Operation Instructions

Model HR-1P

Projector Controller
Programmable Serial Device

Hall Research Technologies, Inc.

Description

The Model HR-1P is a programmable RS-232 serial device designed for control & automation of a Projector, LCD, or any other device with serial port.

The HR-1P has a discrete input that senses a dry contact closure (or Voltage Level). It detects both "Low-To-High" and ""High-To-Low" transitions of the 'EXT CTRL' input and issues corresponding commands out the serial port of the HR-1P to the serial device (projector).

The commands can be any ASCII (or non-ASCII) data with programmable delays embedded in the string. The commands can also be complex multi-part strings typical of many modern projectors. The unit can be configured to send the output string once or to repeat continuously per transition of the 'EXT CTRL' input.

Hall Research provides a powerful Windows® based application (available on-line) that is used to create the data files and upload it to the HR-1P, via a supplied cable.

Features

- ✓ Compact, Reliable, and Economical
- ✓ 2 user-programmable Command Strings
- ✓ Allows multiple instances of user-defined delays within each string
- ✓ Intuitive Operation
- ✓ Windows™ software for programming available on-line
- ✓ Made in USA
- ✓ Dual color front panel LED status indicator
- ✓ Output strings can be continuously repeated if necessary

Operation

The HR-1P is designed to send a string of commands to a serial device (projector) via the serial interface, when the discrete input transitions. When the 'EXT CTRL' input transitions from "High-To-Low", the HR-1P will send the "OFF" string to the serial device (projector) and when the 'EXT CTRL' input transitions from "Low-To-High", the HR-1P will send the "ON" string to the serial device (projector).

The HR-1P will communicate with the serial device (projector) at some baud rate specified in the user's manual of the serial device (projector). The HR-1P programming software will allow the user to select that baud rate for the serial device (projector). The HR-1P programming software will also allow the user to upload two strings to the HR-1P. This will consist of the ON string and the OFF string. These strings are limited to 100 characters in length each. These two strings can be constructed directly in the HR-1P programming software. The user will then be able to upload the baud rate and the two strings to the HR-1P. The HR-1P will, in turn, send out these strings to the serial device (projector) when the 'EXT CTRL' input changes state. The user also has the ability to include a number of waits in the string of commands. For example the user may send out the commands 'CCB' and then wish to wait for 3 seconds and then send out additional commands. This will be explained in further detail below.
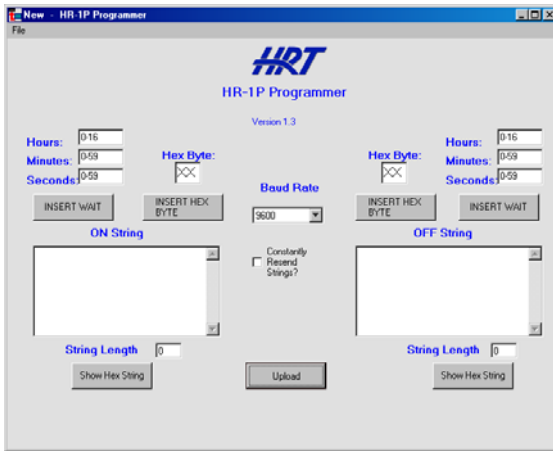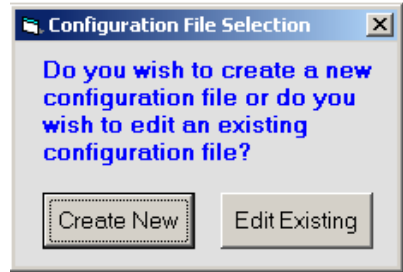
How to Create Command Strings

First, select the comm. port you will use to connect the HR-1P to the PC.
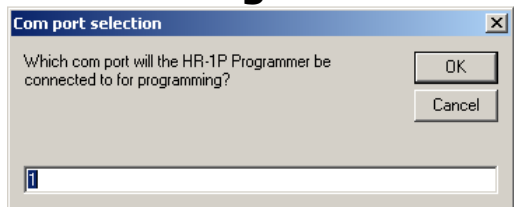
After you select the comm. port, you will be asked if you wish to use an existing file or create a new file. Until you have saved a file, choose "Create New" and give your new file a name.

Create the "ON" and "OFF" strings in the HR-1P programming software by typing the ASCII commands in the "ON String" or "OFF String" windows. If you wish to insert a Wait Time in between codes, just specify the Wait Time in the Hours, Minutes, and Seconds fields and click "Insert Wait". The maximum Wait Time is 16 hrs. 59 min. 59 sec. If you need a Wait Time longer than that, just insert repeated wait commands back to back. If you need to insert a Hexadecimal byte, you must type the Hexadecimal byte into the Hex Byte window and click Insert Hex Byte. The Hexadecimal bytes can occupy the hexadecimal range of 0x00 to 0xFF. If you want the "ON" and "OFF" strings to be continuously sent (rather than just once) then check the "Constantly Resend Strings?" check box.

Note

There are a few restrictions you need to be aware of when you are building your string. The Backspace key is the only way to correct/delete characters in your string. You can only Backspace from the end of the string. The Windows "Paste" function has been disabled. You may only insert a character at the end of the string. The maximum length of the ON or OFF string is 100 characters. A Wait will occupy 3 character spaces in the string. Any ASCII character input from the keyboard will increment the string length by 1. All Hexadecimal bytes will increment the string length by 1 character with the exception of the Hexadecimal byte x1B. This hexadecimal byte will occupy 2 bytes.

If you have configured the unit to "Constantly Resend Strings" and have "WAIT" times in the string, the unit will not see the input transition until the delay is finished.

