ADVANTEST®

ADVANTEST CORPORATION

Q8134

Multi-channel Optical Source

Operation Manual

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Safety Summary

To ensure thorough understanding of all functions and to ensure efficient use of this instrument, please read the manual carefully before using. Note that Advantest bears absolutely no responsibility for the result of operations caused due to incorrect or inappropriate use of this instrument.

If the equipment is used in a manner not specified by Advantest, the protection provided by the equipment may be impaired.

- **Warning Labels**

  Warning labels are applied to Advantest products in locations where specific dangers exist. Pay careful attention to these labels during handling. Do not remove or tear these labels. If you have any questions regarding warning labels, please ask your nearest Advantest dealer. Our address and phone number are listed at the end of this manual.

  Symbols of those warning labels are shown below together with their meaning.

  DANGER: Indicates an imminently hazardous situation which will result in death or serious personal injury.

  WARNING: Indicates a potentially hazardous situation which will result in death or serious personal injury.

  CAUTION: Indicates a potentially hazardous situation which will result in personal injury or a damage to property including the product.

- **Basic Precautions**

  Please observe the following precautions to prevent fire, burn, electric shock, and personal injury.

  - Use a power cable rated for the voltage in question. Be sure however to use a power cable conforming to safety standards of your nation when using a product overseas.
  - When inserting the plug into the electrical outlet, first turn the power switch OFF and then insert the plug as far as it will go.
  - When removing the plug from the electrical outlet, first turn the power switch OFF and then pull it out by gripping the plug. Do not pull on the power cable itself. Make sure your hands are dry at this time.
  - Before turning on the power, be sure to check that the supply voltage matches the voltage requirements of the instrument.
  - Connect the power cable to a power outlet that is connected to a protected ground terminal. Grounding will be defeated if you use an extension cord which does not include a protected ground terminal.
  - Be sure to use fuses rated for the voltage in question.
  - Do not use this instrument with the case open.
  - Do not place anything on the product and do not apply excessive pressure to the product. Also, do not place flower pots or other containers containing liquid such as chemicals near this

product.

- When the product has ventilation outlets, do not stick or drop metal or easily flammable objects into the ventilation outlets.
- When using the product on a cart, fix it with belts to avoid its drop.
- When connecting the product to peripheral equipment, turn the power off.

- **Caution Symbols Used Within this Manual**

Symbols indicating items requiring caution which are used in this manual are shown below together with their meaning.

DANGER: Indicates an item where there is a danger of serious personal injury (death or serious injury).

WARNING: Indicates an item relating to personal safety or health.

CAUTION: Indicates an item relating to possible damage to the product or instrument or relating to a restriction on operation.

- **Safety Marks on the Product**

The following safety marks can be found on Advantest products.

 : ATTENTION - Refer to manual.

 : Protective ground (earth) terminal.

 : DANGER - High voltage.

 : CAUTION - Risk of electric shock.

- **Replacing Parts with Limited Life**

The following parts used in the instrument are main parts with limited life.
Replace the parts listed below before their expected lifespan has expired to maintain the performance and function of the instrument.
Note that the estimated lifespan for the parts listed below may be shortened by factors such as the environment where the instrument is stored or used, and how often the instrument is used.
The parts inside are not user-replaceable. For a part replacement, please contact the Advantest sales office for servicing.

Each product may use parts with limited life.
For more information, refer to the section in this document where the parts with limited life are described.

Main Parts with Limited Life

Part name	Life
Unit power supply	5 years
Fan motor	5 years
Electrolytic capacitor	5 years
LCD display	6 years
LCD backlight	2.5 years
Floppy disk drive	5 years
Memory backup battery	5 years

- **Hard Disk Mounted Products**

The operational warnings are listed below.

- Do not move, shock and vibrate the product while the power is turned on.
  Reading or writing data in the hard disk unit is performed with the memory disk turning at a high speed. It is a very delicate process.

- Store and operate the products under the following environmental conditions.
  An area with no sudden temperature changes.
  An area away from shock or vibrations.
  An area free from moisture, dirt, or dust.
  An area away from magnets or an instrument which generates a magnetic field.

- Make back-ups of important data.
  The data stored in the disk may become damaged if the product is mishandled. The hard disc has a limited life span which depends on the operational conditions. Note that there is no guarantee for any loss of data.

- **Precautions when Disposing of this Instrument**

When disposing of harmful substances, be sure dispose of them properly with abiding by the state-provided law.

Harmful substances: (1) PCB (polycarbon biphenyl)
(2) Mercury
(3) Ni-Cd (nickel cadmium)
(4) Other
Items possessing cyan, organic phosphorous and hexadic chromium and items which may leak cadmium or arsenic (excluding lead in solder).

Example: fluorescent tubes, batteries

Environmental Conditions

This instrument should be only be used in an area which satisfies the following conditions:

- An area free from corrosive gas
- An area away from direct sunlight
- A dust-free area
- An area free from vibrations
- Altitude of up to 2000 m

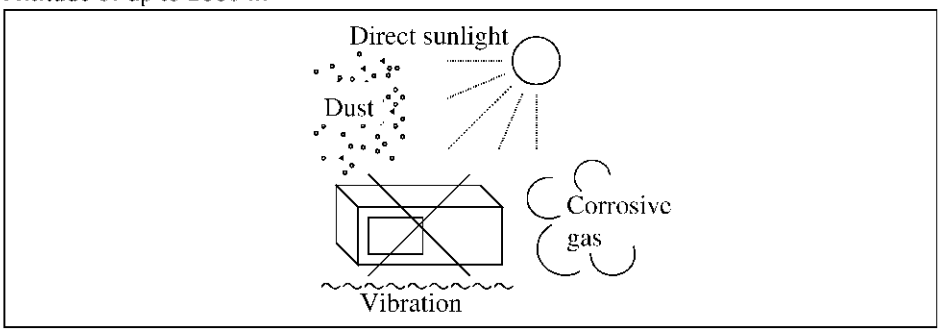


Figure-1 Environmental Conditions

- Operating position

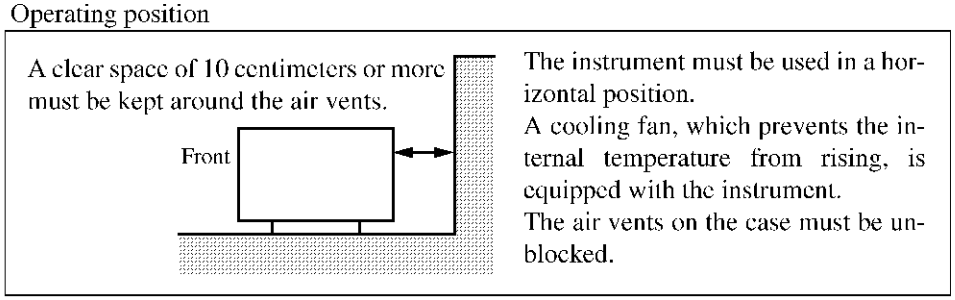


Figure-2 Operating Position

- Storage position

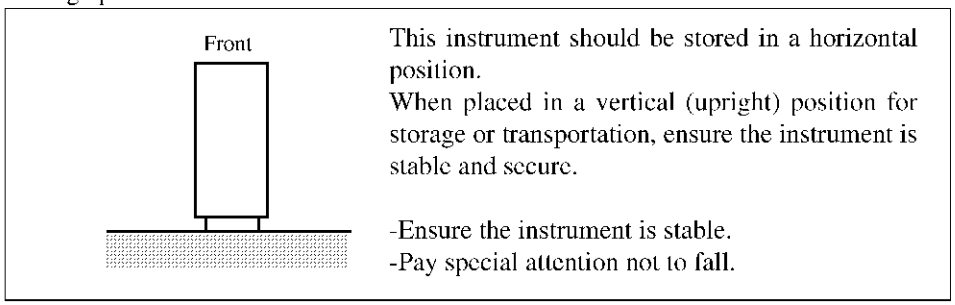


Figure-3 Storage Position

- The classification of the transient over-voltage, which exists typically in the main power supply, and the pollution degree is defined by IEC61010-1 and described below.

  Impulse withstand voltage (over-voltage) category II defined by IEC60364-4-443

  Pollution Degree 2

Types of Power Cable

Replace any references to the power cable type, according to the following table, with the appropriate power cable type for your country.

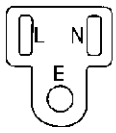
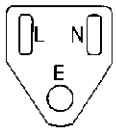
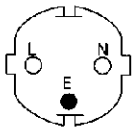
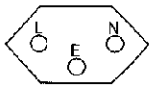
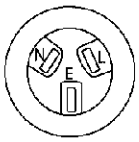
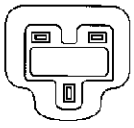
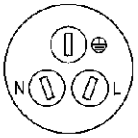
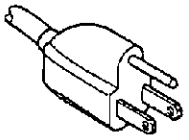
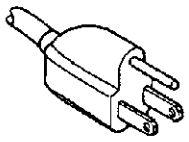
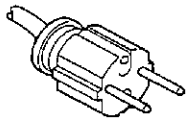
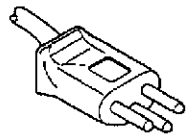
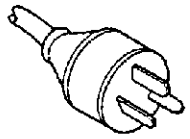
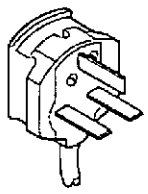
Plug configuration	Standards	Rating, color and length	Model number (Option number)
	PSE: Japan Electrical Appliance and Material Safety Law	125 V at 7 A Black 2 m (6 ft)	Straight: A01402 Angled: A01412
	UL: United States of America CSA: Canada	125 V at 7 A Black 2 m (6 ft)	Straight: A01403 (Option 95) Angled: A01413
	CEE: Europe DEMKO: Denmark NEMKO: Norway VDE: Germany KEMA: The Netherlands CEBEC: Belgium OVE: Austria FIMKO: Finland SEMKO: Sweden	250 V at 6 A Gray 2 m (6 ft)	Straight: A01404 (Option 96) Angled: A01414
	SEV: Switzerland	250 V at 6 A Gray 2 m (6 ft)	Straight: A01405 (Option 97) Angled: A01415
	SAA: Australia, New Zealand	250 V at 6 A Gray 2 m (6 ft)	Straight: A01406 (Option 98) Angled: ---------
	BS: United Kingdom	250 V at 6 A Black 2 m (6 ft)	Straight: A01407 (Option 99) Angled: A01417
	CCC:China	250 V at 10 A Black 2 m (6 ft)	Straight: A114009 (Option 94) Angled: A114109

Table of Power Cable Options

There are six power cable options (refer to following table).

