

LAN Control Protocol

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1. Control commands via LAN

To execute control command communications via LAN, please check the IP address and port number of the target display in advance. Note that connection to the target display is carried out with TCP, with IP address and port specified.

IP address can be verified from the LAN Setup menu or Network Status menu, on the Network Configuration menu. Port number can also be verified from the LAN Setup menu on the Network Configuration menu. The initial port number setting is 1024.

- IP address: [Initial settings]→[Network settings]→[LAN settings] or [Network Status]
- Port number: [Initial settings]→[Network settings]→[LAN settings]

The content of communications differs depending on whether the LAN control protocol on the Options menu is set as "Protocol 1" or "Protocol 2".

Protocol 1

Communications are carried out with a protocol exclusive to Panasonic displays.

This is recommended when controlling a Panasonic plasma display and replacing or adding a Panasonic LCD display.

Protocol 2

Communications are carried out with a protocol shared with Panasonic projectors.

This is recommended for controlling a Panasonic projector and a Panasonic LCD display with the same system.

Select this protocol when controlling or monitoring using applications such as multiple monitoring and control software, symptom monitoring software, or video wall manager.

Below, the mode where the Web Control Administrator-Authorized User Password has been set is called **Protected mode**, and the mode when there is no password set is referred to as **Non-protected mode**.

*For procedures for setting Control Administrator-Authorized User Password, refer to "[Password reset procedure](#)."

2. When LAN control protocol is “Protocol1”

Communications are carried out with a protocol exclusive to Panasonic displays.

2.1. When Web Control Administrator-Authorized password has been set (Protected mode)

● Connection procedure

- 1) Verify the IP address and port number of the display and carry out TCP connection.
- 2) After a successful TCP connection, there is a response from the display.

Table 2-1 Protocol 1(Protected mode) initial response

Data section	Blank	Mode	Blank	Random number section	Terminal symbol
“PDPCONTROL” (ASCII character string)	“ ” 0x20	1 0x31	“ ” 0x20	“zzzzzzz” (ASCII code hexadecimal notation)	(CR) 0x0d
10 bytes	1 byte	1 byte	1 byte	8 bytes	1 byte

Mode: 1 = protected mode

- 3) Using the MD5 algorithm, generate a 32-byte hash value from the following data. The generated hash value will be used in the next command transmission.

“zzzzzzzzyyyyy”

zzzzzzzz : 8-byte random number obtained in step 2S

yyyyy : Web Control Administrator-Authorized User password

*For an Administrator-Authorized User, the default Username is “admin1” and default password is “panasonic.”

● Sending commands

Send commands in the following formats:

Table 2-2 Commands sent in Protocol 1 (Protected mode)

Header	Control symbol	Data section	Control symbol	Terminal symbol
Hash value (Refer to “Connection procedure” above)	(STX) 0x02	Command [Control / Query] (ASCII character string)	(ETX) 0x03	(CR) 0x0d
32byte	1 byte	Unfixed length	1 byte	1 byte

● Command response

Command responses are in the following formats:

Table 2-3 Protocol 1 (Protected mode) response data

Control symbol	Data section	Control symbol	Terminal symbol
(STX) 0x02	Response data (ASCII character string)	(ETX) 0x03	(CR) 0x0d
1 byte	Unfixed length	1 byte	1 byte

● Error response

When errors occur, responses are in the following formats:

Table 2-4 Protocol 1 (Protected mode) Command Error response

Error message (response data)		Terminal symbol
"ERR1"	Undefined control command	(CR)
"ERR2"	Parameter out of range	0x0d
"ERR3"	Busy state or unavailable period	
"ERR4"	Time out or unavailable period	
"ERR5"	Invalid data length	
"PDPCONTROL ERRA"	Mismatching state of a password	
"ER401"	Error occurred on processing command	
4 bytes, 5 bytes or 15 bytes		1 byte

2.2. When Web Control Administrator-Authorized password has not been set (Non-protected mode)

● Connection procedure

- 1) Verify the IP address and port number of the display and carry out TCP connection.
- 2) After a successful TCP connection, there is a response from the display.

