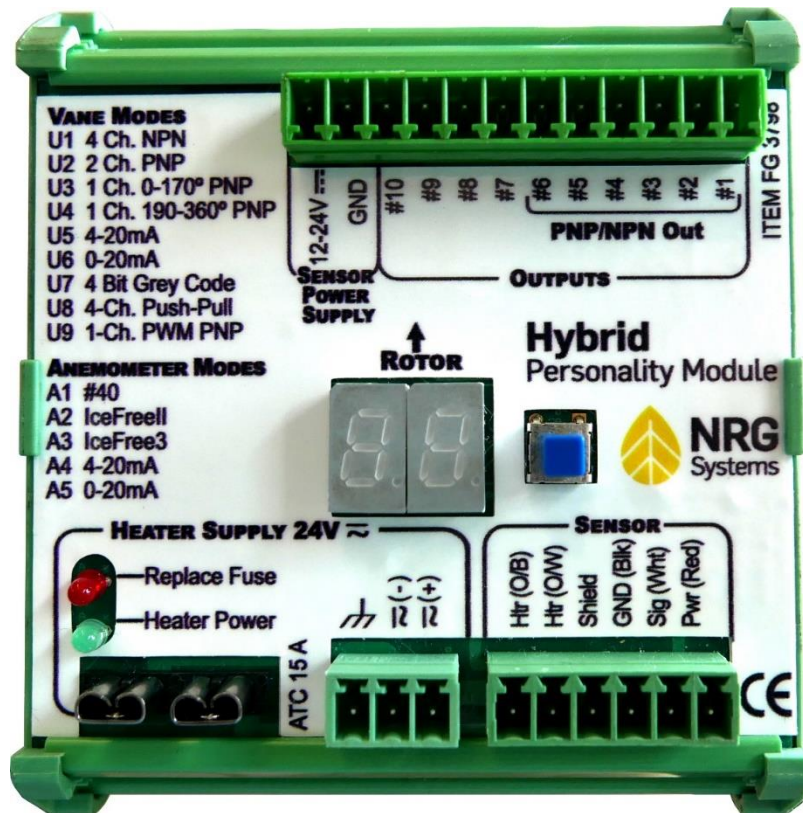


NRG Product Manual

Personality Module

Authors:
Technical Services



NRG_PersonalityModule_Manual

Rev. 1.0



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CUSTOMER SUPPORT

NRG Systems offers a variety of support options to help you get the most from your NRG Systems product. If you have questions about your NRG Systems product, first look in the Tech Support section of the NRG Systems web site. If you cannot find the answer, contact your salesperson or NRG Systems Technical Support for assistance using the information below. Customer support is available 8:30 AM to 5:00 PM EST, Monday through Friday.

**NRG Systems
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05461 U.S.A.**

**Telephone: 802-482-2255
Email: Support@nrgsystems.com**

When you call or email, you should have the appropriate product documentation at hand and be prepared to give the following information:

- Customer name
- Who purchased equipment
- Item number or description
- Serial number
- When equipment was purchased
- Where equipment is installed - terrain conditions
- Description of the problem with some detail
- What events took place leading up to the problem
- What you have tried while attempting to solve the problem

NRG Systems maintains an extensive website which includes an in-depth customer support area for NRG Systems customers. If you need assistance at times other than our regular business hours, we suggest visiting our website, www.nrgsystems.com.

All instruments, sensors, software and towers manufactured by NRG Systems are designed to be reliable and easy to use. We welcome your comments and appreciate your help in making NRG products the best available.



Personality Module

INTRODUCTION

The Hybrid Personality Module (PM) is a signal conversion module designed specifically for the NRG Hybrid Turbine Control Sensor. It will convert the Hybrid sensor’s frequency output signal to most common type signals that your wind turbine controller requires as inputs for wind speed and direction. The type of output signal is selectable from a list of predefined sensor modes.

The sensor mode is selected through a push button on the front of the Personality Module. Connections are made through pluggable terminal blocks. A two-digit display provides visual feedback on the status and operation of both the Hybrid sensor and Personality Module (PM). A 15-amp fuse is provided for heater power. Status LED lights indicate the presence of heater power (green) or a blown fuse (red).

Using This Manual

Read this manual completely before installing and operating the Hybrid XT vane. Follow all instructions and recommendations closely.

This document and the sensor may use the following symbols:



Earth (Ground)



Chassis Ground



AC Voltage



AC or DC Voltage



DC Voltage



Hot Surface



WARNING

NOTICE

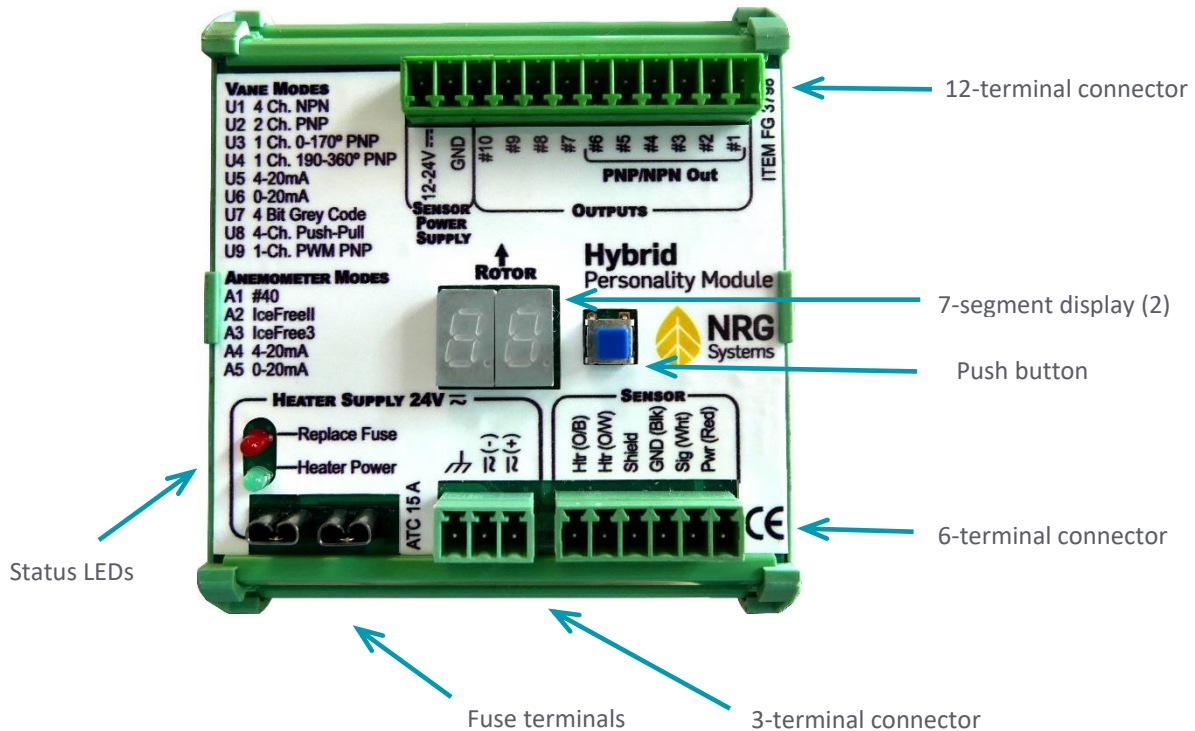
This typeface within the body of the manual is used for general descriptions and instructions to the user.

