

## 7. How to program by RS232

### Projection Display Serial Interface

#### 7-1. RS232 Setting

Baud rate:	<b>9600</b>
Parity check:	<b>None</b>
Data bit:	<b>8</b>
Stop bit:	<b>1</b>
Flow Control	<b>None</b>

Minimum delay for next command: **1ms**

#### 7-2. Control Command Structure

The command is structured by the Header code, command code, data code and end code. Most of the commands are structured except some for the compatibility issue with other projectors.

	Header code	Command code	Data code	End code
HEX	7Eh	Command	Data	0Dh
ASCII	'~'	Command	Data	CR

#### 7-3. Control Sequence

The projector may send a return code after it received a command. If the command isn't received correctly, the projector will not send the return code

#### 7-4. Operation Command

The operation commands execute the basic operation setting of this projector.

Operation	ASCII	HEX
Power On	~PN<CR>	7Eh 50h 4Eh 0Dh
Power Off	~PF<CR>	7Eh 50h 46h 0Dh
Auto Image	~AI<CR>	7Eh 41h 49h 0Dh
Input Select PC	~SR<CR>	7Eh 53h 52h 0Dh
Input Select DVI/HDMI1	~SD<CR>	7Eh 53h 44h 0Dh
Input Select HDMI2	~SH<CR>	7Eh 53h 48h 0Dh
Input Select Video	~SV<CR>	7Eh 53h 56h 0Dh
Input Select S-Video	~SS<CR>	7Eh 53h 53h 0Dh
Input Select Component	~SY<CR>	7Eh 53h 59h 0Dh

※ Power On command will not work for 1 minute after the power off command triggered.

※ **CR**: Carriage Return.

## 7-5. Remote Command

The remote commands simulate the code send from IR remote handset.

Button's name	ASCII	HEX
UP arrow	~rU<CR>	7Eh 72h 55h 0Dh
DOWN arrow	~rD<CR>	7Eh 72h 44h 0Dh
LEFT arrow	~rL<CR>	7Eh 72h 4Ch 0Dh
RIGHT arrow	~rR<CR>	7Eh 72h 52h 0Dh
POWER	~rP<CR>	7Eh 72h 50h 0Dh
EXIT	~rE<CR>	7Eh 72h 45h 0Dh
INPUT	~rI<CR>	7Eh 72h 49h 0Dh
AUTO	~rA<CR>	7Eh 72h 41h 0Dh
KEYSTONE+	~rK<CR>	7Eh 72h 4Bh 0Dh
KEYSTONE-	~rJ<CR>	7Eh 72h 4Ah 0Dh
MENU	~rM<CR>	7Eh 72h 4Dh 0Dh
STATUS	~rS<CR>	7Eh 72h 53h 0Dh
MUTE	~rT<CR>	7Eh 72h 54h 0Dh
ZOOM+	~rZ<CR>	7Eh 72h 5Ah 0Dh
ZOOM-	~rY<CR>	7Eh 72h 59h 0Dh
BLANK	~rB<CR>	7Eh 72h 42h 0Dh
FREEZE	~rF<CR>	7Eh 72h 46h 0Dh
VOLUME+	~rV<CR>	7Eh 72h 56h 0Dh
VOLUME-	~rW<CR>	7Eh 72h 57h 0Dh
ENTER	~rN<CR>	7Eh 72h 4Eh 0Dh

## 7-6. Set Value Command

ITEM	ASCII	HEX
Brightness	~ s B ? CR ※	7Eh 73h 42h ?h 0Dh
Contrast	~ s C ? CR	7Eh 73h 43h ?h 0Dh
Color	~ s R ? CR	7Eh 73h 52h ?h 0Dh
Tint	~ s N ? CR	7Eh 73h 4Eh ?h 0Dh
Scaling	~ s A ? CR	7Eh 73h 41h ?h 0Dh
Color Temperature	~ s T ? CR	7Eh 73h 54h ?h 0Dh
Projection Mode	~ s J ? CR	7Eh 73h 4Ah ?h 0Dh

? : ASCII Data

### Data Range

ITEM	Set Data Range	Source
Brightness	0 ~ 100	ALL
Contrast	0 ~ 100	ALL
Color	0 ~ 100	Video/S-Video/Component
Tint	0 ~ 100	Video/S-Video/Component
Scaling	0: Auto 1: 16:9 2: 4:3 3:4: Letter Box 5 : Real	ALL
Color Temperature	0: LAMP Native 1: Warm 2: Normal 3: Cool 4: Cooler 5: High Cool	ALL
Projection Mode	0: Front table 1: Front 2: Ceiling 3: Rear table 4: Rear+ Ceiling	ALL

