DATA MULTIPLEXER

DM22

Operation and Installation Manual

LIMITED WARRANTY

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This warranty provides for the repair or replacement (at our option) of any parts found to be defective in normal and intended use, provided that such defects are in our opinion due to faulty material or workmanship.

This warranty does not apply to products which have been improperly installed, subjected to extremes beyond the limits of our specifications, or which have been physically damaged. Nor does it apply to products found to be defective due to abuse, lightning or any other electrical discharge, salt or fresh water, spray, or improper or unauthorised repair. Pacific Micro Systems will pay shipping (method to be of our choice) and insurance for return of said product provided that the returned product proved defective under the terms and conditions of this warranty.

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Pacific Micro Systems policy is one of continued development. For this reason, Pacific Micro Systems reserves the right to change specifications without notice and without incurring any obligation to similarly alter products previously purchased.

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Contents

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OUTLINE:

This Data Multiplexer DM22 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. These can be converted to NMEA0183 and transferred to any other output. These above formats can, if required, also be converted into Furuno CIF format.

Features:

2 Current Loop, RS422 or RS232 asynchronous serial Inputs.
2 Current Loop, RS422 or RS232 asynchronous serial Outputs.
User selectable baud rates to allow high thru-put of data..
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) to NMEA0183 or Furuno CIF serial data.
Full transfer capabilities between all Inputs & Outputs allowing flexible data combining.
Filtering of NMEA 0183 data thru any output, ie All, GGA, VTG, ZDA etc
NMEA0183 or Furuno CIF sentences can be generated from JRC sync data or trigger and depth pulses with selectable NMEA0183 depth sentence ie. SDDBT, SDDBS etc. Output in Meters, Fathoms or Feet depth output with selectable sound velocity factors between 1450 and 1550 m/s.
Generate GLL sentence from GGA sentence.
Convert Simrad ITI net position to TLL sentence for display on plotter.
Convert Furuno Sonar target data to TTM sentence for display on plotter.
Capability to change NMEA0183 talkers for any outputs.
Generates log pulses from NMEA0183 sentence VTG or VHW in 100, 200 or 400 PPNM.
Generates NMEA0183 sentence VTG or VHW from 100, 200 or 400 PPNM input.
Alarm output when predefined conditions are met ie No GPS, No DGPS etc.
Galvanic isolation between input supply, data inputs and outputs.
RFI shielded housing.
Front panel status LEDs.
4 x 4-20mA/0-10v/binary inputs.
2 x binary outputs.

PARTS SUPPLIED:

1 x DM22 Interface.
2 x DB15hd cable connectors.

INSTALLATION:

1. Run a two core screened data cable from each serial source to the required serial input (Port 2).

2. For configuring using the external configuration program DM2XC.EXE, run a three core screened cable from Port 2 (RX1+ & RS232 TX1) to a computer running Windows95/NT.
(See **INTERFACING CONNECTIONS to a PC**)

3. Run a two core screened data cable from each output to the data destinations.

4. Run the supply cable to a suitable 11-35v supply. (Red/Black +volts, Black -volts).

Note:
The DM22 has DC isolation between its power supply input and ground. This makes it suitable for interfacing to any computer installation and all isolated ground equipment, without affecting the integrity of the battery positive (+) or negative (-) relative to ground.

DIP SWITCH CONFIGURATION:

The DM22 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 function:

0. Normal run: Dip-switch 2 should be left in this position after the DM22 has been configured using the dip-switches.

b. Configuration functions:

