 38400	<p>This button displays the downstream RS-485 communication configuration with specific baud rate and protocol type. Clicking the button links the installer/tester to the RS-485 connection page.</p>
 Network port	<p>This button is used for connecting up to an MR51e IO on the network using the MSP1 protocol.</p>
Reset controller	<p>Selecting “Reset controller” will reset the controller’s current configuration by clearing the database and rebooting the controller.</p>
Clear results	<p>The “Clear results” button will erase the test results gathered at the time.</p>
Delete controller	<p>Selecting the “Delete controller” button removes the controller from the test list. Note: This button does not delete the controller from the system configuration.</p>
 Not tested	<p>In the bottom left hand corner of the screen is the test progress status. By default, the icon displayed is a red line signifying the controller has not been tested.</p>

DOWNSTREAM DEVICE (SIO) DISCOVERY

Downstream devices are peripheral IOs (also referred to as SIOs) that are connected to the controller either via RS-485 serial ports that operate at a configurable baud rate or over the network using the MSP1 protocol. The EP1501, EP1502, and their equivalent intelligent controllers also can utilize one onboard SIO that is built-in (Fig 3.1 showed the EP1502 example having all three ports; an onboard IO, an RS-485 port, and a network port). Figure 4.1, 4.2, and 4.3 shows the IO device list pages with 4.1 being the Onboard IO port page, 4.2 being the downstream RS-485 port page, and 4.3 being the network port page.

When looking at the onboard or RS-485 port, the IO device type will be automatically displayed under the “Type” column (based on the IO’s model number) along with the device’s physical address in the “Address” column (RS-485 address is set with DIP switches). The “Com Status” column will display the icon that corresponds with the downstream IO device’s communications status between the IO itself and the IC attached to it. The “Status” column on the far right displays the test status for the particular downstream IO device.

Note: Each icon and their meaning are detailed in the “Icon Legend” section at the end of this document.

The onboard IO device page is shown in figure 4.1 below.

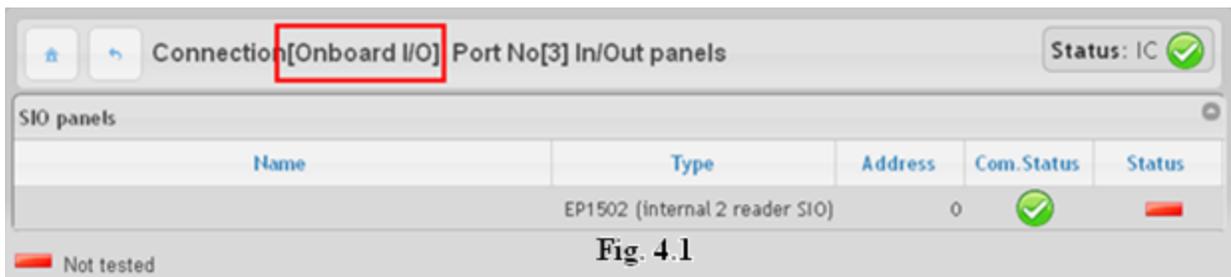


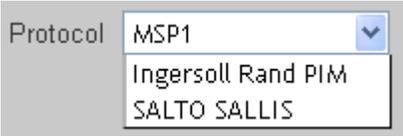
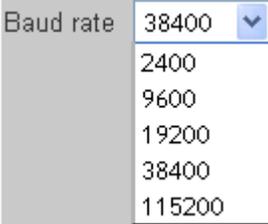
Fig. 4.1

The RS-485 port uses an automatic discovery system to detect multiple downstream IOs based on the protocol and baud rate specified by the installer/tester via dropdown menus. The communication and test progress statuses are also shown next to each IO. The RS-485 IO device screen is shown below in Fig 4.2.



Fig 4.2

The parts of RS-485 port page are described in the following table:

	<p>When configuring the downstream communications port, the installer needs to select which protocol to use for communication with downstream IO devices using the drop down list provided.</p>
	<p>Additionally, the installer needs to select which baud rate is used to communicate with the downstream IO panels.</p>
	<p>Clicking the “Auto discover” button will begin the automatic detection of the downstream IO devices, based on the parameters entered for the protocol and baud rate.</p>

The network port, shown in figure 4.3 below, has fields for the MR51e’s MAC and IP address. The MR51e is currently the only downstream IO that connects over the network so there is no “Type” field. The protocol defaults to MSP1 and cannot be changed. Each MR51e must be manually added by clicking the “Add MR51e” button.