This typeface is used to warn users of a potential danger, either to themselves or to the sensor.



PERSONALITY MODULE OPERATION AND CONSIDERATIONS

Components Diagram





Personality Module

Theory of Operation

The Personality Module (PM) is an easy to use conversion unit for turbine control applications that require an input signal other than the standard frequency signal provided by the Hybrid XT (HXT) Turbine Control Sensor (e.g. retrofit of an existing NRG IceFree installation). The PM requires an input power supply of 12-24VDC. The HXT sensor is connected to the PM through a 6-terminal connector. The desired output signals from the PM are provided through a 12-terminal connector. A 3-terminal connector is available for heater power input to the PM (24V DC or AC).

When the Personality Module (PM) is initially powered on, the firmware revision level flashes briefly on the display (e.g. r1). Next, the sensor mode that is currently programmed into the PM is displayed for two seconds (e.g. U1, U2, A1). If a sensor is connected to the PM, the sensor output will be displayed next. For a HXT anemometer, the display will show the approximate wind speed in m/s. For a HXT vane, the display will indicate the orientation of the vane (see details in section “Display Information”).

If no sensor is connected to the Personality Module an E1 will be displayed indicating an error. If the wrong sensor is connected, then an E2 error will be displayed. An E2 error indicates that the Personality Module has been programmed for a vane (modes U1-U9) and a HXT anemometer is connected. Likewise, an E2 will be displayed if the PM has been programmed for an anemometer (modes A1-A5) and a Hybrid vane has been connected. The PM sensor mode can easily be checked by tapping and releasing the push button.

Programming the PM

The Personality Module is easily programmed through the push button located on the front panel. Quickly pushing and releasing this button will display the sensor mode that is currently programmed in the PM. To change modes simply push and hold the button and the display will cycle through each of the sensor modes. When the desired sensor mode is displayed, release the button. The PM is now ready to use with this sensor mode.

Power Requirements

Supply Voltage: 12-24 V DC

Supply Current: 80 mA (max) 25 mA (typical) plus 51 mA (max) with Hybrid XT Sensor

Heater Supply Voltage: 24 V AC or DC



Sensor Mode Summary Table:

MODE	LABEL	DESCRIPTION	PINS
U1	4 Ch. NPN	Simulates an NRG IceFree NPN 4-Channel Yaw Vane	#1, #2, #3, #4
U2	2 Ch. PNP	Simulates an NRG IceFree PNP 2-Channel Yaw Vane	#1, #2
U3	1 Ch. 0-170° PNP	Simulates an NRG IceFree PNP 1-Channel Yaw Vane for 0-170°	#1
U4	1 Ch. 190-360° PNP	Simulates an NRG IceFree PNP 1-Channel Yaw Vane for 190-360°	#1
U5	4-20mA	Provides a 4-20mA current loop (sourcing) = 0 to 360°	#8
U5	1 – 5V	Provides a 1-5V signal = 0 to 360°	#7
U6	0 – 20 mA	Provides a 0-20mA current loop (sourcing) = 0 to 360°	#8
U6	0 – 5V	Provides a 0-5V signal = 0 to 360°	#7
U7	4 Bit Grey Code	Provides a 4 Bit Grey Code Push Pull	#1, #2, #3, #4
U8	4 Ch. Push-Pull	Simulates the NRG IceFree 4-Channel Yaw Vane with Push-Pull Output	#1, #2, #3, #4
U9	1-Channel PWM PNP	Simulates a PNP 1-channel Yaw Vane for 180° - 360° with artificial dithering from 160° - 200°	#1, #2
A1	#40	Simulates an NRG 40C output with a 16Vp-p (8Vp) signal	#1, #2, #3, #10
A2	IceFreeII	Simulates an IceFreeII anemometer output with 16Vpp (8Vp) signal	#1, #2, #3, #10
A3	IceFree3	Simulates an IceFree3 anemometer output with 16Vpp (8Vp) signal	#1, #2, #3, #10
A4	Other (see Manual)	Provides a 4-20mA current loop (sourcing) = 0 to 50 m/s	#8
A4	Other (see Manual)	Provides a 1-5V signal = 0 to 50 m/s	#7
A5	Other (see Manual)	Provides a 0-20mA current loop (sourcing) = 0 to 50 m/s	#8
A5	Other (see Manual)	Provides a 0-5V signal = 0 to 50 m/s	#7

NOTE: In all cases the Sensor Power Supply 24VDC and GND terminals should be used.

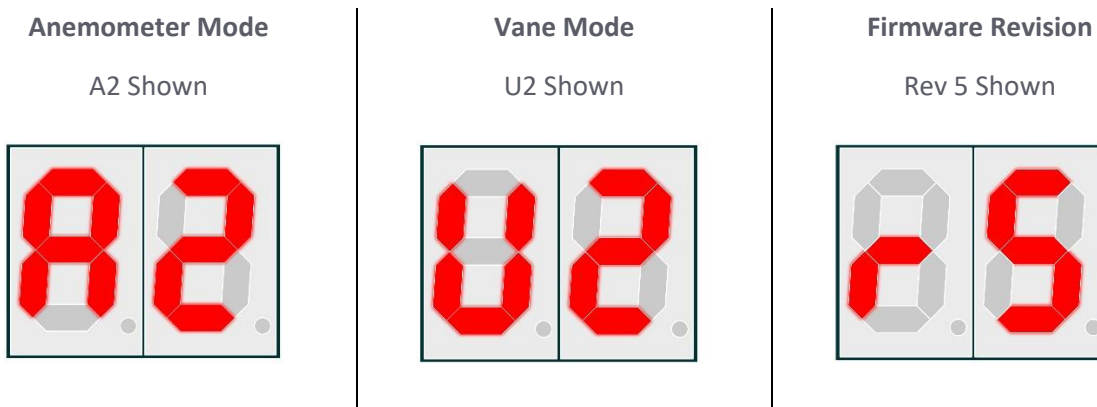


Personality Module

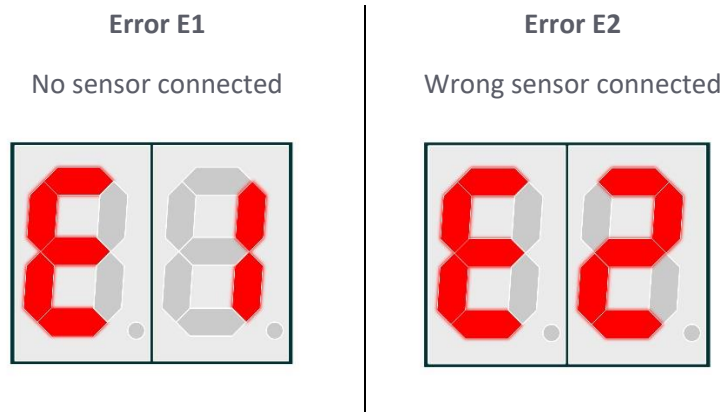
Display Information

The PM display provides information on sensor mode, software revision, sensor reading, and error code. The following sections show examples of each display feature.