1. Input Polarity. Selects Input 1 & 2 polarity (normal or inverted).
2. I/O 1 & 2 Input/Output format. Selects the data format for I/O 1& 2 (NMEA0183, Furuno, JRC etc).
3. I/O 3 & 4 Input/Output format. Selects the data format for I/O 3 & 4 (NMEA0183, Furuno, JRC etc).
4. Input 1 & 2 transfer. Selects which output each input is transferred to.
5. Input 3 & 4 transfer. Selects which output each input is transferred to.
6. Modify Talker. Selects a number of NMEA0183 talkers to which all data received in any one input can be changed to on the way through the DM22 (GP, TR, LG etc).
7. Select options. Selects Depth, PPNM, Alarm, Conversions, Filtering etc.
8. Depth options. Selects which Output/s depth will be output to, Units, NMEA0183 sentence formatter and sentence structure if depth is invalid.
9. PPNM Options1: Selects Port from which speed is calculated, VTG/VHW sentence, PPNM rate, pulse length and averaging factor
10. PPNM Options2: Selects Output to which generated sentence is sent, VTG/VHW sentence, PPNM rate, pulse length and averaging factor.
11. Alarm Options.
12. Filter Options. Filters NMEA sentences for each Output
13. Conversion options. Selects Conversions and Inputs/Outputs for conversions.
14. Future Options.

c. Common Configurations function:

15. Common configurations for quick setup of the DM22.

DIP SWITCH 2 FUNCTIONS:

Dip-switch 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	I/O 1&2 input polarity
2	0	1	0	0	I/O 1&2 format
3	1	1	0	0	
4	0	0	1	0	I/O 1&2 transfer
5	1	0	1	0	
6	0	1	1	0	Modify 0183 Talker
7	1	1	1	0	Select Options
8	0	0	0	1	Depth Options
9	1	0	0	1	PPNM Options1
10	0	1	0	1	PPNM Options2
11	1	1	0	1	Alarm Options
12	0	0	1	1	Filter Options
13	1	0	1	1	Conversion Options
14	0	1	1	1	Future Options
15	1	1	1	1	Common Configurations

Dip Switch Key:

0 OFF
1 On
X Doesn't matter

INPUT POLARITY:

Inputs 1 & 2 have the option of normal or inverted polarity.

Function	1	2	3	4	Dip Switch 2 Function Description
1	1	0	0	0	Inputs 1&2 polarity

1	2	3	4	5	6	7	8	Dip Switch 1 Input Polarity
0	X	X	X	X	X	X	X	Input 1 Normal Polarity
1	X	X	X	X	X	X	X	Input 1 Inverted Polarity
X	0	X	X	X	X	X	X	Input 2 Normal Polarity
X	1	X	X	X	X	X	X	Input 2 Inverted Polarity

INPUT/OUTPUT FORMAT:

Set function to required Input/Output and set Dipswitch 1 for the input and output format required.

Function	1	2	3	4	Dip Switch 2 Function Description
2	0	1	0	0	I/O 1 & 2 Format
3	1	1	0	0	Not Used in DM22

I/O 1				I/O 2				
0	0	0	0	0	0	0	0	None
1	0	0	0	1	0	0	0	NMEA0183
0	1	0	0	0	1	0	0	Furuno CIF
1	1	0	0	1	1	0	0	User
0	0	1	0	0	0	1	0	JRC
1	0	1	0	1	0	1	0	Krupp Atlas
0	1	1	0	0	1	1	0	Direct Transfer
1	1	1	0	1	1	1	0	** *NMEA0182*
0	0	0	1	0	0	0	1	** *CVS8805*
1	0	0	1	1	0	0	1	** *CVS8811/2*
0	1	0	1	0	1	0	1	** *Simrad EK500*
1	1	0	1	1	1	0	1	** *Simrad ITI*
0	0	1	1	0	0	1	1	** *Kaijo Denki*

I/O TRANSFER:

These settings determine which Output/s the received data will be routed or transferred to. If the Output 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 Inputs can be transferred to any of the Outputs.

Function	1	2	3	4	Dip Switch 2 Function Description
4	0	0	1	0	I/O 1& 2 Transfer
5	1	0	1	0	Not Used in DM22

1	2	3	4	5	6	7	8	Dip Switch 1 I/O Transfer
Input 1				Input 2				
0	0	0	0	0	0	0	0	None
1	0	0	0	1	0	0	0	Transfer to Output 1
0	1	0	0	0	1	0	0	Transfer to Output 2
1	1	0	0	1	1	0	0	Transfer to Outputs 1 & 2

MODIFY TALKER:

As NMEA0183 data is passed through the DM22, NMEA sentence talkers for all sentences received in each Input 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 DM22 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
6	0	1	1	0	Modify Talker