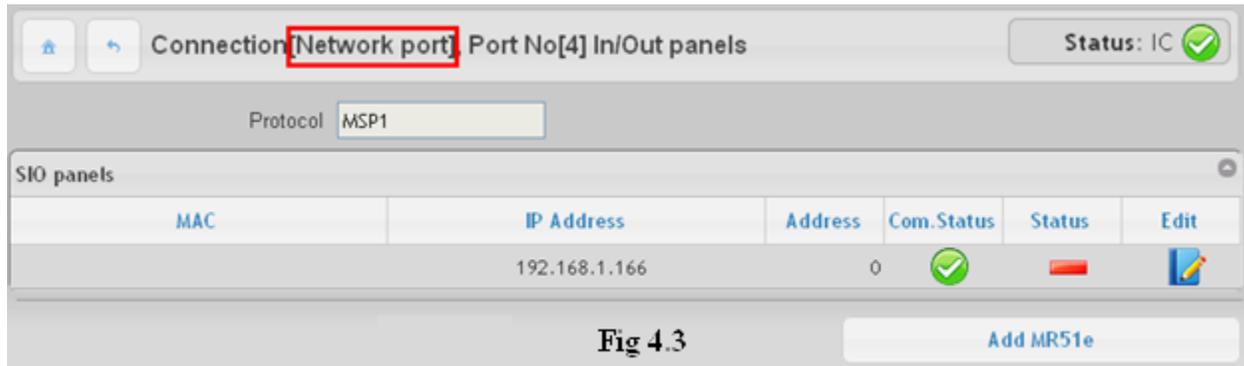


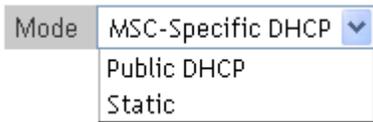
Fig 4.3

After clicking the “Add MR51e” button, the MR51e data page will open (figure 4.4 below). Here, the installer/tester enters the appropriate information based on the “Mode” to bring the MR51e online.



Fig 4.4

The different parts of the MR51e data page are explained in the following table:

	<p>The “Mode” dropdown menu is used for selecting the addressing mode of the MR51e. The addressing method selected will dictate whether an IP or MAC address needs to be entered.</p>
	<p>Using the “Static” option requires the installer/tester to enter the static IP address of the MR51e.</p>
	<p>Using either “MSC-Specific DHCP” or “Public DHCP” will require the installer/tester to enter the MAC address of the MR51e.</p>
	<p>Clicking the “Save” button will save the MR51e data and cause the MR51e to be reflected in the IO panel list. See figure 4.3 above.</p>

Note: After saving, the newly configured MR51e may initially show up with the “Comm Status” as Offline in the IO list until you click on the IO and navigate to the IO page for the first time.

Connect to any IO by selecting it from the IO device list. Once chosen, the IO Panel screen will launch (Fig 4.5 below). This page lists the IO’s type and serial number (SN) on the title bar. Additionally, the connection status of both the IC and the SIO can be seen as either online or offline by looking at that status icon at the top right hand corner of the title bar.

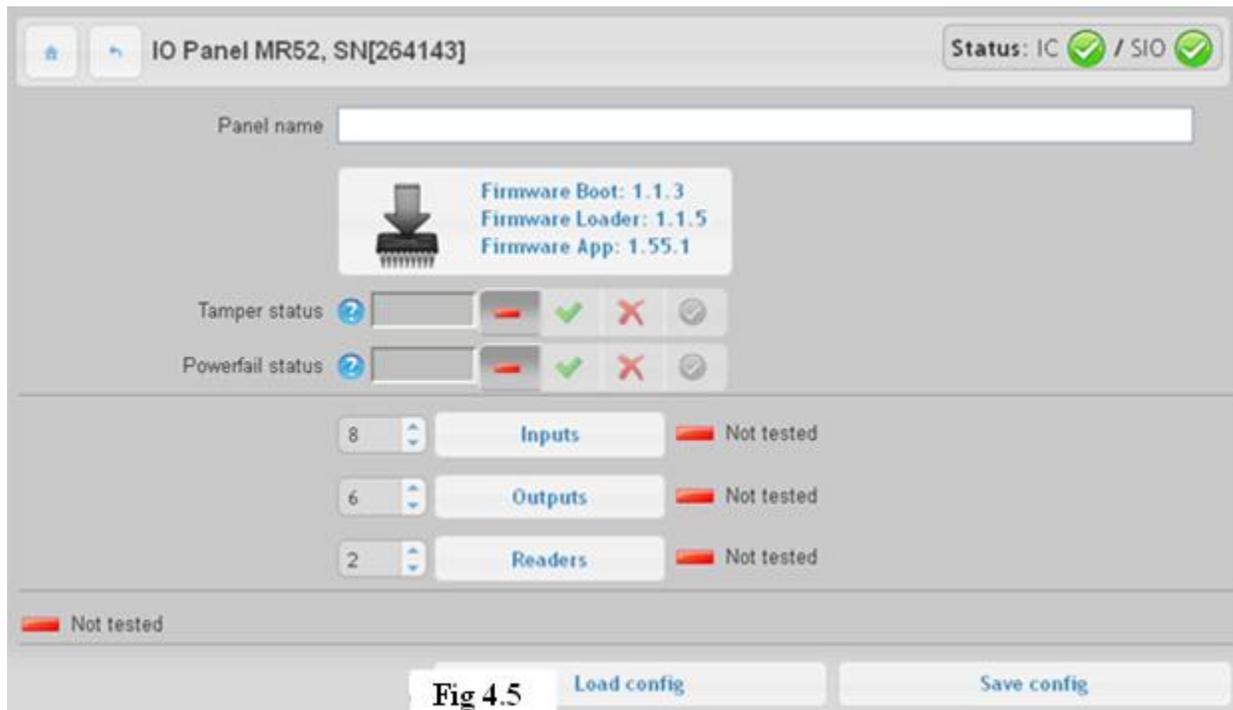


Fig 4.5

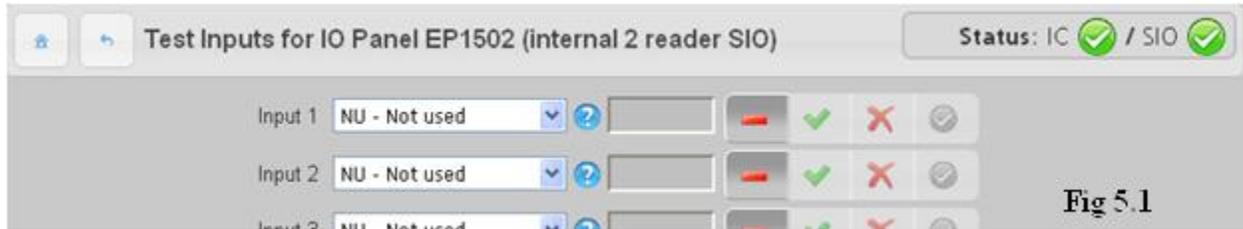
The parts of the IO Panel page are described in the following table:

Panel name <input type="text"/>	Allows a unique name label of each IO panel to be entered.
 Firmware Boot: 1.1.3 Firmware Loader: 1.1.5 Firmware App: 1.55.1	The attached IO’s current firmware version is always displayed and selecting this button allows the installer to download new firmware to the IO.
Tamper status  <input type="text"/> Powerfail status  <input type="text"/>	The “Tamper” and “Powerfail” status of the attached panel will be displayed. The conditions will display individual time stamps reflecting when they were tested.

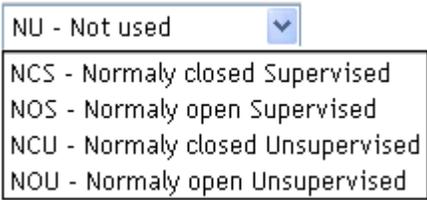
	<p>The “Input”, “Output”, and “Reader” buttons link to the testing pages for the corresponding item. The number next to the button is preloaded with the maximum number of each item available on the device (based on the IO model).</p>
	<p>The “Save” and “Load” configuration buttons at the bottom of the window allow the installer to save the number and the default configuration of inputs, outputs, and readers. This allows installers that need to test the same configuration on multiple panels to save to time in their testing.</p>

TESTING INPUTS

Selecting the “Inputs” button from the SIO configuration screen (Fig 4.3 above) will take the installer/tester to the Test Inputs page (Fig 5.1 below). This page lists all the inputs available on the IO panel.



The parts of the Testing Inputs window are described in the following table:

	<p>Each numbered input has a drop down menu for setting the desired default state of the circuit. Once selected, the default state is continuously compared to the current physical state of the circuit and the result is reflected by the icon next to the drop down menu. The icon should change as the circuit is tested.</p>
	<p>A time stamp is provided when the input was tested. To the right of the time stamp are the test result buttons. The installer/tester can select one based on the results of the test. The icons and their meaning can be found in the “Icon Legend” section at the end of this document.</p>

Selecting the “Toggle log” button at the bottom of the Test Inputs page allows the installer/tester to view a transaction log as they proceed with the input testing. The transaction log shown below in Fig 5.2 records the changes of state for each input. This log can be cleared at any time by clicking the Clear log button.

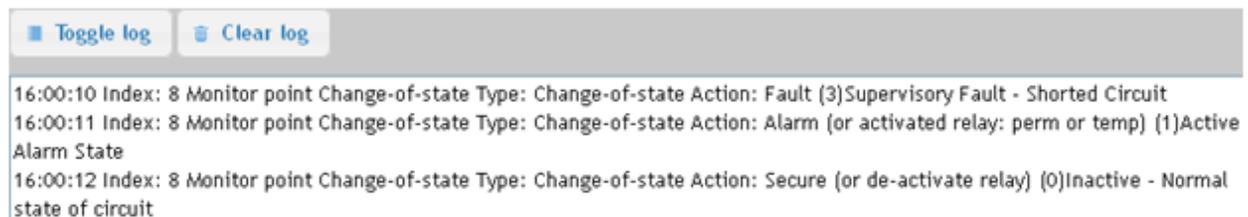


Fig. 5.2

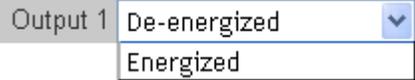
TESTING OUTPUTS

Selecting the “Outputs” button from the SIO configuration screen (Fig 4.3) will navigate the installer/tester to the Test Outputs page displayed below (Fig 6.1). This page lists all the outputs available on the IO panel.



Fig 6.1

The parts of the Testing Outputs window are described below:

	<p>Each numbered output has a drop down menu for setting the desired default state of the output relay. During testing, the selected default state is continuously compared to the current physical state of the relay which is reflected with an icon next to the drop down menu.</p>
	<p>The icon located between the time stamp and the default state menu shows the current state of the relay in relation to its default state. Icon meanings can be seen in the Icon Legend section at the end of this document.</p>
	<p>The “Activate” button causes the relay to toggle from the default selected state. The “Deactivate” button causes the relay to revert back to the default state.</p>
	<p>A time stamp is provided when the output was tested. To the right of the time stamp are the test result buttons. The installer/tester can select one based on the results of the test. The icons and their meaning can be found in the “Icon Legend” section at the end of this document.</p>

Selecting the “Toggle log” button at the bottom of the Test Outputs page allows the installer/tester to view a transaction log as they proceed with the output testing. The transaction log shown below in Fig 6.2 records the changes of state for each output. This log can be cleared at any time by clicking the Clear log button.

