BACANCY®
SYSTEMS PVT LTD

User Guide

Insulating Monitoring Device (Dual Channel)

Please completely read this document and the contained safety instructions and note all given information before usage.

Please maintain the confidentiality of this user guide. It is intended solely for usage by people professionally associated with the product. If you are not the intended recipient, you may not disclose or use the information in this documentation. The information does not constitute an offer or solicitation to buy or sale of any security.

This user guide's text and illustrations have been meticulously crafted. However, we may not be held accountable for any discrepancies or failure consequences.

Some company and label names are protected by a label, a patent, or a trademark.

Address: Bacancy Systems PVT LTD,
15-16, Times Corporate Park,
Near Thaltej-Shilaj Road,
Opp. Copper Stone Flats,
Thaltej, Ahmedabad,
Gujarat, India, 380059
Website: www.bacancysystems.com
Email: systems@bacancysystems.com
Phone: +91 90160 28817

Liability

The given data is primarily for product description reasons and should not be considered a guaranteed characteristic unless specifically stated in the contract. All rights are retained with regard to the content of this documentation and the availability of the product.

DISCLAIMER

The product, product data and any of its specifications are subject to change without notice. Bacancy Systems PVT LTD, its employees, and all persons acting on its behalf shall not be liable for any errors, inaccuracies, or incompleteness that occur if the methodology contained herein or in any other revelation of the product is not followed. The product specifications alter or amend neither the terms nor conditions of purchase nor the warranty expressed therein.

Bacancy Systems PVT LTD offers no warranty, representation, or guarantee other than as set forth in the terms and conditions of purchase. To the maximum extent permitted by applicable law.

Bacancy Systems PVT LTD, Disclaims

(i). Any and all liability arising out of the application or use of any product.

(ii). Any and all liability, including without limitation special, consequential or incidental damages

(iii). Any and all implied warranties, including those of merchantability, fitness for a specific purpose, and non-infringement.

The information provided in user guide and/or specifications may differ from actual results in different circumstances, and efficiency may change over time. Statements on a product's appropriateness for a certain application are based on Bacancy Systems PVT LTD's understanding of standard demands that are frequently put on the products of Bacancy Systems PVT LTD. The customer should determine whether a given Bacancy Systems PVT LTD product with the features mentioned in the product specification is appropriate for use in a specific application.

The product shown herein is not designed for use in lifesaving or life-sustaining applications unless otherwise expressly indicated. Customers who utilise or sell Bacancy Systems PVT LTD products that are not explicitly intended for such applications do so solely at their own risk.

This user guide is intended to improve the operator's efficiency throughout the procedure and does not entirely absolve them of responsibility.

Change Record

Rev. No.	Date	Details	Revised By	Approved By
0	06/06/2024	Initial Release	Rajkumar Patel	Jasmin Nakrani
1	11/07/2024	Section 7.1: Images Updated	Rajkumar Patel	Jasmin Nakrani
2	22/04/2025	Legal Entity Conversion: LLP to PVT LTD	Rajkumar Patel	Jasmin Nakrani
3	04/05/2026	Revised Email Address	Rajkumar Patel	Jasmin Nakrani

Table of Contents

List of Figures

List of Tables

1. About this Document

1.1 Information on the User Guide

This user guide contains basic information to be considered in the utilisation of the product. A precondition for safe working is the observance of all stated safety instructions and directions. Therefore, this user guide should be read and applied without fail by any person assigned to the installation and operating procedures of the product or system.

This user guide is part of the product, and the case may have to be passed to third parties or the following owners. It must be permanently kept at the usage site and be available for the operating personnel who are responsible for the installation of this product or system.

We are eager to ensure the comprehensiveness, relevance, and up-to-dateness of this user guide. It may become essential to make spontaneous changes to the product and its operation, which may not align with this manual, to maintain our technical advancement. In that case, Bacancy Systems PVT LTD will provide you with a new manual. We exclude liability for disturbances, failures, and resulting damages.

The illustrations in this user guide will provide a better understanding. It can occur that illustrations are not drawn to scale or deviate somewhat from the original.

1.2 Limitations of Liability

All statements and remarks in this user guide have been aggregated with consideration of current standards, laws, and regulations, the state of technology, as well as our extensive knowledge, long-time expertise, and experience. In special models, due to demands for additional order options or the latest technical alterations, the actual scope of delivery can differ from the explanations and elaborations described here.

The manufacturer excludes any liability for damages caused by:

- Inappropriate assembling and installation.
- Non-observance of the user manual.
- Non-intended and improper use.
- Use beyond operation limits.
- Deployment of insufficiently qualified and trained personnel.
- Use of unauthorised spare parts and accessories.

2. Safety

The safety directions, cautions, warnings, and notices are stated here. Moreover, in this user guide's section, the following sections have to be followed to reduce potential health risks and prevent hazardous situations as per the ISO 45001:2018 standard for occupational health and safety.

2.1 Safety Graphical Pictogram or Symbol

These prescribe safety signs for the purposes of accident prevention, fire protection, health hazard information, and emergency evacuation as per the ISO 7010:2019 standard for graphical symbols, safety colours, and registered safety signs.

The safety instructions are structured as follows:

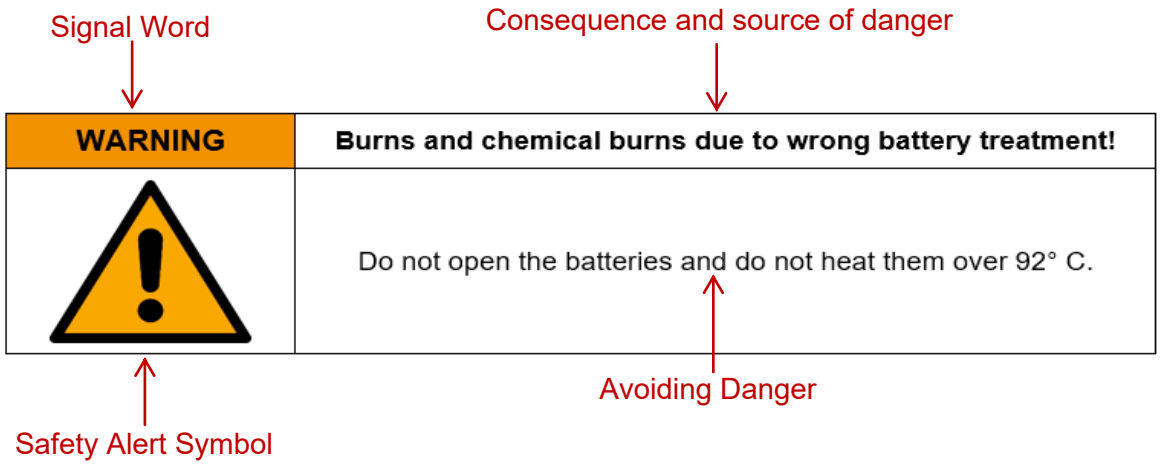


Figure 1 Safety Instruction

Table 1 Safety Graphical Pictogram or Symbol

Pictogram / Symbol	Signal Word	Meaning
	DANGER!	In case of non-compliance with this safety instruction, death or serious injury will occur.
	WARNING!	In case of non-compliance with this safety instruction, death or serious injury can occur.
	CAUTION!	In case of non-compliance with this safety instruction, a minor or moderate injury can occur.
	NOTICE!	In case of non-compliance with this safety instruction, material damage can occur.
	NOTE!	Useful notice or tip on the products or system's easy operation.

2.2 Safety Instruction and Warnings

MANDATORY	Read User Guide
	To get an understanding of the product, the user should pay careful attention to the user guide.

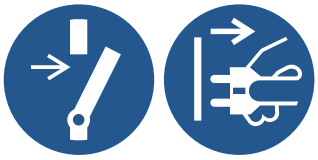
PROHIBITION	Hot Works
	Hot work shall be prohibited in close proximity to fully charged batteries. It will result in a battery explosion.

CAUTION!	Working with Machine Tools Near the Battery
	To prevent the occurrence of sparks, short circuits, or explosions, the user shall take precautions near the operation of a machine tool with a battery.

PROHIBITION	Installation Environment Circumstance
	High concentrations of oxidising or salted gases, wet or dusty surfaces, proximity to sources of extreme heat, open flames, or sparks, or high variation with temperature, proximity to storage of highly flammable materials or gas concentrations, and proximity to areas unprotected from water or high humidity are all prohibited.

MANDATORY	Installation and Maintenance
	Installation and maintenance should be carried out under the supervision or advice of a qualified professional.

PROHIBITION	Assembly and Disassembly
	The assembly or disassembly of an open, repaired, default parameter, or changed production should be prohibited. The warranty could be void and invalid, and the service can be discontinued without notice. The use of a high-pressure washer to clean the product is prohibited.

MANDATORY	Disconnect Power Supply
	The power source or plug should be disconnected in the event of an unanticipated event or when conducting maintenance and repair.

FIRE PROTECTION	Fire Extinguisher
	In the event of a fire, the use of a dry powder fire extinguisher should be advised for fire control, and the use of water should be prohibited.

2.3 The Responsibility of Operator

The product is associated with industrial safety standards. However, the operator who is installing or operating the product is liable for the legal responsibilities for operational safety. In addition to the operational safety instructions in this manual, the safety, accident prevention, and environmental protection regulations valid for the operational area of the product shall be followed.

2.4 Person in Charge of Operations

WARNING!	Risk of injury caused by lack of an adequate qualification!
	Inappropriate handling of the product can lead to severe personal injuries and material damages.

In this manual the following qualification are specified:

Instructed Person	An instructed person is someone who has been instructed by the operator or manufacturer on the given tasks and potential hazards in the event of incorrect behaviour, as well as being semi-skilled and knowledgeable about the necessary safety procedures and safeguards.
Qualified Specialised Professional	Qualified specialised professionals are individuals who are knowledgeable with the assembly, commissioning, and operation of the product and process qualifications related to their work. The specialised individual is able to recognise hazards and prevent potential hazards because of their professional training, knowledge, and experience, as well as their understanding of the appropriate regulations.

2.5 In an occurrence of Danger or an Accident

Preventive Measures:

- Always be prepared for accidents or fires!
- Keep first-aid equipment (ambulance boxes, blankets, etc.) within easy reach.
- Inform personnel with accident alerting, first-aid, and emergency services.
- Keep clear access routes for emergency vehicles.

If the occurrence happens, follow these steps:

- Turn off the product immediately.
- Implement first-aid procedures.
- Get people out of hazardous areas.
- Inform the appropriate person at the usage spot.
- Contact a doctor and/or the fire department.

3. Packaging, Transport and Storage

3.1 Inspection, Packaging and Transport

The products have been properly secured to ensure sufficient safeguarding during shipment. Please scrutinise the delivered products for overall quality and transportation problems as soon as possible.

In the instance of external shipment damage, proceed as follows:

- Do not accept delivery or accept it only on reserve.
- Issue a complaint.
- Do not use items that are obviously defective.

3.2 Transport

Always ensure that your equipment is transported in safe and appropriate containers while transporting it to the usage location or in the field.

Never transfer everything in an unplanned way in the vehicle. Hits and thrusts might seriously impair the product's functionality.

Always use the original packaging, transport containers, transport boxes, or equivalent packaging, whether transporting by train, aircraft, or ship. The container shields the goods from impacts and vibrations.

3.3 Storage

Strictly store the product in well-ventilated, dry spaces. During storage, keep it dry and leverage the original packaging if possible.

Avoid extreme heat fluctuations during storage. The initiation of water condensation can impair the product's operation.

When storing, keep in mind the temperature restrictions of the product. Please refer to the product's technical data for valid storage temperatures.

