OUTLINE:

The PC3I has been designed to assist with the total integration of electronic equipment in the wheelhouse.

This Protocol Converter PC3I receives data from a number of different Lorans, Satellite Navigators, GPS's etc capable of sending NMEA0182/3, Furuno CIF, JRC format, Koden 8805/8811, Kaijo Denki format or Simrad EK500 depth format. Any two of these can be simultaneously converted to NMEA0183 and added to another NMEA0183 format input. All this received data can then be multiplexed and sent out as NMEA0183 data. These above formats can, if required, also be converted into Furuno CIF format.

As well as this NMEA0183, Furuno CIF and/or JRC format depth sentences can be generated from trigger (key) pulse and bottom pulse inputs or synchronous data from a JRC JFV-216 sounder. When generating the NMEA0183 depth sentence Meters, Feet or Fathom outputs can be selected along with changes in sound velocity.

Features:

Three Current Loop, RS422 or RS232 Input asynchronous serial Ports.
Three Current Loop, RS422 or RS232 Output asynchronous serial Ports.
Normal or inverted input data.
Conversion of NMEA0182, NMEA0183, Furuno CIF, Koden 8805, Koden 8811/2,
      JRC, Kaijo Denki (depth), Simrad (depth), Simrad EK500 (depth), Krupp
      Atlas (depth) and Sperry Core GPS serial data to NMEA0183 or Furuno CIF
      serial data.
Full transfer capabilities between all Ports allowing flexible data combining.
NMEA0183, Furuno CIF or JRC depth sentences can be generated from JRC sync
      data or trigger and depth pulses.
Selectable NMEA0183 depth sentence ie. SDDBT, SDDBS etc.
Meters, Fathoms or Feet depth output.
Selectable sound velocity factors between 1450 and 1550 m/s.
Generate GLL sentence from GGA sentence.
Convert Simrad ITI net position to TTM sentence.
Capability to change NMEA0183 talkers.
Generates log pulses from NMEA0183 sentence VTG in 100, 200 or 400 PPNM.
Isolated supply input.
RFI shielded housing.
Front panel status LEDs.

PARTS SUPPLIED:

     1 x PC3I Interface.
     3 x DB9 female cable connectors.
     1 x PC3I Configuration disk complete with PC3IC.EXE.

INSTALLATION:

1. Run a two core screened data cable from each serial data source to the selected input of the PC3I.

2. If the NMEA0183 depth sentence is to be generated from trigger/bottom pulses then:
   Run a two core screened data cable from the Echo Sounder Trigger and Bottom signals to J3 connector of the PC3I.

3. If the NMEA0183 depth sentence is to be generated from synchronous JRC JFV-216 data then:
   a. Run a two core screened cable from the Echo Sounder clock and data outputs to J3 connector of the PC3I.
   b. Run a single core screened cable from the Echo Sounder trigger output to J1 connector of the PC3I.
   c. See page 12 for connection details.

4. Run the supply cable to a suitable 11-30v supply
   (Red + volts, Red/Black - volts).

Note:
The PC3I has DC isolation between its power supply input and ground. This makes it suitable for interfacing to onboard computer installations and all isolated ground equipment, while being powered from the vessel's battery supply, without affecting the integrity of the battery positive (+) or negative (-) relative to ground.

PC3I CONFIGURATION OPTIONS:

The PC3I can be configured in one of two ways:

1. **Using the dip switches:**
   This allows configuration on site without any other equipment. Access to the dip switches, via the top cover, is required until configuration is complete or if re-configuration is required. It is recommended that the Common Configuration (ref page 17) closest to your requirements be used as the start point to reduce configuration time. When configuration is complete it is recommended that dip switch 2 be left in the Normal Run or External Run positions. This is not essential but if dip switch 2 is left in any but the two Run positions it will send its configuration status out port 1 each time it is powered up.

2. **Using an external computer:**
   This allows the PC3I to be configured at any time by using a computer with the external configuration program (supplied) PC3IC.EXE. No access to the dipswitches is required after they have initially been set to External Run. The PC3I searches for the configuration initialisation command each time it is switched ON, the Status LEDs remain lit for this period. If this command is not received within 3 seconds the PC3 will revert to normal operation.

Note:
Dip switches are read at **SWITCH ON ONLY** so after any dip switch change switch the PC3I OFF then On again to save changes.

DIP SWITCH CONFIGURATION:

The PC3I has numerous configuration possibilities. These are set by Dip switch 2 and if required Dip switch 1 which is used to select the various parameters for each Dip switch 2 function.

There are three different function types:

a.   Run functions:

    0:   Normal run: Dip switch 2 should be left in this position after the PC3I has been configured using the dipswitches.

    1:   External run: Dip switch 2 must be left in this position to enable the PC3I to be configured using the external configuration program PC3C.

b.   Configuration functions:

    2:   Input Type/Polarity. Selects RS232 or Current Loop input and input polarity (normal or inverted).

