

HIOKI

INSTRUCTION MANUAL

2341-20

INPUT MODULE

HIOKI E.E. CORPORATION

Contents

| Chapter 1 Overview 9 1.1 Product Overview 9 1.2 Major Features 10 1.3 Name and Function of the Parts 10 1.4 Dimension Diagrams 12 Chapter 2 Settings 13 Chapter 3 Preparations 15 3.1 Installing the Module 15 3.1.1 Installing the Module Base 15 |
|--|
| 1.2 Major Features 10 1.3 Name and Function of the Parts 10 1.4 Dimension Diagrams 12 Chapter 2 Settings 13 Chapter 3 Preparations 15 3.1 Installing the Module 15 |
| 1.3 Name and Function of the Parts 10 1.4 Dimension Diagrams 12 Chapter 2 Settings 13 Chapter 3 Preparations 15 3.1 Installing the Module 15 |
| 1.4 Dimension Diagrams 12 Chapter 2 Settings 13 Chapter 3 Preparations 15 3.1 Installing the Module 15 |
| Chapter 2 Settings 13 Chapter 3 Preparations 15 3.1 Installing the Module 15 |
| Chapter 3 Preparations 15 3.1 Installing the Module15 |
| 3.1 Installing the Module15 |
| |
| 3.1.1 Installing the Module Base |
| |
| 3.1.2 Mounting a Module on the Module |
| Base |
| 3.2 Connecting Input/Output Cables |
| 3.2.1 Connecting the Input/Output |
| Terminal block |
| 3.2.2 The Location of the Input/Output Cable 18 |

ii Contents

| Chapt | er 4 Others | 19 |
|-------|--------------------------------|----|
| 4.1 | Internal Circuit | 19 |
| 4.2 | Insulation of Internal Circuit | 20 |
| Chapt | er 5 Specifications | 21 |
| 5.1 | Basic Specifications | 21 |
| 5.2 | Function Specifications | 22 |
| 5.3 | General Specifications | |
| Chapt | er 6 Maintenance and Service | 25 |
| 6.1 | Cleaning | |
| 6.2 | Service | 26 |

Introduction

Thank you for purchasing the HIOKI "Model 2341-20 INPUT 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 connector. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

| • | | | | | | | | | |
|---|---|---|---|---|---|---|----|---|---|
| Δ | • | ~ | Δ | 2 | e | n | rı | Δ | e |
| | | | | | | | | | |

| Instruction manual | |
|--------------------|--|
|--------------------|--|

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





Indicates a grounding terminal.



Indicates DC (Direct Current).



Indicates AC (Alternating Current).

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

A DANGER

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

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.

NOTE

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



Do not allow the instrument to get wet.







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.



Temperature or humidity





Direct sunlight

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.

Do not store or use the instrument where it

could be exposed to direct sunlight, high

 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.

AWARNING

- 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.
- 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.

- 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 the 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

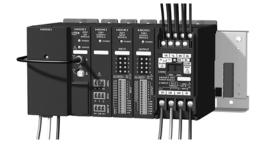
Chapter 1

1.1 Product Overview

The 2341-20 is a logic signal input module for the Hioki Smart Site (remote measurement system). The module monitors contact or voltage signals from external devices second by second. If the module detects any changes in status, it writes the data to a log held in memory.

It is used with a power supply module, a communications module, and a module base.

| Number of input channels | 8 channels |
|--------------------------|--|
| Input signal | contact signal/voltage signal (active LOW) |



1.2 Major Features

- The module records changes in the status of input signals along with time information (30,000 records).
- A reference voltage can be input to set a HIGH level criterion voltage for input signals between 4.5 and 30 VDC.

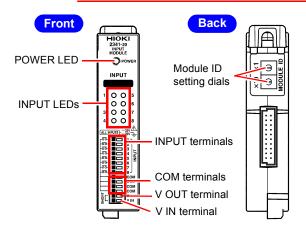
1.3 Name and Function of the Parts



∴CAUTION

Follow the instructions below to avoid damaging internal and connected circuits.

- Make sure the input voltage to the INPUT terminal does not exceed the input voltage to the V IN terminal.
- V IN (VDC) may appear at the INPUT terminals.
 Make sure that the V IN does not exceed rating of the circuit connected to the INPUT terminal.

