

CruzPro® MaxVu110



User Configurable
Multifunction Instrument

Other CruzPro Products

- Depthsounders/w Keel Offset, Deep/Shallow/Anchor Drag Alarms
- PC Based DSP Fishfinder for Windows 98, NT, SE, XP, 2000
- Speed/Temperature/Logs
- Digital DC Volts Gauge/w Alarms
- Digital DC Volts Gauge/w Alarms for 3 Battery Banks
- Digital Amps Gauge
- DC Volts/Amps/Amp-Hour Monitors
- AC Volts/Amps/Freq/kW Monitors
- LPG/Petrol Gas Detectors/Alarms
- Bilge Water Alarms/w Stainless Steel Water Sensor
- Intelligent Bilge Pump Controllers/w Stainless Steel Water Sensors
- Intelligent Windlass Controller/Chain Counters
- Digital Fuel Gauges & Fuel Consumption Calculator
- Digital Tank Level Gauges for 1 or 3 Tanks /w Separate Alarms
- Smart 4 step Alternator Regulator
- Marine Security System/w Reliable Intrusion Sensors
- RPM/Engine Hours/Elapsed Time Gauges/w Alarm
- Digital Engine Temperature Gauge/w Alarms
- Digital Oil Pressure Gauge/w Alarms
- Digital Temperature Gauges for 1 or 3 Areas/w Alarms
- Digital Clock/Watch/Race Timers/w 8 Alarms
- 8 and 16 Amp Light Dimmers/Motor Speed Controller
- Solar Panel Charge Controllers 6/8/9 & 20 Amps
- 4 & 8 Channel NMEA Combiners/RS-232 Convertors
- Engine/Exhaust Temp. Monitor & Digital Pyrometer
- NMEA 0183 Remote Data Repeater/w 4 Input Channels
- High Pressure Digital Hydraulic Pressure Gauge
- Engine Hours/Elapsed Trip Time/Engine Maintenance Alarm Gauge

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A built-in editor enables you to change alarm levels, calibrate data sources, select different calibration curves and change display damping using the front panel keys.

The MaxVu110 is also supplied with software that runs under Windows 98, WinXP, WinNT, Win2K, Vista and Win 7 to simplify editing of the Display Configurations, Alarms, set Units of Measure and select Calibration Curves. You can create and edit custom calibration curves for Engine Temperature, Oil Pressure, Fuel and Tankage Levels and Trim Angle. Settings can be quickly uploaded to the MaxVu110 or downloaded from the MaxVu110 using either a RS232 port or USB port.

- 25 NMEA 0183 input #2A (Display NMEA Depth, Wind, GPS data, etc)
- 26 NMEA 0183 input #2B (Display NMEA Depth, Wind, GPS data, etc)
- 27 NMEA 0183 input #3A (Display NMEA Depth, Wind, GPS data, etc)
- 28 NMEA 0183 input #3B (Display NMEA Depth, Wind, GPS data, etc)
- 29 NMEA 0183 input #4A (Display NMEA Depth, Wind, GPS data, etc)
- 30 NMEA 0183 input #4B (Display NMEA Depth, Wind, GPS data, etc)

- 31 Remote Hardware Data Display #1 (For future expansion options)
- 32 Remote Hardware Data Display #2 (For future expansion options)

- 33 Trim Angle (See Note 1 - Auxiliary Input #1)

- 34 External Backlight ON/OFF control

Note 1 - Auxiliary Input #1. The Yellow #3 wire can be programmed to be:

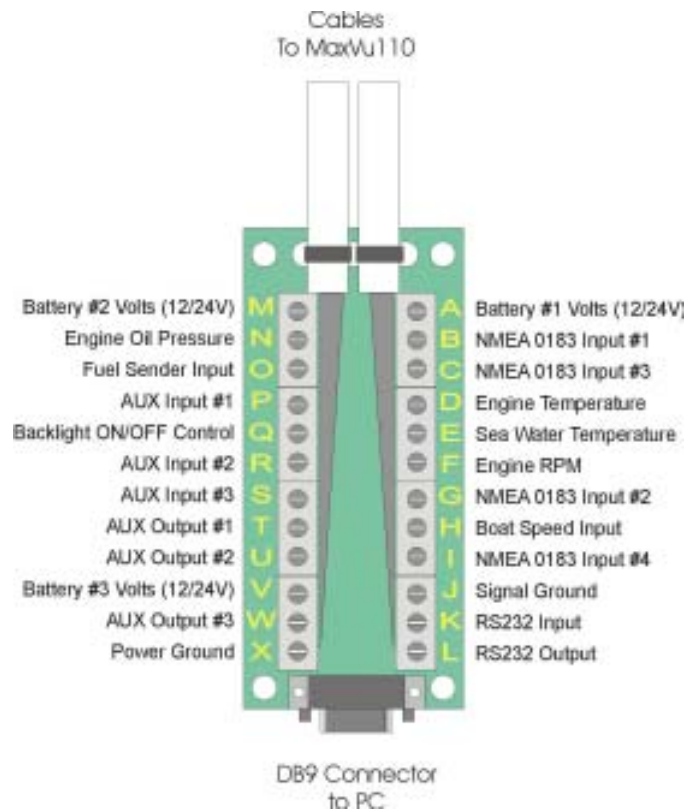
- a) Additional Tankage input (Water, fuel, holding tank - See Note 3)
- b) Third Temperature input (See Note 4)
- c) Trim Angle input (See Note 2)

