smartswitch NV-8000 Navigational Light Controller Monitor Installation Guide

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Contents

Introduction

Thank you for purchasing the NV-8000 navigational light controller / monitor. Smartswitch is very proud to be able to provide this product to you. You have selected a capable system designed to provide years of reliable service under the most demanding conditions.

Smartswitch is a pioneer in the design and development of distributable intelligence controller systems for the marine industry. The NV-8000 is a versatile, compact, modern, stylish and userfriendly intelligent network system. Our Research and Development Team have developed this system specifically for the marine environment using proven techniques and materials, which will ensure a long life at sea.

The NV-8000 provides features typically found only in expensive computer-based systems on mega-yachts, but does so for a fraction of the cost. It is an economical and capable alternative to simplistic monitoring systems. The NV-8000 allows builders and retrofitters to offer a system with maximum functionality thereby providing boat owners with excellent visibility into any alarm condition.

Installation

Smartswitch recommends a Qualified Marine or Auto-Electrician installs this product.

System Overview

The NV-8000 system has been developed to allow control and monitoring of up to 16 lights.
It is a network system consisting of the NV-8000 Master Display Unit and up to 2 Output Units located anywhere on the vessel. In addition, one NR-800 Remote Display Unit may be added to provide an additional display throughout the vessel. A second NV-8000 (slave) may also be connected giving total control and all information at two locations.
A 2-wire network cable, similar to that used for telephone installations, interconnects all devices.
The Master Display Unit (MDU) controls communication with all attached Input/output Units. System components may be located anywhere on the network cable and the cable may be up to 1000 meters in length.
These features, unique to the NV-8000, provide boat builders and retrofitters maximum flexibility in locating components onboard the vessel while minimizing wiring costs.

NV-8000 Master Display Unit

Provides the following functions:

- Latched display for up to 16 lamp alarms
- all names are user programmable
- network communication fault
- visual alarm with tone
- 6 user groups
- join any output to any group
- all outputs belonging to a group turn on/off

NV-100 Input/output Unit:

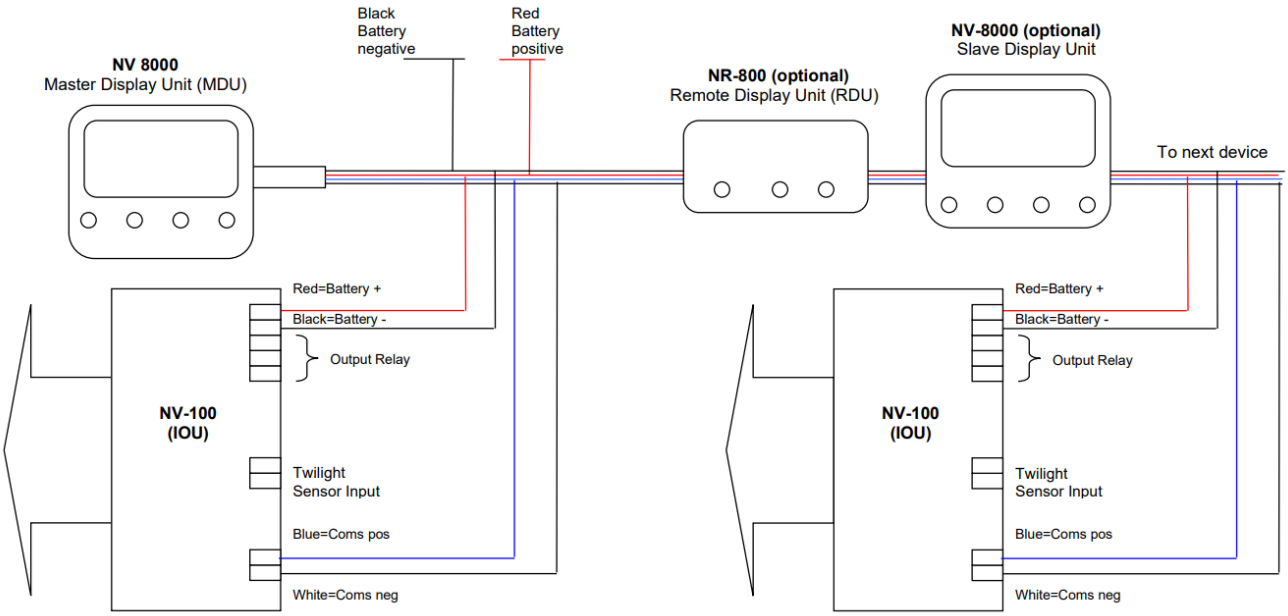
The NV-100 has 8 outputs and one output relay.

