

HIOKI

INSTRUCTION MANUAL

2361-20

AC POWER MODULE

HIOKI E.E. CORPORATION

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Introduction

Thank you for purchasing the HIOKI "Model 2361-20 AC POWER MODULE". To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference

Inspection

When you receive the instrument, inspect it carefully to ensure that no damage occurred during shipping. In particular, check the panel switches, and connectors. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

Accessories

Instruction manual		1
Ferrite clamp		1

Options

•	
9239-20	POWER CORD (for USA, with round
	crimp connector)
9239-21	POWER CORD (for EU, with round
	crimp connector)

Safety Notes

A DANGER

This instrument is designed to comply with IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the instrument. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from instrument defects.

This manual contains information and warnings essential for safe operation of the instrument and for maintaining it in safe operating condition. Before using it, be sure to carefully read the following safety precautions.

Safety Symbols

In the manual, the Λ symbol indicates particularly important information that the user should read before using the instrument.



The \triangle symbol printed on the instrument indicates that the user should refer to a corresponding topic in the manual (marked with the symbol) before using the relevant function.



Indicates a protective conductor terminal.



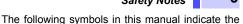
Indicates AC (Alternating Current).



Indicates the ON side of the power switch.



Indicates the OFF side of the power switch.





Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.

relative importance of cautions and warnings.

<u> MARNING</u>

Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.

Indicates that incorrect operation presents a possibility of injury to the user or damage to the instrument.



Indicates advisory items related to performance or correct operation of the instrument.

Other Symbols



Indicates the prohibited action.



Indicates the location of reference information.

Measurement categories (Overvoltage categories)

To ensure safe operation of measurement instruments, IEC 61010 establishes safety standards for various electrical environments, categorized as CAT I to CAT IV, and called measurement categories. These are defined as follows.

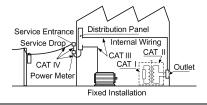
- CAT I Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device.
- CAT II Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)
- CAT III Primary electrical circuits of heavy equipment (fixed installations) connected directly to the distribution panel, and feeders from the distribution panel to outlets
- CAT IV The circuit from the service drop to the service entrance, and to the power meter and primary overcurrent protection device (distribution panel).

Higher-numbered categories correspond to electrical environments with greater momentary energy. So a measurement device designed for CAT III environments can endure greater momentary energy than a device designed for CAT II.

Using a measurement instrument in an environment designated with a higher-numbered category than that for which the instrument is rated could result in a severe accident, and must be carefully avoided.

Never use a CAT I measuring instrument in CAT II, III, or IV environments.

The measurement categories comply with the Overvoltage Categories of the IEC60664 Standards.



Notes on Use



Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.



Do not allow the instrument to get wet.





Corrosive or combustible gases

Do not allow the instrument to get wet, and do not take measurements with wet hands.

This may cause an electric shock.

Do not use the instrument where it may be exposed to corrosive or combustible gases.

The device may be damaged or cause an explosion.

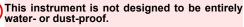
⚠CAUTION

Do not use the instrument near a source of strong electromagnetic radiation, or near a highly electrically charged object.

These may cause a malfunction.

Operation and Installation environment.

Electromagnetic This instrument should be installed and operated radiation or highly electrically indoors only, between 0 and 50°C (32 to 122°F) charged object and 80% RH or less.



Do not use it in an especially dusty environment, nor where it might be splashed with liquid. This Temperature or may cause damage.

When the module is used in a dusty environment, Dust place it in a dustproof case and take measures to

> Do not store or use the instrument where it could be exposed to direct sunlight, high tem-

> perature or humidity, or condensation. Under such conditions, the instrument may be damaged and insulation may deteriorate so that it no longer meets specifications.

> To avoid damage to the instrument, protect it from physical shock when transporting and handling.

> Be especially careful to avoid physical shock from dropping.

> When using the instrument in the case, drill ventilation holes.

> Drill ventilation holes or install a ventilation fan to prevent heat buildup.

humidity ensure heat dissipation.

Direct sunlight



Do not obstruct the ventilation holes.

Ventilation holes for heat radiation are provided on the top and rear panels of the instrument. Leave sufficient space around the ventilation holes and install the instrument with the holes unobstructed. Installation of the instrument with the ventilation holes obstructed may cause a malfunction or fire.

Wiring



- A qualified electrician shall perform the wiring to prevent electric shock.
- Avoid live-line electrical work to prevent electric shock and accidents due to shortcircuiting.
- When tightening the screws, confirm that all screws are securely tightened. A loose screw may result in module errors, fire, or electric shock.
- Ensure that the power supply, input, and output are correctly wired according to the wiring diagram. (See the chapter on "Preparations" in the instructions manual for each module.) This will prevent fire, malfunction, and errors.
- Tighten the screws within the specified torque. Excessive torque may damage the terminals. Inadequate torque may result in module errors, fire, or electric shock.
- Ensure that the power supply module and input are OFF until all wiring work is finished. This will prevent module trouble and electric shock.

