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USP-S24 & USP-S48

Multi-purpose — Web-browser Configurable

24 and 48 Pushbutton Switch Panels

USP-S24 and USP-S48 ***RELIABILITY***

- Ethernet connection to Windows® computers
- Eliminates USB connectivity issues in mission critical applications
- Single button control for commonly used functions
- Reduction in errors saves time and money

USP-S24 and USP-S48 ***FLEXIBILITY***

- SNMP – Ethernet – Serial control capability
- Multi-function Pushbutton Panels for tally and command
- Control and Tally multiple devices
- Perfect for Production Studio and Control Room integration
- Integrate into DNF FLEX Control Network®

USP-S24 and USP-S48 ***ASSIGNABILITY***

- Create the perfect panel for your unique application
- No software programming or scripting– use standard web browsers
- Drop down menus and fill-in text boxes used to assign Commands and Tallies to each pushbutton

USP-S24 and USP-S48 ***DESIRABILITY***

- Compact, desktop, tactile switch panels
- Relegend-able Keycaps
- Green/Amber/Red Tally indicators
- Power Over Ethernet (POE) or External Power Supply

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Revision History

Version 1.0	Original
Version 1.1	Added Self Test description
Version 1.2	Updated SNMP OID Value Type description
Version 1.3	Identified source port number (50000) used for UDP Ethernet Transmit Actions
Version 1.4	Identify Ethernet connection as 10BASE-T Half Duplex

1. INSTALLATION & CONFIGURATION

INSTALLATION

Refer to the REAR PANEL CONNECTORS section for GPI, GPO, and serial connector pin out information.

Refer to the GPIs, WET/ DRY Configuration and GPOs, WET/ DRY Configuration sections for GPI and GPO Wet/ Dry configuration information.

Use the GPI Events web page to configure GPI operation.

Use the GPO Actions web page to configure GPO operation.

Use the Serial Port Configuration web page to configure the serial port.

Use the Remote Device Assignment web page to configure Ethernet connections.

Use the Event Action Table web page to map key presses to Remote Devices and the serial port.

Use the Tally Assignment web page to configure key tallies.

POWER

The USP-24/48 is powered from an Ethernet switcher/ router that supports Power Over Ethernet (POE), or from the supplied external power supply. Power requirement is 12 volts DC at 2 amps from an external power supply and 13 Watts from POE switch.

DEFAULT ETHERNET CONFIGURATION (Supports only 10BASE-T at Half-Duplex)

IP Address:	192.168.10.217
Subnet Mask:	255.255.255.0
Gateway:	192.168.10.1

RESET

Press the RESET switch on the rear of the unit to reboot it.

Switch S1

Press and hold the S1 switch for 10 seconds to reset the IP address, subnet mask, Gateway, and configuration to factory defaults.

CONFIGURATION

The USP-S24/48 is configured using a standard web browser (Internet Explorer, Firefox, and Chrome). Enter the USP's IP address in the Address/ URL bar, typically located at the top of the web browser page, to access the configuration Home Page. Use the links on the left side of the Home Page to access the desired configuration web page.

All configuration settings are saved in non-volatile memory in the unit. Settings are retained when power is removed.

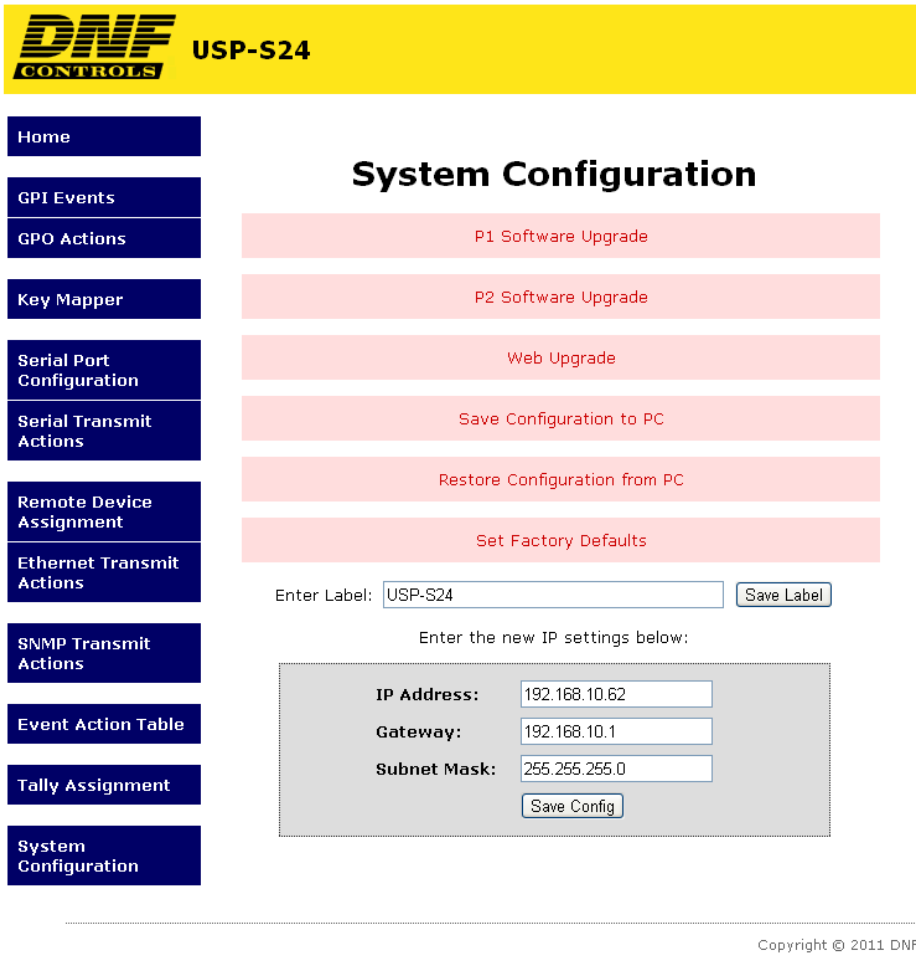
Settings may be uploaded to a computer as a configuration file (.dnf) for storage. Configuration files may be downloaded from a computer into the USP to restore a saved configuration. A configuration file contains all of configuration settings except IP address, subnet mask, and gateway address. Partial configuration upload or download is not supported. The configuration file is a not a text formatted file. It can not be viewed or modified with a text editor.

To access the System Configuration web page, use the following log-on when prompted.

