300-DS-UDX2S
Snowmobile Dash Display

UDX2S Dash Features:

- Engine and jackshaft RPM.
- Speedometer
- Four exhaust gas temperature inputs. (sensors sold separately)
- One water temperature.
- Ace M10 setting input.
- Warning indicator inputs for the following items:
  - Low oil
  - Water temperature
  - High beam
  - Detonation
  - Premium fuel
- External warning indicator output.
- V-Net port for expansion of up to 5 additional channels.
- Minimum and Maximum recall.
- Electro luminescent(EL) back light.

Package Contents:

The Ultra Dash kit should contain the following components:

1 – 2 Button Ultra Dash Display
1 – 12 position connector and wires
1 – 15 position connector and wires
1 – Water temperature sensor
1 – Jackshaft RPM sensor (jackshaft collar and magnet sold separately)
1 – Remote switch
1 – Wire terminal kit
1 – Instruction manual
1 – Cut out template

Optional Items:

- Jackshaft collar. Required for speedometer. Available sizes: 0.75”, 1.00”, 1.125”, 1.25”

INSTALLATION

Selecting a Mounting Location:

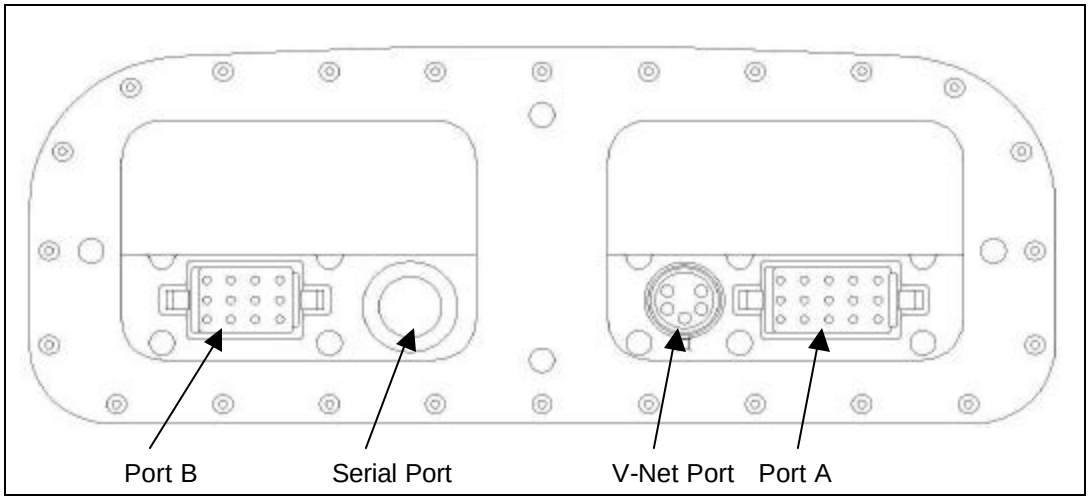
Select a mounting location that does not expose the Ultra Dash to high temperatures. Avoid exposing the front LCD to direct sunlight. Extreme overheating from the sun can temporarily cause the LCD to turn entirely black. Although the dash is water resistant (i.e. rain, snow), you should never submerge any part of the dash under water.

Dash Mounting:

Once you have decided on a mounting location use the supplied template to cut out the rear dash inserts and drill holes for the mounting studs.
Use the supplied machine nuts and locking washers to bolt in the dash. Do not use thread lock or nylock nuts on the mounting studs.

Port Description and Wiring:

Connector Locations



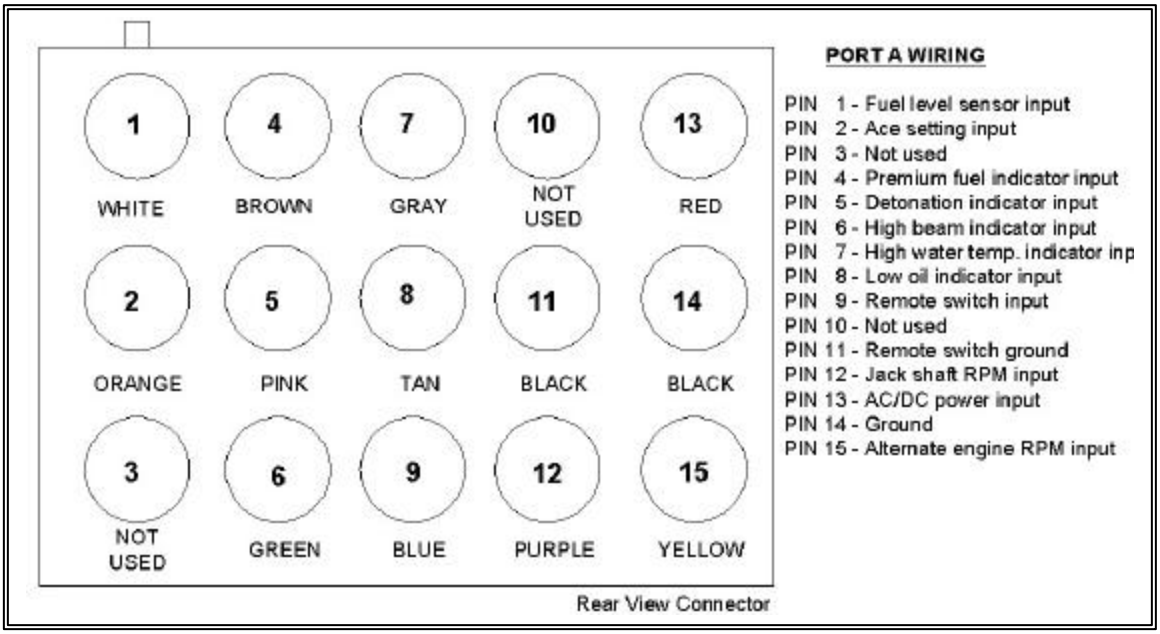
Port A --- Port A is used to connect the main power source, warning indicator inputs, Ace setting input, engine RPM and jackshaft rpm inputs. See the section **Port A Wiring** for complete instructions.

Port B --- Port B is used to connect the 4 EGT probes, water temperature sensor, external warning output and external battery. The EGT probes are sold separately and are not factory installed in the connector. You must install the probes in to the appropriate connector position. See the section **Port B Wiring** for complete instructions.

Serial Port --- The serial port is used to program the dash and download data using the DataLink PC software.

V-Net Port --- The V-Net can be used to install up to 5 additional analog or digital inputs.

Port A Wiring:



Port A uses the 15 position connector. The only factory installed wires in the port A connector are the ones required for power and ground. All other wires are provided with the pins crimped and ready to install if needed. A description of each wire and its function is described below. If you decide not to use an input you may leave the wire uninstalled.

Pin 1 – Fuel Level Sensor Input – 0-5 volt input. Not used in most applications. Can be connected to any standard fuel level sensor.

Pin 2 – Ace M10 Suspension Control Input – When the orange wire is connected the Ace setting will be displayed in the upper left hand corner of the dash. Insert the orange wire in pin position 2. Connect the other end of the orange wire to the Ace M10 controller gauge output wire.

Pin 3 – Not Used.

Pin 4 – Premium Fuel Indicator Input – Grounding the brown wire will cause the premium fuel indicator to activate. Insert the brown wire in pin position 4. Connect the other end of the brown wire to the factory installed premium fuel indicator wire.

Pin 5 – Detonation Indicator Input – Grounding the pink wire will cause the Detonation indicator to activate. Insert the pink wire in pin position 5. Connect the other end of the pink wire to the factory installed detonation indicator wire.

Pin 6 – High Beam Indicator Input – Applying power to the green wire will cause the high beam indicator light in the upper right corner of the dash to activate. Insert the green wire in pin position 6. Connect the other end of the green wire to the high beam wire.

Pin 7 – High Water Temperature Indicator Input – Grounding the gray wire will cause the high water temperature indicator to activate. Insert the gray wire in pin position 7. Connect the other end of the gray wire to the factory installed water temperature switch wire. Do not confuse a water temperature switch with a water temperature sensor. If you are using a water temperature sensor do not use this input. See **Port B Wiring** pin 1 for instructions.

Pin 8 – Low Oil Indicator Input – Applying power to the tan wire will cause the low oil indicator to activate. Insert the tan wire in pin position 8. Connect the other end of the tan wire to the factory installed low oil switch. If your oil level switch goes to ground when activated you will need to install the ground logic level converter contained in the port A wire harness kit. Follow the installation instructions provided in the package.

Pin 9 – Remote Switch Input – When the blue wire is grounded the remote switch input will activate. Insert the blue in pin position 9. Trim the other end of the wire to the desired length and connect to the blue wire on the remote switch using the connectors provided in the remote switch package.

Pin 10 – Not Used.

Pin 11 – Remote Switch Ground – Insert the black wire from the remote switch in pin position 11. Alternately, you can connect the black wire from the remote switch to a good chassis ground instead of running the wire back to pin 11 on the dash.

