

Integration with Ethernet and RS-232 Devices

Revision D



Overview

HomeWorks QS is a system capable of integrating with other equipment in many ways. In most instances this integration can be accomplished using TCP/IP and an Ethernet network, however, it is sometimes necessary to integrate with legacy devices utilizing RS-232 serial connections. HomeWorks QS does not include an on-board RS-232 port, but a simple inexpensive device can be added that will convert Ethernet to RS-232 to accomplish this integration. This application note describes how to set up and configure integration with the HomeWorks QS system using both Ethernet and RS-232. There are four integration scenarios that will be described in this document.

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Scenario 1: Integration with Ethernet Connected Devices Using the Lutron Integration Protocol

Overview:

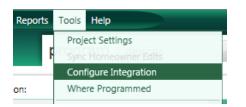
In this scenario, integration between HWQS and 3rd-party devices is accomplished using an Ethernet connection and the Lutron Integration Protocol, which is well documented and freely available. This is the most common type of integration with a HWQS system. Many 3rd-party systems and devices have fully functional two-way integration drivers for HWQS that utilize the Lutron Integration Protocol and allow for simplified bi-directional integration. The 3rd-party device must open and maintain a Telnet session with the HWQS system.

Equipment Required:

All versions of HWQS software can be used in this scenario. No additional equipment is required when integrating with Ethernet connected devices using the Lutron Integration Protocol.

Set Up Steps:

1. Configure integration IDs and Telnet logins in the HWQS software. This is accomplished by clicking on "configure integration" in the Tools drop-down menu.



A separate Telnet login must be created for each device. If the homeowner prefers to have the ability to edit some aspects of their system programming through the Lutron Home Control+ mobile app, make sure that the "Allow Homeowner Editing" box is checked. Click on "Add Telnet Login" in the lower left corner of the "Configure Integration" window to add another telnet login.

Integration 3rd Party Commands	Telnet Logins			
Username	Ð	Password	÷	Allow Homeowner Editing
default		default		Ø
Add Telnet Login				

Be sure to enable integration IDs for all the devices, shades, areas, zones, timeclocks, and HVAC controls that you desire to integrate with. Everything should be checked by default. If any of these are not checked, they will not be available through integration. These settings are also used by the Lutron Home Control+ mobile apps, so do not uncheck anything you would like to access from these apps.



Configure I	ntegration
Integration	3rd Party Commands Te
Assign integratio	n IDs to: Devices
Expand all Colla	pse all
	se <section-header> bor 🔊 bor 🔊 bor 🔊 bor bor bor bor bor bor bor bor bor bor</section-header>

- 2. Configure the Ethernet connected devices to establish a Telnet session with the HWQS processor. This is done using the 3rd-party device or associated software. Consult that product's documentation for details.
- 3. Configure the 3rd-party devices and systems to utilize the Lutron Integration Protocol with the appropriate integration IDs. Many 3rd-party devices have drivers for Lutron systems and devices that will allow easy integration between the two. In other cases, you may be required to configure the 3rd-party device to send the appropriate command. Consult the Lutron Integration Protocol, available within the HWQS software for details. The Integration ID is listed beside each device you have enabled for integration or can be found in the Integration Report, available in the Report Center.

影響 Configure Integration	×
Integration 3rd Party Commands Telnet Logins	
Assign integration IDs to: Devices	Integration Protocol
Expand all Collapse all	
Main House Ist Floor Ist Floor Bath Bath Bath Entry > Device 1 Bath Entry > Device 2 Bath Sensor Bath Sensor If and the sensor	ID: 19 ID: 21 ID: 23
🕂 Bedroom 📈	
Bedroom TV	ID: 24

4. Connect all devices to the same Ethernet network and subnet (refer to the HWQS Networking Guide for details). The devices must be able to communicate over the Ethernet network for the integration to function properly.

