### **GV-IO Box 16 Ports / GV-IO Box 16E**

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### GV-IO Box 16 Ports / GV-IO Box 16E

The GV-IO Box 16 series provides 16 inputs and 16 relay outputs, and supports both DC and AC output voltages.

### 1. Key Features

- 16 inputs and 16 outputs are provided.
- Up to 9 pieces of GV-IO Box 4 / 8 / 16 ports can be chained together.
- A USB port is provided for PC connection (max. 30V DC, 3A output).
- Up to 16 connections from GeoVision software are allowed to control one GV-IO Box (GV-IO Box 16E required).
- Supports GV-IoT mobile app for remote management (GV-IO Box 16E of firmware V2.00 or later required)

#### 2. Models

The GV-IO Box 16 series includes two models:

- GV-IO Box 16 Ports
- GV-IO Box 16E (which includes an Ethernet module with network connectivity)

#### 3. Compatible Software

- GV-DVR / NVR / VMS
- GV-ASManager
- GV-Control Center
- GV-Center V2

**Note:** GV-ASManager and GV-Control Center only accept network connection from GV-IO Box.

### 4. Packing List

- 1. GV-IO Box
- USB Cable (Type A to B, only for GV-IO 4. Download Guide Box 16 Ports)

### 5. Overview



3. Power Adapter DC 12V



#### 6. DIP Switch

The GV-IO Box allows the mix of dry and wet contact devices together. The 16 inputs are divided into four-in-one groups (A, B, C and D) and are related to the 4 switches on the box for dry and wet contact.





To change the inputs to wet contact, push the switch upward.

To change the inputs to dry contact, push the switch downward.

#### Note:

- The RS-485 connectors do not support the conversion function from RS-485 to RS-232. Do not connect RS-485 devices, such as PTZ camera, to the connectors.
- 2. To add a **GV-IO Box 16 Ports** to GV-DVR/NVR version 8.2 or later, select **GVIO-USB (16)** from the Device drop-down list in the System Configure dialog box.

### 7. Connections to PC

There are three ways to connect GV-IO Box to a PC. Only one of the three methods can be applied at a time.

- (1) **USB cable:** Use the USB cable to connect a PC.
- RS-485 wiring: Through the option of GV-Hub, GV-COM, GV-NET Card or GV-NET/IO Card, use the RS-485 connectors to connect to a PC. RS-485 connection is suitable for longer distance wiring of up to 600 m / 1968.5 ft.
- (2) Network: GV-IO Box 16E is required. See 7. Accessing GV-IO Box 16 Ports over Networks.
- 1. Use the USB cable to connect GV-IO Box to a PC. (Allowed for DC Output Voltage only)



Note: It is required to install the USB driver. See 6.1 Installing USB Drive.

2. Use the RS-485 connectors to connect GV-IO Box to a PC. (Allowed for AC/DC Output Voltage)





#### 7.1 Installing USB Driver

To use the USB function, it is required to install the driver on the PC. Follow these steps to install the driver:

1. Download and install the USB Driver from the website.

🛥 GeoVision USB Drive	r Installer	X
Install	Remove	Exit

- 2. Click **Install** to install the drivers. When the installation is complete, this message will appear: *Install Successfully*.
- 3. Click **Exit** to close the dialog box and restart the PC.

To verify the drivers are installed correctly, go to Windows **Device Manager** after restarting the PC. Expanding the **Ports** field, you should see **XR21B1411 USB UART**. The COM number in the parenthesis indicates the COM port currently in use.



**Note:** If you unplug the GV-IO Box 16 Ports from the PC and connect another GV-IO Box to the same USB port, the COM port may be changed. Access the Windows **Device Manager** again to look up the new COM port number.

#### 7.2 Assigning Addresses to GV-IO Box

You can connect any type of GV-IO Box model together through RS-485 wiring. Up to 9 pieces of GV-IO Box can be chained together to expand the IO capacity. Use the ID switch (1~9) to assign addresses 1~9 to each GV-IO Box.



Note: The maximum distance for RS-485 connection is up to 600 m / 1968.5 ft.

#### **ID Switch**



- 1. Addresses 0 and A to F are NOT functional.
- 2. Assign the addresses when the power is off.
- If you want to change the assigned address of the connected GV-IO Box, set the switch to the new address and re-plug the power adaptor.



