Models:

WR80PC-4 Secure 8-Button Programmable Remote Control Unit

HLT36829 Rev. 1.0

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INTRODUCTION

High Sec Labs' 8-button Programmable Remote Control Unit (RCU) allows for easy and convenient operation of a KVM switch or any other RS-232 controlled device. Whether the KVM is stored under a desk, in a cabinet, mounted in a rack, or otherwise out of reach, the RCU enables single-button access to channel switching, presets, and all of the switch's other functions directly from the desk. This is ideal for conference rooms, boardrooms, and any other environment where users need to operate and interact with multiple displays at the same time while keeping their workspace free of clutter.

In addition, in a secure environment like a control room, security protocols can prohibit the use of keyboard shortcuts on a KVM switch. Because HSL's Remote Control Units interact with the KVM directly, a secure KVM can still be used to its full capabilities without any risk of data leakage.

This User Manual shows how to install, configure, and operate an HSL Programmable Remote Control Unit.

Highlights

- **Push-Button Controls:** The RCU has 8 illuminated push-buttons mimicking the front panel of a KVM, allowing simple and intuitive control.
- **Color-Coded Indicators:** The LED illuminated buttons clearly indicate which channel is active, reducing the risk of confusion and mistakes.
- **Preset Configurations:** The RCU has 6 pre-programmed control configurations for the most common workflows when using a KVM.
- **Customization:** Each button can be programmed independently to send different commands, allowing dedicated configurations for any setup.
- **Easy Mounting:** The RCU can simply mount on any desktop or table, allowing convenient setup and operation.
- **Cascading:** The 8-button RCU can connect with other 8-button RCUs, allowing up to 64 buttons to be used at once.
- **Active Anti-Tampering:** Tampering with the RCU will cause it to become unusable, indicated by blinking LEDs. This reduces security risks by preventing physical alteration of the RCU and by warning users that the device has been compromised.
- **Extendable:** The RCU communicates using a standard RS-232 protocol for easy extension to any distance over standard point-to-point extenders.
- **Compatibility:** The RCU is fully compatible with any of HSL's family of secure and commercial KVM switching products, as well as with other RS-232 controlled devices.

Before Installation

Before opening the product's sealed packaging, inspect the seal's condition to verify that the product was not accessed or tampered with during delivery. If the packaging seal looks suspicious, contact the HSL support team and do not use the product.

- After removing the seal, inspect the packaging content to verify that the required components are included.
- Once the Remote Control Unit is removed from its packaging materials, carefully inspect the tamper-evident label to verify that the product is properly sealed. If the label is damaged or missing, contact HSL support and do not use the product.

Tamper-Evident Labels

- The Remote Control Unit uses a holographic tamper-evident label to provide visual indications in case of enclosure intrusion attempts. These labels display white dots or the text "VOID", once removed. When opening the product's packaging, inspect the tamper-evident label.
- If for any reason, one or more tamper-evident labels are missing, appear disrupted, or look different than the example shown here, please call HSL Technical Support and avoid using the product.

***Figure 1**: HSL Holographic Tamper-Evident Label*

INSTALLATION

HSL's Remote Control Units are designed so that installation is as simple as possible. In most configurations, installing the RCU is a single step.

Install an RCU into a KVM Device

To install a Remote Control Unit into a KVM device, connect the RCU to the KVM via the KVM's RCU port.

***Figure 2**: HSL Secure 8-Port KVM Switch, with RCU Port highlighted with a circle*

The RCU can connect into any existing setup, with no additional software required.

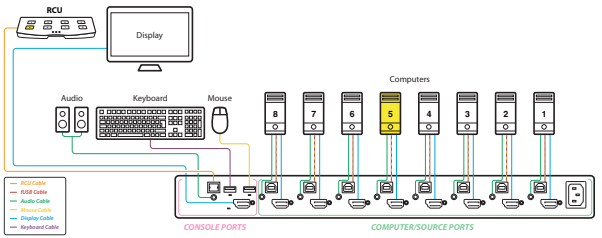


***Figure 3**: RCU connected to an 8-Port KVM Switch*

Cascade Multiple RCUs

Cascading a Remote Control Unit into another effectively doubles the number of programmable buttons available, allowing an even wider range of options. In the example below, one RCU is programmed to select channels on the left display, while the other selects channels on the right display. Another common use case would be for one RCU to select channels while the other selects KVM presets.

