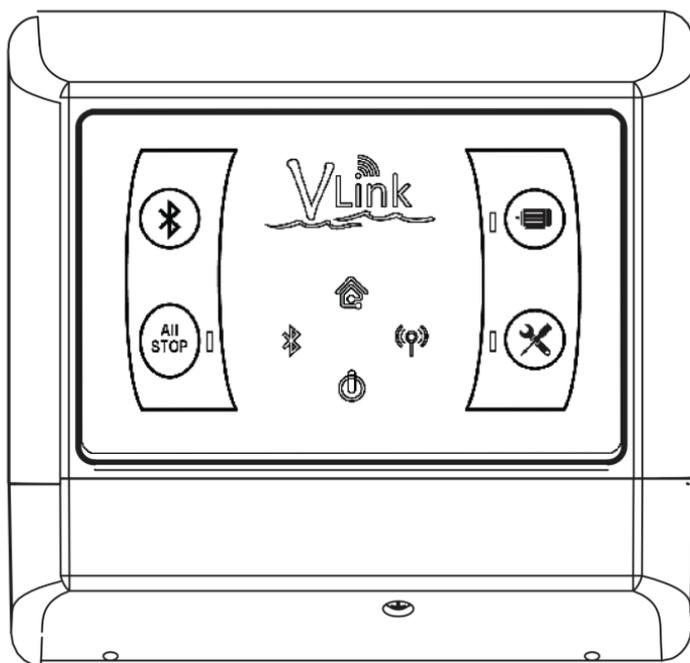




VLink

A wireless adapter for use with
Century VGreen Variable Speed Motors



Installation and User Manual

Stock Number: VL100



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SAFETY

Safety is emphasized throughout the user manual. These are safety alert symbols and signal words. They alert the user to potential personal injury hazards. Obey all safety messages to avoid possible injury or death or damage to equipment and other property.

DANGER



DANGER indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING



WARNING indicates a hazardous situation, which if not avoided, could result in death or serious injury.

CAUTION



CAUTION indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE



NOTICE identifies potential equipment damage or failure conditions. Also, alerts personnel to potential dangerous situations.

1. INTRODUCTION

VLink provides the ability to operate VGreen motors from virtually anywhere in the World. This product gives advanced user controls and features that do not exist in VGreen motors today. With VLink, users can now monitor monthly energy costs, set up to a five-cycle schedule, create preset overrides, and monitor motor health.

⚠️ WARNING

VLink Wireless Adapter and accompanying mobile applications are not intended to be used in an emergency or safety situation.

- Emergency situations require main power to motor shall be shut off / disconnected.
- Pressing "STOP" in mobile application, or pressing "ALL STOP" on VLink wireless adapter may not stop motor if a digital input is active or becomes active at any time (applicable to VGreen 165).
- "STOP" and "ALL STOP" commands are not intended to be used in an emergency situation to stop the motor.
- When mobile device is used to operate motor remotely, hazardous conditions cannot be identified.

Failure to comply with this may result in death, serious personal injury or property damage.

2. OVERVIEW

2.1 VGreen System with VLink

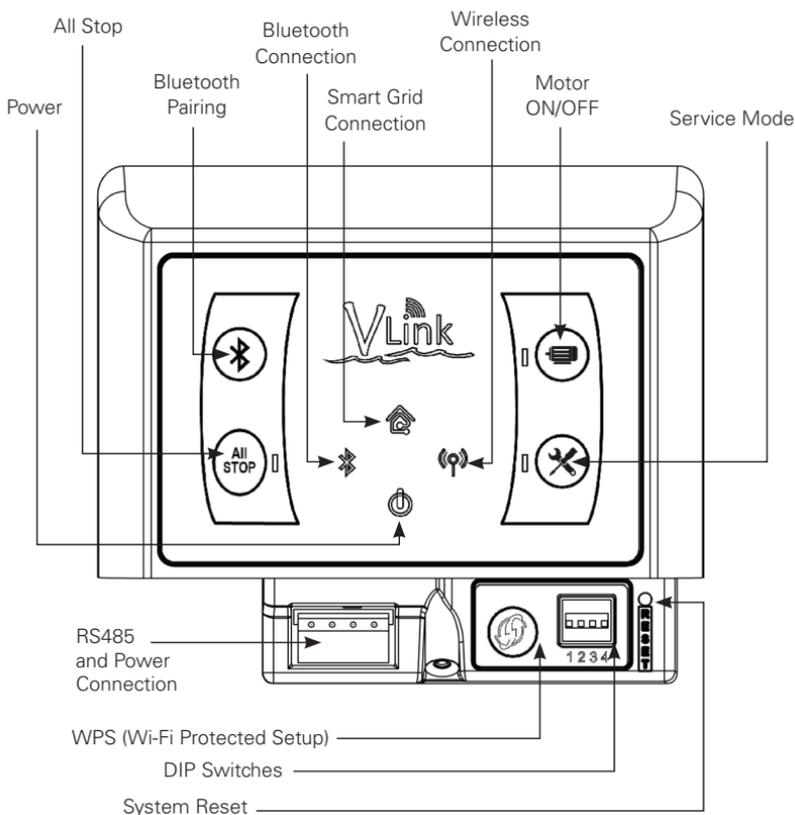


Figure 2: VLink Overview

The VLink manual buttons and LEDs are specified in the following sections:

2.1.1 Bluetooth Pairing Button and Connection LED

This button and corresponding LED are reserved for future use and will not be active on the first generation of this product. Future over the air software updates may activate this functionality.

2.1.2 All Stop Button and LED

⚠WARNING

VLink Wireless Adapter and accompanying mobile applications are not intended to be used in an emergency or safety situation.

- Emergency situations require main power to motor shall be shut off / disconnected.
- Pressing "STOP" in mobile application, or pressing "ALL STOP" on VLink wireless adapter may not stop motor if a digital input is active or becomes active at any time (applicable to VGreen 165).
- "STOP" and "ALL STOP" commands are not intended to be used in an emergency situation to stop the motor.
- When mobile device is used to operate motor remotely, hazardous conditions cannot be identified.

Failure to comply with this may result in death, serious personal injury or property damage.

When this button is pressed, the VGreen motor will stop and the corresponding LED next to the button will illuminate. If connected to a VGreen 270 motor, the auxiliary (Aux) load on the VGreen 270 will also turn off. To resume normal operation, the All Stop Button is pressed again, turning off the LED. The All Stop LED will blink every ½ second for 5 seconds when the All Stop button is pressed to indicate the 5-second delay required between button presses.

2.1.3 Service Mode Button and LED

This button provides service mode functionality allowing the VLink to be locked out from external control while the pool is being serviced. The motor can only be operated via the Motor ON/OFF Button while in Service Mode. To activate Service Mode, press the Service Mode button on VLink. The Service Mode LED will illuminate solid. To deactivate Service Mode, press the Service Mode button again. The Service Mode LED will turn off. The Service Mode LED will blink every ½ second for 5 seconds when the Service Mode button pressed to indicate the 5-second delay required between button presses.

2.1.4 Motor ON/OFF Button and LED

To start the motor while in Service Mode, press the Motor Button on VLink. The Motor LED will illuminate solid. To stop the motor while in Service Mode, press the Motor button again. The Motor LED will turn off. Successively pressing and holding the Motor button for 5 seconds will cycle through motor speeds of 1800 RPM, 2200 RPM, 2600 RPM, and 3450 RPM.

The Motor ON/OFF LED will blink every ½ second for 5 seconds when the Motor button is pressed to indicate the 5-second delay required between button presses.

2.1.5 Smart Grid Connection LED

This button and corresponding LED are reserved for future use and will not be active on the first generation of this product. Future over the air software updates may activate this functionality.

2.1.6 Power LED

This LED illuminates whenever power is supplied to the VLink via the RS-485 Power Connection.

2.1.7 Wireless Connection LED

When the home router connection and Internet access are present, the LED is illuminated solid. When in Wi-Fi Connect mode, the LED will blink once per every two seconds (ON one second, then OFF one second). When the WPS button is pressed, the LED will blink once per every second (ON a 1/2 second, then OFF a 1/2 second).

When the home router connection is present, but there is no Internet access, the LED will blink ON for 3 seconds, OFF for ½ second, ON for ½ second, OFF for ½ second, and repeat. The LED behavior is summarized in Table 1 below.

Wi-Fi LED	When router connection and internet access is present	When in Wi-Fi Connect Mode	When WPS button is pressed to activate WPS	When the router connection is present, but no internet access
Illuminated	Solid	Once per every two seconds (ON one second, then OFF one second)	Once per every second (ON a 1/2 second, then OFF a 1/2 second).	Goes ON for 3 seconds, then blinks OFF, ON, OFF, ON, OFF, repeat. (ON 3 seconds, OFF ½ second, ON ½ second, OFF ½ second, ON ½ second, OFF ½ second, repeat.)

Table 1: Wireless Connection LED

2.1.8 WPS Button

To connect to the home wireless network, the WPS button can be used when connecting via Wi-Fi Connect or WPS, this is specified in section 3.5.2. Pressing and holding the button for greater than 8 seconds, will put the VLink back in Wi-Fi Connect Mode if the user needs to restart the setup for some reason.

To connect to the home wireless network with the WPS method, the WPS button is pressed for less than 5 seconds. The WPS button on the home wireless router is then pressed to complete the pairing process. Once pairing is complete, the Wireless Connection LED will illuminate. The home wireless router must be equipped with the WPS feature in order to connect via this method.

2.1.9 DIP Switches

These dip switches are reserved for future use and will not be active on the first generation of this product. Future over the air software updates may activate this functionality.

2.1.10 System Reset Button

The System Reset Button can be pressed to perform a manual system reset of the VLink. The button can be accessed with a pen or other sufficiently pointed object.

3. INSTALLATION GUIDE

3.1 Verify a Strong Backyard Wi-Fi Signal

Verify Wi-Fi signal is present in your desired mounting location. To do this you can use your mobile device. Make sure the mobile devices Wi-Fi is enabled, walk to the desired mounting location and see if the home network is available. If it is available then this is a suitable mounting location. Otherwise you will have to choose a new location or add a Wi-Fi range extender to your home network.

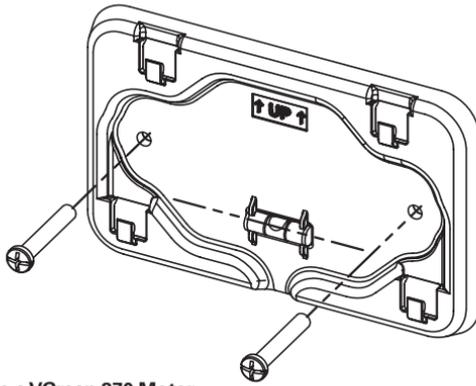
NOTE: It is best to mount VLink away from metal objects, in a raised location and away from as many obstacles as possible.

Once you verify your mounting location has a strong Wi-Fi signal, it is time to mount VLink.