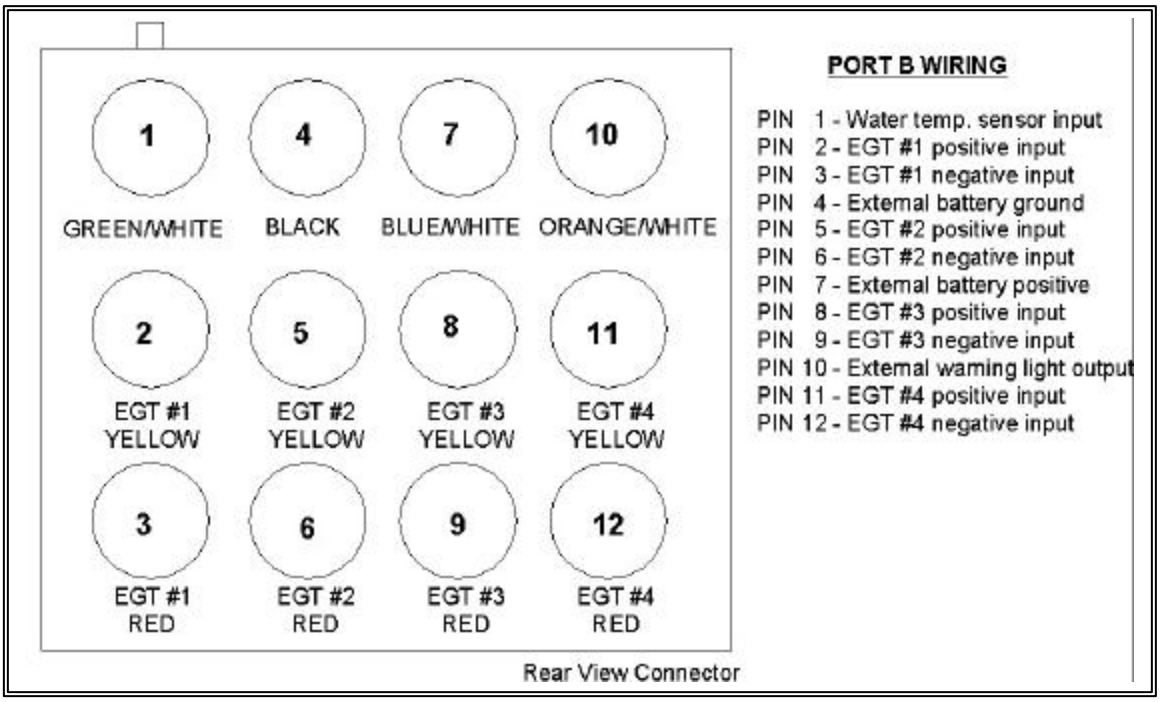
Pin 12 – Jackshaft RPM and Speedometer – Insert the purple wire in pin position 12. Connect the other end of purple wire to the red connector on the jackshaft sensor. See the section **Jackshaft Sensor and Collar Installation** for complete instructions on installing the jackshaft sensor.

Pin 13 – AC/DC power and Engine RPM input – When AC or DC power is applied to this wire the dash will automatically turn on. Connect the red wire to the engine lighting coil. Using this method will get power and the engine RPM signal from this single wire. If only DC power is available then connect the red wire to a DC power source. Using a DC power source will require connecting the yellow wire on pin 15 to get an engine RPM signal. See below for details.

Pin 14 – Ground – Connect the black wire to a solid chassis ground.

Pin 15 –Alternate Engine RPM input – If the red wire is connected to a DC power source you must connect the yellow wire to a valid 5 – 20 volts square wave tachometer output signal in order to get a proper engine RPM reading. Do not connect this wire if the red wire is connected to the AC voltage output from the engine lighting coil.

Port B Wiring:



Port B uses the 12 position connector. Since all port B inputs are optional the wires are provided with the connector pins crimped but the wires are not installed in the connector. A description of each wire and its function is described below. If you decide not to use an input you may leave the wire uninstalled.

Pin 1 – Water Temperature Sensors – Insert the green/white wire in pin position 1. Connect the green/white wire to the optional water temperature sensor. This sensor is used to read the actual temperature in degrees F or C. Do not confuse this input with a high water temperature alarm switch input. If you would like to use the factory installed temperature alarm switch do not use this wire. See **Port A Wiring** pin 7 for instructions.

Pin 2 – EGT #1 Probe Positive – Insert the yellow wire from EGT #1 probe in pin position 2.
Pin 3 – EGT #1 Probe Negative – Insert the red wire from EGT #1 probe in pin position 3.

