Jupiter

Pana 105/81 Displays
API and Pana Connect Manual

December 9, 2022
A-PAN-000-02, Rev. B

Acknowledgments

Jupiter Systems® and Jupiter logo® are registered trademarks of Jupiter Systems. New Jupiter logo, Canvas™, Catalyst™, Fusion Catalyst™, Catalyst XL™, Catalyst V™, Catalyst 4K™, CRS-5K™, CRS-4K™, J4™, J100™, J400™, J600™, Zavus™, and Pana™ are trademarks of Jupiter Systems.

Microsoft, Windows are registered trademarks of Microsoft Corporation.

All non-Jupiter brands and names are the property of their respective owners.

Conventions Used in this Manual

Labels from the user Interface (UI) are in **bold** to make it easier to follow instructions. If you see a **bolded** word or set of words, look for the label in the UI. Where possible tabs and dialog boxes are named in instructions as markers so you know you are in the right place.

Jupiter Systems

31015 Huntwood Avenue

Hayward, CA 94544-7007

510-675-1000 (v)

Support Contact

info@jupiter.com

support@jupiter.com

)

Jupiter

Table of Contents

This page has been intentionally left blank

Jupiter

Chapter 1
# PANA COMMAND & CONTROL SYSTEM

This manual describes

- Command and control for Pana displays via API commands using RJ45 based serial port and IP protocols over Ethernet network port

  See *Title 2, Pana IP API Commands,* on page 11.

- Jupiter's Pana Connect — a utility which sends commands to Pana display using serial and IP interfaces

  See *Title 3, Pana Connect API Test Utility,* on page 15.

1.1   IP or Serial Control

The Pana Displays have two RJ45 connectors. One is for IP connections (named Network) and the other is for Serial connections (named RS232).

Figure 1.1: IP and Serial Connection
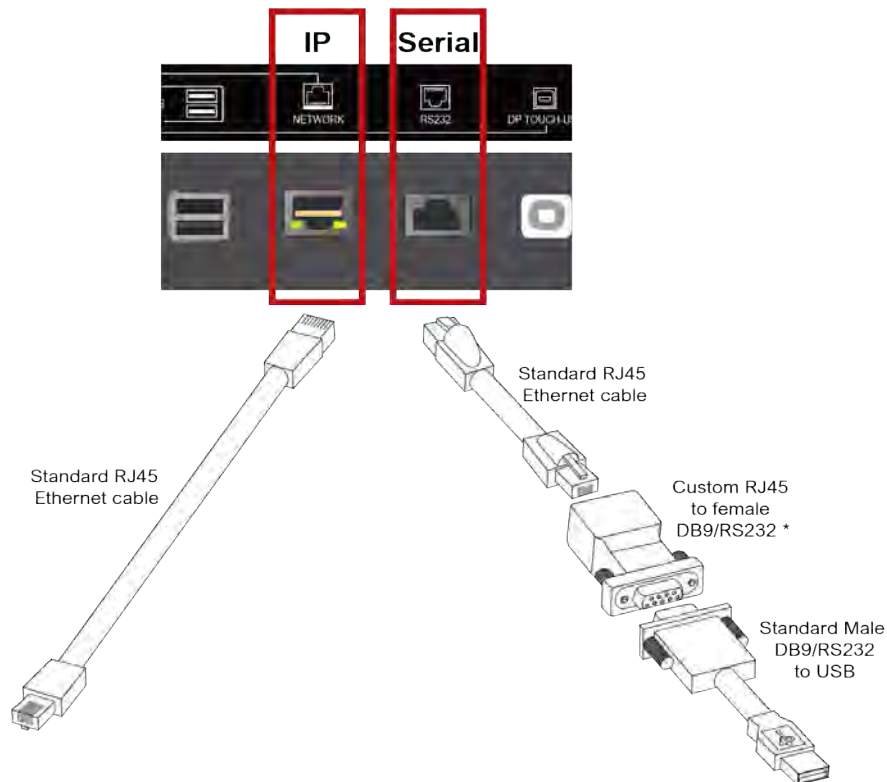
* The custom made RJ45 to DB9/RS232 are available from Jupiter Systems. For creating your own adapter see *Section 1.2.2 Serial Port Pin Map on page 4*.

Note: Whether using the Network port or the RS232 port *Network Control* needs to be turned to *On* in the Advanced menu of the OSD. *Network Control | On* enables serial RS232 and IP based network control.

1.2 Pana Control System Using RS 232 Serial Port

The RS 232 port can be used to control the Pana display via a command set described in *Section 2.2 Command Set on page 12*.

For Serial Connection Control

1   Set *Advanced|Network Control | On*

     Network Control | On enables serial RS232 and IP based network control.

2   *Make physical connection using the RS232 serial port*

3   *Set the serial port configuration*

4   *Send commands*

     See *Section 2.2 Command Set on page 12* for a list of commands.

1.2.1 Serial Port Configuration

Table 1.1: Serial port configuration

Baud Rate	19200
Data Bits	8
Stop Bits	1
Parity Bits	None
Communication Code	Hexadecimal

The connection from the computer may be done with an RJ45 to RS 232/DB-9 adapter using the pin connections described here.

1.2.2 Serial Port Pin Map

If you have an RS-232/DB-9 connections follow Figure 1.2 and Table 1.2. RJ45 Pins for serial connection configuration. See *Figure 1.1, IP and Serial Connection on page 2* for a view of the cable adapters.
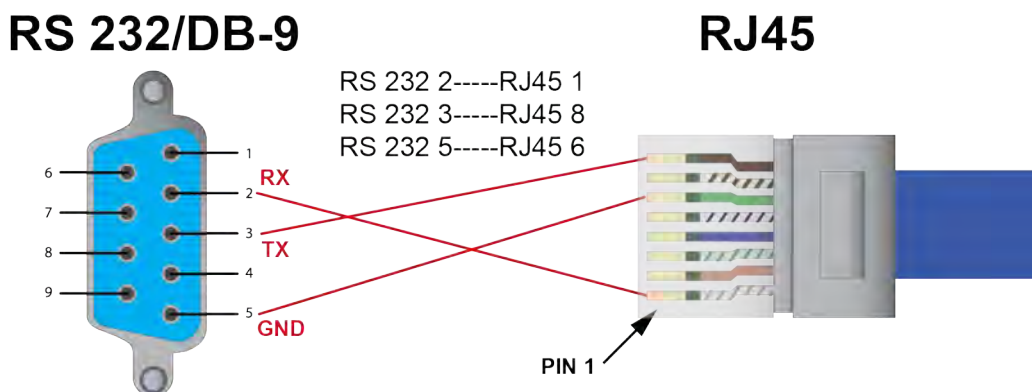
Figure 1.2: Serial port RS 232/DB-9 to RJ45 pin map

Table 1.2: RJ45 Pins

Pin	Definition	Remarks
1	RX	**Choose Either**
2	RX	
3	n/a	
4	n/a	
5	GND	**Choose Either**
6	GND	
7	TX	**Choose Either**
8	TX	

The custom made RJ45 to DB9/RS232 are available from Jupiter Systems.

