GW-1ESW8-40G

Solid State SP8T with 2.92mm Female

Applications

1-Automated Test and Measurement
2-5G and MIMO testing
3-Calibration systems
4-Wireless Communication Systems
5- Switch Matrixes

General Description

The Gigawave GW-1ESW8-40G is a fast switching solid-state SP8T covering an ultra-wide bandwidth, from 10MHz to 40 GHz. The solid-state design features an impressive combination of high isolation (40 dB), good linearity across the entire band. The switch is supplied in a low profile package with precision 2.92 mm RF connectors. The daisy-chain control interface with "dynamic addressing" simplifies control integration, allowing multiple switches to be combined into a Master / Slave chain.
Full software support is provided, including our user-friendly GUI application for Windows and Linux a full API with programming instructions for Windows and Linux environments (both 32-bit and 64-bit

Power Requirements

The device is USB bus-powered and can also be powered via Power over Ethernet (PoE). If PoE is not available, the device must be powered using a USB-C power adapter. The supported PoE input voltage range is 44–57 VDC (48 V nominal), compliant with IEEE 802.3af/at standards.

RF Characterization

Frequency Range	10MHz-8GHz	8GHz-18GHz	18GHz-32GHz	32GHz-40GHz
Return loss (common port)	12	12	11	10
Return loss (active ports) Worst case	12	11	10	12
Isolation (common/active ports)	45	40	42	40
Isolation (active ports) When both ports are OFF	50	45	37	32
Isolation (active ports) When one port is ON	41	40	37	30

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Minimum System Requirements

	Requirements
Hardware	Intel i3 (or equivalent) or later
USB	Windows 7 or later; Linux
Ethernet	Windows, Linux or macOS with Ethernet TCP / IP support

Control Interface

Interface	Supported Protocols
Ethernet Control	TCP / IP
USB Control	Virtual Comp Port at 115200 speed

The device ships from the factory with the following default settings. (TCP port 3333). The device supports communication with a development PC via an Ethernet interface or through a USB connection. When connected over USB, it is recognized by the Windows operating system as a standard USB Communications Device Class (CDC) virtual COM port.

Programming Commands

The primary ASCII/SCPI commands for system control via the Ethernet or USB API are summarized below. For comprehensive details, refer to the programming manual.

Command / Query		Description
Command	Command Group	Description
*IDN?	System	System identification command
INFO		System info command
LIST		Command list
IP	Network Settings	Set IP address
SBMSK		Set Subnet Mask
GTW		Set Gateway
DNS		Set DNS server

SET,PORT1,<Cy>	System Control	Set the individual port channe Y = 1 to 8 Or <Cy> OFF
SET?		Set command help page
CLR,PORT1,<Cy>		Clears individual port channel Y = 1 to 8 Or <Cy> OFF
CLR?		Clear command help page
READ,PORT1		Read selected port
READ?		Read command help page

* All commands must be entered in uppercase letters.

* Avoid engaging in multiple channels on a single port, as this may cause mechanical damage to the RF relays.

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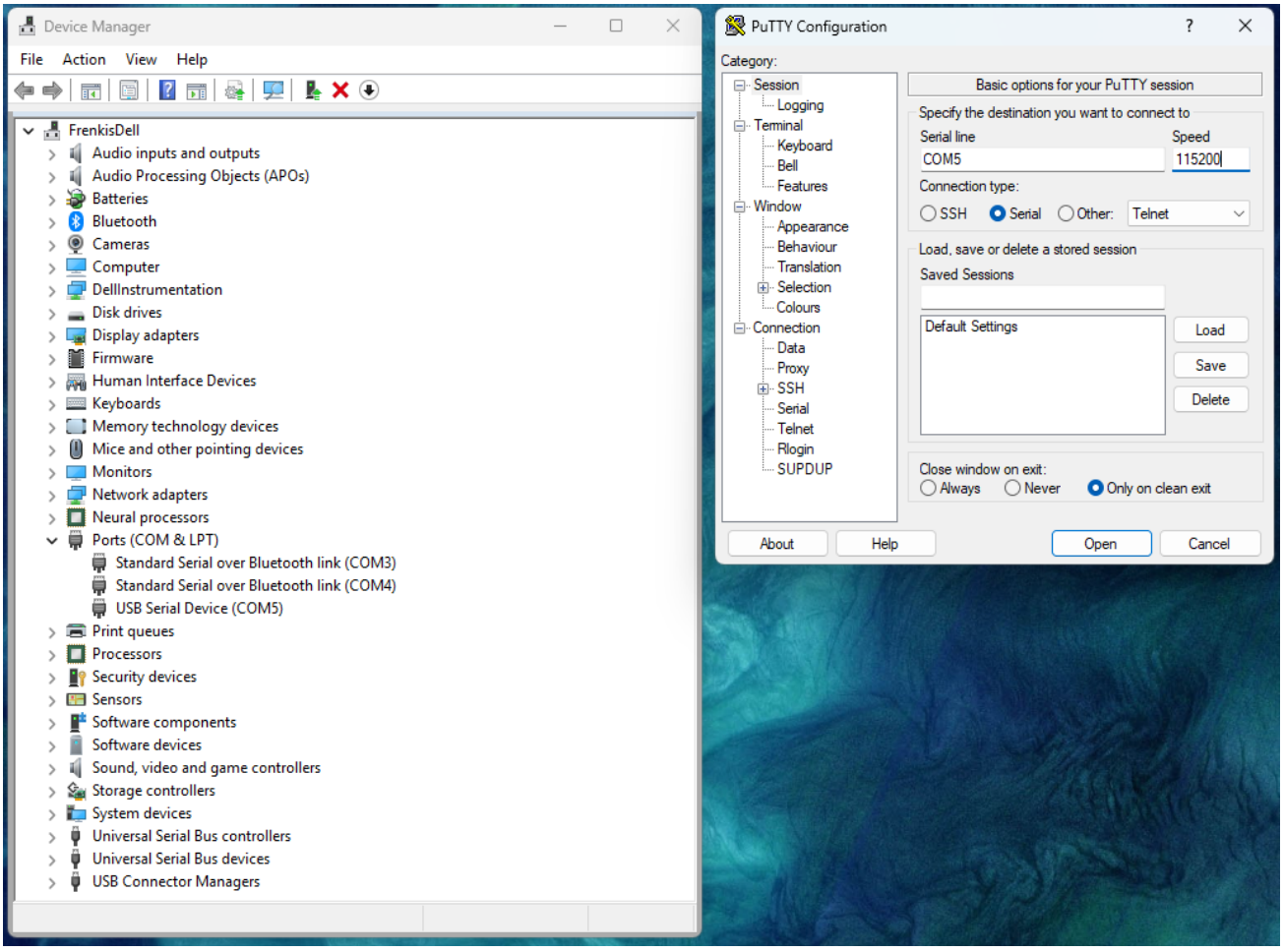
Putty USB connection (Fresh System Setup)

