VIVAX METROTECH

vCamDrain User Handbook

(English Edition)

Version 1.0

P/N: 4.04.000241

General Safety & Care Information

Health and Safety

This equipment is primarily used to inspect sewer pipes by professionals in the sewer and plumbing industry and is maintained by professionals familiar with the health risks of maintaining equipment in a sewer.

Such professionals will be protected by their own company's recommendations and work practices. If for any reason they are not or are not familiar with such practices, please check our website or email SalesUSA@vxmt.com for a copy of the Health and Safety Document used by Vivax-Metrotech for employees involved in the demonstration, maintenance, and handling of sewer camera systems.

- Keep all electrical connections dry and off the ground.
- Be aware of your surroundings at all times. Cone off open utility holes and follow traffic control regulations.
- Use personal protection such as eyewear, rubber gloves, and non-skid safety shoes.

Worksite Safety

- Use your company's or other applicable safety code and rules when using this equipment.
- **Do not** use this equipment in explosive areas – such as in the presence of flammable liquids, gases, and heavy dust.

Equipment Safety

- **Do not** open the enclosures (housings) of the reel or camera heads.
- Opening the housings or camera head will void any warranty.
- Use only the leads supplied with the control module for AC or DC operation and charging.

Batteries and the Environment

This Vivax-Metrotech product uses a rechargeable Lithium-Ion battery and a Lithium metal watch battery.

High-Pressure Water or Pressure Washers

Do not use pressure washers to clean the reel or other camera system parts.

Do not use pressure washers to clean the reel or other camera system parts.

Bleach and chemicals - Do not soak the termination parts or camera heads

Do not soak the spring termination parts or the camera heads in bleach or other chemicals.

General Safety & Care Information

FCC & IC Statement

Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.
This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) This device may not cause interference, and
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry
Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.)
is not more than that necessary for successful communication.
Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé
pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et
son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

5G WiFi IC Statement

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and
(iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

(i)Les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.
(ii) le gain d'antenne maximal autorisé pour les appareils dans les bandes 5250-5350 MHz et 5470-5725 MHz doivent respecter le pire limiter; et
(iii) le gain d'antenne maximal autorisé pour les appareils dans la bande 5725-5825 MHz doivent respecter le pire limites spécifiées pour le point-à-point et l'exploitation non point à point, le cas échéant.

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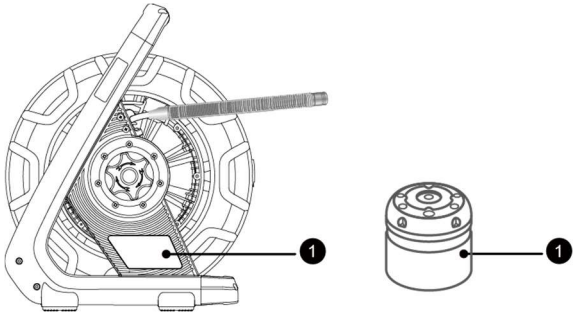
1. Service & Support

1.1 Model and Serial Number Location

When requesting product support, always quote your camera system's model, serial number, and software revision number. The location of serial numbers is shown below.



1. Serial number location

1.2 Firmware Revision Location

The firmware version of the reel can be found by connecting the vCam Mobile Controller app to the reel and going to the ABOUT section in the app.

The vCamDrain firmware updates come in a "zip" extension file. The firmware files can be obtained at www.vivax-metrotech.com, an authorized service center, distributor, or a local Vivax-Metrotech office.

1.3 Request for Service

If any system components need servicing, the more concise information provided will result in a quicker turnaround time. You can fill out a "Service Center Request" form on our website, print it and include it with the unit when shipping. If the unit must be returned, package it well and ship it by a traceable method.

1.4 Distributors and Service Centers

Worldwide Sales Offices and Service Centers

World Headquarters, United States of America
Vivax-Metrotech Corporation
3251 Olcott Street, Santa Clara, CA 95054, USA

T/Free : 1-800-446-3392
Tel : +1-408-734-1400
Fax : +1-408-734-1415
Website : www.vivax-metrotech.com
Email : SalesUSA@vxmt.com

Canada
Vivax Canada Inc.
41 Courtland Ave Unit 8,
Vaughan, ON L4K 3T3, Canada

Tel : +1-289-846-3010
Fax : +1-905-752-0214
Website : www.vivax-metrotech.ca
Email : SalesCA@vxmt.com

Germany
Metrotech Vertriebs GmbH
Am steinernen Kreuz 10a, D-96110 Schesslitz

Tel : +49 954 277 227 43
Website : www.vivax-metrotech.de
Email : SalesEU@vxmt.com

China
Vivax-Metrotech (Shanghai) Ltd.
3/F No.90, Lane 1122 Qinzhou Rd.(N),
Shanghai, China 200233

Tel : +86-21-5109-9980
Fax : +86-21-2281-9562
Website : www.vivax-metrotech.com
Email : SalesCN@vxmt.com.cn

Central/South America and the Caribbean
Ventas para América Latina
3251 Olcott Street,
Santa Clara, CA 95054, USA

T/Free : 1-800-446-3392
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Email : SalesFR@vxmt.com

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TA6 4WA, UK

Tel : +44(0)1793 822679
Website : www.vivax-metrotech.co.uk
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Unit 1, 176 South Creek Road,
Cromer NSW 2099, Australia

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Website : www.vivax-metrotechaus.com
Email : sales@vxmtaus.com

China
Shanghai Vimap Technology Co. Ltd.
9/F, Building 89, Xinhuiyuan,
No.1122 Qinzhou North Road
Shanghai, China 200233

Tel : 4000-999-811
Website : www.vimap.cn
Email : info@vimap.cn

2. Introduction

Please read this section!

Vivax-Metrotech provides technical support for the vCam Mobile Controller (VMC) app, our vCam series camera systems and our locators.

Vivax-Metrotech can not supply technical support or training for smartphones, tablets or file-sharing apps on your phones and tablets.

Please refer to the help screens and documentation included with your file-sharing apps and the operating system on your phone or tablet (Android and iOS Apple).

