USER GUIDE

TR-55i-TC

T&D

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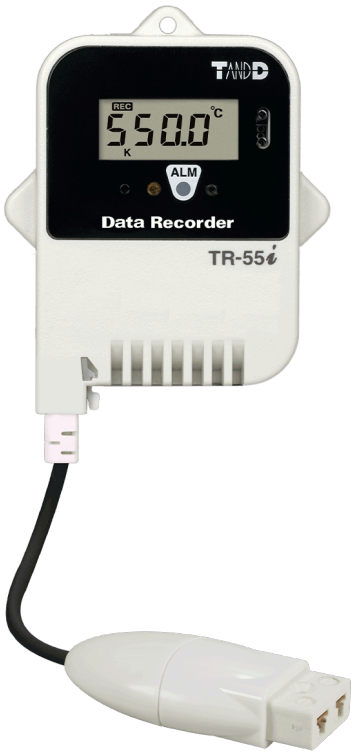


Data Recorder
TR-55*i*
User's Manual

Thank you for purchasing our product.
Carefully read this instruction manual before using this Unit.

Outline of TR-55i

External Input Module Type

Splash proof (rated for use in daily life)

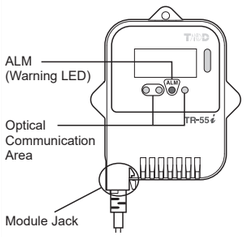
TR-55i is a Data Logger designed to measure and record different items depending on the Input Module to be connected: temperature (Thermocouple/Pt), voltage, 4-20mA, and pulse count. The body is splash proof (rated for use in daily life), which can be placed in an environment between -40 and 80°C. Recorded data can be collected from the TR-55i to PC by using a Communication Port (sold separately). The data can then be viewed in graph and table form as well as printed out by using the software.

Package Contents:

Data Logger (TR-55i), Lithium Battery (LS14250), Input Module(*), Strap, Manual Set (Warranty included)

* The Input Module included in the package differs depending upon which "set model" has been purchased.

Part Names



Data Recorder TR-55i is referred to as the "Unit" in this manual.

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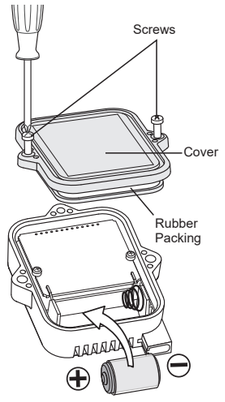
Specifications

Device Name	TR-55i
Measurement Item (*1)	Temperature / Voltage / 4-20mA / Pulse Count
Logging Capacity	16,000 readings
Recording Interval	Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.
Recording Mode	Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)
Communication Interfaces	Optical Communication
Power	Lithium Battery: LS14250 x 1
Battery Life (*2)	See "Estimated Battery Life" in this manual.
Dimensions	H 62 mm x W 47 mm x D 19 mm (excluding protrusions and Input Module)
Weight	About 45 g
Operating Environment	-40 to 80 °C
Waterproof Capacity	IP64: Splash proof (rated for use in daily life) (*3)
Data Collection Devices	TR-50U2 Other devices (*4)

*1: See "Input Module User's Manual" for detailed information including measurement range and accuracy for the Input Module being used.
*2: Battery life depends upon multiple factors including measuring environment, recording interval, and quality of the battery being used.
*3: This is the waterproof capacity of the logger unit with an input module connected. Input Module itself is not water resistant.
*4: Also compatible with the following discontinued products: TR-57DCi, TR-50U

The specifications listed above are subject to change without notice.

Installing the Battery



1. Remove the screws and open the cover.
Make sure to use the proper size and type of screwdriver. (Phillips head #1 screwdriver is recommended.)

2. Insert the supplied battery with tube into the case as shown in the diagram.

3. Check the rubber packing for any cuts or scratches and close the cover as it was when opened.
- Dust or defects on the packing can adversely affect the waterproof capacity; in this case, remove the dust or replace the packing if it is damaged.
- Be sure to completely close the cover.
- Make sure not to over tighten the screws.
(Appropriate Tightening Torque: 20N·cm to 30N·cm{2Kgf·cm to 3Kgf·cm})

Notes about Battery Installation

- After inserting the battery for the first time, nothing may appear or occur for about 10 seconds; this is not a malfunction.
- If a new battery has been installed and nothing appears in the display, please remove and reinsert the battery.
- When inserting a battery, make sure no water or foreign objects get inside the case.
- Make sure that + and - are in the correct direction.