3.2 Mounting

The VLink wireless adapter needs to be mounted to a vertical surface (wall, fence, post, Etc ...). To Mount VLink place the mounting bracket in the desired location and use it as a template to mark the holes. If pre-drilling is required, pre-drill the holes and use the included fasteners to secure the mounting plate. In some cases the included fasteners may not be the correct style or type, you will have to source appropriate fasteners locally.

NOTE: It is recommended to wait until the installation is complete to snap the VLink to the mounting bracket.



3.3 Connecting to a VGreen 270 Motor

⚠WARNING

- A licensed, qualified electrician should complete wiring for this product.
 - Always disconnect main power from motor being serviced and wait 5 full minutes for capacitor voltage discharge before servicing or installing unit.
- Failure to comply with this may result in death, serious personal injury or property damage.

NOTE: Refer to manufacturer's instructions for wiring on all other products other than VLink.

The following steps should be followed to connect VLink to a VGreen 270 motor.

1. Disconnect all power sources from the motor and wait five minutes.
2. Remove the terminal box cover from the controller (two screws).

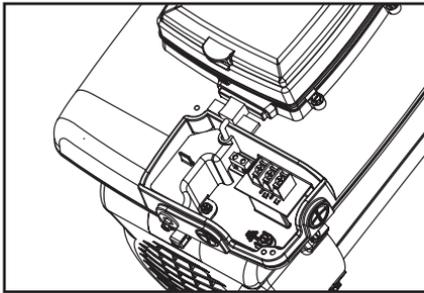


Figure 2: Terminal Box Cover Removed

3. Remove the plastic wiring cover inside the terminal box (one screw).

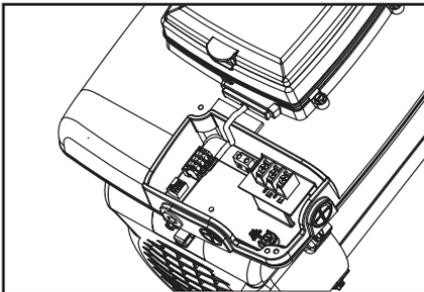


Figure 3: Internal Plastic Cover Removed

4. Disconnect the 4-pin communication connector by pulling up on the connector.

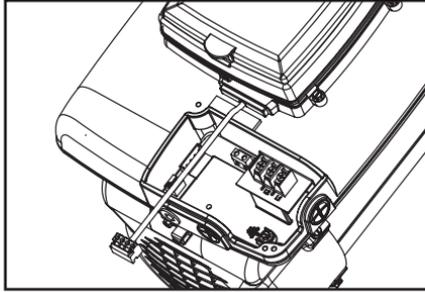


Figure 4: Communication Connector Disconnected

5. Remove the User Interface from the controller (4 screws).

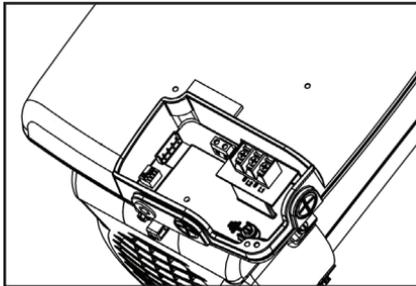
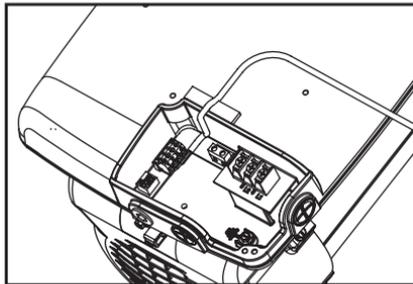


Figure 5: User Interface and Rubber Gasket Removed

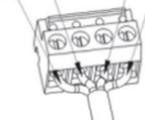
6. Once the existing User Interface has been removed, you are now ready to start the installation



7. Start by assembling the RS-485 connector to the communication cable as follows:

WHITE

RED



Pin #	Wire Color	Description
1	Red	+10V
2	White	RS485-A
3	Green	RS485-B
4	Black	Common

8. Plug in the RS-485 cable into the RS-485 Socket.

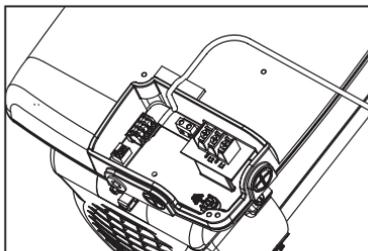
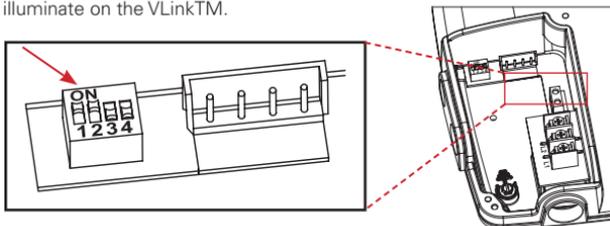


Figure 6: Cable Installed

9. On the VGreen® 270 motor, ensure dip switch #1 and #2 are in the ON position, all others should be off. You can then apply power to the VGreen® motor. The power LED should illuminate on the VLink™.



10. Route the RS-485 cable through the opening and replace the plastic cover inside the terminal box (one screw). Ensure the rectangle gasket seated inside the terminal box cover is still in position, if not reposition the gasket correctly and reassemble.

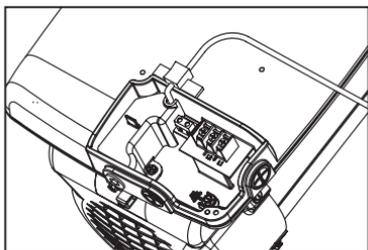


Figure 7: Plastic Cover Installed in Terminal Box

11. Assemble the metal terminal box cover (2 screws), routing the RS-485 cable through the opening. Plug the four User Interface mounting holes with the plastic plugs (PN: 2514059-001) included.

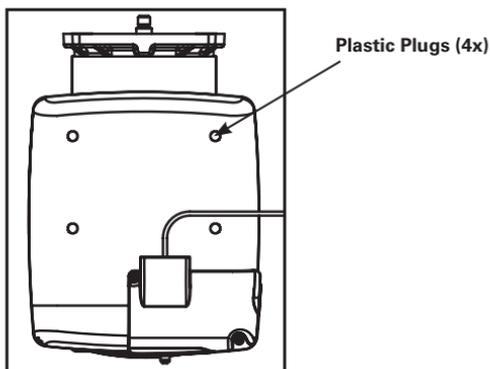


Figure 8: Terminal Box Cover and Plugs Installed

12. Connect the other end of the RS-485 cable into the VLink.
13. On the VGreen motor ensure dip switch #1 is in the ON position, all other dip switches should be turned off.
14. Apply power to the VGreen motor. The power LED should illuminate on the VLink. If it does NOT refer to section 6, TROUBLE SHOOTING GUIDE.
15. Upon applying power for the first time, All Stop is also enabled and indicated with the All Stop LED illuminated solid.
16. Proceed to section 4.1.2, OUT OF BOX OPERATION to verify motor operation.

3.4 Connecting to a VGreen 165 Motor

⚠ WARNING

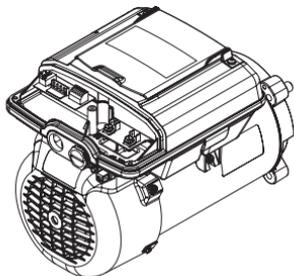
- A licensed, qualified electrician should complete wiring for this product.
- Always disconnect main power from motor being serviced and wait 5 full minutes for capacitor voltage discharge before servicing or installing unit.

Failure to comply with this may result in death, serious personal injury or property damage.

NOTE: Refer to manufacturer's instructions for wiring on all other products other than VLink.

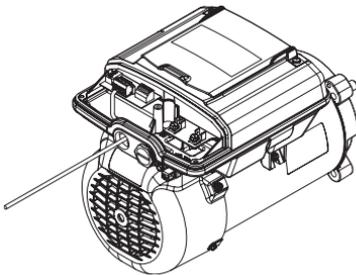
The following steps should be followed to connect VLink to a VGreen 165 motor.

1. Disconnect all power sources from the motor and wait five minutes.



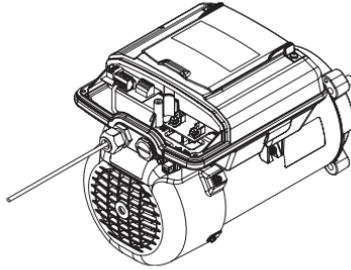
2. Remove the terminal box cover from the controller (one screw).
3. Assemble the RS-485 connector to the communication cable as follows:

	<table border="1"> <thead> <tr> <th>Pin #</th> <th>Wire Color</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Red</td> <td>+10V</td> </tr> <tr> <td>2</td> <td>White</td> <td>RS485-A</td> </tr> <tr> <td>3</td> <td>Green</td> <td>RS485-B</td> </tr> <tr> <td>4</td> <td>Black</td> <td>Common</td> </tr> </tbody> </table>	Pin #	Wire Color	Description	1	Red	+10V	2	White	RS485-A	3	Green	RS485-B	4	Black	Common
Pin #	Wire Color	Description														
1	Red	+10V														
2	White	RS485-A														
3	Green	RS485-B														
4	Black	Common														

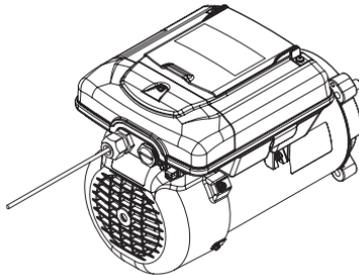


4. Plug in the RS-485 cable into the RS-485 socket.

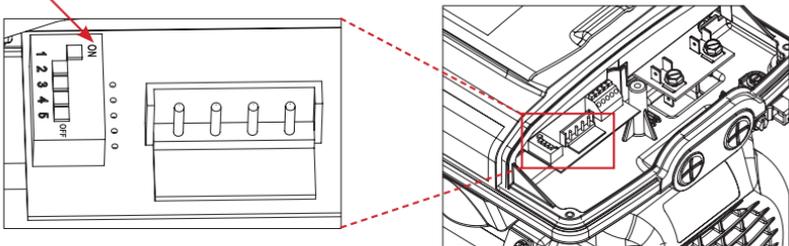
5. Install the included Conduit Fitting and Route the RS-485 cable through the opening.



6. Assemble the metal terminal box cover (1 screw)



7. On the VGreen® 165 motor, ensure dip switch #1 is in the ON position, all others should be off. You can then apply power to the VGreen® motor. The power LED should illuminate on the VLink™.



8. Connect the other end of the RS-485 cable into the VLink.
9. On the VGreen motor ensure dip switch #1 is in the ON position, all other dip switches should be turned off.
10. Apply power to the VGreen motor. The power LED should illuminate on the VLink. If it does NOT refer to section 6 TROUBLE SHOOTING GUIDE.
11. Upon applying power for the first time, All Stop is also enabled and indicated with the All Stop LED illuminated solid.
12. Proceed to section 4.1.2 "OUT OF BOX OPERATION" to verify motor operation.

3.5 Connecting to the Internet

NOTE: The VLink does not have to be immediately connected to the Internet. If you are installing this and do not have access to the homeowners wireless network then you can proceed to section 3.6 "VLink Final Mounting". Refer to section 4.1 "Manual Operation" for how to operate the VLink without connecting to a wireless network.