- each output can supply 1 amp and current sense down to 50mA
- one twilight sensor input Output Relay
- 3 amp resistive (closes on any fault)

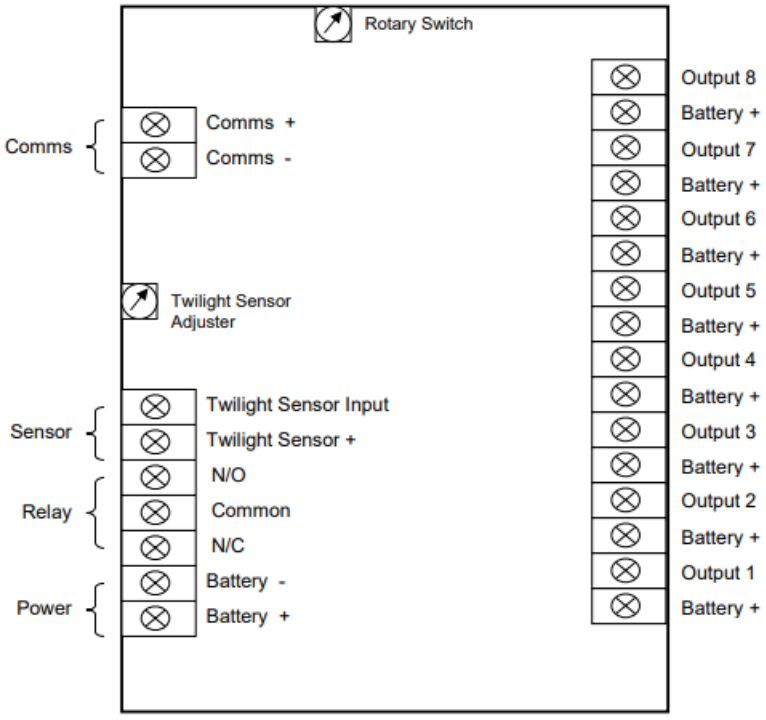
NR-800 Remote Display Unit:

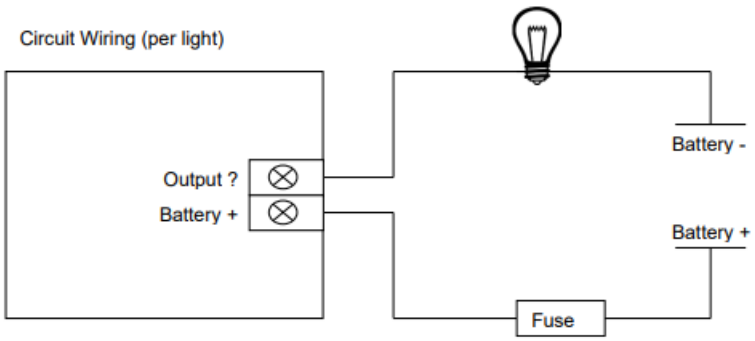
The NR-800 Repeater Display is optional. It is a display, which can be located anywhere on the vessel for convenient monitoring. This will not allow control.

Wiring Block Diagram



Wiring Diagram for Model NV-100





Adjusting the Twilight Sensor:

After installing and programming the system, connect the twilight sensor as per the wiring diagram above. During daylight, turn the twilight sensor adjuster until the system alarms with the “NO NAV LIGHTS ON” message displayed. Now turn the adjuster back slowly until the alarm stops and the displayed message disappears. To test

cover the sensor to simulate twilight.

Installation Steps

Smartswitch recommends a Qualified Marine or Auto-Electrician installs this product.
Step 1:
Install and connect the Master Display Head Unit (NV-8000).
Step 2:
Install and connect the Output Units (NV-100).
Step 3:
Set-up Rotary Switches.
Step 4:
Program the Master Display Unit (NV-8000).
Step 5:
Test system

Electrical Specifications NV-8000
Supply Voltage 12 to 32 Volts DC (Auto-Sensing)
Quiescent Current 0.028 Amps (backlight off)
Data Retention 50 years (without power)
Electrical Specifications NV-100
Supply Voltage 12 to 32 Volts DC (Auto-Sensing)
Quiescent Current 0.024 Amps
Input Voltage (max) 30 vdc
High Relay Load 3 amps Resistive
Data Retention 50 years (without power)
Electrical Specifications NR-800
Supply Voltage 12 to 32 Volts DC (Auto-Sensing)
Quiescent Current 0.03 Amps
Data Retention 50 years (without power)
Network Cable
The cable connecting the Master Display Unit to the Input/output Units is referred to as the network cable and may run up to 1000 meters in total length.

Mounting the NV-8000 Master Display Unit

Position the mounting template tool provided and mark all three pilot holes. Drill a 3mm hole on the two outside holes and fit the mounting screws provided. Place the template tool back over the screws and tighten the screws until the template tool can just slip on and off the screws (ensure the tool in not too loose).
Drill the bottom hole to 12 mm (cable hole).
Place the Master Display Unit keyholes over the two screws and gently pull down. If the screws have been tightened to the correct depth the Display will clip down and self-tighten.

Setting Rotary Switch (Network Address)

To enable the MDU to remotely monitor, each I/O Unit (NV-100) must have a unique network address. This is accomplished by setting the Rotary Switch inside the I/O Unit to either Switch Position 2 OR 3.
Important: Each Input/output Unit on the network must have the Rotary Switch set to a unique number. No two devices may share the same Rotary Switch number.
Each NV-100 installed must use the next switch number available. E.g., if two are installed, then switch settings must be 2 and 3.
For ease of reference please use the chart provided below, as this will enable quick reference when programming the Master Display Unit.