Pin 4 – External Battery Ground – Connect this wire only if you plan to use an external DC battery to power the dash when the engine is not running. Insert the black wire in pin position 3. Connect the black wire to the ground wire on the external battery.

Pin 5 – EGT #2 Probe Positive – Insert the yellow wire from EGT #2 probe in pin position 5.
Pin 6 – EGT #2 Probe Negative – Insert the red wire from EGT #2 probe in pin position 6.

Pin 7 – External Battery Positive – Connect this wire only if you plan to use an external DC voltage Ni-Cad battery to power the dash when the engine is not running. Insert the blue/white wire in pin position 7. Connect blue/white wire to the positive wire on the external battery. Note: A minimum of 9 volts is required to properly power the dash. **DO NOT CONNECT THIS WIRE TO THE ENGINE LIGHTING COIL OR ANY OTHER AC VOLTAGE SOURCE. DOING SO WILL CAUSE SEVERE DAMAGE TO YOUR DASH AND WILL VOID YOUR WARRANTY!!!**

Pin 8 – EGT #3 Probe Positive – Insert the yellow wire from EGT #3 probe in pin position 8.
Pin 9 – EGT #3 Probe Negative – Insert the red wire from EGT #3 probe in pin position 9.

Pin 10 – External Warning Light Output – Connect this wire only if you plan to use an external warning light. Insert the orange/white wire in pin position 10. Connect the other end of the orange/white wire to the ground side of your warning light. Connect the other side of the warning light to power.

Pin 11 – EGT #4 Probe Positive – Insert the yellow wire from EGT #4 probe in pin position 11.
Pin 12 – EGT #4 Probe Negative – Insert the red wire from EGT #4 probe in pin position 12.

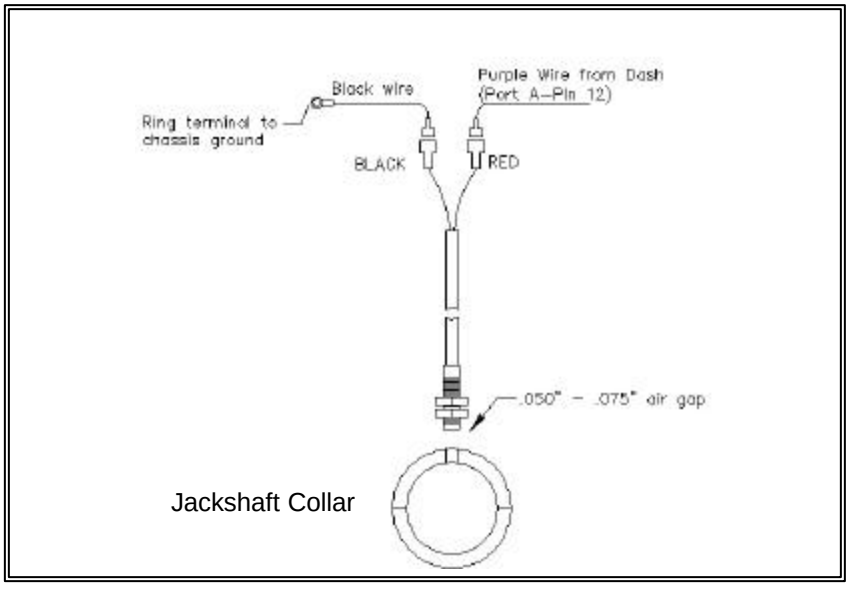
Sensor Installation

EGT Probe Installation
Instructions for the installing the EGT probes in the pipe are provided in the EGT probe package. Follow the instructions provided in the package.

Water Temperature Sensor Installation
The water temperature sensor is typically installed in place of the OEM temperature switch. The water temperature sensor provided uses 1/8" NPT thread. An adaptor will be required if your current temperature switch uses a larger thread. Make sure to use thread sealer when installing the sensor to prevent water leaks.

Removing Wires from the Connector and/or changing EGT Probes
Removing a wire from the connector or changing an EGT probe requires a special tool which can be purchased from your dealer. Carefully follow the instructions provided with the tool if you need to remove a pin from the connector.

Jackshaft Sensor and Collar Installation
Due to the various jackshaft diameters the collar which holds the magnet must be purchased separately. If you did not purchase a jackshaft collar contact your dealer for more information. Install the collar on the jackshaft. Make sure the collar fits snug and cannot slip. If the collar does not fit properly contact your dealer to obtain a correctly sized collar. Mount the sensor so that it is directly over the collar and has 0.050" to 0.075" air gap. Connect the purple wire from the dash port A pin 12 to the red connector on the sensor. Connect the sensors black wire to chassis ground.