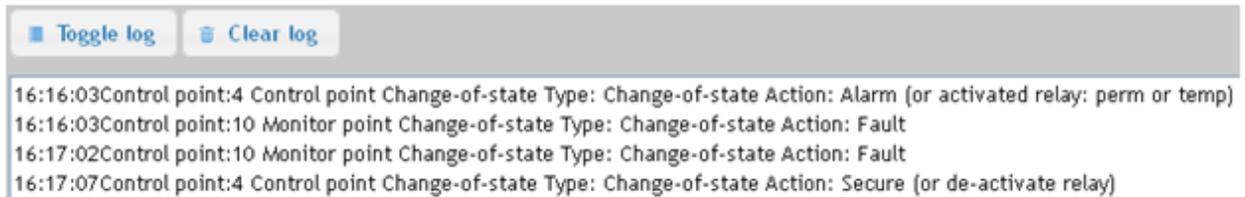
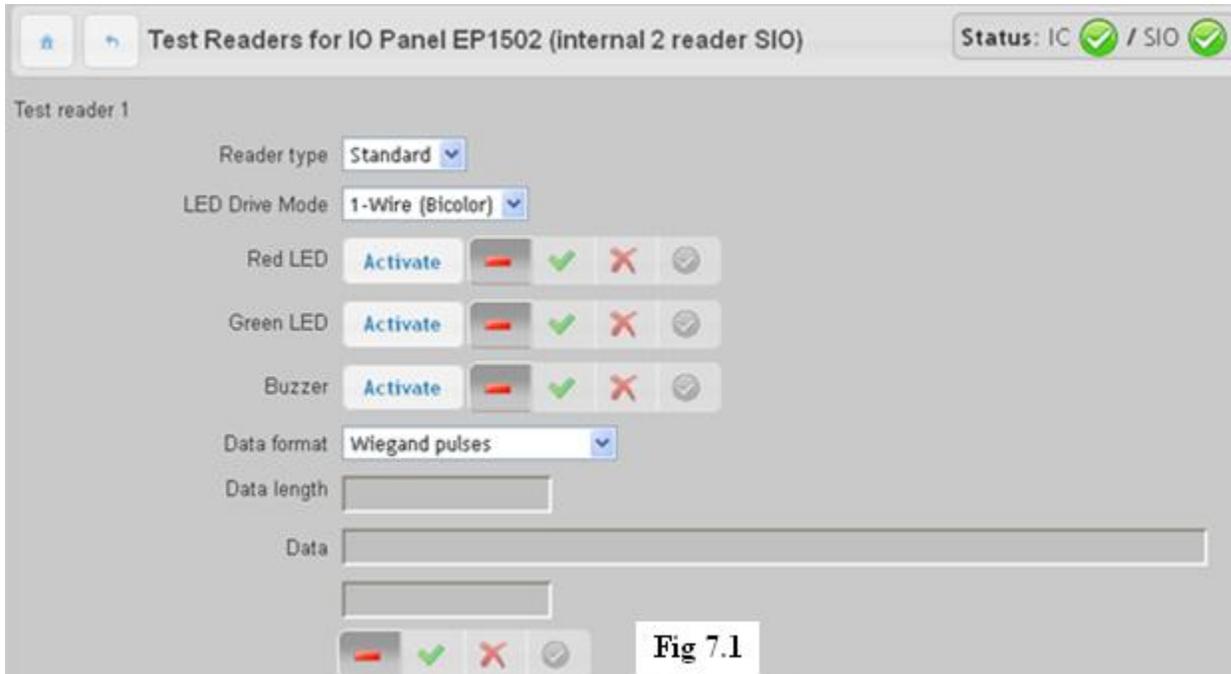


Fig 6.2

TESTING READERS

Selecting the “Readers” button from the IO configuration screen (Fig 4.3) will navigate the installer/tester to the Test Readers page (shown below in Fig 7.1). This page lists all the readers available on the IO panel.



The parts of the Test Readers page are described in the following table:

	Reader type Standard MRDT OSDP Bioscrypt	For each reader attached to the panel, the installer can assign the “Reader type” by making a selection from the dropdown menu.
	LED Drive Mode 1-Wire (Bicolor) 2-Wire Dorado-780	The LED Drive Mode menu allows the installer to select the type of LED configuration used to wire the reader.

	<p>Selecting the “Activate” button next to each of the LED colors or buzzer sends a corresponding signal to the reader to test the functionality of each LED and the buzzer. The test signals for each color or the buzzer are based on the installer/tester’s selection from the LED Drive Mode menu in Fig 7.1.</p> <p>Note: The buzzer is only available for 1-Wire LED Drive Modes.</p>
	<p>The “Data format” menu allows the selecting of how the card data is to be read by the reader.</p>
	<p>After configuring the data format, swiping a card through the reader automatically fills in the “Data length” and “Data” text boxes as well provides a time stamp when the transaction occurred. The “Data length” entry will either be the number of bits on the card or the number of hexadecimal digits on the card (depending on card format).</p>
	<p>After performing the tests, the installer selects one of these buttons to represent a pass or fail for the tested reader.</p>

Selecting the “Toggle log” button at the bottom of the Test Readers page allows the installer/tester to view a transaction log as they proceed with testing each reader. The transaction log shown below in Fig 7.2 records the transactions for each card swipe. This log can be cleared at any time by clicking the Clear log button.