NV-100 (I/OU) Rotary Switch Position 2

Switch Position 2 **Output**	**Light**
1	
2	
3	
4	
5	
6	
7	
8	

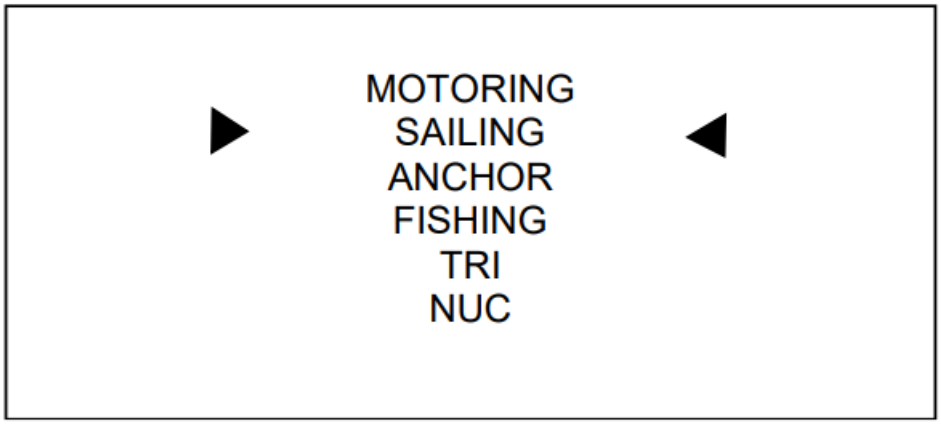
NV-100 (I/OU) Rotary Switch Position 3

Switch Position 3 **Output**	**Light**
1	
2	
3	
4	
5	
6	
7	
8	

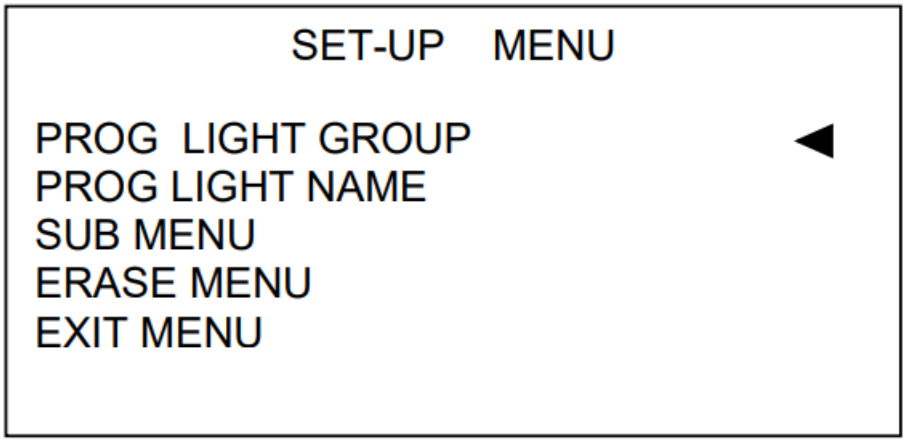
Programming Instructions

Explanation of Groups:
There are Six groups. Any Output and any number of Outputs may be joined to any group.
When a group is selected and the ENT key is pressed ALL LIGHTS that have been joined to the group will turn on, pressing the ENT key again will turn them off. E.g., Output 1, 2, 4 and 6 joined to the Motoring group will all be

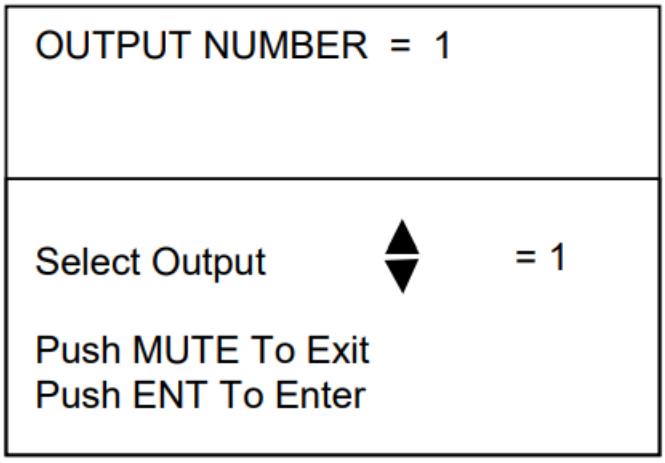
turned ON or OFF when that group is selected and the ENT key is pressed. All group name text can be changed (see Step3)



Explanation of Backup:
A backup light system consists of two lights e.g., two port light, two stb lights, two stern lights. One light is called the primary light and the other is the secondary light.
The primary lights are connected to an NV-100 (Switch Position 2) and the secondary (backup) lights are connected to another NV-100 (Switch Position 3). If a fault occurs on any of the primary lights, the fault is reported on the display unit and the secondary light will automatically turn on. When the primary light is fixed the secondary light will turn off automatically.
See page 17 for programming details.
Installing Two NV-8000 Display Units:
Two NV-8000 displays may be installed; one display unit must be set as the Master and one as the Slave.
Note: It makes no difference which one is which.
See page 16 & 17 for programming details.
Step 1: Placing the unit in Program Mode
Press and hold down the Mute & Select Up keys together for 3 seconds. This will place the Z unit in program mode.

