

SONY®

DATA PROJECTOR

VPL-EW130

VPL-SX125

VPL-SX135

VPL-SW125

VPL-CX235

VPL-CX238

VPL-CX275

VPL-CX278

VPL-CW255

VPL-CW258

VPL-CW275

VPL-CW278

PROTOCOL MANUAL
1st Edition (Revised 4)

警告

このマニュアルは、サービス専用です。
お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、
人身事故につながる可能性があります。
危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that
contained in the operating instructions unless you are qualified to do so. Refer all servicing to
qualified service personnel.

WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die
Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei
Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben
Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung
dazu besitzen.

AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin
de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les
réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres.
Pour toute réparation faire appel à une personne compétente uniquement.

Table of Contents

1. Overview

| | |
|------------------------------------|---|
| 1-1. Introduction | 1 |
| 1-2. Glossary of Terms | 1 |
| 1-3. Protocol Stack Structure..... | 1 |

2. Common Commands

| | |
|--|---|
| 2-1. Sub Commands | 3 |
| 2-1-1. ITEM List | 3 |
| 2-1-2. Infrared Remote Command Code..... | 6 |
| 2-2. Reply | 7 |

3. RS-232C

| | |
|--|----|
| 3-1. Connection | 7 |
| 3-2. Communication Specifications..... | 7 |
| 3-3. Communication Procedure..... | 8 |
| 3-3-1. Outline of Communication | 8 |
| 3-4. Communication Rules | 8 |
| 3-5. Approximate Return Waiting Times..... | 8 |
| 3-6. Command Block Format | 9 |
| 3-6-1. Simplified Command | 9 |
| 3-7. Packet Examples | 10 |
| 3-7-1. Change “ASPECT” to “ZOOM” | 10 |
| 3-8. AMX Device Discovery..... | 10 |

4. Ethernet

| | |
|-----------------------------------|----|
| 4-1. Service..... | 11 |
| 4-1-1. Advertisement..... | 11 |
| 4-1-2. PJ Talk..... | 12 |
| 4-2. Communication Procedure..... | 13 |
| 4-3. Protocols..... | 14 |
| 4-3-1. SDAP | 14 |
| 4-3-2. SDCP..... | 15 |
| 4-3-3. PJLink | 24 |

1. Overview

1-1. Introduction

The projector is remotely controllable over RS-232C as well as Ethernet. It is useful for setting up the projector away from the operator.

This protocol manual describes the specifications such as packet format and procedures for controlling the projector.

In the following sections below, the term “CONTROLLER” is used as a device which controls the projector. CONTROLLER can be a PC or other specific device that is able to handle RS-232C or Ethernet.

Although most of commands are available for both RS-232C and Ethernet, some commands are dedicated to Ethernet.

Note

Ethernet is a registered trademark of Xerox Corporation.

1-2. Glossary of Terms

Table 1-1 Glossary of Terms

| Terms | Formal name | Description |
|------------|---------------------------------------|---|
| CONTROLLER | – | Command initiator such as PCs. |
| PROJECTOR | – | Front projector. |
| SDAP | Simple Display Advertisement Protocol | Protocol name for advertising the projector status over Ethernet. |
| SDCP | Simple Display Control Protocol | Protocol name for controlling projector over Ethernet. |
| PJLink | – | Protocol name for controlling projector over Ethernet. |

1-3. Protocol Stack Structure

The protocol stack structure diagram is shown below. Though the stack is drawn for RS-232C and Ethernet separately, the following portions are common.

Table 1-2 Common Portions in Protocol Stack

| Layer Name | Description |
|--------------------|---|
| Sub Command | Value is assigned for projector's functions. Refer to the section 2-1 for detail description. |
| Simplified Command | Packet format for sending/receiving “Sub Command”. Refer to the section 3-6-1 for detail description. |

(1) RS-232C

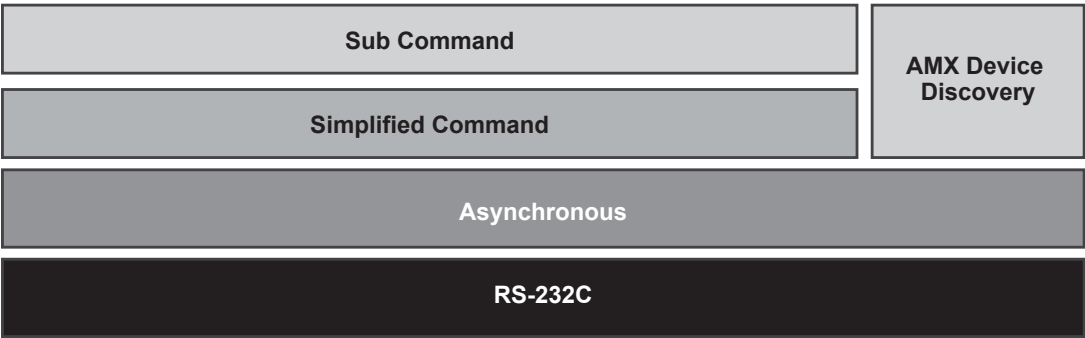


Fig. 1-1 RS-232C Protocol Stack

“RS-232C” layer is physical portion and “Asynchronous” is the traditional protocol layer as shown in the section 3-2.

(2) Ethernet

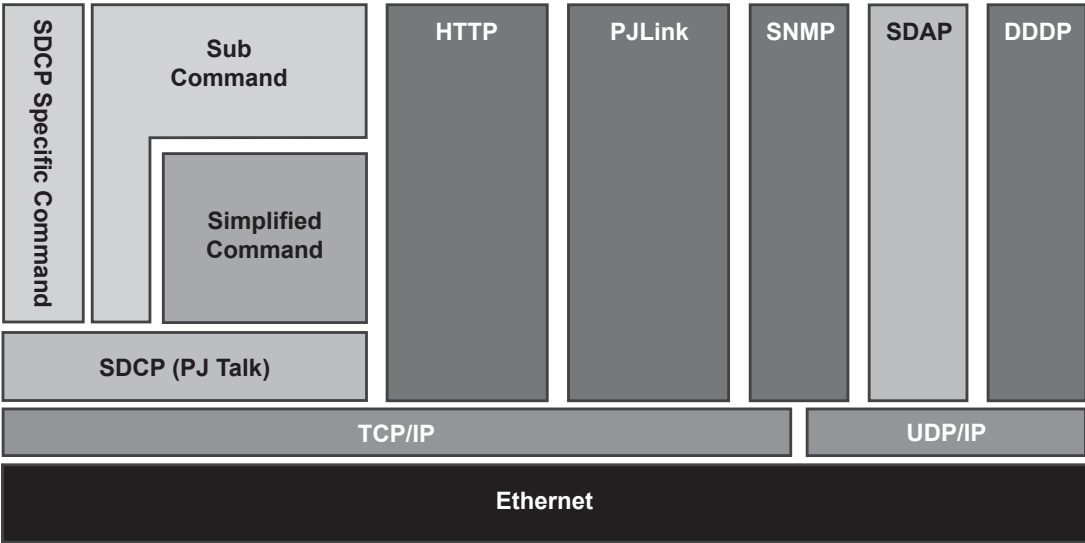


Fig. 1-2 Ethernet Protocol Stack

Ethernet corresponding model

VPL-CX235, VPL-CX238, VPL-CW255, VPL-CW258, VPL-SX125, VPL-SX135, VPL-SW125, VPL-CX275, VPL-CX278, VPL-CW275, VPL-CW278

Because of traditional portions for Ethernet general layer, “TCP/IP”, “UDP/IP” and “HTTP” are out of scope in this document.

