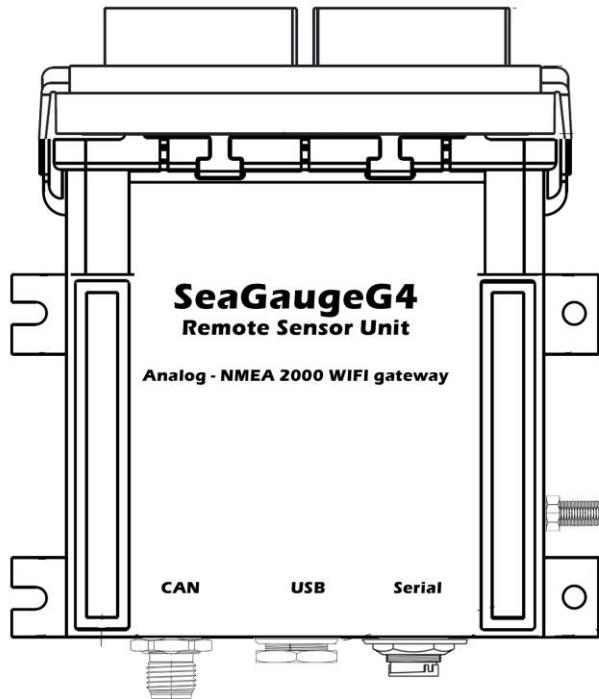


Application Note

ANSS024103101 – SeaGauge G4 Modify
Calibration Files



Chetco Digital Instruments, Inc

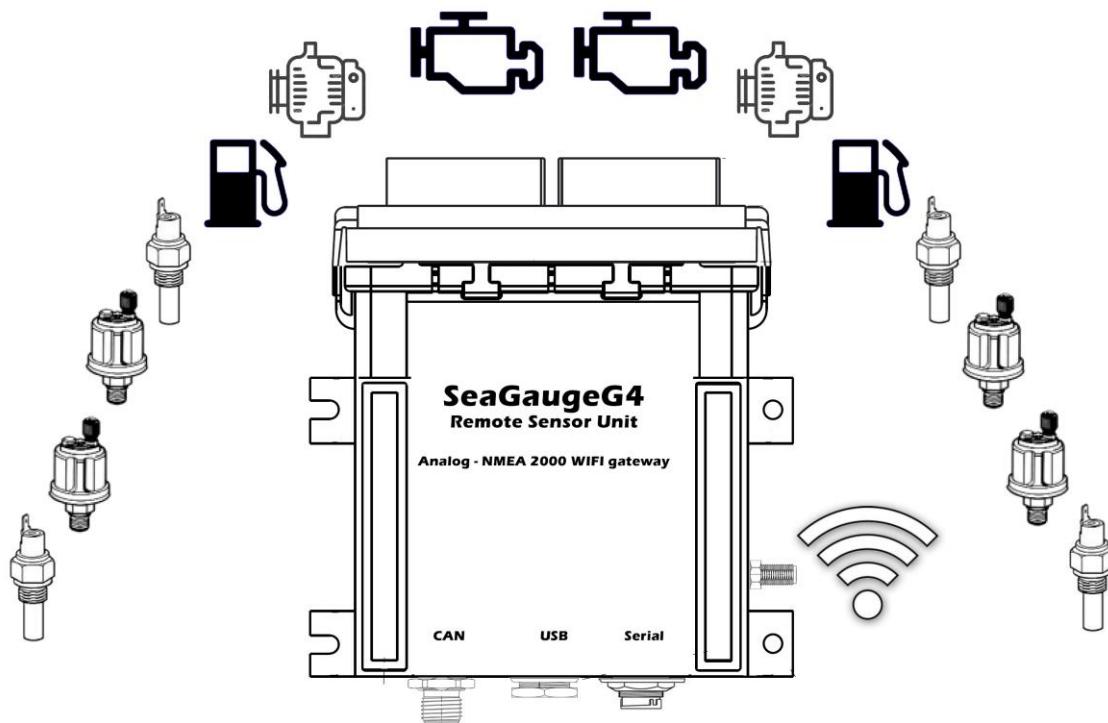
Revision 103124



SeaGaugeG4 supports up to 12 resistive or voltage style sensor inputs and 3 pulse style inputs.

Sensors are connected to the dual 20 pin Molex style connectors and analog voltages converted to digital protocol compatible with CAN bus and WIFI interfaces.

SeaGaugeG4 can trigger multiple alarms based on sensor voltages from any of the 12 analog inputs, 4 indicator inputs, and 3 pulse inputs





SeaGaugeG4 supports up to 12 analog sensor inputs and 8 indicator/relay drive via a 20 pin Molex MX150 plug (black) and 3 pulse style inputs via separate 20 pin Molex MX150 plug (white).

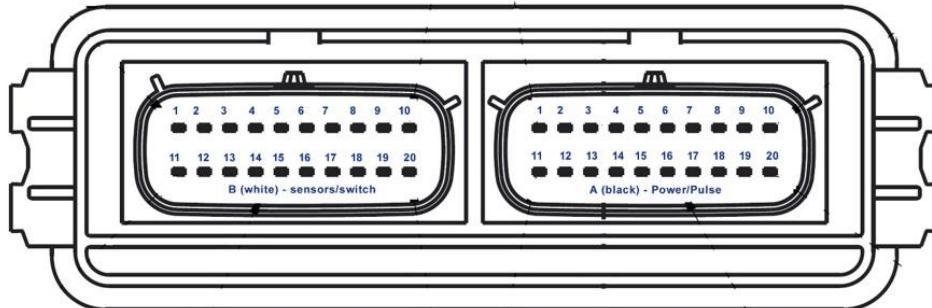
Molex style crimp pins are provided to attach 18 gauge tinned wire and insert into appropriate locations in supplied plugs.

The 12 analog inputs (SEN00-SEN11) are compatible with resistive and voltage style sensors using user configurable internal switches to select operating ranges.

Three pulse inputs are compatible with inductive and hall effect sensors with an AC range of 1Vpp to 18Vpp

Four relay drive (12VDC) outputs (SW4-SW7) can be used as alarm drivers based on user configurable triggers. Alarm outputs are capable of sinking up to 470mA to ground when active - suitable for driving 12VDC relays, indicator lights, or audio buzzers.

