

POWERAIRE

8065 E Crystal Dr. Anaheim CA. 92807

Phone (888) 308-9226

This manual describes the use and operation of the **POWERAIRE** Wind Ranger Plus wind speed monitor and control device. This manual is comprehensive and describes all functions and options available at the time of this manual's writing. Portions of this manual may not apply and are dependent upon the Wind Ranger Plus unit(s) purchased.

The screen graphics in this document are representative images of what appears on the physical touch screen device.

The Wind Ranger Plus reacts to the wind conditions affecting the anemometer. For the Wind Ranger Plus to give maximum beneficial effects the anemometer must be located within the same prevailing wind environment as the controlled device (IE: Fountains, Canopies, Umbrellas, Cooling Towers, Amusement Park Attractions, etc.).

Apply appropriate control power, anemometer input, and stage control connection(s) to the Wind Ranger Plus. The PA-WRPLUS-061423-CUS-ELE schematics are connection references and are designed to be a general wiring guide.

Table of Contents

Power Up Screen Graphic.....	4
Power Up Screen Description.....	5
Single Stage Display Graphic	6
Single Stage Display Description	7
Two Stage Display Graphic	8
Two Stage Display Description	9
Three Stage Display Graphic	11
Three Stage Display Description	12
Four Stage Display Graphic.....	14
Four Stage Display Description	15
Main Menu Display Graphic	17
Main Menu Display Description.....	18
User Password Display Graphic	19
User Password Display Description	20
Display Brightness Display Graphic.....	21
Display Brightness Display Description.....	22
Real Time Clock Display Graphic.....	23
Real Time Clock Display Description	24
Stage 1 Setpoints Display Graphic	25
Stage 1 Setpoints Display Description.....	26
Stage 2 Setpoints Display Graphic	28
Stage 2 Setpoints Display Description.....	29
Stage 3 Setpoints Display Graphic	31
Stage 3 Setpoints Display Description.....	32
Stage 4 Setpoints Display Graphic	34
Stage 4 Setpoints Display Description.....	35
Stage Output Test Display Graphic	37
Stage Output Test Display Description	38
Analog Output Test Display Graphic	41

Analog Output Test Display Description.....	42
Alarm Log Display Graphic.....	45
Alarm Log Display Description.....	46

POWERAIRE

WIND RANGER PLUS
Water Conservation Control For
Fountains, Sprinklers, and other Activities
Adversley Affected by the Wind.

8055 E. Crystal Drive
Anaheim CA 92807
Phone: (888) 308-9226
www.poweraire.com

BAR GRAPH

STGS:1 ANA:0 ALM:0

WRP-HMI-MAN Rev2 20230607

Power Up Screen:

1. This screen is to impart information as to what this control panel is and information as to how to contact the manufacturer of the Wind Ranger Plus control panel.
2. As an option and for a FEE the customer can provide us a bit map image of their logo and address to be inserted in the place of the POWERAIRE logo and address.
3. To indicate PLC operation the bar graph at the bottom of the screen will scroll from left to right, 0To 100%, at a rate of once every two seconds to indicate life. This screen will remain for 10 seconds and then switches to the appropriate SINGLE STAGE DISPLAY, TWO STAGE DISPLAY, THREE STAGE DISPLAY or FOUR STAGE DISPLAY screen.
4. The text at the bottom left of the screen provides information as to what the Wind Ranger Plus is configured as:
 - a. STGS:x
Indicates how many stages have been enabled and the possible register values are 1, 2, 3, and 4.
 - b. ANA:x
Indicates the status of the analog output option. Valid register values are 0 and 1 where a value of 0 indicates the analog option is deactivated and a value of 1 indicates the analog option is activated.
 - c. ALM:x
Indicates the status of the alarm option. Valid register values are 0 and 1 where a value of 0 indicates the alarm option is deactivated and a value of 1 indicates the analog option is activated.
5. The text at the bottom right of the screen provides information of the HMI program file name, revision, and revision date.

2 - SINGLE STAGE DISPLAY

12:52:00
27-JUL-22

SINGLE STAGE DISPLAY

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 1
INACTIVE

STAGE 1 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE RESET

MAIN MENU

SINGLE STAGE DISPLAY screen:

1. This screen is considered the default screen for a Wind Ranger Plus single or 1 stage configuration. When this screen is exited a 2-minute timer is started. The timer is reset when any screen change is detected. If a screen change has not been detected within the 2-minute time period the SINGLE STAGE DISPLAY screen will be displayed.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, SINGLE STAGE DISPLAY.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 1 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 1 INACTIVE text. The physical I/O digital output associated with stage 1 is de-energized.