Scenario 2: Integration with Ethernet Connected Devices Using Custom Integration Commands

Overview:

In this scenario, integration between HWQS and 3rd-party devices is accomplished using an Ethernet connection and the 3rd-party device's communication commands. Common examples include spa/pool controllers, A/V components, and thermostats. The HWQS system will open and maintain the Telnet session or TCP connection with the 3rd-party device. Communication between the 3rd party system and the HWQS system is bi-directional. A driver must be created within the HWQS software to allow the HWQS system to be able to send and receive the 3rd party commands.

Equipment Required:

HWQS software version 2.0 or later must be used in this scenario. Prior to the 6.x version of the software, only commands sent to the 3rd party device were supported. Bi-directional communication support is available in software versions 6.x and newer. No additional equipment is required when integrating with Ethernet connected devices using custom integration commands.

Set Up Steps:

1. Add a "Control 3rd Party" device to your project on the "design" tab under the "define equipment" task. A "Control 3rd Party" device must be added for each device you intend to integrate with using custom integration commands. If the device is not shown in your toolbox, you may need to edit your toolbox to add the device.

design	equipment	-							
Hybrid Hor	controls loads shades								
	equipment								
– 1st	link assignme line items	ent							
Equipment B	ackroom +								Edit Toolbox
R			B to a set of the set		.	R e	I AND		
DIN Rail Power Module Eco	Visor Control Power Su Receiver Panel	pply Hybrid Repeater	Single zone HVAC Controller	1 phase 15A AFCI Panel	LV-21	LV-17	QSM Wireless	Control 3rd Party	

2. The Ethernet integration can be accomplished in one of two ways: using Telnet (the HWQS system will open and maintain a Telnet session with the 3rd-party device) or by sending raw TCP data to a specified port on the 3rd-party device.

If using Telnet, the IP address of the 3rd-party device, Telnet port (default is 23), and the Telnet username and password must be entered. These settings must match the 3rd-party device.



Equipment Locations + Add new Expansion	and all Collapse all Assign Inpu	its/Outputs			
- 3rd Party Device Edit Edit Comr	mand Sets				
	Edit Command Sets	Address	Port Number	Username	Password
	Integration Command Set 001	192.168.1.199	23	myUserName	myPassword

If sending raw TCP data, the username and password fields must be left blank, however, the IP address of the 3rd-party device must be entered in the address field and the TCP port to send the data to must be entered in the Port field.

Equ	ipment Locations	Add new E	xpand all Collapse all Assign Inpu	its/Outputs			
	3rd Party Device	Edit Edit Co	mmand Sets				
			Edit Command Sets	Address	Port Number	Username	Password
			Integration Command Set 001	192.168.1.199	51023		

3. "Edit Command Sets" to create a custom command set for the 3rd-party device. This screen can be opened by clicking the "Edit Command Sets" link in the "Equipment Locations" box, or by going to the "Tools" menu and choosing "Configure Integration". Once in this window, you can "Add Command Sets" and "Add Commands" to existing command sets. The data can be entered in ASCII text or Hex values. You also have the option of appending an RS-232 terminator to each command, if required by the 3rd-party device. Telnet typically requires <CR> <LF> terminators, but this can vary based on the device used.

Commands are assigned a Nickname to identify the command when programming. In versions 6.0 and later, communication direction indicates whether the command is To, From, or both To and From. The actual command is then typed into the Command field.

Video Command Set	Edit	Data Type ASCII	Use RS232 te	rminator		
Audio Command Set		Nickname 0	Communication Direction	θ	Command	0
		Play	To 3rd Party		#PLAY,1	
		Pause	To 3rd Party		#PAUSE,1	
		Stop	To 3rd Party		#STOP,1	
		Play Feedback	From 3rd Party		~PLAY,1	
		Stop Feedback	From 3rd Party		~STOP,1	

4. Assign this command set to the 3rd-party device in the project. This can be chosen from the drop-down box on the device. If using software versions 7.x and newer, proceed to Step 5. If using a prior version of software, skip ahead to step 6.



