

APPENDIX I

RS-232C Protocol

RS232 Setting

Baud rate:	9600
Parity check:	None
Data bit:	8
Stop bit:	1
Flow Control	None
UART16550 FIFO	Disable

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

Control Command Structure

	Header code	Command code	Data code	End code
HEX		Command	Data	0Dh
ASCII	'V'	Command	Data	CR

Operation Command

Note:

"CR" mean Carriage Return

XX=00-98, projector's ID, XX=99 is for all projectors

Return Result P=Pass / F=Fail

n: 0:Disable/1: Enable/Value(0~9999)

Command Group 00				
ASCII	HEX	Function	Description	Return Result
VXXS0001	56h Xh Xh 53h 30h 30h 30h 31h 0Dh	Power On		P/F
VXXS0002	56h Xh Xh 53h 30h 30h 30h 32h 0Dh	Power Off		P/F
VXXS0003	56h Xh Xh 53h 30h 30h 30h 33h 0Dh	Resync		P/F
VXXG0004	56h Xh Xh 47h 30h 30h 30h 34h 0Dh	Get Light Hours		Pn/F
VXXG0005	56h Xh Xh 47h 30h 30h 30h 35h 0Dh	Get Air filter timer	n=0~60000	Pn/F
VXXS0006	56h Xh Xh 53h 30h 30h 30h 36h 0Dh	System Reset		P/F
VXXG0007	56h Xh Xh 47h 30h 30h 30h 37h 0Dh	Get System Status	0:Reset 1:Standby 2:Operation 3:Cooling	Pn/F
VXXG0008	56h Xh Xh 47h 30h 30h 30h 38h 0Dh	Get F/W Version		Pn/F

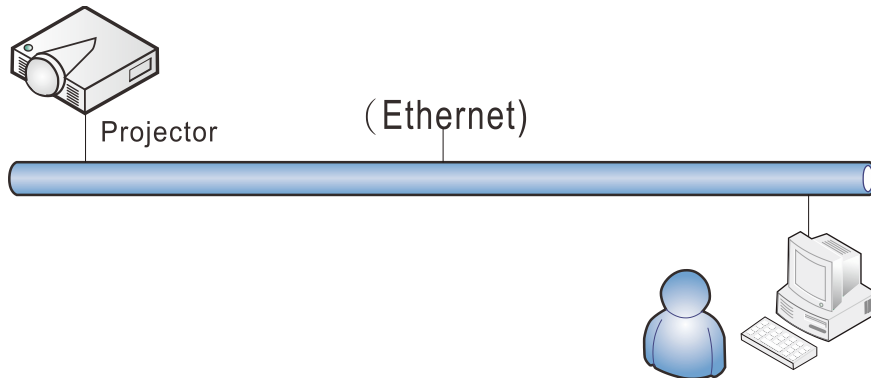
Command Group 01				
ASCII	HEX	Function	Description	Return Value
VXXG0101	56h Xh Xh 47h 30h 31h 30h 31h 0Dh	Get Brightness	n=0~100	Pn/F
VXXS0101n	56h Xh Xh 53h 30h 31h 30h 31h nh 0Dh	Set Brightness	n=0~100	P/F
VXXG0102	56h Xh Xh 47h 30h 31h 30h 32h 0Dh	Get Contrast	n=0~100	Pn/F
VXXS0102n	56h Xh Xh 53h 30h 31h 30h 32h nh 0Dh	Set Contrast	n=0~100	P/F
VXXG0103	56h Xh Xh 47h 30h 31h 30h 33h 0Dh	Get Color	n=0~100	Pn/F
VXXS0103n	56h Xh Xh 53h 30h 31h 30h 33h nh 0Dh	Set Color	n=0~100	P/F
VXXG0104	56h Xh Xh 47h 30h 31h 30h 34h 0Dh	Get Tint	n=0~100	Pn/F
VXXS0104n	56h Xh Xh 53h 30h 31h 30h 34h nh 0Dh	Set Tint	n=0~100	P/F
VXXG0105	56h Xh Xh 47h 30h 31h 30h 35h 0Dh	Get Sharpness	0~31	Pn/F
VXXS0105n	56h Xh Xh 53h 30h 31h 30h 35h nh 0Dh	Set Sharpness	0~31	P/F
VXXG0106	56h Xh Xh 47h 30h 31h 30h 36h 0Dh	Get Color Temperature	0=Warm 1=Normal 2=Cold	Pn/F
VXXS0106n	56h Xh Xh 53h 30h 31h 30h 36h nh 0Dh	Set Color Temperature	0=Warm 1=Normal 2=Cold	P/F
VXXG0107	56h Xh Xh 47h 30h 31h 30h 37h 0Dh	Get Gamma	0:1.8 1:2.0 2:2.2 3:2.4 4:B&W 5.Linear	Pn/F
VXXS0107n	56h Xh Xh 53h 30h 31h 30h 37h nh 0Dh	Set Gamma	0:1.8 1:2.0 2:2.2 3:2.4 4:B&W 5.Linear	P/F
VXXG0108	56h Xh Xh 47h 30h 31h 30h 38h 0Dh	Get Display Mode	0:Presentation 1:Bright 2:Game 3:Movie 4:Vivid 5:TV 6:sRGB 8:DICOM SIM 9:User 10:User2	Pn/F
VXXS0108n	56h Xh Xh 53h 30h 31h 30h 38h nh 0Dh	Set Display Mode	0:Presentation 1:Bright 2:Game 3:Movie 4:Vivid 5:TV 6:sRGB 8:DICOM SIM 9:User 10:User2	P/F

