

INSTRUCTION MANUAL

2392-01

2392-02

MODULE BASE

HIOKI E. E. CORPORATION

Contents

Introduction	1
Inspection.....	1
Safety Notes	2
Notes on Use	4

Chapter 1 Overview 9

1.1 Product Overview	10
1.2 Major Features	11
1.3 Name and Function of the Parts.....	12
1.4 Dimension Diagrams	16

Chapter 2 Preparations 19

2.1 Installing the Module	19
2.1.1 Connecting Module Bases	19
2.1.2 Installing the Module Base	21
2.1.3 Connecting the Functional Earthing Terminal	24
2.1.4 Mounting a Module on the Module Base	24
2.2 Connecting Power Supply Output Cord (2392-01 only)	25
2.3 Connecting the CAN Cable	27

Chapter 3 Specifications 29

- 3.1 Basic Specifications 29
- 3.2 Function Specifications 30
- 3.3 General Specifications 30

Chapter 4 Maintenance and Service 31

- 4.1 Cleaning 31
- 4.2 Servicing 32

Introduction

Thank you for purchasing the HIOKI "Model 2392-01, 2392-02 MODULE BASE." 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 switch 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

Safety Notes






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 ) before using the relevant function.






Indicates a grounding terminal.



Indicates DC (Direct Current).

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

 <u>DANGER</u>	Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.
 <u>WARNING</u>	Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.
 <u>CAUTION</u>	Indicates that incorrect operation presents a possibility of injury to the user or damage to the instrument.
<u>NOTE</u>	Indicates advisory items related to performance or correct operation of the instrument.

Other Symbols



Indicates the prohibited action.



Indicates the reference.

Notes on Use



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

CAUTION

Do not allow the instrument to get wet.



Corrosive or combustible gases



Electromagnetic radiation or highly electrically charged object

- **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.

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

The instrument may be damaged.

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

The instrument may be damaged.

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

These may cause a malfunction.

- **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.

! CAUTION

Temperature or
humidity



Dust



Direct sunlight

- **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.

- **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.

- **When using the instrument in the case, drill ventilation holes.**

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

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.
- Avoid using an unused terminal for relaying or any other purpose to prevent electric shock, errors, and malfunction.

 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.
- 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

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

Overview

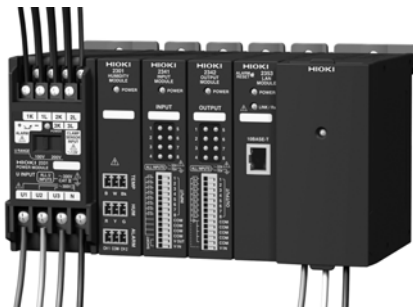
Chapter 1

1.1 Product Overview

The 2392-01/02 is a module base for the Hioki "Smart Site" (remote measurement system). It houses a communications module, a measurement module, and a power supply module. The module base has a module-to-module communications function and an independent power supply.

Number of Connectable Modules

Model No.	2361-20, 2362-20 Power supply module	2351-20, 2352-20, and 2353-20 Communications module	2301-20 to 2343-20 Each module
2392-01	1 unit	--	
2392-02	--	2 units (In the case of power meter module, one unit can be connected.)	



1.2 Major Features

- ◆ The 2392-01 is a base for the power supply module only. The module has CAN terminals for internal bus connections and can provide power to the 2371 FA server*.
- ◆ The 2392-02 is a base for communications, measurement, and input/output modules. Power is supplied from the 2392-01.
- ◆ The internal buses can be connected using CAN terminals. Up to 63 measurement modules can be connected to a single communications module.