4. Intended Use

The purpose of this user guide is to give you basic information about the Insulation Monitoring Device (IMD). This user guide is mainly focused on the technical aspects of the IMD, which are covered in this user guide in graphical and tabular formats in various sections, as listed below:

Sections 1–3 featured information concerning the document and product's liability, safety, packing, transportation, and storage constraints. These first three parts will help you know how to follow pre-conception practises that must be followed before, during, and after utilising the product.

Section five contains technical information about the IMD, such as its features, functions, and applications, as well as its technical specifications and a block diagram for the described internal architecture of the IMD with communication protocol, interface, and its functions.

Section six includes information regarding the installation of the IMD, such as mechanical dimensions and mounting position, along with a diagram.

Section seven provides information on configuring the IMD using RS-485 communication with the holding resistor address.

Finally, the appendix section included an abbreviation and glossary as well as the company's help desk and contact information.

WARNING!	**Risk caused by inappropriate use!**
	Any unconventional use and/or different operation of the product can lead to hazardous situations. • Only use the product in a conventional manner.

4.1 Limitation

The product is intended for use in an operational environment. It should not be used in hostile or explosive conditions.

The operator should consult local safety authorities and safety representatives before performing tasks in hazardous areas or in similar circumstances.

4.2 Alteration and Restoration of the Product/System

To prevent risks and make sure optimal performance, no alterations, attachments, or restoration of the product are permitted without explicit authorisation of Bacancy Systems PVT LTD.

5. Structure and Function

Figure 2 Insulation Monitoring Device (IMD)

Bacancy's Insulation Monitoring Device (IMD) with dual channels is designed to monitor potential electrical hazards in each Electric Vehicle Supply Equipment (EVSE) at DC fast-charging stations. As EVSE requirements move to higher DC voltages to accommodate heavier vehicles, safety becomes a top priority. The IMD ensures safety by detecting insulation faults and earth (ground) faults in the DC charging system.

Moreover, the IMD operates by monitoring the insulation resistance between the DC charging station and ground. Here's how it works:

1. **Dual Channels**:
    - The IMD has two distinct monitoring channels.
    - Each channel continually monitors insulation resistance and detects earth protection problems.
    - Having dual channels enhances redundancy and reliability.
2. **Insulation Resistance Monitoring**:
    - The IMD measures insulation resistance between the charging station's DC circuit and ground.
    - If insulation resistance drops below a safe threshold, it triggers an action.
    - Dual channels enable the simultaneous monitoring of positive and negative conductors.
3. **Ground Fault Detection**:
    - It compares the current flowing through the positive and negative conductors.
    - Any imbalance indicates a ground fault, and the IMD responds accordingly.

5.1 Overview

5.1.1 Feature

List of Feature
DC earth leakage solution with dedicated two relays for positive (+ve) & negative (-ve) leakage fault for each channel.
Method: Switch in a resistive divider to determine the isolation resistance of DC+ or DC- to PE.
Calibrated scale with ± 10% accuracy and configurable time delay and resistance threshold limit using the RS-485 (Modbus) communication.
Calibrated scale with + 10% accuracy for +Ve & -Ve fault & setting & in directions for +Ve /-Ve healthy & relay.
Reliable insulation monitoring accuracy with less than 20 ms (millisecond) response time.
No external resistance required.
Compliance with IEC 61557-8 and IEC 61851-23.

5.1.2 Application

List of Applications
Monitor & Protect the DC Circuits from DC Earth leakage for • Battery, • DC Control Circuits, • Chargers & Rectifiers

5.2 Function

5.2.1 Technical Specification

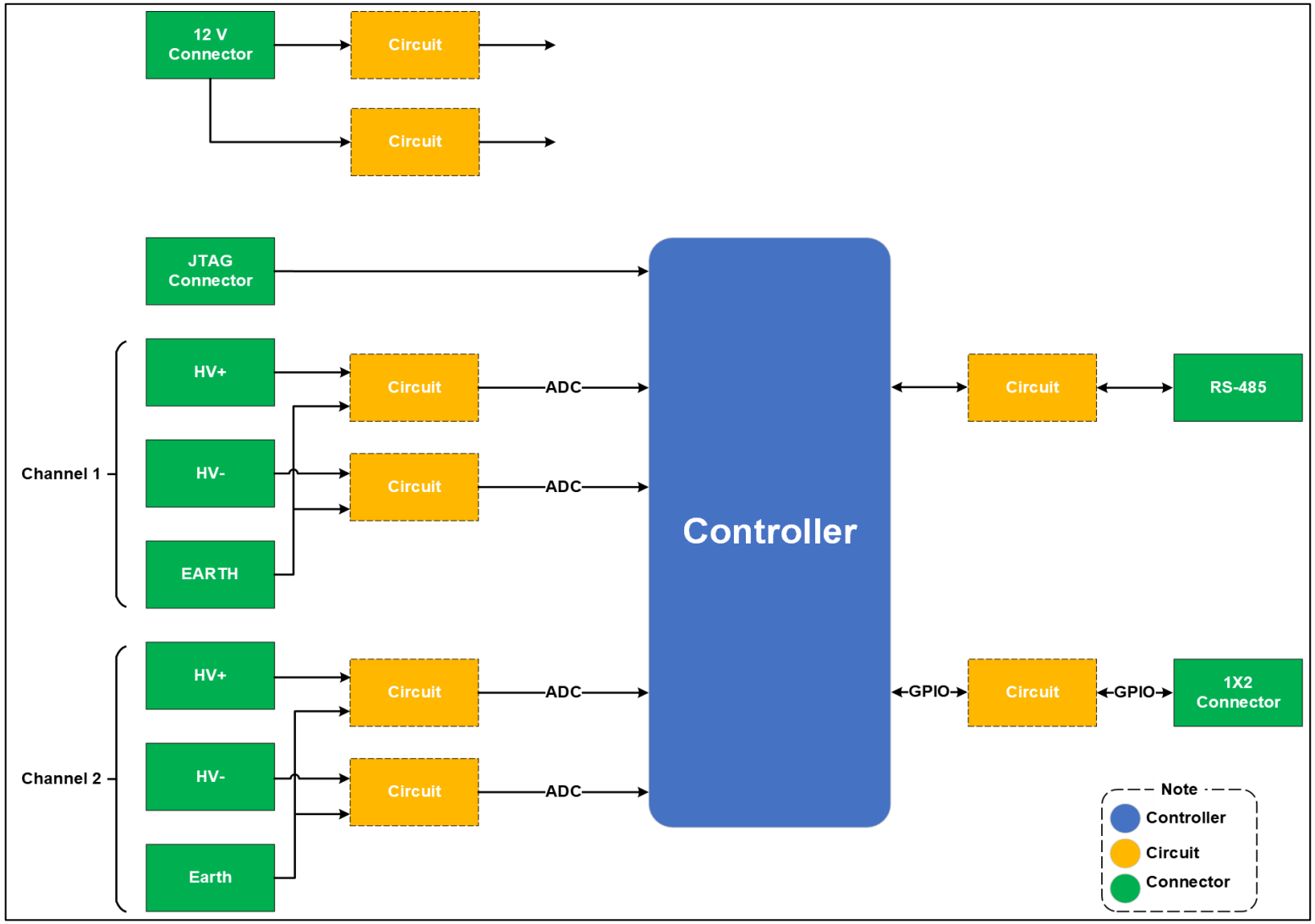
Electrical Properties	
Input Voltage	12 V DC @ 1A
Monitored Isolated Terra Supply Voltage Range	0 to 1100 V DC (0-1000 V Option Available)
Power Consumption	1.2 W
Connector	
Connector Type	PCB Screw Terminal Block (5.08 mm Pitch)
Number of Connectors	3 Nos. (3 Pin) & 6 Nos. (2 Pin)
Communication	
Protocol	Digital I/O for Digital Warning and Fault Signal Lines
Relay	
Output	12 V DC (Channel 1 & 2)
Number of Relays	2 Nos.
LED	
Colour	Two Red LEDs for Errors & One Green LED for Power Supply
Number of LEDs	3 Nos.

Mechanical Properties	
Enclosure Material	ABS
Mounting	Surface and DIN rail
Dimension	110 (L) X 105 (B) X 48.55 (H) mm
Weight	147 g & 82 g (without enclosure)
Ambient Condition	
Operating Temperature	-20°C to 55°C
Storage / Transport Temperature	-20°C to 60°C
Humidity	20 % to 95%
Configuration	
Time Delay	Configurable using the Modbus (Default: 20 ms)
Trip Time Delay	Configurable 1 to 10 Second
Resistance Threshold Limit	Configurable using the Modbus (Default: 2000 Ω)
Standards	
IEC 61557-8 and IEC 61851-23	
Grade Rating: Automotive	
Accuracy	
Setting	0 to 60kΩ (±10%), >60kΩ (>±20%)

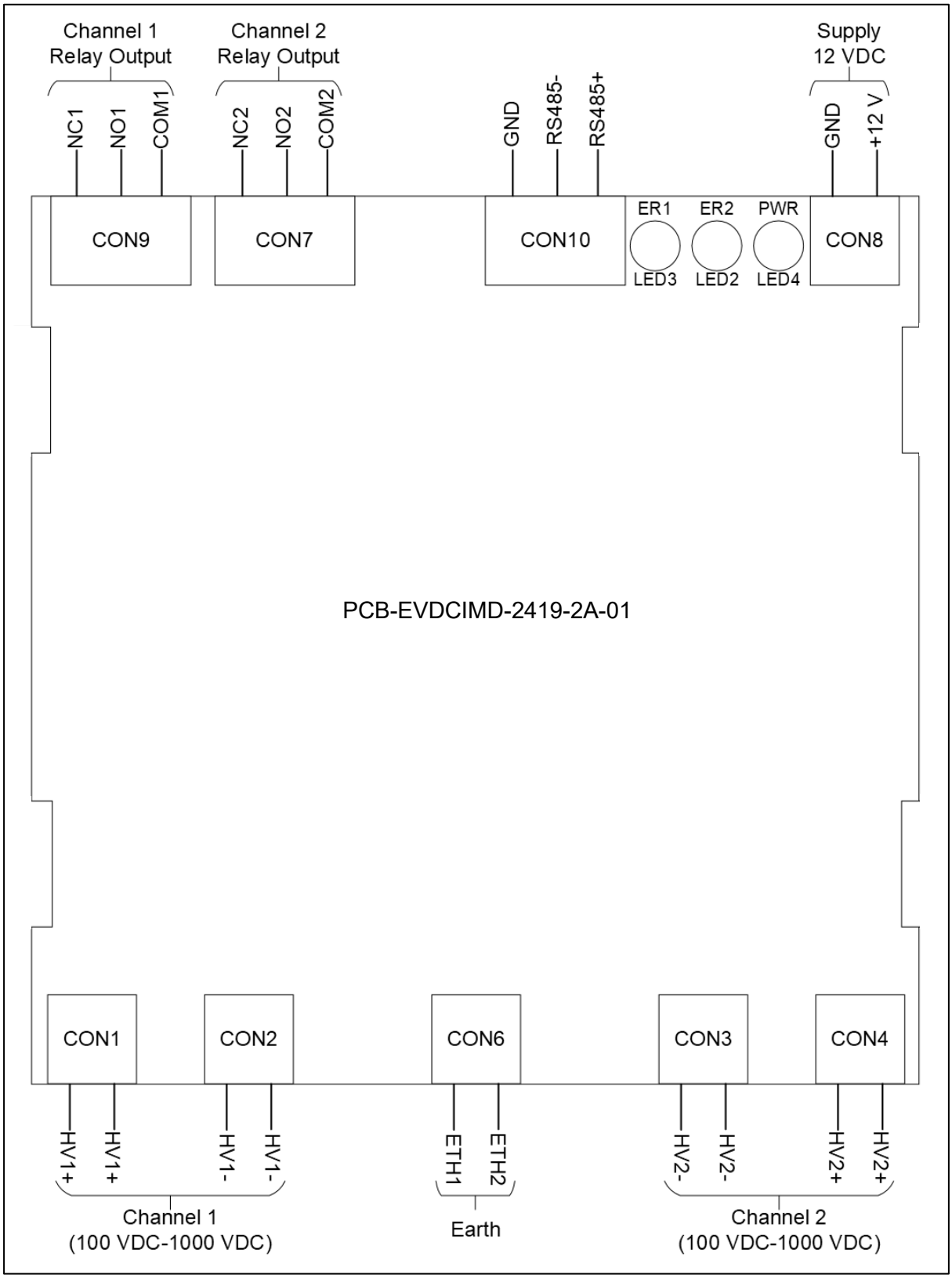
Measurement Range

- 20 kΩ to 1 MΩ: Accuracy of 5% for symmetric faults.
- 1 MΩ Insulation is an ideal indication.
- 20 kΩ to 200 kΩ: Accuracy of 5% for both symmetric and asymmetric faults.
- 0 to 2kΩ: Resistance value flagged as a short.