Command Group 02				
ASCII	HEX	Function	Description	Return Value
VXXS0201	56h Xh Xh 53h 30h 32h 30h 31h 0Dh	Select RGB		P/F
VXXS0203	56h Xh Xh 53h 30h 32h 30h 33h 0Dh	Select DVI		P/F
VXXS0204	56h Xh Xh 53h 30h 32h 30h 34h 0Dh	Select Video		P/F
VXXS0206	56h Xh Xh 53h 30h 32h 30h 36h 0Dh	Select HDMI		P/F
VXXS0207	56h Xh Xh 53h 30h 32h 30h 37h 0Dh	Select BNC		P/F
VXXS0209	56h Xh Xh 53h 30h 32h 30h 39h 0Dh	Select HDMI 2		P/F
VXXS0212	56h Xh Xh 53h 30h 32h 31h 32h 0Dh	Select HDMI 3/MHL		P/F
VXXS0215	56h Xh Xh 53h 30h 32h 31h 35h 0Dh	Select HDBaseT		P/F
VXXG0220	56h Xh Xh 47h 30h 32h 32h 30h 0Dh	Get Current Source	Return 1:RGB 3:DVI 4:Video 6:HDMI 7:BNC 9:HDMI2 12:HDMI3/MHL 15:HDBaseT	Pn/F

Command Group 03				
ASCII	HEX	Function	Description	Return Value
VXXG0301	56h Xh Xh 47h 30h 33h 30h 31h 0Dh	Get Scaling	0:Fill 1:4:3 2:16:9 3:Letter Box 4:Native 5:2.35:1	Pn/F
VXXS0301n	56h Xh Xh 53h 30h 33h 30h 31h nh 0Dh	Set Scaling	0:Fill 1:4:3 2:16:9 3:Letter Box 4:Native 5:2.35:1	P/F
VXXG0302	56h Xh Xh 47h 30h 33h 30h 32h 0Dh	Blank		Pn/F
VXXS0302n	56h Xh Xh 53h 30h 33h 30h 32h nh 0Dh	Blank		P/F
VXXG0304	56h Xh Xh 47h 30h 33h 30h 34h 0Dh	Freeze On		Pn/F
VXXS0304n	56h Xh Xh 53h 30h 33h 30h 34h nh 0Dh	Freeze On		P/F
VXXG0305	56h Xh Xh 47h 30h 33h 30h 35h 0Dh	Volume	n=0~10	Pn/F
VXXS0305n	56h Xh Xh 53h 30h 33h 30h 35h nh 0Dh	Volume	n=0~10	P/F
VXXG0308	56h Xh Xh 47h 30h 33h 30h 38h 0Dh	Projection Mode	0:Front 1:Rear 2:Ceiling 3:Rear+Ceiling	Pn/F
VXXS0308n	56h Xh Xh 53h 30h 33h 30h 38h nh 0Dh	Projection Mode	0:Front 1:Rear 2:Ceiling 3:Rear+Ceiling	P/F
VXXG0309	56h Xh Xh 47h 30h 33h 30h 39h 0Dh	Get vertical keystone value	n=-30~+30	Pn/F
VXXS0309n	56h Xh Xh 53h 30h 33h 30h 39h nh 0Dh	Set vertical keystone value	n=-30~+30	P/F
VXXG0310	56h Xh Xh 47h 30h 33h 31h 30h 0Dh	Get horizontal keystone value	n=-30~+30	Pn/F

Command Group 03				
ASCII	HEX	Function	Description	Return Value
VXXS0310n	56h Xh Xh 53h 30h 33h 31h 30h nh 0Dh	Set horizontal keystone value	n=-30~+30	P/F
VXXG0311	56h Xh Xh 47h 30h 33h 31h 31h 0Dh	Adjust the zoom	n=-10~+10	Pn/F
VXXS0311n	56h Xh Xh 53h 30h 33h 31h 31h nh 0Dh	Adjust the zoom	n=-10~+10	P/F
VXXG0315	56h Xh Xh 47h 30h 33h 31h 35h 0Dh	3D	0:Off 1:DLP-Link 2:IR	Pn/F
VXXS0315n	56h Xh Xh 53h 30h 33h 31h 35h nh 0Dh	3D	0:Off 1:DLP-Link 2:IR	P/F
VXXG0316	56h Xh Xh 47h 30h 33h 31h 36h 0Dh	3D Sync Invert	0:Off 1:On	Pn/F
VXXS0316n	56h Xh Xh 53h 30h 33h 31h 36h nh 0Dh	3D Sync Invert	0:Off 1:On	P/F
VXXG0317	56h Xh Xh 47h 30h 33h 31h 37h 0Dh	3D Format	0:Frame Sequential 1:Top/Bottom 2:Side-By-Side 3:Frame Packing	Pn/F
VXXS0317n	56h Xh Xh 53h 30h 33h 31h 36h nh 0Dh	3D Format	0:Frame Sequential 1:Top/Bottom 2:Side-By-Side 3:Frame Packing	P/F
VXXG0319	56h Xh Xh 47h 30h 33h 31h 38h 0Dh	Light Mode	0:Normal 1:Eco 2:Eco Plus 3:Dimming 4:Extreme Dimming 5:Custom Light	Pn/F
VXXS0319n	56h Xh Xh 53h 30h 33h 31h 38h nh 0Dh	Light Mode	0:Normal 1:Eco 2:Eco Plus 3:Dimming 4:Extreme Dimming 5:Custom Light	P/F
VXXG0321	56h Xh Xh 47h 30h 33h 32h 31h 0Dh	Logo Select	0:Std 1:Black 2:Blue	Pn/F
VXXS0321n	56h Xh Xh 53h 30h 33h 32h 31h nh 0Dh	Logo Select	0:Std 1:Black 2:Blue	P/F
VXXG0322	56h Xh Xh 47h 30h 33h 32h 32h 0Dh	Fan Speed	0:Normal 1:High	Pn/F
VXXS0322n	56h Xh Xh 53h 30h 33h 32h 32h nh 0Dh	Fan Speed	0:Normal 1:High	P/F
VXXG0330	56h Xh Xh 47h 30h 33h 33h 30h 0Dh	Sleep Timer (min = n*5)	0~120	Pn/F
VXXS0330n	56h Xh Xh 53h 30h 33h 33h 30h nh 0Dh	Sleep Timer (min = n*5)	0~120	P/F
VXXG0358	56h Xh Xh 47h 30h 33h 35h 38h 0Dh	Get IR On/Off Control	0:Both IR turn on 1:Front IR turn on 2:Back IR turn on	Pn/F
VXXS0358n	56h Xh Xh 53h 30h 33h 35h 38h n 0Dh	Set IR On/Off Control	0:Both IR turn on 1:Front IR turn on 2:Back IR turn on	P/F

