HOME PAGE:

Homepage provides status summary of Power System monitored via PC500/550.

FIGURE 1

As indicated, the screen is divided in five main sections.
1. Menu Bar
2. Date/Time
3. Device Tiles
4. System Status Bar
5. Homepage Graphs

TOP MENU BAR

This menu bar with graphical icons offers quick navigation to listed sections. Table 1 provides details on available information under each section.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>This is the first screen after login. Click on this icon anytime to navigate back to home page (Fig. 1). As shown in Fig. 1, Homepage offers system status summary. User can generate graphs for quick analysis. Click on any Homepage Device tile directs user to Device Details</td>
</tr>
<tr>
<td>Devices</td>
<td>Like Homepage, Devices section also offers tiled display of configured devices. The annunciations listed on these tiles mimic Genset/ATS panel HMI annunciations. Click on any Device tile directs user to Device Details</td>
</tr>
<tr>
<td>Event Log</td>
<td>Provides compiled list of events from all configured devices (including PC500/PC550). Events are displayed in descending order and by default appear in ‘Active Events’ section. Once acknowledged, events move to ‘Acknowledged Events’ section (provided event condition is cleared from device)</td>
</tr>
<tr>
<td>Reports</td>
<td>Provides option to generate customized Reports for historical data. Report provides high level statistical summary of monitored parameters along with their graphical representation. Report can only be generated per each device separately</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Provides information regarding communication status of Modbus Devices and PC500/550 System Information (Hardware/Software Version, Software update Date/Time etc.) In addition it lists various system processes and services for debugging purposes.</td>
</tr>
<tr>
<td>Setup</td>
<td>Provides access to the followings System configuration menus; Network Settings, Modbus Settings, User Profile Settings, Date and Time Settings, Device Configuration, Sensors and Output Controls, Mail Settings, Notifications, SNMP Server Settings, Data Log Preferences, Contacts, System Settings</td>
</tr>
</tbody>
</table>

**TABLE 1**
DATE/TIME SECTION

The top right corner of User Interface displays the current Date and Time from PC500/PC550 Device. The time may be different from your PC time.

**Note:** All Data Log and Event Logs are recorded based on this Date/Time settings.

(e.g. If you are in year 2016 and your device Date/Time is from 2006, then all Data Log, Event Log records as well as outgoing notifications will have 2006 Date/Time stamp on it.)

➢ To make any adjustments navigate to **Setup > Date and Time Settings**.

DEVICE TILES

Each Device Tile provides

- One click access to Device Details screen
- Modbus Communication Status
- Operation Mode (Genset Running/Stopped, ATS Source1/Source2 status etc.)
- Fault Status (No Fault, Warning, Shutdown etc.)
- Popup text with details on key system parameters

Homepage tiles for various device types are as below. Tiles are arranged in same order in which devices are configured. Site IO tile is always the last tile (when applicable)
For legacy GenSet controls, the communication status is between the PC500/550 and the ModLon Gateway.

When GenSet is not communicating, (i.e. when there is no communication between PC500/550 and ModLon) the Run/Stop and Fault Statuses are not displayed, indicating those details are not available.

Note: CCM GenSet has identical tile display, but the GenSet icon appears in grey instead of Cummins green. The grey tile represents a third party GenSet control.

For legacy ATS controls, the communication status is between the PC500/550 and the ModLon Gateway.

When ATS is not communicating (i.e. when there is no communication between PC500/550 and ModLon), the Switch State and Fault statuses are not displayed, indicating those details are not available.

Note: CCM ATS has identical tile display, but the ATS icon appears in grey instead of Cummins green. The grey tile represents a third party ATS control.
<table>
<thead>
<tr>
<th>ATS Switch State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Icon]</td>
<td>Source 1 and Source 2 Not Available, no source is connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 Available, no source is connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 2 Available, no source is connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 Available and Connected, Source 2 Not Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 2 Available and Connected, Source 1 Not Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 and Source 2 Available, Source 1 connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 and Source 2 Available, Source 2 connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 and Source 2 Available, no source is connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 and Source 2 Available and Connected</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Both Sources Connected, but only Source 1 Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Both Sources Connected, but only Source 2 Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Both Sources Connected, no source is Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 Available but Not Connected, Source 2 Connected but Not Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 2 Available but Not Connected, Source 1 Connected but Not Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 1 Connected, no source is Available</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Source 2 Connected, no source is Available</td>
</tr>
</tbody>
</table>

**TABLE 2**
SITE I/OS

All Analog/Discrete Sensors and Output Controls configured from PC500/PC550 are collectively displayed under this bucket.

- The Communicating Status indicates that at least one sensor or output has a good communication with PC500/PC550.

- The Not Communicating Status indicates that all Sensor(s) and Output(s) are not communicating. When not communicating, the Fault status is not displayed indicating that detail is not available.

- Fault Status becomes active when at least 1 sensor has an active warning.

**Note:** The PC500/550 hardware has two discrete inputs, two discrete outputs and one analog resistive input. The onboard sensors and outputs never lose communication. It is also possible to connect Expandable IO module (AUX 101) to augment Sensor/Output capacity on PC500/550.
Staying on Homepage it’s possible to access details on key parameters from all devices. Hover the cursor over Homepage Device tile and popup will appear as shown below.

As mentioned earlier, click on any of the above tiles will navigate the user to Device Details section.
HOMEPAGE GRAPHS

Homepage graphs are used to graph historical trending data. Each graph is only capable of plotting one parameter at a time. The supported time intervals are; Past 1 hour, Past 24 hours and Past 7 days. The feature can be accessed from both graph windows located on the right side of the Homepage.

Generating a Homepage-Graph is a three step process

1. **Select Device**
   (All Devices including SiteIOs are listed)

2. **Select Parameter**

3. **Select Duration**
   - Past 1 hour
   - Past 24 hours
   - Past 7 days

- As an alternative, Zoom in can be accomplished by (i) selecting specific section from the graph with mouse click and drag (ii) reducing the size of horizontal scroll bar

- The vertical scale auto adjusts itself depending on standard deviation of monitored parameter. The vertical scale does not always start at zero.

- For additional analysis and graphing capabilities, generate a Report for selected Device. Refer to ‘Reports’ section for details.
SYSTEM STATUS BAR

This System Status Bar always stays on top of the UI. It displays a compiled list of the 10 most recent active events from all configured Devices. This includes events from PC500/550 as well. Events scroll at 5 second intervals. Clicking on an event in the status bar navigates the user to the same event in Event Log.

- Up/Down arrows allow the user to scroll through the available events (max. 10).

**Note:** Events cannot be acknowledged from the System Status bar.

When there are no active events, the system status will be displayed as OK!

DEVICES

Similar to Homepage, all configured devices are laid out in tiled format on Devices screen. The information provided on these tiles closely mimics panel mounted HMI annunciations. There are no popup screens which are displayed with mouse hover (like Homepage). Click on Device image directs user to Device Details page.

Typical Device tiles are explained below. Genset and ATS Tiles are arranged in same order how they are configured. Site IOs tile is always the last tile (when applicable).
GENSET

The details are self-explanatory. Communication status and Annunciations are typically displayed as shown.

Click on Genset icon directs user to Device Details page. CCM-Genset is displayed in Grey color keeping all other details same. For CCM-Genset, LEDs function only if appropriate signals are hardwired to CCM hardware.

- Communication Status: For legacy Genset controls, it is the status between PC500/550 and ModLon Gateway. Use Lonmaker for debugging communication issues between ModLon gateway and legacy Genset Controller if any.

- When Genset is not communicating, LEDs are not functional indicating those details are not available.
ATS

The details are self-explanatory. Communication status and Annunciations are typically displayed as shown.

Click on ATS icon navigates user to Device Details page. CCM-ATS is displayed in Grey color keeping all other details same. For CCM-ATS, LEDs function only if appropriate signals are hardwired to CCM hardware.

- Communication Status: For ATS controls, it is the status between PC500/550 and ModLon Gateway. Use Lonmaker for debugging communication issues between ModLon gateway and ATS Controller if any.

- When ATS is not communicating, LEDs are not functional indicating those details are not available.
SITE IO

The details are self-explanatory. Communication status, total sensor count and warning status are displayed as shown.

