PowerLogic® ION7300 Series

Power & Energy Meter

Modicon Modbus Serial Communications Protocol
December 2006

Schneider Electric

Notices

Danger

This symbol indicates the presence of dangerous voltage within and outside the product enclosure that may constitute a risk of electric shock, serious injury or death to persons if proper precautions are not followed.

Caution

This symbol alerts the user to the presence of hazards that may cause minor or moderate injury to persons, damage to property or damage to the device itself, if proper precautions are not followed.

Note

This symbol directs the user's attention to important installation, operating and maintenance instructions.

Installation Considerations

Installation and maintenance of the ION7300 series meter should only be performed by qualified, competent personnel that have appropriate training and experience with high voltage and current devices. The meter must be installed in accordance with all local and national electrical codes.

DANGER

Failure to observe the following instructions may result in severe injury or death.

- During normal operation of the ION7300 series meter, hazardous voltages are present on its terminal strips, and throughout the connected potential transformer (PT), current transformer (CT), digital (status) input, control power and external I/O circuits. PT and CT secondary circuits are capable of generating lethal voltages and currents with their primary circuit energized. Follow standard safety precautions while performing any installation or service work (i.e. removing PT fuses, shorting CT secondaries, etc).
- The terminal strips on the meter base should not be user-accessible after installation.
- Do not use digital output devices for primary protection functions. These include applications where the devices perform energy limiting functions or provide protection of people from injury. Do not use the ION7300 series in situations where failure of the devices can cause injury or death, or cause sufficient energy to be released that can start a fire. The meter can be used for secondary protection functions.
- Do not HIPOT/Dielectric test the digital (status) inputs, digital outputs, or communications terminals. Refer to the label on the ION7300 series meter for the maximum voltage level the device can withstand.

⚠ CAUTION

Observe the following instructions, or permanent damage to the meter may occur.

- The ION7300 series meter offers a range of hardware options that affect input ratings. The ION7300 series meter's serial number label lists all equipped options. Applying current levels incompatible with the current inputs will permanently damage the meter. This document provides installation instructions applicable to each hardware option.
- The ION7300 series meter's chassis ground must be properly connected to the switchgear earth ground for the noise and surge protection circuitry to function correctly. Failure to do so will void the warranty.
- Terminal screw torque: Barrier-type (current, voltage, and relay terminal screws: 1.35 Nm (1.00 ft-lbf) max. Captured-wire type (digital inputs/outputs, communications, power supply: 0.90 Nm (0.66 ft.lbf) max.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The Ringer Equivalence Number (REN) for the ION7300 series optional internal modem is 0.6. Connection to the ION7300 series internal modem should be made via an FCC Part 68 compliant telephone cord (not supplied). The ION7300 series cannot be used on a public coin phone service or party line services.

Network Compatibility Notice for the Internal Modem

The internal modem in meters equipped with this option is compatible with the telephone systems of most countries in the world, with the exception of Australia and New Zealand. Use in some countries may require modification of the internal modem's initialization strings. If problems using the modem on your phone system occur, please contact Schneider Electric Technical Support

Standards Compliance

CSA: Certified to CAN/CSA C22.2 No.1010-1

Certified to UL 3111

Made by Power Measurement Ltd.

Contents

Introduction

This document explains the Modbus protocol for PowerLogic® ION7300 series meters. The ION meter performs Modbus communications by emulating the Modicon 984 Programmable Controller. This document describes the Modbus communications protocol employed by the meter and how to pass information into and out of the meter in a Modbus network. It is assumed that the reader is familiar with the Modbus protocol and serial communications in general.

Purpose of the Communications Protocol

The Modbus protocol allows data and setup information to be efficiently transferred between a Modbus Master Station and a Modbus Slave. This includes:

- interrogation of all meter data which are exported via the Modbus Slave ION Module.
- configuration and interrogation of all meter Module Numeric Bounded and Enumerated set-up registers.
- interrogation and control of the meter External Control ION Modules.

Modbus Implementation on the Meter

Ground Rules

The meter is capable of communicating via the RS-485 serial communication standard. The RS-485 medium allows for multiple devices on a multi-drop network.

The following rules define the protocol for information transfer between a Modbus Master device and the meter:

- All communications on the network conform to a MASTER/SLAVE scheme. In this scheme, information and data is transferred between a Modbus MASTER device and up to 32 SLAVE devices.
- The MASTER initiates and controls all information transfer on the communications loop.
- A SLAVE device never initiates a communications sequence.
- All communications activity on the loop occurs in the form of "PACKETS." A packet is a serial string of 8-bit bytes. The maximum number of bytes contained within one packet is 255.
- All PACKETS transmitted by the MASTER are REQUESTS. All PACKETS transmitted by a SLAVE device are RESPONSES.
- At most one SLAVE can respond to a single request from a MASTER.

