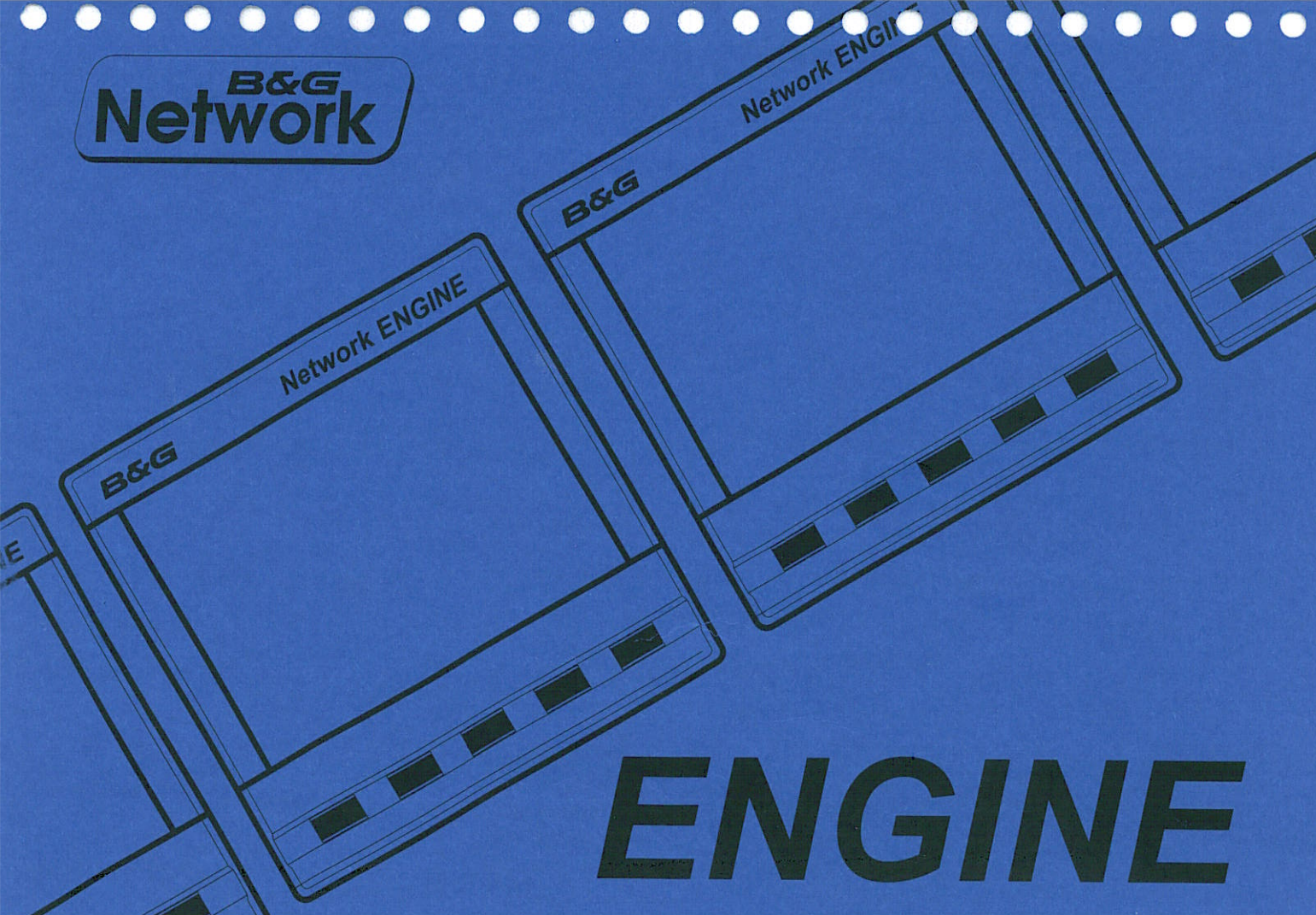
B&G Network



ENGINE

CONTENTS

610-HB-0574-01

GENERAL INTRODUCTION TO B&G NETWORK

The B&G Network range of instruments is designed to be used as individual units or connected together to form an integrated navigational system. A single network cable is used to carry data and power between units. The latest technology and screened cables throughout the Network System ensure the ultimate protection from interference between units and other systems. All Network instruments can be linked to Network PILOT, Network CHART, Network GPS or Network LORAN receivers or via NMEA 0183 (v1.5) to other navigational equipment.

INSTRUMENTS	NAVIGATIONAL AIDS
Network ENGINE	Network GPS
Network SPEED	Network LORAN
Network DEPTH	Network NAV
Network QUAD	Network CHART
Network WIND	
Network TACK	
Network DATA	
AUTOPILOTS	**COMMUNICATIONS**
Network PILOT	Network VHF

INTRODUCTION TO NETWORK ENGINE

The Network ENGINE unit is designed to be used with the General Motors (GM) Engine Interface. It monitors data concerning the engine or engines supplied to it from the interface via a single cable. After translation within the unit, the data is processed to provide a comprehensive range of information which it displays on a large backlit Liquid Crystal Display (LCD).

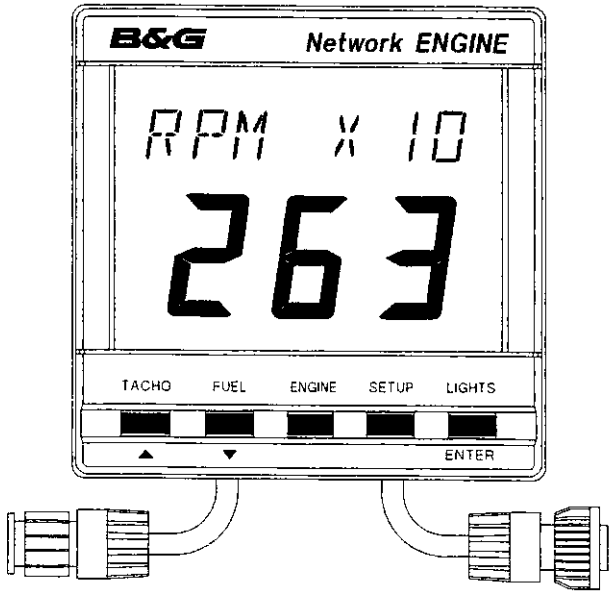
The Network ENGINE unit can be used alone or in combination with other Network ENGINE units to monitor information from single or twin engine installations.

For example, a single engine vessel with two steering positions can have a display unit at each helm. For a twin engine vessel, each unit can be set to show data from both engines or dedicated to the Port engine or the Starboard engine, and display all the information at each helm. The configuration of the Network ENGINE units can be tailored to suit your needs of safety and control.