Remote Switch
The remote switch is used to change dash displays without the rider remove their hands from the bar. If you do not wish to use this function you may leave the remote switch uninstalled if desired.

ACTION	FUNCTION
Press and release button	Scroll between the three display pages

External Battery
An external Ni-Cad battery can be used to power the dash when the engine is not running and power is not available to the main power input at port A pin 13. When the engine is shut off or the main power is disconnected the dash will remain powered on the external battery until the max on time has expired without any button presses. (see **Setup mode** MXON). To turn the dash on without main power, press and hold the MODE button until the dash completely turns on. See **Port B Wiring** for information on wiring an external battery.

WARNING!!
While the engine is running the dash will slowly charge the external battery. Make sure to only use a 9–18 volt Ni-Cad battery.
Attempting to use and charge other types of batteries could cause them to leak and/or explode.

Installing V-Net Channels

Adding V-Net channels requires DataLink PC programming software and serial cable. The software allows you to program which channel you would like to view in each of the display positions. Without this software you will not be able to view channels added to the V-Net port. Contact Racepak or your dealer for purchasing information.

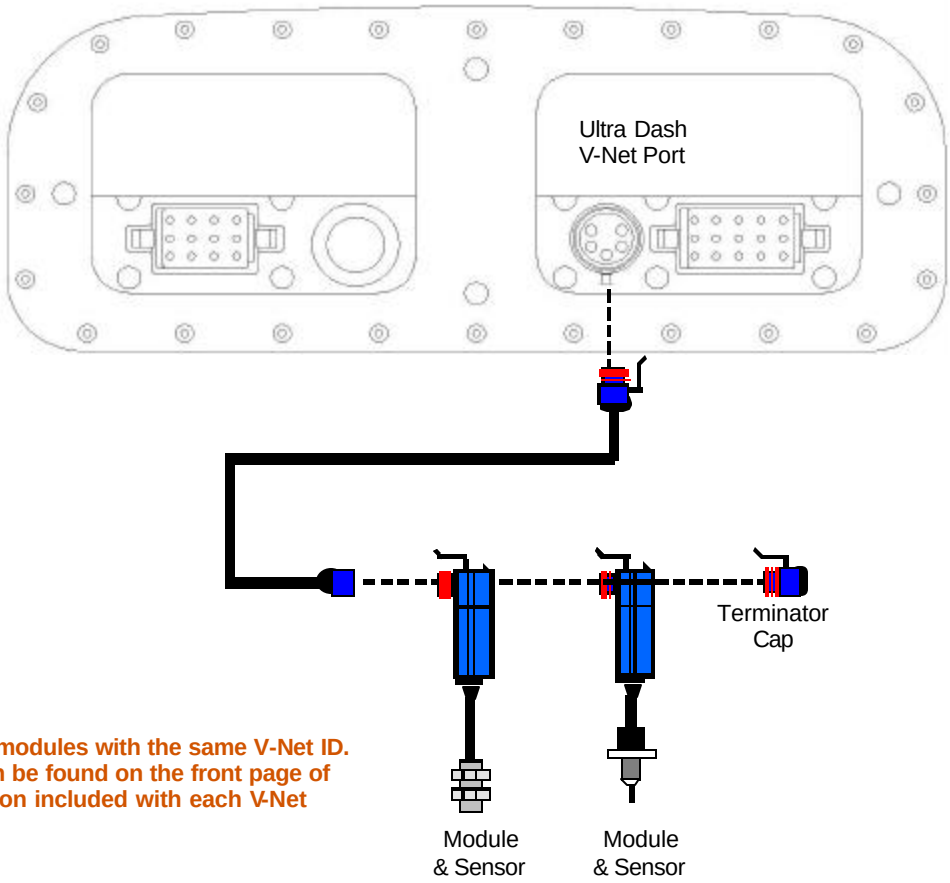
You can add up to five additional channels to your Ultra Dash by installing modules on the V-Net port. For instance, if you wanted to monitor turbo boost pressure you would need to purchase a boost pressure V-Net module. Follow the steps below to add V-Net modules to your Ultra Dash.

Step #1 — Unplug the factory installed terminator cap from the V-Net port on the back of the dash

Step #2 — Plug the V-Net extension cable in the V-Net port.

Step #3 — Plug the other end of the V-Net cable in to the first V-Net module. You can install up to five V-Net modules. You can plug the V-Net modules in any order that is convenient. The modules can be plugged directly in to each other or a V-Net extension cable can be used between modules if necessary.

