GIGA WAVE

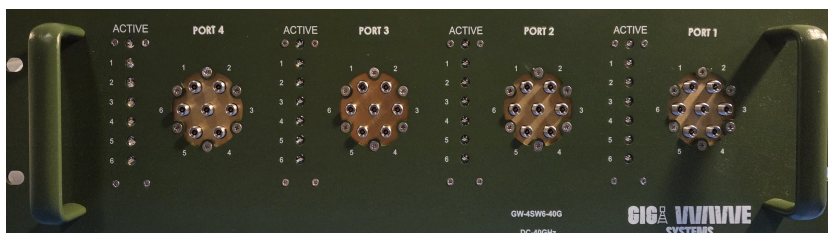# GW-4SW6-40

Mechanical Switch 4×SPDT 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-4SW6-40G features four independently controlled electro-mechanical single-pole Six-throw (SP6T) switches, operating from DC to 40 GHz with high isolation and low insertion loss. These absorptive switches are designed with a failsafe, break-before-make configuration and offer a typical lifespan of 2 million switching cycles when operated within the specified conditions.

Housed in a compact and robust metal enclosure, the switch box is equipped with 2.92 mm (f) connectors and front-panel LED indicators for convenient test bench operation. Control is facilitated via USB (communications device class CDC, virtual com port) or Ethernet, enabling direct operation from a PC or remote access over a network. Comprehensive software support is provided, including programming instructions compatible with both Windows and Linux environments.

Electrical Specifications

Frequency Range	DC-6 GHz	6-12.4 GHz	6-12.4 GHz	6-12.4 GHz	26.5-40 GHz
VSWR max	1.3	1.4	1.5	1.7	2.2
Isolation min	70	60	60	55	50
Switching Time	< 15 ms	< 15 ms	< 15 ms	< 15 ms	< 15 ms
RF Input Power	40W	30W	25W	15W	5W

DC Voltage	24-28V
Current Consumption when relay is not triggered	30mA
Current Consumption when relay is triggered	150mA

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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 Baud

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
*IDN?	Read model name, Serial Number, Software version.
SN?	Read serial number
SET,<PORTx>,<Cy>	Set individual port channel, x parameter [1 - 4] y parameter [1 -6] x refers to ports, y refers to channels example command: SET,PORT1,C1 Explanation: On Port1 turn on Channel1 Note: If individual channel on associated port is already active, device will reject command.

Command / Query	Description
SET,<PORTx>,<Cy>	Clears individual port channel, x parameter [1 - 4] y parameter [1 -6] x refers to ports, y refers to channels example command: CLR,PORT1,C1 Explanation: Clears Channel1 on Port1

* 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.

User Manual and Command List

1.Connect a DC 24V power supply to the designated connector.
2.Connect the device to an available USB port on the computer.
3.Check the Device Manager for newly detected USB ports.
4.Open PuTTY.
5.Explore available commands.