    3:   Port 1 Input/Output format. Selects the data format for Port 1 input and output (NMEA0183, Furuno, JRC etc).

    4:   Port 2 Input/Output format. Selects the data format for Port 2 input and output (NMEA0183, Furuno, JRC etc).

    5:   Port 3 Input/Output format. Selects the data format for Port 3 input and output (NMEA0183, Furuno, JRC etc).

    6:   Port In to Out copy. Selects the copy in/out function so data received in a Port is instantly retransmitted out the same port.

    7:   Port 1 transfer. Selects which output/s the data in Port 1 is transferred to.

    8:   Port 2 transfer. Selects which output/s the data in Port 2 is transferred to.

    9:   Port 3 transfer. Selects which output/s the data in Port 3 is transferred to.

    10: Modify Talker. Selects a number of NMEA0183 talkers to which all data received in any one port can be changed to on the way through the PC3I (GP, TR, LG etc).

    11: Miscellaneous Options. Selects options available, PCDepth, Pulses Per Nautical Mile (PPNM) generation, or Input monitor.

    12: PCDepth Options. Selects which ports depth will be output to, PCDepth units, NMEA0183 sentence formatter and sentence structure if depth is invalid.

    13: PPNM Options: Selects Port from which speed is calculated, PPNM rate pulse length and averaging factor.

c.   Common Configurations function:

    15: Common configurations for quick setup of the PC3I.

DIP SWITCH 2 FUNCTIONS:

Dipswitch 2 functions, as detailed on page 4, are listed below and selected by bits 1, 2, 3, and 4.

Function	1	2	3	4	Dip Switch 2 Function Description
0	0	0	0	0	Normal Run
1	1	0	0	0	External Run
2	0	1	0	0	Port Input type/Polarity
3	1	1	0	0	Port 1 Input/Output Format
4	0	0	1	0	Port 2 Input/Output Format
5	1	0	1	0	Port 3 Input/Output Format
6	0	1	1	0	Port In/Out Copy
7	1	1	1	0	Port 1 Transfer
8	0	0	0	1	Port 2 Transfer
9	1	0	0	1	Port 3 Transfer
10	0	1	0	1	Modify Talker
11	1	1	0	1	Miscellaneous Options
12	0	0	1	1	PCDepth Options
13	1	0	1	1	PPNM Options
14	0	1	1	1	
15	1	1	1	1	Common Configurations

Dip Switch Key:
0   OFF
1   On
X   Doesn't matter

PORT INPUT TYPE/POLARITY:

Each port has the capability to accept data from either its Current loop/RS422 input or RS232 input. The polarity of the data into each port can be either normal or inverted and should be set so that the front panel RX LEDs are normally off flashing on when data is present.

These parameters are setup as follows.

Function	1	2	3	4	Dip Switch 2 Function Description
2	0	1	0	0	Input type/Polarity

1	2	3	4	5	6	7	8	Dip Switch 1 Input/Polarity
X	X	0	X	X	X	X	X	Port 1 Normal Polarity
X	X	1	X	X	X	X	X	Port 1 Inverted Polarity
X	X	X	0	X	X	X	X	Port 1 Input RS232
X	X	X	1	X	X	X	X	Port 1 Input Current Loop
X	X	X	X	0	X	X	X	Port 2 Normal Polarity
X	X	X	X	1	X	X	X	Port 2 Inverted Polarity
X	X	X	X	X	0	X	X	Port 2 Input RS232
X	X	X	X	X	1	X	X	Port 2 Input Current Loop
X	X	X	X	X	X	0	X	Port 3 Normal Polarity
X	X	X	X	X	X	1	X	Port 3 Inverted Polarity
X	X	X	X	X	X	X	0	Port 3 Input RS232
X	X	X	X	X	X	X	1	Port 3 Input Current Loop

Note:
If Port 2 Polarity is set to inverted, Port 2 output data will be inverted.

PORT INPUT/OUTPUT FORMAT:

Set function to required Port Input/Output and set Dipswitch 1 for the input and output format required ensuring the rules below are followed.

Function	1	2	3	4	Dip Switch 2 Function Description
3	1	1	0	0	Port 1 Input/Output Format
4	0	0	1	0	Port 2 Input/Output Format
5	1	0	1	0	Port 3 Input/Output Format

INPUT				OUTPUT				
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Dip Switch 1 I/O Format**
0	0	0	0	0	0	0	0	Not Used
1	0	0	0	1	0	0	0	NMEA0183
0	1	0	0	0	1	0	0	Furuno GPIF [3]
1	1	0	0	1	1	0	0	JRC [3]
0	0	1	0	-	-	-	-	
1	0	1	0	-	-	-	-	NMEA0182 [3]
0	1	1	0	-	-	-	-	
1	1	1	0	-	-	-	-	CVS8805
0	0	0	1	-	-	-	-	CVS8811/2
1	0	0	1	-	-	-	-	Kaijo Denki
0	1	0	1	-	-	-	-	Krupp Atlas
1	1	0	1	-	-	-	-	Simrad EK500
0	0	1	1	-	-	-	-	Simrad ITI
1	0	1	1	-	-	-	-	Krupp Atlas 8600

Input/Output Selection Rules:
1. The Input and Output formats **MUST** be either the same or one of them set to Not Used.
2. If the Input and Output are not set the same format the Output format will do one of two things: If the Input format is a legal Output format for that Port the Output format will default to the same as the Input otherwise it will default to Not Used.
3. Port 3 Input cannot select NMEA0182 Input formats nor Furuno CIF or JRC Output formats. If any of these are selected the appropriate Input or output will default to Not Used.

