

# VNC & Remote Access

## GCX & BDX Systems



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**KEEP THESE INSTRUCTIONS**

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# Introduction

The GCX system has full remote control capabilities using a standard VNC application (virtual network computing) on a phone, tablet or computer.

VNC applications allow full control of the system as if you were at the screen without the need for a subscription or a paid connection to the cloud.

The system can be accessed remotely (off-site) for free though VNC by using one of the following methods:

Connection Method	Advantage	Consideration
Free Tailscale Connection	Free, secure, easy setup.	Need free Tailscale account and app.
Port Forwarding	Free, relatively simple setup.	Must log into router and setup port forwarding rule, less secure.
VPN (virtual private network)	Secure	Requires specialized knowledge to configure.

There are a variety of free VNC client applications that can run on any device:

App	Windows	Mac	Linux	iOS	Android
RealVNC	X	X	X	X	X
Remote Ripple	X	X			X
TightVNC	X		X		
TigerVNC			X		

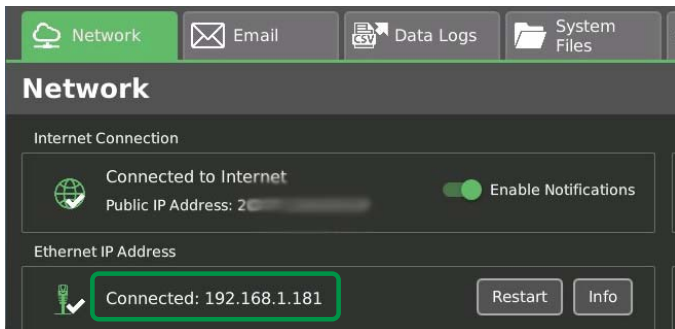
Agrowtek currently recommends "Remote Ripple" or "Real VNC" viewer:



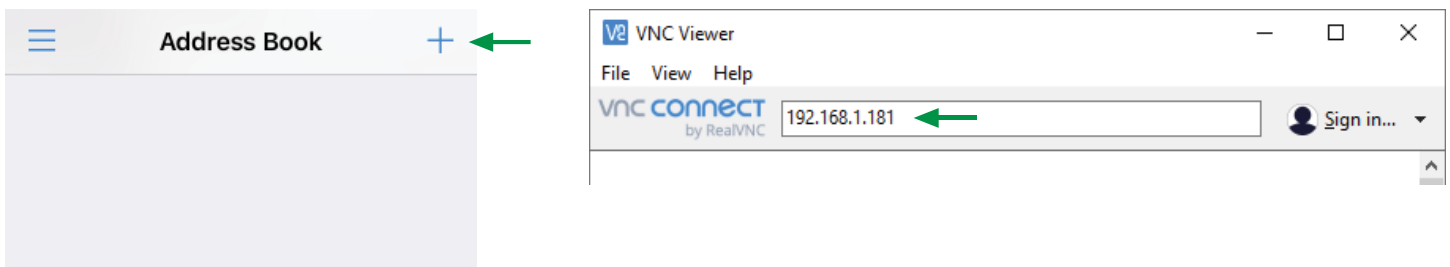
# Local Network Access

Before accessing the system remotely, ensure that the system can be accessed locally. You can test the VNC connection by using a device (computer, phone, tablet) that is connected to the same WIFI or Ethernet network as the Agrowtek device.

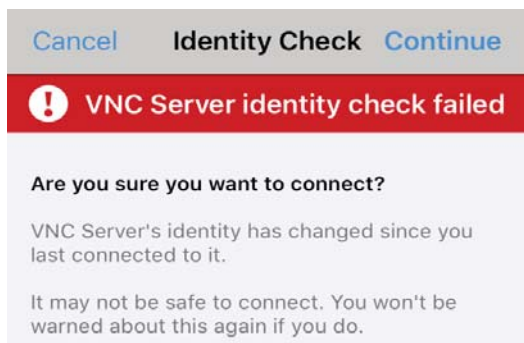
1. Install a VNC Viewer Application. (Real VNC, Remote Ripple, etc.)
2. Locate the Ethernet or Wi-Fi I.P. address of the controller on the Network tab:



3. Open the app and press the + button, or using the desktop app, enter the IP address into the address bar.



4. Accept the new identity check message.  
*This message will only be shown on the first connection.*



## **i** Picture Quality

If you experience picture quality problems (low resolution) change the picture quality from automatic to medium or high.