Equipment Locations	xpand all Collapse all Assign Ing	outs/Outputs		Cu	stomize columns
3rd Party Device × Edit Edit Co	ommand Sets				
	Edit Command Sets	Address	Port Number	Username	Password
ENHEN D	Integration Command Set 001	92.168.1.199	23	myUserName	myPassword
	Integration Command Set 001 My Device Commands A/V Device Commands Lutron Commands Edit Command Sets				

5. FOR SOFTWARE VERSION 7.x AND NEWER ONLY – 3rd Party Controls need to be assigned to a specific processor in the database. Go to "Link Assignment" on the Design tab. Click on the appropriate Ethernet link to assign the 3rd Party Control. On the right-hand side of the screen, find the 3rd Party Control that is to be assigned and check the box to assign it to 1 of the 5 available Ethernet Connections for the specific processor. NOTE: Processor 1 has two of its Connections occupied, by default, for the Remote Access feature of Home Control+. It is possible to regain these two Connections by disabling the Home Control+ Remote Access feature. To disable this feature, check the "Disable Home Control+ Remote Access" option.

design link assignment rogram	activate transfer diagnostics
Hybrid Home Project	Ethernet
Main House Ist Floor Control Room	Expand all Collapse all Assignable items: Show Ethernet Devices
LV21 Processors	Hybrid Home Project 1 of 2 Assigned
Processor 1	Main House 1 of 2 Assigned
Link 1 (HWQS RF)	+ 1st Floor 1 of 2 Assigned
Link 2 (QS)	Control Room 🗌 1 of 2 Assigned
Ethernet	Control 3rd Party Video (Control 3rd Party)
Processor 2	
Link 1 (HWQS Power Panel)	
Link 2 (H48)	
Ethernet	

6. Program keypads, timeclocks, etc. to send commands to the 3rd-party device. This is done on the "program" tab. Choose "Control 3rd Party" from the "Assignable Items" list to view the devices in your project. The "Settings" drop down will display the integration commands that were configured for that device.

Press On	Double Tap	Hold	ł		
Use shared so	ene Share this scen	e			
Assignable Items	Show All 🕟 Cor	ntrol 3rc	i Party	in▶1s	t Floor 🕨 🤇
Expand all Collag	ose all				
- Control Roo	om 🔳 1 of 2 Activ	ve 3rd P	arty Devices		
🕑 Con	trol 3rd Party Video	\checkmark	Settings	Play	▼ Fad
) Cont	trol 3rd Party Audio			Play Pause Stop Edit Command S	Sets



7. If you would like LED feedback on the buttons, you should create a state variable and assign it to the button in addition to assigning the custom output strings.

In versions 6.0 and later, the variable state should then also be assigned to the incoming 3rd party command. Programming the incoming 3rd party commands is similar to programming keypads. You can find the 3rd Party Controls in the Device Location menu and select the 3rd Party Control as if you were selecting a keypad, in an area, to program. For example, when controlling a media playback device with commands to Play, Pause, and Stop, create a state variable with these same states and assign the variable states to the button that sends the corresponding command to the media playback device. Similarly, the variable will then need to be assigned to the appropriate incoming 3rd Party command. Using scene LED logic on the button will ensure that the LED will be lit only when that state is true.