Sensor Mode and Software Revision



Error Codes

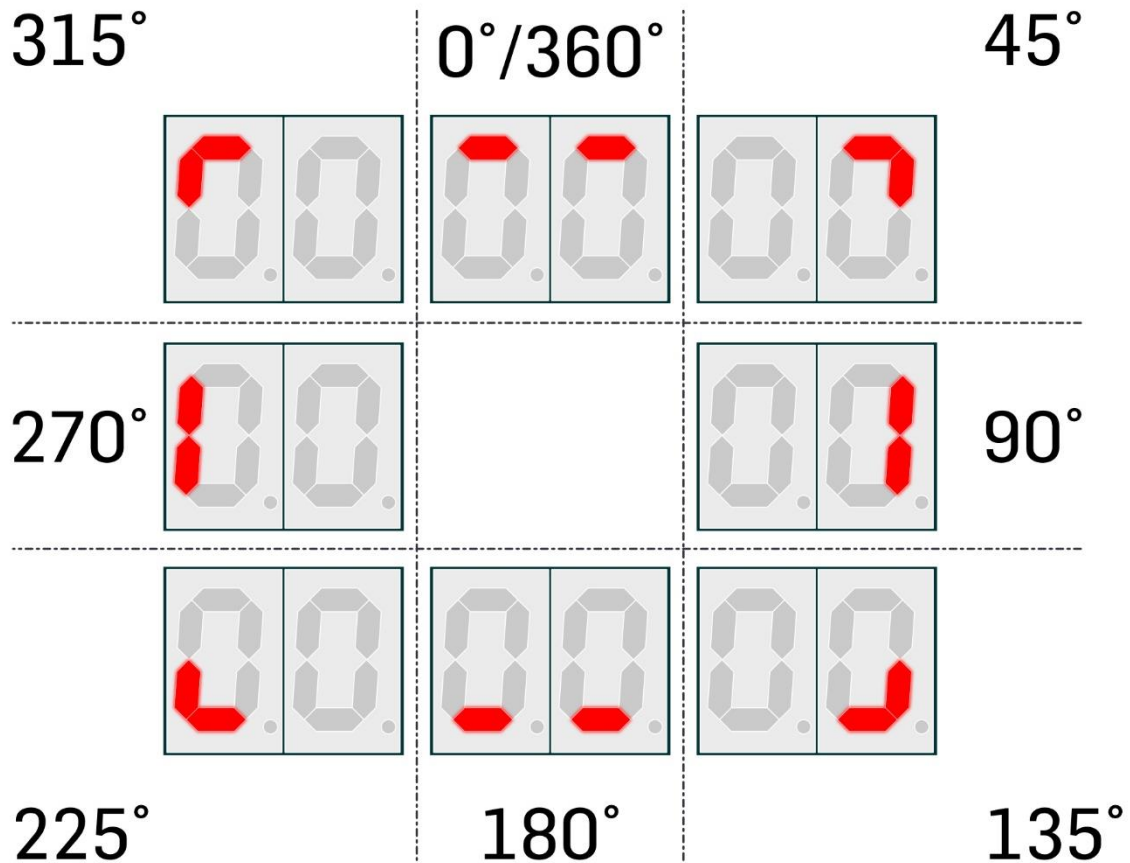




Personality Module

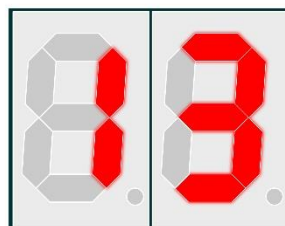
Vane Sensor Reading - Positioning

When programmed for a vane the PM display will show the relative position of the vane with respect to the rotor. The outer segments of the 7-segment display will illuminate based on this relative position as shown.



Anemometer Sensor Reading – m/s

The anemometer is reading 13 m/s.





Connector Details

12-Terminal Connector:

Terminal Label	Function
12-24 VDC	(+) input for power
GND	(-) input for power
#10	(+) output for simulated NRG anemometer modes (A1, A2, or A3)
#9	(-) output
#8	(+) output for 4-20mA mode or 0-20mA mode (U5, U6, A4, or A5)
#7	(+) output for 0-5V in the 0-20mA mode or 1-5V in the 4-20mA mode.
#6 (PNP/NPN Out)	Active PNP output when error (E1 or E2) is detected.
#5 (PNP/NPN Out)	Active NPN output when error (E1 or E2) is detected.
#4 (PNP/NPN Out)	Active NPN output for mode U1
#3 (PNP/NPN Out)	Active NPN output for mode U1; Active Push/Pull for modes A1, A2, A3
#2 (PNP/NPN Out)	Active NPN output for mode U1; Active PNP for modes U2, A1, A2, A3, U9
#1 (PNP/NPN Out)	Active NPN output for modes U1, A1, A2, A3; Active PNP for modes U2, U3, U4, U9

6-Terminal Connector:

Terminal Label	Function
Htr (O/B)	Sensor cable heater connection (orange/black wire)
Htr (O/W)	Sensor cable heater connection (orange/white wire)
Shield	Sensor cable shield connection
GND (Blk)	Sensor cable ground connection (black wire)
Sig (Wht)	Sensor cable signal connection (white wire)
Pwr (Red)	Sensor cable power connection (red wire)

3-Terminal Connector:

Terminal Label	Function
Earth	Ground connection for heater power input (not heater common)
AC (L) / DC (+)	Heater power input [24V AC or DC]
AC (N) / DC (-)	Heater power input [24V AC or DC]