5.2.2 Block Diagram



5.2.3 The Connector Interface



5.2.4 Pin Configuration of BAC IMD

Table 2 Channel 1 DC (+ve) Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON1	1	HV1+	Channel 1 DC (+ve) Supply
2		2	HV1+	Channel 1 DC (+ve) Supply

Table 3 Channel 1 DC (-ve) Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON2	1	HV1-	Channel 1 DC (-ve) Supply
2		2	HV1-	Channel 1 DC (-ve) Supply

Table 4 Channel 2 DC (-ve) Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON3	1	HV2-	Channel 2 DC (-ve) Supply
2		2	HV2-	Channel 2 DC (-ve) Supply

Table 5 Channel 2 DC (+ve) Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON4	1	HV2+	Channel 2 DC (+ve) Supply
2		2	HV2+	Channel 2 DC (+ve) Supply

Table 6 Channel 1 and 2 Protection Earth Connection

No.	Connector	Pin	Signal Name	Description
1	CON6	1	ETH2	Channel 2 Protection Earth
2		2	ETH1	Channel 1 Protection Earth

Table 7 Channel 2 Relay Output Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON7	1	COM2	Channel 2 Relay Output Ground
2		2	NO2	Channel 2 Relay Normally Open
3		3	NC2	Channel 2 Digital Output

Table 8 IMD Power Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON8	1	+12 V	+12 V DC Supply
2		2	GND	Ground

Table 9 Channel 1 Relay Output Supply Connection

No.	Connector	Pin	Signal Name	Description
1	CON9	1	COM1	Channel 1 Relay Output Ground
2		2	NO1	Channel 1 Relay Normally Open
3		3	NC1	Channel 1 Digital Output

Table 10 RS485 Communication Protocol Connection

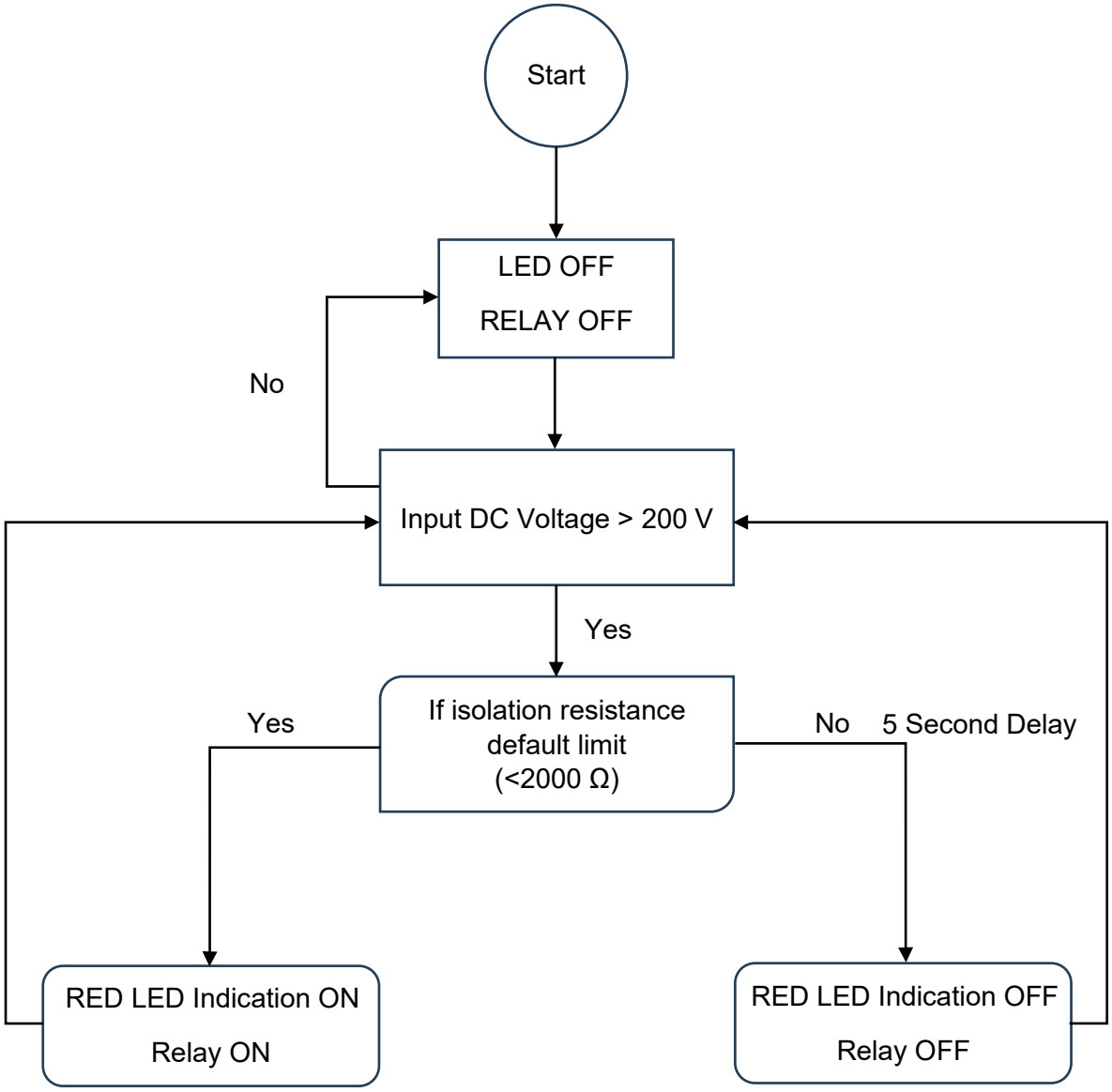
No.	Connector	Pin	Signal Name	Description
1	CON10	1	RS485+	RS485 (A) + Transmitter
2		2	RS485-	RS485 (B) - Receiver
3		3	GND	Ground

5.2.5 The Operation Status

Table 11 LED Status and Its Meaning

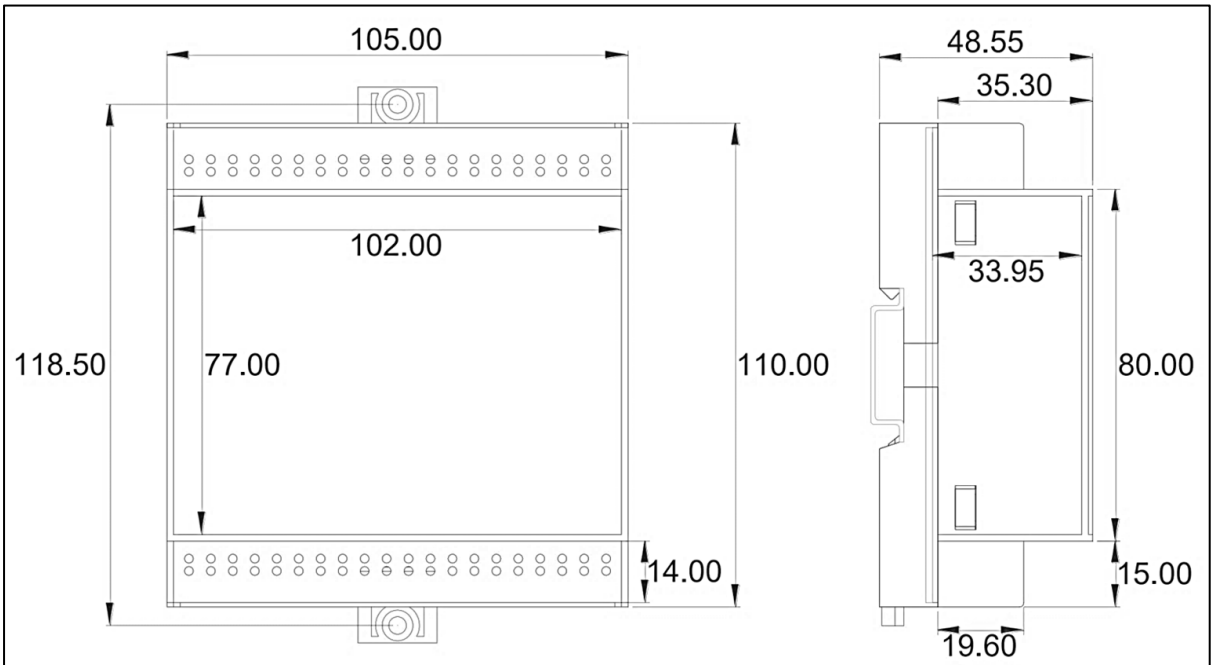
No.	LED Colour	LED Status		Meaning
1	Red	Steady	Error 1	Fault related to the relay channel 1.
2	Red	Steady	Error 2	Fault related to the relay channel 2.
3	Green	Steady	Power	IMD power supply ON.

5.2.6 Function Flow Diagram



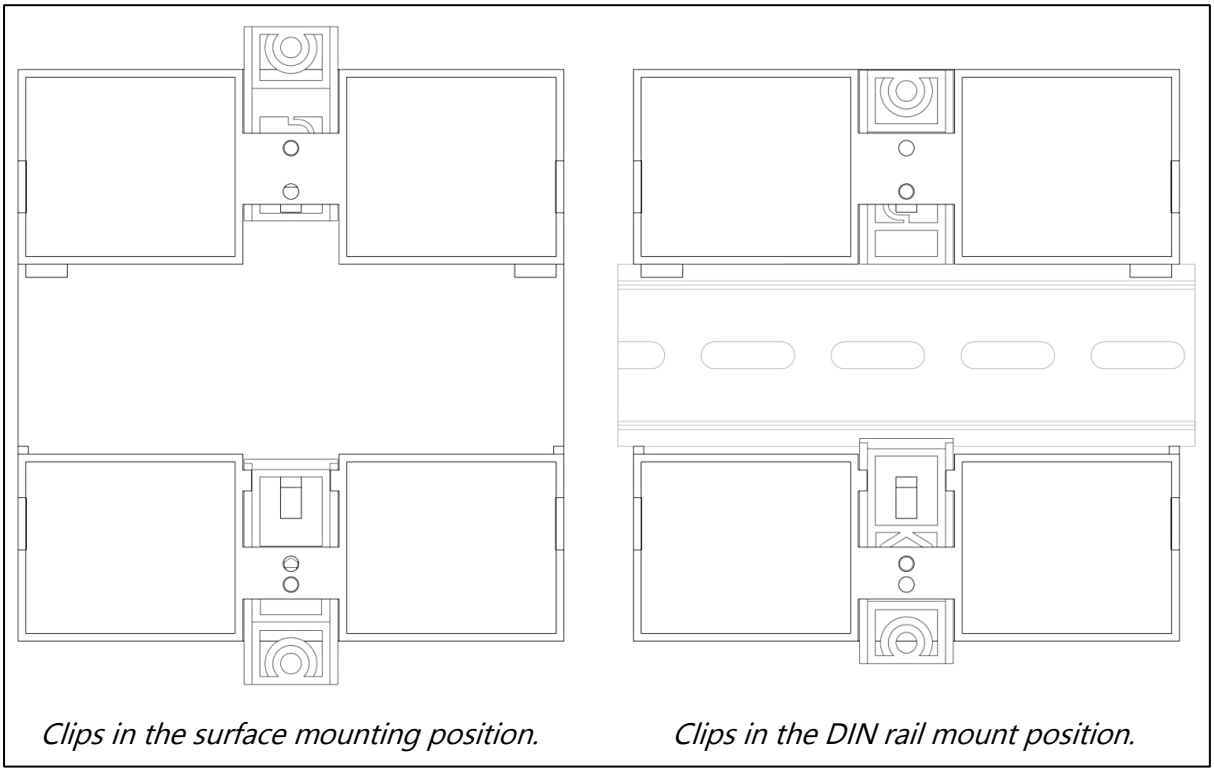
6. Installation

6.1 Mechanical Diagram



All dimensions are in mm.