User Manual Conventions

Read this section – This section is important and should be carefully read.

Stop – Read this section before proceeding.

Safety – Obey all safety messages that follow this symbol to avoid possible injury or death.

Note – Important information that will affect the performance of the product.

Tip – This tip may save you time or provide a better response.

2.1 The vCamDrain Wireless Reel

The vCam Drain Wireless Reel connects to a smartphone or tablet by Wi-Fi and streams the video from the reel into the app. The vCam Mobile Controller app views, records and plays back MP4 videos and image capturing of JPEG pictures. Audio and text commentary can be added to the videos and text commentary can be added to the captured pictures. The time stamping of the current time, date, and distance of the pushrod deployed can be added to both video and pictures.

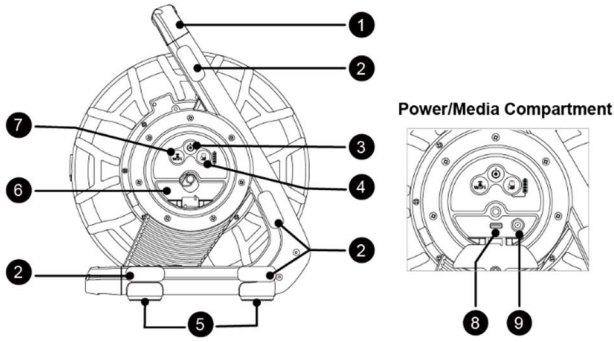
Control Panel Buttons

On/Off Button - Press and release to turn the unit on. When on this button will glow green. Press and hold to turn the unit off.

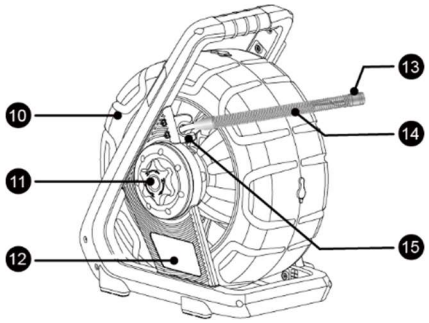
Wi-Fi - Pressing this button will refresh the Wi-Fi signal. Use this button to connect to the app if the app does not automatically find the reel. Also use this button if the Wi-Fi connection seems sluggish, tiling or skipping.

Battery Status - Press this button to see the reel's internal battery status. The indicator is shown in four segments, representing 25% of the reel's battery life.

2.2 vCamDrain Wireless Reel Features



1.	Handle	**6.**	Power/Media Compartment
2.	Horizontal position feet	**7.**	Wi-Fi status LED
3.	Power button and indicator	**8.**	USB Port
4.	Battery status indicator	**9.**	AC/DC Charging socket
5.	Rubber feet		



10.	Cable drum
11.	Brake
12.	Serial number/model label
13.	Camera head
14.	Spring/Sonde assembly
15.	Cable guide

3. vCamDrain Setup

3.1 Initial Setup

3.1.1 Charging the Internal Battery

Plug the supplied battery charger into the reel's AC/DC charging socket**.** The charging icon on the battery status indicator will glow red while charging and glow green when fully charged. The typical time to fully charge a completely discharged battery will be approximately six hours and provide approximately twelve hours of intermittent use.

3.1.2 Check for a Software Update

Please see section 4.3 of this manual.

4. Wi-Fi Connection for App

The vCam Mobile Controller app must be installed to view the camera's images and control all functions of the vCamDrain Wireless Reel.

Platform	Apple	Android
Minimum operating system	14.0 or greater	8.0 or greater

For optimal app performance give the below permissions.

Access and permissions:	
Location	Allow for Wi-Fi scanning
Bluetooth	Allow to search for control modules
Microphone	Allow to add audio to recording videos
Gallery	Allow for the exporting of pictures and videos
Storage	Allow to modify or delete files

4.1 Wi-Fi Connection for App

The vCam Drain Wireless reel has built-in Wi-Fi that broadcasts an SSID (secure network name) and uses DHCP (the protocol that assigns an IP address needed to connect to the control module) to assign IP addresses to a tablet or smartphone running the VMC app.

When connected to the **VMC** app the video stream from the reel will be transmitted. The video stream will include any text on the app's screen and the on-screen display showing the system time, distance count and date.

Visit our website at www.vivax-metrotech.com for more information and download links.

vCam Mobile Controller App icon

VMC Start Screen

4.2 Connect to the VMC App

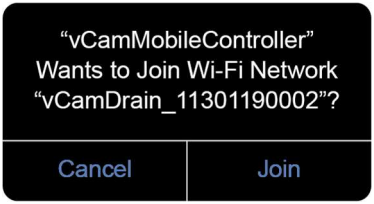
Press and release to turn the unit on. When on, this button will glow green.

Wait, in approximately 30 seconds for the green light in the center of the Wi-Fi button to glow. This shows that the unit is now ready to connect to the app.

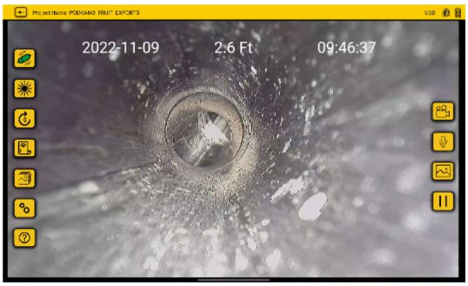
Launch the vCam Mobile Controller App.

Tap on the **vCamDrain** icon at the Start Screen.

The app will show any Vivax-Metrotech reels or control modules in range for connection.
In iOS tap on **Join**, for Android tap on the vCamDrain **Serial Number**.



iOS **Android**



You are now connected to the vCamDrain Wireless Reel.

4.3 Check for a Firmware Update

There are two methods to update the firmware in the vCam Drain reel. The first is an Over-the-air update done through the VMC app, and the other uses a USB thumb drive.

4.3.1 Over-the-Air Update Update

Over-the-air updates are done via the vCam Mobile Controller app.