SDCP specific command is described in the section 4-3-2.

SDAP and SDCP (PJ Talk) are SONY original protocol stack, which are described in the sections 4-3-1 and 4-1-2 respectively.

2. Common Commands

2-1. Sub Commands

Sub Command is the value which is used by Simplified Command. Value is assigned for executing function. For example, if you want to change the picture mode, the appropriate value assigned for the desired picture mode should be chosen.

2-1-1. ITEM List

Item lists are described below. Tables are shown per item name.

ITEM List For Picture

| <Table 1> | | | <Table 2> | | Remarks |
|--------------|------------|------------|--------------|--------------------|---------|
| Item Number | | | Data | | |
| Item | Upper byte | Lower byte | Data | Byte | |
| PICTURE MODE | 00h | 02h | DYNAMIC | 0000h | Set/Get |
| | | | STANDARD | 0001h | |
| | | | PRESENTATION | 0002h | |
| | | | GAME | 0003h | |
| | | | LIVING | 0004h | |
| | | | CINEMA | 0005h | |
| CONTRAST | 00h | 10h | VALUE | 0000h-0064h(0-100) | |
| BRIGHTNESS | 00h | 11h | VALUE | 0000h-0064h(0-100) | |
| COLOR | 00h | 12h | VALUE | 0000h-0064h(0-100) | |
| HUE | 00h | 13h | VALUE | 0000h-0064h(0-100) | |
| SHARPNESS | 00h | 14h | VALUE | 0000h-0064h(0-100) | |
| VOLUME | 00h | 16h | VALUE | 0000h-0064h(0-100) | |
| COLOR TEMP | 00h | 17h | HIGH | 0000h | |
| | | | MID | 0001h | |
| | | | LOW | 0002h | |
| DDE | 00h | 18h | OFF | 0000h | |
| | | | PROGRESSIVE | 0001h | |
| | | | FILM | 0002h | |

ITEM List For Screen

| <Table 1> | | | <Table 2> | | Remarks |
|-------------|------------|------------|-----------|-------|---------|
| Item Number | | | Data | | |
| Item | Upper byte | Lower byte | Data | Byte | |
| ASPECT | 00h | 20h | FULL | 0000h | Set/Get |
| | | | NORMAL | 0001h | |
| | | | ZOOM | 0003h | |
| | | | FULL1 | 0007h | |
| | | | FULL2 | 0008h | |
| | | | FULL3 | 000Ch | |
| | | | WIDE ZOOM | 0002h | |
| | | | 4 : 3 | 0009h | |
| | | | 16 : 9 | 000Ah | |

ITEM List For Setup

| <Table 1> | | | <Table 2> | | Remarks |
|--------------------|------------|------------|-----------|-------|---------|
| Item Number | | | Data | | |
| Item | Upper byte | Lower byte | Data | Byte | |
| INPUT TERMINAL | 00h | 01h | VIDEO | 0000h | Set/Get |
| | | | S-VIDEO | 0001h | |
| | | | INPUT A | 0002h | |
| | | | INPUT B | 0003h | |
| | | | INPUT C* | 0004h | |
| PICTURE MUTING | 00h | 30h | OFF | 0000h | |
| | | | ON | 0001h | |
| AUDIO MUTING | 00h | 31h | OFF | 0000h | |
| | | | ON | 0001h | |
| INPUT A SIGNAL-SEL | 00h | 32h | AUTO | 0000h | |
| | | | COMPUTER | 0001h | |
| | | | COMPONENT | 0002h | |
| | | | VIDEOGBR | 0003h | |
| LAMP MODE | 00h | 40h | HIGH | 0000h | |
| | | | STANDARD | 0001h | |
| | | | LOW | 0002h | |
| | | | AUTO | 0003h | |

Note

If a command that is not supported by the model has been transmitted, NACK (select error) is returned.

ITEM List For Infrared Remote Command

| <Table 1> | | | <Table 2> | | | Remarks |
|--|------------|---------------------------|-----------|------------|------------|----------|
| Item Number | | | Data | | | |
| Item | Upper byte | Lower byte | Data | Upper byte | Lower byte | |
| Infrared Remote Command (VPL-EW series, VPL-SX series, VPL-CX series, VPL-CW series, or 15 bit PROJECTOR) | 17h | Refer to Section 2-1-2.*1 | — | 00h | 00h | Set only |
| Infrared Remote Command (VPL-EW series, VPL-SX series, VPL-CX series, VPL-CW series, or 20 bit E PROJECTOR) | 19h | | — | 00h | 00h | |
| Infrared Remote Command (VPL-EW series, VPL-SX series, VPL-CX series, VPL-CW series, or 20 bit EE PROJECTOR) | 1Bh | | — | 00h | 00h | |

*1: For using this item number, the simulation of the infrared remote controller is enable. Select the corresponding code in the table of Section 2-1-2 and use it as the lower byte of the item number.

Note

Other value (the upper byte) is assigned depending for item name.

ITEM List For Status

| <Table 1> | | | <Table 2> | | Remarks |
|------------------|------------|------------|-----------------|------|----------|
| Item Number | | | Data | | |
| Item | Upper byte | Lower byte | Data | Byte | |
| STATUS ERROR1 | 01h | 01h | NO ERROR | 00h | Get only |
| | | | LAMP ERROR | 01h | |
| | | | FAN ERROR | 02h | |
| | | | COVER ERROR | 04h | |
| | | | TEMP ERROR | 08h | |
| STATUS POWER | 01h | 02h | STANDBY | 00h | |
| | | | STARTUP LAMP | 02h | |
| | | | POWER ON | 03h | |
| | | | COOLING1 | 04h | |
| | | | COOLING2 | 05h | |
| | | | SAVING COOLING1 | 06h | |
| | | | SAVING COOLING2 | 07h | |
| | | | SAVING STANDBY | 08h | |
| LAMP TIMER | 01h | 13h | VALUE | xxh | |
| SUB ROM VERSION | 01h | 1Dh | VALUE | xxh | |
| MAIN ROM VERSION | 01h | 1Eh | VALUE | xxh | |
| STATUS SECURITY | 01h | 1Fh | DISABLE | 00h | |
| | | | ENABLE | 01h | |