SeaGaugeG4 Header



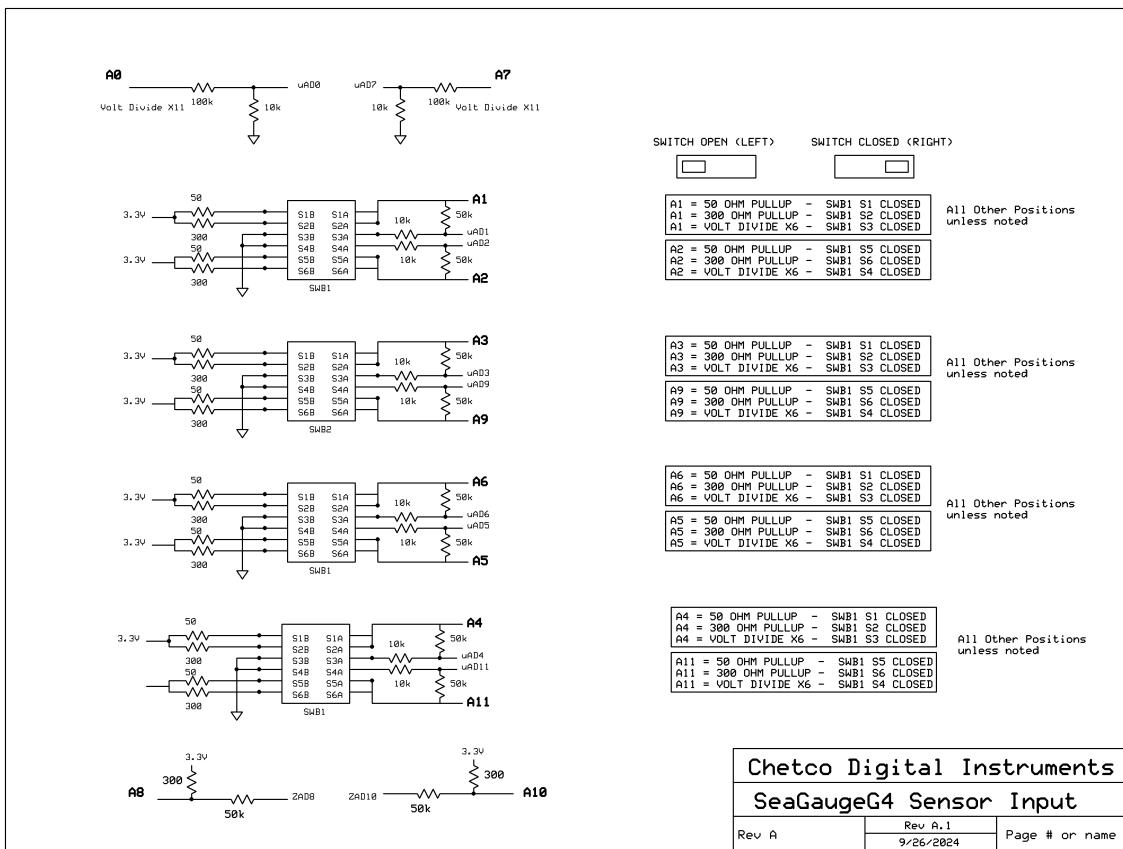
B1 - NC	B11 - NC	A1 - SW5	A11 – SW4
B2 - NC	B12 - NC	A2 - SW7	A12 – SW6
B3 – SEN10 (SBOOST)	B13 – SEN11 (STRAN)	A3 - NC	A13 - NC
B4 – SEN04 (STEMP)	B14 – SEN05 (SOIL)	A4 – P1 (SRPM)	A14 - GND
B5 – SEN06 (SFUEL)	B15 – SEN07 (SBAT)	A5 – P0 (PRPM)	A15 - GND
B6 – SEN00 (PBAT)	B16 – SEN01 (PFUEL)	A6 – P2	A16 - GND
B7 – SEN02 (PTEMP)	B17 – SEN03 (POIL)	A7 – 5VOUT	A17 – 5VOUT
B8 – SEN08 (PBOOST)	B18 – SEN09 (PTRAN)	A8 - GND	A18 - GND
B9 – INC03	B19 – INC02	A9 – 12VIN	A19 = 12VIN
B10 – INC01	B20 – INC00	A10 - NC	A20 - NC



For resistive senders SeaGaugeG4 will provide a 3.3V reference voltage via a user selectable 50 ohm or 300 ohm pullup resistor. Use 50 ohm for sensors with a max range of below 300 ohm and 300 ohm for sensors greater than 300 ohm.

Voltage inputs are scaled and clamped via 6X resistance divider to accept a maximum of 19V.

Separate dedicated dual high voltage inputs up to 36V is available on A0 and A1 for alternator and other applications



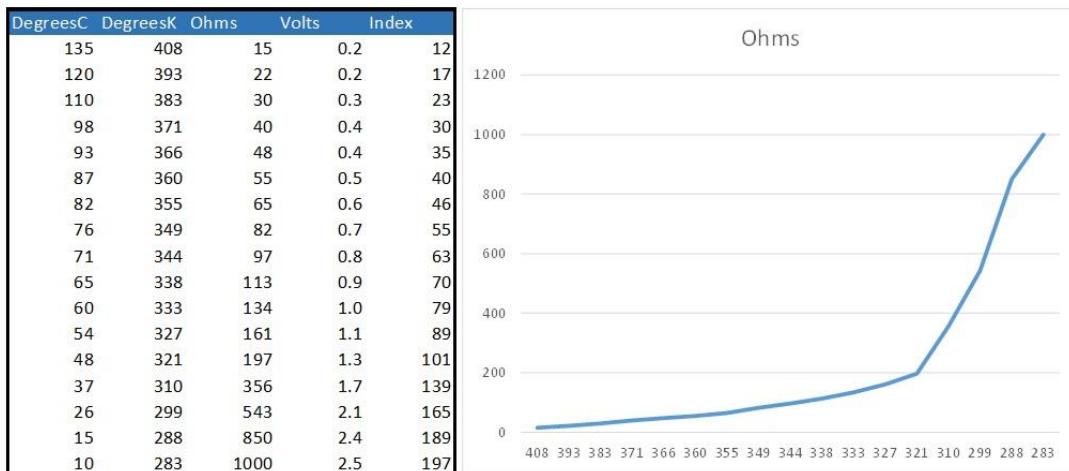


SeaGaugeG4 uses a collection of sensor calibration files to map voltages created by sensor resistance/voltage profiles to physical measurements

Sensor voltages are scaled to a maximum of 3.2VDC and converted to digital values with a range of 0 to 255 resulting in a measurement resolution of 0.4%

Calibration Files contain 256 entries that map the sensor voltages generated by the resistance profiles into corresponding temperature/pressure/voltage/fluid level values based on the sensor type

Temperature VDO 250F Single Station



Since many sensor profiles do not fit a simple straight line, using 256 calibration points allows for very precise measurements and customized calibrations.

Customized calibration files allows for accurate mapping of non-symmetrical fluid tanks and temperature sensors.



Using an example for a typical engine temperature sensor with a resistance range from 1000 ohms@ 10C (50F) to 15 ohms@130C (299F), we can calculate the voltage range using a 300 ohm pull up resistor to 3.2VDC as

$$1000/(1000 + 300) * 3.2VDC = 0.76 * 3.2 VDC = 2.43 \text{ VDC} @ 10C$$

$$15/(15 + 300) * 3.2 \text{VDC} = 0.047 * 3.2 \text{ VDC} = 0.15 \text{ VDC} @ 150\text{C}$$

If we map the 3.2VDC to an index range of 256. We calculate the table index as

$0.76 * 256 = \text{index } 197 \text{ @ } 10\text{C}$ and $0.047 * 256 = \text{index } 12 \text{ @ } 130\text{C}$

Finally, since the table units are in 0.01 degrees kelvin, we convert degrees C to Kelvin and multiply by 100

Index 197 = $(10 + 273) * 100 = 028300$ and Index 5 = $(130 + 273) * 100 = 040300$

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

VDO_TEMP_250FMAX.xml

```
1 <configgroup name = "CALIBRATION_TABLE">
2   <configitem name="DESCRIPTION"><value>VDO Temperature 250F</value></configitem>
3   <configitem name="TYPE"><value>Temperature</value></configitem>
4   <configitem name="UNITS"><value>Kelvin</value></configitem>
5   <configitem name="RESOLUTION"><value>0.01</value></configitem>
6   <configitem name="MIN"><value>24703</value></configitem>
7   <configitem name="MAX"><value>41093</value></configitem>
8   <configitem name="LOOKUPVALUES"><value>
9     041093,
10    041092,
11    041092,
12    041092,
13    041092,
14    041092,
15    041092,
16    041092,
17    041092,
18    041092,
19    041092,
20    041092,
21    041092,
22    040759,
23    040426,
24    040148,
25    039870,
26    039648,
27    039370,
28    039203,
29    039037,
30    038815,
31    038648,
32    038426,
33    038259,
34    038092,
35    037981,
36    037815,
37    037648,
38    037537,
39    037370,
40    037259,
```



SeaGaugeG4 stores sensor calibration files in the \calibration directory on the internal SD memory card

A library of files are available for a large variety of common sensors and can be loaded onto the SD card using the web browser interface or directly copied from local browser device.

The screenshot shows a web browser window titled "SeaSmart Files Page" at the URL "192.168.254.114/Files.html". The page features the Chetco Digital Instruments logo and a "WIFI G3" graphic. A navigation bar includes links for Home, Config, Status CAN, Status 0183, **Files**, and PGN Filters. Below the navigation bar, there's a section titled "Upload files to local SD card" with tabs for LIST, CONFIG, SPIFFS, Firmware, WEB, and Calibrations. Under the LIST tab, a red box highlights the "List Files" button. Another red box highlights the "Files" tab in the navigation bar. A section for "Download files from HelmSmart Server" is also visible.