6.2 Mounting Position



Clips in the surface mounting position.

Clips in the DIN rail mount position.

7. Configuration

This IMD provides user to configure the resistance value (Ω) and relay time delay (ms) for channels 1 and 2 separately.

The Modbus protocol is used to configure the IMD over an RS-485 communication port. This RS-485 communication base IMD module operates in slave mode, with a baud rate of 9600, a communication address of 0x01, no parity check, a default stop bit of 1, and a data bit of 8.

Table 12 IMD Holding Resistors Address

Holding Resistors					
No.	**Address**	**Type**	**Default**	**Data**	**Notes**
1.	0x00	Input	2000 Ω	Resistance Limit Higher bytes for Channel 1.	Size 4 bytes
2.	0x01	Input		Resistance Limit Lower bytes for Channel 1.	
3.	0x02	Input	2000 Ω	Resistance Limit Higher bytes for Channel 2.	Size 4 bytes
4.	0x03	Input		Resistance Limit Lower bytes for Channel 2.	
5.	0x04	Input	20 ms	Relay Delay Configure in ms.	Size 2 bytes
6.	0x05	Output	-	Positive ISO Resistance Value, Higher bytes for Channel 1.	Size 4 bytes
7.	0x06	Output	-	Positive ISO Resistance Value, Lower bytes for Channel 1.	
8.	0x07	Output	-	Negative ISO Resistance Value, Higher bytes for Channel 1.	Size 4 bytes
9.	0x08	Output	-	Negative ISO Resistance Value, Lower bytes for Channel 1.	
10.	0x09	Output	-	Positive ISO Resistance Value, Higher bytes for Channel 2.	Size 4 bytes
11.	0x0A	Output	-	Positive ISO Resistance Value, Lower bytes for Channel 2.	
12.	0x0B	Output	-	Negative ISO Resistance Value, Higher bytes for Channel 2.	Size 4 bytes
13.	0x0C	Output	-	Negative ISO Resistance Value, Lower bytes for Channel 2.	

7.1 Hardware Configuration

To configure resistance limit value and relay time delay, the user should have configured hardware connection based to the following steps:

Step 1: Connect the power supply.

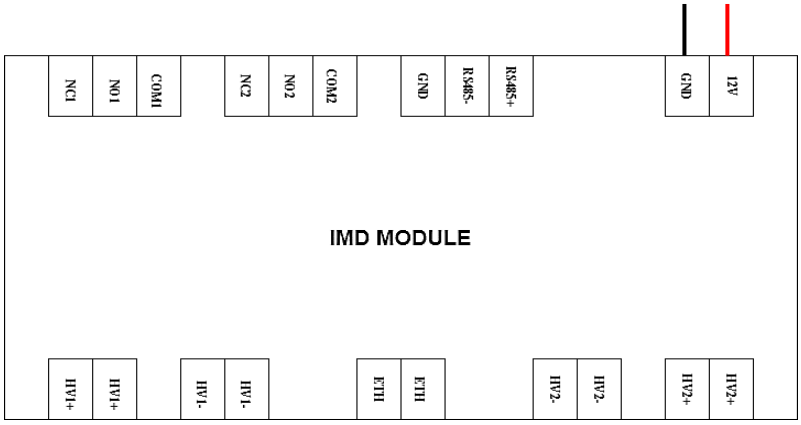


Figure 3 Power Supply Connection.

Step 2: Connect ground between COM1 and COM2.

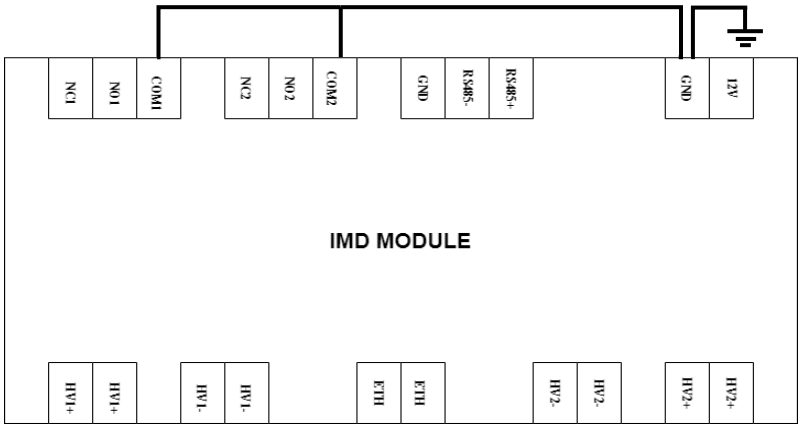


Figure 4 Ground Connection.

Step 3: Connect the digital output.

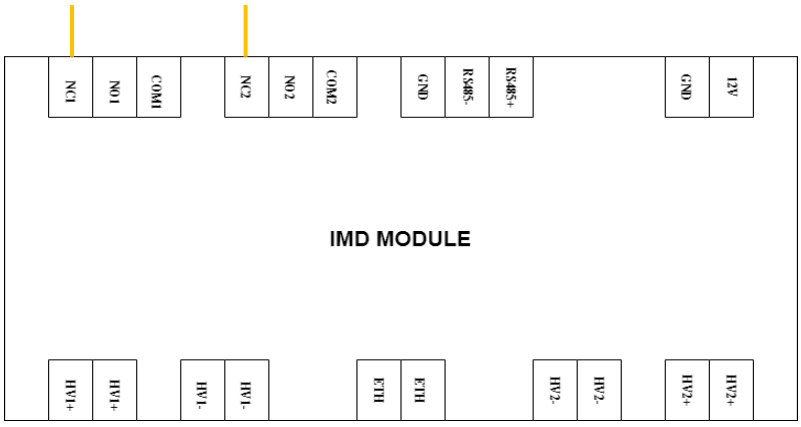


Figure 5 Digital Output Connection.

Step 4: Calculate and verify the insulating resistance between earth and DC+ in relay channel 1.

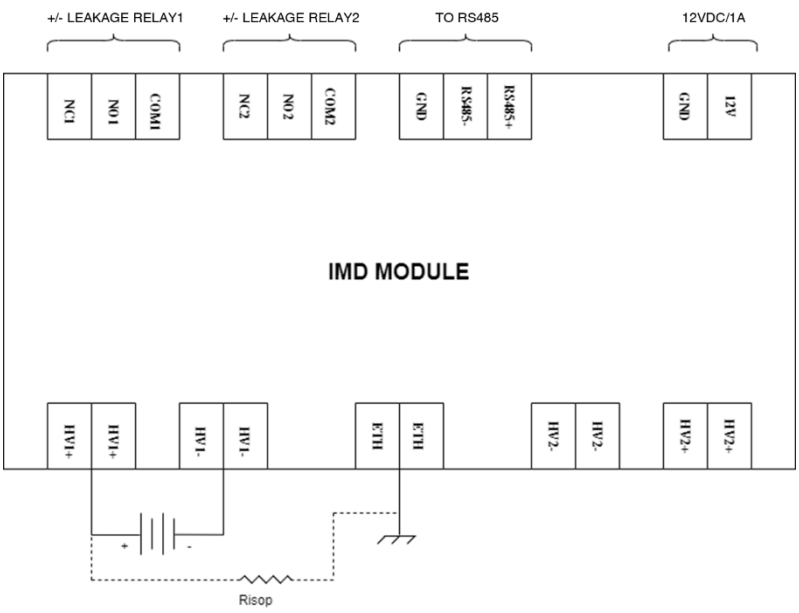


Figure 6 Calculate and verify the Insulation Resistance Between Earth and DC + in Relay Channel 1.

Step 4: Calculate and verify the insulating resistance between earth and DC- in relay channel 1.

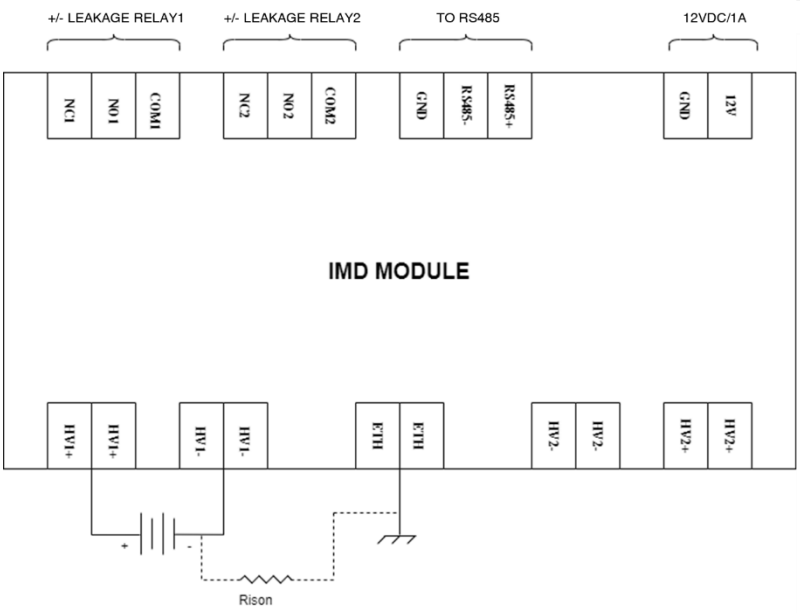


Figure 7 Calculate and verify the Insulation Resistance Between Earth and DC - in Relay Channel 1.

Step 5: Calculate and verify the insulating resistance between earth and DC+ in relay channel 2.

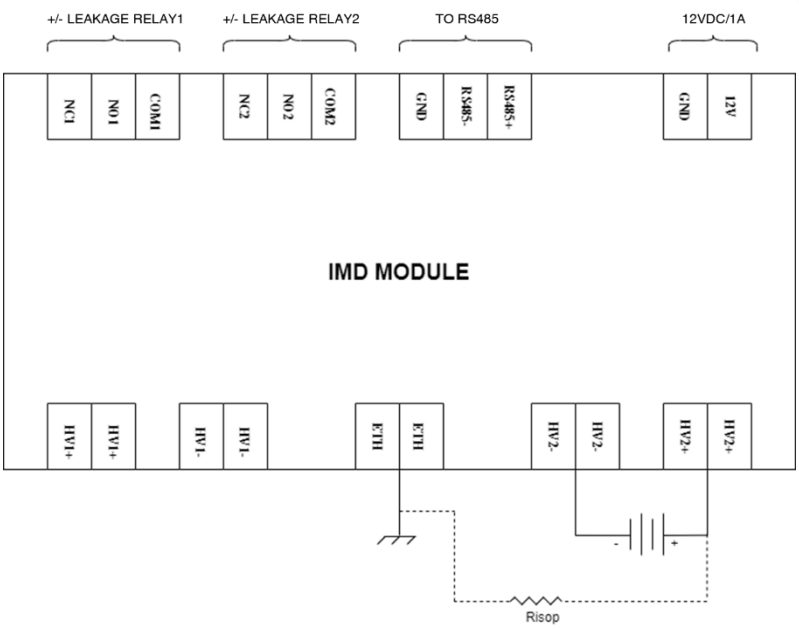


Figure 8 Calculate and verify the Insulation Resistance Between Earth and DC + in Relay Channel 2.