User name: dnfuser

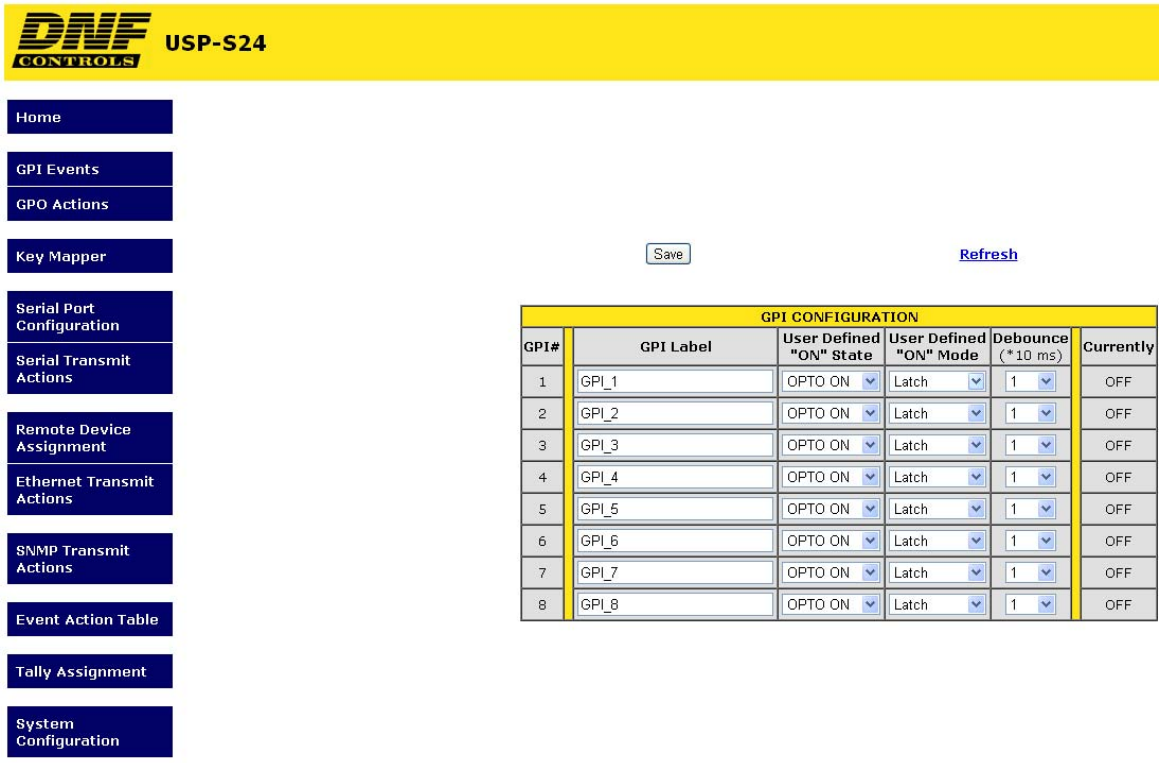
Password: controls

SYSTEM CONFIGURATION Web Page



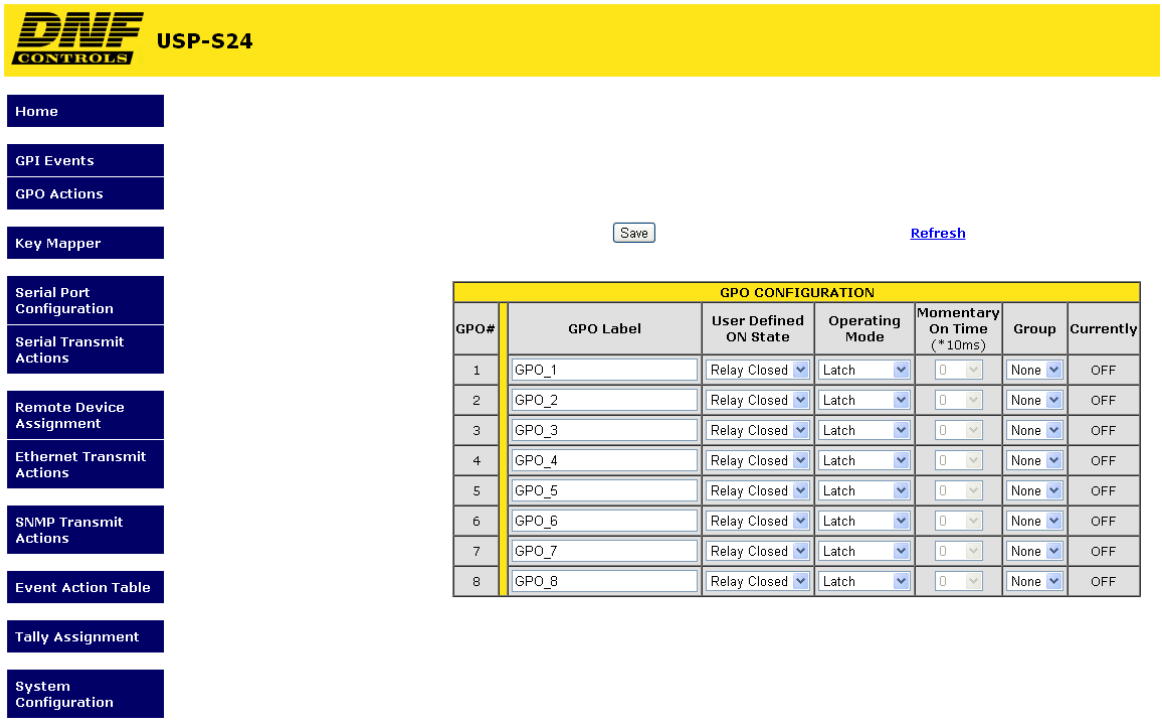
P1 Software Upgrade:	Use this link to install the P1 upgrade file provided by DNF Controls
P2 Software Upgrade:	Use this link to install the P2 upgrade file provided by DNF Controls
Web Upgrade:	Use this link to install the Web pages upgrade file provided by DNF Controls
Save Configuration to PC:	Use this link to save the current configuration to a configuration file on a computer. The web browser will prompt for file name and directory. The file extension must be 'dnf'.
Restore Configuration from PC:	Use this link to download a configuration file from your computer. The web browser will prompt for directory and configuration file name. The file extension must be 'dnf'.
Set Factory Defaults:	Use this link to reset all configurations to factory defaults. This will NOT change the IP address, subnet mask or gateway address. The unit will automatically reboot.
Enter Label	Enter device identifier that is displayed on the home page.
Enter the new IP settings below:	Enter the new IP address, Gateway, and Subnet Mask. Click on Save Config to save the new entries. The AIB will automatically reboot.

2. GPI EVENTS Configuration Web Page



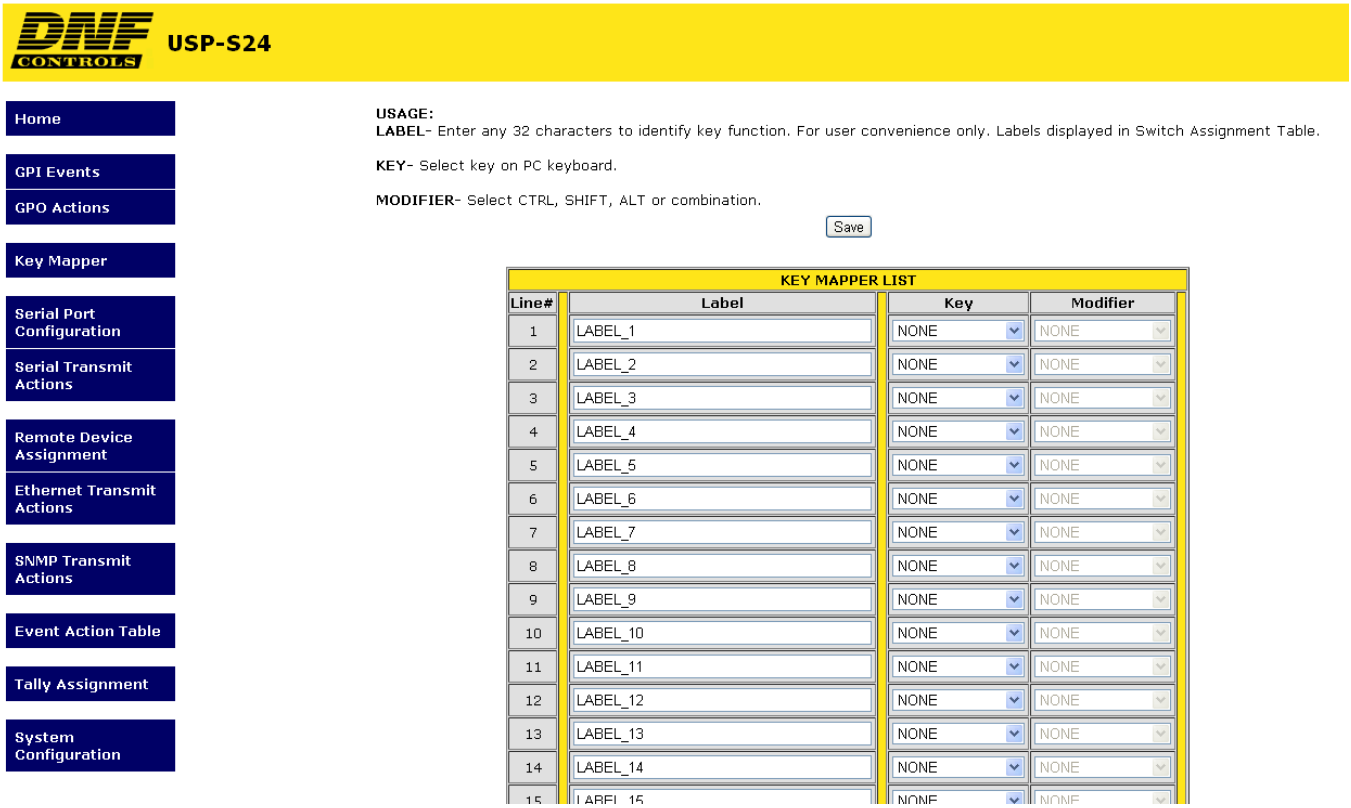
GPI Label	Enter any 15 characters or symbols. For convenience only. Used in Event Action Table
User Defined ON State	OPTO ON: The GPI is ON when the opto-isolator is energized (powered). The GPI is OFF when the opto-isolator is de-energized. OPTO OFF: The GPI is ON when the opto-isolator is de-energized. The GPI is OFF when the opto-isolator is energized (powered).
User Defined ON Mode	LATCHED: The GPI turns ON and stays ON. The GPI turns OFF and stays OFF. MOMENTARY: The GPI turns ON for a short time and then turns OFF and stays OFF. This pattern repeats every time the GPI become active.
Debounce Time	The time period that the GPI must remain ON to be detected as ON. The selected time is multiplied by 10 milliseconds to compute the actual Debounce time.
Currently	Current state of GPI as defined by User Defined ON State.

3. GPO ACTIONS Configuration Web Page



GPO Label	Enter any 15 characters or symbols. For convenience only. Used in Event Action Table
User Defined ON State	**RELAY OPEN**: The relay is OPEN when the GPO is ON. The relay is CLOSED when the GPO is OFF. **RELAY CLOSED**: The relay is CLOSED when the GPO is ON. The relay is OPEN when the GPO is OFF (Factory Default).
User Defined Operating Mode	**MOMENTARY:** The GPO turns ON, waits for the MOMENTARY ON TIME to expire, and then automatically turns OFF. **LATCH:** The GPO turns ON and stays ON. The GPO turns OFF and stays OFF. **TOGGLE:** The GPO alternates states with each GPO ON action. The GPO turns ON if it was previously OFF. The GPO turns OFF if it was previously ON.
Momentary ON Time	For MOMENTARY operating mode only. ON duration for Momentary GPO. Drop down menu settable from 0.01 sec to 2.0 sec.
Group	**Radio Group** RG1 – RG4: Only one GPO in a Group can be ON at a time. Before a GPO is turned ON, all of the other GPOs in the group are immediately turned off. (Break before make) **FLIP-FLOP** FF1–FF4: Only two GPOs can be assigned to one Flip-Flop group. Like a GPO Radio Group, when one GPO turns ON the other automatically turns OFF.
Currently	Current state of GPO as defined by User Defined ON State.

