VISTA TOUCH

Modbus Communications

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Document History		
Version	**Date**	**Change Details**
1.1	20th March 2024	Typographical updates
2.0	14th May 2024	VT-FLOW registers and TCPIP addition
3.0	4th October 2024	VT-POWER added Accumulated Forward Active Energy data
4.0	1st April 2025	VT-POWER added maximum and minimum values, removed %Load as not applicable
5.0, 7.0	25th April 2025	VT-POWER added reset maximum and minimum values to current values.

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1 About this document

This document describes the use of Modbus in the Vista Touch range.

Modbus is implemented in Vista Touch to enable the reading of the measured values and the status of the system.

This document defines the configuration and usage of the Modbus features of the Vista Touch for both Modbus RTU and Modbus TCPIP. The registers are common to both Modbus communication methods.

By default, both the Modbus RTU and Modbus TCP/IP interfaces are enabled.

**** Ensure you're using the latest firmware in order to benefit from the features in this document ****

2 Modbus Data Types

Modbus supports 4 data types:-

1) Coils
2) Inputs
3) Holding registers
4) Input registers

Coils and inputs are both 1 bit in size, whereas both Holding and Input registers are 16 bits wide.

Inputs, and Input registers, can only be read. Coils and Holding registers are both read and writable.

All coil/inputs and registers are addressed in the range of 0-65535, although only portions of that address range are implemented, the remaining address space is invalid.

3 Protocols

Both RTU and TCPIP are supported.

RTU (Remote Terminal Unit) is a serial protocol implemented over the RS485 electrical physical layer and includes commands and data with a CRC (Cyclic Redundancy Check) checksum to ensure reliable data transmission with detection of errors.

TCPIP (Transmission Control Protocol/Internet Protocol) is similar to RTU but without the CRC as lower levels of the protocol include error handling. Normal port for Modbus is 502.

Both RTU and TCPIP use the same function calls and data structure, only the data encapsulation is different.

The Client Server model is used (formerly Master / Slave), with the Client initiating the communication.

4 Formatting

4.1 RTU

RTU is framed with a minimum of 3.5 byte times (28 bits) of non-transmission, both before and after the message. The message itself must be sent without any delays between bytes.

Size (bytes)	Description
1	Unit / Server address (1 to 247)
1	Function code
n	Data, amount of varies according to function code
2	CRC error check

4.1.1 CRC

The CRC is a 16 bit value, which is appended to the message by the transmitter, and verified by the receiver own CRC calculation of the message.

The initial value of the CRC is 0xFFFF.

Each byte of the message is exclusively OR-ed with the register contents.

The CRC is then right shifted (/2). If the least significant bit is a 1, then the register is exclusively OR-ed with 0xA001. This process is repeated 8 times.

Polynomial: x16 + x15 + x2 + 1 (CRC-16-ANSI)

Initial value: 65,535

4.2 TCP/IP

Size (bytes)	Description
2	Sync identifier
2	Identifies the protocol as Modbus, zero.
2	Payload length (length of subsequent data).
1	Unit / Server address, normally zero, ignored.
1	Function code
n	Data, amount of varies according to function code

4.3 Error Frame

An error frame is transmitted by the server to the client when an error free message is received but the message content is not valid for the device, be it an unsupported function, or an issue with the data.

Size (bytes)	Description
1	Unit / Server address (1 to 247)
1	Function code (same as received function code with 80H added)
1	Error code, listed below
2	CRC error check

Error Codes	
Code	**Error**
1	Unsupported Function
2	Illegal Data Address
3	Illegal Data Value

5 Function Codes

Dec. Code	Hex. Code	Function	Access	Supported function code
01	0x01	Read Coils	Coils are read & write capable	No
02	0x02	Read Inputs	Inputs are read only	Yes
03	0x03	Read Multiple Holding Registers	Holding registers are read & writeable	Yes
04	0x04	Read Input Registers	Input registers are read only	Yes
05	0x05	Write single coil	Coils are read & write capable	No
06	0x06	Write single holding register	Holding registers are read & writeable	No
15	0x0F	Write multiple Coils	Coils are read & write capable	No
16	0x10	Write multiple Holding Registers	Holding registers are read & writeable	No

Note.

