

# Technical Note

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## Hoy miles Modbus Protocol for DTU-Pro/Pro-S

Version: V1.3 (Applicable to software versions V00.00.22 and later)

Release Date: 2026-05-19

# CONTENTS

|            |                                                                          |           |
|------------|--------------------------------------------------------------------------|-----------|
| <b>1</b>   | <b>Introduction .....</b>                                                | <b>1</b>  |
| <b>2</b>   | <b>Terms.....</b>                                                        | <b>1</b>  |
| <b>3</b>   | <b>Hoymiles Modbus RTU Connection and Communication.....</b>             | <b>1</b>  |
| <b>3.1</b> | <b>Connection via RS485 Interface .....</b>                              | <b>1</b>  |
| 3.1.1      | Cable Requirements.....                                                  | 2         |
| 3.1.2      | Connection Guides.....                                                   | 2         |
| <b>3.2</b> | <b>Modbus RTU Settings .....</b>                                         | <b>3</b>  |
| 3.2.1      | Setting the Modbus Address.....                                          | 3         |
| 3.2.2      | Setting the Serial Port Parameters.....                                  | 4         |
| <b>3.3</b> | <b>Understanding Modbus RTU Function Codes.....</b>                      | <b>5</b>  |
| 3.3.1      | 03 (0x03) Reading Multiple Microinverters and Meter SNs .....            | 5         |
| 3.3.2      | 04 (0x04) Reading Multiple Microinverters and Meter Real-Time Data ..... | 6         |
| 3.3.3      | 06 (0x06) Writing Single or All Device Status .....                      | 6         |
| 3.3.4      | 16 (0x10) Writing Multiple Device Status .....                           | 7         |
| <b>3.4</b> | <b>Understanding Modbus Registers .....</b>                              | <b>8</b>  |
| 3.4.1      | Device Information.....                                                  | 8         |
| 3.4.2      | DTU Data.....                                                            | 8         |
| 3.4.3      | Real-Time Meter Data.....                                                | 8         |
| 3.4.4      | Real-Time Microinverter Data .....                                       | 11        |
| 3.4.5      | Device SNs.....                                                          | 16        |
| 3.4.6      | RS485 Port Settings.....                                                 | 16        |
| 3.4.7      | Microinverter Status .....                                               | 18        |
| <b>3.5</b> | <b>Message Examples .....</b>                                            | <b>21</b> |
| 3.5.1      | Reading Power ON/OFF Status of Multiple Microinverters .....             | 21        |
| 3.5.2      | Master Control Shutdown .....                                            | 21        |
| 3.5.3      | Single Control Shutdown.....                                             | 21        |
| 3.5.4      | Multi Control Shutdown .....                                             | 21        |
| 3.5.5      | Querying Microinverter Data .....                                        | 21        |
| <b>4</b>   | <b>Hoymiles Modbus TCP Connection and Communication.....</b>             | <b>22</b> |
| <b>4.1</b> | <b>Connection via Ethernet Interface .....</b>                           | <b>22</b> |
| <b>4.2</b> | <b>Modbus TCP Settings.....</b>                                          | <b>22</b> |
| <b>4.3</b> | <b>Understanding Modbus TCP Function Codes.....</b>                      | <b>24</b> |

|            |                                                                          |           |
|------------|--------------------------------------------------------------------------|-----------|
| 4.3.1      | 03 (0x03) Reading Multiple Microinverters and Meter SNs .....            | 24        |
| 4.3.2      | 04 (0x04) Reading Multiple Microinverters and Meter Real-Time Data ..... | 25        |
| 4.3.3      | 06 (0x06) Writing Single or All Device Status .....                      | 26        |
| 4.3.4      | 16 (0x10) Writing Multiple Microinverters Status .....                   | 27        |
| <b>4.4</b> | <b>Understanding Modbus Registers .....</b>                              | <b>28</b> |
| 4.4.1      | Device Information .....                                                 | 28        |
| 4.4.2      | DTU Data .....                                                           | 28        |
| 4.4.3      | Real-Time Meter Data .....                                               | 28        |
| 4.4.4      | Real-Time Microinverter Data .....                                       | 31        |
| 4.4.5      | Device SNs .....                                                         | 36        |
| 4.4.6      | RS485 Port Settings .....                                                | 36        |
| 4.4.7      | Microinverter Status .....                                               | 38        |
| <b>4.5</b> | <b>Message Examples .....</b>                                            | <b>41</b> |
| 4.5.1      | Querying Microinverter Data .....                                        | 41        |
| 4.5.2      | Reading Status of Multiple Microinverters .....                          | 41        |
| 4.5.3      | Writing Register of Microinverter Status .....                           | 41        |
| 4.5.4      | Writing Registers of Multiple Microinverter Status .....                 | 41        |

# 1 Introduction

Hoymiles Modbus protocol is accessible via both the RS485 and Ethernet interfaces, which respectively use Modbus RTU and Modbus TCP protocols.

Hoymiles DTU-Pro/Pro-S integrates both RS485 and Ethernet interfaces, facilitating seamless connectivity between Hoymiles microinverter system and a third-party monitoring server. This integration allows direct access to module-level data and remote control of the microinverter system using the Modbus protocol. You can conveniently process the microinverter data without disrupting communication with Hoymiles Monitoring Platform S-Miles Cloud.

This document introduces Hoymiles Modbus protocols and illustrates how to effectively utilize them.

# 2 Terms

- **DTU:** Hoymiles Data Transfer Unit, which receives data from microinverters and meters, and uploads them to S-Miles Cloud.
- **Modbus:** A standard serial communication protocol commonly used with the RS485 physical layer.
- **Modbus RTU:** A Modbus communication protocol that uses RTU transmission mode (implemented via RS485 interface).
- **Modbus TCP:** A Modbus communication protocol that uses TCP transmission mode (implemented via network interface).
- **Sunspec Modbus:** Sunspec Modbus is a standard serial communication protocol specifically designed to achieve interoperability between Distributed Energy Resource (DER) components and smart grid applications.

# 3 Hoymiles Modbus RTU Connection and Communication

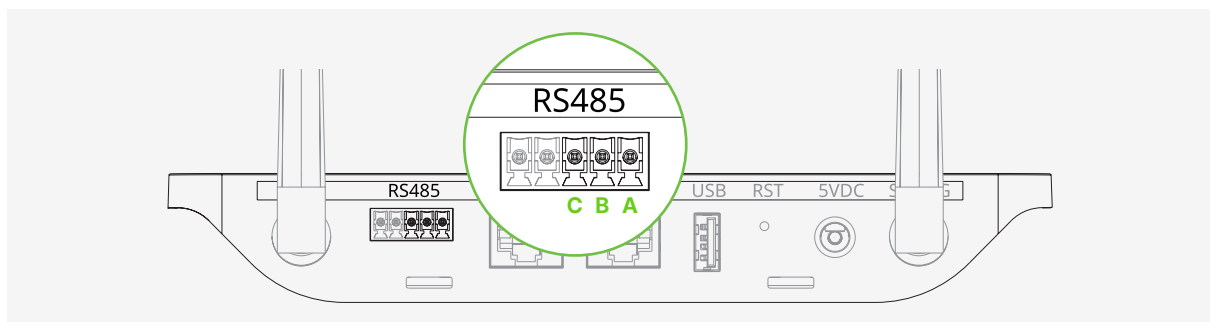
This section offers instructions on wiring and establishing communication using Hoymiles Modbus RTU. It also provides a register list for monitoring data and facilitating remote control.

## 3.1 Connection via RS485 Interface

The Modbus output uses half-duplex two-wire (plus common) communication, using the same pair of wires to send and receive data.

When employing RS485 Modbus communication, adhere to the following guidelines:

- Connect to the A, B, and C (common) terminals to ensure reliable communication between the master device and the slave devices.



- Avoid interchanging terminals to prevent any disruptions in communication.
- For a shielded cable, connect the shielding layer to the Modbus common terminal for optimal performance.

### 3.1.1 Cable Requirements

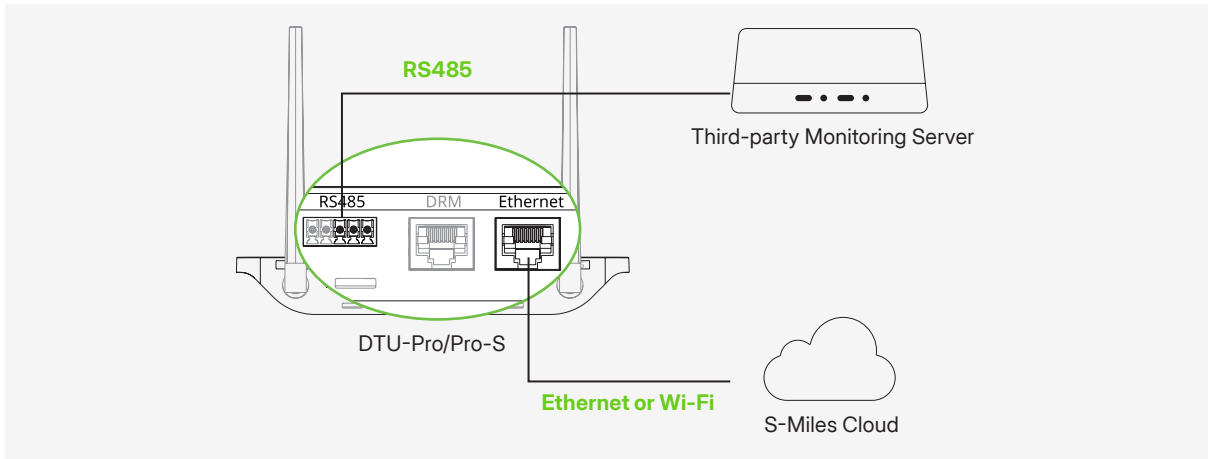
Use a twisted-pair cable to prevent interference, shown as follows. The shielded type is recommended.



### 3.1.2 Connection Guides

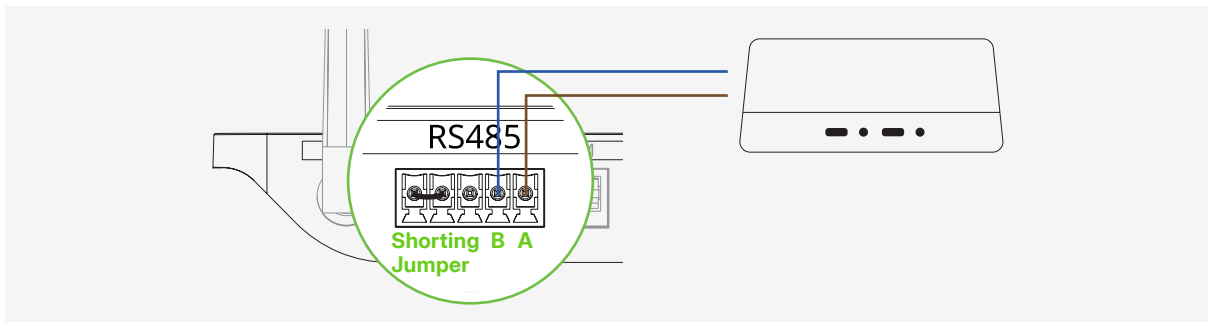
#### Single-DTU System

In a small PV system with only one DTU, connect the DTU to a third-party monitoring server via the RS485 interface. You can also connect the DTU to S-Miles Cloud via the Ethernet interface or Wi-Fi network.



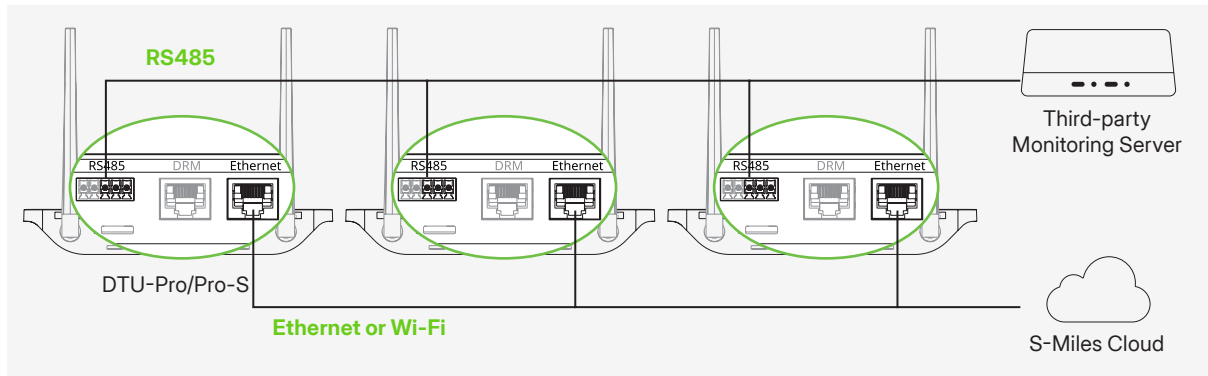
How to connect the RS485 interface:

- Step 1** Connect the RS485 cable to the A and B terminals. Then, connect the other end to the third-party monitoring server.
- Step 2** If the RS485 cable length exceeds 200 meters, it is recommended to use a shorting jumper on the first two terminals.