The VLink is connected to the Internet after creating a user account with the VLink Mobile App. The Internet connection is enabled via the home wireless network. Once connected, the VLink can be controlled by logging in with the User's VLink Account from the Mobile App or from the Web App at www.centuryvlink.com.

3.5.1 Create User Account

Before connecting the VLink to the home wireless network, a user account must be created with the VLink Mobile App for Android or Apple. Download the Mobile App from the appropriate app store and follow the instructions to create a new account.



Search for "Century VLink"

3.5.1.1 Step 1: Click *Create an Account*

After installing the mobile app, click **Create an Account** at the bottom of Figure 11: Initial Login Screen.

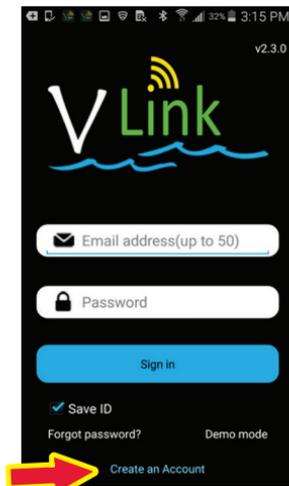


Figure 11: Initial Login Screen

3.5.1.2 Step 2: Enter Email and Password

Enter a valid Email Address and your desired Password and agree to the Terms of Service shown in Figure 12 below.

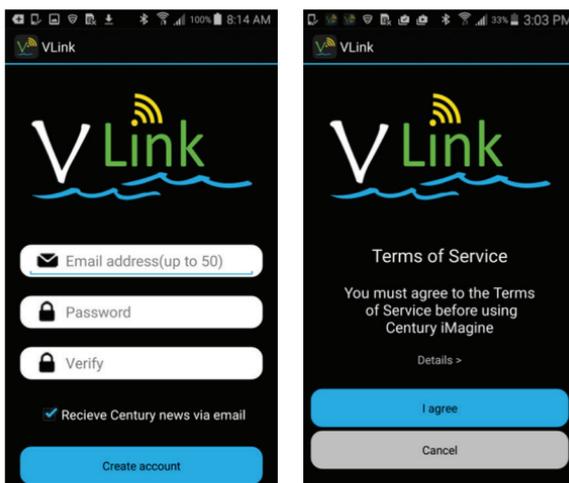


Figure 12: Create Account and Terms of Service Screens

3.5.1.3 Step 3: Enter User Information

Enter your user information, scroll down, and select **Save** as shown in Figure 13. All fields marked with an "*" are required.

The figure consists of two side-by-side screenshots of a mobile application interface. Both screens display the VLink logo at the top, which features a stylized 'V' and 'Link' with a Wi-Fi symbol above the 'i'. Below the logo, the text reads "Welcome! Let Century VLink get to Know you".

The left screenshot shows a form with the following fields: "Last Name *" (with a person icon), "First Name *" (with a person icon), "Address *" (with a house icon), "City *" (with a house icon), and "State *" (with a house icon). The right screenshot shows the continuation of the form with: "Phone Number" (with a telephone icon), "Age" (with a person icon), and "Gender" (with radio buttons for "Male" and "Female"). A blue "Save" button is located at the bottom of the right screenshot.

Figure 13: Welcome Screen

3.5.1.4 Step 4: Enter Security Questions

Enter the security questions in Figure 14. Upon selecting Save, an Email will be sent from VLink@centuryelectricmotor.com to verify your account as specified in section 3.5.1.5 Step 5.

The screenshot shows the VLink mobile app interface for security questions. At the top is the VLink logo and the text "To ensure security please provide password security answers". Below this are two security question cards. The first card asks "What is your dream job?" and has an "Answer" input field. The second card asks "What is your mother's maiden name?" and also has an "Answer" input field. A blue "Save" button is positioned at the bottom of the screen.

Figure 14: Security Screen

3.5.1.5 Step 5: Verify Your Account

Upon completing *Step 4*, an E-mail will be sent from VLink@centuryelectricmotor.com to the E-mail address provided in *Step 2*. You will need to verify your account by clicking "**this link**" in the contents of the Email shown below in Figure 15.

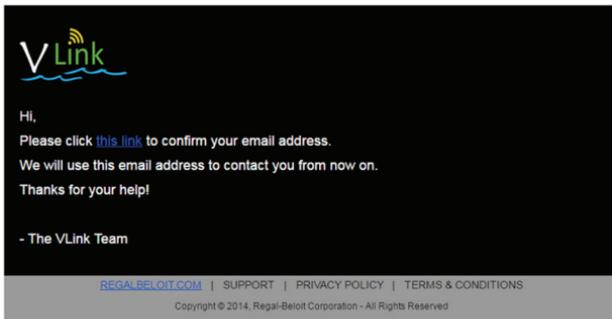


Figure 15: Verification Email

Upon clicking **“this link”**, successful verification is indicated by Figure 16 below.

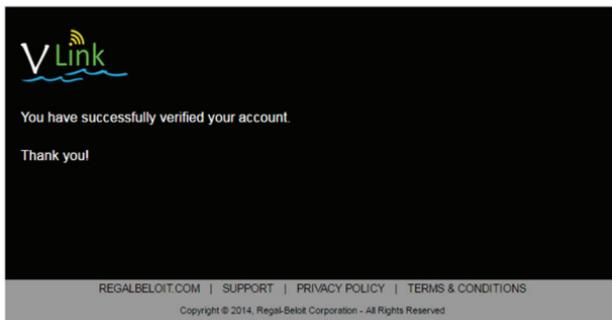


Figure 16: Successful Verification Response

3.5.1.6 Step 6: Sign-In to Your Account

Click **Sign in to new account** as shown in Figure 17 below. If you did not first verify your account per the Verification Email instructions, specified in section 3.5.1.5 Step 5, do so now. Without first verifying your account, clicking **Sign in to new account**, will not allow proceeding Step 7.

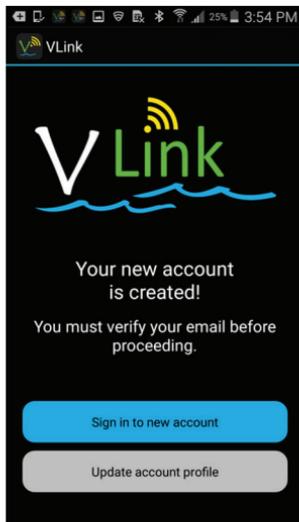


Figure 17: Account Created

3.5.1.7 Step 7: Account Created! Sign-In

Login as shown in Figure 18 with your Email Address and previously specified password. Logging in will transition the Mobile App to guide you through the steps for Connecting to a Home Wireless Network.

NOTE: The email address is case sensitive.

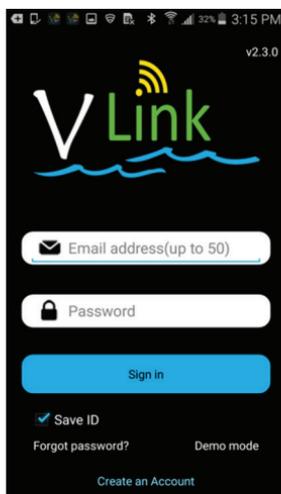


Figure 18: Login Screen

3.5.2 Connecting to a Home Wireless Network

After creating a User Account, login and follow the optional Tutorial for installing the VLink, shown in Figure 19. The Tutorial can be skipped if the VLink has been installed.

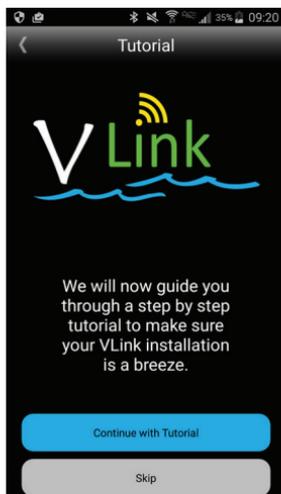


Figure 19: Mobile App Guide Screen

After the Tutorial or if Skip is selected, Connection Setup is provided for connecting the VLink to the home wireless network with either the Wi-Fi or WPS methods as shown in Figure 20.



Figure 20: Choose Connection Setup Screen

3.5.2.1 Connecting with Wi-Fi

Before attempting to connect to your wireless network via the Wi-Fi method, verify the VLink Wireless Connection LED is blinking once per second. This is the Out-of-Box configuration for the LED after power is first applied to the VLink. If the Wireless Connection LED is not blinking once per every two seconds (ON one second, then OFF one second),, press and hold the WPS button for greater than 8 seconds. Once the Wireless Connection LED is blinking once per two seconds, then select Wi-Fi from the Connection Setup Screen shown in Figure 20 above. The connection setup screen will then open as shown in figure 21 below.



Figure 21: Connection Setup Screen

Next, enter the VLink Access ID. The Access ID is obtained from the sticker on the back panel of the VLink and can be entered manually or scanned in with the Mobile app as shown in Figure 22 below. After entering the Access ID, select Continue allowing the Mobile App to associate the Access ID and connect to the VLink as shown in Figure 23.



Figure 22: Mobile QR Code Access ID Screens

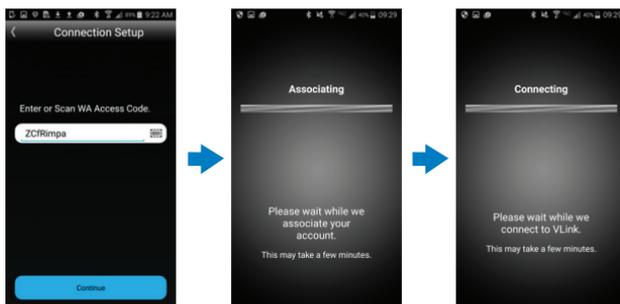


Figure 23: Access ID Associate, and Connect Screens

Next, enter or select the Home Router Name, and enter your router Password as shown in Figure 24 below (also known as SSID & Password).

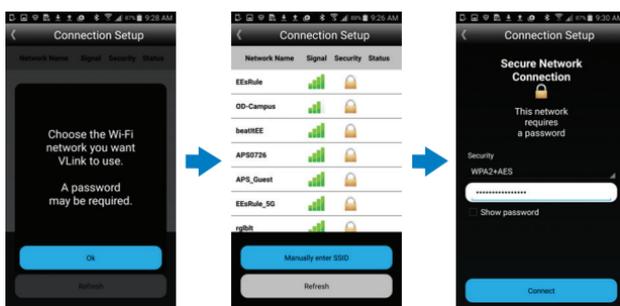


Figure 24: Home Router Name, Security, and Password Screens

3.5.2.2 Connecting with WPS (Wi-Fi Protected Setup)

NOTE: Your wireless router must be equipped with the WPS feature to connect via this method.