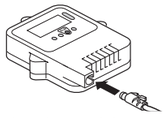
About Lithium Batteries

- Please store the lithium battery LS14250 in a place that is 20 °C or less.
- When using lithium batteries other than LS14250 produced by SAFT, such as CR2, product specifications cannot be guaranteed nor can the performance of some functions, such as the battery warning function.
- Please avoid using the CR2 in the following situations:
  Using the unit in an environment below 0 °C or above 60 °C
  Exposing the CR2 to continuous vibration such as in transportation
- When using a CR2 lithium battery, the tube is not necessary.
- To maintain waterproof capacity, when changing batteries also change the rubber packing and the drying agent (silica gel). When using a CR2 lithium battery, please purchase the optional Maintenance Set (TR-00P1) to replace the rubber packing and silica gel.

Connecting an Input Module

Insert an Input Module into the module jack. Once the Unit recognizes the module, the LCD display will change as shown below and recording will start. (If you have purchased an TR-55i-P, the Unit has been set by default to start recording upon installation of the battery.)

* The factory default settings are as follows: Recording Interval at 10 minutes, Recording Start at Immediate Start, Recording Mode at Endless.



Make sure that the module is completely inserted until you hear a "click" sound.

Set Model Number	Measurement Items	Input Module	LCD Display Items (detailed in "How to Read the LCD Display" section)
TR-55i-TC	Temperature (Type K, J, T, S)	Thermocouple Module (TCM-3010)	Measurement, Unit of Measurement, Sensor Type, Operational Status
TR-55i-Pt	Temperature (Pt100, Pt1000)	PT Module (PTM-3010)	Measurement, Unit of Measurement, Sensor Type, Operational Status
TR-55i-V	Voltage	Voltage Module (VIM-3010)	Measurement, Unit of Measurement, Operational Status
TR-55i-mA	4-20mA	4-20mA Module (AIM-3010)	Measurement, Unit of Measurement, Operational Status
TR-55i-P	Pulse Count	Pulse Input Cable (PIC-3150)	Measurement, Unit of Measurement, Operational Status

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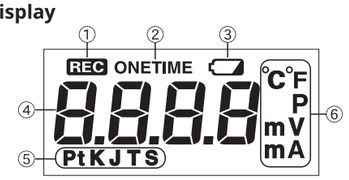
How to Read the LCD Display

When being used in very hot or cold environments, the display may become difficult to read. This is not a malfunction.

Basic LCD Display



① [REC] Mark	The recording status is shown as below. ON: Recording in progress BLINKING: Waiting for programmed start OFF: Recording stopped
② [ONETIME] Mark	When the recording mode is set to "One Time", this mark appears. The factory default setting is "Endless" and this mark will not appear.
③ Battery Warning Mark	When it is time for the battery to be replaced, this mark will appear.
④ Measurement and Message Area	Measurements or operational messages are shown here.
⑤ Sensor Type	The type of sensor connected to or set in the Unit is shown here. Thermocouple: Type K, J, T, S Platinum Thermal Resistance Sensor: Pt (Pt100), PtK (Pt1000)
⑥ Unit of Measurement	The unit of measurement for the display is shown here.

Battery Replacement

1. When it is time for the battery to be replaced, a battery warning mark will appear.

Please change the battery as soon as possible if this mark appears.

2. After removing the battery, wait for about three seconds until [bAtt] appears in the Measurement and Message Area. Once this appears, please insert the new battery as quickly as possible.

- Make sure that [bAtt] is displayed before changing the battery; otherwise the battery warning mark may remain even after battery replacement.
- If you change the battery at this point, all recorded data will be saved.

3. If the battery is further left unchanged, the display will automatically shut off.
If, at this time, a new battery is placed in the Unit, [CHEC] will appear on the display after which recording will begin again using the previously set recording conditions. Note however that all previously recorded data will have been lost.

Estimated Battery Life

The battery warning mark will appear based upon the calculation of battery use. This mark may not appear correctly if the same battery is taken out and put in, therefore do not remove the battery until it can be replaced with a new one.

When communication frequency is 4 times a month:

Set Model Number	Rec Interval = 1 sec.	Rec Interval ≧ 10 sec.
TR-55i-TC	About 6.5 months	About 14 months
TR-55i-Pt	About 10 months	About 24 months
TR-55i-V	About 16 months	About 16 months
TR-55i-mA	About 16 months	About 16 months
TR-55i-P (Input: Open)	About 24 months	
TR-55i-P (Input: Short)	About 16 months	

- When the recording method is set to "average value" for the TR-55i-V or TR-55i-mA, the battery life will be the same as when the recording interval is one second regardless of the actual recording interval.
- The battery warning mark may appear sooner than noted above.
- Battery life will be shortened when: downloading data very often, setting the recording interval at less than ten seconds, or measuring in an environment below -20 °C or above 60 °C.

