

Other CruzPro Products

- Depthsounders/w Keel Offset, Deep/Shallow/Anchor Drag Alarms
- PC Based DSP Fishfinder for Windows98, 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

email: info@cruzpro.com

website: www.cruzpro.com

CruzPro®
RP110

CE



Trainable NMEA 0183
Data Repeater

Table of Contents

Introduction	3
Specifications	4
Installation	5
Operation	7
Key Functions	7
Backlight Intensity	7
Selecting the NMEA Sentence to Display	7
Adding A Sentence To the List	8
Deleting A Sentence From the List	8
Manually Selecting A Data Channel	9
Selecting Different Sentences With Identical ID's	9
Downloading (Training) New NMEA Sentences.	9
NMEA 0183 Sentences - Table 1	11
Other CruzPro Products	16

168 \$WIMDA	BAROMETRIC PRESSURE BARS
169 \$WIMDA	AIR TEMPERATURE DEGREES CELCIUS
170 \$WIMDA	RELATIVE HUMIDITY %
171 \$WIMDA	ABSOLUTE HUMIDITY %
172 \$WIMDA	DEWPOINT DEGREES CELCIUS
173 \$WIMDA	WIND DIRECTION DEGREES TRUE
174 \$WIMDA	WIND DIRECTION DEGREES MAGNETIC
175 \$WIMDA	WIND SPEED KNOTS
176 \$WIMDA	WIND SPEED METERS/SECOND
177 \$WIMWD	WIND DIRECTION DEGREES TRUE
178 \$WIMWD	WIND DIRECTION DEGREES MAGNETIC
179 \$WIMWD	WIND SPEED KNOTS
180 \$WIMWD	WIND SPEED METERS/SECOND
181 \$WIMWV	WIND ANGLE DEGREES
182 \$WIVWR	RELATIVE WIND DIRECTION DEGREES
183 \$WIVWR	SPEED KNOTS
184 \$WIVWR	SPEED METERS/SECOND
185 \$WIVWR	SPEED KM/HOUR
186 \$YXDBK	DEPTH BELOW KEEL FEET
187 \$YXDBK	DEPTH BELOW KEEL METERS
188 \$YXDBK	DEPTH BELOW KEEL FATHOMS
189 \$YXDBS	DEPTH BELOW SURFACE FEET
190 \$YXDBS	DEPTH BELOW SURFACE METERS
191 \$YXDBS	DEPTH BELOW SURFACE FATHOMS
192 \$YXDBT	WATER DEPTH BELOW TRANSDUCER FT.
193 \$YXDBT	WATER DEPTH BELOW TRANSDUCER MTRS
194 \$YXDBT	WATER DEPTH BELOW TRANSDUCER FATH
195 \$YXDPT	DEPTH RELATIVE TO TRANSDUCER MTRS
196 \$YXXDR, A	ANGULAR DISPLACEMENT DEGREES
197 \$YXXDR, C	TEMPERATURE DEGREES CELCIUS
198 \$YXXDR, D	LINEAR DISPLACEMENT METERS
199 \$YXXDR, F	FREQUECY HERTZ
200 \$YXXDR, G	GENERIC
201 \$YXXDR, H	HUMIDITY PERCENT
202 \$YXXDR, I	CURRENT AMPERES
203 \$YXXDR, N	FORCE NEWTONS
204 \$YXXDR, P	PRESSURE PASCAL OR BAR
205 \$YXXDR, R	FLOW RATE LITRES/SECOND
206 \$YXXDR, S	SWITCH OR VALVE
207 \$YXXDR, T	TACHOMETER RPM
208 \$YXXDR, U	VOLTAGE VOLTS
209 \$YXXDR, V	CUBIC METERS
210 TO BE DEFINED	