LAN_RJ45



Wired LAN Terminal functionalites

Remote control and monitoring of a projector from a PC (or Laptop) via wired LAN is also possible. Compatibility with Crestron / AMX (Device Discovery) / Extron control boxes enables not only collective projector management on a network but also management from a control panel on a PC (or Laptop) browser screen.

- ★ Crestron is a registered trademark of Crestron Electronics, Inc. of the United States.
- ★ Extron is a registered trademark of Extron Electronics, Inc. of the United States.
- ★ AMX is a registered trademark of AMX LLC of the United States.
- ★ PJLink applied for trademark and logo registration in Japan, the United States of America, and other countries by JBMIA.

Supported External Devices

This projector is supported by the specified commands of the Crestron Electronics controller and related software (ex, RoomView ®).

<http://www.crestron.com/>

This projector is supported by AMX (Device Discovery).

<http://www.amx.com/>

This projector is compliant to support Extron device(s) for reference.

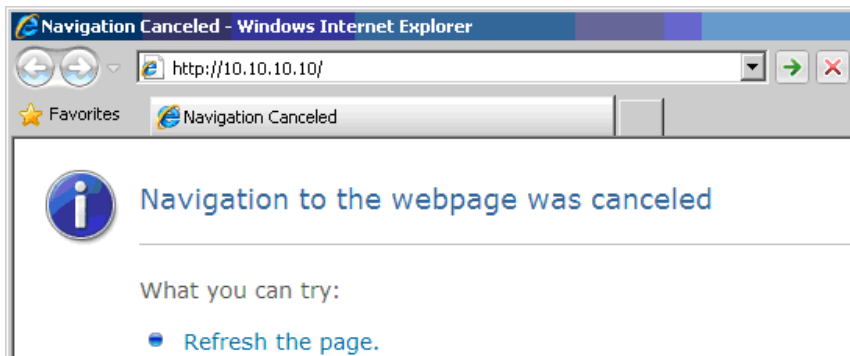
<http://www.extron.com/>

This projector supports all commands of PJLink Class1 (Version 1.00).

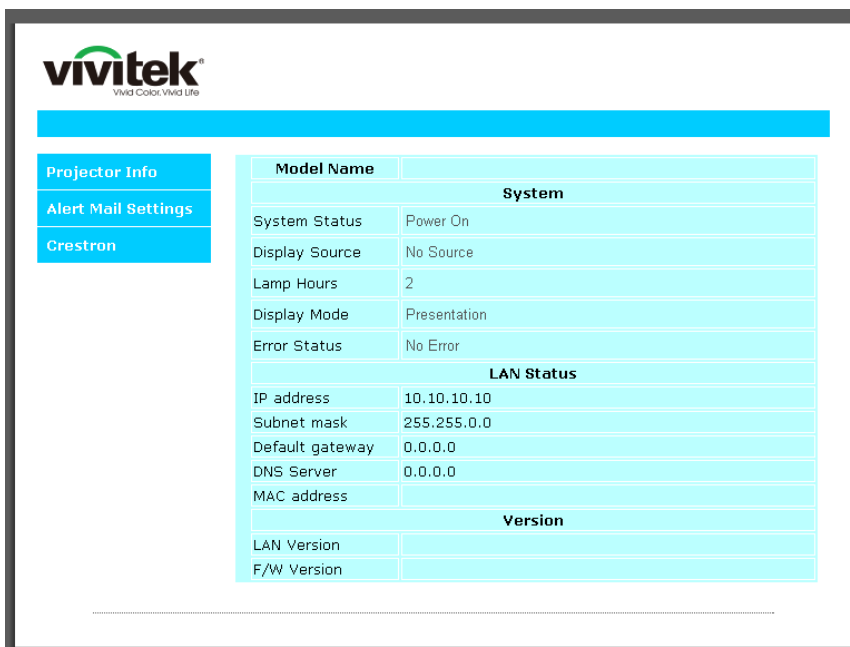
<http://pjlink.jbmia.or.jp/english/>

For more detail of information about the diverse types of external devices which can be connected to the LAN/RJ45 port and remote/control the projector, as well as the related control commands supporting for each external device, kindly please get contact with the Support-Service team directly.