Step 6: Calculate and verify the insulating resistance between earth and DC- in relay channel 2.

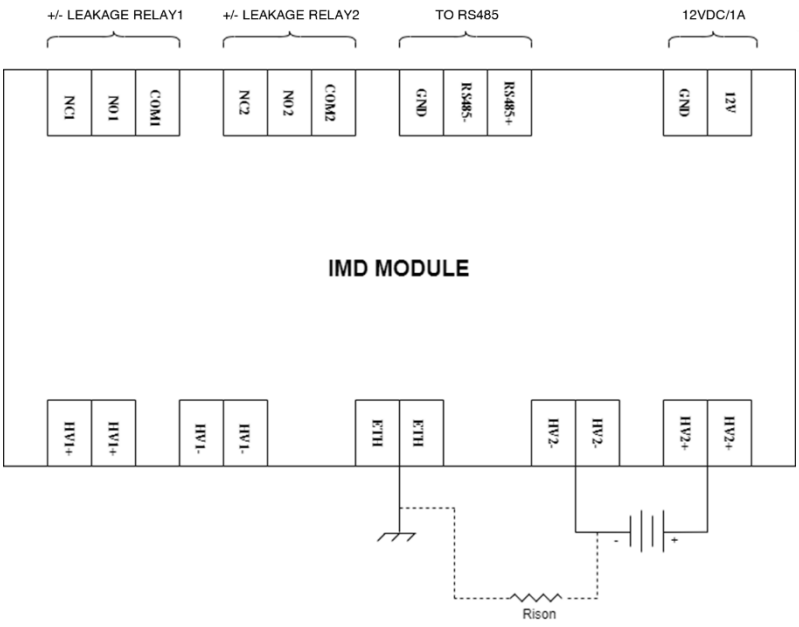


Figure 9 Calculate and verify the Insulation Resistance Between Earth and DC - in Relay Channel 1.

Step 7: Connect the USB to RS-485 converter port to the IMD's RS-485 port, as shown in the image below.

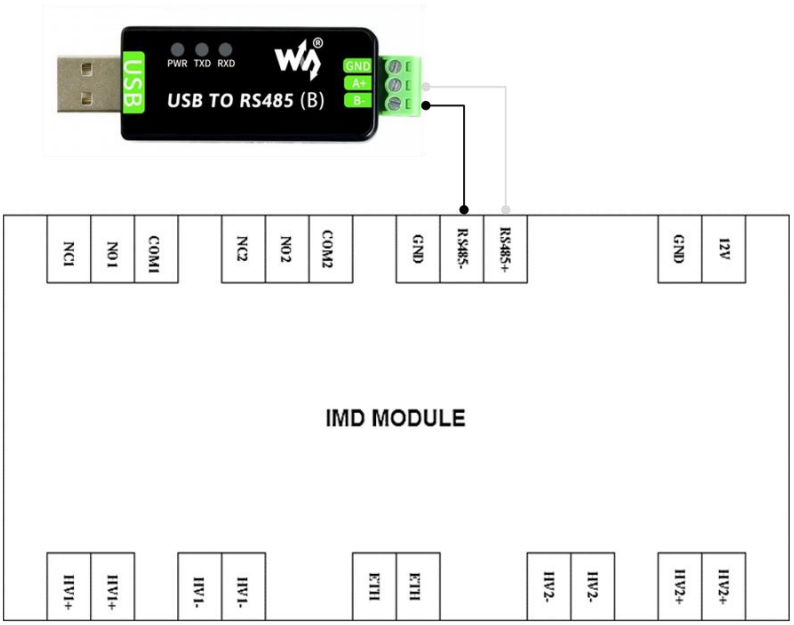


Figure 10 USB to RS-485 Converter Connection.

7.2 Software Configuration

Once the hardware is correctly configured, the user can continue with the software configuration. This setup is required to set the resistance limit value and relay time delays.

For configuration, follow these steps:

- **Pre-Requisite**
  1. **Hardware:**
     - PC/Laptop with Windows 10 or 11 (64-bit) operating system.
     - Waveshare's USB-to-RS-485 bidirectional converter.
  2. **Software:**
     - **Modbus:** Download the Modbus tool application from the URL below: (Download the Modbus Tool)
     - **Driver:** Download the USB to RS-485 driver from the URL below: (USB to RS-485 Converter's Driver)

7.2.1 Install Driver for the USB to RS-485 Converter

The IMD configurations are based on an RS-485 connection; thus, the user should install the USB-to-RS-485 converter driver on their PC/laptop before proceeding to the Modbus tool interface.

For driver installation, follow these steps:

Step 1: Download the driver from the URL provided in the pre-requisite section.

Step 2: Open the zip file.

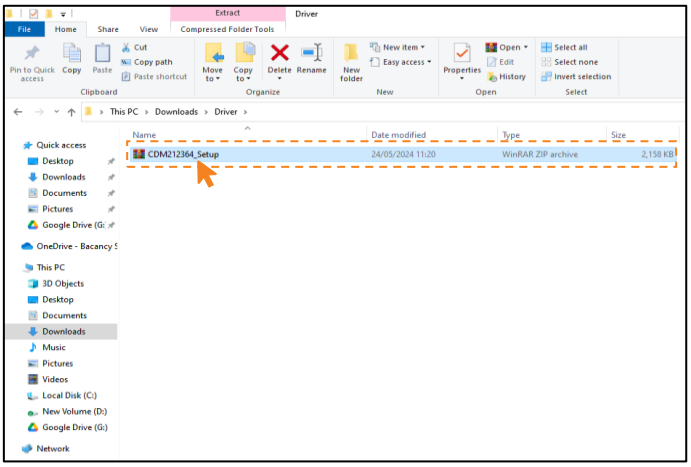


Figure 11 USB to RS-485 Converter's Driver.

Step 3: Open the driver setup (.exe).

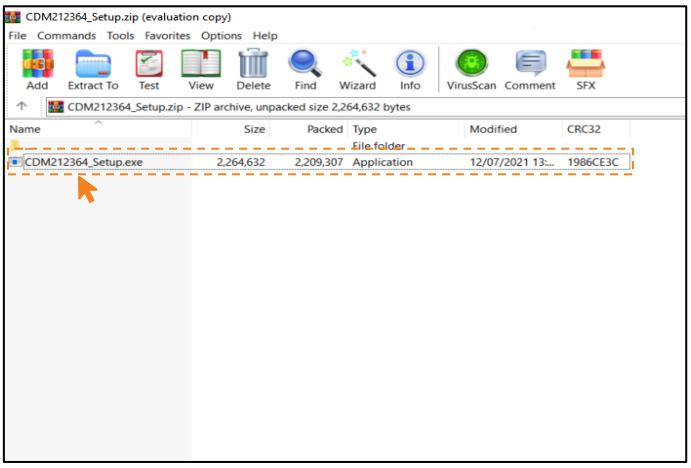


Figure 12 Open the Driver Setup.

Step 4: Now click the “Extract” button to complete the extraction process.

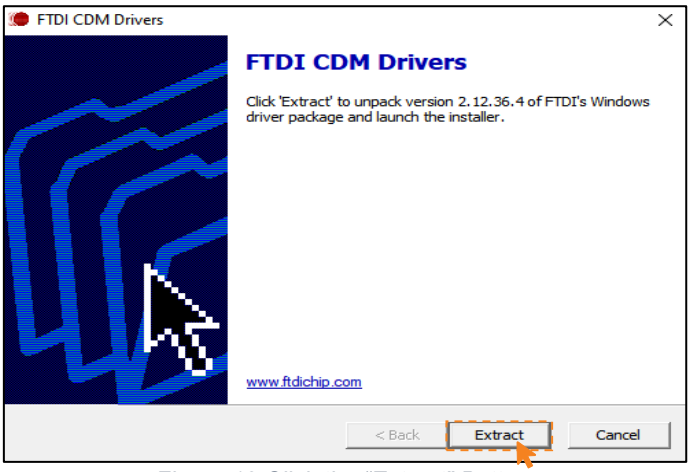


Figure 13 Click the “Extract” Button.

Step 5: This is a driver installation wizard; click the “Next” button.

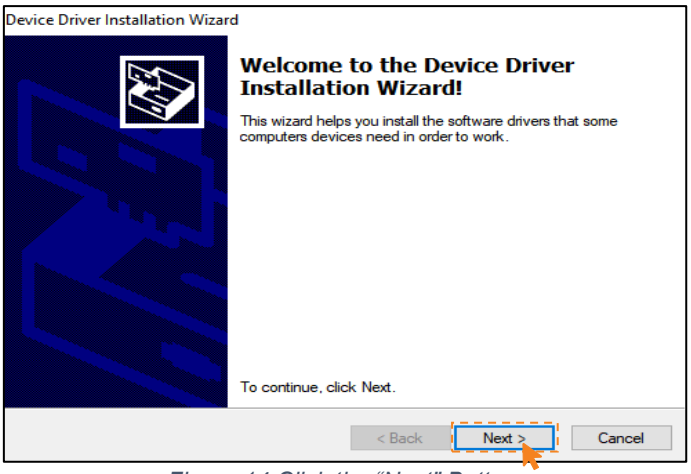


Figure 14 Click the “Next” Button.

Step 6: Wizard for completing licence agreements.

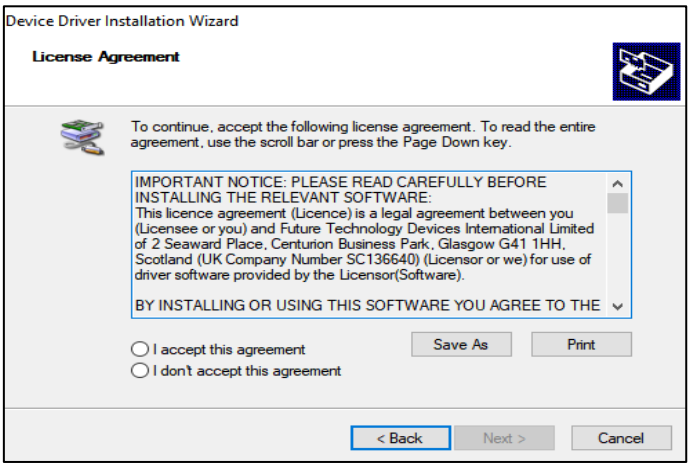


Figure 15 Licence Agreement Wizard.

Step 7: Select “accept” this agreement and then click the “Next” button.

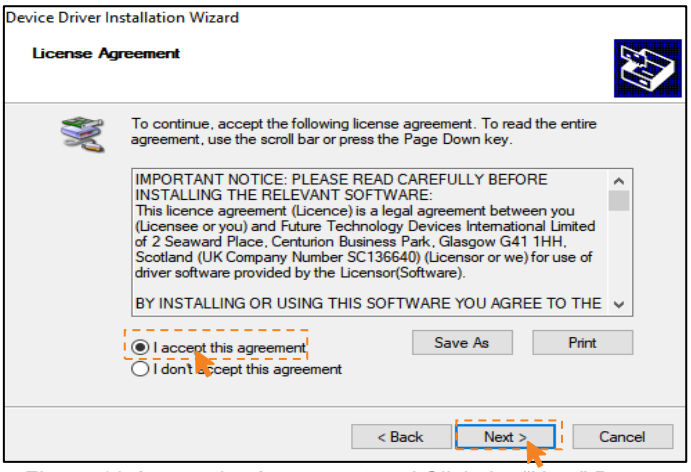


Figure 16 Accept the Agreement and Click the “Next” Button.