Order power cable options by Model number.

	Plug configuration	Standards	Rating, color and length	Model number (Option number)
1		JIS: Japan Law on Electrical Appliances	125 V at 7 A Black 2 m (6 ft)	Straight: A01402 Angled: A01412
2		UL: United States of America CSA: Canada	125 V at 7 A Black 2 m (6 ft)	Straight: A01403 (Option 95) Angled: A01413
3		CEE: Europe DEMKO: Denmark NEMKO: Norway VDE: Germany KEMA: The Netherlands CEBEC: Belgium OVE: Austria FIMKO: Finland SEMKO: Sweden	250 V at 6 A Gray 2 m (6 ft)	Straight: A01404 (Option 96) Angled: A01414
4		SEV: Switzerland	250 V at 6 A Gray 2 m (6 ft)	Straight: A01405 (Option 97) Angled: A01415
5		SAA: Australia, New Zealand	250 V at 6 A Gray 2 m (6 ft)	Straight: A01406 (Option 98) Angled: ---------
6		BS: United Kingdom	250 V at 6 A Black 2 m (6 ft)	Straight: A01407 (Option 99) Angled: A01417

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1. SAFETY INSTRUCTIONS

1.1 Terminologies and Symbols

To assure safety operations, the tester and this manual use the following terminologies and symbols.

Table 1-1 Terminologies and Symbols Printed on the Tester

Symbol	Terminology and explanation
	Caution! This symbol is indicated where you should refer to the instruction manual to assure your safety.
	Ground (GND) terminal This symbol identifies the terminal to be grounded.

Table 1-2 Terminologies Used on the Instruction Manual

Terminology	Explanation
Caution	The general handling notes and cautions that you should use to avoid any chance to damage the system or any attached device.

1.2 Power Supply and Fuses

1.2.1 Power supply used

The Q8134 uses the power supply having the specifications defined on Table 1-3. It can operate within the voltage range of 90 to 250VDC without switching.

Table 1-3 Power Supply Used

Input voltage	90 to 250VDC
Frequency	48 to 66Hz
Power consumption	70VA or less Q8134 :25VA or loss Q81341 to Q81345 :1VA/unit or loss Q81346,Q81347 :15VA/unit or loss

CAUTION

If the power supply of the Q8134 does not satisfy the requirements of Table 1-3, do not use it. If used, the system may be damaged.

1.2.2 Power cable

The power cable has a three-pin plug, and its round pin must be grounded. Try to use the three-pin power receptacle having the ground terminal.
If you need to use a two-pin adapter, connect the ground lead of the adapter or the GND terminal of the Q8134 rear panel to the external GND terminal.

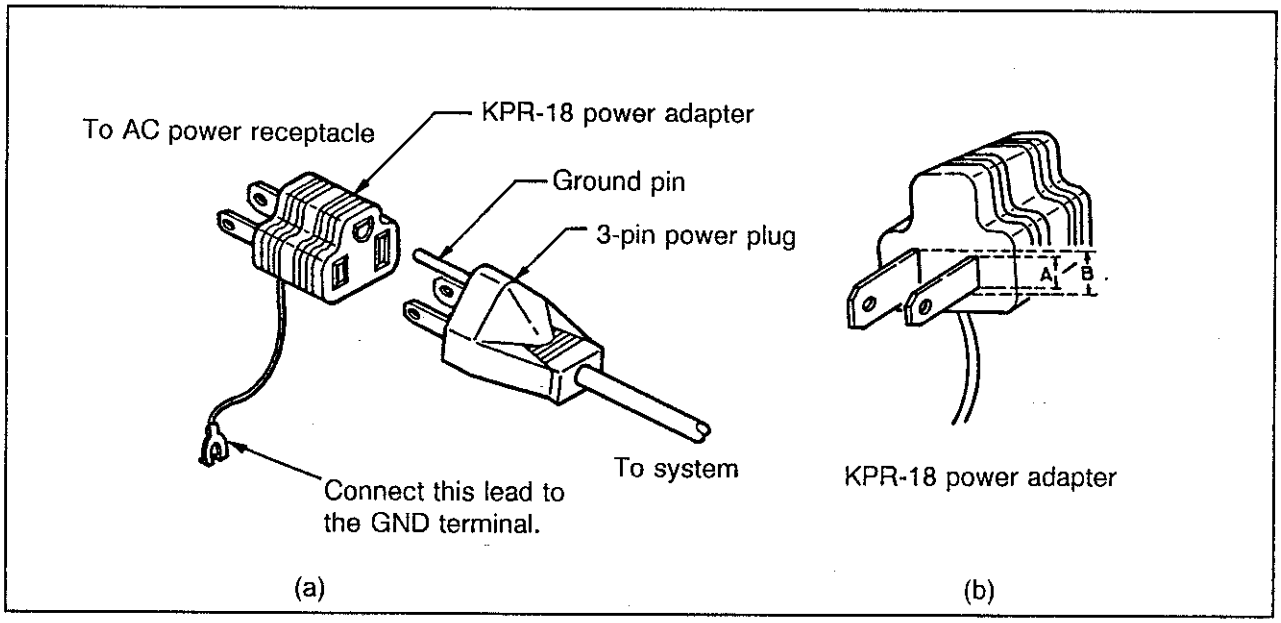


Figure 1-1 Power Cable Plug and Adapter

The KPR-18 power adapter of the accessory kit satisfies the Electric Appliances Regulations. The adapter has the different width of electrodes of A and B as shown in Figure 1-1 (b). Insert the power plug into the receptacle with the correct direction.
If you cannot plug the KPR-18 power adapter into the receptacle due to the different width of electrodes, use the optional KPR-13 adapter.

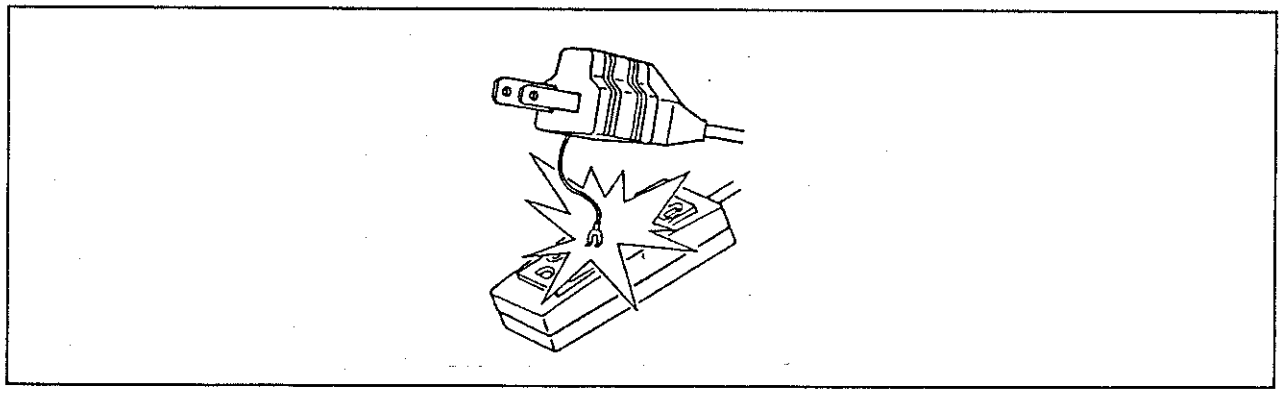


Figure 1-2 A Shortcircuit Caused by the Ground Leads

CAUTION

When you plug the power cable using the power adapter, take care not to cause a contact of the ground lead to the AC power line (Figure 1-2). If you have made an erroneous contact of the lead, the attached devices and equipment may be damaged.

1.2.3 Replacing the fuse

Check the fuse or replace the blown fuse in the following procedure:

① Unplug the power cable from the AC power connector.

② Remove the fuse holder toward you using a screwdriver or others.

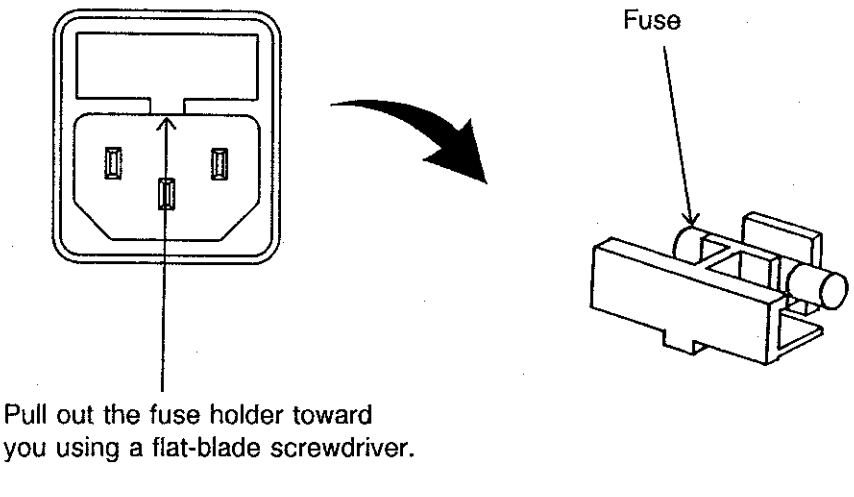


Figure 1-3 Checking the Fuse Blow

③ If the fuse is blown on the fuse holder, replace it with a new one (250VDC, 0.4A).

④ Mount the fuse holder and plug the power cable into receptacle.

CAUTION

Do not mount a fuse having an illegal rating, or the system may be damaged.