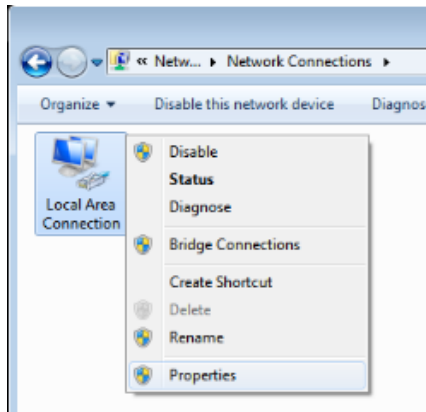
7. Press the **Menu** button on the projector.
8. Select **Settings2** → **Advanced1** → **Network**
9. After getting into **Network**, input the following:
 - ▶ DHCP: Off
 - ▶ IP Address: 10.10.10.10
 - ▶ Subnet Mask: 255.255.255.0
 - ▶ Gateway: 0.0.0.0
 - ▶ DNS Server: 0.0.0.0
10. Press **↵** (Enter) / **▶** to confirm settings.
 Open a web browser
 (for example, Microsoft Internet Explorer with Adobe Flash Player 9.0 or higher).



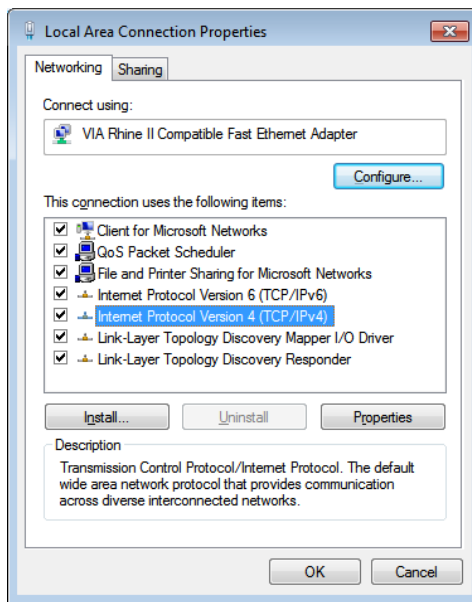
11. In the Address bar, input the IP address: 10.10.10.10.
12. Press **↵** (Enter) / **▶**.
 The projector is setup for remote management. The LAN/RJ45 function displays as follows.



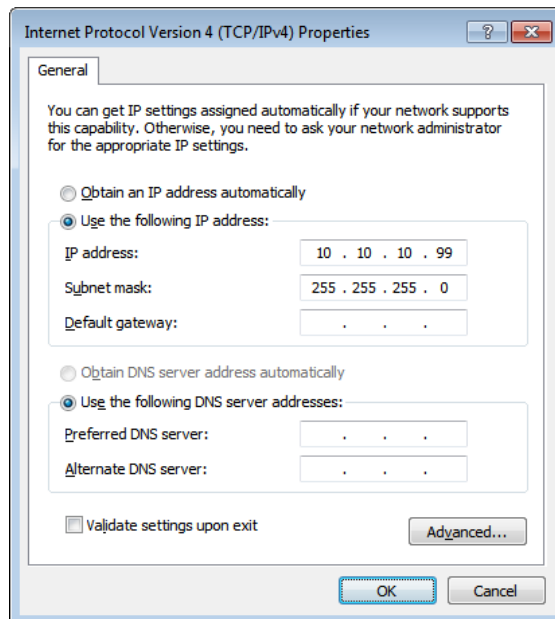
3. Right-click on **Local Area Connection**, and select **Properties**.



4. In the **Properties** window, select the **Networking** tab, and select **Internet Protocol (TCP/IP)**.
5. Click **Properties**.