Before connecting to your home wireless network via the WPS method, insure the VLink Wireless Connection LED blinks ON once per every second (ON a 1/2 second, then OFF a 1/2 second) by pressing and holding the WPS button for less than 5 seconds. Then, select WPS from the Connection Setup Screen, shown in Figure 20 below. Next, enter the VLink Access ID. The Access ID is obtained from the sticker on the back panel of the VLink and can be entered manually or scanned in with the Mobile via the QR code icon as shown in Figure 25 below. After entering the Access ID, select Continue allowing the App to associate the Access ID as shown in Figure 26



Figure 25: Mobile QR Code and Access ID Screens

Follow the manufacturer specified WPS pairing process of your home wireless router. When connecting with WPS, the Home Router Name and Password (also known as SSID & Password) are obtained automatically by first pressing the WPS button on your wireless router and then pressing the WPS button on VLink for less than 5 seconds, as specified in Figure 27

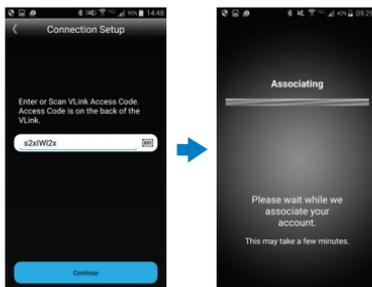


Figure 26: Associate Access ID Screens



Figure 27: WPS Connection Setup Screen

Once pairing is complete and the Wireless Connection LED is illuminated solid on the VLink, press Continue on the screen as shown in Figure 27.

3.5.2.3 Home Wireless Network Connection Completed

If the Wi-Fi or WPS connection is not successful, the Mobile App times out after 2 minutes. Pressing the OK button shown in Figure 28 navigates back to the “Connection Setup” screen. Upon returning to the “Connection Setup” Screen, the connection can be reattempted with either the Wi-Fi or WPS methods.

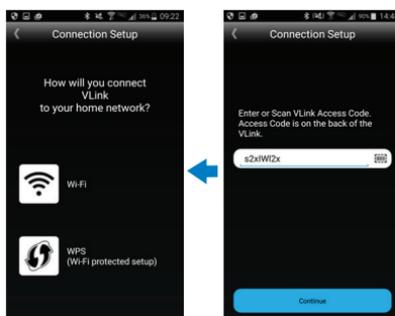


Figure 28: Navigate back to the Choose Connection Setup Screen

The VLink Wireless Connection LED will blink a repeating pattern of ON 3 seconds, OFF ½ second, ON ½ second, and OFF ½ second if connected to your Home Wireless Network, but not connected to the Internet. If this LED blink pattern occurs, verify your Home Router connection to the Internet and refer to section 5, **TROUBLESHOOTING GUIDE**.

When the VLink connects to your Home Wireless Network and the Internet, the Wireless Connection LED will illuminate solid. The Home Wireless Network connection setup is complete and the screen shown in Figure 29 below should appear.



Figure 29: Congratulations, Connected to the Home Network Screen

3.5.3 VLink Initial Setup

Enter the appropriate information for the pool set up: size of the pool in Gallons, private or commercial, the type of filter. The kWh rate charged by the utility company, which is used for energy calculations. Choose the time zone the pool is located in. You will also be prompted to name your VLink wireless adapter per the screens is shown in Figure 30 below.

NOTE: When the VLink is connected to the Internet per section 3.5 “Connecting to the Internet”, the System Time is automatically updated to the local current time from the default power-up time of 12:12 PM CST, as specified in section 4.1.2 “Out-of-Box Operation”. The local time zone and daylight saving time are set from the App Menu as explained in section 4.3.9 “Account”.

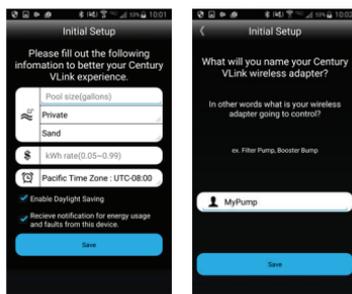


Figure 30: VLink Initial Setup Screen

3.5.4 VLink Mobile App Operation

After connecting the VLink to the internet and logging in with your VLink account, the VLink Mobile App offers Status, Override, Schedule, and Energy tabs shown in Figure 31 below:



Figure 31: Mobile App Status Screen

3.5.5 VLink Web App Operation

To connect to your VLink via a web browser, go to www.centuryvlink.com and login with your user account. The link to the webpage and Login is shown in Figure 32 below:

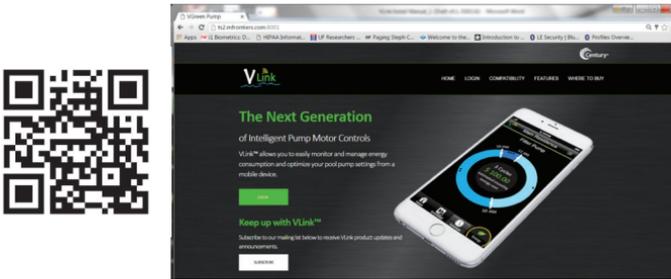


Figure 32: Centuryvlink.com Login Screen

After logging in with your VLink account, the VLink Web App offers the same Status, Override, Schedule, and Energy tabs as provided by the Mobile App, shown in Figure 33 below:



Figure 33: Web App Status Screen

3.6 VLink Final Mounting

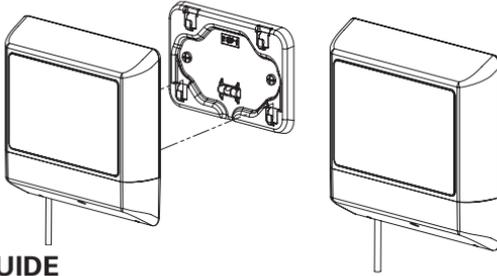
1. Once you are done installing VLink, route the RS-485 cable through the notch



2. Attach the VLink terminal box cover. (1 Screw)



3. Snap the VLink onto its mounting bracket.



4. USER GUIDE

4.1 Manual Operation

The VLink supports manual operation via the All-Stop, Service Mode, and Motor buttons. The VLink does not need to be connected to the Internet for manual operation.

4.1.1 All Stop

⚠ WARNING

VLink Wireless Adapter and accompanying mobile applications are not intended to be used in an emergency or safety situation.

- Emergency situations require main power to motor shall be shut off / disconnected.
- Pressing “STOP” in mobile application, or pressing “ALL STOP” on VLink wireless adapter may not stop motor if a digital input is active or becomes active at any time (applicable to VGreen 165).
- “STOP” and “ALL STOP” commands are not intended to be used in an emergency situation to stop the motor.
- When mobile device is used to operate motor remotely, hazardous conditions cannot be identified.

Failure to comply with this may result in death, serious personal injury or property damage.

⚠ CAUTION

If power is connected to V-Green motor, pressing illuminated “All Stop” button on installed VLink may result in motor starting. Failure to recognize this could result in personal injury or damage to the equipment.

When the All Stop button is pressed, the VGreen motor will stop and the corresponding LED next to the button will illuminate ON. If connected to a VGreen 270 motor, any connected Auxiliary load will also turn off. To resume normal operation, the All Stop Button is pressed again, turning the LED OFF. The All Stop LED will blink ON every ½ second for 5 seconds after the All Stop button is pressed to indicate the 5 second delay required between button presses.

4.1.2 Out-of-Box Operation

The first time power is supplied to the VLink, All Stop is enabled and indicated with the All Stop LED illuminated ON. Upon pressing the button, the VLink will be taken out of All Stop, the LED will turn OFF, and the Default Schedule will run the motor as specified in Table 2 below. Pressing the All Stop button again will stop the motor and illuminate the LED ON.

Default Schedule	Begin	End	Speed
Cycle 1	8:00 AM	12:00 PM	3100 RPM
Cycle 2	12:00 PM	4:00 PM	2600 RPM
Cycle 3	4:00 PM	12:00 AM	1600 RPM
Cycle 4	12:00 AM	8:00 AM	0 RPM

Table 2: VLink Default Schedule

Upon power-up, the System time is set to 12:12 PM CST. The VLink Schedule will run according to the System Time, regardless of the current time. The System Time is automatically corrected to the local current time upon connecting the VLink to the Internet.

NOTE: When the VLink is connected to the Internet per section 3.5 “Connecting to the Internet”, the System Time is automatically updated to the local current time from the default power-up time of 12:12 PM CST, as specified in section 4.1.2 “Out-of-Box Operation”. The local time zone and daylight saving time are set from the App Menu as explained in section 3.3.9 “Account”.

4.1.3 Service Mode

The motor is manually controlled via the Service Mode and Motor buttons. The VLink enters Service Mode by pressing the Service Mode button and the Service Mode LED will illuminate ON. The motor is stopped, if running. Pressing the Service Mode button again will exit Service Mode and turn the LED OFF. The motor will run, if previously running before entering Service Mode. The motor can be manually operated via the Motor ON/OFF Button while in Service Mode. To start the motor while in Service Mode, press the Motor Button. The Motor LED will illuminate ON. To stop the motor while in Service Mode, press the Motor button again. The Motor LED will turn OFF. Successively pressing and holding the Motor button for 5 seconds will cycle through motor speeds of 1800 RPM, 2200 RPM, 2600 RPM, and 3450 RPM. Service Mode is cancelled and the motor is stopped if running when All Stop is pressed. The Service Mode and Motor LEDs will blink ON every ½ second for 5 seconds after the corresponding button is pressed to indicate the 5 second delay required between button presses.

4.2 App Operation

The VLink Mobile App and the corresponding VLink Web App offer four main feature tabs providing Status, Override, Schedule, and Energy functionality.

4.2.1 Status Tab

The Status tab provides the current state of the VLink with a Run / Stop button, shown in Figure 34 below. Pressing the Run button will start the motor for the active Cycle or feature. The outer green ring graphically displays clockwise the percentage of the motor speed invoked from 0 to 3450 RPM. The inner blue ring graphically displays clockwise the percentage of the time remaining of the Cycle or feature.



Figure 34: Run and Stop Status Screens

The motor speed and time remaining are also numerically displayed inside of the rings along with the name of the actively running Cycle or feature such as Priming, Override, Learn Mode, and Freeze Protection as shown in Figure 35 below:



Figure 35: Feature Status Screens

The manual motor operation status per the All Stop and Service Mode is also provided via the Status Tab as shown in Figure 36: Manual Motor Operation Status.



Figure 36: Manual Motor Operation Status

4.2.2 Override Tab

The Override Tab provides the capability to override the active schedule with a predefined motor speed and duration. When VLink is used with VGreen 270, Auxiliary Load can also be invoked with Overrides. Overrides are invoked with on-demand button functionality shown in Figure 37 below. The following override buttons are factory provided:

- Dedicated overrides for Schedule and All Off
- Pre-configured Override Low and Override High
- Custom overrides via the "+" button

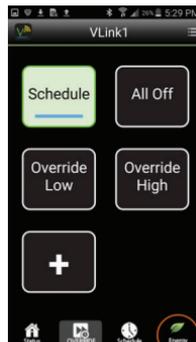


Figure 37: Override Screen

The override buttons for invoking the Schedule and All Off are permanently dedicated and cannot be modified or deleted.

