Technical Note

How to read measurement data via Modbus on Socomec DIRIS power meters

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Table of Contents

Introduction

In this technical note, we will explain how to read measurement data from Socomec power metering equipment using the Modbus Poll software, available for free as a 30-day trial version.

Modbus Poll is a full-featured Modbus® master program that can be used to monitor, configure, and test Socomec power meters. This document provides some pointers on using Modbus Poll successfully with the Socomec DIRIS power meters such as the **DIRIS A-200.**

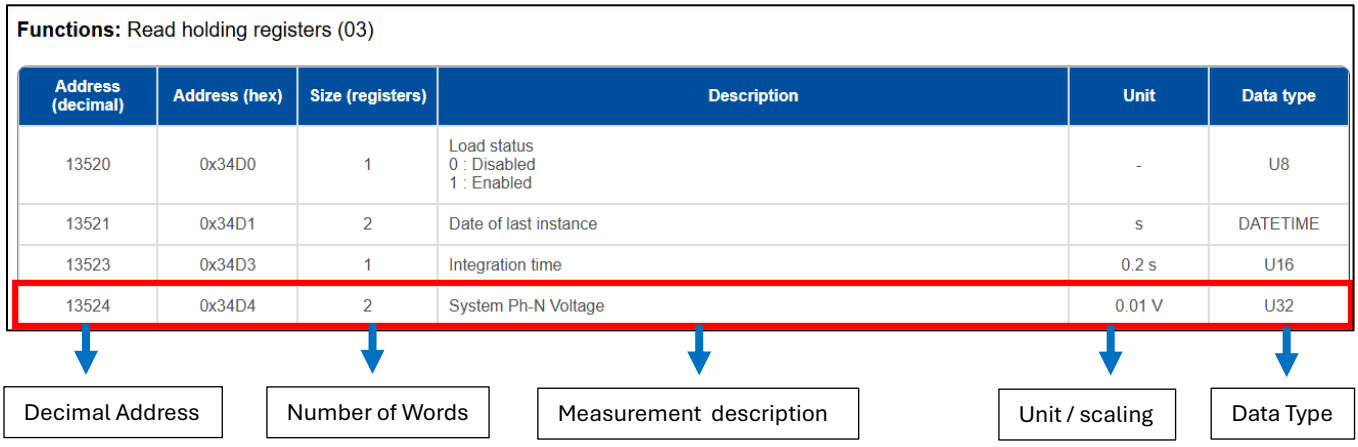
This technical note can also apply to other Socomec power meters like DIRIS B-10/B-30, DIRIS A-40. However, be aware that these models may use different Modbus/JBus register maps, so always verify the register map for the specific device.

1. Prerequisites

1.1 Socomec Modbus Register Maps

You can find the Modbus register map on the Socomec website under each product page.
For example, for the DIRIS A-200, the Modbus communication tables can be found at the link below, then scroll down to the "**Documentation**" section and click on "**Communication table**".
https://www.socomec.us/en-us/p/diris-a-100-a-200

The structure of the register map is as followed:



1.2 Zero vs. One Based Addressing

Modbus is natively a zero-based addressing protocol (Reg+1), whereas JBus is a version of Modbus with a one-based addressing scheme (Reg+0).

In other words, to access Address n, in JBUS use address n and in MODBUS use address n+1. There is an addressing offset of 1 which must be managed.

The register map from Socomec products is in Jbus.
Depending on the Modbus client used and its addressing scheme, +1 may need to be added to the register address to be able to read it correctly in Modbus.

Example:

In the DIRIS A-200, the kWh (positive active energy) register in JBUS is 18131, to read it in MODBUS it will be 18132.

In Modbus Poll, register numbers are zero based by default (Modbus Poll already reads data in JBUS), so no +1 offset is needed.

1.3 Supported Modbus Functions

The supported functions by the SOCOMEC products are:

- Function 3: Read (Read Holding Register)
- Function 6: Write
- Function 16: Multiple write

In the Modbus.org standard documents, holding register addresses are given a prefix of "4" to distinguish them from other register types. For example, a holding register at address 1001 is referred to by "41001". However, the leading "4" is not really part of the address.
***Socomec registers do not include the Modbus function as a prefix,** for example the register for total active power on DIRIS A-200 is 13564.*

1.4 Endianness / Word order

For the 16-bit register values, the most significant byte always precedes the least significant byte (in other words, the register value is transferred in Big-Endian byte order). This is because when the Modbus standard was created in the late 1970's, most processors used a Big-Endian memory architecture (where the most significant part of a multi-byte value is stored at a lower memory address).