Accessing unsupported functions will result in an error code 1 (unsupported function) being returned.

5.1 Function Code 1 (Read Coils)

Coils are bits of information that can be set, cleared, and read.

The 16 bit address of the 1st coil is specified, along with the 16 bit count of the number of coils required in the message request.

The response contains a byte specifying the number of data bytes which contain the requested information, followed by the requested information. Each data byte contains the status of 8 coils. The least significant bit of the first data byte contains the status of the 1st coil requested. The LSB of the next data byte contains the 9th coil, and so on. The last data byte may not by fully occupied with coil statuses and the unused bits will be zero.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data	Checksum LSB MSB
Client	0A	01	00 48	00 0A			xx xx
Server	0A	01			02	FF 03	xx xx

Read from server address 0x0A, using function code 1, from address 0x0048, the status of 10 coils. The server response shows the data is contained within two bytes, and in this case, all the coils are set. Unused bits in the last data byte as always zero.

5.2 Function Code 2 (Read Inputs)

Similar to coils but reflect the status of an input or process. These can only be read.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data	Checksum LSB MSB
Client	0A	02	10 00	00 07			xx xx
Server	0A	02			01	1A	xx xx

Read from server address 0x0A, using function code 2, from address 0x1000, the status of 7 inputs. The server response shows the data is contained within one byte, as shown below.

Coil	Status
0x1000	Off
0x1001	On
0x1002	Off
0x1003	On
0x1004	On
0x1005	Off
0x1006	Off

5.3 Function Code 3 (Read Holding Registers)

Holding registers are locations that hold 16 bit values and are used to configure settings such as setpoints. These are settable, and readable.

The 16 bit address of the 1st register is specified, along with the 16 bit count of the number of registers required in the message request.

The response contains a byte specifying the number of data bytes which contain the requested information, followed by the requested information. Each register is two bytes, and whether the least significant byte, or most significant byte, is transmitted first depends on the configuration settings.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data MSB LSB	Checksum LSB MSB
Client	0A	03	00 00	00 04			xx xx
Server	0A	03			08	00 00 11 11 12 34 56 78	xx xx

Read from server address 0x0A, using function code 3, contents of the register from address 0x0000 to address 0x003. The server response shows the data is contained within eight bytes. Example is with big endian used.

Address	Value
0x0000	0x0000
0x0001	0x1111
0x0002	0x1234
0x0003	0x5678

5.4 Function Code 4 (Read Input Registers)

Similar to holding registers, input registers show input or process values and are only readable.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data MSB LSB	Checksum LSB MSB
Client	0A	04	00 48	00 01			xx xx
Server	0A	04			02	12 34	xx xx

Read from server address 0x0A, using function code 4, contents of the register from address 0x0000. The server response shows the data is contained within two bytes, value being 0x1234 (big endian).

5.5 Function Code 5 (Set Single Coil)

Use to set, or clear, a configuration bit.

The 16 bit address of the coil is supplied, along with the required configuration. The configuration is supplied as a 16 bit value, which if 0x0000 clears the coil, and if 0xFF00 sets the bit. Any other value is invalid.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data	Checksum LSB MSB
Client	0A	05	00 53			FF 00	xx xx
Server	0A	05	00 53			FF 00	xx xx

Set a coil on server address 0x0A, coil address 0x0053.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data	Checksum LSB MSB
Client	0A	05	00 52			00 00	xx xx
Server	0A	05	00 52			00 00	xx xx

Clear a coil on server address 0x0A, coil address 0x0052.

5.6 Function Code 6 (Set Holding Register)

Used to configure a single holding register.

The 16 bit address of the register is supplied, along with the 16 bit value that the register is to contain.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data MSB LSB	Checksum LSB MSB
Client	0A	06	01 23			23 45	xx xx
Server	0A	06	01 23			23 45	xx xx

On server address 0x0A, Set register address 0x0123 to value 0x2345 (big endian)

5.7 Function Code 15 (Set Multiple Coils)

Use to set and / or clear, multiple configuration bits.