- b. Active State: red background with white STAGE 1 ACTIVE text. The physical I/O digital output associated with stage 1 is energized.



7. STAGE 1 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Current value of the stage 1 wind speed setpoint in Miles Per Hour.
 - b. DWELL TO ON: Current value of the stage 1 dwell to on setpoint in Minutes and Seconds.
 - c. DWELL TO OFF: Current value of the stage 1 dwell to off setpoint in Minutes and Seconds.
8. STAGE RESET: This is a momentary push button that when pressed resets stage 1 to an inactive state.
9. MAIN MENU: This is a momentary push button that when pressed the display switches to the MAIN MENU screen,

3 - TWO STAGE DISPLAY

12:52:00
27-JUL-22

TWO STAGE DISPLAY

SUNDAY

CURRENT WIND SPEED	12.3 MPH
--------------------	----------

STAGE 1
INACTIVE

STAGE 2
INACTIVE

STAGE 1 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE 2 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE RESET

MAIN MENU

TWO STAGE DISPLAY screen:

1. This screen is considered the default screen for a Wind Ranger Plus two or 2 stage configuration. When this screen is exited via the MAIN MENU push button a 2-minute timer is started. The timer is reset when any screen change is detected, If a screen change has not been detect within the 2-minute time period the TWO STAGE DISPLAY screen will be displayed.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, TWO STAGE DISPLAY.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 1 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 1 INACTIVE text.
The physical I/O digital output associated with stage 1 is de-energized.



- b. Active State: red background with white STAGE 1 ACTIVE text.
The physical I/O digital output associated with stage 1 is energized.



7. STAGE 1 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Current value of the stage 1 wind speed setpoint in Miles Per Hour.
 - b. DWELL TO ON: Current value of the stage 1 dwell to on setpoint in Minutes and Seconds.
 - c. DWELL TO OFF: Current value of the stage 1 dwell to off setpoint in Minutes and Seconds.
8. Stage 2 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 2 INACTIVE text.
The physical I/O digital output associated with stage 2 is de-energized.



- b. Active State: red background with white STAGE 2 ACTIVE text.
The physical I/O digital output associated with stage 2 is energized.



9. STAGE 2 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Current value of the stage 2 wind speed setpoint in Miles Per Hour.
 - b. DWELL TO ON: Current value of the stage 2 dwell to on setpoint in Minutes and Seconds.
 - c. DWELL TO OFF: Current value of the stage 2 dwell to off setpoint in Minutes and Seconds.

10. STAGE RESET: This is a momentary push button that when pressed resets stages 1 and 2 to an inactive state.
11. MAIN MENU: This is a momentary push button that when pressed the display switches to the MAIN MENU screen,

4 - THREE STAGE DISPLAY

12:52:00
27-JUL-22

THREE STAGE DISPLAY

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 1 INACTIVE STAGE 2 INACTIVE STAGE 3 INACTIVE

STAGE 1 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE 2 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE 3 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE RESET MAIN MENU

THREE STAGE DISPLAY screen:

1. This screen is considered the default screen for a Wind Ranger Plus three or 3 stage configuration. When this screen is exited via the MAIN MENU push button a 2-minute timer is started. The timer is reset when any screen change is detected, If a screen change has not been detect within the 2-minute time period the THREE STAGE DISPLAY screen will be displayed.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, THREE STAGE DISPLAY.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 1 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 1 INACTIVE text.
The physical I/O digital output associated with stage 1 is de-energized.



- b. Active State: red background with white STAGE 1 ACTIVE text.
The physical I/O digital output associated with stage 1 is energized.



7. STAGE 1 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Current value of the stage 1 wind speed setpoint in Miles Per Hour.
 - b. DWELL TO ON: Current value of the stage 1 dwell to on setpoint in Minutes and Seconds.
 - c. DWELL TO OFF: Current value of the stage 1 dwell to off setpoint in Minutes and Seconds.
8. Stage 2 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 2 INACTIVE text.
The physical I/O digital output associated with stage 2 is de-energized.



- b. Active State: red background with white STAGE 2 ACTIVE text.
The physical I/O digital output associated with stage 2 is energized.



9. STAGE 2 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Current value of the stage 2 wind speed setpoint in Miles Per Hour.
 - b. DWELL TO ON: Current value of the stage 2 dwell to on setpoint in Minutes and Seconds.
 - c. DWELL TO OFF: Current value of the stage 2 dwell to off setpoint in Minutes and Seconds.