However, the lack of standardization for values larger than 16 bits has resulted in a situation where Modbus implementers have to make an arbitrary choice as to which address of the register pair contains the most significant word of 32-bit values. Most programs for communicating with Modbus slaves can be configured for either register word order.

Socomec DIRIS power meters follow the Big Endian format for 32-bit Modbus registers.
This means the high word (most significant) comes first, followed by the low word (least significant).

Example:
A Modbus read request for register 13564 (hex: 0x34FC, representing *Total kW*) over two words returns 0001 73B5:

```
29/10/25 09:12:29.619 read @ 0x34fc, size: 2
29/10/25 09:12:29.685 recv: 0001 73b5
```

- Register 13564 → High word: 0x0001
- Register 13565 → Low word: 0x73B5

Register 13564 contains the most significant word (0x001) and register 13565 contains the least significant word (0x73B5).

0x000173B5 = 95,157 W.

1.5 Data type description

- U16 → Unsigned on 16 bits
- S16 → Signed on 16 bits
- U32 → Unsigned on 32 bits
- S32 → Signed on 32 bits

1.6 Unit description

Socomec power meters include registers with different units and scaling factors depending on the measurement type.

Example 1**:** Voltage

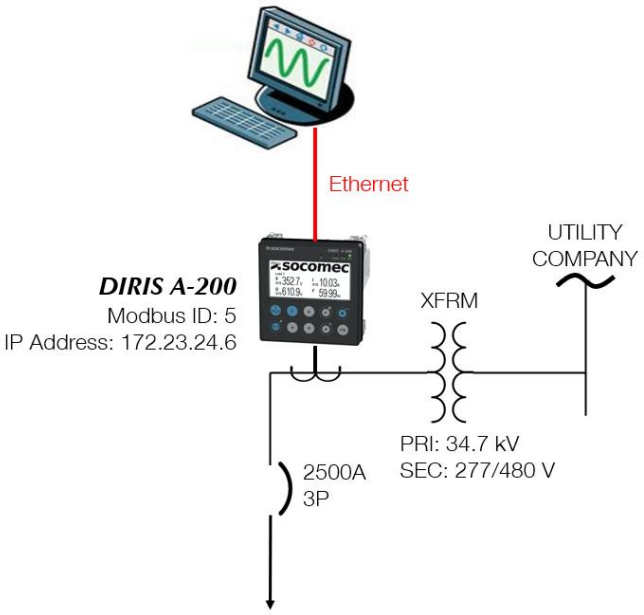
- Unit: V/100 (0.01 V)
- If Modbus returns **27,435**, the actual voltage is:
  27,435 ÷ 100 = 274.35 Volts

Example 2**:** Current

- Unit: A/1000 (mA)
- If Modbus returns **400,435**, the actual current is:
  400,435 ÷ 1,000 = 400.435 Amps

➔ Now that we've covered the prerequisites for interpreting measurement data via Modbus on Socomec meters, let's look at a real-world example.

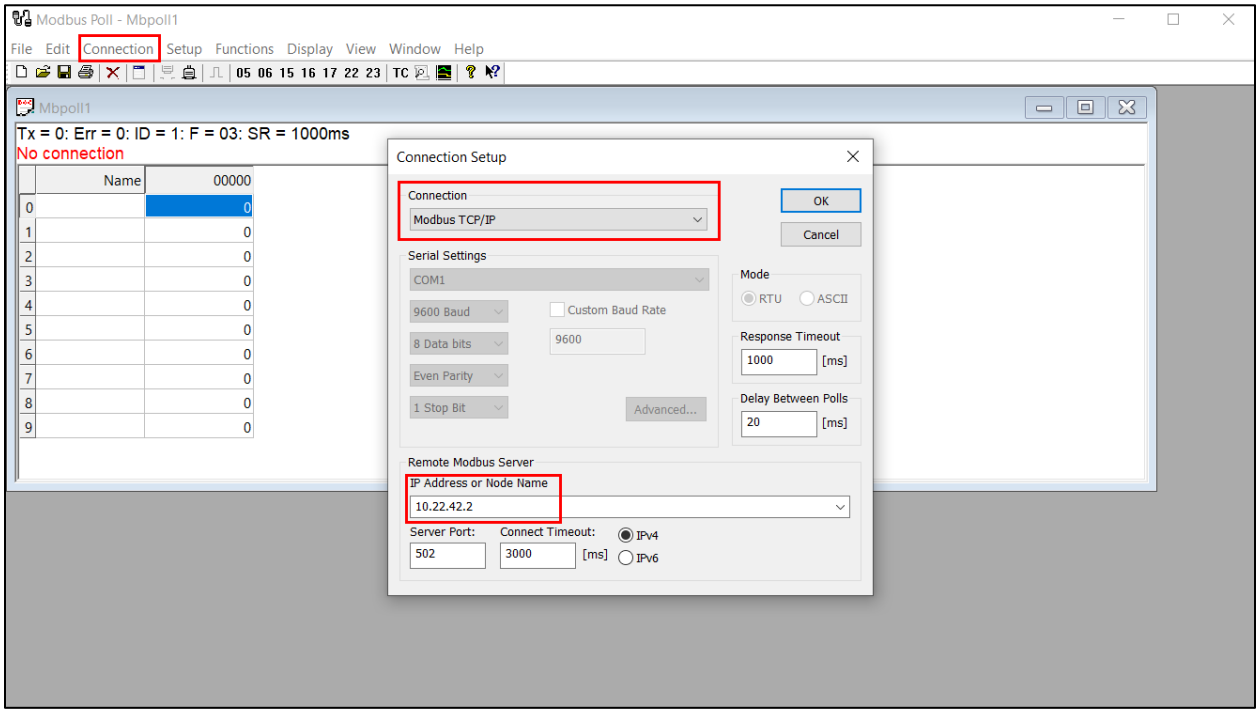
2. Principle diagram of the installation