SENSOR MODE DESCRIPTIONS

Vane Modes U1-U9

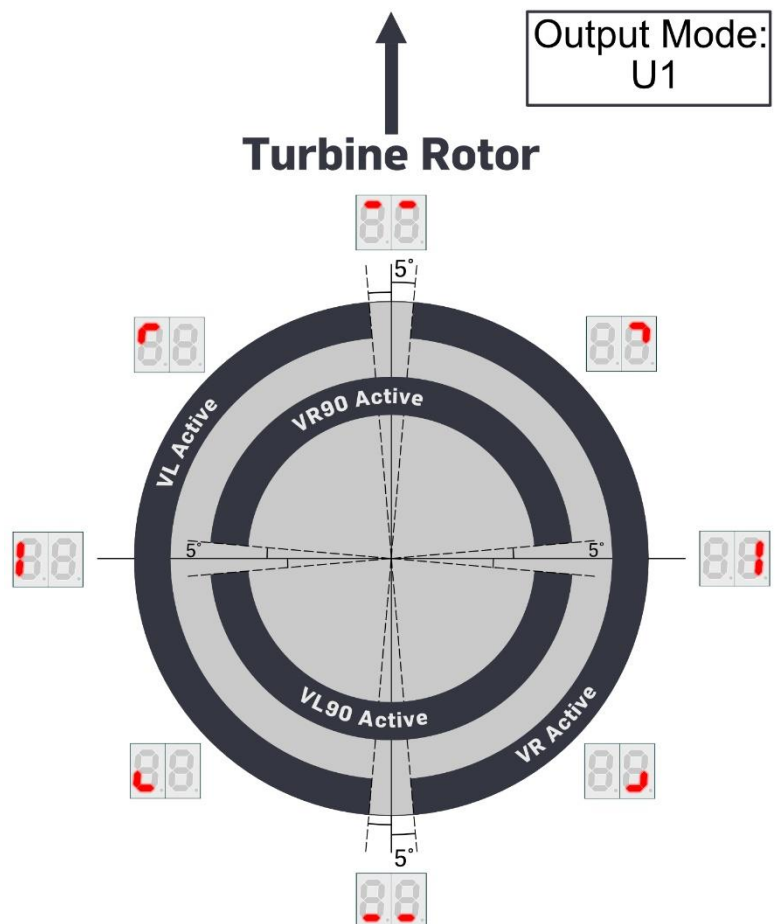
Vane Mode U1: 4-Channel NPN

Vane mode U1 is used to simulate the output of an NRG IceFree model 4-channel NPN yaw vane as shown in Figure 5. Output terminals #1 through #4 correspond to the 4 channels as follows:

Terminal Number	Output Signal
1	VR
2	VL
3	VR90
4	VL90

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1 through #4 will float.





Personality Module

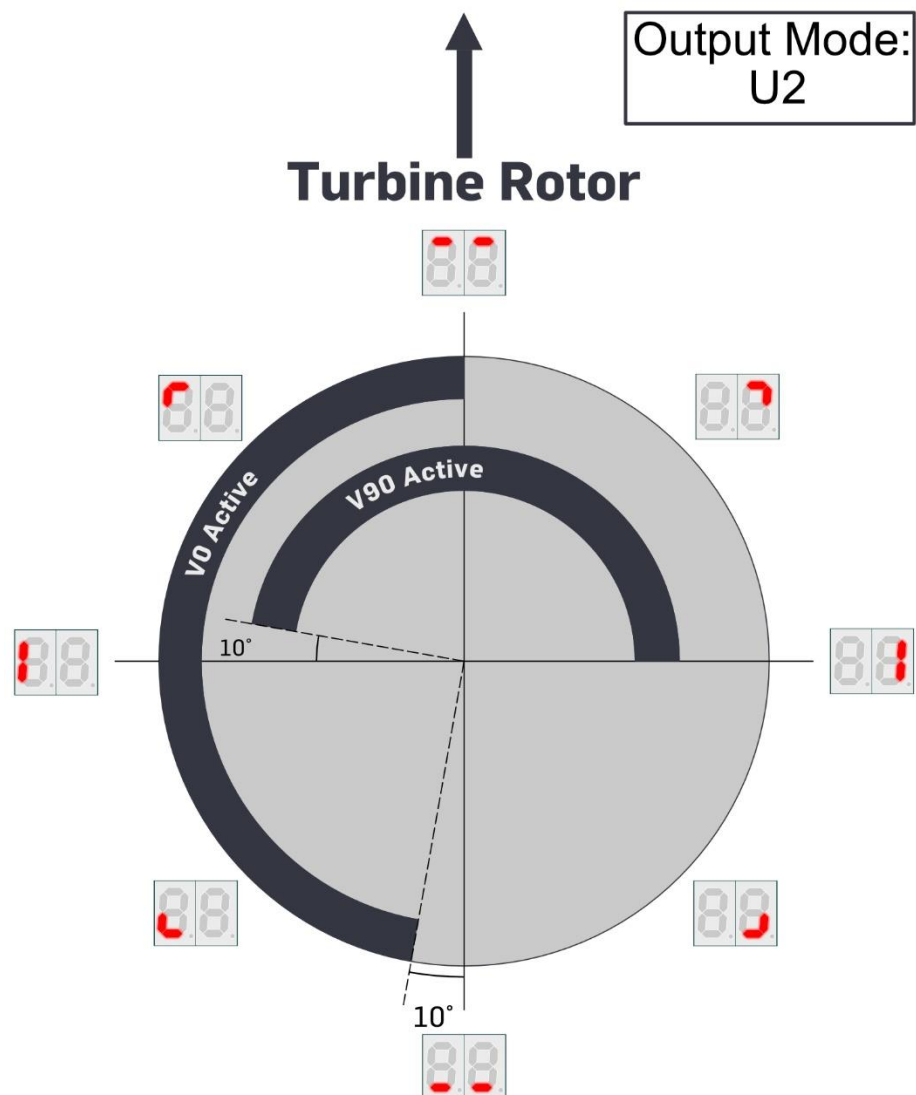
Vane Mode U2: 2-Channel PNP

Vane mode U2 is used to simulate the output of an NRG IceFree model 2-channel PNP yaw vane. A detailed output diagram is shown below. Output terminals #1 and #2 correspond to the 2 channels as follows:

Terminal Number	Output Signal
1	V90
2	V0

Output terminals #3 and #4 will float in this mode. Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1 through #4 will float.





Personality Module

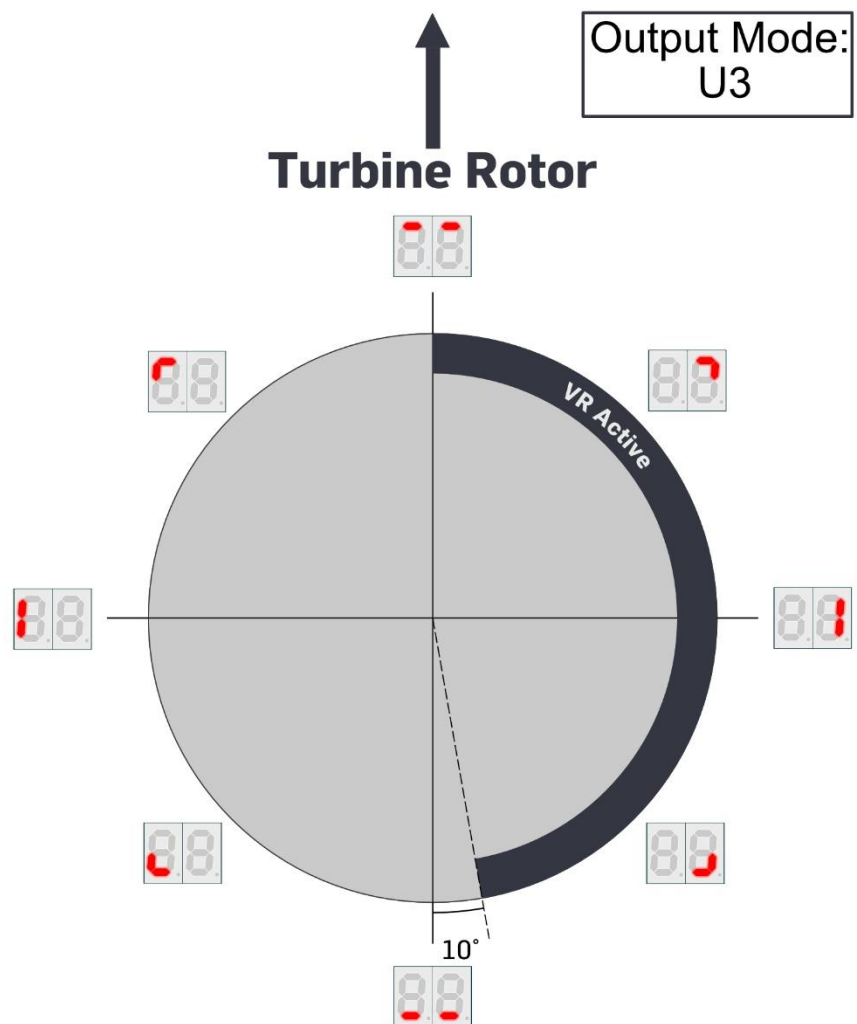
Vane Mode U3: 1-Channel PNP (0-170°)