2. OUTLINE

2.1 System Outline

The Q8134 multi-channel optical source for optical fiber cables can accommodate up to 6 plug-in LED source units or up to 3 LD source units. Both the LED and LD units contain the temperature compensation circuits for stable optical signal output.
The output signals are GW optical light and 270Hz square wave chopper light.
Also, the Q8134 can be controlled via the GPIB. All operations of panel switches can be controlled from a distant place, and the system consisting of any other machines can easily be configured.

2.2 Specifications

The following LED and LD plug-in units are provided. You can select any of them according to your application.

2.2.1 LED plug-in unit

Item \ Model	Q81341	Q81342	Q81343
Wavelength	850 ± 25nm	1310 ± 40nm	1550 ± 30nm
Spectrum half-width	55nm or less	160nm or less	210nm or less
Output level	−15 ± 1dBm (GI 50/125μm at 2-meter fiber emitter end)	−20 ± 1dBm (GI 50/125μm at 2-meter fiber emitter end)	−43 ± 1dBm (SM 10/125μm at 2-meter fiber emitter end)
Output stability (*1)	± 0.02dB or less (for 1 hour at 23 ± 2°C) ± 0.1dB or less (for 8 hours at 10 to 40°C) ± 0.5dB or less (for 1 hour at 0 to 50°C)		± 0.04dBm or less (for 1 hour at 23 ± 2°C) ± 0.2dB or less (for 8 hours at 10 to 40°C) ± 0.6dB or less (for 1 hour at 0 to 50°C)

Item \ Model	Q81344	Q81345
Wavelength	1310 ± 10nm	1550 ± 10nm
Spectrum half-width	20 ± 5nm	20 ± 5nm
Output level	−35 ± 1dBm (GI 50/125μm at 2-meter fiber emitter end)	−53 ± 1dBm (SM 10/125μm at 2-meter fiber emitter end)
Output stability (*1)	± 0.02dB or less (for 1 hour at 23 ± 2°C) ± 0.1dB or less (for 8 hours at 10 to 40°C) ± 0.5dB or less (for 1 hour at 0 to 50°C)	± 0.04dB or less (for 1 hour at 23 ± 2°C) ± 0.2dB or less (for 8 hours at 10 to 40°C) ± 0.6dB or less (for 1 hour at 0 to 50°C)

*1 The output stability was measured when the 60-minute preheat time elapsed after power on.

2.2.2 LD plug-in unit

Item \ Model	Q81346	Q81347
Wavelength	1310 ± 10nm	1550 ± 20nm
Spectrum half-width	5nm or less	10nm or less
Output level	0 ± 1dB (SM 10/125μm at 2-meter fiber emitter end)	
Output stability (*2)	± 0.05dB or less (for 1 hour within ± 2°C of 0 to 40°C) 1dB or less (at 0 to 40°C) 2dB or less (at 0 to 50°C)	

*2 The output stability was measured when the 30-minute preheat time elapsed after power on.

2.2.3 Common specifications of plug-in units

Item	LED plug-in unit	LD plug-in unit
Output waveforms	CW light or 270Hz chopper light	
Output connector	FC type (*3)	
Dimensions	Approx. 30(W) × 80(H) × 140(D)mm	Approx. 60(W) × 85(H) × 140(D)mm
Weight	250g or less	400g or less

*3 Consult to our representative for other connectors.

2.2.4 Q8134 system specifications

Item	Specifications
No. of units accommodated	Up to 6 units
No. of slots occupied	LED plug-in unit: 1 slot LD plug-in unit: 2 slots
Remote control	GPIB (IEEE-488-1978) Functions: • Control On/off control by CW/270Hz chopper switching • Status request On/off control by CW/270Hz chopper switching
Operating environment	Temperature: 0 to 50°C Humidity: 85% or less (relative)
Storage environment	Temperature: −25 to +70°C Humidity: 90% or less (relative)
Power supply	90 to 250VAC Frequency: 48 to 66Hz
Power consumption	70VA or less Q8134: 25VA or less Q81341 to Q81345: 1VA/unit or less Q81346,Q81347: 15VA/unit or less
Dimensions	Approx. 240(W)×88(H)×310(D)mm
Weight	4kg or less
Others	The TQ8135 plug-in unit can also be used.

2.3 Accessories

When you receive the Q8134, check the following:

① The product appearance is not damaged.

② The type and quantity of accessories match the ones defined on Table 2-1.

If the delivery product has been damaged or the accessories are insufficient, contact to our nearest dealership or agency. Their addresses and phone numbers are listed at the end of this manual.

Note: When you order additional accessories, please notify the accessory type code.

Table 2-1 Accessory List

	Accessory	Type code	Quantity	Remarks
1	Power cable (2-pin adapter)	A01402 (KPR-18)	1	125V
2	Fuse	DFT-AAR4A-1	2	250V/0.4A
3	Instruction manual	JQ8134	1	Japanese text

2.4 Storage and Transportation Notes

2.4.1 Storage

If you do not use your Q8134 for a long time, avoid to store it in the following ambient conditions:

- Direct sun light
- Corrosive gas
- Excessive dusts
- Excessive vibration
- High temperature and high humidity

2.4.2 Transportation

Place your Q8134 in its packages or equivalent ones to avoid excessive vibration and mechanical shock during transportation.

3. BASIC OPERATIONS

3.1 System Panels

(1) Q8134 front panel

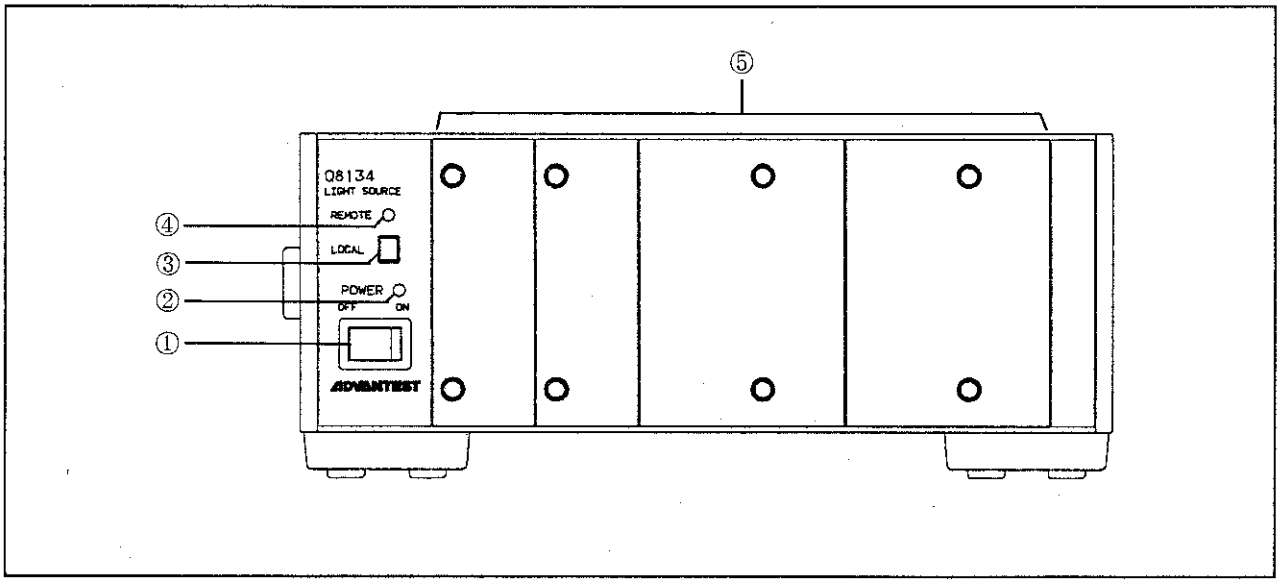


Figure 3-1 Q8134 Front Panel

① POWER switch
Turns the power supply on when it is placed in the right position. All system circuits are powered. When it is placed to the left position, the system power supply is turned off.

② POWER indicator
Lights when the POWER switch is turned on.

③ LOCAL key
Releases the remote control from a peripheral when the Q8134 is controlled via the GPIB (that is, when the REMOTE indicator is on). This key allows your manual setup on the front panel. When the power supply is turned on, the Local mode is selected.

④ REMOTE indicator
Indicates that the Q8134 is in the Remote Control mode via the GPIB interface.

⑤ Optical light source insertion slots
Always turn the system power supply OFF first, then insert or remove the optical light source unit.

(2) Q8134 rear panel

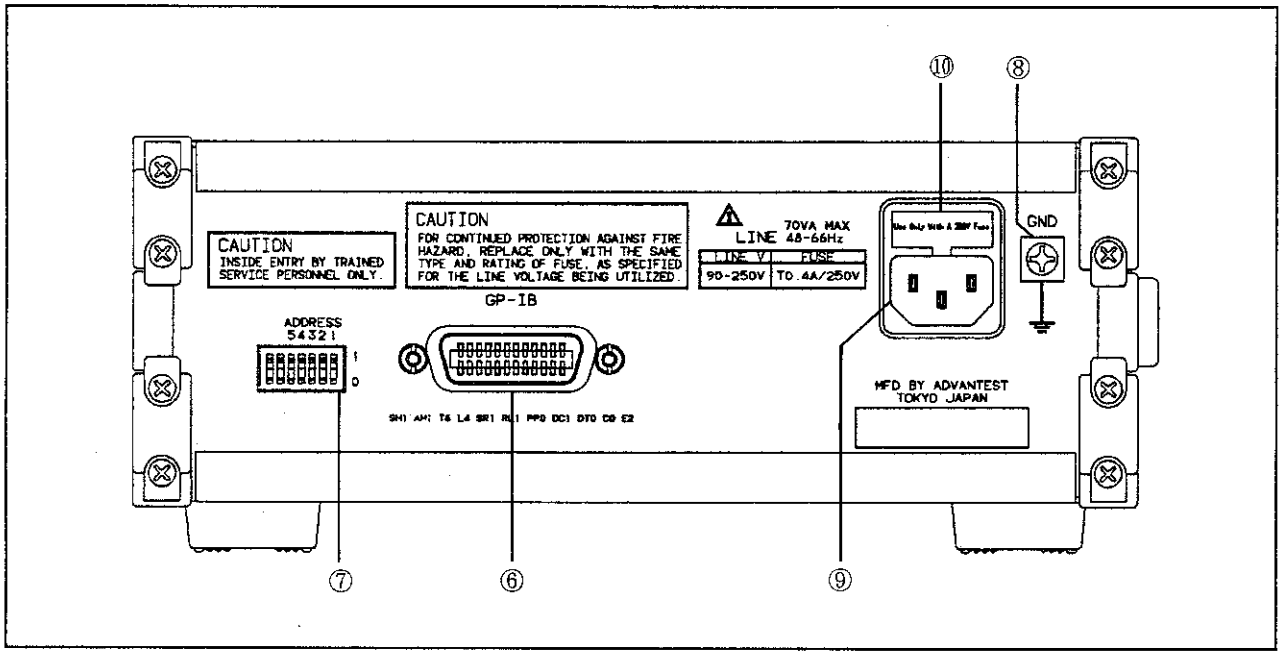


Figure 3-2 Q8134 Rear Panel

⑥ GPIB connector

This is a 24-pin connector for IEEE 488 bus. You can stack the standard bus cables, however, do not stack 3 or more connectors.