UART Communication Example

Upon connecting the USB cable to the development PC and powering the device, it will be recognized as a USB Serial Device (COM5) in the system. You can now start PuTTY or any other serial terminal program. In the Session category, select the Serial radio button and enter COM5 into the Serial Line field. Set the Speed to 115200. After entering the necessary information, click Open to launch the terminal window. Once the new terminal window is open, you will need to configure the terminal settings. Right-click on the two computers icon in the upper-right corner of the terminal window to access the terminal settings. By selecting the Change Settings option, we can modify the Line Discipline settings by enabling the radio buttons for Local Echo: Force On and Local Line Editing: Force On.
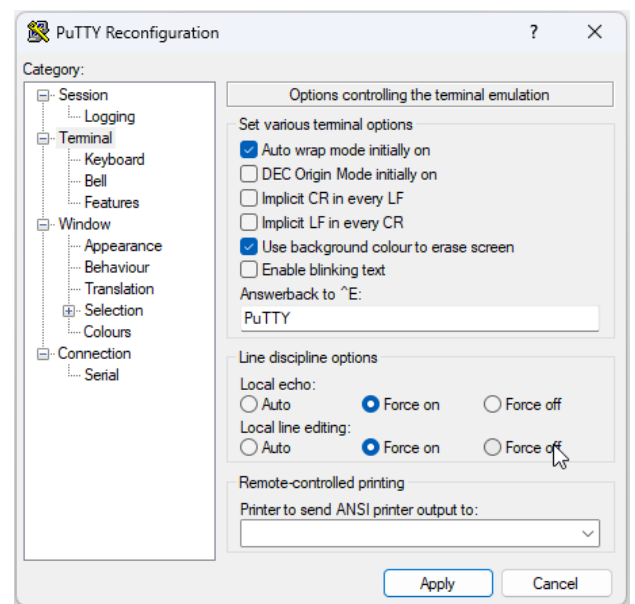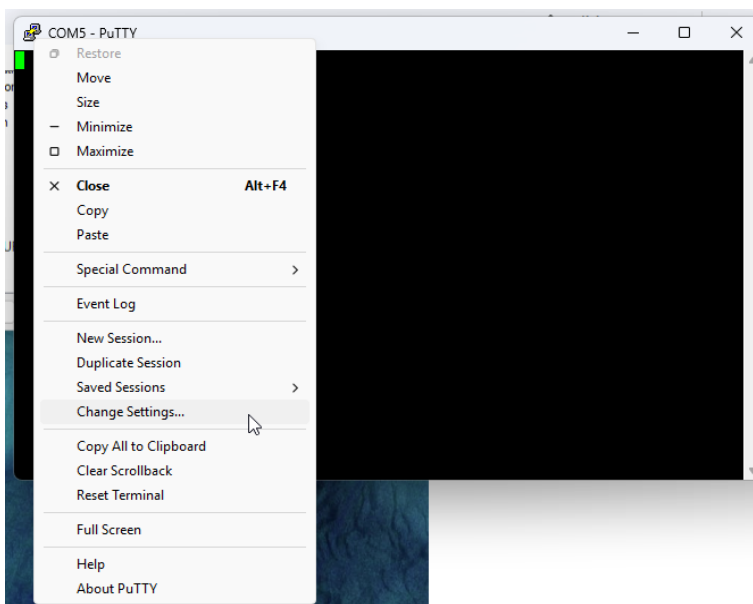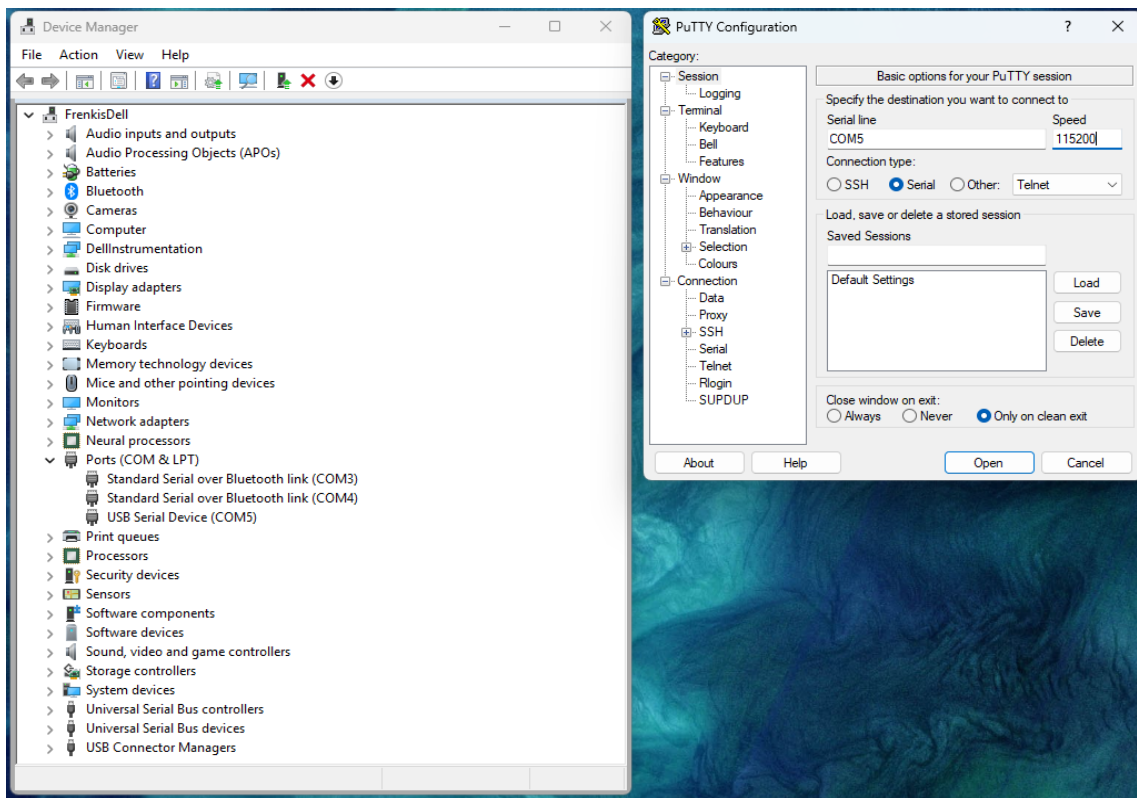
After adjusting these options, click Apply to confirm the changes. The terminal is now ready for use.

```
COM5 - PuTTY                                                    —    □    ×
*IDN?
HUGO Conslulting Group Inc. , Model Name: 4xSP6T RF Relay Switch Box, Serial No:
00001, SW:0.1
INFO?

+-- System Information -----------------------
I
+-- Device Information
I   +-- Name       : 4xSP6T
I   +-- Serial No  : 0001
I   +-- SW Version : 1.0
I   +-- HW Version : 1.0
I
+-- Network Configuration
I   +-- MAC Address : 00:08:DC:12:34:56
I   +-- IP Address  : 192.168.0.155
I   +-- Subnet Mask : 255.255.255.0
I   +-- Gateway     : 00:08:DC:12:34:56
I   +-- DNS Server  : 0.0.0.0
I
+-- Hardware Details
I   +-- RF Relay    : xyzn
I
+-- System Status  : No Errors
+----------------------------------------
```

```
COM3 - PuTTY                                                    —    □    ×
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 : 00:08:DC:16:ED:11
I   +-- IP Address  : 169.254.204.28
I   +-- Subnet Mask : 255.255.255.0
I   +-- Gateway     : 0.0.0.0
I   +-- DNS Server  : 0.0.0.0
I
+-- Port Control
+   +
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   +-- READ,<PORT>
I   I   +--> Read port
I   I   +-- READ?
I   I        +--> HELP page for READ command
I
+-- Debug Commands
I   I
I   +-- XSET,<PORT>,<BIT>,<VALUE>
```