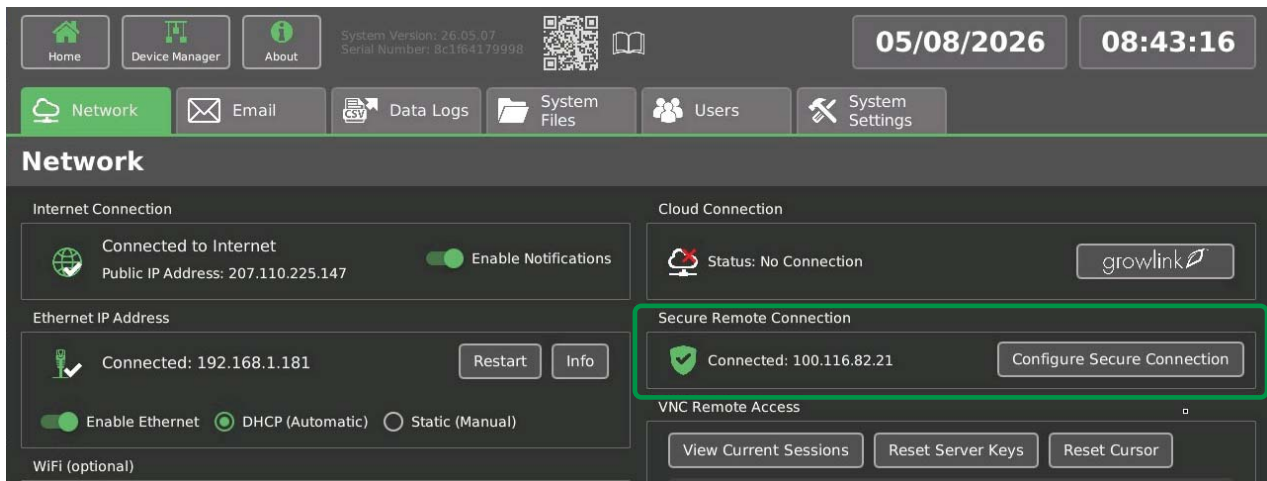
## **i** Mouse Pointer Alignment

If the mouse pointer on your device is not aligned with the mouse pointer on the VNC display, move the mouse to the **upper-left** corner of the screen to align the pointers on the devices.

Tailscale is a free service that establishes a secure connection to your system without any port forwarding in your router. The secure connection allows the user to access the control system with the free VNC client app remotely on a phone or desktop computer over the internet.

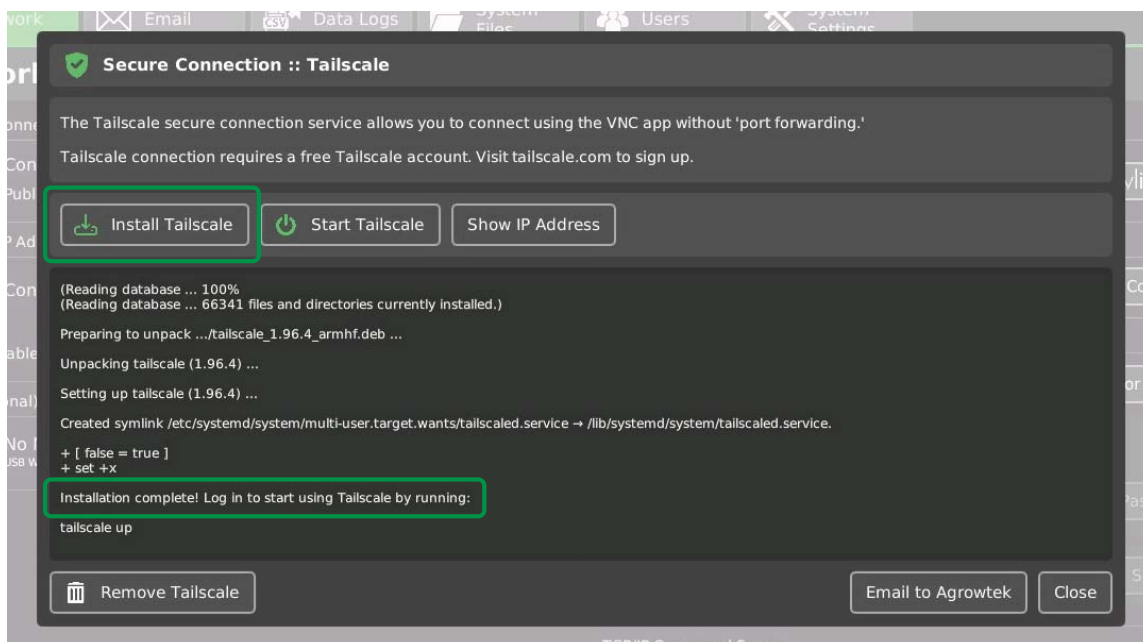
Tailscale simplifies remote access setup for users and works with Starlink and other satellite internet services.