PORT IN/OUT COPY:

When this feature is selected for any of the Ports the serial data received in that Port will immediately be re-transmitted out the same Port. This copy function allows relevant information within the passed through data to be monitored and used as required.

When a Port has this function enabled no data from any other Port nor internally generated Depth data can be transferred to it. This is because data received in the Port is immediately retransmitted out the same Port on a character by character basis. Because of this any data sentence multiplexing is not possible.
This is mainly used for picking out relevant data from a string and converting it to another format while still allowing all the data to carry on to its destination with no delay or additional line loading.
(ie) tapping into a data line and picking off the data without adversely affecting the loading or timing of that line.

Function	1	2	3	4	Dip Switch 2 Function Description
6	0	1	1	0	Port In/Out Copy

1	2	3	4	Dip Switch 1 In to Out copy
0	0	0	0	Copy disabled on all Ports
0	X	X	0	Copy Port 1 disabled
1	X	X	0	Copy Port 1 In to Out
X	0	X	0	Copy Port 2 disabled
X	1	X	0	Copy Port 2 In to Out
X	X	0	0	Copy Port 3 disabled
X	X	1	0	Copy Port 3 In to Out

Warning:
When Port In/Out copy is selected for a Port and other data is already being transferred to it the data transfer to that Port will automatically switch OFF.

(ie) If data is being transferred from Port 3 input to Port 1, 2 and 3 outputs and the Port In/Out copy function is enabled for Port 3, the Port 3 transfer will automatically be modified so that Port 3 data is only output via Port's 1 and 2.

PORT TRANSFER:

These settings determine which Port(s) the received data will be routed or transferred to. If the Port to which the data is being transferred is set for a different format the data will be converted prior to re-transmission. Data received in any of the Ports can be transferred to any of the Ports.

Function	1	2	3	4	Dip Switch 2 Function Description
7	1	1	1	0	Port 1 Transfer
8	0	0	0	1	Port 2 Transfer
9	1	0	0	1	Port 3 Transfer

1	2	3	4	5	6	7	8	Dip Switch 1 Port Transfer
0	0	0	0	X	X	X	X	None
1	0	0	0	X	X	X	X	Transfer to Port 1
0	1	0	0	X	X	X	X	Transfer to Port 2
1	1	0	0	X	X	X	X	Transfer to Ports 1 & 2
0	0	1	0	X	X	X	X	Transfer to Port 3
1	0	1	0	X	X	X	X	Transfer to Ports 1 & 3
0	1	1	0	X	X	X	X	Transfer to Ports 2 & 3
1	1	1	0	X	X	X	X	Transfer to Ports 1, 2 & 3

Note:
If Port transfer is set to transfer data to a Port that has been previously set up for copying data from Input to Output the transfer setting to that Port will be disabled.

MODIFY TALKER:

As NMEA0183 data is passed through the PC3I, NMEA sentence Talkers for all sentences received in a port can be modified to any of the Talkers listed below. This allows data from various sources to be relabelled and therefore provide source differentiation. (ie) If a vessel has two GPS receivers, both can be fed through the PC3 to be output to a plotter capable of prioritising received data. One of the inputs could be set to modify the Talker to II thus allowing the plotter to be configured with GP as the highest priority and II as the default. The plotter can then provide automatic input changeover between the GPS's .

Function	1	2	3	4	Dip Switch 2 Function Description
10	0	1	0	1	Modify Talker

1	2	3	4	5	6	7	8	Dip Switch 1 Modify Talker
0	0	X	X	X	X	X	X	Don't Modify Talkers
1	0	X	X	X	X	X	X	Modify Port 1 Talker
0	1	X	X	X	X	X	X	Modify Port 2 Talker
1	1	X	X	X	X	X	X	Modify Port 3 Talker
X	X	X	X	0	0	0	0	Modify Talker to AG
X	X	X	X	1	0	0	0	Modify Talker to AP
X	X	X	X	0	1	0	0	Modify Talker to DE
X	X	X	X	1	1	0	0	Modify Talker to EC
X	X	X	X	0	0	1	0	Modify Talker to ER
X	X	X	X	1	0	1	0	Modify Talker to GP
X	X	X	X	0	1	1	0	Modify Talker to HC
X	X	X	X	1	1	1	0	Modify Talker to HE
X	X	X	X	0	0	0	1	Modify Talker to II
X	X	X	X	1	0	0	1	Modify Talker to IN
X	X	X	X	0	1	0	1	Modify Talker to LA
X	X	X	X	1	1	0	1	Modify Talker to LC
X	X	X	X	0	0	1	1	Modify Talker to OM
X	X	X	X	1	0	1	1	Modify Talker to SN
X	X	X	X	0	1	1	1	Modify Talker to TR
X	X	X	X	1	1	1	1	Modify Talker to VD

MISCELLANEOUS OPTIONS:

A number of different miscellaneous options are available in the PC3I. These options may increase with each software version as additional features are requested, tested and implemented.