The Network ENGINE unit has an output plug on the rear case to control an external alarm. This output could be utilised to sound a buzzer or illuminate a light when an alarm condition is met.

When used in conjunction with a Network Instrument System, containing a Network SPEED or QUAD unit, boat speed data is supplied via the network interconnecting cables. This additional data allows the Network ENGINE unit to calculated an Economy Factor, i.e. Miles per Gallon (MPG) or Litres per Nautical Mile (L/NM).

NETWORK ENGINE DISPLAY UNIT



OPERATIONAL FEATURES

The five keys allow selection of the displayed information, and setting of the alarms, operating mode and units of measure for the Network ENGINE unit.

Briefly the keys offer the following options:

TACHO Engine speed in revolution per minute (RPM).
This key is also used as the ▲ key during setups.

FUEL Fuel Rate, in US/UK Gallons or Litres per hour.
Fuel Used, in US/UK Gallons or Litres.
Economy, in Miles per Gallon or Litres per Nautical Mile.
This key is also used as the ▼ key during setups.

ENGINE Engine coolant temperature in °F or °C.
Battery voltage at the engine.
Engine hours (total run).
Engine Status.

SETUP Display mode.
Display configuration.
US Gallons, UK Gallons or Litres.
°F or °C.

LIGHTS Three levels of illumination and off. This key is also used as the **ENTER** key during setups.

ALARMS

Alarms can be set for the following conditions:
- Over revving of an engine.
- Engine stopped.
- Fuel used.
- Engine coolant temperature.
- Engine Status.

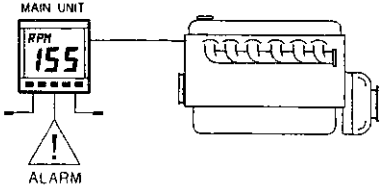
When an alarm condition is met, the display will flash the alarm that has been activated. If an external alarm buzzer or light is connected to the unit, then this will also sound or illuminate. To cancel an alarm warning press any of the five operating keys.
The Network ENGINE unit will also display a warning message that an alarm condition has been met on other Network Instruments (including Network PILOT). Refer to NETWORK SYSTEM ALARMS.

DEMO MODE

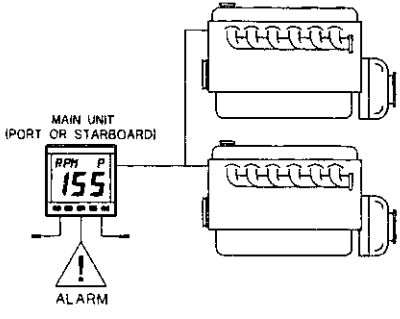
The Network ENGINE unit has a built-in demonstration mode which simulates normal operation. This can be used to help you learn about the operation of the unit. To select the demo mode refer to SELECTING THE DISPLAY MODE or CHANGING THE UNIT MODE.

EXAMPLE NETWORK ENGINE SYSTEMS

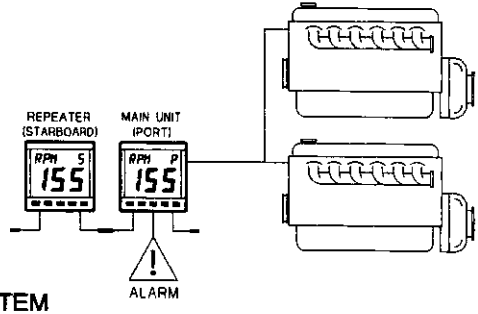
SINGLE ENGINE SYSTEM



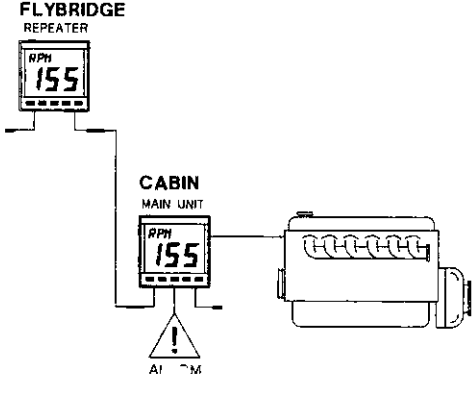
TWIN ENGINE SYSTEM



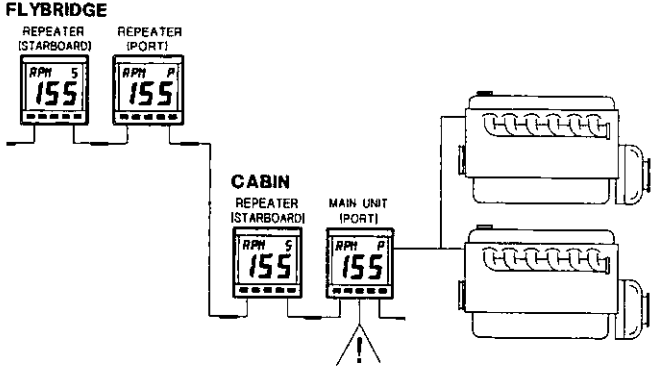
TWIN ENGINE SYSTEM PORT & STARBOARD UNITS



SINGLE ENGINE SYSTEM WITH FLYBRIDGE REPEATER



TWIN ENGINE SYSTEM WITH FLYBRIDGE REPEATERS



INSTALLATION OF THE DISPLAY UNIT

The display units are supplied with a clip-in mounting bracket which allows for easy installation, access from behind is not necessary to secure the unit in place. However to prevent theft and permanently fix the unit in position, locking studs and thumb nuts are supplied.

SITING THE UNIT

All Network Instruments are designed for mounting on or below deck. A mounting position should be selected where they are:

- Easy to read by the helmsman
- On a smooth and flat surface
- At least 100mm (4") from a compass
- Protected from direct splashes of water to the rear of the case
- Accessible from behind for fitting locking studs if required.