To cascade RCUs together, connect the cable of one RCU into the cascade port of another RCU.

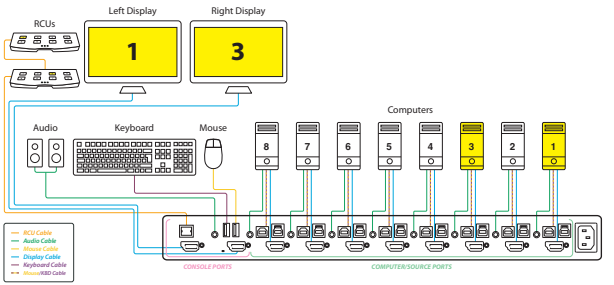


***Figure 4**: 2 RCUs cascaded for 8-port source selection on each display*

OPERATION

Basic Operation

HSL's Programmable Remote Control Unit is operated by pressing the push-buttons on its face. By default, pressing a button will activate the corresponding channel on the KVM device (e.g. Button 1 will activate Channel 1, Button 2 will activate Channel 2, etc).

Pressing the + or – buttons will increase or decrease the brightness of the LEDs.

Presets

The RCU is pre-programmed with 6 built-in control configurations, designed for the most common workflows when using a KVM. These presets allow for easy operation of the RCU regardless of the KVM setup. Unless another preset is selected, the RCU will use a simple 1-8 channel switcher configuration.

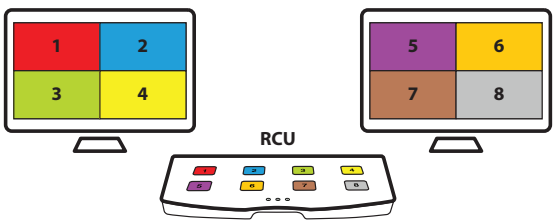
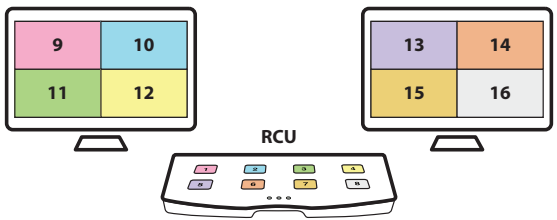


***Figure 5**: RCU Default Configuration*

To activate another preset, enter Configuration Mode by holding down Buttons 1 and 8 simultaneously for approximately 3 seconds, until the LED buttons begin to blink in a wave pattern. While the buttons are blinking, press and hold the desired button for approximately 1 second, until all of the LED buttons light up to signal that a preset has been selected.

The 6 built-in presets are as follows:

1. 16-port KVM: Buttons 1-8 switch Channels 9-16.



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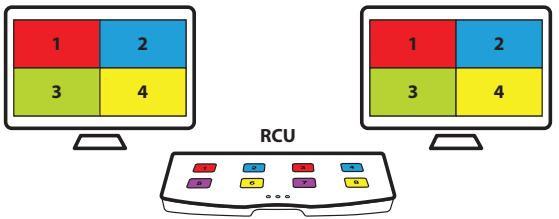
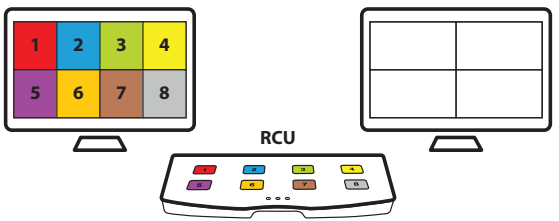
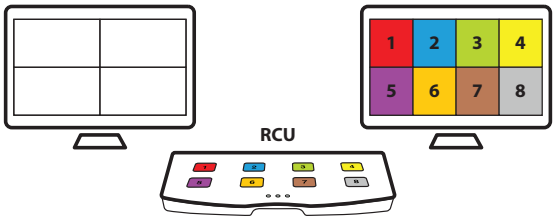
2. 4-port Matrix: Buttons (1,2,5,6) switch Channels 1-4 on the left display, Buttons (3,4,7,8) switch channels 1-4 on the right display.



