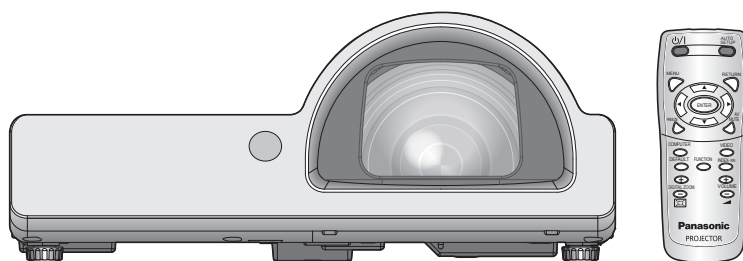


Panasonic®

Operating Instructions Network Operation Manual

LCD Projector

Model No. **PT-ST10E**
PT-ST10EA
PT-ST10U



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Note

The illustrations and screenshots in this manual may be different from those on your computer.

Request Regarding Security

When using this product, security breaches of the type described below are conceivable.

- Leakage of your private information via this product
- Illegal operation of this product by a malicious third-party
- Harm to or cessation of operation of this product by a malicious third-party

Be sure to implement sufficient security measures.

- Set passwords, and limit the users that are permitted login access.
- Make sure the password is as hard to guess as possible.
- Change the password periodically.
- Panasonic Corporation and its affiliated companies never directly ask customers for their password.
Do not give out your password even if directly asked by a third-party representing themselves as Panasonic Corporation.
- Always use on a network that has safety protection such as a firewall implemented.

What you can do

<WEB control> (See page 9)

The following operations are possible when using WebBrowser.

- Setting and adjusting the projector
- Displaying the projector status
- Setting for message transmission

<PJLink> (See page 17)

Compatible with PJLink Class 1. The following operations can be performed from a computer when PJLink protocol is used.

- Setting the projector
- Querying the projector status

<Command control> (Refer to “SERIAL TERMINAL” in “Technical Information” of the Basic Manual.)

You can control the projector from a computer, using the control commands of the serial terminals.

Note

If you use “WEB control”, “PJLink” or “Command control”, turn [ON] the [NETWORK CONTROL] in the NETWORK menu for the projector. (See page 7)

Check your computer

Necessary environment for computers to be connected

- First, check your computer to see whether or not it has a wired LAN* function.
※ LAN : “Glossary” (See page 18)
- Before connecting the computer to the projector, be sure to check the following settings.

Check 1 For LAN cable

- Is the cable properly connected?
- Use LAN cable that is compatible with category 5 or above.

Check 2 Wired LAN settings

<Computer with a built-in wired LAN function>

- Is your wired LAN switched on?

<Computer without a built-in wired LAN function>

- Is your wired LAN adapter properly recognized?
- Is your wired LAN adapter switched on?
- Install the wired LAN adapter driver beforehand.

For details on how to install the driver, refer to the instructions accompanying the wired LAN adapter.

Check 3 For WebBrowser

- WebBrowser is necessary to use WEB control.
- Compatible WebBrowser : Internet Explorer 6.0/7.0/8.0

Note

Do not touch the LAN terminal or the metal part of the LAN cable, the static electricity may discharge from our hand (body) causing a malfunction.

Connecting with Wired LAN

Connection can be made with wired LAN. However, confirm to your system administrator on network settings before changing any settings.

1 Turn on the computer.

2 Make the network setting according to your system administrator.

If the projector settings are the default settings (See page 6), the computer can be used with the following network settings.

IP ADDRESS	192.168.10.101
SUBNETMASK	255.255.255.0
DEFAULT GATEWAY	192.168.10.1

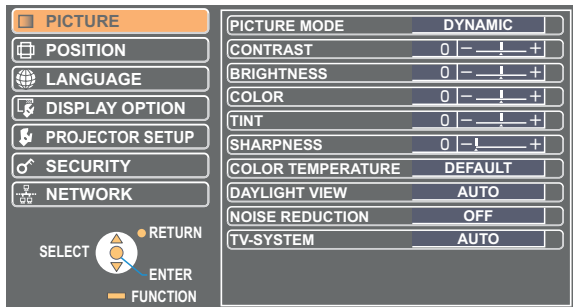
Network setting of the projector

When making a connection between a computer and a projector with settings other than the default settings, perform the procedure below to display the menu required when changing the initial settings.

Displaying the NETWORK menu

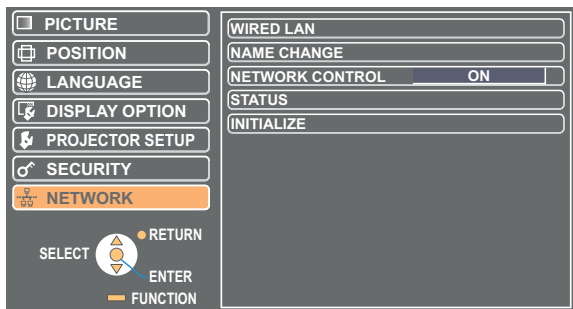
1 Press the [MENU] button on the projector.

The main menu appears.



2 Select [NETWORK] with the [▲ ▼] buttons.

The network menu appears.



3 Press the [ENTER] button

You can select the sub-menu item.