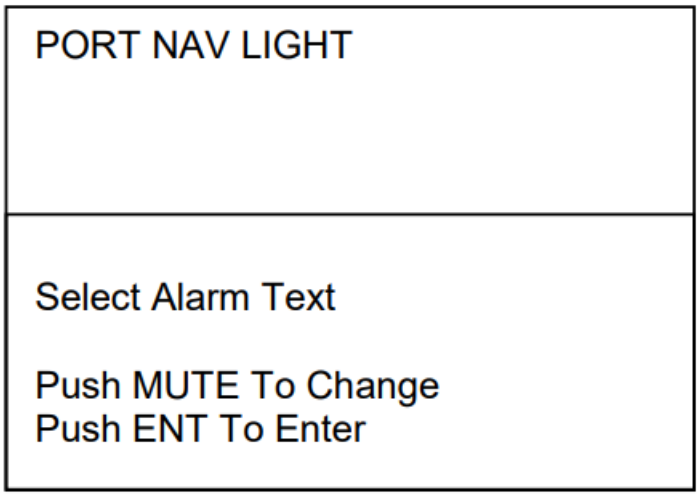


Scroll to PROG LIGHT NAME and press the ENT key.
Step 2: Programming the Light Names
The display will now show



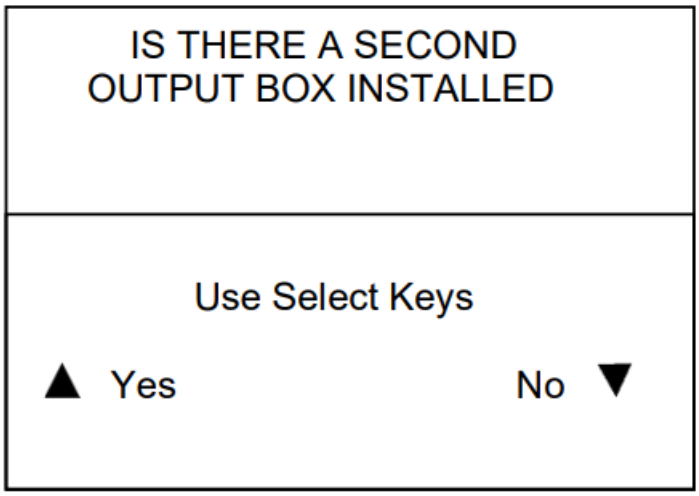
Use the Select Up or Down keys to change the output number, which corresponds to the output being programmed.
Once the output number has been selected press the ENT key to accept

The display will now show:



Use the Select Up or Down key to scroll through the pre-named Alarms. Once you have found the one required press the ENT key.
If you would like to create your own name press the Mute key. Use the Select up or down key to scroll through the alphabet and the Dim up or down keys to change to the next character. When finished press the ENT key (max 21 characters)

REPEAT THIS STEP FOR ALL OUTPUTS:
If a second I/O Box (NV-100) is installed and after Output 8 has been programmed.
The display will now show:

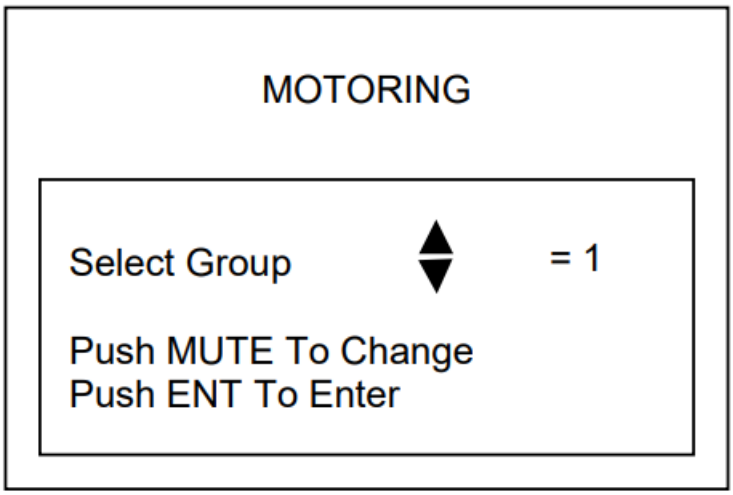


If Yes is selected the system will continue on from Output 8 to Output 9, etc. If No is selected the system will

return to the Set-Up Menu.
Once you have programmed the last Output name, select End, by pressing the Select Down key. This will return you to the Set-Up Menu.
Scroll to PROG LIGHT GROUP and press the ENT key.

