Global Caché

Integrating Global Caché with AMX and Crestron Systems

September 6th, 2007

The Company

- Founded in 2002 by Silicon Valley veterans from the IT industry
- Focused on IP-enabling and connectivity products for residential, educational, and commercial markets
- Open systems based on industry standards
- GC-100 is first product of its kind
- Market leadership with over 20,000 units installed in the field

Sales Channel

- Global Caché products are available through
  - Distributors
  - VARs – Sell as part of total solution; retain GC brand
  - OEMs – Sell under their brand

Why Global Caché?

- Our claim to fame? We're open!
  - Architecture
  - Public API
  - We work with everybody
- Why do you want it?
  - Choice
  - Cost
  - Allows for changing environment

Partners

- Software and hardware partners (partial list)
  - AMX
  - Control4
  - Exceptional Innovation (Lifeware)
  - Niveus
  - NetStreams
  - LG Electronics
  - Many more…

GC-100 Network Adapters

- IP-enable any device
- Address several market segments
  - Residential
    - Home theater
    - Home automation
    - Hi-rise (MDUs)
  - Commercial
    - Boardrooms
  - Educational
    - Classroom multimedia control
    - AV asset management

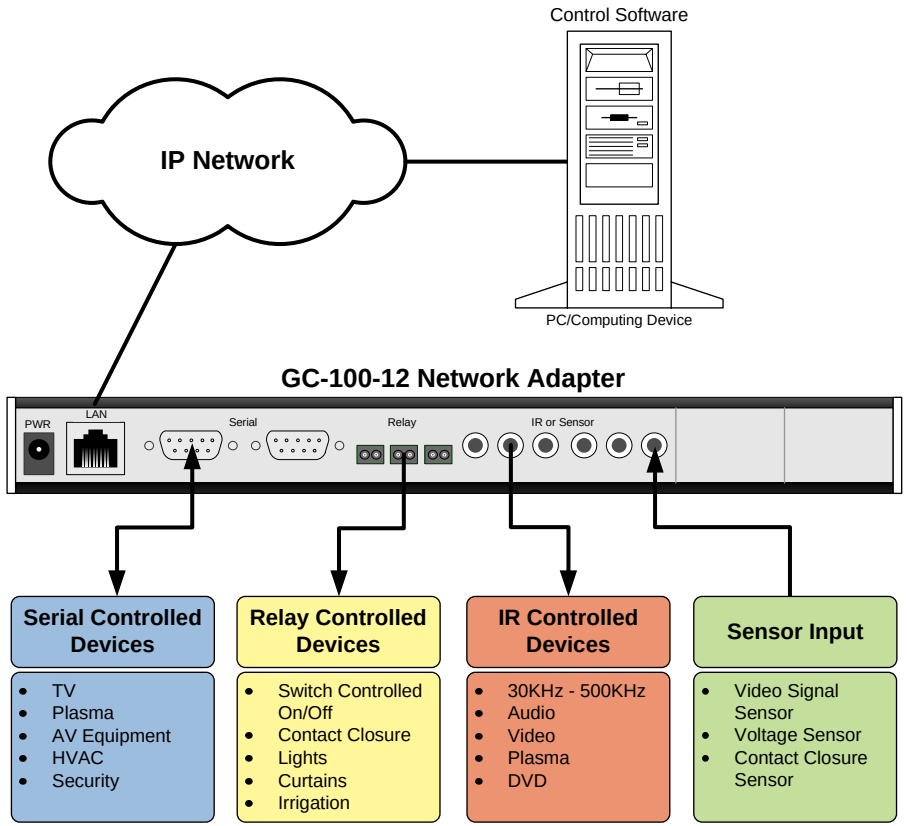
Why a Network Adapter?

- Control systems and software operate on TCP/IP networks
- Networks are everywhere - home and business environments
- Many common devices don't connect directly to a network
  - Common non-IP devices
    - IR – A/V equipment
    - Serial – HVAC, A/V equipment, lighting, pools, security
    - Relay – curtains, projector drops, motors

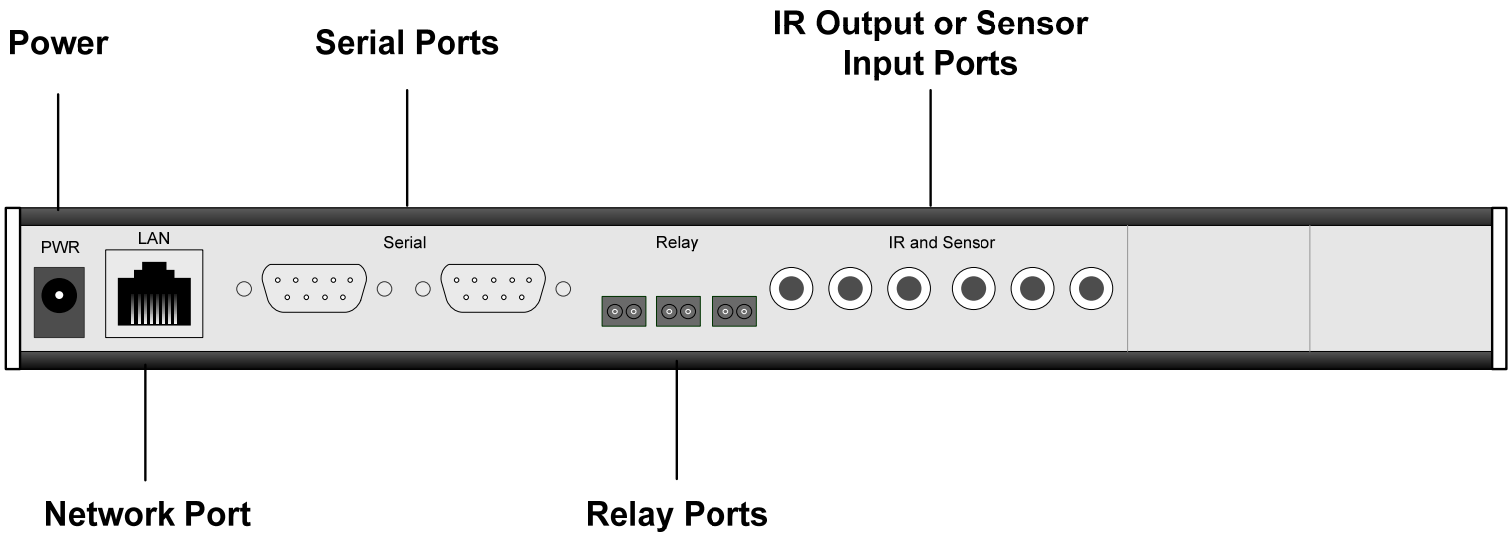
GC-100: IP-Enabling

IP-Enabling

Infrared (IR), Serial (RS232), Relay Devices and Sensor Input



GC-100 Hardware



GC-100 Features & Benefits

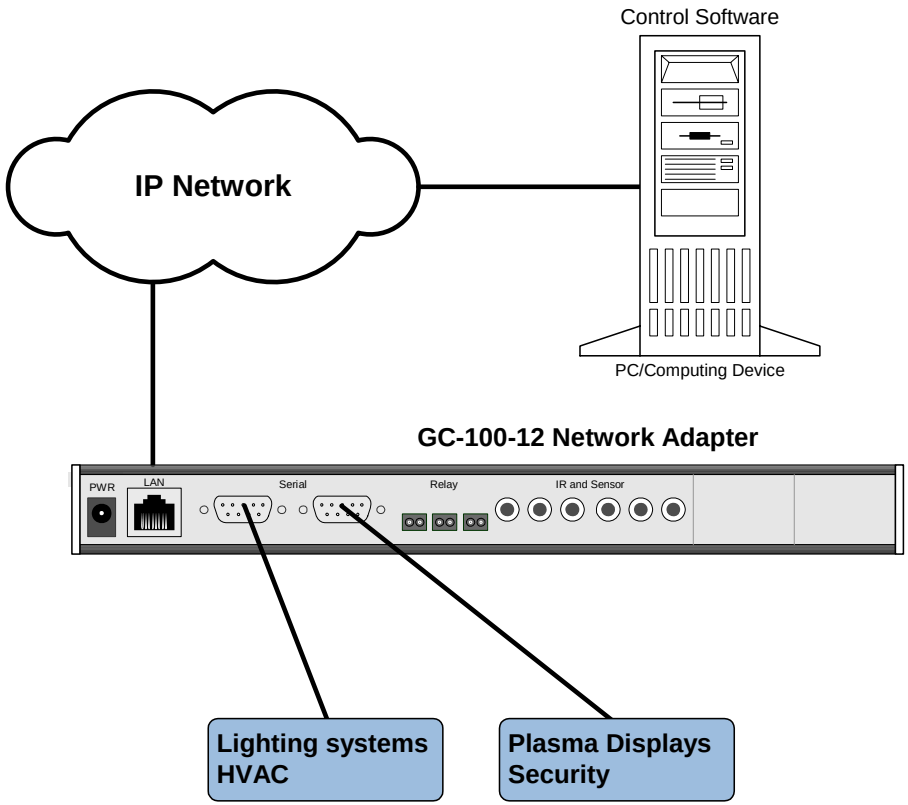
- Features
  - Open architecture, API open and available
  - Flexible and easy to install and use
  - IR, serial, and relay
  - Reliable, no moving parts
  - Sensor and IR input over a network
  - Three models, plus rack mount option
  - Cost effective
- Benefits
  - Saves installation time and money
  - Very little training required
  - Simpler more flexible design choices
  - Fewer support issues
  - Future proof
  - Expands installation opportunities

GC-100 Serial Ports

- Male DB9 connector
- Bi-directional
- 1200 baud to 57.6Kbaud
- Hardware flow control and parity

GC-100 Serial Ports (cont.)