10. Stage 3 activity indicator: This indicator displays the two states of stage activity.

- a. Inactive state; green background with black STAGE 3 INACTIVE text.
The physical I/O digital output associated with stage 3 is de-energized.



- b. Active State: red background with white STAGE 3 ACTIVE text.
The physical I/O digital output associated with stage 3 is energized.



11. STAGE 3 SETPOINTS: Text label describing the following related functions.

- d. WIND SPEED: Current value of the stage 3 wind speed setpoint in Miles Per Hour.
- e. DWELL TO ON: Current value of the stage 3 dwell to on setpoint in Minutes and Seconds.
- f. DWELL TO OFF: Current value of the stage 3 dwell to off setpoint in Minutes and Seconds.

12. STAGE RESET: This is a momentary push button that when pressed resets stages 1, 2 and 3 to an inactive state.

13. MAIN MENU: This is a momentary push button that when pressed the display switches to the MAIN MENU screen,

5 - FOUR STAGE DISPLAY

12:52:00
27-JUL-22

FOUR STAGE DISPLAY

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 1 INACTIVE STAGE 2 INACTIVE STAGE 3 INACTIVE STAGE 4 INACTIVE

STAGE 1 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE 2 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE 3 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE 4 SETPOINTS		
WIND SPEED	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

STAGE RESET MAIN MENUE

FOUR STAGE DISPLAY screen:

1. This screen is considered the default screen for a Wind Ranger Plus four or 4 stage configuration. When this screen is exited via the MAIN MENU push button a 2-minute timer is started. The timer is reset when any screen change is detected, If a screen change has not been detect within the 2-minute time period the FOUR STAGE DISPLAY screen will be displayed.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, FOUR STAGE DISPLAY.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 1 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 1 INACTIVE text.
The physical I/O digital output associated with stage 1 is de-energized.



- b. Active State: red background with white STAGE 1 ACTIVE text.
The physical I/O digital output associated with stage 1 is energized.



7. STAGE 1 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Current value of the stage 1 wind speed setpoint in Miles Per Hour.
 - b. DWELL TO ON: Current value of the stage 1 dwell to on setpoint in Minutes and Seconds.
 - c. DWELL TO OFF: Current value of the stage 1 dwell to off setpoint in Minutes and Seconds.
8. Stage 2 activity indicator: This indicator displays the two states of stage activity.
 - a. Inactive state; green background with black STAGE 2 INACTIVE text.
The physical I/O digital output associated with stage 2 is de-energized.



- b. Active State: red background with white STAGE 2 ACTIVE text.
The physical I/O digital output associated with stage 2 is energized.



9. STAGE 2 SETPOINTS: Text label describing the following related functions.
 - g. WIND SPEED: Current value of the stage 2 wind speed setpoint in Miles Per Hour.
 - h. DWELL TO ON: Current value of the stage 2 dwell to on setpoint in Minutes and Seconds.
 - i. DWELL TO OFF: Current value of the stage 2 dwell to off setpoint in Minutes and Seconds.

10. Stage 3 activity indicator: This indicator displays the two states of stage activity.

- a. Inactive state; green background with black STAGE 3 INACTIVE text.
The physical I/O digital output associated with stage 3 is de-energized.



- b. Active State: red background with white STAGE 3 ACTIVE text.
The physical I/O digital output associated with stage 3 is energized.



11. STAGE 3 SETPOINTS: Text label describing the following related functions.

- j. WIND SPEED: Current value of the stage 3 wind speed setpoint in Miles Per Hour.
- k. DWELL TO ON: Current value of the stage 3 dwell to on setpoint in Minutes and Seconds.
- l. DWELL TO OFF: Current value of the stage 3 dwell to off setpoint in Minutes and Seconds.

12. Stage 4 activity indicator: This indicator displays the two states of stage activity.

- a. Inactive state; green background with black STAGE 4 INACTIVE text.
The physical I/O digital output associated with stage 4 is de-energized.



- b. Active State: red background with white STAGE 4 ACTIVE text.
The physical I/O digital output associated with stage 4 is energized.



13. STAGE 4 SETPOINTS: Text label describing the following related functions.

- a. WIND SPEED: Current value of the stage 4 wind speed setpoint in Miles Per Hour.
- b. DWELL TO ON: Current value of the stage 4 dwell to on setpoint in Minutes and Seconds.
- c. DWELL TO OFF: Current value of the stage 4 dwell to off setpoint in Minutes and Seconds.