NOTE

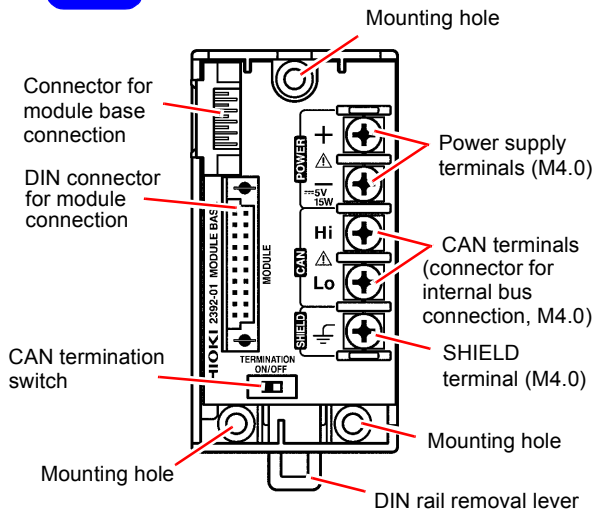
CAN cables should not be extended beyond 100 m (328 feet). Due to the capacity of the power supply module, the number of the 2392-02 MODULE BASEs connected to the 2392-01 is limited to five. (Only one 2392-02 is connectable when the 2392-01 supplies power to the 2371 FA server*.)

* The 2371 is currently under development.

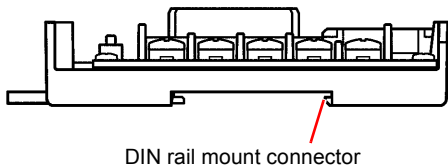
1.3 Name and Function of the Parts

2392-01

Front



Back



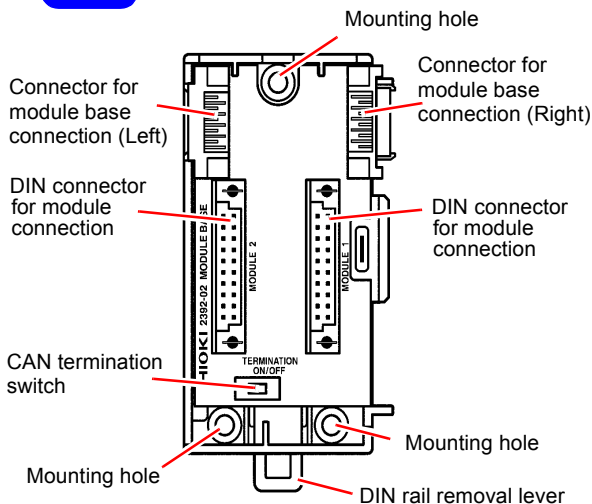


Do not supply power to the power terminal from an external source. Doing so may damage the module base or the internal circuits of modules.

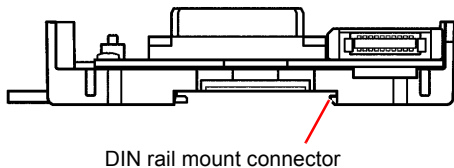
Connector for module base connection	Connect the 2392-02 to this connector.
DIN connector for module connection	This connector is used to connect a power supply module to the module base.
CAN termination switch (Termination ON/OFF)	OFF : When using the CAN terminal on the 2392-01 and the 2392-02 simultaneously, turn off the switch. ON : In cases other than the above, turn on the switch (when a CAN terminal is not used, or when a CAN terminal is used but the 2392-02 is not connected).
Mounting hole	Used to mount the module base to the wall.
Power supply terminals (M4.0)	Used to supply power to the 2371 FA SERVER or other modules (supply capacity: 5 V, 12 W).
CAN terminals (connector for internal bus connection, M4.0)	Used to extend the internal bus. Use the communications cable for the CAN bus (CAN cable). Be sure to connect the shielding wire.
SHIELD terminal	This is a functional ground terminal. Be sure to ground this terminal. Connect the shielding wire for the CAN cable to this terminal.
DIN rail removal lever	Used to dismount this module base from a DIN rail.
DIN rail mount connector	This connector is used to mount the module base on a DIN rail (35 mm/1.38" wide).