Function	1	2	3	4	Dip Switch 2 Function Description
11	1	1	0	1	Miscellaneous options

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	0	0	0	X	X	X	X	No Miscellaneous Options
1	0	0	0	X	X	X	X	PCDepth from Trg/Btm
0	1	0	0	X	X	X	X	PCDepth from JRC Sync
1	1	0	0	X	X	X	X	PPNM generation
0	0	1	0	X	X	X	X	Monitor Data
1	0	1	0	X	X	X	X	Generate GLL from GGA
0	1	1	0	X	X	X	X	Modify APA heading
1	1	1	0	X	X	X	X	Modify VTG heading

PCDepth generation:

A depth sentence can be generated from Trigger and Bottom input pulses or from JRC Sync data. Depth data can be sent out any Port in units of Meters, Feet or Fathoms. If the depth is to be transmitted out a Port that is set for NMEA0183 the NMEA0183 sentence talker and formatter can be selected (ie) SDDBT, SDDBS, etc. If the depth is invalid there can be either no NMEA depth sentence or a sentence with null fields. When the no sentence if invalid option is selected, NMEA0183 depth sentences received in Port 3 are checked. If an invalid or 0 depth sentence is received it will not be retransmitted.

PPNM Speed Pulse Output:

When the NMEA0183 VTG (course and speed over ground) sentence is received the PC3I can generate output pulses at 100,200 and 400 pulses per nautical mile. See PPNM Options for setting up. These pulses are output via Port 2 pin 7 the EXT 4 output. This output is a 5 volt pulse with a current capability of 25mA.

MISCELLANEOUS OPTIONS cont:

Monitor Data:

All data received in any of the ports is transferred on a byte by byte basis to Port 1 output. This enables monitoring of all raw input data from one port at a common baud rate. The bytes are transferred on a first in first out basis. This feature is useful when confirmation of actual data sent to the PC3I is required.

Generate GLL from GGA:

Generates the NMEA0183 GLL sentence from the position received in the GGA sentence.

Modify APA heading:

Uses the magnetic variation calculated from VTG to change the APA heading when using Seaplot to drive an Autopilot. Seaplot v1.31a and below sends out the true heading in the APA magnetic heading position causing magnetic autopilots to head away from the waypoint by the variation. Select this option to correct the problem.

Magnetic heading to VTG:

A number of radars require the VTG sentance to enable the Northup display function. This causes a problem (in the form of an erratic unstable northup display) when the vessel is either stationary or at low speed. When this function is enabled and a magnetic heading sensor (sending either HDG or HDM) is received the received VTG sentence will be modified. The magnetic heading data received in the HDM or HDG sentences will be inserted into the magnetic field of the VTG sentence. The True field of the VTG sentence will be offset by the same variation as in the incoming VTG sentence.

1	2	3	4	5	6	7	8	Dip Switch 1
1	1	1	0	X	X	X	X	Modify VTG heading

HDM or HDG should be input in either Port 1 or 2.
VTG should be input into the Port not used for HDM/HDG.
If the HDM/HDG sentence is not received after 5 VTG sentences are received the VTG sentence will revert to its unmodified state and just be passed through.

 (See page 17 Common configurations for quick setup)

PCDEPTH OPTIONS:

Various different options are available when generating PCDepth sentences.

Function	1	2	3	4	Dip Switch 2 Function Description
12	0	0	1	1	PCDepth Options

PCDepth Output:

The internally generated depth data can be transmitted out any of the three ports. It is transmitted using the format of the Port(s) selected. (ie). If Port 1 output is set to NMEA0183 and Port 2 output set to Furuno with depth output set to Ports 1 & 2 then the NMEA0183 depth sentence $SDDBx (x as selected on the next page) will be transmitted out Port 1 and Furuno CIF sentence #57 transmitted out Port 2.