1	2	3	4	5	6	7	8	Dip Switch 1 Modify Talker
1	0	0	0	X	X	X	X	Modify Input 1 Talker
0	1	0	0	X	X	X	X	Modify Input 2 Talker
0	0	1	0	X	X	X	X	Modify Input 3 Talker
0	0	0	1	X	X	X	X	Modify Input 4 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 EC
X	X	X	X	1	1	0	0	Modify Talker to ER
X	X	X	X	0	0	1	0	Modify Talker to GP
X	X	X	X	1	0	1	0	Modify Talker to HC
X	X	X	X	0	1	1	0	Modify Talker to HE
X	X	X	X	1	1	1	0	Modify Talker to II
X	X	X	X	0	0	0	1	Modify Talker to IN
X	X	X	X	1	0	0	1	Modify Talker to LA
X	X	X	X	0	1	0	1	Modify Talker to LC
X	X	X	X	1	1	0	1	Modify Talker to RA
X	X	X	X	0	0	1	1	Modify Talker to SD
X	X	X	X	1	0	1	1	Modify Talker to TI
X	X	X	X	0	1	1	1	Modify Talker to VD
X	X	X	X	1	1	1	1	Modify Talker to YX

SELECT OPTIONS:

A number of different miscellaneous options are available in the DM22. These options will increase with each software version as additional features are requested, tested and implemented.

Function	1	2	3	4	Dip Switch 2 Function Description
7	1	1	1	0	Select options

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	0	0	0	X	X	X	X	No Generation Options
1	0	0	0	X	X	X	X	Depth from Trg/Btm
0	1	0	0	X	X	X	X	Depth from JRC Sync
1	1	0	0	X	X	X	X	PPNM to NMEA0183
0	0	1	0	X	X	X	X	PPNM from NMEA0183
1	0	1	0	X	X	X	X	** Alarms Output
0	1	1	0	X	X	X	X	Monitor Data (See description)

Depth 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 Output in units of Meters, Feet or Fathoms. If the depth is to be transmitted out an Output 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.

PPNM Speed Pulse Output:

When either the NMEA0183 VTG (course and speed over ground) or VHW sentences are received the DM22 can generate output pulses at 100,200, 400 and 800 pulses per nautical mile. See PPNM from NMEA0183 OPTIONS for setting up. These pulses are output via a 5 volt pulse with a current capability of 5mA and an open circuit collector (100mA) switching to ground.

PPNM Speed Pulse Input:

When pulses are received in AIO3 or AIO4 at 100,200, 400 or 800 pulses per nautical mile the DM22 will generate the NMEA0183 VTG or VHW sentence at a rate of 1one per second.

SELECT OPTIONS cont:

Monitor Data:

All data received in any of the Inputs is transferred on a byte by byte basis to Output 1. This enables monitoring of all raw input data from one Output at 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 DM22 is required.

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	1	1	0	1	X	X	X	Monitor Data from Input 1
0	1	1	0	X	1	X	X	Monitor Data from Input 2

DEPTH OPTIONS:

This will set the DM22 with depth generation options.

Function	1	2	3	4	Dip Switch 2 Function Description
8	0	0	0	1	Depth generation Options

1	2	3	4	5	6	7	8	Dip Switch 1
1	0	0	0	X	X	X	X	Depth to Output 1
0	1	0	0	X	X	X	X	Depth to Output 2
X	X	X	X	0	0	X	X	Depth Units (feet)
X	X	X	X	1	0	X	X	Depth Units (meters)
X	X	X	X	0	1	X	X	Depth Units (fathoms)
X	X	X	X	1	1	X	X	Depth Units (hiros)
X	X	X	X	X	X	0	X	No depth sentence if invalid.
X	X	X	X	X	X	1	X	Null depth sentence if invalid
X	X	X	X	X	X	X	0	0.1meter/fathom/feet resolution
X	X	X	X	X	X	X	1	0.01 m/ft/fa/hi resolution

Trigger/Bottom Velocity Factor

When the DM22 is set-up using dip-switches the velocity factor is fixed at 1500 meters/s, 820 fathoms/s or 4921 feet/s depending on which units are selected.