1. Connect to the vCam Drain Reel via Wi-Fi.
2. If the vCamDrain Wireless Reels firmware is out of date a pop-up dialog box will appear advising so.
3. Select OK to proceed with the firmware update or select Cancel to skip the update process.

4. If OK was selected a progress bar indicator will appear and the reels Wi-FI light will blink during the update.
5. When the update is complete the Wi-Fi light will stop blinking and the unit will reboot itself.
6. After the unit has rebooted and the Wi-Fi light is solid again, you are ready to reconnect to the reel and use it for your next inspection.

4.3.2 USB Thumb Drive Update

This update method requires the use of a USB thumb drive.

1. Connect to the reel via the VMC app, go to **SETTINGS > ABOUT** and note the reel's current firmware version.
2. Go to the **DOWNLOADS** section on the vCamDrain webpage and download the firmware update.
3. Save the download drain_ota.zip file onto a USB thumb drive. This file can be the only file on the USB thumb drive during the update.
4. Plug the USB drive into the vCam Drain Reel.
5. Power on the drain reel.
6. Wait for the Wi-Fi LED to turn on. (the LED on the Wi-Fi button).
7. Press the Wi-Fi button for twenty seconds and then release it.
8. The Wi-Fi LED will blink during the firmware update. The update time will vary depending on the size of the update file and typically should take between 10 and 20 minutes.
9. When the update is complete, the wifi led will turn off and the reel will reboot.
10. Connect to the reel again via the VMC app, go to **SETTINGS > ABOUT** and check that the firmware update was successful by noting the new firmware version number.

5. The vCam Mobile Controller App

The vCam Mobile Controller (VMC) controls all the functions of the vCamDrain Wireless Reel. This manual covers the operation of the vCam Mobile Controller app when used with the vCamDrain Wireless Reel.

5.1 Introduction

Technical Support

When requesting technical support, quote your camera system's model number, tablet/phone model, tablet/phone operating system, and vCam Mobile Controller (VMC) app version number.

Note that the product firmware version will not show unless the app is connected to the product.

The above information can be found by entering **Settings** and then going into **About**.

The Android and iOS About screen

App Icons	
	An **available** action or feature will have a **yellow** background. An action or **feature in use (active)** will show the same icon but with a **black** background.
	Certain **actions or features in use (active)** will show part of the icon in **red** and will be **flashing**.
	All features may **not be available for certain products** or may still be in development. When this happens the icon will be **greyed out**. The example on the left shows the **Picture icon as available** while the **Microphone icon is not** and is greyed out.

5.2 The Statt/Selection Screen

Before launching the app turn on the vCamDrain Reel and wait for the Wi-Fi indicator light to turn green.

The vCam Mobile Controller app starts at the **Selection Screen;** select the vCamDrain.

VMC Selection Screen

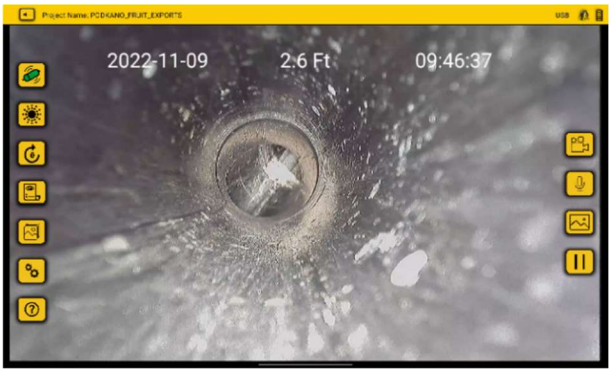
5.3 *Offline Access to Files (access files without being connected to the vCamDrain Reel)*

All files created in the vCam Mobile Controller app are stored in the app in the Gallery. The Gallery can be accessed without being connected to a control module.

1. At the **Selection** screen select the **control module** used to create the files.
2. Tap on **Cancel** when the Connect to dialog box appears.
3. Tap on the **Gallery** icon to enter the Gallery.

5.4 *The Main Screen*

The Main Viewing Screen is the same for Android and iOS.



VMC Main Screen

While a recording is in progress

Step Back/Exit – Tapping this icon will move back one step. Continue tapping to disconnect and exit the app.

Project Name: PODKANO_FRUIT_EXPORTS

Active Project – This shows the project name in which the files are being saved.

Sonde – Tap this icon to activate the Sonde. Tap again to turn off the sonde.

Camera Lights – Tapping this icon will bring up a slider bar to lower and raise the camera's lights.

Distance Reset – Tapping this icon will reset the distance counter to zero.

Observations – Add and remove text observations (comments) to the control module and app screen.

Gallery – Access to the Projects video and picture files.

Settings – Set the user preferences such as language, the unit of measure and sonde frequency.

Help – Tap this icon to bring up an on-screen version of the instruction manual.

05:45
124 MB

Elapsed Time/Size – This shows the elapsed time and size of the recording video.

Record – Tap to Start and Stop a video recording. While recording this icon flashes red.

Microphone – A feature to be added at a later date.

JPEG Capture – Captures the JPEG picture to the Project in the Gallery.

Connection Status – This shows the connected Control Module and its battery status.

Pause / Resume – Tap to pause the recording video. Tap the red Play icon to resume the recording.

Recording in progress icons – When a recording is in progress:

1. The inside top portion of the recording icon will blink red.
2. The video elapsed time and size will appear in red above the recording icon.

Pause and resume a video recording – While recording a video:

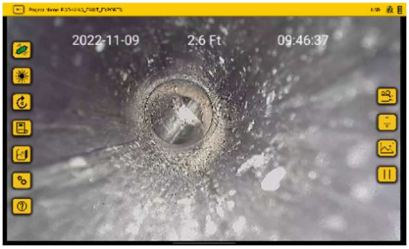
1. Press the **Pause** icon and a **Recording Paused** message will splash on the screen and the pause icon will change from **Pause** to a flashing **Red Play** icon. When the recording is paused the elapsed length and video size will freeze.
2. Press the flashing red **Play** icon to resume the video recording.

Pressing the Record icon while a video is paused will end the video recording.