14. STAGE RESET: This is a momentary push button that when pressed resets stages 1, 2, 3 and 4 to an inactive state.

15. MAIN MENU: This is a momentary push button that when pressed the display switches to the MAIN MENU screen,

6 - MAIN MENU

The image displays a 'MAIN MENU' interface. At the top, a teal bar contains the time '06:45:00' and date '23-JUL-22' on the left, and 'SUNDAY' on the right. The title 'MAIN MENU' is centered in the teal bar. Below this, on a black background, are several grey buttons with white text. The buttons are arranged in three rows. The first row contains 'DISPLAY CONTRAST', 'USER PASSWORD', and 'STAGE SET-POINTS'. The second row contains 'REAL TIME CLOCK SET' and 'STAGE OUTPUT TEST'. The third row contains 'ALARM LOG' and 'ANALOG OUTPUT CONTROL'. A 'RETURN' button is centered at the bottom.

06:45:00 23-JUL-22	MAIN MENU	SUNDAY
DISPLAY CONTRAST	USER PASSWORD	STAGE SET-POINTS
REAL TIME CLOCK SET		STAGE OUTPUT TEST
ALARM LOG		ANALOG OUTPUT CONTROL
RETURN		

MAIN MENU screen:

1. This screen allows the user to select control screens that determine how the Wind Ranger Plus functions. Note that these operators are always visible.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, MAIN MENU.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY.
5. The following screen select push buttons are standard features of the Wind Ranger Plus. They are all password protected with the [UP1] password.
 - a. USER PASSWORD: Push button: Pressing this momentary push button switches the display to the USER PASSWORD control screen.
 - b. DISPLAY CONTRAST: Push button: Pressing this momentary push button switches the display to the DISPLAY CONTRAST control screen.
 - c. REAL TIME CLOCK SET: Push button: Pressing this momentary push button switches the display to the REAL TIME CLOCK SET control screen.
 - d. STAGE SET-POINTS: Push button. Pressing this momentary push button switches the display to the STAGE SET-POINTS control screen.
 - e. STAGE OUTPUT TEST: Push button. Pressing this momentary push button switches the display to the STAGE OUTPU TEST control screen.
6. The following screen select buttons visibility are dependent upon what options have been added. They are password protected with the [UP1] password.
 - a. ANALOG OUTPUT CONTROL: Push button: Pressing this momentary push button switches the display to the ANALOG OUTPUT CONTROL screen.
 - b. ALARM LOG: Push button: Pressing this momentary push button switches the display to the ALARM LOG screen.
7. RETURN Push button: Pressing this momentary push button switches the display to the X STAGE DISPLAY screen from whence it came.
8. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY screen from whence it came.

7 - USER PASSWORD

04:28:00
25-JUL-22

USER PASSWORD

SUNDAY

USER PASSWORD

12345123

!!!CAUTION!!!
DO NOT FORGET THIS PASSWORD.
IF THE PASSWORD IS FORGOTTEN THE
CONTROL UNIT WILL HAVE TO BE RETURNED
TO THE FACTORY FOR RESETTING

RETURN

USER PASSWORD screen:

1. This screen allows the user to enter a numeric password [UP1] to help prevent unauthorized users from making changes to the operation of the Wind Ranger Plus control. The factory default for this password is the number Zero, Take heed of the cautionary note to not forget the password.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, USER PASSWORD.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. USER PASSWORD numeric entry object: Pressing this object will display a numeric entry keypad. The user may enter a numeric password [UP1] that can be up to 8 digits in length IE: 0-99999999.
6. RETURN button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.
7. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY Screen.

8 - DISPLAY BRIGHTNESS



DISPLAY BRIGHTNESS screen:

1. This screen allows the user to adjust the brightness of the HMI display.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, ALARM LIST.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. BRIGHTNESS LEVEL: combined numeric display with increment / decrement value buttons. The display represents the current value of the screen brightness level. The user can make the display brighter by pressing the increment up key ^ and darker by pressing the down key v.
6. RETURN button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.
7. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY Screen.