3. Connecting to the DIRIS A-200

In the Modbus Poll software, click on the "**Connection**" tab and click on "**Connect**".

- Choose Modbus TCP/IP.
- Enter the IP Address of the DIRIS A-200.



4. Reading data on Modbus software for DIRIS A-200

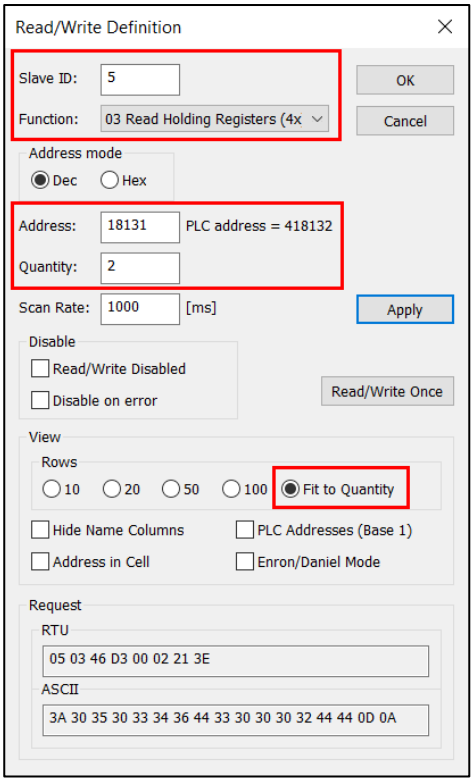
4.1 Reading Energy kWh

The register address for the kWh energy readings in the DIRIS A-200 is given below. The energy value is an unsigned 32-bit integer, and the unit is in kWh.

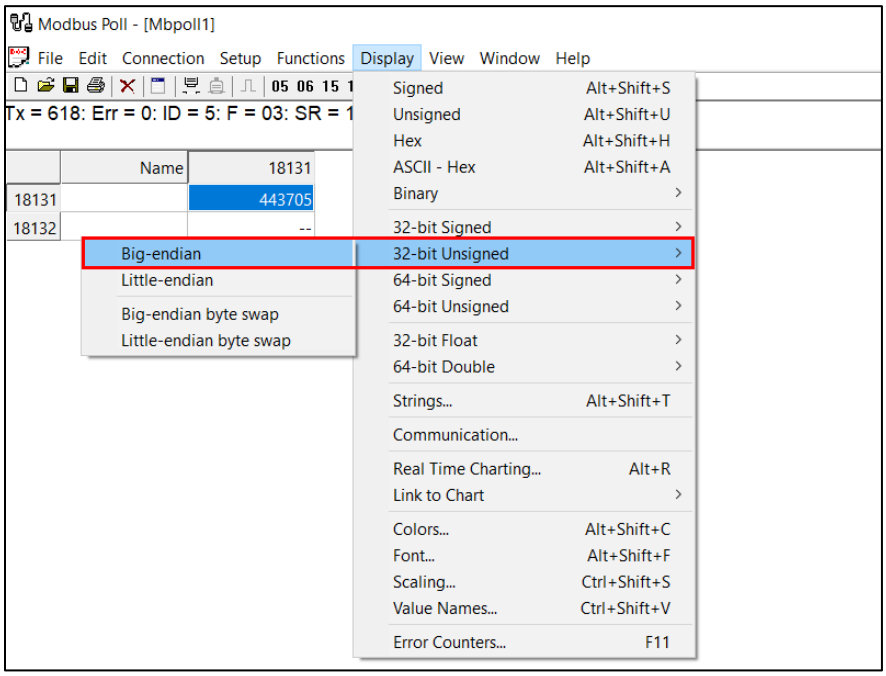
Address (decimal)	Address (hex)	Size (registers)	Description	Unit	Data type
18131	0x46D3	2	Total Positive active Energy: Ea+	kWh	U32