Note

Depending on the signals which are input to the projector, it may not be possible to adjust some of the items and use some of the functions. In the case of an item that cannot be adjusted or a function that cannot be used, the corresponding on-screen item will not be displayed, and you will not be able to execute it even when you press the [ENTER] button.

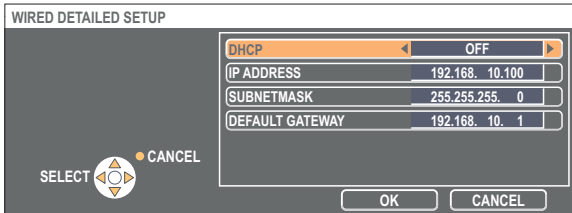
Network setting of the projector (cont.)

NETWORK

Wired LAN settings

You can make detailed wired LAN settings.

1 Select [WIRED LAN] in the NETWORK menu and press the [ENTER] button.



DHCP*

ON: If a DHCP server exists in the network to which the projector is connected, the IP address will automatically be acquired.

OFF: If a DHCP server does not exist in the network to which the projector is connected, additionally set [IP ADDRESS*], [SUBNETMASK*] and [DEFAULT GATEWAY*].

※ "Glossary" (See page 18)

2 Select each item with the [▲ ▼] buttons and change the settings following the menu's Operating guidance.

3 Select [OK] with the [▲ ▼] buttons and press the [ENTER] button.

Default network settings

The following settings are set before the projector leaves the factory.

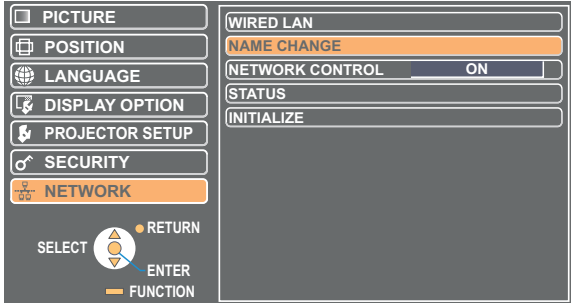
DHCP	OFF
IP ADDRESS	192.168.10.100
SUBNETMASK	255.255.255.0
DEFAULT GATEWAY	192.168.10.1

Network setting of the projector (cont.)

NAME CHANGE

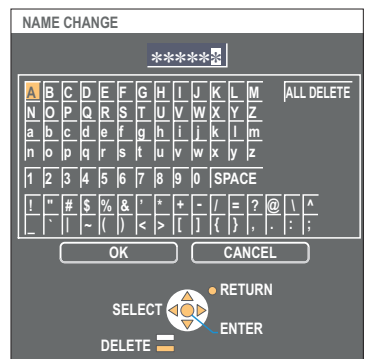
You can change the projector name on the network.

- 1 Select [NAME CHANGE] in the NETWORK menu and press the [ENTER] button.



- 2 Select characters with the [◀▶▲▼] buttons and press the [ENTER] button to enter the projector name.

Select [ALL DELETE] to remove all the entered characters. Press the [DEFAULT] button on the remote-controller to clear a letter which is selected by the cursor in the entry box.



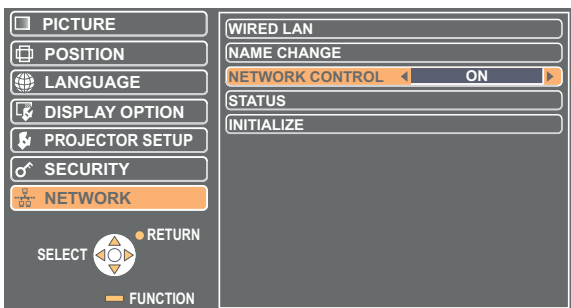
- 3 Select [OK] with the [◀▶▲▼] buttons and press the [ENTER] button.

Select [CANCEL] to undo the changes.

NETWORK CONTROL

Set it to "ON", if you want to control the projector from a computer that is network-connected.

- 1 Select [NETWORK CONTROL] in the NETWORK menu.



- 2 Select [ON] or [OFF] with the [◀▶] buttons.

Note

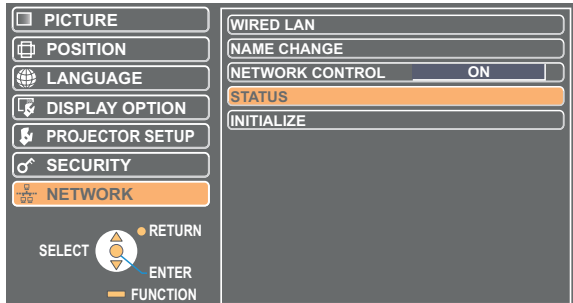
If you turn [ON] the [NETWORK CONTROL], "WEB control", "PJLink" and "Command control" are available.

Network setting of the projector (cont.)

STATUS

Your current settings appear.

Select **[STATUS]** in the **NETWORK** menu and press the **[ENTER]** button.



The status of the following will appear.