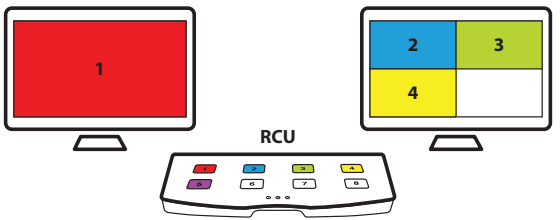
3. 8-port Matrix: Buttons 1-8 switch Channels 1-8 on the left display.



4. 8-port Matrix: Buttons 1-8 switch Channels 1-8 on the right display.

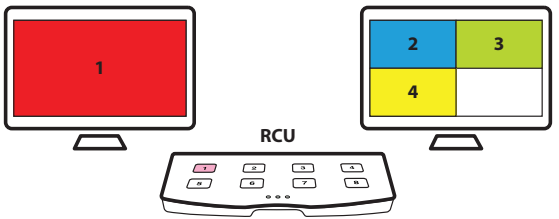


5. KVM Combiner: Buttons 1-4 switch Channel 1-4, Buttons 5-8 switch Channel Presets 1-4.



OPERATION

6. KVM Combiner: Buttons 1-8 switch Channel Presets 1-8.



Reset to Factory Default:

To reset the RCU to its factory default settings, enter Configuration Mode by holding down Buttons 1 and 8 simultaneously for approximately 3 seconds, until the LED buttons begin to blink in a wave pattern. While the buttons are blinking, press and hold both brightness buttons simultaneously.

To perform a soft reset that does not revert to factory default settings, perform a power cycle by disconnecting and reconnecting the RCU and the KVM device.

CONFIGURATION

Beyond the 6 built-in presets, HSL's Remote Control Units can be programmed for a wide range of customized functions, using a serial terminal program such as PuTTY.

Setting up the RCU for Programming

Connect the RCU to a PC

To configure the Remote Control Unit, connect the unit to a PC via its cascade port, using a USB to RJ-14 cable (Part CUS18RJ, sold separately).

***Figure 6**: the RCU cascade port*

Ensure the RCU is connected to the KVM switch via the switch's RCU port. During configuration, this is only to power the RCU.

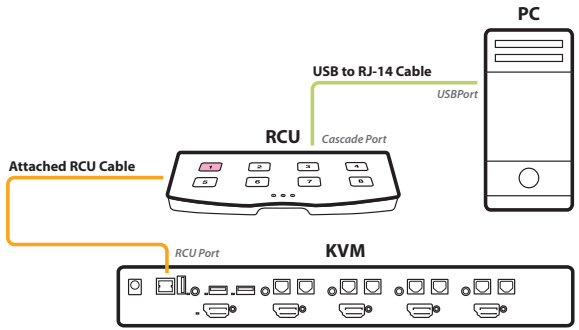


***Figure 7**: The RCU connected to a PC and KVM device, ready for programming.*

Once connected, use the Device Manager to locate the serial port connecting the PC to the RCU.

CONFIGURATION

Connect the RCU to a Serial Terminal Program

- On the PC, open the serial terminal program (e.g., PuTTY).
- Select the serial port connecting to the RCU. This can be found using the PC's Device Manager.
- Set the following options:
  - Speed:115200
  - Data Bits: 8
  - Stop Bits: 1
  - Parity: None
  - Flow Control: None
- Open the connection.

Note: The terminal program may begin displaying a keepalive message. This will stop when a command is entered.

Programming the RCU

Once the RCU is connected to the PC and the terminal program is opened, it is ready to receive commands.

A programming session will have the following structure:

- Start Commands: **#RCCFG START= […]**
- Button Configuration Commands: **#RCCFG BUTTON= […]**
- End Command: **#RCCFG DONE=1**

In all instances, **[…]** represents the custom parameters of the command. The maximum length of an input line is 128 characters, including pressing the **[ENTER]** key to enter the command. Once a command is entered, it will be acknowledged either with "OK" to indicate the command has been accepted, or "ERR" to indicate the RCU cannot accept the command.