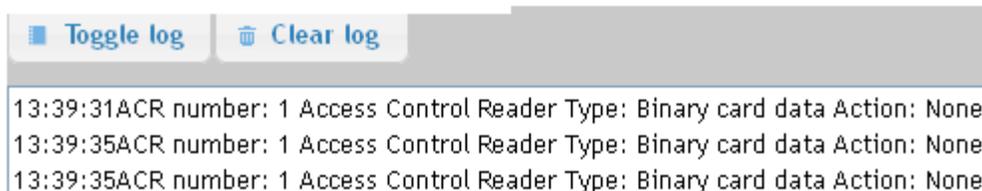


Fig. 7.2

ADVANCED

Note: The Mongoose and Mercury Web Services are two SEPARATE services that both run simultaneously for the IAU to function.

TABLET/SMART PHONE ACCESS

The IAU is accessible using a variety of network devices such as a smart phone or tablet. The device must be on the same network as the computer with the IAU software bundle installed on it. To access the IAU from a smart phone or tablet, use the device's web browser to navigate to the IP address of the computer with the Mercury Web Service and IAU Web Server on it.

CHANGING DEFAULT PORTS

It is also possible to have the Mercury Web Service listen on a port besides the default 8082; such as if another service already listens on that port. To change the port, the installer/tester can either change the *MercuryWebService.conf* configuration file (figure 8.1 below), or start the Mercury Web Service using the command line and set a new port number as the parameter for "ports" (figure 8.2 below).

To change the port number through the configuration file, the installer/tester must edit it in a text editor such as notepad or word pad. Navigate to the C:\IAU directory (if the software installer designated all the files to the default locations) and open up *MercuryWebService.conf*. Remove the pound sign next to "ports:" and specify a new port number after the colon (figure 8.1 below). You must restart the web service for the change to take effect.

The last change that needs to be made is on the configuration page that is accessed from the main IAU screen (clicking the gear icon in Fig 2.1). In the web service IP text box seen in Fig 2.3, enter the IP address of the machine running the Mercury Web Service followed by a colon and the new listening port. For example, if the port was changed to 8081, you would enter: **192.168.1.2:8081**.

```

#####
# This is a Mercury Web Service config file
# Config values are overridden by command line parameters
#####

#####
# Standalone Mode
#standalone

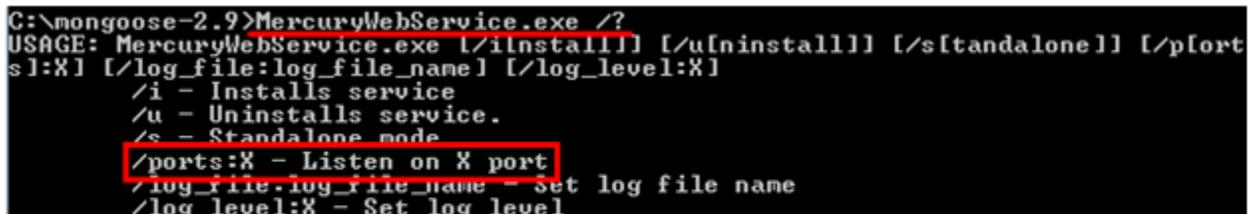
#####
# Specify web service listening ports
#ports:XXXX ← Specify new port number
↑ Remove "#"
#####
# Specify name of a log file
#log_file:C:\Windows\Temp\MerucuryWebService.log

```

Fig 8.1

To make the service listen on a different port through the command prompt, start the Mercury Web Service with a new port specified in the ports parameter:

/ports: X where X is the port number to use



```

C:\mongoose-2.9>MercuryWebService.exe /?
USAGE: MercuryWebService.exe [/i[install]] [/u[uninstall]] [/s[tandalone]] [/p[port
s]:X] [/log_file:log_file_name] [/log_level:X]
    /i - Installs service
    /u - Uninstalls service.
    /s - Standalone mode
    /ports:X - Listen on X port
    /log_file:log_file_name - Set log file name
    /log_level:X - Set log level

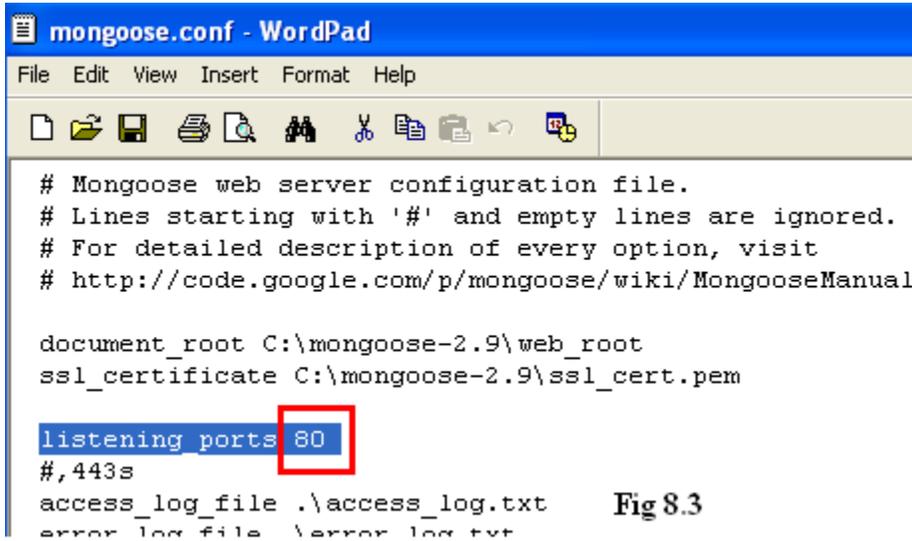
```

Fig 8.2

The default port that the Mongoose Web Service listens on is port 80. It may be necessary to change this port if there is conflict with another web server running on the machine. To change this port number, the installer/tester must edit the *mongoose.conf* file also located in the IAU directory.