1	2	3	4	5	6	7	8	Dip Switch 1 PCDepth Output
0	0	0	X	X	X	X	X	No PCDepth Output
1	0	0	X	X	X	X	X	PCDepth to Port 1
0	1	0	X	X	X	X	X	PCDepth to Port 2
1	1	0	X	X	X	X	X	PCDepth to Ports 1 & 2
0	0	1	X	X	X	X	X	PCDepth to Port 3
1	0	1	X	X	X	X	X	PCDepth to Ports 1 & 3
0	1	1	X	X	X	X	X	PCDepth to Ports 2 & 3
1	1	1	X	X	X	X	X	PCDepth to Ports 1, 2 & 3

PCDepth Validity:

When the output format is NMEA0183 and the depth data generated by trigger and bottom pulses is not valid the PC3I can either transmit no depth sentence or a null depth sentence. (ie). If NMEA0183 output is selected and transmit null sentence is enabled then a null NMEA sentence will be transmitted each time invalid depth data is received. eg $SDDBx,,,,,,(cr)(lf)

1	2	3	4	5	6	7	8	Dip Switch 1 PCDepth Validity
X	X	X	0	X	X	X	X	No Sentence of Invalid
X	X	X	1	X	X	X	X	Null Sentence of Invalid

PCDEPTH OPTIONS cont:

Function	1	2	3	4	Dip Switch 2 Function Description
12	0	0	1	1	PCDepth Options

PCDepth Units:

Depth Units used for the PCDepth generated NMEA0183, Furuno or JRC sentences are selected by dip switches detailed below.

1	2	3	4	5	6	7	8	Dip Switch 1 PCDepth Units
X	X	X	X	0	0	X	X	PCDepth Units - Meters
X	X	X	X	1	0	X	X	PCDepth Units - Fathoms
X	X	X	X	0	1	X	X	PCDepth Units - Feet

PCDepth NMEA Sentence Formatter:

When the PCDepth data is transmitted out a Port that is set for NMEA0183 the NMEA0183 sentence formatter can be selected as DBS, DBT or DBK. The talker SD for Depth Sounder remains the same.

1	2	3	4	5	6	7	8	Dip Switch 1 PCDepth Sentence
X	X	X	X	X	X	0	0	NMEA Sentence SDDBS
X	X	X	X	X	X	1	0	NMEA Sentence SDDBT
X	X	X	X	X	X	0	1	NMEA Sentence SDDBK

PCDepth Velocity Factor:

When the PC3I is set up using dip switches the velocity factor for calculating the depth is fixed at 1500 meters/s, 820 fathoms/s or 4921 feet/s depending on which units are selected.

PPNM OPTIONS:

Function	1	2	3	4	Dip Switch 2 Function Description
13	1	0	1	1	PPNM Options

Pulses Per Nautical Mile (PPNM) Speed Pulse Output:

When the NMEA0183 VTG (course and speed over ground) sentence is received via the selected Port, output pulses at 100, 200 and 400 pulses per nautical mile are generated. The pulse length can be preset to periods of 20, 60, 100 or 200mS. They are output via J2 pin 7 the EXT 4 output. This output is a 5 volt pulse with a current capability of 25mA.

PPNM Port Input:

Selects which input Port the PC3I will use data from to generate the speed pulses. This Port must be set to NMEA0183 and the NMEA0183 sentence VTG must be present with a period not exceeding 10 seconds.

For testing purposes PPNM pulses can be simulated internally. This provides speed pulses at a simulated speed of 10 knots at the PPNM rate set by switch bits 3 and 4.

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	0	X	X	X	X	X	X	Simulate PPNM Pulses
1	0	X	X	X	X	X	X	Use VTG from Port 1
0	1	X	X	X	X	X	X	Use VTG from Port 2
1	1	X	X	X	X	X	X	Use VTG from Port 3

PPNM Rate:

Selects at which rate the PPNM speed pulses are output.

1	2	3	4	5	6	7	8	Dip Switch 1 Function
X	X	0	0	X	X	X	X	100 PPNM
X	X	1	0	X	X	X	X	200 PPNM
X	X	0	1	X	X	X	X	400 PPNM

PPNM OPTIONS Cont:

PPNM Pulse length:

Sets the length of the PPNM pulse.

1	2	3	4	5	6	7	8	Dip Switch 1 Function
X	X	X	X	0	0	X	X	20 mS PPNM Pulse
X	X	X	X	1	0	X	X	60 mS PPNM Pulse
X	X	X	X	0	1	X	X	100 mS PPNM Pulse
X	X	X	X	1	1	X	X	200 mS PPNM Pulse

PPNM Averaging:

Sets the averaging applied to the speed pulse data input sentence VTG. When set to no averaging the period between pulses will update instantly so if an erratic speed is received via the VTG sentence this erratic speed will be transferred into the speed pulse period. When 2 x averaging is selected the period of the speed pulse will be the average of the last two VTG sentences therefore averaging out erratic changes. When set to 3 x averaging the average of the last three sentences is used and if 4 x averaging the average of the last four.

1	2	3	4	5	6	7	8	Dip Switch 1 Function
X	X	X	X	X	X	0	0	No Averaging
X	X	X	X	X	X	1	0	2 x Averaging
X	X	X	X	X	X	0	1	3 x Averaging
X	X	X	X	X	X	1	1	4 x Averaging

COMMON CONFIGURATIONS (Quick Setup):

This will set the PC3I with commonly used and specialised configurations allowing quick setup via the dipswitches.