Table 2-5 Protocol 1(Non-protected mode) initial response

Data section	Blank	Mode	Terminal symbol
"PDPCONTROL"	" "	0	(CR)
(ASCII character string)	0x20	0x30	0x0d
10 byte	1 byte	1 byte	1 byte

Mode: 0 = Non-protected mode

● Sending commands

Send commands in the following formats:

Table 2-6 Data sent in Protocol 1 (Non-protected mode)

Control symbol	Data section	Control symbol	Terminal symbol
(STX)	command[Control / Query]	(ETX)	(CR)
0x02	(ASCII character string)	0x03	0x0d
1 byte	Unfixed length	1 byte	1 byte

● Command response

Command responses are in the following formats:

Table 2-7 Protocol 1(Non-protected mode) response data

Control symbol	Data section	Control symbol	Terminal symbol
(STX)	Response data	(ETX)	(CR)
0x02	(ASCII character string)	0x03	0x0d
1 byte	Unfixed length	1 byte	1 byte

● Error response

When errors occur, responses are in the following formats:

Table 2-8 Protocol 1(Non-protected mode) Error response

Error message (Response data)		Terminal symbol
"ERR1"	Undefined control command	(CR)
"ERR2"	Parameter out of range	0x0d
"ERR3"	Busy state or unavailable period	
"ERR4"	Time out or unavailable period	
"ERR5"	Invalid data length	
"ER401"	Error occurred on processing command	
4 bytes or 5 bytes		1 byte

3. When LAN control protocol is “Protocol2”

Communications are carried out with the same protocol as a Panasonic projector.

3.1. When Web Control Administrator-Authorized password has been set (Protected mode)

● Connection procedure

- 1) Verify the IP address and port number of the display and carry out TCP connection.
- 2) After a successful TCP connection, there is a response from the display.

Table 3-1 Protocol 2(Protected mode) initial response

Data section	Blank	Mode	Blank	Random number section	Terminal symbol
“NTCONTROL” (ASCII character string)	“ ” 0x20	1 0x31	“ ” 0x20	“ZZZZZZ” (ASCII code hexadecimal notation)	(CR) 0x0d
9 bytes	1 byte	1 byte	1 byte	8 bytes	1 byte

Mode: 1 = Protected mode

- 3) Using the MD5 algorithm, generate a 32-byte hash value from the following data. The generated hash value will be used in the next command transmission.

“xxxxxx:yyyyy:zzzzzzzz”

xxxxxx : Web Control Administrator-Authorized User name (Default username is “admin1”)

yyyyy : Password for the above Administrator-Authorized User

zzzzzzzz: 8-byte random number obtained in step 2

● Sending commands

Send commands in the following formats:

Table 3-2 Commands sent in Protocol 2 (Protected mode)

Header			Data section	Terminal symbol
Hash value (Refer to “Connection procedure” above)	‘0’ 0x30	‘0’ 0x30	Command [Control / Query] (ASCII character string)	(CR) 0x0d
32 byte	1 byte	1 byte	Unfixed length	1 byte

● Command response

Command responses are in the following formats:

Table 3-3 Protocol 2 (Protected mode) response data

Header		Data section	Terminal symbol
‘0’ 0x30	‘0’ 0x30	Response data (ASCII character string)	(CR) 0x0d
1 byte	1 byte	Unfixed length	1 byte

- Error response

When errors occur, responses are in the following formats:

Table 3-4 Protocol 2 (Protected mode) Error response

Error message (response data)		Terminal symbol
"ERR1"	Undefined control command	(CR)
"ERR2"	Parameter out of range	0x0d
"ERR3"	Busy state or unavailable period	
"ERR4"	Time out or unavailable period	
"ERR5"	Invalid data length	
"ERRA"	Mismatching state of a password	
"ER401"	Error occurred on processing command	
4 bytes or 5 bytes		1 byte

3.2. When Web Control Administrator-Authorized password has not beenset (Non-protected mode)

- Connection procedure

- 1) Verify the IP address and port number of the display and carry out TCP connection.
- 2) After a successful TCP connection, there is a response from the display.

Response data

Data section	Blank	Mode	Terminal symbol
"NTCONTROL"	" "	0	(CR)
(ASCII character string)	0x20	0x30	0x0d
9 byte	1 byte	1 byte	1 byte

Mode: 0 = Non-protected mode

- Sending commands

Send commands in the following formats:

Sent data

Header		Data section	Terminal symbol
'0'	'0'	Command [Control / Query]	(CR)
0x30	0x30	(ASCII character string)	0x0d
1 byte	1 byte	Unfixed length	1 byte

- Command response

Command responses are in the following formats:

Received data

Header		Data section	Terminal symbol
'0'	'0'	Command [Control / Query]	(CR)
0x30	0x30	(ASCII character string)	0x0d
1 byte	1 byte	Unfixed length	1 byte

- Error response

When errors occur, responses are in the following formats:

Error response

Error messages (response data)		Terminal symbol
"ERR1"	Undefined control command	(CR)
"ERR2"	Parameter out of range	0x0d
"ERR3"	Busy state or unavailable period	
"ERR4"	Time out or unavailable period	
"ERR5"	Invalid data length	
"ER401"	Error occurred on processing command	
4 bytes or 5 bytes		1 byte

4. Differences in content of communications due to difference in LAN control protocol

4.1. Character strings included in display response with TCP connected

LAN control protocol	Character string included in response	Notes
Protocol 1	PDPCONTROL	Fixed character string (10 characters)
Protocol 2	NTCONTROL	Fixed character string (9 characters)

4.2. Data for determining hash value using MD5 algorithm in Protected mode

xxxxxx : WEB Control Administrator-Authorized Username
 yyyy : Password for the above Administrator-AuthorizedUser
 zzzzzzzz : Random 8-byte number sent from the display when TCP connection is successful

LAN control protocol	Data for determining hash value	Notes
Protocol 1	zzzzzzzzyyyy	Random number linked to password
Protocol 2	xxxxxx:yyyy:zzzzzzzz	User, password, random number linked, separated by colons

4.3. Data for command communications

● Control commands and query commands (sent)

LAN control protocol	Command	Notes
Protocol 1	(STX) Command (ETX)(CR)	Command is between (STX) and (ETX), with (CR) at the end
Protocol 2	00 Command (CR)	00 at beginning, (CR) at the end

● Control command (response): When 3-character control command ABC is sent without parameters

LAN control protocol	Command	Notes
Protocol 1	(STX)ABC(ETX)(CR)	Command is between (STX) and (ETX), with (CR) at the end, meaning response is the same as what was sent
Protocol 2	00ABC(CR)	00 at beginning, (CR) at the end, meaning response is the same as what was sent

- Control command (response): When 3-character control command ABC:XYZ is sent with parameters

LAN control protocol	Command	Notes
Protocol 1	(STX)ABC(ETX)(CR)	Command excluding the three characters after the colon is between (STX) and (ETX), with (CR) at the end
Protocol 2	00ABC(CR)	00 at beginning, followed by command excluding the three characters after the colon, (CR) at the end

- Query command (response): When 3-character query command QXX is sent without parameters

LAN control protocol	Command	Notes
Protocol 1	(STX)QXX:***(ETX)(CR)	Command, with response content after the colon, is between (STX) and (ETX), with (CR) at the end
Protocol 2	00***(CR)	00 at beginning, (CR) at the end, it is not known what the sent command was

- Query command (response): When 3-character control command QXX:XYZ is sent with parameters

LAN control protocol	Command	Notes
Protocol 1	(STX)QXX:XYZ***(ETX)(CR)	Command with response content is between (STX) and (ETX), with (CR) at the end
Protocol 2	00XYZ***(CR)	00 at beginning, followed by command with response content after the colon, (CR) at the end, meaning it is not known what the sent command was

5. Password reset procedure

Refer to the user's manual for the display you are using, and access the web browser control page.

*The terminology used to refer to the page may vary depending on the display used; eg. "web browser control", "web control", etc.

Reset the password on the web browser control page. If you execute the password reset without inputting any characters in the new password input field, you will be in Non-protected Mode without a password.

6. Frequently Asked Questions

Q-1) How do I remove the password?

A-1) Please refer to [Password reset procedure](#).

Q-2) What kinds of commands can be made?

A-2) Access Professional Display Support on the <https://panasonic.net/cns/prodisplays/> site and obtain the RS232C command list for the display you are using.

Q-3) Are there any examples that explain the contents of communications?

A-3) Refer to separate document: (LAN_Command_sequence_exp.pptx)

Q-4) Once connected, does the display stay continuously connected?

A-4) No, once connected, operation varies depending on the model, but none will stay continuously connected. Operation after connection is divided into the following two categories:

A) Once connected, and after receiving a response to a sent command, the display disconnects. Reconnect to TCP if you want to send another command.

[Models] VF1H Series, SF2/SF2H Series, EQ1 Series, SQ1 Series, VF2/VF2H Series
BQ1 Series

B) When 30 seconds elapse without communication, the display disconnects. Reconnect to TCP as needed. It is fine to connect each time you want to send a command and then disconnect (Connect → send command → disconnect, reconnect → send command communication → disconnect).

[Models] All other than those listed in A) above

Q-5) Is it possible to send a single command to all displays on the network at once (i.e. broadcast communication)?

A-5) No, command control is incompatible with broadcasting or multi-casting.