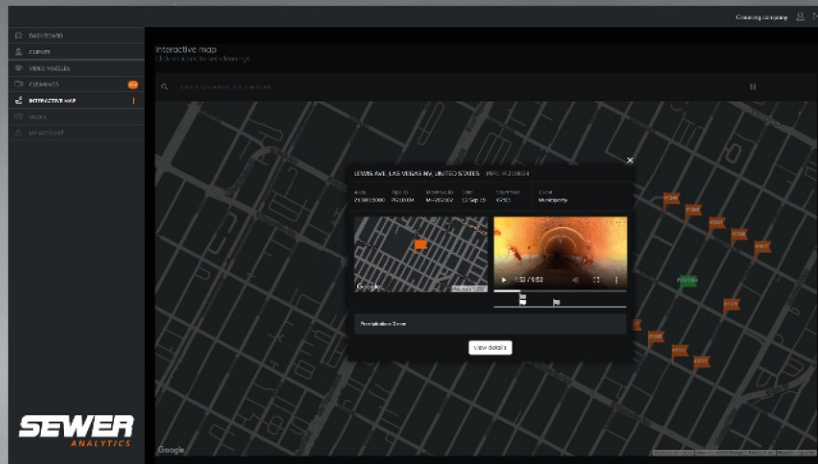


SEWER
ROBOTICS

C70 CAMERA NOZZLE

USER & SAFETY MANUAL v.2022.04



Important message before usage

Please verify that both the front and rear seals are present and undamaged before using your C70 video nozzle to confirm that your C70 video nozzle has not been opened during shipping.



Figure 0.1: C70 video nozzle warranty seals

Contact Sewer Robotics within 10 days after reception of the product if the 'blue' warranty seals are either not applied as displayed, or broken to report possible damage caused by unauthorized opening of the product during shipping.

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Introduction

Thank you for purchasing the Sewer Robotics C70 Video Nozzle.

Working with high-pressure waterjet equipment is dangerous and could lead to severe injuries or death. Any person using, operating, performing maintenance or being in close contact with high pressure equipment, including but not limited to the Sewer Robotics C70 Video Nozzle assumes responsibility and associated risks and therefore has to be well qualified, trained and familiar with safety instructions, identification, operation and applications of all associated equipment.

This *USER MANUAL* is written to provide instructions for the usage of the Sewer Robotics C70 Video Nozzle and is considered a permanent part of the product and should always remain with the product, together with additional safety precautions, standards, guidelines and recommendations regarding operation, applications, adjustments and maintenance of any related product used to support or work with the Sewer Robotics C70 Video Nozzle equipment.

All information in this publication is based on the latest product information available at the time of writing, indicated by the date on the cover. Sewer Robotics reserves the right to make changes at any time without notice and without incurring any obligation.

The user of any waterjet equipment should not use such equipment without receiving training from the manufacturer or licensed seller and consulting all applicable precautions, standards, guidelines, or recommendations including, but not limited to, the Occupational Safety and Health Administration (OSHA), WaterJet Technology Association – Industrial & Municipal Cleaning Association (WJTA-IMCA), Industrial Cleaning Foundation (SIR Stichting Industriële reiniging), American Society for Testing Materials (ASTM), American National Standards Institute (ANSI) OR SIMILAR IN YOUR SPECIFIC COUNTRY and the instructions, recommendations and standards of the equipment manufacturer. In the event of a high-pressure waterjet injury medical attention should be sought immediately. The doctor should be informed of the cause of injury, the type of waterjet project and the source of water used. The doctor should also be shown a safety card, distributed by the WJTA-IMCA or SIR.

It is the users responsibility to contact Sewer Robotics if any information is not clear regarding any Sewer Robotics manual, product or part thereof, technical information, instruction or suggestion.

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Definitions – Safety Warnings

Safety symbols are used to alert you to potentially hazardous situations. The following definitions describe the level of severity for each signal word.

 INFO

Texts with this signal word are to inform you with important information. Please respect precautions and instructions in these texts.

 DANGER

Texts with this signal word are to alert you to dangerous situations leading to physical injury or even death. Be extra cautious in the situations and closely follow the instructions in these texts.

 WARNING

Texts with this signal word are to alert you situations having the potential to become dangerous and lead to physical injury or even death. Be extra cautious in these situations and follow instructions in these texts.

 CAUTION

Texts with this signal word are to alert you to situations in which your device could sustain damage or in which you could hurt yourself. Adjust your work style to the situation.

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1 Safety messages

DANGER
<p>Working with high-pressure waterjet equipment is dangerous and could lead to severe injuries or even death.</p>

1.1 Responsibility

During any waterjet activity the correct operation and application of the waterjet equipment is the responsibility of the operator, who should be familiar with the identification, operation and applications of high-pressure equipment.

DANGER
<p>The user of any waterjet equipment should not use such equipment without receiving training and consulting all applicable precautions, standards, guidelines, or recommendations including, <u>but not limited to</u>, the Occupational Safety and Health Administration (OSHA), WaterJet Technology Association – Industrial & Municipal Cleaning Association (WJTA-IMCA), Industrial Cleaning Foundation (SIR Stichting Industriële reiniging), American Society for Testing Materials (ASTM), American National Standards Institute (ANSI) OR SIMILAR IN OTHER COUNTRIES and the instructions, recommendations and standards of the equipment manufacturer.</p>

1.2 Accidents

A person injured by being hit with a waterjet not necessarily see the full extent of the injury, particularly the internal damage and depth of penetration. Even though the surface wound may be small and may not even bleed, it is quite possible that large quantities of water have punctured the skin, flesh, and internal organs through a very small hole. The spread of microorganisms and infection through a wound of this type is a very real concern; the injury should, therefore, be carefully monitored for several days.

In the event of an injury, immediately take the injured person to a hospital and inform the doctor of the cause of the injury. To ensure that the doctor knows and understand the cause of injury, all waterjet equipment operators **shall** carry a waterproof card that is easily accessible and that outlines the possible nature of the injury. These cards can be purchased from www.wjta.org with wording as follows:

WARNING!!!	IMPORTANT MEDICAL INFORMATION!	MEDICAL ALERT NOTE TO PHYSICIAN
<p>An injury caused by high pressure waterjets can be serious. In the event of any waterjet injury:</p> <ul style="list-style-type: none"> – Seek medical attention immediately. Do not delay! – Inform the doctor of the cause of the injury. – Show the doctor this card. – Tell the physician what type of waterjet project was being performed at the time of the accident and the source of the water. 	<p>READ THIS PLASTIC CARD AND KEEP IT IN YOUR WALLET. IN THE EVENT OF A WATERJET INJURY, SHOW THE CARD TO YOUR DOCTOR.</p> <hr style="width: 50%; margin: 0 auto;"/> <p><small>Distributed by: WaterJet Technology Assn.- Industrial & Municipal Cleaning Assn., 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448, phone: (314)241-1445, fax: (314)241-1449, e-mail: wjta-imca@wjta.org, website: www.wjta.org</small></p>	<p>This patient may be suffering from a waterjet injury. Evaluation and management should parallel that of a gunshot injury. The external manifestations of the injury cannot be used to predict the extent of internal damage. Initial management should include stabilization and a thorough neurovascular examination. X-rays can be used to assess subcutaneous air and foreign bodies distant from the site of injury. Injuries to the extremities can involve extensive nerve, muscle, vessel damage, as well as cause a distal compartment syndrome. Injuries to the torso can involve internal organ damage. Surgical consultation should be obtained. Aggressive irrigation and debridement is recommended. Surgical decompression and exploration may also be necessary. Angiographic studies are recommended pre-operatively if arterial injury is suspected. Bandages with a hygroscopic solution (MgSO₄) and hyperbaric oxygen treatment have been used as adjunctive therapy to decrease pain, edema and subcutaneous emphysema. Unusual infections with uncommon organisms in immunocompetent patients have been seen; the source of the water is important in deciding on initial, empiric antibiotic treatment, and broad-spectrum intravenous antibiotics should be administered. Cultures should be obtained.</p>

Figure 1.1: WJTA IMCA Safety card

2 Quick start guide

**DANGER**

Working with high-pressure waterjet equipment is dangerous and could lead to severe injuries or even death.

Use this QUICK START GUIDE only in addition and after reading and understanding the guidelines described in the Best Practices for the Use of High Pressure Waterjetting Equipment published by the Waterjet Technology Association (www.wjta.org) and this complete C70 Video Nozzle User Manual (available from the C70 Operating Software).



1. Charge

Unbox the C70, use HEX wrench 6 to remove the (larger) "charging" cap by rotating CCW.

Air pressure from previous pressurizing should escape! (Otherwise it has not been pressurized correctly -or- the seals are leaking and service is required!)



Insert the charger plug into the charging port and insert the power cord into a grounded 110-230VAC power outlet.

Use the supplied Micro tablet charger cable to charge the Tablet.



Press the (red) "booster" button on the charger (no longer than 5 seconds), **only** if the LED does not immediately indicate charging (red), until the charger's LED indicate charging (red).

Do not press the (red) "booster" button if the charger's LED indicates charging (red) immediately.



The batteries are fully charged when the charger's LED indicates charged (green).



2. Pressurize

Check the o-ring seal(s) on the cap and replace if damaged.

Insert the "charging" cap and fasten at 4NM by rotating CW.



Use HEX (Allen) wrench 5 to remove the (smaller) "pressurizing" cap by rotating CCW.



Insert the hose-end of the "pressurizing" pump into the "pressurizing" port.



Push the hose-end into the pressurizing port and manually pump a few (3) times.

Air will escape from the pressure valve of the pump when the nozzle is sufficiently pressurized.

Do not over pressurize the C70 Video Nozzle.



Check the o-ring seal on the cap and replace if damaged.

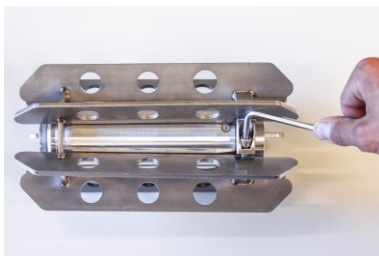
Insert the "pressurizing" cap and fasten at 4NM by rotating CW.



3. MOUNT SKID

Verify the pipe diameter and select the corresponding skid.

Make sure that the Nozzle cannot "turn-around" inside the pipe.



Insert the C70 into the skid by sliding the side of the "charging" and "pressurizing" caps all the way through the skid and into the thicker ring with the "fastening" bolt.

Use Hex wrench 6 to securely fasten the skid.

Make sure that the Wi-Fi antenna is centered between the skid plates.



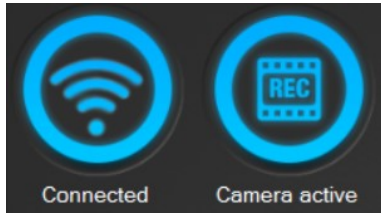
4. ACTIVATE C70 and tablet

Attach the nozzle ring and fasten with the supplied wrench to activate the C70 Video Nozzle.



Press and hold the Tablet's power button to activate the tablet. Check the date and time settings of the tablet.

Double-click the "C70 Video Nozzle" icon on the desktop to launch the software and wait until the Video Nozzle is connected with the software indicated by the (blue) "Connected" icon. Start the tablet and start the C70 Video Nozzle control software. Check if the C70 Video Nozzle is connected "Connected" and the camera is active "Camera active".



5. Verify that the camera is active

Verify that the tablet and C70 Video Nozzle are connected and that the camera is active indicated by the blue icons in the C70 Video Nozzle software.

The tablet can now be placed at a secure place near the cleaning reel where it has GPS reception.

6. Connect Hose

Use the correctly sized wrenches and if necessary a pressure-rated adapter and swivel with the corresponding threads and pressure ratings to connect and securely fasten the jetting hose to the C70 Video Nozzle.

7. Clean the lens

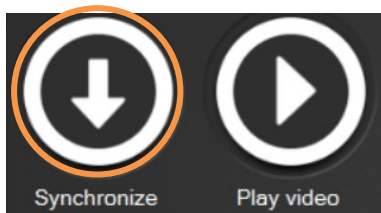
Tip: Spray Rain-X® 2-in-1 Glass Cleaner + Rain Repellent (or similar) on the lens, leave on for a couple of seconds and wipe off with a dry paper towel.

8. Start Cleaning

Carefully lower the C70 Video Nozzle through the manhole into the pipe and keep the lens as clean as possible.

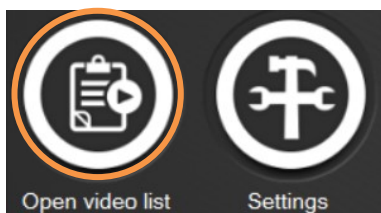
Start jetting only if the C70 Video Nozzle is completely inside the pipe. If possible, go out against the flow (upstream) and use cleaning pressure. To avoid water drops to be drafted on the lens, lower the pressure once at the end and retrieve the nozzle at a "slow walking pace". (Just faster than the flow.)

A video recording will start when the water pressure is on and end when the pressure is off for more than 30 seconds. The tablet will register the GPS locations. (The manual recording procedure is described in chapter 5.2 of the user manual.)



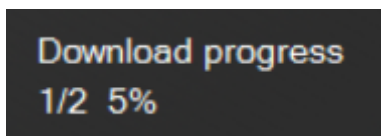
9a. Synchronize (all new) videos

Place the tablet and nozzle close to each other and click "Synchronize" when the C70 Video Nozzle and tablet are connected to download all new cleaning videos.

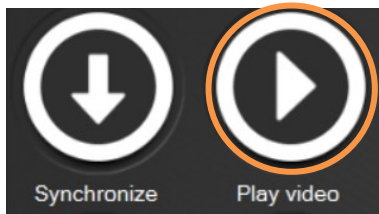


9b. Download a single video

Alternatively, Click "Open video list", click "Camera" and enter the date when the video is recorded. Select the video from the list and click "download" to download the selected video.