1.3 Pana Control Using IP

Pana displays come from the factory with a default IP address of192.168.1.239. Port 9999. DHCP is not currently supported.

IP Connection

1 Set *Advanced|Network Control | On*

Network Control | On enables serial RS232 and IP based network control.

2 *Connect Ethernet cable from PC to PANA RJ45 Ethernet port*

If PC does not have Ethernet port, use male USB to female Ethernet RJ45 adapter.

3 *Set the IP address on your PC so that it is in the same subnet as the Pana*

Set your PC to 192.168.1.xxx/255.255.255.0 (the same network segment as the default IP address), but do not use 192.168.1.239, the default IP address. The xxx can be from 1-255.

4 *Verify connection using the default IP address*

The default IP address takes you to the Pana IP Configuration page. Please see *Section 1.4 Pana Communication Configuration Interface on page 8*

5 *Set new IP address*

Please see *Section 1.3.2 Set IP Configuration on page 6* for configuration information. This section also shows how to configure more control options for your device to control the Pana display.

6 *Send commands*

See *Section 2.2 Command Set on page 12* for a list of commands.

Note: By default, the Pana is set for 9999/9999 for local/server ports for TCP/IP and 6666/6667 for group receive/send for UDP/IP mode. However use or set the ports so they are in agreement.

1.3.1 Discover IP Address

As you are on the same subnet you can discover the IP address of the Pana using the arp command in the Windows prompt. Use `arp -a 192.168.1.24 -N`, where `192.168.1.24` is the IP address of the PC host. The result will show the MAC address (Physical Address) as well as the IP address. The first three sets of the Pana MAC address will begin with "00-80-09."

Figure 1.3:

```
C:\Users\CGillespie>arp -a 192.168.1.24 -N

Interface: 192.168.1.24 --- 0x7
  Internet Address      Physical Address      Type
  192.168.1.239         00-80-09-f1-01-47     dynamic
  192.168.1.255         ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static

C:\Users\CGillespie>
```
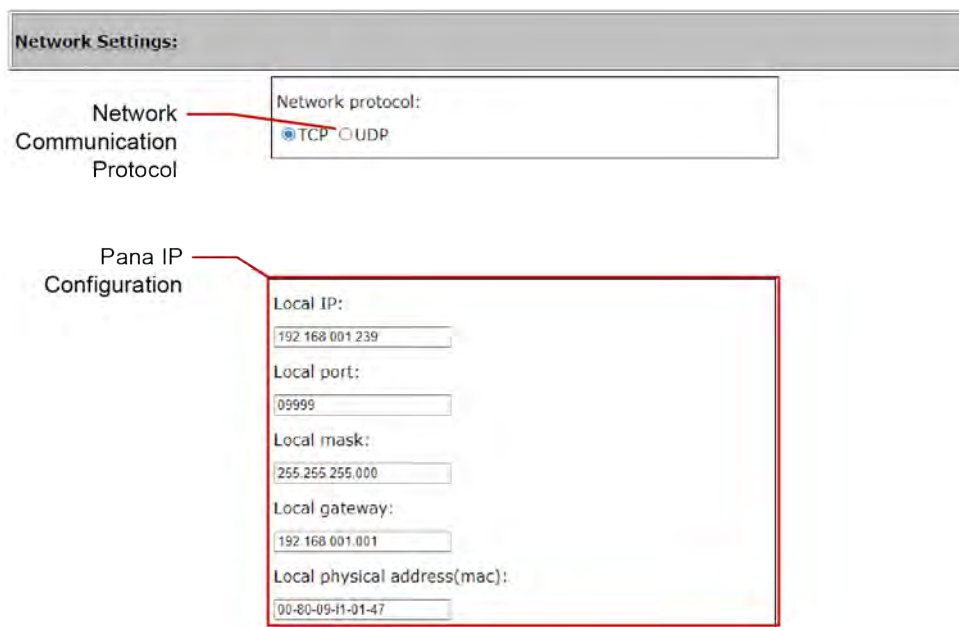
1.3.2 Set IP Configuration

Once you are on the Pana IP Config page you will need to set the following on the display:

- IP address
- Port
- Network communication protocol mode

On the Pana will also need to set the IP and port of the remote-control host which is your PC/control device.

Note: Pana IP addresses and ports configuration should match Pana Connect API Utility IP configuration ports and IP addresses.

1 *Set the IP address, port and Network communication protocol mode on the Pana*

Network Settings:

Network Communication Protocol

Network protocol:
⦿ TCP ○ UDP

Pana IP Configuration

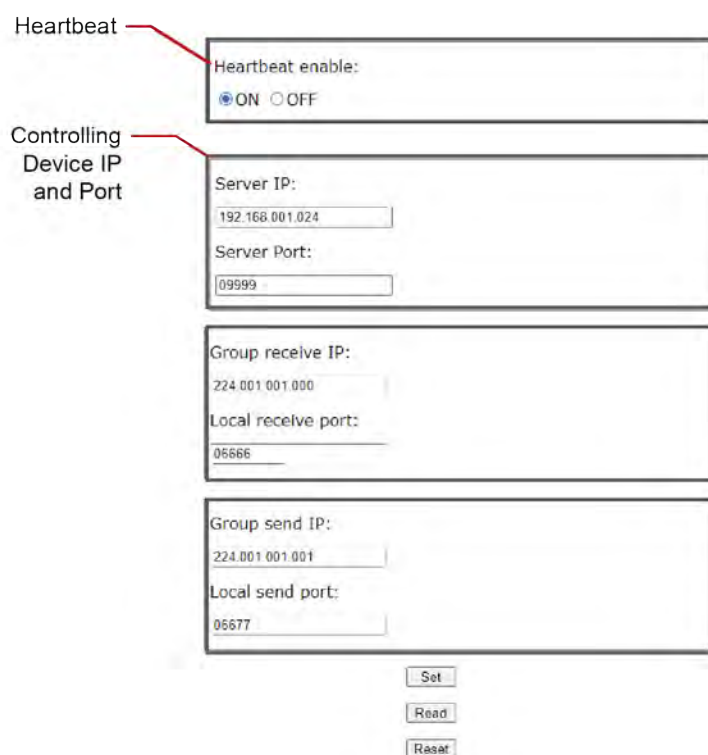Local IP:
192.168.001.239

Local port:
09999

Local mask:
255.255.255.000

Local gateway:
192.168.001.001

Local physical address(mac):
00-80-09-11-01-47

2   *Enable Heartbeat and set information in the Pana for your PC/control device*

Heartbeat sends a packet every few seconds with the Pana IP address heartbeat.

Group receive and Group send are ONLY for receiving and sending control commands to multiple Panas. There is no video multicast or transmission/receipt built into the Pana.
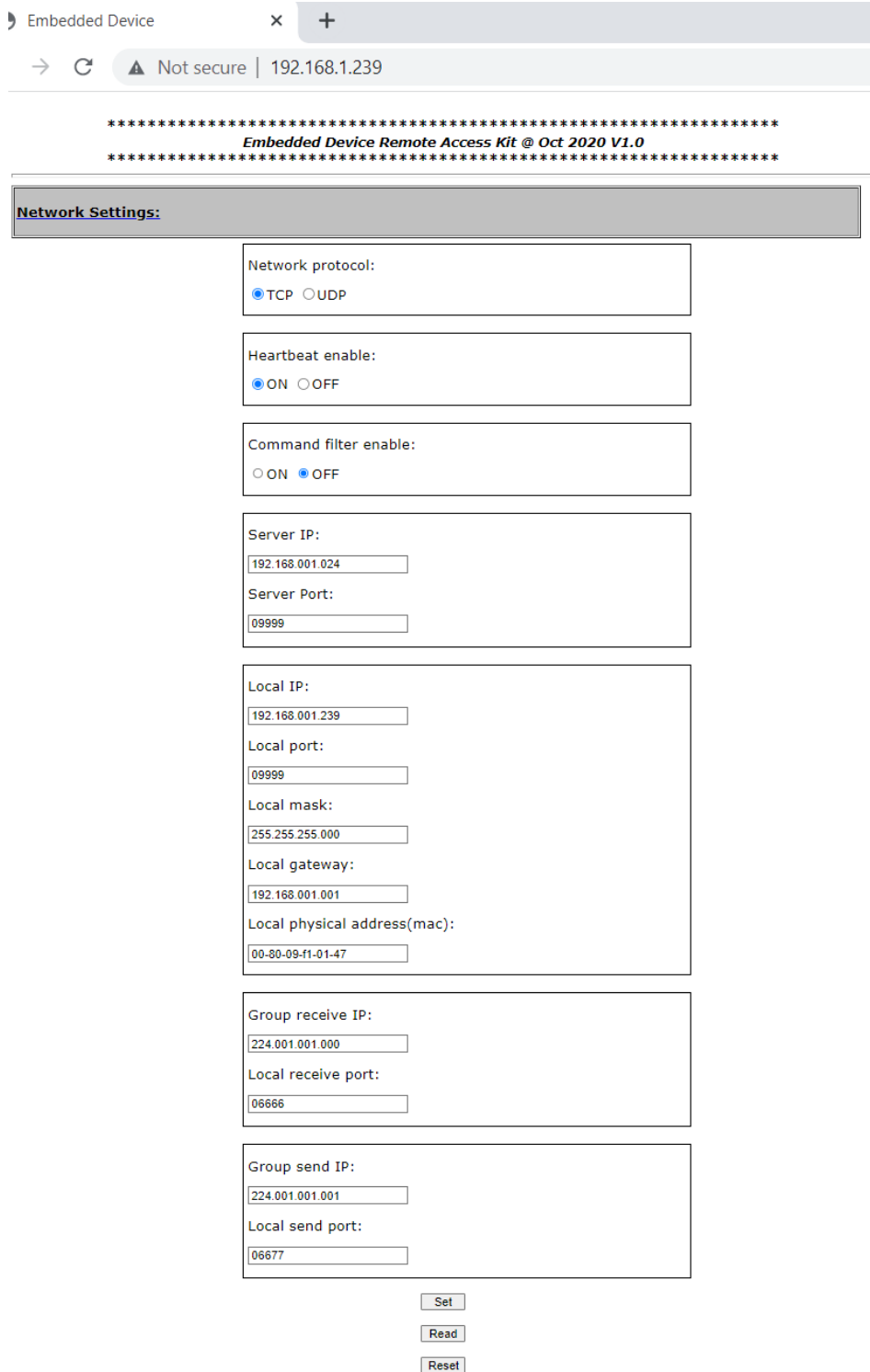
3   *Click **Set** wait for five seconds, then **click Reset***

If you want to verify the settings, five seconds after clicking **Reset**, click **Read**. Most settings will change instantly, however changing the **Local IP** address takes a few seconds.

1.4   Pana Communication Configuration Interface

To open the Pana web page, open the browser and go to the IP address of Pana display.

Figure 1.4: Pana Remote Access Interface

The Pana Communication Configuration Interface web page configures and provides information about the Pana. It can be used to set the correct parameters such as IP address and ports for communication.

To open the Pana web page, open the browser and go to the IP address of Pana monitor.

Note: You need the IP address of the Pana to connect using TCP or UDP. Your system which is sending commands to Pana should be on same subnet as Pana monitor. The default IP address of Pana is 192.168.1.239. If Pana IP address is 192.168.1.239, the system should have IP address 192.168.1.X.