In Modbus Poll, click on the "**Setup**" tap, then "**Read/Write Definition**".

- Enter the Modbus Slave ID of the DIRIS A-200 (5 in our example).
- Select Modbus Function 03 (Read Holding Registers).
- Enter the register address (18131).
- Under Quantity, enter the Number of Words (2).
- We also recommend the "**Fit to Quantity**" option if you don't have too many rows in one register block.

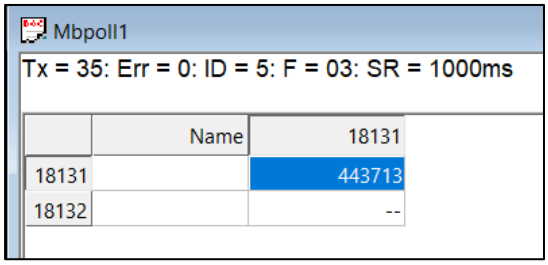


Under "**Display**", under "**32-bit Unsigned**", click on "**Big-endian**".

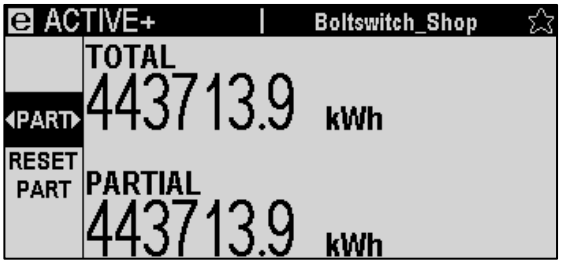


The decimal value returned in Modbus Poll is 443,713 kWh which matches the A-200 screen.

Modbus Poll:



A-200 screen:



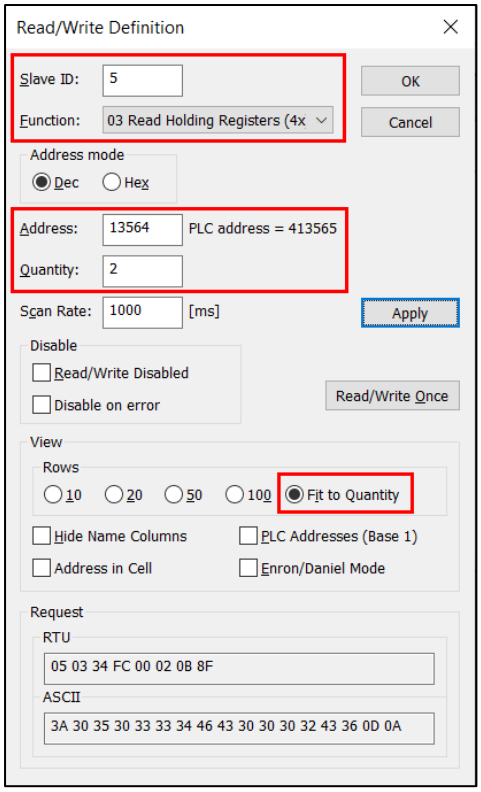
4.2 Reading Power kW

The register address for the total three-phase kW power in the DIRIS A-200 is given below. The power value is a signed 32-bit integer, and the unit is in W.