Step 3: Select Group:

The display will now show



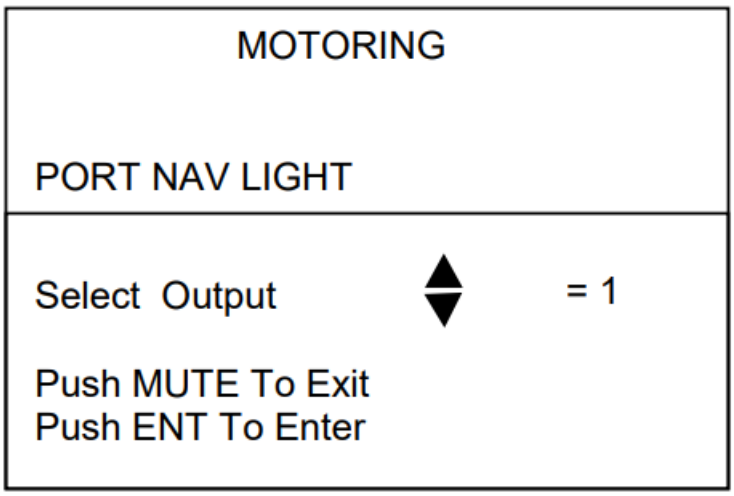
Use the Select Up or Down keys to change the Group number, which corresponds to the Group being programmed.
Once the Group number has been selected press the ENT key to accept.

Changing Group Name:

If you would like to create your own name press the Mute key. Use the Select up or down key to scroll through the alphabet and the Dim up or down keys to change to the next character. . When finished press the ENT key (max 10 characters).
Now you have selected the Group you want to program you must now add all outputs you want to belong to that group. When this group is selected in normal operation mode ALL outputs that have been joined to the group will turn ON or OFF when the group is selected.

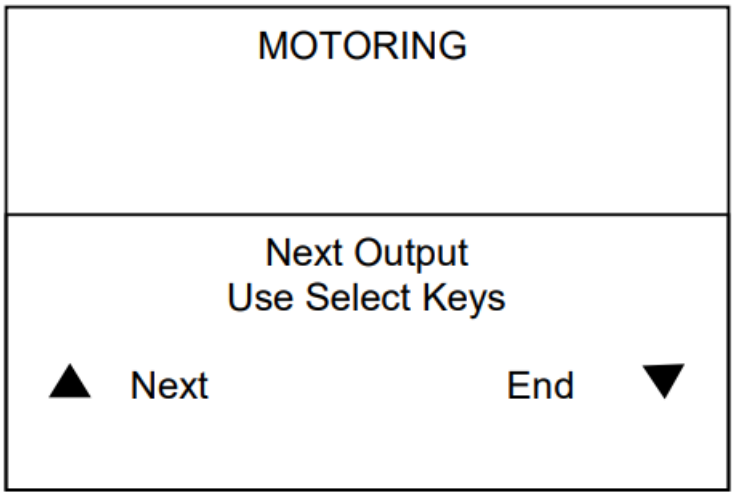
Joining Outputs to the Group:

The display will now show:



Use the Select keys to select the Output you want to join to the Group, once you have scrolled to the Output you want to join to the Group press the ENT key.

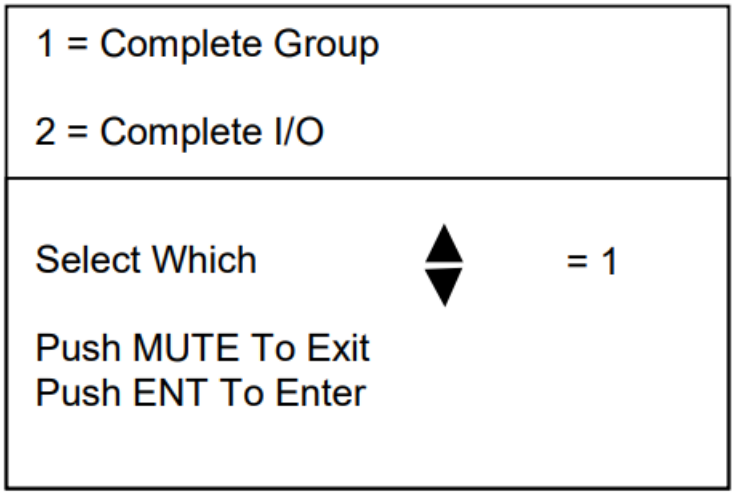
The display will now show:



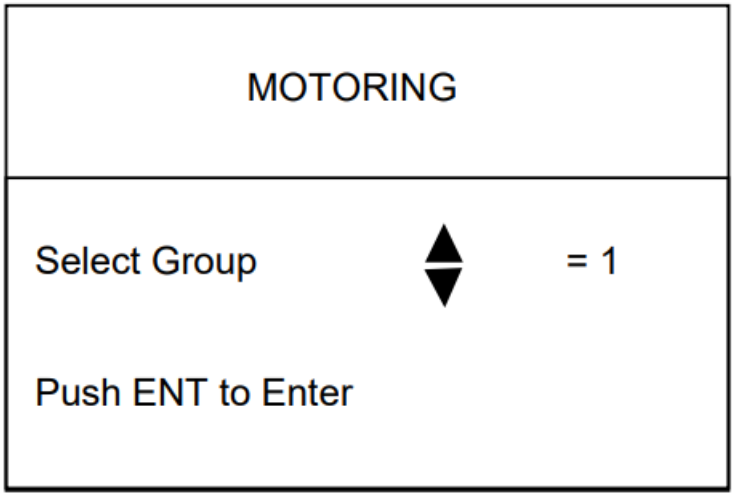
Press the Select Up key to set the next Output for the group or if this is the last, or only, light being associated to the group, then press the Select Down key to exit. If End is selected the system will return to the Set-Up Menu.