NETWORK

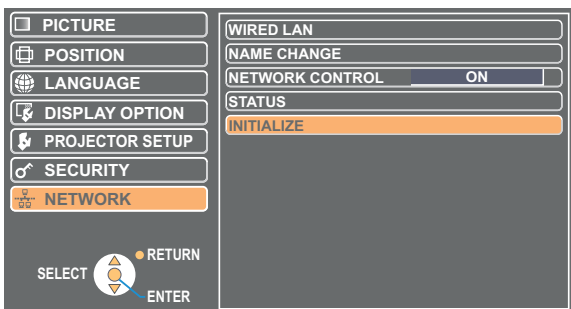
DHCP	“ON” - “OFF”
IP ADDRESS	(See page 6)
SUBNETMASK	(See page 6)
DEFAULT GATEWAY	(See page 6)
MAC ADDRESS*	—

* MAC ADDRESS : “Glossary” (See page 18)

INITIALIZE

You can reset the network settings to the factory default settings of the projector.

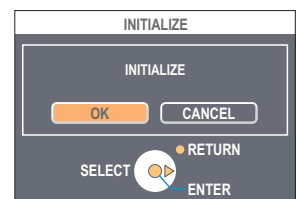
1 Select **[INITIALIZE]** in the **NETWORK** menu and press the **[ENTER]** button.



Note

The entry of the password is prompted if **[PASSWORD]** is turned **[ON]** in the “**SECURITY**” menu.

2 Select **[OK]** with the **[◀▶]** buttons and press the **[ENTER]** button.



Using WebBrowser

Control a projector through the WebBrowser of a computer. It is called “WEB Control”.
(The example is when using Microsoft Internet Explorer.)

Before using the WEB control

Connect the projector and a computer with a LAN cable. (See page 4)

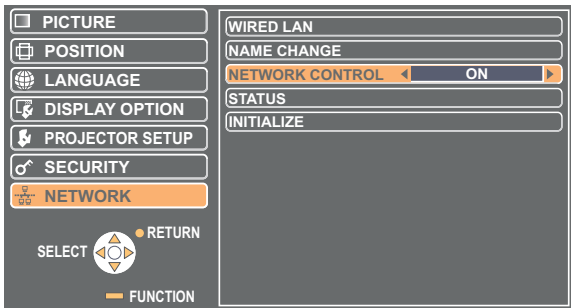
① Projector settings

Turn [ON] the [NETWORK CONTROL] in the NETWORK menu.

1 Select [NETWORK CONTROL] in the NETWORK menu.

2 Select [ON] with the [◀▶] buttons.

ON : This enables control on the WebBrowser.
OFF : This disables control on the WebBrowser.



② Computer settings

■ Proxy server settings

Release the proxy settings of the WebBrowser used.

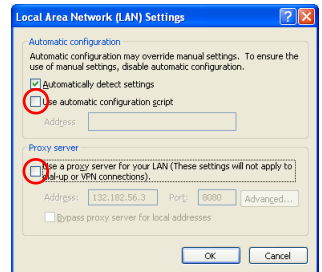
1 Open <Internet Properties> window.

Click [Start] → [Control Panel] → [Network and Internet Connections] → [Internet Option].

2 Click [Connections] tab → [LAN Settings].

3 If [Use a proxy server for your LAN] has been checked, remove the check.
If [Use automatic configuration script] has been checked, remove the check.

4 Click [OK].



Using WebBrowser (cont.)

■ Enabling JavaScript

If JavaScript has been set to disable, enable it.

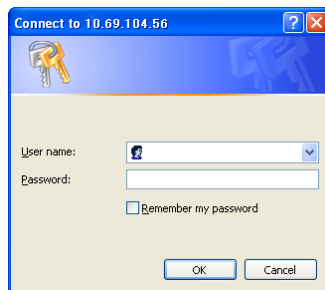
- 1 Open <Internet Properties> window.**
Click [Start] → [Control Panel] → [Network and Internet Connections] → [Internet Option].
- 2 Click the [Security] tab and set the security level to [Default Level], or select [Custom Level] and check the [Enable] checkbox under [Active scripting].**

Accessing from the WebBrowser

- 1 Start up the WebBrowser, and enter the IP address set to the projector.**
The WebBrowser starts up and the authentication window appears.



<Top window>



- 2 Enter the User name and the Password.**
- 3 Click [OK].**
<Monitor information> window appears. (11 page)

Note

- The default user name and password settings are as follows:
User name: user1 (with user authority) / admin1 (administrator authority)
Password: panasonic (lower case)
- Administrator authority has full access to the all features. User authority has access to “Status”, “Projector control” and “Change password”. (User authority has no access to “Detailed set up”.)
- Password used in this page is for accessing the web control window. (See page 16)
- The system locks for several minutes if an incorrect password is entered three times in succession.
- If you initialize the network settings, the password is reset to “panasonic”. Change the password to an appropriate one.
- Make sure the password is as hard to guess as possible.
- Change the password periodically.
- If you have forgotten the password, perform [INITIALIZE] in the projector’s NETWORK menu (See page 8), and set a new one in the “Change password” window of your WebBrowser. (See page 16)
- Panasonic Corporation and its affiliated companies never directly ask customers for their password.
Do not give out your password even if directly asked by a third-party representing themselves as Panasonic Corporation.
- The Top window may not appear depending on the WebBrowser. In this case start up WebBrowser again, or press the [Ctrl] + [R] keys for example to update the screen.
- Connection cannot be made while the WebBrowser is set to dial-up network. Cancel the dial-up network setting.
- It may take some moments for WebBrowser to start up.