- Navigate to Category >>> Session
- Select the Serial connection type
- Enter COM5 in the Serial line field
- Set the Speed to 115200
- Click Open to start the session

Once the terminal window is open, configure the following settings:

- Click the terminal icon in the upper-left corner
- Select Change Settings
- Enable Local echo: Force on
- Enable Local line editing: Force on
- Click Apply



After adjusting these options, click Apply to confirm the changes. The terminal is now ready for use.

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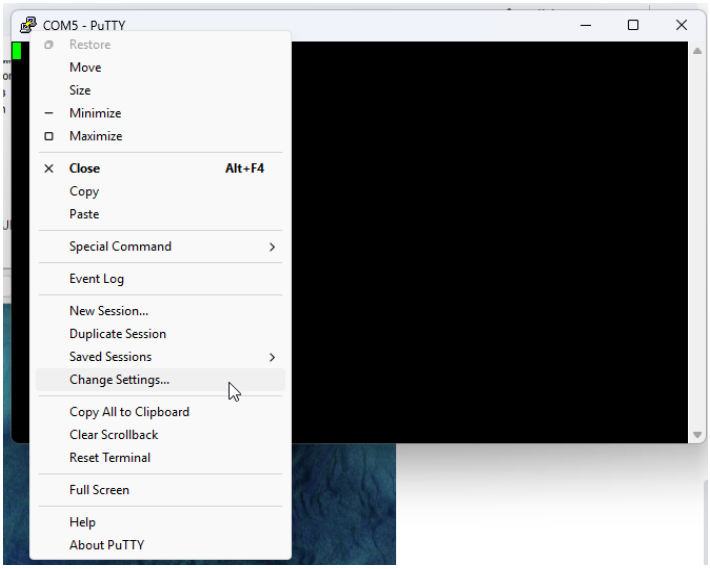
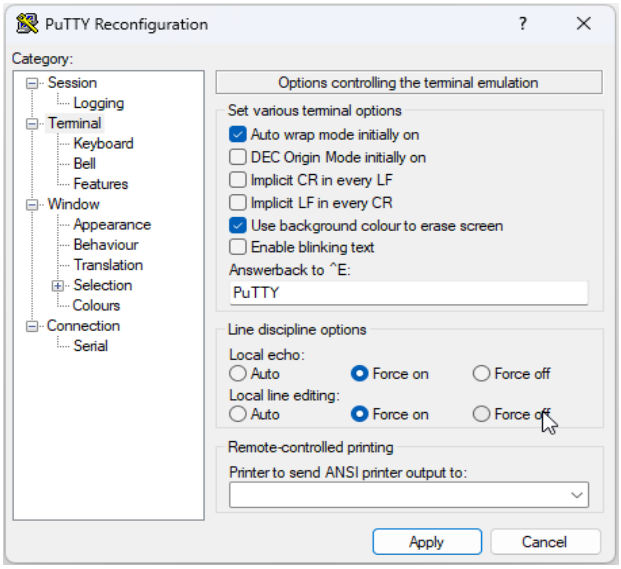
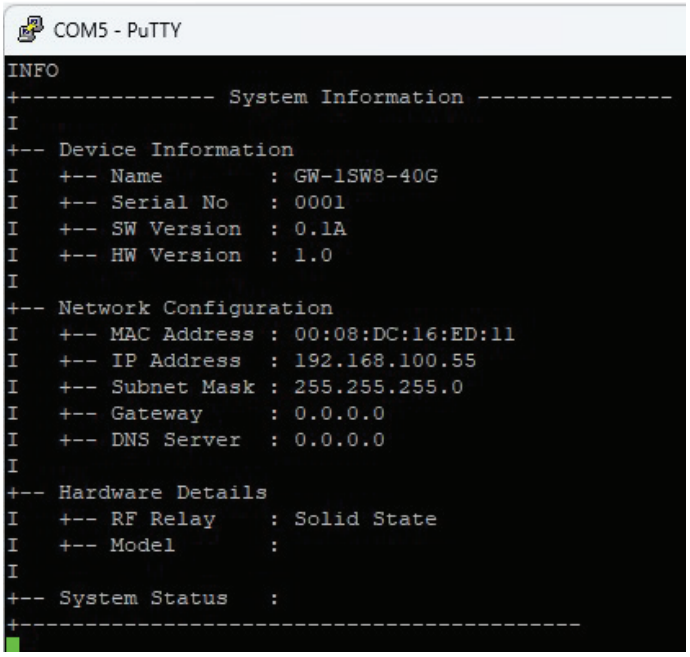