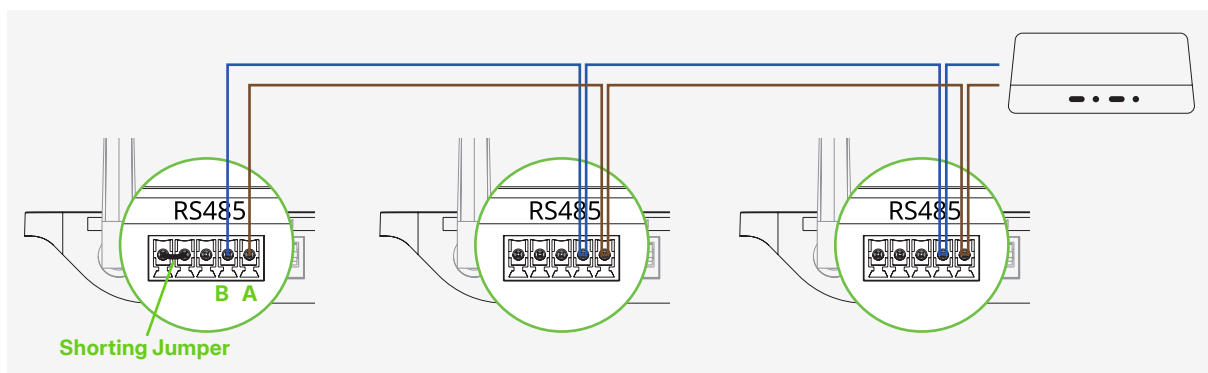
## Multi-DTU System

For an installation with multiple DTUs, connect the DTUs to a third-party monitoring server via the RS485 interfaces in a daisy-chain manner. You can also connect the DTUs to S-Miles Cloud via the Ethernet interfaces or Wi-Fi network.



How to connect the RS485 interfaces:

- Step 1** Connect the RS485 cable to the A and B terminals of the RS485 interface on the first DTU. Then, connect the other end to the third-party monitoring server.
- Step 2** Connect all the DTU RS485 interfaces in daisy chain.
- Step 3** If the distance between the microinverter and the last DTU exceeds 200 meters, it is recommended to use a shorting jumper on the first two terminals of the RS485 interface on the last DTU.



## 3.2 Modbus RTU Settings

### 3.2.1 Setting the Modbus Address

The RS485 interface on the DTU-Pro/Pro-S has two modes:

- **(Default)** DTU acting as the **master device** to control the power export management system.
- DTU acting as a **slave device** and receiving control commands from a third-party monitoring server.

In a general Modbus protocol, the DTU functions as a slave device. To change the mode, follow the steps below.

#### Note:

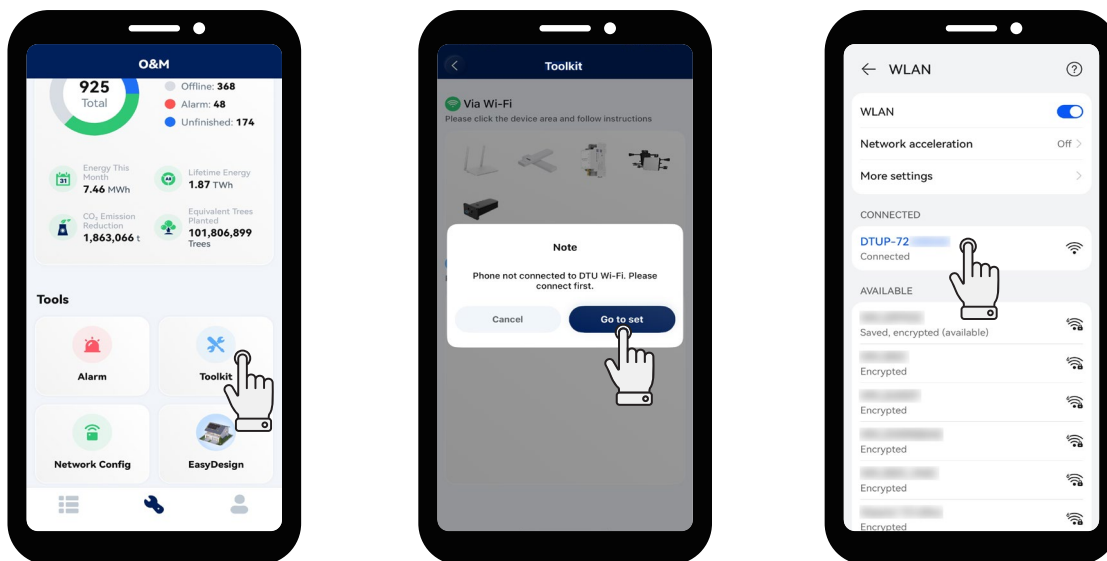
- For a microinverter system with multiple DTUs,
  - All DTUs should be set to the same mode.
  - Each DTU must be assigned a unique address.
- Screenshots provided in this guide are for reference only. The actual screens may vary.

- Step 1** Open S-Miles Installer App and log in.

**Step 2** Tap **O&M** > **Toolkit**.

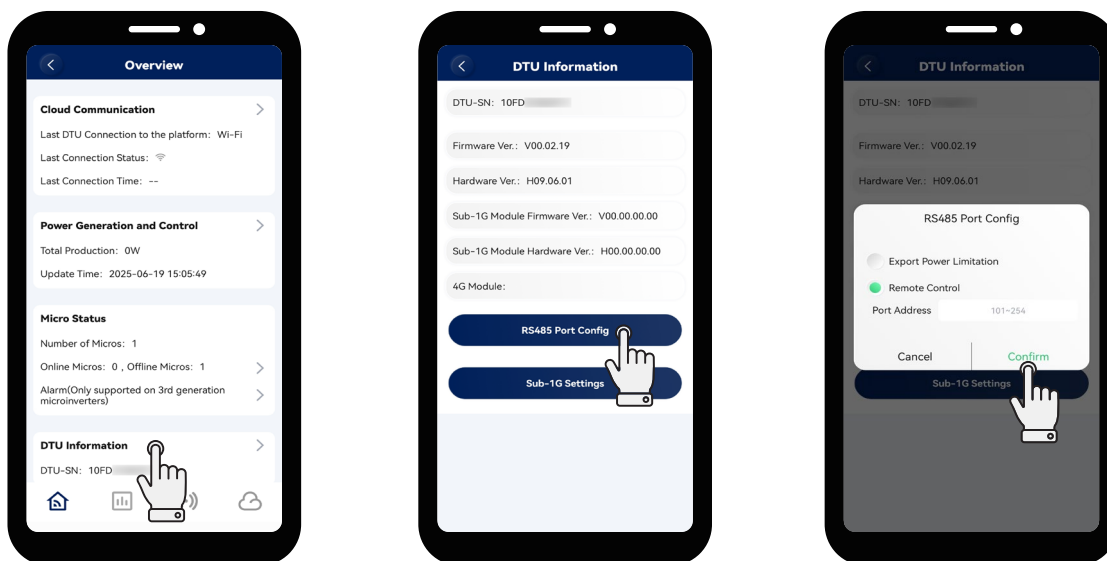
**Step 3** Tap the area under **Via Wi-Fi**, and then tap **Go to set**.

**Step 4** Select the DTU's network (Name: DTUP-last 8 digits of the serial number).



**Step 5** Return to the App. Tap **Toolkit** > **DTU Information** > **RS485 Port Config**.

**Step 6** Select **Remote Control** and enter the port address. Then, tap **Confirm**.



### 3.2.2 Setting the Serial Port Parameters

Serial port parameters refer to baud rate, data bit, parity bit, and stop bit. These parameters are preset with default values and cannot be changed.

| Parameter   | Default Value |
|-------------|---------------|
| Baud Rate   | 9600 bps      |
| Data Bit    | 8             |
| Check Digit | -             |
| Stop Bit    | 1             |

### 3.3 Understanding Modbus RTU Function Codes

The Modbus protocol follows a master-slave structure, where there is one master device and multiple slave devices. When operating as a slave device, the DTU will respond only when queried.

In most cases, the Modbus software automatically utilizes the appropriate Modbus command for any desired action. However, the Hoymiles DTU-Pro/Pro-S only supports the following functions.

| Code                                                | Function                                                                                                          |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 03 (0x03)<br>Read Device Data (Serial Number, etc.) | Reads meter serial number (SN), CT value, microinverter SN, microinverter on/off status, and power limit data.    |
| 04 (0x04)<br>Read Device Real-Time Data             | The input registers of the DTU are usually read-only and report data such as voltage, current, power, and energy. |
| 06 (0x06)<br>Write Single / All Device Status       | Writes a new value to a single status register.                                                                   |
| 16 (0x10)<br>Write Multiple Device Status           | Writes a new value to multiple status registers.                                                                  |

#### 3.3.1 03 (0x03) Reading Multiple Microinverters and Meter SNs

##### Command Sending Format

| Name                  | Length | Value | Remark         |
|-----------------------|--------|-------|----------------|
| Address               | 1      | xx    | DTU485 Address |
| Function Code         | 1      | 0x03  | -              |
| Register Address Code | 2      | xxxx  | Big-Endian     |
| Register Count        | 2      | xxxx  | Big-Endian     |
| CRC                   | 2      | xxxx  | CRC16          |

##### Command Response Format (Successful Commands)

| Name          | Length | Value | Remark         |
|---------------|--------|-------|----------------|
| Address       | 1      | xx    | DTU485 Address |
| Function Code | 1      | 0x03  | -              |
| Data Length   | 1      | xx    | -              |
| Data 1        | 2      | xxxx  | -              |
| Data 2        | 2      | xxxx  | -              |
| .....         |        |       |                |
| CRC           | 2      | xxxx  | CRC16          |

##### Command Response Format (Failed Commands)

| Name            | Length | Value | Remark          |
|-----------------|--------|-------|-----------------|
| Address         | 1      | xx    | DTU 485 Address |
| Function Code   | 1      | 0x83  | -               |
| Error Data Code | 1      | 0x01  | -               |
| CRC             | 2      | xxxx  | CRC16           |

### 3.3.2 04 (0x04) Reading Multiple Microinverters and Meter Real-Time Data

#### Command Sending Format

| Name                  | Length | Value | Remark         |
|-----------------------|--------|-------|----------------|
| Address               | 1      | xx    | DTU485 Address |
| Function Code         | 1      | 0x04  | -              |
| Register Address Code | 2      | xxxx  | Big-Endian     |
| Register Count        | 2      | xxxx  | Big-Endian     |
| CRC                   | 2      | xxxx  | CRC16          |

#### Command Response Format (Successful Commands)

| Name          | Length | Value | Remark         |
|---------------|--------|-------|----------------|
| Address       | 1      | xx    | DTU485 Address |
| Function Code | 1      | 0x04  | -              |
| Data Length   | 1      | xx    | -              |
| Data 1        | 2      | xxxx  | -              |
| Data 2        | 2      | xxxx  | -              |
| .....         |        |       |                |
| CRC           | 2      | xxxx  | CRC16          |

#### Command Response Format (Failed Commands)

| Name            | Length | Value | Remark          |
|-----------------|--------|-------|-----------------|
| Address         | 1      | xx    | DTU 485 Address |
| Function Code   | 1      | 0x84  | -               |
| Error Data Code | 1      | 0x01  | -               |
| CRC             | 2      | xxxx  | CRC16           |

### 3.3.3 06 (0x06) Writing Single or All Device Status

#### Command Sending Format

| Name                  | Length | Value | Remark         |
|-----------------------|--------|-------|----------------|
| Address               | 1      | xx    | DTU485 Address |
| Function Code         | 1      | 0x06  | -              |
| Register Address Code | 2      | xxxx  | Big-Endian     |
| Data                  | 2      | xxxx  | Big-Endian     |
| CRC                   | 2      | xxxx  | -              |