Click on Site icon navigates user to Device Details page.

- When all configured Sensors and Outputs are not communicating, configuration details read 'unknown' or blank indicating those details not available.
- Warnings are user configurable. User can disable all warnings. Navigate to Setup>Sensors and Outputs to update settings.
DEVICE DETAILS - GENSET

All available details for selected Genset can be accessed under different tabs.

This screen provides details on all key system parameters: Alternator data, Engine data, Annunciations and Genset Controls (Start/Stop, Fault Reset).

- The Annunciator data comprises of all NFPA110 and extended NFPA110 parameters and very similar to Genset panel mounted hardware annunciator.
- Selected parameters from Alternator and Engine Data are displayed in middle section.

Note - Units are set to ‘Imperial’ by default. Metric preference can be selected from Setup>System Settings screen.

Control section details are as below

<table>
<thead>
<tr>
<th>Genset Mode:</th>
<th>Running</th>
<th>Stopped</th>
<th>Not Communicating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genset Mode</td>
<td><img src="image1" alt="Gear" /></td>
<td><img src="image2" alt="stopped" /></td>
<td><img src="image3" alt="Not Communicating" /></td>
</tr>
</tbody>
</table>

*Cummins Confidential: All copyrights reserved*
Communication Status: Represents the Modbus RTU communication status between the PC500/550 and the Genset Control. For legacy Genset controls, it is the status between PC500/550 and ModLon Gateway.

When Genset is not communicating, LEDs and data section appears blank (or dashes in all data field) indicating those details are not available.

Control Switches: Controls are accessible only by Administrator and Operator type users. If you are a read only user, controls will appear in ‘Disabled’ state.

<table>
<thead>
<tr>
<th></th>
<th>Enabled</th>
<th>Disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Start</td>
<td><img src="image" alt="Remote Start Enabled" /></td>
<td><img src="image" alt="Remote Start Disabled" /></td>
</tr>
<tr>
<td>Remote Stop</td>
<td><img src="image" alt="Remote Stop Enabled" /></td>
<td><img src="image" alt="Remote Stop Disabled" /></td>
</tr>
<tr>
<td>Fault Reset</td>
<td><img src="image" alt="Fault Reset Enabled" /></td>
<td><img src="image" alt="Fault Reset Disabled" /></td>
</tr>
</tbody>
</table>

Fault reset can reset only ‘Warning’ type events provided fault conditions are no longer active on the Genset.

User confirmation messages are displayed with every control action to avoid any accidental clicks.
DEVICE DETAILS - ATS

All available details for selected ATS can be accessed under different tabs.

This screen provides details on all key system parameters like Source-1 data, Source-2 data, load data, Annunciations and ATS Controls (Test Start/Stop, Fault Reset)

The Annunciator data comprises of all NFPA110 parameters and very similar to ATS panel mounted hardware annunciator. Selected parameters from Source-1, Source-2, Load and switch connection status are displayed in middle sections.

As marked, control section details are as below

1. **ATS Switch State:**

   Not Communicating

---

*Cummins Confidential: All copyrights reserved*
## ATS Switch States

<table>
<thead>
<tr>
<th>ATS Switch State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![icon1] ![icon2]</td>
<td>Source 1 and Source 2 Not Available, no source is connected</td>
</tr>
<tr>
<td>![icon1] ![icon3]</td>
<td>Source 1 Available, no source is connected</td>
</tr>
<tr>
<td>![icon2] ![icon3]</td>
<td>Source 2 Available, no source is connected</td>
</tr>
<tr>
<td>![icon1] ![icon4]</td>
<td>Source 1 Available and Connected, Source 2 Not Available</td>
</tr>
<tr>
<td>![icon2] ![icon4]</td>
<td>Source 2 Available and Connected, Source 1 Not Available</td>
</tr>
<tr>
<td>![icon1] ![icon5]</td>
<td>Source 1 and Source 2 Available, Source 1 connected</td>
</tr>
<tr>
<td>![icon2] ![icon5]</td>
<td>Source 1 and Source 2 Available, Source 2 connected</td>
</tr>
<tr>
<td>![icon1] ![icon6]</td>
<td>Source 1 and Source 2 Available, no source is connected</td>
</tr>
<tr>
<td>![icon2] ![icon6]</td>
<td>Source 1 and Source 2 Available and Connected</td>
</tr>
<tr>
<td>![icon1] ![icon7]</td>
<td>Both Sources Connected, but only Source 1 Available</td>
</tr>
<tr>
<td>![icon2] ![icon7]</td>
<td>Both Sources Connected, but only Source 2 Available</td>
</tr>
<tr>
<td>![icon1] ![icon8]</td>
<td>Both Sources Connected, no source is Available</td>
</tr>
<tr>
<td>![icon2] ![icon8]</td>
<td>Source 1 Available but Not Connected, Source 2 Connected but Not Available</td>
</tr>
<tr>
<td>![icon1] ![icon9]</td>
<td>Source 2 Available but Not Connected, Source 1 Connected but Not Available</td>
</tr>
<tr>
<td>![icon2] ![icon9]</td>
<td>Source 1 Connected, no source is Available</td>
</tr>
<tr>
<td>![icon1] ![icon10]</td>
<td>Source 2 Connected, no source is Available</td>
</tr>
</tbody>
</table>
Communication Status: For ATS controls, the communication status represents the Modbus RTU communications between the PC500/550 and the ModLon Gateway.

When ATS is not communicating, the LEDs and data section appears blank (or dashes in all data field) indicating those details are not available.

Control Switches: Controls are accessible only by Administrator and Operator type users. If you are a read only user, controls will appear in ‘Disabled’ state.

<table>
<thead>
<tr>
<th></th>
<th>Enabled</th>
<th>Disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Test</td>
<td>![Green Button]</td>
<td>![Black Button]</td>
</tr>
<tr>
<td>Stop Test</td>
<td>![Red Button]</td>
<td>![Black Button]</td>
</tr>
<tr>
<td>Fault Reset</td>
<td>![Orange Button]</td>
<td>![Black Button]</td>
</tr>
</tbody>
</table>

Fault reset can reset only ‘Warning’ type events provided fault conditions are no longer active on the ATS.
User confirmation messages are displayed with every control action to avoid any accidental clicks.

DEVICE DETAILS-SITE IOS
All available details for configured Sensors and Outputs can be accessed under different tabs.
This screen provides status details of Sensors and Output Controls.
## Sensor Data:

<table>
<thead>
<tr>
<th>Data Field</th>
<th>Sensor Type/Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State/Value</td>
<td>Analog Sensor</td>
<td>Scaled value of sensed entity. E.g Fuel Gallons, Temp. Degree F</td>
</tr>
<tr>
<td></td>
<td>Discrete Sensor</td>
<td>Active or Inactive</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image.png" alt="Not communicating icon" /> icon will display if there is no communication with IO module through which sensor is wired</td>
</tr>
<tr>
<td>Low Warning</td>
<td>Analog Sensor</td>
<td>Defined threshold (in actual measured units e.g. Gallons, Degree F) to trigger Low Warning. It is Configurable from Setup&gt;Sensors and Outputs</td>
</tr>
<tr>
<td></td>
<td>Discrete Sensor</td>
<td>NA. will always display dash (-)</td>
</tr>
<tr>
<td>High Warning</td>
<td>Analog Sensor</td>
<td>Defined threshold (in actual measured units e.g. Gallons, Degree F) to trigger High Warning. It is Configurable from Setup&gt;Sensors and Outputs</td>
</tr>
<tr>
<td></td>
<td>Discrete Sensor</td>
<td>NA. will always display dash (-)</td>
</tr>
<tr>
<td>Units</td>
<td>Analog Sensor</td>
<td>Defined Unit for measured entity. It is Configurable from Setup&gt;Sensors and Outputs</td>
</tr>
<tr>
<td></td>
<td>Discrete Sensor</td>
<td>NA. will always display dash (-)</td>
</tr>
</tbody>
</table>
Communication Status: Represents the Modbus RTU communication status between PC500/550 and IO Module (i.e. AUX101).
When not communicating, the data section appears blank (or dashes in all data fields), indicating those details are not available.