2-1-2. Infrared Remote Command Code

15bit PROJECTOR

| | x0 | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | xA | xB | xC | xD | xE | xF |
|----|----------|----------|----------------|----------------|-------------------|-----------------|---------------|--------------------------|---------------|---------------|------------|------------|---------|----|-----------------|-----------------|
| 0x | | | | | | | | | | | | | | | | |
| 1x | | | VOL LARGE | VOL-SMALL | AUDIO MUTING | POWER TOGGLE | | | CONTRAST + | CONTRAST - | COLOR + | COLOR - | | | BRIGHTNESS + | BRIGHTNESS - |
| 2x | HUE + | HUE - | SHARPNESS + | SHARPNESS - | PICTURE MUTING | STATUS ON | STATUS OFF | | | MENU | VIDEO | INPUT A | INPUT B | | POWER ON | POWER OFF |
| 3x | | | | CURSOR → | CURSOR ← | CURSOR ↑ | CURSOR ↓ | | | | | | | | | |
| 4x | | | | | | | | PITCH INPUT TOGGLE | SHIFT | | | | | | | |
| 5x | | | | | | | | | | | ENTER | | | | | S VIDEO |
| 6x | | | | | | | | | | | | | | | | INPUT C |
| 7x | | | | | | | | | | | | RESET | | | Pattern | |

※: VPL-CX235/CX238/CW255/CW258 only

20bit PROJECTOR-E

| | x0 | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | xA | xB | xC | xD | xE | xF |
|----|-----|-------|----|----|----|----|----|--------|----|----|----------------------|----------------------|----|----|------------------|----|
| 0x | | | | | | | | | | | | | | | | |
| 1x | | | | | | | | | | | | | | | | |
| 2x | | | | | | | | | | | | | | | | |
| 3x | | | | | | | | | | | V KEYSTONE | | | | | |
| 4x | | | | | | | | | | | | | | | | |
| 5x | | | | | | | | | | | | | | | | |
| 6x | APA | PHASE | | | | | | FREEZE | | | DIGITAL ZOOM + | DIGITAL ZOOM - | | | ASPECT TOGGLE | |
| 7x | | | | | | | | | | | | | | | | |

20bit PROJECTOR-EE

| | x0 | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | xA | xB | xC | xD | xE | xF |
|----|----|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0x | | | | | | | | | | | | | | | | |
| 1x | | ECO MODE | | | | | | | | | | | | | | |
| 2x | | | | | | | | | | | | | | | | |
| 3x | | | | | | | | | | | | | | | | |
| 4x | | | | | | | | | | | | | | | | |
| 5x | | | | | | | | | | | | | | | | |
| 6x | | | | | | | | | | | | | | | | |
| 7x | | | | | | | | | | | | | | | | |

2-2. Reply

| <Table 3> | | | |
|-------------|--------------|------------|------------|
| Item Number | | Data | |
| Item | Data | Upper byte | Lower byte |
| ACK | Complete | 00h | 00h |
| NAK | Select Error | 01h | 05h |

3. RS-232C

3-1. Connection

Communication is enabled by the use of a D-Sub 9 Pin cross (reverse) cable.

The pin assignment of D-Sub 9 Pin and D-Sub 25 Pin is as follows.

| D-Sub 9 Pin | D-Sub 25 Pin | Name | |
|-------------|--------------|------|--|
| Shell = FG | 1 | FG | Grounding for safety protection or cable shield |
| 3 | 2 | TxD | Transmission data |
| 2 | 3 | RxD | Reception data |
| 7 | 4 | RTS | Transmission request |
| 8 | 5 | CTS | Transmission permission |
| 6 | 6 | DSR | Data set ready |
| 5 | 7 | SG | GND for signal |
| 1 | 8 | DCD | Data channel signal carrier detection |
| 4 | 20 | DTR | Data terminal ready |
| 9 | 22 | RI | Calling display (Presence/absence of calling signal) |

Pin numbers not indicated as D-Sub 25 Pin are not used.

Assured cable length: 15 m (However, assurance may not be applicable for some cables.)

The software for controlling the projector from a PC is intended for performing transmission and reception for only the TxD and RxD lines.

Therefore the handshake normally performed by RS-232C is not necessary.

3-2. Communication Specifications

- Full duplex communication channels (Flow control is not performed.)
- Start-stop synchronism system
- Baud rate: 38.4 kbps (bits per second)
- The bit configuration is defined as follows.

1 START Bit + 8 DATA Bits + 1 PARITY Bit + 1 STOP Bit

| | | | | | | | | | | |
|--------------|-------------|----|----|----|----|----|----|-------------|------------------|-------------|
| START BIT | D0 (LSB) | D1 | D2 | D3 | D4 | D5 | D6 | D7 (MSB) | PARITY (EVEN) | STOP BIT |
|--------------|-------------|----|----|----|----|----|----|-------------|------------------|-------------|

EVEN ParityTotal number of “1”s from D0 to D7 is an even number. \Rightarrow 0

.....Total number of “1”s from D0 to D7 is an odd number. \Rightarrow 1

3-3. Communication Procedure

3-3-1. Outline of Communication

All communication between CONTROLLER (PC, etc.) and DEVICE (PROJECTOR) is performed by the command block format. Communication is started by the issue of a command at CONTROLLER and ended when the return data is sent to CONTROLLER after DEVICE receives the command. CONTROLLER is prohibited from sending several commands at one time. This means that after CONTROLLER sends one command, it cannot send other commands until DEVICE returns the return data. DEVICE sends the return data after processing the command. The time from when CONTROLLER sends the command until the return data is returned differs according to the contents of the command.

Note

When SIRCS direct command is sent, return data is not sent.

3-4. Communication Rules

- When sending a command from CONTROLLER, the return data from PROJECTOR should be received first before sending the next command. Even if the next command is sent before receiving the return data, since PROJECTOR will not be able to receive that command, it does not return a response to CONTROLLER. Consequently, no error code is also sent.
For detail of the waiting times for PROJECTOR to return the return data after CONTROLLER sends the command, refer to the section 3-5.
- When a communication error occurs, PROJECTOR ignores the data received until now, and set into the reception standby state.
- For undefined commands or commands determined as invalid by PROJECTOR, PROJECTOR will send the “NAK” as return data to CONTROLLER .
- Take note that when data is written with the unstable input signal of PROJECTOR, that data (value) will not be incorporated.
- When INDEX specified SIRCS direct command is transmitted, leave an interval of 45 msec until the next transmission. (Do not return the return data (ACK, NAK) when the SIRCS direct command is received.)
- For POWER ON/OFF/TOGGLE of the SIRCS direct command, send the command twice when this unit is in standby mode (Low) state.

3-5. Approximate Return Waiting Times

The await-return time is approx. 30 to 1000 msec.

Note

This is the case, unless the communications are interfered anyway.

3-6. Command Block Format

The block format of Simplified Command for RS-232C as shown in the figure below. In this section, the block format for Simplified Command is explained.