125 \$PBVE T-30 TEMPERATURE DEG. FAHRENHEIT
 126 \$PBVE CH-30 WINDLASS BATTERY VOLTAGE
 127 \$PBVE CH-30 RHODE OUT
 128 \$PEVE CT-30 TIME 24 HOURS
 129 \$PEVE OP-30 PRESSURE P.S.I.
 130 \$PBVE FU-30 FUEL REMAINING LTRS OR GALS
 131 \$PBVE FU-30 FUEL USED LITRES OR GALLONS
 132 \$PBVE FU-30 CONSUMPTION LTRS OR GAL./HR
 133 \$SDDBK DEPTH BELOW KEEL FEET
 134 \$SDDBK DEPTH BELOW KEEL METERS
 135 \$SDDBK DEPTH BELOW KEEL FATHOMS
 136 \$SDDBS DEPTH BELOW SURFACE FEET
 137 \$SDDBS DEPTH BELOW SURFACE METERS
 138 \$SDDBS DEPTH BELOW SURFACE FATHOMS
 139 \$SDDBT DEPTH BELOW TRANSDUCER FEET
 140 \$SDDBT DEPTH BELOW TRANSDUCER METERS
 141 \$SDDBT DEPTH BELOW TRANSDUCER FATHOMS
 142 \$SDDPT DEPTH RELATIVE TO TRANSDUCER MTRS
 143 \$TIROT RATE OF TURN DEGREES/MINUTE
 144 \$TIRPM SPEED RPM
 145 \$TIRPM PROPELLER PITCH % OF MAX
 146 \$VDMTW WATER TEMPERATURE DEGREES CELCIUS
 147 \$VDVHW HEADING DEGREES TRUE
 148 \$VDVHW HEADING DEGREES MAGNETIC
 149 \$VDVHW SPEED KNOTS
 150 \$VDVHW SPEED KM/HOUR
 151 \$VDVLW TOTAL DISTANCE N.MILES
 152 \$VDVLW DISTANCE SINCE RESET N.MILES
 153 \$VMMTW WATER TEMPERATURE DEGREES CELCIUS
 154 \$VMVHW HEADING DEGREES TRUE
 155 \$VMVHW HEADING DEGREES MAGNETIC
 156 \$VMVHW SPEED KNOTS
 157 \$VMVHW SPEED KM/HOUR
 158 \$VMVLW TOTAL DISTANCE N.MILES
 159 \$VMVLW DISTANCE SINCE RESET N.MILES
 160 \$VWMTW WATER TEMPERATURE DEGREES CELCIUS
 161 \$VWVHW HEADING DEGREES TRUE
 162 \$VWVHW HEADING DEGREES MAGNETIC
 163 \$VWVHW SPEED KNOTS
 164 \$VWVHW SPEED KM/HOUR
 165 \$VWVLW TOTAL DISTANCE N.MILES
 166 \$VWVLW DISTANCE SINCE RESET N.MILES
 167 \$WIMDA BAROMETRIC PRESS. INCH. OF MERCURY

Introduction

The RP110 remote data repeater is capable of displaying over 200 standard NMEA 0183 and proprietary sentences. The RP110 can monitor up to 4 separate data channels and can be trained to learn new sentences.

The RP110 is trainable to recognize and display new NMEA 0183 sentences not currently defined. Up to ten new sentence formats can be downloaded into non-volatile memory using the RS-232 serial data port of a PC compatible running Windows 95, 98, NT, SE, ME or 2000. A program is supplied on floppy diskette and the latest versions can always be downloaded from the CruzPro website.

Up to 12 sentence ID's can be stored in a list of often viewed sentences. You can select a sentence from this list quickly using the ▼ and ▲ keys to scroll through the selections. You can add and delete sentences to/from this list as often as desired.

Five levels of backlighting can be selected and remotely switched ON/OFF. All settings are automatically saved to non-volatile memory.

The RP110 works on both 12 and 24 VDC systems and with its large display digits draws only .035 amps and only .075 amps with full backlighting.

Specifications

Power supply: 9.5 to 33.0 VDC, .035 amps nominal

Operating temperature: 32 to 122 F (0 to 50 C)

Size: 4.3" x 4.3" x 3.5" deep (110 x 110 x 89 mm).

Display: 4 digit LCD, 5 levels of backlighting.

Input Format: NMEA 0183, standard and proprietary sentences.

Baud Rate: 4800

Input Channels: 4

Data Input voltage range: 0 to 5 V Nominal, -20V to +20V maximum.

Data Memory: Storage for 10 new sentences (may be overwritten).