Table 1.3: Pana Remote Access Interface Parameters

Parameter	Description
Network Protocol	Protocol for IP communication with Pana, either TCP or UDP
Heartbeat enable	Heartbeat is the response from the Pana monitor after connection. You can use the **Read** button in the Pana API tool to read the response from Pana after sending API commands to the Pana.
Command filter enable	Enable or disable the command filter
Server IP	IP address of the PC server (your computer) which will be used to send the API commands to the Pana monitor
Server Port	Port used by PC server for communication. It is recommended to use port 9999 for TCP and 6677 port for UDP connections
Local IP	IP address of the Pana monitor
Local Port	Port used by Pana to listen and communicate. It is recommended to use port 9999 for TCP and port 6666 for UDP connection

When parameters are configured in the Pana Communication Configuration Interface web page click **Reset** at the bottom of the page to commit the changes.

Table 1.4: Pana Remote Access Interface Parameters Actions

Parameter	Description
Set	Modifies the configured parameters and saves them into a register
Reset	Commits the configured parameters of the Pana, the new behavior will occur after clicking **Reset**. For example if you change the IP address you need to click **Set**, then **Reset**, then the Pana will be accessible by the new IP address
Read	Reads the existing parameter from the register. Can be used to verify the existing parameters. **Note** that if you restart the Pana without doing a **Reset**, the configured items such as IP address will not change the behavior of the Pana. It will still respond to the original IP address. To commit the configured items fully you need to click **Reset**.

This page has been intentionally left blank

Chapter 2
PANA IP API COMMANDS

This chapter describes essential command format information including how to calculate checksum as well as the list of available commands.

2.1 Command Format Checksum

Table 2.1: Command Format

Head 1	Head 2	Command Length	Command	ID1	ID2	Parameter	Checksum
Always 0xFF	Always 0x55			0x01	0x01		

Every command in the *Table 2.3.Commands on page 12* has Head 1 and Head 2, so 0xFF 55 needs to be added.

Table 2.2: Command Length and Checksum

Parameter	Description
Command Length	The total byte quantity from "Command" segment to Parameter segment.
Checksum	The lower 8bits of sum result of all the valid bytes "Command+ID1+ID2+Parameter" **Example1:** 0x83+0x01+0x01+0x00=0x85, Checksum=0x85 **Example2:** 0x83+0xAA+0x0AA+0x00=0x1D7, Checksum=0xD7

Jupiter

2.2 Command Set

These symbols (##) denote the two hexadecimal digits for checksum.

Note: The Hex commands shown in the **Command** and **Return** columns in the below table are shown for human readability. The commands sent to the Pana cannot have these spaces,

---

Table 2.3: Commands

Function	Command	Return	Comments
Get Power Status	04 3B 01 01 00 3D	04 3B 01 ** 00 ##	** Power Status 01, Power Off 02, Power Saving
Power On	04 84 01 01 00 86		
Power Off	04 83 01 01 00 85		
Get Volume Setting	04 9C 01 01 00 9E	04 9C 01 ** 00 ##	** Volume Setting, range 0-100 00 is the hex value for 0, 64 is the hex value for 100
Set Volume to 100	04 B6 01 01 64 1C		64 is the hex value for 100, 1C is the checksum value
Set Volume to 0	04 B6 01 01 00 B8		00 is the hex value for 0, B8 is the checksum value
Volume –	04 79 01 01 00 7B		
Volume +	04 7A 01 01 00 7C		
Get Mute/Unmute Status	04 9E 01 01 00 A0	04 9E 01 ** 00 ##	** Mute Status 00, Muted 01, Unmuted
Set Mute/Unmute	04 A6 01 01 00 A8		
Set Input Type C	04 89 01 01 01 8C		
Set Input DP	04 89 01 01 02 8D		
Set Input HDMI	04 89 01 01 04 8F		For 105/81D models this input is HDMI, on T models it is HDMI 2
Set Input HDMI 1	04 89 01 01 05 90		This input is only found on the 105T/81T units
Set Input OPS	04 89 01 01 03 8E		
Set Input Auto	04 89 01 01 09 94		

Table 2.3: Commands

Function	Command	Return	Comments
Get Brightness Status	04 70 01 01 00 72	04 70 01 ** 00 ##	** Brightness Setting, range 0-100 00 is the hex value for 0, 64 is the hex value for 100
Set Brightness	04 50 01 01 ** ##		** Brightness Setting, range 0-100 00 is the hex value for 0, 64 is the hex value for 100
Set Brightness to 100	04 50 01 01 64 B6		64 is the hex value for 100, B6 is the checksum value
Set Brightness to 50	04 50 01 01 32 84		32 is the hex value for 0, 84 is the checksum value
Set Brightness to 0	04 50 01 01 00 52		00 is the hex value for 0, 52 is the checksum value
Enter OSD	04 76 01 01 00 78		
Exit OSD	04 7D 01 01 00 7F		

This page has been intentionally left blank

Jupiter

Chapter 3
PANA CONNECT API TEST UTILITY

Jupiter

The Pana Connect API test utility is used to send API commands to Pana 81/105 displays.

The Pana Connect web page sets the communication parameters such as Server IP address and ports for communication.

Pana Connect is a handy tool for seeing the behavior of each command.