Notes about Changing the Battery

- Before replacing a battery, please make sure to download any necessary data and proceed with changing the battery.
- If + (plus) and – (minus) are mistaken, or if the battery terminals + and – are shorted, the recorded data that is stored in the Unit will be lost.
- Downloading of data cannot occur while the battery is removed.

Example of Display

Display varies depending upon the model being used.

TR-55i-TC (Thermocouple)

Temperature measurement (°F / °C) will be displayed. Sensor type will be displayed under the measurement; the factory default setting is Type K. By using the software for the Communication Port, you can change the sensor type.

TR-55i-Pt (Pt100 / Pt1000)

Temperature measurement (°F / °C) will be displayed. Sensor type will be displayed under the measurement; the factory default setting is Pt100. By using the software for the Communication Port, you can change the sensor type.

TR-55i-V (Voltage)

Voltage measurement (Unit: V / mV) will be displayed. Due to the wide measurement range, the Unit has been set by default to adjust the decimal point automatically to display the measurement in V. By using the software for the Communication Port, you can change the unit of display.

TR-55i-mA (4-20mA)

4-20mA measurement (Unit: mA) will be displayed.

TR-55i-P (Pulse Count)

There are two display methods for the pulse measurement. By using the software for the Communication Port, you can change the method of display.

Pulse Rate (Max: 61439)
The most recent pulse count (Unit: P) for the recording interval period will be displayed. The display will be refreshed every one-sixtieth of the recording interval (at minimum of every one second). 31,500 pulse count will be displayed as [31.50KP], in units of 10 pulse for display.

Total Pulse Count
The cumulative number of pulses (Unit: P) will be displayed from 0 to 9999. The displayed count will be refreshed every one second, and upon exceeding 9999, the count will start over again from 0.

Other Marks or Messages on Display

Logging Capacity FULL

When Recording Mode has been set to "One Time" and the Unit reaches its logging capacity of 16,000 readings, recording will automatically stop and in the LCD the measurement and the word [FULL] will alternately appear.

Estimation of time until [FULL] is displayed

Recording Interval	1 second	30 seconds	1 minute	10 minutes	60 minutes
Period	About 4 hours	About 5 days	About 11 days	About 111 days	About 1 year and 10 months

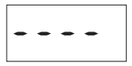
Check

If this appears, all data that was stored in the Unit will have been erased. This message will appear under the following conditions:
- The first time a battery was inserted after purchase
- When the battery is replaced after having been taken out for a long period
- If the battery is replaced after the battery power has been lost.

Continued on Back Page.

How to Read the LCD Display (continued from previous page)

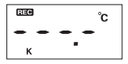
Input Module Unrecognized (factory default)



This will appear if, after purchasing, the Input Module has never been connected to the Unit. (Unit of Measurement not displayed)

Note that a TR-55i-P has been set to measure pulse count by default, therefore the unit "P" will be displayed.

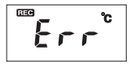
Input Module Unconnected or Damaged



This will appear if the Unit cannot confirm a connection with the Input Module after having recognized it. (Unit of Measurement displayed)

If nothing is displayed after reconnecting the sensor to the Unit, there is a possibility that the sensor or the Unit has been damaged.

Sensor Unconnected or Damaged



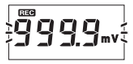
This will be displayed when a sensor has not been connected to the module or the wire has been broken. Recording is in progress and so is battery consumption.

If nothing appears on display after reconnecting the sensor to the Unit, there is a possibility that the sensor or the Unit has been damaged.

Measurement Range Exceeded

[OL] will appear if a measurement exceeds the measurement range.

Display Range Exceeded



When measuring voltage in “mV range”, the measurement in the LCD display will flash if it exceeds the display range of the Unit.

Warning (Set Limit Exceeded)

Warning LED (flashing)

Using the software for the Communication Port, you can make settings for the Upper / Lower Limits and Warning Time. If a measurement exceeds one of the set limits, the warning LED and a message will be displayed.

Upper Limit Exceeded

If a measurement exceeds the set upper limit, the measurement and [HI] will alternately appear on the LCD screen.