Icons that appear greyed out are not available for the control module.

While on the Main Screen tapping on the screen will hide the icons in the left column and the top status bar. Tap the screen again to bring them back.

Android = double tap, iOS – single tap.



Default view with all icons

View with icons and status bar hidden

Step Back/Exit

Use the **StepBack/Exit** icon to return to the **Start/Selection** screen before exiting the app. Returning to the Start/Selection screen will automatically disconnect the control module and free up the Wi-Fi to connect to the internet.

Exiting the app in other ways may leave the tablet showing that it is still connected to the control module by Wi-Fi and produce an error message that there is no internet connection while trying to share files.

6. VMC App Settings

Enter the VMC app settings by tapping the **Settings** icon. To return to the Main Screen tap the Settings icon again or tap on the Step Back/Exit icon.

6.1 Setting up the app options

At the time of publishing this manual, the **Settings** menu consists of the following:

Manage Projects	**Sonde Frequency**
Video Settings	**Image Settings**
Date and Time	**Units**
Language	**About**

6.1.1 Manage Projects

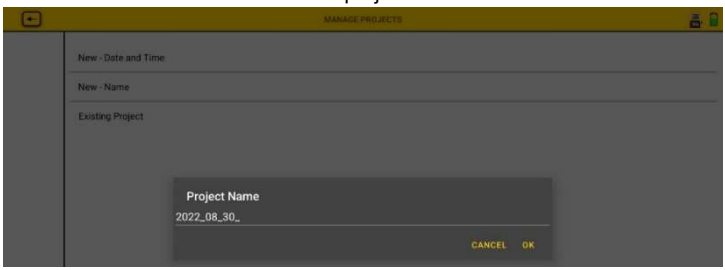
Projects are folders where videos and JPEG images are stored. The current Project in use will show in the upper left corner of the Main Screen. All files created in the VMC app are stored in the Gallery under the Project Name.

The current Project name appears in the upper left of the status bar.

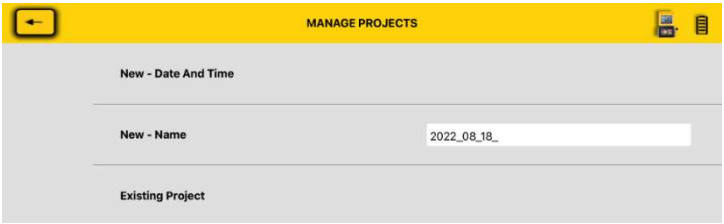
Tap on the **Manage Projects line** and the manage projects sub-menu will appear.

New – Date and Time: This option will create a project based on the tablet's current date and time. An example of a project name created on 30 August 2022 at12:26 PM will be "2022_08_30_12_26"

New – Name: This option will create a project you can name using alpha and numeric characters. Up to 40 alphanumeric characters can be used for a project name.



Android "New-Name" dialog box



iOS New-Name Project

Existing Project – All projects remain in the app until deleted by the user. Select Existing Project to add new files to an existing project. When this option is selected a list of projects will appear. Tap on the project name to use the Project.

6.1.2 Sonde Frequency

Set the sonde frequency to use when the sonde icon is selected. Select from **512Hz, 640Hz** or **33kHz**. Tap the **Step Back** icon to return to the Settings menu.

6.1.3 Video Settings

Set the video quality and frames per second. First select the resolution of 1080p, 720p or 480p. Next set the resolution by tapping on 30fps (frames per second) or 15fps.
1080p with 30fps will give the highest quality video but it will also be the largest file size. Lower resolutions will produce a lower-quality video with a smaller file size. Tap the **Step Back** icon to return to the Settings menu.

6.1.4 Image Settings

Set the size and quality of the JPEG pictures. 1920x1080 produces the best image quality and will have the largest file size. Tap the **Step Back** icon to return to the Settings menu.

6.1.5 Date and Time

The date and time used in the app are from the tablet or phone. This option will update the control module's date and time to match the app's.

6.1.6 Units

Select the distance counter unit of measure. Choose between metric or imperial units. Tap the **Step Back** icon to return to the Settings menu.

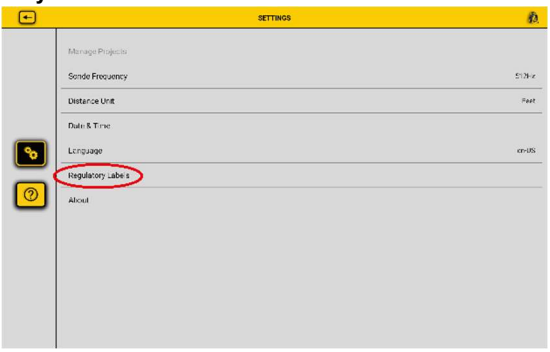
6.1.7 Language

Use this drop-down list to select a language.

6.1.8 Regulatory Labels

This section shows the required FCC and IC information. To access this information do the following:

1. At the Main screen select the Setting icon.
2. Tap on the **Regulatory Labels** to find the FCC and IC information.



6.1.9 About

The About screen contains important information needed when calling for technical support. This screen shows the connected units firmware version, VMC app version and serial number.

This area also has email support and general email options.

The About Screen Information Box

6.1.10 Logs

Logs are recorded for troubleshooting problems with the app. If you should call for technical support, we may ask that you email us a copy of your app's logs using the Log feature.

7. Using the vCam Mobile Controller App

7.1 Overview

Now that the initial settings have been saved let's start using the app!

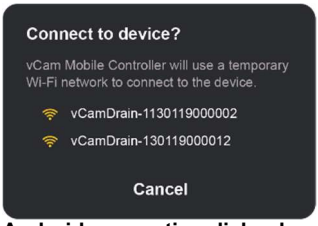
Before launching the app ensure the control module is turned on and the **Wi-Fi** option activated.

7.1.1 Connect to the Control Module

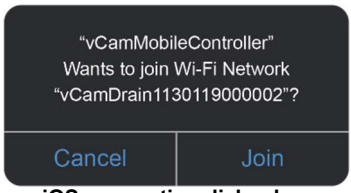
1. From the **Selection** screen select the **Control Module** to connect.