Function	1	2	3	4	Dip Switch 2 Function Description
15	1	1	1	1	Common Configurations

DSW1

1	2	3	4	Port 1 In	Port 2 In	Port 3 In	Port 1 Out	Port 2 Out	Port 3 Out	Port 1 To	Port 2 To	Port 3 To	Misc Opt
0	0	0	0	0183	0183	0183	0183	No	No	1	1	1	No
1	0	0	0	0183	0183	0183	0183	No	No	1	1	1	T/B
0	1	0	0	0183	0183	0183	0183	No	No	1	1	1	Sync
1	1	0	0	0183	0183	0183	0183	No	No	1	1	1	PPNM
0	0	1	0	0183	CIF	0183	0183	No	No	1	1	1	No
1	0	1	0	CIF	0183	0183	CIF	No	No	1	1	1	T/B
0	1	1	0	0183	0183	0183	0183	0183	0183	1	1,3	3	No
1	1	1	0	8805	CIF	0183	No	CIF	0183	2	2,3	2,3	No
0	0	0	1	0183	0183*	0183#	0183	0183*	0183#	2,3	1,3	1,2	No
1	0	0	1	0183	0183	0183	0183	No	No	1	1	1	A**
0	1	0	1	0183	0183	0183	0183	No	No	1	1	1	V##
1	1	0	1	0183	0183	Kaijo	0183	0183	No	1	1	2	No
0	0	1	1	0183	ITI	0183	0183	No	No	1	1	1	No***

**   Data received in Port 1, 2, and 3 will be checked and if the NMEA sentence GGA is found the GLL sentence to 2 decimal places will be generated.

* 1200 baud:

\# 600 baud:

\#\# Update heading fields of VTG sentence with magnetic heading from HDM,HDG.

*** Data received in Port 2 from the Simrad ITI is converted to the NMEA0183 sentence $IITTM so the net can be displayed on the Seaplot screen as a tracked target.

COMMON CONFIGURATIONS Cont.:

Other Parameters:
Other parameters not specified in the table above are preset as follows:

Input (All Ports):	Current Loop.	Polarity (All Ports):	Normal.
Copy In/Out:	No.	Modify Port 1,2 & 3 Talkers:	No.
PCDepth NMEA sentence:	SDDBT.	PCDepth to:	Port 1.
PCDepth Units:	Meters.	Velocity Factor:	1500 m/s.
PPNM rate:	200ppnm.		
PPNM Pulse Length:	100mS.		

Null sentence if depth invalid: No.
VTG sentence for PPNM from: Port 1.

TEST/ERROR REPORTING:

PC3I configuration parameters, including software version and any trigger or bottom pulse problems will be reported when dip switch 2 is **NOT** set to either the Normal Run or External Run modes. This data is transmitted out Port 1 at 4800 baud, no parity, 8 data bits and 1 stop bit.

EXTERNAL CONFIGURATION:

All the PC3I configuration parameters can be setup via an IBM compatible computer running the program PC3IC. The Com 1 serial port of the computer must be connected to the RS232 TX/RX pins of the PC3I Port 1. See page 22 for connection details.

Set the PC3I dipswitches to External Run. After switch ON, the PC3I will go through its initialisation procedure (status LEDs alternately flashing) followed by both status LEDs remaining on for 3-4 seconds (external configuration). During this external configuration period the PC3I is waiting for a configure command from the external configuration program PC3IC. If this command is received while the LEDs are on they will remain on until the PC3I is commanded to restart or is switched OFF.
If the external configuration command is not received within 3-4 seconds the PC3I will configure itself with the parameters stored in its memory and continue as normal.

External configuration procedure:
1. Run a cable between the computer COM1 serial port and the PC3I Port 1.
2. Start the program PC3IC.EXE on the disk supplied or from the hard disk after copying it across.
3. The retrieve window will show that the program is waiting for a reply from the PC3I.
4. Switch the PC3I ON. The PC3I will perform its initialisation procedure and both status LEDs will light.
5. The retrieve window on the computer screen will then be replaced by another window confirming the current setup parameters of the PC3I have been received successfully and the status LEDs on the PC3I will remain on.
6. There is a context sensitive help line at the bottom of the computer screen detailing the options or requirements of the configuration program.
7. Select *Display Configure* in the *DISPLAY* menu to display current PC3I setup. If any changes are required then select *Normal* in the *EDIT* menu to change the necessary parameters.
8. Once into the Edit menu use the <ENTER> key to step through the fields and either the <SPACE> or <F2> to select the options for each field.
9. Once all parameters are correct the PC3I can be updated by selecting the *Update PC3I* or *Update PC3I and Restart* line of the *UPDATE* menu.
10. Serial data transmitted out Port 1 can be monitored selecting *Display Com Data* in the *UTILITIES* menu.
11. To exit the PC3C program select *QUIT* from the top line and confirm exit with **Y** for yes.