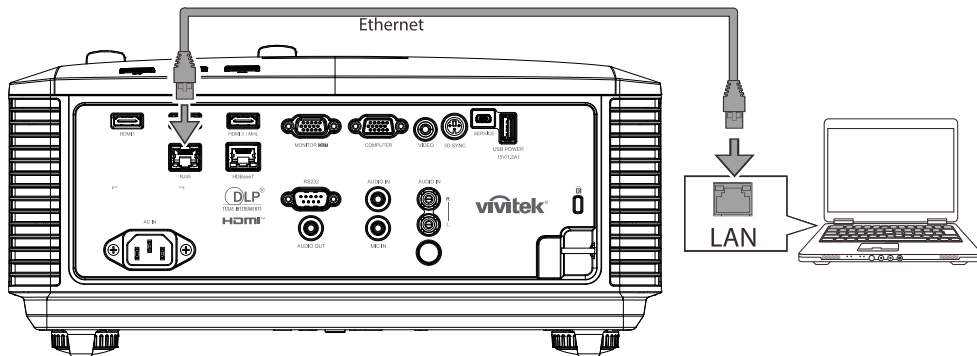


6. Click **Use the following IP address** and fill in the IP address and Subnet mask, then click **OK**.

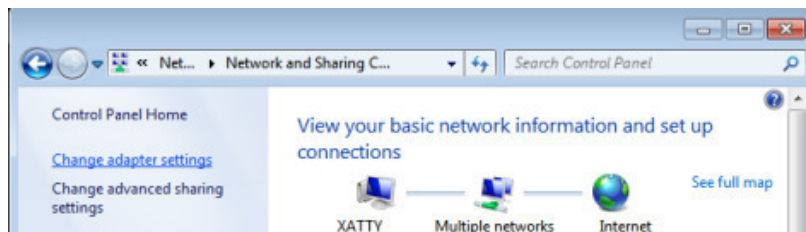
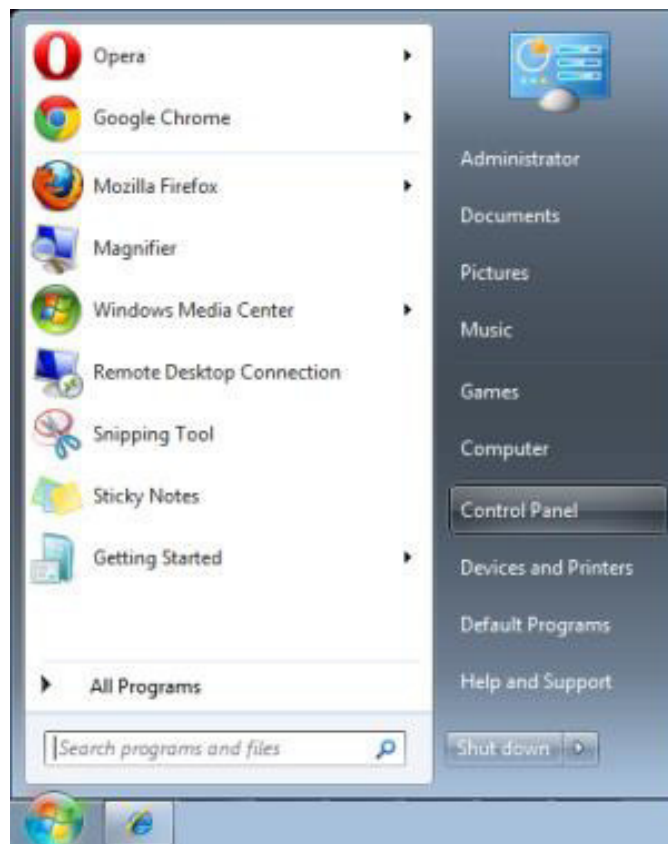


LAN RJ45

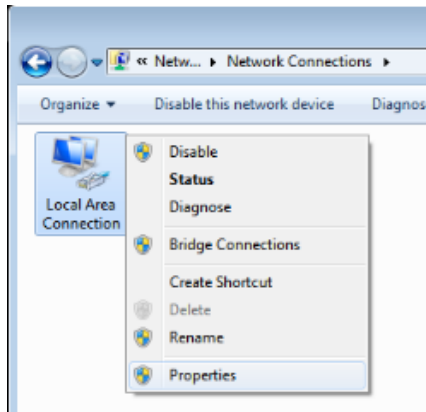
1. Connect an RJ45 cable to RJ45 ports on the projector and the PC (Laptop).



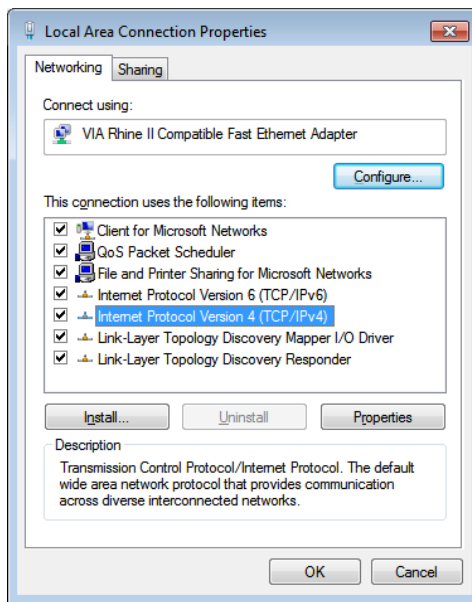
2. On the PC (Laptop), select **Start** → **Control Panel** → **Network and Internet**.



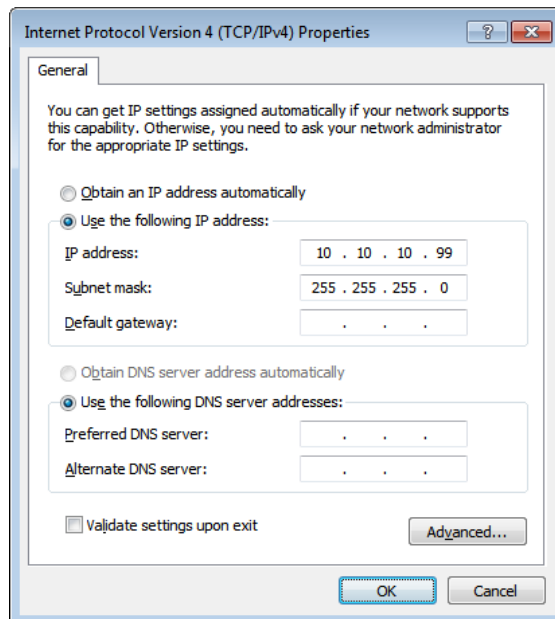
3. Right-click on **Local Area Connection**, and select **Properties**.



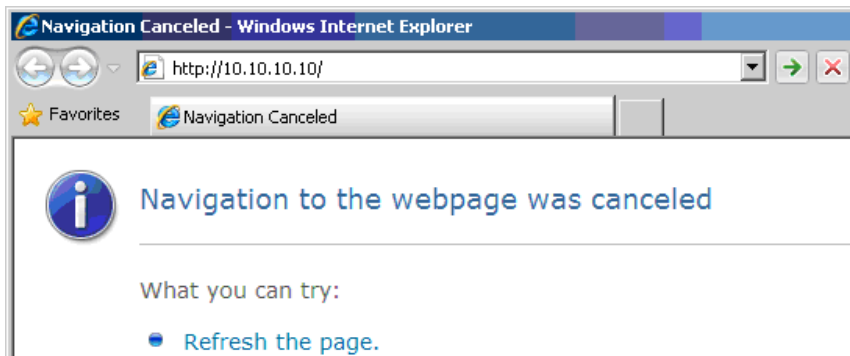
4. In the **Properties** window, select the **Networking** tab, and select **Internet Protocol (TCP/IP)**.
5. Click **Properties**.



