User's Manual

Model 810518803
AQ2200-631
10Gbit/s Optical Receiver
Remote Commands

YOKOGAWA
Yokogawa Electric Corporation

IM 810518803-17E
1st Edition

Introduction

Thank you for your purchasing of this AQ2200-631 10Gbit/s Optical Receiver.

This User's Manual for remote command describes the following interface functions and their related commands.

- GP-IB interface
- Ethernet interface

Before starting operation of this module, thoroughly read this manual to use the product properly.

After reading this manual, always store it in a safe place where all concerned personnel can refer to it immediately.

This manual is useful if the operator have forgotten proper operation steps during operation. In addition to this manual, two kinds of manuals shown below are provided for the AQ2200-631.

Therefore, you need to read the following two manuals, as well as this user's manual.

Manual Item	Manual No.	Description
AQ2200-631 10Gbit/s Optical Receiver User's Manual	IM810518803-01E	This manual describes all functions of the AQ2200-631 except for the communication functions, and proper operating procedures.
AQ2200-631 10Gbit/s Optical Receiver Remote Commands User's Manual	IM810518803-17E	This user's manual. The manual describes the communication functions (remote control functions) of the AQ2200-631.

Additionally, you must also read the manual for AQ2201/AQ2202 Frame Controller, a main unit, on which the AQ2200-631 is to be mounted.

Furthermore, when performing the BER measurement of the 10Gbit/s-band optical interface by combining optional units, such as BERT module*1, light source module*2, and optical modulation module *3 of the AQ2200-series, thoroughly read relevant manuals.

*1: AQ2200-601 10Gbit/s BERT Module
*2: AQ2200-111 DFB-LD Module
*3: AQ2200-621/622 10Gbit/s Optical Modulator

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions. The figures given in this manual may differ from the actual screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
- Copying or reproducing all or any part of the contents of this manual without the permission of Yokogawa Electric Corporation is strictly prohibited.
- This unit uses Montavista Linux.

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How to Use This Manual

Structure of This Manual

This user's manual consists of the following sections:

Chapter	Title	Description
1	Functional Description	This Chapter describes the overview, specifications, and command format of the remote function of this unit.
2	Preparations for Connection	This Chapter describes how to set up the GP-IB and Ethernet interfaces of this unit.
3	Common Commands	This Chapter describes the commands common to all AQ2200-series modules.
4	Unit Specific Commands	This Chapter describes the function commands specific to this module.
5	Remote Command Errors	This Chapter describes the errors that occur when using the remote commands.
6	Troubleshooting	This Chapter describes the troubleshooting procedures.
	Appendix	This Appendix describes the list of commands of this module.

Contents

Chapter 1 Functional Description

1.1 Overview

This remote control function remotely controls the AQ2200-series Frame Controller using an external controller, such as personal computer through the GP-IB or Ethernet interface.

This user's manual describes the remote control functions of "AQ2200-631 10Gbit/s Optical Receiver".

1.2 Connections

For details about connections, see the Remote Command Reference for AQ2201/AQ2202 Frame Controller.

1.3 Specifications of Remote Control Functions

The following shows the specifications of the GP-IB and Ethernet remote control functions.

Specifications of GP-IB remote control function

Item	Specifications
GP-IB address	0 to 30 (Default value: 20)
Delimiter code	"EOI" is put at the end of the data.

Specifications of Ethernet remote control function

Item	Specifications
IP Address	∗.∗.∗.∗ ("∗" shows a numeric value ranging from "0" to "255".) Factory default setting:192.168.1.1
SubNetmask	∗.∗.∗.∗ ("∗" shows a numeric value ranging from "0" to "255".) Factory default setting: 255.255.255.254
Gateway	∗.∗.∗.∗ ("∗" shows a numeric value ranging from "0" to "255".) Factory default setting: No default setting
Port No.	0 to 65535 Factory default setting: 50000
Communication protocol	TCP/IP With Client Server Model, Frame Controller functions as Server.
Delimiter	CR LF (2 bytes)

1.4 Command Format

(1) When the frame No., slot No., and device No. are specified, this manual describes each No. as shown below.

Frame: m

Frame controller → 0

Slot No.: n

AQ2201 → 1 to 3

AQ2202 → 1 to 9

(2) The command in the portion enclosed by [ ] can be omitted.

When the frame No. [m] is omitted, the frame No. becomes “0”.

When the slot No. [n] is omitted, the slot No. becomes “1”.

Example) :SLOT[n]:IDN?, :STATUS[n]?, etc.

(3) When describing a command, the lower case character portion can be omitted.