#### 7.3 Extending Transmission over the Distance

When the transmission signals between the RS-485 communications become weak over the distance, switch on the Terminal Resistance Switches to maintain their stability. Three conditions below illustrate the typical scenarios in which the Terminal Resistance Switches should be switched on.

## 1. Multiple pieces of GV-IO Box are connected to a PC through one single RS-485 cable.

After you connect multiple pieces of GV-IO Box with a PC, only switch on the Terminal Resistance Switches in the first and last connected pieces of GV-IO Box.



**Note:** If you connect **GV-IO Box 4 Ports** as the first device to a PC, do not use the USB cable. Instead, use the RS-485 cable and you need the optional device GV-Hub, GV-COM, GV-NET Card or GV-NET/IO, to connect the RS-485 device to the PC.

#### 2. Multiple pieces of GV-IO Box are connected to a PC through a RS-485 converter.

After you connect multiple pieces of GV-IO Box with a PC through a RS-485 converter, such as GV-NET/IO Card and GV-Hub, insert a Terminal Resistor in the converter and switch on the Terminal Resistance Switch of the last connected GV-IO Box.



## 3. Multiple pieces of GV-IO Box are connected to a PC through separate RS-485 cables.

After you connect multiple pieces of GV-IO Box to a PC through separate RS-485 cables, switch on Terminal Resistance Switches of the connected piece of GV-IO Box at the end of each cable.



#### **Terminal Resistance Switch**



The default setting of the Switch is OFF. To switch on the Terminal Resistance Switch, push the switch downward.



#### 8. Accessing GV-IO Box 16 Ports over Networks

You can link the GV-IO Box to GV-DVR / NVR / VMS, GV-ASManager and GV-Control Center over networks for IO management. While accessing the GV-IO Box, make sure the connected network is stable and the following system requirement is met:

• Microsoft Internet Explorer 8.0 or later

Note: For I/O management over network, GV-IO Box 16E is required.

There are three ways to set up GV-IO Box on a network:

- 1. By default, when the GV-IO Box is connected to a network with DHCP server, a dynamic IP address is assigned to the GV-IO Box.
- 2. When the DHCP server on your network is unavailable or disabled, the GV-IO Box is accessible by the default IP **192.168.0.100**. See *7.1 Fixed IP Connection* for details.
- 3. You may also use the DDNS (Dynamic Doman Name system) instead of an IP address to access the GV-IO Box. For details on the domain name service, see *7.2 DHCP Connection*.

Note: Notice these specifications for GeoVision software applications:

- GV-IO Box is linked to GV-DVR / NVR / VMS by using the Virtual IO function. GV-DVR / NVR / VMS supports up to 9 IO modules which include real and virtual IO devices linked through the network.
- 2. Up to 16 connections from GeoVision software are allowed to control one GV-IO Box.



#### 8.1 Fixed IP Connection

To assign GV-IO Box to a fixed IP:

- 1. Open an Internet browser, and type the default IP address <u>https://192.168.0.100</u>. The login dialog box appears.
- 2. Type default value **admin** for both Username and Password, and click **OK**. This page appears.

	Network Configuration	
	Machine Name	
Network Setting     Other Setting	Machine Name	GV-IOBOX 16E
Input Setting	DHCP Client	
Output Setting	Enable	
<ul><li>In/Out Monitor</li><li>Firmware Update</li></ul>	O Disable	
Account Setting     System Let Viewer	IP Address	192 . 168 . 4 . 127
About	Subnet Mask	255 . 255 . 248 . 0
	Default Gateway	192 . 168 . 0 . 1
	Domain Name Server	8.8.8.8

- 3. In the Machine Name field, edit the name of the connected GV-IO Box.
- 4. Click **Disable**. Type the static IP address information, including IP Address, Subnet Mask, Default Gateway and Domain Name Server.
- 5. Click **Submit**. When the setting is complete, the Status field will indicate *Register Success*. Then GV-IO Box can be accessed through the fixed IP address.

**Note:** If want to use the domain name instead of an IP address, you may use the Domain Name Service. For details on domain name service, see 7.2 DHCP Connection.