IP-Enabling Serial (RS232) Devices

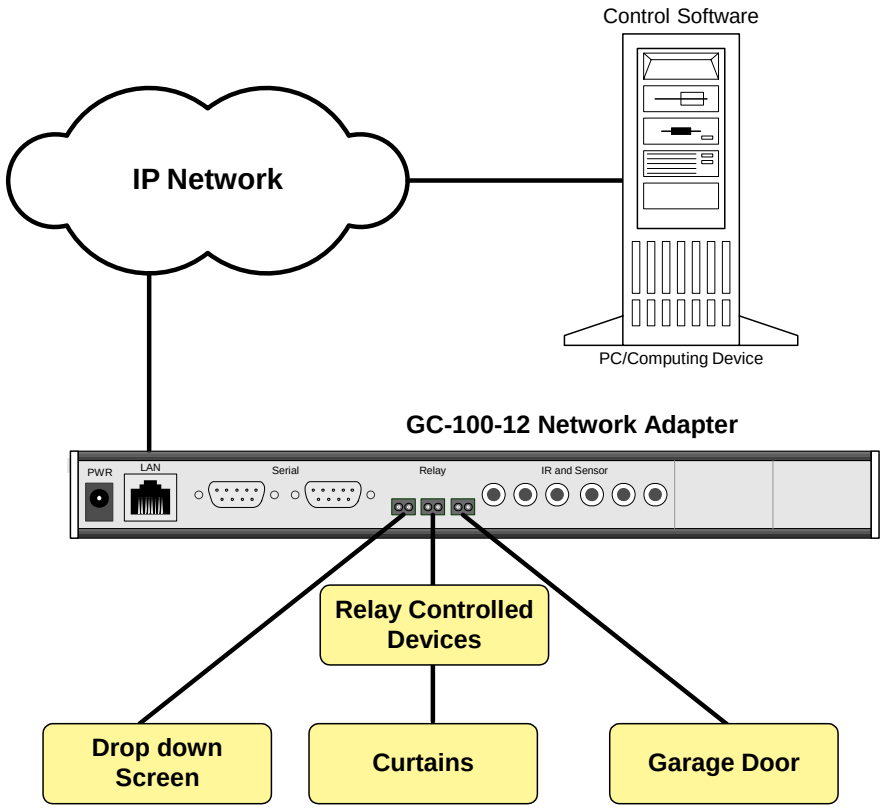


GC-100 Relay Ports

- Three dry contact relay ports
- Phoenix style connectors
- Rated for 24 volt AC/DC @ 500mA max
  - Ideal for low voltage applications

GC-100 Relay Ports (cont.)

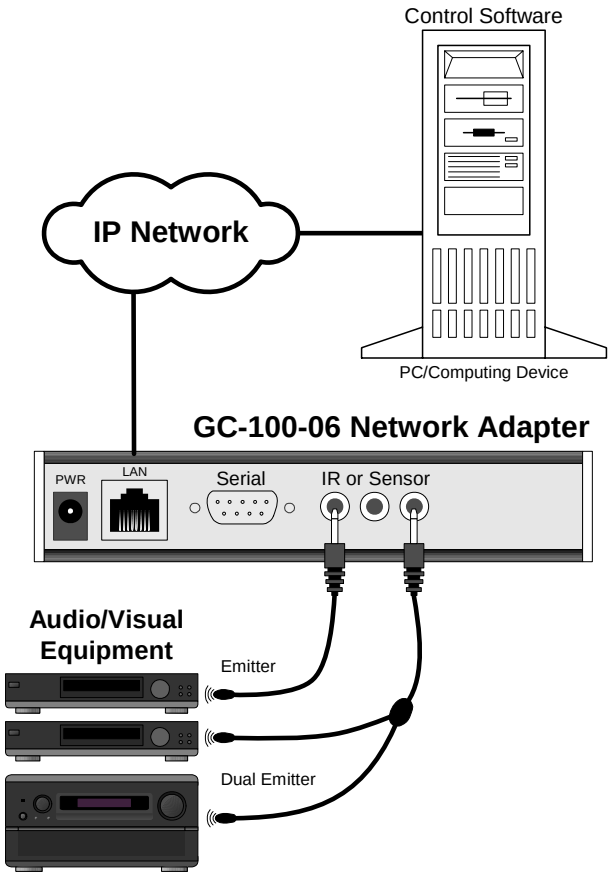
IP-Enabling Relay (Contact Closure) Devices



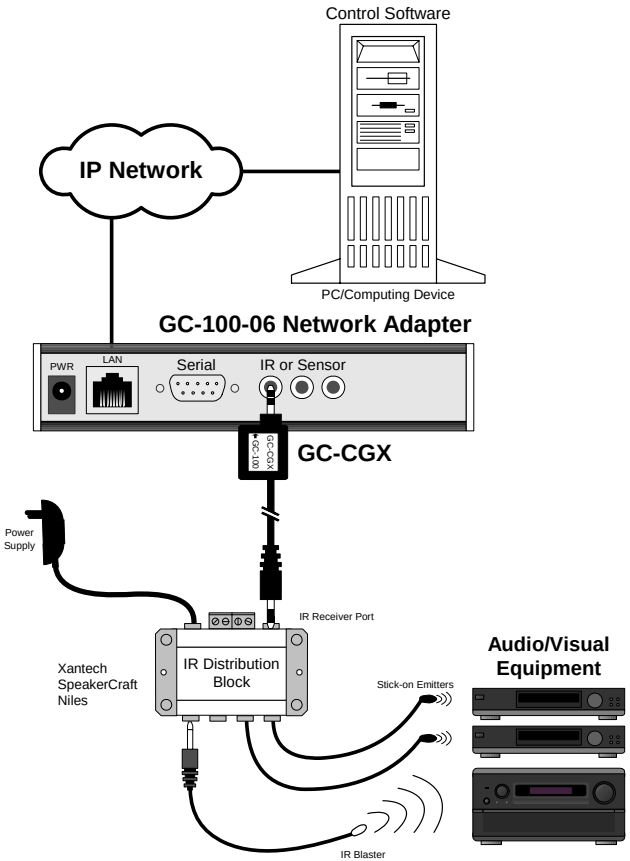
GC-100 IR Ports

- Generates Infrared (IR) for device control
  - Wide frequency range (32kHz – 500kHz) to support high-end equipment, such as B&O
  - Emitters for each IR port included
  - Supports Control-S direct cable connection
  - Output to other IR environments (Xantech) via GC-CGX cable
  - Individually configurable as sensor input ports