Vane mode U3 is used to simulate the output of an NRG IceFree model 1-channel PNP yaw vane with active region between 0° and 170°. A detailed output diagram is shown below. Output terminal #1 corresponds to the 1 channel as follows:

Terminal Number	Output Signal
1	VR

Output terminals #2 through #4 will float in this mode. Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1 through #4 will float.





Personality Module

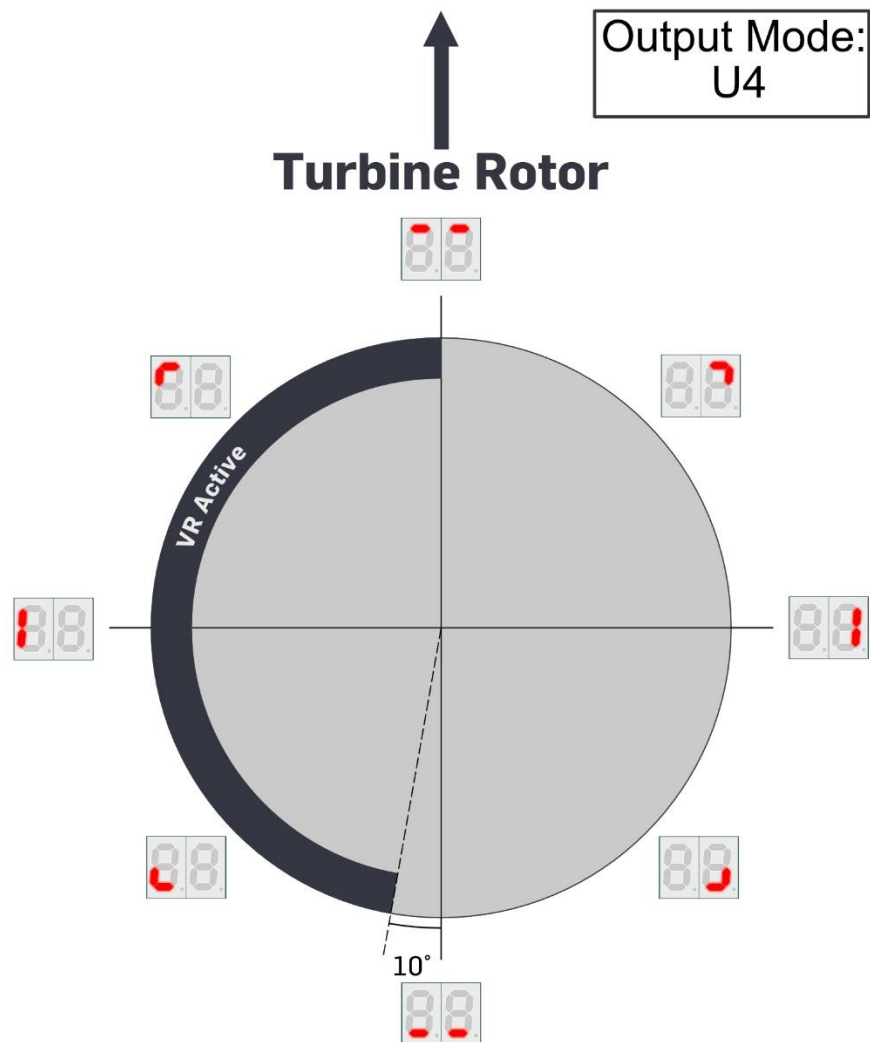
Vane Mode U4: 1 Channel PNP (190° - 360°)

Vane mode U4 is used to simulate the output of an NRG IceFree model 1-channel PNP yaw vane with active region between 190° and 360°. A detailed output diagram is shown below. Output terminal #1 corresponds to the 1 channel as follows:

Terminal Number	Output Signal
1	VR

Output terminals #2 through #4 will float in this mode. Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1 through #4 will float.





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Vane Mode U5: 4-20mA

Vane mode U5 will provide a 4-20mA current loop (sourcing) analog output on output terminal #8. The 4-20mA output corresponds to 0° to 360° for wind direction. The #7 terminal is also active in this mode and will provide a 1 to 5 volt analog output corresponding to 0° to 360° for wind direction. The analog output increases when vane rotates clockwise.

The output is at midrange (12mA or 2.5V) when vane is aligned with wind turbine rotor. The top two segments of the PM display will also be lit.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. When an error condition exists (E1 or E2), the 4-20 mA output on #8 will go to 4 mA, and the 1-5 V output on #7 will go to 1 V. Outputs #1 through #4 will float.

Vane Mode U6: 0-20mA

Vane mode U6 will provide a 0-20mA current loop (sourcing) analog output on output terminal #8. The 0-20mA output corresponds to 0° to 360° for wind direction. The #7 terminal is also active in this mode and will provide a 0 to 5 volt analog output corresponding to 0° to 360° for wind direction. The analog output increases when vane rotates clockwise.

The output is at midrange (10mA or 2.5V) when vane is aligned with wind turbine rotor. The top two segments of the PM display will also be lit.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. When an error condition exists (E1 or E2), the 0-20 mA output on #8 will go to 0 mA, and the 0-5 V on #7 will go to 0 V. Outputs #1 through #4 will float.



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Vane Mode U7: 4-Channel Grey Code Push-Pull