3.1 Pana Connect User Interface
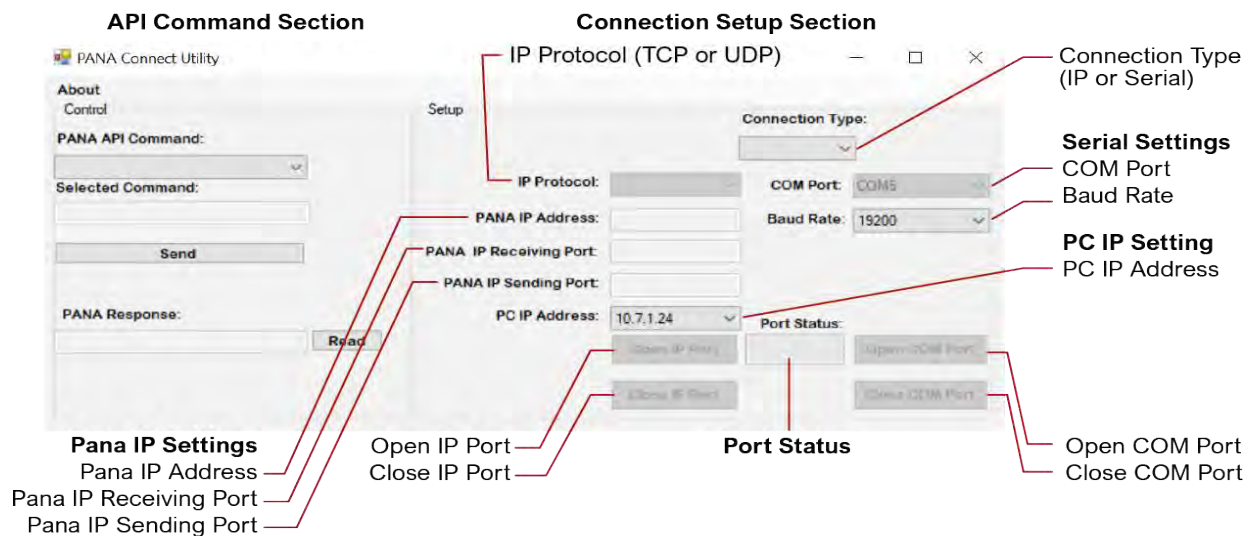
Figure 3.1: API Tool Communication Connection

Table 3.1: API Tool Communication Connection Parameters

Parameter	Description
Connection Type	Communication either via *IP* or *Serial* connector
IP Protocol	Protocol for IP communication with Pana, either *TCP* or *UDP*
Pana IP Address	IP address of the Pana. By default it is 192.168.1.239. Must be set if *Connector Type* is *IP*

Table 3.1: API Tool Communication Connection Parameters

Parameter	Description
Pana IP Receiving Port	Port on the Pana for communication. Must be set if **Connector Type** is **IP**
PC IP Sending Port	Port on the Pana for communication. Must be set if **Connector Type** is **IP**
PC IP Address	IP address of the PC running the Pana Connect application. The IP address must be set on the PC and be in the same subnet as the IP address of the Pana
Port Status	The box area under **Port Status** displays green when the **Open IP Port** or **Open COM Port** action is successful. Message will display if connection is not successful
Open IP Port/Close IP Port	Opens the IP Port. Closes the IP Port
Open COM Port/Close COM Port	Opens the COM Port. Closes the COM Port

3.1.1 Pana Connect via Serial

When you select Serial, connect to the PANA with a RJ45 to RS232 adapter using pin connections. Pana API Utility will automatically display the active COM Port after connecting RJ45 to RS232 on Pana

For information about configuring a serial connection see *Section 1.2 Pana Control System Using RS 232 Serial Port on page 3*.

Figure 3.2: Configure elements for Serial connection

1 *From the **Connection Type** dropdown select **Serial***

2 *Select the **COM Port***

Figure 3.3: Serial COM Port from Device Manager
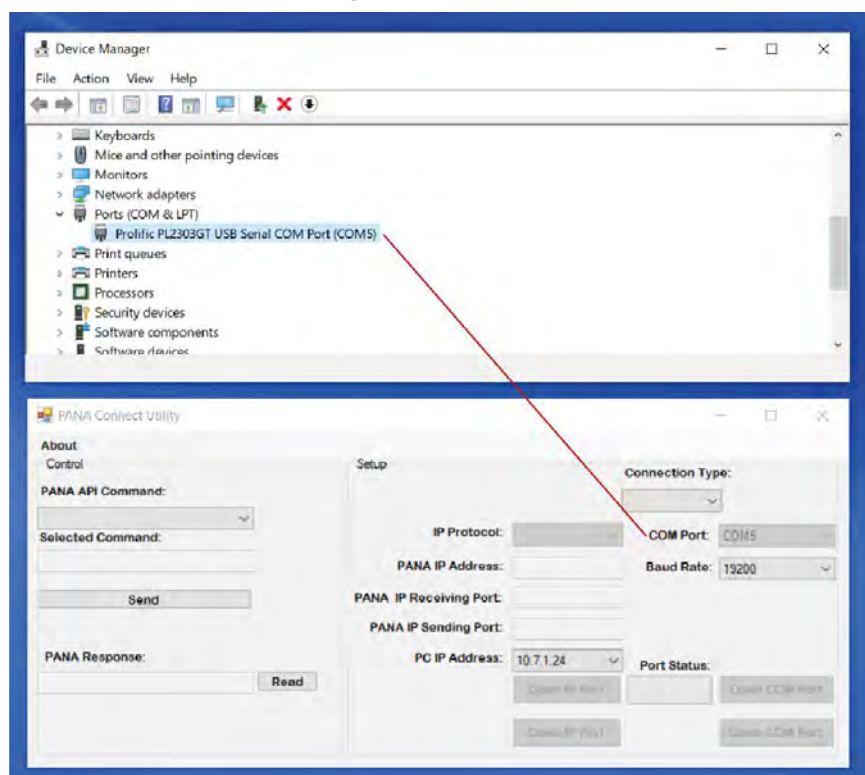
When you connect a serial port (even a USB to RS232/DB9 adapter), Device Manager will display the **Ports (COM & LPT)** devices