Note 2 - Engine temperature, oil pressure, trim angle and fuel senders are not supplied. Transducers to measure boat speed, sea water temperature and depth are not supplied but available separately.

Note 3 - Works with any standard resistive tank sender (European or American). Sender not supplied.

Note 4 - Temperature senders (such as seawater temperature, refrigerator temperature, engine room or battery temperature, etc.) not supplied but available separately in a variety of different formats.

Figure 2 - MaxVu110 Screw Terminal Connections



second the display shows the data for display configuration #1 as shown in figure 5. All 16 of the factory default display configurations are shown in figures 5-20. Note that the two bar graphs can be configured to display only a single arrow as shown in figure 6 or a full bar graph as shown in figure 5. However, once selected, the same type of bar graph is displayed for all display configurations. Figures 7 through 21 all use the full bar graph method.

Figure 4 - Current Display Configuration



“L” Display

Display #1

“R” Display



Display #2

Display #3

Figure 5
Default display configuration 1

- Engine RPM (Display #1)
- Boat Speed (Display #2)
- Depth on NMEA#2A (Display #3)
- Oil Pressure (“L” Display)
- Engine Temperature (“R” Display)

Figure 9
Default display configuration 5

Depth (On NMEA#2A input)
 Boat Speed
 Fuel Remaining
 Oil Pressure
 Engine Temperature



Figure 10
Default display configuration 6

Depth (On NMEA input #2A)
 Boat Speed
 Sea Water Temperature
 Oil Pressure
 Engine Temperature



Figure 11
Default display configuration 7

Boat Speed
 Depth (On NMEA input #2A)
 Engine RPM
 Oil Pressure
 Engine Temperature



Figure 15
Default display configuration 11

Depth (On NMEA input #2A)
 Bearing to Waypoint (GPS On NMEA #4A)
 Distance To Waypoint (GPS On NMEA #4B)
 Oil Pressure
 Engine Temperature



Figure 16
Default display configuration 12

Boats Speed
 Bearing to Waypoint (GPS On NMEA #4A)
 Distance To Waypoint (GPS On NMEA #4B)
 Oil Pressure
 Engine Temperature



Figure 17
Default display configuration 13

Depth (On NMEA input #2A)
 Battery Bank #1 Volts
 Time of Day
 Trim Angle on Aux#1 Input
 EGT Pyrometer (On NMEA #3A)



Turning Alarms ON/OFF

To “arm” the alarms, press and hold the ▲ key 1/2 second. The Bell symbol will be displayed when the alarms are “armed”. To disable the alarms press and hold the ▼ key for 1/2 second. Any press between 1/2 and 2 seconds will work. A press of less than 1/2 second or longer than 2 seconds will be ignored.

Setting High and Low Alarm Values

To View and/or Set the High Alarm value for any of the five current digital displays and bar charts, press and hold the ▲ key for ten seconds (until you hear a long beep). To View and/or Set the Low Alarm value for any of the displays press and hold the ▼ key for ten seconds. The alarm value, display identifier (1, 2, 3, L or r) and the word “HiAL” or “LoAL” will be displayed as shown in Figure 21. Quick press the + key to select the desired display identifier (1, 2, 3, L or r). Press and hold the ▼ and ▲ keys to change the alarm value. Press the + key for 1 second (until the long beep) to accept the new alarm value, save it to memory and leave the Alarm Editor mode.



Figure 21 - Alarm Editor

Editing the Hi alarm
for display #3

To prevent confusion, the High and Low alarm values are unique for each Data Source (i.e. RPM or Fuel level, etc.). For example, if you change the high alarm value for RPM in one display configuration, then the high alarm value for RPM will automatically change for each display configuration where RPM is displayed. **Be sure to read the warnings about alarms in the *Important Notes and***

The figure below shows what you will see when setting Race Timer2. The race timers are set the same way as the clock. Only the minutes can be set for the race timers. Press the + key for 1 seconds when you are done to save the results to memory.