9 - REAL TIME CLOCK SET

05:10:00
25-JUL-22

REAL TIME CLOCK SET

SUNDAY

MONTH	DAY	YEAR
12	12	12
HOUR	MINUTE	SECOND
12	12	12

1. NOTE THAT THE TIME CLOCK USES 24 HOUR TIME CONVENTION.

RETURN

REAL TIME CLOCK SET screen:

1. This screen allows the user to set the real time clock to the local time zone.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, REAL TIME CLOCK SET.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. MONTH numeric entry and display object: The current month is shown in the display. Pressing this object will display a numeric entry keypad. The user may enter the current month. Valid entries are numbers 1 through 12.
6. DAY numeric entry and display object: The current day is shown in the display. Pressing this object will display a numeric entry keypad. The user may enter the current day. Valid entries are numbers 1 through 31.
7. YEAR numeric entry and display object: The current year is shown in the display. Pressing this object will display a numeric entry keypad. The user may enter the current year. Valid entries are numbers 1 through 99.
8. HOUR numeric entry and display object: The current hour is shown in the display. Pressing this object will display a numeric entry keypad. The user may enter the current hour. Valid entries are numbers 0 through 23.
9. MINUTE numeric entry and display object: The current minute is shown in the display. Pressing this object will display a numeric entry keypad. The user may enter the current minute. Valid entries are numbers 0 through 59.
10. SECOND numeric entry and display object: The current second is shown in the display. Pressing this object will display a numeric entry keypad. The user may enter the current second. Valid entries are numbers 0 through 59.
11. RETURN button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.
12. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY Screen.

10 - STAGE 1 SETPOINTS

10:41:00
18-APR-23

STAGE SETPOINTS

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 1
INACTIVE

STAGE 1 SETPOINTS

WIND SPEED SP	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

MAIN MENU

STAGE 1

STAGE 1 SETPOINT screen:

1. This screen allows the user to set the values that control the stage 1 digital outputs.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, STAGE SETPOINTS.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY.
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 1 activity display indicates the current stage state where:

- a. The stage inactive state is shown as:



- b. The stage active state is shown as:



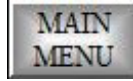
7. STAGE 1 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Text label, Adjacent to this label is a numeric entry and display object. The current wind speed setpoint is shown as Miles Per Hour on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 0.1 through 99.0.
 - b. DWELL TO ON: Text label, Adjacent to this label is:
 - i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
 - ii. The second's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be at or greater than the stage 1 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 1 is energized.

- c. DWELL TO OFF: Text label, Adjacent to this label is:
 - i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
 - ii. The second's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be less than the stage 1 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 1 is de-energized.

8. MAIN MENU push button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.



9. STAGE select push button(s): If the Wind Ranger Plus is configured as a 1-stage device the STAGE 1 push button will be accessible at the bottom of the screen. The stage button is green indicating which stage is being viewed.



10. If no user activity has been detected for 2 minutes the display will automatically switch to the default X STAGE DISPLAY Screen.

10 - STAGE 2 SETPOINTS

10:40:00
18-APR-23

STAGE SETPOINTS

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 2
INACTIVE

STAGE 2 SETPOINTS

WIND SPEED SP	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

MAIN MENU STAGE 1 **STAGE 2**

STAGE 2 SETPOINTS screen:

1. If the Wind Ranger Plus is configured as a 2-stage device this screen allows the user to set the setpoint values that control the stage 2 relay output.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, STAGE SETPOINTS.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY.
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 2 activity display indicates the current stage state where:

- a. The stage inactive state is shown as:



- b. The stage active state is shown as:



7. STAGE 2 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Text label, Adjacent to this label is a numeric entry and display object. The current wind speed setpoint is shown as Miles Per Hour on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 0.1 through 99.0.
 - b. DWELL TO ON: Text label, Adjacent to this label is:
 - i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
 - ii. The second's numeric entry and display object. The current setpoint is shown as seconds on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be at or greater than the stage 2 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 2 is energized.

c. DWELL TO OFF: Text label, Adjacent to this label is:

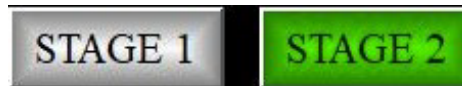
- i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
- ii. The second's numeric entry and display object. The current setpoint is shown as seconds on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be less than the stage 2 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 2 is de-energized.

8. MAIN MENU push button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.



9. STAGE select push buttons: If the Wind Ranger Plus is configured as a 2-stage device the STAGE 1 and STAGE 2 push buttons will be accessible at the bottom of the screen. These buttons allow the user to select which stage he wishes to view or alter the setpoints of. The stage button that is green indicates which stage is being viewed.



10. If no user activity has been detected for 2 minutes the display will automatically switch to the default X STAGE DISPLAY Screen.