Checkout the setup video here for more information: <https://www.youtube.com/watch?v=2RY1aah2ytk>



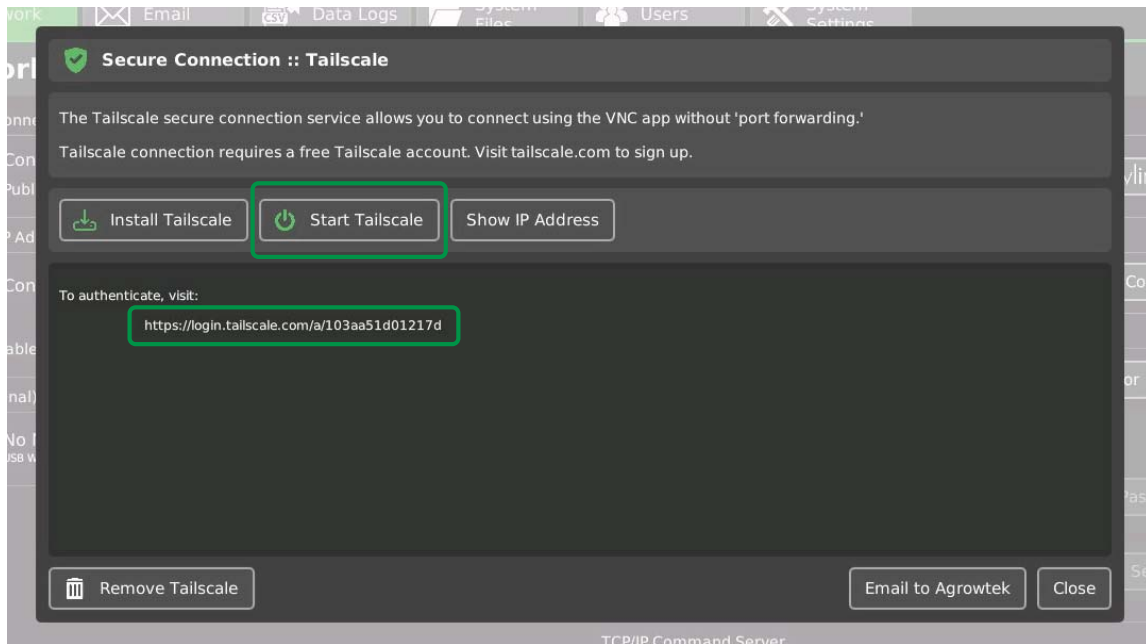
## Installing the Service

1. Navigate to the Network tab and press the “Configure Secure Connection” button.
2. In the Tailscale dialog, press the “Install Tailscale” button and wait for the installation to complete. *This process may take up to a minute to complete.*