#### 8.2 DHCP Connection

DDNS (Dynamic Domain Name System) provides another way of accessing GV-IO Box when using a dynamic IP from a DHCP server. DDNS assigns a domain name to GV-IO Box so that GV servers can always access GV-IO Box by using the domain name.

To enable the DDNS function, first you should apply for a domain name from the DDNS service provider's website. There are 2 providers listed in GV-IO Box: **GeoVision DDNS Server** and **DynDNS.org**. To register at GeoVision DDNS Server, see the following instructions. For details on DynDNS, please consult them at <u>www.dyndns.org</u>.



#### **Registering a DDNS Domain Name**

To obtain a domain name from the GeoVision DDNS Server:

 Click the GeoVision DDNS button on the Network Configuration page. Or open an Internet browser and type the Web address <u>http://ns.dipmap.com/register.aspx</u>. This page appears.

legister	
Username: Somerset01	Username
Password:	Username is 16-character maximum; username may not start with spaces or minus signs ('-'). Username will be your bootname
Re-type Password:	Password
	The password is case-sensitive.
Enter the characters as they are shown in the	Word Verification
box below. IBucy	This step helps us prevent automated registrations.

- In the Username field, type a name. Username can be up to 16 characters with the choices of "a ~ z", "0 ~9", and "-". Note that space or "-" cannot be used as the first character.
- 3. In the Password filed, type a password. Passwords are case-sensitive and must be at least 6 characters. Type the password again in the Re-type Password field for confirmation.
- 4. In the Word Verification section, type the characters or numbers shown in the box. For example, type *i8UCY* in the required field. Word Verification is not case-sensitive.
- Click the Send button. When the registration is complete, this page will appear. The Hostname is the domain name, consisting of the registered username and "dipmap.com", e.g. somerset01.dipmap.com.



Note: The registered username will be invalid if it is not used for over a month.



#### 8.3 Configuring GV-IO Box on Internet

After acquiring a domain name from the DDNS Server, you need to configure the domain name on GV-IO Box so that GV servers can access GV-IO Box by using the domain name on the Internet.

- 1. Follow Steps 1 and 2 in *7.1 Fixed IP Connect*ion section. The Network Configuration page appears.
- 2. Click Enable and select Send to DDNS.
- 3. Type **Host Name**, **User Name** and **Password** that are registered on the DDNS Server. If you select GeoVision DDNS, the system will automatically bring up the Host Name.

( Coollision	Network Configuration	
	Machine Name	
Network Setting	Machine Name	GV-IOBOX 16E
<ul> <li>Other Setting</li> <li>Input Setting</li> </ul>	DHCP Client	
Output Setting	Enable	
<ul><li> In/Out Monitor</li><li> Firmware Update</li></ul>	○ Disable	
Account Setting     System Log Viewer	IP Address	192 . 168 . 4 . 127
About	Subnet Mask	255 . 255 . 248 . 0
	Default Gateway	192 . 168 . 0 . 1
	Domain Name Server	8.8.8.8
	Domain Name Service	
	Disable	
	○ Send to LocalDDNS	
	Server IP	192 . 168 . 0 . 10
	Device Name	user
	○ Send to DDNS	GeoVision DDNS  GeoVision DDNS
	Host Name	
	User Name	
	Password	
	Cloud Service	

4. Click **Submit**. When the setting is complete, the Status field will indicate: Register Success. Then GV-IO Box can be accessed with this domain name.



#### 8.4 Enabling the Cloud Service

The Cloud Service enables you to assign your GV-IO Box 16 Ports to a GV-Cloud Center account so you can use the GV-IoT mobile app to define the input and output pins and trigger output devices remotely. For details, see the <u>GV-IoT Installation Guide</u>.

1. In the left menu, click **Network Setting**. When the Network Configuration page appears, scroll down to the Cloud Service section.

Cloud Service	
• Disable	
○ Enable	
User Name	
Password	
Submit Cancel	

- 2. Click Enable and enter your GV-Cloud Center User Name and Password.
- 3. Click **Submit** to save the settings.