Modes of Transmission

The Modbus protocol uses ASCII and RTU modes of transmission. The meter supports only the RTU mode of transmission, with 8 data bits, no parity, and one stop bit.

Description of the Modbus packet structure

Every Modbus packet consists of four fields:

- Slave Address Field
- Function Field
- Data Field
- Error Check Field (Checksum)

Slave Address Field

The slave address field of a Modbus packet is one byte in length and uniquely identifies the slave device involved in the transaction. Valid addresses range between 1 and 247. A slave device performs the command specified in the packet when it receives a request packet with the slave address field matching its own address. A response packet generated by the slave has the same value in the slave address field.

Function Field

The function field of a Modbus request packet is one byte in length and tells the addressed slave which function to perform. Similarly, the function field of a response packet tells the master what function the addressed slave has just performed. "Table 2: Modbus Functions Supported by the Meters" on page 10 lists the Modbus functions supported by the meter.

Data Field

The data field of a Modbus request is of variable length, and depends upon the function. This field contains information required by the slave device to perform the command specified in a request packet or data being passed back by the slave device in a response packet.

Data in this field is contained in 16-bit or 32-bit registers. Registers are transmitted in the order of high-order byte first, low-order byte second. This ordering of bytes is called "Big Endian" format (see example below).

Example (Big Endian):

A 16-bit register contains the value 12AB Hex. This register is transmitted:

- High order byte = 12 Hex
- Low order byte = AB Hex

This register is transmitted in the order 12 AB.

Error Check Field (Checksum)

The checksum field lets the receiving device determine if a packet is corrupted with transmission errors. In Modbus RTU mode, a 16-bit Cyclic Redundancy Check (CRC-16) is used.

The sending device calculates a 16-bit value, based on every byte in the packet, using the CRC-16 algorithm. The calculated value is inserted in the error check field.

The receiving device performs the calculation, without the error check field, on the entire packet it receives. The resulting value is compared to the error check field. Transmission errors occur when the calculated checksum is not equal to the checksum stored in the incoming packet. The receiving device ignores a bad packet.

The CRC-16 algorithm is detailed in appendix A of this document.

Exception Responses

If a Modbus master device sends an invalid command to a meter or attempts to read an invalid holding register, an exception response is generated. The exception response follows the standard packet format. The high order bit of the function code in an exception response is set to 1.

The data field of an exception response contains the exception error code. The table below describes the exception codes supported by the meter and the possible causes.

Table 1: Exception Codes supported by the meter

Code	Name	Meaning
01	Illegal Function	An Invalid command is contained in the function field of the request packet. The meter only supports Modbus functions 3 and 16.
02	Illegal Address	The address referenced in the data field is an invalid address for the specified function. This could also indicate that the registers requested are not within the valid register range of the meter.
03	Illegal Value	The value referenced in the data field is not allowed for the referenced register on the meter.

Broadcast Packets

The ION Modbus protocol supports broadcast request packets. The purpose of a broadcast request packet is to allow all Slave devices to receive the same command from the Master station.

A broadcast request packet is the same as a normal request packet, except the slave address field is set to zero (0). All Modbus slave devices receive and execute a broadcast request command, but no device will respond. The Preset Multiple Registers command is the only command supporting broadcast packets.

Packet Communications

This section illustrates the Modbus functions supported by the meter.

Function 03: Read Holding Registers

To read meter parameter values, a Master station must send the slave device a Read Holding Registers request packet.

The Read Holding Registers request packet specifies a start register and a number of registers to read. The start register is numbered from zero (40001 = zero, 40002 = one, etc.).

The meter responds with a packet containing the values of the registers in the range defined in the request.

Table 2: Modbus Functions Supported by the Meters

Function	Meaning	Action
03	Read Holding Registers	Obtains the current value in one or more holding registers of the meter.
16	Preset Multiple Registers	Places specific values into a series of consecutive holding registers of the meter. The holding registers that can be written to the meter are shown in the register map.