The synchronization/ download progress is indicated in the bottom right corner.

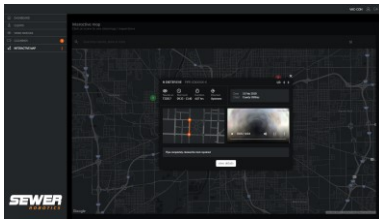
**10. Watch the Video (on the tablet)**

Click "Play video" to open the folder with all cleaning videos and double-click a video to watch it.

**11. Upload videos and GPS locations**

Connect the tablet with an internet connection via Wi-Fi. (No action is required if the tablet is placed in a docking station with Ethernet connection, or connected via a mobile data connection.)

The cleaning videos and GPS locations will be automatically uploaded to the Sewer Analytics cloud.

**12. Watch the videos on Sewer Analytics**

Browse to SewerAnalytics.com and log-in to your account to watch, edit, prioritize and share the cleaning data.

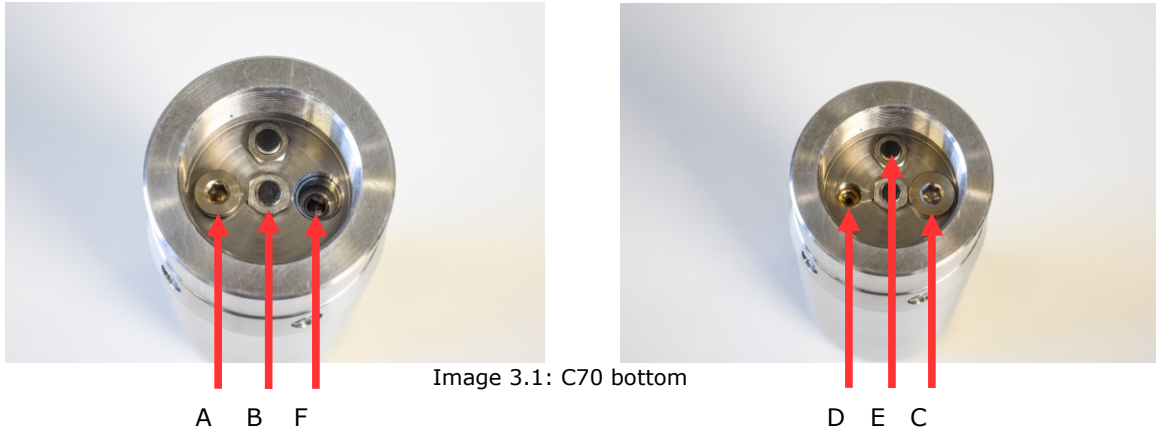
3 Preparing the C70 Video Nozzle

The C70 Video Nozzle has a battery pack that needs to be charged before operation. The charging port needs to be accessed for charging the C70. After charging, the C70 needs to be pressurized.

3.1 Charging the C70 Video Nozzle

i INFO
The C70 Video Nozzle does not have a battery level indicator. It is recommended to always charge the C70 Video Nozzle before usage.

⚠ DANGER
Never use the charger in an area with flammable liquids or gasses.



No.	Description	No.	Description
A	Pressurizing cap	D	Pressurizing port
B	Light/ recording sensor	E	Power sensor
C	Charging cap	F	Charging port

A. Pressurizing cap

The pressurizing cap is to seal the pressurizing port.

B. Light/ recording sensor

The light/ recording sensor is activated when the pressure switch inside the nozzle ring is pushed towards it by the water pressure.

C. Charging cap

The charging cap is to seal the charging port.

D. Pressurizing port

The pressurizing port is used to pressurize the Video Nozzle after each charge.

E. Power sensor

The power sensor will activate the C70 Video Nozzle upon detection of the nozzle ring. It is therefore important that the nozzle ring is securely fastened.

F. Charging port

The charging port is the connection for charging the batteries of the C70 Video Nozzle.

3.1.1 Access the charging port

1. Remove the "nozzle ring" (Image 3.4 K) by rotating it CCW with the special wrench;
2. Remove the (large) "charging cap" (Image 3.1 C) by rotating it CCW with the HEX tool to access the charging port;

INFO
Air pressure from previous pressurizing should escape! (Otherwise it was not pressurized well -or- the C70 has a leakage and service is required!)

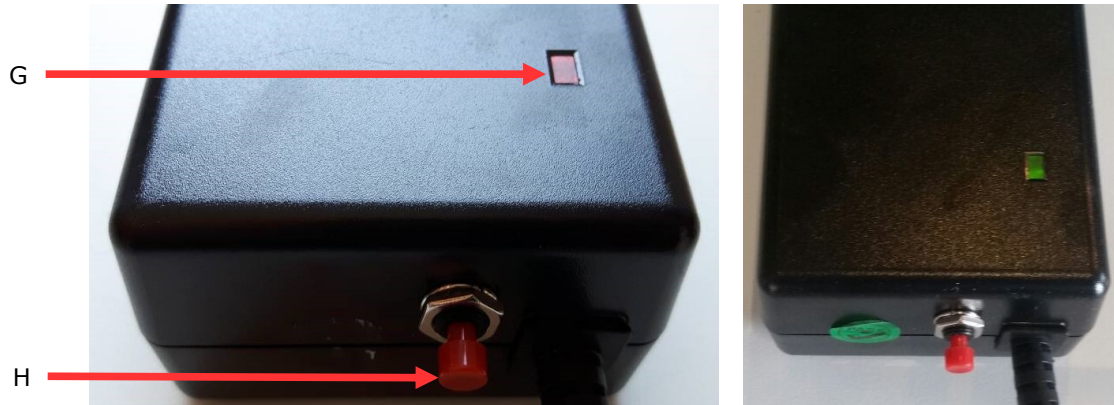


Image 3.2: C70 charger

No.	Description	No.	Description
G	Charger LED indicator	H	Booster button

G. Charger LED indicator

The “Charger LED indicator” indicates the charging status.

H. Booster button

The “Booster” button can be used for a few (3) seconds when the battery is completely empty.

3.1.2 Charging

3. Insert the charging cable into the “charging port” (Image 3.1 F);
4. Connect the charger’s power cord to any 110-230VAC, 50-60hz power outlet;
5. The “charger LED indicator” (Image 3.2 G) indicates if the camera is charging;
 - a. A red light indicates that the batteries are charging;
 - b. A green light indicates that the batteries are fully charged;

INFO
The charger indicates green if the batteries are completely discharged and the charger won’t automatically start charging when connected.

- c. Press and hold the “booster” button (Image 3.2 H) for a few seconds until the LED indicates charging (red).

INFO
It will take several hours to fully charge the C70 Video Nozzle. The battery life is over 8 hours when fully charged.

3.1.3 Cap the charging port

6. Remove the charger plug;
7. Inspect the O-ring seal of the cap and replace if necessary;
8. Fasten the “charging cap” by rotating the cap CW with a HEX tool;

INFO
Always check the o-ring seal of the cap and replace if necessary before putting it back.

CAUTION
Do not apply more than 4NM to fasten the charging cap.

3.2 Pressurizing the C70 Video Nozzle

The C70 Video Nozzle needs to be pressurized with dry air to protect it from outside influences every time a cap is removed for charging the batteries.

A manual hand pump is supplied for pressurizing the Video Nozzle. The hand pump has an automatic pressure valve to avoid over-pressurizing the nozzle.

CAUTION
Make sure that the hand pump is always stored and used only with dry air and in a dry environment.



Image 3.3: Pressurizing Hand Pump

No.	Description	No.	Description
I	Rubber connection tube	J	Pressure valve

3.2.1 Pressurizing the C70 Video Nozzle

9. Remove the (small) "pressurizing cap" (Image 3.1 A) by rotating it CCW with the HEX tool to access the charging port;
10. Press the "Rubber connection tube" (Image 3.3 I) of the hand pump straight into the pressurizing port;
11. Push the rubber connection of the hand pump into the pressure pump while pumping approximately 3 times to pressurize the C70 Video Nozzle;
12. The air pressure will be released from the pumps "Pressure valve" (Image 3.3 J) to indicate that the nozzle is pressurized;
13. Inspect the O-ring seal of the cap and replace if necessary;
14. Fasten the "charging cap" by rotating the cap CW with a HEX tool;

INFO
The pressure inside the C70 Video Nozzle should be 7.25psi (0.5 Bar) above ambient air pressure.

INFO
Always check the o-ring seal of the cap and replace if necessary before putting it back.

CAUTION
Do not apply more than 4NM to fasten the charging cap.

⚠ CAUTION
Moist and dirt might enter and damage the C70 Video Nozzle if the inside air pressure is too low.

⚠ CAUTION
Seals could damage if the inside air pressure is too high.

⚠ CAUTION
Air with a high humidity will damage the electrical components of the C70 Video Nozzle.

3.3 Nozzle ring

The nozzle ring refers to the separate, 'wet part' that is screwed onto the C70 and holds the threaded hose connection and the replaceable cleaning jet inserts. The nozzle ring activates the C70 when attached and provides access to the capped charging and pressurizing ports when detached.

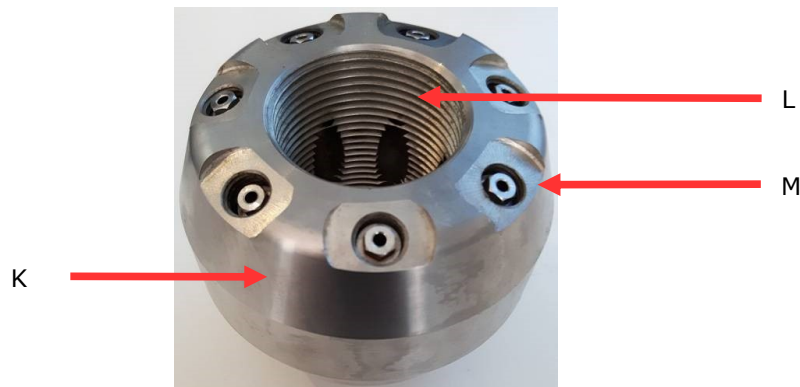


Image 3.4: Nozzle ring

No.	Description	No.	Description
K	Nozzle ring	M	Cleaning jet inserts
L	1 ¼" BSP hose connection		

K. Nozzle ring

The nozzle ring refers to the separate "wet" part that is screwed onto the C70. The Nozzle ring holds the pressure switch, 12 cleaning jets and the threaded connection for the high-pressure hose. The nozzle ring activates the C70 when attached and provides access to charging and pressurizing ports when detached.

L. 1 ¼" BSP high-pressure hose connection

The 1 ¼" BSP thread connects the nozzle with the high-pressure hose of the truck. Make sure that the high pressure jetting hose is connected tight and with the correct pressure rated adapters.

ℹ INFO
A pressure rated high pressure swivel is recommended to avoid that the torsion in the hose will loosen the nozzle ring.

⚠ DANGER
A pressure rated 1 ¼" BSP threaded adapter needs to be used if the C70 Video Nozzle is connected to a different size jetting hose or a NPT threaded connection.

M. Cleaning jets

The ceramic cleaning orifices (jet inserts) are available in a variety of diameters and should be adjusted to the maximum pressure, flow, hose diameter and hose length to get the maximum pressure out of the nozzle.

ℹ INFO
Contact Sewer Robotics or your approved reseller for the right jets (orifices) and configurations.

⚠ WARNING

Always use Loctite 586 thread sealant after applying Loctite activator SF7649 on properly cleaned and decreased threads when mounting the jet inserts.

3.3.1 Activating the C70 Video Nozzle

15. Attach the nozzle ring (Image 3.4 K) to the C70 Video Nozzle by rotating it CW;
16. Fasten the nozzle ring to the C70 Video Nozzle by rotating it CW with the special wrench;

The power sensor will detect the "Nozzle ring" and activate the C70 Video Nozzle.

ℹ INFO

It could take up to two minutes before the C70 Video Nozzle is started and connected to the wireless network and software of the Tablet.

⚠ WARNING

The Nozzle ring needs to be securely fastened by hand to the C70 Video Nozzle before applying water pressure.

The C70 Video Nozzle can be deactivated by removing the nozzle ring completely for charging or storage.

3.4 Activating the LED's

A pressure switch in the center of the "Nozzle ring" is used to activate the LED's automatically when high pressure water is applied and to start a recording. The mechanical switch will push towards the "Light sensor" when water pressure is applied to the nozzle ring.

4 Software

Sewer Robotics software is required on the tablet to use the C70 Video Nozzle. The software manages the communication between the tablet and C70 Video Nozzle, logs the GPS locations of the tablet when used in combination with the C70 and can synchronize the cleaning videos with Sewer Analytics.

4.1 Software installation

Tablets and C70 Video Nozzle kits that are provided by Sewer Robotics have the operating software pre-installed.

INFO

The C70 operating software requires Microsoft Visual C++, Adobe Reader and VLC media player to be installed. Executing the setup.exe file will automatically install VLC media player.

4.1.1 Installing the C70 operating software

1. Copy and paste the "Setup Camera Nozzle X.X.X.X" software to a compatible Windows tablet;

INFO

Contact Sewer Robotics or your local distributor with the serial number of your C70 Video Nozzle for the C70 operating software.