83	\$DFHDT	HEADING DEGREES TRUE
84	\$DFWCV	WAYPOINT CLOSURE VELOCITY KNOTS
85	\$DFWNC	DISTANCE WAYPT TO WAYPT N.MILES
86	\$DFWNC	DISTANCE WAYPOINT TO WAYPOINT KM
87	\$GPBWC	BEARING WAYPT TO WAYPT DEG. TRUE
88	\$GPBWC	BEARING WAYPT TO WAYPT DEG. MAG.
89	\$GPBWC	DISTANCE NAUTICAL MILES
90	\$GPBWR	BEARING WAYPT TO WAYPT DEG. TRUE
91	\$GPBWR	BEARING WAYPT TO WAYPT DEG. MAG.
92	\$GPBWR	DISTANCE NAUTICAL MILES
93	\$GPRMB	CROSS TRACK ERROR NAUTICAL MILES
94	\$GPRMB	RANGE TO DESTINATION NAUT. MILES
95	\$GPRMB	BEARING TO DESTINATION DEG. TRUE
96	\$GPRMB	DESTINATION CLOSING VELOCITY KTS
97	\$GPRMC	SPEED OVER GROUND KNOTS
98	\$GPRMC	COURSE OVER GROUND DEGREES TRUE
99	\$HCBOD	BEARING TRUE
100	\$HCBOD	BEARING MAGNETIC
101	\$HEBOD	BEARING TRUE
102	\$HEBOD	BEARING MAGNETIC
103	\$HNBOD	BEARING TRUE
104	\$HNBOD	BEARING MAGNETIC
105	\$IIXDR,A	ANGULAR DISPLACEMENT DEGREES
106	\$IIXDR,C	TEMPERATURE DEGREES CELCIUS
107	\$IIXDR,D	LINEAR DISPLACEMENT METERS
108	\$IIXDR,F	FREQUENCY HERTZ
109	\$IIXDR,G	GENERIC
110	\$IIXDR,H	HUMIDITY PERCENT
111	\$IIXDR,I	CURRENT AMPERES
112	\$IIXDR,N	FORCE NEWTONS
113	\$IIXDR,P	PRESSURE PASCAL OR BAR
114	\$IIXDR,R	FLOW RATE LITERS/SECOND
115	\$IIXDR,S	SWITCH OR VALVE
116	\$IIXDR,T	TACHOMETER RPM
117	\$IIXDR,U	VOLTAGE VOLTS
118	\$IIXDR,V	VOLUME CUBIC METERS
119	\$INBOD	BEARING TRUE
120	\$INBOD	BEARING MAGNETIC
121	\$PBVE	RH-30 ELAPSED TIME HOURS
122	\$PBVE	RH-30 ELAPSED TIME MIN. AND SEC.
123	\$PBVE	RH-30 ENGINE HOURS AND MINUTES
124	\$PBVE	RH-30 ENGINE RPM