3-6-1. Simplified Command

[Send]

The block format for sending request is shown below.

| | | |
|----|-------------|---|
| B0 | START CODE | [A9h] |
| B1 | ITEM NUMBER | Put the item number. Refer to the item list in the sections 2-1-1 and 2-1-2. |
| B2 | | |
| B3 | TYPE | SET: 00h (Set data) GET: 01h (Get data) |
| B4 | DATA | SET: Put the Data value described in the item list in the sections 2-1-1 and 2-1-2. GET: Unused. Set Dummy data [00h, 00h] |
| B5 | | |
| B6 | CHECK SUM*1 | Check Sum |
| B7 | END CODE | [9Ah] |

[Receive (without data)]

The block format for response which includes no return data is shown below. Response is always sent by PROJECTOR.

| | | |
|----|-------------|---|
| B0 | START CODE | [A9h] |
| B1 | ACK / NAK | Refer to the reply definition table in the section 2-2. |
| B2 | | |
| B3 | TYPE | [03h] |
| B4 | DUMMY DATA | This data does not mean any senses. Dummy Data [00h, 00h] is stored. |
| B5 | | |
| B6 | CHECK SUM*1 | Check Sum |
| B7 | END CODE | [9Ah] |

[Receive (with data)]

The block format for response which includes return data is shown below. Response is always sent by PROJECTOR.

| | | |
|----|-------------|---|
| B0 | START CODE | [A9h] |
| B1 | ITEM NUMBER | Refer to the item list in the sections 2-1-1 and 2-1-2. |
| B2 | | |
| B3 | TYPE | [02h] Express data to be Reply data |
| B4 | DATA | Data value described in the item list in the sections 2-1-1 and 2-1-2. |
| B5 | | |
| B6 | CHECK SUM*1 | Check Sum |
| B7 | END CODE | [9Ah] |

*1: CHECK SUM: B1 to B5 are calculated by OR. Refer to the example below.

<Example of Calculation>

| | | | | | |
|--------|------|------|--------|------|------|
| 0xA9 | 1010 | 1001 | 0xA9 | 1010 | 1001 |
| 0xA9 | 1010 | 1001 | 0x9A | 1001 | 1010 |
| Answer | 1010 | 1001 | Answer | 1011 | 1011 |
| | | 0xA9 | | | 0xBB |

3-7. Packet Examples

3-7-1. Change “ASPECT” to “ZOOM”

START CODE = A9h
ITEM NUMBER = 0020h (ASPECT)
SET/GET = 00h (SET)
DATA = 0003h (ZOOM)
CHECK SUM = 23h
END CODE = 9Ah

You will receive the packet below if the process is successfully completed.

START CODE = A9h
ACK/NAK = 0000h (Complete)
ACK = 03h
DUMMY DATA = 0000h
CHECK SUM = 03h
END CODE = 9Ah

There's another way to realize the same purpose. There is “ASPECT” key on the infrared remote controller. By using this key, wide mode can be changed. Issue the Infrared Remote Command for this key several times to set wide mode “ZOOM”. Packet format will make as follows. Refer to Section 2-1-2 for “ASPECT TOGGLE”.

START CODE = A9h
ITEM NUMBER = 196Eh (ASPECT TOGGLE)
SET/GET = 00h (SET)
DATA = 0000h
CHECK SUM = 7Fh
END CODE = 9Ah

3-8. AMX Device Discovery

This model is equipped with the protocol that conforms to the Device Discovery stipulated by AMX. Contact AMX for details about the Device Discovery.

| |
|-------------|
| Note |
|-------------|

AMX is a trademark of AMX Corporation.

4. Ethernet

Ethernet corresponding model

VPL-CX235, VPL-CX238, VPL-CW255, VPL-CW258, VPL-SX125, VPL-SX135, VPL-SW125, VPL-CX275, VPL-CX278, VPL-CW275, VPL-CW278

4-1. Service

4-1-1. Advertisement

The advertisement service is provided to facilitate development of a PC application that can automatically detect a projector on the network. This function is achieved by broadcasting the equipment information periodically to the network.

This protocol is set to OFF by default.

[Information]

The equipment information shown below is transmitted as the broadcast packet periodically (at certain intervals).

| Information | Description |
|--------------------------|--|
| Category | Category code of the equipment |
| Equipment name | Name of the equipment |
| Serial number | Serial number of the equipment |
| Installation information | Installation location of the equipment |
| Community | Community name of the equipment |
| Power status | Power status of the equipment |

Notes

- The category code of projector is 0Ah.
- The power status sets FFFFh if communication error occurs.

[Protocol]

The SDAP protocol is defined in order to provide this service.

| Item | Description |
|--------------------|---|
| Protocol name | SDAP (Simple Display Advertisement Protocol) |
| Transport | UDP |
| Port number | 53862 (Factory-shipments value) |
| Broadcast interval | Once every 30 seconds (Factory-shipments value) |

[Setup Items]

The items that can be set for the advertisement service are described below.

| Setup items | Description |
|-------------------|--------------------------------|
| Port No. | Port number |
| Interval | Broadcast interval |
| Broadcast Address | Adding the transmission place. |

4-1-2. PJ Talk

By using PJ Talk, it is possible to communicate with PROJECTOR over Ethernet network. Both of set and get method are provided.

This protocol is set to OFF by default.

[Protocol]

| Item | Description |
|------------------------|--|
| Protocol name | SDCP (Simple Display Control Protocol) |
| Transport | TCP |
| Port number | 53484 (Factory-shipments value) |
| TCP connection timeout | 30 seconds (Factory-shipments value) |

[Setup Items]

| Setup item | Description |
|--------------|------------------------------------|
| Port No. | Port number |
| Timeout | TCP connection timeout time |
| Host Address | PC address that is able to connect |
| Community | Header community |

4-2. Communication Procedure

Communication sequence is shown below. SDCP commands must be sent by CONTROLLER and PROJECTOR responses to it. On the other hand, SDAP commands are sent by PROJECTOR and have no response from CONTROLLER.