Repeat this Step for all Groups.

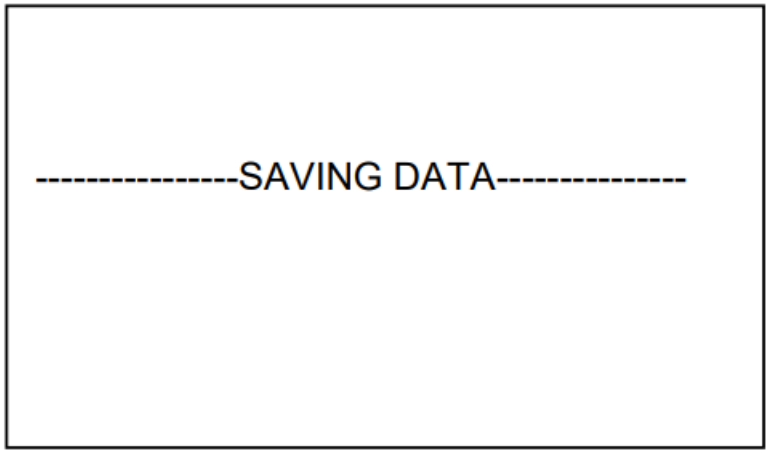
Erase Menu:
Selecting ERASE MENU will erase all settings associated with the NV-100 (IOU). If a mistake is made on an Input a complete erase is not required just reprogram the Input. The display will now show.



Use the Select Up or Down key to select the option you wish to erase, then press the ENT key to enter.
If Complete Group (1) is selected.
The display will now show:

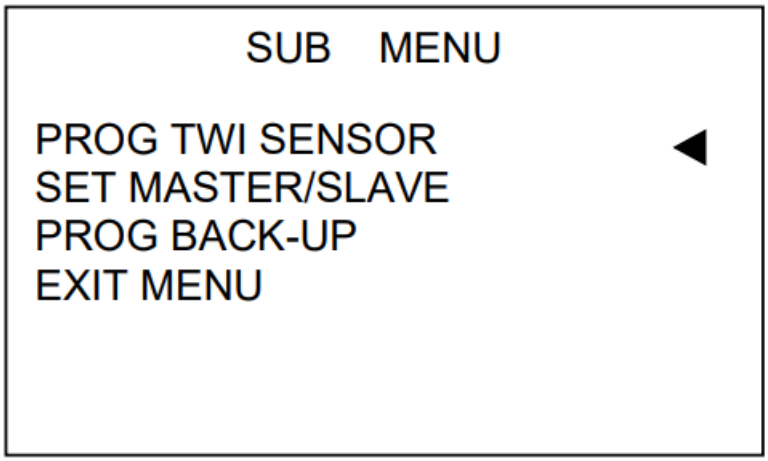


Use the Select Up or Down key to change the Group number, which corresponds to the Group you want to erase. Once the Group number has been selected press the ENT key to accept. The system will now exit program mode as below.
If Complete I/O (2) is selected the complete I/O box is erased

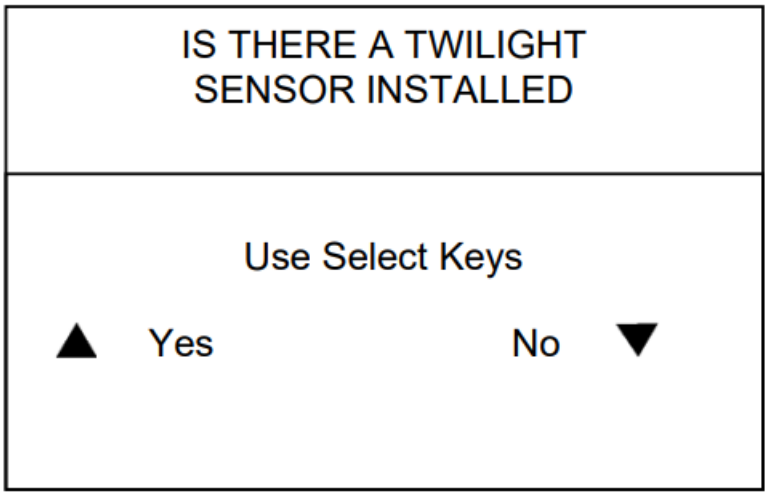


Exit Menu:
Once all Lights and Groups have been programmed you will need to take the system out of Set-Up mode and into monitoring mode. From the Set-Up Menu scroll down to EXIT MENU and press the ENT key.
This will save all associated data that has been set and take the system out of program mode and into monitoring mode. The NV-8000 is now ready for use!