To start Race Timer 1 quick press both the ▼ and + keys. To start Race Timer 2 quick press both the + and ▲ keys. You do not have to be viewing the race timers for them to work - they will work in the background. The race timers will start counting down from their assigned values and beep as each minute is counted down. When the race timers reach 10 seconds each second will be sounded off with a short beep. When the race timers reach zero you will hear a long beep.

In order to prevent confusion, only one race timer can be running. Starting Race Timer 2 will stop Race Timer1 and vice-versa. Once a race timer has been started it can also be stopped the same way. Restarting the race timers will cause them to reset and start from their original values not from where they were stopped.



Note: The Clock, Time-Of-Day alarms and Race Timers can also be set using the Windows software.

If the selected data source cannot be calibrated (such as data read from an NMEA 0183 string or Elapsed Trip Time) then “----” will be displayed for the Data Source value as shown here.



Figure 25 - Calibration Editor

Sample display when attempting to calibrate a Data Source that cannot be calibrated.

Setting Display Damping

It is possible to slow down how fast the numbers on the display change by adding “Display Damping” to the following data sources: RPM, Boat Speed, Fuel, Tank Level, Trim Angle, NMEA 0183 channels 2A, 2B, 3A and 3B. Filter values between 0 (No damping) and 250 (Extremely slow response) are allowed.

Press and hold the ▼ and * keys for ten seconds to enter the Display Damping Editor (until you hear a long beep). The filter value, display identifier (1, 2, 3, L or r) and the word “Filt” will be displayed as shown in Figure 26. Quick press the + key to select the desired display identifier (1, 2, 3, L or r). Press and hold the ▼ and ▲ keys to change the calibration value. Press the + key for 1 second (until the long beep) to accept the new value, save it to memory and leave the Display Damping Editor mode.

Setting Tachometer Sensitivity

Five different values of tachometer sensitivity can be set using the Windows software or on the MaxVu110 instrument itself. Press and hold the ▲ and * keys for ten seconds to enter the Tachometer Sensitivity Editor (until you hear a long beep). RPM will be shown on Display #1, the sensitivity value 1 to 5 on Display #2 and the word “tACH” on Display #3 as shown in Figure 27. Quick press the ▼ or ▲ key to decrease or increase the tachometer sensitivity. Press the + key for 1 second (until the long beep) to accept the new value, save it to memory and leave the Tachometer Sensitivity Editor mode.



Figure 27 - Tachometer Sensitivity

Setting Tachometer Sensitivity to a value of 1 to 5.

Setting Tachometer Pulley Ratio

The tachometer can be rough calibrated to use a pulley ratio between 1:1 to 200:1 (for gear tooth sensors) in seven steps. Final fine calibration is done on the MaxVu110. Pulley Ratio cannot be set on the MaxVu110 itself and must be done using the Windows configuration software

Clearing Trip Fuel, Trip Distance and Trip Time

Press and hold the + key for 10 seconds (until the long beep) to clear Trip Fuel, Trip Distance and Trip Time logs to zero.

If you connect to the MaxVu110 to your PC using a RS232 serial port then you can skip the following USB Driver Installation section and proceed directly to the “Connecting to the MaxVu110” section.

USB Driver Installation

If you plan to connect to the MaxVu110 with a USB cable you will first need to install the USB driver BEFORE you plug the supplied USB cable into your PC. Place the distribution CD in the CD ROM drive and navigate to the “DRIVERS” directory. Double click and run the program: HL-2303.EXE. After a few seconds you will see the following screen:



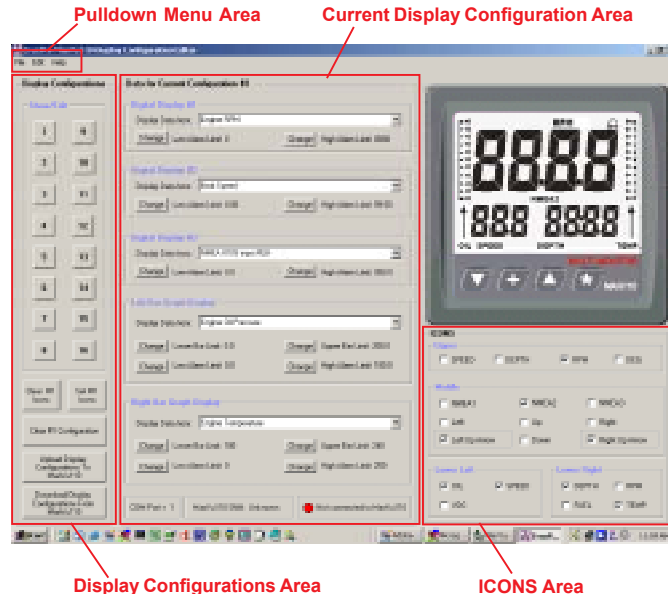
Click “Next” and click “Finish” when you see the following screen:

Connecting to the MaxVu110

Connect the MaxVu110 to your PC using either a RS232 cable or the supplied USB cable (See USB Driver Installation FIRST). The Windows software will look for the MaxVu110 instrument when you wish to upload or download information to or from the instrument.