3 *Select **19200** for the **Baud Rate***

4 *Click **Open COM Port***

Figure 3.4: Successful opening of COM port
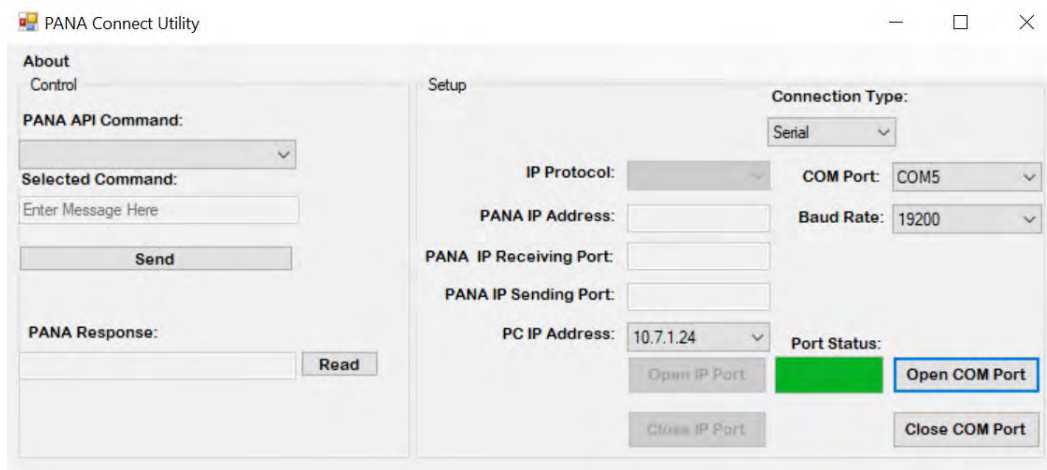
3.1.2 Pana Connect via IP
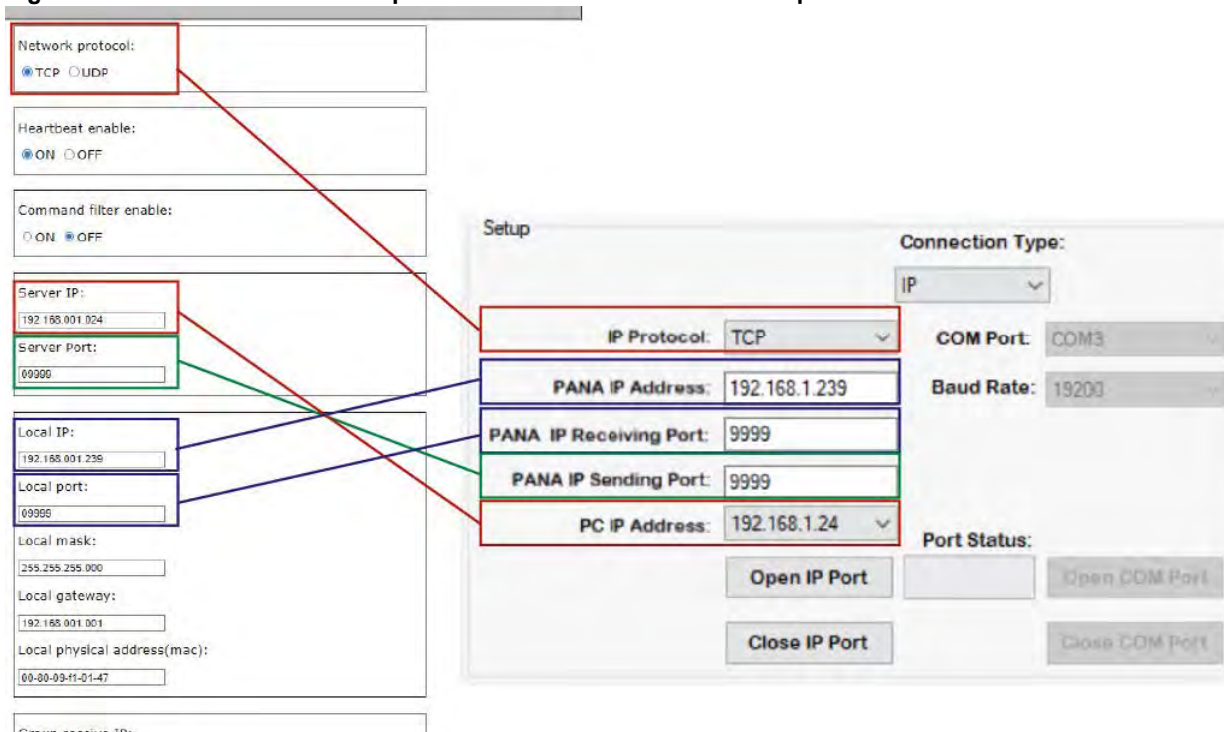
This procedure requires that you have set an appropriate IP address on your host PC.

Note: You need the IP address of the Pana to connect using TCP or UDP. Your system which is sending commands to Pana should be on same subnet as Pana monitor. The default IP address of Pana is 192.168.1.239. If Pana IP address is 192.168.1.239, the system should have IP address 192.168.1.X.

If any of the required information is missing, a message box with "required field missing" will appear when you click **Open IP Port**.

3.1.2.1 IP Connect via TCP

Figure 3.5: Pana Communication provides info for API Test Tool setup — TCP

IP Connection Procedure — TCP

1 *From the **IP Protocol** dropdown select **TCP***

Ports will need to be defined for sending and receiving on the Pana. For this example we will use the following ports:

If using TCP set the **Pana IP Sending Port** to **9999** and set the **Pana IP Receiving Port** to 9999 which are the defaults for the Pana. The setting in Pana Connect must be in agreement with the Pana settings.

2 *In the **Pana IP Address** text box enter the IP address of the Pana*

Copy from **Local IP** from the Pana Communication Setup page.

3 *In the **Pana IP Sending Port** text box enter the port of the Pana*

Copy from **Local port** from the Pana Communication Setup page.

4 *In the **PC IP Address** select the IP address from the dropdown which is in the same subnet as the Pana*

5 *In the **PC IP Listening Port** text box enter the port of the host PC*

Copy from **Server Port** from the Pana Communication Setup page.