#### 8.5 Other Setting

Other Configuration GeoUision: **Device ID Device ID Network Setting** 1 🗸 **Other Setting Connection to IO-BOX** Input Setting **Output Setting** TCP/IP 🗸 **Connection to IO-BOX** In/Out Monitor **Communication Port** • Firmware Update Account Setting **Communication Port** 10000 System Log Viewer Mac Address / Firmware Version About Mac Address 00:13:E2:FF:33:08 Ethernet Module Version V2.0.7\_20200915 Reboot System / Set Default Reboot **Reboot System:** Default **Default Value:** Submit Cancel

In the left menu, click Other Setting. This page appears.

[Device ID] Indicates the current ID of the device.

**[Connection to IO-BOX]** Select **Enable** to use GV-IO Box through a network or select **Disable** to use GV-IO Box through USB or RS-485 connection. GV-IO Box cannot support more than one method simultaneously.

[Communication Port] Keeps the default port value 10000.

[Mac Address/Firmware Version] Indicates the MAC address of the network medium and the Ethernet module version of GV-IO Box.

#### [Reboot System/Set Default]

- Reboot System: Performs a warm boot of GV-IO Box. This operation keeps the current configuration.
- Default Value: Resets all configuration parameters back to factory settings. This may take 5 seconds to complete.

**Note:** If you switch the connection from USB or RS-485 to network, first remove the USB or RS-485 cable from GV-IO Box before selecting **Enable** in this setting page; otherwise, the network connection will not function.

#### 8.6 Input Setting

In the left menu, click Input Setting. This page appears.

	Inpu	t Configura	ition			
Geovision	Inpu	t Setting				
Network Setting		Enable	Name	Output Mode	Pulse Mode D	elay Time(1 - 255)
Other Setting	1	$\checkmark$	Output 1	5) Pulse Mode N/O 🗸	255	Sec
Input Setting	2	$\checkmark$	Output 2	2) Normal Mode N/C 🗸	0	Sec
Output Setting	3	$\checkmark$	Output 3	3) Toggle Mode N/O 🗸	0	Sec
In/Out Monitor	4	$\checkmark$	Output 4	4) Toggle Mode N/C 🗸	0	Sec
Firmware Update     Account Setting	5	$\checkmark$	Output 5	1) Normal Mode N/O 🗸	1	Sec
System Log Viewer	6	$\checkmark$	Output 6	1) Normal Mode N/O V	1	Sec
About	7	$\checkmark$	Output 7	1) Normal Mode N/O 🗸	1	Sec
	8	$\checkmark$	Output 8	1) Normal Mode N/O V	1	Sec
	9	$\checkmark$	Output 9	1) Normal Mode N/O 🗸	1	Sec
	10		Output 10	1) Normal Mode N/O ∨	0	Sec
	11	<b>v</b>	Output 11	1) Normal Mode N/O ∨	0	Sec
	12		Output 12	1) Normal Mode N/O ∨	0	Sec
	13	~	Output 13	1) Normal Mode N/O ∨	0	Sec
	14		Output 14	1) Normal Mode N/O ∨	0	Sec
	15		Output 15	5) Pulse Mode N/O V		Sec
	16		Output 16	6) Pulse Mode N/C		Sec
	10	•	- Ouplit To	of this mode the		000
	Su	omit Canc	el			

- Enable: Select to enable this Input function to be used by GV-IO Box.
- Name: Name the input. The name is restricted to 16 alphanumeric characters or 5 Chinese characters.
- Input Mode: Configure the input to NC (normally closed) or NO (normally open) mode.
- Enable Latch: Instead of a constant output of N/O or N/C, this option provides a momentary alarm when triggered.
- Alarm Output: Select None for no alarm output, or select between Output 1 and Output 16 to trigger when input is detected.

Click the **Submit** button to save the changes, or click the **Cancel** button to return the changes to its previous state.



