Integration Note

Manufacturer:	Global Cache
Model Number(s):	**GC-100-06, GC-100-12, GC-100-18**
Document Revision Date:	1/10/2013

OVERVIEW AND SUPPORTED FEATURES

The Global Cache is an IR Network Adapter that converts hex signals sent over IP to IR codes that can be configured for output from 3.5mm jacks using either IR flashers or direct cabling (see note below). The Global Cache also supports RS-232 serial ports for control of serial devices, and relays on supported models. Optional cables are also available to use the IR ports as sense inputs.

THE GC-100 SUPPORTS THE FOLLOWING FEATURES:

RS-232 Ports: The GC-100-06 includes one RS-232 port; the GC-100-12 and GC-100-18 each have two. These provide a convenient means to connect to sub-systems close to the Global Cache.

IMPORTANT: The Global Cache serial ports are not compatible with all serial devices. Test all serial devices using these ports for proper operation prior to installation.

IR Output: The GC-100 can send IR signals to IR flashers compatible with ELAN, Xantech, Speakercraft and Niles (etc.) in the frequency range of 20KHz – 250KHz. The GC-100-06 includes three connections, whereas the GC-100-12 and GC-100-18 includes 6 connections, any of which can be used for IR output.

Note: Any connection setup for IR output cannot be used for input.

Inputs: Any of the IR output connections on the GC-100 can be configured as an input. Allowed input voltages are from -24V to +24V. Voltages greater than 2.5V are considered to be ON, and voltages less than 0.8V are considered to be OFF. Two examples where this is useful are for video sensing and power sensing.

Note: Any connection setup for input cannot be used for IR output.

See below for Global Cache Sensor cables:

GC-SV1	Video Out Sensor cable
GC-SP1	AC/DC Input Sensor cable
GC-SC1	Contact Closure Sensor cable

Relay Outputs: The GC-100-12 and GC-100-18 include three normally open relays rated at 24V (DC or AC) and 500mA.

THE GC-100 DOES NOT SUPPORT THE FOLLOWING FEATURES:

IR output direct to an IR input port on a device: The GC-100 uses a non standard voltage for their IR outputs. This works fine with IR flashers but does NOT typically work for direct input to a device or receiver port on a connecting block. Global Cache makes an adapter cable, GC-CGX, that will convert the voltage and allow connection to some devices directly. Refer to Global Cache documentation and the **Alternative Connections** diagram below for details.

IR Input: Global Cache ports cannot be used for IR Input, and optional parts (IRL or IRE) are required for this function. See the appropriate Integration Notes for more detail.

Standalone Operation: The Global Cache is an IR Network Adapter. It will not route IR independently of an external control system.

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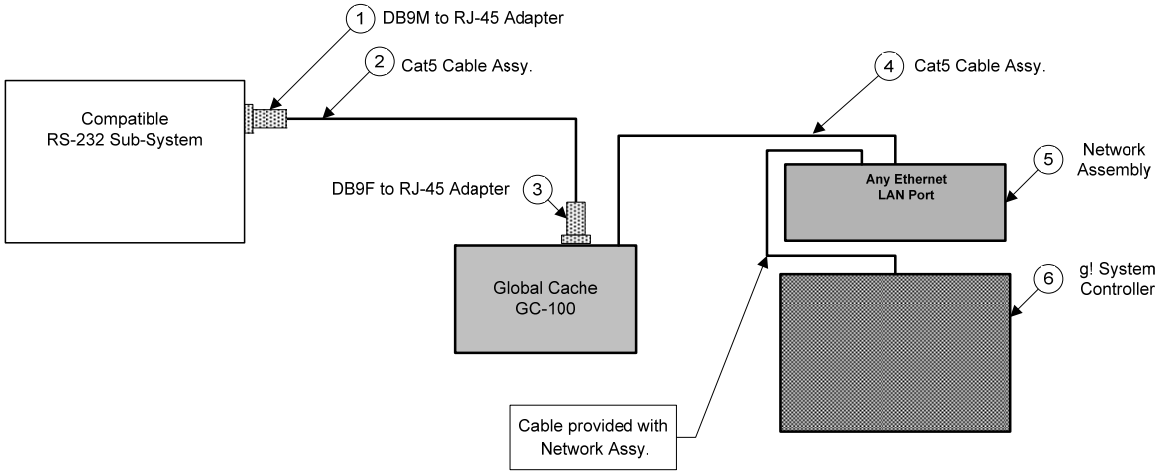
INSTALLATION OVERVIEW

1. During the rough-in phase, pull Cat5 from the GC-100 location back to the System Enclosure.
2. If using RS-232 from the GC-100, and the GC-100 is a distance from the equipment, then pull Cat5 from the equipment to the location of the GC-100.
3. If using RS-232 from the GC-100, install and connect the RS-232 equipment to the GC-100.
4. If using IR from the GC-100, install the equipment that will be controlled by the GC-100, and run IR flashers back from each piece of equipment to the GC-100.
5. If more than three (for the GC-100-06) or six (for the GC-100-12 and GC-100-18) IR outputs are needed, then install additional GC-100 units, or use an IR repeating block to repeat the signal as needed.
6. Configure the GC-100 using its built-in web server or the Global Cache Discovery & Configuration Utility. See **Configuring the GC-100** below.
7. Connect the GC-100 to the **g!** system electrically.
8. Configure the **g!** system for the GC-100. Refer to **Using the GC-100 with g!** and **g! System Configuration Details** below.