Basic Commands

To verify communication, enter:
*IDN? and press Enter.
INFO – Displays general device information
LIST – Displays all supported commands

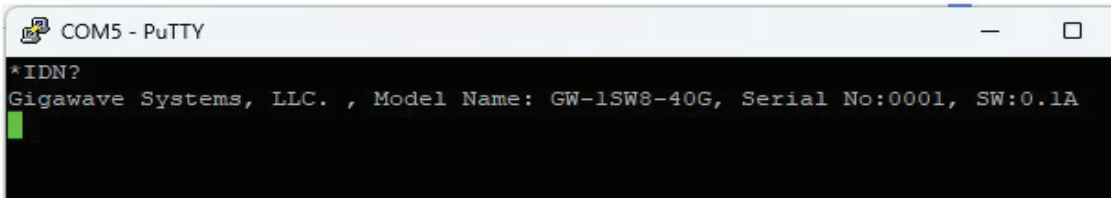


Port Control

SET,PORT1,C2 >> Connects Channel 2 to Port 1
CLR,PORT1,C2 >> Disconnects Channel 2 to Port 1

Important Notes

- All commands must be entered in uppercase letters
- The device supports hot switching between channels



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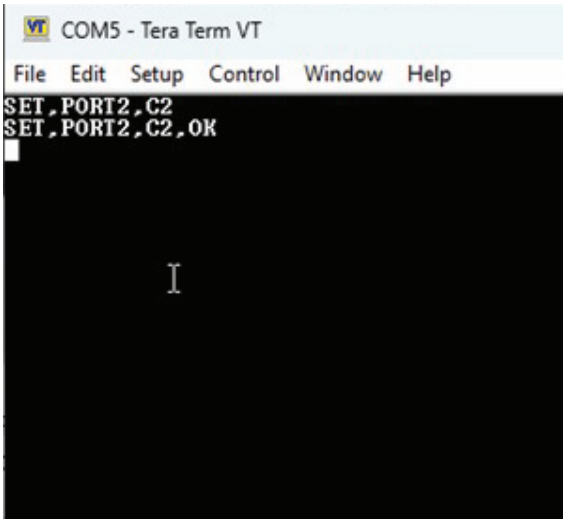
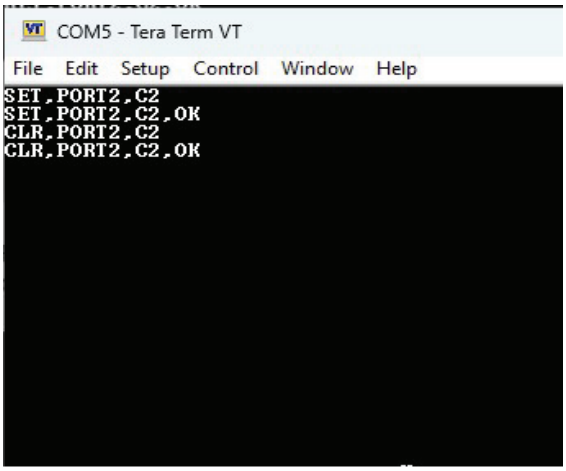
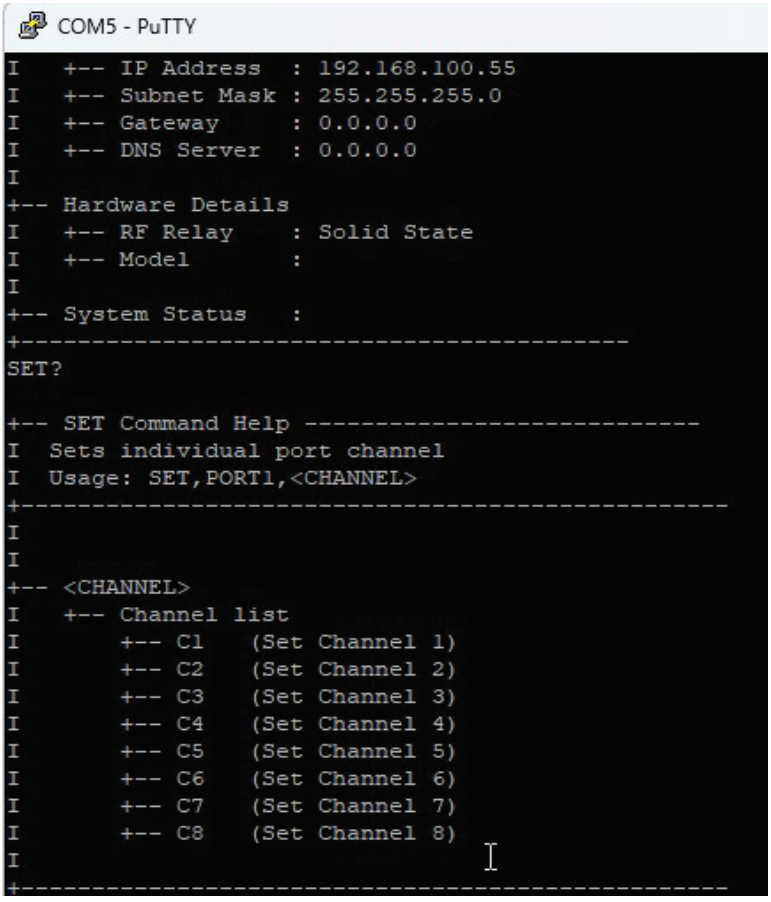
The first command to try is entering *IDN? (without quotation marks) into the terminal and pressing the Return key. If the device is properly connected and configured, it will respond with a simple identification command to confirm its presence. The command INFO? will display all the relevant information about the device. Each command for controlling ports includes a built-in help page. For example, the SET command is used to close a selected channel on a desired port. To close the switch on Channel 3 associated with Port 2, the command would be SET,PORT2,C3. After entering the command and confirming it by pressing the Return key, the device will execute the command and close the RF path associated with Channel 3 on Port 2.
To disconnect the selected path, the command CLR,PORT2,C3 should be used. Upon confirming the command, the device will disconnect the selected path on the associated port.