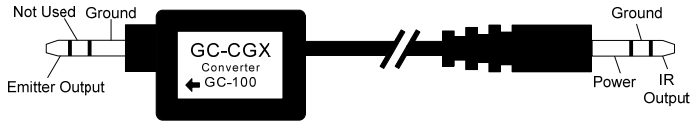
IR Emitters Over a Network



Connecting Other IR Environments

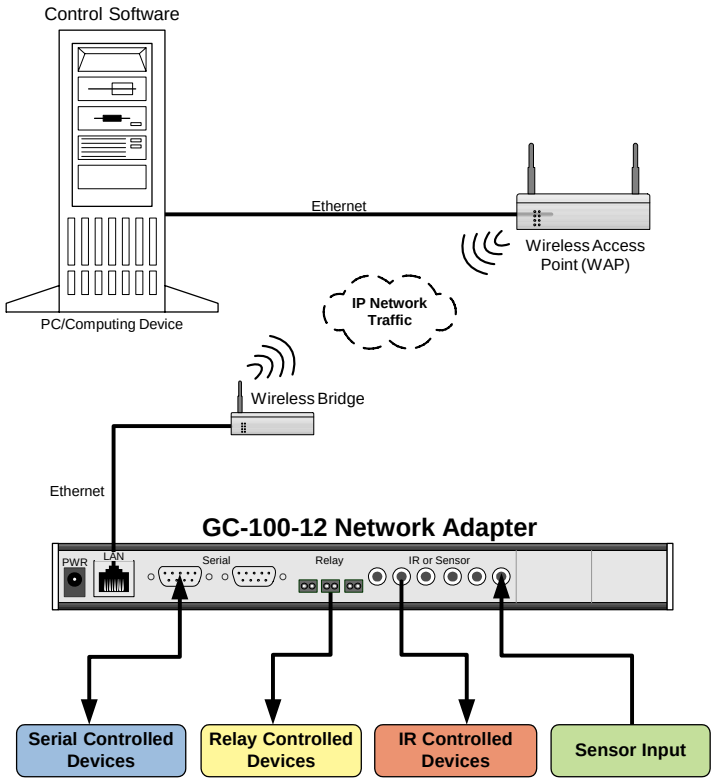


GC-CGX Converter Cable



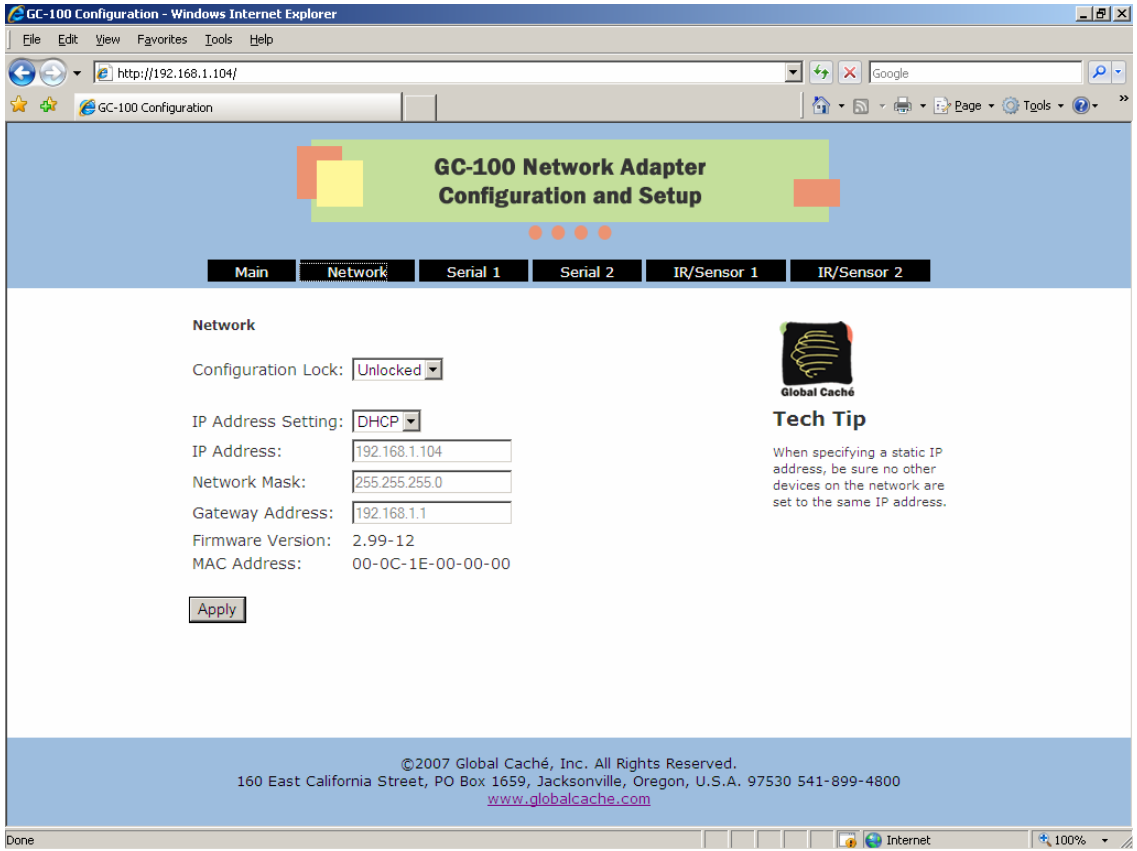
GC-100 Wireless Environment

IP-Enabling Devices in a Wireless Environment



GC-100 Configuration

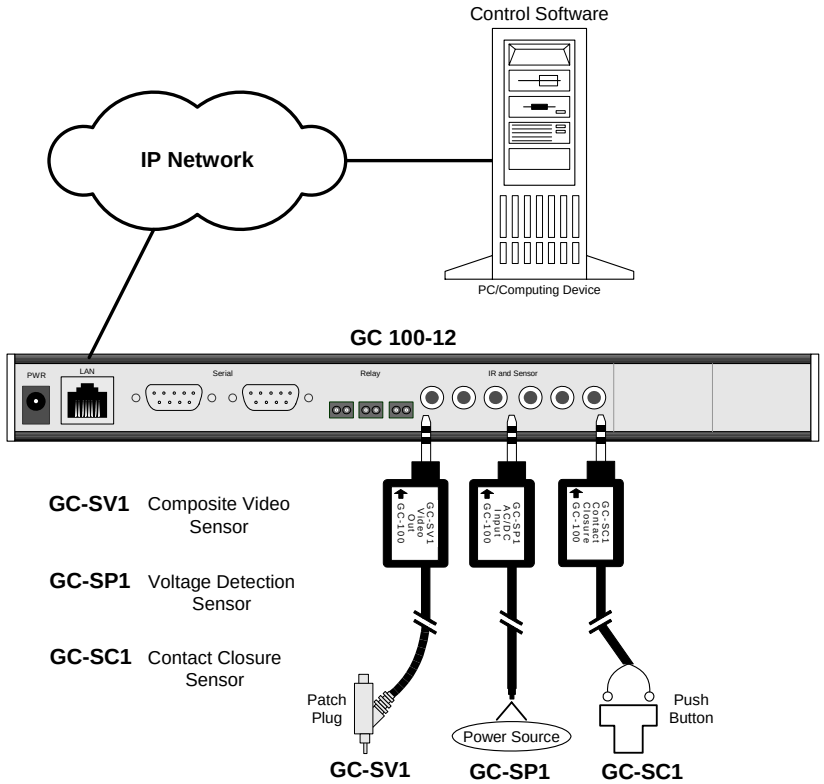
- Embedded web server for easy configuration



Sensor Products

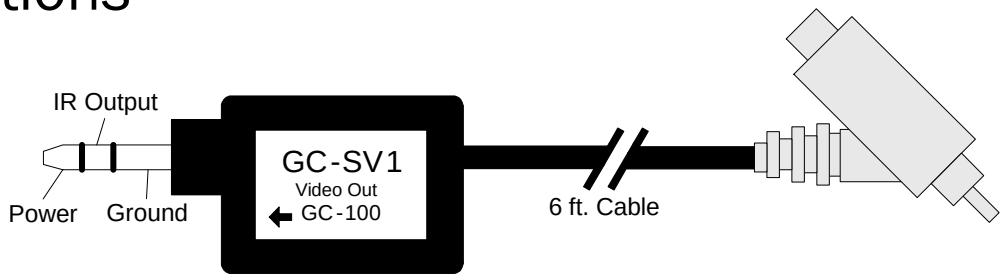
- Configure IR ports as sensor input
- Device state condition accessible over a network
  - Verify IR command
  - Interfacing with other systems
  - Providing feedback
- Three Sensors for maximum flexibility
  - Video signal sensor
  - Power sensor
  - Contact closure sensor

Sensor Input over a Network



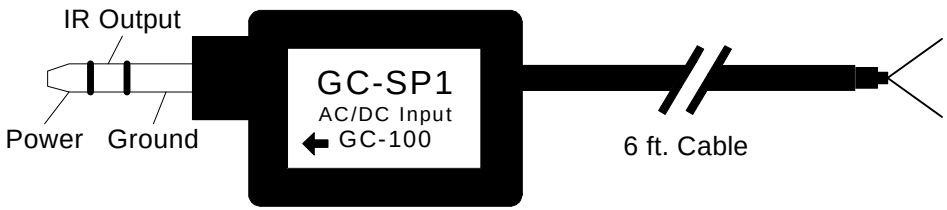
GC-SV1 Video Out Sensor

- Monitors on/off status of video equipment
  - Detects presence of composite or component video signals
  - Ideally suited for DVDs and VCRs
  - Plugs directly into GC-100
  - Can be polled by control system or send automatic notifications



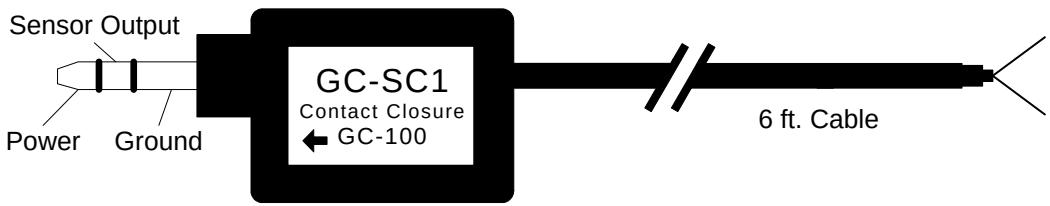
GC-SP1 AC/DC Voltage Sensor

- Monitors on/off status of powered state of electronic equipment
  - Detects AC or DC voltage ± 2V up to 24 volts
    - Equipment, power strips (via wall adapter) or ring condition of a telephone circuit
  - Optically isolated for circuit protection
  - Plugs directly into the GC-100
  - Can be polled by control system or send automatic notifications



GC-SC1 Contact Closure Sensor

- Detects the open and closed status of a pair of isolated contacts such as a relay or switch
  - Ideal for detecting contact closures on thermostats, motion sensors, security contacts, and doors
- Filters false triggers associated with contact bounce (debounce)
- Plugs directly into the GC-100
- Can be polled by control system or send automatic notifications



GC-100 Models

- **GC-100-06**
  Power input
  Network connection
  Serial port
  Three independent IR outputs or sensor inputs
  Dimensions: 6.0" L x 3.0" D x 1.3" H

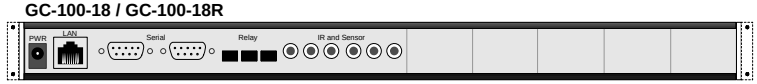
GC-100-06

- **GC-100-12**
  Power input
  Network connection
  Two serial ports
  Three relays
  Six independent IR outputs or sensor inputs
  Dimensions: 12.0" L x 3.0" D x 1.3" H