### Command Response Format (Successful Commands)

| Name                  | Length | Value | Remark         |
|-----------------------|--------|-------|----------------|
| Address               | 1      | xx    | DTU485 Address |
| Function Code         | 1      | 0x06  | -              |
| Register Address Code | 2      | xxxx  | Big-Endian     |
| Data                  | 2      | xxxx  | Big-Endian     |
| CRC                   | 2      | xxxx  | CRC16          |

### Command Response Format (Failed Commands)

| Name            | Length | Value | Remark          |
|-----------------|--------|-------|-----------------|
| Address         | 1      | xx    | DTU 485 Address |
| Function Code   | 1      | 0x86  | -               |
| Error Data Code | 1      | 0x01  | -               |
| CRC             | 2      | xxxx  | CRC16           |

## 3.3.4 16 (0x10) Writing Multiple Device Status

### Command Sending Format

| Name                  | Length | Value | Remark         |
|-----------------------|--------|-------|----------------|
| Address               | 1      | xx    | DTU485 Address |
| Function Code         | 1      | 0x10  | -              |
| Register Address Code | 2      | xxxx  | Big-Endian     |
| Register Count        | 2      | xxxx  | Big-Endian     |
| Data Length           | 1      | xx    | -              |
| Data 1                | 1      | xx    | -              |
| Data 2                | 1      | xx    | -              |
| .....                 |        |       |                |
| CRC                   | 2      | xxxx  | -              |

### Command Response Format (Successful Commands)

| Name                  | Length | Value | Remark         |
|-----------------------|--------|-------|----------------|
| Address               | 1      | xx    | DTU485 Address |
| Function Code         | 1      | 0x10  | -              |
| Register Address Code | 2      | xxxx  | Big-Endian     |
| Register Count        | 2      | xxxx  | Big-Endian     |
| CRC                   | 2      | xxxx  | CRC16          |

**Command Response Format (Failed Commands)**

| Name            | Length | Value | Remark          |
|-----------------|--------|-------|-----------------|
| Address         | 1      | xx    | DTU 485 Address |
| Function Code   | 1      | 0x90  | -               |
| Error Data Code | 1      | 0x01  | -               |
| CRC             | 2      | xxxx  | CRC16           |

**3.4 Understanding Modbus Registers****3.4.1 Device Information**

| Registers | Numbers | Name                 | Coefficient | Unit | R/W | Type   | Function Code (Supported) | Remark            |
|-----------|---------|----------------------|-------------|------|-----|--------|---------------------------|-------------------|
| 0x3000    | 3       | DTU Serial Number    | -           | N/A  | R   | uint16 | 0x04                      | E.g.,10F800000001 |
| 0x3003    | 1       | Meter Number         | 1           | N/A  | R   | uint16 | 0x04                      | E.g.,1            |
| 0x3004    | 1       | Microinverter Number | 1           | N/A  | R   | uint16 | 0x04                      | E.g.,2            |

**3.4.2 DTU Data**

| Registers | Numbers | Name                                               | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3100    | 4       | Sum of All Microinverters' Total Production in DTU | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3104    | 4       | Sum of All Microinverters' Today Production in DTU | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3108    | 2       | Sum of All Microinverters' Active Power in DTU     | 0.1         | W    | R   | uint32 | 0x04                      |
| 0x310A    | 2       | Sum of All Microinverters' Reactive Power in DTU   | 0.1         | VA   | R   | uint32 | 0x04                      |

**3.4.3 Real-Time Meter Data**

| Registers | Numbers | Name                          | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|-------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3160    | 3       | Meter 1: Serial Number        | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3163    | 2       | Meter 1: Total Active Power   | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x3165    | 2       | Meter 1: Phase A Active Power | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x3167    | 2       | Meter 1: Phase B Active Power | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x3169    | 2       | Meter 1: Phase C Active Power | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x316B    | 2       | Meter 1: Power Factor         | 0.001       | N/A  | R   | uint32 | 0x04                      |

| Registers | Numbers | Name                                               | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x316D    | 2       | Meter 1: Total Electricity Positive Import         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x316F    | 2       | Meter 1: Phase A Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3171    | 2       | Meter 1: Phase B Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3173    | 2       | Meter 1: Phase C Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3175    | 2       | Meter 1: Total Electricity Positive Export         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3177    | 2       | Meter 1: Phase A Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3179    | 2       | Meter 1: Phase B Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x317B    | 2       | Meter 1: Phase C Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x317D    | 2       | Meter 1: Phase A Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x317F    | 2       | Meter 1: Phase B Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3181    | 2       | Meter 1: Phase C Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3183    | 2       | Meter 1: Phase A Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3185    | 2       | Meter 1: Phase B Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3187    | 2       | Meter 1: Phase C Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3189    | 2       | Meter 1: Phase A Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x318B    | 2       | Meter 1: Phase B Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x318D    | 2       | Meter 1: Phase C Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x318F    | 1       | Meter 1: Status<br>(0: Offline; 1: Online)         | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3190    | 2       | Meter 1: Uab Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3192    | 2       | Meter 1: Ubc Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3194    | 2       | Meter 1: Uca Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3196    | 74      | Meter 1: Reserved                                  | -           | N/A  | R   | uint16 | 0x04                      |
| 0x31E0    | 3       | Meter 2: Serial Number                             | -           | N/A  | R   | uint16 | 0x04                      |
| 0x31E3    | 2       | Meter 2: Total Active Power                        | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31E5    | 2       | Meter 2: Phase A Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31E7    | 2       | Meter 2: Phase B Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31E9    | 2       | Meter 2: Phase C Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31EB    | 2       | Meter 2: Power Factor                              | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x31ED    | 2       | Meter 2: Total Electricity Positive Import         | 0.01        | kWh  | R   | uint32 | 0x04                      |

| Registers                                                | Numbers | Name                                               | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|----------------------------------------------------------|---------|----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x31EF                                                   | 2       | Meter 2: Phase A Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F1                                                   | 2       | Meter 2: Phase B Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F3                                                   | 2       | Meter 2: Phase C Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F5                                                   | 2       | Meter 2: Total Electricity Positive Export         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F7                                                   | 2       | Meter 2: Phase A Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F9                                                   | 2       | Meter 2: Phase B Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31FB                                                   | 2       | Meter 2: Phase C Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31FD                                                   | 2       | Meter 2: Phase A Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x31FF                                                   | 2       | Meter 2: Phase B Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3201                                                   | 2       | Meter 2: Phase C Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3203                                                   | 2       | Meter 2: Phase A Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3205                                                   | 2       | Meter 2: Phase B Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3207                                                   | 2       | Meter 2: Phase C Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3209                                                   | 2       | Meter 2: Phase A Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x320B                                                   | 2       | Meter 2: Phase B Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x320D                                                   | 2       | Meter 2: Phase C Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x320F                                                   | 1       | Meter 2: Status<br>(0: Offline; 1: Online)         | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3210                                                   | 2       | Meter 2: Uab Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3212                                                   | 2       | Meter 2: Ubc Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3214                                                   | 2       | Meter 2: Uca Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3216                                                   | 74      | Meter 2: Reserved                                  | -           | N/A  | R   | uint16 | 0x04                      |
| ... (A single DTU supports a maximum of 10 meter units.) |         |                                                    |             |      |     |        |                           |
| 0x35E0                                                   | 3       | Meter 10: Serial Number                            | -           | N/A  | R   | uint16 | 0x04                      |
| 0x35E3                                                   | 2       | Meter 10: Total Active Power                       | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35E5                                                   | 2       | Meter 10: Phase A Active Power                     | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35E7                                                   | 2       | Meter 10: Phase B Active Power                     | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35E9                                                   | 2       | Meter 10: Phase C Active Power                     | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35EB                                                   | 2       | Meter 10: Power Factor                             | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x35ED                                                   | 2       | Meter 10: Total Electricity Positive Import        | 0.01        | kWh  | R   | uint32 | 0x04                      |

| Registers | Numbers | Name                                                | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|-----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x35EF    | 2       | Meter 10: Phase A Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F1    | 2       | Meter 10: Phase B Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F3    | 2       | Meter 10: Phase C Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F5    | 2       | Meter 10: Total Electricity Positive Export         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F7    | 2       | Meter 10: Phase A Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F9    | 2       | Meter 10: Phase B Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35FB    | 2       | Meter 10: Phase C Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35FD    | 2       | Meter 10: Phase A Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x35FF    | 2       | Meter 10: Phase B Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3601    | 2       | Meter 10: Phase C Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3603    | 2       | Meter 10: Phase A Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3605    | 2       | Meter 10: Phase B Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3607    | 2       | Meter 10: Phase C Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3609    | 2       | Meter 10: Phase A Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x360B    | 2       | Meter 10: Phase B Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x360D    | 2       | Meter 10: Phase C Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x360F    | 1       | Meter 10: Status (0: Offline; 1: Online)            | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3610    | 2       | Meter 10: Uab Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3612    | 2       | Meter 10: Ubc Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3614    | 2       | Meter 10: Uca Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3616    | 74      | Meter 10: Reserved                                  | 0           | N/A  | R   | uint16 | 0x04                      |

### 3.4.4 Real-Time Microinverter Data

| Registers | Numbers | Name                              | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|-----------------------------------|-------------|------|-----|--------|---------------------------|
| 0x38E0    | 3       | Microinverter 1: Serial Number    | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x38E3    | 2       | Microinverter 1: Total Production | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x38E5    | 2       | Microinverter 1: Today Production | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x38E7    | 1       | Microinverter 1: Active Power     | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38E8    | 1       | Microinverter 1: Reactive Power   | 0.1         | VA   | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                                   | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x38E9    | 1       | Microinverter 1: Power Factor          | 0.001       | N/A  | R   | uint16 | 0x04                      |
| 0x38EA    | 1       | Microinverter 1: Phase A Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EB    | 1       | Microinverter 1: Phase B Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EC    | 1       | Microinverter 1: Phase C Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38ED    | 1       | Microinverter 1: Phase AB Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EE    | 1       | Microinverter 1: Phase BC Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EF    | 1       | Microinverter 1: Phase CA Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38F0    | 1       | Microinverter 1: Phase A Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F1    | 1       | Microinverter 1: Phase B Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F2    | 1       | Microinverter 1: Phase C Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F3    | 1       | Microinverter 1: Grid Frequency        | 0.01        | Hz   | R   | uint16 | 0x04                      |
| 0x38F4    | 1       | Microinverter 1: Device Temperature    | 0.1         | °C   | R   | uint16 | 0x04                      |
| 0x38F5    | 1       | Microinverter 1: PV1 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38F6    | 1       | Microinverter 1: PV1 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F7    | 1       | Microinverter 1: PV1 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38F8    | 1       | Microinverter 1: PV2 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38F9    | 1       | Microinverter 1: PV2 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38FA    | 1       | Microinverter 1: PV2 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38FB    | 1       | Microinverter 1: PV3 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38FC    | 1       | Microinverter 1: PV3 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38FD    | 1       | Microinverter 1: PV3 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38FE    | 1       | Microinverter 1: PV4 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38FF    | 1       | Microinverter 1: PV4 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3900    | 1       | Microinverter 1: PV4 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3901    | 1       | Microinverter 1: PV5 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3902    | 1       | Microinverter 1: PV5 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3903    | 1       | Microinverter 1: PV5 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3904    | 1       | Microinverter 1: PV6 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3905    | 1       | Microinverter 1: PV6 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3906    | 1       | Microinverter 1: PV6 Power             | 0.1         | W    | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                                   | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3907    | 1       | Microinverter 1: Microinverter Status  | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3908    | 1       | Microinverter 1: Alarm Code 1          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3909    | 1       | Microinverter 1: Alarm Code 2          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390A    | 1       | Microinverter 1: Alarm Code 3          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390B    | 1       | Microinverter 1: Alarm Code 4          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390C    | 1       | Microinverter 1: Alarm Code 5          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390D    | 1       | Microinverter 1: Alarm Code 6          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390E    | 50      | Microinverter 1: Reserved              | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3940    | 3       | Microinverter 2: Serial Number         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3943    | 2       | Microinverter 2: Total Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3945    | 2       | Microinverter 2: Today Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3947    | 1       | Microinverter 2: Active Power          | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3948    | 1       | Microinverter 2: Reactive Power        | 0.1         | VA   | R   | uint16 | 0x04                      |
| 0x3949    | 1       | Microinverter 2: Power Factor          | 0.001       | N/A  | R   | uint16 | 0x04                      |
| 0x394A    | 1       | Microinverter 2: Phase A Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394B    | 1       | Microinverter 2: Phase B Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394C    | 1       | Microinverter 2: Phase C Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394D    | 1       | Microinverter 2: Phase AB Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394E    | 1       | Microinverter 2: Phase BC Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394F    | 1       | Microinverter 2: Phase CA Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3950    | 1       | Microinverter 2: Phase A Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3951    | 1       | Microinverter 2: Phase B Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3952    | 1       | Microinverter 2: Phase C Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3953    | 1       | Microinverter 2: Grid Frequency        | 0.01        | Hz   | R   | uint16 | 0x04                      |
| 0x3954    | 1       | Microinverter 2: Device Temperature    | 0.1         | °C   | R   | uint16 | 0x04                      |
| 0x3955    | 1       | Microinverter 2: PV1 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3956    | 1       | Microinverter 2: PV1 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3957    | 1       | Microinverter 2: PV1 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3958    | 1       | Microinverter 2: PV2 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3959    | 1       | Microinverter 2: PV2 Current           | 0.01        | A    | R   | uint16 | 0x04                      |