2. Double-click the "Setup Camera Nozzle X.X.X.X" application and extract all files;
3. Double-click the extracted "Setup Camera Nozzle X.X.X.X" application to start the installation wizard;
4. Click "Yes" to allow the Setup Camera Nozzle from an unknown developer to make changes to the PC;

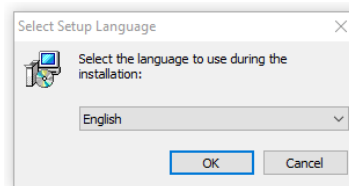


Figure 4.1: Setup language

5. Select the desired language and click "OK";

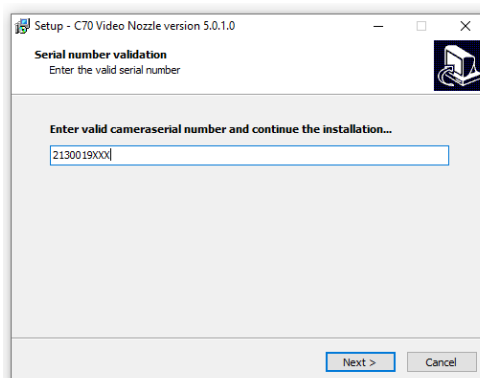


Figure 4.2: Enter serial number

6. Enter a valid camera serial number and click "Next>";

A valid camera serial number is "2130019XXX" where the "XXX" is unique for each C70 Video Nozzle and engraved in the back of the C70 Video Nozzle. If the serial number engraved has 2 digits, please use "21300190XX";

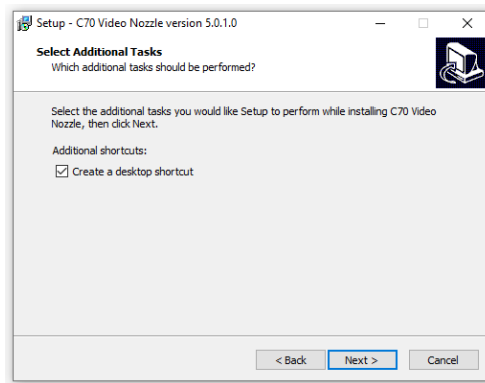


Figure 4.3: Create desktop shortcut

7. Mark the box to "Create a desktop shortcut" and click "Next >";

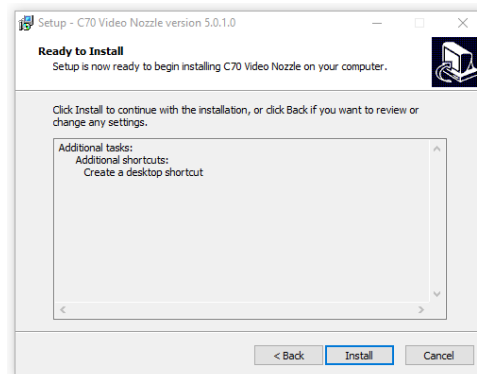


Figure 4.4: Continue with the installation

8. Click "Install" to continue with the installation;
9. The installation wizard will now install the operating software;

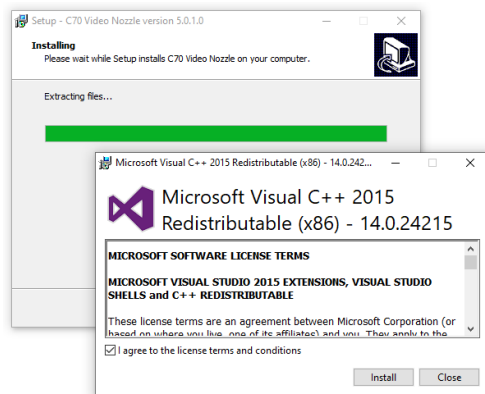


Figure 4.5: Install Microsoft Visual C++

10. Mark the box to "agree to the license terms and conditions" to install Microsoft Visual C++ and click "Install";
11. Click "Close" to close the Microsoft Visual C++ installation wizard;

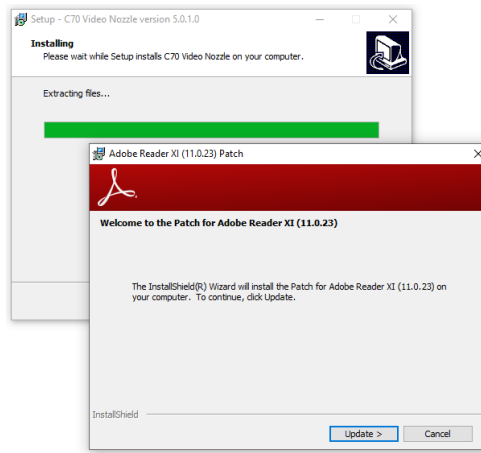


Figure 4.6: Install Adobe Reader

12. Click "Update >" to install Adobe Reader;
13. Click "Finish" to close the Adobe Reader setup;

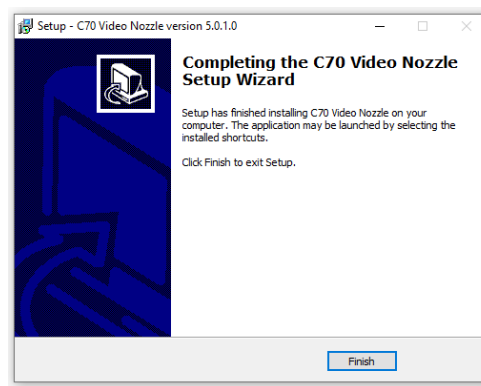


Figure 4.7: Finish installation

14. Click "Finish" to close the installation;

4.2 Wi-Fi Connection

The C70 Video Nozzle has its own wireless network router. No external wireless routers are required to establish a connection between the C70 and the supplied tablet. The network SSID is either: "IPC-XXXX" or: "xmjp_beye_XXXX" where the "XXXX" is unique for each C70 Video Nozzle to allow multiple C70 Video Nozzles to work in close proximity.

Wi-Fi network: "IPC-XXXX" or "xmjp_beye_XXXX"
WPA2 password: 1234567890

i INFO

Your C70 video nozzle does not support automatic recording if your C70's network ID has the format "xmjp_beye_XXXX". Make sure that manual recording is enabled in the settings (chapter 4.5) and use the start- and stop recording buttons (chapter 5.2).

4.2.1 Connecting the tablet with the C70

15. Make sure that the C70 Video Nozzle is fully charged, pressurized and powered "On";

i INFO

Once the C70 Video Nozzle is powered-on, by attaching the "nozzle ring" it could take up to 2 minutes before it is connected to the network or appears in the tablet's Wi-Fi settings.

16. Make sure that the tablet is fully charged, that it is started and that it has the camera nozzle software installed;
17. Open the "Network settings" menu by clicking the network icon in the bottom right corner of the screen;

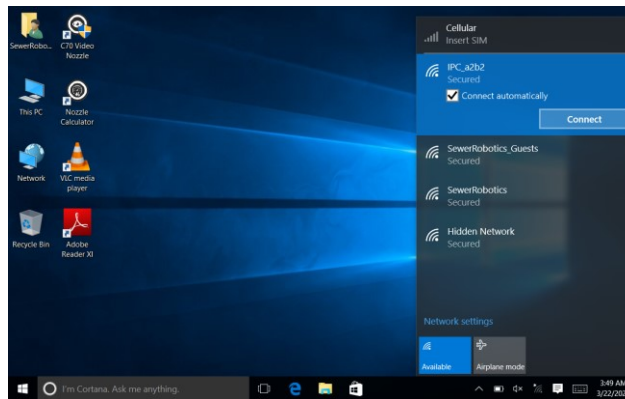


Figure 4.8: Connect to Wi-Fi network

18. Mark the "Connect automatically" box of the C70 Video Nozzle network ("IPC-XXXX" or "xmjp_beye_XXXX") and click "Connect" to establish a Wi-Fi connection between the tablet and the C70 Video Nozzle;

INFO

When the connection is not set to connect automatically, the Wi-Fi connection with the C70 has to be established according to the above mentioned steps every time it has been off or out of reach!

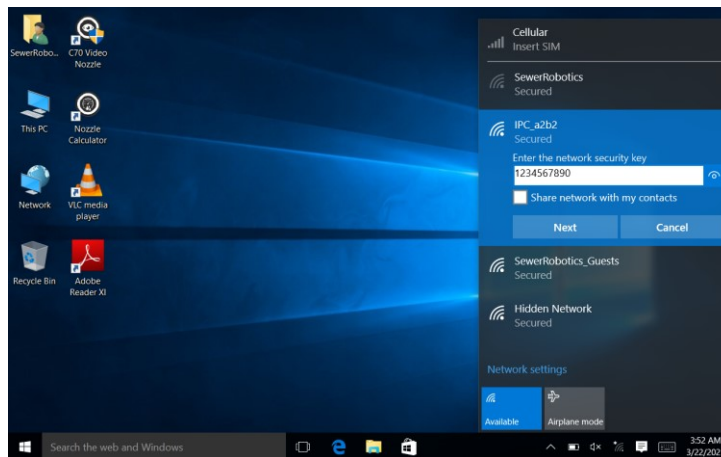


Figure 4.9: Enter the Wi-Fi password

19. Enter the Wi-Fi password "1234567890" and click next to connect to the network;

INFO

To reconnect to the network, open the network list, select the network and press "disconnect". Once disconnected follow the previous steps to reconnect to the C70 Video Nozzle.

4.3 C70 Video Nozzle software

4.3.1 Launch the C70 Video Nozzle software



Figure 4.10: Launch the C70 Video Nozzle software

20. Double-click the "C70 Video Nozzle" desktop shortcut with administrator rights (click "Yes" to allow this app to make changes on the PC) and launch the Video Nozzle operating software;

4.3.2 Disclaimer

When the software is opened for the first time a disclaimer will be displayed.

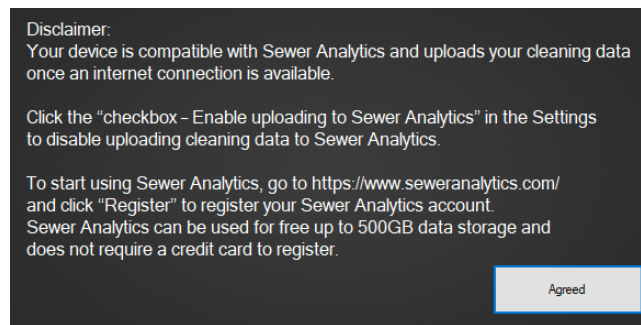


Figure 4.11: Disclaimer

Click "agreed" to confirm that you have read and understood the message about uploading data to Sewer Analytics.

If you don't want to use Sewer Analytics and therefore not wish to upload data, "Click" the "checkbox - Enable uploading to Sewer Analytics" in the Settings (chapter 4.5) to disable uploading cleaning data to Sewer Analytics.

4.4 Main menu

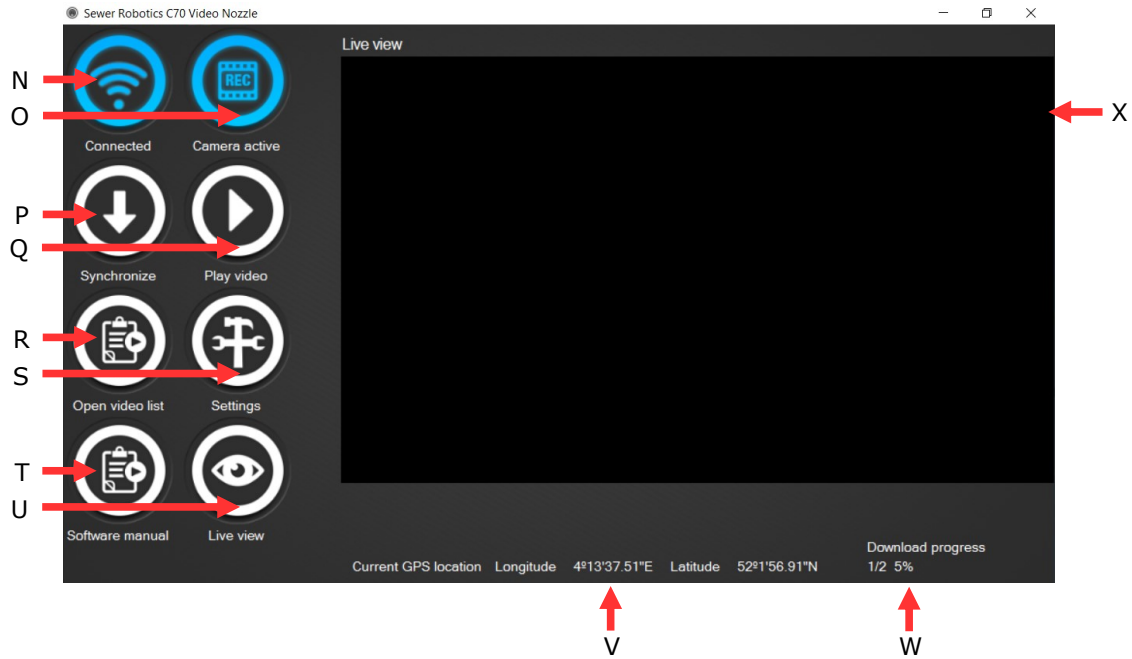


Figure 4.11: C70 Video Nozzle operating software

No.	Description	No.	Description
N	Connected	T	Software manual
O	Camera active	U	Live view
P	Synchronize	V	GPS location
Q	Play video	W	Download/ synchronize progress
R	Open video list	X	Video display
S	Settings		

N. Connected

The "Connected" icon will turn blue to indicate an active Wi-Fi connection between the C70 Video Nozzle software and the C70 Video Nozzle.

O. Camera active

After establishing connection between the software and the C70 Video Nozzle it will calibrate the date and time between the two devices and set the C70 Video Nozzle to activate recordings with the pressure switch.

The "Camera active" icon will turn blue to indicate that the C70 nozzle was calibrated successfully and ready for usage.

INFO

The C70 Video Nozzle will now automatically start a recording when the water pressure is on and stop the recording when the water pressure is off for more than 30 seconds.

INFO
Your C70 video nozzle does not support automatic recording if your C70's network ID has the format "xmjp_beye_XXXX". Enable manual recording in the settings to start- and stop a recording manually as covered in 5.2 Manual recording.