The 16 bit address of the 1st coil is supplied, along with the 16 bit number of coils to configure.

A byte is supplied showing how many bytes of data are following containing the configuration data.

The subsequent data bytes contain the configuration, 8 coils per byte. The LSB of the 1st data byte is for the coil specified by the address. 0 is off, 1 is on.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data	Checksum LSB MSB
Client	03	0F	00 02	01 00	20	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	xx xx
Server	03	0F	00 02	01 00			xx xx

On server address 0x03, all the coils from address 0x0002 to 0x0102 are cleared (256 coils).

5.8 Function code 16 (Set Multiple Holding Registers)

Simultaneously configures multiple configuration registers.

The 16 bit address of the 1st register is supplied, along with the 16 bit count of the registers, and a 8 bit byte containing the amount of data bytes following which contain the register values. Two bytes per register, and the significant order is according to the configuration of the unit.

	Server ID	Function code	Address MSB LSB	Count MSB LSB	Bytes	Data LSB MSB	Checksum LSB MSB
Client	03	10	00 00	00 04	08	01 00 12 11 34 12 78 56	xx xx
Server	03	10	00 00	00 04			xx xx

On server address 0x03, the registers from address 0x0000 to 0x0003 are preset to the following values using the little endian data format.

Address	Value
0x0000	0x0001
0x0001	0x1112
0x0002	0x1234
0x0003	0x5678

6 RTU & TCPIP Configuration

6.1 RTU

6.1.1 Slave ID

Any value between 1 and 247 can be entered.

6.1.2 Baud Rate

Baud rates from 9600 to 192000 are supported.

See Appendices 10.1- Modbus Baud Rate for full list.

6.1.3 Stop Bits

Both 1 and 2 stop bits are supported

6.1.4 Parity

Parity can be None, Even, or Odd

6.2 TCP/IP

6.2.1 DHCP Client

Enable and disable are selectable.

6.2.2 Configurable options

The following parameters are adjustable. IP address and Subnet Mask are only adjustable if DHCP is disabled.

Parameter
IP address
Subnet mask
Gateway
DNS 1
DNS 2
Hostname
Interface Name
Modbus port address
Modbus timeout period

6.3 RTU & TCP/IP

6.3.1 Modbus Enable

Each interface can be independently enabled.

6.3.2 Sentence Protocol

The 16 bit registers can be transferred as either High Byte First (Big Endian) or Low Byte First (Little Endian).

32 bit registers are transferred high word first'

CRC fields are always little endian. Address and count fields are big endian.

6.3.3 Floating point numbers

Floats are 32 bits wide and formatted according to the IEEE-754 standard.

7 Address Map

Decimal		Hex		Description
Start address	End address	Start address	End address	
0	32,767	0x0000	0x7FFF	Generic registers
32,768	33,791	0x8000	0x83FF	Vista Touch Flow
33,792	34,816	0x8400	0x87FF	Vista Touch Power
34,816	35,839	0x8800	0x8BFF	345

Note.

Accessing addresses outside the above ranges will result in an error code 2 (illegal data address) being returned.

8 Generic Registers – All Vista Touch Products

8.1.1 Function code 2 (Read Status Bits):

Address		Description	Function Codes						R/W	Length (bits)	Unit
Dec	Hex		1	2	3	4	15	16			
0	0x0000	Event 1 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
1	0x0001	Event 2 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
2	0x0002	Event 3 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
3	0x0003	Event 4 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
4	0x0004	Event 5 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
5	0x0005	Event 6 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
6	0x0006	Event 7 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
7	0x0007	Event 8 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
8	0x0008	Event 9 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
9	0x0009	Event 10 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
10 - 31	0x000A – 0x001F	Not used.	-	Y	-	-	-	-	R	1	N/A
32	0x0020	Relay 1 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active
33	0x0021	Relay 2 status	-	Y	-	-	-	-	R	1	0=Inactive 1=Active

8.1.2 Function code 3 (Read Configuration Registers):

Address		Description	Function Codes						R/W	Length (bytes)	Unit
Dec	Hex		1	2	3	4	15	16			
0	0x0000	Model type	-	-	Y	-	-	-	R	2	0=Flow 1=Power 2=345

Note.