| Registers                                                                                                                                            | Numbers | Name                                    | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x395A                                                                                                                                               | 1       | Microinverter 2: PV2 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x395B                                                                                                                                               | 1       | Microinverter 2: PV3 Voltage            | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x395C                                                                                                                                               | 1       | Microinverter 2: PV3 Current            | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x395D                                                                                                                                               | 1       | Microinverter 2: PV3 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x395E                                                                                                                                               | 1       | Microinverter 2: PV4 Voltage            | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x395F                                                                                                                                               | 1       | Microinverter 2: PV4 Current            | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3960                                                                                                                                               | 1       | Microinverter 2: PV4 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3961                                                                                                                                               | 1       | Microinverter 2: PV5 Voltage            | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3962                                                                                                                                               | 1       | Microinverter 2: PV5 Current            | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3963                                                                                                                                               | 1       | Microinverter 2: PV5 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3964                                                                                                                                               | 1       | Microinverter 2: PV6 Voltage            | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3965                                                                                                                                               | 1       | Microinverter 2: PV6 Current            | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3966                                                                                                                                               | 1       | Microinverter 2: PV6 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3967                                                                                                                                               | 1       | Microinverter 2: Microinverter Status   | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3968                                                                                                                                               | 1       | Microinverter 2: Alarm Code 1           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3969                                                                                                                                               | 1       | Microinverter 2: Alarm Code 2           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396A                                                                                                                                               | 1       | Microinverter 2: Alarm Code 3           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396B                                                                                                                                               | 1       | Microinverter 2: Alarm Code 4           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396C                                                                                                                                               | 1       | Microinverter 2: Alarm Code 5           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396D                                                                                                                                               | 1       | Microinverter 2: Alarm Code 6           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396E                                                                                                                                               | 50      | Microinverter 2: Reserved               | 1           | N/A  | R   | uint16 | 0x04                      |
| ... (A single DTU supports a maximum of 99 units of 1-in-1 microinverters, 49 units of 1-in-2 microinverters, or 24 units of 1-in-4 microinverters.) |         |                                         |             |      |     |        |                           |
| 0x5DA0                                                                                                                                               | 3       | Microinverter 99: Serial Number         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DA3                                                                                                                                               | 2       | Microinverter 99: Total Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x5DA5                                                                                                                                               | 2       | Microinverter 99: Today Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x5DA7                                                                                                                                               | 1       | Microinverter 99: Active Power          | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DA8                                                                                                                                               | 1       | Microinverter 99: Reactive Power        | 0.1         | VA   | R   | uint16 | 0x04                      |
| 0x5DA9                                                                                                                                               | 1       | Microinverter 99: Power Factor          | 0.001       | N/A  | R   | uint16 | 0x04                      |
| 0x5DAA                                                                                                                                               | 1       | Microinverter 99: Phase A Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAB                                                                                                                                               | 1       | Microinverter 99: Phase B Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAC                                                                                                                                               | 1       | Microinverter 99: Phase C Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                                    | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|-----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x5DAD    | 1       | Microinverter 99: Phase AB Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAE    | 1       | Microinverter 99: Phase BC Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAF    | 1       | Microinverter 99: Phase CA Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DB0    | 1       | Microinverter 99: Phase A Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB1    | 1       | Microinverter 99: Phase B Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB2    | 1       | Microinverter 99: Phase C Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB3    | 1       | Microinverter 99: Grid Frequency        | 0.01        | Hz   | R   | uint16 | 0x04                      |
| 0x5DB4    | 1       | Microinverter 99: Device Temperature    | 0.1         | °C   | R   | uint16 | 0x04                      |
| 0x5DB5    | 1       | Microinverter 99: PV1 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DB6    | 1       | Microinverter 99: PV1 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB7    | 1       | Microinverter 99: PV1 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DB8    | 1       | Microinverter 99: PV2 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DB9    | 1       | Microinverter 99: PV2 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DBA    | 1       | Microinverter 99: PV2 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DBB    | 1       | Microinverter 99: PV3 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DBC    | 1       | Microinverter 99: PV3 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DBD    | 1       | Microinverter 99: PV3 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DBE    | 1       | Microinverter 99: PV4 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DBF    | 1       | Microinverter 99: PV4 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DC0    | 1       | Microinverter 99: PV4 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DC1    | 1       | Microinverter 99: PV5 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DC2    | 1       | Microinverter 99: PV5 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DC3    | 1       | Microinverter 99: PV5 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DC4    | 1       | Microinverter 99: PV6 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DC5    | 1       | Microinverter 99: PV6 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DC6    | 1       | Microinverter 99: PV6 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DC7    | 1       | Microinverter 99: Microinverter Status  | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DC8    | 1       | Microinverter 99: Alarm Code 1          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DC9    | 1       | Microinverter 99: Alarm Code 2          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCA    | 1       | Microinverter 99: Alarm Code 3          | 1           | N/A  | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                           | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|--------------------------------|-------------|------|-----|--------|---------------------------|
| 0x5DCB    | 1       | Microinverter 99: Alarm Code 4 | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCC    | 1       | Microinverter 99: Alarm Code 5 | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCD    | 1       | Microinverter 99: Alarm Code 6 | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCE    | 50      | Microinverter 99: Reserved     | 1           | N/A  | R   | uint16 | 0x04                      |

### 3.4.5 Device SNs

| Registers                                                         | Length | Name             | Coefficient | R/W | Type     | Function Code (Supported) | Remark            |
|-------------------------------------------------------------------|--------|------------------|-------------|-----|----------|---------------------------|-------------------|
| 0x5000                                                            | 3      | DTU SN           | -           | R   | 3*uint16 | 0x03                      | E.g.,10F854300201 |
| 0x5003                                                            | 3      | Meter SN         | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,10C012000001 |
| 0x5006                                                            | 1      | Meter CT Setting | -           | R/W | uint16   | 0x03 / 0x06 / 0x10        | E.g.,100          |
| 0x5007                                                            | 3      | Meter SN         | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,10C012000002 |
| 0x500A                                                            | 1      | Meter CT Setting | -           | R/W | uint16   | 0x03 / 0x06 / 0x10        | E.g.,100          |
| ... (A single DTU supports a maximum of 10 meter units.)          |        |                  |             |     |          |                           |                   |
| 0x502B                                                            | 3      | Microinverter SN | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,106000050201 |
| 0x502E                                                            | 3      | Microinverter SN | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,106000050202 |
| ... (A single DTU can write a maximum of 99 microinverter units.) |        |                  |             |     |          |                           |                   |

### 3.4.6 RS485 Port Settings

**Note:**

If the port number is changed, restart the DTU.

| Registers | Quantity | Name               | Decimal | Unit | R/W | Type   | Function Code      | Remark                                       |
|-----------|----------|--------------------|---------|------|-----|--------|--------------------|----------------------------------------------|
| 0x5500    | 1        | Power Grid Mode    | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | 0: GPRS, 1: Wi-Fi, 2: Ethernet               |
| 0x5501    | 1        | TCP Modbus Port    | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | E.g., 502 (Effective after restart)          |
| 0x5502    | 1        | 485 Modbus Mode    | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | 0: Power Export Limiting, 1: Hoymiles Modbus |
| 0x5503    | 1        | 485 Modbus Address | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | -                                            |

| Registers | Quantity | Name                                                                    | Decimal | Unit   | R/<br>W | Type   | Function<br>Code   | Remark                                                                                                 |
|-----------|----------|-------------------------------------------------------------------------|---------|--------|---------|--------|--------------------|--------------------------------------------------------------------------------------------------------|
| 0x5504    | 1        | Power Export Limiting Mode                                              | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x10 | 0: Power Export Limiting Off,<br>1: Meter Power Export Limiting,<br>2: AC Couple Power Export Limiting |
| 0x5505    | 1        | Power Grid Type                                                         | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x10 | -                                                                                                      |
| 0x5506    | 1        | Group Control Enable                                                    | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x11 | -                                                                                                      |
| 0x5507    | 1        | Power Export Limiting Shutdown Parameters Enable                        | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x12 | -                                                                                                      |
| 0x5508    | 1        | Communication Interruption Timeout                                      | 1       | s      | R/<br>W | uint16 | 0x03 / 0x06 / 0x13 | -                                                                                                      |
| 0x5509    | 1        | Communication Interruption Status                                       | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x14 | -                                                                                                      |
| 0x550A    | 1        | Restart Status After Communication- Interruption Shutdown               | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x15 | -                                                                                                      |
| 0x550B    | 1        | Microinverter Reconnection Time                                         | 1       | s      | R/<br>W | uint16 | 0x03 / 0x06 / 0x16 | -                                                                                                      |
| 0x550C    | 1        | Microinverter Restart Power Ramp Rate                                   | 4       | %Pn/s  | R/<br>W | uint16 | 0x03 / 0x06 / 0x17 | -                                                                                                      |
| 0x550D    | 1        | Active Power Setting During Communication Interruption Without Shutdown | 3       | %Pn    | R/<br>W | uint16 | 0x03 / 0x06 / 0x18 | -                                                                                                      |
| 0x550E    | 1        | Power Export Limiting Mode                                              | -       | -      | R/<br>W | uint16 | 0x03 / 0x06 / 0x10 | 0: Power Export Limiting Off,<br>1: Meter Power Export Limiting                                        |
| 0x550F    | 1        | Max. Export Power A (%)                                                 | 4       | 0.0001 | R/<br>W | int16  | 0x03 / 0x06 / 0x18 | -                                                                                                      |
| 0x5510    | 1        | Max. Export Power B (%)                                                 | 4       | 0.0001 | R/<br>W | int16  | 0x03 / 0x06 / 0x18 | -                                                                                                      |
| 0x5511    | 1        | Max. Export Power C (%)                                                 | 4       | 0.0001 | R/<br>W | int16  | 0x03 / 0x06 / 0x18 | -                                                                                                      |
| 0x5512    | 1        | Max. Export Power A (kW)                                                | 2       | kW     | R/<br>W | int16  | 0x03 / 0x06 / 0x18 | -                                                                                                      |

| Registers | Quantity | Name                                 | Decimal | Unit | R/W | Type  | Function Code      | Remark |
|-----------|----------|--------------------------------------|---------|------|-----|-------|--------------------|--------|
| 0x5513    | 1        | Max. Export Power B (kW)             | 2       | kW   | R/W | int16 | 0x03 / 0x06 / 0x18 | -      |
| 0x5514    | 1        | Max. Export Power C (kW)             | 2       | kW   | R/W | int16 | 0x03 / 0x06 / 0x18 | -      |
| 0x5515    | 1        | Active Power Control (Whole Plant)   | 2       | kW   | R/W | int16 | 0x03 / 0x06 / 0x18 | -      |
| 0x5516    | 1        | Reactive Power Control (Whole Plant) | 2       | kVar | R/W | int16 | 0x03 / 0x06 / 0x18 | -      |
| 0x5517    | 1        | Power Factor Control (Whole Plant)   | 2       | 0.01 | R/W | int16 | 0x03 / 0x06 / 0x18 | -      |
| 0x5518    | -        | Reserved                             | -       | -    | -   | -     | -                  | -      |

### 3.4.7 Microinverter Status

**Note:**

- For 4-in-1 microinverters, there are four ports available. For 2-in-1 microinverters, there are two ports available. And for 1-in-1 microinverters, there is one port available.
- In the case of 4-in-1 and 2-in-1 microinverters, the control settings should be consistent across all ports within a single microinverter.