INFO
The tablet should remain on and placed where it has GPS reception as close to the cleaning reel as safely possible to register the GPS location close to the manhole. This data is uploaded to the Sewer Analytics cloud when the tablet is connected to the internet.

P. Synchronize

Click the "Synchronize" button when the tablet and C70 Video Nozzle are connected to download all videos that are on the C70 Video Nozzle and not yet on the tablet.

Q. Play video

Click the "Play video" button to open the folder where downloaded videos are saved.

Double-click a video to play the video in VLC media player.

R. Open video list

Click the "Open video list" button to open a file browser.

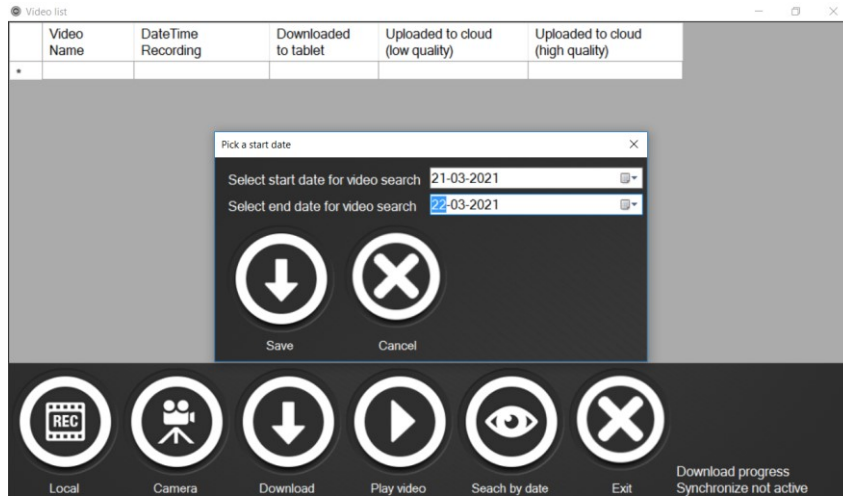


Figure 4.12: Video list

Click "Local" to display the list of videos that are recently downloaded.

Click "Camera", then enter the "start date" and "end date" and click "Save" to access the list of videos that are stored on the C70 Video Nozzles and were recorded between the set dates.

Click in the list to select the video and click the "Download" button to download the video from the C70 Video Nozzle to the tablet or click the "Play video" button to play a video that has been downloaded onto the tablet already.

The video list shows the "Video Name", "DateTime of Recording", and whether it was "Downloaded to tablet". The two final fields are to indicate whether the video was "Uploaded to cloud" in "low quality" or "high quality" and refers to the Sewer Analytics cloud.

S. Settings

Click the "Settings" button to open the settings menu. The settings are described in chapter 4.5 Settings.

T. Software manual

Click the "Software manual" button to open a PDF version of this manual.

U. Live view

Limited Live view can be used for testing the camera, checking the date of the camera and for demonstration purposes above ground. The C70 Video Nozzle needs to be within close

proximity of the tablet and connected to the software. Click the "Live view" button to display live view of the C70 Video Nozzle.

Live view will end once a recording is activated by the "pressure switch".

i INFO

Please note that the live view could be delayed and off poor quality due to a bad connection.

i INFO

Live View requires a strong Wi-Fi connection and high CPU performance.

V. GPS location

The standard provided tablet has a GPS receiver built-in that registers the GPS location of the tablet when the C70 Video Nozzle software is active. The GPS coordinates are displayed at the bottom in NMEA format.

The GPS coordinates are automatically uploaded to the Sewer Analytics cloud when the tablet is connected to the internet. The GPS coordinates are matched with the cleaning videos in Sewer Analytics.

i INFO

If there is no GPS signal available, the cleaning location cannot be displayed automatically in Sewer Analytics.

i INFO

The tablet's sleep mode should be turned off for proper functioning of the GPS registering. Chapter 6.1 explains how the sleep mode can be turned off.

W. Download/ synchronize progress

The download progress is indicated in the bottom right corner with the video # that is downloading / the total # of videos to synchronize and the percentage of the current video download.

X. Video display

The Video display shows the camera image when live view is enabled.

4.5 Settings menu

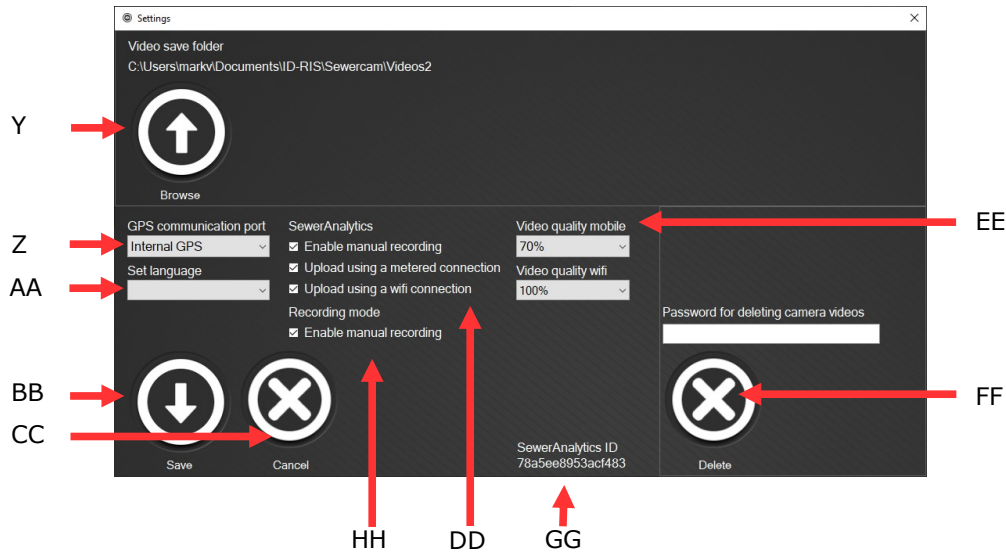


Image 4.13: Settings

No.	Description	No.	Description
Y	Video save folder	DD	Upload preferences
Z	GPS communication port	EE	Upload quality
AA	Set language	FF	Delete
BB	Save	GG	Sewer Analytics ID
CC	Cancel	HH	Enable manual recording

Y. Video save folder

All downloaded videos are stored inside this location on the tablet’s hard drive. Press the “Browse” button to change the location where downloaded videos are saved.

Z. GPS communication port

The “GPS communication port” setting is used to select the communication port for the GPS device. The GPS communication port for Sewer Robotics supplied tablets is “Internal GPS”.

AA. Set language

Click the current set language to open the drop-down button and select the desired language.

BB. Save

Click the “Save” button to save the changed settings and return to the main menu.

CC. Cancel

Click the “Cancel” button to cancel the changed settings and return to the main menu.

DD. Upload preferences

Click the “checkbox - Enable uploading to Sewer Analytics” to enable/ disable uploading cleaning data to Sewer Analytics when there is an internet connection available.

Click the “Checkbox - Upload videos while using a metered connection” to allow the software to upload to the Sewer Analytics cloud when the tablet is connected with the internet via a mobile data connection (3G/ 4G/ 5G SIM).

i INFO
Uploading while using a mobile data connection could result in high costs.

Mark the "Upload videos while connected to wifi" box to allow the software to upload to the Sewer Analytics cloud when the tablet is connected with the internet via a Wi-Fi connection.

i INFO

The tablet can be connected with only a single Wi-Fi network. Therefore, the C70 Video Nozzle must be disconnected first.

EE. Upload quality

The upload quality can be adjusted to reduce the data usage by changing the file size of the videos that are uploaded.

Open the dropdown menu under "Video quality mobile internet" to adjust the quality of the video that will be uploaded while uploading via a mobile internet connection.

Open the dropdown menu under "Video quality wifi" to adjust the quality of the video that will be uploaded while uploading via a Wi-Fi internet connection.

i INFO

Reducing the video quality will result in lower quality videos on the Sewer Analytics cloud.

FF. Delete

All videos are recorded on the SD-card inside the C70 Video Nozzle and will remain stored on the SD card until the SD card is formatted.

Click the "Delete" button after entering the password to delete all video files saved on the C70 Video Nozzle. The default password for deleting all video files is: "sddelete". A message will be displayed when the SD card format is completed.

i INFO

Make sure to download all videos before formatting the SD card. Videos cannot be restored after a SD card format is completed.

GG.Sewer Analytics ID

The Sewer Analytics ID" is a unique identifier for the camera unit inside the C70 Video Nozzle and used to register a C70 Video Nozzle in the Sewer Analytics cloud.

HH.Enable manual recording

Mark the "Enable manual recording" box and click "save" to adjust the settings to manual recording. The "Start recording" button will now appear in the main menu and the video camera can be used in the manual recording mode.

Unmark the "Enable manual recording" box and click "save" to adjust the settings to automatic recording.

5 Recording mode

The C70 can be used in automatic- and manual recording modes.

5.1 Automatic recording

In automatic recording mode, the C70 Video Nozzle will automatically initiate a video recording when the water pressure is on and will end the recording when the pressure is off for more than 30 seconds.

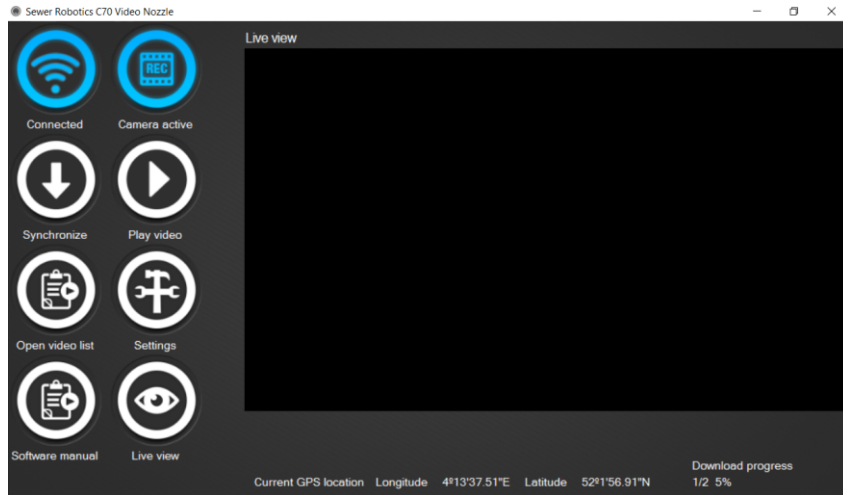


Figure 5.1: C70 connected in automatic recording mode

To use the C70 in automatic recording mode

Verify that the tablet and C70 Video Nozzle are connected and that the camera is active indicated by the blue icons in the C70 Video Nozzle software.

A video recording will start when the water pressure is on and will end when the pressure is off for more than 30 seconds.

i INFO
Your C70 video nozzle does not support automatic recording if your C70's network ID has the format "xmjp_beye_XXXX".

5.2 Manual recording

In manual recording mode, the C70 Video Nozzle will start recording once the "Start recording" button is pressed and stop recording, once the "Stop recording" button is pressed.

Mark the "Enable manual recording" box and click "save" to adjust the settings to manual recording. The "Start recording" button will now appear in the main menu.

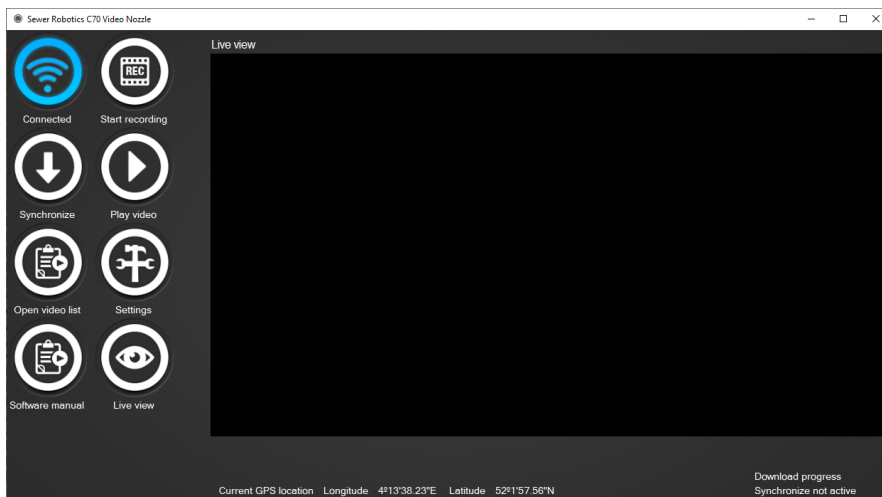


Figure 5.2: C70 connected in manual recording mode

Click the "Start recording" button when the tablet and C70 Video Nozzle are connected indicated by the blue "Connected" button.

The recording button will now turn blue to indicate that a recording is active and the text will change to "Stop recording".

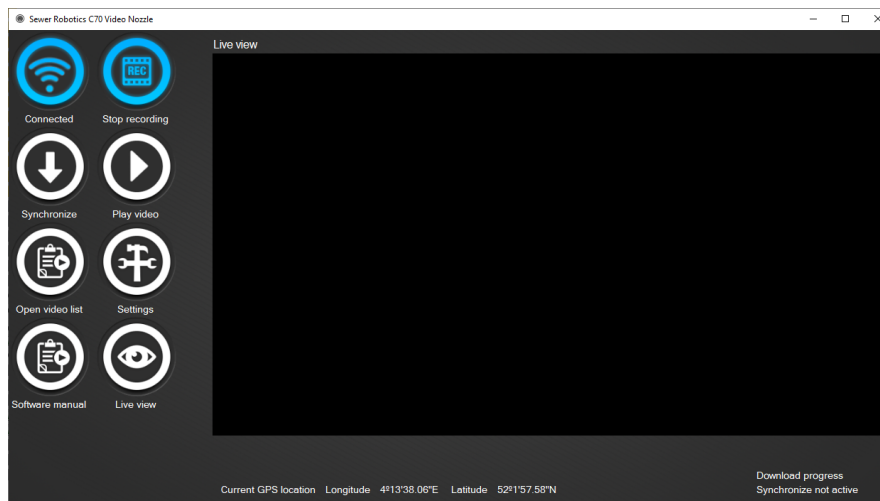


Figure 5.3: C70 Manual recording on

After cleaning, recover the C70 Video Nozzle from the manhole and allow a minute to re-establish Wi-Fi connection with the tablet and the software.