Step 8: Wait till the procedure is completed.

Step 9: Click the “Finish” button to complete the installation procedure.

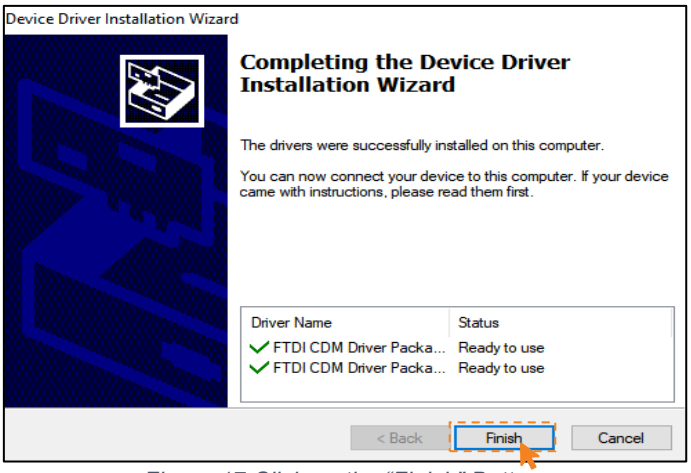


Figure 17 Click on the “Finish” Button.

7.2.2 IMD Configuration

Follow the IMD configuration steps:

Step 1: Download the Modbus Tool software from the URL provided in the prerequisites section.

Step 2: Unzip the Modbus utility that you recently downloaded.

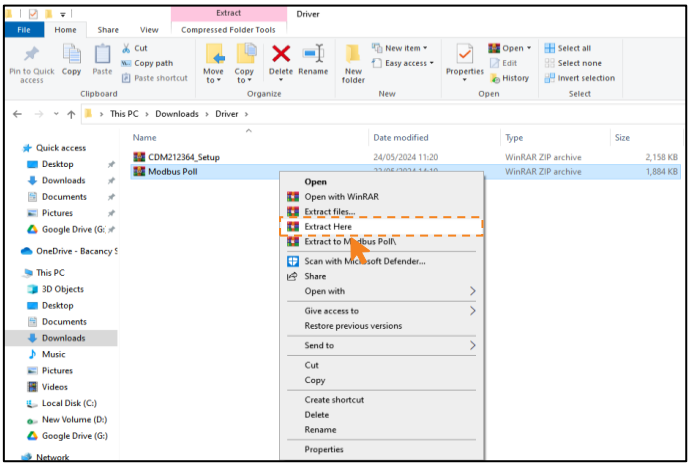


Figure 18 Unzip the Modbus Utility.

Step 3: Open the “Modbus Poll” folder.

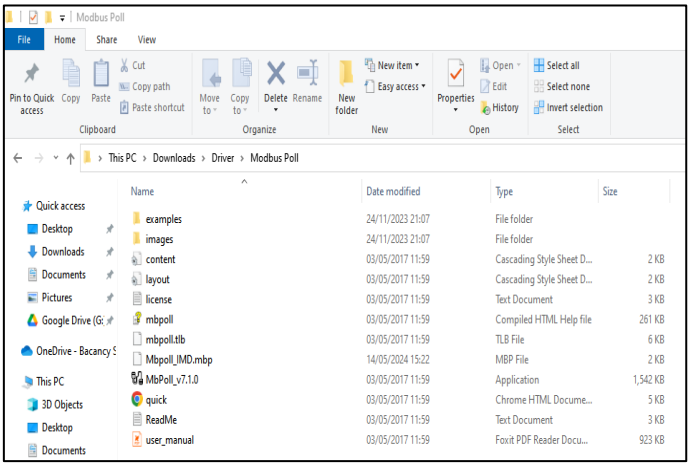


Figure 19 Modbus Poll Folder.

Step 4: Open the “MbPoll_v7.1.0” (.exe) application.

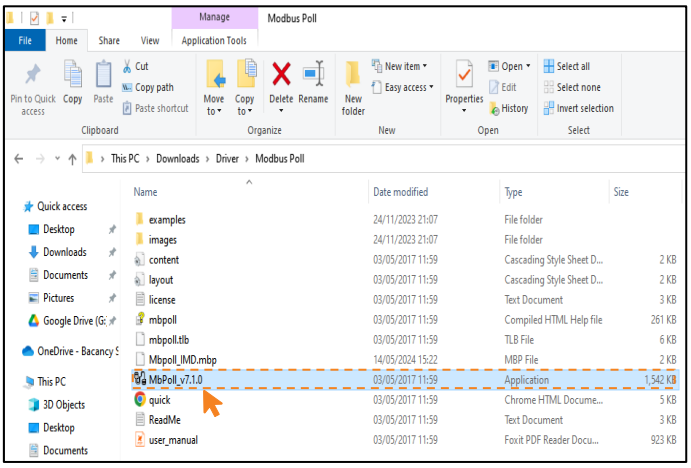


Figure 20 Open the “MbPoll_v7.1.0” Application.

Step 5: This is the “Modbus Poll” application's screen. The “No connection” message appears on the screen.

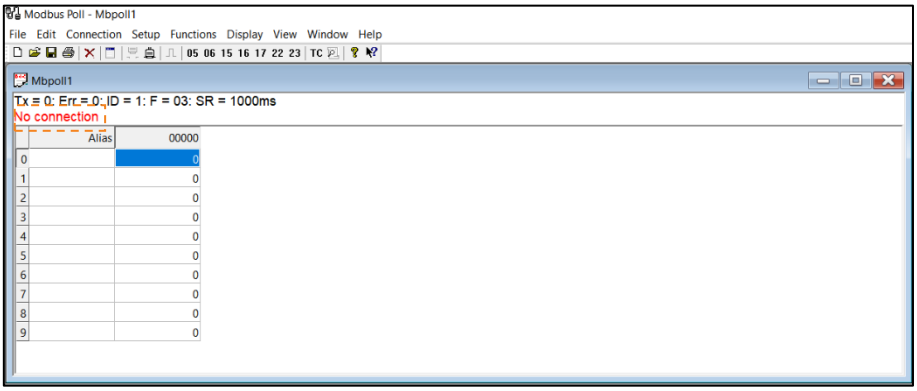


Figure 21 “No connection” Message.

Step 6: Connect the USB to RS-485 converter to the PC / Laptop.

Step 7: Open the Modbus application’s menu bar and select the “Connection” option.

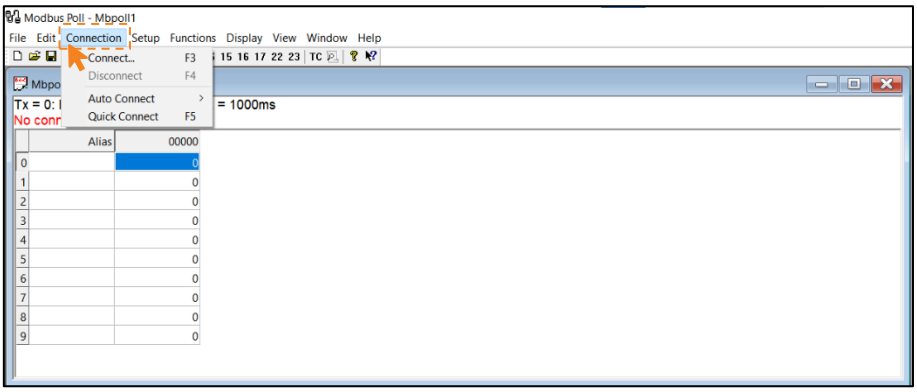


Figure 22 Open the “Connection” Menu.

Step 8: Click the “Connect” option from the connection menu.

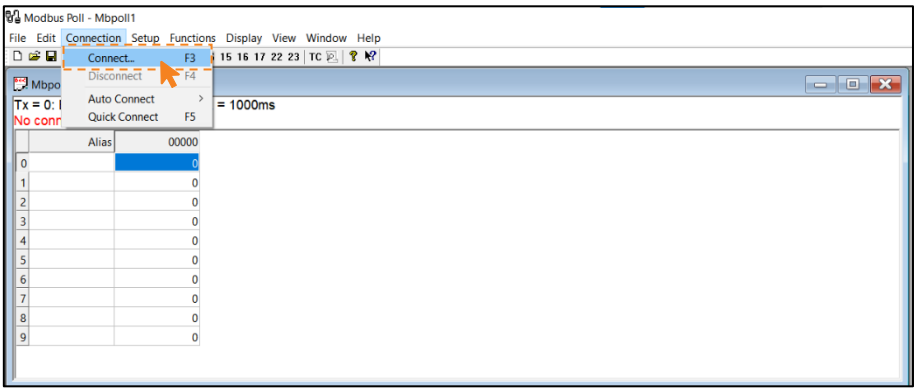


Figure 23 Click the “Connection” Option.

Step 9: The connection setup dialogue box opens on the screen.

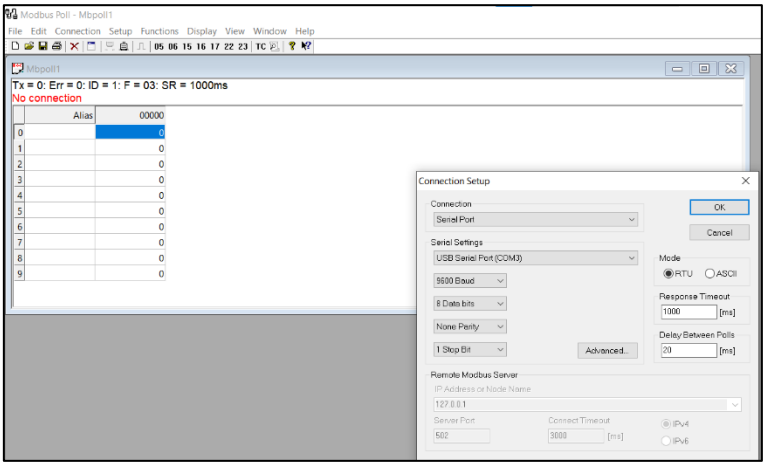


Figure 24 The Connection Setup Dialogue Box.

Step 10: Select the “serial port” option from the connection section.

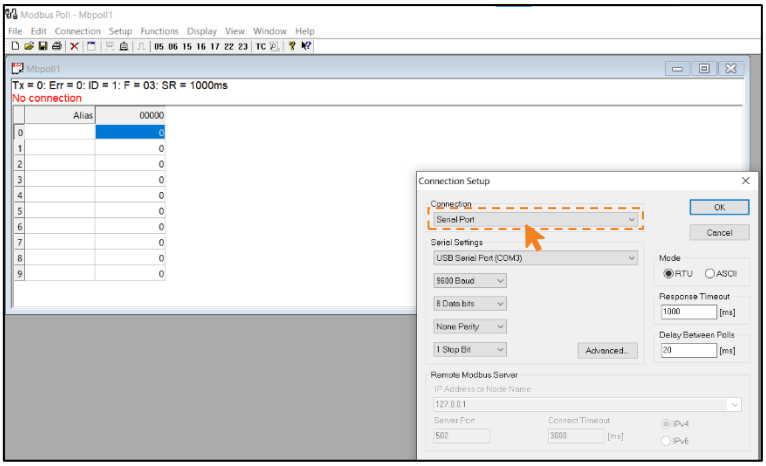


Figure 25 Select the “Serial Port” Option.