Using WebBrowser (cont.)

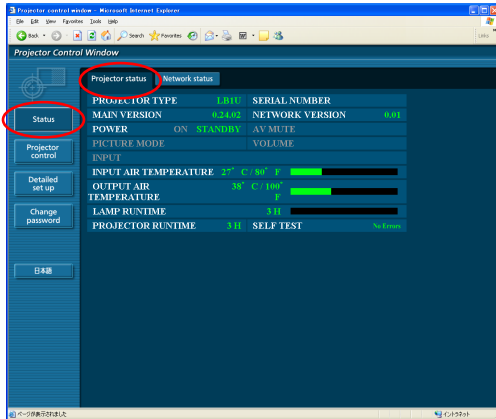
Monitor information window

This page indicates the projector status.

To access this page from other pages, click [Status] in the main menu (at the left of the window).

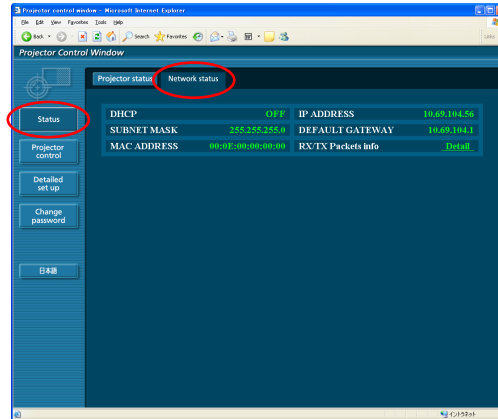
Projector status

On this window, click the [Projector status] tab.



Network status

On this window, click the [Network status] tab.

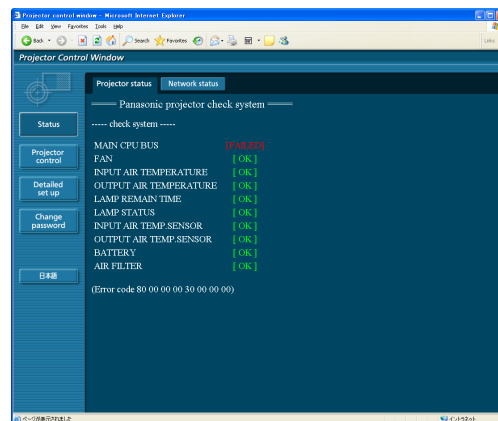


Note

The monitor information is refreshed at fixed intervals, but the current exact information can be checked by clicking [View] → [Refresh].

If [SELF TEST Error (Detail)] appears on the Monitor information window, click it to view the error details.

SELF TEST Error (Detail)



If [FAILED] appears

Item	Description
MAIN CPU BUS	There is a problem with a microcontroller circuit. Contact your dealer.
FAN	There is a problem with the fan or fan drive circuit. Contact your dealer.
INPUT AIR TEMPERATURE	Input air temperature is high. The projector is likely being used in a high temperature environment such as near heating equipment.
OUTPUT AIR TEMPERATURE	Temperature surrounding the lamp is high. The exhaust vent is likely blocked.
LAMP REMAIN TIME	The lamp has been used for longer than its rated useful life, and it is time to replace it.
LAMP STATUS	The lamp could not be lit. Allow the bulb of the light source to cool, and then turn on the projector.
INPUT AIR TEMP.SENSOR	There is a problem with the air intake temperature sensor. Contact your dealer.
OUTPUT AIR TEMP.SENSOR	There is a problem with the exhaust temperature sensor. Contact your dealer.
BATTERY	The battery must be replaced. Contact your dealer.
AIR FILTER	The remaining filter gets low. For further detail, see the Basic Manual.

Using WebBrowser (cont.)

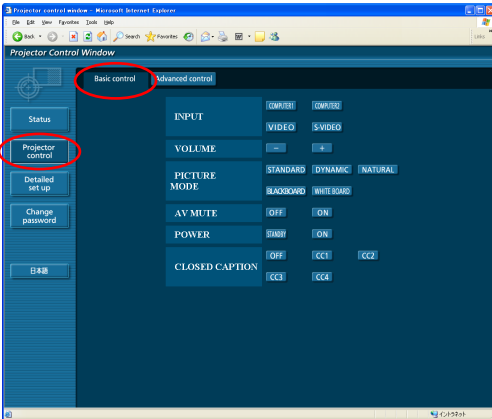
Projector control window

You can make various projector settings.

If you migrate from other page, click [Projector control] in the main menu (at the left of the window).

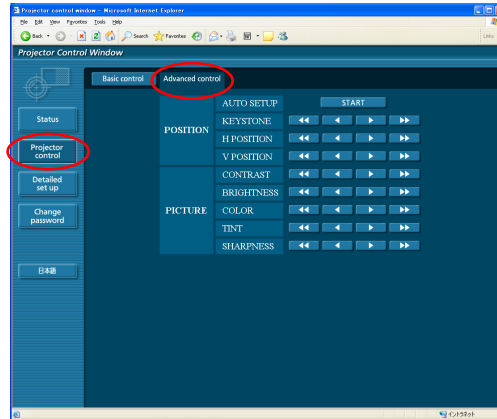
Basic control window

On this window, click the [Basic control] tab.