design	program devices	✓ activate transfer diagnostics
Device Location:		Button Number 22 Engraving Icon F rogram Type Normal
• Master Bedro	om 🕨 Master Bedroom Entry	Button Type: Single Action 🔽 LED Logic: Scene 🔽 🖵 ycle Dim
•	00	Press On Double Tap Hold
Prev	Next	Use shared scene Share this scene
	(10.00 m)	Assignable Items Show All 🕟 Control 3rd Party 🔽 in + 1st Floor + Control Room
_	nic keypad Configure 🧿	Expand all Collapse all
+ A/V + A	VV System	Control Room 1 of 2 Active 3rd Party Devices
		Control 3rd Party Video Settings Play Fade s Delay 0 s
		Pause Stop
LUTRON		Edit Command Sets
	Row LEDs	
Video	1 Label	
	■ 3 Button 🔽 🗹 🗹	
-	None	
Audio	1 Label	
<u>NO</u>	1 Button	
Volume	1 Label Mutel3 Button	
	Mute3 Button	
☆ ON - ☆ FAV	0 OFF	
		Type A rem Description A setting
	(Variables XX Video Play
		Control 3rd Party () Main House + 1st Floor + Control Room + Control 3rd Party Video Play

design	program	devices	-	activ	vate	transf	er	diag	nostic	5					
Dence Location:				Program	m Type Nor	mai		T							
Prev Indexed Country Nickname Play Feedback Stop Feedback			Next	Use Assignat yx yx yx	shared scen	e Share this Shoty All yx y Settings	scene	•	Fade	•	Delay	0	5		
				Type Variab	0 les	Item Descri	ption							θ	Setting Play

8. Connect all devices to the same Ethernet network and subnet (refer to the HWQS Networking Guide for details). The devices must be able to communicate over the Ethernet network for the integration to function properly.

Scenario 3: Integration with RS-232 Devices Using the Lutron Integration Protocol

Overview:

In this scenario, integration between HWQS and 3rd-party devices is accomplished using an RS-232 serial connection and the Lutron Integration Protocol, which is well documented and freely available. Many 3rd-party systems and devices have fully functional two-way integration drivers for HWQS that utilize the Lutron Integration Protocol and allow for simplified bi-directional integration. An Ethernet to RS-232 converter will be required, since the HWQS system has Ethernet connections and the 3rd-party device has only an RS-232 port. The converter device must open and maintain a Telnet session with the HWQS system, which will then allow the Lutron Integration Protocol data to pass through to the RS-232 port. This scenario is identical to Scenario 1 in this document with the exception that the Ethernet to RS-232 converter device is used between the HWQS system and the 3rd-party device.

Equipment Required:

All versions of HWQS software will work with this scenario. An Ethernet to RS-232 converter device is required to communicate with RS-232 devices from a HWQS system. There are many devices with these capabilities, however, two such devices that Lutron has had success with are the following:



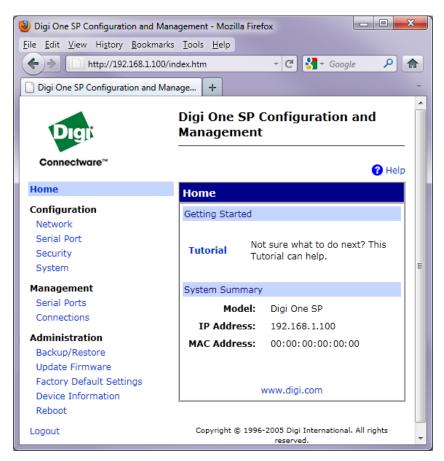
Set Up Steps:

- 1. Connect the Ethernet port on the Ethernet to RS-232 converter device to the same Ethernet network as the HWQS system and your computer. A standard Ethernet patch cable can be used.
- 2. Open the web-based configuration and management portal for the device. This can be accomplished by using the setup utility included with the device, or by using the web-based configuration and management portal. The steps contained in this document are for the Digi One SP device using the web-based setup, but are similar to those for the B & B Electronics ES1A device. The configuration and management portal is accessed by pointing your internet browser



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to the IP address of the device. The default username is "root" and the default password is "dbps". The home screen is shown below.



3. Configure the network settings on the Ethernet to RS-232 converter device by clicking on the "Network" option on the left side. It is recommended to use a static IP address. This address should be outside the DHCP range of the router. The device must be on the same network and subnet as the HWQS processor. Be sure to Apply the settings. The device may need to reboot for the settings to take effect.