**Attention:** Data range may be different for different models

**Example 1. Adjust Brightness value to 100**

Send Command : ~sB100CR

**Example 2. Adjust Color Temperature to Warm**

Send Command : ~sT2CR

## 7-7. Query Command

ITEM	ASCII	HEX
Software Version	~ q V CR	7Eh 71h 56h 0Dh
Power State	~ q P CR	7Eh 71h 50h 0Dh
Input Select	~ q S CR	7Eh 71h 53h 0Dh
Lamp Hours	~ q L CR	7Eh 71h 4Ch 0Dh
Brightness	~ q B CR	7Eh 71h 42h 0Dh
Contrast	~ q C CR	7Eh 71h 43h 0Dh
Color	~ q R CR	7Eh 71h 52h 0Dh
Tint	~ q N CR	7Eh 71h 4Eh 0Dh
Scaling	~ q A CR	7Eh 71h 41h 0Dh
Color Temperature	~ q T CR	7Eh 71h 54h 0Dh
Projection Mode	~ q J CR	7Eh 71h 4Ah 0Dh

### Response message

ITEM	Response Message examples
Software Version	.....
Power State	On Off
Input Select	RGB HDMI1 HDMI2 Video S-Video Component
Lamp Hours	2000
Brightness	100
Contrast	100
Color (Video)	100
Tint (Video)	100
Scaling	Auto 16:9 4:3 LetterBox Rear
Color Temperature	0:LAMP Native 1:Warm 2:Normal 3:Cool4:Cooler5:High Cool
Projection Mode	Front table Front Ceiling Rear table Rear+ Ceiling

#### Example 1. Get Brightness value

Send Command : ~qB CR

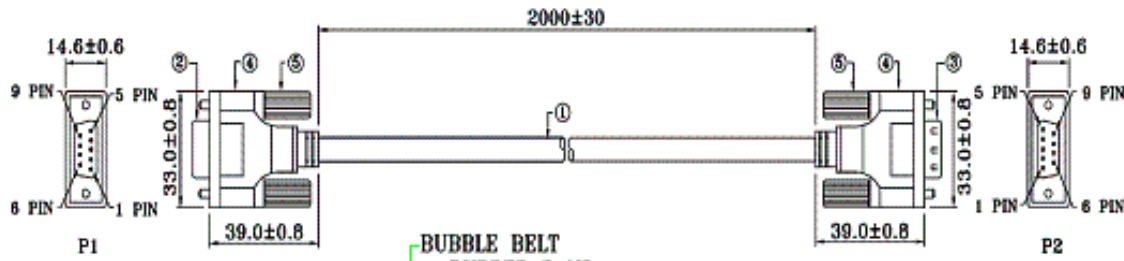
Response : 100

#### Example 2. Get Color Temperature

Send Command : ~qT CR

Response : Warm

### 7-8. RS-232 HARDWARE CONNECTION



WIRE ARRANGEMENT		
P1	COLOR	P2
1	BLACK	1
2	BROWN	3
3	RED	2
4	ORANGE	4
5	YELLOW	5
6	GREEN	6
7	BLUE	7
8	PURPLE	8
9	GRAY	9
CASE	DRAIN WIRE	CASE

#### PC RS-232 pin alignment

Pin	Description	Pin	Description
1	NC	2	RXD
3	TXD	4	NC
5	GND	6	NC
7	RTS	8	CTS
9	NC		