Null if invalid:

When depth is generated from the trigger and bottom source and no bottom pulse is received after two trigger pulses a NMEA0183 null sentence will be output.

Output Resolution

When the depth is generated from Trigger/Bottom inputs the output resolution is either 0.1 or 0.01 of the selected units.
Depth generated from the JRC JFV216 has a resolution of 1 of the selected units so the decimals are always 0.

PPNM to/from NMEA0183 OPTIONS 1:

Function	1	2	3	4	Dip Switch 2 Function Description
9	1	0	0	1	PPNM Options 1

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	0	X	X	X	X	X	X	Serial source - Input 1
1	0	X	X	X	X	X	X	Serial source - Input 2
X	X	0	X	X	X	X	X	No Simulation
X	X	1	X	X	X	X	X	Simulate speed (10knots)
X	X	X	0	X	X	X	X	Generate/Use VTG
X	X	X	1	X	X	X	X	Generate/Use VHW
X	X	X	X	0	0	X	X	100 PPNM
X	X	X	X	1	0	X	X	200 PPNM
X	X	X	X	0	1	X	X	400 PPNM
X	X	X	X	1	1	X	X	800 PPNM
X	X	X	X	X	X	0	0	50 mS PPNM o/p Pulse
X	X	X	X	X	X	1	0	100 mS PPNM o/p Pulse
X	X	X	X	X	X	0	1	200 mS PPNM o/p Pulse
X	X	X	X	X	X	1	1	500 mS PPNM o/p Pulse

Serial Source Input 1..4:

Selects which serial input the DM22 will use data from to generate the speed pulses. This serial input must be set to NMEA0183 and the NMEA0183 either sentence VTG or VHW, depending which is selected as the source, must be present with a period not exceeding 10 seconds.

Simulation and Serial Sentence:

For testing purposes PPNM pulses or a serial VHW/VTG sentence can be simulated internally. This provides speed pulses at a simulated speed of 10 knots at the PPNM or a serial VHW/VTG sentence.

Pulses Per Nautical Mile (PPNM) Speed Pulse Output:

When the NMEA0183 VTG (course and speed over ground) sentence is received via the selected Input, output pulses at 100, 200 and 400 pulses per nautical mile are generated. The pulse length can be pre-set to periods of 50, 100, 200 or 500mS. This output is a 5 volt pulse with a current capability of 5mA AIO1..4 and an open circuit collector (100mA) AO1/2 switching to ground is also provided.

PPNM to/from NMEA0183 OPTIONS 2:

Function	1	2	3	4	Dip Switch 2 Function Description
10	0	1	0	1	PPNM Options 2

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	1	X	X	X	X	X	X	PPNM to serial in AIO 3
1	1	X	X	X	X	X	X	PPNM to serial in AIO 4
X	X	0	X	X	X	X	X	No PPNM to AIO1..4
X	X	1	X	X	X	X	X	Serial to PPNM AIO1..4
X	X	X	0	X	X	X	X	No PPNM Output 1/2
X	X	X	1	X	X	X	X	Serial to PPNM Output 1/2
X	X	X	X	0	X	X	X	AIO1..4 Normal
X	X	X	X	1	X	X	X	AIO1..4 Inverted
X	X	X	X	X	0	X	X	Output 1 Normal
X	X	X	X	X	1	X	X	Output 1 Inverted
X	X	X	X	X	X	0	X	Output 2 Normal
X	X	X	X	X	X	1	X	Output 2 Inverted
X	X	X	X	X	X	X	0	No Averaging
X	X	X	X	X	X	X	1	3 x Averaging

PPNM to Serial:

The pulses for PPNM to Serial are received in either AIO3 (Port1 Pin 8) or AIO4 (Port1 Pin 7). These pulses must be at a level between 2 and 10 volts.

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.