The screenshot shows a web browser window titled "SeaSmart File Upload Page 7" at the URL "192.168.254.114/download/calibrations/". The page features the Chetco Digital Instruments logo and a "WIFI G3" graphic. A navigation bar includes links for Home, Config, Status, and Files. Below the navigation bar is a table listing calibration files:

Name	Action	Type	Size (Bytes)	Remove
VDO_TEMP_250FMAX.xml	Download Upload Delete	file	2811	!REMOVE!
VDO_PSI_400MAX.xml	Download Upload Delete	file	2799	!REMOVE!
VDO_TEMP_400FMAX.xml	Download Upload Delete	file	2811	!REMOVE!
testCalFile.xml	Download Upload Delete	file	452	!REMOVE!
NEW_TEMP_250FMAX.xml	Download Upload Delete	file	2484	!REMOVE!
ALT_VOLTS_27MAX.xml	Download Upload Delete	file	2793	!REMOVE!
ALT_VOLTS_36MAX.xml	Download Upload Delete	file	2793	!REMOVE!
FUEL_180to10.xml	Download Upload Delete	file	2801	!REMOVE!
VDO_PSI_150MAX.xml	Download Upload Delete	file	2800	!REMOVE!
VDOscaled250FMAX.xml	Download Upload Delete	file	2484	!REMOVE!

At the bottom of the page, it says "www.chetcodigital.com - www.seasmart.net - www.netgauges.net - www.digitalmarinegauges.com copyright 2022".



The embedded browser interface allows assigning any of the stored calibration files to the desired sensor input channel

The Analog Input Configuration section of the Configuration page will show the currently assigned calibration files used for each sensor channels

SELECT will allow changing the current file used for the target channel

This screenshot shows the 'SeaSmart G3 Configuration Page' at the URL 192.168.254.114/conf.html. The main content is a table titled 'Channel Instance PGN' listing 12 analog input channels (ADC0 to ADC11). Each row contains fields for Channel Instance PGN, Parameter, Set value, and Calibration. The 'Calibration' column includes a 'select' button and a 'modify' button. The 'select' button for ADC3 is highlighted with a red box. Below the table are sections for 'Analog Alarms Configurations' and 'Timestamp Configurations'. At the bottom are buttons for 'Save Settings', 'Update Firmware', 'Update SPIFFS', and 'Reset', along with a copyright notice: www.chetcodigital.com - www.seasmart.net - www.netgauges.net - www.digitalmarinegauges.com copyright 2024.

This screenshot shows the 'SeaSmart File Upload Page' at the URL 192.168.254.114/download/calibrations/3/. The page features the Chetco Digital Instruments logo, the 'SeaSmart' brand name, and the 'WIFI G3' logo. It has tabs for Home, Config, Status, and Files. The 'Files' tab is active, displaying a table of calibration files. One row in the table, 'New_PSI_400MAX.xml', has its 'Action' field highlighted with a red box. The table columns are Name, Action, Type, Size (Bytes), and Remove. The 'Remove' column for all files contains the text '!REMOVE!'. At the bottom is a copyright notice: www.chetcodigital.com - www.seasmart.net - www.netgauges.net - www.digitalmarinegauges.com copyright 2022.



New calibration files can be created, and existing ones modified using the embedded browser page.

You can access it directly using the device url
<http://www.seagaugeg4-XXX.local/ModifyCalTable.html>

Or by using the MODIFY button on the Analog Input Configuration page

The screenshot shows a web-based configuration tool for a SeaSmart device. The title bar reads "SeaGauge G4" and the URL is "192.168.254.114/ModifyCalTable.html". The main heading is "Modify selected calibration table". Below it, there are three buttons: "Choose SD card file", "Choose local file", and "Save to SD card". A dropdown menu shows "VDO_TEMP_250FMAX.xn" and a "Choose File" button with "No file chosen". A "Save" button is also present. Below these controls is a section titled "Modify Calibration table and save back to internal SD card" with three buttons: "Interpolate", "Scale", and "Offset". The configuration parameters are listed in a table:

FILE NAME	VDO_TEMP_250FMAX.xml
DESCRIPTION	VDO Temperature 250F
TYPE	Temperature
UNITS	Kelvin
RESOLUTION	0.01
MIN	24703
MAX	41093

Below the parameters is a table for modifying calibration data points:

Index	Volts	Current	New
0	0.00	41093	<input type="text"/>
1	0.01	41092	<input type="text"/>
2	0.03	41092	<input type="text"/>
3	0.04	41092	<input type="text"/>
4	0.05	41092	<input type="text"/>



Start configuration by connecting to the SeaGaugeG4 WIFI interface via Access Point (AP) mode or Station mode (STA).

AP mode is used when connecting directly to SeaGaugeG4 without using a local router or internet connection. Full CAN bus function can still be enabled and configured in AP mode.

Station mode is used for joining an existing local WIFI network and requires entering the SSID and password of the local network.

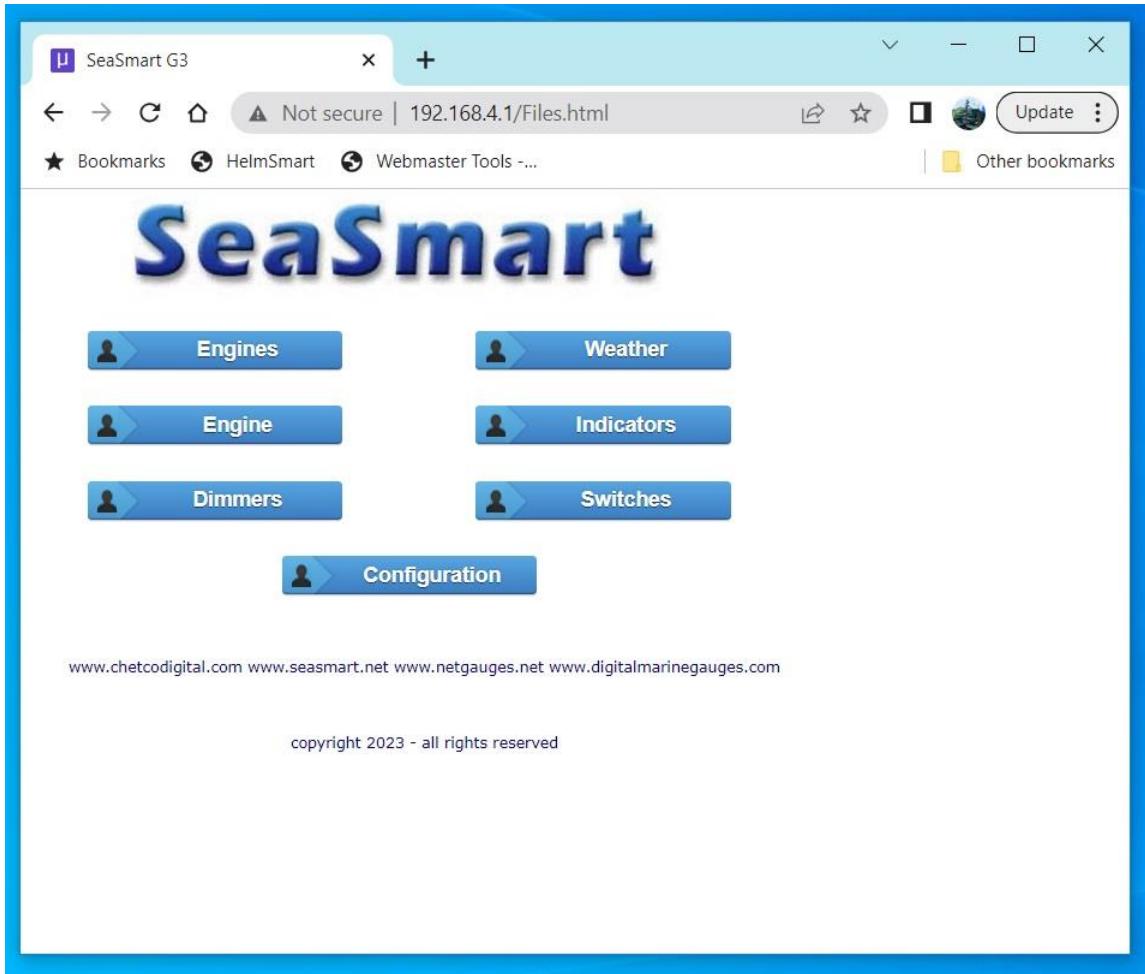




Once connected, enter the default IP <http://192.168.4.1> for AP.

For station mode the default protocol is DHCP enabled which means the local router will automatically assign the IP address for SeaGaugeG4. If mDNS is enabled and supported by your browser you can use the default url printed on the SeaGaugeG4 network label.

For example <http://seagaugeg4-XXX.local> where XXXX is the last 4 digits of the device MAC address



Once connected to the SeaGaugeG4 Home page you can navigate to the CONFIGURATION page



The CONFIGURATION page will have two additional sections for SeaGaugeG4 only - Analog Input Configuration and Analog Alarms Configurations.