Accessing unused/unimplemented addresses between 0x0000 and the last register listed above will return zero.

Accessing register addresses after the last register, up to 0x7FFF, will result in an error code 2 (illegal data address) being returned.

9 Model Specific Registers –

9.1 Vista Touch Flow

9.1.1 Function Code 4 (Read Measurement Data):

Address		Description	Function Codes						R/W	Length (bytes)	1 LSB	Unit
Dec	Hex		1	2	3	4	15	16				
32,768	0x8000	Flow rate	-	-	-	Y	-	-	R	4	0.01	US Gal per sec
32,770	0x8002	Total 1	-	-	-	Y	-	-	R	4	0.01	US Gal
32,772	0x8004	Total 2	-	-	-	Y	-	-	R	4	0.01	US Gal

Note.

Accessing unused/unimplemented addresses between 0x8000 and the last register listed above will return zero.

Accessing register addresses after the last register, up to 0x83FF, will result in an error code 2 (illegal data address) being returned.

9.2 Vista Touch Power

9.2.1 Function Code 4 (Read Measurement Data):

Address		Description	Function Codes						R/W	Length (bytes)	1 LSB	Type
Dec	Hex		1	2	3	4	15	16				
33,792	0x8400	Frequency	-	-	-	Y	-	-	R	2	0.01Hz	Unsigned
33,793	0x8401	Average Voltage L-L	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,795	0x8403	Average Voltage L-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,797	0x8405	Average Current	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33,799	0x8407	Total Active Power	-	-	-	Y	-	-	R	4	4W	Signed
33,801	0x8409	Total Apparent Power	-	-	-	Y	-	-	R	4	4VA	Unsigned
33,803	0x840B	Total Reactive Power	-	-	-	Y	-	-	R	4	4VAr	Signed
33,806	0x840E	Average Power Factor	-	-	-	Y	-	-	R	2	0.001	Signed
33,807	0x840F	Average THD Volts	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,808	0x8410	Average THD Current	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,809	0x8411	L1 to L2 Voltage	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,811	0x8413	L2 to L3 Voltage	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,813	0x8415	L3 to L1 Voltage	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,815	0x8417	L1 to N Voltage	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,817	0x8419	L2 to N Voltage	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,819	0x841B	L3 to N Voltage	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33,821	0x841D	L1 Current	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33,823	0x841F	L2 Current	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33,825	0x8421	L3 Current	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33,827	0x8423	L1 Active Power	-	-	-	Y	-	-	R	4	1W	Signed
33,829	0x8425	L2 Active Power	-	-	-	Y	-	-	R	4	1W	Signed
33,831	0x8427	L3 Active Power	-	-	-	Y	-	-	R	4	1W	Signed
33,833	0x8429	L1 Apparent Power	-	-	-	Y	-	-	R	4	1VA	Unsigned
33,835	0x842B	L2 Apparent Power	-	-	-	Y	-	-	R	4	1VA	Unsigned
33,837	0x842D	L3 Apparent Power	-	-	-	Y	-	-	R	4	1VA	Unsigned
33,839	0x842F	L1 Reactive Power	-	-	-	Y	-	-	R	4	1VAr	Signed
33,841	0x8431	L2 Reactive Power	-	-	-	Y	-	-	R	4	1VAr	Signed
33,843	0x8433	L3 Reactive Power	-	-	-	Y	-	-	R	4	1VAr	Signed
33,848	0x8438	L1 Power Factor	-	-	-	Y	-	-	R	2	0.001	Signed
33,849	0x8439	L2 Power Factor	-	-	-	Y	-	-	R	2	0.001	Signed
33,850	0x843A	L3 Power Factor	-	-	-	Y	-	-	R	2	0.001	Signed
33,851	0x843B	L1 Voltage THD	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,852	0x843C	L2 Voltage THD	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,853	0x843D	L3 Voltage THD	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,854	0x843E	L1 Current THD	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,855	0x843F	L2 Current THD	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,856	0x8440	L3 Current THD	-	-	-	Y	-	-	R	2	0.01%	Unsigned
33,857	0x8441	L1 Current Phase Angle	-	-	-	Y	-	-	R	2	0.1°	Signed
33,858	0x8442	L2 Current Phase Angle	-	-	-	Y	-	-	R	2	0.1°	Signed
33,859	0x8443	L3 Current Phase Angle	-	-	-	Y	-	-	R	2	0.1°	Signed
33,860	0x8444	L1 to L2 Voltage Phase Ang	-	-	-	Y	-	-	R	2	0.1°	Signed
33,861	0x8445	L1 to L3 Voltage Phase Ang	-	-	-	Y	-	-	R	2	0.1°	Signed
33,682	0x8446	Temperature	-	-	-	Y	-	-	R	2	0.1° C	Signed
33863	0x8447	Total Accumulated Forward Active Energy	-	-	-	Y	-	-	R	4	0.1kWH	Unsigned
33865	0x8449	L1 Accumulated Forward Active Energy	-	-	-	Y	-	-	R	4	0.1kWH	Unsigned