** Notes . commands that reference ports beyond the supported port count are not available and will not execute.

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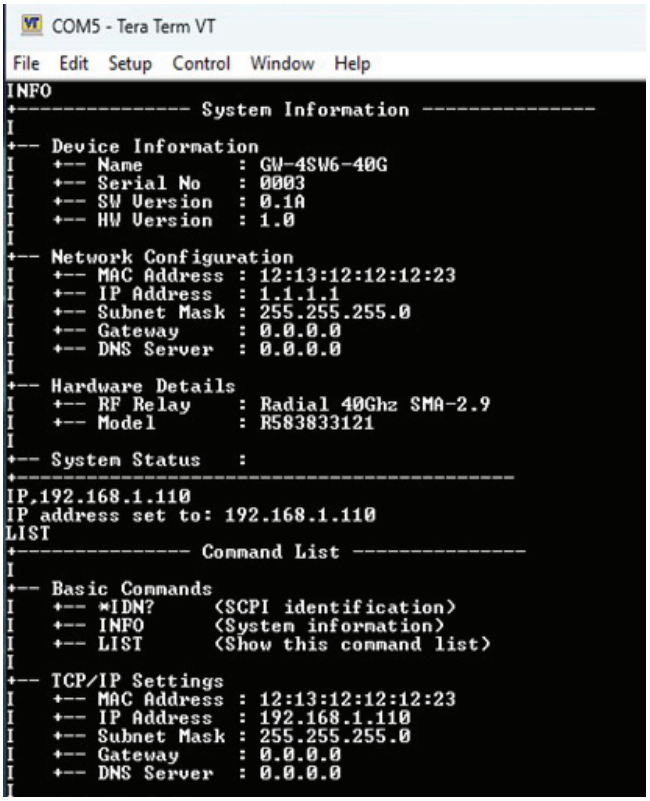
Putty LAN connection (Fresh System Setup)

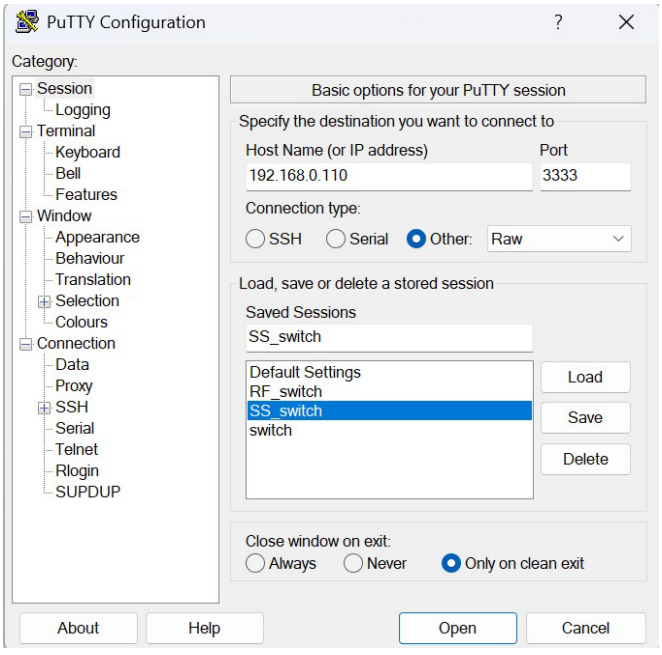
To control device over the ethernet, the device IP address and subnet mask must be set. This initial configuration is performed via the USB interface.

- Navigate to Category >>> Session
- Select the Serial connection type
- Set IP using: IP,x.x.x.x (e.g., IP,192.168.1.100)
- Use Telnet over TCP port 3333 for communication.
- Click Open to start the session

Once the terminal window is open, configure the following settings:

- Click the terminal icon in the upper-left corner
- Select Change Settings
- Enable Local echo: Force on
- Enable Local line editing: Force on
- Click Apply





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Extended Command List

Command	Command Group	Description
*IDN?	System	System identification command
INFO?		System info command
LIST		Command list
RESET		Software reset od device
IP	Network Settings	Set IP address
SBMSK		Set Subnet Mask
GTW		Set Gateway
DNS		Set DNS server
SET,<PORTx>,<Cy>	System Control	Set individual port channel
SET?		Set command help page
CLR,<PORTx>,<Cy>		Clears individual port channel
CLR?		Clear command hep page
READ,<PORTx>		Read selected port
READ?		Read command help page
XSET?	Debugging	Use of these commands is only for debugging purposes. This command will be password protected, regular user should not have access to this commands.
XREAD		

Gigawave offers a complete software and support package, available for free download, which includes a user guide, Windows GUI, example programs in various programming languages (LabVIEW, Python), an API programming manual, and sample implementations (refer to the last page for the download link). A comprehensive range of software control options is provided.