Advanced control window

On this window, click the [Advanced control] tab.



Note

Connection with the projector may not be possible immediately after the power is turned on. In this case wait a bit and then make the connection again.

Detailed set up window

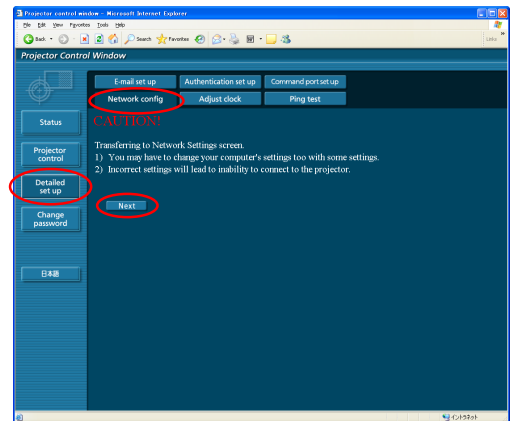
Network config

You can make detailed wired LAN settings.

- 1 Click [Detailed set up] → [Network config] in the menu.
- 2 Confirm the notes that appear on the screen and click [Next].

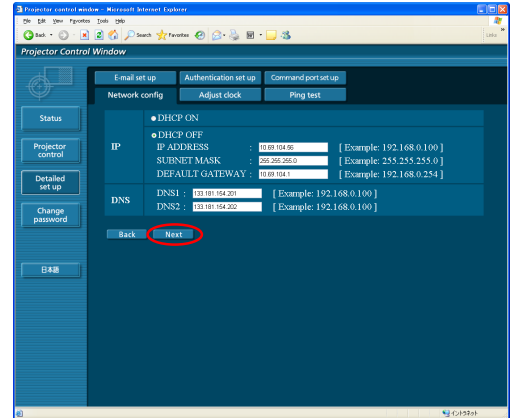
The settings window appears, showing the current settings.

- To change the LAN settings, click [Change].
- To return to the previous window, click [Back].

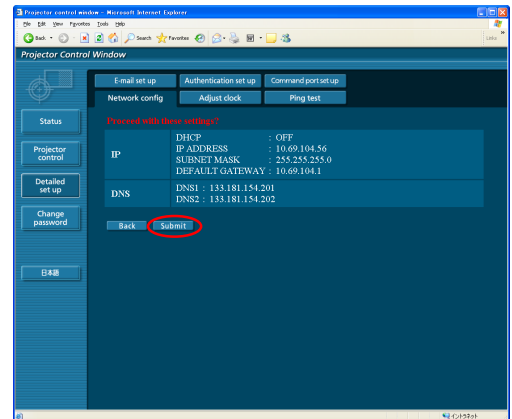


Using WebBrowser (cont.)

- 3 Complete the detailed settings and click [Next].**
When [Next] is clicked, the next page appears, enabling you to complete the detailed settings as desired.
After all required items have been entered, a confirmation window appears.



- 4 Click [Submit].**
The settings will be registered.

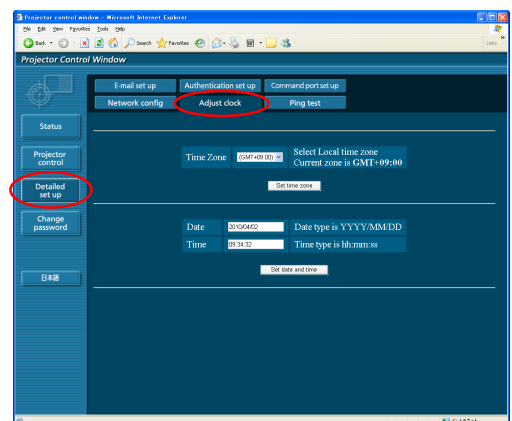


Note

If you have changed the LAN settings that are currently in use, the connection may break off.

Adjust clock

- Click [Detailed set up] → [Adjust clock] in the menu.
- Time zone : Select the time zone and click [Set time zone].
- Time : Enter the current date and time in [Date] and [Time], and then click [Set date and time].



Using WebBrowser (cont.)

E-mail set up

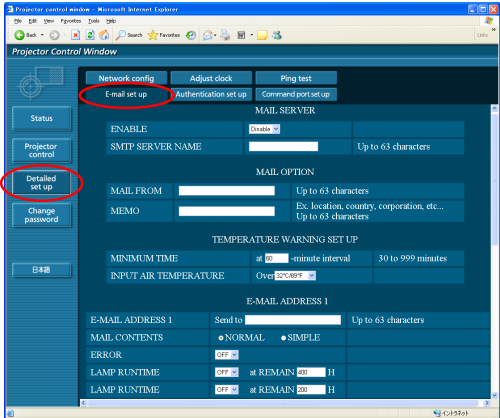
You can specify two email recipients.
Click [Detailed set up] → [E-mail set up] in the menu.