Home	Network Configurat	ion			
Configuration	▼ IP Settings				
Network	Obtain an IP address automatically using DHCP *				
Serial Port	Ouse the following IP a	address:			
Security	* IP Address:	192.168.1.199			
System	* Subnet Mask:	255.255.255.0			
Management	Default Gateway:	192.168.1.1			
Serial Ports					
Connections	* Changes to DHCP, IP address and Subnet Mask				
Administration	require a reboot to take effect.				
Backup/Restore					
Update Firmware	Apply				
Factory Default Settings					

4. Configure the serial port profile on the converter device by clicking on the "Serial Port" option on the left side and then selecting "Port Profile" at the top. Choose the "TCP Sockets"



port profile. Under "TCP Client", check the box to "Automatically establish TCP connections". Enter the IP address of the HWQS processor in the "Connect To:" field. Choose "Telnet" in the "Service:" field. Enter "23" in the "TCP Port Number:" field. Be sure to Apply the settings. The image below contains the appropriate settings, however, you must replace the displayed IP address with the IP address of your HWQS processor.

Home	Serial Port Configuration				
Configuration	▼ Port Profile				
Network	Current Port Profile: TCP Sockets Change Profile				
Serial Port	The TCP Sockets Profile allows a serial device to communicate over a				
Security	TCP network.				
System					
Management	Profile Settings				
Serial Ports	TCP Server				
Connections	Connect to the following TCP ports on the network (calculated from				
Administration	Base Socket).				
Backup/Restore	Telnet TCP Port: 2001 Unavailable				
Update Firmware	Raw TCP Port: 2101 Unavailable				
Factory Default Settings					
Device Information	TCP Client				
Reboot	Automatically establish TCP connections to a server or other networked device.				
Logout	Automatically establish TCP connections				
	Connect: Always 				
	When data arrives				
	When DCD goes high				
	Connect To: 192.168.1.200				
	Service: Telnet -				
	TCP Port Number: 23				
	Flush Start Character: Auto 🗸				
	Send Keepalive Packets:				
(Apply				

5. Configure the serial port parameters by clicking the "Serial Port" option on the left side and then selecting "Basic Serial Settings". Set the baud rate, data bits, parity, stop bits, and flow control. These are determined by the 3rd-party device that will be connected to the RS-232 port on the device, and must match.

Home	Serial Port Configuration			
Configuration Network	► Port Profile			
Serial Port	▼ Basic Serial Settings			
Security	Description: HWQS System			
System	Baud Rate: 115200 -			
Management Serial Ports Connections Administration Backup/Restore	Data Bits: 8 - Parity: None - Stop Bits: 1 - Flow Control: None -			
Update Firmware Factory Default Settings Device Information Reboot Logout	Apply Port Security Settings Advanced Serial Settings Restore Factory Serial Port Settings 			

- 6. Refer to Scenario 1 in this document to set up the HWQS system to use the Lutron Integration Protocol. From the HWQS system perspective, this scenario is identical to Scenario 1, as the Ethernet to RS-232 conversion occurs outside the HWQS system.
- 7. Connect an RS-232 cable between the 3rd-party device and the converter. Depending on the configuration of the 3rd-party device, you may require a null-modem cable and/or gender adapters. The Ethernet to RS-232 converter devices in this document are DTE (Data Terminal Equipment) devices. Refer to Appendix A at the end of this document for an RS-232 pinout diagram of the converter.
- 8. The Ethernet to RS-232 converter device will automatically open the Telnet session with the HWQS processor, however, the 3rd-party device must send the Telnet username/password via RS-232 when prompted. After the login occurs, the 3rd-party device can then utilize the Lutron Integration Protocol, as if the device was connected via Ethernet.