1.GUI for Windows – A user-friendly software interface enabling control via Ethernet and or USB.

2.Programming and Automation via Ethernet

3. Provides a comprehensive set of control commands that can be transmitted through supported protocol, ensuring seamless integration into most modern programming environments.

4.Programming and Automation via USB/CDC

5. Provides same functionality as Ethernet but only over USB CDC

6. USB (Communication Device Class) is a standard USB device class that enables communication between a host computer (e.g., a PC) and a USB device (e.g., a microcontroller) via a virtual serial port.

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Windows GUI

You can download GUI from website and run an *.exe file for windows . This GUI is so user friendly and has:

1- **RF Switch Control**:

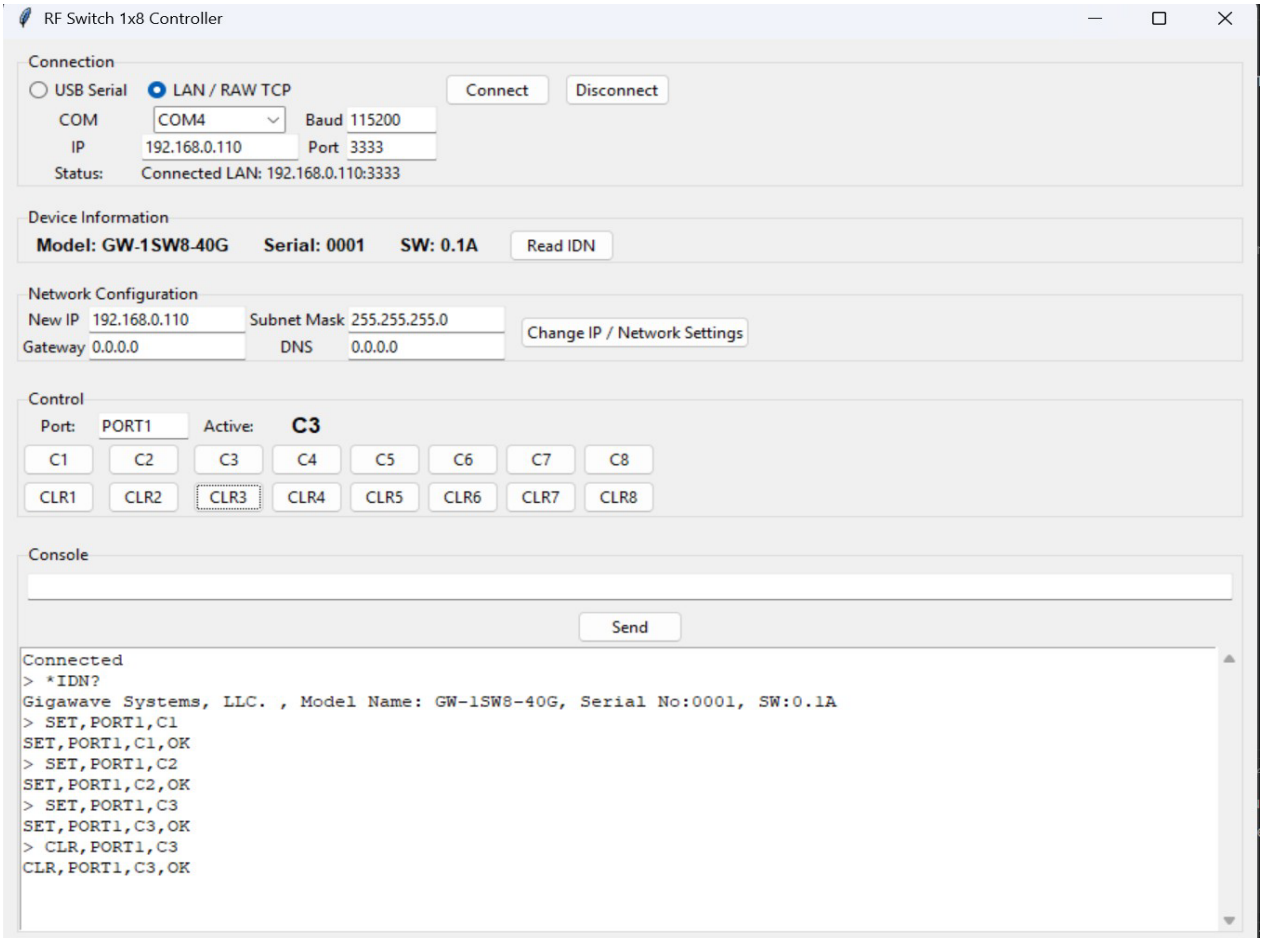
Interactive GUI displays eight RF ports with selectable channels (C1–C8) in a straight layout.

2- **Serial Communication Flexibility:**

Supports COM ports and allows dynamic connection to the switch hardware.

3- **Command line:**

On console you can enter the command manually



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Linux Serial Control (Fresh System Setup)

The unit is controlled via a USB connection using a CDC-ACM serial interface. On Linux systems, command-based communication is supported through standard serial terminal applications, allowing users to issue text commands for configuration and control without the need for additional drivers.