- [MAIL SERVER]
 - ENABLE : Enable or disable email transmission.
 - SMTP SERVER NAME : Enter the SMTP server name.
- [MAIL OPTION]
 - MAIL FROM : Enter the sender's email address.
 - MEMO : Enter a description of the sender.
- [TEMPERATURE WARNING SET UP]
 - MINIMUM TIME : Enter the interval for sending email.
 - INPUT AIR TEMPERATURE : Select the temperature of the intake sensor at which to send a warning message.
- [E-MAIL ADDRESS]
 - E-MAIL ADDRESS : Enter the email addresses of the recipients.
 - MAIL CONTENTS : Change the type of message as desired. When sending messages to mobile phones, select "SIMPLE".
 - ERROR : Select ON to send email when errors occur.
 - LAMP RUNTIME : Select ON to send email when "at REMAIN" is reached.
 - INPUT AIR TEMPERATURE : Select ON to send email when the temperature set in [TEMPERATURE WARNING SET UP] is exceeded.
 - PERIODIC REPORT : Send a message with the projector status at the selected date and time.

When [submit] is clicked, the settings are applied.

Note

Consult your system administrator on MAIL SERVER and E-MAIL ADDRESS settings.



Ping test

You can confirm if a network connection is established with Mail server, POP server, DNS server or the like.

Click [Detailed set up] → [Ping test] in the menu.

Input IP address : Enter the IP address of the server you want to test, and then click [Submit].

If succeeded in connection, the following display appears.

```

PING 198.245.80.10 (198.245.80.10): 56 data bytes
64 bytes from 198.245.80.10: icmp_seq=0 ttl=255 time=0.7 ms
64 bytes from 198.245.80.10: icmp_seq=1 ttl=255 time=0.4 ms
64 bytes from 198.245.80.10: icmp_seq=2 ttl=255 time=0.4 ms
64 bytes from 198.245.80.10: icmp_seq=3 ttl=255 time=0.4 ms

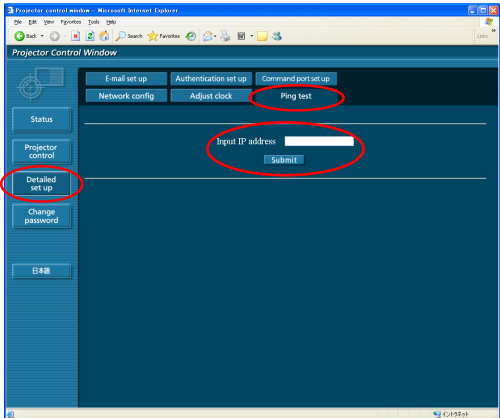
--- 198.245.80.10 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.4/0.4/0.7 ms
  
```

If failed in connection, the following display appears.

```

PING 198.245.80.100 (198.245.80.100): 56 data bytes

--- 198.245.80.100 ping statistics ---
4 packets transmitted, 0 packets received, 100% packet loss
  
```



Using WebBrowser (cont.)

※ Example of email message sent

■ If [NORMAL] is selected under [MAIL CONTENTS]

① If you have completed the email settings

```

=== Panasonic projector report (CONFIGURE) ===
Projector Type      : ST10
Serial No          : D234567AB

----- E-mail setup data -----
TEMPERATURE WARNING SETUP
MINIMUM TIME      at [ 60] minutes interval
INPUT AIR TEMPERATURE Over [ 38C / 100F ]

ERROR             [ ON ]
LAMP RUNTIME     [ ON ] at REMAIN [ 400] H
LAMP RUNTIME     [ ON ] at REMAIN [ 200] H
INPUT AIR TEMPERATURE [ ON ]
PERIODIC REPORT
Sunday [ ON ] Monday [ ON ] Tuesday [ ON ] Wednesday [ ON ]
Thursday [ ON ] Friday [ ON ] Saturday [ ON ]

00:00 [ ON ] 01:00 [ ON ] 02:00 [ ON ] 03:00 [ ON ]
04:00 [ ON ] 05:00 [ ON ] 06:00 [ ON ] 07:00 [ ON ]
08:00 [ ON ] 09:00 [ ON ] 10:00 [ ON ] 11:00 [ ON ]
12:00 [ ON ] 13:00 [ ON ] 14:00 [ ON ] 15:00 [ ON ]
16:00 [ ON ] 17:00 [ ON ] 18:00 [ ON ] 19:00 [ ON ]
20:00 [ ON ] 21:00 [ ON ] 22:00 [ ON ] 23:00 [ ON ]

----- check system -----
MAIN CPU BUS      [ OK ]
FAN               [ OK ]
INPUT AIR TEMPERATURE [ OK ]
OUTPUT AIR TEMPERATURE [ OK ]
LAMP REMAIN TIME [ OK ]
LAMP STATUS       [ OK ]
INPUT AIR TEMP. SENSOR [ OK ]
OUTPUT AIR TEMP. SENSOR [ OK ]
BATTERY           [ OK ]
AIR FILTER        [ OK ]
(Error code 00 00 00 00 00 00)

Input air temperature : 24 degC / 75 degF
Output air temperature : 26 degC / 78 degF
SET RUNTIME          79 H
LAMP ON              190 times
LAMP HIGH            0 H
LAMP REMAIN          2921 H

----- Current status -----
MAIN VERSION        0.22
NETWORK VERSION     0.01.00
LAMP STATUS         LAMP-OFF
INPUT SIGNAL        0.00kHz / 0.00Hz

----- Wired Network configuration -----
DHCP Client OFF
IP address 10.69.104.56
MAC address 00:0B:97:41:E3:16

Wed Mar 31 00:53:42 2010

----- Memo -----
st10
    
```