Pressing and holding the preconfigured or custom override buttons, provides menu options for deleting or modifying the Override with the Name, Duration, and Speed, as shown in Figure 38 below:

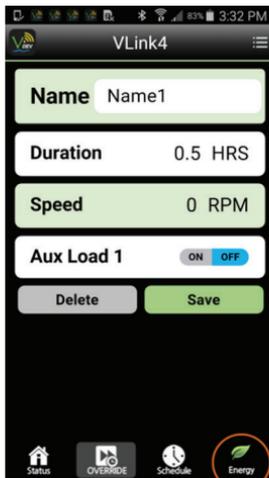


Figure 38: Override Edit Screen

The capabilities are summarized in Table 3: Override Capabilities

Override Capabilities	
Min Overrides	2
Max Overrides	6
Speed Range	600-3450 RPM
Speed Steps	25 RPM Increments
Min Duration	30 minutes
Max Duration	10 hours
Time Steps	30 minutes

Table 3: Override Capabilities

The default values for Override Low and Override High are provided in Table 4: Override Defaults.

Override Defaults			
Override Button	Speed	Aux Load	Duration
Override Low	1725 RPM	OFF	8 hours
Override High	3450 RPM	OFF	2 hours

Table 4: Override Defaults

4.2.3 Schedule Tab

The Schedule Tab provides the main functionality for controlling the VGreen Motor. The Schedule is specified with defined cycles over a 24-hour period and provides the estimated monthly energy cost shown in Figure 39 below:



Figure 39: Schedule Screen

Each cycle is displayed with a different color on the Cycle Ring with the number of black dots indicating the cycle number. Cycle length and speed are modified directly on the Cycle Ring by selecting and dragging the cycle function to the desired length or speed as shown in Figure 40 below:

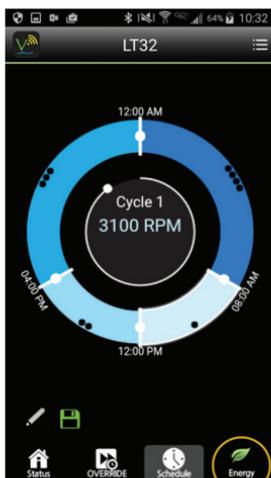


Figure 40: Cycle Speed and Length Schedule Screen

The Schedule Edit function shown in Figure 41 below provides the capability to add/delete cycles and schedule Aux Load per cycle.

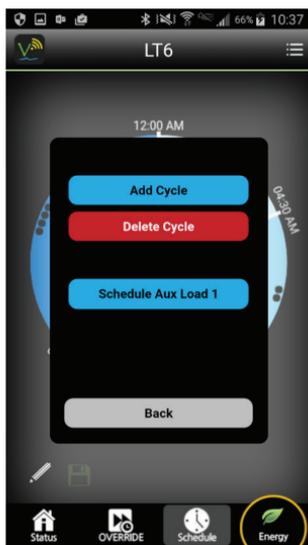


Figure 41: Edit Schedule Screen

The speed range of each cycle can be changed to 0, 600-3450 RPM in 25-RPM increments. The cycle time duration of each cycle is provided over the 24 hour period with a minimum cycle time of 2 hours that can be edited / adjusted in 15 minute increments. The capabilities are summarized in Table 5: Schedule Capabilities.

Schedule Capabilities	
Min Cycles	2
Max Cycles	5
Speed Range	0, 600-3450 RPM
Speed Steps	25 RPM Increments
Time Steps	15 Minute Increments
Min Cycle Time	2 hours

Table 5: Schedule Capabilities

The default values are provided in Table 6: Schedule Default Values

Schedule Defaults			
	Begin	End	Speed
Cycle 1	8:00 AM	12:00 PM	3100 RPM
Cycle 2	12:00 PM	4:00 PM	2600 RPM
Cycle 3	4:00 PM	12:00 AM	1600 RPM
Cycle 4	12:00 AM	8:00 AM	0 RPM

Table 6: Schedule Default Values

4.2.4 Energy Tab

The Energy tab provides the VLink energy usage as shown in Figure 42 below. A slider function for adjusting the kWh Rate cost is provided. The kilowatt-hour usage and monthly energy cost are based on the set schedule, and are used to calculate total estimated monthly and yearly energy cost and Kilowatt-hour consumption.



Figure 42: Energy Screen

4.3 VLink Features

4.3.1 App Menu

The App Menu provides for configuration and setup of the VLink features and capabilities. Feature Setup, Motor Info, Reminders, Alerts & Emails, About Information, Software Update, Account, Network, and Help functionality are all accessed via the Menu, as shown in Figure 43. An additional VLink adapter can be added by clicking the “<” to the right of the motor graphic.

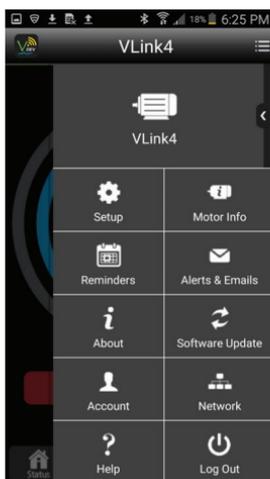


Figure 43: App Menu Screen

An overview of the App Menu functionality is provided in Table 7: App Menu Functionality.

App Menu Item	Functionality
Add VLink	Add another VLink for a 2nd pool.
Setup	Configuration of the Aux Load, Priming, Freeze Protection, and Service Mode features
Motor Info	Motor health, motor faults, and general motor information
Reminders and Alerts & Emails	Custom user notifications

About	VLink model number, serial number, software version, and mobile app versions.
Software Update	Over-the-Air Software Update capability.
Account	Login credentials, personal information, and general information with capability for changing the time zone, resetting the VLink to factory default settings, and removing/adding the VLink account to another VLink
Network	Home Wireless Router name with the ability to disconnect/connect to another router.
Help	Select button to obtain Help information.
Logout	Select button to Logout of the VLink App.

Table 7: App Menu Functionality

4.3.2 Add 2nd VLink

For a 2nd Pump, the App Menu allows for adding a 2nd VLink Adapter to your user account by pressing “Add” to the right of the motor graphic. After pressing Add, the App Guide and Tutorial are provided as previously specified in section 3.5.2 describing the steps for adding the 2nd VLink as shown in Figure 44 below:

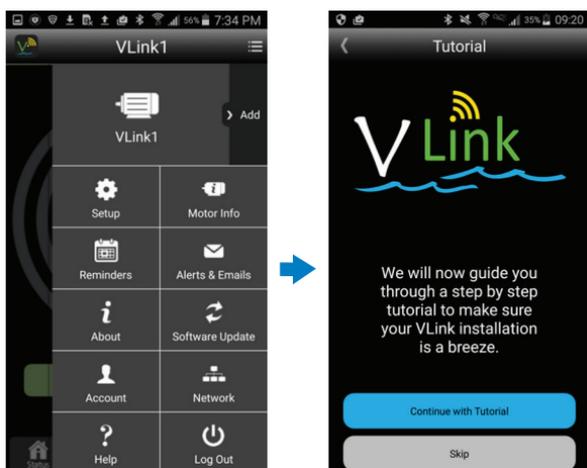


Figure 44: Add Additional VLink

4.3.3 Setup

Setup provides access to Aux Load (VGreen 270 Only), Priming, Freeze Protection, Service Mode, and Learn Mode as shown in Figure 45 below. If necessary, scroll down to see all items of the Setup Menu.

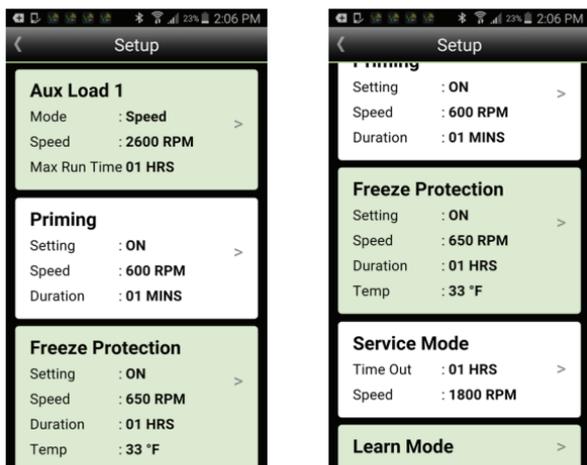


Figure 45: Setup Menu Items

4.3.3.1 VLINK Wireless Adapter Use with Aux Load (VGreen 270 Only)

Aux Load provides for controlling an auxiliary connection to the VGreen 270 Motor. Aux Load can be configured in the Menu, Schedule, and Override setup screens. From the Menu, select Setup->Aux Load, where Aux Load can be set for Schedule or Speed shown in Figure 46 below:

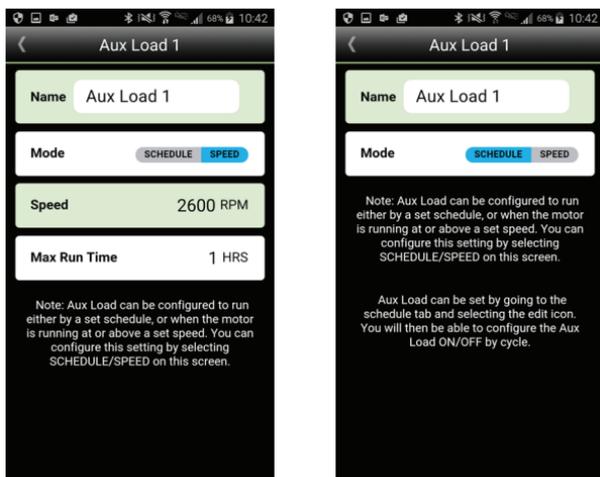


Figure 46: Aux Setup Menu Screens

If the Mode is set to Speed, Aux Load will turn on when the motor runs at or above the specified speed. The Aux Load will stay on while the motor is running up to the specified Max Run Time. If the Mode is set to Schedule as shown in Figure 46 above, the Aux Load is selected in the Schedule Tab and set per Cycle shown in Figure 47 below:



Figure 47: Aux set per Cycle Screens

Independent of the Menu or Schedule, Aux Load can also be specified to operate per Override, as described in section 4.2.2 "Override Tab". Edit of the Override is shown in Figure 48 below:

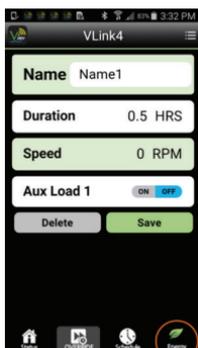


Figure 48: Aux set per Override Edit Screen

The Aux capabilities are summarized in Table 8: Aux Capabilities.

Aux Load Capabilities	
Mode	Schedule or Speed
Speed Min	600 RPM
Speed Max	3450 RPM
Min Run Time	1 Hour
Max Run Time	12 Hours

Table 8: Aux Capabilities

The Aux defaults are summarized in Table 9: Aux Default Values.