Example) SYSTem

- Correct description
  SYSTem, SyStEm, SYST, sysTEM, syst, SYSTEm, SYSTeM, System, sYSTEM, syST, etc.
- Incorrect description
  SYSTe, SYS, SYSTemm, syste, etc.

(4) Items described in < > in the syntax and response of the command show parameters. Parameter name is described in < >.

Example) syntax :SENSe[n]:THReshold:DATA <threshold>

parameters <state>

response <status>

(5) If there are multiple parameters, they are separated by a comma (,).

Example) response <Manufacturer>, <Model>, <Serial Numbers>, <Firmware Revision>

There are also commands, which do not have any parameters.

Example) :SLOT[n]:IDN?

(6) Items that “I” is described in Range of the parameter show that one element is selected from those listed. (A | B = Either A or B is selected.)

Example) Range: OFF | ON

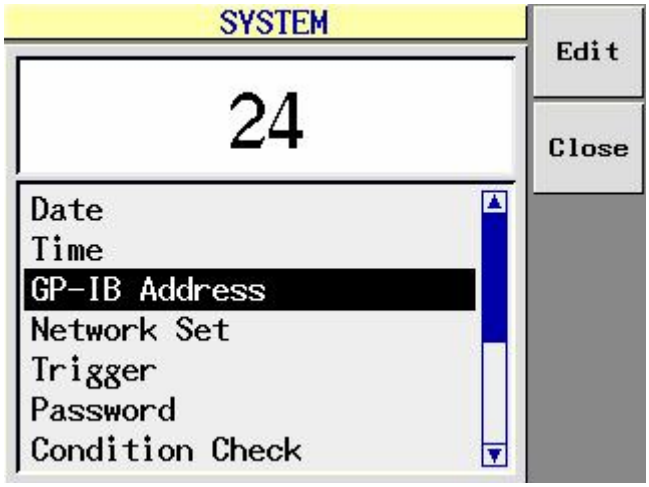
For details, see the Remote Command Reference for AQ2201/AQ2202 Frame Controller.

Chapter 2 Preparations for Connection

2.1 Connecting through GP-IB

When connecting multiple units, a different address needs to be set for the GP-IB address.
Follow the steps below to set the GP-IB address.

1. Press the [SYSTEM] key to display the SYSTEM screen.
2. With the [▲] or [▼] key, move the cursor to "GP-IB Address" and press the <Edit> or [ENTER] key.
3. With the ten-key pad or the [▲] or [▼] key, change the address.
4. After the input has been completed, press the <OK> or [ENTER] key.



GP-IB Address Display Screen

Note

In this Chapter, keys are indicated as described below.

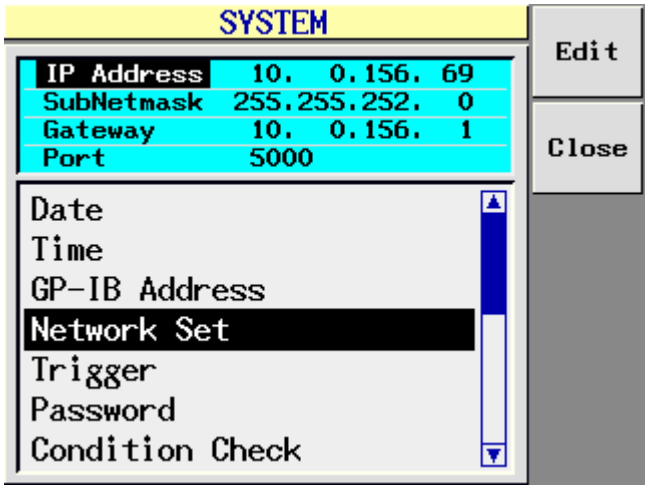
- Hard key: [ ]
- Parameter item: " "
- Function key: < >

2.2 Connecting through Ethernet

A different address needs to be set for the network address of each unit in order to identify the unit to be connected to the network.

Follow the steps below to set the network address.

1. Press the [SYSTEM] key to display the system screen.
2. With the [▲] or [▼] key, move the cursor to "Network Set" and press the <Edit> or [ENTER] key.
3. With the [▲] or [▼] key, move the cursor to "IP Address", "SubNetmask", or "Gateway", and press the <Edit> or [ENTER] key to select it.
4. With the ten-key pad or the [▲] or [▼] key, change the numeric value and press the <OK> or [ENTER] key.
5. Repeat steps 3 and 4 to input all parameters, "IP Address", "SubNetmask", and "Gateway".
6. After all parameters have been input, press the <Close> or [CANCEL] key.
7. To make the set numeric values valid, turn OFF the power and turn it ON again.



Network Address Display Screen

Note

For "IP Address", "SubNetmask", and "Gateway" of Network Set items, the numeric values you have input become valid after the power has been turned OFF and it has been turned ON again (Power OFF →ON). The previous status is retained unless the power is turned OFF and it is turned ON again.