** ALARM OPTIONS:

Function	1	2	3	4	Dip Switch 2 Function Description
11	1	1	0	1	Alarm Options

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	0	X	X	X	X	X	X	Alarm source – Input 1
1	0	X	X	X	X	X	X	Alarm source – Input 2
X	X	1	X	X	X	X	X	(A0) No GPS (from GGA)
X	X	X	1	X	X	X	X	(A1) No DGPS (from GGA)
X	X	X	X	1	X	X	X	(A2) Depth below 10m (from DBT)

Alarm Operation:

When an the alarm option is selected and one of the above conditions selected the alarm output P1-5 (Analogue Out 2) will pulse at 0.5 second intervals until the alarm condition is cleared (input data returns to a non alarm condition).

**** Not included in software version prior to 1.20**

FILTER OPTIONS:

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

1	2	3	4	5	6	7	8	Dip Switch 1 Function
1	0	0	0	X	X	X	X	Output 1 NMEA0183 filter
0	1	0	0	X	X	X	X	Output 2 NMEA0183 filter
X	X	X	X	0	0	0	0	No filtering
X	X	X	X	1	X	X	X	Filter GGA
X	X	X	X	X	1	X	X	Filter TLL
X	X	X	X	X	X	1	X	Filter VTG
X	X	X	X	X	X	X	1	Filter ZDA

Filter Operation:

When filtering is selected all data out the selected Output will be filtered and only the selected NMEA0183 sentences passed through.

CONVERSION OPTIONS:

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

1	2	3	4	5	6	7	8	Dip Switch 1 Function
0	0	X	X	X	X	X	X	Conversion Source - Input 1
1	0	X	X	X	X	X	X	Conversion Source - Input 2
X	X	0	0	X	X	X	X	Conversion Destination Output 1
X	X	1	0	X	X	X	X	Conversion Destination Output 2
X	X	X	X	1	0	0	0	Generate GLL from GGA
X	X	X	X	0	1	0	0	Generate TLL from GLL
X	X	X	X	1	1	0	0	** Generate TTM from CSH
X	X	X	X	0	0	1	0	** Generate APA from APB
X	X	X	X	1	0	1	0	** Generate VWR/VWT from MWV
X	X	X	X	0	1	1	0	Generate APA from GP30/1/5/6 data
X	X	X	X	1	1	1	0	Generate APB from RMB
X	X	X	X	0	0	0	1	Add Checksum
X	X	X	X	1	0	0	1	Remove Checksum
X	X	X	X	0	1	0	1	Generate ZLZ from ZDA
X	X	X	X	1	1	0	1	Convert GGA version 2 to 1.5
X	X	X	X	0	0	1	1	Replace Heading in VTG with HDT/M
X	X	X	X	1	0	1	1	Add speed received using log pulses to VHW. Convert GGA to GXP and IOM

Generate GLL from GGA:

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

Generate TLL from GLL:

Generates NMEA0183 TLL sentence from the position received in the GLL sentence, labels the target 99 with name NET. Specifically for displaying ITI net as a target on a plotter

CONVERSION OPTIONS Cont.:

** Generate TTM from Furuno Sonar:
Generates NMEA0183 TTM sentence from the data received from Furuno Sonar CSH 21,22,71,82 outputting target data 98 with name FISH and event data 97 with name EVENT.

** Generate APA from APB:
Generates NMEA0183 APA sentence from NMEA0183 sentence APB.
Requires NMEA0183 VTG or RMA/RMC to obtain variation which is used if the APB sentence bearing is output in True.

** Generate VWR and VWT from MWV:
Generates NMEA0183 VWR and VWT sentences from the NMEA0183 MWV sentence.

Generate APA from GP30/1/5/6 data:
Generates NMEA0183 APA sentence from the data output from the Furuno GP30/1/5/6. Requires NMEA0183 RMB and VTG or RMA/RMC. Ensure the GP30/1/5/6 Brg Ref in the Plotter Setup menu is set to True otherwise the VTG sentence does not include the true heading which is required to calculate variation. Variation is used to convert the bearing to destination from true in RMB to magnetic in APA. If no variation is able to be calculated the APA bearing will be true.

Generate APB from RMB:
Generates NMEA0183 APB sentence from the data contained in the received sentence RMB.