Scenario 4: Integration with RS-232 Devices Using Custom Integration Commands

Overview:

In this scenario, integration between HWQS and 3rd-party devices is accomplished using an RS-232 connection and the 3rd-party device's communication commands. This type of integration is commonly used when the 3rd-party device is capable of being controlled, however the HWQS system will not receive any feedback from the device. Common examples include spa/pool controllers, A/V components, and thermostats. An Ethernet to RS-232 converter will be required, since the HWQS system has Ethernet connections and the 3rd-party device has only an RS-232 port. The HWQS processor will open and maintain a TCP connection with the converter device, which will then allow the custom command strings to pass through to the RS-232 port. This scenario is identical to Scenario 2 in this document with the exception that the Ethernet to RS-232 converter device is used between the HWQS system and the 3rd-party device.

Equipment Required:

HWQS software version 2.0 or later must be used in this scenario. An Ethernet to RS-232 converter device is required to communicate with RS-232 devices from a HWQS system. There are many devices with these capabilities, however, two such devices that Lutron has had success with are the following:



Set Up Steps:

- 1. Connect the Ethernet port on the Ethernet to RS-232 converter device to the same Ethernet network as the HWQS system and your computer. A standard Ethernet patch cable can be used.
- 2. Open the web-based configuration and management portal for the device. This can be accomplished by using the setup utility included with the device, or by using the web-based configuration and management portal. The steps contained in this document are for the Digi One SP device using the web-based setup, but are similar to those for the B & B Electronics ES1A device. The configuration and management portal is accessed by pointing your internet browser



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to the IP address of the device. The default username is "root" and the default password is "dbps". The home screen is shown below.

le <u>E</u> dit <u>V</u> iew Hi <u>s</u> tory <u>B</u> ookm	
Digi One SP Configuration and	Manage +
Digi	Digi One SP Configuration and Management
Connectware™	😮 Help
Home	Home
Configuration Network	Getting Started
Serial Port Security System	Tutorial Not sure what to do next? This Tutorial can help.
Management	System Summary
Serial Ports Connections	Model: Digi One SP
Administration Backup/Restore Update Firmware	IP Address: 192.168.1.100 MAC Address: 00:00:00:00:00
Factory Default Settings	www.digi.com

3. Configure the network settings on the Ethernet to RS-232 converter device by clicking on the "Network" option on the left side. It is recommended to use a static IP address. This address should be outside the DHCP range of the router. The device must be on the same network and subnet as the HWQS processor. Be sure to Apply the settings. The device may need to reboot for the settings to take effect.

Home	Network Configurat	ion			
Configuration	▼ IP Settings				
Serial Port	 Obtain an IP address automatically using DHCP * Ouse the following IP address: 				
Security	* IP Address:	192.168.1.199			
System	* Subnet Mask:	255.255.255.0			
Management Serial Ports	Default Gateway: 192.168.1.1				
Connections	* Changes to DHCP, IP address and Subnet Mask require a reboot to take effect.				
Administration Backup/Restore Update Firmware Factory Default Settings	Apply				

4. Configure the Advanced Network Settings on the Ethernet to RS-232 converter device by clicking on the "Network option on the left side and then clicking on "Advanced Network Settings". The settings must be set to the following:

TCP Time-To-Live:	30 hops
IP Time-To-Live:	60 hops
Probe Interval:	10 secs
Probe Count:	5
Retransmission Timeout:	30 secs
Enable TCP Keepalive Idle Timeout:	(checked) 1 min

The settings are shown below. Be sure to Apply the settings at the bottom of the page when done. These settings are important because they allow the HWQS processor to maintain the connection with the converter device and quickly re-establish the connection if it is lost.

Home	Network Configuration
Configuration Network	▶ IP Settings
Serial Port	DNS Settings
Security System	Advanced Network Settings Ethernet Interface
Management Serial Ports	Speed: Auto 💌 Mode: Auto 💌
Connections	TCP/IP Settings
Administration	TCP Time-To-Live: 30 hops IP Time-To-Live: 60 hops
Backup/Restore Update Firmware Factory Default Settings Device Information	Probe Interval: 10 secs Probe Count: 5 Retransmission Timeout: 30 secs
Reboot	TCP Keepalive Settings
Logout	 ✓ Enable TCP Keepalive Idle Timeout: 0 hrs 1 mins 0 secs □ Store extra byte in TCP Keepalive packets



5.