Note: Once a custom configuration is programmed into the RCU, it will remain active until a different preset configuration is selected. If a different preset is selected, the custom configuration can be recovered by performing a power cycle.

Start Commands

Each preset must begin with a **START** command. This specifies how the RCU will operate upon activation. Configuration can start with the current preset or with the buttons "clear," meaning unconfigured.

- **#RCCFG START=active** : Start with the current active Preset.
- **#RCCFG START=blank** : Start with all LEDs white, no commands defined, and all buttons working as one group, meaning that when one button is active (LED = ON), the others are inactive (LEDs = OFF).
- **#RCCFG START=singles** : Start with all LEDS white, no commands defined, and all buttons working independently, meaning that more than one button's LED can be ON at the same time.

Button Configuration Commands

Button Configuration Commands must begin with specifying which button is being configured.

#RCCFG BUTTON= <n>, where <n> is the button number (1-8).

All other parameters in the command are optional.

Enable / Disable

#RCCFG BUTTON=<n> EN=[1 OR 0]

- 1= Button is Enabled
- 0= Button is Disabled

CONFIGURATION

Color

#RCCFG BUTTON=<n> COLOR=<color>

Select one of the following color options:

- red
- orange
- yellow
- white
- mint
- green
- cyan
- blue
- purple
- magenta

Dimming

#RCCFG BUTTON=<n> DIM=[1 OR 0]

- **DIM=1** – button's LED will be dimmed when the button is inactive.
- **DIM=0** – button's LED will be turned off when the button is inactive.

Command Strings

#RCCFG BUTTON=<n> CMD1="string" CMD2="string" CMD3="string" CMD4="string"

Define up to 4 commands that will be sent one after the other when a button is pressed. The maximum length of a command is 32 characters (including an escape sequence).

A Command String must start and end with a double quote **["]** and can include any printable characters (except double quote **["]** or backslash **[\]**), plus the following escape sequences:

- **\r** – carriage return
- **\n** – newline
- **\t** – tab
- **\a** – bell
- **\"** – double quote
- **** – backslash

Delay

#RCCFG BUTTON=<n> DELAY1=<d1> DELAY2=<d2> DELAY3=<d3> DELAY4=<d4>

Each command in a Command String can be delayed by <d> seconds.

CONFIGURATION

Advanced Button Configuration Commands

Group

RCCFG BUTTON=<n> GROUP="<n1> <n2> ... "

Grouping buttons can impose behavior over multiple buttons at a time (for example, having a group of four buttons where only the selected button is lit while the other three are dimmed). A group must start and end with double quote **["]** and can either be empty (ungrouping the button) or include button numbers, with a single space separating each number.

- **GROUP=""** – No group, the button is independent.
- **GROUP="1 2 3 4"** – Buttons 1, 2, 3 and 4 form a group.

Note: A button can only be a member of one group at a time. Defining one non-empty group may require other groups to be redefined.

Active-On or Always-On

#RCCFG BUTTON=<n> ACTON=[1 OR 0]

Determine whether an independent (ungrouped) button remains on after being pressed.

- **ACTON=1** : Active-on: The button's LED will turn on after the button is pressed and stay on while sending its command/s, then turn OFF.
- **ACTON=0** : Always-on: The button's LED will briefly blink after the button is pressed and stay on.

KVM Synchronizing

A button can be programmed to synchronize with a KVM device's own button settings by linking to a KVM channels' position in the device's keepalive sequence, matching a corresponding channel's colors, or applying a channel's dimming mask. In all instances, the position range is **[0…16]** to link to a corresponding channel, where **[0]** is unlinked.

- **#RCCFG BUTTON=<n> POS=<p>** : Link a button to a channel's position in the KVM's keepalive sequence, associating a button with any keepalive events programmed into that position. This can be used to capture a specific setup on a KVM device and create a preset.
- **#RCCFG BUTTON=<n> COLOR_POS=<p>** : match colors with a corresponding KVM channel.
- **#RCCFG BUTTON=<n> DIM_POS=<p>** : apply a KVM channel's dimming mask to a button.