Step 11: Select the “communication port” from the serial setting section.

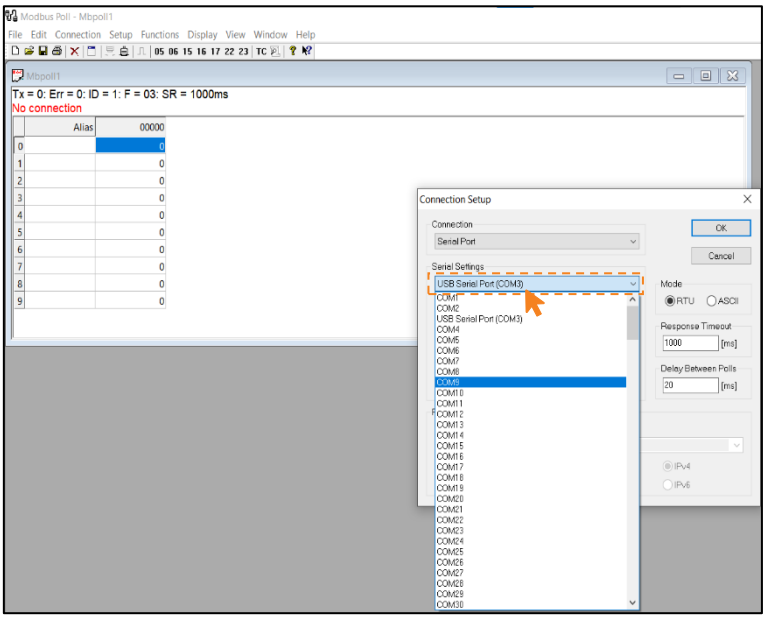


Figure 26 Select the "Communication Port”.

- **To know the communication port number.**

Step 11.1: Right-click on the “This PC” icon and select “Manage” from the menu.

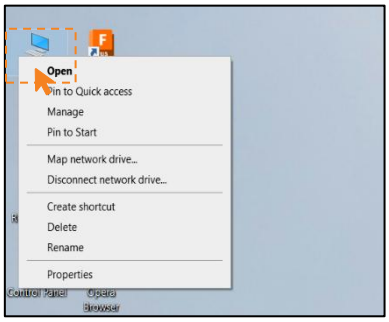


Figure 28 Right-click on the “This PC.”

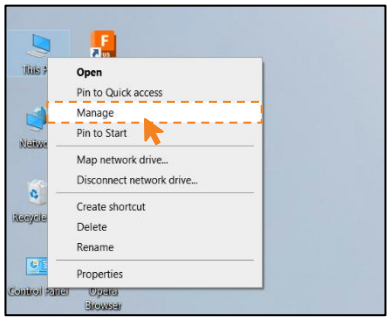


Figure 27 Select the “Manage” option.

Step 11.2: This is the “Computer Management” screen; click on “Device Manager”.

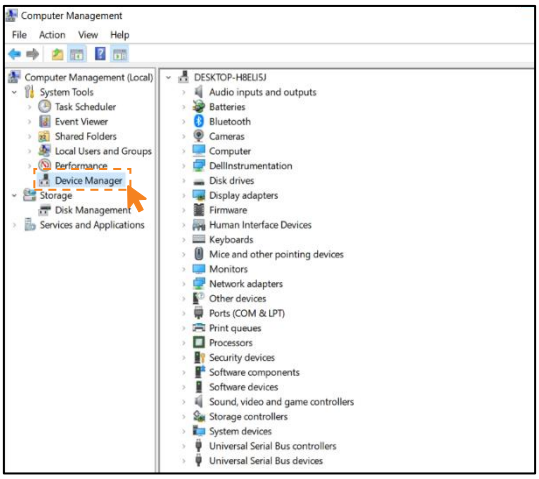


Figure 29 Click the “Device Manager”.

Step 11.3: Select and extend the “Port (COM & LPT)” device categories.

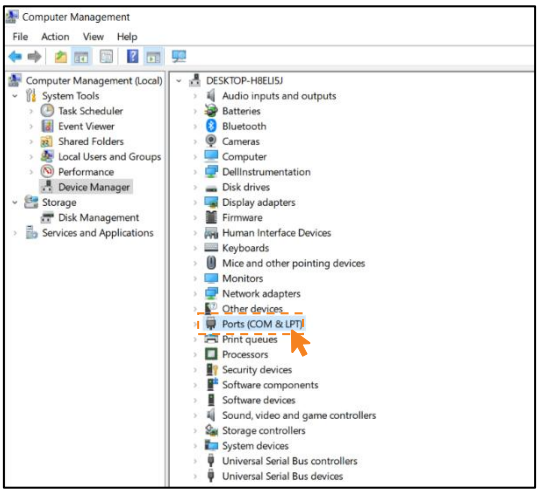


Figure 30 Select and extend the "Port (COM & LPT)”.

Step 11.4: The USB to RS-485 converter’s communication port is available here. It will differ according to the PC or laptop configurations.

This communication port should be noted and the right one selected in the serial setup.

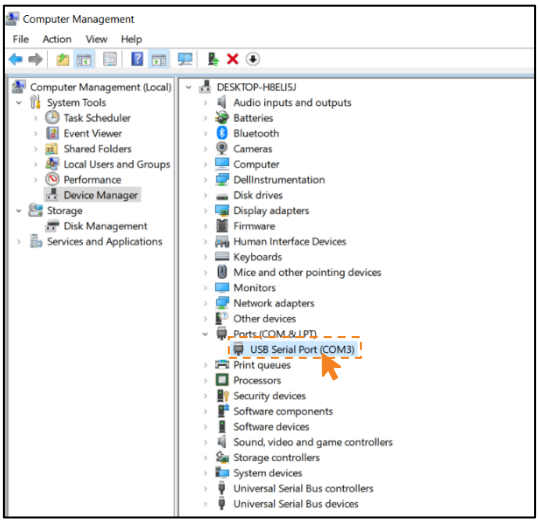


Figure 31 Note the Serial Port Number.

Step 12: Select the “None Parity” option from the dropdown list.

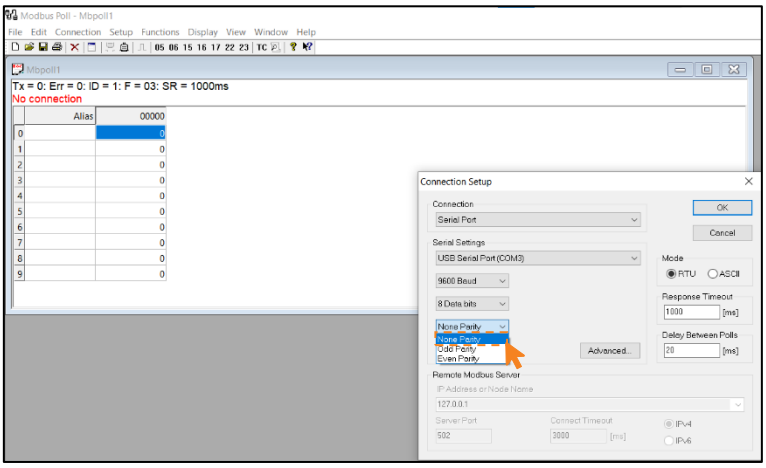


Figure 32 Select the “Non-Parity” Option.

Step 13: Click the “OK” button to save the “connection setup” configuration.

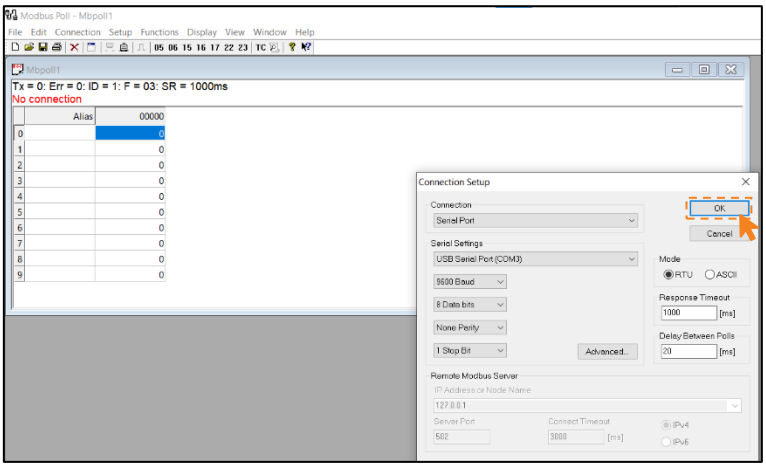


Figure 33 Click on the “OK” Button.

Step 14: Now the “No connection” message disappeared from the corner. It will initially display the default resistance values for channels 1 and 2, as well as the time delay. To understand more about it, the user can open the default set “Modbus Poll” file (.mbp) in the Modbus tool folder.

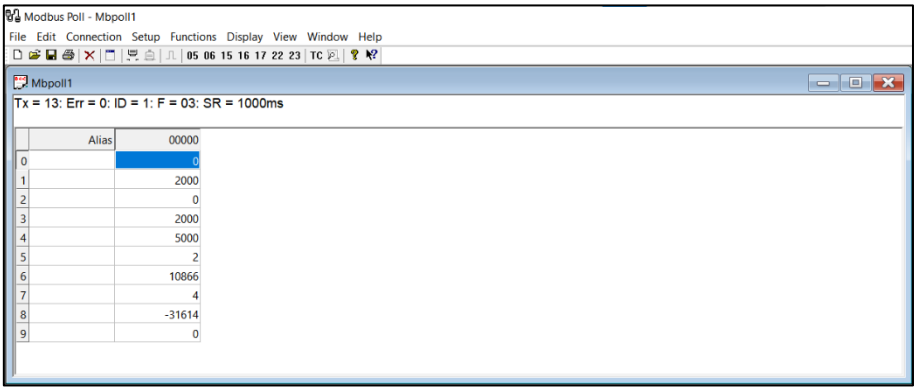


Figure 34 “Modbus Poll” connected with IMD.

Step 15: Click on the “file” option from the menu bar, then select “open” from the menu.

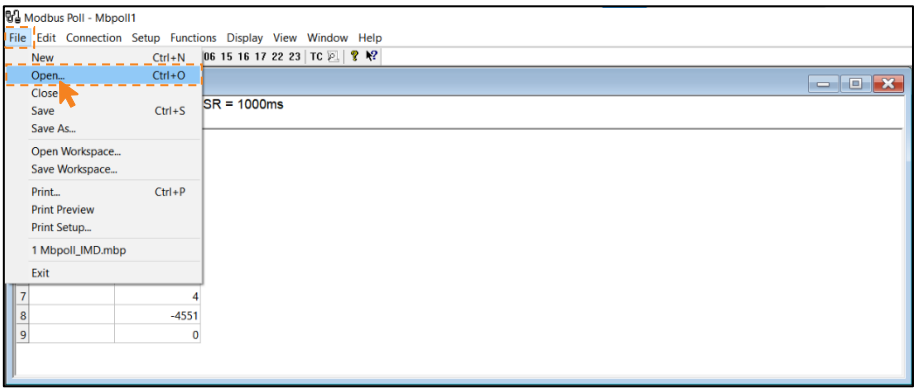


Figure 35 Click on the File Menu and Select the “Open” Option.

Step 17: Select the “Mbpoll_IMD” (.mbp) file from the Modbus tool folder.