Configure the serial port profile on the converter device by clicking on the "Serial Port" option on the left side and then selecting "Port Profile" at the top. Choose the "TCP Sockets" port profile. Make note of the "Raw TCP Port" number (2101) listed under the "TCP Server". This is the port you will program the HWQS software to send the 3rd-party device commands to. Ensure the box is unchecked to "Automatically establish TCP connections". Be sure to Apply the settings. The image below contains the appropriate settings.

Home	Serial Port Configuration				
Configuration	▼ Port Profile				
Network Serial Port	Current Port Profile TCP Sockets Change Profile The TCP Sockets Profile allows a serial device to communicate over a TCP				
Security System	network.				
Management	Profile Settings				
Serial Ports	TCP Server				
Connections	Connect to the following TCP ports on the network (calculated from Base				
Administration	Socket).				
Backup/Restore	Telnet TCP Port: 2001				
Update Firmware	Raw TCP Port: 2101				
Factory Default Settings					
Device Information	TCP Client				
Reboot	Automatically establish TCP connections to a server or other networked device.				
Logout	Automatically establish TCP connections				
	Connect: Always				
	 When data arrives 				
	When DCD goes high				
	Connect To: 0.0.0.0				
	Service: Raw -				
	TCP Port Number: 0				
	Flush Start Character:				
	Send Keepalive Packets:				
	Apply				

6. Configure the serial port parameters by clicking the "Serial Port" option on the left side and then selecting "Basic Serial Settings". Set the baud rate, data bits, parity, stop bits, and flow control. These are determined by the 3rd-party device that will be connected to the RS-232 port on the device, and must match.

Home	Serial Port Configuration				
Configuration Network	▶ Port Profile				
Serial Port	▼ Basic Serial Settings				
Security	Description: HWQS System				
System	Baud Rate: 115200 -				
Management Serial Ports Connections Administration	Data Bits: 8 ▼ Parity: None ▼ Stop Bits: 1 ▼ Flow Control: None ▼				
Backup/Restore Update Firmware Factory Default Settings Device Information Reboot Logout	Apply Port Security Settings Advanced Serial Settings Restore Factory Serial Port Settings 				

7. Refer to Scenario 2 in this document to set up the HWQS system to use custom integration commands to communicate with a 3rd-party device. For the Address of the 3rd-party device in the HWQS software, use the IP address of the converter device set in step 3 and enter that IP address in the Address field. Enter the Raw TCP port number from step 5 in the Port Number field. Leave the Username and Password fields blank. From the HWQS system perspective, this scenario is identical to Scenario 2, as the Ethernet to RS-232 conversion occurs outside the HWQS system.

Equipment Locations	and all Collapse all Assign Inputs/Outputs		Cus
3rd Party Device Edit Edit Comr	mand Sets		
	Edit Command Sets Address	Port Number Vsername	Password
() () () () () () () () () () () () () (A/V Device Commands 192.168.1.199	2101	

- 8. Connect an RS-232 cable between the 3rd-party device and the converter. Depending on the configuration of the 3rd-party device, you may require a null-modem cable and/or gender adapters. The Ethernet to RS-232 converter devices in this document are DTE (Data Terminal Equipment) devices. Refer to the Appendix at the end of this document for an RS-232 pinout diagram of the converter.
- 9. The HWQS system will send the command strings to the Ethernet to RS-232 converter device on the specified port, which will then be passed out the RS-232 port to the 3rd-party device. No login/password is required.



Appendix

Digi One SP / B&B Electronics ES1A RS-232 Pinout