10 - STAGE 3 SETPOINTS

10:40:00
18-APR-23

STAGE SETPOINTS

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 3
INACTIVE

STAGE 3 SETPOINTS

WIND SPEED SP	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

MAIN MENU STAGE 1 STAGE 2 **STAGE 3**

STAGE 3 SETPOINTS screen:

1. If the Wind Ranger Plus is configured as a 3-stage device this screen allows the user to set the setpoint values that control the stage 3 relay output.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, STAGE SETPOINTS.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY.
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 3 activity display indicates the current stage state where:

- a. The stage inactive state is shown as:



- b. The stage active state is shown as:



7. STAGE 2 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Text label, Adjacent to this label is a numeric entry and display object. The current wind speed setpoint is shown as Miles Per Hour on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 0.1 through 99.0.
 - b. DWELL TO ON: Text label, Adjacent to this label is:
 - i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
 - ii. The second's numeric entry and display object. The current setpoint is shown as seconds on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be at or greater than the stage 3 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 3 is energized.

- c. DWELL TO OFF: Text label, Adjacent to this label is:
 - i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
 - ii. The second's numeric entry and display object. The current setpoint is shown as seconds on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be less than the stage 3 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 3 is de-energized.

- 8. MAIN MENU push button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.



- 9. STAGE select push buttons: If the Wind Ranger Plus is configured as a 3-stage device the STAGE 1, STAGE 2 and STAGE 3 push buttons will be accessible at the bottom of the screen. These buttons allow the user to select which stage he wishes to view or alter the setpoints of. The stage button that is green indicates which stage is being viewed.



- 10. If no user activity has been detected for 2 minutes the display will automatically switch to the default X STAGE DISPLAY Screen.

10 - STAGE 4 SETPOINTS

10:43:00
18-APR-23

STAGE SETPOINTS

SUNDAY

CURRENT WIND SPEED 12.3 MPH

STAGE 4
INACTIVE

STAGE 4 SETPOINTS

WIND SPEED SP	12.3 MPH	
DWELL TO ON	12 MIN	12 SEC
DWELL TO OFF	12 MIN	12 SEC

MAIN MENU STAGE 1 STAGE 2 STAGE 3 **STAGE 4**

STAGE 4 SETPOINTS screen:

1. If the Wind Ranger Plus is configured as a 4-stage device this screen allows the user to set the setpoint values that control the stage 4 relay output.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, STAGE SETPOINTS.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY.
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. Stage 4 activity display indicates the current stage state where:
 - a. The stage inactive state is shown as:



- b. The stage active state is shown as:



7. STAGE 2 SETPOINTS: Text label describing the following related functions.
 - a. WIND SPEED: Text label, Adjacent to this label is a numeric entry and display object. The current wind speed setpoint is shown as Miles Per Hour on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 0.1 through 99.0.
 - b. DWELL TO ON: Text label, Adjacent to this label is:
 - i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
 - ii. The second's numeric entry and display object. The current setpoint is shown as seconds on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be at or greater than the stage 4 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 4 is energized.

c. DWELL TO OFF: Text label, Adjacent to this label is:

- i. The minute's numeric entry and display object. The current setpoint is shown as minutes on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 99.
- ii. The second's numeric entry and display object. The current setpoint is shown as seconds on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 00 through 59.

Note that this time value is the amount of time the wind speed must be less than the stage 4 wind speed setpoint. When this occurs the physical I/O digital output associated with stage 4 is de-energized.

8. MAIN MENU push button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.



9. STAGE select push buttons: If the Wind Ranger Plus is configured as a 4-stage device the STAGE 1, STAGE 2, STAGE 3, and STAGE 4 push buttons will be accessible at the bottom of the screen. These buttons allow the user to select which stage he wishes to view or alter the setpoints of. The stage button that is green indicates which stage is being viewed.



10. If no user activity has been detected for 2 minutes the display will automatically switch to the default X STAGE DISPLAY Screen.