TOOLS REQUIRED

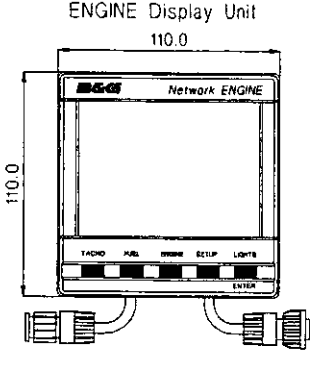
- 70 mm (2 3/4") Holecutter
- 2.9mm, 5mm Drills
- Screwdrivers
- Measuring tape or rule
- Cable clips, Tie-wraps

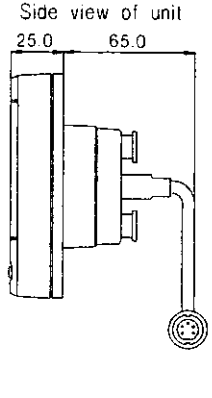
MOUNTING THE UNIT

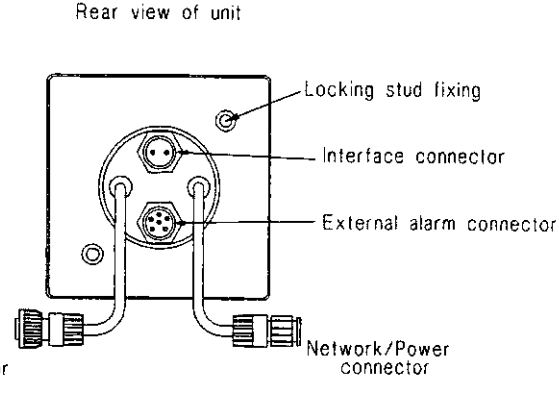
Use the cutting template supplied to mark the centres of the holes for the self-tapping screw, the fixing stud holes and the mounting bracket.

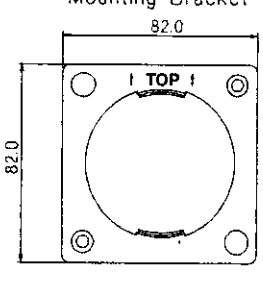
- The template allows 4mm (5/32") between adjacent units for the suncover, increase this distance if required to maximum of 60mm (2 3/8") between units or 180mm (3 1/8") between centres. For greater distances between units extension cables are available.
- Use a 70mm (2 3/4") diameter hole-cutter for the mounting bracket hole.
- Use a 2.9mm for the self-tapping screw holes.
- Use a 5mm (3/32") drill for the locking stud holes.
- Secure the mounting bracket to the bulkhead with the self-tapping screws supplied
- Fit the rubber sealing gasket around the mounting bracket.
- Screw the locking studs into the back of the display head (if required).
- Carefully pass the cable tails through the mounting bracket hole, connect the cables to the main units.
- Clip the display head into the mounting bracket.
- Secure the instrument with the thumb nuts supplied.

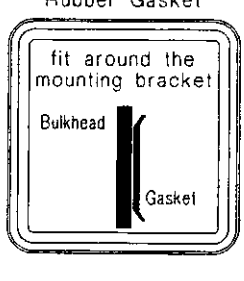
INSTALLATION DATA

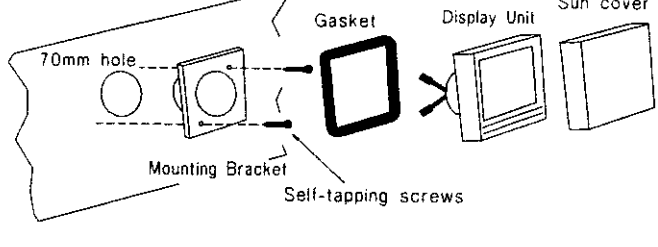












All Dimensions in millimeters

CONNECTING THE NETWORK ENGINE UNIT

- Connect the unit into Network Instrument cable chain, refer to the installation notes on the sheet supplied. The unit is supplied with power and network data via the cable tails.

- If the Network ENGINE units are not connected as above a power supply cable is supplied. Connect this power cable via a 2A 12V fuse or circuit breaker to the distribution and supply panel. Connect the power cable to one of the Network ENGINE units. Power is supplied to all other units via the interconnecting cables.

- Connect the interface cable supplied to the top socket on the rear of the unit. For installations with multiple Network ENGINE's select only one of the units, usually the most convenient for cable routing and connection.

- Connect the other end of the cable to the GM engine diagnostic connector. Refer to the engine manufacturer's handbook for its location.

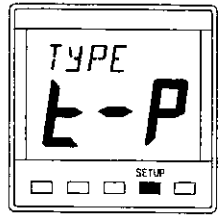
INITIAL SETUP OF UNITS

NOTE: THE FOLLOWING SHOULD BE CARRIED OUT WITH THE IGNITION OFF.

- Power up the Network unit(s).

- The displays will show **NO DATA**.

- Using the unit connected to the GM engine interface, check that the correct mode or unit **TYPE** is selected. Press the **SETUP** key, the **TYPE** should be **t-P**.



- If the **TYPE** is different to that show above, go to the next section.

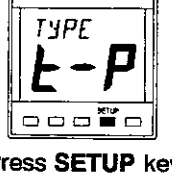
- If there is more than one Network Engine installed then the other units must be set to repeater mode as shown in the next section.

SELECTING THE DISPLAY MODE

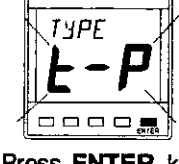
The Network ENGINE unit has four operating modes indicated by **TYPE**. The correct **TYPE** must be selected for your system to operate properly.

- **t-P** Transducer-port, used (initially) for the Network ENGINE unit connected to the GM engine interface.
- **t-S** Transducer-starboard, used to change the engine assignment form port to starboard.
- **d** Demo mode, the unit runs an internal demonstration program.
- **rEP** Repeater mode, all Network ENGINE units not connected to the GM engine interface MUST be in this mode.

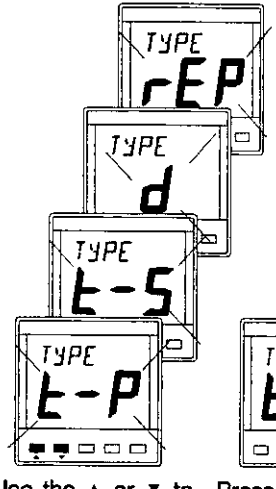
When powered on the display will initially show, **NO DATA.**



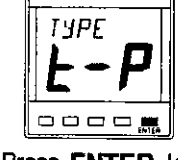
Press **SETUP** key, to display the current **TYPE.**



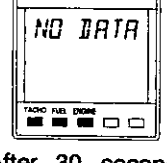
Press **ENTER** key if the mode needs to be changed. The display flashes.



Use the ▲ or ▼ to change the mode.



Press **ENTER** key to store the new mode in memory.



After 30 seconds or by pressing the keys shown above, the display will revert to **NO DATA.**

CHECKING THE SETUP - ENGINE(S) RUNNING

- Start the engine(s) following the engine manufacturer's instructions.
- After a brief pause, press the **TACHO** key on the Network ENGINE unit. The display should now be showing **RPM**. If the display still shows **NO DATA**, stop the engine(s) and check the wiring between the engine interface and the Network ENGINE unit.
- For installations with twin engines, pressing the **TACHO** key will cause the display to show **RPM P** then **RPM S**, and vice versa.
- It is now necessary to check that the port and starboard information is the correct way round, e.g. the display of **RPM P** is for the port engine.
- This can be determined by cutting the fuel to one engine and observing the **RPM P** or **RPM S** displays. If the **RPM P** display changes when the port engine is cut then the setup is correct and no change is necessary. Conversely, if the **RPM S** display changes when the port engine is cut then the port and starboard engine assignment must be changed.