Expand the Analog Input Configuration by clicking the arrow on the left

The screenshot shows a web-based configuration interface for a SeaSmart device. At the top, there's a header with the Chetco Digital Instruments logo, the text "SeaSmart", and a "WIFI G3" icon. Below the header is a navigation menu with links for Home, Config, Status CAN, Status 0183, Files, and PGN Filters. The main content area displays device information: DeviceID E831CD2D3CB8 and Version 1.9.2.8.23. A table titled "Current Network:" shows the following details:

IP Address 192.168.254.114	SSID = Winchuck Mesh
IP Mask 255.255.255.0	Net Type = Station
IP Gateway 192.168.254.254	STATIC IP
CELL DB 0	CELL AI = connected

On the left side, a sidebar lists various configuration sections with arrows indicating they can be expanded:

- ▶ Boot Config
- ▶ Network Mode
- ▶ Network Configurations
- ▶ HelmSmart Configurations
- ▶ TCP/UDP Configurations
- ▶ SD logging Configurations
- ▶ Port Configurations
- ▶ Dimmer/Switch Configurations
- ▶ Pulse Input Configurations
- ▶ Analog Input Configurations
- ▶ Analog Alarms Configurations
- ▶ Timestamp Configurations

At the bottom of the page are four buttons: Save Settings, Update Firmware, Update SPIFFS, and Reset. Below these buttons is a copyright notice: www.chetcodigital.com - www.seasmart.net - www.netgauges.net - www.digitalmarinegauges.com copyright 2024.



You will now see a list of options for each of the 12 analog inputs with assigned parameters and calibration files

Selecting the MODIFY button will open a new screen to allow modification of any of the stored calibration files

The screenshot shows a web-based configuration interface for the SeaSmart G3. The main menu includes Port Configurations, Dimmer/Switch Configurations, Pulse Input Configurations, and Analog Input Configurations. The Analog Input Configurations section lists 12 channels (ADC0 to ADC11) with their respective PGNs, parameters, set values, and calibration files. A red box highlights the 'modify' button column for each row. At the bottom, there are buttons for Save Settings, Update Firmware, Update SPIFFS, and Reset, along with a copyright notice.

Channel Instance PGN	Parameter	Set value	Calibration	modify	
ADC0 0 PGN127508 - Battery Status	Battery Volt		ALT_VOLTS_36MAX.xml	select	modify
ADC1 0 PGN127505 - Fluid Level	Fuel Level		FUEL_180to10.xml	select	modify
ADC2 0 PGN127489 - Engine Dynamic	Engine Temp		VDO_TEMP_250FMAX	select	modify
ADC3 0 PGN127489 - Engine Dynamic	Oil Pressure		VDO_PSI_150MAX.xml	select	modify
ADC4 1 PGN127489 - Engine Dynamic	Oil Pressure		VDO_PSI_150MAX.xml	select	modify
ADC5 1 PGN127489 - Engine Dynamic	Engine Temp		VDO_TEMP_250FMAX	select	modify
ADC6 1 PGN127505 - Fluid Level	Fuel Level		FUEL_180to10.xml	select	modify
ADC7 1 PGN127508 - Battery Status	Battery Volt		ALT_VOLTS_36MAX.xml	select	modify
ADC8 0 PGN127288 - Engine Rapid	Trim		VDO_TEMP_250FMAX	select	modify
ADC9 0 PGN127288 - Engine Rapid	Boost		VDO_PSI_150MAX.xml	select	modify
ADC10 1 PGN127288 - Engine Rapid	Trim		VDO_TEMP_250FMAX	select	modify
ADC11 1 PGN127288 - Engine Rapid	Boost		VDO_PSI_150MAX.xml	select	modify



The ModifyCalTable.htm page allows selection of any of the stored files, modifying the tables and then writing the new file back to the SD card.

The modified file can either retain the original name or be assigned a new file name entered in the FILE NAME text box.

The screenshot shows a web browser window titled "SeaGauge G4" with the URL "192.168.254.114/ModifyCalTable.html". The main title is "SeaSmart" in large blue letters. Below it is the sub-header "Modify selected calibration table". There are three input fields: "Choose SD card file" (dropdown menu showing "VDO_TEMP_250FMAX.xn"), "Choose local file" (button "Choose File" with message "No file chosen"), and "Save to SD card" (button "Save"). Below these is a section for modifying calibration tables with buttons for "Interpolate", "Scale", and "Offset". The "FILE NAME" field contains "VDO_TEMP_250FMAX.xml". Under "DESCRIPTION", it says "VDO Temperature 250F". Other settings include "TYPE" (Temperature), "UNITS" (Kelvin), "RESOLUTION" (0.01), "MIN" (24703), and "MAX" (41093). At the bottom is a table for modifying calibration data:

Index	Volts	Current	New
0	0.00	41093	
1	0.01	41092	
2	0.03	41092	
3	0.04	41092	
4	0.05	41092	



The top section allows for choosing the file and saving the results

Files can be picked directly from the internal SD card or from a local file on the browser device.

Any modified files are stored back directly to the SD card as browser security will not allow saving files locally

Choose SD card file Choose local file Save to SD card

VDO_TEMP_250FMAX.xn Choose File No file chosen Save

Modify Calibration table and save back to internal SD card

Interpolate Scale Offset

FILE NAME VDO_TEMP_250FMAX.xml

DESCRIPTION VDO Temperature 250F

TYPE Temperature

UNITS Kelvin

RESOLUTION 0.01

MIN 24703

MAX 41093

Index	Volts	Current	New
0	0.00	41093	
1	0.01	41092	
2	0.03	41092	
3	0.04	41092	
4	0.05	41092	



The next section defines the type of file modification

INTERPOLATE – will allow entering new data points from 2 to 255 any performing a straight line interpolation between all points entered. The more points entered results in a more accurate calibration

SCALE – a simple scaling of all the values in the calibration table

OFFSET – adds/subtracts a constant to all values in the table

Operations can not be combined without saving the file first

SeaGauge G4

Not secure 192.168.254.114/ModifyCalTable.html

Seasmart

Modify selected calibration table

Choose SD card file Choose local file Save to SD card

VDO_TEMP_250FMAX.xn Choose File No file chosen Save

Modify Calibration table and save back to internal SD card

Interpolate **Scale** **Offset**

FILE NAME VDO_TEMP_250FMAX.xml

DESCRIPTION VDO Temperature 250F

TYPE Temperature

UNITS Kelvin

RESOLUTION 0.01

MIN 24703

MAX 41093

Index	Volts	Current	New
0	0.00	41093	
1	0.01	41092	
2	0.03	41092	
3	0.04	41092	
4	0.05	41092	



The FILE HEADER section contains the current file info and can be modified by entry into the appropriate text field.

HEADER values are for information only and are not used in any calibration calculations other then to describe the file contents

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. At the top, there are three buttons: "Choose SD card file", "Choose local file", and "Save to SD card". Below these are two dropdown menus: one showing "VDO_TEMP_250FMAX.xn" and another showing "Choose File" with "No file chosen". A "Save" button is also present. A red box highlights the "FILE NAME" field containing "VDO_TEMP_250FMAX.xml". The "DESCRIPTION" field shows "VDO Temperature 250F". The "TYPE" field is "Temperature", "UNITS" is "Kelvin", "RESOLUTION" is "0.01", "MIN" is "24703", and "MAX" is "41093". Below this is a table with columns "Index", "Volts", "Current", and "New". The table rows are:

Index	Volts	Current	New
0	0.00	41093	<input type="text"/>
1	0.01	41092	<input type="text"/>
2	0.03	41092	<input type="text"/>
3	0.04	41092	<input type="text"/>
4	0.05	41092	<input type="text"/>



The DATA section contains the actual calibration lookup data from index 0 to 255

The existing values can be modified by entry into NEW field in each row.

Selecting any row will automatically enter the CURRENT value into the NEW field.

Index	Volts	Current	New
0	0.00	41093	
1	0.01	41092	
2	0.03	41092	
3	0.04	41092	
4	0.05	41092	



Scroll down the table rows to view all entries

The screenshot shows a web browser window titled "SeaGauge G4" with the URL "192.168.254.114/ModifyCalTable.html". The page displays a table of calibration data with three columns: ID, Value, and Address. The table has 255 rows, starting from row 239 and ending at row 255. The "Value" column contains values such as 2.99, 3.00, 3.01, etc., and the "Address" column contains values such as 25703, 25592, 25481, etc. The browser interface includes standard navigation buttons (back, forward, search), a status bar with the URL, and a footer with copyright information.