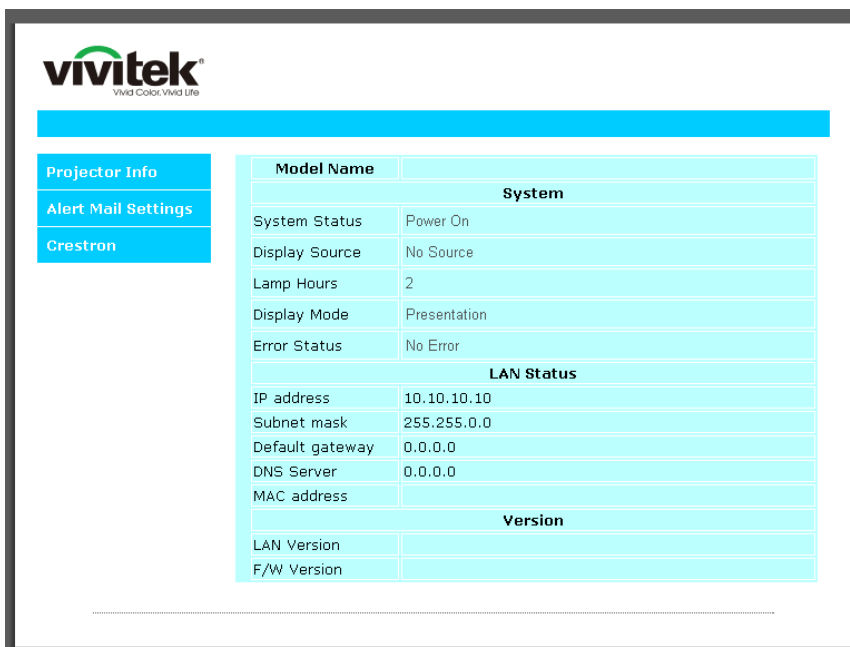
6. Click **Use the following IP address** and fill in the IP address and Subnet mask, then click **OK**.

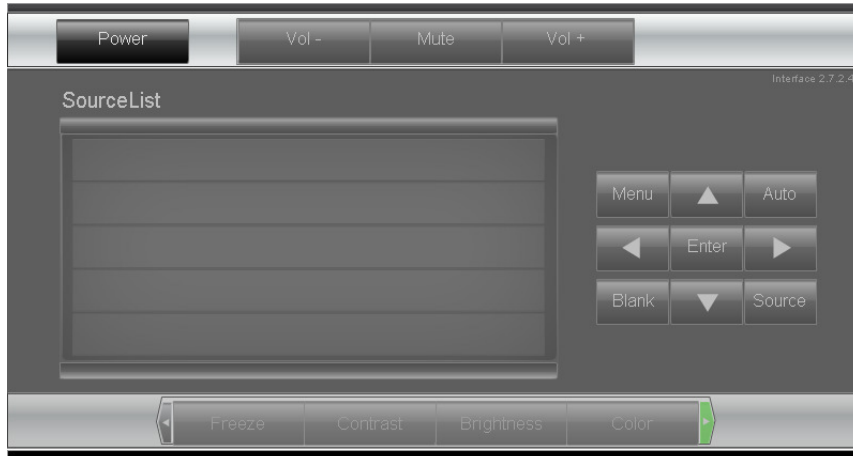


7. Press the **Menu** button on the projector.
8. Select **Settings2** → **Advanced1** → **Network**
9. After getting into **Network**, input the following:
 - ▶ DHCP: Off
 - ▶ IP Address: 10.10.10.10
 - ▶ Subnet Mask: 255.255.255.0
 - ▶ Gateway: 0.0.0.0
 - ▶ DNS Server: 0.0.0.0
10. Press **↵** (Enter) / **▶** to confirm settings.
 Open a web browser
 (for example, Microsoft Internet Explorer with Adobe Flash Player 9.0 or higher).



11. In the Address bar, input the IP address: 10.10.10.10.
12. Press **↵** (Enter) / **▶**.
 The projector is setup for remote management. The LAN/RJ45 function displays as follows.





CRESTRON Expansion Options

Crestron Control	Projector	User Password
IP Address <input type="text"/>	Projector Name <input type="text" value="PJ01"/>	<input type="checkbox"/> Usr Enabled
IP ID <input type="text"/>	Location <input type="text" value="RM01"/>	Password <input type="text"/>
Control Port <input type="text"/>	Assigned To <input type="text" value="Sir"/>	Confirmed <input type="text"/>
<input type="button" value="Control Set"/>	<input type="button" value="Set"/>	<input type="button" value="Usr Set"/>
	Network Config <input type="checkbox"/> DHCP Enabled	Admin Password
	IP Address <input type="text" value="10.10.10.10"/>	<input type="checkbox"/> Adm Enabled
	Subnet Mask <input type="text" value="255.255.255.0"/>	Password <input type="text"/>
	Default Gateway <input type="text" value="0.0.0.0"/>	Confirmed <input type="text"/>
	DNS Server <input type="text" value="0.0.0.0"/>	<input type="button" value="Adm Set"/>
	<input type="button" value="Net Set"/>	
	<input type="button" value="Tools Exit"/>	

CATEGORY	ITEM	INPUT-LENGTH
Crestron Control	IP Address	15
	IP ID	3
	Port	5
Projector	Projector Name	10
	Location	10
	Assigned To	10
Network Configuration	DHCP (Enabled)	(N/A)
	IP Address	15
	Subnet Mask	15
	Default Gateway	15
	DNS Server	15
User Password	Enabled	(N/A)
	New Password	10
	Confirm	10
Admin Password	Enabled	(N/A)
	New Password	10
	Confirm	10

For more information, please visit <http://www.crestron.com>.