Add Checksum:
Adds the checksum to all sentences that do not already have one..

Remove Checksum:
Removes the checksum from all sentences that have one.

Generate ZLZ from ZDA:
Generates NMEA0183 ZLZ sentence from the data contained in the received sentence ZDA.

Convert GGA version 2 to version 1.5:
Converts NMEA0183 GGA sentence from version 2 to version 1.5.

**** Not included in software version prior to 1.20**

CONVERSION OPTIONS Cont.:

Replace heading in VTG with HDT/M:

Replaces the true heading in NMEA0183 VTG sentence with that from an HDT sentence received in any serial input. If no HDT sentence is received or it is received then not received for more than 10 received VTG sentences the true field of the VTG sentence will be null.
If HDM is received in any serial input the magnetic heading in VTG will also be replaced with the value in the HTM sentence. If no HDM sentence is received or it is received then not received for more than 10 received VTG sentences the magnetic field of the VTG sentence will be null.

Replace heading in VTG with HDT/M:

Adds speed through the water calculated by received log pulses to the received NMEA0183 VHW sentence.
Converts the received GGA sentence to GXP and IOM sentences.

DM22 COMMON CONFIGURATIONS:

This will set the DM22 with commonly used and specialised configurations allowing quick set-up via the dip-switches.

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

DIP Switch 1:

1	2	3	4	5	6	7	8	I/O 1	I/O 2	1 Out	2 Out	Misc Opt	Misc
0	0	0	0	0	0	0	0	0183	0183	1	1	-	-
1	0	0	0	0	0	0	0	0183	0183	1,2	1,2	-	-
0	1	0	0	0	0	0	0	0183	0183	1,2	1,2	-	-
1	1	0	0	0	0	0	0	0183	0183	1,2	1,2	-	-
0	0	1	0	0	0	0	0	0183	CIF	1	1	-	-
1	0	1	0	0	0	0	0	0183	0183	1,2	1,2	C.1	-
0	1	1	0	0	0	0	0	0183	0183	1,2	1,2	O.1	-
1	1	1	0	0	0	0	0	0183	0183	1,2	1,2	O.2	-
0	0	0	1	0	0	0	0	0183	User	1,2	1	-	P1>HE, P2>9600
1	0	0	1	X	X	X	X	0183	0183	1	1	C.E	100ppmn
0	1	0	1	X	X	X	X	0183	0183	1	1	C.E	200ppmn
1	1	0	1	X	X	X	X	0183	0183	1	1	C.E	400ppmn
*	*	*	*	0	0	X	X	0183	0183	1	1	C.E	Talker GP
*	*	*	*	1	0	X	X	0183	0183	1	1	C.E	Talker LC
*	*	*	*	0	1	X	X	0183	0183	1	1	C.E	Talker LG
*	*	*	*	1	1	X	X	0183	0183	1	1	C.E	Talker II
*	*	*	*	X	X	0	X	0183	0183	1	1	C.E	No Checksum
*	*	*	*	X	X	1	X	0183	0183	1	1	C.E	Add Checksum

C.E: Conversion E,
* Must be set to 100, 200 or 400ppnm
Data received in Input 1: GGA is converted to GXP and IOM and sent to Output 1 .
Data received in Input 2: VHW, ppnm received will be added to VHW speed and sent to Output 2.
PPNM normally open contact closure to Analogue I/O 3
(Port 1 Pin 8 and Port 1 Pin 6).
Put link between Port 1 Pin 2 and Port 1 Pin 8,

When Common Configurations is selected all options and settings not selected will revert to default settings as detailed below.