GC-100-12

- **GC-100-18**
  Same configuration as GC-100-12
  Dimensions: 17.5" L x 3.0" D x 1.3" H

GC-100-18 / GC-100-18R



- **GC-100-18R**
  Same configuration as GC-100-18 with rack mount kit installed

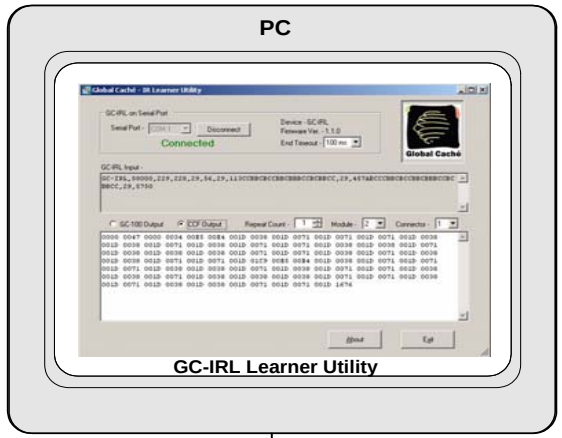
IR Products

- Integrated IR solutions for IP network environments
  - GC-IRL IR Learner
  - GC-IRE IR Extender
  - GC-RG1 IR Receiver

GC-IRL IR Learner

- Learns and digitizes IR codes simply and easily
- Full frequency IR spectrum 30KHz to 500KHz
- Free software utility to capture IR codes directly to the Windows clipboard for easy database creation
- Plugs directly into any serial port
- Tiny footprint; fits in your pocket
- Very cost effective
- Must have tool for dealers and installers
- No external power supply required

IR Learning for Dealers/Installers



Free GC-IRL IR Learner Utility

- Learns IR commands
- Displays
  - GC-100 or
  - CCF format
- Auto copies to clipboard for easy database creation

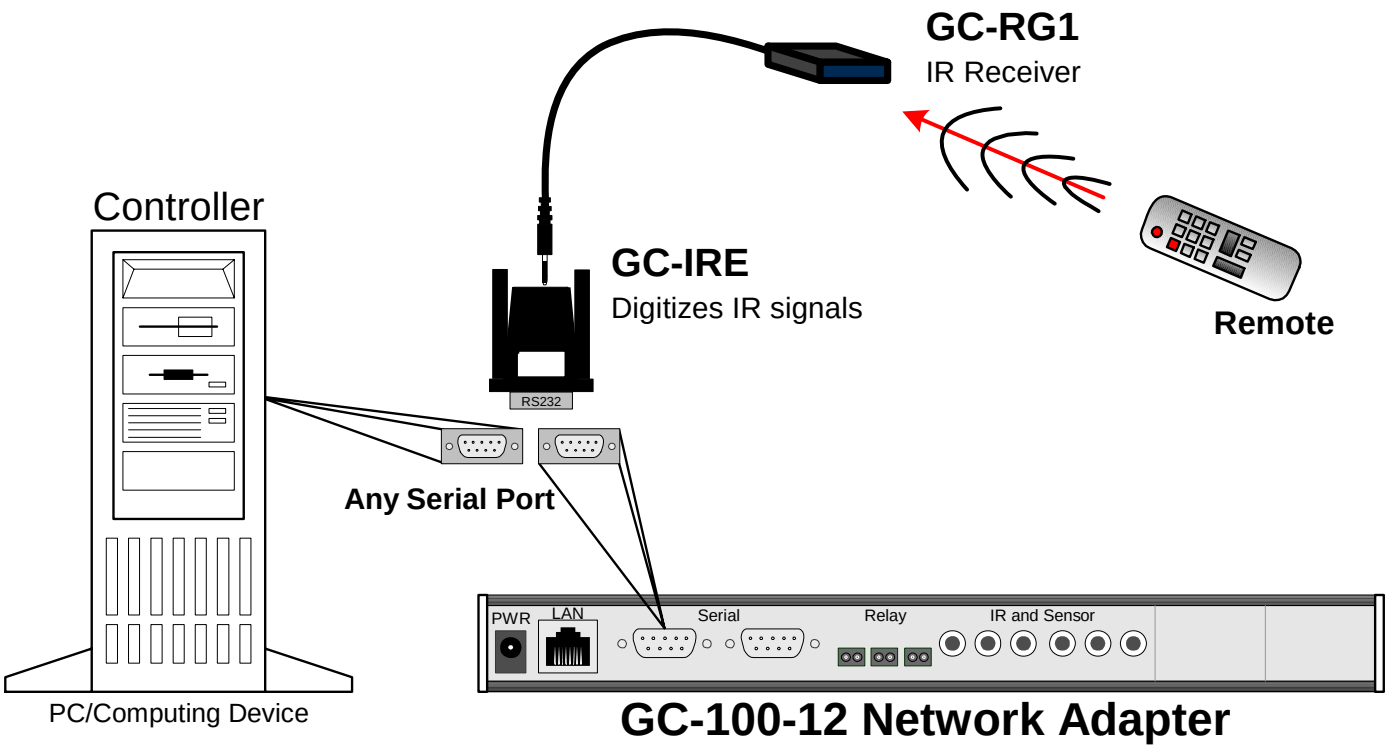
GC-IRL

- Captures full IR spectrum signals (30KHz - 500KHz)
- Digitizes IR signals
- Works with PCs Windows 2000/XP

GC-IRE IR Extender

- Digitize IR signals from receivers
- Powered by the serial port
- Full frequency IR spectrum 30KHz to 500KHz
- Compatible with GC-RG1 receiver
- Compatible with other receivers via GC-CXG converter cable
  - Xantech
  - Speakercraft
  - Niles

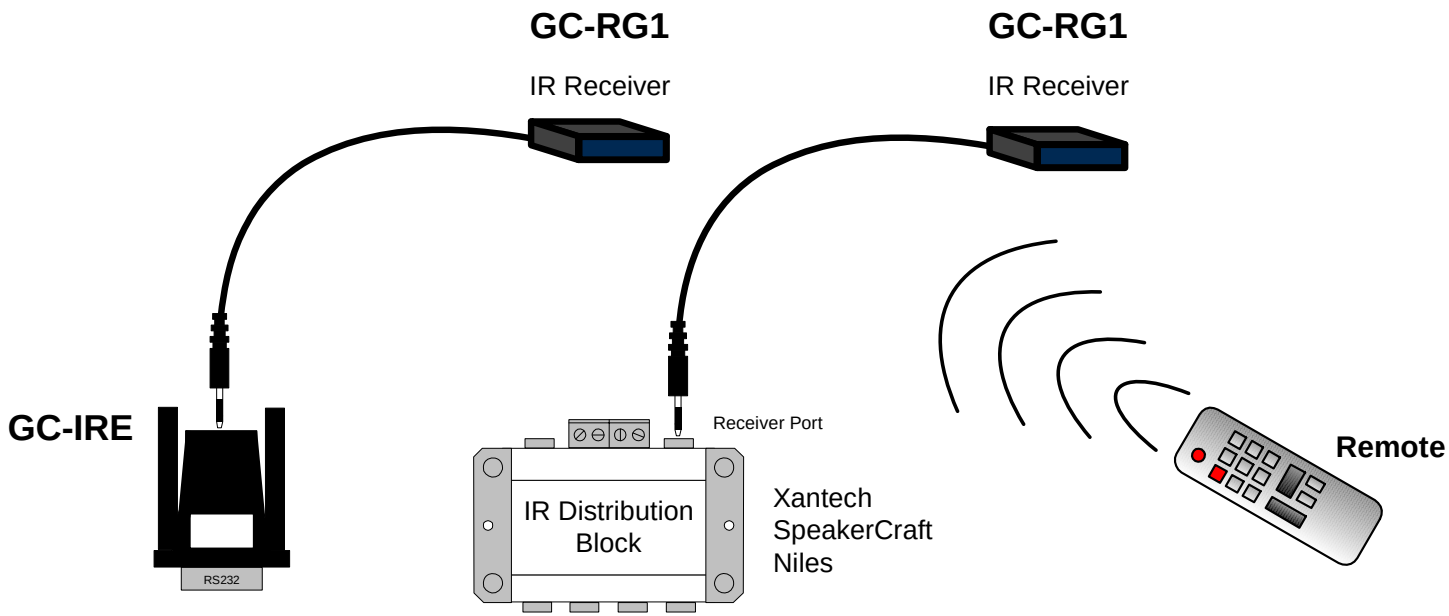
Converting IR Signals to Digital



GC-RG1 Receiver

- General spectrum IR receiver 30KHz to 80KHz
- Plasma display and fluorescent light friendly
- Compatible with Xantech and other IR distribution systems
- Very small footprint - 10mm x 21mm x 25mm (.40”x.82”x.95”)
- Plugs directly into the GC-IRE or IR distribution box
- No external power supply required
- Cost effective

GC-RG1 (cont.)