2392-02

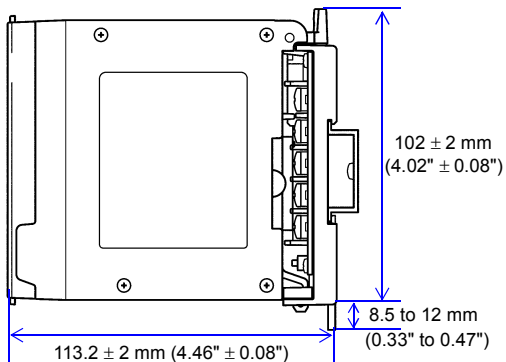
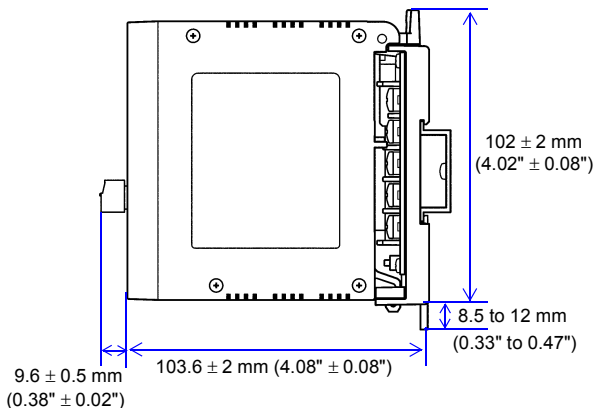
Front



Back



CAN termination switch (Termination ON/OFF)	OFF : When connecting the 2392-02 to the left connector, turn it off. ON : When not connecting the 2392-02 to the left connector, turn it on.
Connector for module base connection	Left : Connect the 2392-02 to this connector. Right : Connect the 2392-01 or the 2392-02 to this connector.
DIN connector for module connection	These connectors are used to mount the communications, and measurement modules on the module base.
Mounting hole	Used to mount the module base on a wall.
DIN rail removal lever	Used to dismount this module base from a DIN rail.
DIN rail mount connector	This connector is used for mounting the module base on a DIN rail (35 mm/1.38" wide).

2331, 2361, 2362 (Common to 2392-01 and -02)**2301 to 2305 (Common to 2392-01 and -02)**

Preparations

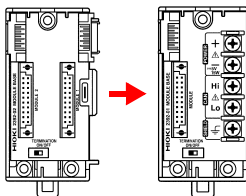
Chapter 2

2.1 Installing the Module

2.1.1 Connecting Module Bases

When using several 2392 MODULE BASE series connect them by the procedure given below.

1. Place the 2392-02 on the left and the 2392-01 on the right.
2. Press the module bases together to connect their connectors for the module bases. Make sure the connectors are connected securely.
3. When using 3 or more module bases, connect the second 2392-02 to the left of the first 2392-02 in the same way.
4. Pull on the module bases to confirm that they are securely connected.

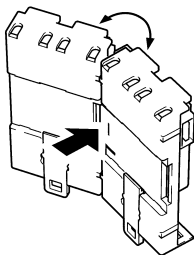


NOTE

When using the 2392 MODULE BASE series, one unit of the 2392-01 must always be used.

Disconnecting Module Bases

Push the connected joint from behind to apply a lever action to the joint and disconnect the module bases.



2.1.2 Installing the Module Base

CAUTION

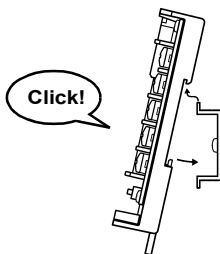
- Do not mount the module base on the ceiling where it may fall off.
- The module base shall be fastened using the proper means. If the module base slides right and left due to tolerances of the DIN rail dimensions, modules may fall off, wires may be short-circuited, or circuits broken.

Fasten the module base securely using either method below.

Mounting the Module Base on a DIN Rail

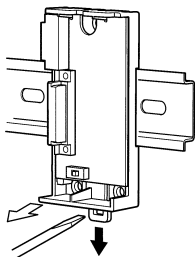
Use the DIN rail mount connector on the rear of the base to mount the module base on a DIN rail (35 mm/1.38" wide).