4. KEY MAPPER Configuration Web Page

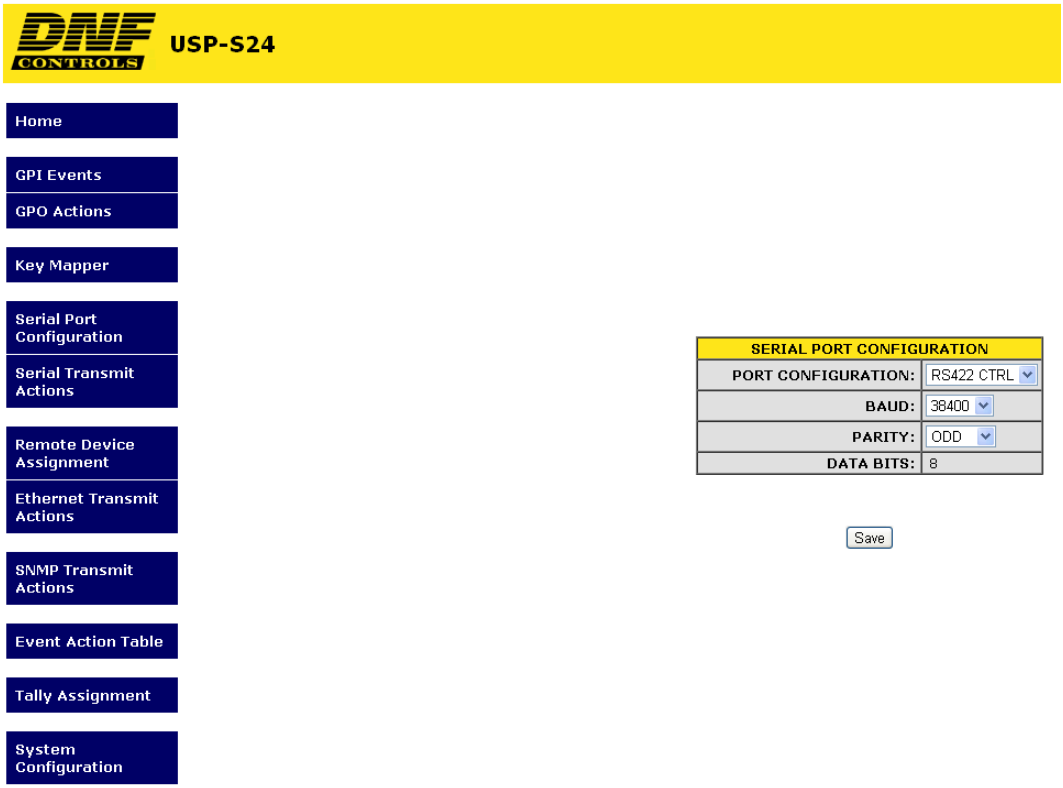


The Key Mapper List contains 48 entries. Select a PC keyboard combination from the drop down menus and assign an identifier label for the Event Action Table.

When a USP key is pressed, the assigned Key Mapper List entry is transmitted to the Panel Key Mapper application, pkm.exe, running on the Microsoft Windows based remote device.

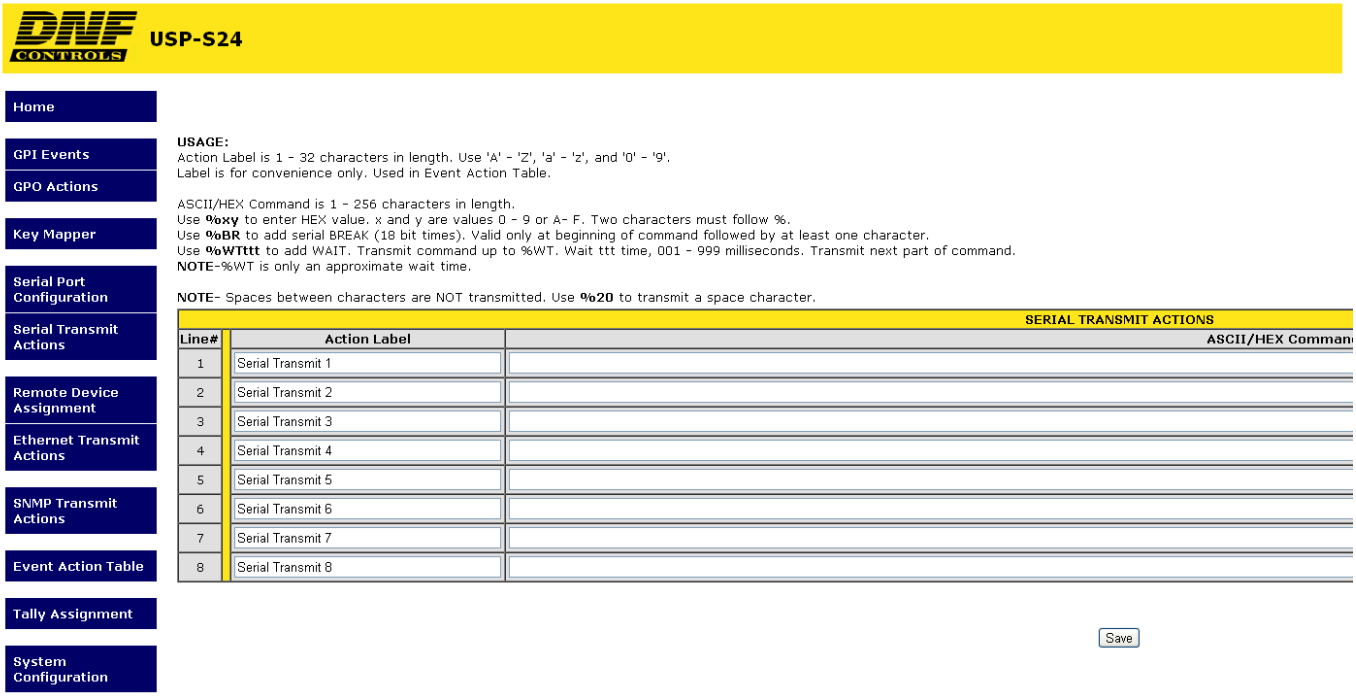
Label	Enter any 32 characters or symbols. For convenience only. Used in Event Action Table
Key	Select PC Keyboard key from drop down menu
Modifier	Select NONE or CTRL, SHIFT, ALT combination

5. SERIAL PORT CONFIGURATION Web Page



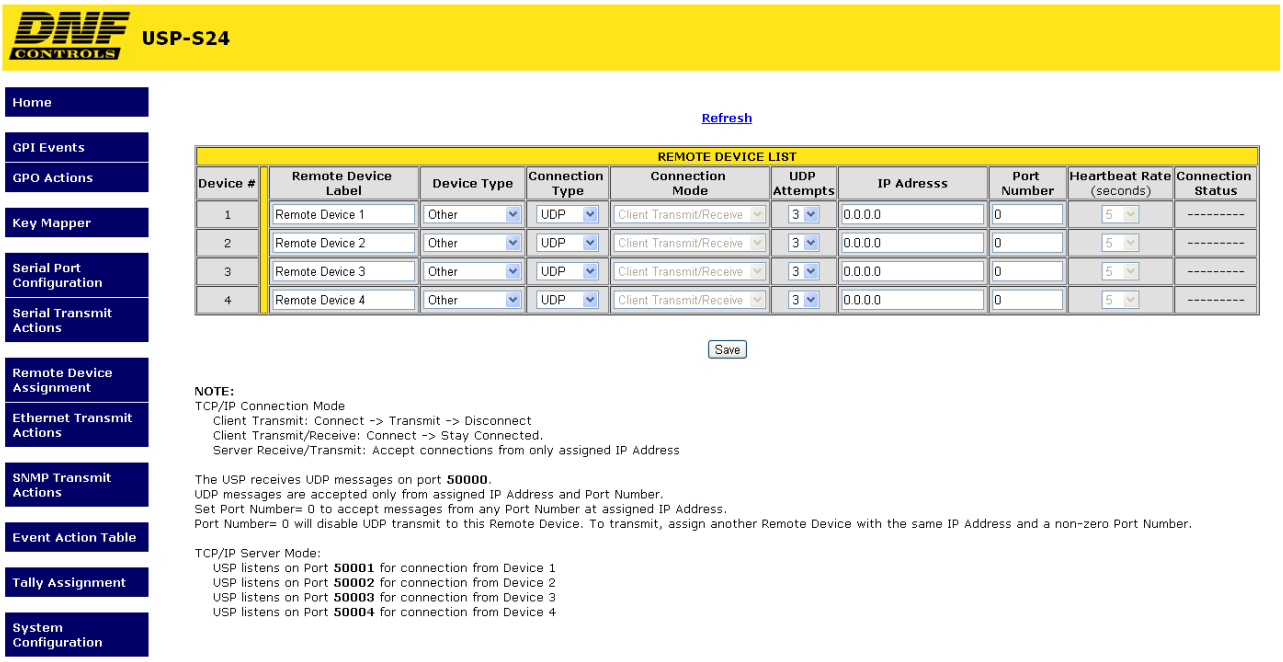
Port Configuration	RS232 DTE, RS422 Controller, or RS422 Device
Baud Rate	300, 1200, 2400, 4800, 9600,19200, 38400
Parity	None, Odd, Even
Data Bits	Fixed at 8
Stop Bits	Fixed at 1
Start Bits	Fixed at 1