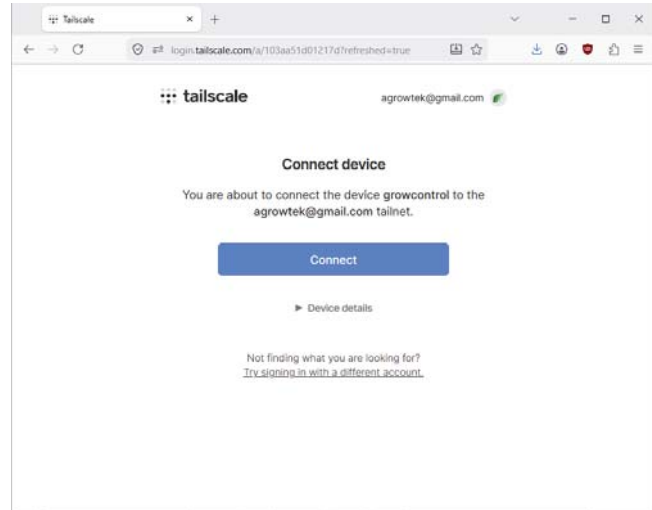
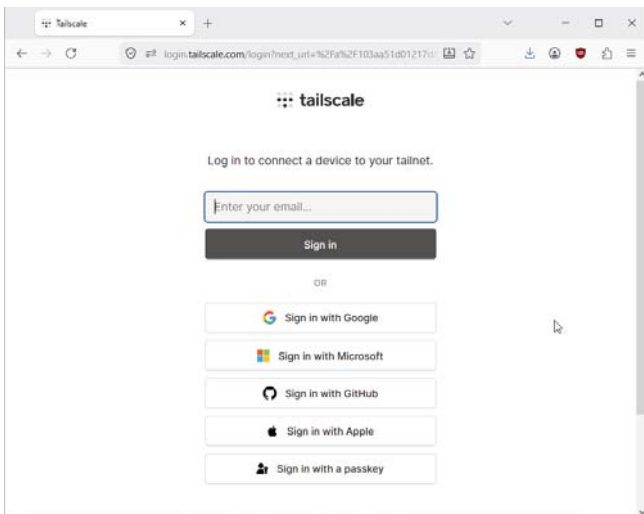
# Registering the System

1. Once Tailscale is installed, you can Start Tailscale; press the "Start Tailscale" button. Wait for the system to generate a registration link. *This may take up to 30 seconds, please wait for the link to appear.*



2. Open the link in a browser on your computer or phone to complete the registration with Tailscale.

If you do not have a Tailscale account, create one now.



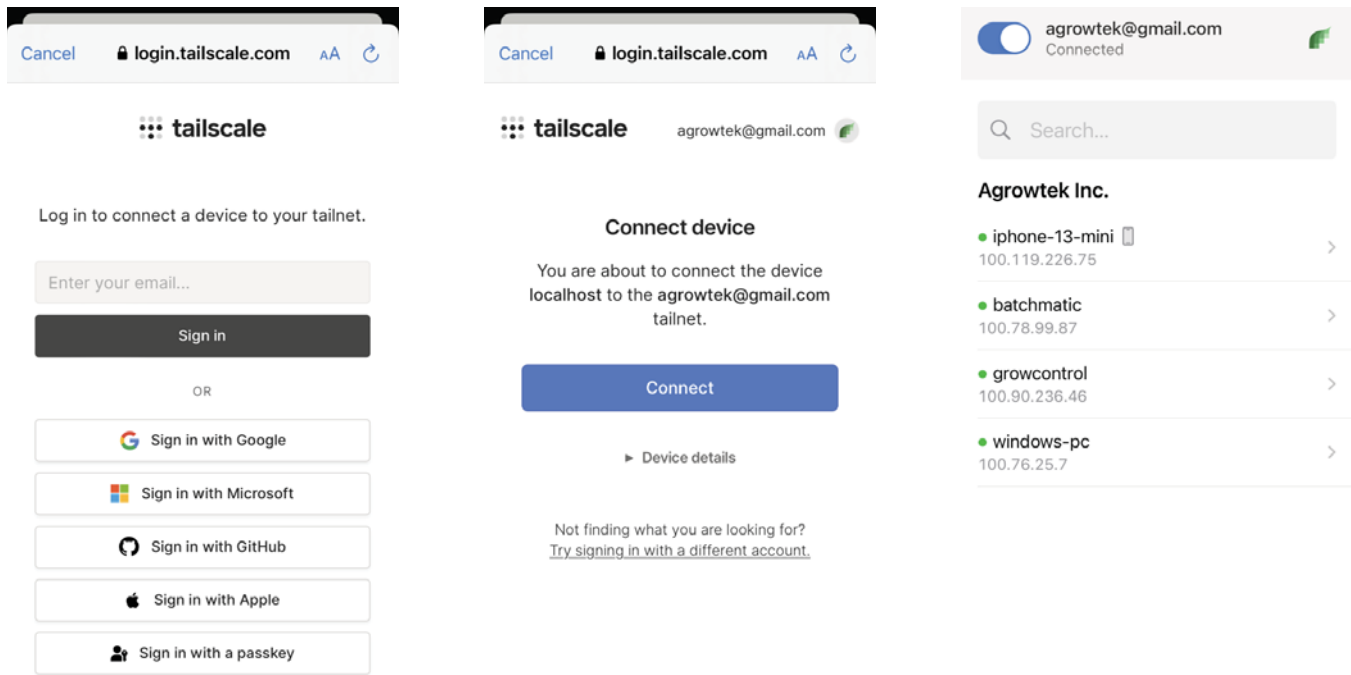
3. The devices will now be shown in your Tailscale dashboard with their remote IP address.