Main Screen

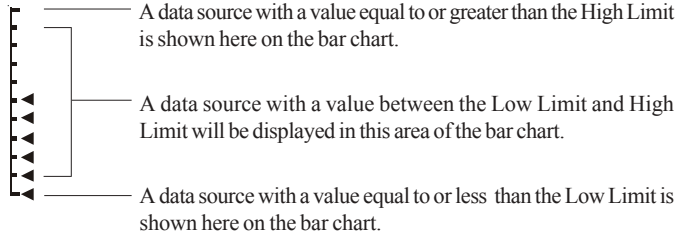
The Main Screen is divided into 4 areas: Pulldown Menus, Display Configurations, Data for Current Display Configuration and an ICONS area.



High and Low Alarm Values: The High and Low alarm values assigned to the data source for each of the five displays (1, 2, 3, L, R) are shown in the Current Display Configuration area with a “change” box next to each. Clicking the “Change” box allows you to change the High and Low alarm limits as shown below. **Be sure to read the warnings about alarms in the *Important Notes and Warnings* section about which Data Sources and conditions will sound an audible alarm.**

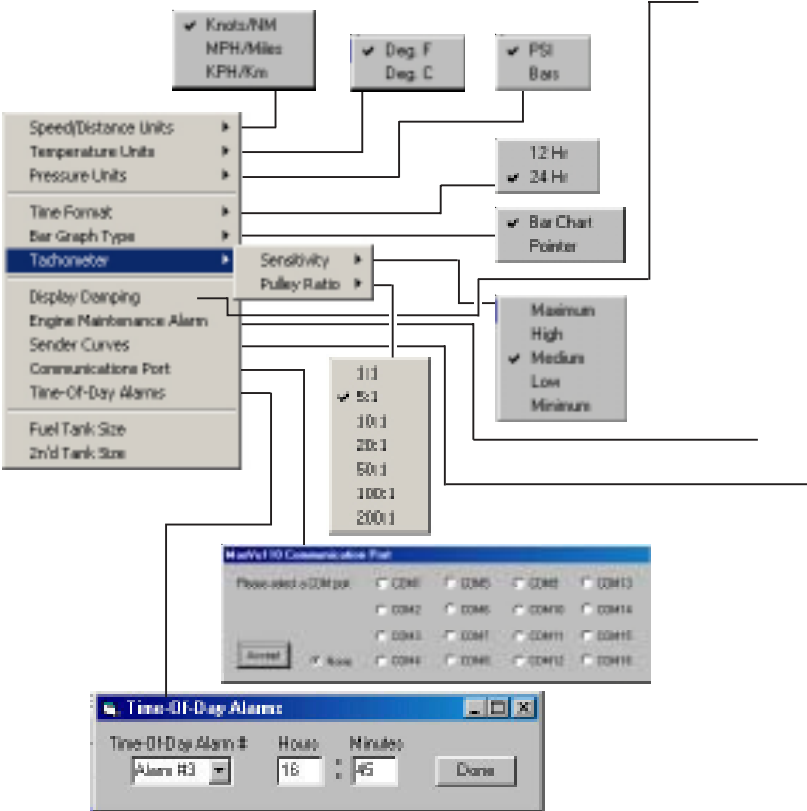


High and Low Limit Values for Bar Charts: Similarly the High and Low Limit values of the two bar charts are shown in the Current Display Configuration area along with “Change” boxes. Clicking on the “Change” box allows you to change the High and Low Limit values for the two bar charts. The high limit is the value that displays at the top of the bar chart and the low limit is the value that displays at the bottom of the bar chart.