Chapter 3 Common Commands

3.1 Common Commands

This Chapter describes the commands common to all modules.

:SLOT[n]:IDN?

description Obtains the module information.
response <Manufacturer>,<Model>,<Serial Numbers>,<Firmware Revision>
example :SLOT:IDN?
→ YOKOGAWA,AQ2200-631,813D00051,01.00

:SLOT[n]:OPC?

description Obtains the command process status.
response <status>
Type: integer
Range: 0 | 1
0: Process is in progress.
1: Process is completed.

:SLOT[n]:OPTions?

description Obtains the module information.
response <option>
Type: integer

Bit

7	6	5	4	3	2	1	0

Bit	Item Name	Value
2 – 0	Wavelength	011: 1.3μm / 1.5μm
3	PD Type	0: PIN-PD
4	Not used.	0
5	Option2	1: Limiting Amp
6	Bitrate	0: 10Gbit/s
7	Logic	0: Normal

example :SLOT:OPT? → 3

:SLOT[n]:PRESet

description Returns the setting information to the factory default setting status.

:SLOT[n]:TST?

description Obtains the self-test results.
response <result>
Type: integer
Range: 0: Correct
Value other than “0”: Faulty

If the value is not “0”, the bit value corresponding to the fault item becomes “1”.

Bit	7	6	5	4	3	2	1	0

Bit	Item Name
0	Upgrade Memory error
1	ID Information Memory error
2	Temperature alarm
6-3	Not used.
7	A/D error

Chapter 4 Unit Specific Commands

4.1 Unit Specific Commands

This Chapter describes the function commands of the AQ2200-631.

:STATUS[n]?

description Obtains the alarm information.
response <alarm>
Type: integer

Bit

3	2	1	0

Bit	Item Name	Obtained Value
1 – 0	Temperature alarm	00: Correct status 01: The temperature exceeds the upper limit of the operating temperature. This may cause an operational fault.
2	LOS alarm	0: Correct 1: Faulty
3	OVERLOAD alarm	0: Correct 1: Faulty

:SENSe[n]: THReshold:DATA

syntax :SENSe[n]: THReshold:DATA <threshold>
description Sets a data threshold value level.
parameters <threshold>
Type: integer
Range: -364 to 273 (1 Step)
Default: 0
example :SENS:THR:DATA 150

:SENSe[n]:THReshold:DATA?

description Obtains the set value of the data threshold level.
response <threshold>
Type: integer
Range: -364 to 273 (1 Step)

:OUTPut[n]:STATe

syntax :OUTPut[n]:STATe <state>
description Sets the data output to ON or OFF.
parameters <state>
Type: discrete
Range: OFF | ON
OFF: Data output is OFF.
ON: Data output is ON.
Default: ON
example :OUTP:STAT ON

:OUTPut[n]:STATe?

description Obtains the data output status.
response <state>
Type: discrete
Range: OFF | ON

: INPut[n]:POWer?

description Obtains the average optical input power value.
response <power>
Type: decimal

:SENSe[n]:OVER[:LEVel]

syntax :SENSe[n]:OVLD[:LEVel] <overload>
description Sets an OVERLOAD detection level.
parameters <overload>
Type: decimal
Range: -19.0 to 2.0 (0.1dBm Step)
Default: -1.0
example :SENS:OVLD -10.0

:SENSe[n]:OVER[:LEVel]?

description Obtains the set value of the OVERLOAD detection level.
response <overload>
Type: decimal
Range: -19.0 to 2.0 (0.1dBm Step)

:SENSe[n]:LOS[:LEVel]

syntax :SENSe[n]:LOS[:LEVel] <los>
description Sets a LOS detection level.
parameters <los>
Type: decimal
Range: -19.0 to 2.0 (0.1dBm Step)
Default: -16.0 (Wavelength is 1500nm.)
-15.0 (Wavelength is 1300nm.)
example :SENS:LOS -10.0

:SENSe[n]:LOS[:LEVel]?

description Obtains the set value of the LOS detection level.
response <los>
Type: decimal
Range: -19.0 to 2.0 (0.1dBm Step)

:INPut[n]:WAVelength

syntax :INPut[n]:WAVelength <length>
description Sets a wavelength band of the receive light signal.
parameters <length>
Type: discrete
Range: 1500NM | 1300NM
1500NM: 1500nm
1300NM: 1300nm
Default: 1500NM
example :INPut:WAV 1500NM

:INPut[n]: WAVelength?

description Obtains the wavelength band setting status of the receive light signal.
response <length>
Type: discrete
Range: 1500NM | 1300NM

Chapter 5 Remote Command Errors

5.1 Remote Command Errors

This Chapter describes errors that occur when using the remote command.

