HIOKI

INSTRUCTION MANUAL

2362-20

DC POWER MODULE

HIOKI E. E. CORPORATION

Contents

Introduction

Thank you for purchasing the HIOKI “Model 2362-20 DC 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

Safety Notes

⚠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 ⚠ symbol indicates particularly important information that the user should read before using the instrument.
	The ⚠ 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 DC (Direct Current).
	Indicates the ON side of the power switch.
	Indicates the OFF side of the power switch.

The following symbols in this manual indicate the relative importance of cautions and warnings.

DANGER	Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.
WARNING	Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
CAUTION	Indicates that incorrect operation presents a possibility of injury to the user or damage to the instrument.
NOTE	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 instrument.

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.

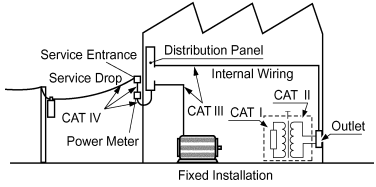
CAT IV The circuit from the service drop to the service entrance, and to the power meter and primary overcurrent protection instrument (distribution panel).

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

⚠WARNING

Do not allow the instrument to get wet.

Corrosive or combustible gases

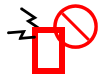
Do not allow the instrument to get wet, and do not take measurements with wet hands.

This may cause an electric shock.

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

The instrument may be damaged or cause an explosion.

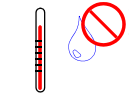
⚠CAUTION



Electromagnetic radiation or highly electrically charged object

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



Temperature or humidity

Dust

Direct sunlight

This instrument is not designed to be entirely water- or dust-proof.
Do not use it in an especially dusty environment, nor where it might be splashed with liquid. This may cause damage.
When the module is used in a dusty environment, place it in a dustproof case and take measures to ensure heat dissipation.

Do not store or use the instrument where it could be exposed to direct sunlight, high temperature 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.

⚠CAUTION

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

⚠WARNING

- A qualified electrician shall perform the wiring to prevent electric shock.
- Avoid live-line electrical work to prevent electric shock and accidents due to short-circuiting.
- When tightening the screws, confirm that all screws are securely tightened. A loose screw may result in module errors, fire, or electric shock.
- 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.
- 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.
- Do not use any available terminal for relaying or any other purpose as electric shock, errors, or malfunction may result.

⚠CAUTION

- Connect the module to a power source that matches the rating in order to prevent fire.
- 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.
- 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 instrument 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

1.1 Product Overview

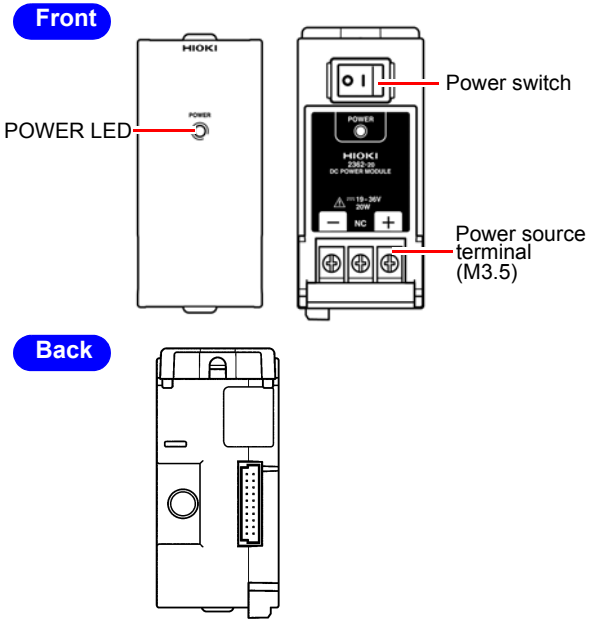
- The 2362-20 is a power module of the Hioki "Smart Site" (remote measurement system).
- The 2362-20 is used with the communications module, meausrement module, and module base.
- The power supply module supplies power to one communications module and 10 measurement modules (or five power meter modules).

(Conceptual image)