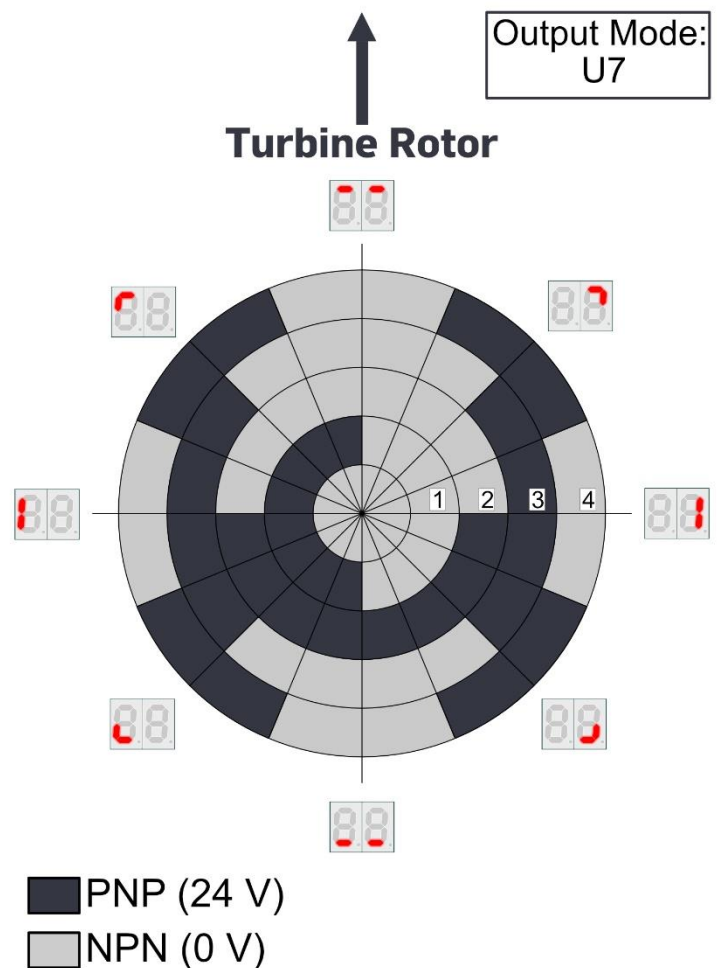
Vane mode U7 provides a 4 bit Grey Code Push-Pull output as shown. See the diagram below for the signal key. Each terminal number is denoted in the right half of the diagram.

Output terminals #1 through #4 correspond to the 4 channels as follows:

Terminal Number	Output Signal
1	MSB
2	3SB
3	2SB
4	LSB

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1 through #4 will float.





Personality Module

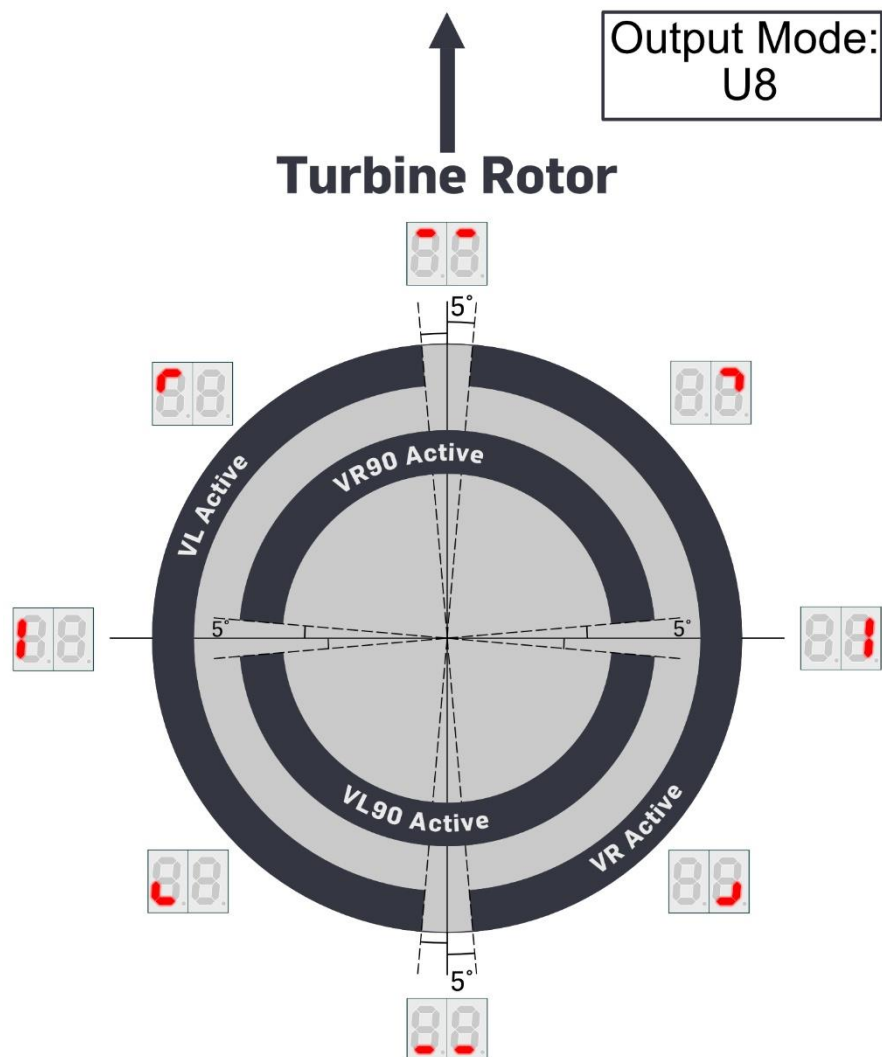
Vane Mode U8: 4-Channel Push-Pull

Vane mode U8 is used to simulate the output of an NRG IceFree model 4-channel NPN yaw vane as shown but instead of being an NPN output, it is a Push-Pull output. Output terminals #1 through #4 correspond to the 4 channels as follows:

Terminal Number	Output Signal
1	VR
2	VL
3	VR90
4	VL90

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1 through #4 will float.



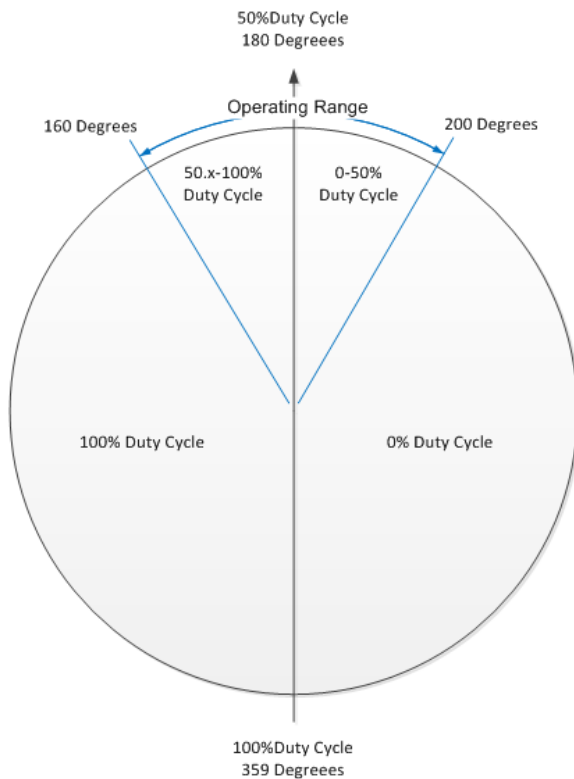


Personality Module

Vane Mode U9: 1-Channel PWM PNP (180° - 360°)

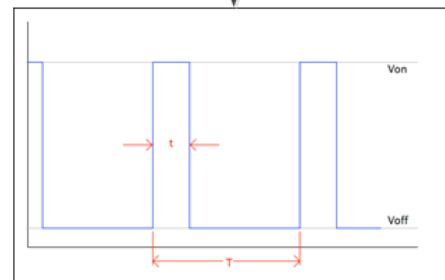
Vane mode U9 will simulate a PNP 1-channel Yaw Vane active from 180° - 360° with artificial dithering from 160° - 200°. This output mode converts the HXT Vane output into a primary PNP output on pin#1 of the PM. The output is on from 0° to 160°. Through the range 160° - 200° (180° +/- 20°), the output switches on and off every 400 milliseconds (ms), with the duty cycle varying from 100% at 160°, through 50% at 180°, to 0% at 200°. The output is off from 200° - 360°.