⑦ Address switch

This is a 7-bit DIP switch for system addressing by the GPIB program. Use switches 1 to 5 for addressing. Up to 31 addresses of address 0 to address 30 can be set.

⑧ GND terminal

The ground (GND) terminal of the Q8134 chassis.

When you use a dual-pin adapter for the power cable connection, connect the ground lead of the adapter to this GND terminal, or directly ground this terminal.

⑨ AC power connector

Plug the AC power cable into this connector socket.

⑩ Power fuse

The 0.4A slow-blow fuse is used.

(3) Front panel of optical source unit

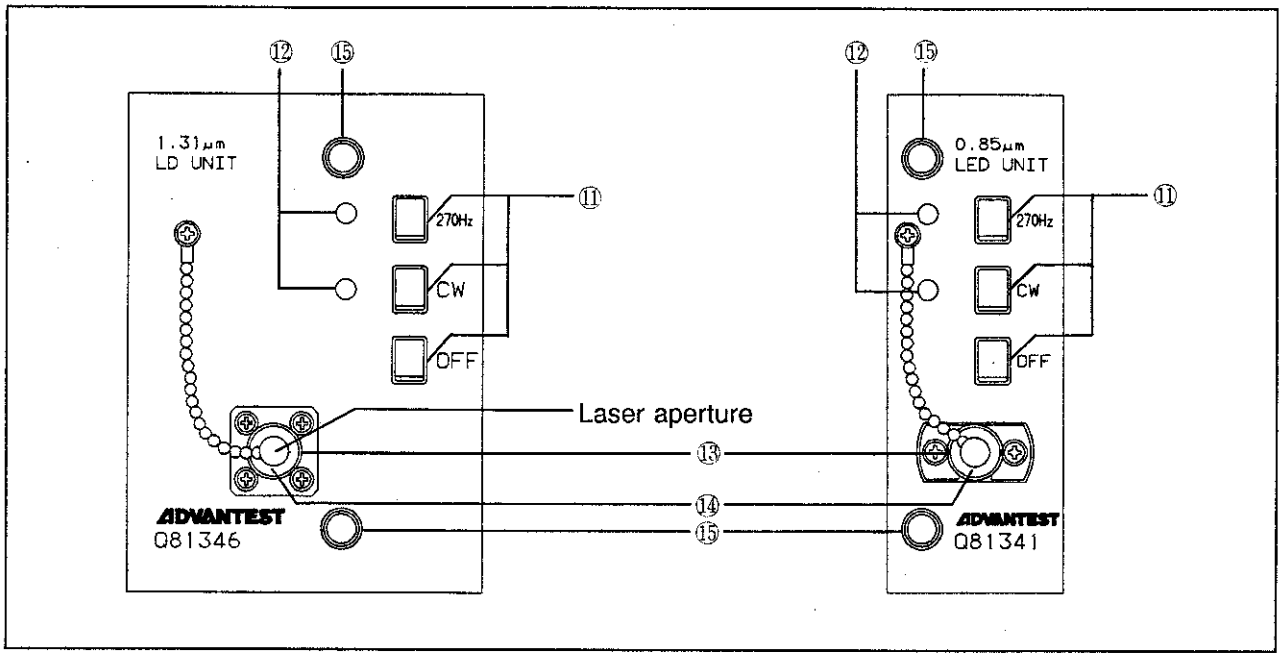


Figure 3-3 Front Panel of Optical Source Unit

⑪ Optical output mode keys

270Hz: Outputs the chopper light with 270Hz square wave modulation (50% duty).
CW: Outputs the direct current (DC) light.
OFF: Turns off the optical signal output.
(When the power supply is turned on, the key is set to OFF automatically.)

⑫ Optical output mode indicator

Indicates the current optical output mode.

The indicator lights at left to 270Hz key.:
The 270Hz chopper light is output.
The indicator lights at left to CW key.:
The DC light is output.
Both indicators are off.
No optical signal is output.

⑬ Optical output connector

The FC-type receptacle is mounted.

⑭ Protection cap

Cover the connector with the protection cap to prevent dust insertion into it.

⑮ Unit fixture knob

After you have inserted the optical light source unit into your Q8134, fix it with this knob.

3.2 Operation Procedure

3.2.1 Setup

① Turn off the POWER switch of the Q8134.

② Insert the optical source unit to be used into the slot of Q8134.

③ Turn on the POWER switch of the Q8134. The Optical Output mode will be turned off automatically. Wait for 60 minutes until the warmup ends and the output stables.

3.2.2 Operation

① Make sure that the Optical Output mode of the optical source unit is off, and plug the optical fiber cable into the optical output connector.

② Select the desired output using the optical output mode keys of the Q8134.

③ After operation, .turn off the Optical Output mode of the Q8134 using the optical output keys, and unplug the optical fiber cable from its connector.

CAUTIONS

1. Always turn off the Optical Output mode of the Q8134 first, then disconnect the optical fiber cable.
2. The optical source unit has a small output power (1/5mW or less) and it is not dangerous for human body. However, avoid to directly watch the emission end of the connected optical fiber cable terminal . (The optical beam of the LD plug-in unit expands approximately 20mm in the 2-meter distance.)
3. Wipe and clean the end of optical fiber cable with an alcohol. Use the unscratched cable only.
4. Always cover the optical output connector with the protection cap to prevent dust insertion.

4. GPIB

The Q8134 has the General Purpose Interface Buses (GPIB) satisfying the IEEE 488-1978 standards. The GPIB's allow separate control of CW light, 270Hz chopper light, and turn-off of each channel.

4.1 GPIB Standards and Specifications of Q8134

4.1.1 Bus lines

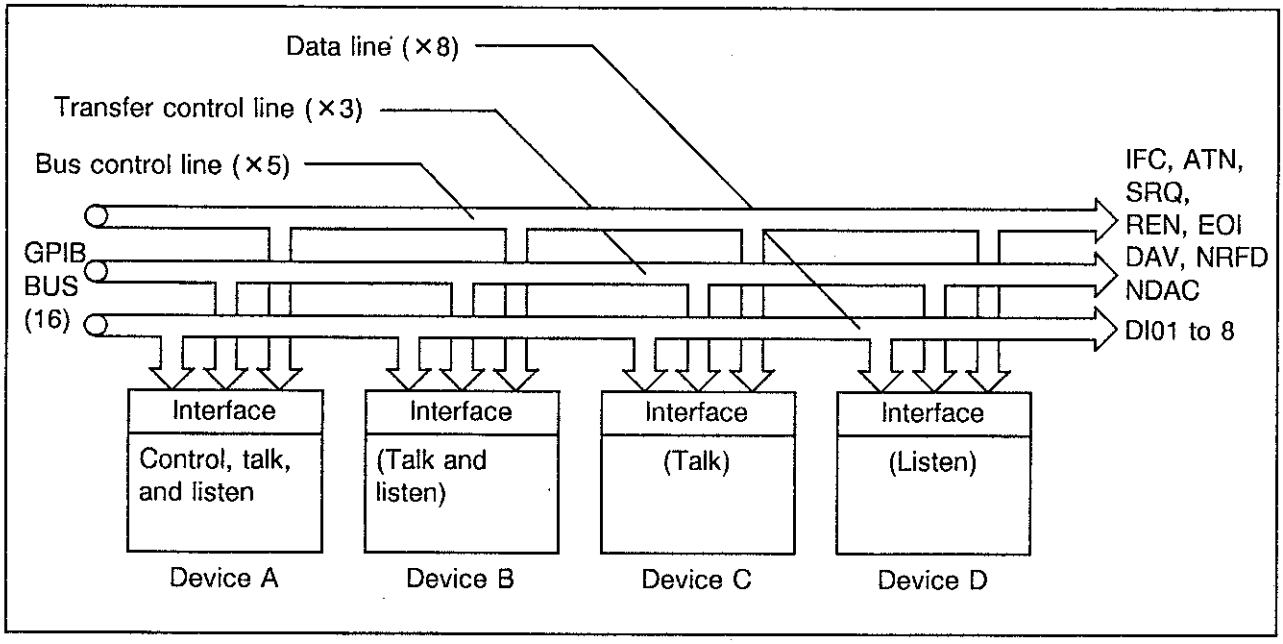


Figure 4-1 GPIB Bus Line Configuration

The GPIB bus cables consist of 8 data lines, 3 transmission control lines (handshaking lines) for control of asynchronous data transmission and reception between devices, and 5 bus control lines for control of information flow on the buses.

- Data lines
  Eight data lines are used for bit-parallel and byte-serial data transmission between devices. They allow asynchronous and bidirectional data transmission. As the system transmission is asynchronous, a high-speed device and a low-speed device can be mixed. Data (or messages) of ASCII codes are transferred between devices. They can be the measurement data, measuring condition setup data (programs), and various commands.

- Transmission control lines (handshaking lines) can handle the following signals:

  DAV (Data Valid) : Indicates the data validity.

  NRFD (Not Ready For Data) : Indicates the availability of data reception.