6 *Click **Open IP Port***

When the connection is made Port Status will be green.
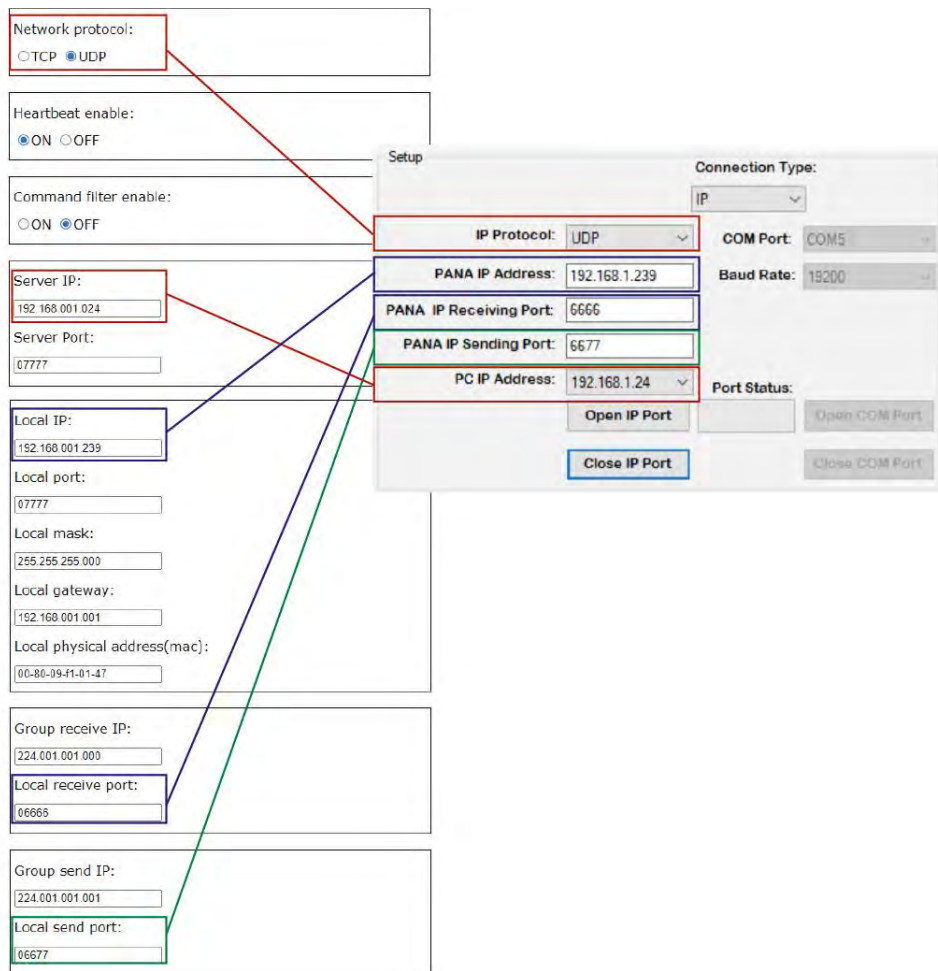
Figure 3.6: IP Port Open
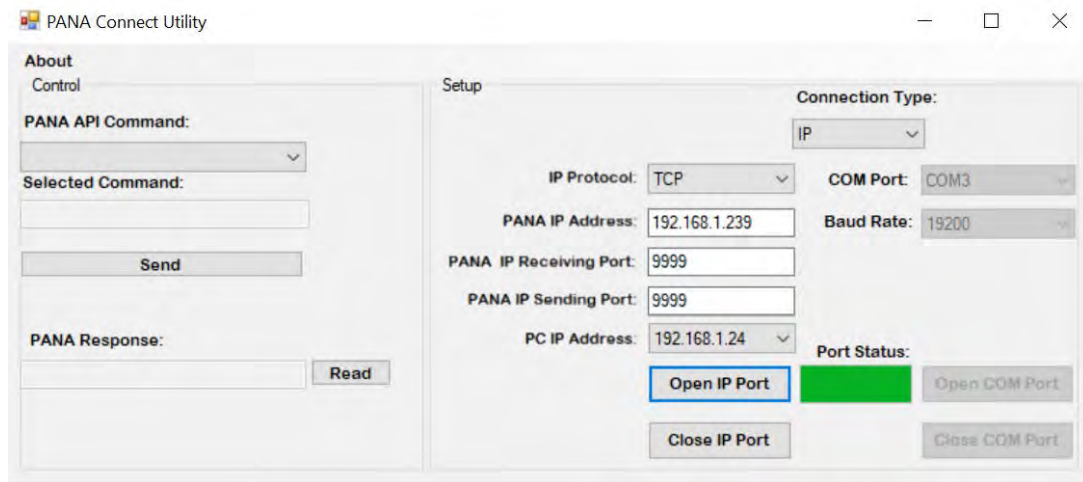
If any of the required information is missing, a message box with "***required field missing***" will appear when you click **Open IP Port**.

3.1.2.2　IP Connect via UDP

Figure 3.7: Pana Communication provides info for API Test Tool setup — UDP

IP Connection Procedure — UDP

1　*From the **IP Protocol** dropdown select **TCP***

Ports will need to be defined for sending and receiving on the Pana. For this example we will use the following ports:

If using **UDP** set the **Pana IP Sending Port** to **the Local receive port** and set the **Pana IP Receiving Port** to **Local send port**.

2　*In the **Pana IP Address** text box enter the IP address of the Pana*

Copy from **Local IP** from the Pana Communication Setup page.

3　*In the **Pana IP Sending Port** text box enter the port of the Pana*

Copy from **Local port** from the Pana Communication Setup page.

4　*In the **PC IP Address** select the IP address from the dropdown which is in the same subnet as the Pana*

5　*In the **PC IP Listening Port** text box enter the port of the host PC*

Copy from **Server Port** from the Pana Communication Setup page.

6 *Click* ***Open IP Port***

When the connection is made Port Status will be green.

Figure 3.8: IP Port Open
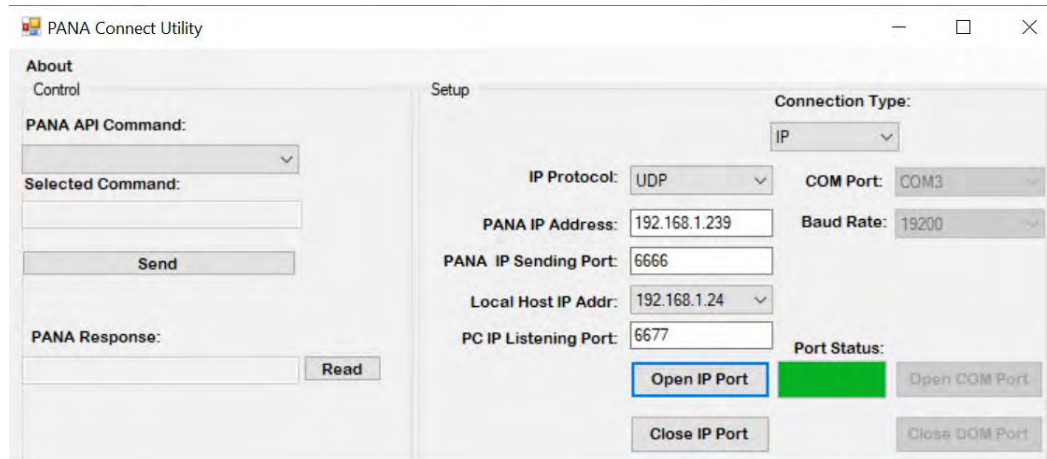
If any of the required information is missing, a message box with "***required field missing***" will appear when you click ***Open IP Port***.

3.2 Adding Commands

The Pana Connect application fetches the commands from the `PANA_API_COMMANDS.csv` file upon launch when the file is in the same directory as the Pana Connect application.

You can use this existing file to add/edit the commands as long as you do not change the file name.