Aux Defaults for Menu		Aux Defaults for Schedule		Aux Defaults for Overrides	
Name	Aux Load 1	Mode	Schedule	Aux Load	Off
Mode	Schedule	Cycle1	OFF		
		Cycle2	OFF		
		Cycle3	OFF		
		Cycle4	OFF		

Table 9: Aux Default Values

4.3.3.2 VLINK Wireless Adapter Use with Digital Inputs (VGreen 165 Only)

⚠ WARNING

VLink Wireless Adapter and accompanying mobile applications are not intended to be used in an emergency or safety situation.

- Emergency situations require main power to motor shall be shut off / disconnected.
- Pressing "STOP" in mobile application, or pressing "ALL STOP" on VLink wireless adapter may not stop motor if a digital input is active or becomes active at any time (applicable to VGreen 165).
- "STOP" and "ALL STOP" commands are not intended to be used in an emergency situation to stop the motor.
- When mobile device is used to operate motor remotely, hazardous conditions cannot be identified.

Failure to comply with this may result in death, serious personal injury or property damage.

VGreen 165 can be controlled with the VLINK wireless adapter by itself or it can be controlled in conjunction with digital inputs. When controlling the V-Green 165 with Digital inputs, refer to the Installation and User manual that came with the motor. If this manual is not readily available, it can be found at www.pool-motors.com. When controlling a V-Green 165 with both a VLink wireless adapter and digital inputs it is important to understand the communication priority scheme. Communication priority scheme determines what communication will have priority over another (I.E. Digital input vs. VLink).

- 1) Motor Priority – this is the priority scheme that will take precedence when sending RUN or STOP commands to the motor:
 - a. Priority #1: Digital inputs
 - b. Priority #2: External Serial Input via RS-485 (VLink Wireless Adapter)
 - c. Priority #3: On-board user interface (Key pad located on top of the VGreen 165)

Note: As described above, if a digital input is applied, it will take precedence over any other input that may be applied.

- 2) VGreen 165 On-board user interface 'STOP' button
 - a. This is a temporary stop function. This button stops the motor only for 4 Minutes when either a 'Digital Input' or 'Wireless Adapter' are active/connected.
 - b. This 'STOP' button has higher priority than all other 'STOP' buttons.
- 3) Wireless Adapter 'ALL STOP' button
 - a. If a 'Digital Input' is active, the 'All STOP' button on the 'Wireless Adapter' will not work.
 - b. If a 'Digital Input' is active, the 'STOP' button on the 'Mobile App' will be 'grayed out' and will not work.
 - c. If a 'Digital Input' is not applied and the 'ALL STOP' button is pressed, the motor will stop. The motor will not restart unless the 'ALL STOP' button is pressed again, after 5 seconds.
 - d. If the 'ALL STOP' button on the Wireless Adapter is pressed (motor is stopped) and a 'Digital Input' is applied, the motor will start and run until the 'Digital Input' is removed. When the 'Digital Input' is removed, the motor will then stop if 'ALL STOP' is still active on the Wireless Adapter.

4) Mobile App 'STOP' button

If a 'Digital Input' is active or becomes active:

- a. The 'STOP' button on the 'Mobile App' will be 'grayed out' and will not work until the digital input is removed, as shown in Figure 49 below:



Figure 49: Digital Input Applied Screen

NOTICE

At any time during use - if a Digital Input is applied to the VGreen 165 the motor could start running regardless of what the VLink Wireless adapter is set to do. The digital input will always have priority over any other control device connected to the motor, including the VLink Wireless Adapter.

4.3.3.3 Priming

The VLink invokes Priming as shown in Figure 50 below, if configured prior to starting the motor. Priming is invoked whenever motor transitions from zero RPM to a non-zero RPM Cycle per the Schedule, an Override, or Learn Mode. Priming is not invoked prior to running Freeze Protection or Service Mode.



Figure 50: Priming Invoked Screen

Priming is configured from the App Menu by selecting Setup → Priming where Setting (On/Off), Duration, and Speed can be modified, shown in Figure 51 below:

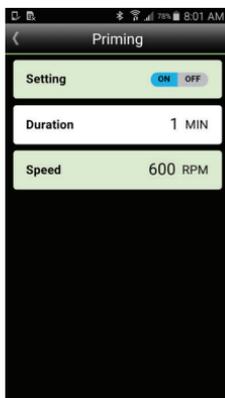


Figure 51: Priming Configuration Screen

If the Setting is ON, the motor will Prime at the specified Speed and Duration whenever transitioning from zero to non-zero RPM. If Setting is Off, Priming will not be invoked prior to starting and running the motor.

The Priming capabilities are summarized in Table 10 below:

Priming Capabilities	
Speed Min	600 RPM
Speed Max	3450 RPM
Min Duration	1 Minute
Max Duration	59 Minutes

Table 10: Priming Capabilities

The Priming defaults are summarized in Table 11: Priming Default Values.

Priming Defaults	
Setting	Enabled/ON
Speed	2600 RPM
Duration	3 Minutes

Table 11: Priming Default Values

4.3.3.4 Freeze Protection

If configured, the VLink invokes Freeze Protection when detecting a specified temperature as shown in Figure 52 below. The VLink continuously monitors the temperature and if executing a zero RPM Cycle per the Schedule, will invoke Freeze Protection when the temperature drops below the configured value. Freeze Protection is not invoked if the motor is stopped per the Status Tab or is already running a non-zero RPM Cycle per the Schedule, an Override, or Learn Mode. Freeze Protection is also not invoked while the VLink is in All-Stop or Service Mode.

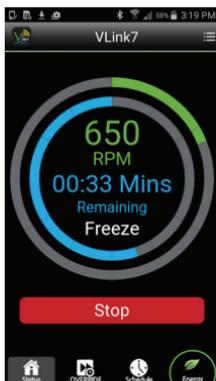


Figure 52: Freeze Protection Invoked Screen

Freeze Protection is configured from the App Menu by selecting Setup → Freeze Protection where Setting (On/Off), Speed, Duration, and Turn On Temp can be modified, shown in Figure 53 below:

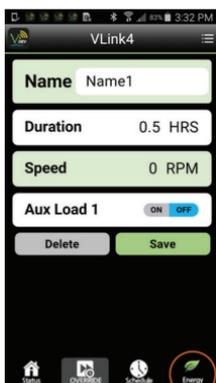


Figure 53: Freeze Protection Configuration Screen

If Setting is **On**, Freeze Protection will be invoked as previously described running the motor at the specified speed and duration when the temperature falls below the Turn On Temp value. If Setting is **Off**, Freeze Protection will not be invoked.

Freeze Protection capabilities are summarized in Table 12 below:

Freeze Protection Capabilities	
Speed Min	600 RPM
Speed Max	3450 RPM
Min Duration	1 Hours
Max Duration	12 Hours
Min Turn On Temp	33°F
Max Turn On Temp	50°F

Table 12: Freeze Protection Capabilities

Freeze Protection defaults are summarized in Table 13 below:

Freeze Protection Defaults	
Setting	Enabled/ON
Speed	2600 RPM
Duration	8 Hours
Turn On Temp	39°F

Table 13: Freeze Protection Defaults

4.3.3.5 Service Mode

NOTE: Pressing the Service Mode button on the VLink places the motor in manual stop mode, as indicated by the LED. The motor will remain in manual stop mode until the button is pressed again turning the corresponding LED Off and returning to normal operation. When the VLink is in Service Mode, the mobile app will not function.

The Service Mode provides manual control of the motor and can be used with All Stop. The Service Mode, Motor, and All Stop buttons are described in section 4.1 “Manual Operation”. When the All Stop button is pressed, the VGreen motor will stop and the corresponding LED next to the button will illuminate ON. The VLink enters Service Mode by pressing the Service Mode button and the Service Mode LED will illuminate ON. The motor can then be operated via the Motor ON/OFF Button while in Service Mode. Service Mode is cancelled and the motor is stopped, if running, when All Stop is pressed. The All Stop and Service Mode button status is displayed as shown in Figure 54 below:



Figure 54: All Stop and Service Mode Screens

Service Mode is configured from the App Menu by selecting Setup → Service Mode where Duration and Speed can be modified, as shown in Figure 55 below:

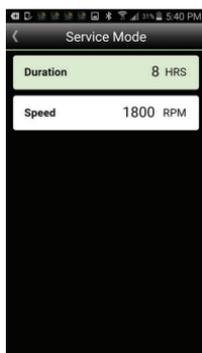


Figure 55: Service Mode Edit Screen

Service Mode capabilities are summarized in Table 14: Service Mode Capabilities.

Service Mode Capabilities	
Speed Min	1800 RPM
Speed Max	3450 RPM
Min Duration	1 Hour
Max Duration	12 Hours

Table 14: Service Mode Capabilities

Service Mode defaults are summarized in Table 15: Service Mode Default Values.

Service Mode Defaults	
Speed 1	1800 RPM
Speed 2	2200 RPM
Speed 3	2600 RPM
Speed 4	3450 RPM

Table 15: Service Mode Default Values

4.3.3.6 Learn Mode

NOTICE

The VLink is equipped with a learning mode feature used to estimate energy consumption. Learn Mode will run prior to the Schedule invoking a Cycle, preceded by Priming if enabled. Learn Mode can be preempted by executing an Override or per the Stop Button on the Status Tab by invoking All Stop or Service Mode per the respective VLink hard button. If preempted, Learn Mode will re-start prior to the next time the Schedule invokes a Cycle to run the motor. If completed prior to creating a VLink account, the Learn Mode data is not saved. Learn Mode should be re-initialized after a VLink account is created for obtaining the most accurate energy consumption, as displayed on the Schedule Tab shown in Figure 54: “Estimated Energy Consumption Screen”

The Learn Mode feature is provided to estimate energy consumption. The Learn Mode data is obtained by running the motor at the top speed of 3450 RPM for 5 minutes. Out-of-the-Box, the VLink will automatically invoke Learn Mode prior to the first time the Schedule is run. While running, the Learn Mode status is displayed as shown in Figure 56 below:



Figure 56: Learn Mode Screen

The estimated monthly energy consumption is displayed inside the Schedule Ring of the Schedule Tab shown in Figure 57 below. This value will be accurate after Learn Mode is executed.

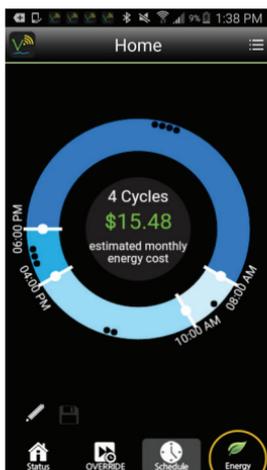


Figure 57: Estimated Energy Consumption Screen

Learn Mode should be reinitialized and executed whenever the motor or other component of the VGreen system is changed or if the VLink account is updated. Learn Mode should also be reinitialized if previously completed during the VLink Installation, before the respective VLink account was created. Learn Mode can be reinitialized from the App Menu by selecting Setup → Learn Mode Re-Initialize, as shown in Figure 58 below. Reinitializing will automatically invoke Learn Mode prior to the next time the Schedule runs the motor.