MACHINE	ADDRESSES ⓘ	VERSION	
● batchmatic agrowtek@gmail.com	100.78.99.87 ▼	1.96.4 Linux 4.19.66-v7+	...
● growcontrol agrowtek@gmail.com	100.90.236.46 ▼	1.96.4 Linux 4.19.66-v7+	...

# Adding Other Devices

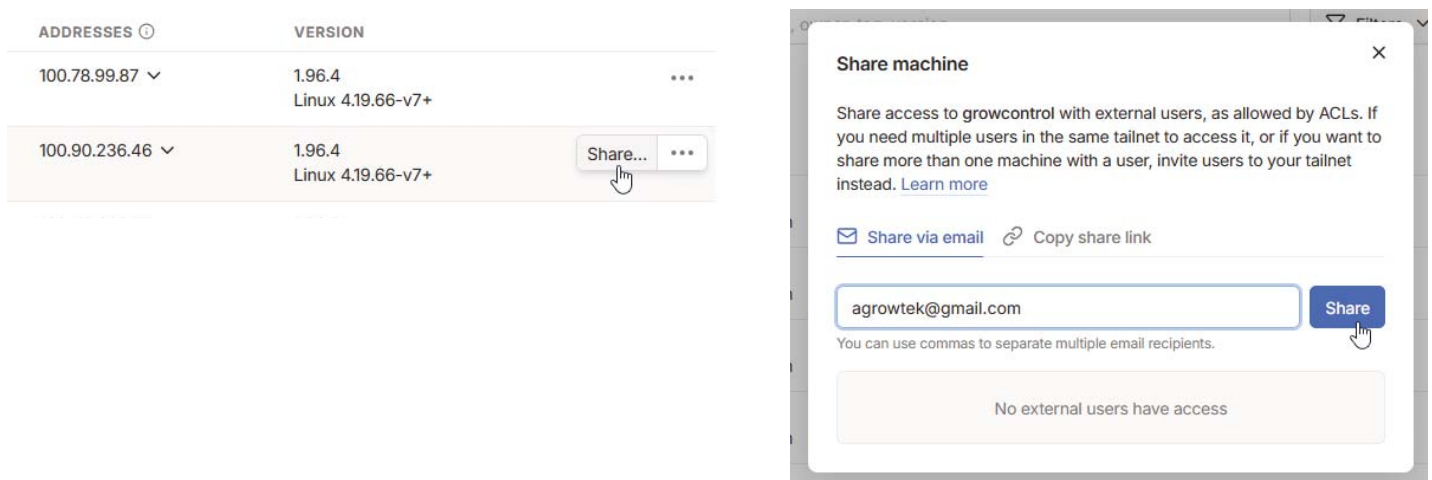
To access the Agrowtek system using the Tailscale secure connection, the Tailscale app or software must be also installed on the device (phone, pc, etc.) which will be used to connect to the Agrowtek system. This allows a secure end-to-end connection between the devices that can only be accessed by authorized users.

1. Visit Tailscale.com or open the app store on your device and install the Tailscale app.
2. Authenticate the device and connect it to your Tailscale account.
3. Open the Tailscale app to see all of your devices and their connection addresses.  
*The connection address is used to connect the VNC app to the system.*



# Sharing Tailscale Connections

You may grant another Tailscale user access to your system by sharing the connection with them by email or a link. Select the device in your tailscale dashboard and click "Share."



# Port Forwarding

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Port Forwarding allows a router to pass traffic from an external connection outside of the network, into a specific device on the network at a specified port number on the device. VNC connections use port 5900 by default (but can be set to any port number.)

Port forwarding is done at the network router/modem that the system is connected to. Port Forwarding requires logging into the network router and setting up a port forwarding "rule."