## 7-9. Hyper Terminal setting guide

### 7-9-1 Connect the RS232 Cable between your computer and Projector.

### 7-9-2 Open HyperTerminal

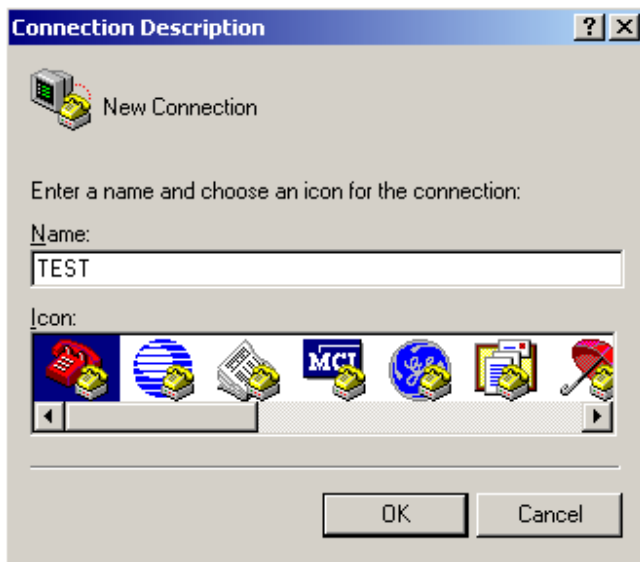
Window2000/XP HyperTerminal path :

Start \ Programs \ Accessories \ Communications \ HyperTerminal ◦



### 7-9-3 Setting the HyperTerminal parameter :

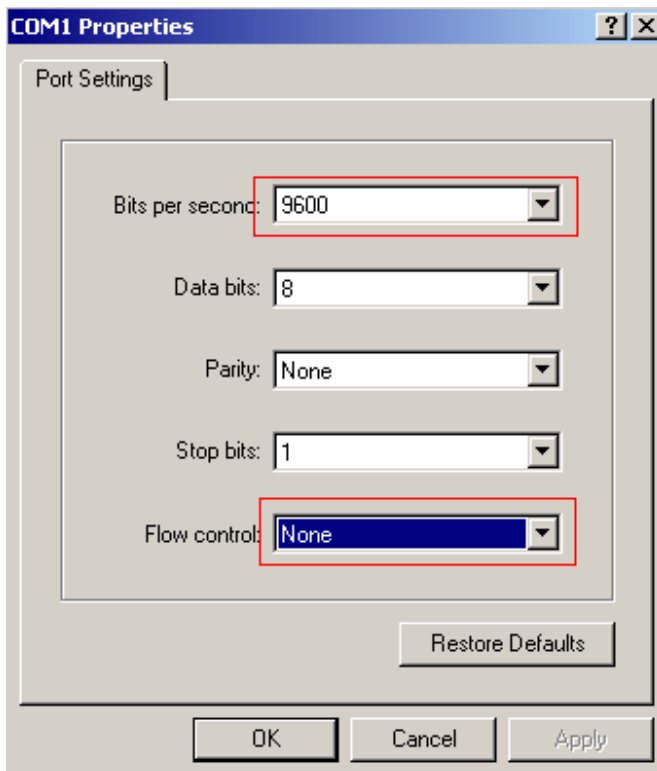
Step 1. Type the connection name .



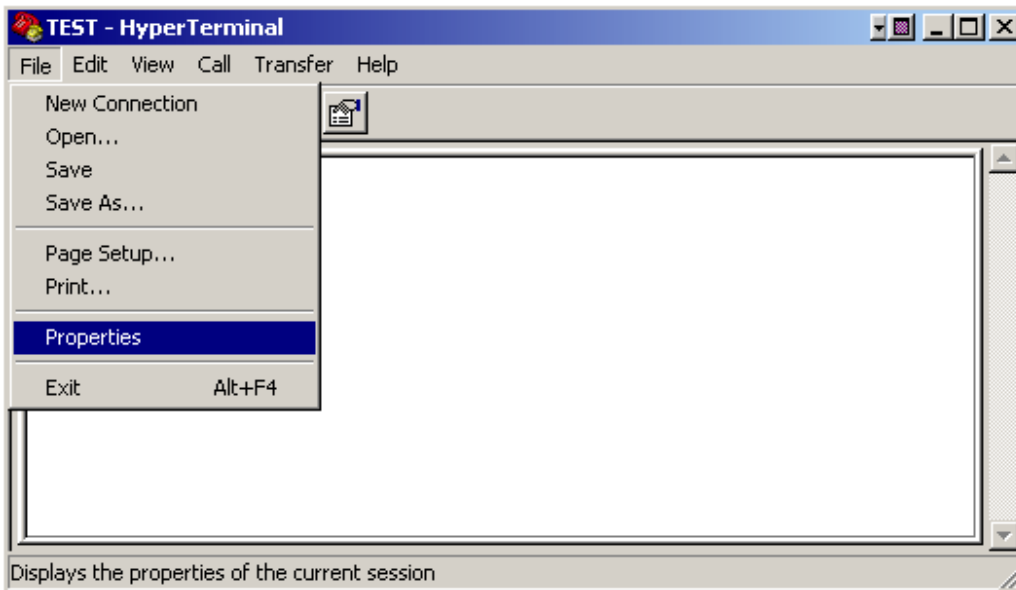
Step2. Choose the COM port for your RS232 Cable connected to.