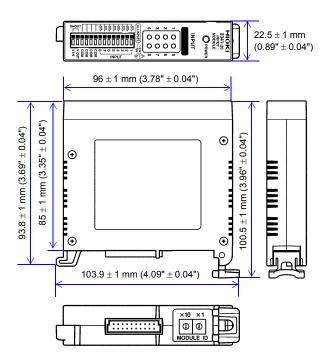


| POWER LED | Goes on or flashes when power is supplied to the module. Remains on, flashes, or changes to another color according to the state of the module. | | | | |
|-------------------------|--|--|--|--|--|
| | POWER LED indication Lit in green : Data being recorded. Flashing in green : Standing by. Lit in red : Non-recoverable error | | | | |
| | occurred. *1 Flashing in red : Recoverable error occurred. *2 | | | | |
| INPUT LEDS | Indicates the status of the input signal. Lights up in green when the contact signal is ON or the voltage signal is at LOW level. | | | | |
| INPUT terminals | Connect input signals to these terminals. Up to 8-channel contact signals or voltage signals (active LOW) can be detected. Contact signals and voltage signals may be mixed on these terminals. Criterion threshold Contact signal: ON: 10 Ω or less, OFF: 1 M Ω or higher Voltage signal: LOW: 0 to 1.0 (V), HIGH: V IN - 1.0 to V IN (V) | | | | |
| COM terminals | This is a low-potential terminal shared by the INPUT, V IN and V OUT terminals. | | | | |
| V OUT terminal | Outputs a voltage (5 \pm 0.5 VDC, 20 mA Max.) between V OUT and COM. | | | | |
| V IN terminal | The contact detection voltage and the HIGH level criterion voltage for the voltage signal are input to this terminal (input range: 4.5 to 30 VDC). If the V IN terminal is short-circuited with V OUT, the threshold is set to approximately 5 VDC. | | | | |
| Module ID setting dials | Use the dial to set the module's identification No. | | | | |

^{*1:} The module needs repair. Contact your dealer or Hioki representative.

^{*2:} The same module ID may be used by another module.

1.4 Dimension Diagrams



Settings

Chapter 2

Setting the Module ID

You can connect up to 63 modules (measurement, input/output, and link) to one communications module.

Setting Procedure



Use the module ID setting dial to set the ID No. of the module to a number from 01 and to 63. (You cannot set a number other than the above.)

NOTE

- Ensure that the set ID is not used for any other module connected to the same communications module.
- The ID numbers of modules need not be consecutive.
- Setting the ID to 99, then turning on the power resets all internal settings to the defaults.
- The module ID and COM ID are not related and can be set independently.
- For COM ID, see the instruction manual for the communications module.

Preparations

Chapter 3

3.1 Installing the Module

3.1.1 Installing the Module Base

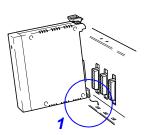
∴CAUTION

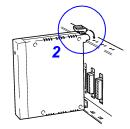
Do not mount the module base on the ceiling where it may fall off.

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.

3.1.2 Mounting a Module on the Module Base

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





3.2 Connecting Input/Output Cables



⚠CAUTION

The channels are not insulated from each other. Take care to avoid short circuits. When measuring two measurement points having a potential difference, equalize the ground level potential of the object to be measured with that of the module, or use another 2341-20 module. This prevents unreliable measurements.

Recommended Cable

Single-wire : 0.32 to 0.65 mm

(Recommended: 0.65 mm)

Stranded-wire : 0.08 to 0.32 mm²

Strand diameter: 0.125 or more

(Recommended: 0.32 mm² Strand diameter: 0.18 or more)

AWG : 22 to 28

(Recommended: AWG22)

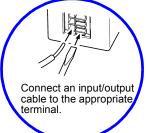
Cable strip length: 9 to 10 mm



3.2.1 Connecting the Input/Output Terminal block

The maximum input voltage is INPUT \leq V IN \leq +30 V.

Ensure that the input does not exceed the maximum input voltage to avoid instrument damage, short-circuiting and electric shock resulting from heat building.



- Hold down the button of the terminal using a flat-blade screwdriver or similar tool.
- While holding down the button, insert an input/output cable into the lead connection hole.
- 3. Release the button to lock the cable

NOTE

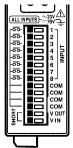
Make sure the cable length does not exceed 30 m (98 feet). If the cable is longer than 30 m, measurement may be affected by external noise or other electromagnetic environment.

3.2.2 The Location of the Input/Output Cable

⚠CAUTION

Follow the instructions below to avoid damaging internal and connected circuits.

- Make sure the input voltage to the INPUT terminal does not exceed the input voltage to the V IN terminal.
- V IN (VDC) may appear at the INPUT terminals.
 Make sure that the V IN does not exceed rating of the circuit connected to the INPUT terminal.



| Terminal | Function | | |
|------------------------------|--|--|--|
| INPUT terminal (Input) | Logic signal input (Between INPUT1 to 8 and COM) | | |
| V OUT terminal 5 VDC output) | Connected to V IN Set V IN = 5 VDC. | | |
| V IN terminal (Input) | Sets contact detection voltage/HI level voltage for voltage signal. (Between V IN and COM) | | |

NOTE

To detect signals, make sure a voltage is applied to the V IN terminal from the V OUT terminal or from an external source.

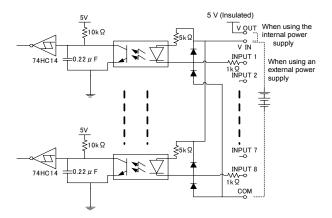
4.1 "Internal Circuit" (19 page)

Others

Chapter 4

4.1 Internal Circuit

The diagram below shows the internal circuit of an input/output terminal. Use the diagram as a guide for terminal connections.