Step #4 — Plug the terminator cap removed in step #1 in to the last V-Net module.



IMPORTANT!!
Do not use two modules with the same V-Net ID. The V-Net ID can be found on the front page of the documentation included with each V-Net module.

PROGRAMMING AND OPERATION

Getting Started:

After installation the first thing you should do is configure the setup parameters. Although the factory defaults will work fine for most users, you should run through the setup mode and adjust the engine rpm pulses per revolution, EGT warning levels and speedometer calibration. See **Setup Mode** for more information.

How the Buttons Work:

Each button can perform three different functions depending on how long the button is held down. In this manual we will refer to the three different button press types as SHORT, MED and LONG. To help determine when to release the button, and as a result the type of button press, you need to look at the how many times the warning indicators in the upper corners of the dash flash. If you release the button after one flash a SHORT button press will be entered. Releasing the button after two flashes will result in a MED button press and three flashes will result in a LONG button press. Table 1 list the three different button press types.

Type	Warning Flashes	Time in Seconds
SHORT	1	Less than 2
MED	2	2
LONG	3	3 or more

Table 1

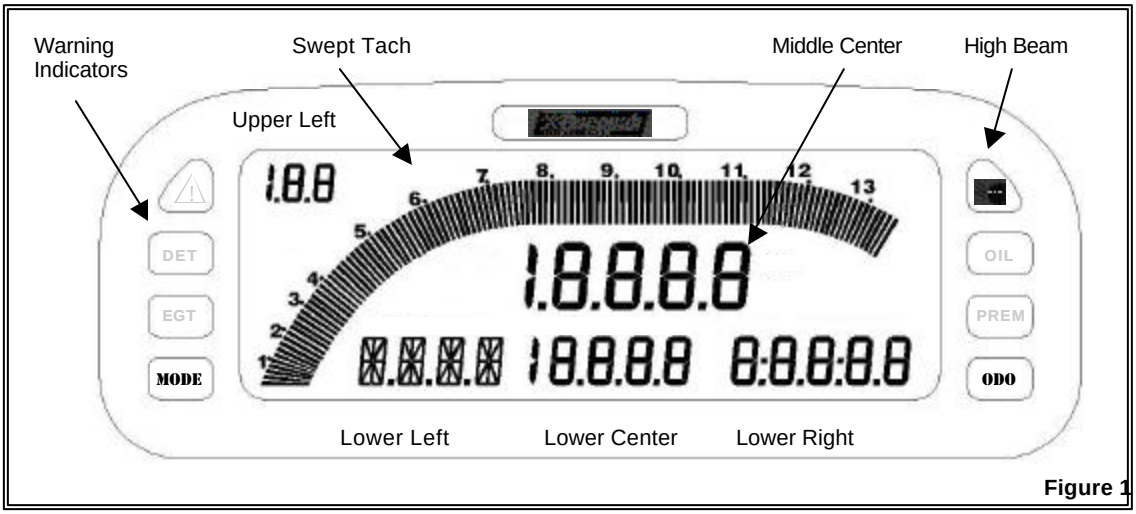


Figure 1

Figure 1 illustrates the channel positions and labels the terminology used in this manual to describe each position on the LCD display. There are six channel positions on the LCD and six indicator lights. The lower left channel position can display both numbers and letters. The other five positions can only display numerical values.

Display Modes:

The behavior of each button press depends on the mode the dash is currently in. See the appropriate mode section below for a list of button behaviors in each mode.

There are 3 different modes.

- Setup Mode
- Real-time Mode
- Min – Max Recall Mode

Setup Mode:

Turn the dash on by either starting the engine or, if you have an external battery connected, pressing and holding the MODE button until the display turns on. Enter a MED press on the ODO button by pressing and holding for two warning light flashes. While in setup mode a SHORT press on the MODE button will change to the next setup parameter. A MED press on the MODE button will step back to the previous setup parameter. A SHORT press on the ODO will increment the value in small steps. Press and hold on the ODO button will increment the value in large steps. A MED press on the ODO button will decrement the value. To exit setup mode enter a LONG press on the MODE button until the word **WAIT** is displayed in the lower left LCD position. Make sure you do not turn the dash off until the word **WAIT** has disappeared and the dash has reset.

Table 2 shows the behavior of each button while in Setup mode.

Button	SHORT Button Press (one light flash)	MED Button Press (two light flashes)	LONG Button Press (three light flashes)
MODE	Move to next setup parameter	Move to previous setup parameter	Exit Setup mode
ODO	Increment setup parameter value in small step	Decrement setup parameter value	Increment setup parameter value in large step (press and Hold)

Table 2

Table 3 shows each setup parameter and the available options.