Outputs Data: Output Controls are accessible only by Administrator and Operator type users. If you are a read only user, controls will appear in ‘Disabled’ and grey state.

<table>
<thead>
<tr>
<th>Switch position</th>
<th>Disabled</th>
<th>Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding State</td>
<td>Inactive</td>
<td>Active</td>
</tr>
<tr>
<td>Not communicating</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Output control operation asks for user confirmation to avoid any accidental clicks

DEVICE ACTIVE EVENTS-GENSET/ATS/SITE IO

All currently active as well as past unacknowledged events are listed here with Date/Time stamp, Source, Event Type, Event Code and Description. Events are listed only for the selected device. For consolidated event list of all devices, access System Event log from top menu bar.
1 **Event Acknowledge:**

- To acknowledge a device event, the event must first be cleared at the device control. (i.e. Genset or ATS Control)
- Click on the green check mark in the Acknowledge column to acknowledge an event. If the event condition is still active at the control, the acknowledged event will reappear when the page is refreshed by either clicking on the Refresh button or re-entering the page.

**Note 1:** Only Administrator and Operator users can acknowledge event.

**Note 2:** Events can be defined for Sensors. Event triggering for outputs is not currently supported.

2 **Event Type:**

<table>
<thead>
<tr>
<th></th>
<th>Information</th>
<th>Warning</th>
<th>Shutdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genset</td>
<td>Information</td>
<td>Warning</td>
<td></td>
</tr>
<tr>
<td>ATS</td>
<td>Information</td>
<td>Warning</td>
<td></td>
</tr>
<tr>
<td>Site IOs</td>
<td>Warning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Information events are specifically created for PC500/550’s use and not available in Genset or ATS Service Manuals.

3 **Page Scroll control:** Events are displayed 50 per page. Use page navigation controls to scroll between pages.

4 **Page Count:** Section 4 provides details on maximum available page count for the selected device.

5 **Export Button:** User can export events displayed on screen (50max,) to csv file

Note: PC500/550 stores maximum 5000 events (including active and acknowledged). Events are automatically cleared on FIFO (first in first out) basis once maximum capacity is reached. Events are always stored on internal storage regardless of availability of SD/USB storage.

6 **Refresh Button:** User clicks on button to refresh the event log view. New events are only displayed by either clicking on the Refresh button or reentering the Event Log page.
DEVICE ACKNOWLEDGED EVENTS - GENSET/ATS/SITE IO

All acknowledged events are listed here with Date/Time stamp, Source, Event Type, Event Code and Description. Events are listed only for selected device. For consolidated event list of all devices, access System Event log from top menu bar. If event is acknowledged from active event log and event condition is still active at the control, acknowledged event goes back to ‘Active Events’ upon page refresh.

1. **Event Type:**

<table>
<thead>
<tr>
<th>Source</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genset</td>
<td>Information, Warning,</td>
</tr>
<tr>
<td></td>
<td>Shutdown</td>
</tr>
<tr>
<td>ATS</td>
<td>Information, Warning</td>
</tr>
<tr>
<td>Site IOs</td>
<td>Warning</td>
</tr>
</tbody>
</table>

- Information events are specifically created for PC500/550’s use and not available in Genset or ATS Service Manuals.

2. **Page Scroll control:** Events are displayed 50 per page. Use page navigation controls to scroll between pages.

3. **Page Count:** Section 3 provides details on maximum available page count for the selected device.
Export: User can export events displayed on screen (50 max.) to csv file.

Note: PC500/550 stores maximum 5000 events (including active and acknowledged). Events are automatically cleared on FIFO (first in first out) basis once maximum capacity is reached. Events are always stored on internal storage regardless of availability of SD/USB storage.

Refresh: User clicks on button to refresh the event log view. New events are only displayed by either clicking on the Refresh button or reentering the Event Log page.

DEVICE DATA LOG-GENSET/ATS

Data log specific for the selected device is listed here in Descending order. The UI response can be slow at times depending on other system operations.

Note1: Sensor Data logs are not supported. Sensor data can be obtained from the Reports section.

Note2: Data sampling frequency is configurable and can be accessed from Setup>Data Log Preferences. User can also extend data storage capability by enabling SD/USB storage.
1. **Page Scroll control**: Data log records are displayed 50 per page. Use page navigation controls to scroll between pages.

2. **Page Count**: As marked, Section 2 provides details on maximum available page count.

3. **Export**: User can export data log records displayed on screen (50 max) to csv file. Use Reports to quickly retrieve historical data (30 days max).

4. **Refresh**: User clicks on button to refresh the data log view. New data entries are only displayed by either clicking on the Refresh button or reentering the Data Log page.

5. **Storage**: Click Storage button on access details on storage capacity. All available and selected storage devices (internal flash, SD storage, USB storage) are listed on this screen. The available and utilized storage space details are also available.

User can select to store Data Log on PC500/550’s internal storage (approx. 8.5Mb) or external high capacity storage devices like SD Card or USB flash drive from Setup>Data Log Preferences.

If selecting external storage make sure to select correct device as per ambient conditions (temperature, humidity etc.). There is no maximum limit on capacity of external storage devices, but considering system performance dependencies it is recommended to use storage device up to 1GB capacity.
Note: PC500/500 issues two separate warnings when storage space is nearing its capacity. First warning is issued when storage space is 70% full and second warning is issued at 90%. Second warning clears 25% of old Data Logs (10% in case selected external storage) on FIFO (first in first out) basis and makes room for new data records.

**GAUGES - GENSET**

Gauges are applicable for Gensets only. User can select any eight parameters for displaying on Analog dial. The parameters can be selected/updated from Page2 of Genset Configuration wizard.

Genset configuration wizard also provides a checkbox for selecting default eight parameters as listed below:

- Battery Voltage
- Coolant Temperature
- Engine RPM
- Oil Pressure
- Frequency
- Line Current 1
- L-L Volt 1(a-b)
- Total kW

Navigate to Setup>Device Configuration and click ‘Edit Genset’ menu for making changes to Gauge display parameters.

**SYSTEM EVENT LOG**

**ACTIVE EVENTS**

All Active events and unacknowledged events are collectively listed for all devices along with Date/Time stamp, Source, Event Type, Event Code and Description.
Event Acknowledge:

- To acknowledge a device event, the event must first be cleared at the device control. (i.e. Genset or ATS Control)
- Click on the green check mark in the Acknowledge column to acknowledge an event. If the event condition is still active at the control, the acknowledged event will reappear when the page is refreshed by either clicking on the Refresh button or re-entering the page.

Note1: Only Administrator and Operator users can acknowledge events.

Note2: Events can be defined for Sensors. Event triggering for outputs is not currently supported.

Event Type:

Various supported event types are

<table>
<thead>
<tr>
<th>Genset</th>
<th>Information</th>
<th>Warning</th>
<th>Shutdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS</td>
<td>Information</td>
<td>Warning</td>
<td></td>
</tr>
<tr>
<td>Site IOs</td>
<td>Warning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Note: Information events are specifically created for PC500/550’s use and not available in Genset or ATS Service Manuals.

3. **Page Scroll control:** Events are displayed 50 per page. Use page navigation controls to scroll between pages.

4. **Page Count:** Section 4 provides details on maximum available page count.

5. **Export:** User can export events displayed on screen (50max.) to csv file

6. **Refresh:** User clicks on button to refresh the event log view. New events are only displayed by either clicking on the Refresh button or reentering the Event Log page.

Note: PC500/550 stores maximum 5000 events (including active and acknowledged). Events are automatically cleared on FIFO basis once maximum capacity is reached. Events are always stored on internal storage regardless of availability of SD/USB storage.

**ACKNOWLEDGED EVENTS**

All acknowledged events are collectively listed here with Date/Time stamp, Source, Event Type, Event Code and Description. If event is acknowledged from active event log and event condition is still active at device, acknowledged event goes back to ‘Active Events’ on page refresh.
1 Event Type:
Various supported event types are

<table>
<thead>
<tr>
<th>Type</th>
<th>Information</th>
<th>Warning</th>
<th>Shutdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genset</td>
<td><img src="image" alt="Information" /></td>
<td><img src="image" alt="Warning" /></td>
<td><img src="image" alt="Shutdown" /></td>
</tr>
<tr>
<td>ATS</td>
<td><img src="image" alt="Information" /></td>
<td><img src="image" alt="Warning" /></td>
<td></td>
</tr>
<tr>
<td>Site IOs</td>
<td><img src="image" alt="Warning" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Information events are specifically created for PC500/550's use, and not available in Genset Service Manuals.