CHANGING THE ENGINE ASSIGNMENT

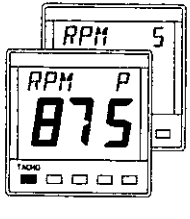
- Switch off both engines in accordance with the manufacturer's instructions. Ensure that the ignition is switched off.
- The Network ENGINE displays will now show **NO DATA**.
- Repeat the procedure described in SELECTING THE DISPLAY MODE, so that the display **TYPE** is set to **t-S**.
- When the engine assignment has been changed repeat the procedures described in CHECKING THE SETUP - ENGINE(S) RUNNING.
- When satisfied that the set up is correct proceed with configuring the displays.

CONFIGURING MULTIPLE NETWORK ENGINES

When multiple Network ENGINE's are connected to a twin engine installation the units can be set up to show information from either; the port engine only, the starboard engine only, or both engines. The best configuration depends upon how the units are located in a particular installation.

- The ignition must be on to configure the units.

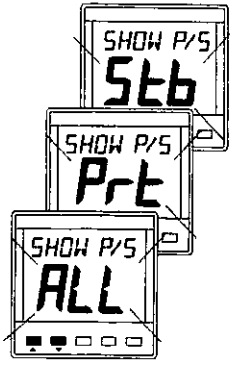
The following selections are available for every unit;
ALL Information from both engines is displayed.
Prt Information from the Port engine is displayed.
Stb Information from the Starboard engine is displayed.



Press **TACHO** key to display **RPM P** or **RPM S.**

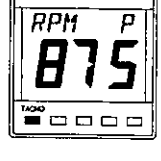
Press **SETUP** key 4 times, the display shows **SHOW P/S.**

Press **ENTER** key if the configuration is to be changed.



Use ▲ or ▼ to change the configuration.

Press **ENTER** key to store the new configuration in memory.



Press **TACHO** key. The display will now only show **RPM P.**

SETTING THE FUEL UNITS

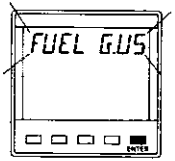
The Network ENGINE unit can be set to display the Fuel Rate and Fuel Used displays in one of three different units of measure. The units of measure selected is for ALL units connected in to the system.

US Gallons	**FUEL G.US**
UK Gallons	**FUEL G.UK**
Litres	**FUEL LIT**

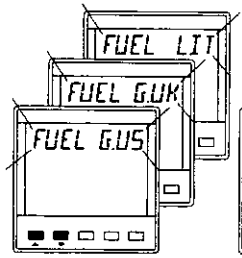
The factory setting is US Gallons.

Press **FUEL** key to display **GAL/HR**, **GAL/HR P**, **GAL/HR S** or **GAL/HR T**.

Press **SETUP** key, the display flashes the current setting.



Press **ENTER** key if the fuel units are to be changed.



Use ▲ or ▼ to change the fuel units.

Press **ENTER** key to store the new setting in memory.

Press **FUEL** key. The unit will now display in the selected units.

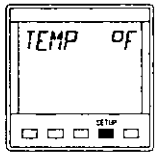
SETTING THE TEMPERATURE UNITS

The Network ENGINE unit can set to display the engine coolant temperature in degrees Fahrenheit (°F) or degrees Celsius (°C). The units of measure selected is for ALL units connected in to the system.

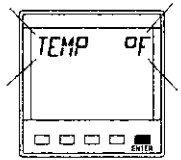
Degrees Fahrenheit **TEMP °F**
Degrees Celsius **TEMP °C**

The factory setting is degrees Fahrenheit.

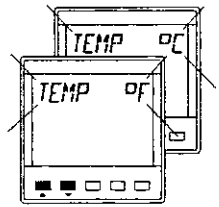
Press **ENGINE** key to display **ENG °F**, **ENG °F P** or **ENG °F S**.



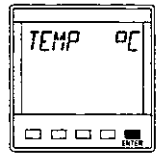
Press **SETUP** key 3 times, the display shows **TEMP °F**.



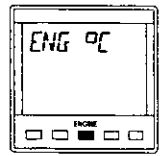
Press **ENTER** key, the display will flash.



Use ▲ or ▼ to change the units of measure.



Press **ENTER** key to memorise the new units.



Press **ENGINE** key to display engine temperature.

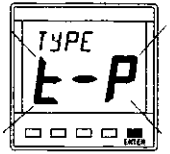
CHANGING THE UNIT MODE

The display mode can be changed while the unit is operating. The Network ENGINE unit has four operating modes indicated by **TYPE**. The correct **TYPE** must be selected for your system to operate properly.

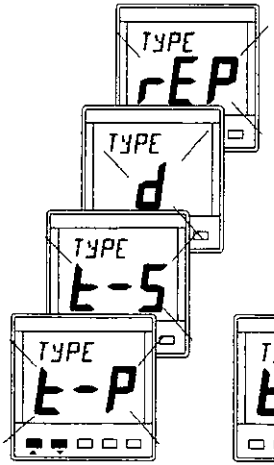
- **t-P** Transducer-port, used (initially) for the Network ENGINE unit connected to the GM engine interface.
- **t-S** Transducer-starboard, used to change the engine assignment form port to starboard.
- **d** Demo mode, the unit runs an internal demonstration program.
- **rEP** Repeater mode, all Network ENGINE units not connected to the GM engine interface MUST be in this mode.

Press **ENGINE** key to display **VOLTS**, **VOLTS P**, **VOLTS S**.

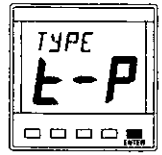
Press **SETUP** key, to display the current **TYPE**.



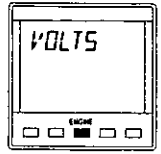
Press **ENTER** key if the mode needs to be changed. The display flashes.



Use ▲ or ▼ to change the mode.



Press **ENTER** key to memorise the new mode.



Press **ENGINE** key to display engine volts.

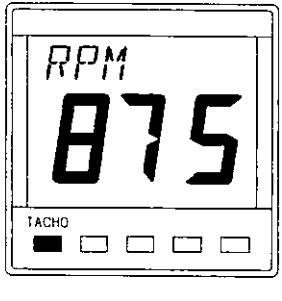
USING THE TACHO KEY – SINGLE ENGINE

Press the **TACHO** key to display the engine speed in revolutions per minute **RPM**.

