



**IR-422**

**INFRARED TO RS-422 TRANSLATOR  
FOR  
VTR REMOTE CONTROL**

**INSTRUCTION MANUAL**  
VERSION: 050101

## SCOPE

This manual provides operating instructions for the BUF Technology IR-422 Infrared to RS-422 Translator for Broadcast and Professional Video Tape Recorder Remote Control. Information is included to aid the user in fully understanding all the features and capabilities of the device.

## WARRANTY STATEMENT

BUF Technology warrants that the equipment it manufactures is free from defects in materials and workmanship. Equipment which has been operated within its ratings and has not been subjected to mechanical or other abuse or modification and has failed because of such defects, will, at the option of BUF Technology, be repaired or replaced if it is returned, freight pre-paid, to BUF Technology within two years from the date of shipment. Equipment that fails under conditions other than described herein will be repaired at the price of parts and labor in effect at the time of repair.

This warranty is in lieu of all other warranties, express or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. BUF Technology is not liable for any consequential damages.

## OVERVIEW

The IR-422 makes it possible to control most Professional and Broadcast VTRs from a remote location using an off-the-shelf Infrared VCR Remote Control. Any VTR equipped with a "9-pin" remote control connector which conforms to the SONY (Japanese) RS-422 protocol can be controlled. Supported formats include SVHS, Hi-8, BETA, D1, D2, D3, D5, DCT, SONY 1 INCH, 3/4 INCH, HDTV VTRs, and many emerging digitally compressed VTRs. Many digital audio recorders and digital video disk recorders (DDRs) also can be controlled. A data terminal or PC running terminal software may be used to reconfigure the unit from its defaults. Configurable items include Infrared Remote type, certain options, and various test modes. The device may also be used to send infrared remote button push information to a PC com port for remote control of software programs.

## TROUBLESHOOTING cont.

### Remote control recognition:

When you press buttons on the remote, the LED should blink. If not, and the IR-422 is configured for the correct remote type, the remote may simply have dead battery cells. If you purchased the universal remote from BUF, it should operate correctly as-is without having to reconfigure the IR-422. Try taking the cells out of the remote and reinstalling them, this resets the universal remote to its default type.

### VTR function:

The only way to check VTR function is to connect the IR-422 to the Remote connector on a VTR, insert a tape, put the VTR in the correct 9-pin remote mode, and press buttons (like PLAY and STOP) on the remote. If the VTR fails to function, check the connections (temporarily try the included VTR cable if you are using your own cabling). Also, check that the VTR is in the correct mode, and that it uses the SONY protocol (virtually all RS-422 controllable VTRs use this protocol except most AMPEX models). Some VTRs and Digital Disk Recorders have to be configured for this protocol. If you have used a PC to configure the unit, you may have left it in a test mode. Make sure test mode zero is selected (see **CONFIGURATION**).

### IR-422 won't respond to pressing ENTER on the terminal:

This is almost always a connection or terminal configuration problem. Before assuming there is something wrong with the IR-422, try a simple test to verify the PC is connected and configured correctly. Take the connector off the back of the IR-422 and verify that pressing keys on the PC do NOT display characters on the screen. Then short pins 2 and 6 together on the connector which had been connected to the IR-422 and verify that characters now display as entered. (If they did display before shorting the pins, each character should now display twice.) If this test works, there are two possibilities other than a malfunctioning IR-422. First, the BAUD rate, data bits, or parity settings may be incorrect, check that the PC is set for 9600, 8, N, 1. The second possibility is that pins 2 and 3 may need to be swapped at the computer end (this should not be necessary if using the BUF RS-232 cable and a PC with a 9-pin RS-232 connector).

## RS-232 CONNECTION

A special RS-232 cable is available at a nominal charge for connection to a terminal or PC for configuration purposes. This cable may also be used with the IR-422 to provide infrared remote control of software programs. The cable uses the 9-pin "PC standard" for direct connection to most laptop and many desktop computers.

The following table provides information to construct your own cable:

IR-422 9-PIN 'D' MALE	SIGNAL (WITH RESPECT TO PC)	PC RS-232 9-PIN 'D' FEMALE	PC RS-232 25-PIN 'D' FEMALE
---	DCD	1	8
6	RX (IR TX)	2	3
2	TX (IR RX)	3	2
---	DTR	4	20
1	GROUND	5	7
---	DSR	6	6
---	RTS	7	4
---	CTS	8	5
---	RI	9	22

CONNECT  
THESE PINS  
\  
TOGETHER  
|- TO ACCOMMODATE  
/  
HARDWARE  
HANDSHAKING

**CONNECTING PINS 6, 7, AND 8 TOGETHER ON THE 9 PIN PC CONNECTOR (4-5-6 ON THE 25 PIN) SATISFIES ANY HARDWARE HANDSHAKING THE TERMINAL OR PC MAY REQUIRE.**

NOTE: No hardware or software communication handshaking is needed due to the limited length of all messages.