Read Holding Registers Packet Structure

Read Registers Request Packet (Master station to meter)	Read Registers Response Packet (meter to Master station)
Unit ID/Slave Address (1 byte)	Unit ID/Slave Address (1 byte)
03 (Function code) (1byte)	03 (Function code) (1 byte)
Start Register (sr) (2 bytes)	Byte Count (2 x nr) (1 byte)
# of Registers to Read (nr) (2 bytes)	First Register in range (2 bytes)
CRC Checksum	Second Register in range (2 bytes)
	...
	CRC Checksum (2 bytes)

Example:

A meter in 4-wire WYE volts mode is configured as a Modbus slave device with slave address 100. The master station requests to read all three voltage phases (A, B, C). These three parameters are exported via a Modbus Slave Module to Modbus registers 40011, 40012 and 40013, with a scaling factor of 10. In accordance with the Modbus protocol, register 40011 is numbered as 10 when transmitted. The request must read 3 registers starting at 10.

Slave address: 100 = 64 (hex) Start register 10 = 000A (hex)

Request Packet: white background denotes the DATA field of the packet.

Slave	Function	Start Register (40011)		# of Registers (3)		CRC Checksum	
64*	03	00	0A	00	03	2C	3C

Response Packet:

Slave	Function	Byte Count	Register 1		Register 2		Register 3		CRC Checksum	
64	03	06	2E	CE	2E	E8	2F	13	0D	58

The Master station retrieves the data from the response:

Register 40011: 2ECE(hex) = 11982 (scaled: 1198.2)

Register 40012: 2EE8(hex) = 12008 (scaled: 1200.8)

Register 40013: 2F13(hex) = 12051 (scaled: 1205.1)

* The values shown in illustrated packets are in hexadecimal format.

Function 16: Preset Multiple Registers

The Preset Multiple Registers command packet allows a Modbus master to configure or control the meter.

A Preset Multiple Registers data-field request packet contains a definition of a range of registers to write to, and the values that are written to those registers.

The meter responds with a packet indicating that a write was performed to the range of registers specified in the request.

The Preset Multiple Registers request and response packet formats are shown in the example transaction below.

NOTE

Except for the function field, the Preset Registers Response packet is identical in format to the Read Registers Request packet.

Preset Multiple Registers

Preset Registers Request Packet (Master station to meter)	Preset Registers Response Packet (meter to Master station)
Unit ID/Slave Address (1 byte)	Unit ID/Slave Address (1 byte)
16 (Function code) (1byte)	16 (Function code) (1 byte)
Start Register (sr) (2 bytes)	Start Register (sr) (2 bytes)
# of Registers to Write (nr) (2 bytes)	# of Registers Written (nr) (2 bytes)
Byte Count (2 x nr) (1 byte)	CRC Checksum (2 bytes)
First Register in range (2 bytes)	
Second Register in range (2 bytes)	
...	
CRC Checksum (2 bytes)	

Example:

A meter is configured as a Modbus slave device with slave address 200. The Master station requests to set the PT ratio to 1200:120. From the register map, the Power Meter PT Primary and Secondary setup registers are Modbus registers 46001/2 and 46003/4. Register 46001 is numbered 6000. The request must write 4 registers starting at 6000.

Slave address: 200 = C8(hex) Start register 6000 = 1770 (hex)

Value 1: 1200 = = 0000 | 04B0 (hex) Value 2: 120 = 0000 | 0078 (hex)

Request Packet: white background denotes the DATA field of the packet.

Slave	Function	Start Register (46001)		# of Registers (4)		Byte Count	Register 1		Register 2		Register 3		Register 4		CRC Checksum	
C8*	10	17	70	00	04	08	00	00	04	B0	00	00	00	78	8B	F8

Response Packet:

Slave	Function	Start Register (46001)		# of Registers (4)		CRC Checksum	
C8	10	17	70	00	04	D4	3C

* The values shown in illustrated packets are represented in hexadecimal format.

Invalid Registers

In the meter Modbus register map, there are gaps between some registers. For example, the next register after *42232* is *42301*. Unmapped registers (*42233* through to *42300*) are INVALID. Invalid registers store no information.

When an invalid register is read, the data field is FFFF(hex). When an invalid register is written, the data field is not stored. The meter does not reject the request.

Meter Modbus Registers

The meter Modbus register map defines a set of parameters which are treated as HOLDING REGISTERS of the Modicon 984 PLC, having addresses ***4xxxx***. According to the Modbus protocol, in response to a request for register ***4xxxx*** of a particular slave device, the Modbus master reads register ***xxxx-1*** from the slave. For example, register ***40011*** corresponds to register 10.