CONNECTION DIAGRAM: RS-232 CONNECTIONS

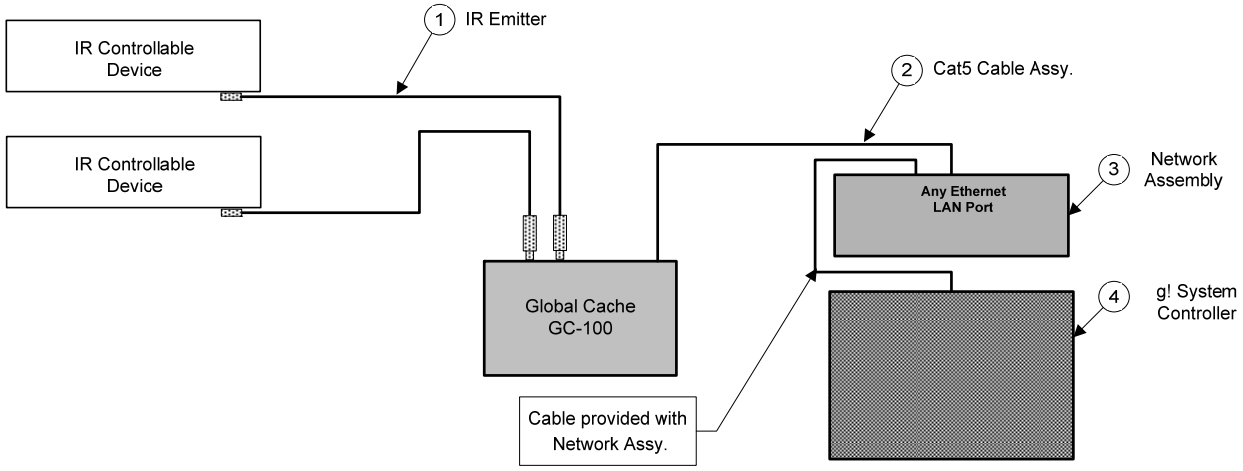


BILL OF MATERIALS FOR RS-232 CONNECTIONS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	DB9M to RJ45 Adapter	ELAN	HA-CB-307	RS-232	DB-9 Male X RJ-45 Female	Included with HW-USB-100
2	Cat5 Cable Assy.	Installer	N/A	RS-232	RJ-45 Male X RJ-45 Male	Must terminate all 8 conductors
3	DB9F to RJ45 Adapter	ELAN	HA-CB-308	RS-232	DB-9 Female X RJ-45 Female	Included with HW-USB-100
4	Cat5 Cable Assy.	Installer	N/A	IP	RJ-45 Male X RJ-45 Male	
5	Network Assembly	ELAN	NWA18	IP	RJ-45 Female X RJ-45 Female	Use any available LAN port
6	g! System Controller	ELAN	Various (e.g. HC-12)	IP	RJ-45 Female	

CONNECTION DIAGRAM: IR CONTROL FROM G!

In this configuration IR commands can be sent from the **g!** system through the GC-100 to each IR controlled device individually. An IR command sent to one device will not be sent to any other IR device unless it is specifically configured to do so.

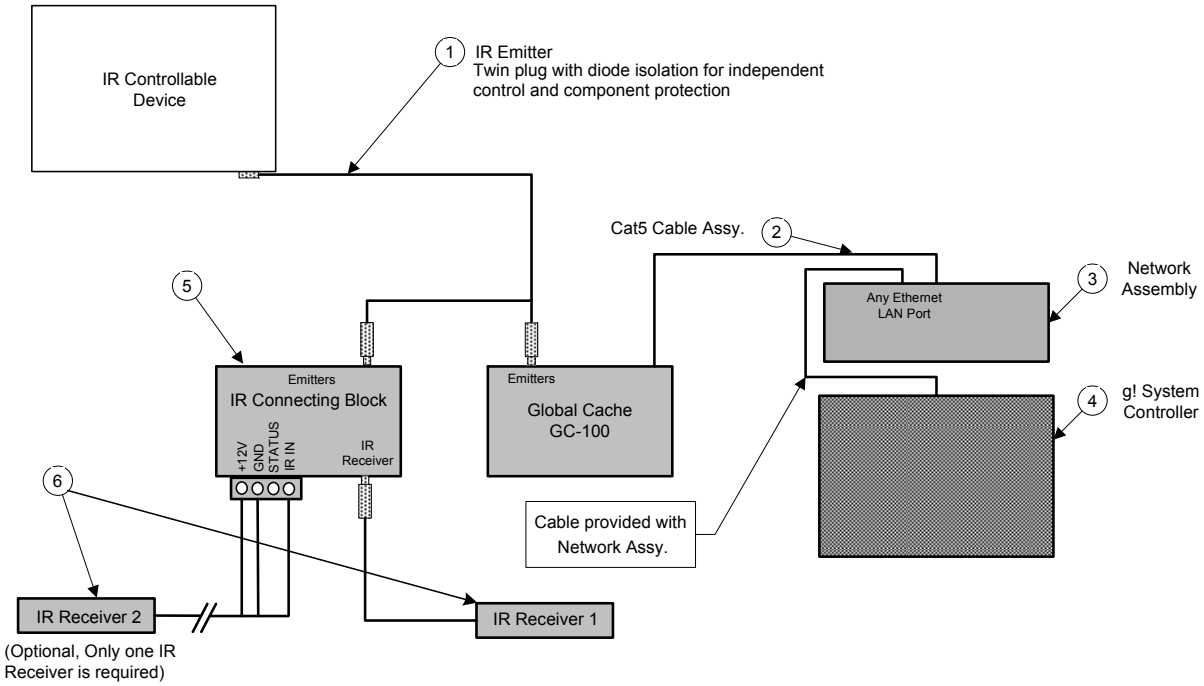


BILL OF MATERIALS FOR IR CONNECTIONS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	IR Emitter	Various	N/A	IR	3.5mm Male	Compatible with Xantech, Speakercraft, Niles, Russound
2	Cat5 Cable Assy.	Installer	N/A	IP	RJ-45 Male X RJ-45 Male	
3	Network Assembly	ELAN	NWA-18	IP	RJ-45 Female X RJ-45 Female	Use any available LAN port
4	g! System Controller	ELAN	Various (e.g. HC-12)	IP	RJ-45 Female	

CONNECTION DIAGRAM: IR CONTROL FROM IR REMOTES AND G!