Press the "Stop recording" button only if the "Connected" button is blue and shows "connected". The recording will stop and the video will automatically download.

6 Automatic uploading to Sewer Analytics

The C70 Video Nozzle software runs a program in the background to automatically register the GPS locations so that the GPS location can be uploaded together with the cleaning videos, their date and time to the Sewer Analytics web cloud (if enabled) when the tablet is connected to the internet.

i INFO

The tablet's sleep mode should be turned off for proper functioning of the GPS location registration and automatic uploading function.

i INFO

Uncheck the "checkbox - Enable uploading to Sewer Analytics" in the Settings (chapter 4.5) to disable uploading cleaning data to Sewer Analytics.

i INFO

To start using Sewer Analytics, go to <https://www.seweranalytics.com/> and click "Register" to register your Sewer Analytics account. Sewer Analytics can be used for free up to 500GB data storage and does not require a credit card to register.

6.1 Deactivating the tablet's sleep mode

To deactivate the tablet's sleep mode:

1. Click the Windows button at the bottom left side of the tablet;
2. Click "settings";

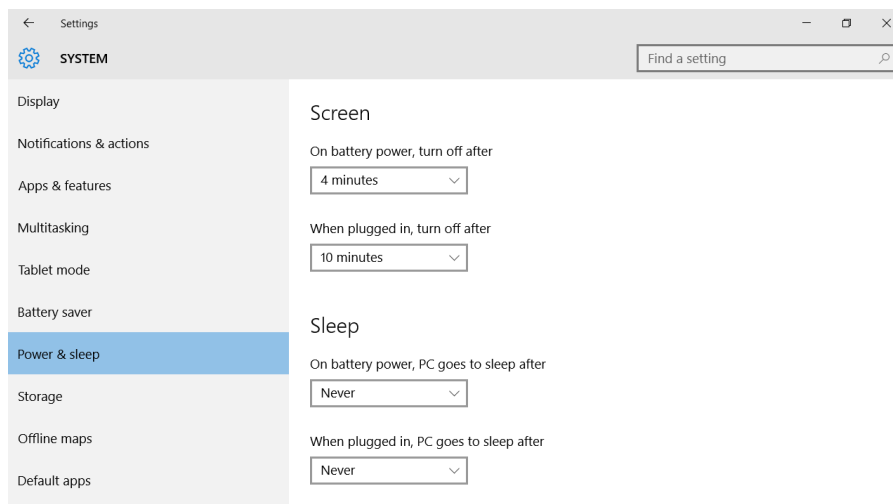


Figure 6.1: Deactivating the tablet's sleep mode

3. Click "system";
4. Click "power & sleep"
5. Set sleep On batter power, PC goes to sleep after"... and "When plugged in, PC goes to sleep after" both to "Never"

7 Sewer Analytics

The Sewer Analytics web cloud can be used for free up to 500GB and is accessible in any web browser at <https://www.seweranalytics.com/> to automatize data processing by conveniently organizing, displaying and saving all your cleaning videos with their date, time and GPS location.

i INFO

By using Sewer Analytics you agree to the Terms of use and privacy policy which can be reviewed at:

<https://www.seweranalytics.com/register#terms>

<https://www.seweranalytics.com/register#privacy>

7.1 Log in

To use Sewer Analytics, open the internet browser and surf to <https://www.seweranalytics.com/>

7.1.1 New user

If you are using Sewer Analytics for the first time you need to register to create a Sewer Analytics account and link your C70 Video nozzle.

7.1.1.1 Account registration

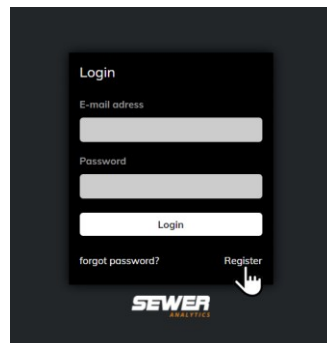


Figure 7.1: Register a new account

1. Click "Register" at the bottom right corner (or go to <https://www.seweranalytics.com/register>) to open the "Registration form";

Figure 7.2: Registration form

2. Complete all fields by entering the company details, contact person, a valid C70 Serial number and a chosen password;

INFO

A valid camera serial number is "2130019XXX" where the "XXX" is unique for each C70 Video Nozzle and engraved in the back of the C70 Video Nozzle.
If the serial number engraved has 2 digits, use "21300190XX".

3. Click "register" after completing all fields to submit your account information to Sewer Analytics;

7.1.1.2 Email verification

4. After submitting your information to Sewer Analytics an email will be sent with a verification link;
5. Click the "verify e-mail address" button in the verification email or paste the link into your browser to verify your email address and finish the account registration.

7.1.1.3 Account activation

Your Sewer Analytics account is now verified, but not yet activated. You will receive an email when your registration has been processed and activated.

7.1.1.4 Log in

Users with a registered account can log in with their email address and password.

6. Go to the website <https://www.seweranalytics.com/>
7. Use your email address and password to log in to your account;

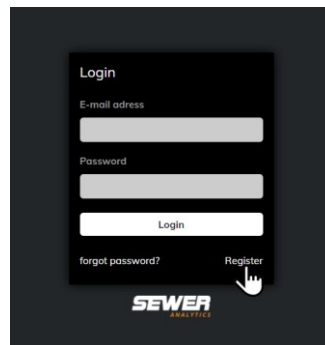


Figure 7.3: Login or register to Sewer Analytics

7.2 Menu

The menu can be used to navigate between the different screens. On a desktop the menu is always visible at the top left side of the screen. On a smartphone or other device with a 'small' screen, the menu can be accessed via the 3 bars at the top left corner of the screen.

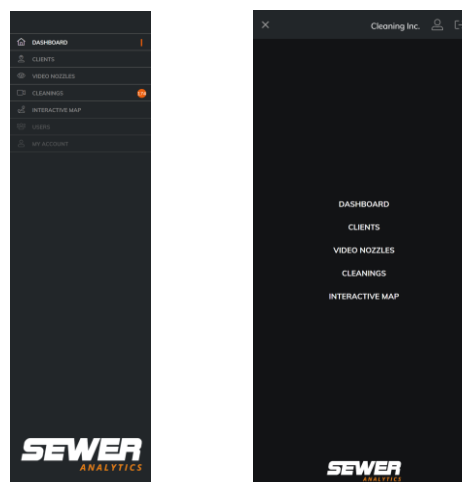


Figure 7.4: Desktop and Smartphone menu

7.3 Dashboard

The Dashboard is the first in the menu and default window after login. The Dashboard shows the 25 most recent cleanings and general account statistics, such as the number of registered clients, video nozzles and cleanings.

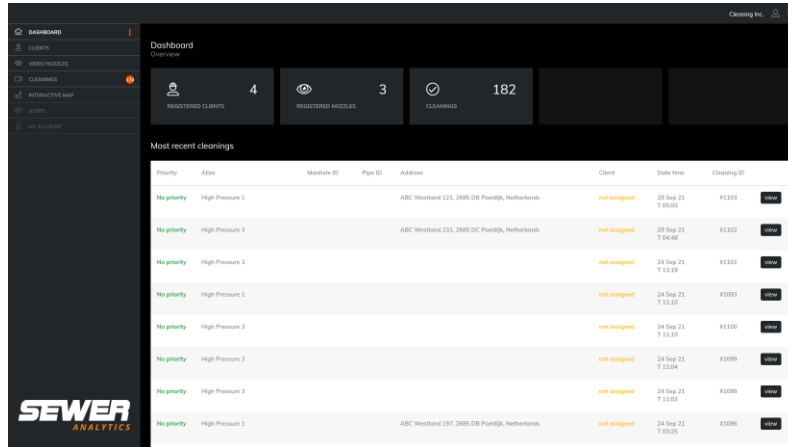


Figure 7.5: Dashboard

7.4 Clients

Cleanings can be shared with the organizations for whom the cleanings were completed.

Click "Clients" in the menu to access the clients screen, where registered "Clients" are displayed with their status, organization, contact persons, the number of cleanings performed for them and the number of cleanings marked as "high priority".

7.4.1 Add client

1. To add a client, click "add new client" at the top right in the "Client" window to open the client registration form;

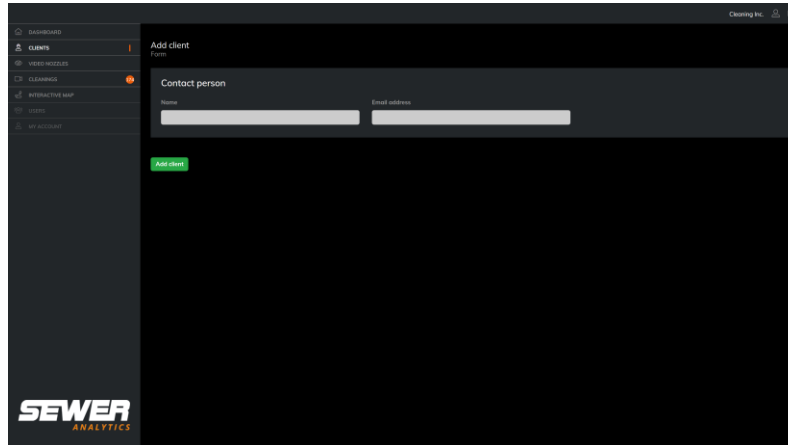


Figure 7.6: Add new client

2. Enter the name and email address of the client's contact person and click "add client";
3. The Client will now receive an invitation via email to register a Sewer Analytics account.

7.4.2 Client registration

4. The client can use the link in the email to accept your invitation and register to Sewer Analytics.

After your client's successful registration, you can select the customer in the 'cleaning details' to make the specific cleaning available in your customer's Sewer Analytics account.

7.5 Video nozzles

Your video nozzles need to be linked to your Sewer Analytics account in order to display your cleanings in your account.

Click "Video nozzles" in the menu to access the video nozzle screen where all your registered C70 Video Nozzles are displayed with their serial numbers, alias and the number of cleanings for each nozzle.

After registering your video nozzles, all cleanings recorded with these video nozzles will be visible in your Sewer Analytics account.

Serial no.	Alias	Cleanings
2130019000	Sewer Combil 221	68
2130019033	Sewer Combil 222	38
2130019084	Sewer Combil 223	78
2130019102	Jetting Truck 111	209
2130019106	Jetting Truck 112	11

Figure 7.7: Video nozzles

7.5.1 Add nozzle

To register a C70 video nozzle:

1. Click "add new video nozzle" at the top right to open the video nozzle registration form;

Figure 7.8: Video nozzle registration form

2. Enter the "Serial number" of the C70 video nozzle;

INFO
A valid camera serial number is "2130019XXX" where the "XXX" is unique for each C70 Video Nozzle and engraved in the back of the C70 Video Nozzle. If the serial number engraved has 2 digits, please use "21300190XX".

3. Enter the "Sewer Analytics ID" of the C70 video nozzle;

INFO
A valid "Sewer Analytics ID" is a 16 digit code that is unique for each C70 Video Nozzle. The "Sewer Analytics ID" can be found at the bottom of the "Settings" menu in the C70 (tablet) operating software when the tablet is connected to the C70.

4. Enter an "Alias" for the video nozzle. For example the identification number of the cleaning vehicle or the name of the operator;
5. Select "C70 Video Nozzle" as the product;

7.6 Cleanings

Click “Cleanings” in the menu to see an overview of all cleanings and use the search bar, or organize the different columns to easily find a specific cleaning.

Priority	Alias	Manhole ID	Pipe ID	Address	Client	Date time	Cleaning ID
No priority	2130019000	21114	211145	ABC Westland 121, 2685 D9 Poeldijk, Netherlands	cleaning test	29 Nov 21 T 13:32	#1382

Figure 7.9: Cleanings overview

The cleanings overview provides information about the: marked Priority; Alias of the video nozzle; start Manhole ID; Pipe ID; Address; Client; Date and Cleaning ID.

7.7 Cleaning details

The cleaning details can be accessed by clicking “view” or the “eye” icon behind the cleaning in the cleanings menu, -or- by clicking “view details” in the popup that appears when clicking an individual cleaning in the interactive map.

The “cleaning details” page shows the information about a cleaning that is gathered automatically, such as the video, GPS coordinates and closest address (when the tablet had GPS reception during the cleaning), the date, the time and the video nozzle that was used.

In addition to the automatically gathered information, other information such as observations, pipe details, client details, cleaning details and project details can be added.

INFO

Always click “Save changes” at the bottom of the “Cleaning details” page to save any changed or added information.

7.7.1 Cleaning location

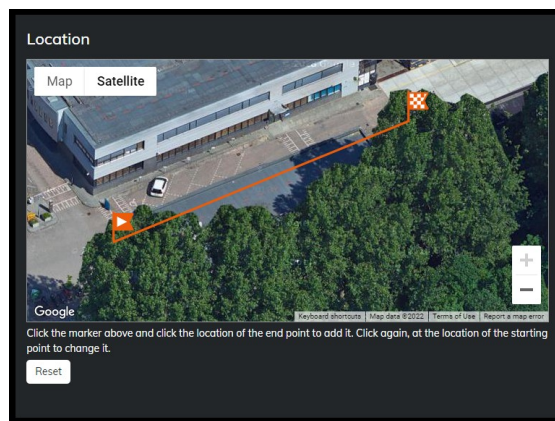


Figure 7.10: Cleaning location

The start- and end locations of a cleaning can be marked on the map to calculate the length of the pipe.