| Registers | Length | Name                                                | Unit | R/W | Type   | Function Code (Supported) | Remark                                                                                                   |
|-----------|--------|-----------------------------------------------------|------|-----|--------|---------------------------|----------------------------------------------------------------------------------------------------------|
| 0xD000    | 1      | Turn ON/OFF (All Microinverters)                    | -    | W   | uint16 | 0x06                      | 0: OFF 1: ON                                                                                             |
| 0xD001    | 1      | Temporary Limit Active Power (All Microinverters)   | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD002    | 1      | Permanent Limit Active Power (All Microinverters)   | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD003    | 1      | Permanent Power Factor Control (All Microinverters) | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |

| Registers | Length | Name                                                  | Unit | R/W | Type   | Function Code (Supported) | Remark                                                                                                   |
|-----------|--------|-------------------------------------------------------|------|-----|--------|---------------------------|----------------------------------------------------------------------------------------------------------|
| 0xD004    | 1      | Permanent Reactive Power Control (All Microinverters) | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD005    | 1      | Reserved                                              | -    | W   | uint16 | 0x06                      | -                                                                                                        |
| 0xD006    | 1      | Turn ON/OFF (Port 1)                                  | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | 0: OFF 1: ON                                                                                             |
| 0xD007    | 1      | Temporary Limit Active Power (Port 1)                 | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD008    | 1      | Permanent Limit Active Power (Port 1)                 | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD009    | 1      | Permanent Power Factor Control (Port 1)               | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00A    | 1      | Permanent Reactive Power Control (Port 1)             | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00B    | 1      | Reserved                                              | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | -                                                                                                        |
| 0xD00C    | 1      | Turn ON/OFF (Port 2)                                  | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | 0: OFF; 1: ON                                                                                            |
| 0xD00D    | 1      | Temporary Limit Active Power (Port 2)                 | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |

| Registers | Length | Name                                      | Unit | R/W | Type   | Function Code (Supported) | Remark                                                                                                   |
|-----------|--------|-------------------------------------------|------|-----|--------|---------------------------|----------------------------------------------------------------------------------------------------------|
| 0xD00E    | 1      | Permanent Limit Active Power (Port 2)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00F    | 1      | Permanent Power Factor Control (Port 2)   | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD010    | 1      | Permanent Reactive Power Control (Port 2) | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD011    | 1      | Reserved                                  |      | R/W | uint16 | 0x03 / 0x06 / 0x10        | -                                                                                                        |
| 0xD012    | 1      | Turn ON/OFF (Port 3)                      | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | 0: OFF; 1: ON                                                                                            |
| 0xD013    | 1      | Temporary Limit Active Power (Port 3)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD014    | 1      | Permanent Limit Active Power (Port 3)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD015    | 1      | Permanent Power Factor Control (Port 3)   | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD016    | 1      | Permanent Reactive Power Control (Port 3) | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |

| Registers                                          | Length | Name     | Unit | R/W | Type   | Function Code (Supported) | Remark |
|----------------------------------------------------|--------|----------|------|-----|--------|---------------------------|--------|
| 0xD017                                             | 1      | Reserved | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | -      |
| ... (A single DTU supports a maximum of 99 ports.) |        |          |      |     |        |                           |        |

## 3.5 Message Examples

### 3.5.1 Reading Power ON/OFF Status of Multiple Microinverters

**Send:** 65 03 D0 06 00 24 34 95

**Receive:** 65 03 48 00 00 00 64 00 64 00 64 00 00 00 00 00 64 00 64 00 64 00 00 00 00 00 00 64 00 64 00 64 00 00 00 00 00 00 64 00 64 00 64 00 00 00 00 00 00 64 00 64 00 64 00 00 00 00 00 00 00 64 00 64 00 00 00 00 6B 8C

### 3.5.2 Master Control Shutdown

**Send:** 65 06 D0 00 00 00 2E B9

**Receive:** 65 06 D0 00 00 00 2E B9

### 3.5.3 Single Control Shutdown

**Send:** 65 06 D0 06 00 00 2F 59

**Receive:** 65 06 D0 06 00 00 2F 59

### 3.5.4 Multi Control Shutdown

**Send:** 65 10 D0 0C 00 06 0C 00 00 00 64 00 64 00 64 00 00 00 DF F3

**Receive:** 65 10 D0 0C 00 06 EC B0

### 3.5.5 Querying Microinverter Data

**Send:** 65 04 38 E0 00 07 B5 7A

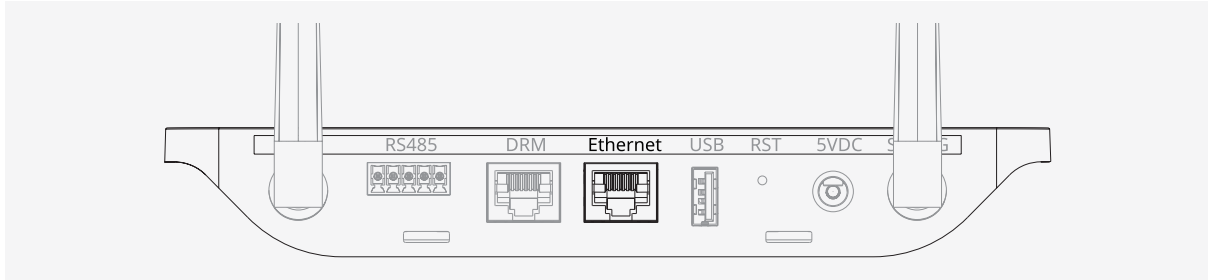
**Receive:** 65 04 0E 11 61 12 34 56 78 00 01 FE CF 00 00 03 7F 76 82

## 4 Hoymiles Modbus TCP Connection and Communication

This section provides the register mapping for monitoring data and remote control using the Hoymiles Modbus TCP protocol via the Ethernet interface.

### 4.1 Connection via Ethernet Interface

The TCP Modbus protocol can be utilized via the Ethernet interface. To establish connectivity, use a standard Ethernet cable to connect the DTU to a network device, such as a router.



Typically, the DTU-Pro/Pro-S is intended for usage within a local area network, and its IP address can be located on the router's management page. If you wish to use the DTU-Pro/Pro-S in a wide area network, it is necessary to perform network mapping on the router.

### 4.2 Modbus TCP Settings

In the Modbus TCP protocol, the DTU functions as a slave device and receives commands from a third-party monitoring server.

The default port number for Modbus TCP is 502. The IP address can be obtained from higher-level gateway devices such as routers. To set TCP, follow the steps below.

**Note:**

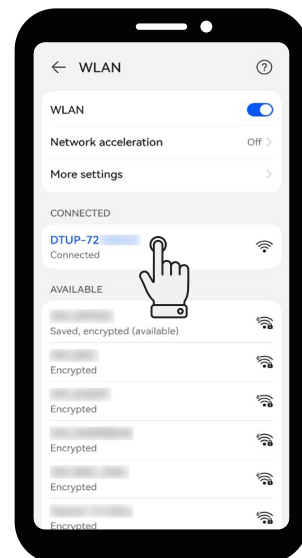
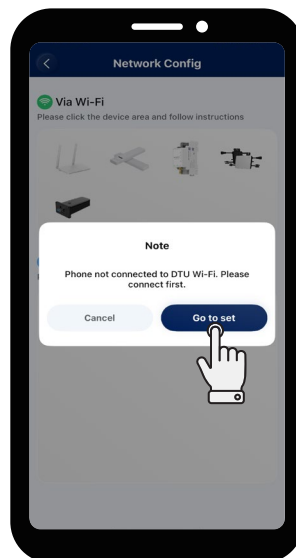
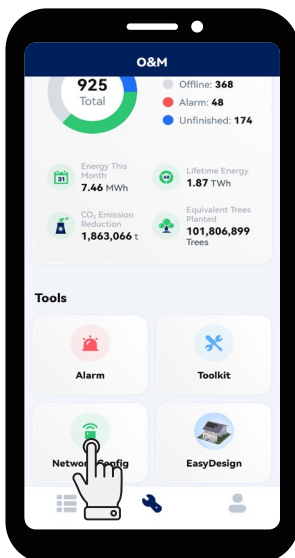
Screenshots provided in this guide are for reference only. The actual screens may vary.

**Step 1** Open S-Miles Installer App and log in.

**Step 2** Tap **O&M** > **Network Config**.

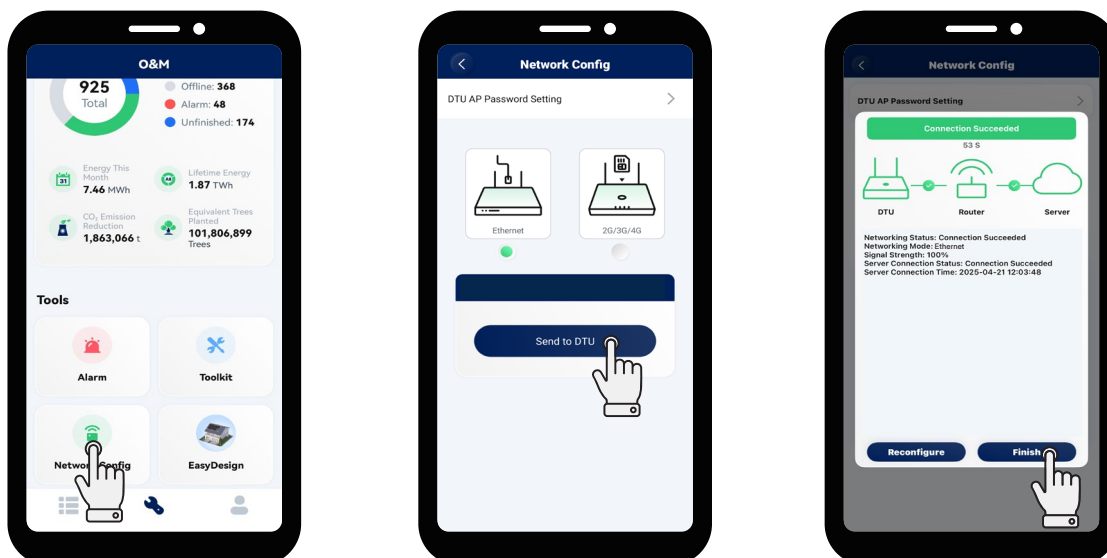
**Step 3** Tap the area under **Via Wi-Fi**, and then tap **Go to set**.

**Step 4** Select the DTU's network (Name: DTUP-last 8 digits of the serial number).

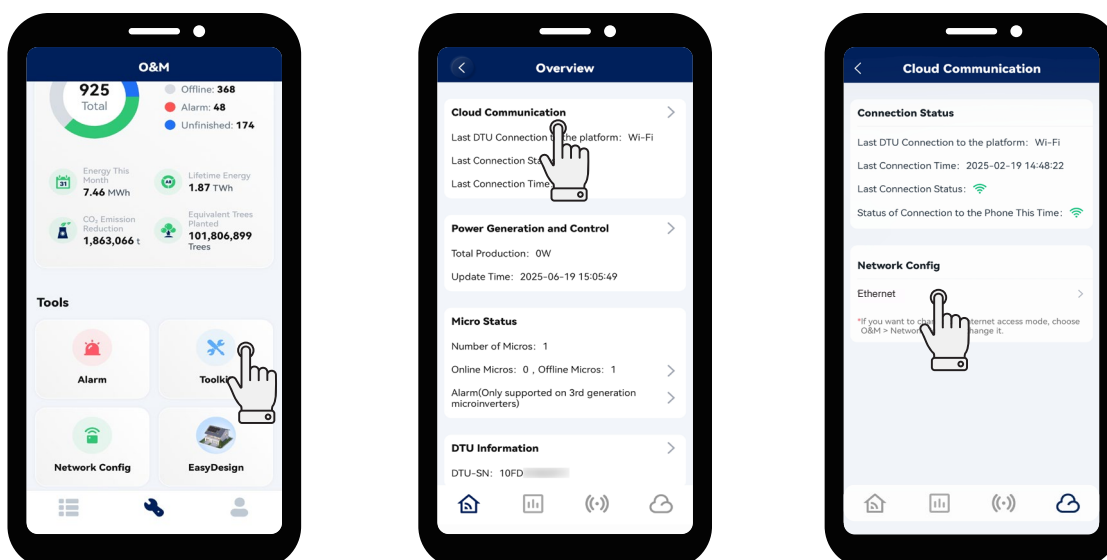


**Step 5** Return to the App. Tap  **Network Config** > **Ethernet** > **Send to DTU**.

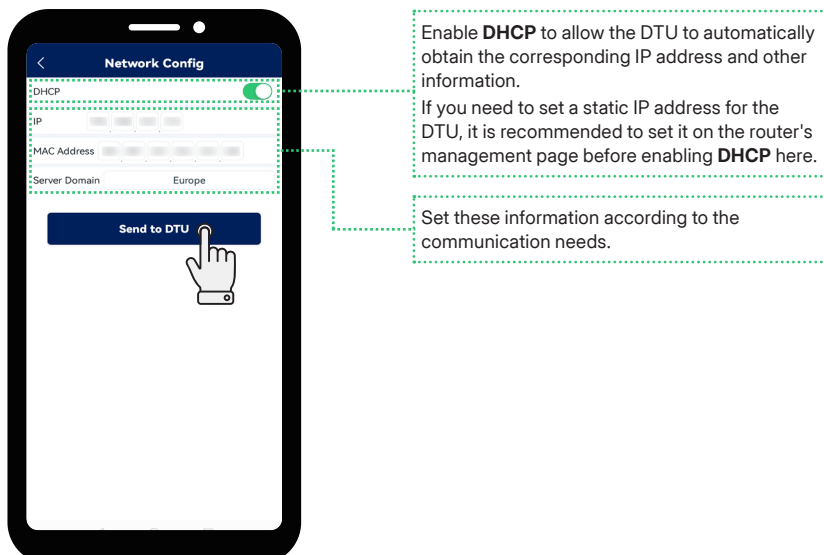
**Step 6** Wait for the connection to succeed. Then, tap **Finish**.