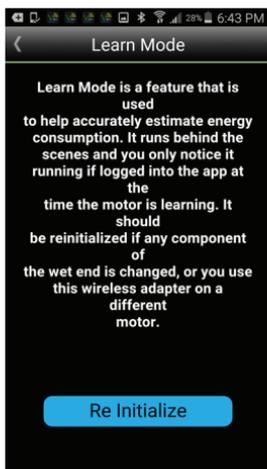


Figure 58: Learn Mode Reinitialize Screen

Learn Mode is summarized in Table 16 below:

Learn Mode Summary	
Speed	3450 RPM
Duration	5 Minutes
Default (Out-of-Box)	Uninitialized

Table 16: Learn Mode Summary

4.3.4 Motor Info

Accessing the App Menu's Motor Info feature provides Motor Health, Faults, and About Motor information, shown in Figure 59 below:

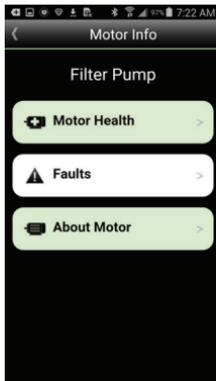


Figure 59: Motor Info Screen

The Motor Health Status and associated information is obtained by clicking the Motor Health button shown in Figure 59 above, and the **Run New Test** button of the next screen shown in Figure 60 below:

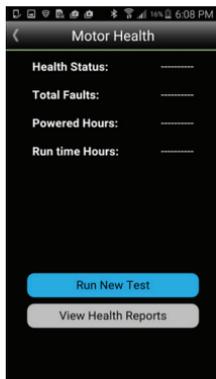


Figure 60: Motor Health Test Screen

Health Reports are obtained by clicking the View Health Reports button, as shown in Figure 61 below:

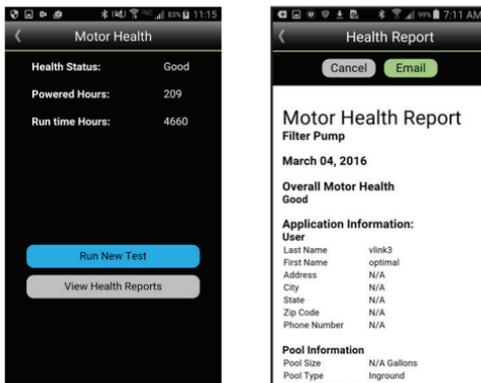


Figure 61: Motor Health Test and Report Screens

Motor Faults are displayed in the Mobile App in the Status Tab shown in Figure 62 below. The faults listed per date and time are shown in Figure 63 below. This data can be obtained by selecting **Faults** as shown in Figure 59: "Motor Info Screen" above.



Figure 62: Motor Fault displayed by the Status Screen

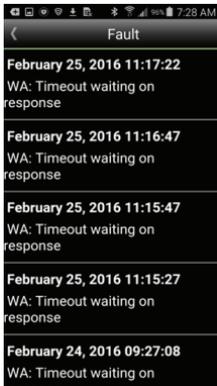


Figure 63: Motor Faults Screen

About Motor provides Motor and Control Details shown in Figure 64:

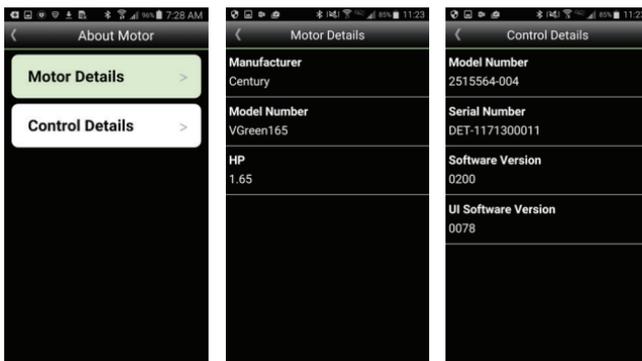


Figure 64: Motor and Control Details

4.3.5 Reminders

The Reminders feature provides a notification to the user pool maintenance tasks. Touching the green number of days provides a pop-up allowing modification of the number from 1 to 30, shown in Figure 65 below:

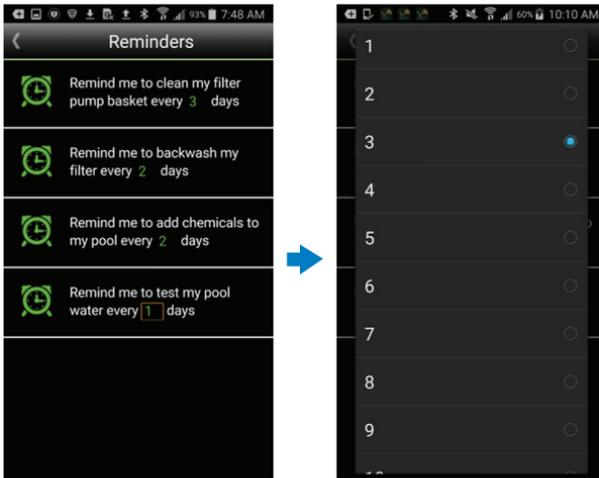


Figure 65: Reminders

4.3.6 Alerts & Emails

The Reminders feature provides a notification to the user pool maintenance tasks. The Alerts & Emails feature provides a notification mechanism alerting the user of pool issues, news, energy usage, faults, and Reminders. To receive notifications for Faults check the Receive Notifications box shown in Figure 66 below:



Figure 66: Alerts & Emails

4.3.7 About

The About feature provides Model Number, Serial Number, VLink Software Version, and the Mobile's Web and App versions shown in Figure 67 below:

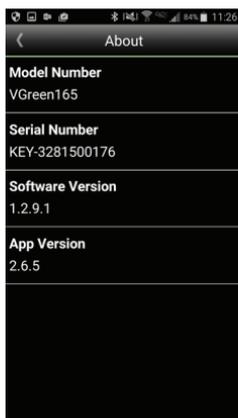


Figure 67: About Screen

4.3.8 Software Update

The Software Update feature shows the latest VLink software version available and if selected, Over-The-Air (OTA) download to the WA can be initiated as shown in Figure 68 below by selecting the available software version and clicking the Update button. During the OTA, all VLink features and capabilities are accessible.

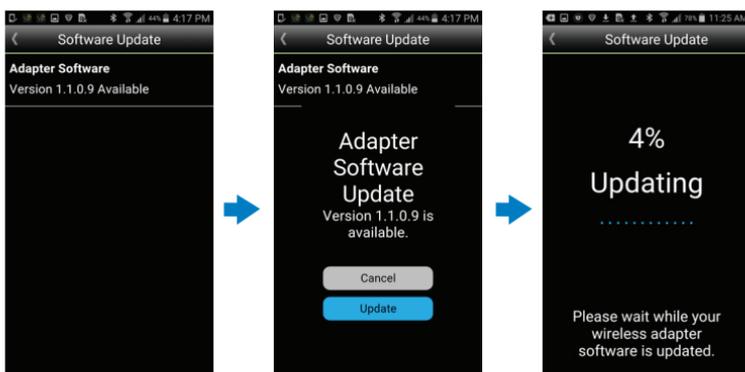


Figure 68: Software OTA Update

When the OTA is 100% complete, Software Update Complete is provided along with a Push Notification indicating the OTA download succeeded at the VLink, as shown in Figure 69 below:

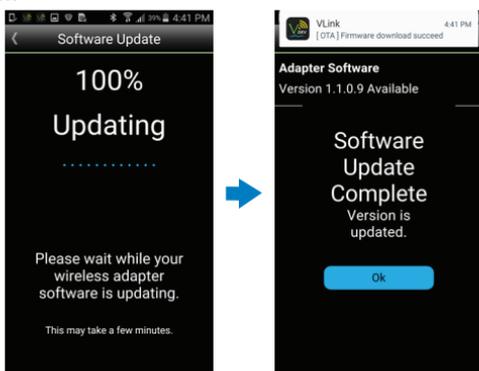


Figure 69: Software Update Complete Screens

4.3.9 Account

Account provides accessibility to Login and Password credentials, Personal and General Information, and VLink specific capabilities, shown in Figure 70 below:

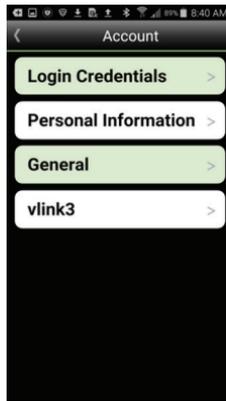


Figure 70: VLink Account Screen

Login with Change Password capability, Personal, and General Legal Information are provided in Figure 71 below:

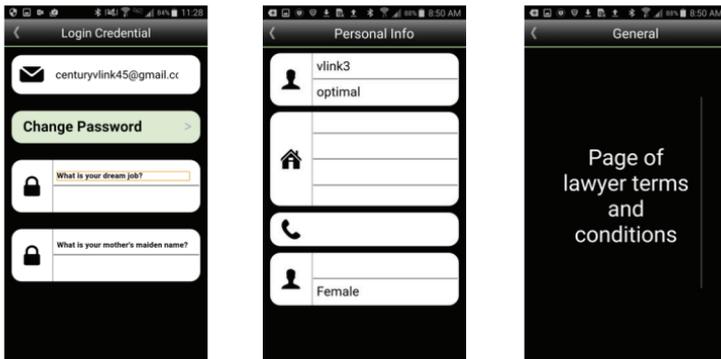


Figure 71: Login Credential, Personal Information, and General Screens

VLink specific information with Time Zone, Daylight Savings Time, Reset, and Remove Adapter from Account are shown in Figure 72 below:

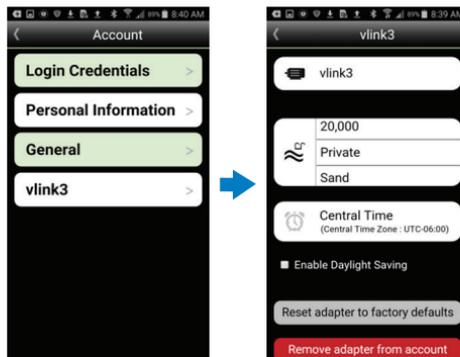


Figure 72: VLink Specific Information and Capabilities Screen

The Time Zone and Enable Daylight Savings Time are set in this screen.

If the Reset adapter to factory defaults button is pressed and Yes is chosen as shown in Figure 73 below, the factory default values are set for Priming, Freeze Protection, Schedule, Aux Load, kilowatt hour (kWhr) rate, Service Mode speeds, and Overrides as specified in section 4 of this manual.



Figure 73: Reset to Factory Defaults

If the Remove adapter from account button is pressed and Yes is chosen as shown in Figure 74 below: Remove and Add VLink Adapter, the App transitions to the Login screen requiring re-login to the user account to begin re-install of the VLink as previously specified in section 3.5.2 Connecting to a Home Wireless Network.