PC3IC PROGRAM OPERATION:

The top menu bar comprises of the following options:

DISPLAY: There are two items in this menu:

   Display Configuration: This displays the current setup of the PC3I. If any changes have been made using the ***EDIT*** menu these will also be included.

   About: Gives details about program version and origin.

RETRIEVE: This is used to retrieve the current parameters from the PC3I. It is functionally identical to restarting the program. ie the retrieve window will be displayed until a reply is received from the PC3I or the <ESC> key is pressed.

EDIT: There are two items in this menu:

   Normal: This is the main edit screen whereby all standard parameters can be edited.

   Special: This item is has three options, Port 1, Port 2 or Port 3. The protocol of each port can be modified via these options. The protocol is set when entering the edit screen to the format selected. ie when NMEA0183 is selected for a port the protocol will default to 4800, no parity, 8 bits and 1 stop bit. Any of these parameters can be changed via this ***Special*** item but once changed the ***Normal*** display must not be re-entered. If it is the protocol will revert back to the default parameters. ***Display configuration*** should be used to confirm changes.

UTILITIES: By selecting ***Display Com*** Data all data received in the selected Com port of the Computer is displayed. Data can be sent out the selected Com port via the keyboard. The transmitted and received data are displayed in different colours.

UPDATE: There are two items in this menu:

   Update PC3I: Current parameters as shown in the ***Display Configuration*** menu will be down loaded to the PC3I. A confirmation window will confirm a successful download. After a successful download the PC3I will remain in the external configuration mode.

   Update PC3I and Restart: This provides the same download as ***Update PC3I*** but instead of leaving the PC3I in external configuration mode it is restarted, the same as switching it OFF then back ON.

QUIT: Used to exit the PC3IC program. A confirmation <Y> is required.

PC3IC Program basics:

From the top bar menu either use the appropriate highlighted letter or the
<←> or <→> arrows followed by <ENTER> to pull down the selected menu.
To select the required item in the pull down menu either use the appropriate
highlighted letter or the <↑> or <↓> arrows followed by <ENTER> to enable the
selected item.

The program has full mouse support so all menus can be selected using an installed
mouse.

Help for each menu, item and details for changing settings are displayed at the bottom
line of the display.

PC3I OPERATION:

1.   Polarity should be set so the front panel RX LED's are normally off and
        flashing on when receiving serial data.

2.   If serial data is received via the current loop input the internal LED mounted
        on the PCB and situated closest to the appropriate input connector will light
        when current is flowing. It will either be off flashing on or on flashing off,
        depending on polarity of the input data.

3.   At power up the two status LED's will flash alternately then extinguish.
        These LED's should remain off at all times during normal operation.

4.   As data is received in each of the Ports the appropriate RX LED will flash.

5.   As data is transmitted out each Port the appropriate TX LED will flash.

6.   If data receive errors are detected the status LEDs will flash. Should either
        of these flash check the setup configuration and connections between the PC3I
        and equipment sending data to the PC3I.

Note:
Combined/converted data is transmitted out the appropriate Port via the RS232 and
RS422/Current loop outputs concurrently.

SPECIFICATIONS:

Serial data capabilities:
Inputs: Port 1,2 and 3. RS232 or Current Loop/RS422.
Outputs: Port 1,2 and 3. RS232 or Current Loop/RS422.

Formats received:
Port 1 & 2 Input: NMEA0183, Furuno CIF, JRC, NMEA0182,
                  CVS8805, CVS8811/2, Kaijo Denki, Krupp Atlas or
                  Simrad EK500.
Port 3 Input :   NMEA0183, Furuno CIF, JRC, CVS8805, CVS8811/2,
                  Kaijo Denki, Krupp Atlas, or Simrad EK500.

Formats Transmitted:
Port 1 & 2 Output: NMEA0183, Furuno CIF or JRC.
Port 3 Output: NMEA0183.

Sounder Interface requirements:
Trigger/Bottom: Trigger/Clock/Data: (JRC JFV-216)
  Level: 5-10 volt pulse.   Level: 5 volt TTL.
  Polarity: Normal.   Polarity: Inverted.
  Pulse width: 100 uS - 5 mS.
  Velocity factor : 1450-1550 m/s

Log Pulse Output: (EXT 4, Port 2 Pin 7)
Level: 5 volt TTL.
Polarity: Normally low pulsing high.
Current: 25mA.
Pulse length: 20, 60, 100 or 200mS.

Power Requirements: 11-32 vdc @ 100 mA.
DC isolation between power supply input and ground is provided.

Weight: 300 grams.

Dimensions: 135 x 165 x 50 mm

Mounting: Table top or under shelf

Pacific Micro Systems has a policy of continued development and therefore reserves the
right to change specifications without notice.