## TROUBLESHOOTING

### Power indication:

An LED inside the front panel lights to indicate power is applied and the internal microcontroller is functioning. If this LED doesn't light, there is no power reaching the unit, or a catastrophic failure exists.

## PHYSICAL

The IR-422 is enclosed in a small, impact resistant plastic enclosure. An infrared-transparent front panel allows remote control infrared pulses in, while rejecting unwanted visible light. VTR connection is via a rear mounted 9-pin 'D' female connector. The included VTR control cable may be used for VTR connection, or user cabling not exceeding one kilometer combined with any combination of routing switchers and patch bays may be used. The rear panel also has a power jack for connection to the included power supply module.

## OPERATION

If you purchased the optional Universal Infrared Remote, simply install the included battery cells, attach the power supply and VTR connections, and you're ready to go.

PLAY, STOP, and PAUSE perform their respective functions. After pressing the VTR button, the channel UP and DOWN buttons control Jog forward and reverse, and the POWER button ejects the tape. See **CONFIGURATION - Options** to disable eject.

The FF and REW buttons ramp VTR shuttle speed up and down to scan tape at any desired speed. Releasing these buttons holds the speed, and tapping them adjusts the speed incrementally. Holding FF or REW for three seconds puts the VTR in the Fast Forward or Rewind modes. These modes will unload tape from the heads on some VTRs making picture recognition impossible until the opposite button is tapped to reenter the shuttle mode.

## RECORDING

Recording is possible using the remote's REC button, however this function is initially disabled to prevent accidental recording. Recording is enabled using a terminal or a PC running terminal software and the optional RS-232 cable (see **CONFIGURATION**). Keep in mind that the record mode used is a hard (or crash) record, which disrupts the control track on the tape, resulting in "dirty" in and out points.

## CONFIGURATION

Some features of the IR-422 are adjustable by connecting a terminal or PC running terminal software. A special RS-232 cable is available from BUF Technology at a nominal charge, or you may construct your own (see **RS-232 CONNECTION**). Connect the cable from the 9-pin 'D' connector on the IR-422 rear panel to an available com port on the terminal or PC and run the terminal program. If your terminal or PC has only a 25 pin 'D' connector, you can make your own cable or purchase an adapter from a computer store.

Once connected, configure for 9600 BAUD, No Parity, 8 bits, 1 stop bit. Press ENTER (RETURN) to display the IR-422 system information. You may change the remote type, certain options, or the test mode. These items are stored in an EEPROM (Electrically Erasable Programmable Read Only Memory) and will remain in effect until changed regardless of how long power is removed from the IR-422. Before any change takes effect, you must press 'Y' to confirm. This prevents accidental changes which might otherwise be caused by random noise.

### Remote Type:

Press 'R' to display a list of the available remote types. Your remote might use one of the available protocols even if the name doesn't appear, so you may need to try several. Choose a remote type by pushing the numbers shown to the left of the name. You must then press 'Y' to save the change in order for it to take effect. You'll know you have selected the correct type if the LED blinks while you press buttons on the remote. The terminal may display garbage when you do so; this is normal due to the different BAUD rate at which the VTR commands are sent. See **Test Modes** if you want to view the VTR commands on the terminal.

### Options:

Press 'O' (that's the letter o, not a zero) to display the available options. You can change an option by pressing the number to the left of it's description. You must then press 'Y' to verify before it will take effect. Current options are RECORD ENABLE and EJECT ENABLE.

Recording is disabled initially and can be enabled only by changing the Record Enable option. See **RECORDING** for more information.

## CONFIGURATION cont.

Pressing the POWER button on the remote will eject the tape from the VTR. If you don't want accidental ejections, you may defeat this feature by selecting option 1, and confirming with 'Y'.

### Test Modes:

Test modes are provided for two purposes. Primarily, the test modes are used to characterize new remote controls. Also, test mode 2 may be used to input remote button push information to a com port on a PC, so the IR-422 can be used to control the operation of software programs.

Test mode 0 is the normal (and default) mode. In response to buttons being pushed on the remote, commands are sent using the SONY VTR protocol at 38.4K BAUD with ODD Parity. Most terminals will show garbage on the screen when VTR commands are sent; this is normal.

Test mode 1 causes VTR commands to be sent to the terminal as readable English commands at 9600 BAUD. Use this mode to verify the operation of a newly selected remote type. You must remember to set the test mode back to zero in order to control a VTR!

Test mode 2 displays the remote control data pattern in hexadecimal as buttons are pressed. This mode is used to identify which key is which, so the correct VTR commands can be programmed. This mode may also be used to control program flow on a PC. The 2-digit hexadecimal key data numbers are separated by commas.

Test modes 3, 4, and 5 display groups of sixteen 4-digit hexadecimal numbers which are the time periods measured between pulses from the remote. This is used to determine the basic pulse code parameters used in the remote's protocol. Mode 3 displays the first 16 pulses, mode 4 displays pluses 17-32, and mode 5 displays pulses 33-48 (if applicable).