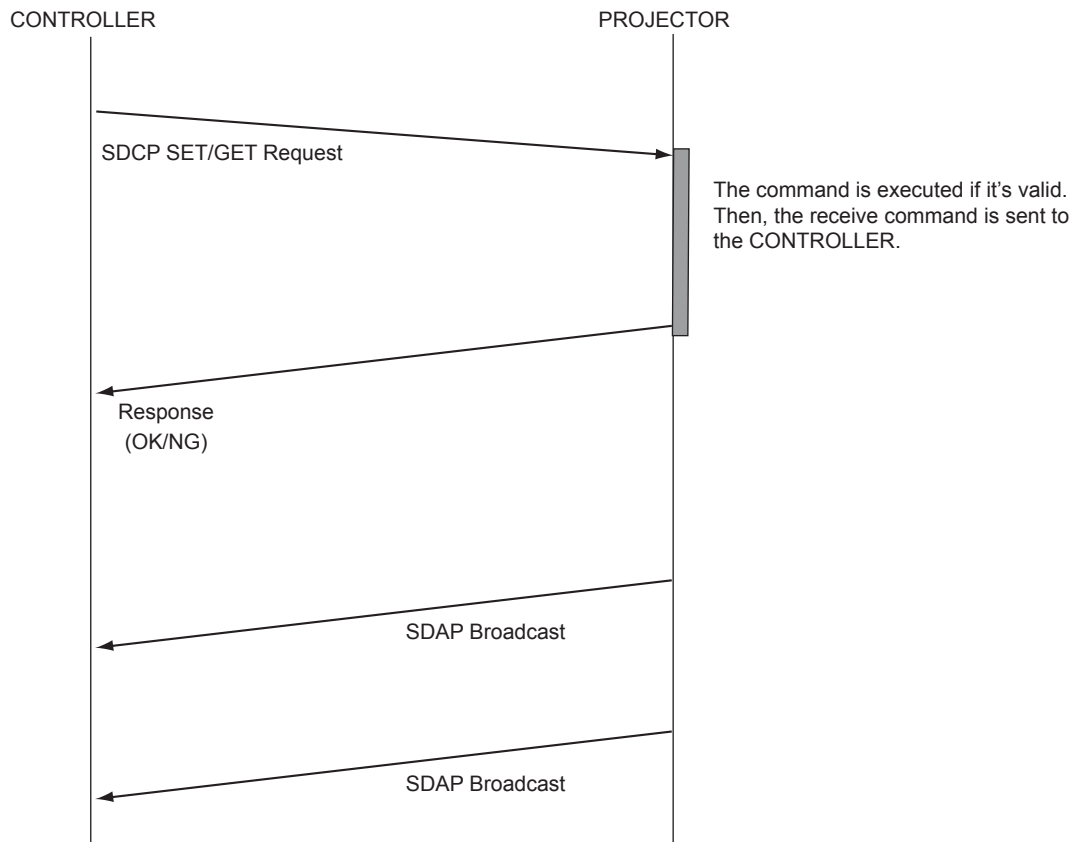


Fig. 4-1 Command Sequence

It is prohibited that CONTROLLER send another command before receiving the response to the previous command. Since PROJECTOR executes the command before sending the return data, CONTROLLER must wait a while before receiving the response. The waiting time depends on not only the commands but also network traffic.

4-3. Protocols

4-3-1. SDAP

This section describes the SDAP packet structure. The number in the parentheses shows byte.

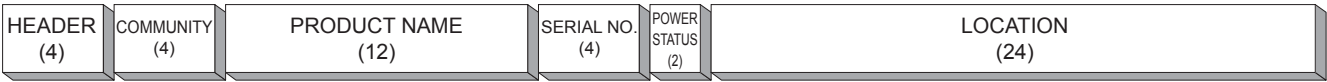


Fig.4-2 Packet structure

- 1. Header
The header consists of ID (2 bytes), version (1 byte) and category (1 byte).



Fig. 4-3 HEADER

ID
It is fixed to “4441h”.

VERSION
This indicates the version number of protocol.
It is fixed to 01h (version 1).

CATEGORY
Category code 0Ah of the projector is entered here.

- 2. COMMUNITY (Refer to 3. of the section 4-3-2.)
The community that is set in the display equipment is entered.



Fig. 4-4 COMMUNITY

- 3. Equipment Information

PRODUCT NAME
Name of equipment (Maximum twelve characters)
In case, less than twelve characters, 00h is entered in the blank space.

SERIAL NO.
Serial number is entered.

POWER STATUS
Power supply status of the equipment is entered.

LOCATION
Information of installation location (Maximum twenty four characters)
In case, less than twenty four characters, 00h is entered in the blank space.

4-3-2. SDCP

1. Packet Structure

The Fig. 4-5 shows SDCP packet format. The number in the parentheses shows byte. The statement for each field is described below.



Fig. 4-5 SDCP Packet Structure

2. HEADER Field

The HEADER field consists of VERSION and CATEGORY sub field shown below. The length of each sub field is 1 byte.

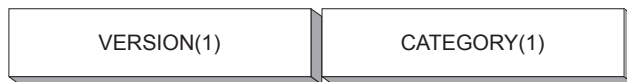


Fig. 4-6 HEADER Field

(1) VERSION sub field

This is a fixed value of 02h, which means “version2”.

(2) CATEGORY sub field

Category code number 0Ah of the projector is entered here. Projector checks the category code. If a different equipment category code is entered, the request is ignored.

3. COMMUNITY Field

When the community data matches the community that is set in the display equipment, the request is executed. COMMUNITY field should be consist of four alphanumeric characters (case sensitive). All display equipment has the default value “SONY” when shipped at the factory.

Note

COMMUNITY field should be filled with four characters. Three characters or less are not allowed.

4. COMMAND Field

There are two types of COMMAND field, which are REQUEST and RESPONSE. REQUEST command is sent to the PROJECTOR from CONTROLLER. On the other hand, RESPONSE command is sent by PROJECTOR as a response to the REQUEST command.

(1) REQUEST Command

COMMAND field for REQUEST has three sub fields shown as follows.

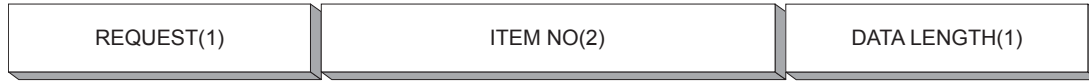


Fig. 4-7 COMMAND Field for REQUEST

1) REQUEST sub field

There are only two types of request. One is the GET request to acquire the projector information and status. The other is the SET request to modify the projector setup.

SET (00h) Used to control turning the power on/off and to control the input selector, and to change the various setups.

GET (01h) Used to acquire the installation information, equipment status and various setup values.

2) ITEM NO sub field

Refer to 6. of the section 4-3-2.

3) DATA LENGTH sub field

This sub field shows the length in byte of the DATA field in the SDCP packet. The maximum data length is 128 bytes. If there is no data to be sent, its value should be 0h.

(2) RESPONSE Command

COMMAND field for RESPONSE has three sub fields shown as follows.

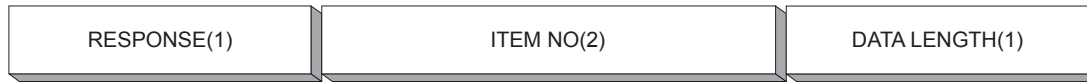


Fig. 4-8 COMMAND Filed for RESPONSE

1) RESPONSE sub field

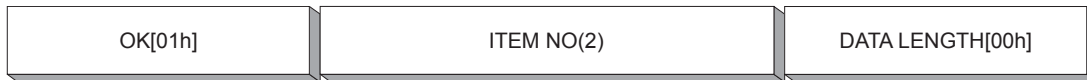
The response returns the result of the request.

OK (01h) Indicates that the request was executed correctly.

NG (00h) Indicates that the request is illegal or cannot be executed.

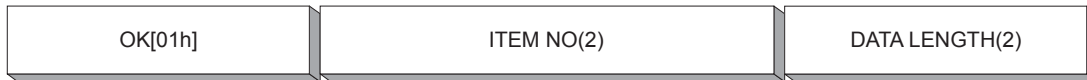
(1-1) OK Response

For SET Request, the packet format will be as follows.



If the response for SET Request is OK, DATA field should be 00h. Therefore, DATA LENGTH field should be 00h as well.

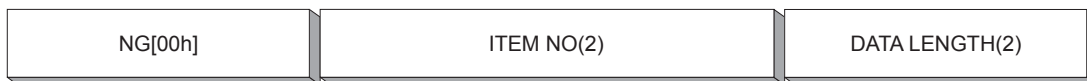
For Get Request, the packet format will be as follows.