ID	Value	Address
239	2.99	25703
240	3.00	25592
241	3.01	25481
242	3.03	25315
243	3.04	25203
244	3.05	25037
245	3.06	24870
246	3.08	24703
247	3.09	24703
248	3.10	24703
249	3.11	24703
250	3.13	24703
251	3.14	24703
252	3.15	24703
253	3.16	24703
254	3.18	24703
255	3.19	24703



CHOOSE SD FILE will allow selection of calibration files stored on internal SD card.

Once modified, these files are stored back to the SD card

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. The main title "SeaSmart" is displayed prominently at the top. Below it, the sub-tittle "Modify selected calibration table" is visible. The interface includes several input fields and dropdown menus:

- A dropdown menu labeled "Choose SD card file" containing options like "VDO_TEMP_250FMAX.xml", "VDO_TEMP_250FMAX.xml", "VDO_PSI_400MAX.xml", "VDO_TEMP_400FMAX.xml", "ALT_VOLTS_27MAX.xml", "ALT_VOLTS_36MAX.xml", "FUEL_180to10.xml", and "VDO_PSI_150MAX.xml".
- A "Choose local file" button and a "Save" button.
- A "Scale" and "Offset" button pair.
- A "TYPE" dropdown set to "temperature".
- Input fields for "UNITS" (set to "Kelvin") and "RESOLUTION" (set to "0.01").
- Input fields for "MIN" (set to "24703") and "MAX" (set to "41093").
- A table section with columns "Index", "Volts", "Current", and "New". The table contains five rows of data:

Index	Volts	Current	New
0	0.00	41093	<input type="text"/>
1	0.01	41092	<input type="text"/>
2	0.03	41092	<input type="text"/>
3	0.04	41092	<input type="text"/>
4	0.05	41092	<input type="text"/>



Selecting a new file will automatically load the selected calibration file and update the HEADER and DATA sections for edit

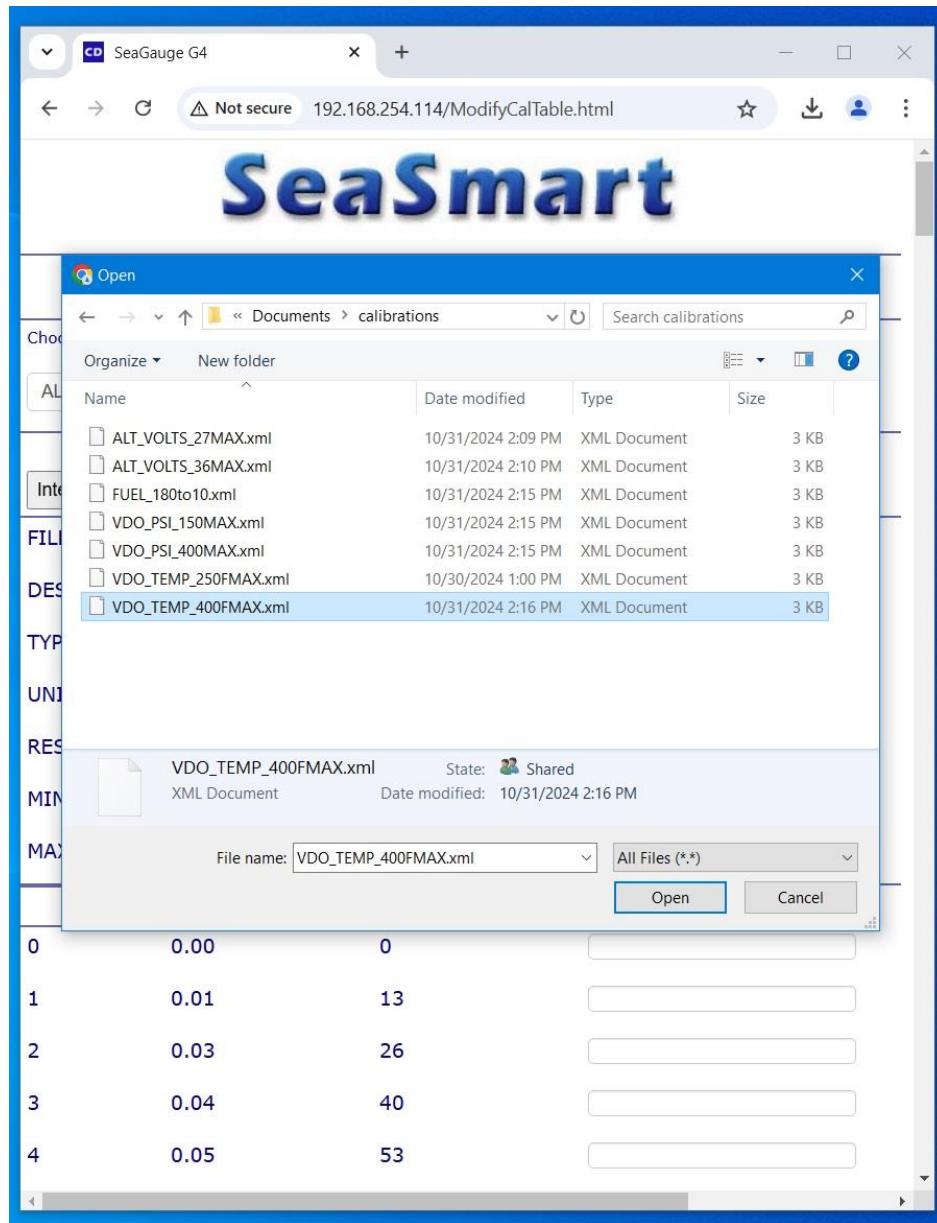
The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. The URL is 192.168.254.114/ModifyCalTable.html. The page has a header "Modify selected calibration table". It includes three file selection buttons: "Choose SD card file" (selected to "ALT_VOLTS_36MAX.xml"), "Choose local file" (button labeled "Choose File" with "No file chosen"), and "Save to SD card" (button labeled "Save"). Below these are three buttons: "Interpolate", "Scale", and "Offset". The calibration table section has fields for FILE NAME (ALT_VOLTS_36MAX.xml), DESCRIPTION (ALT VOTS 36MAX), TYPE (Volts), UNITS (Volts), RESOLUTION (0.01), MIN (0), and MAX (3650). A table lists data points:

Index	Volts	Current	New
0	0.00	0	
1	0.01	13	
2	0.03	26	
3	0.04	40	
4	0.05	53	



Choosing a local file is also possible by using the file picker.

If modifying a local file – the modified file is always stored back the SD card for security reasons





Choosing a local file will also autoload the file contents

The screenshot shows a web browser window titled "SeaGauge G4" displaying the "Modify selected calibration table" page. The URL in the address bar is "192.168.254.114/ModifyCalTable.html". The page features a large "SeaSmart" logo at the top. Below it, there are three buttons: "Choose SD card file", "Choose local file", and "Save to SD card". A dropdown menu shows "ALT_VOLTS_36MAX.xml", a "Choose File" button with "VDO_...AX.xml", and a "Save" button. A note below says "Modify Calibration table and save back to internal SD card". There are three buttons: "Interpolate", "Scale", and "Offset". The form fields include:

FILE NAME	VDO_TEMP_400FMAX.xml
DESCRIPTION	VDO Temperature 250F
TYPE	Temperature
UNITS	Kelvin
RESOLUTION	0.01
MIN	24700
MAX	41000

A table below lists calibration points:

Index	Volts	Current	New
0	0.00	41093	
1	0.01	41092	
2	0.03	41092	
3	0.04	41092	
4	0.05	41092	



Once a file is loaded – modification options are available

Scale is a simple multiply of all values in the loaded file by a constant value.