To add commands add the name of the command in column A. In column B add the hex command. Make sure to have the hex command has no spaces. Save the `PANA_API_COMMANDS.csv` file before launching the test tool application.

Note: The `.csv` filename must be `PANA_API_COMMANDS.csv` and must be saved as a `.csv` file

Figure 4: CSV input file

	A	B
1	Get Power Status	FF55043B0101003D
2	Power On	FF55048401010086
3	Power Off	FF55048301010085
4	Get Volume Setting	FF55049C0101009E
5	Set Volume to 100	FF5504B60101641C
6	Set Volume to 0	FF5504B6010100B8
7	Volume -	FF5504790101007B
8	Volume +	FF55047A0101007C
9	Get Mute/Unmute Status	FF55049E010100A0
10	Set Mute/Unmute	FF5504A6010100A8
11	Set Input Type C	FF5504890101018C
12	Set Input DP	FF5504890101028D
13	Set Input HDMI 2	FF5504890101048F
14	Set Input HDMI 1	FF55048901010590
15	Set Input OPS	FF5504890101038E
16	Set Input Auto	FF55048901010994
17	Get Brightness Status	FF55047001010072
18	Set Brightness	FF55045001**##
19	Set Brightness to 100	FF550450010164B6
20	Set Brightness to 50	FF55045001013284
21	Set Brightness to 0	FF55045001010052
22	Enter OSD	FF55047601010078
23	Exit OSD	FF55047D0101007F
24	Enter Factory Menu	FF55047E01010080
25		

3.3 Test Interface

The Pana Connect application fetches the commands from the `PANA_API_COMMANDS.csv` file and makes them available in the **PANA API Command** dropdown
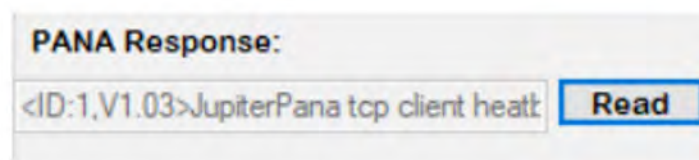
Figure 3.1: Pana API Test Utility Interface
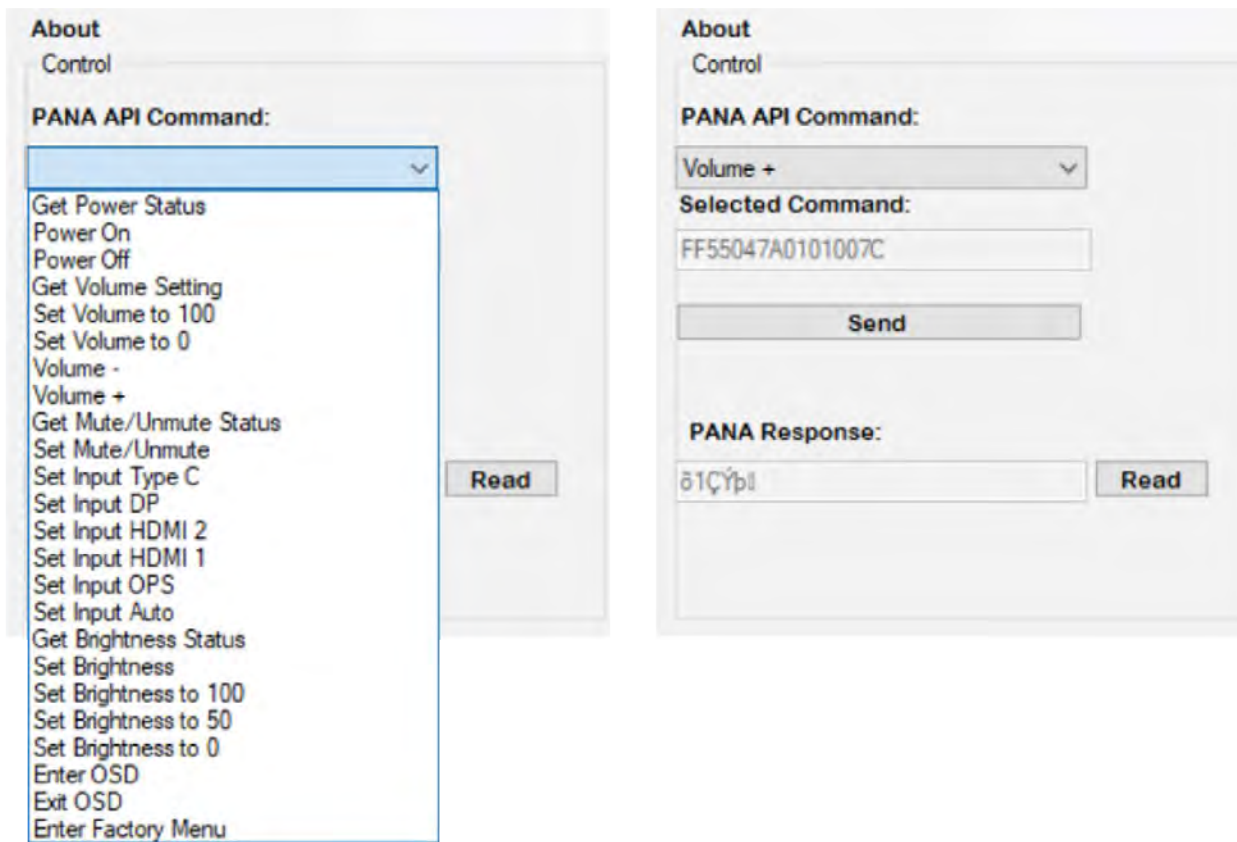
Test Command Procedure

1 *Select a command from the **PANA API Command** dropdown*

2 *Click **Send***

3 *Visually verify the Pana behavior*

Figure 3.2: Pana Response

Chapter 4
TECHNICAL SUPPORT

4.1 Technical Assistance

If you require technical assistance, please contact Jupiter Systems' technical support team. Please provide as much information to the support team about the fault and any steps you have taken in trying to resolve the issue.

4.2 Contact Information

- Website
  www.jupiter.com /support

- Phone
  1-510-675-1000

- Email
  support@jupiter.com

- Mail (physical)
  ATTN: Technical Support
  Jupiter Systems
  31015 Huntwood Avenue
  Hayward, CA 94544-7007

This page has been intentionally left blank

Jupiter

Index