2 Page Scroll control: Events are displayed 50 per page. Use page navigation controls to scroll between pages.

3 Page Count: Section 3 provides details on maximum available page count.

4 Export: User can export events displayed on screen (50max,) to csv file

5 Refresh: User clicks on button to refresh the event log view. New events are only displayed by either clicking on the Refresh button or reentering the Event Log page.

Note: PC500/550 stores maximum 5000 events (including active and acknowledged). Events are automatically cleared on FIFO basis once maximum capacity is reached. Events are always stored on internal storage regardless of availability of SD/USB storage.

REPORTS SUMMARY

Report provides Summary of selected parameters (Min, Max and Average) along with their graphical representation. In graphical representation, parameters are plotted on time scale with three intermediate values displayed in the beginning, middle and end of selected duration. Selecting parameter in left pane displays it graphically in right pane. Only 1 parameter graph is displayed at time. Refer to sample Report below.
1. **Parameter or Analog Sensor Data:** Displays the selected device parameters along with minimum, maximum and average values.

2. **Annunciator or Discrete Sensor Data:** Displays Annunciator Data for the selected device OR Discrete Sensor data. %Active for Discrete parameters is displayed in last column.

**Note:** Annunciator data is only displayed when selecting all the Genset or ATS device parameters.

3. **Zoom In**
4. **Zoom Out**

- As an alternative, Zoom in can be accomplished by (i) selecting specific section from the graph with mouse click and drag (ii) reducing the size of horizontal scroll bar

- The vertical scale auto adjusts itself depending on standard deviation of monitored parameter. The vertical scale does not always start at zero.

4. **Save Report:** Reports can be exported to CSV file format for further analysis. Only the data is exported. Report graphs are not exported.
REPORT WIZARD

Report are generated from historical data based on preset durations (past 24 hours, past 7 days, past 31 days) or custom duration (any historical interval - 31 days max.) The User can selectively generate report for all parameters listed in device data log or Parameters can be individually selected through Wizard. User can select all parameters in single click if desired.

**Note1:** When generating a report for sensors, the user can only select maximum 5 sensors at a time.

**Note2:** Output Control report is not supported.

Refer image below for details. Fill in all required fields and click ‘Create’ to generate Report.
**DIAGNOSTICS**

The Diagnostics section provides useful system status information for remote troubleshooting. The section is divided in 5 tabs.

**DIAGNOSTICS/COMMUNICATION**

Communication status for each configured device, number of Modbus packets sent, received and failed, date/time of last successful communication is listed.

![Diagnostics/Communication Section](image)

**Clear Counters:** It’s a hyperlink which resets sent, received and failed counters to zero. User has to acknowledge confirmation before counters are set to zero again.

If device is in ‘Not Communicating’ state after initialization, try below options

- Check if there is a mismatch of Modbus configuration (Modbus Address, Baud Rate, Parity, Stop Bits) between PC500/550 and connected device (Genset, Aux101 etc.). Modbus settings must match to have successful communications.
- Verify the Modbus cable is in good shape (verify continuity)
- Verify the polarity of the Modbus connections.
- Check if RS485 LEDs on PC500/550 hardware are blinking. If not, reboot the device.
PC500/550 - Help

2 Get Wireless Data: CDMA/GSM modem types, mobile number, signal strength and frequency band are displayed. When there is no SIM card, a dash (-) or blank space shall appear in all fields. If displayed GSM frequency is not suitable for your area, it can be changed from Setup>System Settings. The signal strength is displayed in Green bars.

Note: The Mobile number is displayed when the CDMA modem is activated OR the GSM SIM card is activated and properly inserted in the SIM card slot in the hardware.

If there are all grey bars ( ), try changing location of PC500/550 device OR use the antenna extension cable (PN# A035C381)

DIAGNOSTICS/PROCESSES

This screen lists all processes running on PC500/550 server. This screen is intended for Developers debugging software related issues.
**PC550/500 - Help**

1. **Reboot Device:** This button provides ‘soft reboot’ option for PC500/PC550 device. When operated, it resets power supply to processor pins on motherboard. The device will simply reboot like any Windows PC retaining all configurations and log files.

**Note:** Reboot Device operation is NOT a ‘factory reset’ option.

**DIAGNOSTICS/SERVICES**

This screen lists all services running on PC5xx server.

1. **Reboot Device:** This button provides ‘soft reboot’ option for PC500/PC550 device. When operated, it resets power supply to processor pins on motherboard. The device will simply reboot like any Windows PC retaining all configurations and log files.

This screen is also intended for Developers debugging software related issues.

**Note:** Reboot Device operation is NOT a ‘factory reset’ option.
DIAGNOSTICS/PERFORMANCE

This screen provides all 'Performance Data' related to memory load and utilization. As like other screens above this screen is also intended for Developers debugging software related issues.

DIAGNOSTICS/SYSTEM INFORMATION

PC500/550 Hardware details (PC5xx model, hardware version, modem type, MEID/IMEA number) and software details (PC5xx software version, OS Version, build number, last software update date/time) are listed. During any service call, user may be asked to provide details from this screen.
• If Software update is required, it can be initiated from Setup>System Settings. The update file can be downloaded from Cummins Incal website.
SETUP

All PC500/550 configuration wizards are accessible under the Setup menu. During initial configuration of device, it is recommended to proceed in a sequence how tiles are arranged (left to right). E.g. Network Settings, Modbus Configuration, User Profile settings and so on.

**Note:** Only Administrator users can make changes in the Setup menus. For Read only and Operator users all Edit buttons are grayed out.

NETWORK SETTINGS

Network settings are identical to IPv4 settings of Windows network configuration menu. User can select AUTO or manual configuration mode by selecting radio buttons accordingly. For manual configuration obtain all details listed in image from your IT Administrator.

- Click Edit Button to make changes
DHCP Settings

**Hostname:** It serves as a PC500/550's name tag for its identification over network. Hostname can be used for accessing device over web and instead of IP address it can be used directly to access UI from within the network.

**IP address:** It is the numerical label assigned to device for its identification over network. It can be used to access PC500/550's UI from within the network.

**Subnet Mask:** A subnet mask separates the IP address into two parts- the network address and the host addresses (<network><host>).

**Default Gateway:** It is the node on the computer network which PC500/550 UI uses when an IP address does not match any other routes in the routing table.

**DNS Server (Domain Name System):** It is a network system used to translate names into IP addresses.

User can select to configure network settings automatically or manually.

- For Auto configuration,
  - Connect Ethernet network cable to PC500/550
  - Select auto detect option for IP
  - Select auto detect option for DNS configuration
  - Save settings

- For manual configuration,
  - Select 'Use the following...' radio button for IP and enter details provided by your IT administrator
  - Select 'Use the following...' radio button for DNS and enter details provided by your IT administrator
  - Save Settings

As an alternative, user can select to detect IP address automatically but configure DNS server settings manually.

**SSL (Secure Sockets Layer) is a standard security protocol that provides communication security over the Internet. SSL provides a secure connection between two machines operating over the Internet or an internal network. SSL protects confidential data by creating a uniquely encrypted channel for private communication. It helps preventing hackers from tapping into client-Server communication and misusing confidential data. Refer PC500/550 Owner's manual for details.
**Note:** Any change made in the Network Settings requires a system reboot. This is done automatically.

**MODBUS SETTINGS**

PC500/550 has two RS-485 channels for Modbus communications. As indicated both channels can be independently configured as required. Make sure that ALL slave devices wired to these channels have identical Modbus configuration. Seamless Communication will not be possible if there is any mismatch. Device supports various configuration options as pointed out. Refer Modbus Protocol Specifications from [http://www.modbus.org/](http://www.modbus.org/) for more details.

Click Edit to begin.