  NDAC (Not Data Accepted) : Indicates the completion of data reception.

- Bus control lines can handle the following signals:

  ATN (Attention) : Identifies the address or command or any other information when signals are transferred on the data line.

  IFC (Interface Clear) : Clears the interface.

  EOI (End or Identify) : Used at the end of information transmission.

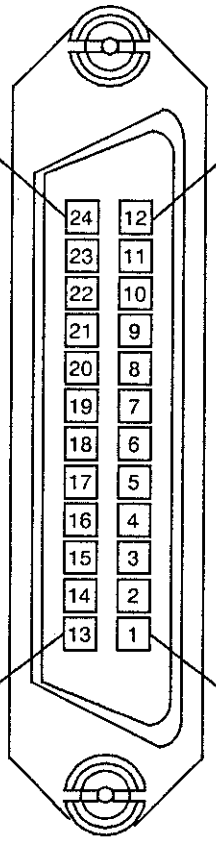
  SRQ (Service Request) : Used by any device when it requests the controller for services.

  REN (Remote Enable) : Used for remote control of a device having the remote programming functions.

4.1.2 GPIB connector

The 24-pin GPIB connector, model 57-20240-D35A (Amphenol or equivalent), is used.

Signal name	Pin No.
GND LOGIC	24
GND (ATN)	23
GND (SRQ)	22
GND (IFC)	21
GND (NDAC)	20
GND (NRFD)	19
GND (DAV)	18
REN	17
DIO 8	16
DIO 7	15
DIO 6	14
DIO 5	13



Pin No.	Signal name
12	SHIELD
11	ATN
10	SRQ
9	IFC
8	NDAC
7	NRFD
6	DAV
5	EOI
4	DIO 4
3	DIO 3
2	DIO 2
1	DIO 1

Figure 4-2 Pin Assignment of GPIB Connector

4.1.3 Specifications

Logical level : Logic 0 (High state) +2.4VDC or more
Logic 1 (Low state) +0.4VDC or less

Driver specifications : Tri-state
Low state output voltage : +0.4V or less, 48mA
High state output voltage : +2.4V or more, –5.2mA

Receiver specifications : Low state : +0.6V or less
High state : +2.0V or more

Addressing : Any of 31 talk/listen addresses can be set by the Address Select switch.

Remote programming : The optical signal output of each channel can be set.

4.1.4 Interface functions

Table 4-1 lists the interface functions.

Table 4-1 Interface Functions

Code	Function
SH1	Source handshaking function
AH1	Acceptor handshaking function
T6	Basic talker and serial polling functions
L4	Basic listener functions
SR1	Service request function
RL1	Remote/local control switching function
PP0	No parallel polling function
DC1	Device clear function
DT0	Device trigger function
C0	No controller function
E2	Tri-state output

4.2 Talker Format

Example:

CH01	XX,	CH02	XX,	~,	CH06	XX	CRLF
(1)	(2)	(1)	(2)		(1)	(2)	(3)

(1) Header
(2) Status
(3) Delimiter

These talker codes are sent only when an output request of the control status of each channel is issued by the RCH command.

4.2.1 Header

CH	XX
	①

① Channel No.

Plug-in units(Q81346,Q81347) used two slots are controlled by channel No. of a right slot.
The example : Q81346 is inserted in the slot of CH1 and CH2. In this case,Q81346 is controlled by CH2 of the right slot.

4.2.2 Status

The optical output status of each channel is indicated by the status code (see Table 4-2).

Table 4-2 Status Codes of Optical Output Atatus

Optical output status	Status code
CW light	C0
270Hz chopper light	C1
Off	C2

4.2.3 Delimiter

A delimiter code is output to indicate the end of a single data set. You can select one of three types of delimiters by using program codes as follows:

① Two-byte data of CR (15_8) and LF (12_8) is output. When the LF is output, the EOI single line signal is also output.

Control status command	CR	LF	Control status command	CR	LF	
		EOI			EOI	

② A single-byte data of LF (12_8) is output.

Control status command	LF	Control status command		

③ A single line signal of EOI is output simultaneously when the last byte of data is sent.

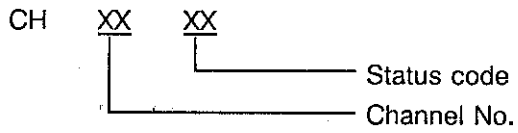
Control status command	Control status command	
	EOI	EOI

However, the initial status is equal to ① CR and LF (EOI).

4.3 Remote Programming

4.3.1 Control commands of optical source unit

The Q8134 can select the CW light, 270Hz chopper light, or off mode of the optical source unit of channels 1 to 6.
Select the desired mode in the following format:



The channel number represents the channel of the optical source unit. Therefore, channel numbers 1 to 6 can be set. If any other value is set, it causes an error. A channel of CH1 to CH6 or CH01 to CH06 can be set.

Plug-in units(Q81346,Q81347) used two slots are controlled by channel No. of a right slot.
The example : Q81346 is inserted in the slot of CH1 and CH2. In this case,Q81346 is controlled by CH2 of the right slot.

Set the optical output status of each channel using the status code (see Table 4-3).

Table 4-3 Control of Optical Output Status

Status code	Optical output status	Initial setup
C0	CW light	
C1	270Hz chopper light	
C2	Off	○

4.3.2 Status request command

Format: RCH

This command requests for an output of status information about all of the connected channels.

4.3.3 Other functions

Table 4-4 Other Devices

Code	Function	Initial setup
C	Executes the equivalent routine during power-on. The program is executed from its most beginning.	
DL0	Outputs the "EOI" delimiter simultaneously when "CR" and "LF" are output or when "LF" is output.	○
DL1	Outputs the "LF" delimiter only.	
DL2	Outputs the "EOI" delimiter when the last byte of the send data is output.	

4.4 Application

(1) Addressing

Set the Q8134 talk address and listen address on the GPIB.
Five bits (positions) of addresses 1 to 5 allow you to set any of 31 addresses (address 0 to address 30). In the example of Figure 4-3, addressing of "01110" specifiesVAlue "14" in decimal notation. If all bits are set to 1, address 31 is set. However, the Q8134 does not operate at address 31.
Table 4-5 lists the address codes.

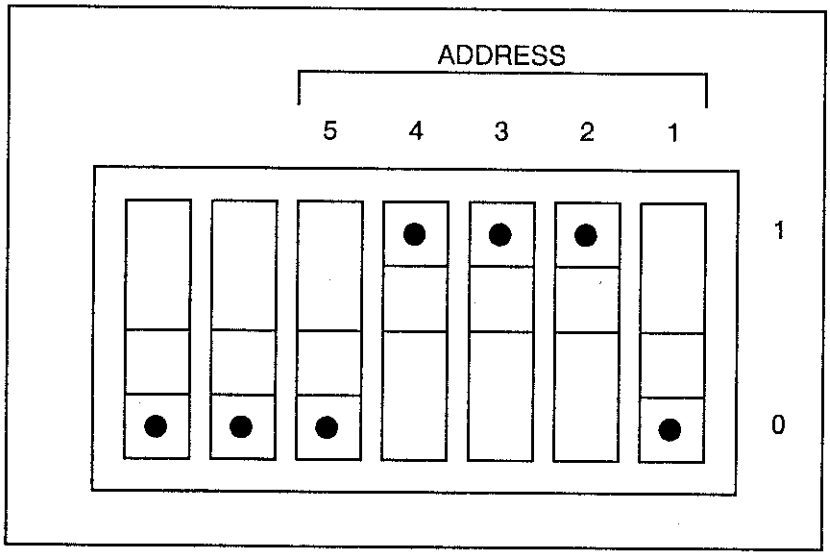


Figure 4-3 Address Switch

Table 4-5 Address Codes

Address switch					Decimal code
A5	A4	A3	A2	A1	
0	0	0	0	0	0
0	0	0	0	1	1
0	0	0	1	0	2
0	0	0	1	1	3
0	0	1	0	0	4
0	0	1	0	1	5
0	0	1	1	0	6
0	0	1	1	1	7
0	1	0	0	0	8
0	1	0	0	1	9
0	1	0	1	0	10
0	1	0	1	1	11
0	1	1	0	0	12
0	1	1	0	1	13
0	1	1	1	0	14
0	1	1	1	1	15
1	0	0	0	0	16
1	0	0	0	1	17
1	0	0	1	0	18
1	0	0	1	1	19
1	0	1	0	0	20
1	0	1	0	1	21
1	0	1	1	0	22
1	0	1	1	1	23
1	1	0	0	0	24
1	1	0	0	1	25
1	1	0	1	0	26
1	1	0	1	1	27
1	1	1	0	0	28
1	1	1	0	1	29
1	1	1	1	0	30

(2) Operation preparation

① Connect the Q8134 to the controller and other configuration devices using bus cables. Also connect the AC power cables and ground leads.

② Set the address switch and turn on the power switch of the Q8134 and connected controller and other configuration devices.

(3) General operation notes

- Changing the address switch
  If you have changed the Q8134 addresses, the current operation continues with the previously set addresses. To operate the devices with the modified address, turn the Q8134 power supply off and turn it on again, modify the address in the program, and execute the program again.