Lower Limit Exceeded

If a measurement exceeds the set lower limit, the measurement and [Lo] will alternately appear on the LCD screen.

❗ Starting the Warning Monitoring Function

If these settings are made in an environment where one of the limits is being exceeded and recording is started, the monitoring function will enter “wait” mode. Once a measurement returns to within the set limits, the monitoring function will begin to operate.

❗ How to Turn Off a Warning

- Restart recording from the software.
- In the software use [Clear Warning]
- Download the recorded data (only when successfully completed).
- Produce a condition so that [CHEC] is displayed.

Communicating with your Computer

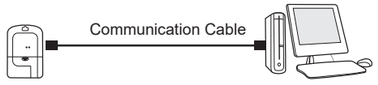
❗ In order to change settings in the Unit such as recording settings, download recorded data from the Unit to your computer, or communicate with your computer, it is necessary to purchase separately a Communication Port (TR-50U2) .

❗ By using the software "T&D Recorder for Windows (TR-5,7xU)" for the Communication Port, it is possible to carry out communication with a PC. For details about how to make recording settings, download data and other operations, please see the User’s Manual that comes with the Communication Port.

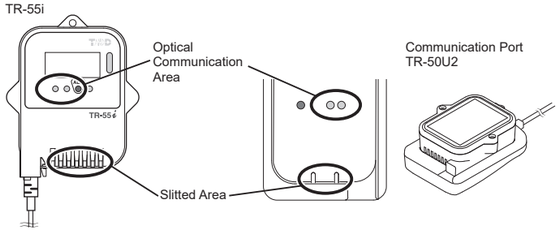
❗ The latest version of "T&D Recorder for Windows (TR-5,7xU)" can be downloaded free of charge from our website. (TR-55i can be used with Ver. 2.00 or higher.)

How to Communicate with the Computer

1. Follow directions as issued in the software to connect the Communication Port to your PC.



2. Place the Data Logger on the Communication Port making sure to align the optical communication areas and slitted areas.



Using a PC allows the following:

It is possible to change recording settings in the Unit, download recorded data to a PC, and view downloaded data.

Recording Settings for the Unit

The factory default settings are as follows: Recording Interval at 10 minutes, Recording Start at Immediate Start, Recording Mode at Endless.

Recording Interval	Select from 15 choices: 1, 2, 5, 10, 15, 20, and 30 seconds or 1, 2, 5, 10, 15, 20, 30, and 60 minutes
Recording Start	Immediate Start: Recording will start immediately upon installation of the battery. Programmed Start: Recording will start at the set date and time.
Recording Mode	One Time: Upon reaching logging capacity of 16,000 readings, recording will automatically stop. (The word [FULL] and the measurement will alternately appear on the LCD screen.) Endless: Upon reaching capacity of 16,000 readings, the oldest data will be overwritten and recording will continue.

❗ Notes about Optical Communication

- Proper communication may not be possible in the following situations:
  where temperatures are very high or very low, in an environment with intense brightness (higher than 5,000lx), or when the remaining battery life for the Unit is very low.

Disclaimers

In order to properly use this product, please carefully read this manual before using.

- All rights of this document and attached documents belong to T&D Corporation (hereinafter referred to as “the Company”). It is prohibited to use, duplicate and/or arrange a part or whole of them without the permission of the Company.
- All registered trademarks, company names, product names and logos mentioned herein or for products being used are the property of the Company or of their respective owners.
- Specifications, design and other contents outlined in this document and attached documents are subject to change without notice.
- Please follow the safety precautions outlined in this document and attached documents carefully. We cannot guarantee nor are we responsible for safety if this product is used in any manner other than was intended.
- On-screen messages in this document may vary slightly from the actual messages.
- Please notify the distributor where you purchased this product or the Company of any mistakes, errors or unclear explanations in this document and attached documents.
- The Company’s liability for the product shall be limited to repair or replacement in accordance with our free repair policy, as stated on the included warranty card. The Company shall not be liable for any lost profits, business interruption, other consequential damages, indirect damages, punitive damages, or damages based on a claim for compensation from a third party that the Customer incurs as a result of a failure or malfunction of the product. However, if due to the Company’s intentional or gross negligence the Customer suffers damages, the Company shall be liable for damages up to the amount paid by the Customer for such product.
- This manual cannot be reissued, so please keep it in a safe place.
- Please read the warranty and provisions for free repair carefully.