In this configuration file, go to the line that says “listening_ports” and change the default value of 80 to whatever new port you want the web server to listen on (Fig 8.3 below). You must restart the mongoose web service for the changes to take effect (can be done from the start menu

entry created during the install). To access the IAU from the web browser, point the web browser to “localhost:XX” where the XX is the new port number chosen.



```
mongoose.conf - WordPad
File Edit View Insert Format Help
# Mongoose web server configuration file.
# Lines starting with '#' and empty lines are ignored.
# For detailed description of every option, visit
# http://code.google.com/p/mongoose/wiki/MongooseManual

document_root C:\mongoose-2.9\web_root
ssl_certificate C:\mongoose-2.9\ssl_cert.pem

listening ports 80
#,443s
access_log_file .\access_log.txt
error_log_file .\error_log.txt
```

Fig 8.3

SECURITY

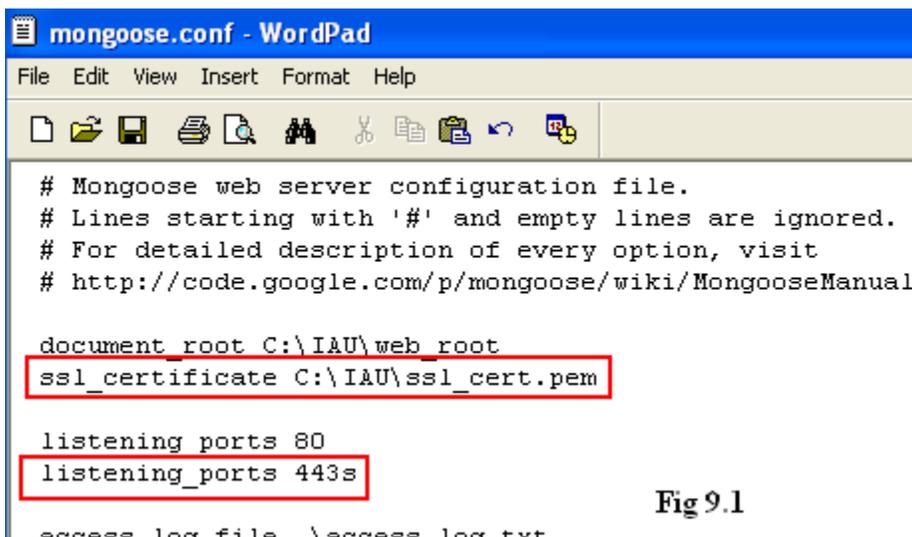
The IAU installation bundle is capable of certificate authorized connections and comes with already created certificates. There are two separate connections to be secured; 1) between the device being used to access the IAU web server and the web server itself and 2) between the IAU web server and the Mercury Web Service. To configure for secure connections, the IAU web server configuration file (`mongoose.conf`) and the Mercury web service configuration file (`MercuryWebService.conf`) need to be edited. These files are found in the IAU directory.

In order to secure the connection between the installer/tester's device and the IAU web server, the `mongoose.conf` file needs to be modified with the following changes:

- Make sure there is no “#” before the `ssl_certificate` line and enter the path:
`C:\IAU\ssl_cert.pem`
- Remove the “#” from before the `listening_ports 443s` line since 443 is the port for HTTPS connections.

Note: Changing the `mongoose.conf` file requires restarting the IAU Web Server service for changes to take effect.