6. SERIAL TRANSMIT ACTIONS Configuration Web Page



Action Label	Enter any 32 characters. This label is for convenience only and is used in the Event Action Table.
ASCII/ HEX Command	The ASCII/HEX Command is 1 - 256 characters in length. Use %yz to enter a HEX value. 'y' and 'z' are values 0 - 9 or A- F. Two characters must follow %. Use %BR to add a serial BREAK (18 bit times). BREAK is valid only at the beginning of a command and must be followed by at least one character. Use %WTttt to add a WAIT time, 001 - 999 milliseconds. Three numbers must follow %WT. The characters preceding %WT are sent immediately. The characters after %WTttt are sent after the wait time expires. More than one %WT can be included in a command. NOTE- %WT is only an approximate wait time. NOTE- Spaces between characters are NOT transmitted. Use %20 to transmit a space character.

7. REMOTE DEVICE ASSIGNMENT Configuration Web Page



Remote Device Label	Enter any 32 characters. This label is for convenience only and is used in the Event Action Table.
Device Type	OTHER PKM- Use to connect to DNF's Panel Key Mapper application running on a Microsoft Windows computer. GTP-32/DC20- Use to connect to DNF Controls GTP-32 and DC20 devices
Connection Type	Select UDP, SNMP, or TCP/IP. **NOTE**- USP-S24/48 listens only on Port 50000 for UDP messages. For UDP Ethernet Transmit Actions, the USP-S uses source port 50000
Connection Mode	For TCP/IP Only Client Transmit: Establish connection to remote device. Transmit command. Disconnect from remote device. Client Transmit/Receive: Establish connection to remote device. Maintain connection to remote device. Server Receive/Transmit: Accept connection from client. Only client at assigned IP Address can connect The client is responsible for maintaining connection. Server Mode only, AnyWhere Interface Box listens on the following ports: Port **50001** for connection from Remote Device 1 Port **50002** for connection from Remote Device 2 Port **50003** for connection from Remote Device 3 Port **50004** for connection from Remote Device 4

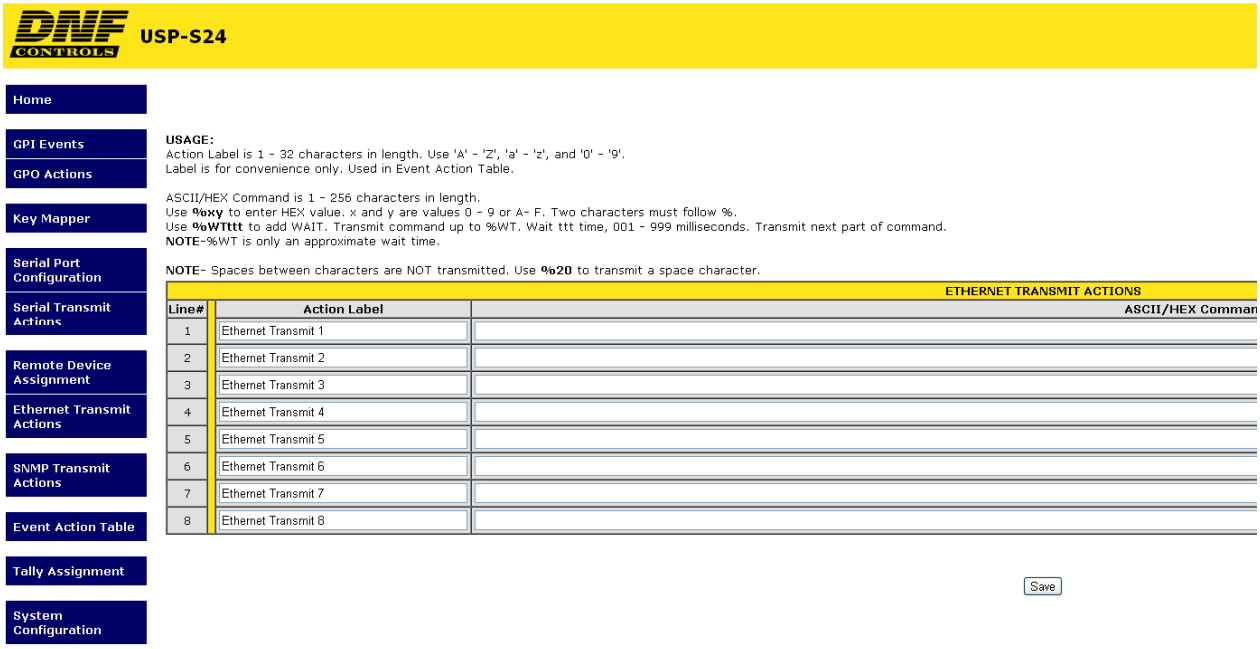
UDP Attempts	For UDP and SNMP Connection Type only. The number of times that the message will be sent separated by 10milliseconds. Since UDP does not provide guaranteed delivery, UDP Attempts provides more than one transmit attempt to deliver the message.
IP Address	Client or Destination IP address
Port Number	Destination port number for transmit actions Source port number for receive events
Heartbeat Rate	For GTP-32/DC20 Device Types. Default value is 5 seconds. Communication error is defined as loss of two consecutive heartbeats.
Connection Status	For GTP-32/DC20 Device Type and TCP/IP Connection Type only.

Please note-

The USP-S24/48 will transmit messages only to the specified IP address **and** Port number listed in the Remote Device Assignment Table.

The USP-S24/48 will only accept UDP and TCP/IP messages only from the specified IP address **and** Port number listed in the Remote Device Assignment Table. The sender's IP address and Port number must match the entry in the table.

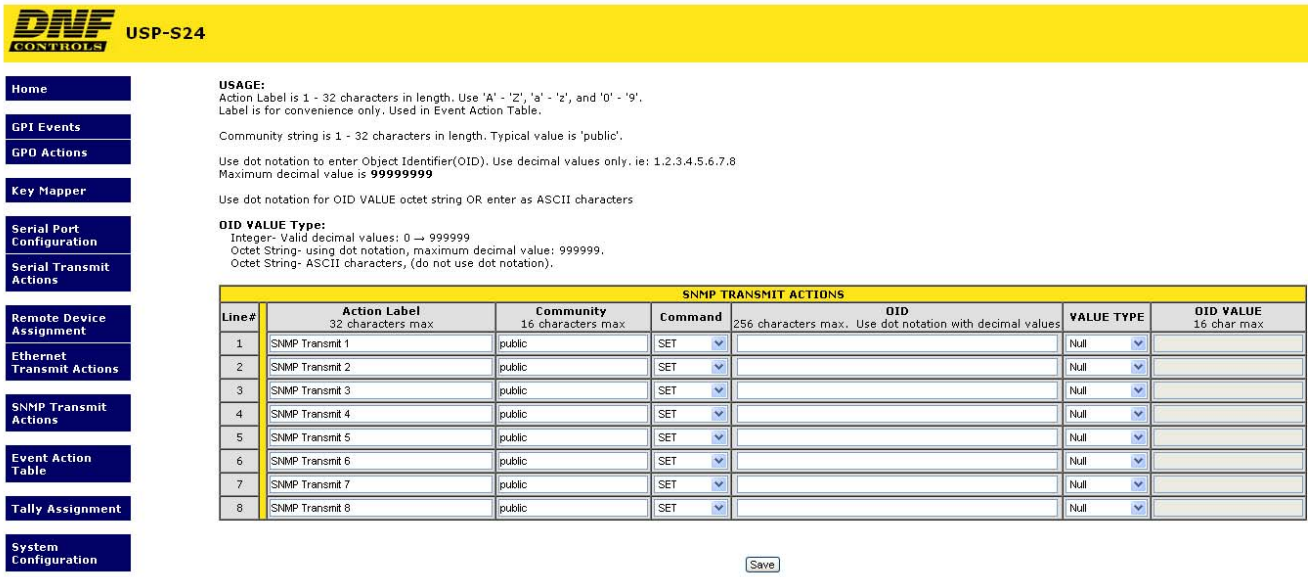
8. ETHERNET TRANSMIT ACTIONS Configuration Web Page



Action Label	Enter any 32 characters. This label is for convenience only and is used in the Event Action Table.
ASCII/ HEX Command	The ASCII/HEX Command is 1 - 256 characters in length. Use %yz to enter a HEX value. 'y' and 'z' are values 0 - 9 or A- F. Two characters must follow %. Use %WTttt to add a WAIT time, 001 - 999 milliseconds. Three numbers must follow %WT. The characters preceding %WT are sent immediately. The characters after %WTttt are sent after the wait time expires. More than one %WT can be included in a command. NOTE- %WT is only an approximate wait time. NOTE- Spaces between characters are NOT transmitted. Use %20 to transmit a space character.