The display range automatically changes depending upon the engine revs.

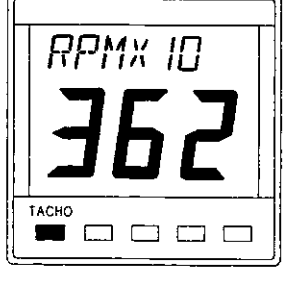
SINGLE ENGINE

0 – 999 rpm



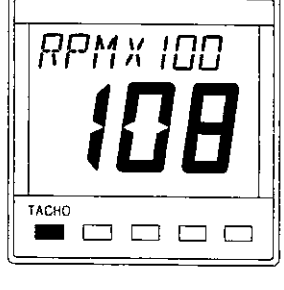
The display is showing 875 rpm.

1000 – 9999 rpm



The display is showing 3,620 rpm.

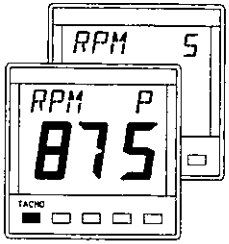
10000 – 65535 rpm

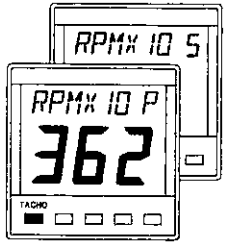


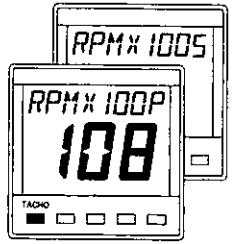
The display is showing 10,800 rpm.

TWIN ENGINES - SINGLE NETWORK ENGINE UNIT

Press the **TACHO** key for the Port Engine **RPM P**,
Press the key again for the Starboard Engine **RPM S**.

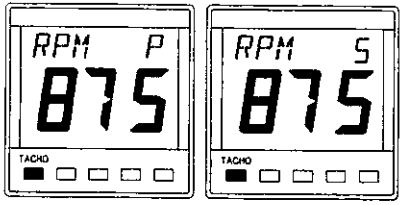


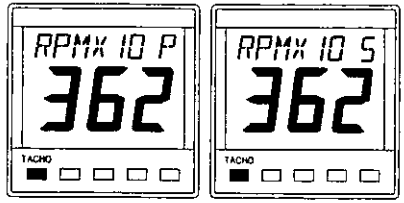


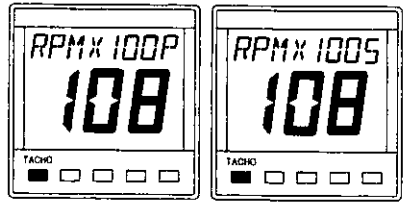


TWIN ENGINES - TWIN NETWORK ENGINE UNITS

Press the **TACHO** key on both Network Engine units.



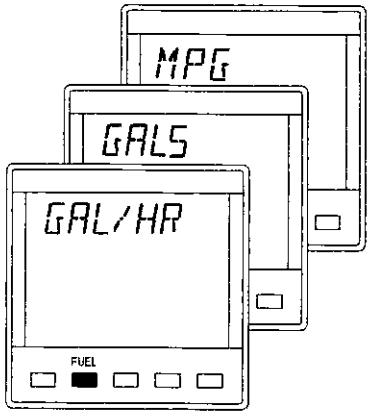




USING THE FUEL KEY - SINGLE ENGINE

Press the **FUEL** key to cycle through the following options. The configuration of your system will determine which group of displays apply to you. The units displayed can be set for US/UK Gallons or Litres, see SETTING THE FUEL UNITS.

SINGLE ENGINE INSTALLATION



GAL/HR	This is the rate at which fuel is being consumed. It can be set to show the rate in US/UK Gallons per Hour or Litres per Hour.
GAL/HR P	Rate for Port Engine.
GAL/HR S	Rate for Starboard Engine.
GAL/HR T	Total rate for both engines.
GALS*	This is the amount of fuel used since the display was last reset. It is important to reset (to zero) this display whenever the fuel tank is filled.
GALS P	Fuel used by Port engine.
GALS S	Fuel used by Starboard engine.
GALS T*	Total fuel used by both engines.
MPG**	Fuel economy in Statute Miles per Gallon or Litres per Nautical Mile.
MPG P**	Economy for Port engine.
MPG S**	Economy for Starboard engine.
MPG T**	Economy for both engines.

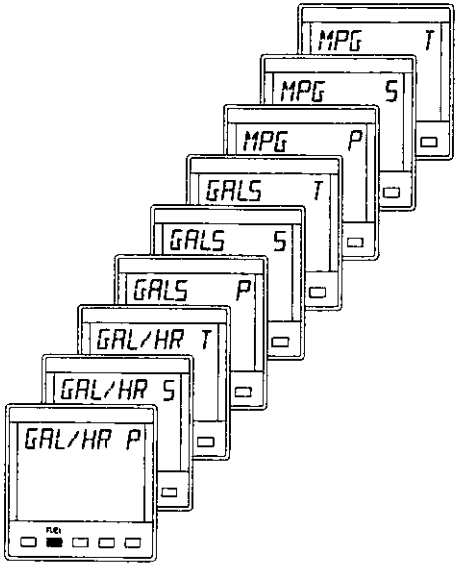
***NOTE** An alarm can be set for Total Fuel Used.

****NOTE** These functions are only available when the Network ENGINE unit is used in combination with a Network SPEED or Network QUAD unit.

USING THE FUEL KEY – TWIN ENGINES

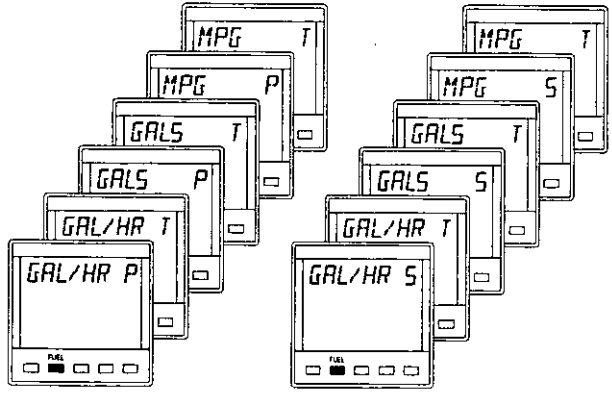
TWIN ENGINE SYSTEM – SINGLE NETWORK ENGINE

Network ENGINE configured to **SHOW ALL**



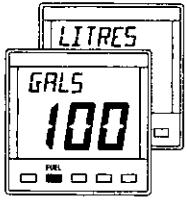
TWIN ENGINE SYSTEM – TWO NETWORK ENGINES

One Network ENGINE configured to **SHOW Prt.**
Other Network ENGINE configured to **SHOW Stb.**

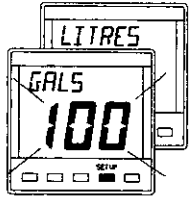


RESETTING THE FUEL USED DISPLAY

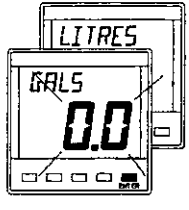
The Fuel Used display show the amount of fuel consumed by the engine or engines and displays it in the units of measure set previously.
It should be reset to zero whenever the fuel tank is filled.
When used in combination with the Fuel Alarm, every trip can be conducted with confidence that sufficient fuel is available for a safe return.