Safety Precautions and Instructions

The following items should be strictly obeyed for the safe usage of this product, and for protecting yourself and other people from bodily harm and/or damage to property.
To ensure the proper use of this product, we ask that before using it you carefully read, understand and follow the safety rules and precautions as outlined below.

Explanation of Symbols

Warning Symbols

⚠ DANGER	These entries are actions that, if taken, may cause serious personal physical damage or death.
⚠ CAUTION	These entries are actions that, if taken, may lead to physical injury or damage to persons or things.

Picture Symbols

△ Denotes an important warning or caution.	⃠ Denotes a forbidden action.	● Denotes an action that should be carried out.

⚠ DANGER

- This Unit has been designed for private and/or industrial use only. It should not be used in situations where strict safety precautions are necessary such as with medical equipment, or in systems directly or indirectly connected with human life or well-being.
- Do not disassemble, repair or modify the Unit.
  It may result in malfunction or unexpected accidents.
- Harmful gases or chemicals may cause corrosion and/or other danger to the Unit. Also, by coming in contact with hazardous substances, harm may occur to the people handling the Unit. Therefore, do not use or store the Unit in any environment that is exposed to chemicals and harmful gases.
- Do not use any other batteries than those that are specified in this manual.
  It may cause fire or malfunction.
- If water or a foreign object enters the case, immediately remove the battery and cease using it.
  It may result in malfunction or unexpected accidents.
- Store the Unit and accessories out of the reach of children.
  Not doing so may cause an unexpected accident.
- If any smoke or strange smells are emitted from the Unit, immediately remove the battery and stop using.
  Continued use may cause fire or electrocution.
- Please be careful not to touch the Unit during or after use in overly hot or cold environments.
  It may cause burns or frostbite.

⚠ CAUTION

- Battery life depends upon multiple factors including measuring environment, recording interval, and quality of the battery being used.
- When using the Unit in unusually high or low temperature environments, the battery power will be depleted more quickly than when using under normal temperature conditions.
- The Unit becomes splash proof (rated for use in daily life) only after the Input Module has been connected.
  Without the module connected, neither the module jack nor the connector part of the temperature sensor on the Unit is water resistant; make sure not to get wet.
- If the Unit is not to be used for a long period of time, store it in a place where it is not exposed to high temperature and high humidity.
  If the Unit has condensation on the inside, it may cause malfunction and damage.
- Do not remove or reinsert the battery once it has been set; continue using until battery power is depleted. Always use a new battery for replacement.
  Not doing so may result in improper operation.
- To maintain waterproof capacity, we suggest periodically changing the parts inside the case.
  If the rubber packing should be damaged or deteriorated, please replace it along with the drying agent.
- If the Unit is subjected to significant temperature change while wet, it may cause condensation inside the case.
  Especially be careful with temperature changes from high to low; if the Unit has condensation on the inside, it may cause malfunction, damage, and/or unexpected accidents.
- Do not drop or expose the Unit to a strong impact.
  It may cause damage or malfunction.
- Do not put fingers or foreign objects into the modular jack.

- Do not use or store the Unit in places such as listed below. It may result in malfunction or unexpected accidents.
  - Areas exposed to direct sunlight
  - Areas exposed in water or high-pressure water flow
  - Areas exposed to organic solvents and corrosive gas
  - Areas exposed to strong magnetic fields
  - Areas exposed to static electricity
  - Areas near fire or exposed to excessive heat
  - Areas exposed to excessive dust, dirt and smoke

⚠ Contact with oil may cause cracks to appear in the casing of the Unit. When using this Unit in environments where such oils are present, please ensure that it is protected from contact through use of a polyethylene bag or other means.

⚠ Notices about using the Input Modules

When using T&D Recorder for Windows to make “Adjustment Settings”, the adjustment values will be saved to the Input Module. Therefore, when an Input Module is replaced, it is necessary to re-make any desired adjustment settings to be written into the newly connected module.

⚠ Compliance Information

FCC Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party (US) :
TandD US, LLC
Santa Fe, New Mexico
https://tandd.com/

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To comply with the limits for the Class B digital device, pursuant to Part 15 of the FCC Rules, this device must be installed in computer equipment certified to comply with the Class B limits.

All cables used to connect the computer and peripherals must be shielded and grounded. Operation with non-certified computers or non-shielded cables may result in interference to radio or television reception.
Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

CE Statement

Hereby, T&D Corporation declares that this device is in compliance with EMC Directive. The full text of the EU declaration of conformity is available at the following internet address:
https://tandd.com/manual/pdf/doc-tr55i.pdf

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