In this configuration, IR commands can be sent from the **g!** system through the GC-100 to each IR controlled device individually. IR commands can also be received from an IR remote control through an IR receiver connected to the IR connecting block. The connecting block will then repeat those IR commands out of its emitter ports to any IR devices connected to the block.



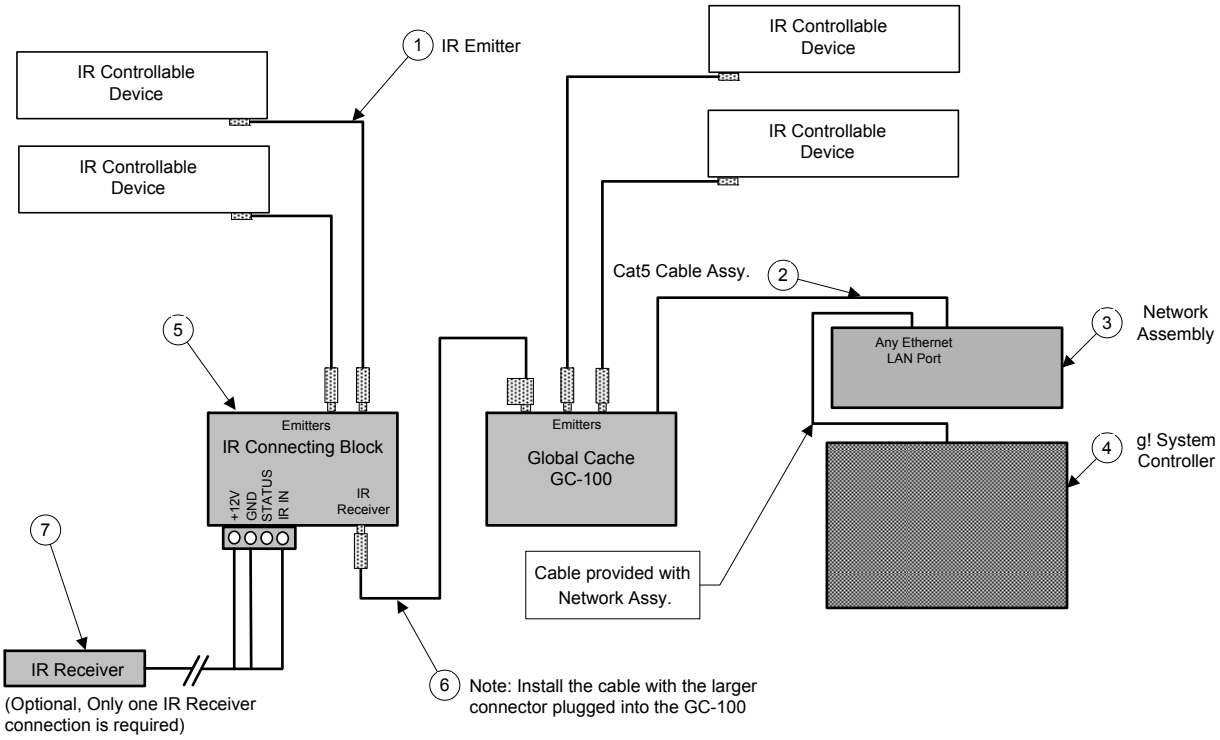
BILL OF MATERIALS FOR IR CONNECTIONS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	IR Emitter	Xantech, or equivalent	283TP or equivalent	IR	3.5mm Male	Twin plug blink mouse emitter with diode isolation
2	Cat5 Cable Assy.	Installer	N/A	IP	RJ-45 Male X RJ-45 Male	
3	Network Assembly	ELAN	NWA-18	IP	RJ-45 Female X RJ-45 Female	Use any available LAN port
4	g! System Controller	ELAN	Various (e.g. HC-12)	IP	RJ-45 Female	
5	IR Connecting Block	Xantech, or equivalent	789-44 or equivalent	IR	3.5mm Female & Screw terminal	
6	IR Receiver	Xantech, or equivalent	490-00 or equivalent	IR	3.5mm Male or wire pigtail	

CONNECTION DIAGRAM: IR CONTROL FROM IR REMOTES AND G! (ALTERNATIVE CONNECTIONS)

In this configuration, IR commands can be sent from the **g!** system through the GC-100 to IR controlled devices, individually when connected directly to the GC-100, or to a group of IR devices when connected through the IR connecting block.

Note: Any IR commands received by the IR receiver will be repeated to any devices connected to the IR block but NOT to any devices connected directly to the GC-100.