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. At the top, there are three buttons: "Choose SD card file", "Choose local file", and "Save to SD card". Below these are dropdown menus for "VDO_TEMP_250FMAX.xn" (selected) and "Choose File" (set to "No file chosen"), with a "Save" button. A section titled "Modify Calibration table and save back to internal SD card" contains three buttons: "Interpolate", "Scale" (which is highlighted with a red box), and "Offset". Below this, form fields include "FILE NAME" (set to "VDO_TEMP_250FMAX.xml"), "DESCRIPTION" (set to "VDO Temperature 250F"), "TYPE" (set to "Temperature"), "UNITS" (set to "Kelvin"), "RESOLUTION" (set to "0.01"), "MIN" (set to "24703"), and "MAX" (set to "41093"). A table below lists calibration points with columns for Index, Volts, Current, and New. The data is as follows:

Index	Volts	Current	New
0	0.00	41093	
1	0.01	41092	
2	0.03	41092	
3	0.04	41092	
4	0.05	41092	



Enter the desired scale factor in the popup dialog

Be aware the all values are positive only and can not exceed the maximum of 65536.

Any values beyond the maximum will be clipped to 65536

The screenshot shows the SeaGauge G4 software interface. A modal dialog box is open, prompting for a scale value. The URL in the browser bar is 192.168.254.114/ModifyCalTable.html. The dialog contains the text "192.168.254.114 says" and "Please enter a scale value:" followed by a text input field containing "1.3". Below the dialog are buttons for "OK" and "Cancel". The main window shows a configuration for a VDO_TEMP_250F sensor. It includes fields for FILE NAME (VDO_TEMP_250FMAX.xml), DESCRIPTION (VDO Temperature 250F), TYPE (Temperature), UNITS (Kelvin), RESOLUTION (0.01), MIN (24703), and MAX (41093). At the bottom is a table for modifying calibration data:

Index	Volts	Current	New
0	0.00	41093	<input type="text"/>
1	0.01	41092	<input type="text"/>
2	0.03	41092	<input type="text"/>
3	0.04	41092	<input type="text"/>
4	0.05	41092	<input type="text"/>



The resulting scaled values will be displayed in the NEW column.

Any value in the NEW column can be edited.

The screenshot shows a web browser window titled "SeaGauge G4" displaying the "Modify selected calibration table" page. The page includes fields for choosing an SD card file (VDO_TEMP_250FMAX.xn), choosing a local file, and saving to SD card. It also has buttons for Interpolate, Scale, and Offset. Below these are input fields for FILE NAME (VDO_TEMP_250FMAX.xml), DESCRIPTION (VDO Temperature 250F), TYPE (Temperature), UNITS (Kelvin), RESOLUTION (0.01), MIN (24703), and MAX (41093). At the bottom is a table with columns: Index, Volts, Current, and New. The "New" column for all rows is highlighted with a red border. The table data is as follows:

Index	Volts	Current	New
0	0.00	41093	53420
1	0.01	41092	53419
2	0.03	41092	53419
3	0.04	41092	53419
4	0.05	41092	53419



OFFSET is a simple adder to each value in the table

The screenshot shows a web-based calibration tool for a VDO TEMP sensor. The interface includes fields for choosing an SD card file (VDO_TEMP_250FMAX.xn), choosing a local file, and saving to SD card. It also features three buttons: Interpolate, Scale, and Offset (which is highlighted with a red box). Below these are configuration fields for FILE NAME (VDO_TEMP_250FMAX.xml), DESCRIPTION (VDO Temperature 250F), TYPE (Temperature), UNITS (Kelvin), RESOLUTION (0.01), MIN (24703), and MAX (41093). At the bottom is a table for modifying calibration data:

Index	Volts	Current	New
0	0.00	41093	53420
1	0.01	41092	53000
2	0.03	41092	53419
3	0.04	41092	53419
4	0.05	41092	53419



Enter the desired offset value in the popup dialog

Be aware the all values are positive only and can not exceed the maximum of 65536.

Any values beyond the maximum will be clipped to 65536 or 0

The screenshot shows the SeaGauge G4 software interface. A modal dialog box is open, prompting for an offset value. The input field contains '100'. Below the dialog, there is a section for modifying a calibration table, with fields for FILE NAME (VDO_TEMP_250FMAX.xml), DESCRIPTION (VDO Temperature 250F), TYPE (Temperature), UNITS (Kelvin), RESOLUTION (0.01), MIN (24703), and MAX (41093). At the bottom, a table lists calibration points with columns for Index, Volts, Current, and New. The 'New' column shows values being entered into the dialog.

Index	Volts	Current	New
0	0.00	41093	53420
1	0.01	41092	53000
2	0.03	41092	53419
3	0.04	41092	53419
4	0.05	41092	53419



The resulting offset values will be displayed in the NEW column

SeaGauge G4 Not secure 192.168.254.114/ModifyCalTable.html

SeaSmart

Modify selected calibration table

Choose SD card file Choose local file Save to SD card

VDO_TEMP_250FMAX.xn Choose File No file chosen Save

Modify Calibration table and save back to internal SD card

Interpolate Scale Offset

FILE NAME: VDO_TEMP_250FMAX.xml

DESCRIPTION: VDO Temperature 250F

TYPE: Temperature

UNITS: Kelvin

RESOLUTION: 0.01

MIN: 24703

MAX: 41093

Index	Volts	Current	New
0	0.00	41093	41193
1	0.01	41092	41192
2	0.03	41092	41192
3	0.04	41092	41192
4	0.05	41092	41192



Any NEW value can be edited by selecting the desired row and entry of a new value

The screenshot shows a web browser window titled "SeaGauge G4" with the URL "192.168.254.114/ModifyCalTable.html". The page is titled "SeaSmart" and displays a form for modifying a calibration table. The form includes fields for choosing an SD card file ("VDO_TEMP_250FMAX.xn"), choosing a local file ("Choose File" button), and saving to SD card ("Save" button). Below these are three buttons: "Interpolate", "Scale", and "Offset". The form also contains fields for FILE NAME ("VDO_TEMP_250FMAX.xml"), DESCRIPTION ("VDO Temperature 250F"), TYPE ("Temperature"), UNITS ("Kelvin"), RESOLUTION ("0.01"), MIN ("24703"), and MAX ("41093"). At the bottom is a table with columns: Index, Volts, Current, and New. The "New" column for index 1 has a dropdown menu with "53000" selected, which is highlighted with a red box. The table data is as follows:

Index	Volts	Current	New
0	0.00	41093	53420
1	0.01	41092	53000
2	0.03	41092	53419
3	0.04	41092	53419
4	0.05	41092	53419



The resulting modified file can be saved back to SD card using the entry in the FILE NAME field

SeaSmart

Modify selected calibration table

Choose SD card file Choose local file Save to SD card

VDO_TEMP_250FMAX.xn Choose File No file chosen **Save**

Modify Calibration table and save back to internal SD card

Interpolate Scale Offset

FILE NAME

DESCRIPTION VDO Temperature 250F

TYPE Temperature

UNITS Kelvin

RESOLUTION 0.01

MIN 24703

MAX 41093

Index	Volts	Current	New
0	0.00	41093	53420
1	0.01	41092	53000
2	0.03	41092	53419
3	0.04	41092	53419
4	0.05	41092	53419



INTERPOLATION allows entry of 2 to 255 new data points that are then connected by straight line interpolations.

The more data points entered will result in a very precise calibration.

This type of modification is commonly done for fluid tanks and when trying to match existing analog gauge installations

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. At the top, there are three buttons: "Choose SD card file" (containing "VDO_PSI_400MAX.xml"), "Choose local file" (containing "Choose File No file chosen"), and "Save to SD card" (containing a "Save" button). Below these are three buttons: "Interpolate" (highlighted with a red box), "Scale", and "Offset".
FILE NAME: VDO_PSI_400MAX.xml
DESCRIPTION: VDO PSI 400 MAX
TYPE: Pressure
UNITS: Pascal
RESOLUTION: 0.01
MIN: 0
MAX: 27570

Index	Volts	Current	New
0	0.00	0	
1	0.01	0	
2	0.03	0	
3	0.04	0	
4	0.05	0	



Interpolation starts with entering the first and last data points.