Input polarity: Normal Modify talker: None Select options: None Depth resolution: 0.1 Depth units: Meters Depth velocity factor 1500m/s Depth output: Output 1 No depth output if invalid PPNM source: Input 1 PPNM destination: Output 1 PPNM pulses: 100 PPNM averaging: None PPNM source sentence: VTG PPNM destination sentence: VTG PPNM pulse length: 100mS PPNM pulse input: Analogue I/O 3	Alarm options: None Alarm input: Input 1 Filter options: None Filter output: Output 1 Conversion options: None Conversion source: Input 1 Conversion destination: Output 1

DM22 OPERATION:

1. The front panel RX LED's are normally off and flashing on when receiving serial data.

2. As data is received in 1, 2, 3 or 4 the appropriate RX LED will flash.

3. As data is transmitted out 1, 2, 3 or 4 the appropriate TX LED will flash.

4. When the DM22 is in external programming mode the ON LED will flash at 0.5 second intervals.

5. If the format is not NMEA0183, 4800 baud, Start character not $ or Stop character not (lf) the on LED will flash at 0.3 second intervals for 5 seconds. During this time the DM22 must be called if external programming is used, to ensure a programming link is obtained.

DM2XC.EXE (DM22/4 CONFIGURATION):

Due to the extensive capabilities available in the DM22 many of the options are not accessible through the limited combinations with dip switches. The full range of features are only accessible with the configuration program DM2xC.EXE.

Connect the DM22 I/O 1 to the Com1 port of a computer capable of running Windows 95, 98, NT or XP and launch the program DM2XC.EXE. Select Call DM2x and the DM22 will link to the computer and the ON LED will then flash at 0.5 sec intervals. The current DM22 configuration will be downloaded to the computer. Change the options to those required and when completed update the DM22. Reset DM22 to restart after Updating the DM22 or switch off then on again.

SPECIFICATIONS:

Serial data capabilities:
Inputs: 1, 2, 3 and 4. RS232 or Current Loop/RS422.
Outputs: 1, 2, 3 and 4. RS232 or Current Loop/RS422.

Serial Formats Received:
NMEA0183, Furuno CIF.

Serial Format Transmitted:
NMEA0183, CIF

Transmitted Data:
NMEA0183: 4800, 8 data bits, no parity, 1 stop bit.
CIF: 4800, 7 data bits, even parity, 2 stop bits
User: 50-115200, 5-8 data bits, None, Odd, Even parity, 1 or 2 stop bits.

Power Requirements: 11-35 vdc @ 150 mA.
DC isolation between power supply input and ground is provided.

Weight: 200 grams.

Dimensions: 92 x 155 x 37 mm

Mounting: Table top or under shelf

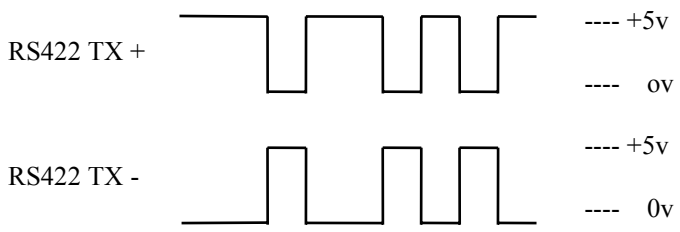
Pacific Micro Systems has a policy of continued development and therefore reserves the right to change specifications without notice.

CONNECTION DETAILS

DM22 Port 2 DB15HD male	Description
1	N/C
2	N/C
3	N/C
4	N/C
5	RS232 Output TX1
6	Current Loop Input RX2 + (Signal)
7	Current Loop Input RX2 - (Return)
8	RS422 Output TX1 +
9	RS422 Output TX1 -
10	RS232 Output TX2a
11	Current Loop Input RX1 + (Signal)
12	Current Loop Input RX1 - (Return)
13	RS232 Output TX2b
14	RS232 Output TX2c
15	Ground

DM22 Port 1 DB15HD female	Description
1	Analogue I/O 1 (PPNM out)
2	Analogue Out 1 (PPNM out)
3	RS422 Output TX2a +
4	RS422 Output TX2a -
5	Analogue Out 2 (Alarm/PPNM out)
6	Ground (Trigger, Bottom, PPNM, AD10)
7	Analogue I/O 4 (T/B & JRC Trig, AD10 Data, PPNM in)
8	Analogue I/O 3 (T/B Bot. JRC Clk, AD10 Sh, PPNM in)
9	Analogue I/O 2 (JRC Data)
10	RS422 Output TX2b -
11	Ground
12	RS422 Output TX2b +
13	RS422 Output TX2c +
14	RS422 Output TX2c -
15	Input Supply –ve

RS422 DATA OUTPUT POLARITY:



INTERFACING CONNECTIONS to a PC:

For configuring using DM2xC.EXE.