33867	0x844B	L2 Accumulated Forward Active Energy	-	-	-	Y	-	-	R	4	0.1kWH	Unsigned
33869	0x844D	L3 Accumulated Forward Active Energy	-	-	-	Y	-	-	R	4	0.1kWH	Unsigned
33871	0x844F	Average Power Factor	-	-	-	Y	-	-	R	2	0.001	Signed
33872	0x8450	Max Voltage L1-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33874	0x8452	Max Voltage L2-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33876	0x8454	Max Voltage L3-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33878	0x8456	Max Voltage L1-L2	-	-	-	Y	-	-	R	4	0.01V	Signed
33880	0x8458	Max Voltage L2-L3	-	-	-	Y	-	-	R	4	0.01V	Signed
33882	0x845A	Max Voltage L3-L1	-	-	-	Y	-	-	R	4	0.01V	Signed
33884	0x845C	Min Voltage L1-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33886	0x845E	Min Voltage L2-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33888	0x8460	Min Voltage L3-N	-	-	-	Y	-	-	R	4	0.01V	Unsigned
33890	0x8462	Min Voltage L1-L2	-	-	-	Y	-	-	R	4	0.01V	Signed
33892	0x8464	Min Voltage L2-L3	-	-	-	Y	-	-	R	4	0.01V	Signed
33894	0x8466	Min Voltage L3-L1	-	-	-	Y	-	-	R	4	0.01V	Signed
33896	0x8468	Max Current L1	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33898	0x846A	Max Current L2	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33900	0x846C	Max Current L3	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33902	0x846E	Min Current L1	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33904	0x8470	Min Current L2	-	-	-	Y	-	-	R	4	0.001A	Unsigned
33906	0x8472	Min Current L3	-	-	-	Y	-	-	R	4	0.001A	Unsigned

Accessing unused/unimplemented addresses between 0x8400 and the last register listed above will return zero.

Accessing register addresses after the last register, up to 0x87FF, will result in an error code 2 (illegal data address) being returned.