1. Install Required Tools

On a fresh Ubuntu / Debian system, install the serial terminal and line editor:

```
$ sudo apt update
$ sudo apt install picocom rlwrap
```

2. Connect the Device

Connect the Gigawave switch controller via USB. Verify the serial device appears

```
$ ls /dev/ttyACM*
```

Expected output:

```
/dev/ttyACM0
```

3. Start the Serial Console (Recommended)

Use rlwrap to enable command editing and history:

```
$ rlwrap -a picocom -b 115200 --omap delbs /dev/ttyACM0
```

4. Basic Command Test

After the terminal is ready, verify communication:

```
*IDN?
```

Example response:

```
Gigawave Systems, LLC., Model Name: GW-1SW8-40G, Serial No:0001, SW:0.1A
SET,PORT2,C1
SET,PORT2,C4
SET,PORT2,C5
```

Expected response:

```
SET,PORTx,Cy,OK
```

6. Exit the Terminal

To exit the session cleanly:

```
Ctrl + A, then Ctrl + X
```

Notes Default serial settings: *Baud rate: **115200** * Data bits: **8** * Parity: **None** * Stop bits: **1** * Flow control: **None**

The controller uses a raw serial interface; command echo is handled locally.

rlwrap is recommended for improved usability but is not required.

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Linux Serial Control (USB) displayed output

Representative command-response output displayed using the picocom serial terminal on a Linux system. Other standard terminal applications (e.g., minicom, screen) may also be used.

```
workspace@workspace:~$ rlwrap -a picocom -b 115200 --omap delbs /dev/ttyACM0
picocom v3.1

port is        : /dev/ttyACM0
flowcontrol    : none
baudrate is    : 115200
parity is      : none
databits are   : 8
stopbits are   : 1
escape is      : C-a
local echo is  : no
noinit is      : no
noreset is     : no
hangup is      : no
nolock is      : no
send_cmd is    : sz -vv
receive_cmd is : rz -vv -E
imap is        :
omap is        : delbs,
emap is        : crcrlf,delbs,
logfile is     : none
initstring     : none
exit_after is  : not set
exit is        : no

Type [C-a] [C-h] to see available commands
Terminal ready
SET,PORT2,C4,OK
SET,PORT2,C5,OK
```

Command and control are supported via Ethernet (LAN) using a Telnet interface over TCP/IP. The device is accessed by connecting to its assigned IP address (e.g., 192.168.0.110) on port 3333, allowing text-based command operation from a host computer on the same local network.

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Linux LAN Control (Fresh System Setup)

1. Physical Connection

Connect the device's Ethernet (LAN) port to a network switch/router or directly to the host PC.

2. Network Configuration

Ensure the host computer is on the same subnet as the device. Device IP address: 192.168.0.110 and Subnet mask: 255.255.255.0

Verify the host IP:

```
$ ip a
```

If required, configure the host with a compatible IP address (example):

```
$ sudo ip addr add 192.168.0.50/24 dev <ethernet_interface>
$ sudo ip link set <ethernet_interface> up
```

3. Verify Network Connectivity

Confirm that the device is reachable:

```
$ ping 192.168.0.110
```

Successful replies indicate proper LAN connectivity.

4. Establish Telnet Connection

Install Telnet then open a Telnet session to the device on port 3333:

```
$ telnet 192.168.0.110 3333
```

Upon successful connection, the device is ready to receive commands.

5. Verify Communication

Send the identification command:

```
*IDN?
```

Example response:

Gigawave Systems, LLC., Model Name: GW-1SW8-40G, Serial No:0001, SW:0.1A

7. Close the Telnet Session

To exit the Telnet connection: 1. Press: Ctrl +] 2. At the telnet> prompt, type: quit

Notes

* LAN control uses standard TCP/IP networking. * Telnet communication occurs on TCP port 3333.
* Any Telnet-compatible client may be used. * The device supports text-based, command-response operation similar to USB serial control.

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Linux LAN Control Output

Representative command-response output displayed using the telnet standard TCP/IP on a Linux system. Other standard terminal applications (e.g., minicom, screen) may also be used.

```
workspace@workspace:~$ ping -c 4 192.168.0.110
PING 192.168.0.110 (192.168.0.110) 56(84) bytes of data.
64 bytes from 192.168.0.110: icmp_seq=1 ttl=128 time=0.223 ms
64 bytes from 192.168.0.110: icmp_seq=2 ttl=128 time=0.316 ms
64 bytes from 192.168.0.110: icmp_seq=3 ttl=128 time=0.271 ms
64 bytes from 192.168.0.110: icmp_seq=4 ttl=128 time=0.279 ms

--- 192.168.0.110 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3089ms
rtt min/avg/max/mdev = 0.223/0.272/0.316/0.033 ms
workspace@workspace:~$ telnet 192.168.0.110 3333
Trying 192.168.0.110...
Connected to 192.168.0.110.
Escape character is '^]'.
*IDN?
Gigawave Systems, LLC. , Model Name: GW-2SW6-40G, Serial No:0001, SW:0.1A
LIST
+--------------- Command List ---------------
I
+-- Basic Commands
I   +-- *IDN?     (SCPI identification)
I   +-- INFO      (System information)
I   +-- LIST      (Show this command list)
I
+-- TCP/IP Settings
I   +-- MAC Address : 8C:1F:64:F9:30:07
I   +-- IP Address  : 192.168.0.110
I   +-- Subnet Mask : 255.255.255.0
I   +-- Gateway     : 0.0.0.0
I   +-- DNS Server  : 0.0.0.0
I
+-- Port Control
I   +
I   +-- SET,<PORT>,<CHANNEL>
I   I   +--> Set individual channel on defined port
I   I   +-- SET?
I   I       +--> HELP page for SET command
I   I
I   I
I   +-- CLR,<PORT>,<CHANNEL>
I   I    +--> Clear individual channel on defined port
I   I    +-- CLR?
I   I        +--> HELP page for CLR command
I   I
I   +-- READ,<PORT>
I       +--> Read port
I       +-- READ?
I           +--> HELP page for READ command
I
I
+-----------------------------------------
```