Each manufacturer has slightly different configurations for port forwarding screens, however the concept is the same. Port forwarding must be configured by the user.

## Before You Begin

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Collect some information that will be required during the configuration process.

**Local IP Address:** \_\_\_\_\_

Can be found in the Network Tab (System > Network > Ethernet IP Address (or Wifi if equipped)).

**Port Number: 5900** (Default) // \_\_\_\_\_ (Custom)

Port number can be adjusted if there are multiple devices that require a VNC connection on the network. Typically 5900 (Default)

**Public IP Address:** \_\_\_\_\_

Found at the top of the Network Tab, (System > Network > Internet Connection > Public IP Address.)

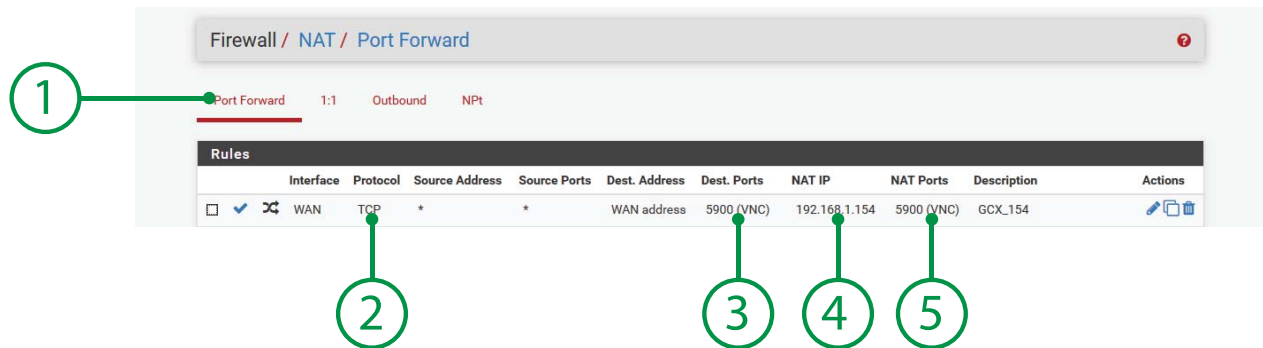
**Static IP Address:** \_\_\_\_\_

A static IP address should be assigned to the controller in the network router to ensure continuous remote access. Only assign a static IP at the controller if necessary.

# Router Configuration

For “port forwarding” instructions, please reference the manual for your network router. Each router has unique menus, however, the process is generally the same; an example is shown below.

**i** **Portforward.com** - An online resource that explains port forwarding in more detail and includes several router specific guides. <https://portforward.com/how-to-port-forward/>



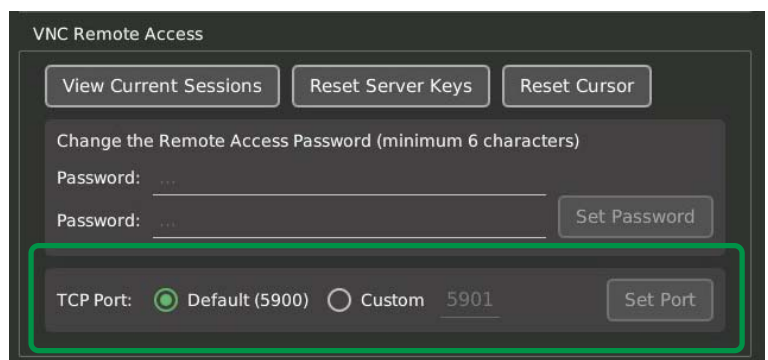
- |                      |  |
|----------------------|--|
| 1. Port Forwarding   | Navigate to the Port Forwarding rules section of your router.  |
| 2. Protocol          | Set the protocol type to <b>TCP</b> if prompted.   |
| 3. Destination Port  | The port number that is used to access the controller on the router.<br><i>This is sometimes referred to an “external” port number.</i>            |
| 4. IP Address        | The local IP address of the controller as shown on the controller screen.  |
| 5. Device (NAT) Port | The port number that is used by the controller (default 5900 or customer port.)<br><i>This is sometimes referred to an “internal” port number.</i> |

**i** **NOTE:** Some routers/modems (Comcast) do not have separate port numbers and instead use the same port number for both. In this case, use the port number that is configured for use on the controller.