**Baud Rate:** It specifies number of bits to be transmitted per second. This is not applicable only for data bits. Total bits comprised in a frame are considered (Parity, Stop Bits etc.).
Device supports all standard baud rates from 2400 to 38400. Select suitable baud rate from drop down list. 19200 is default on many Cummins devices including PC500/550.

**Parity:** Parity is a method of detecting errors in transmission. When parity is used with a serial port, an extra data bit is sent with each data character, arranged so that the number of ‘1’ bits in character including parity bit is always Odd or always Even.

‘None’ parity is the default selection. Even and Odd parity can be selected if required. Note that PC500/550 uses 11 bit pattern for data formatting.

**Stop Bits:** Stop bits are sent at end of every character to allow receiving signal hardware to detect the end of a character. Select 1 or 2 stop bits to suit parity selection.

**Note:** 2 stop bits cannot be selected with Even/Odd parity. As an exception, all Cummins devices support ‘None’ parity and 1 stop bit selection (10 bit pattern).

**Data Bits:** Considering the bit pattern of Modbus parameters in Cummins controls, Data Bits are defaulted to 8 and cannot be changed.

**Timeout:** It is the duration for which PC500/550 waits before sending another request. A default setting is 250ms and can be configured to suit performance of other connected devices in network.

**Modbus/TCP:** Modbus transmission control (TCP) service provides client-server communication between Modbus TCP client and PC500/550 server. PC500/550 responds to Modbus/TCP requests but does not initiate communication. PC500/550 uses a default port 502 for all Modbus/TCP transactions and it is configurable. Check ‘Enable Modbus TCP’ and unlock port number for editing. Note that Modbus TCP has read-only access for all Genset and ATS data. Sensor and Output Control data cannot be read over Modbus TCP.

Refer to Modbus Register Mapping (A029X159) for details on Modbus TCP implementation for PC500/550.

**USER PROFILE SETTINGS**

The settings are divided in two tabs: Users and User Groups.

**USERS**

- **Add New User**
- **Delete**
- **Change Password**
- **Test SMS**
- **Test Email**

<table>
<thead>
<tr>
<th>Username</th>
<th>First Name</th>
<th>Last Name</th>
<th>Email</th>
<th>Mobile Number</th>
<th>Access Level</th>
<th>User Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>admin</td>
<td>Admin</td>
<td>Admin</td>
<td><a href="mailto:admin@admin.com">admin@admin.com</a></td>
<td>999999999999</td>
<td>Administrator</td>
<td>User Group</td>
</tr>
</tbody>
</table>
Add New User: Navigates the user to User Setup Wizard for adding new users to the system.

Edit: Navigates the user to User Setup Wizard for editing existing user information.

Change Password: This option allows Administrators to change other users’ passwords. To change your own password, the user must use the Change Password option on the login screen.

To change password of other users, just select user, click on ‘Change Password’ and enter required details in below wizard.

Administrators can change their password ONLY from login page as shown below.

Test SMS: If you are using PC500/550 GSM or CDMA device, SMS functionality can be verified from here (provided CDMA cell modem is activated OR active SIM card is plugged in GSM modem). For convenience, mobile number of selected user is auto populated. A confirmation message is displayed once SMS is sent.
If no SMS is received, please check wireless signal strength from Diagnostics>Communications>Get wireless data. Refer Diagnostics Help section for additional details

5 **Test Email:** Similar to SMS, email can be sent to confirm functionality of configured SMTP server and the users email address. For convenience, the email address of selected user is auto populated. A confirmation message is displayed once email is sent.

**Note:** SMTP settings must be configured before using this feature otherwise popup warning message shows up. SMTP server settings can be configured from Setup>Mail settings.

6 **View All Members link:** Select link to view the Group which the selected User belongs to.

**USER SETUP WIZARD**

Create a new User by using wizard to enter in User required information. The fields are self-explanatory. A screen shot and details provided below.
**Username:** The Username is used to log into the system.

**Access Level:** Assign access level to the new User.
- *Administrator* – Has all access to configure system, control devices and export data.
- *Operator* – Has access to control devices and export data. Operator User can’t edit or modify system settings.
- *Read Only* – Only has access to monitor system data. Read only user can’t edit or modify system settings, control devices or export data.

**Email:** User must fill in a valid email address. The email address is used for notifications and password recovery.

**Mobil Number:** User must fill in a valid mobile number if the user selects to receive notifications via SMS.

**Select a Method to Receive Notifications:** The user can select Email, SMS or both. If SMS is selected, the Mobile Number field becomes a required field and must be filled in with a valid mobile number.
USER GROUPS:

PC500/550 sends SMS and Email notifications to User Groups and then they are delivered to the users under those Groups. The notion of User Groups is for convenience of grouping users based on their need of getting notified. E.g. Different groups can be notified when Genset started/stopped and when Genset has an active fault.

![User Group Setup Wizard](image)

1. **Add New User Group**: Navigates the user to the User Group Setup Wizard for adding new User Groups to the system.

2. **Edit**: Navigates the user to the User Group Setup Wizard for editing existing User Group information.

3. **View All Members link**: Select link to view all Users within the selected User Group.

USER GROUPS WIZARD:

Wizard is used for adding a User Group to the PC500/550 system.

1. **Group Name**: User must enter in a name for the User Group.

2. **Description**: If desired, the user can add a description for the group. This is not a required field.

3. **Select Users**: User must select the Users to be included in the User Group. There must be at least one user in User Group.
DATE AND TIME SETTINGS

There are two options to configure Time settings on PC500/550: **manually OR in sync with time servers.** Select appropriate radio button as required. This time settings is applied to PC500/550’s Real Time Clock and all new data and event log entries use the time setting while storing records in a system. **Make sure to select local time zone to device when adjusting time from different time zone.**

Click Edit to begin

1. **Manual settings:** Once this radio button is selected, it populates the time field with the current Date and Time from the user’s PC.

2. **Time Server:** If available, enter primary and backup time server details. On click of save, device synchronizes with primary Time Server and sets date and time. If there is no response, secondary time server is used. Make sure to have correct local time zone selected before saving.

**Note:** The system must be plugged into a network that has access to the Time Server in order to access time for the time server.

3. **Time Zone:** Select local time zone of PC500/550 device.

4. **Day Light Savings Time:** If PC500/550 device is located in a Time Zone which follows Day Light Savings, check this box.
**Note:** Checkbox is checked by default for the time zones which follows Day Light Savings. User must ensure current applicability of Day Light Savings for the selected time zone and check/uncheck accordingly.

**Test Time Server:** Click this button to request the current time settings from primary and secondary time server. It can be operated without entering into Edit Mode. This button is only active when a time server has been configured.

**Note:** Any change made in the Data and Time Settings requires a system reboot. This is done automatically.
DEVICE CONFIGURATION

PC500 supports up to 2 devices while PC550 supports 12 Devices (any combination of Genset, ATS and Aux101)

All configured devices are displayed in the Devices grid along with some configuration details (Device Name, Device Type, Device Model, Modbus Channel, Modbus Address, etc.)

**Note:** All devices except for I/O devices are displayed on the homepage. Sensors and Outputs configured using Aux101 inputs/outputs appear under tile Site IOs on Homepage.

Add New Device: Select which type of device from drop down menu. After selection, the user is then navigated to the selected device’s setup wizard.

GENSET WIZARD

PC500/550 has preconfigured register maps of all Cummins commercial Genset controls. If your Genset control is not in the list, it’s not supported. If there is a third party Genset which you want to monitor, consider wiring it through CCM (Custom Communication Module) or Auxiliary IO device like Aux101. If using CCM, select CCM-G from 'Device Model' dropdown list.

**Note:** The PC500/550 system does not support configuring Modbus register maps for unsupported/third party Genset controls.
All Required Fields must be filled in to complete device configuration. Some field details are provided below.

1. **Device Model:** All supported Genset controls are listed in the dropdown menu.
   - All new controls (PCC1301, PCC1302, PS0500, PCC2300, and PCC3300) communicate directly to the PC500/550 over Modbus.
   - Legacy controls (PCC2100, PCC3100, PCC3200, PCC3201 and CCM-G) all communicate to a Modlon Gateway which then communicates to the Genset controls over Lonworks. Modlon information (Modlon Template and Index) must be filled in to complete setup.