Contact information: For technical support
Email: info@gigawavesystem.com

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 4, the command would be SET,PORT4,SET_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 4.

To disconnect the selected path, the command CLR,PORT4,CLR_C3 should be used. Upon confirming the command, the device will disconnect the selected path on the associated port.

```
+-------------------------------------------------
SET?

+-- SET Command Help --------------------------
I   Sets individual port channel
I   Usage: SET,<PORT>,<CHANNEL>
+-------------------------------------------------
I
+-- <PORT>
I    +-- PORT1     (Port 1 Control)
I    +-- PORT2     (Port 2 Control)
I    +-- PORT3     (Port 3 Control)
I    +-- PORT4     (Port 4 Control)
I
+-- <CHANNEL>
I    +-- Channel list
I    I   +-- SET_C1    (Set Channel 1)
I    I   +-- SET_C2    (Set Channel 2)
I    I   +-- SET_C3    (Set Channel 3)
I    I   +-- SET_C4    (Set Channel 4)
I    I   +-- SET_C5    (Set Channel 5)
I    I   +-- SET_C6    (Set Channel 6)
I
+-------------------------------------------------
```

```
+-------------------------------------------
SET,PORT4,SET_C3
Setting port PORT4, bit SET_C3 to value
Checking entry: PORT1
Checking entry: PORT2
Checking entry: PORT3
Checking entry: PORT4
entry: PORT4
port_b 23
Checking entry: SET_C1
Checking entry: SET_C2
Checking entry: SET_C3
entry: SET_C3
bit_b 4
```

Switch Control Logic

Switch Command	Switch State				Front Panel LED					
	Port1	Port2	Port3	Port4	1	2	3	4	5	6
SET,PORT1,C1	PORT1 Channel1 active				ON					
SET,PORT2,C2	PORT2 Channel2 active					ON				
SET,PORT3,C4	PORT3 Channel4 active							ON		
SET,PORT4,C6	PORT4 Channel5 active									ON