#	Parameter Description	Lower Left LCD Code	Available Options (Lower Right LCD)	Factory Default
1	Default back light intensity level	bLIT	Level 0-9 9 = highest level 6 = factory default	6
2	Default Display Page (see Real-time section for info)	dISP	1, 2, 3	1
3	Units of Measure	UNIT	0=English 1=Metric	0
4	Engine RPM odd fire	OddF	0 – 8 Set to 0 if your engine is not an odd fire	0
5	Engine RPM pulses per revolution	R1 P	0 – 20 6 is correct for most snowmobiles.	6

6	Swept tach engine rpm scale	**SCAL**	0 = 11,500 rpm max 1 = 13,500 rpm max	0
7	Engine RPM rev warning	**REVL**	0 – 20,000 RPM	8,500
8	Jackshaft sensor type	**R2TY**	0 = Magnet switch 1 = Zero crossing	0
9	Number of magnets in jackshaft collar (pulses per rev)	**R2 P**	0 – 20 1 is standard setting	1
10	Jackshaft pulses in 1/8th mile/km (see **Speedometer Calibration** section)	**P8MI**	0 – 10,000	660
11	Jackshaft pulses in 1 mile/km (see Speedometer Calibration section)	**P1MI**	0 – 10,000	5280
12	Odometer Starting Value	**OdOS**	0 – 320,000	0
13	Water temp. sensor type	**WTYP**	0 – 6 4 = standard sensor provided with kit	4
14	Fuel tank empty value. (see **Fuel Level Calibration** section)	**FTLO**	0 – 5,000	0
15	Fuel tank full value. (see **Fuel Level Calibration** section)	**FTHI**	0 – 5,000	5000
16	Remote switch input value when ON.	**SWON**	0 = input is grounded when ON 1 = input has voltage when ON	0
17	High beam indicator input value when ON.	**HbON**	0 = input is grounded when ON 1 = input has voltage when ON	1
18	Detonation indicator input value when ON.	**SWON**	0 = input is grounded when ON 1 = input has voltage when ON	0
19	Premium fuel indicator input value when ON.	**PFON**	0 = input is grounded when ON 1 = input has voltage when ON	0
20	Low oil level indicator input value when ON.	**OLON**	0 = input is grounded when ON 1 = input has voltage when ON	1
21	High water temp. switch indicator input value when ON.	**HWON**	0 = input is grounded when ON 1 = input has voltage when ON	0
22	EGT #1 alarm level	**EGT1**	0 – 1700 Deg.	1350
23	EGT #2 alarm level	**EGT2**	0 – 1700 Deg.	1350

24	EGT #3 alarm level	**EGT3**	0 – 1700 Deg.	1350
25	EGT #4 alarm level	**EGT4**	0 – 1700 Deg.	1350
26	High water temp alarm level	**H2OT**	0 – 300 Deg.	170
27	Auto off time.	**MXON**	0 – 100 minutes	5

Table 3

Speedometer Calibration:

The speedometer, odometer and trip odometer will not read correctly until you perform the following calibration procedure.

1) Turn on the dash and enter setup mode by entering a MED press on the ODO button.
2) Step through each setup parameter by entering a SHORT press on the MODE button until you reach the **P8MI** parameter in the lower left LCD position.
3) Drive exactly 1/8 of mile (660 ft) and stop. (Drive 1/8 of kilometer if using metric units)
4) Enter a LONG press on the ODO button to set the calibration factor.
5) Exit setup mode by entering a LONG press on the MODE button until the word **WAIT** is displayed in the lower left LCD position. Make sure you do not turn the dash off until the word **WAIT** has disappeared and the dash has reset.

Fuel Level Calibration:

From the factory, the fuel level will read from 0 to 5000. If you would like the fuel level to read from 0 to 100 percent you must properly perform the following calibration procedure.

1) Empty the fuel tank to the level you wish to call %0.
2) Turn on the dash and enter setup mode by entering a MED press on the ODO button.
3) Step through each setup parameter by entering a SHORT press on the MODE button until you reach the **FTLO** parameter in the lower left LCD position.
4) Enter a LONG press on the ODO button to set the tanks empty value.
5) Enter a SHORT press on the MODE button to reach the next parameter **FTHI**.
6) Fill the fuel tank to the level you wish to call %100.
7) Enter a LONG press on the ODO button to set the tanks full value.
8) Exit setup mode by entering a LONG press on the MODE button until the word **WAIT** is displayed in the lower left LCD position. Make sure you do not turn the dash off until the word **WAIT** has disappeared and the dash has reset.