2. **Modbus Address:** The Modbus address entered MUST match the modbus address from the genset control in order to communicate. For legacy controls, the Modbus address represents the address for the Modleon Gateway.

3. **Modbus/TCP Unit ID:** PC500/550 provides read only access of monitored Genset data over Modbus TCP. Enter Modbus TCP unit ID which can be same or different than Modbus address. Modbus TCP master can send read commands using Modbus TCP unit Id in query.

> Click Next to continue.
Parameters which are displayed on gauge dial (Tab5 in Genset Device Details) can be configured from this screen. Total 8 parameters can be selected. Checkbox ‘Default 8 Gauges’ selects the parameters listed below:

- Battery Voltage
- Coolant Temperature
- Engine RPM
- Oil Pressure
- Frequency
- Line Current 1
- L-L Volt 1(a-b)
- Total kW

Click Finish to save and complete configuration.

ATS WIZARD

PC500/550 has preconfigured register maps of all Cummins ATS controls. If your ATS control is not in the list, it’s not supported. If there is a third party ATS which you want to monitor, consider wiring it through CCM (Custom Communication Module) or Auxiliary IO device like Aux101. If using CCM, select CCM-T from ‘Device Model’ dropdown list.
Note: The PC500/550 system does not support configuring Modbus register maps for unsupported/third party ATS controls.

Enter all required details marked with asterisk. Details regarding Modlon Template and Modlon Index are also required. Enter these details based on configuration of Modlon gateway. For ATS controls, Modbus Address is the address for Modlon.

PC500/550 also provides read only access of monitored ATS data over Modbus TCP. Enter Modbus TCP unit ID which can be same or different than Modbus address. Modbus TCP master can send read commands using Modbus TCP unit Id in query.

1. **Device Model:** All supported ATS controls are listed in the dropdown menu. All communicate to a Modlon Gateway which then communicates to the ATS controls over Lonworks. Modlon information (Modlon Template and Index) must be filled in to complete setup.

2. **Modbus Address:** The Modbus address entered MUST match the Modbus address for the Modleon Gateway.

3. **Modbus/TCP Unit ID:** PC500/550 provides read only access of monitored ATS data over Modbus TCP. Enter Modbus TCP unit ID which can be same or different than Modbus address. Modbus TCP master can send read commands using Modbus TCP unit Id in query.

- Click Finish to save and complete configuration.
IO DEVICE (AUX101-102) WIZARD

Currently Aux101-102 is the only IO device supported from PC500/550. Sensors that use the AUX inputs and Outputs are configured in Setup->Sensors and Output Controls page.

Each Aux101 has

- 8 Analog/Discrete Inputs (Analog/Discrete selection is configurable; All 8 Inputs can be selected as Discrete or Analog or in combination of both. Discrete Inputs can be configured as Discrete Active High/Low)
- 8 Discrete Outputs

Each Aux102 has

- 4 Discrete Inputs (Discrete Active Low – Not configurable)
- 8 Discrete Outputs

To add Aux101-102, select IO device from ‘Add New Device’ menu. Make sure that Aux101 is in Modbus Mode (7 segment display on Aux101 board must read ‘H’).
Enter all required details marked with asterisk.

**Note:** PC500/550 does not support IO devices over Modbus TCP. However two discrete inputs and one Analog resistive input of PC500/550 hardware are supported over Modbus TCP with the read only access. Modbus TCP master can send read commands using TCP unit ID of PC5xx Device (ID: 255) in query.

- **Modbus Address:** The Modbus address entered MUST match the Modbus address for the AUX101.

**Note:** Must use Service tool to gather AUX101 Modbus settings.

- Click Next to continue.

On next screen, Aux101 inputs can be configured as Analog or Discrete (Active High/Low). Default configuration checkbox automatically selects below configuration. Note that Current Source1 through 4 are used with Inputs 3 to 6. Refer Aux101/102 Owner’s manual for details. User can select Input types in any combination as required. Current Source settings are enabled only if the corresponding Input (3-6) is configured as an Analog input.

Default Selection:

![Select default configuration for Aux101's Inputs and Current Sources](image)

Check Aux102 available checkbox if Aux102 is available and connected to Aux101.
Note1: The P500/550 cannot detect Aux101 configuration if it was carried out using other tools. Existing configuration is overwritten.

Note2: The PC500/550 system does not support configuring Modbus register maps for unsupported/third party I/O modules.

➢ Click Finish to save and complete configuration.

SENSORS AND OUTPUT CONTROLS

Sensors and Output Controls are added to the system using this setup. Sensors and Output Controls can be configured to use Inputs/Outputs from PC500/550 or Aux101-102.

The PC500/550 hardware I/O:

- 1 Resistive Analog Input (600-2500 Ohm)
- 2 Discrete Inputs
- 2 Discrete Outputs
When required, IO expansion modules Aux101/102 can be connected to augment input/output capacity of the PC500/550.

**Aux101 I/O:**
- 8 Analog/Discrete Inputs (Analog/Discrete selection is configurable; All 8 Inputs can be selected as Discrete or Analog or in combination of both. Discrete Inputs can be configured as Discrete Active High/Low)
- 8 Discrete Outputs

**AUX 102 I/O:**
- 4 Discrete Inputs (Discrete Active Low; Not configurable)
- 8 Discrete Outputs

Analog (e.g. Fuel, Temperature, etc.) or Discrete (e.g. Fault Condition Active/Inactive, Switch On/Off sensing etc.) entities can be monitored through Sensors. Similarly, Discrete Outputs can be controlled from UI once they are configured (e.g. Light Turn On/Off, Genset Start/Stop etc.).

**PC500/550 Analog Input:** This input shall be used primarily for measuring fuel level using a sensor with a 600Ω – 2500Ω range (0.29V to 1.21V). Resistance is sensed by directing a 485uA constant current source through the sensor. The voltage created is captured by the analog to digital convert (A/D).

**PC550 Discrete Inputs:** There are two discrete opto-isolated inputs to the PC500/550 base board. Grounding of the input provides an active LOW logic level and letting the input float produces an active HIGH logic level. Both inputs include ESD and overvoltage protection by way of a capacitor and TVS.

**PC550 Discrete Outputs:** There are two discrete outputs from the PC500/550 base board in a Form C contact configuration (normally open, normally closed and common). Low side switches are used to drive each relay coil. Capacitors and PTCs on each common add ESD and overcurrent protection to the outputs.

*Refer Aux101 Owner’s Manual for details on Aux101/102 Inputs/Outputs*
DISCRETE SENSOR WIZARD

Select ‘Add New Sensor’ button, then select ‘Discrete’ from the dropdown menu.

Enter all required details marked by asterisk. Source field displays compiled list of all unused discrete inputs (Active High and Active Low) available for selection.

1. **Source:** Contains a dropdown list of all the available Discrete inputs (includes Pc500/550 inputs and AUX101 inputs, if configured).

2. **Event Trigger:** This field defines event activation rule.
   - **None:** No Event will be logged for any sensor state
   - **Active:** Event will be logged when Sensor state changes from Inactive to Active
   - **Inactive:** Event will be logged when Sensor state changes from Active to Inactive
   - **State Change:** Event will be logged for any change in state. Active to Inactive OR Inactive to Active

Once Sensor is created, it shows up on Details page under Site IOs. There is no Data log displayed in the UI for Sensors but Report can be generated for retrieving historical data.
ANALOG SENSOR WIZARD

Select ‘Add New Sensor’ button, then select ‘Analog’ from the dropdown menu.

Enter all required details marked by asterisk.

1. **Type**: Select closest match to analog entity being measured; Temperature, Pressure, Volume, or Battery.

2. **Unit**: Displays Imperial and Metric Units as per Sensor type (e.g. Temperature: DegF and DegC). These units are intended only for conveniently displaying data on Device Details screen and do not change with Imperial/Metric preference for PC500/550.

3. **Source**: Contains a dropdown list of all the available Discrete inputs (includes PC500/550 input and AUX101 inputs, if configured).
Click Next to continue.

On next page, data is collected for evaluating 'liner scaling' for conversion of voltage/resistance values to actual measured analog entity (Gallons, DegreeF etc.)