Sub Menu:

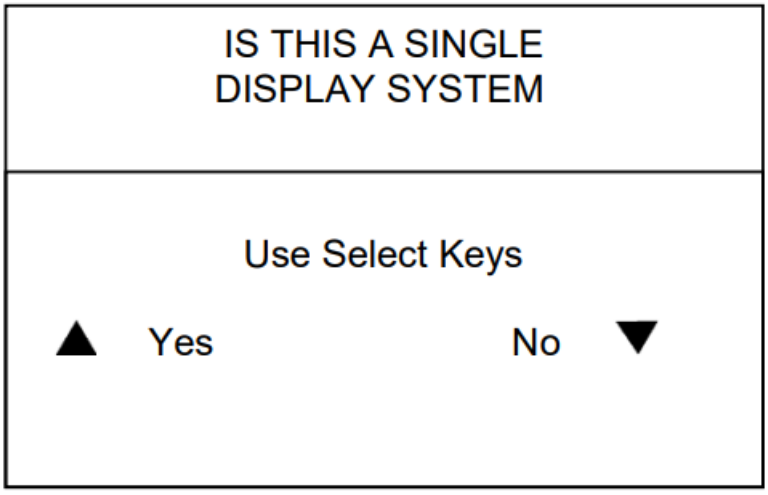


The Sub Menu contains a list of other features that may be programmed to suit your needs.
Use the Select Up and Down to scroll to the feature you wish to set and press the ENT Key. Follow the on screen instructions.
If PROG TWI SENSOR is selected.
The display will now show:

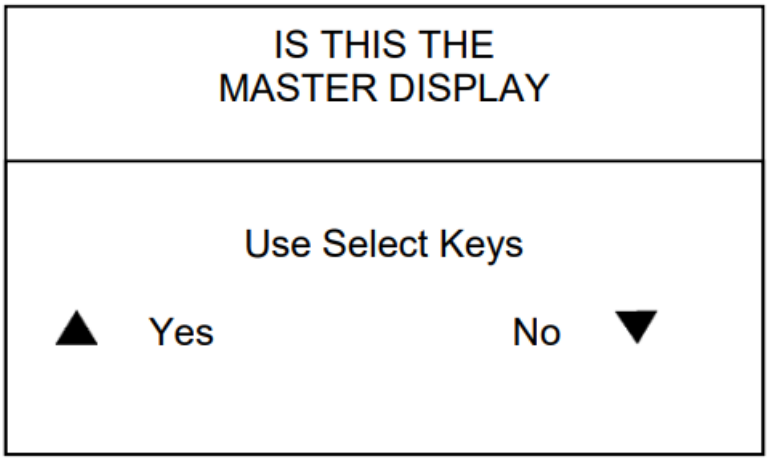


If there is a Twilight sensor installed select Yes, if not select No.
The system will then return you to the Set-Up Menu.
Master or Slave:

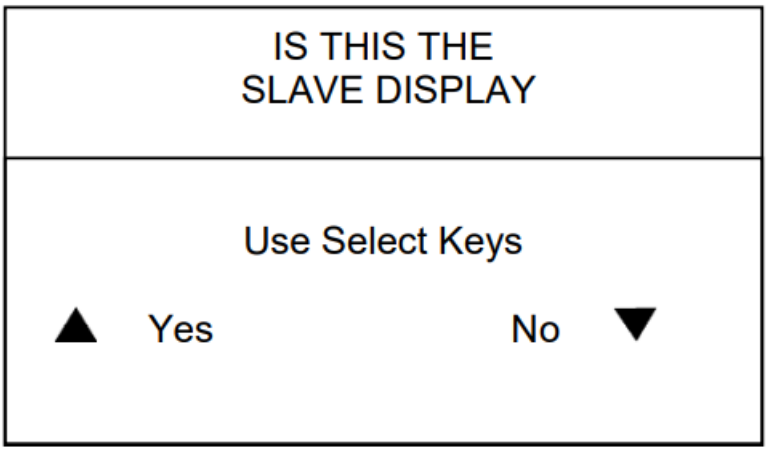
If there are two NV-8000 Displays units installed then one must be set as the MASTER and one as the SLAVE.
If SET MASTER/SLAVE is selected.
The display will now show:



If there is only one NV-8000 Display installed then answer YES this will return you to the main menu. If NO is selected then the display will now show.
The display will now show:

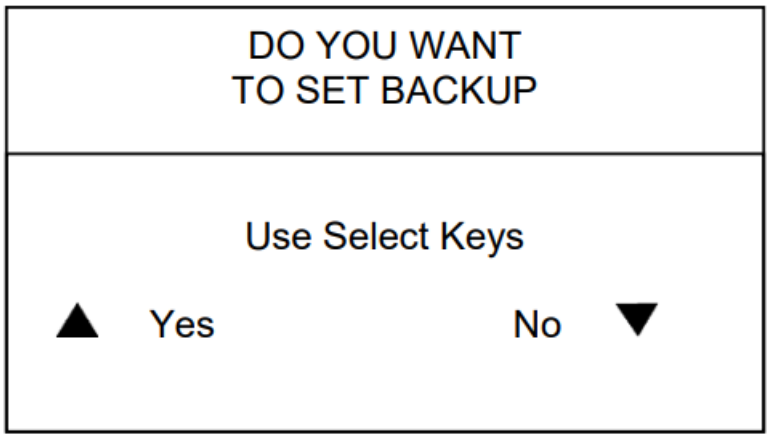


If Yes is selected the system will then return you to the Set-Up Menu. If NO is selected then the display will now show.
The display will now show:



If either Yes or No is selected the system will then return you to the Set-Up Menu.
Program Backup Unit:
If secondary lights are installed as backups to the primary lights then a second NV-100
I/O Box will need to be used.
We suggest the output names be the same but with (for example) a 2 added.
E.g. Primary light name = Stern, Secondary name = Stern 2
If PROG BACK-UP is selected.