4.5 GPIB Programming Examples

4.5.1 Programming example of HP300 series

```
10    !Q8134 SAMPLE PROGRAM
20    DIM A$[50]
30    ASSIGN @Q TO 701
40    OUTPUT @Q;"C"
50   Choff:      !CHANNEL OFF
60               OUTPUT @Q;"CH01C2CH02C2CH04C2CH06C2"
70               GOSUB St
80               !CH01,CH04=CHOP  CH02,CH06=CW
90               OUTPUT @Q;"CH01C1CH02C0CH04C1CH06C0"
100              GOSUB St
110              !CH01,CH04=CW  CH02,CH06=CHOP
120              OUTPUT @Q;"CH01C0CH02C1CH04C0CH06C1"
130              GOSUB St
140   GOTO Choff
150  St:         OUTPUT @Q;"RCH"
160              ENTER @Q;A$
170              PRINT A$
180              RETURN
190   END
```

Output of example program:

```
CH01C2,CH02C2,CH04C2,CH06C2
CH01C1,CH02C0,CH04C1,CH06C0
CH01C0,CH02C1,CH04C0,CH06C1
CH01C2,CH02C2,CH04C2,CH06C2
```

4.5.2 Programming example of IBM PC

This example program operates on the IBM PS/2 model 30 286 in Microsoft Basic Version 7.0 if the GPIB-PC II A.2 board and driver software of National Instruments are used.

```
'Q8134 SAMPLE PROGRAM FOR IBM PC by MICROSOFT BASIC NI488 calls
REM $INCLUDE:'C: \GPIB\MBDECL.BAS'
DIM READING AS STRING * 30
DEV$ = "Q8134"

CALL IBFIND(DEV$,Q%)
CALL IBLOC (Q%)

CHOFF :'CHANNEL OFF
        CALL IBWRT(Q%,"CH01C2CH02C2CH04C2CH06C2")
        GOSUB ST
        'CH01,CH04=CHOP CH02,CH06=CW
        CALL IBWRT(Q%,"CH01C1CH02C0CH04C1CH06C0")
        GOSUB ST
        'CH01,CH04=CW CH02,CH06=CHOP
        CALL IBWRT(Q%,"CH01C0CH02C1CH04C0CH06C1")
        GOSUB ST
GOTO CHOFF

ST: CALL IBWRT(Q%,"RCH")
   CALL IBRD(Q%,READING$)
   PRINT READING$
   RETURN
END
```

Output of example program:

```
CH01C2      CH02C2      CH04C2      CH06C2
CH01C1      CH02C0      CH04C1      CH06C0
CH01C0      CH02C1      CH04C0      CH06C1
CH01C2      CH02C2      CH04C2      CH06C2
```

4.5.3 Programming example of NEC PC-9801

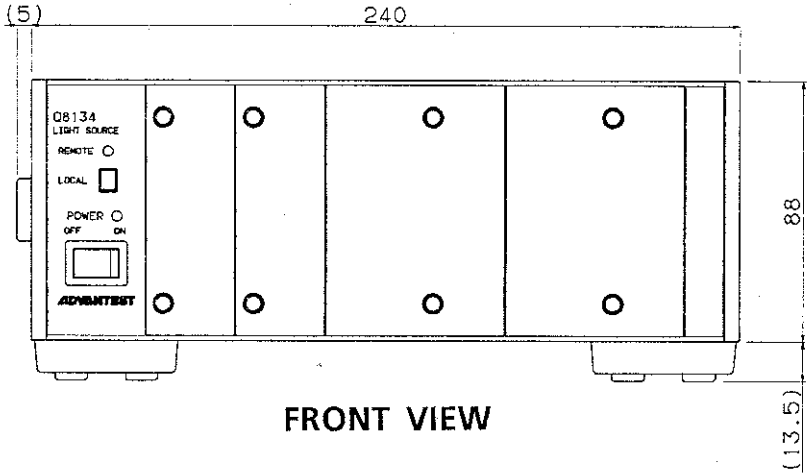
This example program operates on the NEC's PC-9801 series PC in the N88-BASIC (MS-DOS version) if the NEC's PC-9801-29n GPIB interface board is used.

```
10   'Q8134 SAMPLE PROGRAM
20   DIM A$(10),B$(10),C$(10),D$(10)
30   Q = 1
40   ISET IFC
50   ISET REN
60   PRINT @Q;"C"
70   *CHOFF
80        'Channel Off
90        PRINT @Q;"CH01C2CH02C2CH04C2CH06C2"
100       GOSUB *RCH
110       'CH01,CH04=CHOP  CH02,CH06=CW
120       PRINT @Q;"CH01C1CH02C0CH04C1CH06C0"
130       GOSUB *RCH
140       'CH01,CH04=CW  CH02,CH06=CHOP
150       PRINT @Q;"CH01C0CH02C1CH04C0CH06C1"
160       GOSUB *RCH
170  GOTO *CHOFF
180  END
190  '
200  *RCH
210  PRINT @Q;"RCH"
220  INPUT @Q;A$,B$,C$,D$
230  PRINT A$,B$,C$,D$
240  RETURN
```

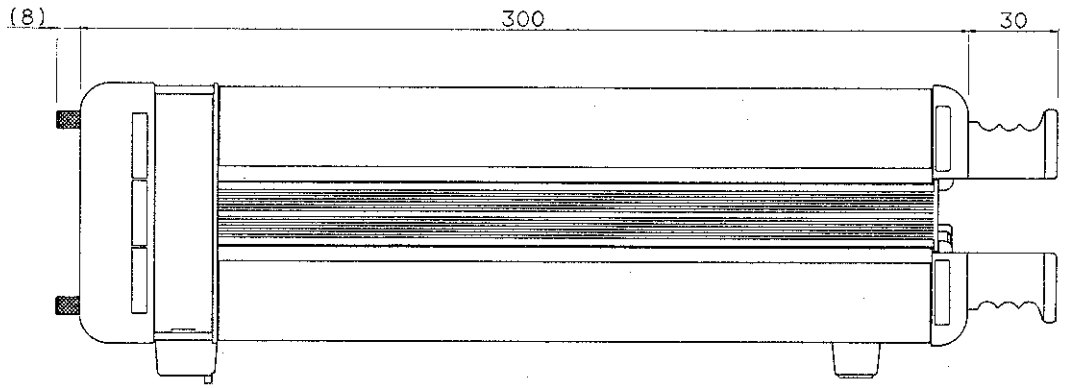
Output of example program:

```
CH01C2        CH02C2        CH04C2        CH06C2
CH01C1        CH02C0        CH04C1        CH06C0
CH01C0        CH02C1        CH04C0        CH06C1
CH01C2        CH02C2        CH04C2        CH06C2
```