When using the provided certificates, the new configuration should be **IDENTICAL** to screenshot shown below in figure 9.1.



```
# Mongoose web server configuration file.
# Lines starting with '#' and empty lines are ignored.
# For detailed description of every option, visit
# http://code.google.com/p/mongoose/wiki/MongooseManual

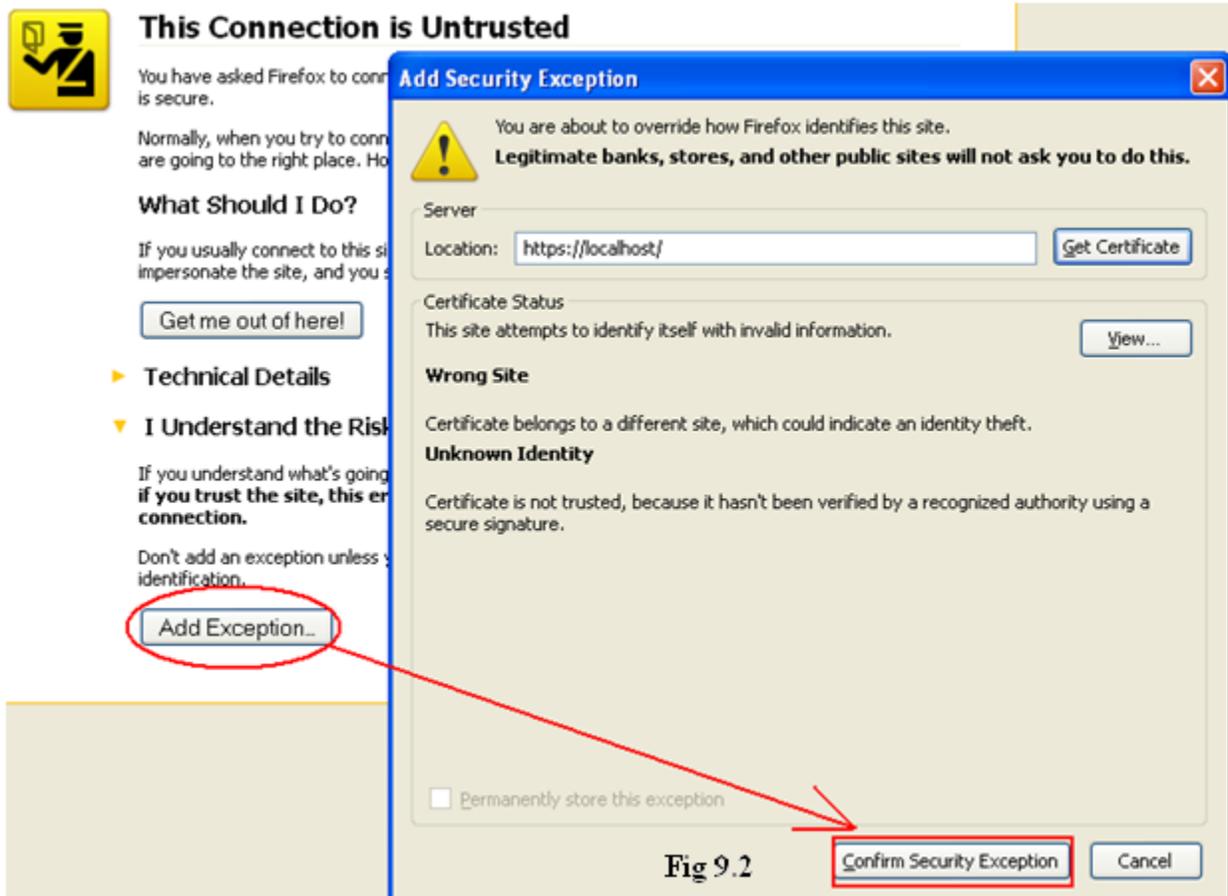
document_root C:\IAU\web_root
ssl_certificate C:\IAU\ssl_cert.pem

listening_ports 80
listening_ports 443s

access_log file \access_log.txt
```

Fig 9.1

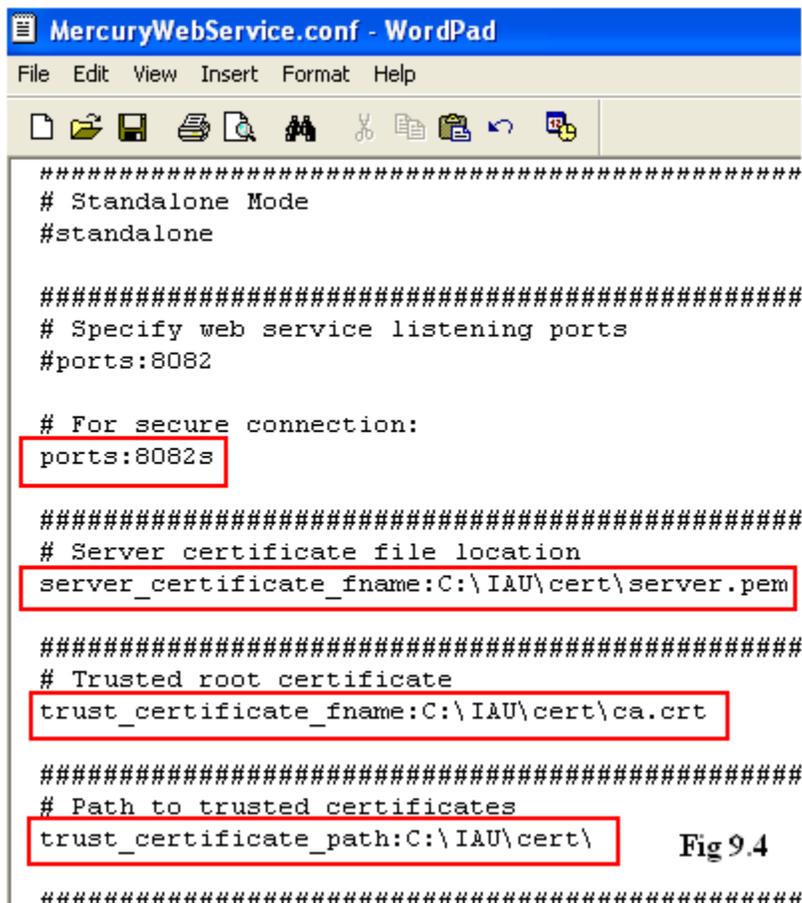
The connection between the installer/tester's device to IAU web server is now secure with certificate authentication and can now be accessed by putting [HTTPS://localhost](https://localhost) (or [HTTPS://IP_ADDRESS](https://IP_ADDRESS) if connecting from a different computer, tablet, or smart phone) in the web browser's address bar. If a security warning is presented, select "confirm exception." Examples of this exception in firefox (Fig 9.2) and Chrome (Fig 9.3) are shown below.