Preparing Email Alerts

1. Make sure that user can access the homepage of LAN RJ45 function by web browser (for ex-ample, Microsoft Internet Explorer v6.01/v8.0).
2. From the Homepage of LAN/RJ45, click **Alert Mail Settings**.

The screenshot shows the Vivitek web interface. On the left, there is a navigation menu with three items: "Projector Info", "Alert Mail Settings" (which is circled in red), and "Crestron". The main content area displays a table of system and LAN status information.

Model Name	
System	
System Status	Power On
Display Source	No Source
Lamp Hours	2
Display Mode	Presentation
Error Status	No Error
LAN Status	
IP address	10.10.10.10
Subnet mask	255.255.0.0
Default gateway	0.0.0.0
DNS Server	0.0.0.0
MAC address	
Version	
LAN Version	
F/W Version	

3. By default, these input boxes in **Alert Mail Settings** are blank.

The screenshot shows the "Send E-Mail" configuration page in the Vivitek web interface. The left navigation menu has "Alert Mail Settings" selected. The main content area contains the following configuration options:

SMTP Server: [Input Field] **Port:** 25

User Name: [Input Field]

Password: [Input Field]

[Mail Server Apply]

From: [Input Field]

To: [Input Field]

CC: [Input Field]

[Mail Address Apply]

E-mail Alert Options:

Fan lock : **Over_Heat:**

Case Open: **Lamp Fail:**

Lamp Hours Over: **Filter Hours Over:**

Weekly Report:

[Alert Option Apply]

[Send Test Mail]

4. For Sending alert mail, input the following:

The **SMTP** field is the mail server for sending out email (SMTP protocol). This is a required field.

The **To** field is the recipient's email address (for example, the projector administrator). This is a required field.

The **Cc** field sends a carbon copy of the alert to the specified email address. This is an optional field (for example, the projector administrator's assistant).

The **From** field is the sender's email address (for example, the projector administrator). This is a required field.

Select the alert conditions by checking the desired boxes.

The screenshot shows the 'Send E-Mail' configuration interface. On the left, a sidebar contains 'Projector Info', 'Alert Mail Settings', and 'Crestron'. The main area is titled 'Send E-Mail' and includes the instruction: 'Enter the appropriate settings in the fields below: (Your SMTP server may not require a user name or password.)'. The form fields are as follows:

- SMTP Server:** mail.corp.com
- Port:** 25
- User Name:** Sender.US
- Password:** *****
- From:** send@mail.corp.com
- To:** rcvr1@mail.corp.com
- CC:** rcvr2@mail.corp.com

E-mail Alert Options:

Fan lock :	<input checked="" type="checkbox"/>	Over_Heat:	<input checked="" type="checkbox"/>
Case Open:	<input checked="" type="checkbox"/>	Lamp Fail:	<input checked="" type="checkbox"/>
Lamp Hours Over:	<input checked="" type="checkbox"/>	Filter Hours Over:	<input checked="" type="checkbox"/>
Weekly Report:	<input type="checkbox"/>		

Buttons: Mail Server Apply, Mail Address Apply, Alert Option Apply, Send Test Mail.

Note: Fill in all fields as specified. User can click **Send Test Mail** to test what setting is correct. For successful sending an e-mail alert, you must select alert conditions and enter a correct e-mail address.

RS232 by Telnet Function

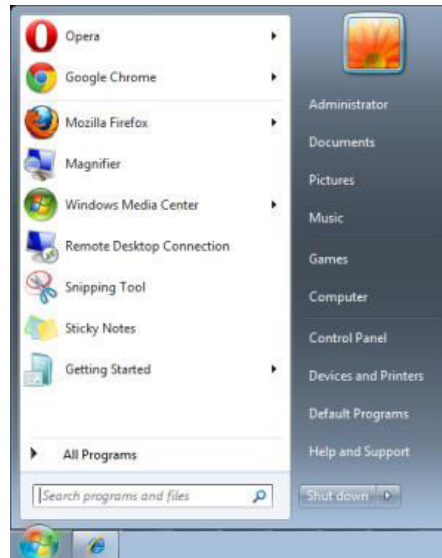
Besides projector connected to RS232 interface with “Hyper-Terminal” communication by dedicated RS232 command control, there is alternative RS232 command control way, so called “RS232 by TELNET” for LAN/RJ45 interface.

Quick Start-Guide for “RS232 by TELNET”

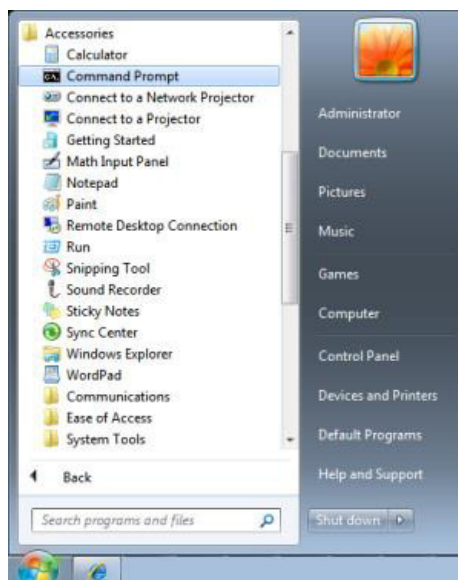
Check and get the IP-Address on OSD of the projector.

Make sure that laptop/PC can access the web-page of the projector.

Make sure that “Windows Firewall” setting to be disabled in case of “TELNET” function filtering out by laptop/PC.