Once port forwarding has been configured correctly, the system may now be accessed remotely (off site) by using the Public IP Address. Enter the Public IP Address into the VNC Viewer to connect to the system.

## VNC Port

GCX controllers use the standard VNC port number of 5900, or a custom VNC port can be configured.



## **i** Notes

- A static IP address should be assigned to the controller in the network router’s DHCP table.
- An external port of your choice should be opened and directed to the VNC port on the GCX controller.
- If the internet service is not static IP, consider using the Tailscale connection option.

# Virtual Private Network

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VPN (virtual private network) connections provide a secure tunnel between a remote computer and the facility network that the controller is operating on.

The advantage is that VPN connections are very secure when configured correctly, and the controller can be connected to with the same IP address as on-site without any port forwarding rules.

A VPN connection may require specific network hardware and the assistance of your IT professional.

Agrowtek recommends OpenVPN for virtual private networks.

Agrowtek does not provide assistance with configuring VPN's.

## VNC Password & Security

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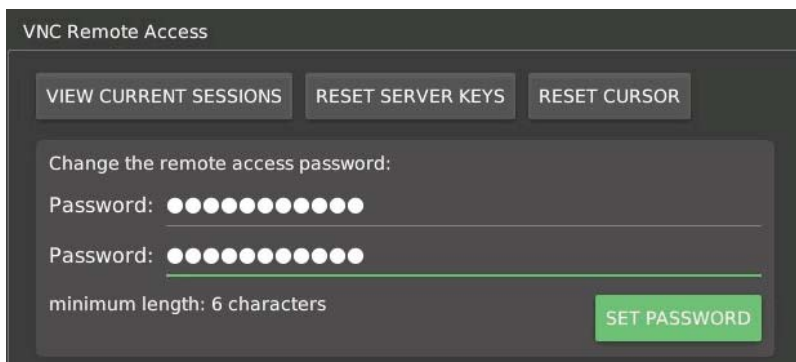
Agrowtek controllers operate on a Linux OS without any windowing system. VNC connections are password protected and encrypted, with access only to the framebuffer. Internally managed security certificates and phrases will invalidate and require resetting if excessive unauthorized access is attempted. Additionally, the system may be secured with user access control to prevent physical or remote access to the screen.

With secure passwords there are no known security vulnerabilities on GCX systems using VNC.

### **IMPORTANT**

Change the VNC password and setup user accounts on the system to ensure system security.

To change the password, navigate to the network tab and set the desired password:



The screenshot shows a dark-themed interface titled "VNC Remote Access". At the top, there are three buttons: "VIEW CURRENT SESSIONS", "RESET SERVER KEYS", and "RESET CURSOR". Below these is a section for changing the password, labeled "Change the remote access password:". It contains two password input fields, each with a row of 12 dots representing characters. A green underline is visible under the second field. Below the fields, it says "minimum length: 6 characters". A green "SET PASSWORD" button is located at the bottom right of the form.

# Troubleshooting

Problem	Solution
The mouse pointer is not aligned on the VNC window.	<p>If the mouse pointer on your device is not aligned with the mouse pointer on the VNC display, move the mouse to the upper-left corner of the screen to align the pointers on the devices.</p> <p>If the pointer is still not aligned, move the mouse to all four edges of the window to align the pointers.</p>
Low picture quality.	<p>Usually poor image quality problems are attributed to network issues or low network speed.</p> <p>If you experience picture quality problems, change the picture quality from “automatic” to “medium” or “high”.</p> <p>If you continue to experience quality problems and are using WiFi, hard wire the network connection with Ethernet cable.</p>
The Local IP address of the controller is changing causing the port forwarding to stop working.	<p>Set the system’s connection to be ‘static’ in the router interface so that the router does not change the system’s IP address. If necessary, set a static IP address on the router.</p>
Can not access the system with the VNC viewer; connection times out.	<p>Ensure the system is connected to the internet. Check the internet connection status on the Network tab.</p> <p>Check if the system can be connected to with the local Ethernet IP address (see Local Network Access.)</p> <p>If using port forwarding, ensure the rule is setup correctly and you are using the Public IP address as the connection address in the app.</p> <p>If using Tailscale, ensure the system and the device you are connecting on are connected to the Tailscale dashboard, and you are using the Tailscale provided IP address for the system.</p>