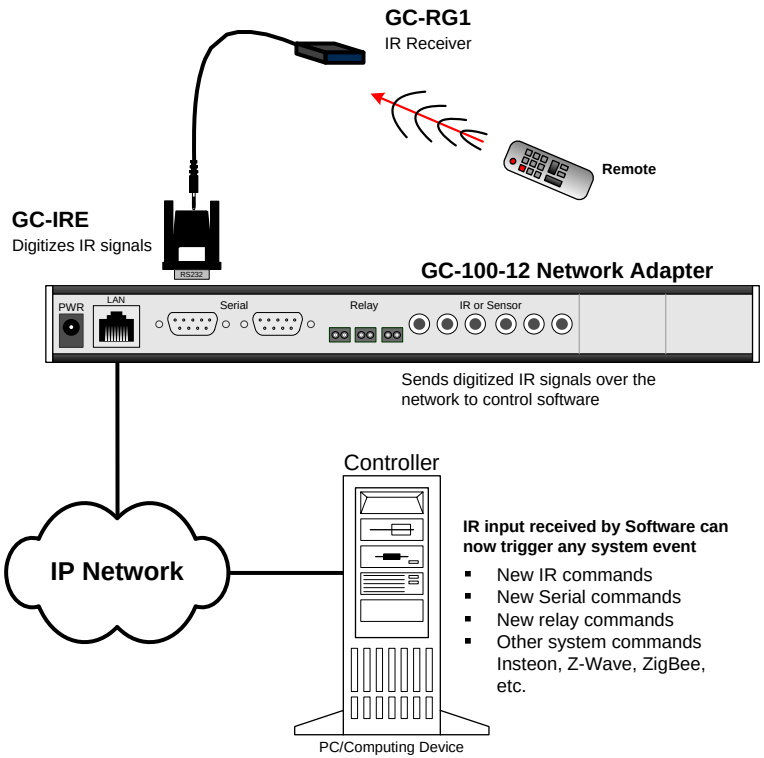

GC-RG1
IR Receiver
GC-RG1
IR Receiver
GC-IRE
RS232
Receiver Port
IR Distribution Block
Xantech
SpeakerCraft
Niles
Remote

IR Events

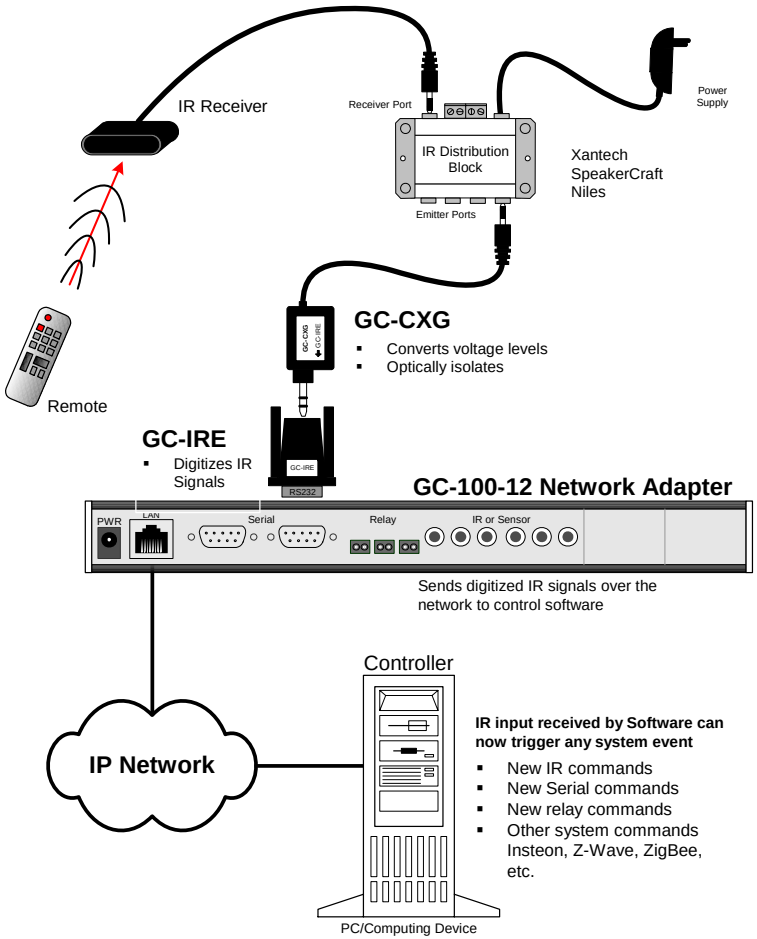
- Use IR remote control as input device for control systems with the GC-RG1 and GC-IRE
  - Activate events or other system-wide commands

IR to Digital Input Events

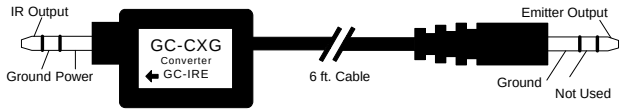
- A remote can now activate any event



IR to Digital Input Events (cont.)