Start => All Programs => Accessories => Command Prompt



Input the command format like the below:

telnet tt.ttt.xxx.yyy.zzz 23 (“Enter” key pressed)

(**tt.ttt.xxx.yyy.zzz**: IP-Address of the projector)

If Telnet-Connection ready, and user can have RS232 command input, then “Enter” key pressed, the RS232 command will be workable.

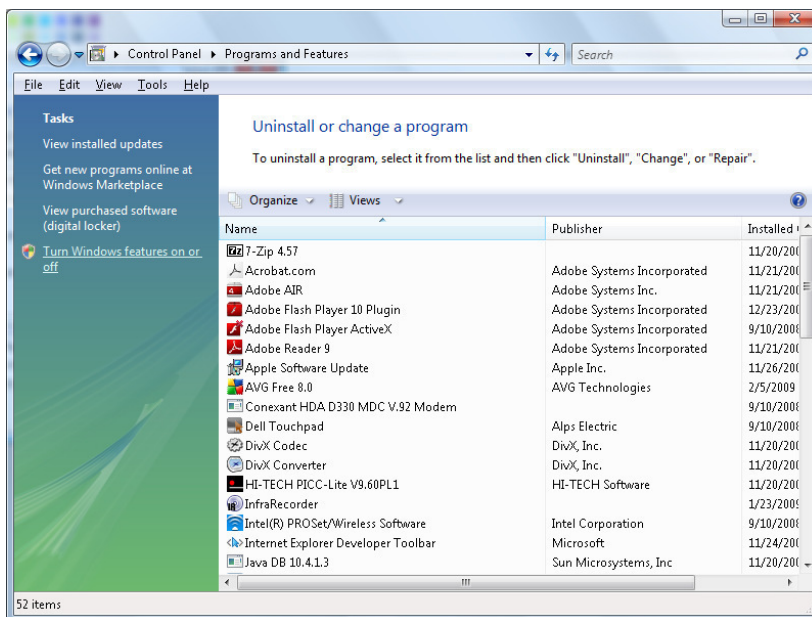
How to have TELNET enabled in Windows 7 / 8 / 10

By default installation for Windows, “TELNET” function is not included. But end-user can have it by way of “Turn Windows features On or Off” to be enabled.

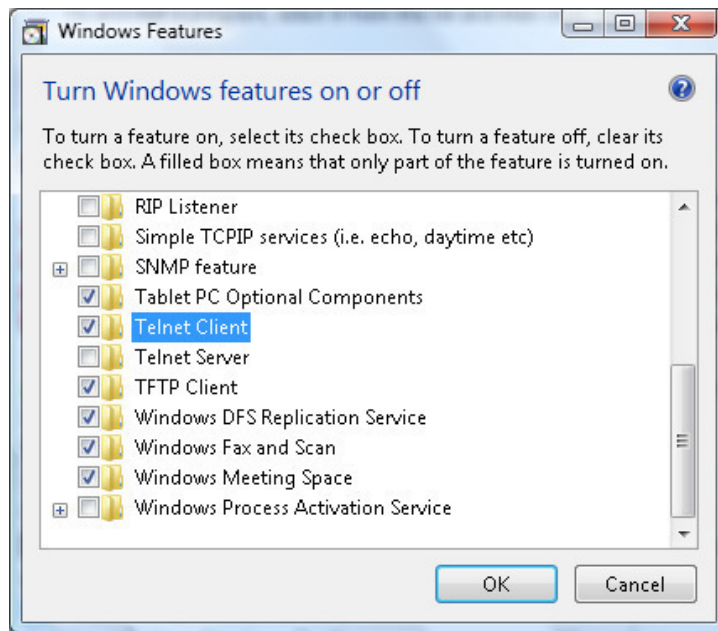
Open “Control Panel” in Windows



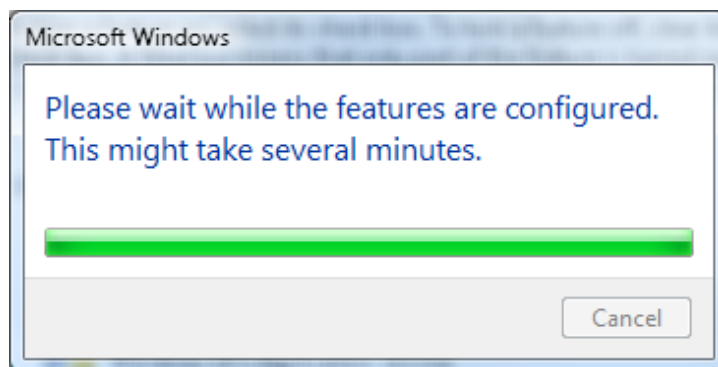
Open “Programs”



Select “Turn Windows features on or off” to open



Have “Telnet Client” option checked, then press “OK” button.



Specsheet for “RS232 by TELNET” :

1. Telnet: TCP
2. Telnet port: 23
(for more detail, kindly please get contact with the service agent or team)
3. Telnet utility: Windows “TELNET.exe” (console mode)
4. Disconnection for RS232-by-Telnet control normally: Close Windows Telnet utility directly after TELNET connection ready
5. Limitation 1 for Telnet-Control: there is less than 50 bytes for successive network payload for Telnet-Control application.
Limitation 2 for Telnet-Control: there is less than 26 bytes for one complete RS232 command for Telnet-Control.
Limitation 3 for Telnet-Control: Minimum delay for next RS232 command must be more than 200 (ms).
(* , In Windows built-in “TELNET.exe” utility, “Enter” key pressed will have “Carriage-Return” and “New-Line” code.)