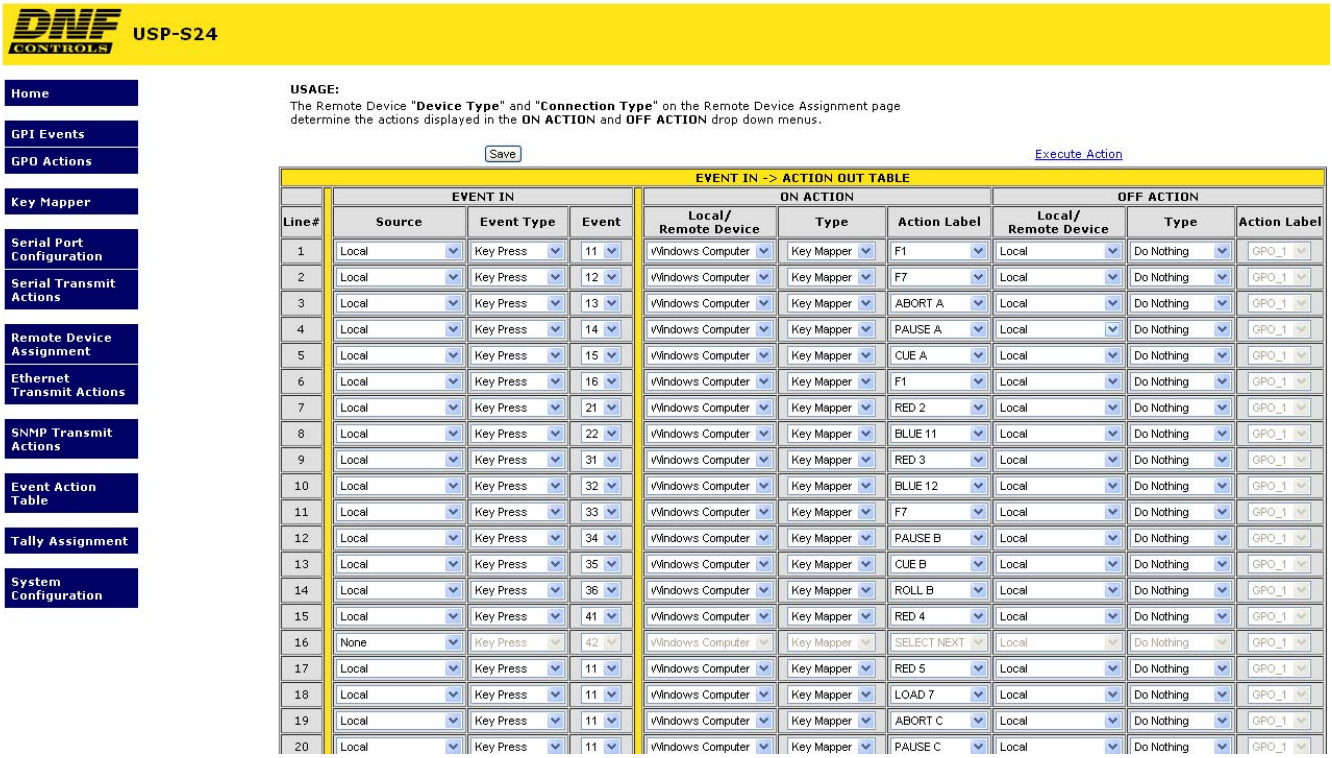
NOTE- For UDP Ethernet Transmit Actions, the USP-S uses source port 50000

9. SNMP TRANSMIT ACTIONS Configuration Web Page



Action Label	Enter any 32 characters. This label is for convenience only and is used in the Event Action Table.
Community	Community string is 1 - 32 characters in length. Typical value is 'public'.
Command	SET, GET, GET RESPONSE
Object Identifier (OID)	The OID is 8 - 256 decimal values in length entered in dot notation. Only decimal values are accepted. ie: 1.22.333.4.55.666.7.88. Maximum entered decimal value is 99999999.
Value Type OID Value	OID Value Type: Integer: Enter decimal value 0 – 999999 for OID value Octet Integer: Enter decimal value 0 – 999999 for OID value Octet String: Enter 16 alphanumeric characters NULL: Set to NULL when no OID value is entered.

10. EVENT ACTION TABLE Configuration Web Page



DNF CONTROLS USP-S24

Home
GPI Events
GPO Actions
Key Mapper
Serial Port Configuration
Serial Transmit Actions
Remote Device Assignment
Ethernet Transmit Actions
SNMP Transmit Actions
Event Action Table
Tally Assignment
System Configuration

USAGE:
The Remote Device "**Device Type**" and "**Connection Type**" on the Remote Device Assignment page determine the actions displayed in the **ON ACTION** and **OFF ACTION** drop down menus.

Save Execute Action

EVENT IN -> ACTION OUT TABLE

	EVENT IN			ON ACTION			OFF ACTION		
Line#	Source	Event Type	Event	Local/ Remote Device	Type	Action Label	Local/ Remote Device	Type	Action Label
1	Local	Key Press	11	Windows Computer	Key Mapper	F1	Local	Do Nothing	GPO_1
2	Local	Key Press	12	Windows Computer	Key Mapper	F7	Local	Do Nothing	GPO_1
3	Local	Key Press	13	Windows Computer	Key Mapper	ABORT A	Local	Do Nothing	GPO_1
4	Local	Key Press	14	Windows Computer	Key Mapper	PAUSE A	Local	Do Nothing	GPO_1
5	Local	Key Press	15	Windows Computer	Key Mapper	CUE A	Local	Do Nothing	GPO_1
6	Local	Key Press	16	Windows Computer	Key Mapper	F1	Local	Do Nothing	GPO_1
7	Local	Key Press	21	Windows Computer	Key Mapper	RED 2	Local	Do Nothing	GPO_1
8	Local	Key Press	22	Windows Computer	Key Mapper	BLUE 11	Local	Do Nothing	GPO_1
9	Local	Key Press	31	Windows Computer	Key Mapper	RED 3	Local	Do Nothing	GPO_1
10	Local	Key Press	32	Windows Computer	Key Mapper	BLUE 12	Local	Do Nothing	GPO_1
11	Local	Key Press	33	Windows Computer	Key Mapper	F7	Local	Do Nothing	GPO_1
12	Local	Key Press	34	Windows Computer	Key Mapper	PAUSE B	Local	Do Nothing	GPO_1
13	Local	Key Press	35	Windows Computer	Key Mapper	CUE B	Local	Do Nothing	GPO_1
14	Local	Key Press	36	Windows Computer	Key Mapper	ROLL B	Local	Do Nothing	GPO_1
15	Local	Key Press	41	Windows Computer	Key Mapper	RED 4	Local	Do Nothing	GPO_1
16	None	Key Press	42	Windows Computer	Key Mapper	SELECT NEXT	Local	Do Nothing	GPO_1
17	Local	Key Press	11	Windows Computer	Key Mapper	RED 5	Local	Do Nothing	GPO_1
18	Local	Key Press	11	Windows Computer	Key Mapper	LOAD 7	Local	Do Nothing	GPO_1
19	Local	Key Press	11	Windows Computer	Key Mapper	ABORT C	Local	Do Nothing	GPO_1
20	Local	Key Press	11	Windows Computer	Key Mapper	PAUSE C	Local	Do Nothing	GPO_1

On an Event Action Table line, select an EVENT IN on the left side of the table and then select an ACTION on the right side. Some events only support ON ACTIONS, so the OFF ACTION entries will be grayed out. There are 64 lines in the Event Action Table.

One EVENT IN can trigger more than one ACTION. Select the same EVENT IN on multiple lines and then select an ON or OFF ACTION on each line.

Only EVENTs and ACTIONs associated with the Remote Device's Device Type or Connection Type will be displayed in the drop down menus. If the desired event or action is not displayed, then go to the Remote Device Assignment web page and change the Device Type or Connection Type for the Remote Device.