DM22 Port 2 DB15HD male	Description	Computer DB9
5	RS232 Output TX1	2
11	RX1+ (Signal)	3
12	RX1 - (Return)	5
15	Ground	5

JRC JFV-216 to DM22 Connections

DM22	Signal Type	JFV-216 TB101
Port1 pin 7	Trigger	Terminal 13
Port1 pin 6	Screen (Gnd)	Terminal 14
Port1 pin 8	Clock	Terminal 12
Port1 pin 9	Data	Terminal 11
Port1 pin 11	Screen (Gnd)	Terminal 14

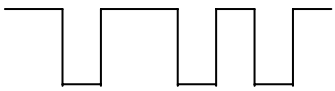
JFV-216 Notes:

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 dip-switches or external set-up.

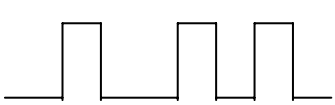
PPNM Connections

DM22 Port 1 DB15HD female	Description	Computer DB9
2	Analogue Out 1	2
5	Analogue Out 2	3
6	Ground/Return	5

Output 1/2 Normal



Output 1/2 Inverted



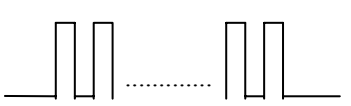
If either open collector output is to be used with a supply other than the internal 5V the internal pull up 1K resistors must be removed. R36 for Output 1.R47 for Output 2.

Note:
With internal pull up resistors max sink current is 5mA.
Using the internal open collector transistor max sink current is 100mA.

AD10 Data Connections

DM22 Port 1 DB15HD female	Description	Signal
8	Analogue IO 3 AD10 Shift (clk)	Shift (H)
7	Analogue IO 4 AD10 Data	Data (H)
6	Ground/Return	Shift & Data (C)

Output 1



Output 2

Note: **To provide sufficient drive to the opto-couplers in the Radar, it is essential to remove R30, R31, C18 & C19 on the DM24 pcb**

PPNM Connections for common Configuration C.E

Log contact closure connections

DM22 Port 1 DB15HD female	Description	To
8	Analogue I/O 3	Log Contact
2	Analogue Out 1	Log Contact
6	Ground/Return	Log Contact Return

Pin 8 is linked to Pin 2 to provide a 5v Pullup to the contact closure.

GPS Comnnections

DM22 Port 2 DB15HD male	Description	GPS
11	RS422 + (Signal)	Signal
12	RS422 - (Signal)	Return
15	Ground	Ground

DM22 Input/AD100 NMEA output connections

DM22 Port 2 DB15HD male	Description	AD100 IEC-61162-1 Connector
6	RX1+ (Signal)	1
7	RX1 - (Return)	2
15	Ground	3

DM22 Output connections to Weapon System

DM22 Port 2 DB15HD male	Description	To Weapon System
8	TX1+ (Signal)	
9	TX1 - (Return)	
5	RS232 Output TX1	
15	Ground (Return)	

DM22 Output connections to Radar

DM22 Port 1 DB15HD female	Description	To Radar
3	TX2+ (Signal)	
4	TX2 - (Return)	
15	Ground (Return)	

SOFTWARE UPGRADES:

Upgrading DM22 Software: Remove U2 and replace it with the new one.

After the DM22 software has been upgraded it is necessary to reset the contents of the internal EEPROM to the default values.

DM22 Reset:

Set the dip switches as follows:
S1 11111111. (All ON)
S2 1111. (All ON)

Switch the DM22 ON.
Port 1 TX LED fill flash for approx 2 seconds.
The DM2x has now been reset to the default setup.
Switch OFF the DM22.
Switch all dipswiches to OFF.
Switch ON the DM22.
Configure to the desired configuration using the configuration program DM2xC.exe.

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

1	2	3	4	5	6	7	8	Dip Switch 1 Function
1	1	1	1	1	1	1	1	Reset to defaults