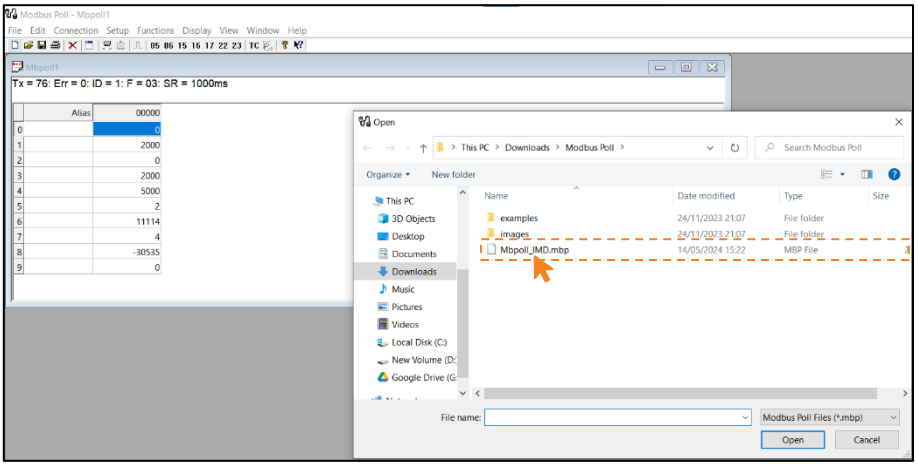


Figure 36 Select the “Mbpoll_IMD.mbp” File.

Step 18: Click the “open” button.

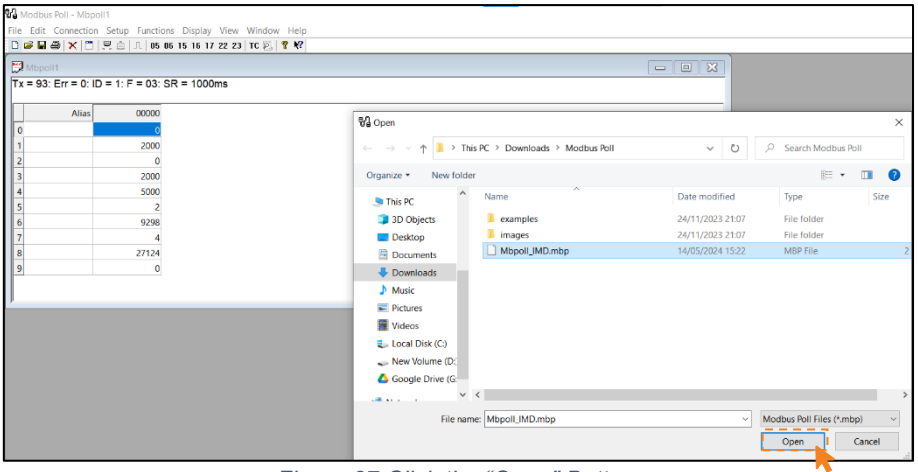


Figure 37 Click the “Open” Button.

Step 19: The “Alias” column displays the resistance limit values for channels 1 and 2, as well as the relay time delay.

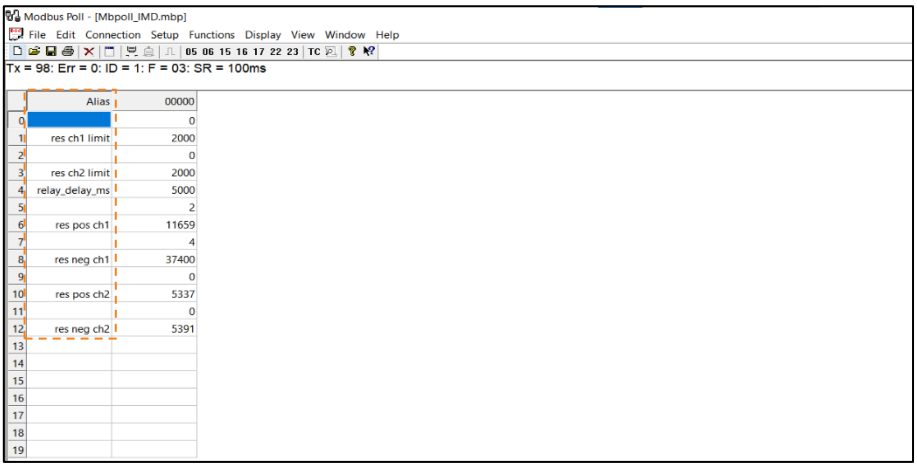


Figure 38 “Alias” Column to Displays the Value Name.

Step 20: Configure as per the user’s requirements.

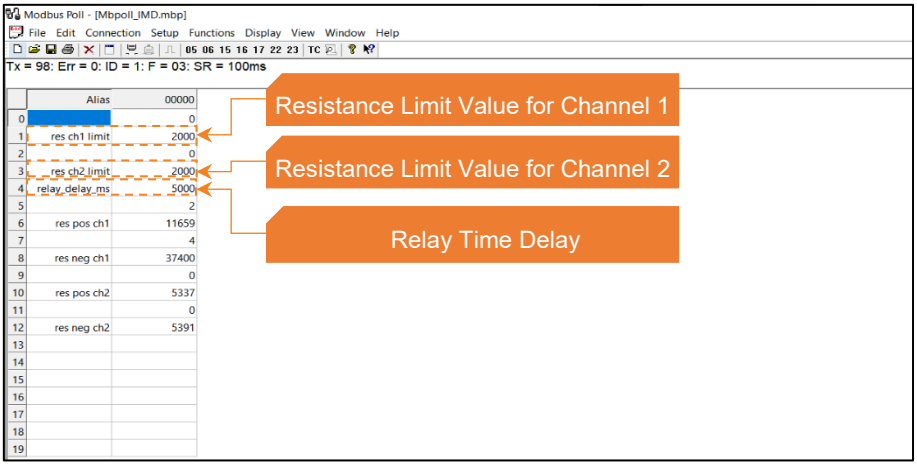


Figure 39 Configure the “Values” as per the User's Requirements.

Step 21: To disconnect the “Modbus Poll” application with the USB to RS-485 converter, go to the menu bar and select the “connection” option, then “disconnect” from the connection menu.

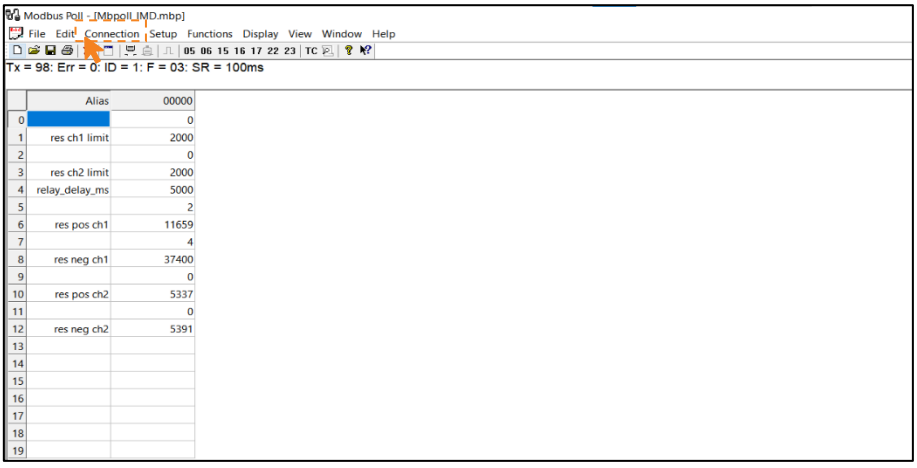


Figure 40 Click on the “Connection” Option form the Menu Bar.

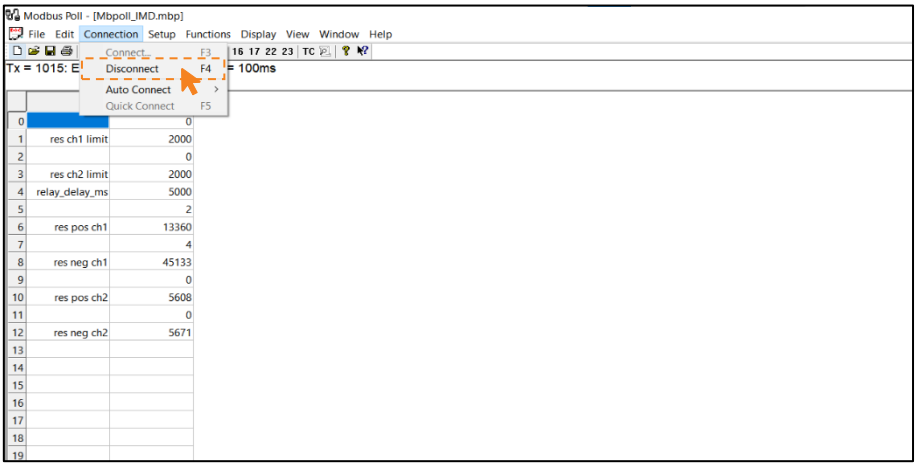


Figure 41 Select the "Disconnect" Option.

Step 22: Once the "No connection" message appears again on the screen, close the "Modbus Poll" application.

Figure 42 "No connection" Message Appears Again on the Screen.

Step 23: Remove the USB to RS-485 converter from the PC or laptop.

8. Appendix

8.1 Abbreviations and Glossary

ABS	*Acrylonitrile butadiene styrene (ABS) is a common thermoplastic polymer.*
ADC	*Analog to Digital Converter*
CON	*Connector*
DC	*Direct current (DC) is one-directional flow of electric charge.*
DIN Rail	*A DIN rail is a metal rail of a standard type widely used for mounting circuit breakers and industrial control equipment inside equipment racks.*
EV	*An EV is defined as a vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source.*
EVSE	*Electric vehicle supply equipment (EVSE) supplies electricity to an electric vehicle (EV). Commonly called charging stations or charging docks, they provide electric power to the vehicle and use that to recharge the vehicle's batteries.*
GND	*GND stands for Ground. A common or shared return route of electrical current to the power source that enables the completion of the circuit refers to the ground in both electrical and electronic circuits.*
GPIO	*General Purpose Input/Output*
IC	*An integrated circuit (IC), sometimes called a chip, microchip, or microelectronic circuit, is a semiconductor wafer on which thousands or millions of tiny resistors, capacitors, diodes, and transistors are fabricated.*
IEC 61557-8	*Electrical safety in low voltage distribution systems up to 1 000 V AC. and 1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 8: Insulation monitoring devices for IT systems*
IEC 61851-23	*It gives the requirements for DC electric vehicle (EV) charging stations, herein also referred to as "DC charger", for conductive connection to the vehicle, with an AC or DC input voltage up to 1000 V AC and up to 1500 V DC.*
IMD	*Insulation Monitoring Device*
kΩ	*Symbol for kiloohm, an SI unit of electrical resistance equal to 10^3 ohms.*

LED	*A light-emitting diode (LED) is a semiconductor device that emits light when current flows through it.*
mm	*The millimetre is a unit of length in the International System of Units (SI), equal to one thousandth of a metre.*
ms	*A millisecond is a unit of time in the International System of Units equal to one thousandth (0.001 or 10^{-3} or 1/1000) of a second and to 1000 microseconds.*
MΩ	*Symbol for megaohm, an SI unit of electrical resistance equal to 10^{6} ohms.*
RS-485	*RS-485 is an industrial specification that defines the electrical interface and physical layer for point-to-point communication of electrical devices. The RS-485 standard allows for long cabling distances in electrically noisy environments and can support multiple devices on the same bus.*
Ω	*A unit of electric resistance equal to the resistance of a circuit in which a potential difference of one volt produces a current of one ampere.*

Bacancy Systems PVT LTD,
15-16, Times Corporate Park,
Near Thaltej-Shilaj Road,
Opp. Copper Stone Flats,
Thaltej, Ahmedabad,
Gujarat, India, 380059
www.bacancysystems.com
systems@bacancysystems.com
+91 90160 28817
Helpdesk: https://bacancy.freshdesk.com/a/dashboard/default