The Selection Screen

2. **Android** – Tap on the serial number of the control module to connect.
   iOS – Tap on the Join icon of the control module to connect.



Android connection dialog box



iOS connection dialog box

After a few seconds the Main Viewing Screen will appear with an icon of the control module and its battery status in the upper right corner.

7.1.2 Making a video recording

1. Tap the **Record** icon to start the video recording. If no project is selected the **Manage Project** dialog will appear. See section ***3.1.1 Manage Projects.***
   Create a new project or select an existing project to continue.

05:45 124 MB	When a recording is started the record icon flashes red and the elapsed recording time and file size will be displayed above the icon.
	To Pause the recording video tap on the **Pause** icon.
	To resume recording tap on the flashing red **Play** icon.

2. To end the recording video tap on the red flashing **Record** icon again.

7.1.3 Capturing JPEG images (taking pictures)

Tap the JPEG button to capture a JPEG image. The screen will momentarily flash yellow confirming a captured image.

7.1.4 Adding an observation to the screen

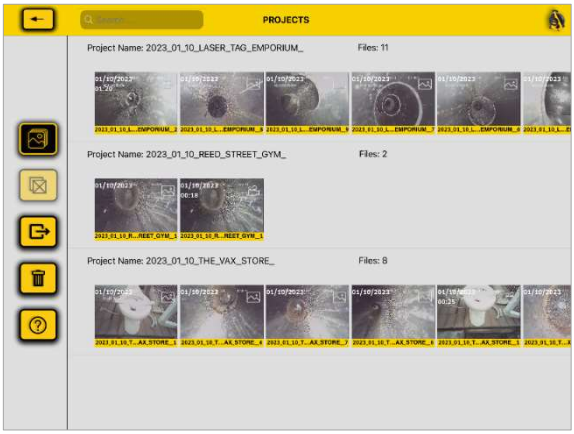
Observations are text comments added to the screen which appear in videos and pictures.

1.		Tap on the **Observation** icon to open the Text Box.
2.		The icon will fill with a black background when the text box opens.
3a.	Android	Enter text in the text box, up to 100 characters, and tap on **OK**.
3i.	iOS	Enter text in the text box, up to 100 characters and then tap **Return** on the keyboard.
4.		Remove the text from the screen by tapping on the black background **Observation** icon.

7.1.5 File Management

All recorded videos and pictures are stored in **Projects** in the **Gallery**.

7.1.5.1 The Gallery



The Gallery Main Screen

Return to the previous screen

Search the gallery

Exit the gallery

Select All files or projects

Share files or projects

Delete files or projects

Help opens the manual to the help topic

7.1.5.2 Searching the Gallery

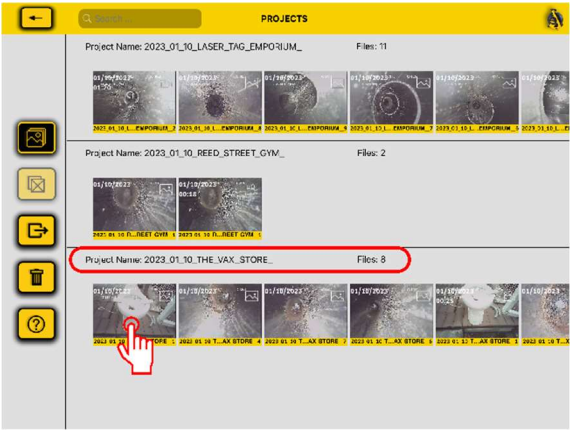
Use the Search feature to find files in the Gallery.

1. Start typing in the search bar to find files and projects in the gallery.
2. Press the X to the far right to clear the search box.

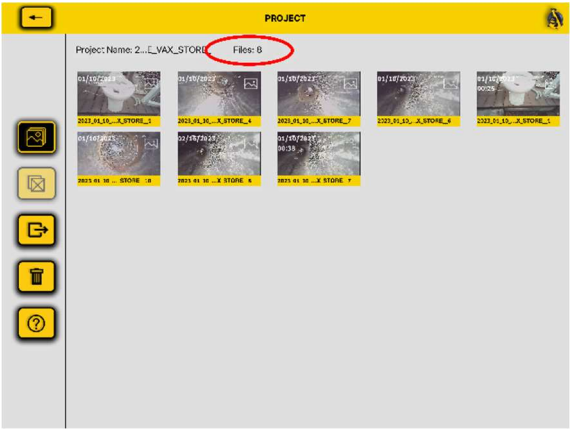
7.1.5.3 Reviewing Files in the Gallery

In the Gallery files can be reviewed, shared or deleted. This section will cover reviewing the files.

1. Tap on a **Thumbnail** to enter that Project's gallery.

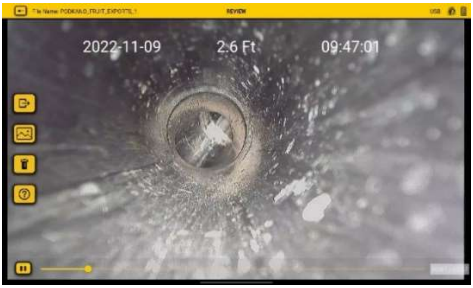


Gallery Main Screen



Gallery Review Screen

2. Tap on a **Video Thumbnail** to enter the video review screen.

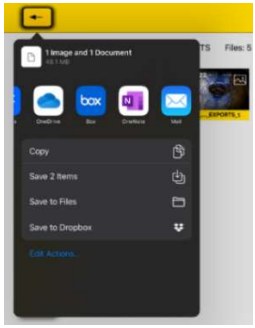


The video review screen

While in the Review screens swiping right to left and back will scroll through all of the files in that Project folder.