ALPHABETICAL INDEX

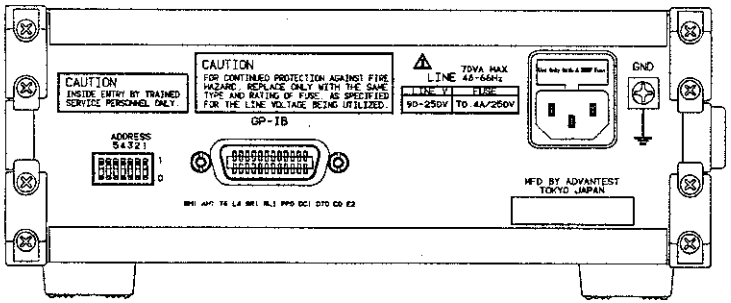


FRONT VIEW



SIDE VIEW

Unit; mm



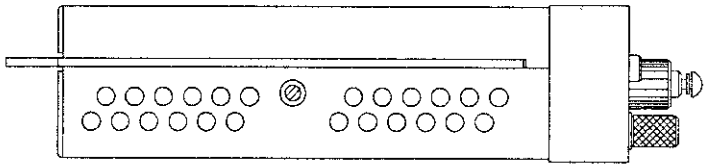
REAR VIEW

EXT1-9208-B

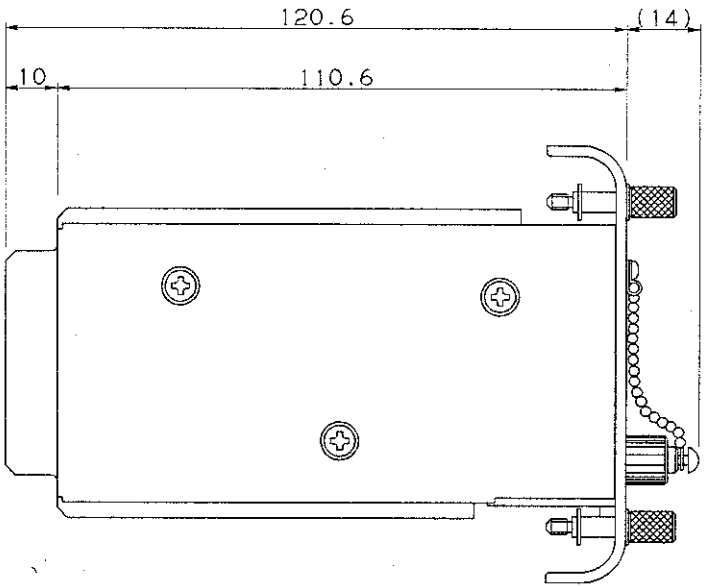
Q8134

EXTERNAL VIEW

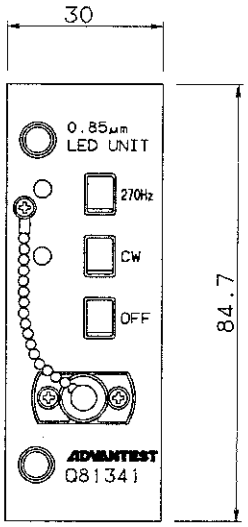
Q81341
EXTERNAL VIEW



TOP VIEW



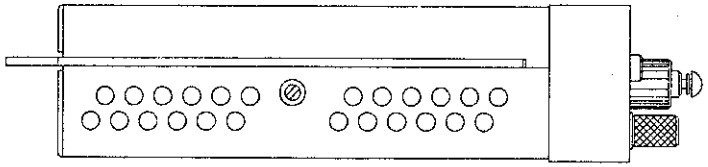
SIDE VIEW



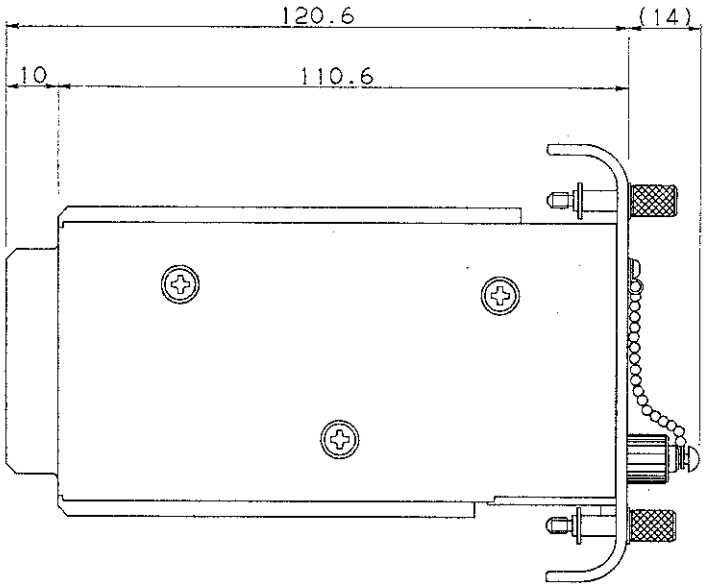
FRONT VIEW

Unit; mm

Q81342
EXTERNAL VIEW



TOP VIEW



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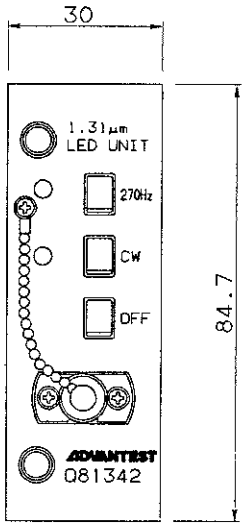
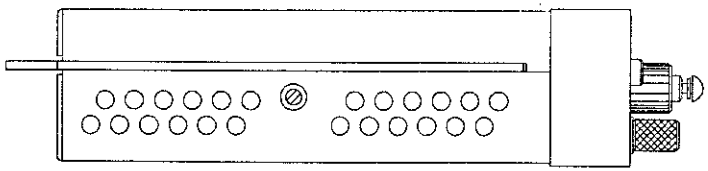


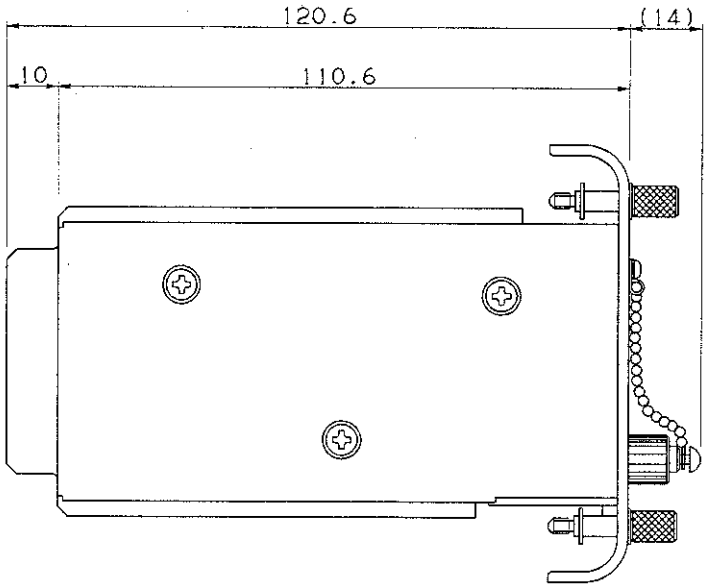
Unit; mm

FRONT VIEW

Q81343
EXTERNAL VIEW



TOP VIEW



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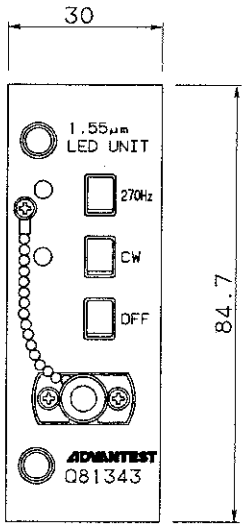

Unit; mm

FRONT VIEW

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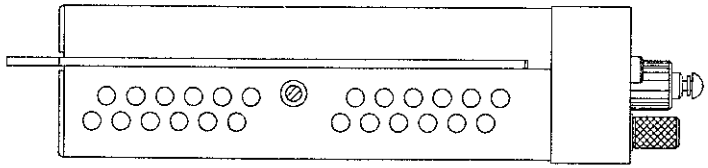
EXTERNAL VIEW



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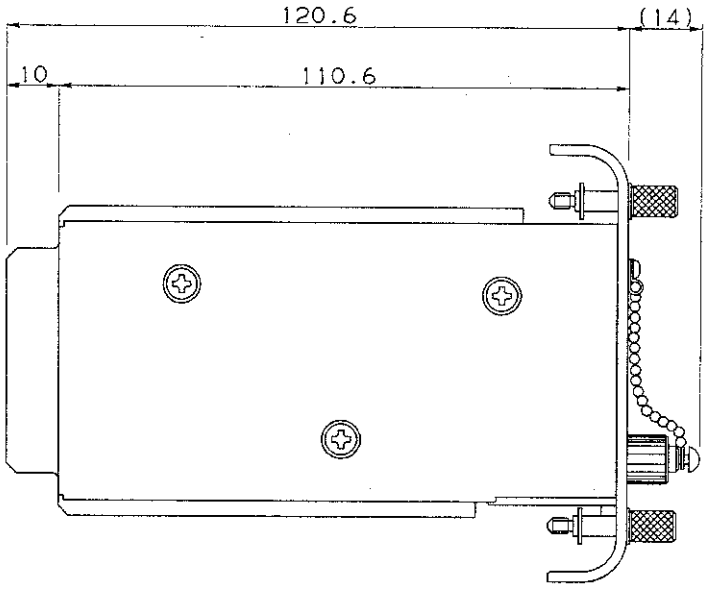
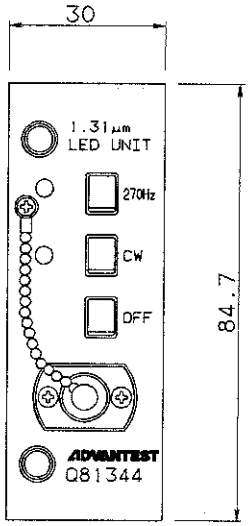


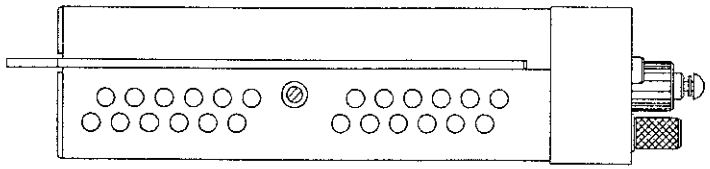
SIDE VIEW



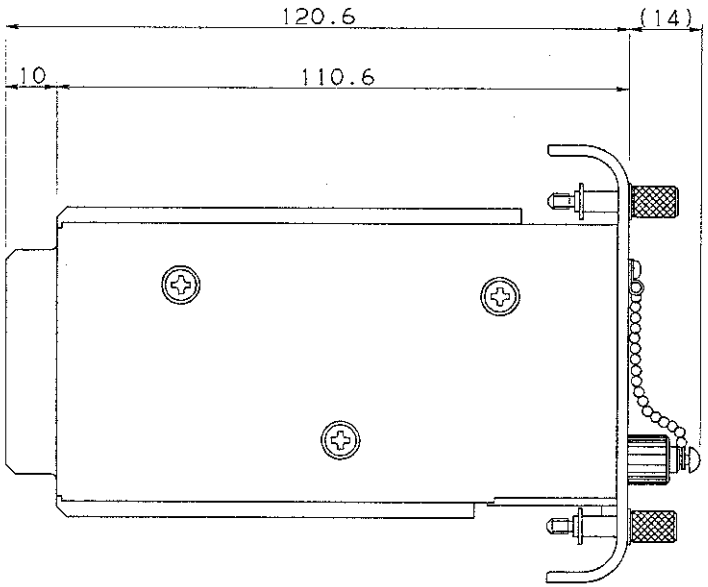
Unit; mm

FRONT VIEW

Q81345
EXTERNAL VIEW



TOP VIEW



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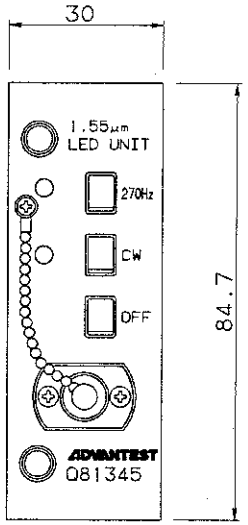
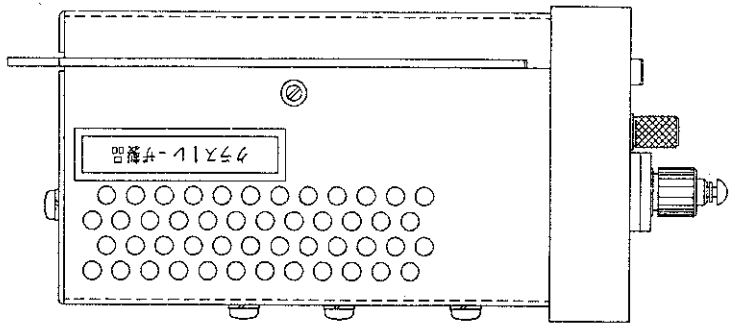