7.7.2 Cleaning video

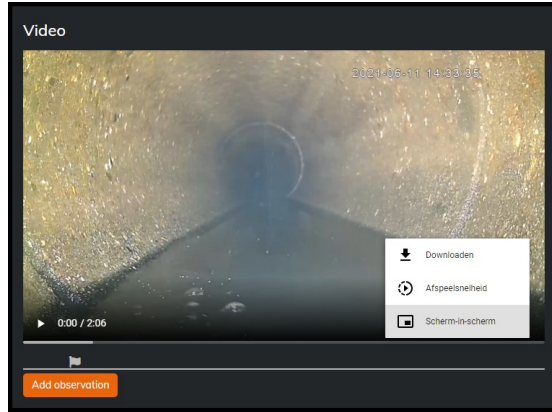


Figure 7.11: Cleaning video

The cleaning video can be reviewed at the top of the cleaning details, next to the location map. The menu indicated by the 3 dots at the bottom right corner of the player can be clicked to download the video, change the video speed or watch the video full screen.

7.7.3 Observations

Previously marked observations appear as a “flag” in the timeline underneath the video and are displayed in the “Observations” section with the time in the video, code, how the observation was added, a description with location and with a screenshot.

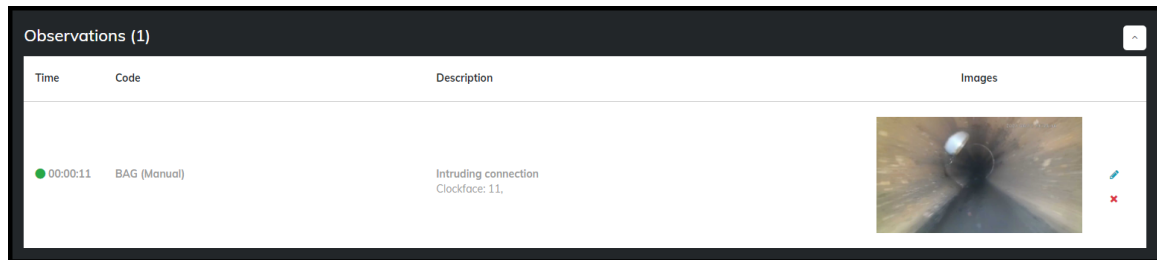


Figure 7.12: Observations section

7.7.3.1 Add observations

1. Click the “Add observation” button underneath the video to add new observations;

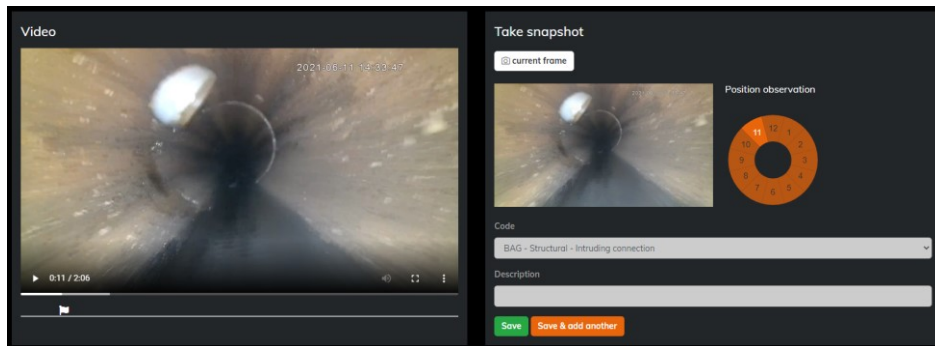


Figure 7.13: Add observation

2. “Pause” the video where you wish to add an observation;
3. Click “Current frame” to take a snapshot;
4. Select the “clock position(s)” by clicking the number(s) of the hour(s);
5. Select the “defect code” from the drop down list;
6. Select the category(s) from the drop down list, if applicable;
7. Add a “description” if desired;
8. Click “Save & add another” to save the observation and add another one or click “save” to save the observation and go back to the cleaning details.

7.7.3.2 Pipe details

Header information about the ‘asset’ or pipe that was cleaned with the C70 video nozzle can be added in the “pipe details” section.

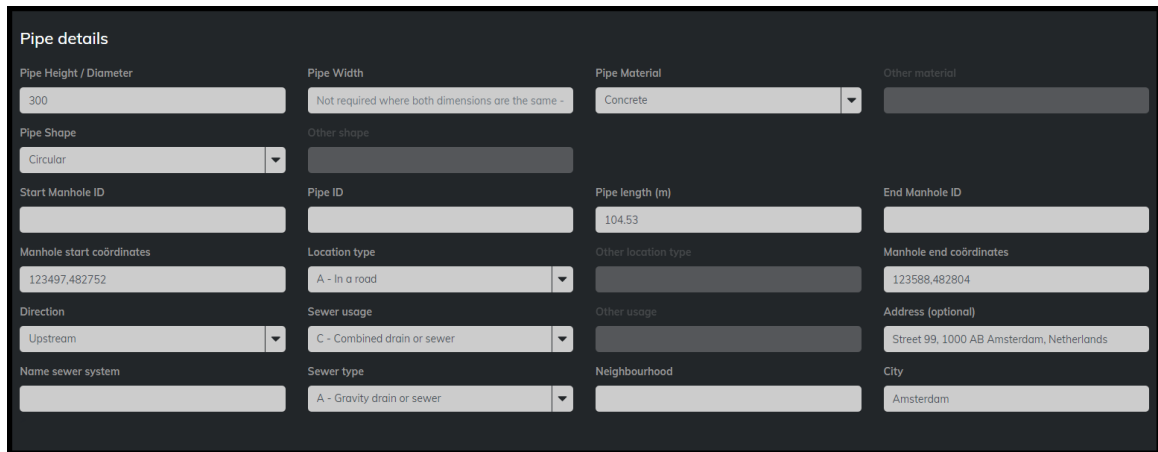


Figure 7.14: Pipe details

7.7.3.3 Client details

Select the client organization from the dropdown in the 'Client details' to assign the cleaning to that specific client and make it available in their Sewer Analytics account. A contact person and Purchase Order number can be added if desired.

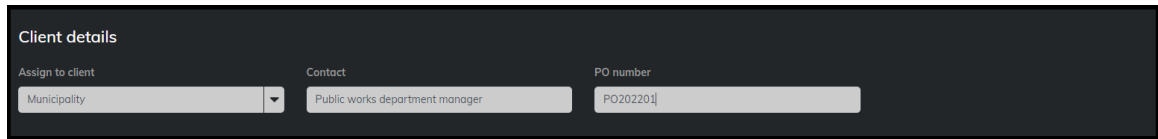


Figure 7.15: Client details

INFO
A client will be able to access the video and information, but can not add or edit information.

7.7.3.4 Cleaning details

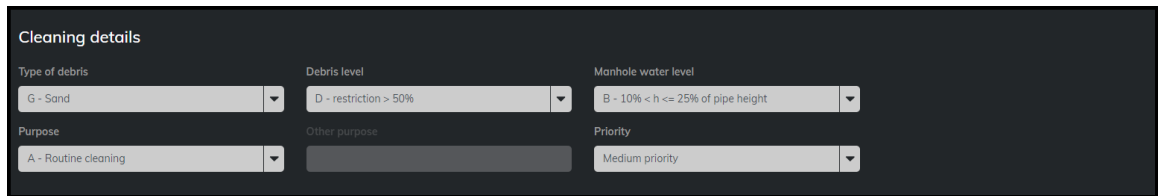


Figure 7.16: Cleaning details

The "type of debris" found, "debris level" in the pipe, the "manhole water level" and the "purpose" of the cleaning can be added in the cleaning details section as well as the "priority" of the cleaning.

According to the priority given to the cleaning, the colour of the icon on the interactive map changes.

7.7.3.5 Project details

The surveyor, cleaning operator and cleaning truck(s) can be added with the work order in the project details.

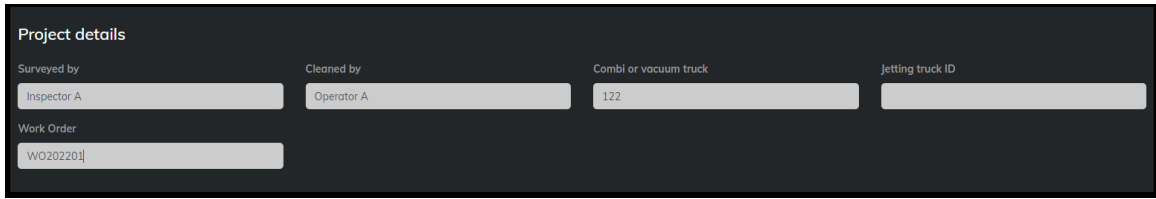


Figure 7.17: Project details

INFO
Always click "Save changes" at the bottom of the "Cleaning details" page to save any changed or added information.

7.7.3.6 Cleanings history

Other cleanings with the same manhole- or pipe ID, or within a 30m (90ft) radius are listed under cleanings history.

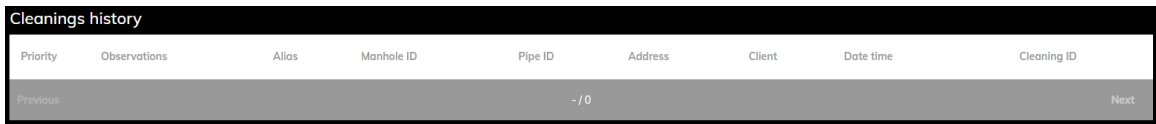


Figure 7.18: Cleanings history

7.8 Interactive map

All cleanings with location, either registered by the GPS receiver in the tablet or added manually in the "cleaning details" are displayed conveniently on the interactive map.

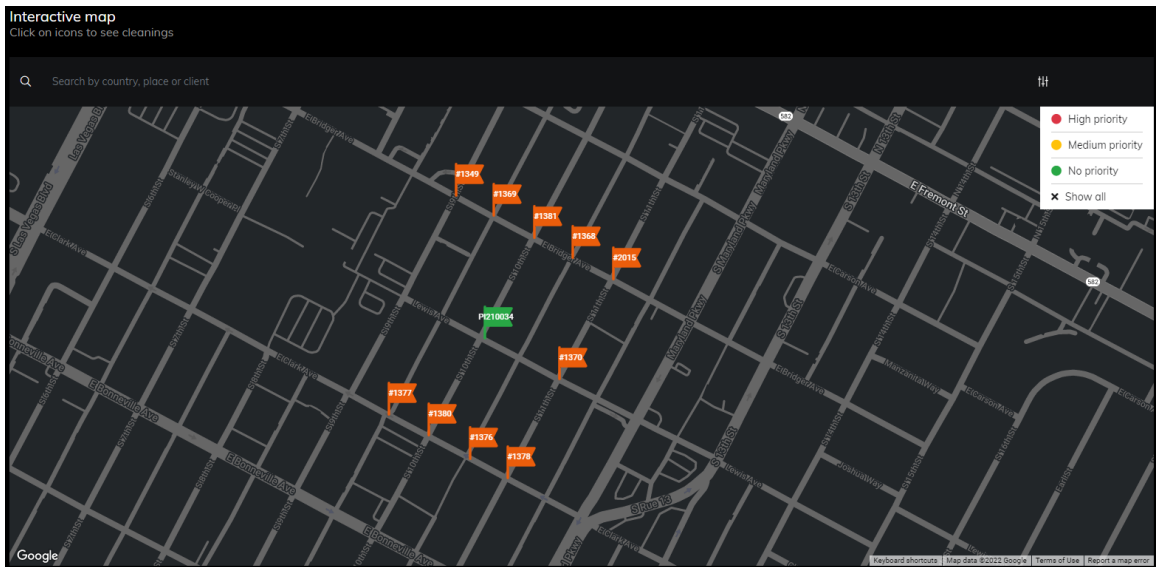


Figure 7.19: Interactive map

The search bar and the "priority filters" can be used to help find a specific cleaning, or to display only cleanings of a specific priority level.

INFO
Cleanings close to each other are bundled when there is not sufficient space to show them all individually. Less than 10 bundled cleanings are blue, 10 – 99 bundled cleanings are yellow and 100 or more cleanings are red (with the number of cleanings in the icon). These cleanings will be unbundled when zooming in on the map.

7.8.1 Cleaning popup

A popup appears after clicking an individual cleaning on the map.

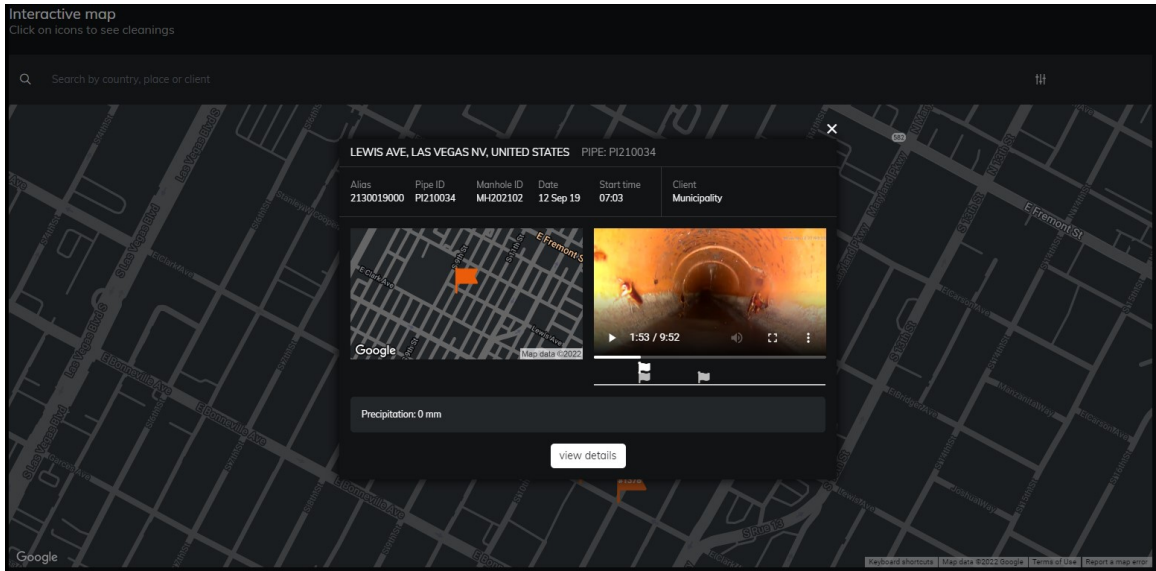


Figure 7.20: Cleaning popup

The cleaning popup shows the video and some information, including the location, client, date and time, pipe and manhole ID's, comments and observations. The observations are indicated by the flag(s) under the video.