End Command

After entering all chosen commands for the new preset, end the programming session by entering the End Command.

#RCCFG DONE=1

This saves the new preset and restarts the RCU. The End Command must be entered, or the previous commands will not be saved.

CONFIGURATION

Examples

These examples use RS-232 commands specific to the channels of an 8-port KVM Mini-Matrix. For further information on entering RS-232 commands to other KVM devices, consult the RS-232 Control Administrator Guide:

https://highseclabs.com/downloads/rs232-control-administrator-guide/

In the command <CMD1> of the following examples, the term "AFP_ALIVE" indicates the keepalive sequence of the KVM's front panel, and the terms "FFFFFE" and "FFFFFD" indicate KVM channels 1 and 2, respectively.

Example 1

- Button 1 is colored red, and pressing it switches the KVM to Channel 1. Button 2 is colored blue, and pressing it switches the KVM to Channel 2. The other buttons are colored white and are inactive. All buttons are grouped together, meaning that when a button is pressed, its LED will turn on and all other buttons' LEDs will turn off. Buttons 1 and 2 are dimmed when inactive.
- **#RCCFG START=blank**
- **#RCCFG BUTTON=1 COLOR=red DIM=1 CMD1="#AFP_ALIVE FFFFFE\r"**
- **#RCCFG BUTTON=2 COLOR=blue DIM=1 CMD1="#AFP_ALIVE FFFFFD\r"**
- **#RCCFG DONE=1**

Example 2

Button 1 is colored red, and pressing it switches the KVM to Channel 1. Button 2 is colored blue, and pressing it switches the KVM to Channel 2. The other buttons are colored white and are inactive. All buttons are independent and set to Always-on, meaning that when a button is pressed, its LED blinks briefly and stays on, while the other buttons are unaffected.

- **#RCCFG START=singles**
- **#RCCFG BUTTON=1 COLOR=red CMD1="#AFP_ALIVE FFFFFE\r"**
- **#RCCFG BUTTON=2 COLOR=blue CMD1="#AFP_ALIVE FFFFFD\r"**
- **#RCCFG DONE=1**

CONFIGURATION

Example 3

Button 1 is colored red, and pressing it switches the KVM to Channel 1. Button 2 is colored blue, and pressing it switches the KVM to Channel 2. The other buttons are colored white and are inactive. All buttons are independent, and Buttons 1 and 2 are set to Active-on, meaning they will only turn on when sending a command. Button 1 is dimmed; all other buttons are set to Always-on.

- **#RCCFG START=singles**
- **#RCCFG BUTTON=1 COLOR=red DIM=1 ACTON=1 CMD1="#AFP_ALIVE FFFFFE\r"**
- **#RCCFG BUTTON=2 COLOR=blue ACTON=1 CMD1="#AFP_ALIVE FFFFFD\r"**
- **#RCCFG DONE=1**

Example 4

This example preset uses the RCU's current active preset, switching the KVM positions of Buttons 1 and 2, so that pressing Button 1 on the RCU will behave as if pressing Button 2 on the KVM and vice versa.

- **#RCCFG START=active**
- **#RCCFG BUTTON=1 POS=2 COLOR_POS=2 DIM_POS=2 CMD1="#AFP_ALIVE FFFFFD\r"**
- **#RCCFG BUTTON=2 POS=1 COLOR_POS=1 DIM_POS=1 CMD1="#AFP_ALIVE FFFFFE\r"**
- **#RCCFG DONE=1**

Example 5

This example preset uses the RCU's current active Preset. Button 1 is disabled, and Button 2 has the KVM positions of Button 1, so that pressing Button 2 on the RCU will behave as if pressing Button 1 on the KVM.

- **#RCCFG START=active**
- **#RCCFG BUTTON=1 EN=0**
- **#RCCFG BUTTON=2 POS=1 COLOR_POS=1 DIM_POS=1 CMD1="#AFP_ALIVE FFFFFE\r"**
- **#RCCFG DONE=1**

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