Press **FUEL** key to display **GALS**, **GALS P**, **GALS S** or **GALS T**.



Press **SETUP** key, the display flashes the current amount of fuel used.



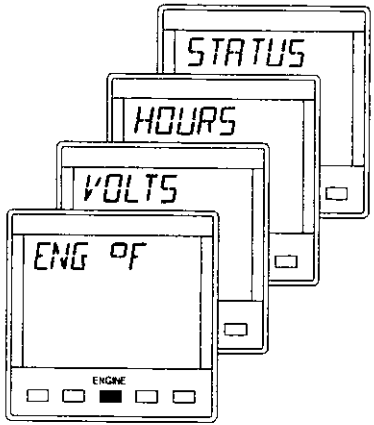
Press **ENTER** key, the flashing fuel used display will zero immediately.
If the engines are running the display will begin counting up again.

Press **FUEL** key. The display will stop flashing.

USING THE ENGINE KEY – SINGLE ENGINE

Press the **ENGINE** key to cycle through the following options. The configuration of your system will determine which group of displays apply to you.

SINGLE ENGINE INSTALLATION



ENG °F* Engine coolant temperature. It can be displayed in degrees Fahrenheit °F or Celsius °C.
ENG °F P* Port engine coolant temperature.
ENG °F S* Starboard engine coolant temperature.

VOLTS Battery voltage measured at the engine.
VOLTS P Battery voltage at the Port engine.
VOLTS S Battery voltage at the Starboard engine.

HOURS Total engine hours run.
HOURS P Port engine hours run.
HOURS S Starboard engine hours run.

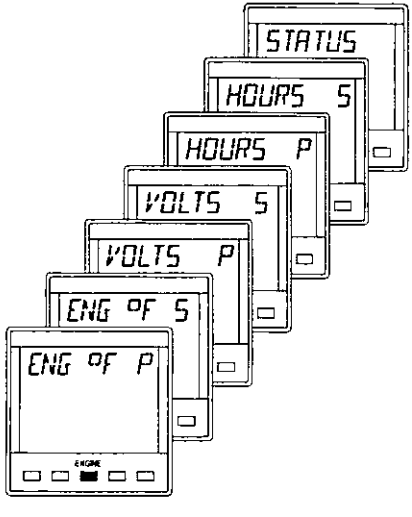
STATUS* The engine status is reported by the GM Engine Interface Unit. If all monitored conditions are correct the Network ENGINE unit will display **OK.** If a fault is detected the Network ENGINE unit will display which engine is at fault (twin engine installations), then one or more of the messages listed in ENGINE STATUS ALARM MESSAGES.

NOTE* All these functions have alarms.

USING THE ENGINE KEY – TWIN ENGINES

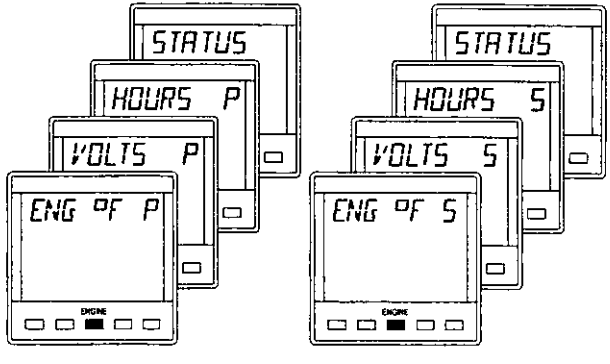
TWIN ENGINE SYSTEM – SINGLE NETWORK ENGINE

Network ENGINE configured to **SHOW ALL**



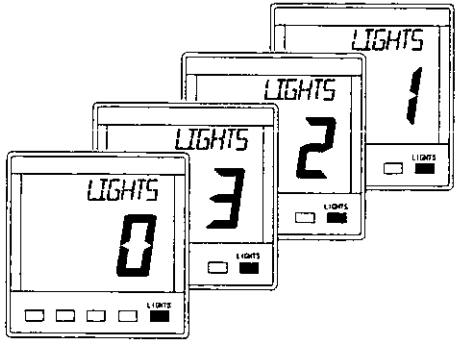
TWIN ENGINE SYSTEM – TWO NETWORK ENGINES

One Network ENGINE configured to **SHOW Prt.**
Other Network ENGINE configured to **SHOW Stb.**



USING THE LIGHTS KEY

The Network ENGINE Display unit has 3 levels of illumination and off, controlled by the **LIGHTS** key.



- **LIGHTS 0** OFF
- **LIGHTS 3** High
- **LIGHTS 2** Medium
- **LIGHTS 1** Low

The **LIGHTS** key also changes the illumination level of the key legends; it is always illuminated so even in complete darkness the key can be located.

NETWORK ENGINE ALARMS

Alarms can be set for the following conditions:

- Over revving of an engine.
- Engine stopped.
- Fuel used.
- Engine coolant temperature.
- Engine Status.

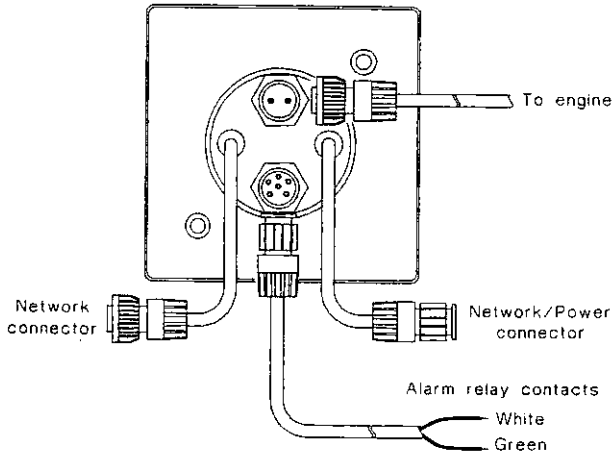
The procedures for setting of the alarms is described in the next sections.