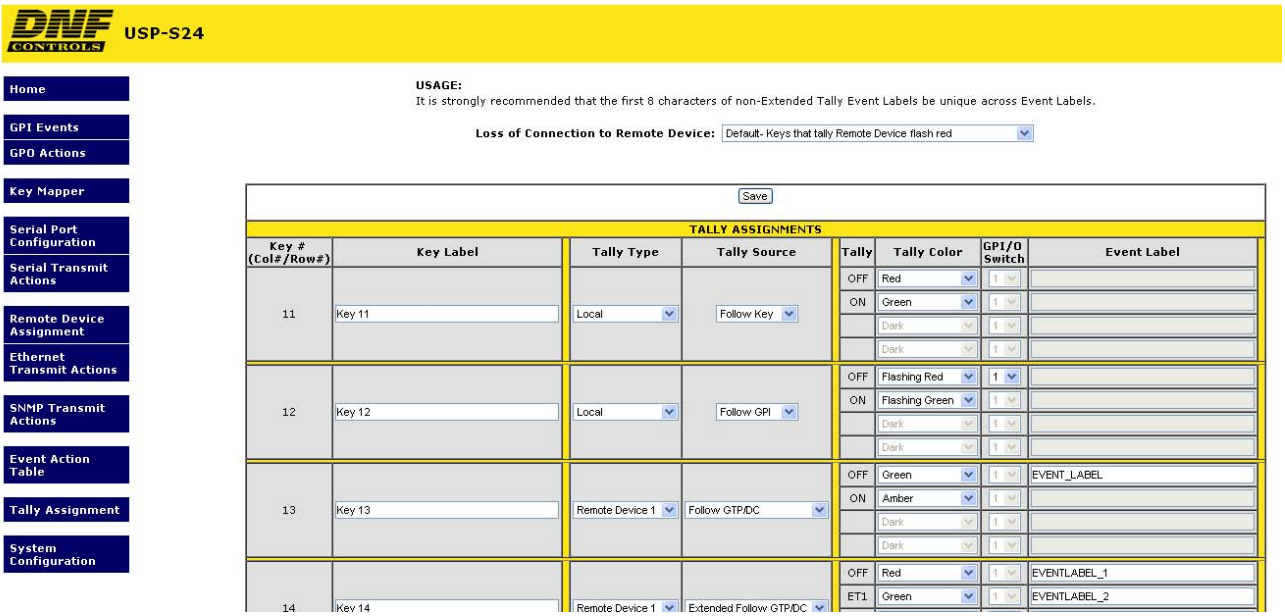
In the Event Action and Tally Assignment Tables, the USP-S24/48 keys are identified by their Column, Row position for easy identification. Key number #11 is located in column #1, on row #1. Key number #16 is located in column #1, on row #6. Key number #84 is located in column #8, on row #4.

EVENT IN	**Source**	None (Disable line) Local Event
	Event Type	Local: **GPI** GPI changed from OFF to ON. The selected ON ACTION will execute. GPI changed from ON to OFF. The selected OFF ACTION will execute **Key Press** (Only available for Device Type "PKM") USP-S24/48 key press (ON ACTION) or key release (OFF ACTION).
		Remote: **GTP-32/DC20 Receive** (Only available for Device Type "GTP-32/DC20") Use Tally Assignment web page to map received Event Label to key tally
	Event	GPI Number or Key Number

ON ACTION	**Local / Remote**	Execute Action on Local resource Execute Action on Remote Device
	Type	Local: **GPO** Do Nothing Turn GPO ON Turn GPO OFF **Serial Transmit Action** Transmit selected Serial Action command once. If command contains WAIT (%WT), then transmit all characters prior to %WT, wait for the time period defined by %WT, and then transmit the remaining characters or until the next %WT. A command may contain more than one %WT.
		Remote: **Ethernet Transmit Action** Transmit the selected Ethernet Action command. If command contains WAIT (%WT), then transmit all characters prior to %WT, wait for the time period defined by %WT, and then transmit the remaining characters or until the next %WT. A command may contain more than one %WT. **SNMP Transmit Action** (Only available for Connection Type "SNMP") Transmit the selected SNMP Action. WAIT is not supported. The SNMP Action entry must contain a "Community" entry and OID entry. **GTP-32/ DC20** (Only available for Device Type "GTP-32/DC20") Transmit Key Press or Key Release message using Event In Key number.
	Action Label	GPO Number Serial Transmit Action Ethernet Transmit Action SNMP Transmit Action (Only available for Remote Device Connection Type "SNMP")

OFF ACTION	**Local / Remote**	Execute Action on Local resource Execute Action on Remote Device
	Type	Local: **GPO** Do Nothing Turn GPO ON Turn GPO OFF **Serial Transmit Action** Transmit selected Serial Action command once. If command contains WAIT (%WT), then transmit all characters prior to %WT, wait for the time period defined by %WT, and then transmit the remaining characters or until the next %WT. A command may contain more than one %WT.
		Remote: **Ethernet Transmit Action** Transmit the selected Ethernet Action command. If command contains WAIT (%WT), then transmit all characters prior to %WT, wait for the time period defined by %WT, and then transmit the remaining characters or until the next %WT. A command may contain more than one %WT. **SNMP Transmit Action** (Only available for Connection Type "SNMP") Transmit the selected SNMP Action. WAIT is not supported. The SNMP Action entry must contain a "Community" entry and OID entry. **GTP-32/ DC20** (Only available for Device Type "GTP-32/DC20") Transmit Key Press or Key Release message using Event In Key number.
	Action Label	GPO Number Serial Transmit Action Ethernet Transmit Action SNMP Transmit Action (Only available for Remote Device Connection Type "SNMP")

11. TALLY ASSIGNMENT Configuration Web Page

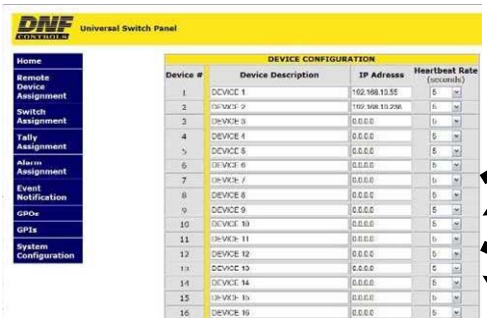


Use the Tally Assignment Table to assign a tally to a key. The Tally Assignment Table contains one entry for each key. A key can tally OFF and ON, or up to 4 states (OFF, ET1, ET2, ET3).

Key Number	The USP-S24/48 keys are identified by their Column, Row position for easy identification. Key number #11 is located in column #1, on row #1. Key number #16 is located in column #1, on row #6. Key number #84 is located in column #8, on row #4.	
Key Label	Enter any 32 characters. This label is for convenience only and is used only on this web page.	
Tally Type	Local- Tally local GPI, GPO, or key press Remote- Tally status from Remote Device (GTP-32/DC20 Device Type)	
Tally Source	Local	Follow Key- Tally is ON when key is pressed Tally is OFF when key is released Follow GPI- Tally is ON when GPI is ON Tally is OFF when GPI is OFF Follow GPO- Tally is ON when GPO is ON Tally is OFF when GPO is OFF
	Remote	Follow GTP/DC- Assign one Event Label Tally is ON when assigned Event Label is ON Tally is OFF when assigned Event Label is OFF Extended Follow GTP/DC- Assign up to 4 Event Labels Tally is ON when any of the assigned Event Labels is ON The associated Event Label's color entry is used Tally is OFF when all assigned Event Labels are OFF

Tally	Tally Identifiers: OFF, ON or ET1, ET2, ET3, ET4 (Read Only Labels)
Tally Color	Dark Red Green Amber Flashing Red Blinking Red Flashing Green Blinking Green Flashing Amber Blinking Amber
GPI/O Number	GPI: 1 – 8 GPO: 1 – 8
Event Label	Manually enter, or cut & paste, the Event Label from the GTP-32's or DC20's Event Notification Table. The event label is case sensitive, may not contain spaces, and must exactly match the Event Notification Table entry. (Refer to the GTP-32 or DC20 User Manual.)

12. USP-S24/48 TO GTP-32/DC20 SYSTEM CONFIGURATION

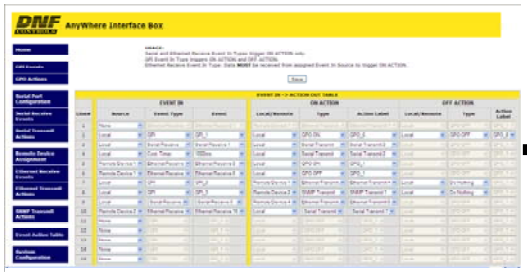


Define Remote Devices that the USP will communicate with.

Identify Remote Device to send data to and receive data from

GTP-32 or DC20

Event Action Table



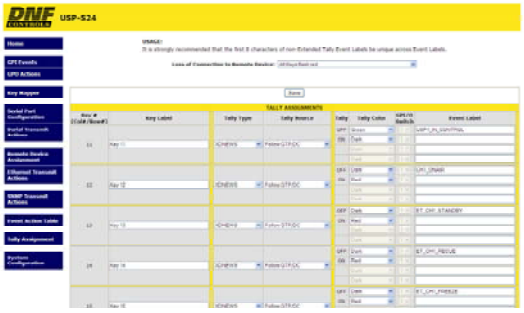
Map Key Press and Key Release to a Remote Device. Map key press/release to one or more Remote Devices

Key presses to Remote Device

USP Event Definitions

Map USP Key Press/ Release to a unique Source Event Label that will be used in the GTP-32's configuration tables.

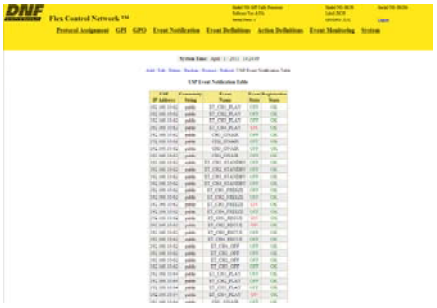
Tally Asignment Table



Map Tally Source to each Key. Map local source or status from Remote Device.