41 \$APAPB BEARING PRESENT TO DESTINATION
 42 \$APAPB HEADING TO STEER TO DESTINATION
 43 \$APBEC BEARING DEGREES TRUE
 44 \$APBEC BEARING DEGREES MAGNETIC
 45 \$APBEC DISTANCE NAUTICAL MILES
 46 \$APBOD BEARING TRUE
 47 \$APBOD BEARING MAGNETIC
 48 \$APBWC BEARING TO WAYPOINT DEGREES TRUE
 49 \$APBWC BEARING TO WAYPOINT DEGREES MAG.
 50 \$APBWC DISTANCE NAUTICAL MILES
 51 \$APBWR BEARING TO WAYPOINT DEGREES TRUE
 52 \$APBWR BEARING TO WAYPOINT DEGREES MAG.
 53 \$APBWR DISTANCE NAUTICAL MILES
 54 \$APBWW BEARING WAYPOINT TO WAYPOINT TRUE
 55 \$APBWW BEARING WAYPOINT TO WAYPOINT MAG.
 56 \$APHSC COMMANDED HEADING DEGREES TRUE
 57 \$APHSC COMMANDED HEADING DEGREES MAG.
 58 \$APVBW LONGITUDNAL WATER SPEED KNOTS
 59 \$APVBW TRANSVERSE WATER SPEED KNOTS
 60 \$APVBW LONGITUDNAL GROUND SPEED KNOTS
 61 \$APVBW TRANSVERSE GROUND SPEED KNOTS
 62 \$APWCV WAYPOINT CLOSURE VELOCITY KNOTS
 63 \$APWNC DISTANCE WAYPT TO WAYPT N.MILES
 64 \$APWNC DISTANCE WAYPOINT TO WAYPOINT KM
 65 \$DEDCN POSITION UNCERTAINTY N.MILES
 66 \$DFAPB BEARING ORIGIN TO DISTANCE
 67 \$DFAPB BEARING PRESENT TO DESTINATION
 68 \$DFAPB HEADING TO STEER TO DESTINATION
 69 \$DFABE BEARING DEGREES TRUE
 70 \$DFBEC BEARING DEGREES MAGNETIC
 71 \$DFBEC DISTANCE NAUTICAL MILES
 72 \$DFBOD BEARING TRUE
 73 \$DFBOD BEARING MAGNETIC
 74 \$DFBWC BEARING TO WAYPOINT DEGREES TRUE
 75 \$DFBWC BEARING TO WAYPOINT DEGREES MAG.
 76 \$DFBWC DISTANCE NAUTICAL MILES
 77 \$DFBWR BEARING TO WAYPOINT DEGREES TRUE
 78 \$DFBWR BEARING TO WAYPOINT DEGREES MAG.
 79 \$DFBWR DISTANCE NAUTICAL MILES
 80 \$DFBWW BEARING WAYPOINT TO WAYPOINT TRUE
 81 \$DFBWW BEARING WAYPOINT TO WAYPOINT MAG.
 82 \$DFHDG MAGNETIC SENSOR HEADING DEGREES

Installation

Before starting the installation, please read this entire section first. Finger tighten the screws that mount the instrument bracket - It is not necessary or recommended to use tools.

- Drill a 2-1/8" (55mm) mounting hole where you desire to mount the instrument (Figure 1).
- Connect the various wires as shown in Figure 2
- Carefully check all your wiring against figures 2 and then mount the instrument in the hole. Use only finger tension to tighten the bracket hold-down nuts

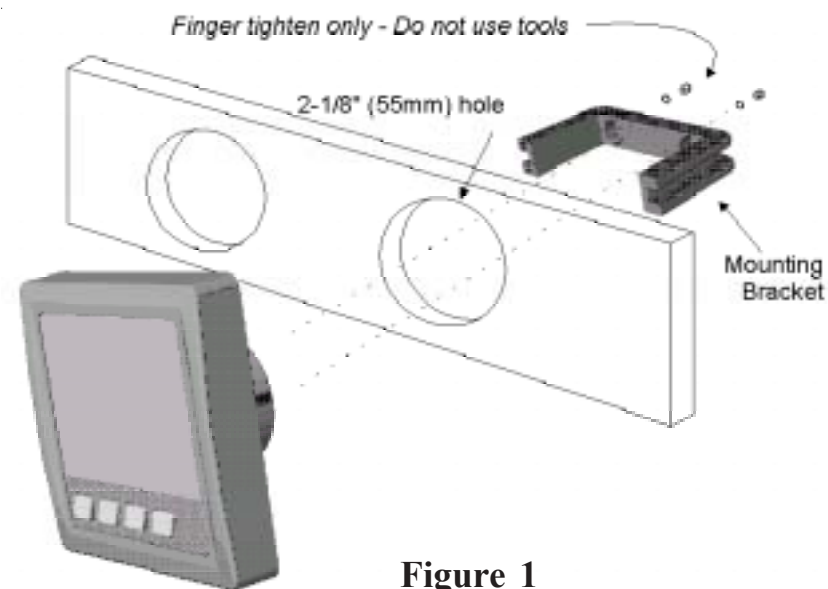
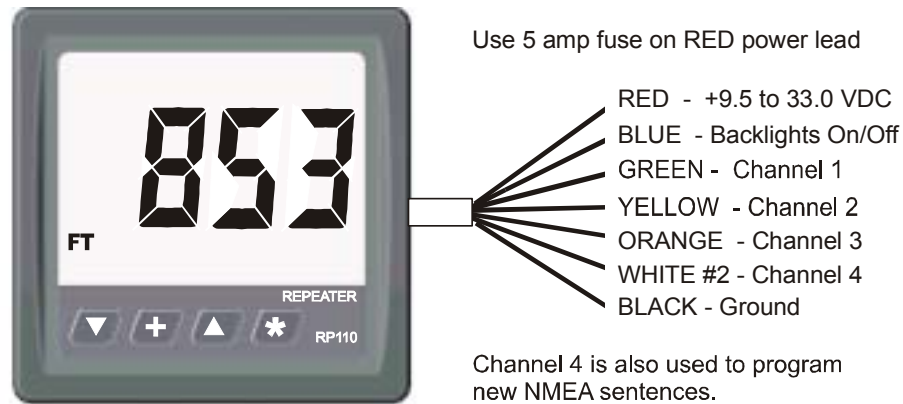