The following shows the error messages caused by the remote command.

For details about other errors, see the list of error codes stated in the Operation Manual for AQ2200 multi-application system.

Additionally, the flag set information on standard, status, and register is described in Type.

CME: Command error

EXE: Execution error

DDE: Device error

QYE: Query error

Remote Command Errors (1/2)

Code	Item	Description
1030	Message	Command Error
	Contents	Command error
	Remedy	Check the command and send it again.
	Type	CME
1031	Message	Syntax Error
	Contents	Syntax error
	Remedy	Check the command syntax and send the command again.
	Type	CME
1032	Message	Parameter Error
	Contents	Parameter error
	Remedy	Check the command parameter and send the command again.
	Type	CME
1033	Message	Execution Error
	Contents	Execution error
	Remedy	Check the command and send it again.
	Type	EXE
1034	Message	Data out of range
	Contents	Data is beyond the setting range.
	Remedy	Check the setting range and send the command again.
	Type	EXE
1036	Message	Queue Overflow
	Contents	Error queue overflow
	Remedy	Read out the error or clear the error queue.
	Type	DDE
1037	Message	Query Error
	Contents	Query error
	Remedy	Check the command and send it again.
	Type	CME

Remote Command Errors (2/2)

Code	Item	Description
2031	Message	Invalid update memory
	Contents	Update Memory of the Firmware is faulty.
	Remedy	Update the firmware again.
	Type	DDE
2032	Message	Invalid ID information memory
	Contents	Update Memory of the Firmware is faulty.
	Remedy	Hardware is faulty.
	Type	DDE
2033	Message	Temperature limit error
	Contents	Temperature error is detected.
	Remedy	Check whether or not the temperature of the installation place is too high.
	Type	DDE
2036	Message	A/D timeout error
	Contents	A/D conversion is failed.
	Remedy	Hardware is faulty.
	Type	DDE

Chapter 6 Troubleshooting

6.1 Troubleshooting

(1) The setting does not become valid even though the setting command is sent.
Send ":SYST:ERR?" command to check the error contents. After that, send the correct command.

(Example) Parameter value beyond the setting range is specified.

```
>  :SENS3:LOS:LEV -20.0 (Parameter value beyond the range is set.)
>  :SYST:ERR?
<  +1034, “Data out of range”


>  :SENS3:LOS:LEV -10.0 (Parameter value within the range is set.)
>  :SYST:ERR?
<  +0, “No Error””
```

(2) Command process time
According to the command, it takes a long time to make the setting, causing "Timeout Error" to occur.
If this occurs, wait for enough time after the command has been sent and send the next command or send the next command after the command has been completed by the OPC command.

(Example) The completion of the command is checked with :SLOT:OPC command.

```
>  :SENS3:LOS:LEV -15.0
>  :SLOT3:OPC?
<  0
.
.
>  :SLOT3:OPC?
<  1

>  :SENS3:LOS:LEV -15.5
```

- The following shows the response of :SLOT:OPC? command.
  - 0: Command is being processed.
  - 1: Command process is completed.

Appendix

Appendix 1 List of Commands

Common Commands

Command	Description	Page
:SLOT[n]:IDN?	Obtains the module information.	3-1
:SLOT[n]:OPC?	Obtains the command processing status.	3-1
:SLOT[n]:OPTions?	Obtains the module information.	3-1
:SLOT[n]:PRESet	Returns the set information to its factory default setting.	3-1
:SLOT[n]:TST?	Obtains the self-test results.	3-2

Unit Specific Commands

Command	Description	Page
:STATUS[n]?	Obtains the alarm information.	4-1
:SENSe[n] THReshold:DATA	Sets a data threshold value level.	4-1
:SENSe[n]:THReshold:DATA?	Obtains the data threshold value level.	4-1
: OUTPut[n]:STATe	Sets the data output to ON or OFF.	4-2
: OUTPut[n]:STATe?	Obtains the status of the data output.	4-2
: INPut[n]:POWer?	Obtains the average optical input power value.	4-2
:SENSe[n]:OVER[:LEVel]	Sets an OVERLOAD detection level.	4-2
:SENSe[n]:OVER[:LEVel]?	Obtains the set value of the OVERLOAD detection level.	4-2
:SENSe[n]:LOS[:LEVel]	Sets a LOS detection level.	4-3
:SENSe[n]:LOS[:LEVel]?	Obtains the set value of the LOS detection level.	4-3
:INPut[n]:WAVelength	Sets a wavelength band of the receive light signal.	4-3
:INPut[n]:WAVelength?	Obtains the wavelength band setting of the receive light signal.	4-3