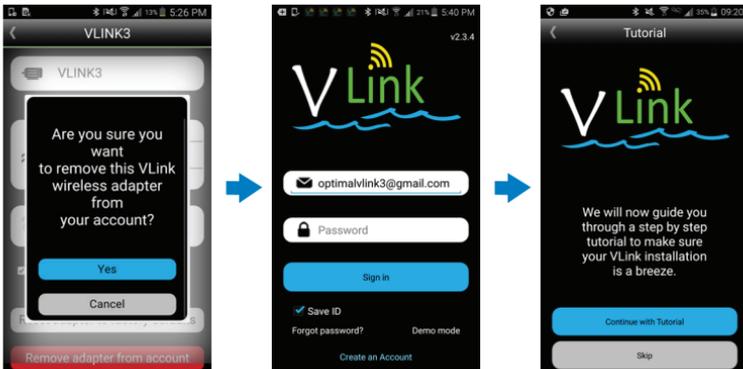


Figure 74: Remove and Add VLink Adapter

4.3.10 Network

The Network feature provides the capability to disconnect and reconnect to the Home Wireless Network. Your Home Wireless Router information can be changed without disconnecting your account and having to re-enter the VLink Access ID. After pressing the Disconnect and Connect to a Network buttons, the App attempts to connect to the VLink, as shown in Figure 75 below. Press and hold the WPS button on the WA for greater than 8 seconds if the Wireless Connection LED is not blinking once per second.

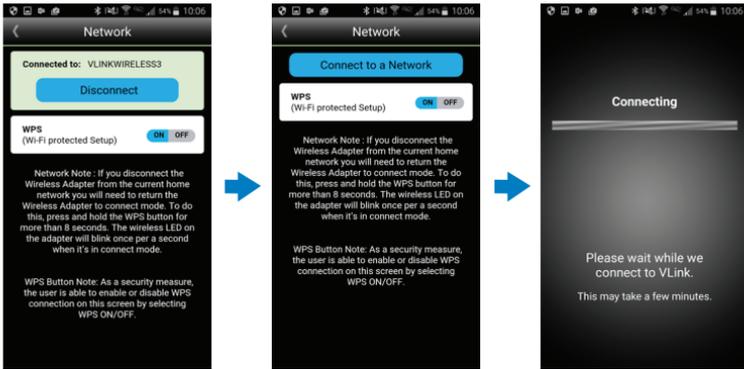


Figure 75: Network Disconnect and Connect Screens

Once the App is connected, enter or select the Home Router Name and Password as shown in Figure 76 below:

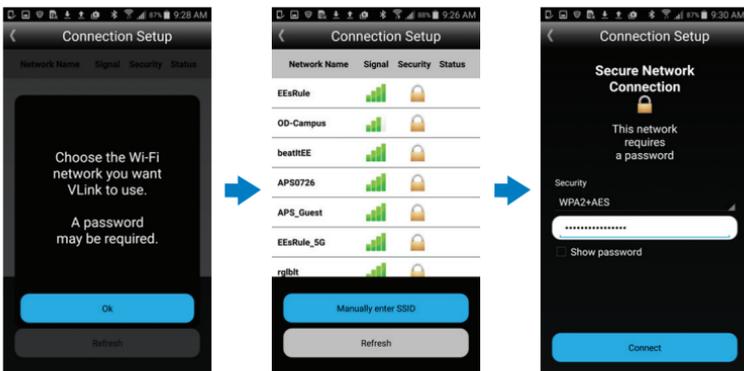


Figure 76: Network Connection Setup Screens

4.3.11 Help

The Help feature enables sending an Email to VLink@centuryelectricmotor.com. Upon selecting Help from the App Menu, the user is provided the Email options available and the Email as shown in Figure 77 below:

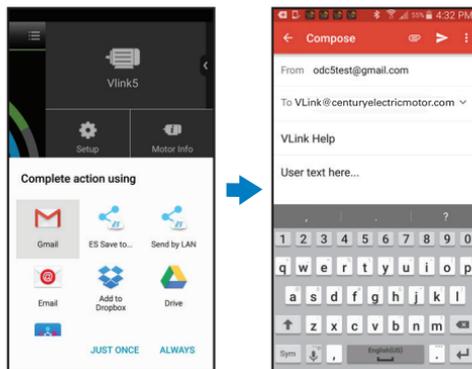


Figure 77: Send Help Email Screens

The user can now enter the desired text to obtain Help from VLink@centuryelectricmotor.com.

5. TROUBLESHOOTING GUIDE

⚠ WARNING

- A licensed, qualified electrician should complete the wiring for this product.
- Always disconnect main power from the motor being serviced and wait a full 5 minutes for capacitor voltage discharge before servicing or installing unit.
- Diagnosing certain symptoms may require close interaction with, or in close proximity to, components that are energized with electricity.

Failure to comply with this may result in death, serious personal injury or property damage.

Symptom	Possible Causes	Potential Solutions
Power is applied to the motor, but power LED is not illuminated on the VLink.	Power supply cables are loose at the motor and/or VLink RS-485 connector.	Check/ tighten the connections at both ends of the cable.
	Incorrect Dip switch settings on the motor.	<i>For VGreen 165 motors:</i> Set switch 1 to the ON position <i>For VGreen 270 motors:</i> Set both switches 1 and 2 to the ON position
	VLink is damaged.	Replace VLink.
Power is applied to the motor, but power LED repeatedly pulses on and off slowly.	Power supply cables were not installed correctly into the RS-485 connectors.	Check each connector end and make sure wires are in the correct connector slot.
Status Screen displays "Motor is Stopped".	Motor was turned off from the App.	Press Run to return to the Schedule Cycle or Override that was initiated before stopping the Motor. Add a 0 RPM Cycle to the Schedule if it is desired to not have the Motor run for specified times.
Status Screen displays "All Stop".	Motor was turned off by pressing the All Stop button on the VLink.	Press the ALL Stop button on the VLink to return to the Schedule Cycle or Override that was initiated before stopping the Motor with the All Stop button.
Motor Fault: Ill Formed Packet.	Power supply cables are loose at the motor and/or VLink RS-485 connector.	Check/ tighten the connections at both ends of the cable.
	Power supply cables were not installed correctly into the RS-485 connectors.	Check each connector end and make sure wires are in the correct connector slot.
When attempting to connect to the Home Wireless Network via the Wi-Fi Method, the Mobile Phone gets stuck in the Connecting State of the Connection Setup. The VLink Mobile App timeout is 2 minutes when stuck in the Connecting State and the "Failed to connect to VLink" screen is displayed.	Some specific Mobile Phone models occasionally get stuck when switching connection from the Home Wi-Fi to the VLink Wi-Fi. For example, this is a known issue on the LG Smart Phone.	After timeout, go to the Wi-Fi setting of the wireless device and manually select VLink_WA. Re-attempt the Mobile App Connection Setup.
	The WPS button was not pressed or was not pressed and held for greater than 8 seconds.	After timeout, enter Wi-Fi connect mode by pressing and holding the WPS button for greater than 8 seconds. Re-attempt the Mobile App Connection Setup.

VLink Wireless Connection LED is not illuminated.	Home Router is off-line.	Check home router on-line status and restore power if necessary.
	VLink disconnected from the Home Wireless Network.	Re-connect the VLink to the Home Wireless Network via Wi-Fi or WPS methods.
	The SSID entered into the VLink app was not valid.	Retry VLink connection setup and re-enter a valid SSID for the desired home network.
VLink Wireless Connection LED blinks once per every two seconds (ON one second, then OFF one second).	VLink disconnected from the Home Wireless Network and is now in Wi-Fi connect mode.	Re-connect the VLink to the Home Wireless Network via the Wi-Fi method as described in the quick start guide or user manual. Do not attempt to connect to a 5GHz band wireless connection.
	During first-time setup: The wireless network you have tried to connect to is on the 5GHz band. The VLink only supports 2.4GHz connection.	(To use the WPS method to connect instead of the Wi-Fi method, hold the WPS button for less than 5 seconds. The VLink wireless connection LED will blink once every second (ON a 1/2 second, then OFF a 1/2 second) to confirm it is in WPS connect mode.)
VLink Wireless Connection LED blinks once every second (ON a 1/2 second, then OFF a 1/2 second).	VLink disconnected from the Home Wireless Network and is now in WPS connect mode.	Re-connect the VLink to the Home Wireless Network via the WPS method as described in the quick start guide or user manual. Do not attempt to connect to a 5GHz band wireless connection.
	During first-time setup: The wireless network you have tried to connect to is on the 5GHz band. The VLink only supports 2.4GHz connection.	(To use the Wi-Fi method to connect instead of the WPS method, hold the WPS button for more than 8 seconds. The VLink wireless connection LED will blink once per every two seconds (ON one second, then OFF one second) to confirm it is in Wi-Fi connect mode.)
VLink Wireless Connection LED blinks twice and then stays ON for 3 seconds, then repeats this pattern.	The Home Wireless Network is disconnected from the Internet.	Check home router on-line status and restore connection to the Internet if necessary.
VLink Wireless Connection LED blinks twice and then stays OFF for 3 seconds, then repeats this pattern.	The incorrect password was entered when attempting to connect the VLink to the Home Wireless Network.	Re-connect the VLink to the Home Wireless Network via the Wi-Fi or WPS methods. Re-enter correct wireless password in network window.

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6.1.1 Publicly Available Software

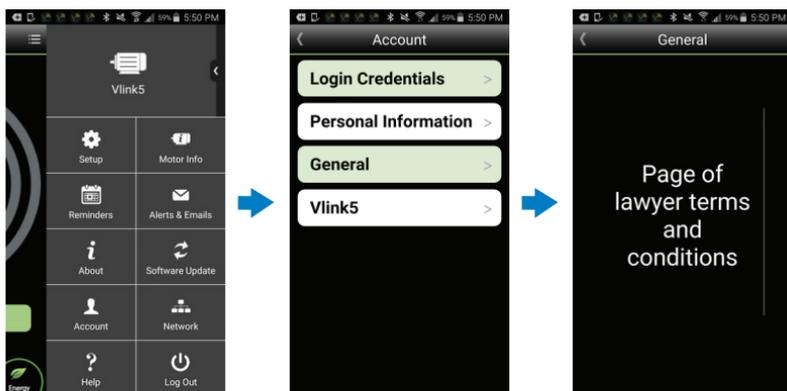


Figure 122: Legal Notices Screen

Name: FreeRTOS

Version: 8.2.1.1

Description: FreeRTOS is a real-time operating system from Real Time Engineers LTD that supports multiple hardware architectures.

Software Site: <http://www.freertos.org/a00104.html>

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Name: MBED TLS

Version: 2.1.2

Description: Mbed TLS is an SSL library providing cryptographic and SSL/TLS capabilities for embedded products.

Software Site: <https://tls.mbed.org/download>

License: Apache 2.0 License

Apache License

Version 2.0, January 2004

<http://www.apache.org/licenses/>

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7. VLINK SPECIFICATIONS

OVERALL RATINGS	
Input	10-14 VDC (30mA Typical)
Ambient Conditions	
Storage	-30°C to 80°C (-22°F to 176°F)
Operat-ing	0°C to 50°C (32°F to 122°F)
Humidity	0-85% Non-Condensing
APPROXIMATE SIZE	
VLink	
Enclosure w/Mounting Plate	
Length	5.7 inches
Width	5.4 inches
Height	1.6 inches
SECURITY	
VLink	
Wireless Connections	
Home Router	WPA2+AES
Cloud	TLS v1.2

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