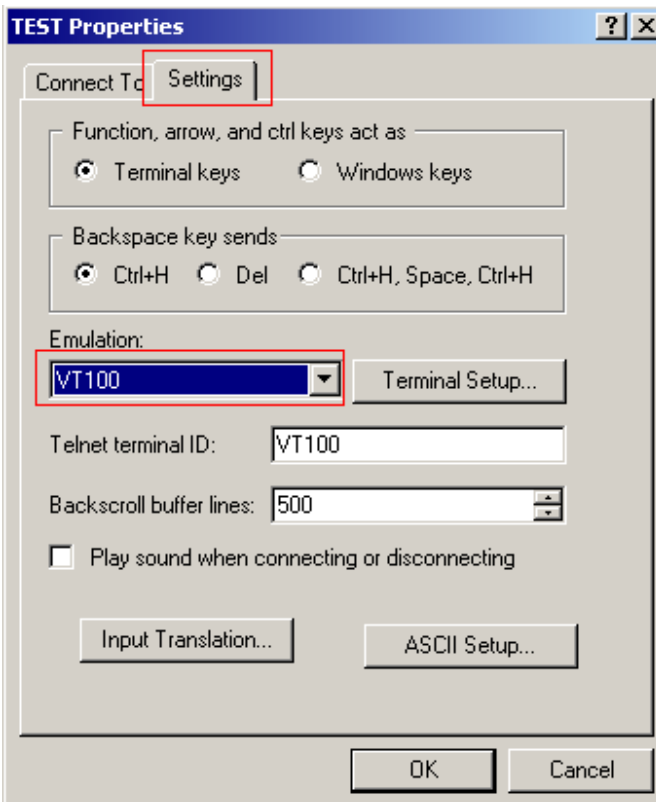
Step3. In Bits per second choose “ 9600 ” and in Flow control choose “ None ” ◦



Step4. Click the File and choose Properties to setting Keyboard parameter ◦

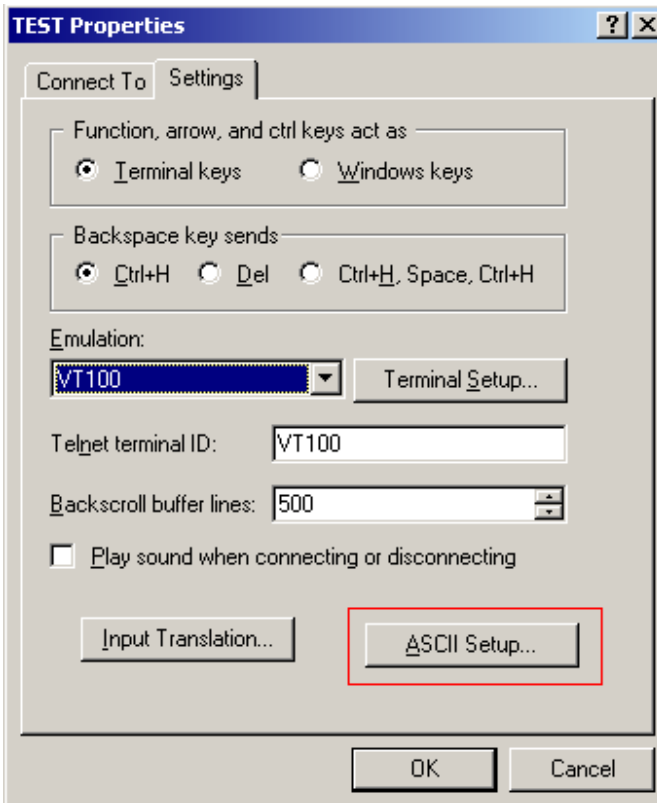


Step5. In Setting page , choose Emulation type for your keyboard.



Step6. Click ASCII Setting icon to setup ASCII code parameter.





Step7. Mark Send Line ends with line feeds and Echo typed characters locally and click OK bottom to complete setting.