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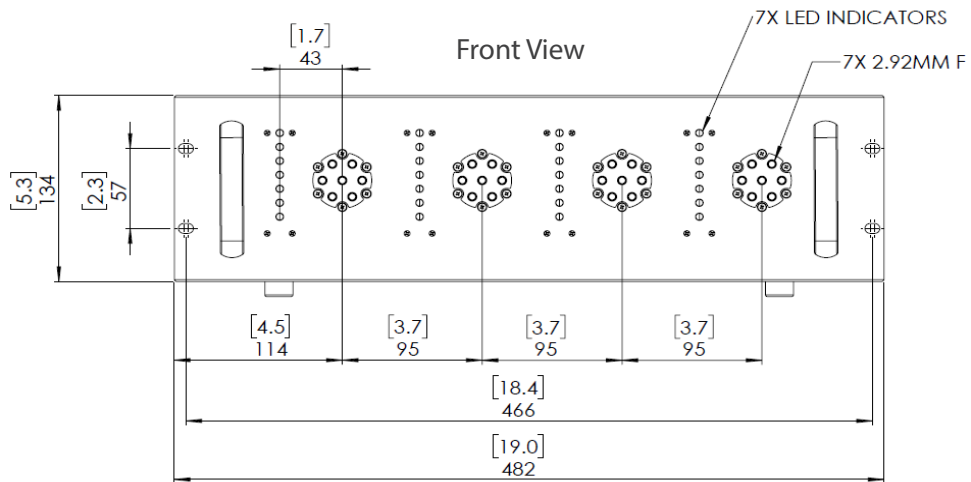
1. GUI for Windows – A user-friendly software interface enabling control via Ethernet and or USB.

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.
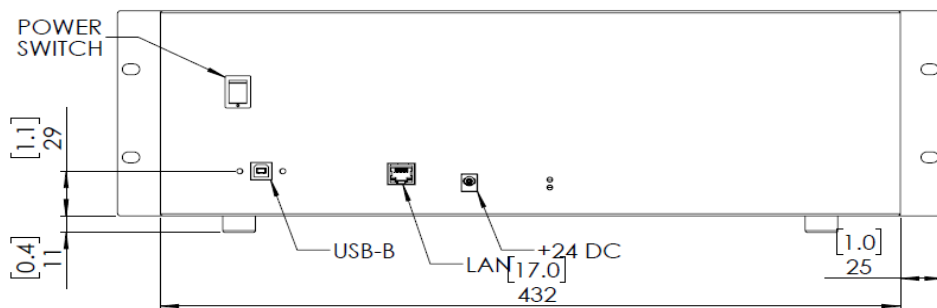
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Mechanical Specifications

Top View

[17.0]
432

[10.2]
258

2X HANDLE

Front View

7X LED INDICATORS

7X 2.92MM F

[1.7]
43

[5.3]
134

[2.3]
57

[4.5]
114

[3.7]
95

[3.7]
95

[3.7]
95

[18.4]
466

[19.0]
482

RearView

POWER SWITCH

[1.1]
29

[0.4]
11

USB-B

LAN

+24 DC

[17.0]
432

[1.0]
25
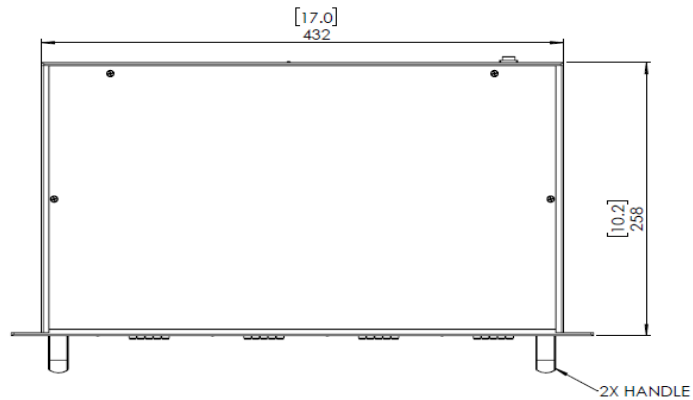
*All dimensions are in millimeters

Contact information: For technical support
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