If the response for GET Request is OK, the DATA field which follows the DATA LENGTH field should be filled with returned data.

(1-2) NG Response

For SET/GET Request



If the response for SET/GET Request is no good, DATA field which follows the DATA LENGTH field should be filled with "ERROR CODE". "ERROR CODE" are defined in 7. of the section 4-3-2.

2) ITEM NO sub field

Refer to 6. of the section 4-3-2.

3) DATA LENGTH sub field

This sub field shows the length in byte of the DATA field in the SDCP packet. The maximum data length is 128 bytes. If there is no data to be sent, its value should be 0h.

5. DATA Field

The content to be filled in this field depends on the COMMAND field. For SET Request commands, appropriate DATA value accompanied with ITEM NO should be chosen. ITEM NO (item number) and its data is shown in the section 2-1-1.

For the GET REQUEST and OK RESPONSE, this field should not be provided. In that case, DATA LENGTH should be 0h.

6. Items

ITEM NO sub field has two bytes long. Some of the value for ITEM NO (item number) are defined in the section 2-1-1 as a part of the Sub Command.

Table 4-1 ITEM List For SDCP

| ITEM NO | Remarks | SET | GET |
|---------------|--|-----|-----|
| 0000h – 00FFh | Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field. | ○ | ○ |
| 0100h – 01FFh | Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field. | ○ | ○ |
| 1700h – 17FFh | Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field. | ○ | – |
| 1900h – 19FFh | Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field. | ○ | – |
| 1B00h – 1BFFh | Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field. | ○ | – |
| 7000h – 7001h | This is the RS-232C encapsulation mode. “Simple Command” can be encapsulated in the DATA field. For the packet format of the command, refer to the section 3-6-1. Use 7000h for the command which the response is expected. Use 7001h for the command which no response is expected. | ○ | – |
| 8000h – 80FFh | For acquiring equipment information. Refer to the (1) below. | – | ○ |
| 9000h – 90FFh | For acquiring the network setup information. Refer to the (2) below. | – | ○ |

[SDCP Specific Command]

(1) Acquire Equipment Information

This is for acquiring information of PROJECTOR. While the higher byte is fixed as 80h shown in the table above, the lower byte is defined as follows.

| Lower byte | Contents | SET | GET |
|------------|-------------------------|-----|-----|
| 00h | Equipment category code | – | ○ |
| 01h | Model name | – | ○ |
| 02h | Serial number | – | ○ |
| 03h | Installation location | ○ | ○ |

0x8000 Equipment category code

1 byte

0x8001 Model name

Alphanumeric 12 characters

If the number of characters is less than 12, the remaining digits are filled with 00h.

0x8002 Serial number

4 bytes

Note

The serial number is in the range from 00000000 to 99999999.

0x8003 Installation location

Alphanumeric 24 characters

If the number of characters is less than 24, the remaining digits are filled with 00h.

(2) Acquire Network Setup Information

This is for acquiring network setting of PROJECTOR. While the upper byte is fixed as 90h, the lower byte is defined as follows.

| Lower bytes | Contents | SET | GET |
|-------------|-----------------|-----|-----|
| 00h | MAC Address | — | ○ |
| 01h | IP Address | — | ○ |
| 02h | Subnet Mask | — | ○ |
| 03h | Default Gateway | — | ○ |
| 04h | DHCP | — | ○ |

0x9000 Mac Address

6 bytes

0x9001 IP Address

4 bytes

0x9002 Subnet Mask

4 bytes

0x9003 Default Gateway

4 bytes

0x9004 DHCP

1 byte

DHCP disable: 0

DHCP enable: 1

7. ERROR CODE

ERROR CODE has two bytes long. The table below shows the error code. Each error equipment category code is explained as follows.

| Equipment category code | Error | Error Code |
|-------------------------|---------------------------------|------------|
| Item Error (01**h) | Invalid Item | 01h |
| | Invalid Item Request | 02h |
| | Invalid Length | 03h |
| | Invalid Data | 04h |
| | Short Data | 11h |
| | Not Applicable Item | 80h |
| Community Error (02**h) | Different Community | 01h |
| Request Error (10**h) | Invalid Version | 01h |
| | Invalid equipment category code | 02h |
| | Invalid Request | 03h |
| | Short Header | 11h |
| | Short Community | 12h |
| | Short Command | 13h |
| Network Error (20**h) | Timeout | 01h |
| Comm Error (F0**h) | Timeout | 01h |
| | Check Sum Error | 10h |
| | Framing Error | 20h |
| | Parity Error | 30h |
| | Over Run Error | 40h |
| | Other Comm Error | 50h |
| | Unknown Response | F0h |
| NVRAM Error (F1**h) | Read Error | 10h |
| | Write Error | 20h |

(1) Item Error

This error occurs when the Item No. of a request is illegal or its data is illegal. The conditions for occurrence of the respective errors are shown below.

Invalid Item

An unsupported Item No. is specified.

Example 1: The unsupported equipment category code A**h is specified.

Example 2: The unsupported Item No. 8010h is specified.

Invalid Item Request

The Item No. is supported but an unsupported Request is sent.

Example: An attempt is made to set data in the Model Name (8001h).

Invalid Length

Data length of the specified Item No. is too long.

Example: An attempt is made to set 25 bytes data in the installation location (8003h).

Invalid Data

Data of the specified Item No. is outside the setting range.

Example: An attempt is made to set 101 in the Item when the setting range of the Item is 1 to 100.

Short Data

The length of data is shorter than the value specified by the data length.

Example: The actual data length is nine bytes but the specified value is 10.

Not Applicable Item

An item that is not valid at present is specified.

Example: The item to switch the display is specified when the main power is off.

(2) Community Error

This error occurs when community is different.

Example: “ABCD” is specified when “SONY” is set.

(3) Request Error

This error occurs when header or command is illegal. The conditions of occurrence of the respective errors are shown below.

Invalid Version

The version of the header is other than two.

Invalid Equipment Category Code

The equipment category code does not match.

Example: 0Bh is specified in the device of equipment category code = 0Ah.

Invalid Request

An unsupported request is specified.

Example: Request = 02h is specified.

Short Header

The received data is one byte.

Short Community

The received data is in the range of two to five bytes.

Short Command

The received data is in the range of six to nine bytes.

(4) Network Error

There is something wrong with TCP/IP.

Timeout

Communication was interrupted.

(5) Comm Error

Communication between Ethernet controller and main CPU has been failed.

Timeout

Timeout occurred.

Check Sum Error

A check sum error occurred.

Framing Error

A framing error occurred.

Parity Error

A parity error occurred.

Over Run Error

An overrun error occurred.

Other Comm Error

Another error occurred.

Unknown Response

The data cannot be processed was received.

(6) NVRAM Error

Read Error

Reading from NVRAM was failed.

Write Error

Writing to NVRAM was failed.

8. Packet Examples

For setting the picture mode to dynamic, the packet should be as follows.