In addition, a secondary PNP output is provided at pin #2 of the PM. This signal is the same as the primary PNP output but delayed by 100 ms.



Output: PWM signal with a period (T) of 400ms and duty cycle scaled over range of 160-200 degrees. (0 -160 degrees = 100% duty cycle, 180 degrees = 50% duty cycle, 200-359 degrees = 0% duty cycle)

The "duty cycle" **D** is the ON time as a percentage of the period. Period **T** is 400 ms. The ON time **t** varies from 0 to 400 ms. $D = (t / T)$





Anemometer Modes A1-A5

Anemometer Mode A1: #40

Anemometer mode A1 will simulate an NRG 40C anemometer signal on the output terminal labeled #10. The output signal is a 16V peak-to-peak (+ and - 8V) square wave with variable frequency that simulates an NRG 40C anemometer. The NRG 40C slope and offset would apply to this signal.

If a digital type signal is desired the following outputs are also active when the PM is programmed for A1:

Terminal Number	Output Signal
1	NPN
2	PNP
3	PNP/NPN (push/pull)

These digital type outputs would simulate an NRG 40H (Hall effect) type sensor.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1, #2, and #3 will float.



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Anemometer Mode A2: IceFreeII

Anemometer mode A2 will simulate an NRG IceFreeII anemometer signal on the output terminal labeled #10. The output signal is a 16V peak-to-peak (+ and - 8V) square wave with variable frequency that simulates an NRG IceFreeII anemometer. The NRG IceFreeII slope and offset would apply to this signal.

If a digital type square wave signal is desired the following outputs are also available when the PM is programmed for A2:

Terminal Number	Output Signal
1	NPN
2	PNP
3	PNP/NPN (push/pull)

These type outputs would simulate an NRG IceFreeII Digital anemometer.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 *or* E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1, #2, and #3 will float.



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Anemometer Mode A3: IceFree3

Anemometer mode A3 will simulate an NRG IceFree3 anemometer signal on the output terminal labeled #10. The output signal is a 16V peak-to-peak (+ and - 8V) square wave with variable frequency that simulates an NRG IceFree3 anemometer. The NRG IceFree3 slope and offset would apply to this signal.

If a digital type signal is desired the following outputs are also available when the PM is programmed for A3:

Terminal Number	Output Signal
1	NPN
2	PNP
3	PNP/NPN (push/pull)

These type outputs would simulate an NRG IceFree3 Digital anemometer.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 **or** E2 error. Refer to the display to know which error has been detected. If an error is present, outputs #1, #2, and #3 will float.



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Anemometer Mode A4: 4-20mA

Anemometer mode A4 will provide a 4-20mA current loop (sourcing) analog signal on the output terminal labeled #8. The 4 to 20mA output signal corresponds to 0 to 50 m/s wind speed. Note that the output will peak at 20mA when actual wind speed is greater than 50 m/s.

The #7 terminal is also active in this mode and will provide a 1 to 5V analog output corresponding to 0 to 50 m/s wind speed. Note that this output will peak at 5V when actual wind speed is greater than 50 m/s.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 **or** E2 error. Refer to the display to know which error has been detected. When an error condition exists (E1 or E2), the 4-20 mA output on #8 will go to 4 mA, and the 1-5 V output on #7 will go to 1 V. Outputs #1, #2, #3 and #4 float at all times in the A4 mode.

Anemometer Mode A5: 0-20mA

Anemometer mode A5 will provide a 0 to 20mA current loop (sourcing) analog signal on the output terminal labeled #8. The 0 to 20mA output signal corresponds to 0 to 50 m/s wind speed. Note that the output will peak at 20mA when actual wind speed is greater than 50 m/s.

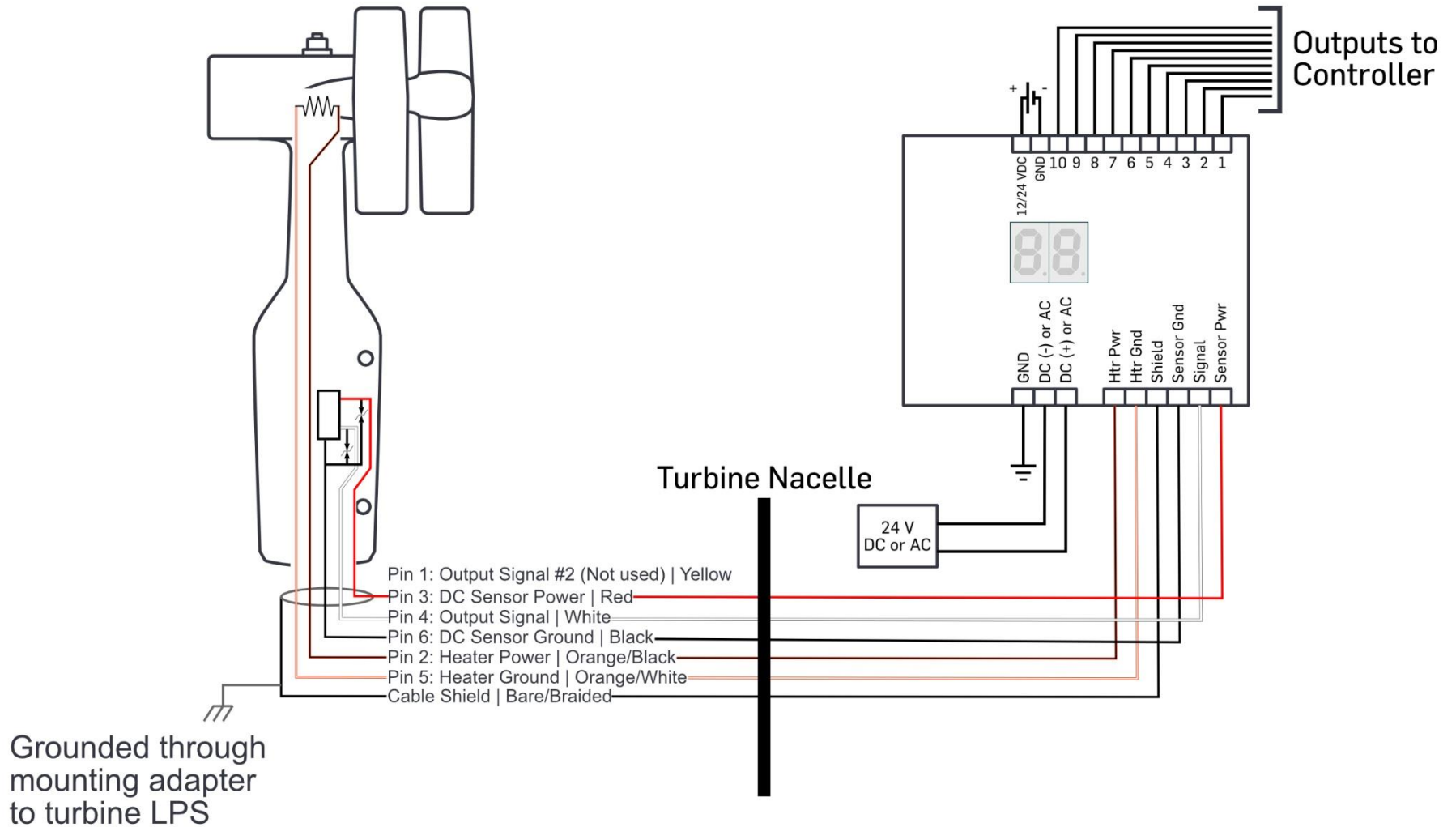
The #7 terminal is also active in this mode and will provide a 0 to 5V analog output corresponding to 0 to 50 m/s wind speed. Note that this output will peak at 5V when actual wind speed is greater than 50 m/s.