CONNECTION DETAILS

PORT 1 (J1)

PC3I J1 DB9	Description
1	RS422 TX -
2	RS232 RX
3	RS232 TX
4	Current Loop RX + (Signal)
5	Ground
6	RS422 TX +
7	EXT 3
8	Current Loop RX - (Return)
9	Ground

PORT 2 (J2)

PC3I J2 DB9	Description
1	RS422 TX -
2	RS232 RX
3	RS232 TX
4	Current Loop RX + (Signal)
5	Ground
6	RS422 TX +
7	EXT 4 (PPNM output)
8	Current Loop RX - (Return)
9	EXT 5

PORT 3 (J3)

PC3I J3 DB9	Description
1	RS422 TX -
2	RS232 RX
3	RS232 TX
4	Current Loop RX + (Signal)
5	Ground
6	RS422 TX +
7	EXT 1 (Trg Pulse In)
8	Current Loop RX - (Return)
9	EXT 2 (Btm Pulse In)

CONNECTION DETAILS Cont.

Data Output Polarity:

RS422 TX -

RS422 TX +

+5v
0v

+5v
0v
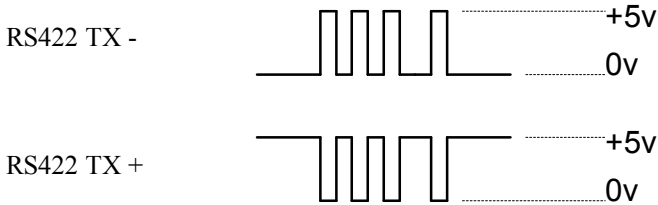
Computer to PC3I Connections for External Configuration:

Computer Com1 DB9	Signal Type	PC3I Port 1
Pin 2	TX Data	J1 Pin 3
Pin 3	RX Data	J1 Pin 2
Pin 5	Signal Ground	J1 Pin 5
Connector body	Protective Ground	Connector body

The example below, when configured, allows NMEA0183 data to be received in the Port 1 and 2 current loop inputs and Furuno CIF data to be received in the Port 3 current loop input. The NMEA0183 data is combined and transmitted out Port 2 and Port 1. The Furuno CIF data is converted to NMEA0183 and multiplexed with the NMEA0183 data transmitted out Port 1. PCDepth data is generated using the Trigger and bottom inputs then transmitted out Port 1. In this situation the external configuration program would be in the computer allowing the PC3I to be configured or reconfigured at any time.

Computer	TX (3) RX (2) Gnd (5)	1 PC3
NMEA0183 to Port 1	RX(4,8)	2
NMEA0183 from Port 1	TX(1,6)	
NMEA0183 to Port 2	RX(4,8)	3
Furuno CIF to Port 3	RX(4,8)	
Trigger/bottom input	Trig(7) Btm(9) Gnd(5)	
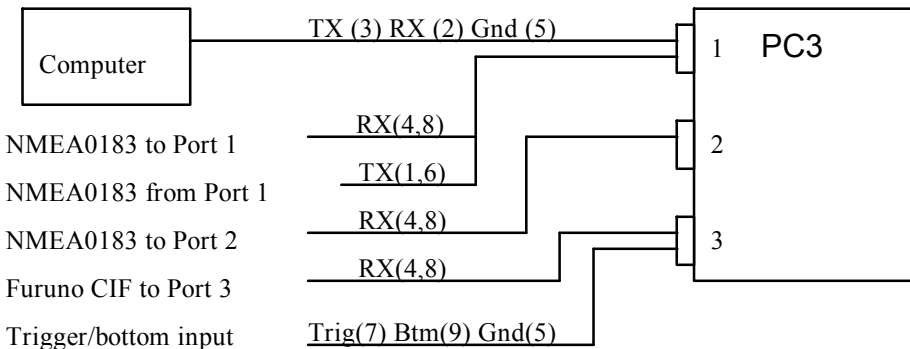
CONNECTION DETAILS Cont.

JRC JFV-216 to PC3I Connections

PC3I	Signal Type	JFV-216 TB101
J1 pin 7	Trigger	Terminal 13
J1 pin 5	Screen (Gnd)	Terminal 14
J3 pin 9	Clock	Terminal 12
J3 pin 7	Data	Terminal 11
J3 pin 5	Screen (Gnd)	Terminal 14

JFV-216 Notes:
1. The JFV-216 does not output details of which depth units are used on the display. Ensure the NMEA0183 depth sentence contains the same units as the JFV-216 is set to by selecting the appropriate units via the dipswitches or external setup.

2. Ensure the following mods are performed when interfacing to a JFV-216.
   a. Remove C6, C7, C8, D13, D14, D15.
   b. Ensure T6 (BC547) and R22 (2k2) are fitted.
   c. Fit a 680pf capacitor between Pin 8 and 23 of U1.

Furuno to PC3I Connections

PC3I	Signal Type	Furuno CIF 10 pin con
Pin 1	PC3I TX - sig	Pin 3
Pin 6	PC3I TX + sig	Pin 4
Pin 4	PC3I RX sig	Pin 1
Pin 8	PC3I RX rtn	Pin 2
Pin 5	Screen (Gnd)	Pin 10

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