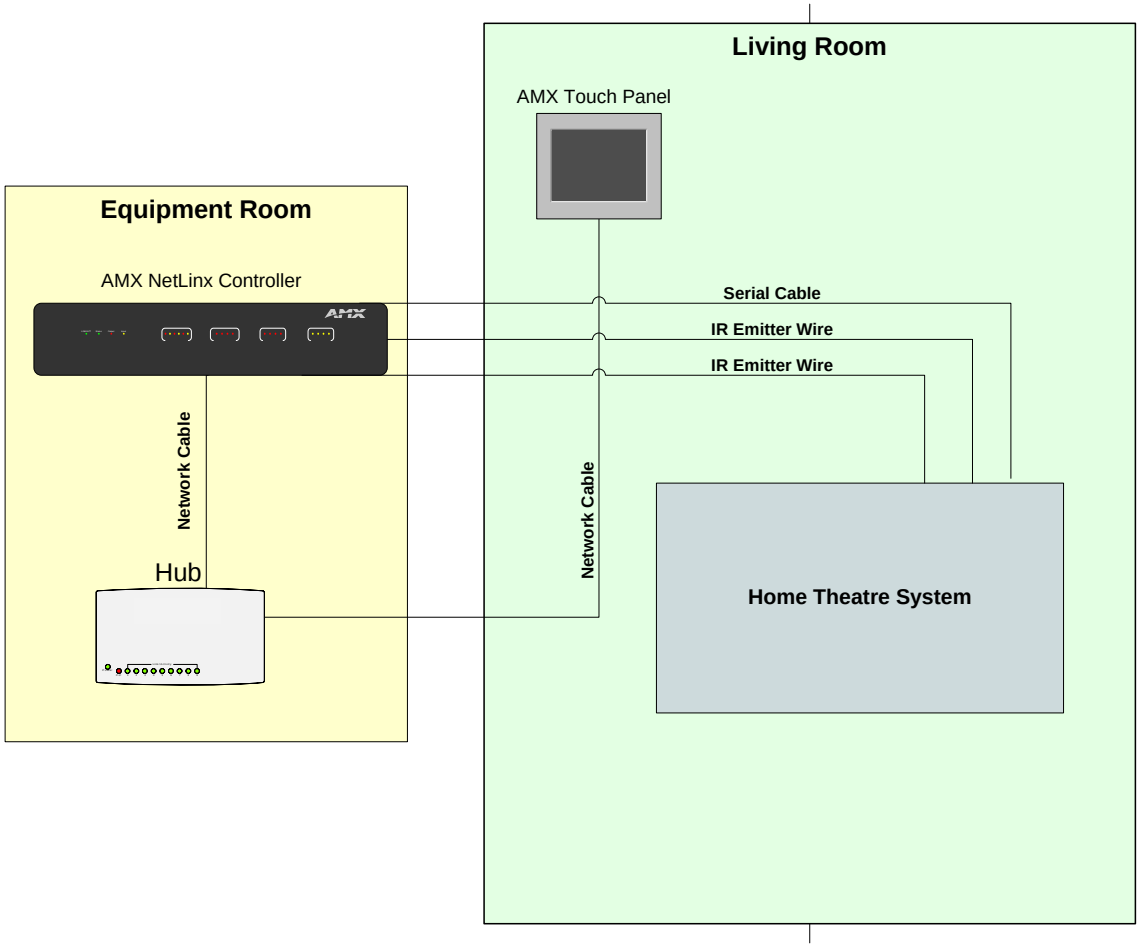
GC-CGX Converter Cable



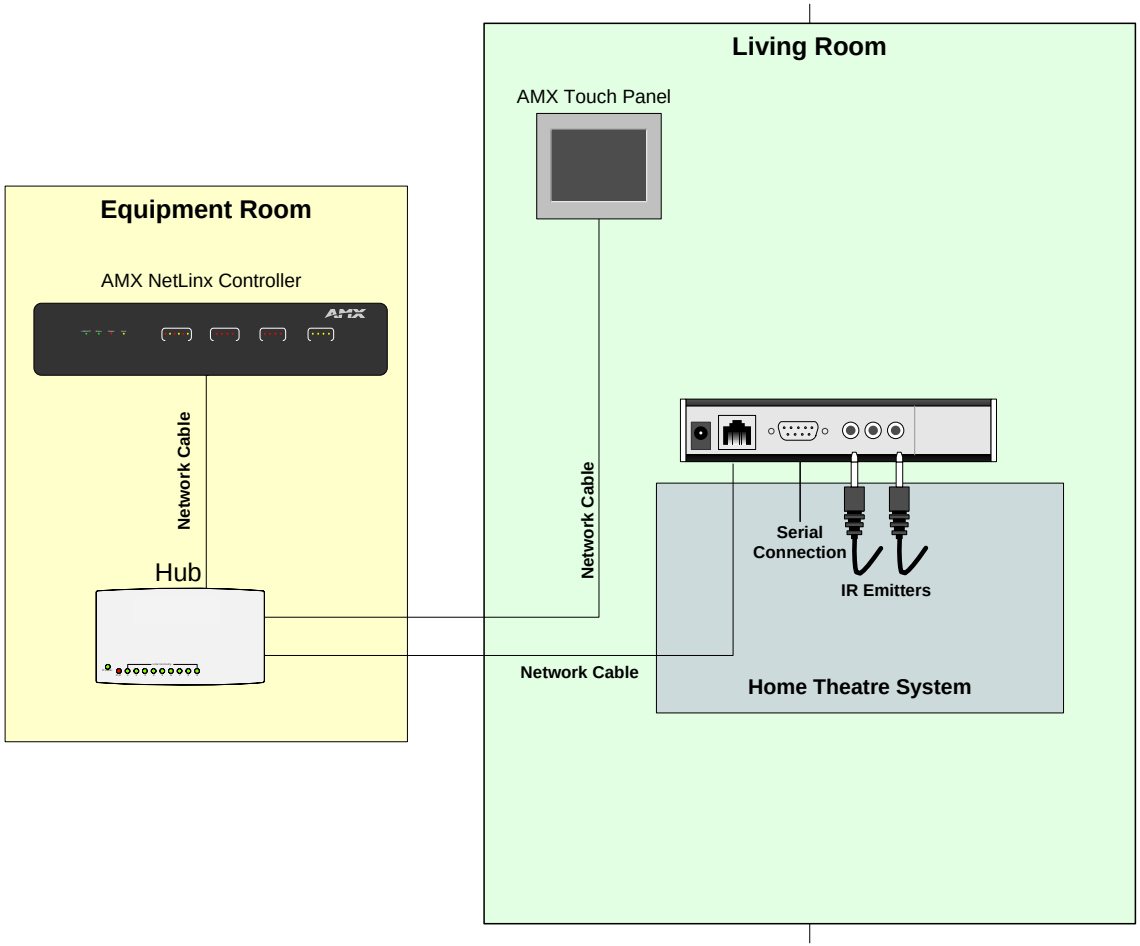
Benefits of using with AMX

- Easily add IR, serial, and relay control to any room by running a single Cat5 network cable
- Leverage existing AMX equipment
- Auto discovery of GC-100s via the AMX Duet driver makes installation easy
- Cost effective

AMX without GC-100



AMX with GC-100



Using the AMX Duet Driver

- Download and install the GC-100 Duet driver from AMX's website
- Define devices for each GC-100 module (serial ports, relay ports, and IR ports)
- Initialize the driver
- Include IR conversion program code
- Call the driver to send IR, serial, or relay control commands

Using the AMX Duet Driver

- Define device numbers in NetLinx application

```
37  (***********************************************************)
38  (*          DEVICE NUMBER DEFINITIONS GO BELOW             *)
39  (***********************************************************)
40  DEFINE_DEVICE
41
42  dvTP         = 10001:1:0          (* G4 TOUCH PANEL     *)
43  dvSERIALDEVICE1 = 5001:1:1        (* Netlinx serial port 1 *)
44  dvSERIALDEVICE2 = 5001:2:1        (* Netlinx Serial Port 2*)
45  dvIROUT = 5001:3:1                 (* Netlinx IR output port *)
46
47  dvDEVICE    = 0:5:0               (* GLOBAL CACHE GC-100     *)
48  vdvDEVICE1 = 41001:1:0            (* GC100 control module 1 Serial port 1 *)
49  vdvDEVICE2 = 41001:2:0            (* GC100 control module 2 Serial Port 2  *)
50  vdvDEVICE3 = 41001:3:0            (* GC100 relay control module 3  *)
51  vdvDEVICE4 = 41001:4:0            (* GC100 IR control module 4  *)
52  vdvDEVICE5 = 41001:5:0            (* GC100 IR control module 5  *)
53
54  (* CABLE FOR THE GLOBAL CACHE GC-100 IS ETHERNET. *)
55
56  (***********************************************************)
57  (*               CONSTANT DEFINITIONS GO BELOW             *)
58  (***********************************************************)
59  DEFINE_CONSTANT
60
```

Using the AMX Duet Driver

- Initialize the driver

```
106  (***********************************************************)
107  (*                STARTUP CODE GOES BELOW                  *)
108  (***********************************************************)
109  DEFINE_START
110
111
112
113  DYNAMIC_APPLICATION_DEVICE(vdvDEVICE1,duet_dev_type_utility,'GlobalCache')
114  DEFINE_MODULE 'GlobalCache_GC100_UI'    TP1(vdvArray, dvTP, nButtons, dvSERIALDEVICE1, dvIROUT)
115  (***********************************************************)
116  (*                THE EVENTS GOES BELOW                    *)
117  (***********************************************************)
118  DEFINE_EVENT
119  (***********************************************************)
120  (*             THE ACTUAL PROGRAM GOES BELOW               *)
121  (***********************************************************)
122
```

Using the AMX Duet Driver

- Include IR conversion program code

```
113 DATA_EVENT [dvSERIAL1]
114 {
115     online:
116     {
117         SEND_COMMAND dvSERIAL1,'set baud 9600,N,8,1 485 disable'
118         SEND_COMMAND dvSERIAL1,'HSOFF'
119     }
120
121     string:
122     {
123         strSerialData = "strSerialData,data.text"
124         x1 = find_string(strSerialData,"$0d",1)
125         if (x1 > 0)
126         {
127             strSerialDataToUncompress = Remove_String(strSerialData,Mid_String(strSerialData,1
128
129             CALL 'Prepare IR Code'
130             strTemp = itoa(iGCConnectorNumber)
131             strTemp = "strTemp,44"
132             strTemp = "strTemp,'1,'"
133             strIRCommand = "strTemp,strIRCommand"
134
135             SEND_COMMAND vdvDEVICE[iGCModuleNumber],"'SEND_IR-',strIRCommand"
136
137         }
138     }
139 }
```

Using the AMX Duet Driver

- Sending IR commands

```
142  BUTTON_EVENT[dvTP, nButtons]
143  {
144      PUSH:
145      {
146          nIndex = get_last(nButtons)
147                   switch(nIndex)
148                   {
149                       case POWER_BTN:
150                       {
151                           iGCModuleNumber = 4
152                           iGCConnectorNumber = 1
153                           PULSE[dvIROUT,9]
154                       }
155                       case EJECT_BTN:
156                       {
157                           iGCModuleNumber = 4
158                           iGCConnectorNumber = 1
159                           PULSE[dvIROUT,12]
160                       }
161                       case PLAY_BTN:
162                       {
163                           iGCModuleNumber = 4
164                           iGCConnectorNumber = 1
165                           PULSE[dvIROUT,10]
166                       }
```

Using the AMX Duet Driver

- Sending Relay Commands

```
142  BUTTON_EVENT[dvTP, nButtons]
143  {
144      PUSH:
145      {
146          nIndex = get_last(nButtons)
147                   switch(nIndex)
148                   {
149                       case RELAY1OFF_BTN:
150                       {
151                           send_command vdvDEVICE[RELAY_MODULE_ADDRESS],"'SET_RELAY-1,0'"
152                       }
153                       case RELAY1ON_BTN:
154                       {
155                           send_command vdvDEVICE[RELAY_MODULE_ADDRESS],"'SET_RELAY-1,1'"
156                       }
```