Uploading commands to the HR-1P

After you have loaded a configuration file containing your "ON" string and "OFF" string or you have created your "ON" string and "OFF" string you are now ready to upload the "ON" and "OFF" strings to the HR-1P. Connect the HR-1P to the PC's comm. port you selected earlier via the supplied cable.

Connect the HR-1P to the PC's comm. port you selected earlier via the supplied programming cable. The supplied programming cable is a 6' cable that has a female DB-9 connector that connects to the PC and the other end is a male mini-stereo connector that plugs into the HR-1P.

Important!

You may need to use a crossover serial cable (also know as a NULL-modem cable) to connect the HR-1P to the device you want to control.

There are 2 types of serial devices:

1. DTE (Data Terminal Equipment) ex. Computer/ PC
2. DCE (Data Communication Equipment) e.g. Serial controlled projector, modem, or the HR-1P.

DTE devices talk directly to DCE devices. If you have 2 DTE devices trying to talk, they need a crossover serial cable connecting them. In the same way if you have 2 DCE devices trying to talk, they will need a crossover serial cable connecting them as well. Generally DTE devices will have a male DB9 connector and DCE devices will have a female DB9 connector. You will notice that the serial cable included with the HR-1P has a female DB9 connector. This indicates that the HR-1P is a DCE device, which is why it will connect directly to a computer/PC serial port. When you are done uploading the "ON" and "OFF" strings to the HR-1P, you will need to use a crossover or straight through serial cable to connect the HR-1P to your serial device depending on what type of serial device you are trying to control. Here is the pinout for the HR-1P.

DB9 - Female

PIN 3 - RX
PIN 2 - TX
PIN 5 - GND
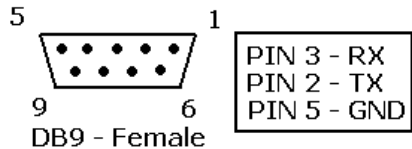
Power on the HR-1P and click the "Upload" button. A message box will tell you when the upload has completed.

The "ON" and "OFF" strings and baud rate have now been loaded into the HR-1P. Disconnect the HR-1P from the computer and power the HR-1P off. Connect the HR-1P to the serial device (projector) via the serial interface. Connect the discrete input to the HR-1P. Power on the HR-1P and you are done.

Connecting the HR-1P to the serial device

- Connect the HR-1P to the serial device (projector) via the serial interface using the supplied programming cable.
- When connecting the HR-1P to the serial device (projector) you must use a crossover serial cable in addition to the supplied programming cable.
- This will connect the TX line of the serial interface on the HR-1P to the RX line on the serial interface of the serial device (projector).
- Without a crossover serial cable between the supplied programming cable and the serial device (projector), the serial device (projector) will not receive any commands from the HR-1P.
- Connect the dry contact closure wiring to the EXT CTRL input to the HR-1P. If you're using a HR-1P-OPTO version, connect the external power source to the EXT CTRL input of the HR-1P.
- Connect the supplied Power Supply to the HR-1P and you are done.

SPECIAL CONNECTION INFORMATION:

- By default the HR-1P is configured to detect a **<u>CONTACT</u>** or a **<u>NON-ISOLATED VOLTAGE</u>**. By special request at the time of the order, the unit can be configured to detect an **<u>OPTICALLY ISOLATED VOLTAGE.</u>**
- Both the **<u>CONTACT/NON-ISOLATED</u>** and **<u>OPTICALLY ISOLATED</u>** configurations use the EXT CTL jack for detection of the signal.
- **<u>For Contact/Non-Isolated Voltage configurations</u>** of the unit, ALWAYS ensure that if you supply a voltage to the EXT-CTL jack, it is applied as CENTER POSITIVE in the range of 3-24 vDC. The device will not sense 0 volts by unplugging the EXT CTL jack. The sensing circuit is normally 'pulled' high. This means that in order to detect the 'No-Voltage applied' condition, your circuit must represent a low resistance.
- **<u>For OPTICALLY ISOLATED configurations,</u>** ALWAYS ensure that the voltage is applied as a CENTER POSITIVE in the range of 3-9 vDC. This voltage should be isolated from the units Supply Voltage.
- Failure to observe these warnings may result in damage to the unit and void your warranty

Front Panel Status Indicator

The front panel has a convenient dual color LED that is used to indicate which of the two command strings has been issued last from the HR-1P. If the last command sent to the device was an "ON" string then the LED will be solid Green. If the last command sent to the device was an "OFF" string then the LED will be Red. Anytime the unit is powered on, the LED will blink Red and Green until a string is sent out. While the "ON" string is being sent out, the LED will blink Green. When the "ON" string is done being sent out, the LED will be a solid Green. While the "OFF" string is being sent out, the LED will blink Red.
When the OFF string is done being sent out, the LED will be a solid Red. After uploading commands to the HR-1P via the HR-1P programming software, the front panel LED will blink Red and Green until a string is sent out the serial port.

Federal Communications Commission Statement

This equipment generates; uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. This equipment has been designed to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC rules. Harmful interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

If necessary, you should consult the place of purchase or and experienced radio/television technician for additional suggestions.

Warranty

HRT warrants that the supplied equipment is free from defective workmanship and material. Subject to the agreements set forth, will repair or replace, at its option, the defective components for a period of 2 years after purchase. The following conditions apply to the Warranty:

Warranty void if item subject to improper use, negligence, or unauthorized modification

Instructions must be followed in obtaining RMA number as explained below

Any defective part should be returned, insured and freight prepaid, to Hall Research, with the following:

- Return Material Authorization Number (RMA#)

- Description of failure, as detailed as possible

- Shipping address and contact name and phone number

Limited Liability

IN NO EVENT SHALL THE DIRECT VENDOR'S LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT OR ITS DOCUMENTATION

Hall Research Technologies, Inc.

Products Designed and Made in the USA