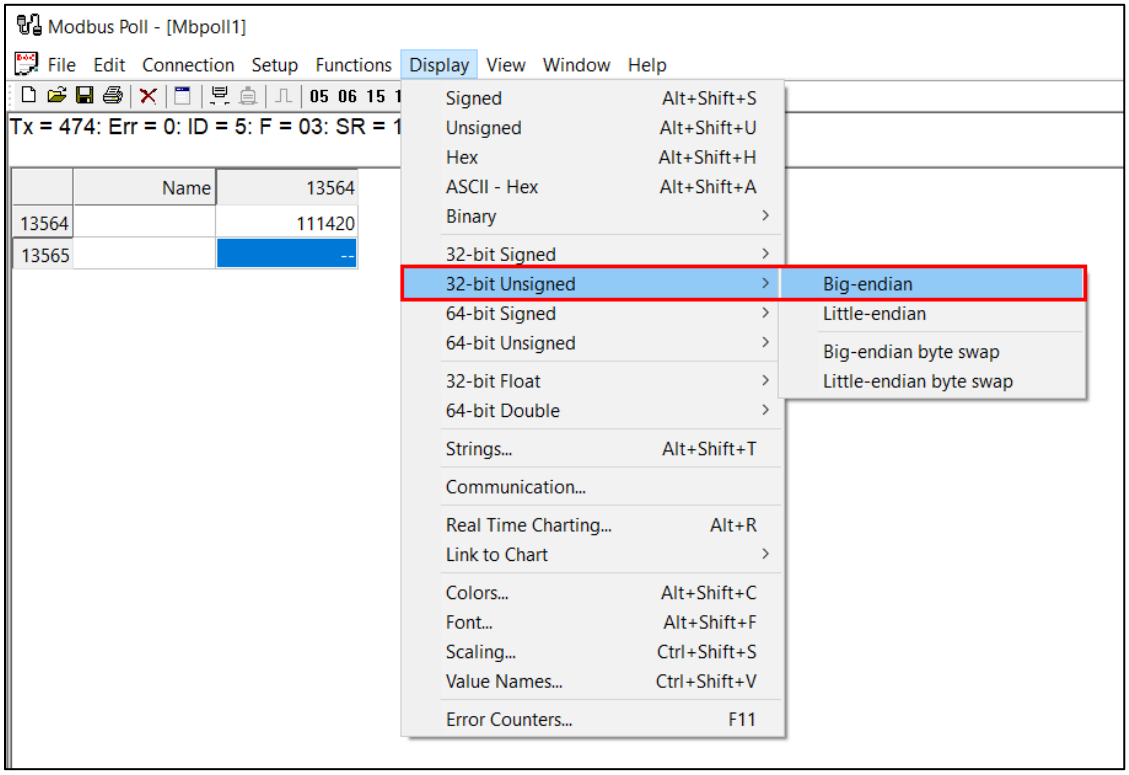
Address (decimal)	Address (hex)	Size (registers)	Description	Unit	Data type
13564	0x34FC	2	Total active power	W	S32

In Modbus Poll, click on the "**Setup**" tap, then "**Read/Write Definition**":

- Enter the Modbus Slave ID of the DIRIS A-200 (5 in our example).
- Select Modbus Function 03 (Read Holding Registers).
- Enter the register address (13564).
- Under Quantity, enter the Number of Words (2).
- We also recommend the "**Fit to Quantity**" option if you don't have too many rows in one register block.

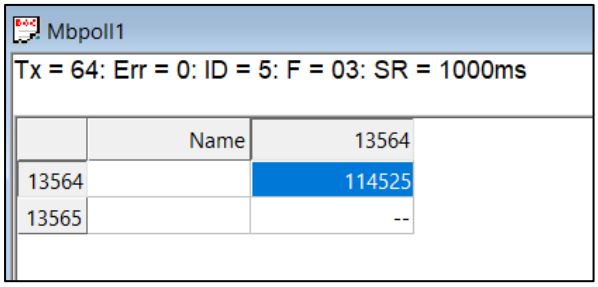


Under "Display", under "32-bit Unsigned", click on "Big-endian".

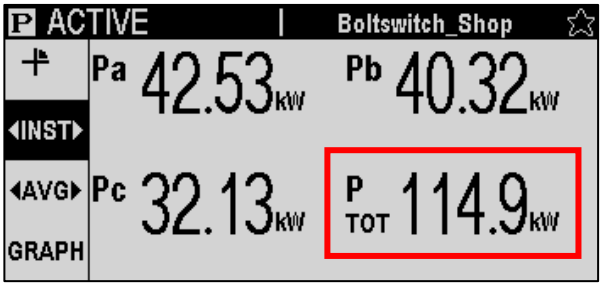


The decimal value returned in Modbus Poll is 114,525 W or 114.525 kW which matches the A-200 screen.

Modbus Poll:



A-200 screen:



5. Key takeaways

- Socomec registers are in **Jbus**. A +1 offset may need to be applied in your Modbus client software if it's using a zero-based convention.
- Socomec registers are listed **without the Modbus function prefix** (example kWh register on A-200 is 18131).
- Socomec measurement registers are **Read Holding Integer** registers using **Modbus function 3**.
- Socomec 32-bit registers are in **Big Endian** (most significant word comes first).