Clicking an observation flag will jump the video to that specific frame in the video. Click "View details" to go to the "cleaning details" page to add or edit observations and cleaning information.

7.9 My account

Click "my account" in the menu or the "profile icon" at the top right of the screen to go your account page.

You can update company details, contact information, password and personal preferences on the account page.

The screenshot shows the 'My account' page with three main sections:

- Company details:**
 - Company name: Cleaning company
 - Address: 1 Street
 - Postal code: 23456NV
 - Country: United States
 - City: Las Vegas
 - Phone number (e.g. +31201112233): +11012223344
- Contact person:**
 - Name: Cleaning supervisor
 - Email address: cleaningsupervisor@cleaningcompany.com
 - Phone number (e.g. +31201112233): +11012223344
- Password:**
 - Choose new password: [input field]
 - Re-enter new password: [input field]

At the bottom, there is a checkbox: I don't want to receive notifications by mail

Figure 7.21: My account

7.9.1 Delete account

Click the "Delete account" button at the bottom of your account page to delete your Sewer Analytics account.



Mark the checkbox to confirm that you want to delete your account and click “Confirm”.

INFO
Deleting your account cannot be undone. As a result information will be lost.

INFO
Deleting your account will not release any payment obligations according the Sewer Analytics terms of use.

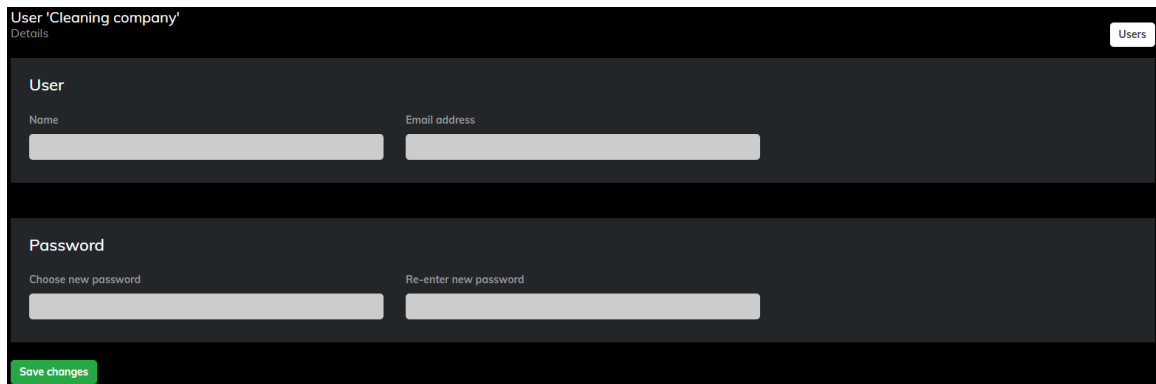
7.10 Users

Click “Users” in the menu to add or edit more account users.

All users except the account owner are listed on the “Users” page. User information and passwords can be edited and users can be deleted.

7.10.1 Add user

1. Click “Add user” at the top right corner of the “Users” page to add a new user;



2. Complete all fields to register a new user;
3. The new user will receive a verification email and needs to use the link in the mail to login and verify the email address.

INFO
Complimentary Sewer Analytics accounts include 2 users in addition to the account owner (3 users total). Your account can be upgraded to Basic, Pro or Unlimited if more users are required.

8 Maintenance

The C70 Video Nozzle is designed and manufactured to minimize service and maintenance. Please refer to the Troubleshooting table in this chapter to diagnose and solve possible user issues and diagnoses.

Please contact Sewer Robotics' or your certified reseller's customer service immediately if the Sapphire lens and/ or PMMA LED protection ring are damaged or broken for assistance and spare parts.

Sewer Robotics
ABC-Westland 197
2685 DB, Poeldijk
The Netherlands
+31 (0)174-289475
+1 503-504-8474
info@sewerrobotics.com

⚠ CAUTION

DO NOT OPEN THE C70 VIDEO NOZZLE WITHOUT SEWER ROBOTICS' WRITTEN APPROVAL. DAMAGE AS A RESULT OF OPENING OR ALTERING THE SEWER ROBOTICS PRODUCT IS NOT COVERED BY ITS ONE-YEAR LIMITED WARRANTY.

i INFO

The complete "Sewer Robotics One-Year Limited Warranty" terms are described in appendix 9.2.

8.1 Troubleshooting

Issue	Diagnose	Solution
No Connection	Connect the nozzle ring to the C70. Open the Wi-Fi settings in windows – Does the C70 with name: "IPC-XXXX" or "xmjp_beye_xxxx" appear?	YES: Restart the tablet, reconnect the Windows tablet to the C70 and start the software again.
		NO: Check if the batteries are full by pushing the pressure switch (by hand). The lights should turn on if the batteries are full. Charge the batteries if the lights don't turn on.
		Restart the C70 Video Nozzle, Tablet and ID-RIS software. Contact Sewer Robotics if the problem is not solved.
The camera stopped recording during cleaning	The camera storage is full	Clear the camera storage
	Battery is empty	Charge the C70 Video Nozzle
	The nozzle ring got loose	Securely fasten the nozzle ring with the supplied wrench
		Restart the C70 Video Nozzle, Tablet and ID-RIS software. Contact Sewer Robotics if the problem is not solved.
The videos are not synchronized	Bad connection	Hold the C70 Video Nozzle next to the Tablet and make sure the "Connected" icon remains blue.
	Interfering networks	Move to a location with low Wi-Fi activity and try again. Hold the C70 Video Nozzle next to the Tablet and make sure the "Connected" icon remains blue.
		Restart the C70 Video Nozzle, Tablet and ID-RIS software. Contact Sewer Robotics if the problem is not solved.
The lights do not turn on	No water pressure	Check if the LED's activate by pushing the pressure switch (by hand). If not, check the battery.
	Low battery	Recharge the camera
Other		Restart the C70 Video Nozzle, Tablet and ID-RIS software. Contact Sewer Robotics if the problem is not solved.

9 Appendices

9.1 Appendix 1: C70 Video Nozzle Accesories

9.1.1 Skids

Different skids are available to protect and centralize the C70 video nozzle inside the pipe.

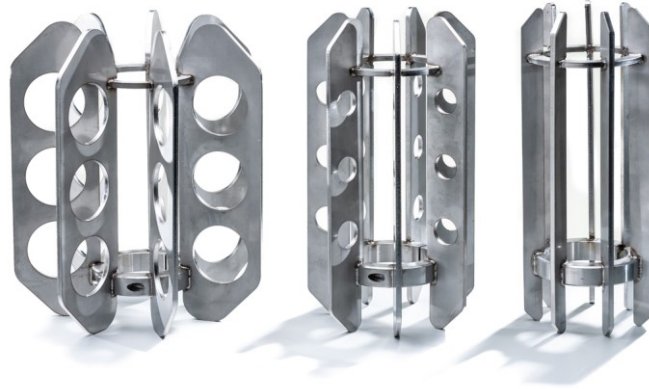


Figure 9.1: C70 video nozzle skids 105, 200 and 300

C70_105 Skid for 150mm pipe (6")

- For diameter 150mm (6")
- Stainless Steel
- Weight: 2,2kg (4,9 Lbs)
- Dimensions: $\varnothing 120 \times 295 \text{mm}$ ($\varnothing 4,7 \times 11,6$ ")

C70_200 Skid for 200 - 375mm pipes (8-15")

- For diameter 200 - 375mm (8-15") pipelines
- Stainless Steel
- Weight: 3,2kg (7,1 Lbs)
- Dimensions: $\varnothing 160 \times 295 \text{mm}$ ($\varnothing 6,3 \times 11,2$ ")

C70_300 Skid for 300 - 600mm pipes (12-24")

- For diameter 300 - 600mm (12-24") pipelines
- Stainless Steel
- Weight: 4,2kg (9,3 Lbs)
- Dimensions: $\varnothing 235 \times 280 \text{mm}$ ($\varnothing 9,3 \times 11$ ")



Image 9.2: C70_600L Large diameter skid

C70_600L Floor cleaner skid for 600 - 1000mm pipes (12-40")

The C70 large diameter skid is developed to overtake obstacles and sediments, with less risk of getting stuck in the mud. Rechargeable, high-power, auxiliary light torches are added to enhance visibility.

- Scope of Use : 400 – 1000mm (16 - 40")
- Auxiliary lighting : 2 rechargeable LED torches
- Hose connection : 1 1/4" F Swivel connection (or smaller with adapter)
- Dimensions LxWxH : 420x170x160mm (16.5x6.7x6.3")
- Weight (kg) : 19,7 kg (43.4Lbs) (without C70)
- Rear jets : 9 x 0°/5°/10°/15°/25°
- Lateral jets : 2 x 90°
- Minimum Flow : 150 LPM (40GPM)
- 11 Ceramic inserts
- Pressure switch for automatic recording
- Optimized for floor cleaning

9.1.2 Adapters**C70_ADA34BSP Adapter for 3/4" BSP hose**

- Adapter for 3/4" BSP jetting hose
- 1 1/4" Male BSP connection
- 3/4" Female BSP connection
- Steel

C70_ADA1BSP Adapter for 1" BSP hose

- Adapter for 1" BSP hose
- 1 1/4" Male BSP connection
- 1" Female BSP connection
- Steel

C70_SWVL114BSP

- Swivel for 1 1/4" BSP

C70_SWVL112BSP

- Swivel for 1 1/2" BSP

C70_ADA34NPT Adapter for 3/4" NPT hose

- Adapter for 3/4" NPT jetting hose
- 1" Male NPT connection
- 3/4" Female NPT connection
- Steel
- To be used in combination with ADA1NPT

C70_ADA1NPT Adapter for 1" NPT hose

- Adapter for 1" NPT hose
- 1 1/4" Male BSP connection
- 1" Female NPT connection
- Steel

9.2 Appendix 2: SEWER ROBOTICS One (1) Year Limited Warranty

SEWER ROBOTICS One (1) Year Limited Warranty

IMPORTANT: BY USING YOUR SEWER ROBOTICS PRODUCT, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THE SEWER ROBOTICS 1-YEAR LIMITED WARRANTY (“WARRANTY”) AS SET OUT BELOW. DO NOT USE YOUR PRODUCT UNTIL YOU HAVE READ THE TERMS OF THE WARRANTY.

WHAT IS COVERED BY THIS WARRANTY

SEWER ROBOTICS, having its principal place of business at ABC-Westland 197, 2685 DB Poeldijk, the Netherlands (“SEWER ROBOTICS”) warrants the SEWER ROBOTICS-branded product and SEWER ROBOTICS-branded accessories contained in the original packaging (“SEWER ROBOTICS product”) against defects in materials and workmanship when used normally in accordance with the provided User Manual, User Training and published guidelines for a period of ONE (1) YEAR from the date of purchase by the original purchaser (“Warranty Period”). SEWER ROBOTICS’ published guidelines include but are not limited to information contained in technical specifications, user manuals and service communications.

WHAT IS NOT COVERED BY THIS WARRANTY

This warranty does not apply to any non-SEWER ROBOTICS branded hardware products or any software, even if packaged or sold with SEWER ROBOTICS hardware. Manufacturers, suppliers, or publishers, other than SEWER ROBOTICS, may provide their own warranties to you – please contact them for further information. Software distributed by SEWER ROBOTICS with or without the SEWER ROBOTICS brand (including, but not limited to operating software) is not covered by this warranty. Please refer to the licensing agreement accompanying the software for details of your rights with respect to its use. SEWER ROBOTICS does not warrant that the operation of the SEWER ROBOTICS product will be uninterrupted or error-free. SEWER ROBOTICS is not responsible for damage arising from failure to follow instructions relating to the SEWER ROBOTICS product’s use.

This warranty does not apply: (a) to protective coatings that are designed to diminish over time; (b) to batteries, unless failure has occurred due to a defect in materials or workmanship; (c) to cosmetic damage, including but not limited to scratches and dents unless failure has occurred due to a defect in materials or workmanship; (d) to damage or malfunction caused by use with a third party component or product not obtained from or approved in writing by SEWER ROBOTICS; (e) to damage or malfunction caused by accident, disaster, event of force majeure, abuse, misuse, misapplication, negligence, fire, freezing, freight, liquid contact or other external cause; (f) to damage or malfunction caused by operating the product outside SEWER ROBOTICS’ published guidelines; (g) to damage or malfunction caused by improper storage; (h) to damage or malfunction directly or indirectly caused by, due to or resulting from any maintenance not performed as required to the scheduled intervals specified in SEWER ROBOTICS’ published guidelines or recommendations; (i) to damage or malfunction caused by service (including upgrades and expansions) performed by anyone without SEWER ROBOTICS’ written approval; (j) to an SEWER ROBOTICS product or part thereof that has been opened and/ or modified to alter functionality or capability without SEWER ROBOTICS’ written approval; (k) to defects caused by normal wear and tear or otherwise due to the normal aging of the SEWER ROBOTICS product; (l) if any serial number has been removed or defaced from the SEWER ROBOTICS product; or (m) if there is no direct proof indicating the authorized user of the product. (eg. by presenting proof of purchase).