The display will now show:

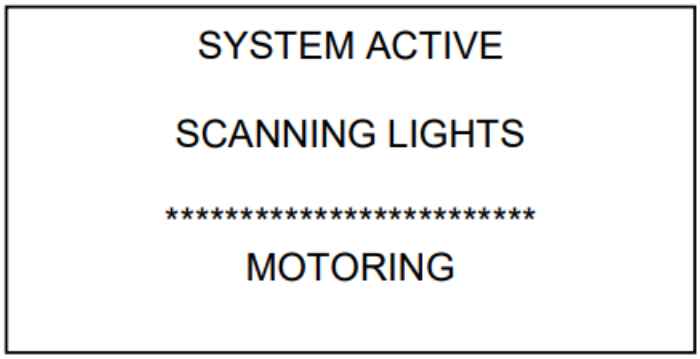


If Yes is selected the second NV-100 I/O Box (Rotary Switch Position 3) will copy the primary I/O Box and the system will then return you to the Set-Up Menu.
If No is selected the system will then return you to the Set-Up Menu.

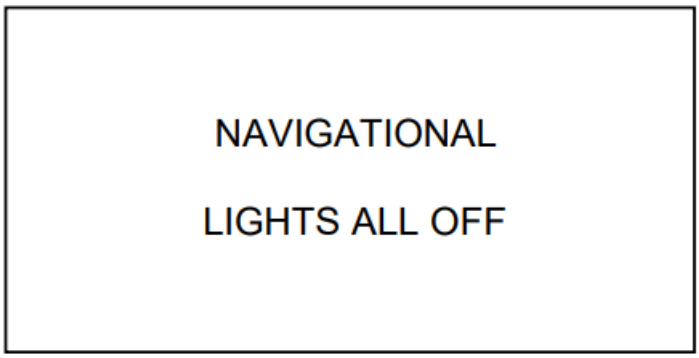
Operating Instructions

Keyboard:
Select Up or Down – scroll up and down the groups (also used in Program Mode).
Mute – mutes the alarm (also used in Program Mode).
ENT – turns lights On and Off (also used in Program Mode).
Dim Up and Down – adjusts the display contrast.
Page Up or Down – used for scrolling up or down a page if more than 8 alarms exist at once.
Alarms:
Should any light fail, due to either a faulty bulb or cable fault, the alarm text will flash on the display and the audible alarm will sound.
Pressing the Mute key will mute all alarms. If the fault condition is still present the alarm text will stop flashing and stay on, should another fault occur the alarm would start again. When the fault condition has gone the fault text will disappear from the screen.
If a twilight sensor has been fitted and no navigational lights have been turned on at dusk, the alarm will sound and the following text will be displayed: “NO NAV LIGHTS ON”.
Normal operation screen if any lights ON e.g. MOTORING

Normal operation screen if any lights ON e.g. MOTORING



Normal operation screen all lights OFF



Interrogating the System:
Whilst in monitoring mode, press and hold the Mute key for 3 seconds (you will hear a bleep every second). The system will now display each Group and the associated Outputs. Twilight Sensor (Anchor Light):
If a twilight sensor is fitted and turned ON: At twilight, if there are NO navigational lights on, the alarm will sound and the display will show “NO NAV LIGHTS ON”.
If a twilight sensor is fitted and turned ON and the Anchor Group has been selected: The Anchor Light will turn ON automatically at twilight and OFF at sunrise. This will continue day after day until the Anchor Group, or sensor, has been turned off.

Error Messages

Errors:
Should the Master Display Unit lose communication with the first I/O Box (NV-100) at rotary switch position 2 the following error massage will be displayed will display “Cable / Fault I/O SW 2 “
If a second I/O Box is fitted:
Should the Master Display Unit lose communication with the second I/O Box (NV-100) at rotary switch position 3 the following error massage will be displayed will display “Cable / Fault I/O SW 3 “ Should the Master Display Unit lose communication with all I/O Box (NV-100) the following error massage will be displayed will display “———-NETWORK FAULT———“. “————CHECK CABLE————“.

Fix:
Check the I/O Box is wired correctly (power and comms) and that the rotary switch (see page 9) is in the correct position.
Check the network cable for open or short circuit, also check network polarity.

Customer Support

Email: sales@smartswitch.co.nz Web: www.smartswitch.co.nz

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INFORMATION = CONTROL

Documents / Resources

	**smartswitch NV-8000 Navigational Light Controller Monitor** [pdf] Installation Guide NV-8000, NV-8000 Navigational Light Controller Monitor, Navigational Light Controller Monitor, Light Controller Monitor, Controller Monitor, Monitor

References

- **Boat Gauges & Marine Monitoring Instruments**