HEADER (VERSION, CATEGORY) = (02h, 0Ah)

COMMUNITY = "SONY" = (534F4E59h)

COMMAND (REQUEST, ITEM NO, DATA LENGTH) = (00h, 0002h, 02h)

DATA = 0000h

The same result can be obtained by using ENCAPSULATION mode as well.

HEADER (VERSION, CATEGORY) = (02h, 0Ah)

COMMUNITY = "SONY" = (534F4E59h)

COMMAND (REQUEST, ITEM NO, DATA LENGTH) = (00h, 7000h, 08h)

DATA (START CODE, ITEM NO, SET/GET, DATA, CHECK SUM, END CODE)
= (A9h, 0002h, 00h, 0000h, 02h, 9Ah)

4-3-3. PJLink

The following model is equipped with the PJLink class1 protocol.

For details about this protocol, refer to the PJLink specifications published from JBMIA.

You can turn on or off the PJLink protocol and set a password from the Web setting screen > “Advertisement/PJ Talk/PJ Link” tab > PJLINK.

When the authentication setting is changed, the connected controller will be disconnected.

This protocol is set to OFF by default.

PJLink class1 corresponding model

VPL-CX235, VPL-CX238, VPL-CW255, VPL-CW258, VPL-SX125, VPL-SX135, VPL-SW125

Note

PJLink is a registered trademark of Japan Business Machine and Information System Industries Association.

1. Command Details

| Command | Data | Remark |
|---------|---|--|
| POWR | 0 | Changes the projector's power status to 'Standby'. |
| | 1 | Changes the projector's power status to 'Lamp ON'. |
| POWR ? | The following values are returned: | |
| | 0 : Standby | |
| | 1 : Lamp ON | |
| | 2 : Cooling state | |
| | 3 : Warm-up state | |
| | 4 : Unacceptable period | |
| | 5 : Projector defect | |
| INPT | 1* | Changes the projector input to 'RGB*'. |
| | 2* | Changes the projector input to 'VIDEO*'. |
| | 3* | Changes the projector input to 'DIGITAL*'. |
| | 4* | Changes the projector input to 'STORAGE*'. |
| | 5* | Changes the projector input to 'NETWORK*'. |
| INPT ? | The following values are returned: | |
| | 1*: RGB* | |
| | 2*: VIDEO* | |
| | 3*: DIGITAL* | |
| | 4*: STORAGE* | |
| AVMT | 10 | Cancels the projector's video muting. |
| | 11 | Sets the projector's video muting. |
| | 20 | Cancels the projector's audio muting. |
| | 21 | Sets the projector's audio muting. |
| | 30 | Cancels the projector's video + audio muting. |
| | 31 | Sets the projector's video + audio muting. |
| AVMT ? | The following values are returned: | |
| | 11 : Projector video muting ON | |
| | 21 : Projector audio muting ON | |
| | 30 : Projector video + audio muting OFF | |
| | 31 : Projector video + audio muting ON | |

| Command | Data | Remark |
|---------|------|--|
| ERST ? | | The following values are returned: |
| | | 6th digit : Fan error |
| | | 5th digit : Lamp error |
| | | 4th digit : Temperature error |
| | | 3rd digit : Cover open error |
| | | 2nd digit : Filter error |
| | | 1st digit : Other error |
| | | The following values are assigned to each digit : |
| | | 0 : No error, or detection impossible |
| | | 1 : Warning |
| | | 2 : Error occurring |
| LAMP ? | | The following values are returned: |
| | | Lamp accumulative time (0 to 99999) |
| | | '1' when the lamp is on, '0' when off. |
| | | Returns data for each lamp if there are multiple lamps. |
| INST ? | | The following values are returned: |
| | | Source No. of the input that can be switched |
| | | For source Nos., refer to the section on INPT. |
| NAME ? | | Returned value is a projector name (Max. 64 characters) |
| INF1 ? | | Returned value is a manufacturer name (Max. 32 characters) |
| INF2 ? | | Returned value is a model name (Max. 32 characters) |
| INFO ? | | Returned value is desired information (Max. 32 characters) |
| CLSS ? | | Returned value is the class of the corresponding PJLINK. |

Specifications

The specifications of PJLink installed on the projector are as follows:

- Used port
4352
- Maximum number of controllers simultaneously connected
1 unit
- Authentication setting

Can be set on the Web screen.

The default settings are as follows:

Authentication setting : Enabled

Password : JBMIAProjectorLink

Note

When the authentication setting is changed, the connected controller will be disconnected.

- **Commands**

The following 14 commands are supported :

- (01) [Power control command] POWR
- (02) [Power status inquiry] POWR ?
- (03) [Input switch command] INPT
- (04) [Input switch inquiry] INPT ?
- (05) [AV muting command] AVMT
- (06) [AV muting status inquiry] AVMT ?
- (07) [Error status inquiry] ERST ?
- (08) [Lamp count/lamp time inquiry] LAMP ?
- (09) [Input switch list inquiry] INST ?
- (10) [Projector name inquiry] NAME ?
- (11) [Manufacturer name inquiry] INF1 ?
- (12) [Model name inquiry] INF2 ?
- (13) [Other information inquiry] INFO ?
- (14) [Class information inquiry] CLSS ?

2. PJLink Protocol Connection

When connecting a controller, the authentication procedure is required.

The projector responds as follows at the time of authentication:

- | | |
|---|--|
| When starting connection with authentication setting enabled : | Returns "PJLINK 1 random number". The random number converts a four-byte integer into a character string. |
| When authentication is successful : | Waits for a command. |
| When authentication failed : | Returns "PJLINK ERR4". |
| When starting connection with authentication setting disabled : | Returns "PJLINK 0", and then waits for a command. |

3. PJLink Protocol Command

This section provides explanation for each command.

(1) [Power control command] POWR

This command sets the projector's power status.

The available parameters are as follows:

Parameter 1 : Projector power ON

Parameter 0 : Projector power OFF

The projector responds as follows:

When processed properly : Returns "OK".

When parameter is out of range : Returns "ERR2".

Unacceptable period (when the power status is other than Standby or Power ON) : Returns "ERR3".

Projector error occurring (including warning) : Returns "ERR4".

(2) [Power status inquiry] POWR?

This command obtains the projector's power status.

The projector responds as follows:

Returns the following values when the power status is obtained:

Standby or power-saving state : Returns "0".

Power ON state : Returns "1".

Cooling state, or cooling state during power-saving state : Returns "2".

Startup state : Returns "3".

Projector error occurring (including warning) : Returns "ERR4".

(3) [Input switch command] INPT

This command switches the projector's inputs.

The available parameter examples are as follows: (The input channel varies depending on the model.)

| | |
|--------------------------------|---------|
| Parameter 21 : Projector input | Video |
| Parameter 22 : Projector input | S-Video |
| Parameter 31 : Projector input | Input A |
| Parameter 32 : Projector input | Input B |
| Parameter 33 : Projector input | Input C |
| Parameter 34 : Projector input | Input D |
| Parameter 35 : Projector input | Input E |
| Parameter 36 : Projector input | Input F |
| Parameter 41 : Projector input | USB |
| Parameter 51 : Projector input | Network |

The projector responds as follows:

When processed properly : Returns "OK".