Sensor Voltage Limits: Enter min/max voltage limits for Sensor. Since this sensor gets connected to PC500/550 or Aux101, make sure that Sensor voltage limits fall within range of PC500/550's resistive input limit or Aux101 voltage limits. Refer to table below for details on min and max voltage limits on each analog input.

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aux101 Input1</td>
<td>-5V</td>
<td>5V</td>
</tr>
<tr>
<td>Aux101 Input2</td>
<td>-5V</td>
<td>5V</td>
</tr>
<tr>
<td>Aux101 Input3</td>
<td>0V</td>
<td>5V</td>
</tr>
<tr>
<td>Aux101 Input4</td>
<td>0V</td>
<td>5V</td>
</tr>
<tr>
<td>Aux101 Input5</td>
<td>0V</td>
<td>5V</td>
</tr>
<tr>
<td>Aux101 Input6</td>
<td>0V</td>
<td>5V</td>
</tr>
<tr>
<td>Aux101 Input7</td>
<td>0V</td>
<td>38V</td>
</tr>
<tr>
<td>Aux101 Input8</td>
<td>0V</td>
<td>38V</td>
</tr>
<tr>
<td>PC500/550’s Analog Input</td>
<td>600 Ohm</td>
<td>2500 Ohm</td>
</tr>
</tbody>
</table>

As a guideline, the note at the bottom of wizard dictates voltage/resistance limits for each selected input.

Corresponding Min/Max limits: This section provides the sensor scaling. Enter corresponding limits for measured entity. i.e. Max or Min Voltage/Resistance values and
their linkage to sensed entity (Gallons, DegreeF etc.) e.g. Fuel Sensor where 600 Ohm corresponding to 0 Gallons 2500 Ohm corresponding to 250 Gallons shall be entered as shown below. The **linear scale** is based on the entered values. The sensor value is displayed on Site IO Details page. E.g. Fuel Sensor: 100 Gallons

![Add New Analog Sensor](image)

Similar to discrete sensors, trigger mode can be selected as High Warning, Low Warning OR both. Enter Warning thresholds in actual units. E.g. for Fuel sensor shown above with tank capacity 0-250 Gallons, user needs Low warning threshold as 40 Gallon and High Warning Threshold as blank. Blank field means ‘None’ or No warning is needed. Make sure that High/Low warning limits fall within Min/Max values of selected sensor (0-250 in this example). Every time Fuel level goes below 40 Gallons, it will trigger an event.

Use Hysteresis checkboxes on right side to avoid nuisance triggering.
E.g. If above Fuel tank for some reason fluctuates around 40 Gallons, the system could potentially log multiple Low Warning events. If Hysteresis box is checked, it prevents these nuisance warnings. For 40 Gallons with 3% Hysteresis, the Low fuel level event will become active when Fuel level falls below 40 Gallons and inactive when fuel level rises above 41.2 Gallons. Similarly if High Warning was set at 100 Gallons and Hysteresis checkbox is checked, the High Warning will become active when Fuel level rises above 100 Gallons and inactive when it falls below 97 Gallons.

**Note:** With Hysteresis enabled, Event Activation conditions do not change (40 Gallons and 100 Gallons). The Inactive condition changes so that noise does not deactivate an active sensor warning.

Once Sensor is created, it shows up on Details page under Site IOs. There is no Data log displayed on the UI for Sensors but Report can be generated for retrieving historical data.

- Click Finish to save and complete configuration.

**OUTPUT CONTROLS WIZARD**

In Output Controls tab, Click “Add New Output”

Enter in all required details marked with asterisk.
Source: Contains a dropdown list of all the available Discrete Outputs (includes PC500/550 outputs and AUX101 outputs, if configured).

Note: There is no Event Trigger for Output Controls, thus no warnings are logged in the Event Log when an Output is manually activated/deactivated.

Once Output Control is created, it shows up on Details page under Site IOs. No Data log is maintained for Outputs. Outputs state (Active/Inactive) can be controlled using control switch provided on UI thereby controlling any circuitry connected beyond relay contacts (e.g. Genset Start/Stop, Lights On/Off etc.)

<table>
<thead>
<tr>
<th>Switch position</th>
<th>Disabled</th>
<th>Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding State</td>
<td>Inactive</td>
<td>Active</td>
</tr>
<tr>
<td>Not communicating</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MAIL SETTINGS

The Mail Settings page is used for configuring the SMTP server. The PC500/550 uses the SMTP server when sending out SMTP/email notifications events become active on the System.
1. **SMTP Server Information:** Enter required details marked with asterisk. Get in touch with IT Administrator if you prefer to use internal SMTP server. As an alternative, any web SMTP servers like Gmail, Hotmail can also be used. Make sure to use appropriate Port Number according to selected encryption method (SSL or TLS or None).

**Note:** Web SMTP server information can be located online.


2. **Enter Authentication Information:** Check the checkbox for Enable Authentication. Fill in personal email Username (do not include @yahoo.com) and password information so the system can use account to send SMTP/email notifications.

3. **Test Mail:** To confirm correctness of SMTP configuration, send a Test Email. Click on ‘Test Email’ button and enter any accessible email address. Confirmation message will be
displayed once email is sent. Unless Test Email is received, do not rely on delivery of email notifications.

NOTIFICATIONS

Event Notifications can be created against the PC500/550 and configured devices within the System. Notifications are assigned to a User Group/s which in turn get delivered to all the Users within the User Group. The notification delivery to each user is based on their selected preference when adding new users in the system from the Setup->Users page.

Prerequisites:

- Emails: Functional SMTP server must be configured from Setup>Mail Settings.
- SMS: PC500/550 Device must have an activated CDMA modem OR GSM modem with activated SIM card.

1. **Add New Notification**: Navigates the user to Notification wizard for adding new Notifications to the System.
2. **User Group Link**: Displays the User Group/s the notification is assigned to.
3. **Test SMS**: If you are using PC500/550's GSM or CDMA device, SMS functionality can be verified (provided CDMA cell modem is activated or active SIM card is plugged in GSM modem). A confirmation message is displayed once SMS is sent.
If no SMS is received, please check wireless signal strength from Diagnostics>Communications>Get wireless data. Refer Diagnostics Help section for additional details

Test Email: Similar to SMS, email can be sent to confirm functionality of configured SMTP server. Note that SMTP settings must be configured before using this feature. If not a popup warning message shows up when Test email is operated. SMTP server settings can be configured from Setup>Mail settings. For convenience, email address of selected user is auto populated. A confirmation message is displayed once email is sent.

NOTIFICATIONS WIZARD

The Notifications wizard is used to add new notifications to the system. Notifications are assigned to system events. When the system event becomes active, the notification gets delivered to all members within a User Group.

Note: A User Group must be configured first before adding a Notification to the system. If a user tries to configure a notification before adding a User Group, the system will display the following pop-up message.
**Select Device Name:** The dropdown list displays the PC500/550 and all added devices in the system. Based on the device selected, the Event Type field populates with available event types to choose from.

Event types are displayed as per selected device.

<table>
<thead>
<tr>
<th>Device</th>
<th>Supported Event Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC500/550</td>
<td>Information, Warning, Error</td>
</tr>
<tr>
<td>Genset</td>
<td>Information (Genset Start/Stop), Warning and Shutdown</td>
</tr>
<tr>
<td>ATS</td>
<td>Information (ATS Test Start/Stop, Source1 or Source2 connected/disconnected), Warning</td>
</tr>
<tr>
<td>Site IOs</td>
<td>High/Low Warning for Analog Sensors, Active/Inactive warnings for discrete sensors</td>
</tr>
</tbody>
</table>
Select Event Type: The Notification types are based on the selected Device (shown in chart above). The user can select one or more Event types at a time.

User Group: The user must select one or multiple User Groups to receive the notification. When the configured event becomes active, all Users, from the selected User Group, receive the email and/or SMS notification.

Add new notification for Site IOs:

1. Device Name: Select Site IOs
2. Select Event Type: This field is locked. All Sensors events are warnings events.
3. Select Sensors: All configured sensors are displayed in field. Select one or multiple sensors.
4. User Group: Select one or multiple User Groups to receive the notification. When the configured event becomes active, all Users, from the selected User Group, receive the email and/or SMS notification.
SNMP SERVER SETTINGS

PC500/550 has the capability to send out SNMP trap notifications when System events become active. A trap is a one-way message sent from a network element to the NMS. The PC500/550 serves as a network element and uses SNMP to send out trap notifications to a management system. Set SNMP Manager/Trap Receiver on the same network and enter details in 'Server' field.