② If an error occurs

```

=== Panasonic projector report (ERROR) ===
Projector Type      : ST10
Serial No          : D234567AB

----- check system -----
MAIN CPU BUS      [ FAILED ]
FAN               [ OK ]
INPUT AIR TEMPERATURE [ OK ]
OUTPUT AIR TEMPERATURE [ OK ]
LAMP REMAIN TIME [ OK ]
LAMP STATUS       [ OK ]
INPUT AIR TEMP. SENSOR [ OK ]
OUTPUT AIR TEMP. SENSOR [ OK ]
BATTERY           [ OK ]
AIR FILTER        [ OK ]
(Error code 80 00 00 00 10 00 00)

Input air temperature : 24 degC / 75 degF
Output air temperature : 26 degC / 78 degF
SET RUNTIME          79 H
LAMP ON              190 times
LAMP HIGH            0 H
LAMP REMAIN          2921 H

----- Current status -----
MAIN VERSION        0.22
NETWORK VERSION     0.01.00
LAMP STATUS         LAMP-OFF
INPUT SIGNAL        0.00kHz / 0.00Hz

----- Wired Network configuration -----
DHCP Client OFF
IP address 10.69.104.56
MAC address 00:0B:97:41:E3:16

Wed Mar 31 01:28:46 2010

----- Memo -----
st10
    
```

■ If [SIMPLE] is selected under [MAIL CONTENTS]

③ If you have completed the email settings

```

Projector Type:
[ST10]
Serial No:
[]

--- E-mail setup data
-TEMP. WARNING SETUP
MINIMUM TIME :
at [ 60] minutes interval
INPUT AIR TEMP. :
Over [ 38C / 100F ]
-
ERROR [ ON ]
LAMP REMAIN [1000H]
LAMP REMAIN [ 999H]
INPUT TEMP. [ ON ]
-PERIODIC REPORT
Sun[ON] Mon[ON]
Tue[ON] Wed[ON]
Thu[ON] Fri[ON]
Sat[ON]
00:00[ON] 01:00[ON]
02:00[ON] 03:00[ON]
04:00[ON] 05:00[ON]
06:00[ON] 07:00[ON]
08:00[ON] 09:00[ON]
10:00[ON] 11:00[ON]
12:00[ON] 13:00[ON]
14:00[ON] 15:00[ON]
16:00[ON] 17:00[ON]
18:00[ON] 19:00[ON]
20:00[ON] 21:00[ON]
22:00[ON] 23:00[ON]

--- check system
FAN [ OK ]
LAMP [ OK ]
TEMP. [ OK ]
FILTER [ OK ]
OTHER [ OK ]
Error code :
00 00 00 00
00 00 00 00

--- Temperature
Input air:
24 C / 75 F
Output air:
26 C / 78 F

--- Lamp remain
LAMP 2921 H

----- Memo -----
st10
    
```

④ If an error occurs

```

Projector Type:
[ST10]
Serial No:
[]

--- check system
FAN [ OK ]
LAMP [ OK ]
TEMP. [ OK ]
FILTER [ OK ]
OTHER [ FAILED ]
Error code :
80 00 00 00
10 00 00 00

--- Temperature
Input air:
24 C / 75 F
Output air:
26 C / 78 F

--- Lamp remain
LAMP 2921 H

----- Memo -----
st10
    
```

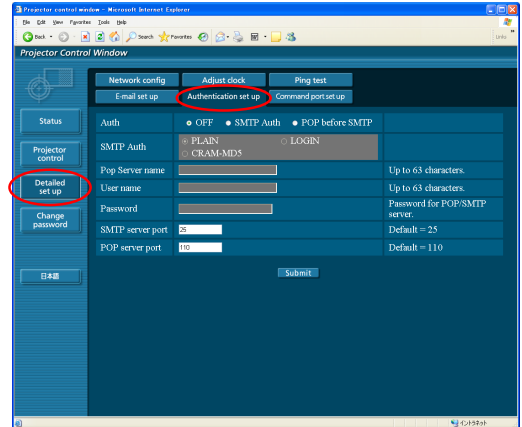
Using WebBrowser (cont.)

Authentication set up

Click [Detailed set up] → [Authentication set up] in the menu.

- Auth : Change the authentication method as desired.
- SMTP Auth : For SMTP authentication, change the authentication method to use, as desired.
- Pop Server name : Enter the POP server name.
- User name : Enter the user name for the SMTP or POP server.
- Password : Enter the password for the SMTP or POP server.
- SMTP server port : Enter the SMTP server port number.
- POP server port : Enter the POP server port number.

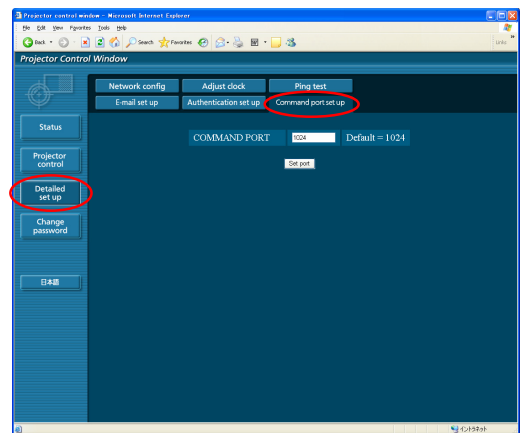
When [submit] is clicked, the settings are applied.