1. Pull down the DIN rail mount lever.
2. Hang the top hook of the DIN rail mount connector on the DIN rail and push in the bottom of the module.
3. Push up the DIN rail mount lever until it clicks into place.



◆ **Dismounting the Module Base from the DIN Rail**

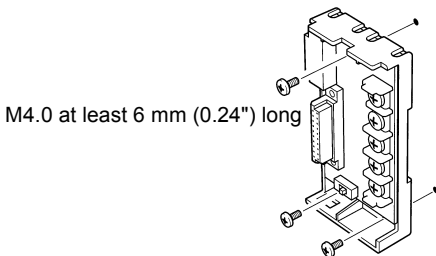
Pull down the DIN rail dismount lever using a flat blade screwdriver and remove the module base from the DIN rail. Use the module as the fulcrum for the screwdriver.



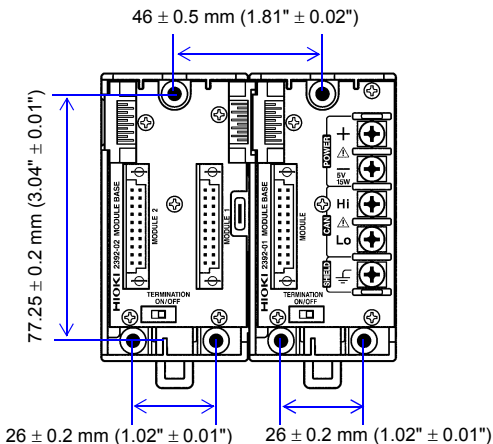
◆ Mounting the Module Base on a Wall

Mount the module base on a wall by using the wall mounting holes.

Ensure that the wall is sufficiently strong. Insert and tighten the screws where shown below.



M4.0 at least 6 mm (0.24") long



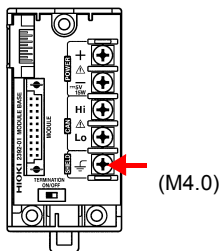
Positions of Wall Mounting Holes

2.1.3 Connecting the Functional Earthing Terminal

Ground the functional earthing terminal. We recommend that you use a cable with a conductor cross section of 0.75 mm^2 (AWG18) or more and a round solderless terminal (tightening torque: $1.2 \text{ N} \cdot \text{m}$).

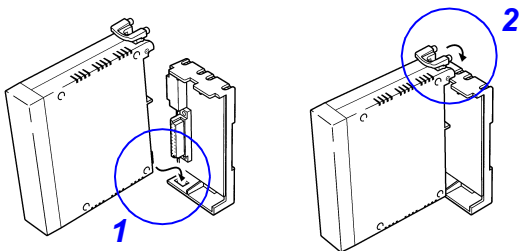
Example:

RAV1.25-4, BT1.25-F4



2.1.4 Mounting a Module on the Module Base

Connect a module to the connector of the module base as shown below. Ensure that the levers make a clicking sound.



2.2 Connecting Power Supply Output Cord (2392-01 only)



⚠ DANGER

- Before turning the instrument on, make sure the supply voltage matches that indicated on the its power connector.
- Be careful to avoid connecting voltage improperly, as the internal circuitry may be destroyed.
- Ensure that the cable is not live when connecting it. This will prevent short-circuiting.
- Ensure that module base power is OFF when connecting the power supply output cable. If the switch is ON when connecting the power cable, sparks may be generated and ignite a battery, organic solvent, or any other nearby volatile substance.

NOTE

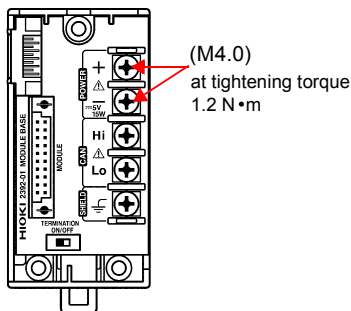
- A cable more than 1 meter (3.28 feet) long may be affected by external noise or the electromagnetic environment, and instruments may malfunction due to a drop in supply voltage.
- When the 2392-01 supplies power to the 2371 FA SERVER*, only one 2392-02 base is connectable to the 2392-01.)