When inexistent input is specified : Returns "ERR2".

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".

Projector error occurring (including warning) : Returns "ERR4".

(4) [Input switch inquiry] INPT?

This command obtains the projector's input status.

The projector responds examples as follows:

Returns the following values when the input status is obtained (The input channel varies depending on the model.):

When the projector input is Video : Returns "21".

When the projector input is S-Video : Returns "22".

When the projector input is Input A : Returns "31".

When the projector input is Input B : Returns "32".

When the projector input is Input C : Returns "33".

When the projector input is Input D : Returns "34".

When the projector input is Input E : Returns "35".

When the projector input is Input F : Returns "36".

When the projector input is USB : Returns "41".

When the projector input is Network : Returns "51".

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".

Projector error occurring (including warning) : Returns "ERR4".

(5) [AV muting command] AVMT

This command sets the projector's AV muting setting.

The available parameter examples are as follows:

Parameter 11 : Projector video muting ON

Parameter 10 : Projector video muting OFF

Parameter 21 : Projector audio muting ON

Parameter 20 : Projector audio muting OFF

Parameter 31 : Projector video + audio muting ON

Parameter 30 : Projector video + audio muting OFF

The projector responds as follows:

When processed properly : Returns "OK".

When parameter is out of range : Returns "ERR2".

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".

Projector error occurring (including warning) : Returns "ERR4".

(6) [AV muting status inquiry] AVMT?

This command obtains the projector's AV muting status.

The projector responds as follows:

Returns the following values when the AV muting status is obtained:

When the projector video muting is ON : Returns "11".

When the projector audio muting is ON : Returns "21".

When the projector video + audio muting is ON : Returns "31".

When the projector video + audio muting is OFF : Returns "30".

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".

Projector error occurring (including warning) : Returns "ERR4".

(7) [Error status inquiry] ERST?

This command obtains the projector's error status.

The projector responds as follows:

Returns the response for the error status in the following format.

The error status is expressed with a six-digit number.

6th digit : Fan error

5th digit : Lamp error

4th digit : Temperature error

3rd digit : Cover open error

2nd digit : Filter error

1st digit : Other error

The number in each digit has the following meaning:

0 : No error detected

1 : Warning

2 : Error

For example, when the Fan error and the Temperature warning occur, the response will be as follows:
"201000"

(8) [Lamp count/lamp time inquiry] LAMP?

This command obtains the number of the projector's lamps and the lamp time.

The projector responds as follows:

When normal:

Returns the lamp accumulative time and the lamp illuminated state for only the available number of lamps.

For the lamp illuminated state, "1" represents lit, while "0" represents unlit.

The following table shows an example of the response from a projector.

| Lamp count | Lamp 1 accumulative time | Lamp 1 illuminated state | Lamp 2 accumulative time | Lamp 2 illuminated state | Response |
|------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------|
| 1 | 40 | Lit | — | — | 40 1 |
| 1 | 40 | Unlit | — | — | 40 0 |
| 2 | 40 | Lit | 20 | Lit | 40 1 20 1 |
| 2 | 40 | Lit | 20 | Unlit | 40 1 20 0 |
| 2 | 40 | Unlit | 20 | Lit | 40 0 20 1 |
| 2 | 40 | Unlit | 20 | Unlit | 40 0 20 0 |

Projector error occurring (including warning) : Returns "ERR4".

(9) [Input switch list inquiry] INST?

This command obtains the input switch list.

The projector responds as follows:

When normal :

Returns a source No. whose input can be switched.

The source Nos. examples are as follows : (The input channel varies depending on the model.)

Source No. 21 : Projector input Video

Source No. 22 : Projector input S-Video

Source No. 31 : Projector input Input A

Source No. 32 : Projector input Input B

Source No. 33 : Projector input Input C

Source No. 34 : Projector input Input D

Source No. 35 : Projector input Input E

Source No. 36 : Projector input Input F

Source No. 41 : Projector input USB

Source No. 51 : Projector input Network

Therefore, the response will be as follows for example:

(The number of the input channels varies depending on the model.)

“21 22 31 32 33”

Unacceptable period (when the power status is other than Power ON) : Returns “ERR3”.

Projector error occurring (including warning) : Returns “ERR4”.

(10)[Projector name inquiry] NAME?

This command obtains the projector name.

The projector responds as follows :

When normal :

Returns a projector name. (The projector name is displayed as a nickname for the projector’s GUI.)

Returns a space when no projector name is set.

Projector error occurring (including warning) : Returns “ERR4”.

(11)[Manufacturer name inquiry] INF1?

This command obtains the manufacturer name.

The projector responds as follows:

When normal : Returns a manufacturer name (SONY).

Projector error occurring (including warning) : Returns “ERR4”.

(12)[Model name inquiry] INF2?

This command obtains the model name.

The projector responds as follows:

When normal : Returns a model name.

Projector error occurring (including warning) : Returns “ERR4”.

(13)[Other information inquiry] INFO?

This command obtains other information.

The projector responds as follows:

When normal : Returns a space.

Projector error occurring (including warning) : Returns “ERR4”.

(14)[Class information inquiry] CLSS?

This command obtains the class information.

The projector responds as follows:

When normal : Returns “1”.

Projector error occurring (including warning) : Returns “ERR4”.

このマニュアルに記載されている事柄の著作権は当社にあります。

従って、当社の許可なしに無断で複写したり、説明内容（操作、保守等）と異なる目的で本マニュアルを使用することを禁止します。

The material contained in this manual consists of information that is the property of Sony Corporation.

Sony Corporation expressly prohibits the duplication of any portion of this manual or the use thereof for any purpose other than the operation or maintenance of the equipment described in this manual without the express written permission of Sony Corporation.

Le matériel contenu dans ce manuel consiste en informations qui sont la propriété de Sony Corporation.

Sony Corporation interdit formellement la copie de quelque partie que ce soit de ce manuel ou son emploi pour tout autre but que des opérations ou entretiens de l'équipement à moins d'une permission écrite de Sony Corporation.

Das in dieser Anleitung enthaltene Material besteht aus Informationen, die Eigentum der Sony Corporation sind.

Die Sony Corporation untersagt ausdrücklich die Vervielfältigung jeglicher Teile dieser Anleitung oder den Gebrauch derselben für irgendeinen anderen Zweck als die Bedienung oder Wartung der in dieser Anleitung beschriebenen Ausrüstung ohne ausdrückliche schriftliche Erlaubnis der Sony Corporation.

VPL-CW258 (CN)
VPL-CW255 (SY)
VPL-CW275 (SY)
VPL-CW278 (CN)
VPL-CX238 (CN)
VPL-CX235 (SY)
VPL-CX275 (SY)
VPL-CX278 (CN)
VPL-EW130 (CN)
VPL-EW130 (SY)
VPL-SX125 (CN)
VPL-SX125 (SY)
VPL-SX135 (CN)
VPL-SW125 (CN)
VPL-SW125 (SY) E
9-968-822-05

Sony Corporation

Printed in Japan
2013. 3 32
©2011