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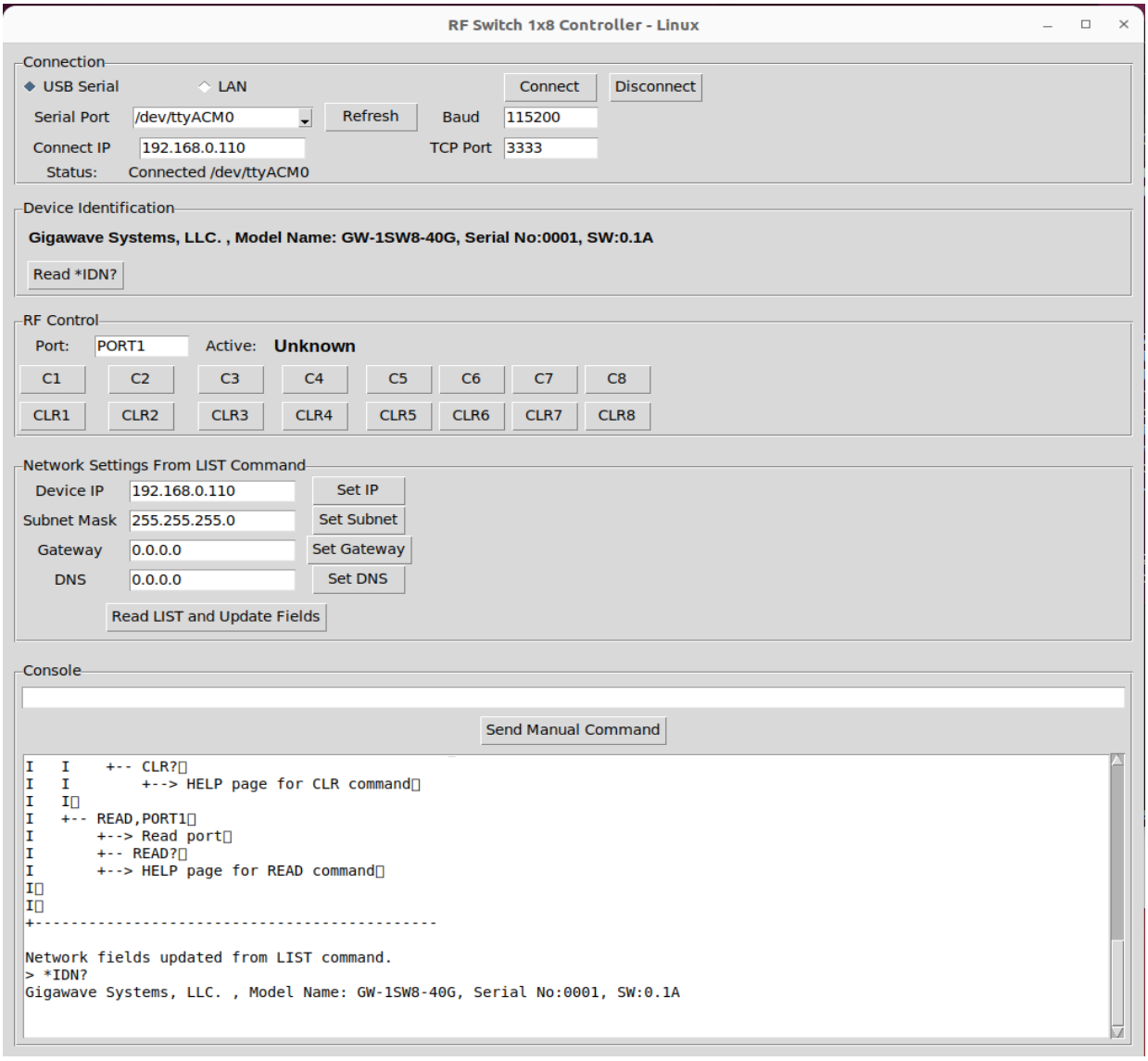
Linux GUI

You can download GUI from website and run GUI file (type ./1SW8-verxx in terminal at the same folder that GUI file copied) .
This GUI is so user friendly and has:
1- RF Switch Control:
Interactive GUI displays eight RF ports with selectable channels (C1–C8) in a straight layout.
2- Serial Communication Flexibility:
Supports COM ports and allows dynamic connection to the switch hardware.
3- State Management & Network Info:



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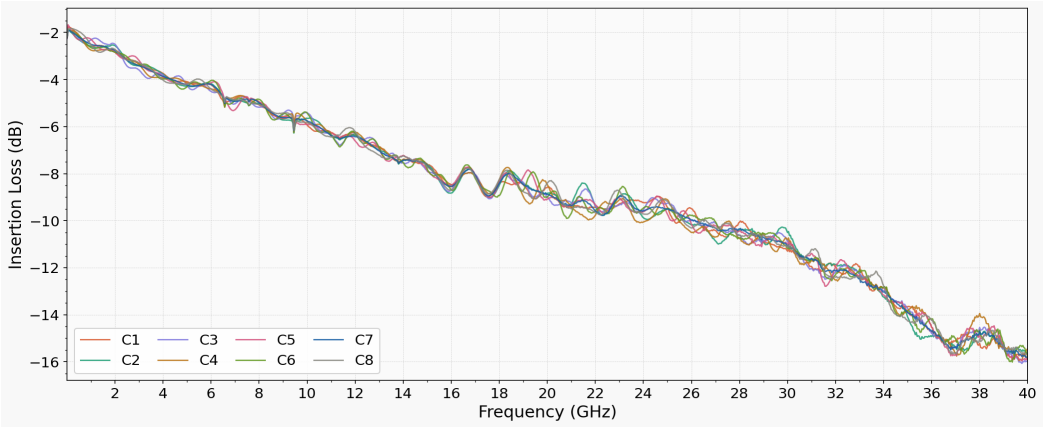
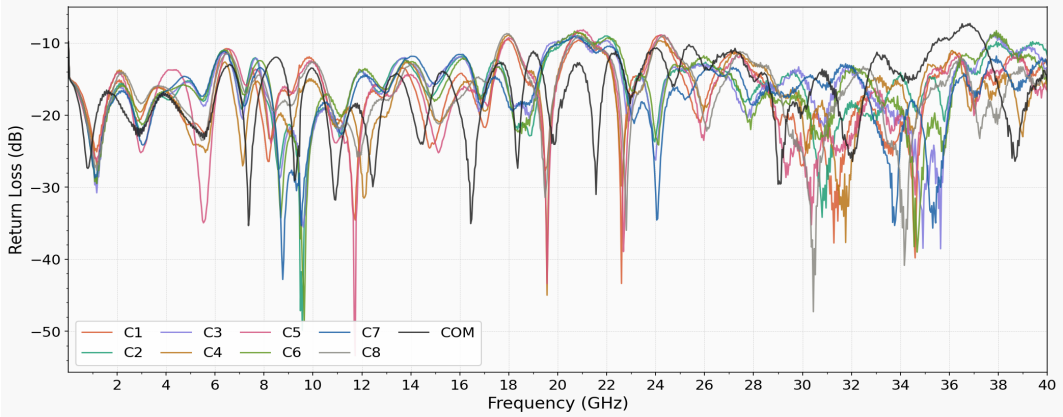
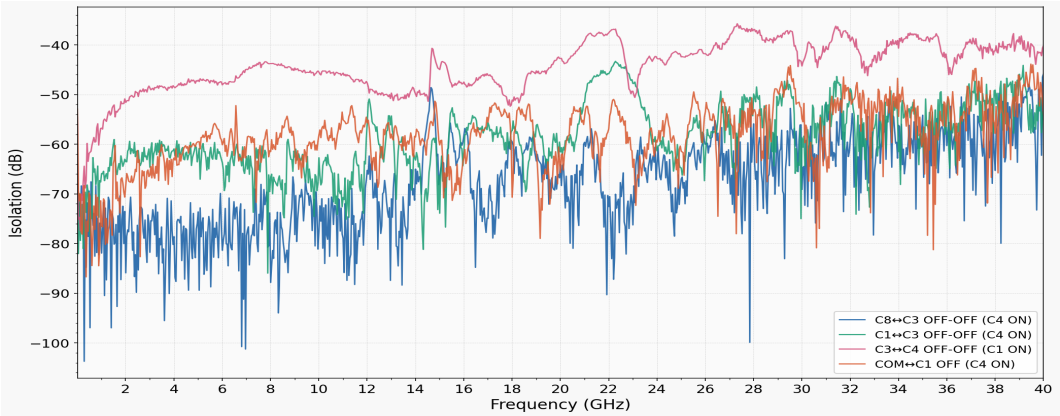
Insertion Loss (dB)



Return Loss (dB)



Isolation (dB)



*All dimensions are in inch (millimeters)

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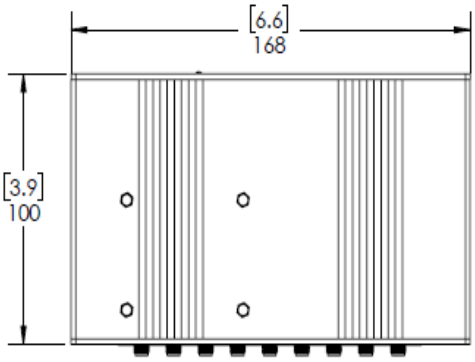
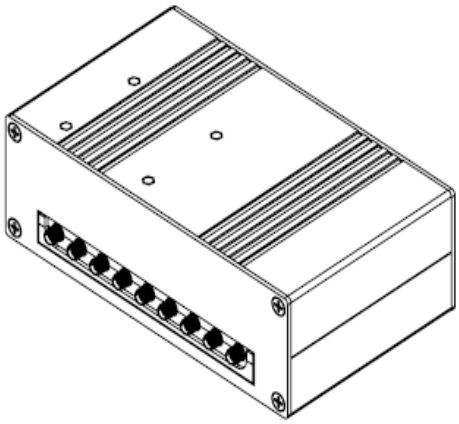
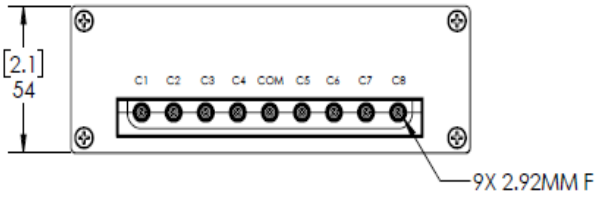
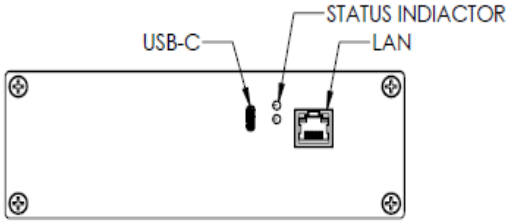
Mechanical Specifications









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