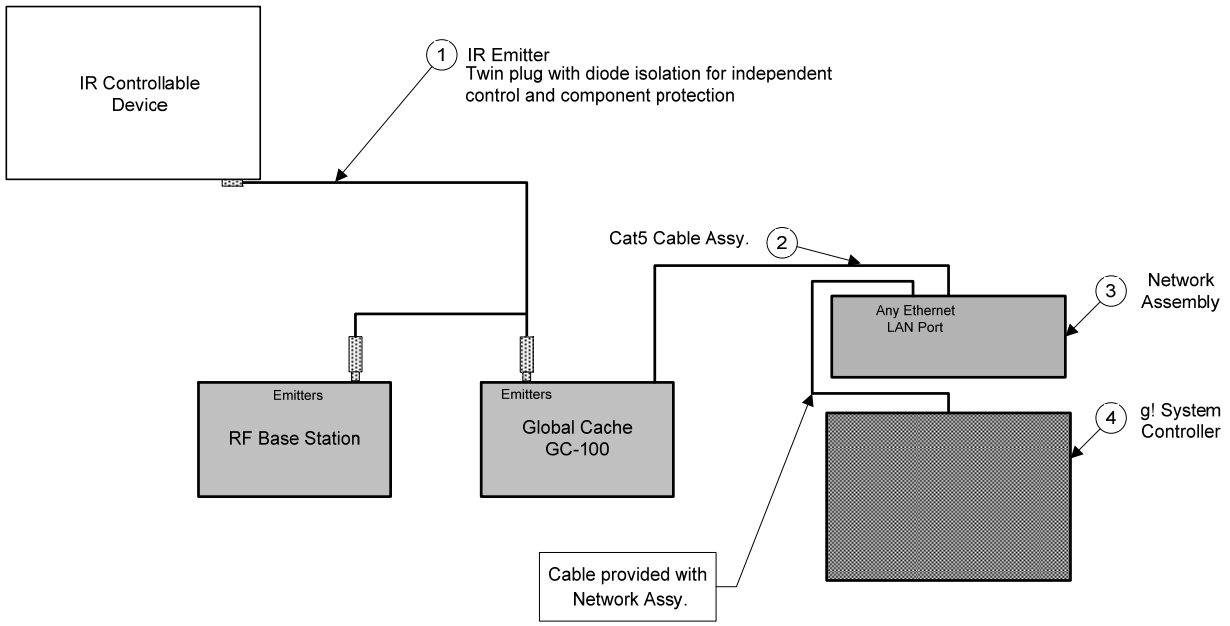
BILL OF MATERIALS FOR IR CONNECTIONS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	IR Emitter	Xantech, or equivalent	283TP or equivalent	IR	3.5mm Male	Twin plug blink mouse emitter with diode isolation
2	Cat5 Cable Assy.	Installer	N/A	IP	RJ-45 Male X RJ-45 Male	
3	Network Assembly	ELAN	NWA18	IP	RJ-45 Female X RJ-45 Female	Use any available LAN port
4	g! System Controller	ELAN	Various (e.g. HC-12)	IP	RJ-45 Female	
5	IR Connecting Block	Xantech, or equivalent	789-44 or equivalent	IR	3.5mm Female & Screw terminal	
6	IR Cable, GC-100 to IR Block	Global Cache	GC-CGX	IR	3.5mm Male	Install with larger connector in the GC-100
7	IR Receiver	Xantech, or equivalent	490-00 or equivalent	IR	3.5mm Male or wire pigtail	

CONNECTION DIAGRAM: IR CONTROL FROM RF REMOTES AND G!

In this configuration IR commands can be sent from the **g!** system through the GC-100 to each IR controlled device individually. IR commands can also be received from an RF remote control through an RF base station.

Note: Any IR commands received from the RF remote will be sent to all devices connected to the RF base station.



BILL OF MATERIALS FOR IR CONNECTIONS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	IR Emitter	Various	N/A	IR	3.5mm Male	Compatible with Xantech, Speakercraft, Niles, Russound
2	Cat5 Cable Assy.	Installer	N/A	IP	RJ-45 Male X RJ-45 Male	
3	Network Assembly	ELAN	NWA-18	IP	RJ-45 Female X RJ-45 Female	Use any available LAN port
4	g! System Controller	ELAN	Various (e.g. HC-12)	IP	RJ-45 Female	

CONFIGURING THE GC-100

The Global Cache units come out of the box with a network configuration that needs to be changed to properly function on the **g!** system default network. The procedure for configuration depends on the version of the Global Cache. Check the label on the box of each unit to be configured. Follow the appropriate procedure below to configure the different versions of Global Caches.

Note: Units purchased from ELAN will be preconfigured to a static IP. If you are using only one unit, or if you made special notation on your order to have multiple units configured to consecutive IP's, you may skip this step. See the sticker on the unit for its IP.

If you have multiple Global Caches in an installation, power them up one at a time and change the IP address as follows. Each Global Cache must be on a different IP.

GC-100 –VERSION 3.0 AND LATER

Global Cache units versions 3.0 and later come configured as a DHCP client. These need to be configured with static IP addresses using the GC Finder application as follows:

Note: Version 3.0 GC-100s can also be configured from the built-in web server

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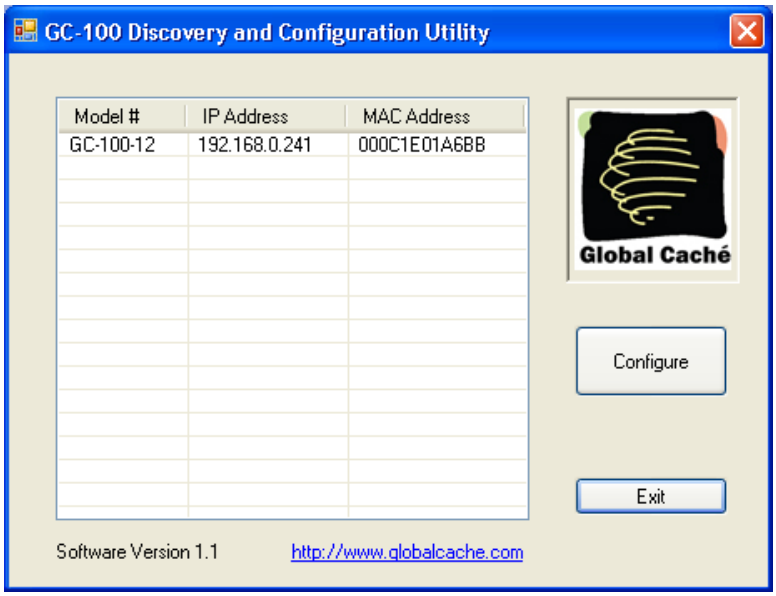
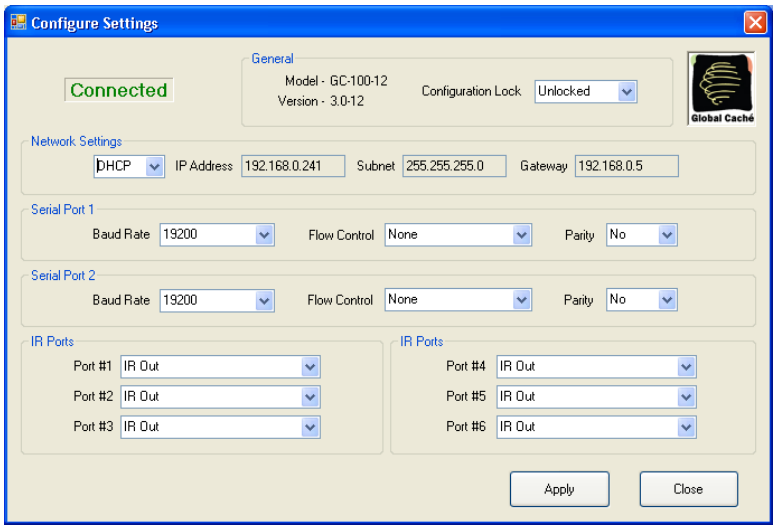
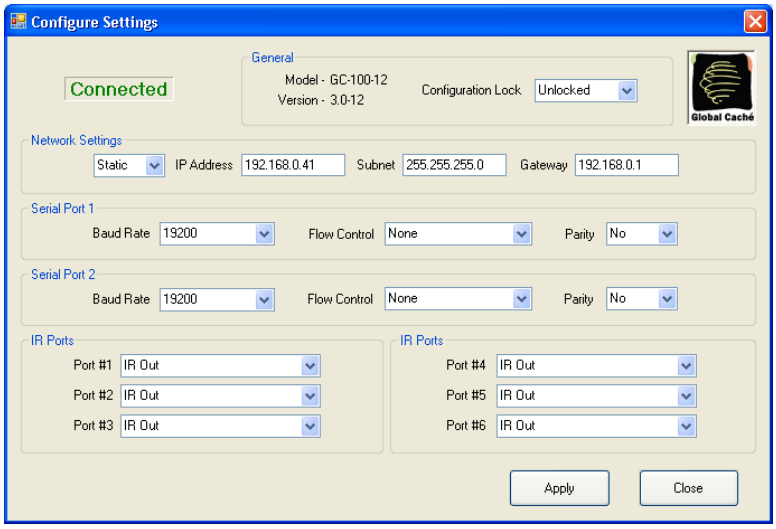
1. Browse to the Global Cache website and download the GC Discovery application. http://www.globalcache.com/files/Software/GC-Discovery.zip
2. Set up the unit to be configured by plugging in power and the network cable to allow the unit to boot up and obtain an IP address.
3. Unzip and run the **GC Discovery** application downloaded in step 1 above. A GC-100 Discovery and Configuration Utility window will popup as shown on the right. The GC-100 to be configured will show up in the list with its model#, current IP Address and MAC Address. **Note**: Global Caches may take a moment to appear in the list.
4. Click on the Global Cache in the list then click the **Configure** button to open the GC-100 configuration window as shown below.





5. In the Network Settings area change the following: DHCP to Static; IP Address to 192.168.0.41; Gateway to 192.168.0.1. If you are configuring more than one Global Cache then set the second unit to 192.168.0.42, the third to 192.168.0.43, and so on.

6. Check your settings against the screenshot below, then click **Apply**. The unit should reboot.



7. Confirm the unit shows up in the GC-100 Discovery and Configuration Utility with the new IP address.

GC-100—PRIOR TO VERSION 3.0

If you did not purchase the GC-100 from ELAN and it is prior to version 3.0, then the IP address of the unit will be the factory default 192.168.1.70. To configure the GC-100, you must first get your computer's IP address to the same subnet, so it has an address that is 192.168.1.X, where X is between 1 and 254, but not equal to 70.

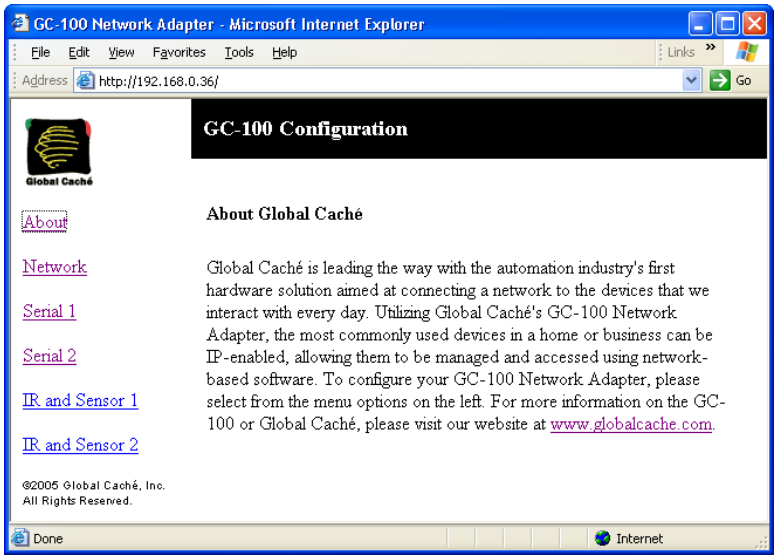
If you purchased the GC-100 from ELAN, then the IP address will be preset to 192.168.0.41.

When you bring up the GC-100 web interface, you will be able to do the following:

- Setup the serial ports on the GC-100. The **g!** system automatically performs this step for you, so you should **NOT** make any changes to the serial port settings in the web interface.
- Configure the IR connectors for input or output, as explained below.
- Set the new IP address of the GC-100, as explained below.