1. **SNMP Version:**
   - SNMP v1 - SNMP version 1 (SNMPv1) is the initial implementation of SNMP protocol. SNMPv1 operates over protocols such as User Datagram Protocol (UDP), Internet Protocol (IP) etc. It is defined in RFCs 1155 and 1157 and specifies five core protocol data units (PDUs). Version 1 is often criticized by its poor security where client authentication is performed only by a "community string". This community string is in effect a type of password which is
transmitted in 'cleartext'. Unavailability of 64 bit counters has been one of the major limitations of SNMPv1.

- SNMPv2C revises SNMPv1 and includes improvements in the areas of performance, security, confidentiality, and manager-to-manager communications. It introduced methods for retrieving large amounts of data in a single request. It is defined in RFC 1901, RFC 1905, RFC 1906, and RFC2578. SNMPv2C supports 64 bit counters

- PC500/550 does not support SNMPv3.

- Refer to RFC publications for more details on protocol specifications.

**SNMP Server Settings:**

1. **SNMP Server:** Provide SNMP server name or IP address.
2. **Port:** It is recommended to use default port 162 which is used by TCP and UDP for receiving SNMP Traps; it is configurable.
3. **Community:** All trap messages get tagged with the community name. Use any community name as required. "Public" is the default setting.

**DATA LOG PREFERENCES**

User can configure the frequency at which new entries are entered in Data log. The resolution can be in Minutes, Hours or Days. A separate log interval can be configured for a Genset when it's running and stopped. The PC500/550 stores data for Sensors but not for Outputs Controls.
Select Memory Device for data log storage: User can select to store Data Log on PC500/550's internal storage (approx. 8.5Mb) or an external SD Card or USB flash drive. There is no maximum limit on capacity of external storage devices, but it is recommended to use storage device up to 1GB capacity.

Note: Before selecting an external memory device, the external memory device must already be inserted in the PC500/550. Otherwise the PC500/550 will not allow selection.

Enter time interval for data log schedule: User can select different data log intervals specific to device types. Also, the user can select a different time interval for a Running Genset and a Stopped Genset. Time intervals are in minutes, Hours and Days.
**CONTACTS**

Use Contacts setup page to add and store Service contact information.

**Note:** Contacts are not Users in the system.

1. **Add New Contact:** Navigates user to the Contacts setup wizard for adding new Contacts to the system.
2. **View hyperlink:** Selecting the View link displays the Contact’s information as shown below.
CONTACTS WIZARD

Complete all required fields marked with asterisk.
SYSTEM SETTINGS

System settings page is used for setting system preferences, updating software, exporting and importing system configurations, CDMA modem activation and GSM frequency selection.

1 **Imperial/metric Preference:** PC500/550 supports displaying data in both Imperial and Metric. User selects the preferred unit of measurement. The system converts data to be shown in the selected unit of measurement.

Applicable parameters types are listed below.

<table>
<thead>
<tr>
<th>Parameter Types</th>
<th>Imperial</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>psi</td>
<td>kpa</td>
</tr>
<tr>
<td>Temperature</td>
<td>°F</td>
<td>°C</td>
</tr>
<tr>
<td>Engine RPM</td>
<td>RPM</td>
<td>2000</td>
</tr>
<tr>
<td>Fuel Rate</td>
<td>Gal/hr</td>
<td>L/hr</td>
</tr>
<tr>
<td>Volume</td>
<td>Gallons</td>
<td>Liters</td>
</tr>
</tbody>
</table>

**Note:** Setting doesn’t apply to analog sensors.

2 **Inactive Session Timeout:** Three options are available; 10 minutes, 30 minutes and 60 minutes. If user remains inactive on UI for the selected time duration, session ends automatically and user is taken back to login page.
Language Preference: Language preference can be changed anytime. UI switches to new language immediately however events which are already logged remain in same language. All new events follow changed language preference.

Set GSM Frequency: This selection allows the user to select the operating frequency band for the GSM modem. The GSM modem is a quad band modem. The supported GSM frequencies are as listed; 850MHz, 900MHz, 1800MHz, 1900MHz, 850/1900MHz, 900/1800MHz, 900/1900MHz.

Note: The GSM frequency selection is only displayed on PC500/550 systems that have the GSM option.

Software Update: If a new software update is released on Incal website follow these instructions for updating your PC500/550.

- Navigate to Diagnostics>System Information and confirm that current software is older than what’s available on Incal.
- Download update zip file from Incal website and save on personal computer.
- Click ‘Software update’ button to open a browse window. Select the saved PC500_PC550_Update.zip file and confirm warning message.

After software update has completed, the system reboots and navigates the user to the Login page.

Post update, check Diagnostics>System Information screen again to confirm the Software version has updated successfully. The system logs an informational event when software update has completed successfully.

Note: Software downgrade is not allowed. Users receive “Invalid zip file” error if they attempt to downgrade software to lower version.

Export Configuration: This feature is used to save the PC500/550 configuration. User can save configuration file on personal computer for later access

Import Configuration: This feature is used to import saved system configurations.
1. Press the 'Import Configuration' button and select the 'browse' button to navigate to the location where the Export Configuration settings were saved.
2. Select the check boxes for the desired configuration settings for importing.
3. Select ‘OK’ to begin.

**Note:** Import configuration completely erases all configuration tables and replaces it with settings selected from imported (*.cpgc) file.

![Import Configuration dialog box](image)

After Import Configuration has completed, the system reboots for changes to take effect. The user is then navigated to the Login page. The Import configuration process takes up to 5 minutes to complete.

This is useful when multiple PC500/550 devices at site need to be configured. In such a scenario, most of the configuration data like Modbus settings, Time Zone Setting, Users, User Groups, Service Contacts, System Settings etc. remain same. Configuration time can be reduced by exporting configuration from one device and then selectively importing to other PC500/550 devices.

Click Export Config. and save configuration file (*.cpgc)

Access UI from PC500/550 Device where above settings are to be imported. Click Import Config. and select file saved from parent device.

Do not use ‘Select All’ preference unless you are importing from backup configuration file of same device.

Select only tables which you want to import. For convenience and preciseness, some interdependencies are created as below

- Selecting ‘Sensors and Outputs’ automatically selects ‘Device Configuration’
Selecting 'Notifications' automatically selects 'Device Configuration', 'Sensors and Outputs' and 'User Profile Settings'.

Activate CDMA Modem: CDMA activation is a 2-step process.

1. **Verizon Activation**: Contact a Verizon representative and provide modem and service information (2G, SMS service only). Verizon then activates the CDMA modem.

2. **Local Activation**: After Verizon has activated the modem, press the 'Activate CDMA button' to complete the activation process. Once the CDMA modem has successfully been activated, the 'Activate CDMA Modem' button becomes inactive and grayed out; as shown above.

**Note**: The CDMA activation button is only displayed on PC500/550 systems that have the CDMA option.
RESOTRE TO FACTORY SETTINGS

As it implies, all settings (Modbus Devices, Data log preferences etc.) are erased and need to be recreated after restore is complete. User can recreate setup manually or import using saved configuration backup.

Restore to factory setting is available at login page as well as in system settings tab.

**Restore To Factory Setting From Login Page:**

1 If user forgets username and/or password and is unable to use the Password recovery option then user can use login page’s ‘Restore to Factory Settings’ option, this allows user to login back as a default User.

This feature is visible and accessible only when locally connected to PC500/550 device over RNDIS cable and accessed UI with IP 169.254.0.1

Click on the Restore to factory settings when connected over RNDIS to get confirmation message.

Cummins Confidential: All copyrights reserved
**Restore to Factory Settings from System Settings Page:**

Click on the Restore to factory settings from system settings page when connected over network IP to get confirmation message.

On successfully restored to the factory settings, successful message will get displayed and also user can check the event log for the restore to factory successful event.

**Note:** There is no need to access the application over RNDIS, if user has valid login credentials and can login to Gateway UI over network IP