Figure 1

NMEA 0183 Sentences - TABLE 1

Figure 2 - Wiring Diagram



1	USER PROGRAMMED
2	USER PROGRAMMED
3	USER PROGRAMMED
4	USER PROGRAMMED
5	USER PROGRAMMED
6	USER PROGRAMMED
7	USER PROGRAMMED
8	USER PROGRAMMED
9	USER PROGRAMMED
10	USER PROGRAMMED
11	\$AGAAM WAYPOINT ARRIVAL ALARM RADIUS
12	\$AGAPB MAGNITUDE OF CROSSTRACK ERROR
13	\$AGAPB BEARING ORIGIN TO DESTINATION
14	\$AGAPB BEARING PRESENT TO DESTINATION
15	\$AGAPB HEADING TO STEER TO DESTINATION
16	\$AGBEC BEARING DEGREES TRUE
17	\$AGBEC BEARING DEGREES MAGNETIC
18	\$AGBEC DISTANCE NAUTICAL MILES
19	\$AGBOD BEARING TRUE
20	\$AGBOD BEARING MAGNETIC
21	\$AGBWC BEARING TO WAYPOINT DEGREES TRUE
22	\$AGBWC BEARING TO WAYPOINT DEGREES MAG.
23	\$AGBWC DISTANCE NAUTICAL MILES
24	\$AGBWC BEARING TO WAYPOINT DEGREES TRUE
25	\$AGBWR BEARING TO WAYPOINT DEGREES MAG.
26	\$AGBWR DISTANCE NAUTICAL MILES
27	\$AGBWW BEARING WAYPOINT TO WAYPOINT TRUE
28	\$AGBWW BEARING WAYPOINT TO WAYPOINT MAG.
29	\$AGHSC COMMANDED HEADING DEGREES TRUE
30	\$AGHSC COMMANDED HEADING DEGREES MAG.
31	\$AGVBW LONGITUDNAL WATER SPEED KNOTS
32	\$AGVBW TRANSVERSE WATER SPEED KNOTS
33	\$AGVBW LONGITUDNAL GROUND SPEED KNOTS
34	\$AGVBW TRANSVERSE GROUND SPEED KNOTS
35	\$AGWCV WAYPOINT CLOSURE VELOCITY KNOTS
36	\$AGWNC DISTANCE WAYPT TO WAYPT N.MILES
37	\$AGWNC DISTANCE WAYPOINT TO WAYPOINT KM.
38	\$APAAM WAYPOINT ARRIVAL ALARM RADIUS
39	\$APAPB MAGNITUDE OF CROSSTRACK ERROR
40	\$APAPB BEARING ORIGIN TO DESTINATION

Execute the program called RP110.EXE on the supplied floppy diskette. Check www.cruzpro.com for any later versions.

When a beep is heard check the display for the status of the transfer, if "good" is displayed, the process was successful. If "bAd" is displayed, the process was unsuccessful, try the download process again.