To bring up the web interface to the GC-100, ensure you are on the correct subnet (as explained above), and then surf to the appropriate address (192.168.0.41 for units from ELAN, or 192.168.1.70 for units from other sources): you will see the web interface as shown below (this shows a GC-100-12):

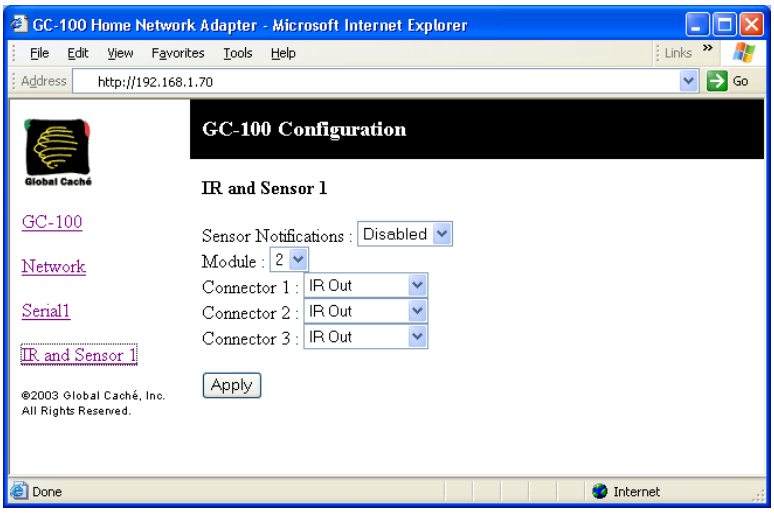
Note: *Screenshots are from version 2.0 units. Newer units will have different web pages*



CONFIGURE CONNECTORS FOR INPUT OR OUTPUT

If you plan to use either the IR output or the input function on the GC-100:

1. Click **IR and Sensor 1** at left: an image similar to that below appears.

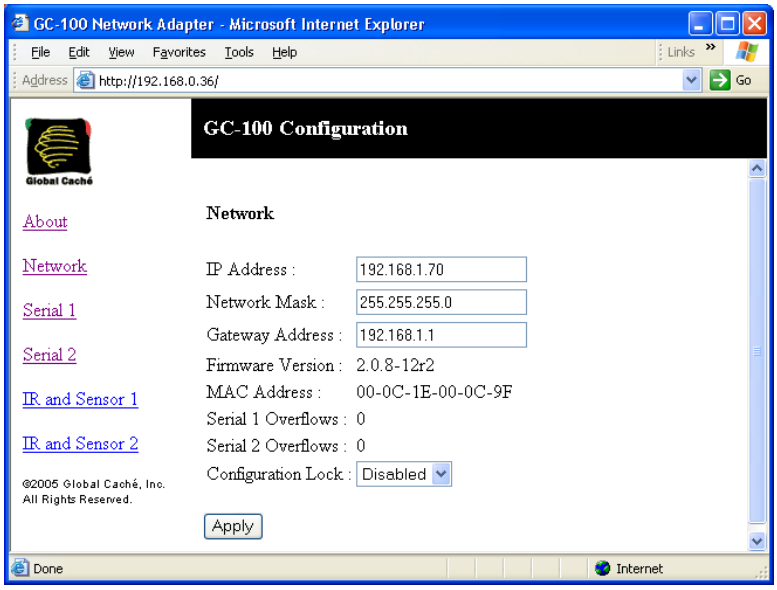


2. Change the **Sensor Notifications** to Enabled.
3. For each of the three connectors (1, 2, 3), select either:
   - **IR Out** if that connector is for IR output
   - **Sensor In** if that connector is for an input.
4. Click Apply to save your settings. If the browser hangs, restart the browser and return to the GC-100, and verify that the settings now appear as desired.
5. For the GC-100-12 and GC-100-18, click **IR and Sensor 2** at the left, and then repeat the steps above to configure the outputs for connectors 4, 5 and 6.

CONFIGURE IP ADDRESS

To set the IP address of the GC-100:

1. Click Network at left: an image similar to that below appears.



2. Type in the desired IP address in the **IP Address** box: by default we suggest setting the first GC-100 to 192.168.0.41, the second GC-100 to 192.168.0.42, and so on.
3. **Important**: Check and recheck your new IP address for typos or errors before clicking **Apply**.
4. Click **Apply** to save your settings. If the browser hangs or does not connect to the GC-100 at its new address shut down the browser then open a command prompt. From the start button choose Run then type cmd to open the command prompt. Type arp –d * to clear browser arp table. Reopen the browser to connect to the GC-100. Verify that the settings now appear as desired.
5. Finished: Close the browser.

USING THE GC-100 WITH G!

g! will automatically populate the proper number of IR senders and the relay outputs if applicable when it is initially configured. See below for details pertaining to the functionality of the GC-100.

SERIAL PORTS

Important: The Global Cache should be configured and discovered on the input/output tab prior to setting up control of a device through its serial com ports.

The serial ports on the GC only need to be added in the configurator as a Communication Device on the tab of the subsystem that they are going to be used for. For instance if a GC com port is used to control a lighting system, the GC com device is **only** configured on the lighting tab of the configurator. The proper selection for a com device using a Global Cache com port is **(IP to Serial) Global Cache**. This will open up a selection box to choose Com 1 or Com 2 from the Global Cache. Finally add the device to be connected following its Integration Note.

IR

The IR senders are automatically populated once the unit is discovered in the configurator. These are then linked to IR Devices to allow proper routing of IR to the GC IR ports. For more Information, refer to the IR lessons of the ***g!** Training Guide*. The training guide can be found in the Dealer area of the ELAN website (http://www.elanhomesystems.com).

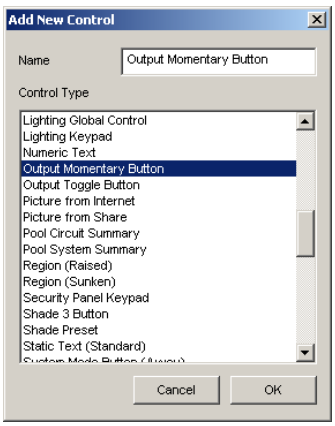
RELAYS

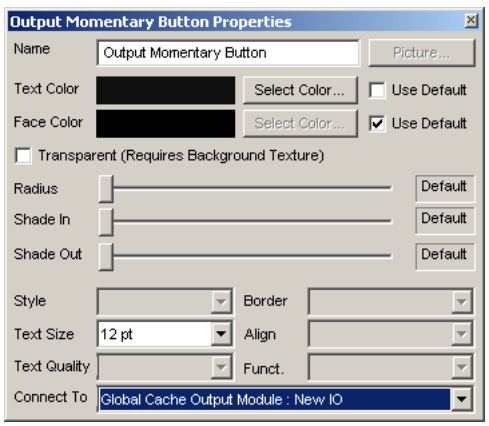
The relays on the GC-100-12 and GC-100-18 are "Normally Open" contacts rated for 500mA at 24V (DC or AC). These relays are automatically populated during the "Discover Devices" process and can be actuated directly using a Button Press or by using the Event Mapper. The two possible ways of implementing this are outlined below:

Button Press:

Add a new control to a custom tab or Home Page. Select either "Output Momentary" or "Output Toggle" as the control type:

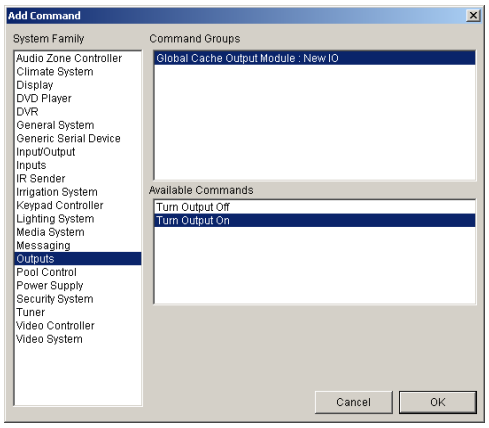
"Output Momentary" will trigger the relay only while the button is being held. "Output Toggle" will turn the relay on the first time the button is pressed, off the second time. After the button has been added, select it. The "Output Momentary Button Properties" dialogue box will be displayed. Click the arrow in the "Connect To" dropdown, and select the output relay to control.





Event Mapper:

On the "Event Mapper" tab. Right click "Event Maps" and select "Add New Event Map". Under "Events" on the right, select the event that will trigger the relay, such as a faulted zone in the security system. Then under "Commands", select "Outputs", the appropriate GC-100 Output Module, and select "Turn On" or Turn Off" from available events.



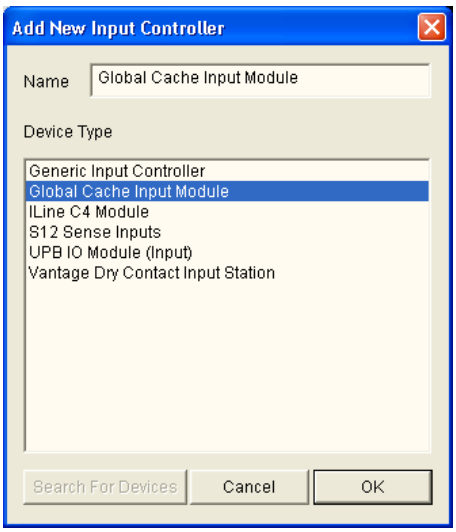
INPUTS

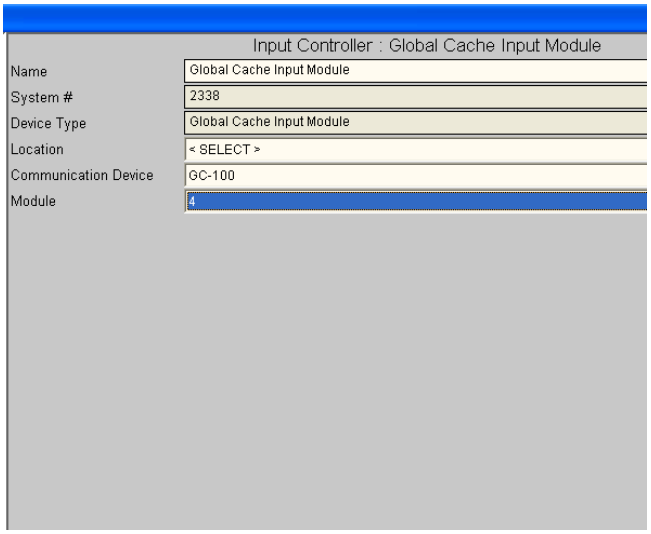
Note: Inputs will not auto discover and require the following configuration steps.

Any of the IR output ports can be alternatively configured as an input. GC Inputs in the **g!** system can be connected to an **Input Toggle Indicator** on a custom page or used as a **Trigger** or **Conditional** in the event mapper. See page 1 for compatible input sensor cables.

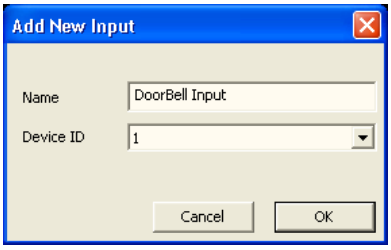
This requires that the port is first specified as an input in the Global Cache configuration, see details in the Global Cache Web (prior to 2.0) configuration above. Then on the input/output tab of the configurator any inputs are to be used with the GC and the **g!** system will need to be setup as follows:

1. Right-click on Inputs, choose **Add New Input Controller**, and then select **Global Cache Input Module** as shown below. Set the Module number, referring to the Module and Device Information table below. Click **Apply** to save the changes.