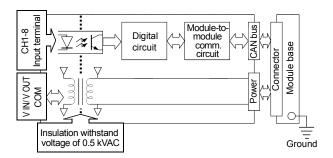


4.2 Insulation of Internal Circuit

ACAUTION

The channels in the measurement input section are not insulated from each other. When connecting signals different in potential to these terminals, use an additional module, or insulate the signals externally, then connect to the terminals. This will prevent errors and module malfunctions.

In the instrument, the input circuit is insulated from the CAN bus as shown in the block diagram below. (Withstand voltage: 0.5 kVAC, 50/60 Hz, Response current: 5 mA, 1 minute)



Specifications

Chapter 5

5.1 Basic Specifications

| Operation | Receives contact signals from an external device and monitors the status of the signals. |
|-------------------------------------|--|
| Number of Inputs | 8 channels |
| Input Signal | Contact/active-LOW input (Photocoupler insulation) |
| Signal Level | HIGH: V IN - 1.0 to V IN (V) LOW: 0 V to 1.0 V |
| Contact Detection Level | ON : Resistance of 10 Ω or less OFF : Resistance of 1 M Ω or more |
| Internal Insulation Power Supply | 5 ± 0.5 VDC, 20 mA Max. Between V OUT and COM. |
| External Input Power Supply | 4.5 to 30 VDC Between V IN and COM |
| Input Status Indication | Contact ON, LOW level |
| Input Terminal | Terminal block |
| Low-Pass Filter | Time constant of 2.2 ms |
| Sampling | Once per second |

5.2 Function Specifications

| Actual Time Management | Time management using PC application |
|------------------------------|--|
| Recording Method | Instantaneous value recording (A log event is recorded only when the recording is started or stopped, or when changes in status are detected.) * Recording is initiated by a command (transmitted via the CAN bus). |
| Recorded Data | data set contains the time and data for the 8 channels. New data is appended to previous data when recording begins. |
| Recording End Condition | Memory full stop or indefinite * Set the condition before the start of recording. |
| Quantity of Recorded Data | 512 K bytes Flash memory (30,000 data) |
| Alarm Output | All logged data, data for a specified time, or the current status (monitored) |
| Data Deletion | All logged data can be deleted by a command. |
| Power Outage Protection | After recovering from a power outage, the instrument automatically returns to the state held before the outage. |

5.3 General Specifications

| Clock Accuracy | ± 100 ppm (Reference value at temperature from 0 to 50°C (32 to 122°F) without the communications module) | | | |
|--|---|--|--|--|
| Backup | Recorded data (saved in flash memory) * Data loss for up to 2 minutes before and after a power outage may occur. | | | |
| Communication Interface | CAN bus (500 kps) | | | |
| Maximum Rated Voltage to Earth | 33 Vrms, 70 VDC (Sum with input voltage) | | | |
| Rated Supply Voltage | 5 ± 0.25 VDC | | | |
| Maximum Rated Power | 1.4 W | | | |
| Withstand Voltage | 500 VAC Between input terminal and CAN bus (50/60 Hz, Response current 5 mA, one minutes | | | |
| Dimensions | Approx. 22.5W X 96H X 85D mm (0.89"W X 3.78"H X 3.35"D) (excluding projections) | | | |
| Mass | Approx. 120 g (4.2 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 | | | |

Maintenance and Service

Chapter 6

6.1 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.

6.2 Service

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: INPUT MODULE

Model Number: 2341-20

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

<u> Jují Járolsí</u> Yuji Hioki

President

2341A999-00

HIOKI 2341-20 INPUT MODULE Instruction Manual

Publication date: July 2004 Edition 1

Edited and published by HIOKI E.E. CORPORATION Technical Support Section

All inquiries to International Sales and Marketing Department

81 Koizumi, Ueda, Nagano, 386-1192, Japan TEL: +81-268-28-0562 / FAX: +81-268-28-0568

E-mail: os-com@hioki.co.ip

URL http://www.hioki.co.jp/

Printed in Japan 2341A981-00

- All reasonable care has been taken in the production of this manual, but if you find any points which are unclear or in error, please contact your supplier or the International Sales and Marketing Department at HIOKI headquarters.
- In the interests of product development, the contents of this manual are subject to revision without prior notice.
- Unauthorized reproduction or copying of this manual is prohibited.



HIOKI E.E. CORPORATION

HEAD OFFICE

81 Koizumi, Ueda, Nagano 386-1192, Japan TEL +81-268-28-0562 / FAX +81-268-28-0568 E-mail: os-com@hioki.co.jp URL http://www.hioki.co.jp/

HIOKI USA CORPORATION

6 Corporate Drive, Cranbury, NJ 08512, USA TEL +1-609-409-9109 / FAX +1-609-409-9108

2341A981-00 04-07H



Printed on recycled paper