In order to secure the IAU to Mercury Web Service connection, the MercuryWebService.conf file needs to have the following changes made:

- Remove “#” from *ports* line under “Secure Connection” where **8082s** is the port number
Note: The port number can be something other than 8082 default as explained in the ADVANCED section, but the ‘s’ must be added for a secure connection.
- Remove “#” from *server_certificate_fname* line and enter the path **C:\IAU\cert\server.pem**
- Remove “#” from *trust_certificate_fname* line and enter the path **C:\IAU\cert\ca.crt**
- Remove “#” from *trust_certificate_path* line and enter the path **C:\IAU\cert**

When using the provided certificates and the default port 8082, the new configuration should be **IDENTICAL** to screenshot shown below in figure 9.4.



```
MercuryWebService.conf - WordPad
File Edit View Insert Format Help
# Standalone Mode
#standalone

# Specify web service listening ports
#ports:8082

# For secure connection:
ports:8082s

# Server certificate file location
server_certificate_fname:C:\IAU\cert\server.pem

# Trusted root certificate
trust_certificate_fname:C:\IAU\cert\ca.crt

# Path to trusted certificates
trust_certificate_path:C:\IAU\cert\

*****
```

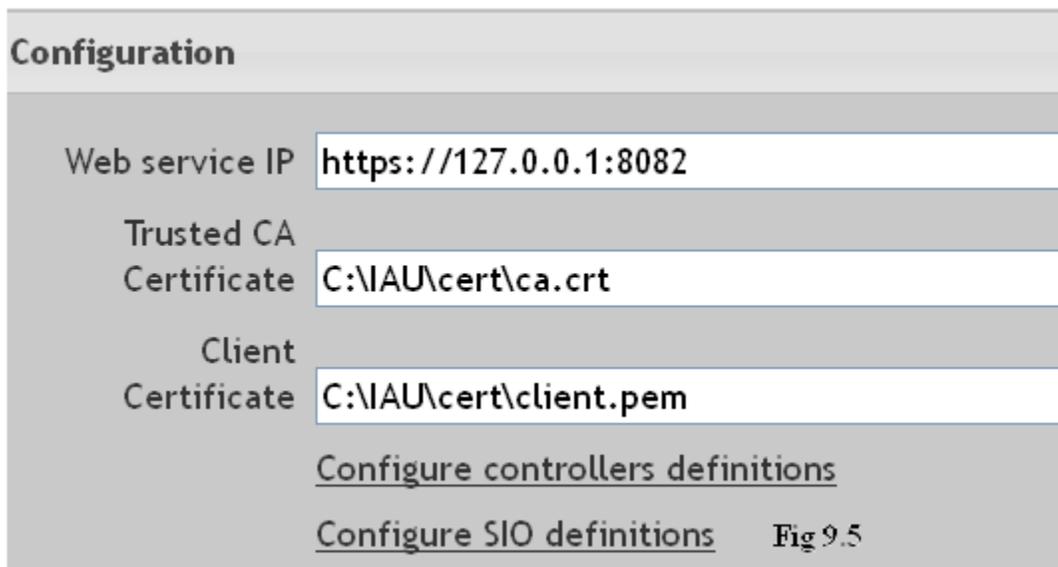
Fig 9.4

Note: Changing the MercuryWebService.conf file requires restarting the Mercury Web Service for changes to take effect.

Before the secure connection can be used, the configuration window in the IAU main page needs to be adjusted. Access the IAU web server and open the configuration window and make the following modifications:

- Enter a Web service IP of [HTTPS://127.0.0.1:8082](https://127.0.0.1:8082)
- Enter the path **C:\IAU\cert\ca.crt** for the **ca.crt** in the Trusted CA Certificate field
- Enter the path **C:\IAU\cert\client.pem** for the **client.pem** in the Client Certificate field

Then click OK to save settings. An example of a proper configuration is shown below in figure 9.5. The Web Service IP 127.0.0.1 because both the Mercury web service and IAU web server are on the same machine.



Configuration

Web service IP

Trusted CA Certificate

Client Certificate

[Configure controllers definitions](#)

[Configure SIO definitions](#) **Fig 9.5**

The connection between the IAU web server and the Mercury Web Service is now secure.

ICON LEGEND

	<p>These icons are present on the navigable pages and selecting them allows the installer to quickly return to the IAU home page or return to the previous page.</p>
<p>COMM STATUS ICONS</p> <p>  Online Status: IC   Offline Status: IC  / SIO   Unknown </p>	<p>Depending on the page displayed, the Communication Status Icons will represent the connectivity (or lack thereof) of the controller, SIO, etc.</p> <p>For example, on the Controller page, the tester/installer will see an IC status icon and on the IO page there will be both the IC and IO status.</p>
<p>TEST RESULT</p> <p> Not Tested     Pass     Fail     Not Used     </p>	<p>As the installer goes through each test item, the result of the test is individually marked with either pass or fail.</p> <p>“Not Tested” is the default icon for all newly discovered and configured devices no matter the type.</p> <p>“Not Used” is selected if the point is not currently configured for use.</p>
<p>TEST STATUS ICONS</p> <p>  Not tested  In progress  Tests passed  Some tests failed </p>	<p>Test Status Icons appear for each controller, device, or group of controllers/devices. Once a test begins, test items are automatically labeled with a test progression status icon that is reflective of all their individual or group test statuses.</p> <p>“Not tested” is the default for all newly discovered controller/devices on the network.</p> <p>Note: The In progress icon signifies that some parts of a test group have been tested, and does not specify pass or failure of a point, device or a controller.</p>

INPUT/OUTPUT TESTING

-  Current state does NOT match default state
-  Current state matches default state
-  Supervisory Fault (input only)

After setting the default state for inputs and outputs, the installer physically tests each item on the panel. Based on the new state in relation to the default, the installer should see a corresponding icon.

For example, setting an input's default state to normally closed and then opening that circuit, the panel should yield a .