WARNING

Ensure that the power supply module and input are OFF when connecting or disconnecting the module to the system. This will prevent electric shock, errors, and malfunction.

⚠ CAUTION

- Connect the module to a power source that matches the rating in order to prevent fire.
- Use cables of the proper sizes for the rated current. This will prevent entire system errors and fire resulting from broken wire.
- Use crimp connectors suitable for the cable sizes. This will prevent module errors and fire due to broken wires.
- If power supply noise poses a problem, use of a noise filter is recommended.
- When the power and signal lines may be subject to a lightning-induced surge, install a lightning arrester between another device or module connected to this module and line to protect the system.
- Avoid stepping on or pinching cables, which could damage the cable insulation.
- Keep the cables well away from heat sources, as bare conductors could be exposed if the insulation melts.

Preliminary Checks

_WARNING

Before using the instrument, make sure that the insulation on the cables is undamaged and that no bare conductors are improperly exposed. Using the product in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

Before using the instrument the first time, verify that it operates normally to ensure that the no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.

Overview

Chapter '

1.1 Product Overview

- The 2361-20 is a power module of the Hioki "Smart Site" (remote measurement system).
- The 2361-20 is used with the communications module, meausrement module, and module base.
- The power supply module supplies power to one communications module and 10 measurement modules (or five power meter modules).

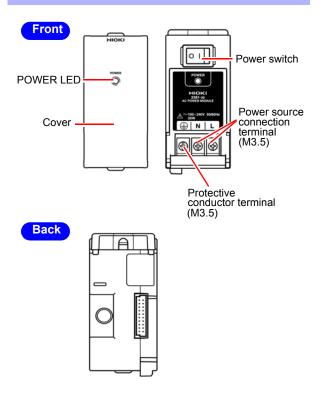


(Conceptual image)

1.2 Major Features

The module supplies the rated supply voltage, ranging from 100 to 240 VAC (50/60Hz), without any manual switching.

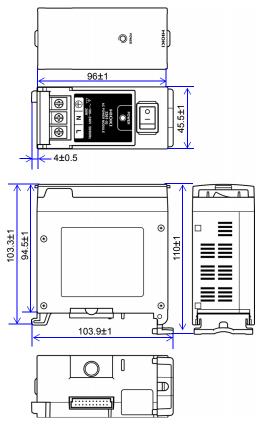
1.3 Name and Function of the Parts



1.3 Name and Function of the Parts 13

Power switch	Turns power ON/OFF. side: Power ON, Oside: Power OFF
POWER LED	Remains green while the module is in operation. POWER LED indication Lit in green: Power ON
Power source connection terminal N (-), L (+)	Connect the power cord.
Protective conductor terminal	This is an protective earthing terminal. Be sure to ground the terminal.

1.4 Dimension Diagrams



(Unit: mm)

Preparations

Chapter 2

2.1 Installing the Module

2.1.1 Installing the Module Base

ACAUTION

Do not mount the module base on the ceiling where it may fall off.

Fasten the module base to a DIN rail or the wall according to the procedure described in the 2391 or 2392 series MODULE BASE instruction manual.

2.1.2 Mounting a Module on the Module Base

AWARNING

We make every effort to ensure the quality of this system. However, should the system emit a strange odor or smoke, turn off power immediately.

Moreover, to ensure that you can turn power off easily, do not lay cables in front of this module.

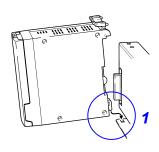
ACAUTION

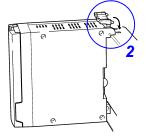
This module does not support parallel operation. Mount only one power supply module on a module base. Mounting two or more modules on a module base may damage the modules.

NOTE

Mount the module in the slots for the power supply module on the left edge of the module base.

Mount a module on the module base as shown below. Ensure that the lever clicks.





2.2 Connecting Power Cable



A DANGER

- This device should only be connected to the secondary side of a breaker, so the breaker can prevent an accident if a short circuit occurs. Connections should never be made to the primary side of a breaker, because unrestricted current flow could cause a serious accident if a short circuit occurs.
- Ensure that the 9239 series POWER CORD is not plugged into an AC outlet when connecting it to the module. This will prevent electric shock and short-circuiting.
- Be sure to put the cover on the 2361-20 when the power line is live to avoid electric shock and short-circuiting.
- Be sure to connect the earthing terminal to ground to avoid electric shock. Connect the earthing terminal to ground before connecting any other cable.

MARNING

- Before turning the device on, make sure the supply voltage matches that indicated on the its power connector. Connection to an improper supply voltage may damage the device and present an electrical hazard.
- Ensure that the power switch of the module is OFF when connecting the power cable to the power line. If the switch is ON sparks may be generated and ignite a battery, organic solvent, or any other nearby volatile substance.

2.2 Connecting Power Cable

NOTE

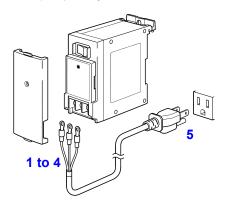
The functions of this system may be interfered by external noise or an electromagnetic environment when connecting a cable more than 3 meters long.