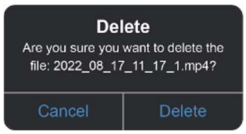
3. Tap on the **Play** icon to watch the video. While playing the video tap the **Pause** icon to pause and unpause the video. Use your finger on the progress line to move forward and backward through the video.
4. While in the Video Review screen, the Share, JPEG Capture, Delete and Help options are available.

a. Tap on the **Share** icon to open the dialog box to share the file or add it to another location on the tablet.



b. Tap the **JPEG Capture** icon while the video is playing or paused to capture a picture.

c. Tap the **Delete** icon to delete the video.



Note: Use the same steps to view pictures; the picture view will have the same Delete and Share options.

Deleted files cannot be recovered!

7.1.6 Sharing (Export) Files and Projects

Files created in the VMC app can be shared (exported) in several ways.

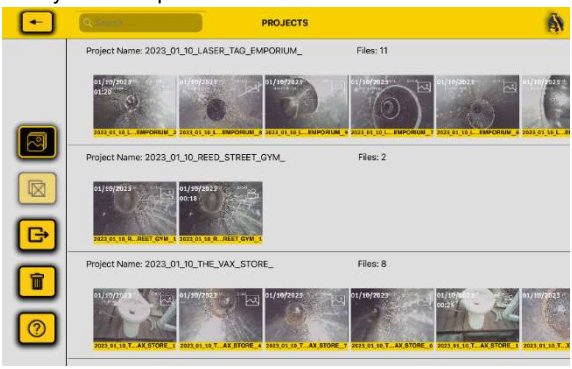
- Use the share features native to the iOS and Android platforms.
- Export files into file-sharing apps such as BOX™, DropBox™ or OneDrive™.

Individual files can be selected from Projects and exported, or the entire Project can be exported.

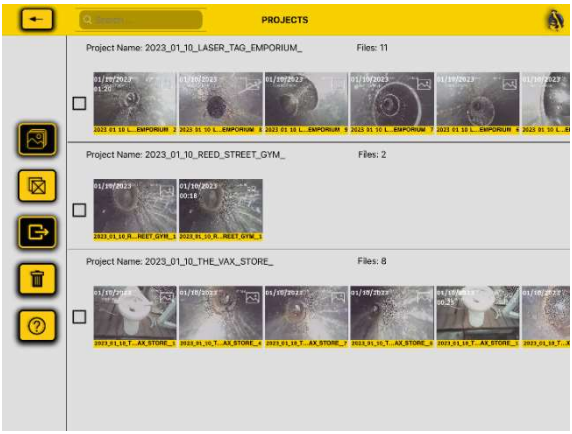
It is better to share files when the app is not connected to a control module. When the app is connected to a control module files cannot be shared because there is no internet or cellular connection. Disconnect from the control module, then use the internet or cellular connection.

7.1.6.1 Sharing an Entire Project

1. From the Main Gallery screen tap on the Share icon.

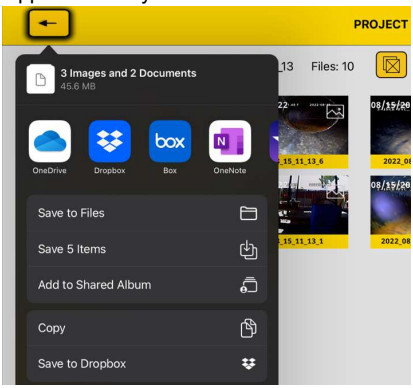


Main Gallery Screen



Main Gallery screen with selection boxes

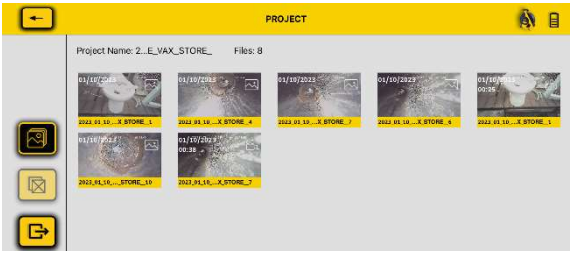
2. Tap on the **Selection Boxes** of each Project to export then tap the Share icon again.
3. The sharing dialog box will appear. Make your selections and continue.



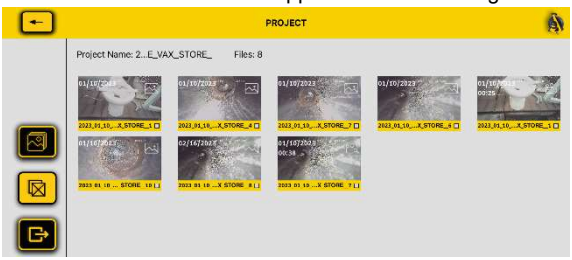
File sharing dialog box

7.1.6.2 Sharing Single Files

1. Tap any thumbnail in the Project to enter its Gallery.

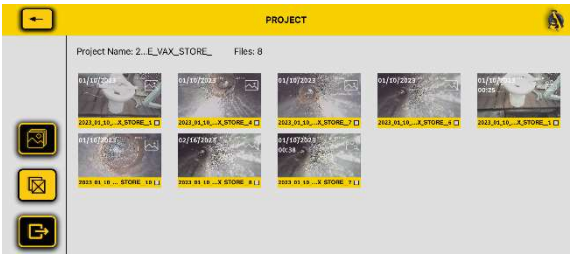


2. Tap the **Share** icon and checkboxes will appear in the bottom right corner of each thumbnail.



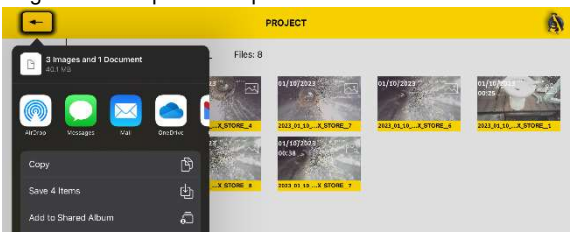
3. Tap on each thumbnail to apply the checkmark to mark them for export.
   - or -

   Use the **Multi-File Select** icon to apply checkmarks against all the thumbnails.



4. Select **OK** in the Export files dialog box.

5. Use the Share dialog box to complete the operation.



7.1.7 Deleting Files

Delete files or projects from the Gallery by following the steps in section 7.1.6 except choose **Delete** rather than Share.