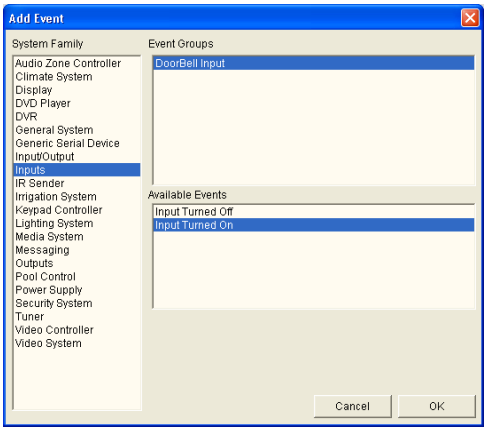


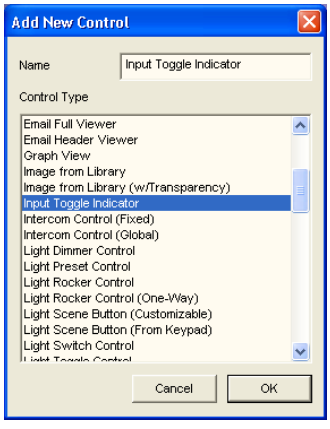


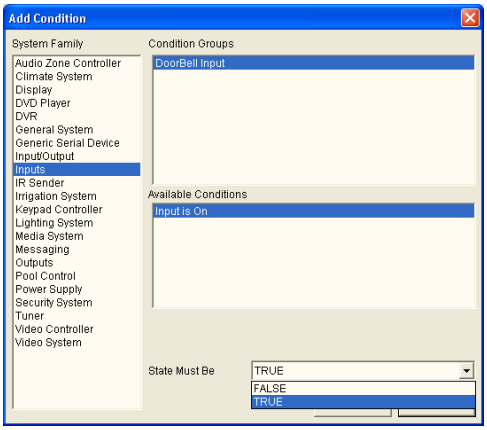
2. Click the **+** to expand the Input Module node then right-click where it says no inputs and select **Add New Input**. Name the input as desired and set the Device ID, referring to the Module and Device Information table below. Click **OK** to add the input.



3. Finally, connect the input to an Input Toggle Indicator or use the input in an event map as desired:







G! CONFIGURATION DETAILS

The following sections provide details on configuring the GC-100. There are four separate situations covered in the tables below:

1. Configuring the RS-232 ports on the GC-100
2. Configuring IR outputs on the GC-100
3. Configuring the relay outputs on the GC-100
4. Configuring inputs on the GC-100

RS-232, RELAY, IR CONFIGURING MODULE AND DEVICE INFORMATION

You will need the following information when you configure the GC-100 units with the Configurator:

Connection	GC-100-06	GC-100-12 and GC-100-18
Serial 1	Module 1	Module 1
Serial 2	N/A	Module 2
Relay 1	N/A	Module 3, Device 1
Relay 2	N/A	Module 3, Device 2
Relay 3	N/A	Module 3, Device 3
Connector 1	Module 2, Device 1	Module 4, Device 1
Connector 2	Module 2, Device 2	Module 4, Device 2
Connector 3	Module 2, Device 3	Module 4, Device 3
Connector 4	N/A	Module 5, Device 1
Connector 5	N/A	Module 5, Device 2
Connector 6	N/A	Module 5, Device 3

In the tables, the following items appear:

- o "<Select>" Select the desired item from the list (or drop-down) in Configurator.
- o "<User Defined>", etc. Type in the desired name for the item.

CONFIGURING IR OUTPUTS

This table provides settings used in the Configurator to setup the IR outputs on the GC-100. Configure the IR outputs on the Input/Output tab in Configurator.

Devices	Variable Name	Setting	Comments
Communication Devices	**Name**	<User Defined> (Default: **Global Cache GC-100**)	Rename to **Global Cache GC-100 IR** to avoid confusion with the serial ports
	Type	**Ethernet**	
	Communication Type	**Global Cache GC-100**	
	Location	<User Defined> (Not Required)	
	IP Address	<User Defined> (Default: **192.168.0.41**) (See Note 1)	
	Port	**4998**	All IR commands are sent to port 4998
IR Senders <See Note 2>	**Name**	<User Defined>	For eg: **Comcast (IR2)**
	Device Type	**Global Cache**	
	Location	<User Defined> (Not Required)	
	COM Device	<Select> (Default: **Global Cache GC-100**)	
	Module	<Select>	See the table shown earlier for the Module number for each connector
	Device	<Select>	See the table shown earlier for the Device number for each connector

Notes:

1. By default, set the GC-100 to 192.168.0.41. If you have more than one GC-100, set the second to 192.168.0.42 and so on.
2. In older versions of the **g!** software, pre - 4.0.528, these will need to be added manually. The windows configurator will add these automatically in version 4.0.528 and newer

CONFIGURING RS-232 PORTS

This table provides settings used in Configurator to setup the serial port(s) on the GC-100. Configure the serial ports on the tab of the system that the serial port will connect to.

Important: Configure the Global Cache IR outputs as shown above before configuring any Global Cache Serial ports.

Devices	Variable Name	Setting	Comments
Communication Devices	**Name**	<User Defined> (Default: **Global Cache GC-100**)	Rename to **Global Cache GC-100 (COM#)** to avoid confusion with the IR output
	Type	**(IP to Serial) Global Cache**	
	Global Cache Port	**<Select>**	Select the COM port that will be used
	Communication Type	**<Select>**	Select the appropriate Communication Type for the particular sub-system
	Location	<User Defined> (Not Required)	
	IP Address	<User Defined> (Default: **192.168.0.41**) (See Note 1)	
	Port	<User Defined> (Default: **4999**)	Serial port 1 is port 4999, Serial port 2 is port 5000

Note: By default, set the GC-100 to 192.168.0.41. If you have more than one GC-100, set the second to 192.168.0.42 and so on.

CONFIGURING RELAYS AND INPUTS

Refer to the **Using the GC-100 with g!** section above for details.

COMMON MISTAKES

1. Incorrect Communication Device for initial GC-100 configuration. The proper Communication Device to configure the GC-100 on the Input/Output tab is:

   Type: Ethernet

   Communication Type: Global Cache GC-100.

   Refer to **Configuring IR Outputs** above.

2. Not checking the RS-232 port for compatibility with the sub-system. The GC-100 has some limitations that prevent it from working properly with all RS-232 devices. This includes a limit on baud and parity settings, among others. You should test your equipment with the GC-100 prior to installation to ensure communications are reliable.

3. Not configuring and discovering the Global Cache before trying to configure a device with the Global Cache serial ports. The Global Cache should be configured on the Input/Output tab before trying to configure a device to communicate using one of the GC-100 serial ports.