- Remove the cover.
- Select a power cable of sufficient current-carrying capacity and withstand voltage, considering the power consumption and supply voltage. Power consumption: 20 W (50 VA) Available from 100 to 240 VAC (50/60 Hz) without manual switching

Example:

300 V vinyl cabtire cable

3-core, 0.75 mm² (AWG18) or more The 9239 series POWER CORD (with round crimp connector) is optionally available.



Connect the cable leads as shown below (at tightening torque of 0.8 N•m).

We recommend that you use M3.5 round crimp connectors.

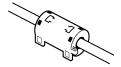
Example: RAV 1.25-3.5

When using the optional 9239-20 POWER CORD, connect leads E, N, and L in this order from the left, while referring to the marker tubes.



- **4.** Secure the cover back in place.
- Connect the power cable to the power source (AC outlet or panelboard).

In case of external noise, mount the ferrite core supplied as an accessory as shown below.



Specifications

Chapter 3

3.1 Basic Specifications

Operation	Supplies power to measurement/communications modules and the FA server.
Rated Output Voltage	5.0 VDC
Maximum Output Current	2.4 A
Maximum Output Power	12.0 VA
Output Voltage Accuracy	±5.0% (Within operating temperature and humidity ranges)

3.2 Function Specifications

Overcurrent Protection	Min. 105% (Output current limiting and automatic reset)
Overvoltage Protection	Min. 110% (Zener diode clamp)
Input Surge Current	Up to 20 A at 100 VAC or 40 A at 200 VAC
Parallel Operation	Not available

3.3 General Specifications

Communication Interface	Not available
Input Terminal	terminal block (Front panel)

Output Terminal	Internal bus connector	
Power Switch	ON/OFF of output voltage	
Rated Supply Voltage	100 to 240 VAC (50/60 Hz) (Voltage fluctuations of ±10% from the rated supply voltage are taken into account.)	
Maximum Rated Power	20 W	
Withstand Voltage	3.0 kVAC (Between Input L, N and output) Response current 20 mA 2.0 kVAC (Between Input L, N and FG) Response current 20 mA	
Fuse	2.5 A Built-in time-lag fuse (on the live side)	
Dimensions	Approx. 45.5W × 96H × 94.5D mm (1.79"W × 3.78"H × 3.72"D) (Including cover, excluding projections)	
Mass	Approx. 275 g (9.7 oz.) (Including cover)	
Accessories	Ferrite clamp	
Options	9239-20 POWER CORD (for USA, with round crimp connector) 9239-21 POWER CORD (for CE, with round crimp connector)	
Operating Temperature and Humidity	0 to 50°C (32 to 122°F), 80%RH or less (non-condensating)	
Storage Temperature and humidity	-10 to 50°C (14 to 122°F), 80%RH or less (non-condensating)	
Operating Environment	Indoors, altitude up to 2000 m (6562-ft.)	
Applicable Standards	Safety EN61010-1:2001 Pollution degree 2 EMC EN61326:1997+A1:1998+A2:2001 CLASS A EN61000-3-2:2000 EN61000-3-3:1995+A1:2001	

Maintenance and Service

Chapter 4

4.1 Cleaning

To clean the device, wipe it gently with a soft cloth moistened with water or mild detergent. Never use solvents such as benzene, alcohol, acetone, ether, ketones, thinners or gasoline, as they can deform and discolor the case.

4.2 Servicing

MARNING

Never modify the device. Only Hioki service engineers should disassemble or repair the device. Failure to observe these precautions may result in fire, electric shock, or injury.

- If the device seems to be malfunctioning, confirm that the cables are not open circuited before contacting your dealer or Hioki representative.
- When sending the device for repair, pack carefully to prevent damage in transit. Include cushioning material so the device cannot move within the package. Be sure to include details of the problem. Hioki cannot be responsible for damage that occurs during shipment.
- When transporting the 2361-20 or a system containing this module, tape the front of the module or take similar measures to avoid losing internal components.
- The fuse is housed in the instrument. If the power does not turn on, the fuse may be blown.
 If this occurs, a replacement or repair cannot be performed by customers. Please contact your dealer or Hioki representative.

HIOKI

DECLARATION OF CONFORMITY

Manufacturer's Name: HIOKI E.E. CORPORATION

Manufacturer's Address: 81 Koizumi, Ueda, Nagano 386-1192, Japan

Product Name: AC POWER MODULE

Model Number: 2361-20

Option: 9239-21 POWER CORD

The above mentioned products conform to the following product

specifications:

Safety: EN61010-1:2001

EMC: EN61326:1997+A1:1998+A2:2001

Class A equipment

Equipment intended for use in industrial location

EN61000-3-2:2000

EN61000-3-3:1995+A1:2001

Supplementary Information:

16 July 2004

The products herewith comply with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

HIOKI E.E. CORPORATION

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Yuji Hioki

President

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