Please read this section!

Vivax-Metrotech provides technical support for the vCam Mobile Controller (VMC) app, our vCam series camera systems and our locators.

Vivax-Metrotech does not supply technical support or training for smartphones, tablets or file-sharing apps on your phones and tablets.

Please refer to the help screens and documentation included with your file-sharing apps and the operating system on your phone or tablet (Android and iOS (Apple).

8. Cable Reels

8.1 Using the Cable Reel

8.1.1 Pushrod Cable

The Pushrod Cable comprises a fiberglass rod surrounded by wire conductors and a Kevlar braid coated with a thick polypropylene jacket. Because of the harsh environment the pushrod is used in, care should be taken to keep it in good operating condition.

Check Pushrod for Wear – Inspect the pushrod for cuts, kinks, and abrasions as it is retrieved back into the cable cage. If the jacket is cut or worn to the point that the yellow or white Kevlar braid can be seen, it is time to replace the pushrod. Using the pushrod with open cuts will result in water and moisture entering the pushrod and eventually traveling through it, causing a degraded camera image or total image failure.

Keep the Pushrod and Termination Spring Assembly dry and clean – When retrieving the pushrod, keep a dry rag in one hand and wipe down the pushrod as it moves through it. Use low-pressure water to rinse off the camera head and rinse away accumulated dirt and debris that may be caught in the spring. Shake dry or use low-pressure air to blow the excess water away and dry the parts. The Camera Head, Pushrod and Termination Parts are exposed to harsh chemicals in day-to-day use, and keeping a clean system will help prolong the life of these parts.
Maintain proper control of the pushrod – Attempting to pull the pushrod out of the reel while the reel is locked will result in the pushrod collapsing and stressing the pushrod. Pushing the pushrod back into the reel while locked may cause the reel to tip over or kink the cable.

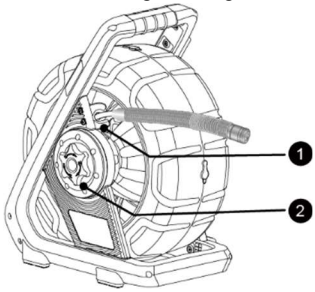
Rinse off the termination parts before the end of the day – The camera and pushrod are subjected to a very harsh environment with possibly very caustic chemicals. If the parts are not cleaned off and are allowed to dry dirty, the chemicals may wear these parts prematurely. Use low-pressure water to rinse out the termination spring parts. Wipe dry or use air to blow off the water before storing it for the night or long periods. Removing the skid when storing it is good to prevent water from drying between the skid and the camera head.

8.1.2 Deployment of the Pushrod Cable

WARNING
The friction brake should always be partially applied to slow down cable deployment. Care should be taken to prevent the cable from unwinding uncontrolled to avoid injury.

Do not wear loose clothing that can become caught in a spinning reel. Keep hands away from a spinning reel.

Position the reel on a flat surface approximately 3 to 4 feet or 1 to 1-1/2 meters from the entry point. This will provide enough space to work with the pushrod without much slack dragging on the ground. Use the friction brake to slow down the movement of the cable cage if needed. Using the reel in a horizontal position increases the width between the feet, giving the reel more stability on uneven surfaces and lowering the height in confined spaces.



MX Mini Reel	
1.	Cable Guide
2.	Locking and Friction Brake

TIP

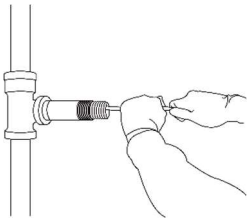
Before deploying the pushrod you should:

a) Remove any standing water from the pipe. The images will be much better if the camera head is not underwater.

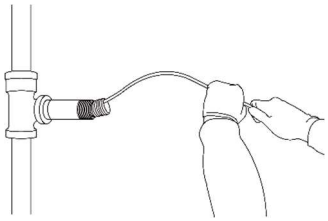
b) Remove debris and objects from the pipe first. The camera is made to inspect the insides of pipes and not to clean or unblock them.

Use “grip” type rubber gloves to better grasp and protect your hands from sludge during retrieval. The gripping action of the gloves will help keep a good hold on the pushrod while deploying.

Apply the push force to the pushrod as close to the entry point. Excess pushrod between the point of entry and while pushing could kick the pushrod. Never stand to use your weight to push on the pushrod which may cause the pushrod to kink.



Proper placement and pushing force



Improper placement and pushing may result in kinking the pushrod

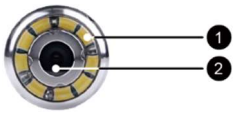
Use finesse and not force when needed. The camera and pushrod are made to travel through multiple bends within reason. If you are having trouble navigating through the pipe try pulling the camera back four to six inches and giving it a quick push-through. Sometimes the quick pushing motion will push the camera and termination through a tight area. Never pull the camera head back and repeatedly ram it into the pipe to get through.

9. Camera Heads and Terminations

9.1 Camera Head

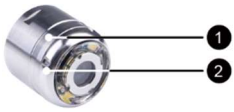
The vCamDrain ships standard with the D18-HD camera head. Check with your local distributor or Vivax-Metrotech office for optional camera heads that may be used with the vCamDrain system. A 2.5mm flat blade screwdriver is included in the kit for the standard skid removal and installation.

D18-HD Camera for the vCamDrain Reel



Camera Head Face

1. Sapphire glass lens
2. Polycarbonate LED cover



Camera Head Body

1. Groove for skid setscrews
2. Camera Housing

1. Interior threads
2. Gold contact pins
3. Circuit board

Camera Head	Fits Reels	Pipe Size Range
D18-HD Non-Leveling 18mm / 0.76” diameter	vCamDrain vCamMX-2	1.5 to 3 inches 30 to 75mm
Contact a local Vivax-Metrotech distributor or local office for ordering information, applications, compatibility, and pricing.		

9.2 Spring Sonde Assembly

The Spring Sonde Assembly comprises parts that connect the camera head on one end and the reel base on the other. The termination spring assembly for the vCam Drain consists of a preassembled spring, coiled cable, sonde, and lanyard.