### 8.7 Output Setting

Outp	ut setting				
	Enable	Name	Output Mode	Pulse Mode	Delay Time(1 - 255)
1	$\checkmark$	Output 1	5) Pulse Mode N/O 🗸	255	Sec
2	$\checkmark$	Output 2	2) Normal Mode N/C 🗸	0	Sec
3	$\checkmark$	Output 3	3) Toggle Mode N/O 🗸	0	Sec
4	$\checkmark$	Output 4	4) Toggle Mode N/C ∨	0	Sec
5	V	Output 5	1) Normal Mode N/O ✓	1	Sec
6	<b>V</b>	Output 6	1) Normal Mode N/O V	1	Sec
7	<b>v</b>	Output 7	1) Normal Mode N/O ✓	1	Sec
8		Output 8	1) Normal Mode N/O V	1	Sec
9	<b>V</b>	Output 9	1) Normal Mode N/O ✓	1	Sec
10		Output 10	1) Normal Mode N/O V	0	Sec
11	<u> </u>	Output 11	1) Normal Mode N/O ✓	0	Sec
12	2	Output 12	1) Normal Mode N/O V	0	Sec
13	<u> </u>	Output 13	1) Normal Mode N/O ✓	0	Sec
14	2	Output 14	1) Normal Mode N/O ✓	0	Sec
15	<b>V</b>	Output 15	5) Pulse Mode N/O V	1	Sec
16	2	Output 16	6) Pulse Mode N/C V	1	Sec
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	2       1         3       1         4       1         5       1         6       1         7       1         8       1         9       1         10       1         11       1         12       1         13       1         14       1         15       1	2     ☑     Output 2       3     ☑     Output 3       4     ☑     Output 3       5     ☑     Output 4       5     ☑     Output 5       6     ☑     Output 6       7     ☑     Output 7       8     ☑     Output 8       9     ☑     Output 9       10     ☑     Output 10       11     ☑     Output 11       12     ☑     Output 12       13     ☑     Output 13       14     ☑     Output 14       15     ☑     Output 16	2       2       0uput 2       (2) Normal Mode N/O          3       ✓       Output 3       (3) Toggle Mode N/O          4       ✓       Output 4       (4) Toggle Mode N/O          5       ✓       Output 5       (1) Normal Mode N/O          6       ✓       Output 6       (1) Normal Mode N/O          7       ✓       Output 7       (1) Normal Mode N/O          8       ✓       Output 8       (1) Normal Mode N/O          9       ✓       Output 9       (1) Normal Mode N/O          10       ✓       Output 10       (1) Normal Mode N/O          11       ✓       Output 11       (1) Normal Mode N/O          12       ✓       Output 12       (1) Normal Mode N/O          13       ✓       Output 13       (1) Normal Mode N/O          14       ✓       Output 13       (1) Normal Mode N/O          15       ✓       Output 15       (5) Pulse Mode N/O          16       ✓       Output 16       (6) Pulse Mode N/C	2       w       Output 2       1 Normal Mode N/O ✓       0         3       ✓       Output 3       3) Toggle Mode N/O ✓       0         4       ✓       Output 4       4) Toggle Mode N/O ✓       0         5       ✓       Output 5       1) Normal Mode N/O ✓       1         6       ✓       Output 6       1) Normal Mode N/O ✓       1         7       ✓       Output 7       1) Normal Mode N/O ✓       1         8       ✓       Output 8       1) Normal Mode N/O ✓       1         9       ✓       Output 9       1) Normal Mode N/O ✓       1         10       ✓       Output 10       1) Normal Mode N/O ✓       0         11       ✓       Output 11       1) Normal Mode N/O ✓       0         12       ✓       Output 12       1) Normal Mode N/O ✓       0         13       ✓       Output 13       1) Normal Mode N/O ✓       0         14       ✓       Output 14       1) Normal Mode N/O ✓       1         16       ✓       Output 16       6) Pulse Mode N/O ✓       1

In the left menu, click **Output Setting**. This page appears.

- Enable: Select to enable this Output function to be used by GV-IO Box.
- Name: Name the output. The name is restricted to 16 alphanumeric characters or 5 Chinese characters.
- Output Mode: Configure the input to NC (normally closed) or NO (normally open) mode.
  - Normal Mode (N/O and N/C): Output continues to be triggered until the source of the output condition is stopped.
  - **Toggle Mode (N/O and N/C):** Output continues to be triggered until a new input trigger ends the output.
  - Pulse Mode (N/O and N/C): Output is triggered for the amount of time set in the Pulse Mode Delay Time (1-255) field.
- Pulse Mode Delay Time (1-255): Enter the time in seconds for the pulse delay time between 1 and 255 seconds.

Click the **Submit** button to save the changes, or click the **Cancel** button to return the changes to its previous state.