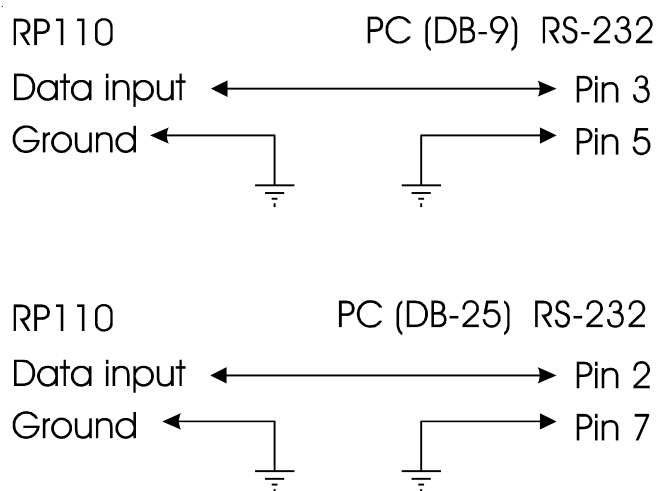


Figure 3 - RP110 to PC Connections

Note: Check for possible newer versions of this software on our website www.cruzpro.com

Operation

Key Functions

The ▼, + and ▲ keys are used to select and set backlight levels, and set/change constants such as which NMEA sentences to display, select a data channel, save and delete NMEA sentences from the favorites list and prepare the instrument to receive new sentences from a PC. New information is automatically saved to non-volatile memory.

Backlight Intensity

Press + the key 1/2 second to adjust the backlight level for night viewing. Each time you press the + key 1/2 second, the level will get brighter 1, 2, 3, 4, OFF, 1, 2, ... etc. The blue backlight ON/OFF control wire must be switched to +12/24V for the backlights to work and offers external backlight ON/OFF control. If ON/OFF control is not required, connect the blue wire to +12/24VDC permanently.

Selecting a NMEA Sentence to Display

Up to 12 sentences can be stored in a list of often viewed sentences. You can select a sentence from the list using the ▼ and ▲ keys. The RP110 comes pre-programmed with the following list:

142	\$SDPT	DEPTH RELATIVE TO TRANSDUCER MTRS
163	\$VWHW	SPEED KNOTS
160	\$VMTW	WATER TEMPERATURE DEGREES
98	\$GPRMC	COURSE OVER GROUND DEGREES TRUE

36	\$AGWNC	DISTANCE WAYPT TO WAYPT N.MILES
125	\$PBVE	T-30 TEMPERATURE DEG. FAHRENHEIT
129	\$PBVE	OP-30 PRESSURE P.S.I.
124	\$PBVE	RH-30 ENGINE RPM

You can add and delete sentences to/from this list as often as desired. Pressing the ▼ or ▲ key will step you through the list. "- - -" will be displayed until the selected sentence is found on one of the channels.

Adding A Sentence To the List

Press and hold the + and ▲ keys for 10 seconds until a long beep is heard. "c011" is displayed. Use the ▼ and ▲ keys to select a sentence from Table 1. Once the desired table entry is displayed, hold down the + key for 1/2 second to save the sentence to the list. The RP110 will immediately start searching for the new sentence on all four channels.

If "FULL" is displayed in place of "c011", a sentence will first have to be deleted from the list (see "Deleting A Sentence From the List").

Deleting A Sentence From the List

If all 12 list positions are full, one sentence will have to be deleted. Press and hold the ▼ and + keys for 10 seconds. Use the ▼ and ▲ keys to scroll through the list. When the sentence to be deleted is displayed, press the + key for 1/2 second.

Manually Selecting A Data Channel

The RP110 searches each of the four data channels for the desired sentence. When a matching sentence is found the RP110 stops at that channel and displays the data. To select between two or more data channels containing the same sentence, press and hold the + key for 3 seconds. The RP110 will search the other channels for the sentence. If the sentence is only available on the one channel, it will return back to the original.

Selecting Different Sentences With Identical ID's

Some CruzPro instruments (such as the V30 triple volts gauge and the TL30 triple tank level gauge) transmit more than one sentence with the same identifier but different data. The TL30 Digital Tank Level Gauge for three tanks transmits one sentence per tank but each have the same NMEA identifier "\$IIXDR". When viewing data from one of these CruzPro instruments you can step through the different values with a quick press the + key.

Downloading New NMEA Sentences

You can add up to 10 new sentences to Table 1 using a PC and a serial data cable connected to channel 3 on the back of the RP110 as shown in Figure 4. To upload a new sentence to the RP110, press and hold the ▼ and ▲ keys for 10 seconds. The instrument is ready for data transfer when "rdY" is displayed.