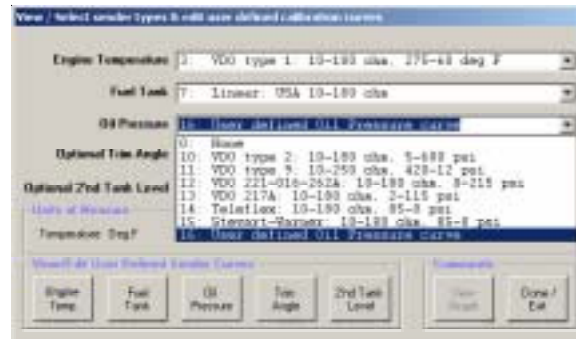


Selecting the High and Low Limit values appropriately allows you to scale the data or “zoom” into the area of interest to you. For example if you direct the battery voltage of a 12V battery to one of the bar charts you can set the Low Limit value at 11.8 V and the High Limit value to 12.2V providing an expanded scale for battery voltage. The High and Low Limit values are completely independent of the high and low alarm limits.

Edit Menu: The Edit menu is where you make changes to the Units of Measure (such as Degrees F or C), select 12 or 24 hour time format, select from two different bar graph formats, set display damping for different Data Sources and select/create sender calibration curves, etc. A summary of the Edit Menu choices are shown here:



View/Set Sender Curves: The Edit- View/Set Sender Curves menu is where you select sender calibration curves for Engine Temperature, Fuel, Oil Pressure, Optional Trim Angle and Optional Second Tank Level senders. For each data source there are a number of sender options to select from using the pull down menus.



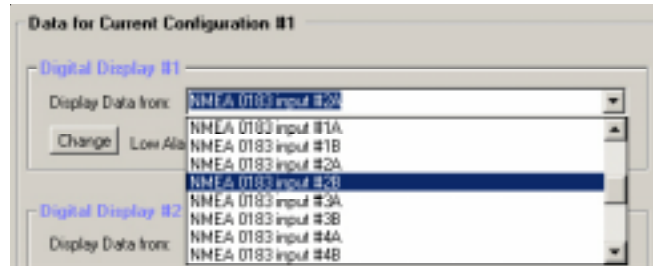
There is also an option to select a User Defined calibration curve. Click on one of the five user-definable sender buttons and create your own calibration curve using the built-in editor. This is very useful if your sender is not listed or if you have odd shaped tanks but still need an accurate display.

Index	Offset	Value
19	108	58.0
20	114	63.2
21	119	64.5
22	125	67.7
23	130	70.9
24	136	74.1
25	141	77.4
26	147	80.6
27	152	83.8
28	158	87.0
29	163	90.3
30	169	93.5
31	174	96.7
32	180	100.0

Help Menu: Click on the Help Menu to see the version number of the Windows software, the instrument internal firmware version and serial number.

Selecting an NMEA Sentence to Display

The Max Vu110 can display up to eight different sets of NMEA 0183 data coming in on one of the four NMEA 0183 compatible input channels (up to two different sentences per data line). The selected data can be displayed on one of three digital displays or one of the bar charts. The NMEA data to be displayed is selected on the “Current Configuration” screen using the pull down menus.

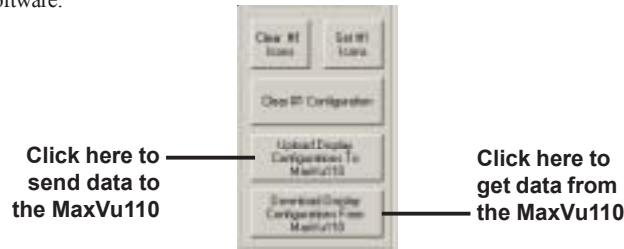


When you click on one of the eight possible input channels (#1A to #4B) another pull down menu lets you select the NMEA 0183 string to search for as shown here:



Uploading and Downloading Display Configurations

To upload and download display configuration data to and from the MaxVu110 instrument you must connect it to your PC using either the RS232 serial connector or to a USB port using the supplied RS232/USB converter. **Switch off the power to the MaxVu110 “A” terminal** and click the “Upload Display Configurations to MaxVu110” box or the “Download Display Configurations From MaxVu110” box in the display configurations area of the Windows software.



You will be shown a warning box and presented with the following choices when *uploading* data:

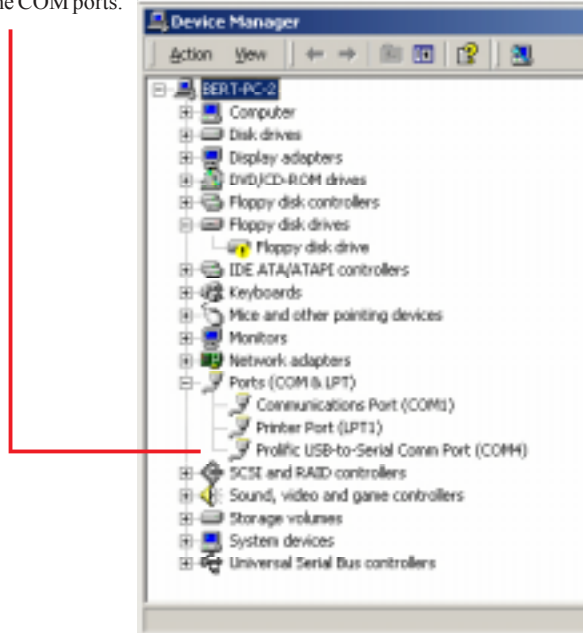


Uncheck the items that you do NOT want to transfer to the MaxVu110 and click CONTINUE.