Output terminals #5 and #6 provide an error signal to indicate that error condition E1 or E2 exists. Output #5 is active NPN. Output #6 is active PNP.

Note that outputs #5 and #6 will go active on an E1 **or** E2 error. Refer to the display to know which error has been detected. When an error condition exists (E1 or E2), the 0-20 mA output on #8 will go to 0 mA, and the 0-5 V output on #7 will go to 0 V. Outputs #1, #2, #3 and #4 float at all times in the A5 mode.



WIRING DIAGRAM





TECHNICAL SPECIFICATION TABLE

Description	Sensor Type	Sensor Interface
	Applications	<ul style="list-style-type: none"> – Conversion of certain HXT turbine control sensor signals to be compatible with legacy IceFree sensors – Conversion of Hybrid turbine control sensor signal to industry standard signals – Provides diagnostic display
	Sensor range	Anemometer: 0-50 m/s (0-111 mph) Vane: 0 to 359°
	Sensor compatibility	HXT anemometer #4718 HXT vane #4715
Input signal	Signal type (sensor output)	Square wave signal from compatible HXT sensors
Output signal	Signal type (User-selectable)	Anemometer output types: <ul style="list-style-type: none"> – IceFree II – IceFree3 – NRG 40C – 0 to 20 mA – 4 to 20 mA Vane output types: <ul style="list-style-type: none"> – IceFree, 4-channel NPN – IceFree, 4-channel Push-Pull – IceFree, 2-channel PNP – IceFree, 1 channel 0-170° PNP – IceFree, 1 channel 190 to 360° PNP – 0 to 20 mA – 4 to 20 mA – 4 bit Gray code, push-pull – IceFree, 1 channel PWM PNP
	Recommended load resistance	4-20 current loop: 1000 Ω max. (24 V supply), 300 Ω max. (8 V supply) All other outputs: 1200 Ω min
	Output signal range	<ul style="list-style-type: none"> – Digital signal range set by supply voltage – Outputs protected against overvoltage, shorts, reverse wiring and mis-wiring
	Display Resolution	Anemometer: 2-digit wind speed Resolution: 1 m/s



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		Vane: 16 sectors
Power requirements	Supply voltage	8-24 VDC Also powers the connected sensor
	Supply current	80 mA max., plus 51 mA max. sensor current, plus output load current(s)
	Heater supply voltage	24 V, AC or DC
	Heater supply current	Passed through to sensor terminals, fused 10 A
Installation	Mounting	Snaps to 35 mm DIN rail (DIN EN 50022)
	Tools required	1.5 - 2.5 mm flat (-) screwdriver for terminals
Environmental	Operating temp	-40 - 65 °C (-40 - 149 °F)
	Operating humidity	0 - 100%, Non-condensing
Physical	Connections	Three de-pluggable terminal blocks: <ul style="list-style-type: none"> - 3 position for heater power supply - 6 position for sensor - 12 position for DC power and signal outputs
	Dimensions	82 mm length (along DIN rail) x 90 mm wide (centered on DIN rail) x 50 mm high (above DIN rail) (3.3 x 3.5 x 2.0 inches)
Materials	Terminals	Polyamide
	Base	Polyamide



WARRANTY

NRG Systems (NRG) warrants its products for a period of two years from date of original purchase solely for the benefit of the original consumer purchaser. If this product is determined to be defective in materials or workmanship, NRG will, at NRG's option, repair or replace this product without charge.

This warranty does not cover damage due to improper installation or use, accident or misuse, damages due to any unauthorized service or lightning. This warranty also will not apply if any seal on any instrument or sensor is broken, if any cable has been severed, or the equipment was not adequately grounded.

For complete information about NRG's warranty, visit the [Warranty](#) page on our website, located in the [Customer Support](#) section.

REPAIR

To return a defective product, request an RMA (return merchandise authorization) number by calling us at the number below or by emailing support@nrgsystems.com, or by submitting a request through our website's Technical Support area.

Please provide the serial number of the item as well as date of purchase. No products will be accepted for repair work without an RMA number. The product must be returned, postage prepaid, to NRG with a brief description of the problem, RMA number and a return address with phone number.

For complete information about returns and the RMA process, visit the [Return Authorization Request](#) page on our website, located in the [Customer Support](#) section.



DECLARATION OF CONFORMITY

Declaration of Conformity

(in accordance with ISO/IEC 17050-1:2004)



NRG Systems Document Number: N4441, Rev F

SUPPLIER: RENEWABLE NRG SYSTEMS

SUPPLIER ADDRESS: 110 Riggs Road, Hinesburg, VT 05461, USA
Telephone: 802 482 2255, Fax: 802 482 2272
Email: sales@nrgsystems.com

DECLARES UNDER ITS SOLE AUTHORITY THAT THE PRODUCT:

ICEFREE HYBRID TURBINE CONTROL SENSOR ACCESSORIES

INCLUDING MODEL NUMBERS:

NRG IceFree Hybrid Personality Module	Item FG 3798
NRG IceFree Hybrid 10M Cable	Item FG 9234
NRG IceFree Hybrid 20M Cable	Item FG 9319
NRG IceFree Hybrid 10M 600V Cable	Item FG 4716
NRG IceFree Hybrid 20M 600V Cable	Item FG 4717

ARE IN CONFORMITY WITH THE REQUIREMENTS OF THE FOLLOWING STANDARDS:

Safety: IEC 61010-1 Edition 3.0 2010, "Safety requirements for electrical equipment for measurement, control, and laboratory use"

EMC: 2014/30/EU, "on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)"

EN61326-1:2006 Class B "Electrical Equipment for Measurement, Control, and Laboratory Use—EMC Requirements"

RoHS: DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment

ADDITIONAL INFORMATION:

All circuits are extra low voltage (ELV), therefore standard 2014/35/EU (the Low-Voltage Directive) does not apply, and

The product is CE marked in accordance with 93/68/EEC.

The design documentation, test reports, assessment laboratory accreditation, and technical construction file are on file with Mr. Barry King, Electrical Engineer.

Issued at Hinesburg, VT, USA
February 1, 2017


 Wallace Lafferty
 VP Engineering