Clicking on any row will automatically copy the CURRENT value to the NEW value

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. At the top, there are three file selection buttons: "Choose SD card file" (selected, showing "VDO_PSI_400MAX.xml"), "Choose local file" (disabled, showing "No file chosen"), and "Save to SD card" (disabled). Below these are three buttons: "Interpolate", "Scale", and "Offset". The "FILE NAME" field contains "VDO_PSI_400MAX.xml". The "DESCRIPTION" field contains "VDO PSI 400 MAX". The "TYPE" field contains "Pressure". The "UNITS" field contains "Pascal". The "RESOLUTION" field contains "0.01". The "MIN" field contains "0". The "MAX" field contains "27570". A table below lists calibration points:

Index	Volts	Current	New
0	0.00	0	<input type="text" value="0"/>
1	0.01	0	<input type="text"/>
2	0.03	0	<input type="text"/>
3	0.04	0	<input type="text"/>
4	0.05	0	<input type="text"/>



Any NEW value can then be modified

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. At the top, there are three buttons: "Choose SD card file" (dropdown menu showing "VDO_PSI_400MAX.xml"), "Choose local file" (button labeled "Choose File" with "No file chosen"), and "Save to SD card" (button labeled "Save"). Below these are three buttons: "Interpolate", "Scale", and "Offset". The main area contains fields for "FILE NAME" (VDO_PSI_400MAX.xml), "DESCRIPTION" (VDO PSI 400 MAX), "TYPE" (Pressure), "UNITS" (Pascal), "RESOLUTION" (0.01), "MIN" (0), and "MAX" (27570). Below these fields is a table with columns: Index, Volts, Current, and New. The "New" column for index 0 contains the value "2.2" with a red border and a dropdown arrow, indicating it is the current selected value for modification.

Index	Volts	Current	New
0	0.00	0	2.2
1	0.01	0	
2	0.03	0	
3	0.04	0	
4	0.05	0	



Scroll down through the data section to enter new values at each interpolation point

43	0.54	0	
44	0.55	0	
45	0.56	0	
46	0.58	184	
47	0.59	184	
48	0.60	184	
49	0.61	184	
50	0.63	184	
51	0.64	368	
52	0.65	368	
53	0.66	368	
54	0.68	368	
55	0.69	368	
56	0.70	552	
57	0.71	552	
58	0.73	735	
59	0.74	735	
60	0.75	735	800
61	0.76	735	
62	0.78	919	



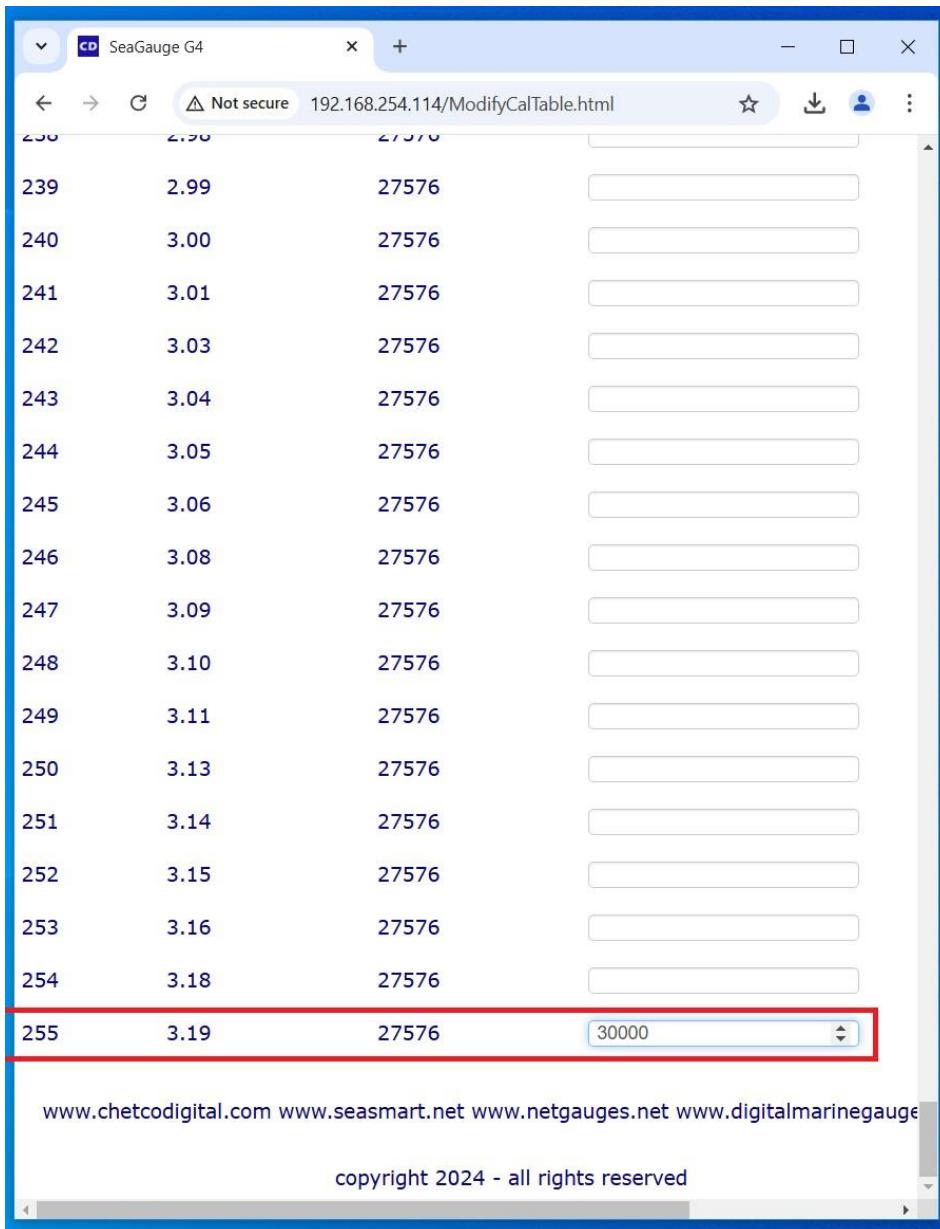
Be sure to use enough entries to approximate the desired calibration curve

194	2.43	21142	
195	2.44	21693	
196	2.45	22245	
197	2.46	22796	
198	2.48	23348	
199	2.49	23715	
200	2.50	24451	
201	2.51	25002	
202	2.53	25554	
203	2.54	26289	27000
204	2.55	26841	
205	2.56	27576	
206	2.58	27576	
207	2.59	27576	
208	2.60	27576	
209	2.61	27576	
210	2.63	27576	
211	2.64	27576	
212	2.65	27576	
213	2.66	27576	



Finally, be sure to enter the last value to complete the table.

If no new entry is made for the first and last value – the current values will be used by default.



238	2.98	27576
239	2.99	27576
240	3.00	27576
241	3.01	27576
242	3.03	27576
243	3.04	27576
244	3.05	27576
245	3.06	27576
246	3.08	27576
247	3.09	27576
248	3.10	27576
249	3.11	27576
250	3.13	27576
251	3.14	27576
252	3.15	27576
253	3.16	27576
254	3.18	27576
255	3.19	27576

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Once data entry is complete, click the INTERPOLATE button to calculate the NEW values

The screenshot shows a web-based application titled "SeaSmart" for modifying calibration tables. At the top, there are three buttons: "Choose SD card file" (dropdown menu showing "VDO_PSI_400MAX.xml"), "Choose local file" (button labeled "Choose File" with "No file chosen"), and "Save to SD card" (button labeled "Save"). Below these are three buttons: "Interpolate" (highlighted with a red box), "Scale", and "Offset". A message above the buttons says "Modify Calibration table and save back to internal SD card". The form fields include: FILE NAME (VDO_PSI_400MAX.xml), DESCRIPTION (VDO PSI 400 MAX), TYPE (Pressure), UNITS (Pascal), RESOLUTION (0.01), MIN (0), and MAX (27570). At the bottom is a table with columns: Index, Volts, Current, and New. The table rows are numbered 0 to 4, with the first row having a value of 2.2 in the "New" column.

Index	Volts	Current	New
0	0.00	0	2.2
1	0.01	0	
2	0.03	0	
3	0.04	0	
4	0.05	0	



NEW values will be shown in the data section

Any row can still be modified at this time

The screenshot shows a web browser window titled "SeaGauge G4" with the URL "192.168.254.114/ModifyCalTable.html". The page is titled "SeaSmart" and displays a form for modifying a calibration table. The form includes fields for choosing an SD card file (dropdown menu showing "VDO_PSI_400MAX.xml"), choosing a local file (button "Choose File" with message "No file chosen"), and saving to SD card (button "Save"). Below these are three buttons: "Interpolate", "Scale", and "Offset". The form also contains fields for FILE NAME ("VDO_PSI_400MAX.xml"), DESCRIPTION ("VDO PSI 400 MAX"), TYPE ("Pressure"), UNITS ("Pascal"), RESOLUTION ("0.01"), MIN ("0"), and MAX ("27570"). At the bottom is a table with columns: Index, Volts, Current, and New. The table rows are numbered 0 to 4, with the entire table highlighted by a red border. The data in the table is as follows:

Index	Volts	Current	New
0	0.00	0	2
1	0.01	0	15
2	0.03	0	28
3	0.04	0	41
4	0.05	0	55



Once interpolation is complete, save the resulting calibration back to the SD card.