**Step 7** Return to the O&M screen. Tap  **Toolkit** > **Cloud Communication** > **Ethernet**.



**Step 8** Configure the network. When finished, tap **Send to DTU**.



### 4.3 Understanding Modbus TCP Function Codes

The Modbus protocol follows a master-slave structure, where there is one master device and multiple slave devices. When operating as a slave device, the DTU will respond only when queried.

In most cases, the Modbus software automatically utilizes the appropriate Modbus command for any desired action. However, the Hoymiles DTU-Pro/Pro-S only supports the following functions.

| Code                                                | Function                                                                                                          |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 03 (0x03)<br>Read Device Data (Serial Number, etc.) | Reads meter serial number (SN), CT value, microinverter SN, microinverter on/off status, and power limit data.    |
| 04 (0x04)<br>Read Device Real-Time Data             | The input registers of the DTU are usually read-only and report data such as voltage, current, power, and energy. |
| 06 (0x06)<br>Write Single / All Device Status       | Writes a new value to a single status register.                                                                   |
| 16 (0x10)<br>Write Multiple Device Status           | Writes a new value to multiple status registers.                                                                  |

#### 4.3.1 03 (0x03) Reading Multiple Microinverters and Meter SNs

##### Command Sending Format

|             | Name                | Length | Value | Remark     |
|-------------|---------------------|--------|-------|------------|
| Header      | Transaction ID      | 2      | xxxx  | Big-Endian |
|             | Protocol ID         | 2      | xxxx  | Big-Endian |
|             | Length              | 2      | xxxx  | Big-Endian |
|             | Unit ID             | 1      | xx    | -          |
| Modbus Data | Function Code       | 1      | 0x03  | -          |
|             | Address Code        | 2      | xxxx  | Big-Endian |
|             | Number of Registers | 2      | xxxx  | Big-Endian |

##### Command Response Format (Successful Commands)

|             | Name           | Length | Value | Remark     |
|-------------|----------------|--------|-------|------------|
| Header      | Transaction ID | 2      | xxxx  | Big-Endian |
|             | Protocol ID    | 2      | xxxx  | Big-Endian |
|             | Length         | 2      | xxxx  | Big-Endian |
|             | Unit ID        | 1      | xx    | -          |
| Modbus Data | Function Code  | 1      | 0x03  | -          |
|             | Data length    | 1      | xx    | -          |
|             | Data 1         | 2      | xxxx  | Big-Endian |
|             | Data 2         | 2      | xxxx  | Big-Endian |
|             | ...            |        |       |            |

### Command Response Format (Failed Commands)

|             | Name            | Length | Value | Remark     |
|-------------|-----------------|--------|-------|------------|
| Header      | Transaction ID  | 2      | xxxx  | Big-Endian |
|             | Protocol ID     | 2      | xxxx  | Big-Endian |
|             | Length          | 2      | xxxx  | Big-Endian |
|             | Unit ID         | 1      | xx    | -          |
| Modbus Data | Function Code   | 1      | 0x83  | -          |
|             | Error Data Code | 1      | 0x01  | -          |

## 4.3.2 04 (0x04) Reading Multiple Microinverters and Meter Real-Time Data

### Command Sending Format

|             | Name                | Length | Value | Remark     |
|-------------|---------------------|--------|-------|------------|
| Header      | Transaction ID      | 2      | xxxx  | Big-Endian |
|             | Protocol ID         | 2      | xxxx  | Big-Endian |
|             | Length              | 2      | xxxx  | Big-Endian |
|             | Unit ID             | 1      | xx    | -          |
| Modbus Data | Function Code       | 1      | 0x04  | -          |
|             | Address Code        | 2      | xxxx  | Big-Endian |
|             | Number of Registers | 2      | xxxx  | Big-Endian |

### Command Response Format (Successful Commands)

|             | Name           | Length | Value | Remark     |
|-------------|----------------|--------|-------|------------|
| Header      | Transaction ID | 2      | xxxx  | Big-Endian |
|             | Protocol ID    | 2      | xxxx  | Big-Endian |
|             | Length         | 2      | xxxx  | Big-Endian |
|             | Unit ID        | 1      | xx    | -          |
| Modbus Data | Function Code  | 1      | 0x04  | -          |
|             | Data length    | 1      | xx    | -          |
|             | Data 1         | 2      | xxxx  | -          |
|             | Data 2         | 2      | xxxx  | -          |
|             | ...            |        |       |            |

### Command Response Format (Failed Commands)

|        | Name           | Length | Value | Remark     |
|--------|----------------|--------|-------|------------|
| Header | Transaction ID | 2      | xxxx  | Big-Endian |
|        | Protocol ID    | 2      | xxxx  | Big-Endian |
|        | Length         | 2      | xxxx  | Big-Endian |
|        | Unit ID        | 1      | xx    | -          |

|             | Name            | Length | Value | Remark |
|-------------|-----------------|--------|-------|--------|
| Modbus Data | Function Code   | 1      | 0x84  | -      |
|             | Error Data Code | 1      | 0x01  | -      |

### 4.3.3 06 (0x06) Writing Single or All Device Status

#### Command Sending Format

|             | Name                | Length | Value | Remark     |
|-------------|---------------------|--------|-------|------------|
| Header      | Transaction ID      | 2      | xxxx  | Big-Endian |
|             | Protocol ID         | 2      | xxxx  | Big-Endian |
|             | Length              | 2      | xxxx  | Big-Endian |
|             | Unit ID             | 1      | xx    | -          |
| Modbus Data | Function Code       | 1      | 0x06  | -          |
|             | Address Code        | 2      | xxxx  | Big-Endian |
|             | Number of Registers | 2      | xxxx  | Big-Endian |

#### Command Response Format (Successful Commands)

|             | Name           | Length | Value | Remark     |
|-------------|----------------|--------|-------|------------|
| Header      | Transaction ID | 2      | xxxx  | Big-Endian |
|             | Protocol ID    | 2      | xxxx  | Big-Endian |
|             | Length         | 2      | xxxx  | Big-Endian |
|             | Unit ID        | 1      | xx    | -          |
| Modbus Data | Function Code  | 1      | 0x06  | -          |
|             | Address Code   | 2      | xxxx  | Big-Endian |
|             | Data 1         | 2      | xxxx  | Big-Endian |
|             | Data 2         | 2      | xxxx  | Big-Endian |

#### Command Response Format (Failed Commands)

|             | Name            | Length | Value | Remark     |
|-------------|-----------------|--------|-------|------------|
| Header      | Transaction ID  | 2      | xxxx  | Big-Endian |
|             | Protocol ID     | 2      | xxxx  | Big-Endian |
|             | Length          | 2      | xxxx  | Big-Endian |
|             | Unit ID         | 1      | xx    | -          |
| Modbus Data | Function Code   | 1      | 0x86  | -          |
|             | Error Data Code | 1      | 0x01  | -          |

#### 4.3.4 16 (0x10) Writing Multiple Microinverters Status

##### Command Sending Format

|             | Name                | Length | Value | Remark     |
|-------------|---------------------|--------|-------|------------|
| Header      | Transaction ID      | 2      | xxxx  | Big-Endian |
|             | Protocol ID         | 2      | xxxx  | Big-Endian |
|             | Length              | 2      | xxxx  | Big-Endian |
|             | Unit ID             | 1      | xx    | -          |
| Modbus Data | Function Code       | 1      | 0x10  | -          |
|             | Address Code        | 2      | xxxx  | Big-Endian |
|             | Number of Registers | 2      | xxxx  | Big-Endian |
|             | Data length         | 1      | xx    | -          |
|             | Data 1              | 1      | xx    | -          |
|             | Data 2              | 1      | xx    | -          |

##### Command Response Format (Successful Commands)

|             | Name                | Length | Value | Remark     |
|-------------|---------------------|--------|-------|------------|
| Header      | Transaction ID      | 2      | xxxx  | Big-Endian |
|             | Protocol ID         | 2      | xxxx  | Big-Endian |
|             | Length              | 2      | xxxx  | Big-Endian |
|             | Unit ID             | 1      | xx    | -          |
| Modbus Data | Function Code       | 1      | 0x10  | -          |
|             | Address Code        | 2      | xxxx  | Big-Endian |
|             | Number of Registers | 2      | xxxx  | Big-Endian |

##### Command Response Format (Failed Commands)

|             | Name            | Length | Value | Remark     |
|-------------|-----------------|--------|-------|------------|
| Header      | Transaction ID  | 2      | xxxx  | Big-Endian |
|             | Protocol ID     | 2      | xxxx  | Big-Endian |
|             | Length          | 2      | xxxx  | Big-Endian |
|             | Unit ID         | 1      | xx    | -          |
| Modbus Data | Function Code   | 1      | 0x90  | -          |
|             | Error Data Code | 1      | 0x01  | -          |

## 4.4 Understanding Modbus Registers

### 4.4.1 Device Information

| Registers | Numbers | Name                 | Coefficient | Unit | R/W | Type   | Function Code (Supported) | Remark            |
|-----------|---------|----------------------|-------------|------|-----|--------|---------------------------|-------------------|
| 0x3000    | 3       | DTU Serial Number    | -           | N/A  | R   | uint16 | 0x04                      | E.g.,10F800000001 |
| 0x3003    | 1       | Meter Number         | 1           | N/A  | R   | uint16 | 0x04                      | E.g.,1            |
| 0x3004    | 1       | Microinverter Number | 1           | N/A  | R   | uint16 | 0x04                      | E.g.,2            |

### 4.4.2 DTU Data

| Registers | Numbers | Name                                               | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3100    | 4       | Sum of All Microinverters' Total Production in DTU | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3104    | 4       | Sum of All Microinverters' Today Production in DTU | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3108    | 2       | Sum of All Microinverters' Active Power in DTU     | 0.1         | W    | R   | uint32 | 0x04                      |
| 0x310A    | 2       | Sum of All Microinverters' Reactive Power in DTU   | 0.1         | VA   | R   | uint32 | 0x04                      |