Progress screen displayed while data is being transferred between MaxVu110 and PC.

If you do not know which communications port the MaxVu110 is connected to you can use the Windows Device Manager to show you the hardware configuration of the COM ports.



Trip Log
Total Log
Trip Time

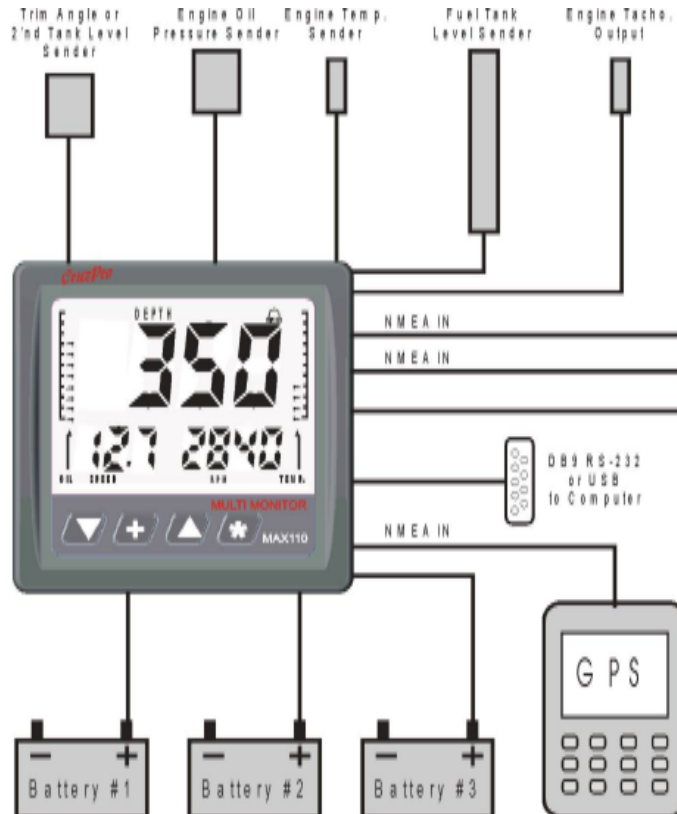
Outputs: External alarm output.

Memory: Nonvolatile memory for alarms, display configurations, calibrations, backlight levels, etc.

Calibration Curves:

25 curves for Engine Temperature, Oil Pressure, Fuel Level, Optional Trim Angle and Optional 2n'd tank Level, including five user definable calibration curves.

Appendix C - Typical Setup



Appendix D - Important Notes and Warnings

- 1) The NMEA 0183 serial data output from Other CruzPro instruments can be sent to the MaxVu110 to display additional functions on the MaxVu110 display such as:
 - a) Extra water and fuel tanks
 - b) Battery charge remaining, battery amps
 - c) Exhaust gas pyrometers
 - d) Rudder Angle
 - e) Refrigerator, freezer, bait tank, room temperatures, etc.
 - f) AC volts, frequency, amps, Kilowatts
- 2) The CruzPro NC20/4 and NC20/8 NMEA 0183 combiners can be used to add additional NMEA 0183 input lines to the MaxVu110 beyond the 4 lines already contained in the MaxVu110. This way you can expand the number of NMEA 0183 instrument lines from 4 up to a maximum of 32.
- 3) The front of the MaxVu110 can get splashed. The back is not sealed and must be protected from water.
- 4) The nonvolatile memory in the MaxVu110 will retain data for a minimum of 10 years without power.
- 5) Lines connecting to Battery #1, #2 and #3 should be protected from shorts by placing a 5 amp fuse near the battery side of the connection. The Battery #3 input line is used to run the engine hours log and engine maintenance timer and should be connected to the ignition line.
- 6) The factory default for the Engine Maintenance Alarm value is 200 hours and can only be changed using the Windows Software. When the Engine Maintenance Alarm value has counted down to zero the Engine Maintenance Alarm will sound and the value will then restart from the original setting (i.e. 200 hours or whatever you selected.) If the alarm value is changed using the Windows Software, the new value will be used when the existing alarm value has finished counting down to 0 hours.