9.2.2 Function Code 15 (Write to Control Bits):

Address		Description	Function Codes						R/W	Length (bits)	Unit
Dec	Hex		1	2	3	4	15	16			
33,792	0x8400	Set ALL Max and Min values to the current live values	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,793	0x8401	Set Max Voltage (L1-N) = Voltage (L1-N)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,794	0x8402	Set Max Voltage (L2-N) = Voltage (L2-N)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,795	0x8403	Set Max Voltage (L3-N) = Voltage (L3-N)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,796	0x8404	Set Max Voltage (L1-L2) = Voltage (L1-L2)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,797	0x8405	Set Max Voltage (L2-L3) = Voltage (L2-L3)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,798	0x8406	Set Max Voltage (L3-L1) = Voltage (L3-L1)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,799	0x8407	Set Min Voltage (L1-N) = Voltage (L1-N)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,800	0x8408	Set Min Voltage (L2-N) = Voltage (L2-N)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,801	0x8409	Set Min Voltage (L3-N) = Voltage (L3-N)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,802	0x840A	Set Min Voltage (L1-L2) = Voltage (L1-L2)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,803	0x840B	Set Min Voltage (L2-L3) = Voltage (L2-L3)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,804	0x840C	Set Min Voltage (L3-L1) = Voltage (L3-L1)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,805	0x840D	Set Max Current (L1) = Current (L1)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,806	0x840E	Set Max Current (L2) = Current (L2)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,807	0x840F	Set Max Current (L3) = Current (L3)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,808	0x8410	Set Min Current (L1) = Current (L1)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,809	0x8411	Set Min Current (L2) = Current (L2)	-	-	-	-	Y	-	W	1	0=No action 1=Set value
33,810	0x8412	Set Min Current (L3) = Current (L3)	-	-	-	-	Y	-	W	1	0=No action 1=Set value

Note

Accessing undefined register addresses between 0x8400 and 0x87FF, will result in an error code 2 (illegal data address) being returned.

9.2.3 Function Code 16 (Write Measurement Data):

Address		Description	Function Codes						R/W	Length (bytes)	1 LSB	Type
Dec	Hex		1	2	3	4	15	16				
33872	0x8450	Max Voltage L1-N (Note 1)	-	-	-	-	-	Y	W	2		
33874	0x8452	Max Voltage L2-N (Note 1)	-	-	-	-	-	Y	W	2		
33876	0x8454	Max Voltage L3-N (Note 1)	-	-	-	-	-	Y	W	2		
33878	0x8456	Max Voltage L1-L2 (Note 1)	-	-	-	-	-	Y	W	2		
33880	0x8458	Max Voltage L2-L3 (Note 1)	-	-	-	-	-	Y	W	2		
33882	0x845A	Max Voltage L3-L1 (Note 1)	-	-	-	-	-	Y	W	2		
33884	0x845C	Min Voltage L1-N (Note 1)	-	-	-	-	-	Y	W	2		
33886	0x845E	Min Voltage L2-N (Note 1)	-	-	-	-	-	Y	W	2		
33888	0x8460	Min Voltage L3-N (Note 1)	-	-	-	-	-	Y	W	2		
33890	0x8462	Min Voltage L1-L2 (Note 1)	-	-	-	-	-	Y	W	2		
33892	0x8464	Min Voltage L2-L3 (Note 1)	-	-	-	-	-	Y	W	2		
33894	0x8466	Min Voltage L3-L1 (Note 1)	-	-	-	-	-	Y	W	2		
33896	0x8468	Max Current L1 (Note 1)	-	-	-	-	-	Y	W	2		
33898	0x846A	Max Current L2 (Note 1)	-	-	-	-	-	Y	W	2		
33900	0x846C	Max Current L3 (Note 1)	-	-	-	-	-	Y	W	2		
33902	0x846E	Min Current L1 (Note 1)	-	-	-	-	-	Y	W	2		
33904	0x8470	Min Current L2 (Note 1)	-	-	-	-	-	Y	W	2		
33906	0x8472	Min Current L3 (Note 1)	-	-	-	-	-	Y	W	2		

Notes:-

1) Writing to any address within the range 0x8450 to 0x8472 will reset ALL the maximum and minimum values (registers 0x8450 to 0x8472) to the current live values.

Accessing undefined register addresses between 0x8400 and 0x87FF, will result in an error code 2 (illegal data address) being returned.

10 Appendices

10.1 Modbus Baud Rates

Baud Rates				
	9,600	14,400	19,200	24,000
28,800	33,600	38,400	43,200	48,000
52,800	57,600	62,400	67,200	72,000
76,800	81,600	86,400	91,200	96,000
100,800	105,600	110,400	115,200	120,000
124,800	129,600	134,400	139,200	144,000
148,800	153,600	158,400	163,200	168,000
172,800	177,600	182,400	187,200	192,000

10.2 Device sample rate

New data is available up to a maximum of 0.33 samples per second.