### 4.4.3 Real-Time Meter Data

| Registers | Numbers | Name                                               | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3160    | 3       | Meter 1: Serial Number                             | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3163    | 2       | Meter 1: Total Active Power                        | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x3165    | 2       | Meter 1: Phase A Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x3167    | 2       | Meter 1: Phase B Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x3169    | 2       | Meter 1: Phase C Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x316B    | 2       | Meter 1: Power Factor                              | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x316D    | 2       | Meter 1: Total Electricity Positive Import         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x316F    | 2       | Meter 1: Phase A Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3171    | 2       | Meter 1: Phase B Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3173    | 2       | Meter 1: Phase C Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |

| Registers | Numbers | Name                                               | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3175    | 2       | Meter 1: Total Electricity Positive Export         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3177    | 2       | Meter 1: Phase A Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x3179    | 2       | Meter 1: Phase B Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x317B    | 2       | Meter 1: Phase C Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x317D    | 2       | Meter 1: Phase A Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x317F    | 2       | Meter 1: Phase B Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3181    | 2       | Meter 1: Phase C Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3183    | 2       | Meter 1: Phase A Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3185    | 2       | Meter 1: Phase B Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3187    | 2       | Meter 1: Phase C Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3189    | 2       | Meter 1: Phase A Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x318B    | 2       | Meter 1: Phase B Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x318D    | 2       | Meter 1: Phase C Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x318F    | 1       | Meter 1: Status<br>(0: Offline; 1: Online)         | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3190    | 2       | Meter 1: Uab Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3192    | 2       | Meter 1: Ubc Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3194    | 2       | Meter 1: Uca Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3196    | 74      | Meter 1: Reserved                                  | -           | N/A  | R   | uint16 | 0x04                      |
| 0x31E0    | 3       | Meter 2: Serial Number                             | -           | N/A  | R   | uint16 | 0x04                      |
| 0x31E3    | 2       | Meter 2: Total Active Power                        | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31E5    | 2       | Meter 2: Phase A Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31E7    | 2       | Meter 2: Phase B Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31E9    | 2       | Meter 2: Phase C Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x31EB    | 2       | Meter 2: Power Factor                              | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x31ED    | 2       | Meter 2: Total Electricity Positive Import         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31EF    | 2       | Meter 2: Phase A Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F1    | 2       | Meter 2: Phase B Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F3    | 2       | Meter 2: Phase C Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F5    | 2       | Meter 2: Total Electricity Positive Export         | 0.01        | kWh  | R   | uint32 | 0x04                      |

| Registers                                                | Numbers | Name                                                | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|----------------------------------------------------------|---------|-----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x31F7                                                   | 2       | Meter 2: Phase A Total Electricity Positive Export  | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31F9                                                   | 2       | Meter 2: Phase B Total Electricity Positive Export  | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31FB                                                   | 2       | Meter 2: Phase C Total Electricity Positive Export  | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x31FD                                                   | 2       | Meter 2: Phase A Voltage                            | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x31FF                                                   | 2       | Meter 2: Phase B Voltage                            | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3201                                                   | 2       | Meter 2: Phase C Voltage                            | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3203                                                   | 2       | Meter 2: Phase A Current                            | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3205                                                   | 2       | Meter 2: Phase B Current                            | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3207                                                   | 2       | Meter 2: Phase C Current                            | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3209                                                   | 2       | Meter 2: Phase A Power Factor                       | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x320B                                                   | 2       | Meter 2: Phase B Power Factor                       | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x320D                                                   | 2       | Meter 2: Phase C Power Factor                       | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x320F                                                   | 1       | Meter 2: Status<br>(0: Offline; 1: Online)          | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3210                                                   | 2       | Meter 2: Uab Line Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3212                                                   | 2       | Meter 2: Ubc Line Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3214                                                   | 2       | Meter 2: Uca Line Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3216                                                   | 74      | Meter 2: Reserved                                   | -           | N/A  | R   | uint16 | 0x04                      |
| ... (A single DTU supports a maximum of 10 meter units.) |         |                                                     |             |      |     |        |                           |
| 0x35E0                                                   | 3       | Meter 10: Serial Number                             | -           | N/A  | R   | uint16 | 0x04                      |
| 0x35E3                                                   | 2       | Meter 10: Total Active Power                        | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35E5                                                   | 2       | Meter 10: Phase A Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35E7                                                   | 2       | Meter 10: Phase B Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35E9                                                   | 2       | Meter 10: Phase C Active Power                      | 0.01        | kW   | R   | uint32 | 0x04                      |
| 0x35EB                                                   | 2       | Meter 10: Power Factor                              | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x35ED                                                   | 2       | Meter 10: Total Electricity Positive Import         | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35EF                                                   | 2       | Meter 10: Phase A Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F1                                                   | 2       | Meter 10: Phase B Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F3                                                   | 2       | Meter 10: Phase C Total Electricity Positive Import | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F5                                                   | 2       | Meter 10: Total Electricity Positive Export         | 0.01        | kWh  | R   | uint32 | 0x04                      |

| Registers | Numbers | Name                                                | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|-----------------------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x35F7    | 2       | Meter 10: Phase A Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35F9    | 2       | Meter 10: Phase B Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35FB    | 2       | Meter 10: Phase C Total Electricity Positive Export | 0.01        | kWh  | R   | uint32 | 0x04                      |
| 0x35FD    | 2       | Meter 10: Phase A Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x35FF    | 2       | Meter 10: Phase B Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3601    | 2       | Meter 10: Phase C Voltage                           | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3603    | 2       | Meter 10: Phase A Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3605    | 2       | Meter 10: Phase B Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3607    | 2       | Meter 10: Phase C Current                           | 0.01        | A    | R   | uint32 | 0x04                      |
| 0x3609    | 2       | Meter 10: Phase A Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x360B    | 2       | Meter 10: Phase B Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x360D    | 2       | Meter 10: Phase C Power Factor                      | 0.001       | N/A  | R   | uint32 | 0x04                      |
| 0x360F    | 1       | Meter 10: Status (0: Offline; 1: Online)            | -           | N/A  | R   | uint16 | 0x04                      |
| 0x3610    | 2       | Meter 10: Uab Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3612    | 2       | Meter 10: Ubc Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3614    | 2       | Meter 10: Uca Line Voltage                          | 0.01        | V    | R   | uint32 | 0x04                      |
| 0x3616    | 74      | Meter 10: Reserved                                  | 0           | N/A  | R   | uint16 | 0x04                      |

#### 4.4.4 Real-Time Microinverter Data

| Registers | Numbers | Name                                   | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x38E0    | 3       | Microinverter 1: Serial Number         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x38E3    | 2       | Microinverter 1: Total Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x38E5    | 2       | Microinverter 1: Today Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x38E7    | 1       | Microinverter 1: Active Power          | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38E8    | 1       | Microinverter 1: Reactive Power        | 0.1         | VA   | R   | uint16 | 0x04                      |
| 0x38E9    | 1       | Microinverter 1: Power Factor          | 0.001       | N/A  | R   | uint16 | 0x04                      |
| 0x38EA    | 1       | Microinverter 1: Phase A Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EB    | 1       | Microinverter 1: Phase B Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EC    | 1       | Microinverter 1: Phase C Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                                   | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x38ED    | 1       | Microinverter 1: Phase AB Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EE    | 1       | Microinverter 1: Phase BC Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38EF    | 1       | Microinverter 1: Phase CA Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38F0    | 1       | Microinverter 1: Phase A Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F1    | 1       | Microinverter 1: Phase B Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F2    | 1       | Microinverter 1: Phase C Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F3    | 1       | Microinverter 1: Grid Frequency        | 0.01        | Hz   | R   | uint16 | 0x04                      |
| 0x38F4    | 1       | Microinverter 1: Device Temperature    | 0.1         | °C   | R   | uint16 | 0x04                      |
| 0x38F5    | 1       | Microinverter 1: PV1 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38F6    | 1       | Microinverter 1: PV1 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38F7    | 1       | Microinverter 1: PV1 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38F8    | 1       | Microinverter 1: PV2 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38F9    | 1       | Microinverter 1: PV2 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38FA    | 1       | Microinverter 1: PV2 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38FB    | 1       | Microinverter 1: PV3 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38FC    | 1       | Microinverter 1: PV3 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x38FD    | 1       | Microinverter 1: PV3 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x38FE    | 1       | Microinverter 1: PV4 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x38FF    | 1       | Microinverter 1: PV4 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3900    | 1       | Microinverter 1: PV4 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3901    | 1       | Microinverter 1: PV5 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3902    | 1       | Microinverter 1: PV5 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3903    | 1       | Microinverter 1: PV5 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3904    | 1       | Microinverter 1: PV6 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3905    | 1       | Microinverter 1: PV6 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3906    | 1       | Microinverter 1: PV6 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3907    | 1       | Microinverter 1: Microinverter Status  | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3908    | 1       | Microinverter 1: Alarm Code 1          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3909    | 1       | Microinverter 1: Alarm Code 2          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390A    | 1       | Microinverter 1: Alarm Code 3          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390B    | 1       | Microinverter 1: Alarm Code 4          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390C    | 1       | Microinverter 1: Alarm Code 5          | 1           | N/A  | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                                   | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x390D    | 1       | Microinverter 1: Alarm Code 6          | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x390E    | 50      | Microinverter 1: Reserved              | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3940    | 3       | Microinverter 2: Serial Number         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3943    | 2       | Microinverter 2: Total Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3945    | 2       | Microinverter 2: Today Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x3947    | 1       | Microinverter 2: Active Power          | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3948    | 1       | Microinverter 2: Reactive Power        | 0.1         | VA   | R   | uint16 | 0x04                      |
| 0x3949    | 1       | Microinverter 2: Power Factor          | 0.001       | N/A  | R   | uint16 | 0x04                      |
| 0x394A    | 1       | Microinverter 2: Phase A Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394B    | 1       | Microinverter 2: Phase B Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394C    | 1       | Microinverter 2: Phase C Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394D    | 1       | Microinverter 2: Phase AB Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394E    | 1       | Microinverter 2: Phase BC Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x394F    | 1       | Microinverter 2: Phase CA Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3950    | 1       | Microinverter 2: Phase A Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3951    | 1       | Microinverter 2: Phase B Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3952    | 1       | Microinverter 2: Phase C Current       | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3953    | 1       | Microinverter 2: Grid Frequency        | 0.01        | Hz   | R   | uint16 | 0x04                      |
| 0x3954    | 1       | Microinverter 2: Device Temperature    | 0.1         | °C   | R   | uint16 | 0x04                      |
| 0x3955    | 1       | Microinverter 2: PV1 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3956    | 1       | Microinverter 2: PV1 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3957    | 1       | Microinverter 2: PV1 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3958    | 1       | Microinverter 2: PV2 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3959    | 1       | Microinverter 2: PV2 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x395A    | 1       | Microinverter 2: PV2 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x395B    | 1       | Microinverter 2: PV3 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x395C    | 1       | Microinverter 2: PV3 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x395D    | 1       | Microinverter 2: PV3 Power             | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x395E    | 1       | Microinverter 2: PV4 Voltage           | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x395F    | 1       | Microinverter 2: PV4 Current           | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3960    | 1       | Microinverter 2: PV4 Power             | 0.1         | W    | R   | uint16 | 0x04                      |

| Registers                                                                                                                                            | Numbers | Name                                    | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x3961                                                                                                                                               | 1       | Microinverter 2: PV5 Voltage            | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3962                                                                                                                                               | 1       | Microinverter 2: PV5 Current            | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3963                                                                                                                                               | 1       | Microinverter 2: PV5 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3964                                                                                                                                               | 1       | Microinverter 2: PV6 Voltage            | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x3965                                                                                                                                               | 1       | Microinverter 2: PV6 Current            | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x3966                                                                                                                                               | 1       | Microinverter 2: PV6 Power              | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x3967                                                                                                                                               | 1       | Microinverter 2: Microinverter Status   | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3968                                                                                                                                               | 1       | Microinverter 2: Alarm Code 1           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x3969                                                                                                                                               | 1       | Microinverter 2: Alarm Code 2           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396A                                                                                                                                               | 1       | Microinverter 2: Alarm Code 3           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396B                                                                                                                                               | 1       | Microinverter 2: Alarm Code 4           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396C                                                                                                                                               | 1       | Microinverter 2: Alarm Code 5           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396D                                                                                                                                               | 1       | Microinverter 2: Alarm Code 6           | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x396E                                                                                                                                               | 50      | Microinverter 2: Reserved               | 1           | N/A  | R   | uint16 | 0x04                      |
| ... (A single DTU supports a maximum of 99 units of 1-in-1 microinverters, 49 units of 1-in-2 microinverters, or 24 units of 1-in-4 microinverters.) |         |                                         |             |      |     |        |                           |
| 0x5DA0                                                                                                                                               | 3       | Microinverter 99: Serial Number         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DA3                                                                                                                                               | 2       | Microinverter 99: Total Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x5DA5                                                                                                                                               | 2       | Microinverter 99: Today Production      | 1           | Wh   | R   | uint64 | 0x04                      |
| 0x5DA7                                                                                                                                               | 1       | Microinverter 99: Active Power          | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DA8                                                                                                                                               | 1       | Microinverter 99: Reactive Power        | 0.1         | VA   | R   | uint16 | 0x04                      |
| 0x5DA9                                                                                                                                               | 1       | Microinverter 99: Power Factor          | 0.001       | N/A  | R   | uint16 | 0x04                      |
| 0x5DAA                                                                                                                                               | 1       | Microinverter 99: Phase A Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAB                                                                                                                                               | 1       | Microinverter 99: Phase B Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAC                                                                                                                                               | 1       | Microinverter 99: Phase C Phase Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAD                                                                                                                                               | 1       | Microinverter 99: Phase AB Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAE                                                                                                                                               | 1       | Microinverter 99: Phase BC Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DAF                                                                                                                                               | 1       | Microinverter 99: Phase CA Line Voltage | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DB0                                                                                                                                               | 1       | Microinverter 99: Phase A Current       | 0.01        | A    | R   | uint16 | 0x04                      |