IMPORTANT: DO NOT OPEN THE COVERED SEWER ROBOTICS PRODUCT, AS DAMAGE CAUSED AS A RESULT OF OPENING THE SEWER ROBOTICS PRODUCT IS NOT COVERED BY THIS WARRANTY.

IMPORTANT: YOU MAY BE RESPONSIBLE FOR ALL CHARGES, INCLUDING BUT NOT LIMITED TO SHIPPING, HANDLING, (TEMPORARY) PRODUCT REPLACEMENT OR PARTS AND LABOR IF WARRANTY DOES NOT APPLY.

YOUR RESPONSIBILITIES

IF YOUR SEWER ROBOTICS PRODUCT OR PART THEREOF IS CAPABLE OF STORING SOFTWARE PROGRAMS, DATA AND OTHER INFORMATION, YOU SHOULD MAKE PERIODIC BACKUP COPIES OF THE INFORMATION CONTAINED ON THE STORAGE MEDIA TO PROTECT THE CONTENTS AND AS A PRECAUTION AGAINST POSSIBLE OPERATIONAL FAILURES.

To receive warranty service, you agree to comply with each of the terms listed below.

(i) You will access and review the User Manual and Maintenance Manual (if applicable) prior to seeking warranty service and follow SEWER ROBOTICS' procedures for obtaining warranty service.

(ii) You will provide detailed information about the symptoms, causes, history of attempts made to solve the issues of the SEWER ROBOTICS-branded product and any repairs or services that were not performed by SEWER ROBOTICS or an authorized service provider, including but not limited to providing remote software access, photos and (live) videos. When contacting SEWER ROBOTICS via telephone or providing remote access, photos and (live) videos, other charges may apply depending on your location.

(iii) You will respond to all requests for information, including but not limited to the serial number, model, version of the operating system and software installed, questions designed to assist with diagnosing potential issues, any peripherals devices connected or used in combination with the SEWER ROBOTICS product, any error messages displayed, the actions which were taken before the SEWER ROBOTICS product experienced the issue, the steps taken to resolve the issue.

(iv) You will follow instructions SEWER ROBOTICS gives you, including but not limited to refraining from sending SEWER ROBOTICS products and accessories that are not subject to warranty service and packing the SEWER ROBOTICS product in accordance with shipping instructions.

(v) You will maintain a separate backup copy of the contents of its storage media, remove all personal information that you want to protect and disable all security passwords before submitting your SEWER ROBOTICS product for warranty service.

DURING WARRANTY SERVICE IT IS POSSIBLE THAT THE CONTENTS OF THE SEWER ROBOTICS PRODUCTS STORAGE MEDIA WILL BE LOST, REPLACED OR REFORMATTED. IN SUCH AN EVENT SEWER ROBOTICS AND ITS AGENTS ARE NOT RESPONSIBLE FOR ANY LOSS OF SOFTWARE PROGRAMS, DATA OR OTHER INFORMATION CONTAINED ON THE STORAGE MEDIA OR ANY OTHER PART OF THE SEWER ROBOTICS PRODUCT SERVICED.

Following warranty service your SEWER ROBOTICS product or a replacement device will be returned to you as your SEWER ROBOTICS product was configured when originally purchased, subject to applicable updates. SEWER ROBOTICS may install system software updates as part of the warranty service that will prevent the SEWER ROBOTICS product from reverting to an earlier version of the system software. Third party applications installed on the SEWER ROBOTICS product may not be compatible or work with the SEWER ROBOTICS product as a result of the system software update. You will be responsible for reinstalling all other software programs, data and information. Recovery and reinstallation of other software programs, data and information are not covered under this warranty.

WHAT WILL SEWER ROBOTICS DO IN THE EVENT THE WARRANTY IS BREACHED?

If during the warranty Period you submit a claim to SEWER ROBOTICS or an authorized service provider in accordance with this warranty, SEWER ROBOTICS will, at its option:

(i) repair the SEWER ROBOTICS product using new or previously used parts that are equivalent to new in performance and reliability, or

(ii) replace the SEWER ROBOTICS product with the same model (or with your consent a product that has similar functionality) formed from new and/or previously used parts that are equivalent to new in performance and reliability.

Loaner equipment may be provided as temporary replacement equipment if the warranty repair is estimated to take longer than 5 business days from the day of arrival at SEWER ROBOTICS subject to availability and the Loaner Equipment terms and conditions.

SEWER ROBOTICS may request that you replace certain parts or SEWER ROBOTICS products. A replacement part or SEWER ROBOTICS product, including a user-installable part that has been installed in accordance with instructions provided by SEWER ROBOTICS, assumes the remaining term of the warranty or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. When an SEWER ROBOTICS product or part is replaced or a refund provided, any replacement item becomes your property and the replaced or refunded item becomes SEWER ROBOTICS' property.

HOW TO OBTAIN WARRANTY SERVICE?

Please access and review the User Manual and the Maintenance Manual (if applicable) before seeking warranty service. If the SEWER ROBOTICS Product is still not functioning properly after making use of these resources, please contact an SEWER ROBOTICS service representative or authorized service provider using the information provided below. An SEWER ROBOTICS representative or authorized service provider will help determine whether your SEWER ROBOTICS product requires service and, if it does, will inform you how SEWER ROBOTICS will provide it. When contacting SEWER ROBOTICS via telephone, other charges may apply depending on your location.

Contact information for obtaining warranty service is provided on the final page.

WARRANTY SERVICE OPTIONS

SEWER ROBOTICS will provide warranty service through one or more of the following options:

(i) Carry-in service. You may return your SEWER ROBOTICS product to SEWER ROBOTICS or an authorized service provider offering carry-in service. Service will be performed at the location, or the authorized service provider may send your SEWER ROBOTICS product to SEWER ROBOTICS to be serviced. Once you are notified that the service is complete, you will retrieve the SEWER ROBOTICS product without delay unless SEWER ROBOTICS notifies you that the SEWER ROBOTICS product will be sent directly to your location.

(ii) Mail-in service. If SEWER ROBOTICS determines that your SEWER ROBOTICS product is eligible for mail-in service, SEWER ROBOTICS will send you shipping instructions to be used with the original packaging and instructions on how to properly pack and address your product, so that you may ship your product to SEWER ROBOTICS or an authorized service provider near your location. Instructions may be sent to you via E-mail. Once service is completed, SEWER ROBOTICS or the authorized service provider will return the product to you. SEWER ROBOTICS will pay for economy shipping to and from your location if all instructions regarding the warranty claim, method of packaging and shipping the product are followed.

(iii) Self-service. Self-service parts allow you to service your own SEWER ROBOTICS product. If self-service is available in the circumstances, the following process will apply.

(a) Service where SEWER ROBOTICS requires return of the replaced product or part. SEWER ROBOTICS will ship a replacement product or part to you with installation instructions, if applicable, and any requirements for the return of the replaced product or part. If you fail to follow the instructions or return the replaced product or part as instructed or return a replaced product or part that is ineligible for service, SEWER ROBOTICS will charge you for the amount of the replacement product or part and shipping to and from your location.

(b) Service where SEWER ROBOTICS does not require return of the replaced product or part. SEWER ROBOTICS will ship you free of charge a replacement product or part accompanied by instructions on installation, if applicable, and any requirements for the disposal of the replaced SEWER ROBOTICS Product or part. SEWER ROBOTICS may require photos or videos of the installed replacement product.

(c) SEWER ROBOTICS is not responsible for any labor costs you incur relating to self-service. Should you require further assistance, contact SEWER ROBOTICS at the telephone number listed below.

SEWER ROBOTICS reserves the right to change the method by which SEWER ROBOTICS may provide warranty service to you, and your SEWER ROBOTICS product's eligibility to receive a particular method of service. Service will be limited to the options available in the country where service is requested. Service options, parts availability and response times may vary according to country. You may be responsible for shipping and handling charges for expedited service or if the SEWER ROBOTICS product cannot be serviced in the country it is in. If you seek service in a country that is not the country of purchase, you will comply with all applicable import and export laws and regulations and be responsible for all custom duties, V.A.T. and other associated taxes and charges. For international service, SEWER ROBOTICS may repair or replace SEWER ROBOTICS Products and parts with comparable SEWER ROBOTICS products and parts that comply with local standards.

LIMITATION OF LIABILITY

EXCEPT AS PROVIDED IN THIS WARRANTY AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, SEWER ROBOTICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOSS OF USE; LOSS OF REVENUE; LOSS OF ACTUAL OR ANTICIPATED PROFITS (INCLUDING LOSS OF PROFITS ON CONTRACTS); LOSS OF THE USE OF MONEY; LOSS OF ANTICIPATED SAVINGS; LOSS OF BUSINESS; LOSS OF OPPORTUNITY; LOSS OF GOODWILL; LOSS OF REPUTATION; LOSS OF, DAMAGE TO, COMPROMISE OR CORRUPTION OF DATA; OR ANY INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE HOWSOEVER CAUSED INCLUDING THE REPLACEMENT OF EQUIPMENT AND PROPERTY, ANY COSTS OF RECOVERING, PROGRAMMING, OR REPRODUCING ANY PROGRAM OR DATA STORED IN OR USED WITH THE SEWER ROBOTICS PRODUCT OR ANY FAILURE TO MAINTAIN THE CONFIDENTIALITY OF INFORMATION STORED IN THE SEWER ROBOTICS PRODUCT.

THE FOREGOING LIMITATION SHALL NOT APPLY TO DEATH OR PERSONAL INJURY CLAIMS, OR ANY STATUTORY LIABILITY FOR INTENTIONAL AND GROSS NEGLIGENT ACTS AND/OR OMISSIONS. SEWER ROBOTICS DISCLAIMS ANY REPRESENTATION THAT IT WILL BE ABLE TO REPAIR ANY SEWER ROBOTICS PRODUCT UNDER THIS WARRANTY OR REPLACE THE SEWER ROBOTICS PRODUCT WITHOUT RISK TO OR LOSS OF INFORMATION STORED ON THE SEWER ROBOTICS PRODUCT.

GENERAL

No SEWER ROBOTICS reseller, agent, or employee is authorized to make any modification, extension, or addition to this warranty. If any term is held to be illegal or unenforceable, the legality or enforceability of the remaining terms shall not be affected or impaired. This warranty is governed by and construed under the laws of the Netherlands. SEWER ROBOTICS or its successor in title is the warrantor under this warranty.

CONTACT INFORMATION

SEWER ROBOTICS
ABC-Westland 197
2685 DB, Poeldijk
The Netherlands
+31 (0)174 – 289 475
+1 503-504-8474
info@sewerrobotics.com

9.3 Appendix 3: Service request

These instructions have been carefully designed to minimize the service costs and turnaround time of your Sewer Robotics C70 Video Nozzle. Please follow these steps to obtain service:

9.3.1.1 Request service

Contact Sewer Robotics' service department via Whatsapp¹ at the number +31 174 257 141 or via email address service@sewerrobotics.com

A service representative will help you to diagnose and/ or solve the issue(s).

9.3.1.2 Mail-in service

Please follow the following instructions if Mail-in service is deemed necessary according Sewer Robotics' service representative.

9.3.1.3 Service request form

Complete the Service Request Form of appendix 1 and send via Whatsapp or email to: service@sewerrobotics.com to receive shipping labels. Print a hard copy to include with the shipment.

Clean and sanitize the equipment

Equipment should be cleaned and sanitized before they are offered for service².

Pack accordingly

Always use the rugged suitcase with foam inlay (or similar suitable packing material) to safely pack the items for shipping and make pictures of the in- and outside of the shipment³. Seal the suitcase with zip ties and use shrink wrap and/ or a cardboard box to prevent shipping damages to the suitcase.

Attach label

The shipping labels will be sent via Whatsapp or e-mailed to you when mail-in service is deemed necessary. Please print the shipping labels and attach them to the package.

Make available for pick up

Make the shipment available for the courier to pick-up at the indicated time and address.

¹ Search for Whatsapp in the app store on your mobile phone or go to <http://whatsapp.com/dl>

² Equipment that is not clean may cause shipping delays and cleaning costs.

³ Claims for shipping damage can only be processed if there are pictures of the in-and outside of the shipment.


<h1>Service Request Form</h1>							
<small>* Please complete all grey fields</small>				+31 (0)174 289 475			
<h3>Customer reference</h3>							
Date:			PO nr.:				
<h3>Equipment</h3>							
Product							
Serial nr.							
<h3>Customer requesting service</h3>							
Organization							
Contact name				Phone			
E-mail							
Address							
City, Country				Zip code			
<h3>Available for pick up</h3>							
From date			to date				
From time			to time				
<h3>Pick up address (if different)</h3>							
Organization							
Contact name				Phone			
E-mail							
Address							
City, Country				Zip code			
<h3>Return address (if different)</h3>							
Organization							
Contact name				Phone			
E-mail							
Address							
City, Country				Zip code			
<h3>Required repair (description of diagnostics)</h3>							
Please provide a detailed description of the required repair/ maintenance:							
The equipment is properly packed according the shipping instructions with the provided shipping label and completed service request form attached and made available for pick up at the indicated time and location!							
Signature				Date			
<h3>Repair details (to be completed by ID-tec)</h3>							
Order number:			Repaired by:				
Comments:							

Figure 9.3: Service request form

***“VALUABLE INTELLIGENCE
AT **LOW COSTS** & MINIMUM
EFFORT.”***

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