14) Turning Power ON/OFF. The MaxVu110 draws very little power and is intended to have power ON at all times. Press and hold the * key to turn the MaxVu110 *display* OFF. The clock will keep running. Press and hold the * key again to enable the display. The Time-Of-Day clock will have to be set again *if you remove power to the MaxVu110 "A" terminal* but all other data is saved to a nonvolatile memory and not lost.

15) NMEA 0183 channel 2A is monitored in the background as one of the "Critical Alarm" functions (See list in Appendix E). You should assign an important NMEA sentence to this channel such as Depth. If depth is connected to another NMEA channel it will not be monitored in the background. Depth will still be monitored if it is being viewed on the current display configuration however.

16) After settings are changed it can take up to 30 seconds to save the data to the nonvolatile memory. If power is removed from the MaxVu110 during this time the changes may not be saved to memory and the older settings will be used when power is reapplied.

17) Both High and Low alarms for NMEA 0183 data can only be set in full units (i.e. full Degrees not tenths of a Degree, etc.).

18) When using the ▼ and ▲ keys to change a value, holding them down will cause the value to scroll fast after three seconds and very fast after ten seconds.

19) Engine Hours and the Maintenance Alarm only run when the ignition line is On. Battery #3 is used to determine if the ignition is On so wire Battery #3 to the ignition line.

20) When creating User defined calibration curves for Fuel/Tanks, Oil Pressure, and Engine Temperature it is important that the resistance and displayed values change between each of the 32 calibration points and that the curves either rise or fall but do not double back (e.g. start to rise then fall or vice-versa).

Sample Critical Alarm Displays



Alarm Source # 02
Engine Temperature



Alarm Source # 20
Battery #3 Volts



Alarm Source # 15
Time-Of-Day

In “Set Low/High Alarm Values” Mode

Keys	Secs	Function
+	0.1	Scroll through Display Number (1, 2, 3, L, R)
▼	0.1	Decrease displayed reading
▲	0.1	Increase displayed reading
+	1.0	Save new calibration value(s) to memory

In “Set Display Damping” Mode

Key Presses	Sec.	Function
+	0.1	Scroll through Display Number (1, 2, 3, L, R)
▼	0.1	Decrease selected display damping
▲	0.1	Increase selected display damping
+	1.0	Save new value(s) to nonvolatile memory

In “Calibrate Displays” Mode

Keys	Secs	Function
+	0.1	Scroll through Display Number (1, 2, 3, L, R)
▼	0.1	Decrease displayed reading
▲	0.1	Increase displayed reading
+	1.0	Save new calibration value(s) to memory

Appendix G - NMEA 0183 search string handling

Each NMEA input #1-4 can be programmed to search for two different NMEA 0183 strings. Each NMEA search string is identified with a one digit “Talker” index which points to a talker identifier such as “GP” for GPS, a one digit “Search String” index which points to a 3 character search string such as “RMC” and a one digit “Comma Counter”. The talker index, identifier and comma counter are stored as part of the Display Configuration.

Limitations on NMEA string decoding:

- a) Numbers larger than 9999 will display as “----” on a 4 digit display
- b) Numbers larger than 999 will display as “---” on a 3 digit display
- c) Negative numbers smaller than (less than) -999 will display as “----” on a 4 digit display
- d) Negative numbers smaller than (less than) -99 will display as “---” on a 3 digit display
- f) The bar charts will display both positive and negative NMEA 0183 numbers as positive.

Talker

Index	Talker ID Code
0	None - not used
1	AG Autopilot - General
2	AP Autopilot - Magnetic
3	CC Computer - Programmed Calculator (outdated)
4	CD Communications - Digital Selective Calling (DSC)
5	CM Computer - Memory Data (outdated)
6	CR Data Receiver
7	CS Communications - Satellite
8	CT Communications - Radio-Telephone (MF/HF)
9	CV Communications - Radio-Telephone (VHF)
10	CX Communications - Scanning Receiver
11	DE DECCA Navigation (outdated)
12	DF Direction Finder