| Registers | Numbers | Name                                   | Coefficient | Unit | R/W | Type   | Function Code (Supported) |
|-----------|---------|----------------------------------------|-------------|------|-----|--------|---------------------------|
| 0x5DB1    | 1       | Microinverter 99: Phase B Current      | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB2    | 1       | Microinverter 99: Phase C Current      | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB3    | 1       | Microinverter 99: Grid Frequency       | 0.01        | Hz   | R   | uint16 | 0x04                      |
| 0x5DB4    | 1       | Microinverter 99: Device Temperature   | 0.1         | °C   | R   | uint16 | 0x04                      |
| 0x5DB5    | 1       | Microinverter 99: PV1 Voltage          | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DB6    | 1       | Microinverter 99: PV1 Current          | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DB7    | 1       | Microinverter 99: PV1 Power            | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DB8    | 1       | Microinverter 99: PV2 Voltage          | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DB9    | 1       | Microinverter 99: PV2 Current          | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DBA    | 1       | Microinverter 99: PV2 Power            | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DBB    | 1       | Microinverter 99: PV3 Voltage          | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DBC    | 1       | Microinverter 99: PV3 Current          | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DBD    | 1       | Microinverter 99: PV3 Power            | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DBE    | 1       | Microinverter 99: PV4 Voltage          | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DBF    | 1       | Microinverter 99: PV4 Current          | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DC0    | 1       | Microinverter 99: PV4 Power            | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DC1    | 1       | Microinverter 99: PV5 Voltage          | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DC2    | 1       | Microinverter 99: PV5 Current          | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DC3    | 1       | Microinverter 99: PV5 Power            | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DC4    | 1       | Microinverter 99: PV6 Voltage          | 0.1         | V    | R   | uint16 | 0x04                      |
| 0x5DC5    | 1       | Microinverter 99: PV6 Current          | 0.01        | A    | R   | uint16 | 0x04                      |
| 0x5DC6    | 1       | Microinverter 99: PV6 Power            | 0.1         | W    | R   | uint16 | 0x04                      |
| 0x5DC7    | 1       | Microinverter 99: Microinverter Status | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DC8    | 1       | Microinverter 99: Alarm Code 1         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DC9    | 1       | Microinverter 99: Alarm Code 2         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCA    | 1       | Microinverter 99: Alarm Code 3         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCB    | 1       | Microinverter 99: Alarm Code 4         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCC    | 1       | Microinverter 99: Alarm Code 5         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCD    | 1       | Microinverter 99: Alarm Code 6         | 1           | N/A  | R   | uint16 | 0x04                      |
| 0x5DCE    | 50      | Microinverter 99: Reserved             | 1           | N/A  | R   | uint16 | 0x04                      |

#### 4.4.5 Device SNs

| Registers                                                         | Length | Name             | Coefficient | R/W | Type     | Function Code (Supported) | Remark             |
|-------------------------------------------------------------------|--------|------------------|-------------|-----|----------|---------------------------|--------------------|
| 0x5000                                                            | 3      | DTU SN           | -           | R   | 3*uint16 | 0x03                      | E.g.,10F854300201  |
| 0x5003                                                            | 3      | Meter SN         | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,10C0120000001 |
| 0x5006                                                            | 1      | Meter CT Setting | -           | R/W | uint16   | 0x03 / 0x06 / 0x10        | E.g.,100           |
| 0x5007                                                            | 3      | Meter SN         | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,10C0120000002 |
| 0x500A                                                            | 1      | Meter CT Setting | -           | R/W | uint16   | 0x03 / 0x06 / 0x10        | E.g.,100           |
| ... (A single DTU supports a maximum of 10 meter units.)          |        |                  |             |     |          |                           |                    |
| 0x502B                                                            | 3      | Microinverter SN | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,106000050201  |
| 0x502E                                                            | 3      | Microinverter SN | -           | R/W | 3*uint16 | 0x03 / 0x06 / 0x10        | E.g.,106000050202  |
| ... (A single DTU can write a maximum of 99 microinverter units.) |        |                  |             |     |          |                           |                    |

#### 4.4.6 RS485 Port Settings

**Note:**

If the port number is changed, restart the DTU.

| Registers | Quantity | Name                       | Decimal | Unit | R/W | Type   | Function Code      | Remark                                                                                           |
|-----------|----------|----------------------------|---------|------|-----|--------|--------------------|--------------------------------------------------------------------------------------------------|
| 0x5500    | 1        | Power Grid Mode            | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | 0: GPRS, 1: Wi-Fi, 2: Ethernet                                                                   |
| 0x5501    | 1        | TCP Modbus Port            | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | E.g., 502 (Effective after restart)                                                              |
| 0x5502    | 1        | 485 Modbus Mode            | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | 0: Power Export Limiting, 1: Hoymiles Modbus                                                     |
| 0x5503    | 1        | 485 Modbus Address         | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | -                                                                                                |
| 0x5504    | 1        | Power Export Limiting Mode | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | 0: Power Export Limiting Off, 1: Meter Power Export Limiting, 2: AC Couple Power Export Limiting |
| 0x5505    | 1        | Power Grid Type            | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x10 | -                                                                                                |
| 0x5506    | 1        | Group Control Enable       | -       | -    | R/W | uint16 | 0x03 / 0x06 / 0x11 | -                                                                                                |

| Registers | Quantity | Name                                                                                   | Decimal | Unit   | R/<br>W | Type   | Function<br>Code      | Remark                                                                |
|-----------|----------|----------------------------------------------------------------------------------------|---------|--------|---------|--------|-----------------------|-----------------------------------------------------------------------|
| 0x5507    | 1        | Power Export<br>Limiting<br>Shutdown<br>Parameters<br>Enable                           | -       | -      | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x12 | -                                                                     |
| 0x5508    | 1        | Communication<br>Interruption<br>Timeout                                               | 1       | s      | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x13 | -                                                                     |
| 0x5509    | 1        | Communication<br>Interruption<br>Status                                                | -       | -      | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x14 | -                                                                     |
| 0x550A    | 1        | Restart<br>Status After<br>Communication-<br>Interruption<br>Shutdown                  | -       | -      | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x15 | -                                                                     |
| 0x550B    | 1        | Microinverter<br>Reconnection<br>Time                                                  | 1       | s      | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x16 | -                                                                     |
| 0x550C    | 1        | Microinverter<br>Restart Power<br>Ramp Rate                                            | 4       | %Pn/s  | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x17 | -                                                                     |
| 0x550D    | 1        | Active Power<br>Setting During<br>Communication<br>Interruption<br>Without<br>Shutdown | 3       | %Pn    | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x550E    | 1        | Power Export<br>Limiting Mode                                                          | -       | -      | R/<br>W | uint16 | 0x03 / 0x06<br>/ 0x10 | 0: Power Export<br>Limiting Off,<br>1: Meter Power<br>Export Limiting |
| 0x550F    | 1        | Max. Export<br>Power A (%)                                                             | 4       | 0.0001 | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5510    | 1        | Max. Export<br>Power B (%)                                                             | 4       | 0.0001 | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5511    | 1        | Max. Export<br>Power C (%)                                                             | 4       | 0.0001 | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5512    | 1        | Max. Export<br>Power A (kW)                                                            | 2       | kW     | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5513    | 1        | Max. Export<br>Power B (kW)                                                            | 2       | kW     | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5514    | 1        | Max. Export<br>Power C (kW)                                                            | 2       | kW     | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5515    | 1        | Active Power<br>Control<br>(Whole Plant)                                               | 2       | kW     | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |
| 0x5516    | 1        | Reactive Power<br>Control<br>(Whole Plant)                                             | 2       | kVar   | R/<br>W | int16  | 0x03 / 0x06<br>/ 0x18 | -                                                                     |

| Registers | Quantity | Name                               | Decimal | Unit | R/W | Type  | Function Code      | Remark |
|-----------|----------|------------------------------------|---------|------|-----|-------|--------------------|--------|
| 0x5517    | 1        | Power Factor Control (Whole Plant) | 2       | 0.01 | R/W | int16 | 0x03 / 0x06 / 0x18 | -      |
| 0x5518    | -        | Reserved                           | -       | -    | -   | -     | -                  | -      |

#### 4.4.7 Microinverter Status

**Note:**

- For 4-in-1 microinverters, there are four ports available. For 2-in-1 microinverters, there are two ports available. And for 1-in-1 microinverters, there is one port available.
- In the case of 4-in-1 and 2-in-1 microinverters, the control settings should be consistent across all ports within a single microinverter.

| Registers | Length | Name                                                  | Unit | R/W | Type   | Function Code (Supported) | Remark                                                                                                   |
|-----------|--------|-------------------------------------------------------|------|-----|--------|---------------------------|----------------------------------------------------------------------------------------------------------|
| 0xD000    | 1      | Turn ON/OFF (All Microinverters)                      | -    | W   | uint16 | 0x06                      | 0: OFF 1: ON                                                                                             |
| 0xD001    | 1      | Temporary Limit Active Power (All Microinverters)     | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD002    | 1      | Permanent Limit Active Power (All Microinverters)     | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD003    | 1      | Permanent Power Factor Control (All Microinverters)   | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD004    | 1      | Permanent Reactive Power Control (All Microinverters) | -    | W   | uint16 | 0x06                      | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD005    | 1      | Reserved                                              | -    | W   | uint16 | 0x06                      | -                                                                                                        |
| 0xD006    | 1      | Turn ON/OFF (Port 1)                                  | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | 0: OFF 1: ON                                                                                             |

| Registers | Length | Name                                      | Unit | R/W | Type   | Function Code (Supported) | Remark                                                                                                   |
|-----------|--------|-------------------------------------------|------|-----|--------|---------------------------|----------------------------------------------------------------------------------------------------------|
| 0xD007    | 1      | Temporary Limit Active Power (Port 1)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD008    | 1      | Permanent Limit Active Power (Port 1)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD009    | 1      | Permanent Power Factor Control (Port 1)   | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00A    | 1      | Permanent Reactive Power Control (Port 1) | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00B    | 1      | Reserved                                  | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | -                                                                                                        |
| 0xD00C    | 1      | Turn ON/OFF (Port 2)                      | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | 0: OFF; 1: ON                                                                                            |
| 0xD00D    | 1      | Temporary Limit Active Power (Port 2)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00E    | 1      | Permanent Limit Active Power (Port 2)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD00F    | 1      | Permanent Power Factor Control (Port 2)   | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |

| Registers                                          | Length | Name                                      | Unit | R/W | Type   | Function Code (Supported) | Remark                                                                                                   |
|----------------------------------------------------|--------|-------------------------------------------|------|-----|--------|---------------------------|----------------------------------------------------------------------------------------------------------|
| 0xD010                                             | 1      | Permanent Reactive Power Control (Port 2) | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD011                                             | 1      | Reserved                                  |      | R/W | uint16 | 0x03 / 0x06 / 0x10        | -                                                                                                        |
| 0xD012                                             | 1      | Turn ON/OFF (Port 3)                      | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | 0: OFF; 1: ON                                                                                            |
| 0xD013                                             | 1      | Temporary Limit Active Power (Port 3)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD014                                             | 1      | Permanent Limit Active Power (Port 3)     | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD015                                             | 1      | Permanent Power Factor Control (Port 3)   | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD016                                             | 1      | Permanent Reactive Power Control (Port 3) | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | Percentage: 2 to 100 for Third-Generation Microinverters; 10 to 100 for Second-Generation Microinverters |
| 0xD017                                             | 1      | Reserved                                  | -    | R/W | uint16 | 0x03 / 0x06 / 0x10        | -                                                                                                        |
| ... (A single DTU supports a maximum of 99 ports.) |        |                                           |      |     |        |                           |                                                                                                          |