Status from Remote Device

USP Event Notifications



Send GTP-32 Events to one or more USPs: GPI, GPO, Combinatorial Event, UserRegister, and more

13. PANEL KEY MAPPER™ APPLICATION

The DNF Controls supplied Panel Key Mapper™ is a small Windows® application that maps USP-S24 and USP-S48 key presses to HOTKEYs for Editors, Graphic devices, Production Playout & Automation systems, as well as other Windows based applications.

For example, map USP-S24 Key: #2 to “SHIFT F3”

#10 to “CTRL SHIFT F10”

#23 to “CTRL ALT F1”

The USP-S24/48 connects to the Windows computer running Panel Key Mapper (pkm.exe) over an Ethernet connection, eliminating USB connectivity issues in mission critical applications.

The USP-S24/48 provides single button control for commonly used functions reducing errors, which saves time and money.

Use the Key Mapper web page to create the HOTKEY key combinations used by the Editor or other Windows applicaton. Use the Event Action Table to map a key press to one or more Key Mapper entries and assign the Remote Device to transmit the HOTKEY to. One HOTKEY can be sent to multiple remote devices.

INSTALLATION

Install the supplied pkm.exe and pkm.ini files in a folder on the Windows computer.

Edit the pkm.ini with Notepad.exe or other simple text editor. (Do not use a word processor.) Change the Panel 1 IP address to the IP address of the USP-S24 or USP-S48 that will send HOTKEYs to the computer. Change the Port number from 50000 to any other port number if that port is already in use on the computer.

Add pkm.exe to the computer’s Start Up folder or create a Scheduled Task to launch the application when the computer starts up. Or, using a mouse, double click on the application to launch it. A black box will appear briefly on the screen and then disappear. Check Windows’ Task Manager to confirm that pkm.exe is running.

LOGGING

pkm.exe will create a log file, pkm.log, in the same folder that it resides. Open the log file with a text editor. Each time pkm.exe is launched the log file will show:

04/02/2011, 13:09:41 DNF Control Panel Key Mapper Log
04/02/2011, 13:09:41 pkm.exe startup
04/02/2011, 13:09:41 Console hidden
04/02/2011, 13:09:41 C:\temp\pkm.exe Version 1.3
04/02/2011, 13:09:41 Successfully opened file C:\temp\pkm.ini
04/02/2011, 13:09:41 Successfully processed file C:\temp\pkm.ini
04/02/2011, 13:09:41 Listening on Port 50000 for Panel Key Mapper commands
04/02/2011, 13:09:41 Accepting commands from Panel IP Address 192.168.10.62

where Panel IP Address and Port will reflect the pkm.ini entries.

Every command received from the USP-S24/48 will be logged as follows:

04/01/2011, 23:50:05 Received OID Value: KM_70:1

04/01/2011, 23:50:05 Generate Key Press/Release sequence VKEY= 70, SCAN= 3b, SHIFT= 0, CTRL= 0, ALT= 0

04/01/2011, 23:50:05 Received OID Value: KM_74_C_A:1
04/01/2011, 23:50:05 Generate Key Press/Release sequence VKEY= 74, SCAN= 3f, SHIFT= 0, CTRL= 1, ALT= 1

04/01/2011, 23:50:05 Received OID Value: KM_37_C:1
04/01/2011, 23:50:05 Generate Key Press/Release sequence VKEY= 37, SCAN= 08, SHIFT= 0, CTRL= 1, ALT= 0
04/01/2011, 23:50:05 Received OID Value: KM_33_A:1

Use Windows' Task Manager to stop pkm.exe.

14. REAR PANEL CONNECTORS

Physical size: 8.25” W x 4.125” D x 1.5” H

GPI CONNECTOR 8 Isolated Opto-Isolator Inputs			
Pin #	Description	Pin #	Description
1	Ground	14	GPI 8 **+**
2	GPI 8 –	15	+V
3	+V	16	GPI 7 –
4	GPI 7 **+**	17	GPI 6 **+**
5	GPI 6 –	18	+V
6	+V	19	GPI 5 –
7	GPI 5 **+**	20	GPI 4 **+**
8	GPI 4 –	21	+V
9	+V	22	GPI 3 –
10	GPI 3 **+**	23	GPI 2 **+**
11	GPI 2 –	24	+V
12	+V	25	GPI 1 –
13	GPI 1 **+**		

GPO CONNECTOR 8 Isolated Relay Contact Closure Outputs			
Pin #	Description	Pin #	Description
1	Ground	14	GP0 8 N.O
2	GPO 8 Com	15	Common Bus
3	+V	16	GPO 7 N.O.
4	GPO 7 Com	17	GPO 6 N.O.
5	GPO 6 Com	18	Common Bus
6	Common Bus	19	GPO 5 N.O.
7	GPO 5 Com	20	GPO 4 N.O.
8	GPO 4 Com	21	Common Bus
9	Common Bus	22	GPIO 3 N.O.
10	GPO 3 Com	23	GPO 2 N.O.
11	GPO 2 Com	24	Common Bus
12	Common Bus	25	GPO 1 N.O.
13	GPO 1 Com		

REAR PANEL CONNECTORS (continued)

ETHERNET CONNECTOR
1- 10BASE-T Half Duplex
Supports Power Over Ethernet

S1 Switch
Press and hold 10 seconds to reset: IP address to 192.168.10.217 Configuration to default

USB CONNECTOR
Not Used

POWER CONNECTOR
12V DC, 2.0Amps

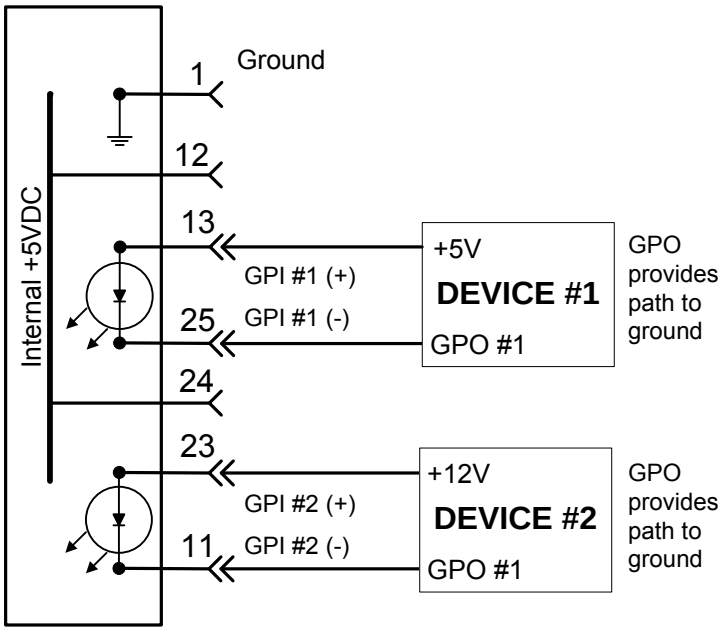
SERIAL CONNECTOR			
Pin	**RS232 DTE**	**RS422 Controller**	**RS422 Device**
1	N/C	Frame Ground	Frame Ground
2	RxD	Receive A (-)	Transmit A (-)
3	TxD	Transmit B (+)	Receive B (+)
4	Tied to 6	Receive Common	Receive Common
5	Ground	N/C	N/C
6	Tied to 4	Transmit Common	Transmit Common
7	N/C	Receive B (+)	Transmit B (+)
8	N/C	Transmit A (-)	Receive A (-)
9	N/C	Frame Ground	Frame Ground

15. GPIs, WET/ DRY Configuration

GPI CONNECTION DIAGRAM

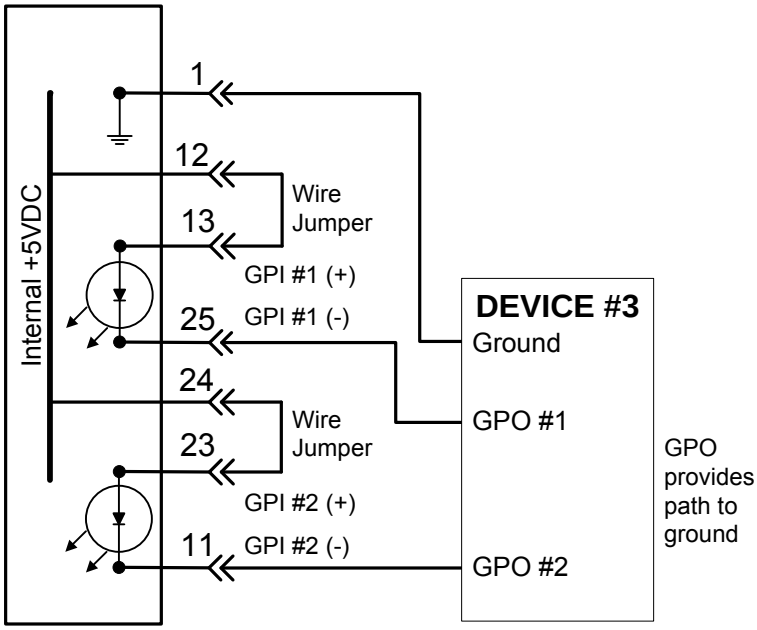
EXAMPLE #1- Device Powered GPIs

GPI Connector

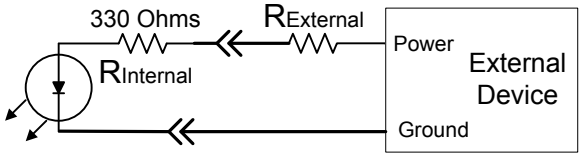


EXAMPLE #2- WET GPIs using internal +5V

GPI Connector



GPI Technical Data



Specification for GPI input:

1. Voltage: (Internal resistor only)
   - +3.3V minimum
   - +5V typical
   - +6V maximum
2. Current: (Internal resistor only)
   - 5mA minimum
   - 10mA typical
   - 15mA maximum

For typical 10mA current, if external voltage is higher than +5V, a series resistor is required:

$R_{ext} = (V_{ext} - 4.5) / 0.01$

V_{ext} = +9V => R_{ext} = 450 Ohms

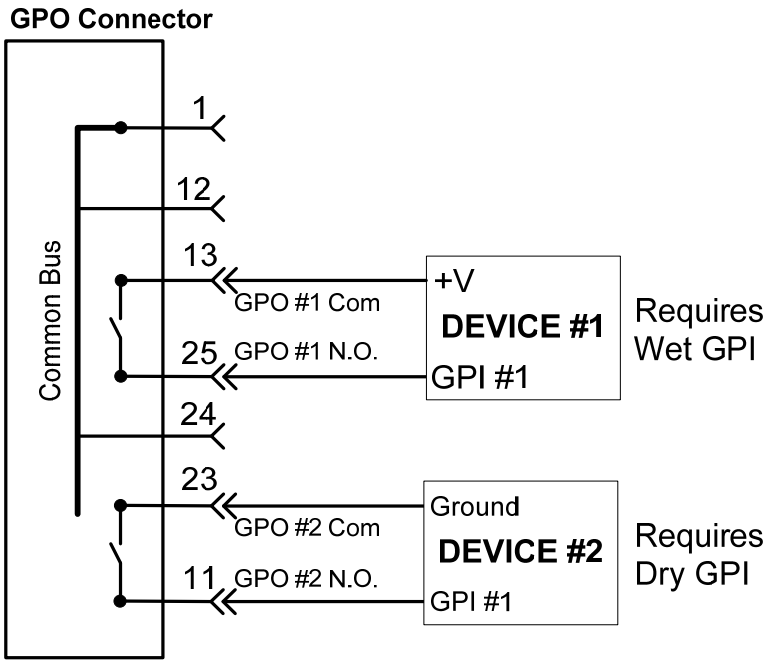
V_{ext} = +12V => R_{ext} = 750 Ohms

V_{ext} = +24V => R_{ext} = 1950 Ohms

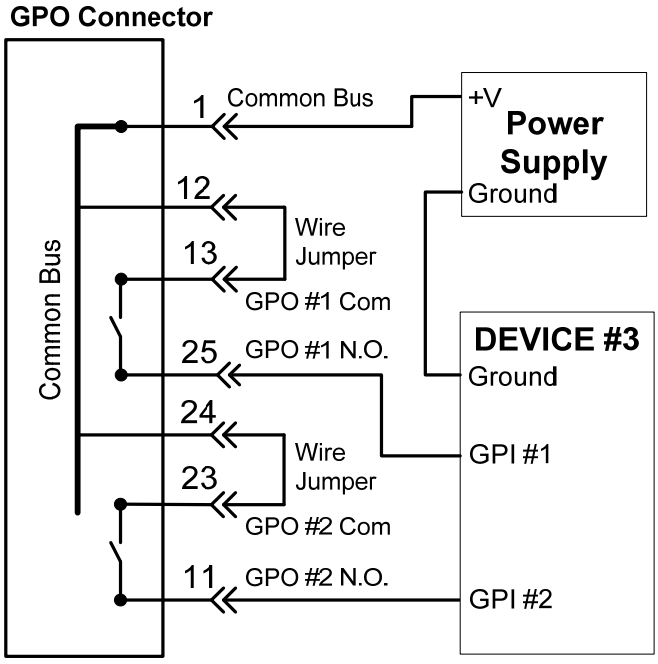
16. GPOs, WET/ DRY Configuration

EXAMPLE #1-
Isolated WET & DRY GPOs

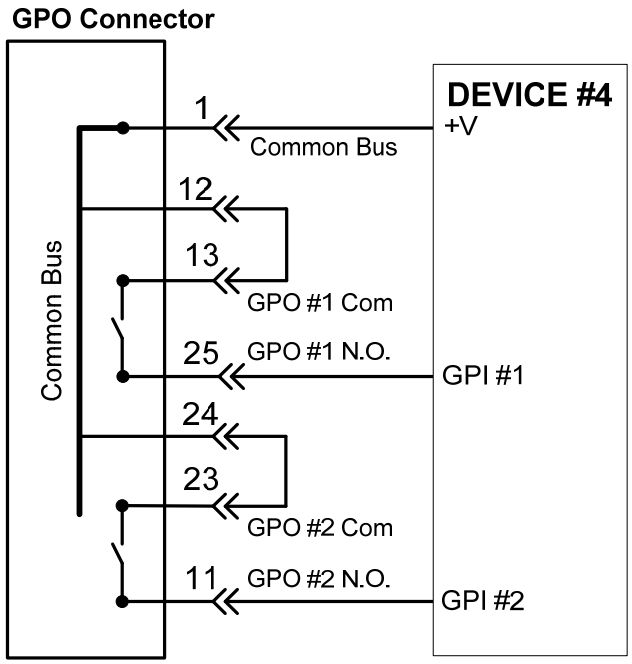
GPO CONNECTION DIAGRAM



EXAMPLE #2-
External Power Supply to wet multiple GPOs



EXAMPLE #3-
Device supplied power to wet multiple GPOs



17. BUILT-IN SELFTEST

KEYBOARD SUB-SYSTEM Self Test

Tests keyboard switches and key indicators

To enter Keyboard Selftest:

On USP-S24, press and hold keys #11, #41, and #16.
On USP-S48, press and hold keys #11, #81, and #16.

All key indicators will go dark.

Press a key. The key indicator will turn GREEN.

Press key again. The key indicator will turn RED.

Press key again. The key indicator will turn AMBER.

Press key again. The key indicator will turn dark.

Reboot to exit Self Test.

SYSTEM Self Test

Tests switches, key indicators, GPIs, GPOs, Serial Transmit and Serial Receive

NOTE- Prior to entering Self Test mode, confirm that serial port has been configured for RS232, 38400 baud and ODD parity. Web pages are not available when Self Test is running.

Prior to powering up the unit, press and hold S1, located on the rear of the panel. All keys will flash AMBER.

Release S1. (If S1 is held pressed for 10 seconds, all configuration items including IP address will be set to factory defaults.)

All key indicators will turn GREEN.

Press key. Its indicator will turn RED.
Release key. Its indicator will turn GREEN.

Activate GPI #1. GPO #1 will turn on.
De-activate GPI- #1. GPO #1 will turn off.
Repeat for GPIs 2 – 8 to control GPOs 2 – 8, respectively.

Connect serial port on computer running Hyperterminal (or other terminal application) to unit's serial port. Confirm that terminal settings match Serial Port Config settings.

Press 'A' on keyboard. The USP-S responds with 'a'.
Press 'a' on keyboard. The USP-S responds with 'A'.

Reboot to exit Self Test.

18. DNF CONTROLS LIMITED WARRANTY

DNF Controls warrants its product to be free from defects in material and workmanship for a period of one (1) year from the date of sale to the original purchaser from DNF Controls. In order to enforce the rights under this warranty, the customer must first contact DNF's Customer Support Department to afford the opportunity of identifying and fixing the problem without sending the unit in for repair. If DNF's Customer Support Department cannot fix the problem, the customer will be issued a Returned Merchandise Authorization number (RMA). The customer will then ship the defective product prepaid to DNF Controls with the RMA number clearly indicated on the customer's shipping document.

The merchandise is to be shipped to:

DNF Controls
12843 Foothill Blvd., Suite C
Sylmar, CA 91342
USA

Failure to obtain a proper RMA number prior to returning the product may result in the return not being accepted, or in a charge for the required repair. DNF Controls, at its option, will repair or replace the defective unit. DNF Controls will return the unit prepaid to the customer. The method of shipment is at the discretion of DNF Controls, principally UPS Ground for shipments within the United States of America. Shipments to international customers will be sent via air. Should a customer require the product to be returned in a more expeditious manner, the return shipment will be billed to their freight account.
This warranty will be considered null and void if accident, misuse, abuse, improper line voltage, fire, water, lightning or other acts of God damaged the product. All repair parts are to be supplied by DNF Controls, either directly or through its authorized dealer network. Similarly, any repair work not performed by either DNF Controls or its authorized dealer may void the warranty.

After the warranty period has expired, DNF Controls offers repair services at prices listed in the DNF Controls Price List. DNF Controls reserves the right to refuse repair of any unit outside the warranty period that is deemed non-repairable.

DNF Controls shall not be liable for direct, indirect, incidental, consequential or other types of damage resulting from the use of the product.