* The 2371 is currently under development.

2.2 Connecting Power Supply Output Cord (2392-

To supply power (5 VDC, 10 W) to the 2371 FA SERVER*, use the power supply output cable to connect the power supply output terminal to the 2371 FA SERVER*.

❖ 1.3 "Name and Function of the Parts" (12 page)



For the power supply output cable, use a cable with a conductor cross section of 1.0 mm^2 or more and length of up to 1 meter (3.28 feet).

Example:

UL1007 AWG18/AWG16 (equivalent to 0.75 mm^2 /
 1.25 mm^2) or equivalent

300 V vinyl-cabtire cable 2-core, 1.0 mm^2 or more
The cable length shall not exceed 1 meter.

We recommend using a round solderless terminal for the connection.

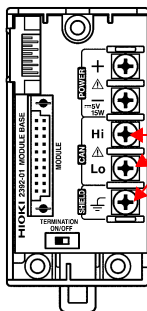
Example:

RAV1.25-4, BT1.25-F4

2.3 Connecting the CAN Cable



Extending the internal bus by connecting CAN cables to the CAN terminals allows up to 63 measurement modules to be connected to a single communications module.



(M4.0)
Tightening torque:
1.2 N·m

Connect Hi terminal to Hi terminal and Lo terminal to Lo terminal.
Use a CAN cable that complies with ISO 11898.

NOTE

- The cable length shall not exceed 100 meters (328 feet).
- Be sure to connect the shielded wire.

Specifications

Chapter 3

3.1 Basic Specifications

Basic Functions	Sends signals and supply power to remote measurement system modules connected thereto via the built-in internal bus (CAN bus). Also supplies power to the FA server (2392-01 only).
-----------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2392-01

Number of Module Connection Connectors	1 connector (All connectors are used for a power supply module.)
Interface	<ul style="list-style-type: none"> • Connector for internal bus extension 3 terminals × 1 Hi Lo Shield • Power supply terminal 2 terminals × 1 VCC GND • Connector for module base connection (For connection with the 2392-02)

2392-02

Number of Module Connection Connectors	2 connectors
Interface	<ul style="list-style-type: none"> • Connector for module base connection (left, For connection with the 2392-02) • Connector for module base connection (right, For connection with the 2392-01/02)

3.2 Function Specifications

Internal Bus Termination	Terminates the internal bus with a termination switch.
--------------------------	--------------------------------------------------------

3.3 General Specifications

Dimensions	2391-01: Approx. 46W X 90H X 18.5D mm 2392-02: Approx. 46W X 90H X 18.5D mm (1.81"W × 3.54"H × 0.73"D) (excluding projections)
Mass	2392-01: Approx. 50 g (1.8 oz.) 2392-02: Approx. 45 g (1.6 oz.)
Accessories	Instruction manual
Operating Temperature and Humidity	0 to 50°C (32 to 122°F), 80%RH or less (with no condensation)
Storage Temperature and Humidity	-10 to 50°C (14 to 122°F), 80%RH or less (with no condensation)
Operating Environment	Indoors, <2000 m (6562 feet) ASL
Standards Applying	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 instrument, 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



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 instrument or a system containing this module, tape the front of the module or take similar measures to avoid losing internal components.

HIOKI

DECLARATION OF CONFORMITY

Manufacturer's Name: HIOKI E.E. CORPORATION

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

Product Name: MODULE BASE

Model Number: 2391-01, 2391-02, 2391-03
2392-01, 2392-02

The above mentioned products conform to the following product specifications:

Safety: EN61010-1:2001

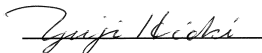
EMC: EN61326:1997+A1:1998+A2:2001
Class A equipment
Equipment intended for use in industrial location

Supplementary Information:

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

16 July 2004

HIOKI E.E. CORPORATION



Yuji Hioki

President

2391A999-00



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