1.2 Major Features

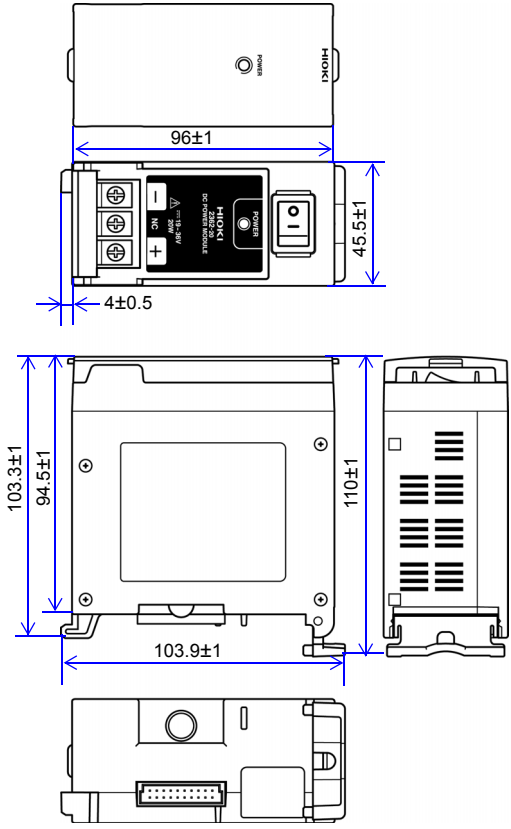
The module supplies the rated supply voltage ranging from 19 to 36 VDC.

1.3 Name and Function of the Parts



Power switch	Turns power ON/OFF. ❙ side: Power ON ◯side: Power OFF
POWER LED	Remains green while the module is in operation. **POWER LED indication** Lit in green: Power ON
Power source terminal	Connect the power cord. The terminal connectors are for "-," "NC" (non-connection), and "+" from the left.

1.4 Dimension Diagrams



(Unit: mm)

Preparations Chapter 2

2.1 Installing the Module

2.1.1 Installing the Module Base

⚠CAUTION 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.

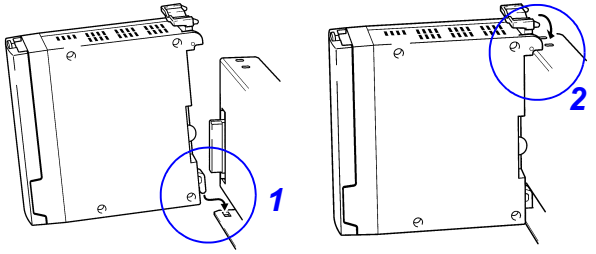
2.1.2 Mounting a Module on the Module Base

⚠WARNING 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.

⚠CAUTION 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

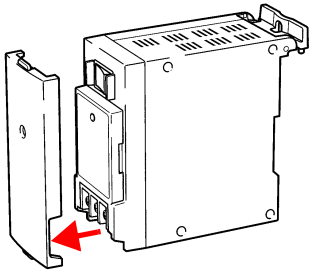
⚠WARNING

- Before turning the instrument on, make sure the supply voltage matches that indicated on the its power connector. Connection to an improper supply voltage may damage the instrument and present an electrical hazard.
- Ensure that the power switch of the module is OFF when connecting the power cable to the module. If the switch is ON when you connect the power cable, sparks may be generated and ignite a battery, organic solvent, or any other nearby volatile substance.
- Ensure that the cable is not live when connecting it. This will prevent short-circuiting.

⚠CAUTION Be careful to avoid connecting voltage improperly, as the internal circuit may be destroyed.

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.

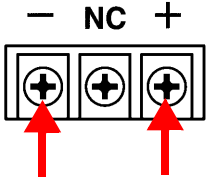
1. Remove the cover.



2. Select a power cable of sufficient current-carrying capacity and withstand voltage, considering the power consumption and supply voltage.
Power consumption: 20 VA (20 W)
Available from 19 to 36 VDC.

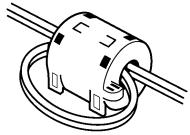
Example:
300 V vinyl cabtire cable
2-core, 0.75 mm^2 (AWG18) or more

3. 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



4. Secure the cover back in place.

When using the module as a CE-mark compliant product, 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% (Constant current/constant voltage pendent and automatic rest)
Overvoltage Protection	110 to 140% (Output shutdown and manual reset)
Input Surge Current	80 A max at 36 VDC.
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	19 to 36 VDC
Maximum Rated Power	20 W
Withstand Voltage	0.5 kVAC (Between input and output) Response current 5 mA
Fuse	The polyswitch is built in (on the + side with trip current of 3.7A).
Dimensions	Approx. 45.5W × 96H × 94.5D mm (1.79"W × 3.78"H × 3.72"D) (Including cover, excluding projections)
Mass	Approx. 250 g (8.8 oz.) (Including cover)
Accessories	Ferrite clamp ..... 1 Instruction manual 1
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

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

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

- If the instrument seems to be malfunctioning, confirm that the cables are not open circuited before contacting your dealer or Hioki representative.
- When sending the instrument for repair, pack carefully to prevent damage in transit. Include cushioning material so the instrument 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 2362-20 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: DC POWER MODULE

Model Number: 2362-20

The above mentioned product comforms 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

Supplementary Information:

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

HIOKI E.E. CORPORATION

16 July 2004

Yuji Hioki

President

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