- 48 ZQ Timekeeper - Quartz
- 49 ZV Timekeeper - Radio Update, WWV or WWVH

String

Index Sentence Formatter

- 0 None - not used
- 1 AAM - Waypoint Arrival Alarm
- 2 ALM - GPS Almanac Data
- 3 APA - Autopilot Sentence "A"
- 4 APB - Autopilot Sentence "B"
- 5 ASD - Autopilot System Data
- 6 BEC - Bearing & Distance to Waypoint - Dead Reckoning
- 7 BOD - Bearing - Waypoint to Waypoint
- 8 BWC - Brg and Dist. to Wypt, Lat., N/S, Long.,E/W,UTC, Status
- 9 BWR - Brg and Dist. to Wypt,Rhumb Line, Lat, N/S, Long,E/
W,UTC,Status
- 10 BWW - Bearing - Waypoint to Waypoint
- 11 DBK - Depth Below Keel
- 12 DBS - Depth Below Surface
- 13 DBT - Depth below transducer
- 14 DCN - Decca Position (obsolete)
- 15 DPT - Depth
- 16 DRU - Dual Doppler Auxiliary Data
- 17 DSC - Digital Selective Calling Information
- 18 DSE - Extended DSC
- 19 DSI - DSC Transponder Initiate
- 20 DSR - DSC Transponder Response
- 21 DTM - Datum Reference
- 22 FSI - Frequency Set Information
- 23 GBS - GPS Satellite Fault Detection
- 24 GDA Dead Reckoning Position
- 25 GGA - Global Positioning System Fix Data, Time, Position and fix
- 26 GLA - Loran-C Positions
- 27 GLC - Geographic Position, Loran-C

62	RPM - Revolutions
63	RSA - Rudder Sensor Angle
64	RSD - RADAR System Data
65	RTE - Routes
66	SFI - Scanning Frequency Information
67	SNU - Loran - C SNR Status
68	STC - Time Constant
69	STN - Multiple Data ID
70	STR - Tracking Reference
71	SYS - Hybrid System Configuration
72	TEC - TRANSIT Satellite Error Code & Doppler Count
73	TEP - TRANSIT Satellite Predicted Elevation
74	TGA - TRANSIT Satellite Antenna & Geoidal Heights
75	TIF - TRANSIT Satellite Initial Flag
76	TLL - Target latitude and longitude
77	TRF - TRANSIT Fix Data (obsolete)
78	TRP - TRANSIT Satellite Predicted Direction of Rise
79	TRS - TRANSIT Satellite Operating Status
80	TTM - Tracked Target Message
81	VBW - Dual Ground/Water Speed
82	VDC - Current at Selected Depth
83	VDR - Set and Drift
84	VHW - Water speed and heading
85	VLW - Distance Traveled through Water
86	VPE - Speed, Dead Reckoning Parallel to True Wind
87	VPW - Speed - Measured Parallel to Wind
88	VTa - Actual Track
89	VTG - Track made good and Ground speed
90	VTI - Intended Track
91	VWE - Wind Track Efficiency
92	VWR - Relative Wind Speed and Angle
93	VWT - True Wind Speed and Angle
94	WCV - Waypoint Closure Velocity
95	WDC - Distance to Waypoint - Great Circle
96	WDR - Distance to Waypoint - Rhumb Line

Appendix H - Expansion With Optional Accessories

A generous number of spare input and output lines are provided to enable additional connections with external hardware in the future. At this time the following optional accessories are under consideration:

- 1) Chain Counter
- 2) Data Logger
- 3) NMEA 0183 Output
- 4) Alarm Fault Log
- 5) Security Alarm

Your suggestions for additional accessories are welcomed. Please email suggestions to support@cruzpro.com.

Appendix K - Error Codes

The internal software that runs the MaxVu110 instrument can detect and display some software and hardware errors. A listing of those error codes and their meaning as shown below.

- 0 Contents of internal nonvolatile memory are corrupted and factory defaults are being used. Please check and set/reset all alarm values, etc.
- 1 Unable to communicate with micro U101 - contact dealer
- 2 Unable to communicate with micro U201 - contact dealer
- 3 Unable to communicate with micro U301 - contact dealer
- 4 Unable to communicate with micro U401 - contact dealer
- 5 Contents of nonvolatile memory corrupted and factory defaults are being used. Please check and set/reset Engine Hours, Maintenance Alarm, Total Log and Total Fuel used.
- 6 Supply voltage below the minimum 11.2 VDC required to update Engine hours, logs, fuel used, etc. data to the nonvolatile memory. Check power.
- 7 Unable to program or read nonvolatile memory - contact dealer.
- 8 Error reading Current Configuration Data from nonvolatile memory. Contact dealer if unable to reprogram.
- 9 Not used
- 10 Not used
- 11 Not used
- 12 Error reading Engine Hours and logs from nonvolatile memory - contact dealer.
13. Activation code error - contact dealer.

Index

A

Alarm 3, 20, 32, 33, 43, 57
alarm 6, 13, 31, 32, 44, 49
Alarm Code 51
Alarms 20, 53
armed 49

B

background alarm 49
Backlight 8, 13
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