Using the AMX Duet Driver

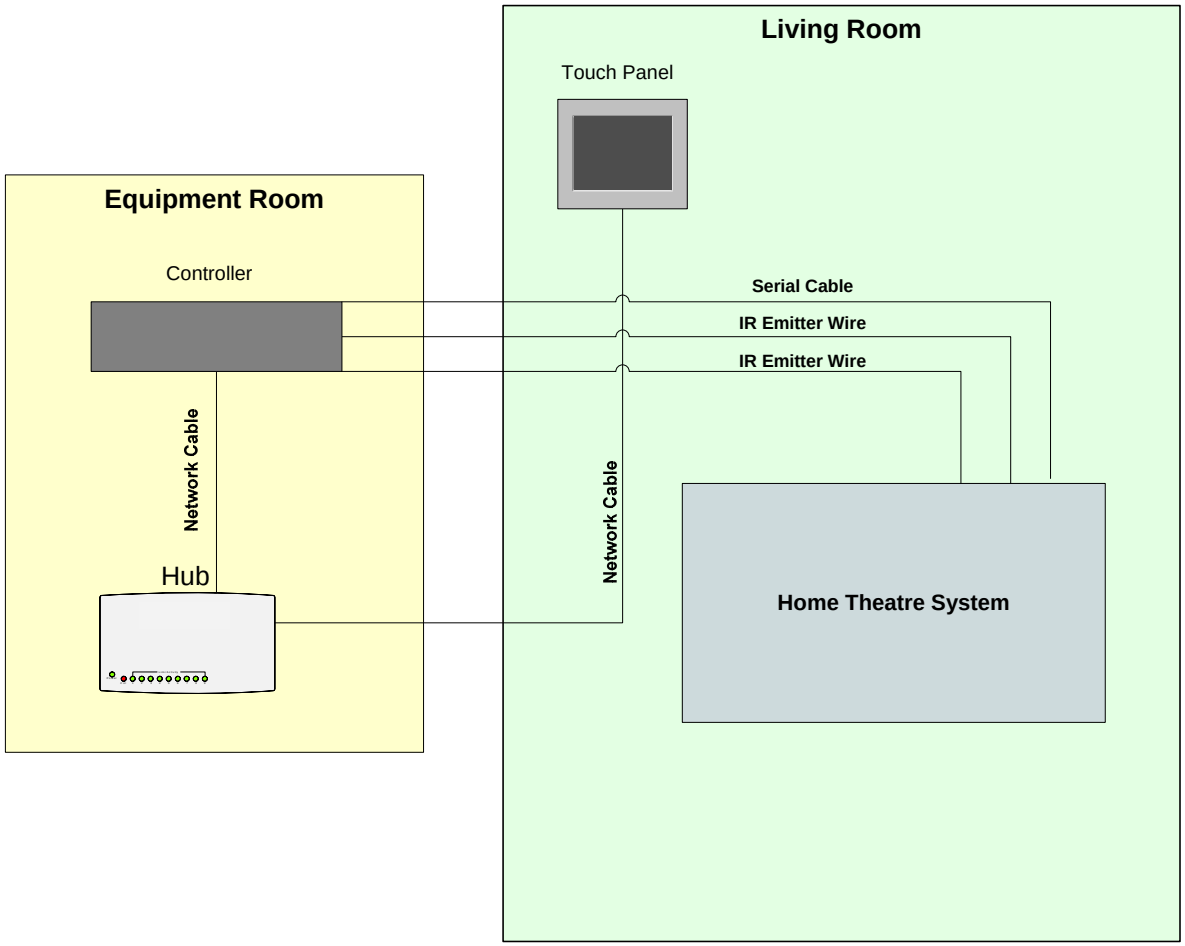
- Sending RS232 Serial Data

```
142  BUTTON_EVENT[dvTP, nButtons]
143  {
144      PUSH:
145      {
146          nIndex = get_last(nButtons)
147              switch(nIndex)
148              {
149                  case SENDSERIAL_BTN:
150                  {
151                      send_command vdvDEVICE[SERIAL1_MODULE_ADDR],"'SEND_RS232-',strSomeData"
152                  }
153
```

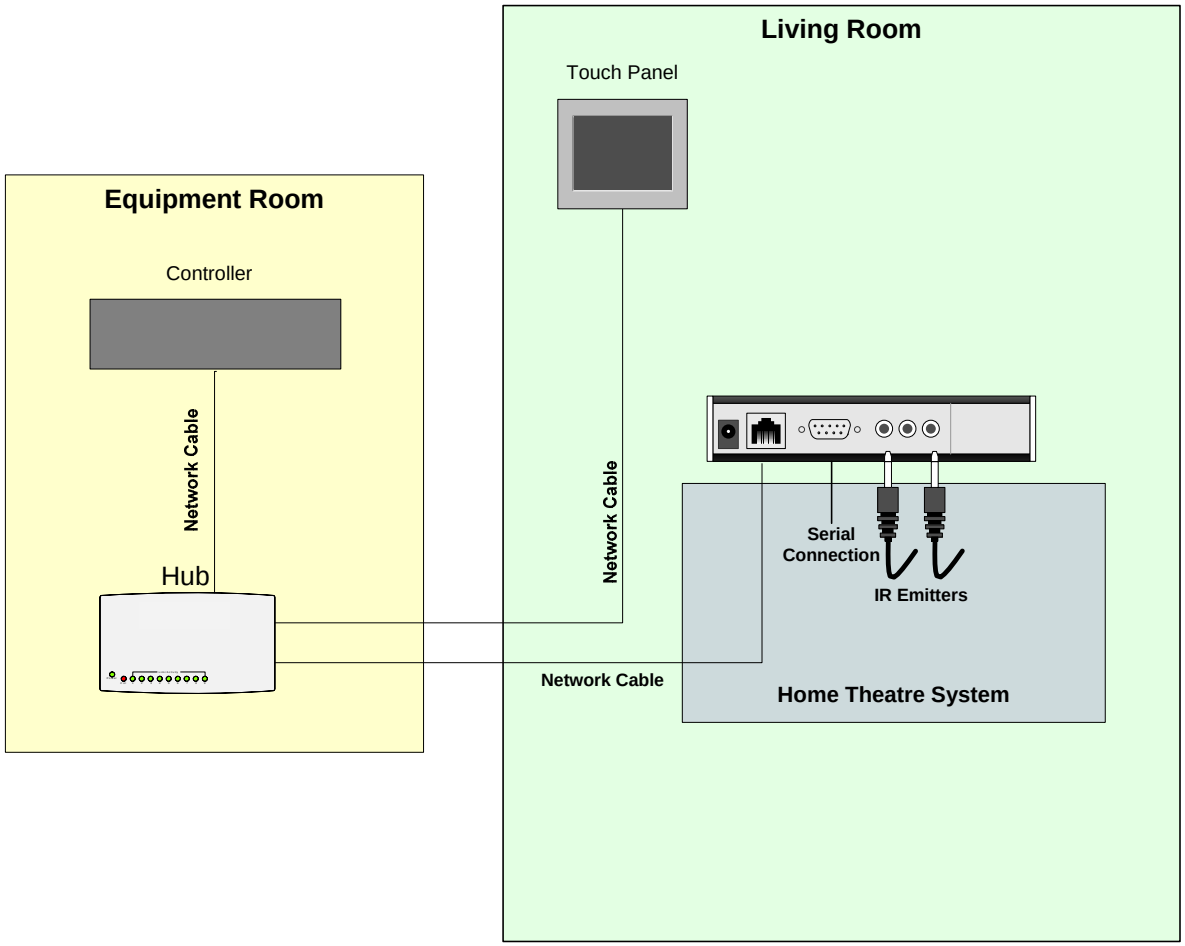
Benefits of using with Crestron

- Easily add IR, serial, and relay control to any room by running a single Cat5 network cable
- Leverage existing Crestron equipment
- Cost effective

Crestron without GC-100



Crestron with GC-100

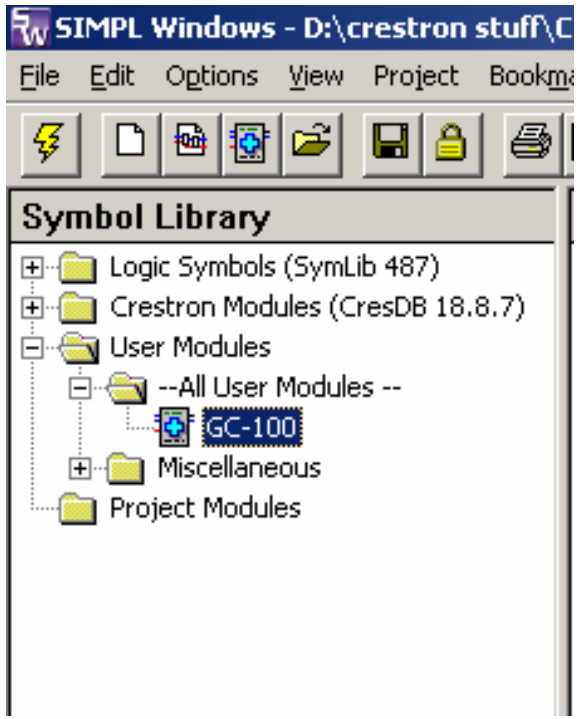


Using the Crestron Module

- Download and install the GC-100 Crestron template module from Global Caché's website
- Create TCP/IP Client objects
- Initialize the module and set model number
- Module provides functions for sending IR, relay control, and sensor inputs.
- Serial communications are done directly with the TCP/IP Client objects