When an alarm condition is met, the display will flash the alarm that has been activated. If an external alarm buzzer or light is connected to the unit, then this will also sound or illuminate. To cancel an alarm warning press any of the five operating keys.

The alarm connector is internal connected to a normally open, 2A/30V DC relay contact, and is therefore capable of controlling a warning light or a klaxon.

CONNECTING AN EXTERNAL ALARM

Rear view of Network ENGINE unit.

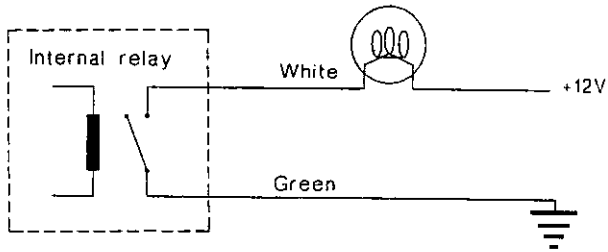


NOTE

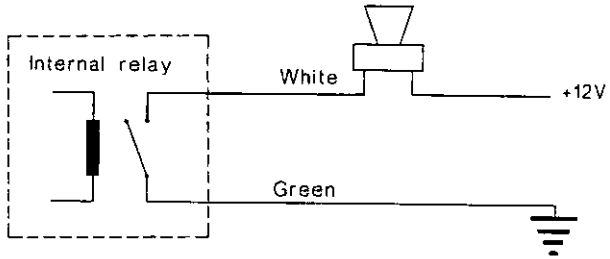
All other wires of the External Alarm Connecting Cable are currently un-used and should be cut off to prevent accidental shorting of the alarm contacts.

External Alarm Connection Schematics

ALARM WARNING LIGHT



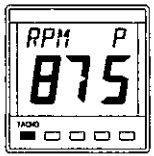
ALARM KLAXON



THE HIGH REVS ALARM

The Revs Alarm is used to warn against over revving of an engine. The value set is the high limit for rpm.

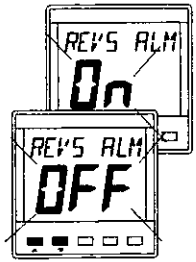
ENABLING/DISABLING THE ALARM



Press TACHO key to display **RPM P**, **RPM S** or **RPM**.

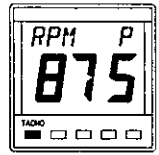
Press **SETUP** key, the display shows **REVS ALM**.

Press **ENTER** key, the display will flash.



Use ▲ or ▼ to enable/disable the alarm.

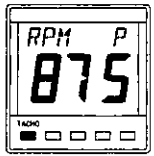
Press **ENTER** key to memorise the alarm state.



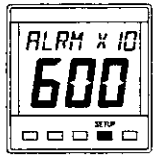
Press **TACHO** key to display rpm.

ADJUSTING THE HIGH REVS ALARM LIMIT

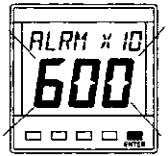
The high revs limit can be set between 10 – 9990 rpm.
The default value is 6000 rpm.



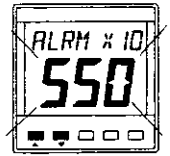
Press TACHO key to display **RPM P**, **RPM S** or **RPM**.



Press **SETUP** key twice, the alarm limit is displayed.

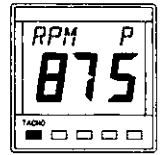


Press **ENTER** key, the display will flash.



Use ▲ or ▼ to adjust the alarm limit.

Press **ENTER** key to memorise the new alarm limit.

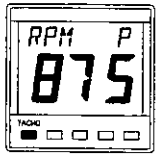


Press **TACHO** key to display rpm.

THE ENGINE STOPPED ALARM

The Engine Stopped Alarm is used to warn that an engine's speed has dropped below 10 rpm or stopped.

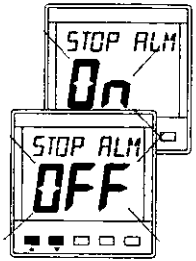
ENABLING/DISABLING THE ALARM



Press TACHO key to display **RPM P**, **RPM S** or **RPM**.

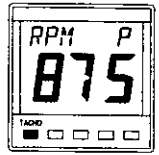
Press **SETUP** key 3 times, the display shows **STOP ALM**.

Press **ENTER** key, the display will flash.



Use ▲ or ▼ to enable/disable the alarm.

Press **ENTER** key to memorise the alarm state.



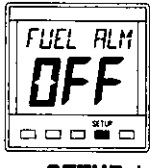
Press **TACHO** key to display rpm.

SETTING THE FUEL USED ALARM

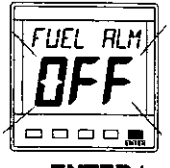
The Fuel Used alarm can be set to warn when a preset amount of fuel has been consumed.

ENABLING/DISABLING THE ALARM

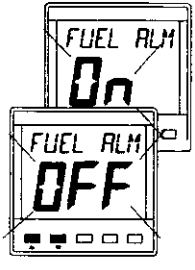
Press **FUEL** key to display **GALS**, **GALS P**, **GAL S** or **GALS T**.



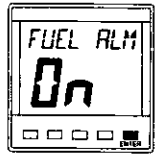
Press **SETUP** key twice, the display shows **FUEL ALM**.



Press **ENTER** key, the display will flash.



Use ▲ or ▼ to enable/disable the alarm.



Press **ENTER** key to memorise the alarm state.

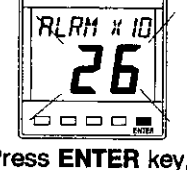
Press **FUEL** key to display fuel used.

ADJUSTING THE FUEL USED ALARM LIMIT

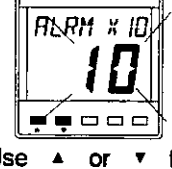
The fuel used limit can be set between 10 – 9990 gallon/litres.
The default value is 260 G.US, (220 G.UK, 98 litres).

Press **FUEL** key to display **GALS**, **GALS P**, **GALS S** or **GALS T**.

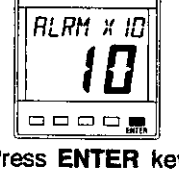
Press **SETUP** key 3 times, the alarm limit is displayed.



Press **ENTER** key, the display will flash.



Use ▲ or ▼ to adjust the alarm limit.



Press **ENTER** key to memorise the new alarm limit.

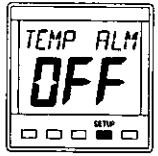
Press **FUEL** key to display fuel used.

SETTING THE ENGINE TEMPERATURE ALARM

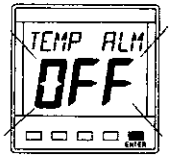
The Engine Temperature alarm can be set to warn against engine overheating. The value set is the high temperature limit for the engine or engines.