Drain Termination Spring Assembly

1. Camera End with Circular Circuit Board
2. Spring Assembly with Coiled Cable, Sonde and Lanyard
3. Pushrod End with Push Pins

9.2.1 Termination Parts List

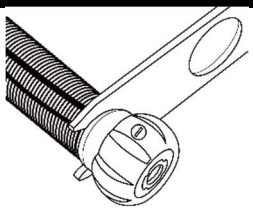
Picture	Description	Comments
	Spring assembly O-Ring, 14mm x 1.5mm, NBR	Two are required, one at each end.
	Drain Spring Sonde Assembly	An all-in-one assembly consisting of spring, coiled cable, sonde and lanyard preassembled.
Contact a local distributor or local Vivax-Metrotech office for ordering information, applications, compatibility, and pricing.		

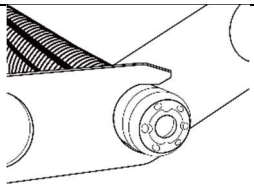
9.3 Removing and Installing the Camera Head

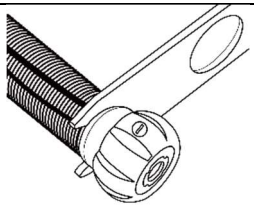
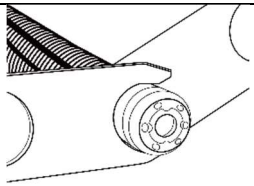
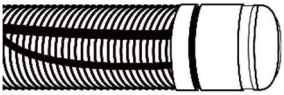
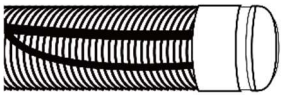
Do not touch the green circuit board or gold pins on the spring assembly or camera head with bare hands. Touching these will transfer oils from the fingers to these components, leading to premature corrosion. Wear clean rubber gloves if possible.

The vCamDrain is supplied with tools for camera and spring removal and installation.

1. 3-Point tool for spring removal/installation
2. Wrench flats for camera and spring removal/installation

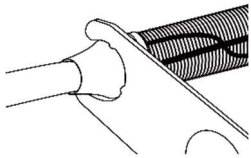
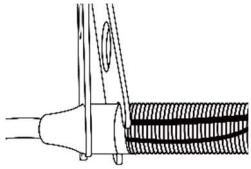
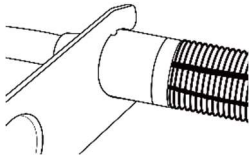
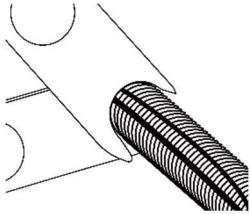
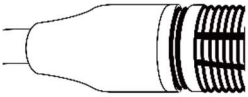
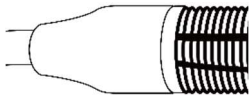
Camera head removal	
1. Use one camera tool to hold the flats on the spring.	

2. Place the flats of the other tool on the camera head flats and turn counterclockwise until the camera is loosened. **3.** Proceed to unscrew the camera head by hand until it is removed.	

Camera head installation	
Remove any excess dirt that might contact the gold pins or green circuit board. Check that the O-ring is in good condition. Wipe the circuit board in the spring and camera contact pins with an alcohol wipe or swab.	
1. Use one camera tool to hold the flats on the spring. **2.** Screw on the camera head by hand until the O-ring is engaged.	
3. Place the flats of the second tool on the camera head flats and turn clockwise **until the O-ring is no longer visible**.	
 **Visible O-Ring**	 **O-Ring is no longer visible**

9.4 Removing and Installing the Spring Sonde Assembly

Don't touch the green circuit board, gold pins on the spring sonde assembly, or camera head with bare hands. Touching these will transfer oils from the fingers to these components, leading to premature corrosion. Wear clean rubber gloves if possible.

1. Remove the camera head following the instructions shown in section 9.3	
2. Use the 3-point section of the camera tool to hold the termination base.	
3. Use the second camera tool to loosen the spring sonde by the wrench flats by turning it in the counterclockwise direction. **4.** After the spring sonde is loosened unscrew it and remove it.	
Installing: Remove any excess dirt that might get onto the gold pins or green circuit board. Check that the O-rings are in good condition.	
1. Hold the termination base with the 3-point section of the camera tool while screwing on the spring sonde in the clockwise direction.	
2. Use the camera tool and continue to screw on the spring while holding the base with the 3-point tool section.	
3. Tighten with the tools until the O-Ring is no longer visible.	
 **Visible O-Ring**	 **O-Ring is no longer visible**

10. Troubleshooting

Please check the Knowledge Center on the Vivax-Metrotech website for the latest support information. Go to www.vivax-metrotech.com and then click **Support**, **Knowledge Center**.

Problem: No control modules are seen in the range to connect.

Check:

1. Check that the Wi-Fi on the control module or vCamDrain reel is turned on.
2. Check the control module or vCamDrain reel has the latest software installed.
3. Check that the SSID on the control module or vCamDrain reel starts with "vCam." If the SSID was changed the app might be unable to find the control module.
4. Try restarting the app.
5. Try restarting the control module or vCamDraion reel.

Problem: The control module will not connect.

Check:

1. Ensure the Wi-Fi is turned on in the control module or the Wi-Fi LED is glowing on the vCamDrain reel.
2. Make sure that the SSID has not been changed. The SSID must start with “vCam” for the app to see the reel.
3. Check that the battery life of the control module or vCamDrain reel is greater than 15% charged.

Problem: The picture is freezing

Check:

1. Ensure no source of interference is between the app and the reel or control module.
2. Restart the app.
3. Restart the reel or control module.

Problem: The Share File dialog box does not show up

Check: This is probably an Access Permission setting in the iOS settings.

1. Go to **Settings**.
2. Find the VMC app.
3. Under **ALLOW VMC TO ACCESS**, ensure that **Photos** or Add **Photos Only** is selected.

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