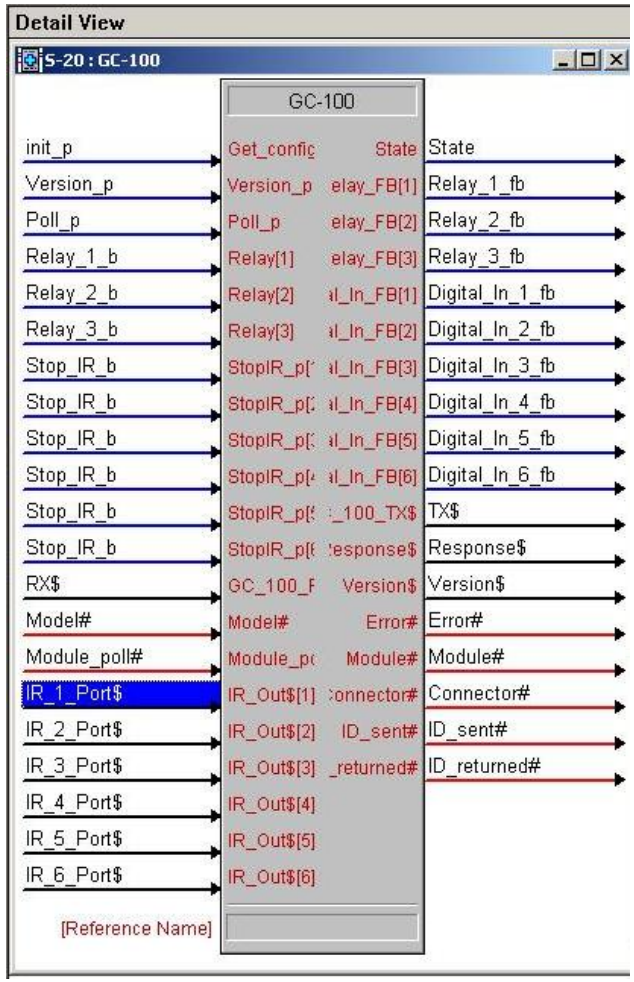
Using the Crestron Module

- Add module to your Simpl Windows application



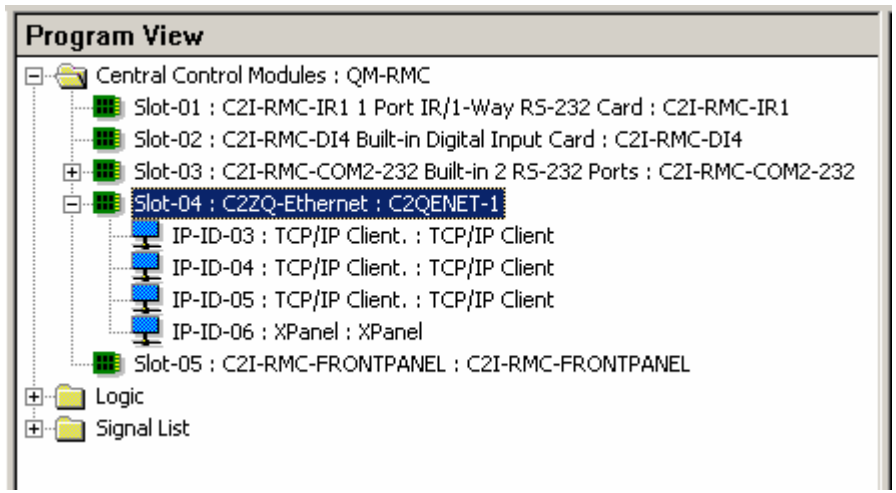
Using the Crestron Module

- Logic pins for GC-100 module



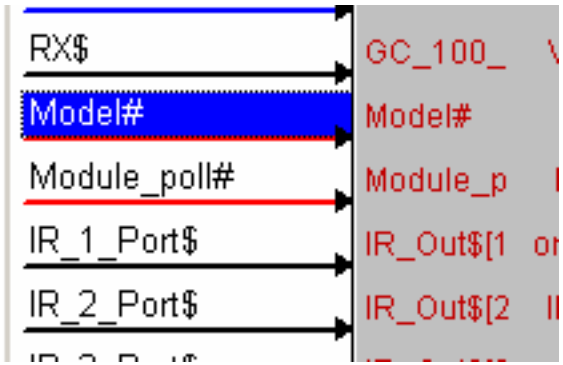
Using the Crestron Module

- TCP/IP Client objects



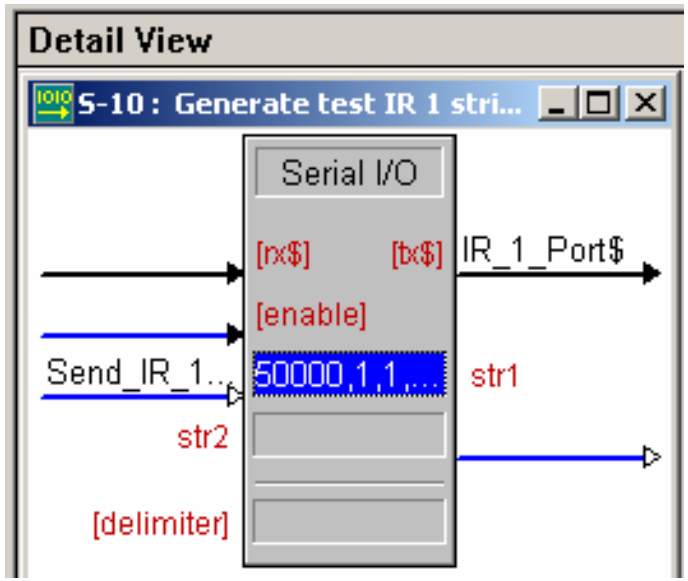
Using the Crestron Module

- Initialize module and set model number



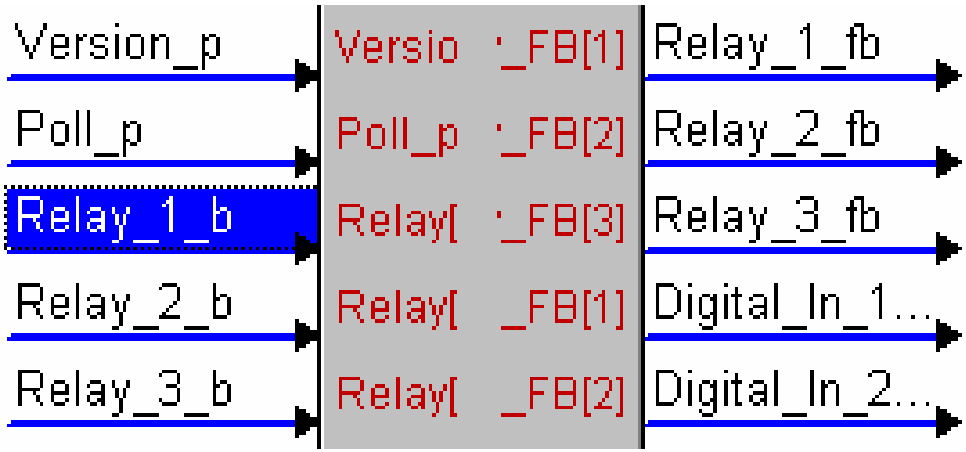
Using the Crestron Module

- Send IR by loading the IR command text into one of the IR output pins



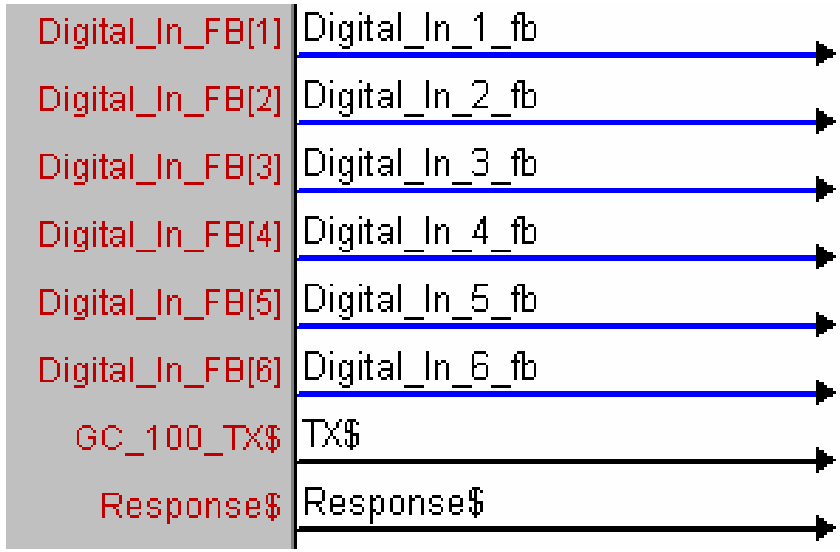
Using the Crestron Module

- Control relay outputs via digital input pins



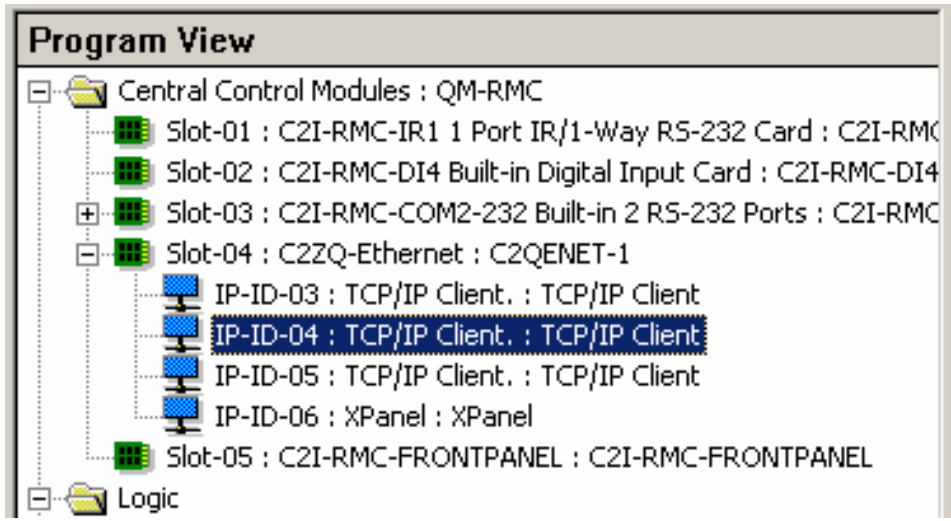
Using the Crestron Module

- Poll for sensor input states



Using the Crestron Module

- Serial communications are performed directly on the TCP/IP Client objects and are not interpreted by the module



Conclusion

- Established leader in the market
- First product of its kind
- Partnered with almost every control system provider
- Flexible, cost effective, and embraces open systems
- Simple hardware design for high reliability
- Simplest way to glue it all together via IP networking

More Information

- Sales – Robin Ford

  robin.ford@globalcache.com

- Technical Support

  support@globalcache.com

- Marketing - Rusty Keller

  rusty.keller@globalcache.com