ENABLING/DISABLING THE ALARM

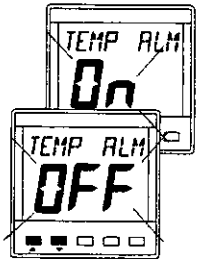
Press **ENGINE** key to display **ENG °F**, **ENG °F P** or **ENG °F S**.



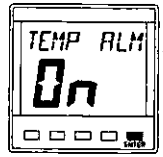
Press **SETUP** key, the display shows **TEMP ALM**.



Press **ENTER** key, the display will flash.



Use ▲ or ▼ to enable/disable the alarm.



Press **ENTER** key to memorise the alarm state.

Press **ENGINE** key to display engine temperature.

ADJUSTING THE ENGINE TEMPERATURE ALARM LIMIT

The alarm limit can be set between 32° - 299°F (0° - 149°C). The default value is 212°F (100°C).

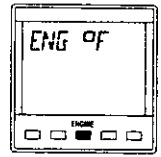
Press **ENGINE** key to display **ENG °F**, **ENG °F P** or **ENG °F S**.

Press **SETUP** key twice, the alarm limit is displayed.

Press **ENTER** key, the display will flash.

Use ▲ or ▼ to adjust the alarm limit.

Press **ENTER** key to memorise the new alarm limit.

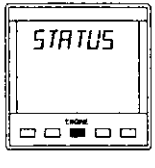


Press **ENGINE** key to display engine temperature.

ENGINE STATUS ALARM

The Engine Status Alarm will sound and display a warning if the Network ENGINE unit is receiving an error message from the GM engine interface unit. This alarm will activate everytime the Network ENGINE unit is turned on until the engine at fault is serviced (and the GM engine interface is reset). The default condition is alarm on.

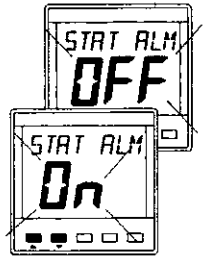
THIS ALARM SHOULD ONLY BE TURNED OFF IN EXCEPTIONAL CIRCUMSTANCES AS SERIOUS DAMAGE COULD RESULT IF IT IS IGNORED.



Press **ENGINE** key to display **STATUS**.

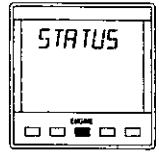
Press **SETUP** key, the display shows **STAT ALM**.

Press **ENTER** key, the display will flash.



Use ▲ or ▼ to enable/disable the alarm.

Press **ENTER** key to memorise the alarm state.



Press **ENGINE** key to display engine status.

ENGINE STATUS ALARM MESSAGES

The Network ENGINE will display warning messages for the follows engine or sensor faults.

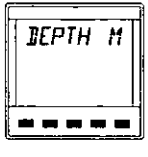
RETARD	Spark retard error
TIMING	Spark timing error
PRESSURE	Manifold pressure sensor error
TACHO	Speed sensor (engine) sensor error
AIR TEMP	Manifold air temperature sensor error
THROTTLE	Throttle position sensor error
ENG TEMP	Engine coolant temperature sensor error
OXYGEN	Oxygen sensor error

ALL ENGINE STATUS ALARM MESSAGES SHOULD BE REPORTED IMMEDIATELY TO YOUR ENGINE SUPPLIER OR DEALER.

NETWORK ALARMS

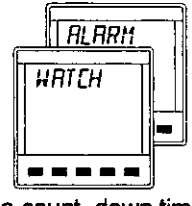
The Network ENGINE unit has an external alarm output that will sound if an alarm condition is met on a Network unit that has alarm functions ie. Network DEPTH and Network QUAD for depth alarms and Network PILOT for Watch Alarm and Off Course alarms. The unit will also display which alarm is activated.
To silence the alarm and return the display to normal operation press any of the five keys.

DEPTH ALARM DISPLAY

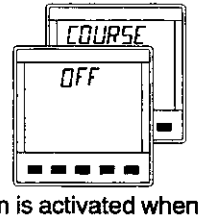


Depth alarms can be set for the following:
Shallow water
Deep water
Anchor Watch
Check your Network DEPTH or QUAD unit to see which alarm is activated.

NETWORK PILOT ALARM DISPLAYS



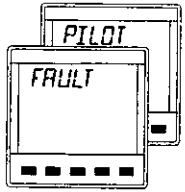
The Watch Alarm is a count-down timer with is activated at the end of the preset count-down period. The display alternates between the messages above.



The Off Course alarm is activated when the boat deviates off course by a preset amount. The display alternates between the messages above.

NETWORK FAULT AND ERROR MESSAGES

NETWORK PILOT FAULT DISPLAY



If Network PILOT should have a fault the autopilot computer unit will send a message to all other Network Display Units. The Network ENGINE unit will alternately display the follow message, the actual fault will have to be read from the Network PILOT Display unit.

UNIT INTERNAL ERRORS

In the unlikely event that your Network ENGINE unit should develop an internal error, the unit will sound it's alarm continuously and the display will show an error number. Pressing the keys will not silence this alarm.
In some cases the fault can be cleared by switching off the instruments at the supply, waiting a few moments and then switching on again. If this does not clear the fault the error number should be recorded.
Switch off the supply and disconnect the faulty unit. Return it with the error number to your dealer for servicing.

SPECIFICATION

PHYSICAL PARAMETERS

Construction	High impact ABS plastic
Window	Acrylic
Display	Back-lit Liquid Crystal Display: Large Digits: 28.6mm 1.12" Small Digits: 11.5mm 0.45"
Dimensions	110 x 110 x 25.4mm 4 x 4 x 1" Requires 65mm 2.6" depth behind bulkhead for display barrel
Weight	0.3 kg 0.66lbs

ENVIRONMENTAL

Operating Temp	-10 to +55°C @ 93%RH +14 to +131°F @ 93%RH
Storage Temp	-25 to +70°C @ 95%RH -13 to +158°F @ 93%RH
Humidity	Up to 95%RH
Sealing	Fully sealed front, suitable for bulkhead cockpit mounting. Vented barrel to prevent condensation.

ELECTRICAL

Power Supply	12V DC nominal (10 to 16V)
Operating Current	40mA typical, 100mA illuminated
Protection	Connect via external fuse or circuit breaker.

CABLES AND CONNECTIONS

Connection to adjacent units is via cable tails fitted with either a plug or a socket. Extension cables are available from your dealer. The cable tails carry power and NMEA data between units.

ALARM

External alarm output via rear connector, internally connected to a Normal Open, 2A/30V DC relay.