11- STAGE OUTPUT TEST

12:52:00
27-JUL-22

STAGE OUTPUT TEST

SUNDAY

CURRENT WIND SPEED

12.3 MPH

STAGE 1 OUTPUT

OFF

STAGE 1
INACTIVE

STAGE 2 OUTPUT

OFF

STAGE 2
INACTIVE

STAGE 3 OUTPUT

OFF

STAGE 3
INACTIVE

STAGE 4 OUTPUT

OFF

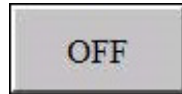
STAGE 4
INACTIVE

RETURN

STAGE OUTPUT TEST screen:

1. This screen allows the user to test the functionality of the digital output(s) that are controlled by their respective stage setpoints. The display of the screen is dependent upon the number of stages the Wind Ranger Plus has been configured as. For example: If the Wind Ranger Plus has been configured as a single stage unit, The STAGE 1 OUTPUT will be displayed whereas the STAGE 2 OUTPUT, STAGE 3 OUTPUT, and STAGE 4 OUTPUT will not be visible to the user. This logic pertains to the other 3 configurations
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, STAGE OUTPUT TEST.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
5. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
6. STAGE 1 OUTPUT: Text label describing the following related functions.
 - a. Below and to the left of the label is a push button. The function of this push button are as follows:

- i. Inactive state: gray background with black OFF text. Stage 1 digital output off.



- ii. Active state: red background with white ON text. Stage 1 digital output on.



- b. Below and to the right of the label is an activity indicator. This function of this indicator is to display the two states of stage activity.

- i. Inactive state: green background with black STAGE 1 INACTIVE text. Stage 1 digital output off.



- ii. Active state: red background with white STAGE 1 ACTIVE text. Stage 1 digital output on.



7. STAGE 2 OUTPUT: Text label describing the following related functions.

- a. Below and to the left of the label is a push button. The function of this push button are as follows:

- i. Inactive state: gray background with black OFF text. Stage 2 digital output off.



- ii. Active state: red background with white ON text. Stage 2 digital output on.



- b. Below and to the right of the label is an activity indicator. This function of this indicator is to display the two states of stage activity.

- i. Inactive state: green background with black STAGE 1 INACTIVE text. Stage 2 digital output off.



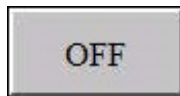
- ii. Active state: red background with white STAGE 1 ACTIVE text. Stage 2 digital output on.



8. STAGE 3 OUTPUT: Text label describing the following related functions.

- a. Below and to the left of the label is a push button. The function of this push button are as follows:

- i. Inactive state: gray background with black OFF text. Stage 3 digital output off.



- ii. Active state: red background with white ON text. Stage 3 digital output on.



b. Below and to the right of the label is an activity indicator. This function of this indicator is to display the two states of stage activity.

i. Inactive state: green background with black STAGE 3 INACTIVE text. Stage 3 digital output off.



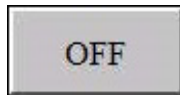
ii. Active state: red background with white STAGE 3 ACTIVE text. Stage 3 digital output on.



9. STAGE 4 OUTPUT: Text label describing the following related functions.

a. Below and to the left of the label is a push button. The function of this push button are as follows:

i. Inactive state: gray background with black OFF text. Stage 4 digital output off.



ii. Active state: red background with white ON text. Stage 4 digital output on.



b. Below and to the right of the label is an activity indicator. This function of this indicator is to display the two states of stage activity.

i. Inactive state: green background with black STAGE 4 INACTIVE text. Stage 4 digital output off.



ii. Active state: red background with white STAGE 4 ACTIVE text. Stage 4 digital output on.



10. Note that leaving this screen for any reason deactivates any manual control of the digital outputs and resets resets any logic that has manual control of the digital output logic. All the pushbuttons should go to their respective inactive states.

11. RETURN button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.

12. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY Screen.

12 - ANALOG OUTPUT CONTROL

08:58:00
19-APR-23

ANALOG OUTPUT

SUNDAY

CURRENT WIND SPEED
12.3 MPH

ANALOG OUT SCALE AUTO MODE

WIND SPEED MIN	12.3 MPH	ANALOG OUT a	12.3 mA
WIND SPEED MAX	12.3 MPH	ANALOG OUT b	12.3 mA

ANALOG OUT HAND
12.3 mA

ANALOG OUT CONTROL
HAND OFF AUTO

CURRENT ANALOG OUT
123.4 mA

RETURN

ANALOG OUTPUT CONTROL screen:

6. This screen controls how the analog I/O output functions with respect to wind conditions. This screen is only accessible if the analog option has been enabled.
7. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
8. Upper Middle: This is a text label designating the name of the screen, ALARM LIST.
9. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY
10. CURRENT WIND SPEED: Real time display of the anemometer's value in Miles Per Hour.
11. ANALOG OUT SCALE AUTO MODE: Text label describing the following related functions. The Wind Ranger Plus analog output is intended to interface with a variable frequency drive (VFD). This VFD presumably powers the pump motor that supplies the water to the feature the Wind Ranger Plus was installed to protect. This protection includes wind born water loss and or water damage caused by the feature pump running in inclement conditions.
 - a. WIND SPEED MIN: This is a text label, Adjacent to this label is a numeric entry and display object. The current wind speed low setpoint is shown as Miles Per Hour on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 0.1 through 99.9. The following logic will never run again under normal circumstances. Upon very first power up and run of the PLC program a value of 0 is to be written into this register.
 - b. WIND SPEED MAX: This is a text label, Adjacent to this label is a numeric entry and display object. The current wind speed high setpoint is shown as Miles Per Hour on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 0.1 through 99.9. The following logic will never run again under normal circumstances. Upon very first power up and run of the PLC program a value of 99.9 is to be written into this register.
 - c. ANALOG OUTPUT a: This is a text label, Adjacent to this label is a numeric entry and display object. The current analog output a setpoint is shown as milliamps on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 4.0 through 20.0. The following logic will never run again under normal circumstances. Upon very first power up and run of the PLC program a value of 20.0 is to be written into this register.
 - d. ANALOG OUTPUT b: This is a text label, Adjacent to this label is a numeric entry and display object. The current analog output b setpoint is shown as milliamps on the display. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 4.0 through 20.0. The following logic will never run again under normal circumstances. Upon very first power up and run of the PLC program a value of 4.0 is to be written into this register.

The setpoint data values entered above are part of a linear mathematical formula that takes this form:

$$\frac{((Wind\ Speed - Wind\ Speed\ Min) * (Analog\ Out\ b - Analog\ Out\ a))}{(Wind\ Speed\ Max - Wind\ Speed\ Min)} + Analog\ Out\ a = Analog\ Out$$

Note that all CAPS are not used in the formula to keep it contiguous and readable.

Using the default setpoint values and increasing wind speeds the Wind Ranger Plus will produce the following Analog output:

- a. 0.0 MPH the analog I/O output is approximately 20.0 mA.
- b. 50.0 MPH the analog I/O output is approximately 12.0 mA.
- c. 99.9 MPH the analog I/O output is approximately 4.0 mA.

12. ANALOG OUT CONTROL: Text label describing the following related functions.

These three push buttons serve as type of HOA (Hand/Off/Auto) three position selector switch where: Only one function can be active at a time. Any of the three pushbuttons can initiate a function, there is no order to the selection of functions as you would find in a 3-position HOA selector switch. The following logic will never run again under normal circumstances. Upon very first power up and run of the PLC program the OFF push button should be in its active state.

- a. HAND push button: The function of this push button are as follows:
 - i. Inactive state: gray background with black HAND text.
 - ii. Active state: yellow background with black HAND text. The ANALOG OUT HAND value is sent out the analog I/O output.



- b. OFF push button: The function of this push button are as follows:
 - i. Inactive state: gray background with black OFF text.
 - ii. Active state: red background with black OFF text. A value of 4 mA is sent out the analog I/O output.



- c. AUTO push button: The function of this push button are as follows:
 - i. Inactive state: gray background with black AUTO text.
 - ii. Active state: green background with black OFF text. The ANALOG OUT SCALE AUTO MODE value is sent out the analog I/O output.



13. ANALOG OUT HAND: This is a numeric entry and display object. Pressing this object will display a numeric entry keypad. The user may enter a new setpoint value. Valid entries are numbers 4.0 through 20.0. This device works in conjunction the ANALOG OUT CONTROL HAND push button.
14. CURRENT ANALOG OUT: Real time display of the analog I/O output signal.
15. RETURN button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.
16. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY Screen.

13 - ALARM LOG

05:42:00 20-APR-23		ALARM LOG			SUNDAY
Alarm Time	Device	Value	Alarm Type	Description	

ALARM LOG screen:

1. This screen allows users to view alarms that are triggered by stage output activity. This screen is only accessible if the alarm option has been enabled.
2. Upper Left Corner: Real Time Clock display formatted as 24-hour indicating the hour, minute, and second of the day and the date formatted as DD-MM-YY.
3. Upper Middle: This is a text label designating the name of the screen, ALARM LOG.
4. Upper Right Corner: Day of week display formatted as SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY.
5. RETURN button: Pressing this momentary push button causes the display to return from whence it came, the MAIN MENU screen.
6. CLEAR ALARMS button: Pressing this momentary push button clears the alarm log.
7. If for two minutes no user activity has been detected the display will automatically switch to the default X STAGE DISPLAY Screen.