The FILE NAME can be updated to create a new file if desired.

All other HEADER information can also be updated before saving file

SeaSmart

Modify selected calibration table

Choose SD card file Choose local file Save to SD card

VDO_PSI_400MAX.xml Choose File No file chosen **Save**

Modify Calibration table and save back to internal SD card

Interpolate Scale Offset

FILE NAME New_PSI_400MAX.xml

DESCRIPTION VDO PSI 400 MAX

TYPE Pressure

UNITS Pascal

RESOLUTION 0.01

MIN 0

MAX 30000

Index	Volts	Current	New
0	0.00	0	2
1	0.01	0	15
2	0.03	0	28
3	0.04	0	41
4	0.05	0	55



The new/modified calibration file can now be viewed on the SD card

CD SeaSmart Files Page

Not secure 192.168.254.114/Files.html

SeaSmart WIFI G3

Home Config Status CAN Status 0183 **Files** PGN Filters

▼ Upload files to local SD card

LIST	CONFIG	SPIFFS	Firmware	WEB	Calibrations
List Files	Choose Files				

► Download files from HelmSmart Server

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CD SeaSmart File Upload Page 7

Not secure 192.168.254.114/download/calibrations/

SeaSmart WIFI G3

Name	Action	Type	Size (Bytes)	Remove
VDO_TEMP_250FMAX.xml	Download Upload Delete	file	2811	[REDACTED]
VDO_PSI_400MAX.xml	Download Upload Delete	file	2799	[REDACTED]
VDO_TEMP_400FMAX.xml	Download Upload Delete	file	2811	[REDACTED]
New_PSI_400MAX.xml	Download Upload Delete	file	2292	[REDACTED]
ALT_VOLTS_27MAX.xml	Download Upload Delete	file	2793	[REDACTED]
ALT_VOLTS_36MAX.xml	Download Upload Delete	file	2793	[REDACTED]
FUEL_180to10.xml	Download Upload Delete	file	2801	[REDACTED]
VDO_PSI_150MAX.xml	Download Upload Delete	file	2800	[REDACTED]

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Modified calibration files are now available for assignment to sensor ADC channels

The screenshot shows a configuration interface for the SeaSmart G3 device. The main table lists 12 ADC channels (ADC0 to ADC11) with their corresponding PGNs and parameters. The 'Calibration' column contains dropdown menus for selecting calibration files. A red box highlights the 'select' option for ADC3's calibration file, which is set to 'VDO_PSI_150MAX.xml'. Below the table are sections for 'Analog Alarms Configurations' and 'Timestamp Configurations', each with a 'Save Settings' button. At the bottom, there are links to various websites and the copyright notice 'copyright 2024'.

Channel Instance PGN	Parameter	Set value	Calibration	Action
ADC0 0 ✓ PGN127508 - Battery Status	Battery Volt	ALT_VOLTS_36MAX.xml	select	modify
ADC1 0 ✓ PGN127505 - Fluid Level	Fuel Level	FUEL_180to10.xml	select	modify
ADC2 0 ✓ PGN127489 - Engine Dynamic	Engine Temp	VDO_TEMP_250FMAX	select	modify
ADC3 0 ✓ PGN127489 - Engine Dynamic	Oil Pressure	VDO_PSI_150MAX.xml	select	modify
ADC4 1 ✓ PGN127489 - Engine Dynamic	Oil Pressure	VDO_PSI_150MAX.xml	select	modify
ADC5 1 ✓ PGN127489 - Engine Dynamic	Engine Temp	VDO_TEMP_250FMAX	select	modify
ADC6 1 ✓ PGN127505 - Fluid Level	Fuel Level	FUEL_180to10.xml	select	modify
ADC7 1 ✓ PGN127508 - Battery Status	Battery Volt	ALT_VOLTS_36MAX.xml	select	modify
ADC8 0 ✓ PGN127288 - Engine Rapid	Trim	VDO_TEMP_250FMAX	select	modify
ADC9 0 ✓ PGN127288 - Engine Rapid	Boost	VDO_PSI_150MAX.xml	select	modify
ADC10 1 ✓ PGN127288 - Engine Rapid	Trim	VDO_TEMP_250FMAX	select	modify
ADC11 1 ✓ PGN127288 - Engine Rapid	Boost	VDO_PSI_150MAX.xml	select	modify

The screenshot shows a file upload page for the SeaSmart device. The top features the 'SeaSmart' logo and a 'WIFI G3' icon. The main area displays a table of calibration files with their names, sizes, and actions. A red box highlights the 'Set ADC 3 Calibration file' action for the 'New_PSI_400MAX.xml' file. Below the table, there are links to various websites and the copyright notice 'copyright 2022'.

Name	Action	Type	Size (Bytes)	Remove
VDO_TEMP_250FMAX.xml	Set ADC 3 Calibration file	file	2811	[REMOVE!]
VDO_PSI_400MAX.xml	Set ADC 3 Calibration file	file	2799	[REMOVE!]
VDO_TEMP_400FMAX.xml	Set ADC 3 Calibration file	file	2811	[REMOVE!]
New_PSI_400MAX.xml	Set ADC 3 Calibration file	file	2292	[REMOVE!]
ALT_VOLTS_27MAX.xml	Set ADC 3 Calibration file	file	2793	[REMOVE!]
ALT_VOLTS_36MAX.xml	Set ADC 3 Calibration file	file	2793	[REMOVE!]
FUEL_180to10.xml	Set ADC 3 Calibration file	file	2801	[REMOVE!]
VDO_PSI_150MAX.xml	Set ADC 3 Calibration file	file	2800	[REMOVE!]



Calibration Files can be transferred from the internal SD card to local browser device by using the DOWNLOAD button

Name	Action	Type	Size (Bytes)	Remove
VDO_TEMP_250FMAX.xml	Download Upload Delete	file	2811	!REMOVE!
VDO_PSI_400MAX.xml	Download Upload Delete	file	2799	!REMOVE!
VDO_TEMP_400FMAX.xml	Download Upload Delete	file	2811	!REMOVE!
testCalFile.xml	Download Upload Delete	file	452	!REMOVE!
NEW_TEMP_250FMAX.xml	Download Upload Delete	file	2484	!REMOVE!
ALT_VOLTS_27MAX.xml	Download Upload Delete	file	2793	!REMOVE!
ALT_VOLTS_36MAX.xml	Download Upload Delete	file	2793	!REMOVE!
FUEL_180to10.xml	Download Upload Delete	file	2801	!REMOVE!
VDO_PSI_150MAX.xml	Download Upload Delete	file	2800	!REMOVE!
VDOscaled250FMAX.xml	Download Upload Delete	file	2484	!REMOVE!

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The downloaded file will be stored on the local browser device

VDO_TEMP_250FMAX.xml Keep >
Insecure download blocked

Name	Action	Type	Size (Bytes)	Remove
VDO_TEMP_250FMAX.xml	Download Upload Delete	file	2811	!REMOVE!
VDO_PSI_400MAX.xml	Download Upload Delete	file	2799	!REMOVE!
VDO_TEMP_400FMAX.xml	Download Upload Delete	file	2811	!REMOVE!
testCalFile.xml	Download Upload Delete	file	452	!REMOVE!
NEW_TEMP_250FMAX.xml	Download Upload Delete	file	2484	!REMOVE!
ALT_VOLTS_27MAX.xml	Download Upload Delete	file	2793	!REMOVE!
ALT_VOLTS_36MAX.xml	Download Upload Delete	file	2793	!REMOVE!
FUEL_180to10.xml	Download Upload Delete	file	2801	!REMOVE!
VDO_PSI_150MAX.xml	Download Upload Delete	file	2800	!REMOVE!
VDOscaled250FMAX.xml	Download Upload Delete	file	2484	!REMOVE!

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SeaGaugeG4 contains an embedded WEB page interface for configuring the analog inputs to transmit NMEA 2000 or J1939 style messages via its CAN bus interface. These messages are also passed to its embedded Web Server to enable viewing using the local browser interface