#### 8.8 In/Out Monitor

In the left menu, click In/Out Monitor. This page appears.

	Status Monitor		
<b>Geovision</b>	Input S	tatus	
Network Setting     Other Setting     Input Setting     Output Setting	01 02 03	OFF OFF OFF	
In/Out Monitor     Firmware Update	04 05 06	ON OFF	
System Log Viewer     About	07 08	OFF OFF	
	Output	Status	
	ALL O	ALLON	
	ALL O	N ALLON FF ALLOFF	
	ALL O	N ALLON FF ALLOFF	
	ALL 0 ALL 0 01 02 03	N ALLON FF ALLOFF OFF V OFF V	
	ALL 0 ALL 0 01 02 03 04	N ALLON FF ALLOFF OFF V OFF V OFF V	
	ALL 0 ALL 0 01 02 03 04 05 06	N ALLON FF ALLOFF OFF • OFF • OFF • OFF • OFF •	
	ALL 0 ALL 0 01 02 03 04 05 06 07	N ALLON FF ALLOFF OFF • OFF • OFF • ON • OFF • ON • OFF •	
	ALL 0 ALL 0 01 02 03 04 05 06 07 08	N ALLON FF ALLOFF OFF • OFF • OFF • ON • OFF • OFF • OFF • OFF •	

- Input Status: Indicates the current status of the 16 inputs, whether it is ON (triggered) or OFF (no input).
- Output Status: Indicates the current status of the 16 outputs, whether it is ON (triggered) or OFF (no output). Click the ALL ON button to force all 16 outputs to be triggered. Click the ALL OFF button to turn off all 16 outputs. Select the individual outputs to turn it ON to force the output to be triggered or turn it OFF.

Click the **Submit** button to save the changes, or click the **Cancel** button to return the changes to its previous state.



#### 9. Updating Firmware

#### **IMPORTANT:**

- 1. For firmware update from Version 1.10 or earlier to the latest version, it is required to access the GV-IO Box over the network on Windows XP or Windows 7.
- The firmware updates to V2.00 are only for Ethernet modules. If you are having updating issues, please contact your local GV vendor or our team at <u>support@geovision.com.tw</u> for further assistance.

To update the firmware of GV-IO Box, follow the steps below:

1. In the left menu, click **Firmware Update**. This page appears.

	Firmware Update				
Network Setting     Other Setting     Input Setting     Output Setting	Firmware Update After pressing the Update button, please wait while the update request is being processed. After update is completed, the device will reboot automatically. You can re-login afterwards.				
In/Out Monitor     Firmware Update     Account Setting	Select Firmware: Choose File No file chosen				
About	Update State: Update Process: 0 %				

- 2. Click the **Browse...** button to open the firmware file (\*.bin)
- 3. Click the **Upload** button. This update procedure may take 60 seconds to complete.
- 4. When Update is complete, a dialog box appears and asks you to reboot the system.
- 5. Click **OK**. GV-IO Box starts the Reboot operation.

#### Note:

- 1. It is required to reboot GV-IO Box after updating the firmware. Without rebooting, the firmware update is not complete.
- 2. Updating of firmware through **GV-IP Device Utility** is only supported when updating from firmware V1.21 or later.

### 10. Changing Login ID and Password

In the left menu, click **Account Setting**. This page appears. You can modify the login name and password. The password is case sensitive and is limited to 4 characters with the choices of "a  $\sim$  z" and "0  $\sim$  9".

<b>GeoVision</b>	Security Configuration			
<ul> <li>Network Setting</li> <li>Other Setting</li> <li>Input Setting</li> <li>Output Setting</li> </ul>	For safety reasons, th It must contain thro uppercase letters (A-Z	e password must be at least 8 characters long. ee character categories among the following: ), lowercase letters (a-z), digits (0-9), and special characters. (!^,+[]()=).		
In/Out Monitor	Administrator Account			
Firmware Update     Account Setting	Login Name	Admin 123		
System Log Viewer     About	Password			
- About	New Password Confirm Password Submit Cancel			

### 11. Viewing System Log Information

The system log information contains the current system status and dump data that can be used by service personnel for analyzing problems.

#### 12. Specifications

For details, see **Datasheet**.