Real-time Mode:

The dash will power up in Real-time mode each time it is turned on. While in Real-time mode you can scroll between the three main display pages by entering a SHORT key press on the MODE button. The lower right display is controlled by the ODO button. Enter a SHORT key press on the ODO button to change the lower right display. Enter a LONG press on the ODO button to Reset the trip odometer.

Table 4 shows the channel positions for each of the three display pages.

	LCD Section	Channel Displayed
DISPLAY #1	Swept Tach	Engine RPM
	Middle Center	Speedometer
	Upper Left	Fuel Level
	Lower Left	Water Temperature
	Lower Center	Maximum Exhaust Gas Temperature Value and Cylinder Number
	Lower Right	Odometer/ Trip / EGT 3 / EGT 4 (see note below)
DISPLAY #2	Swept Tach	Speedometer
	Middle Center	Engine RPM
	Upper Left	Ace Setting
	Lower Left	Water Temperature
	Lower Center	Maximum EGT Value and Cylinder Number
	Lower Right	Odometer/ Trip / EGT 3 / EGT 4 (see note below)
DISPLAY #3	Swept Tach	Engine RPM
	Middle Center	Speedometer
	Upper Left	Water Temperature
	Lower Left	EGT 1
	Lower Center	EGT 2
	Lower Right	Odometer/ Trip / EGT 3 / EGT 4 (see note below)

Table 4

Table 5 shows the behavior of each button while in Real-time mode.

Button	SHORT Button Press (one light flash)	MED Button Press (two light flashes)	LONG Button Press (three light flashes)
MODE	Change display pages	Switches between Real-time, min & max modes	Reset minimum & maximum recall values
ODO	Toggle lower right channel position between odometer, trip and EGT 3 and EGT 4	Enter Setup Mode	Reset trip odometer

Table 5

Note: The number 4 will not show in the channel tag when EGT channel four is displayed in the lower right corner.

Min – Max Recall Mode:

The min – max recall mode displays the minimum and maximum reading on all channels since the dash was turned on or the min – max values have been manually cleared. To display the minimum values enter a MED press on the MODE button. The word MIN will be displayed under the swept tach. To display the maximum values enter another MED press on the MODE button. The word MAX will be displayed under the swept tach. While you are in min – max mode you may change displays to see additional channels if needed. To return to Real-time mode and exit min – max mode enter another MED press on the MODE button.
To clear the minimum and maximum values enter a LONG press on the MODE button.

Warning Indicators:

Your Ultra Dash has three types of warning indicators.

- Internal warning lights.
- Alpha display in the lower left position on the LCD.
- External warning light output. (see **Wiring Port B**).

All of the warning inputs do not activate all three warning indicator types. Some only activate the alpha display, while others activate all three.

Table 9 shows which warning types are activated by each warning indicator.

Warning Cause	Alpha Warning Tag	External Warning	Internal Warning	Upper Right Internal Warning
Water Temp. Sensor	H2OT	X	X	
Water Temp. Switch	H20T	X	X	
Low Oil Level	OIL			
Detonation	DET	X	X	
Premium Fuel Required	PREM		X	
High Beam				X
EGT 1	EGT1	X	X	
EGT 2	EGT2	X	X	
EGT 3	EGT3	X	X	
EGT 4	EGT4	X	X	
Engine Rev Limit	RPM	X		

Table 9

Six Month Limited Warranty on Parts and Workmanship

Purchaser's only remedy and seller's only liability shall be to repair or replace materials provided by the purchaser to be defective and returned to seller with a copy of purchaser's receipt. Seller shall not be liable for any injury, expenses, profits, loss or damage, direct, incidental, or consequential, or any other pecuniary loss arising out of the use or inability to use the product in question even if seller has been advised of the possibility of such damages. Because some states do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you.

It is purchaser's responsibility to notify seller of suspected defects as soon as purchaser becomes aware of them, and to follow seller's instructions to minimize further damage. Seller is not responsible for damage resulting from purchaser's inaction.

Exhaust gas temperatures are intended only for use as a tuning tool. Due to differences in installation and airflow the reported temperature at the probe may be substantially different from the temperature inside the cylinder. The determination of such differences is the sole responsibility of the user of the equipment.

CSI assumes no liability for probes. Temperature probes are covered by 'Exhaust Gas Technologies' warranty. For warranty information on temperature probes contact EGT at 1-800-348-4678.