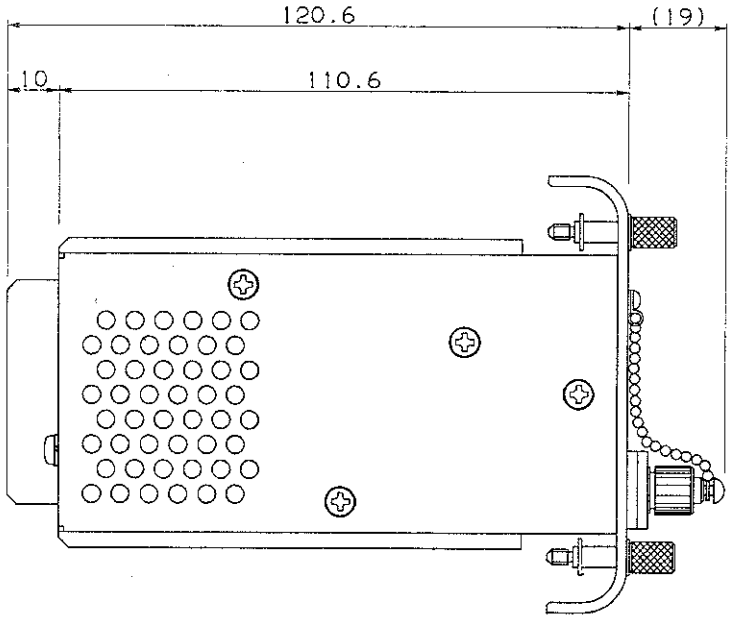
Unit; mm

FRONT VIEW

Q81346
EXTERNAL VIEW



TOP VIEW



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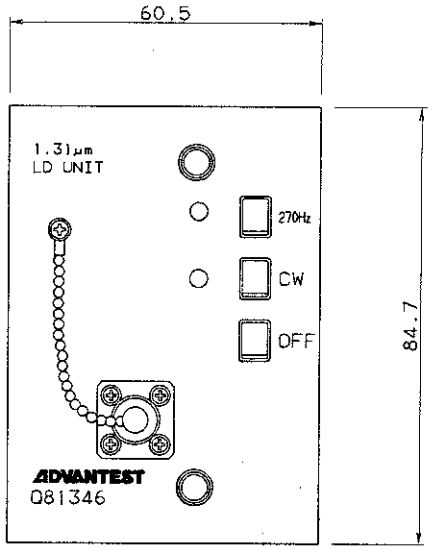
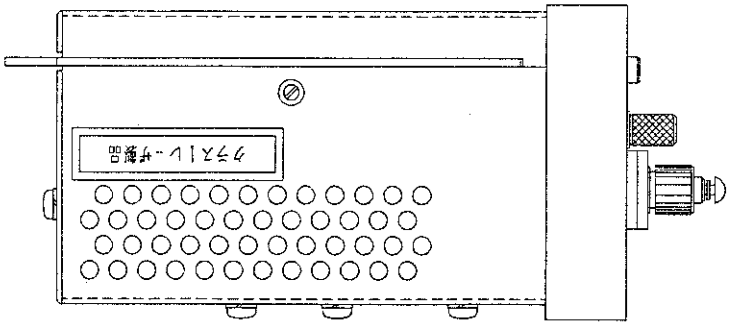


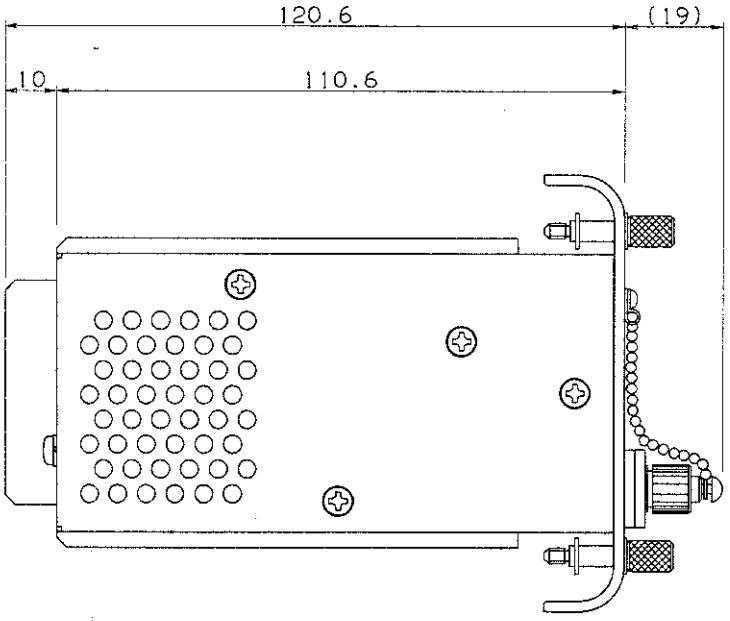
FRONT VIEW

Unit; mm

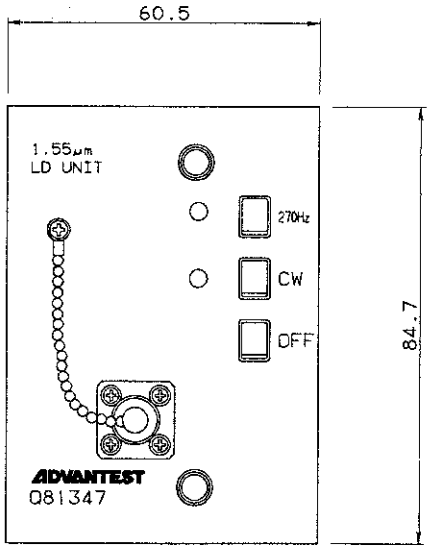
Q81347
EXTERNAL VIEW



TOP VIEW



SIDE VIEW



FRONT VIEW

Unit; mm

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(3) You may not reverse engineer, de-compile, or disassemble, all or any part of, the SOFTWARE.

Liability

Advantest shall have no liability (1) for any PRODUCT failures, which may arise out of any misuse (misuse is deemed to be use of the SOFTWARE for purposes other than it's intended use) of the SOFTWARE. (2) For any dispute between you and any third party for any reason whatsoever including, but not limited to, infringement of intellectual property rights.

LIMITED WARRANTY

1. Unless otherwise specifically agreed by Seller and Purchaser in writing, Advantest will warrant to the Purchaser that during the Warranty Period this Product (other than consumables included in the Product) will be free from defects in material and workmanship and shall conform to the specifications set forth in this Operation Manual.

2. The warranty period for the Product (the "Warranty Period") will be a period of one year commencing on the delivery date of the Product.

3. If the Product is found to be defective during the Warranty Period, Advantest will, at its option and in its sole and absolute discretion, either (a) repair the defective Product or part or component thereof or (b) replace the defective Product or part or component thereof, in either case at Advantest's sole cost and expense.

4. This limited warranty will not apply to defects or damage to the Product or any part or component thereof resulting from any of the following:

   (a) any modifications, maintenance or repairs other than modifications, maintenance or repairs (i) performed by Advantest or (ii) specifically recommended or authorized by Advantest and performed in accordance with Advantest 's instructions;

   (b) any improper or inadequate handling, carriage or storage of the Product by the Purchaser or any third party (other than Advantest or its agents);

   (c) use of the Product under operating conditions or environments different than those specified in the Operation Manual or recommended by Advantest, including, without limitation, (i) instances where the Product has been subjected to physical stress or electrical voltage exceeding the permissible range and (ii) instances where the corrosion of electrical circuits or other deterioration was accelerated by exposure to corrosive gases or dusty environments;

   (d) use of the Product in connection with software, interfaces, products or parts other than software, interfaces, products or parts supplied or recommended by Advantest;

   (e) incorporation in the Product of any parts or components (i) provided by Purchaser or (ii) provided by a third party at the request or direction of Purchaser or due to specifications or designs supplied by Purchaser (including, without limitation, any degradation in performance of such parts or components);

   (f) Advantest's incorporation or use of any specifications or designs supplied by Purchaser;

   (g) the occurrence of an event of force majeure, including, without limitation, fire, explosion, geological change, storm, flood, earthquake, tidal wave, lightning or act of war; or

   (h) any negligent act or omission of the Purchaser or any third party other than Advantest.

5. **EXCEPT TO THE EXTENT EXPRESSLY PROVIDED HEREIN, ADVANTEST HEREBY EXPRESSLY DISCLAIMS, AND THE PURCHASER HEREBY WAIVES, ALL WARRANTIES, WHETHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, (A) ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND (B) ANY WARRANTY OR REPRESENTATION AS TO THE VALIDITY, SCOPE, EFFECTIVENESS OR USEFULNESS OF ANY TECHNOLOGY OR ANY INVENTION.**

6. **THE REMEDY SET FORTH HEREIN SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF THE PURCHASER FOR BREACH OF WARRANTY WITH RESPECT TO THE PRODUCT.**

7. **ADVANTEST WILL NOT HAVE ANY LIABILITY TO THE PURCHASER FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR REVENUES, IN ANY AND ALL CIRCUMSTANCES, EVEN IF ADVANTEST HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING, WITHOUT LIMITATION, NEGLIGENCE), STRICT LIABILITY, INDEMNITY, CONTRIBUTION OR OTHERWISE. TORT (INCLUDING, WITHOUT LIMITATION, NEGLIGENCE), STRICT LIABILITY, INDEMNITY, CONTRIBUTION OR OTHERWISE.**

8. **OTHER THAN THE REMEDY FOR THE BREACH OF WARRANTY SET FORTH HEREIN, ADVANTEST SHALL NOT BE LIABLE FOR, AND HEREBY DISCLAIMS TO THE FULLEST EXTENT PERMITTED BY LAW ANY LIABILITY FOR, DAMAGES FOR PRODUCT FAILURE OR DEFECT, WHETHER ARISING OUT OF BREACH OF CONTRACT, TORT (INCLUDING, WITHOUT LIMITATION, NEGLEGENCE), STRICT LIABILITY, INDEMNITY, CONTRIBUTION OR OTHERWISE.**

CUSTOMER SERVICE DESCRIPTION

In order to maintain safe and trouble-free operation of the Product and to prevent the incurrence of unnecessary costs and expenses, Advantest recommends a regular preventive maintenance program under its maintenance agreement.

Advantest's maintenance agreement provides the Purchaser on-site and off-site maintenance, parts, maintenance machinery, regular inspections, and telephone support and will last a maximum of ten years from the date the delivery of the Product. For specific details of the services provided under the maintenance agreement, please contact the nearest Advantest office listed at the end of this Operation Manual or Advantest 's sales representatives.

Some of the components and parts of this Product have a limited operating life (such as, electrical and mechanical parts, fan motors, unit power supply, etc.). Accordingly, these components and parts will have to be replaced on a periodic basis. If the operating life of a component or part has expired and such component or part has not been replaced, there is a possibility that the Product will not perform properly. Additionally, if the operating life of a component or part has expired and continued use of such component or part damages the Product, the Product may not be repairable. Please contact the nearest Advantest office listed at the end of this Operation Manual or Advantest's sales representatives to determine the operating life of a specific component or part, as the operating life may vary depending on various factors such as operating condition and usage environment.

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