Command port set up

Click [Detailed set up] → [Command port set up] in the menu.

- COMMAND PORT : Specify a port number to be used for command control and click [Set port].



Change password window

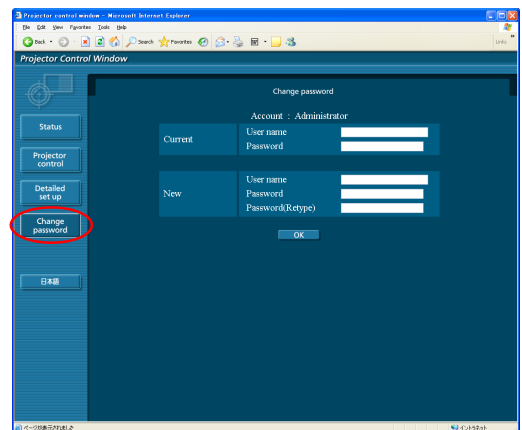
Password settings

Click [Change password] in the main menu.

- Set a password for accessing the web control window.
- Enter the previous password and the new password.
- Enter the new password in [Retype] and click [OK].

Note

- You can enter a password up to 16 characters (upper case/lower case) and symbols.
- When log in as administrator, you can reset the User name and the Password (forced change) that logged in with administrator/user authority.



Switching Languages

Switch the language of the web control window.
Click [English] / [日本語] in the main menu.

Using PJLink protocol

The projector's network functions conform to PJLink Class 1 standards, enabling the following operations from a computer using the PJLink protocol.

- Setting the projector
- Querying the projector status

Note

To use PJLink protocol, turn [ON] the [NETWORK CONTROL] in the NETWORK menu for the projector. (See page 7)

Applicable commands

The following commands are used to control the projector with the PJLink protocol.

Command	Control details	Notes
POWR	Power control	Parameters 0 = Standby 1 = On
POWR ?	Power status query	Parameters 0 = Standby 1 = On 2 = Cooling down 3 = Warming up
INPT	Input switching	Parameters 11 = COMPUTER1 12 = COMPUTER2 21 = VIDEO 22 = S-VIDEO
INPT ?	Input switching query	
AVMT	AV mute control	Parameters 30 = AV mute off 31 = AV mute on
AVMT ?	AV mute status query	
ERST ?	Error status query	Parameters 1st byte : Indicates fan errors; a number from 0 to 2 2nd byte : Indicates lamp errors; a number from 0 to 2 3rd byte : Indicates temperature errors; a number from 0 to 2 4th byte : Fixed at 0 5th byte : Fixed at 0 6th byte : Indicates other errors; a number from 0 to 2 Numbers from 0 to 2 indicate the following 0 = No error detected 1 = Warning 2 = Error
LAMP ?	Lamp status query	Parameters 1st number (1–5 digits) : Cumulative hours of lamp use 2nd number : 0 = lamp off ; 1 = lamp lit
INST ?	Input switching list query	The following values are returned in this parameter "11 12 21 22"
NAME ?	Projector name query	Returns the name set in "HOSTNAME*" in "NETWORK" * The "HOSTNAME" is the projector name set in the projector itself.
INF1 ?	Manufacturer name query	Returns "Panasonic"
INF2 ?	Model name query	Answers the name of the projector in use.
INFO ?	Query for other information	Returns the version number or similar identification
CLSS ?	Class information query	Returns "1"

PJLink security authentication

The password used for PJLink is same as the one you set in the WEB control.

Configure this without specifying the password for the WEB control, if you use it without authentication.

For details on PJLink specifications, refer to the Japan Business Machine and Information System Industries Association website.

The URL is <http://pjlink.jbmia.or.jp/english/>

Glossary

Item	Descriptions	Page
LAN	Abbreviation for Local Area Network. This is a network with a relatively narrow range such as inside a company.	4
DHCP	Abbreviation for Dynamic Host Configuration Protocol. This function automatically assigns IP addresses to the connected equipment. If a device with the DHCP server function is present within a LAN, it automatically assigns IP addresses to the connected equipment.	6
IP address	Internet Protocol (IP) is a protocol for distributing data, and the address corresponding to the data distribution destination is called the IP address. The same IP address cannot be used within the same LAN.	6
Subnetmask	This limits the range of the IP addresses assigned to computers in order to divide the network into a number of sections during TCP/IP connection. The value used to divide the network at this time is called the subnetmask.	6
Default Gateway	The devices that are used for different network standards from yours. Default Gateway enables a connection with other network, by adjusting bilateral differences such as communication protocols. If no gateway is specified for the IP address of access destination, data will be sent to the host set as the default gateway.	6
MAC address	Each network adapter has its own ID No. A discrete ID No. is assigned to each and every network adapter around the world. These IDs are used to exchange data between adapters. These IDs are a combination of a discrete number managed and assigned by the IEEE to each individual manufacturer and a unique number assigned to each individual adapter by the manufacturer.	8

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