There are four main classes of registers available via Modbus:

- Modbus Slave Module Output Registers
- External Control Registers
- Enumerated ION Module Setup Registers
- Numeric Bounded ION Module Setup Registers.

Modbus Slave Module Output Registers

The meter contains ION Modbus Slave Modules each capable of exporting up to sixteen ION registers into the Modbus protocol. Some modules are pre-configured with common meter values. The Slave module takes Numeric or Boolean type ION registers as input, scales and formats the input values according to a configurable setup, and makes the ION data available in a contiguous set of Modbus Holding Registers.

Modbus Slave Module output registers are located in the Modbus register map (from *40001* to *41800*). The actual location depends on the setup of the individual Modbus Slave Modules.

The Modbus Slave Module can scale and offset input values, and format the outputs in one of seven selectable formats:

- Unsigned 16-bit Integer Format
- Signed 16-bit Integer Format
- Unsigned 32-bit Integer Format
- Signed 32-bit Integer Format
- Unsigned 32-bit 'Modulus-10000' Format
- Signed 32-bit 'Modulus-10000' Format
- Packed Boolean Format

16-bit Integer Format

Unsigned and Signed 16-bit Integer Formats are the simplest formats. Each ION input register to the module corresponds to one 16-bit Modbus Holding Register output. If the format is unsigned the value range for the output registers is 0 to 65535. If the format is signed, the value range is -32767 to +32767.

32-bit Integer Format

To accommodate values that can reach beyond the 16-bit limitation, the Modbus Slave Module provides 32-bit integer format as an output option. In Signed and Unsigned 32-bit Integer Formats, each ION input register to the module corresponds to two 16-bit Modbus Holding Register outputs.

A 32-bit register represented in 32-bit Integer format is passed via communications as two 16-bit registers:

High-Order Register

$register_{high}$=value/65536

Low-Order Register

$register_{low}$= value **modulus** 65536

value = $register_{high}$ x 65536 + $register_{low}$, or

value = $register_{high}$ | $register_{low}$

Example (Unsigned 32-bit):

Value 12345678 is passed in *unsigned* 32-bit integer format:

12345678 = 00BC614E Hex

$Register_{high}$ = 00BC Hex (unsigned) = 188

$Register_{low}$ = 614E Hex (unsigned) = 24910

value = 188 x 65536 + 24910 = 12345678

In Unsigned 32-bit Integer Format, both the High-Order and Low-Order registers are unsigned 16-bit integers.

Example (Signed 32-bit):

Value -12345678 is passed in *signed* 32-bit integer format:

-12345678 = FF439EB2 Hex

$Register_{high}$ = FF43 Hex (signed) = -189

$Register_{low}$ = 9EB2 Hex (unsigned) = 40626

value = -189 x 65536 + 40626 = -12345678

In Signed 32-bit Integer Format, the High-Order register is a signed 16-bit number, but the Low-Order register is unsigned.

32-bit 'Modulus-10000' Format

The Modulo-10000 (M10K) format breaks a 32-bit value into two 16-bit registers, according to the following relationship:

High-Order Register

$register_{high}$=value/10000

Low-Order Register

$register_{low}$= value **modulus**10000

The 32-bit value can be retrieved by the following calculation:

value = $register_{high}$ x 10000 + $register_{low}$

Example (Unsigned):

Value 12345678 is passed in *unsigned* 32-bit Modulus-10000 format.

$Register_{high}$: 1234 = 04D2 Hex

$Register_{low}$: 5678 = 162E Hex

value = 1234 * 10000 + 5678 = 12345678

Example (Signed):

Value -12345678 is passed in *signed* 32-bit Modulus-10000 format. Both high and low are signed.

$Register_{high}$: -1234 = FB2E Hex

$Register_{low}$: -5678 = E9D2 Hex

value = -1234 * 10000 + -5678 = -12345678

Packed Boolean Format

Boolean ION registers can be packed into a single Modbus register via the Modbus Slave Module. When the Modbus Slave Module is configured to produce packed Boolean outputs each input register (to the module) corresponds to one bit in the single output register of the module. The relationship is left to right: the first input register corresponds to the left-most bit in the 16-bit output register, etc.

Example:

Six Boolean registers are linked to a Modbus Slave Module, which is configured for Packed Boolean output format. If the first three are valued 'False', and the remaining three are valued 'True', the output register value is:

Register: 0001110000000000 Bin = 1C00 Hex

If the first input register became 'True', the output register value changes to:

Register: 1001110000000000 Bin = 9C00 Hex

Meter Firmware Revision

All ION meters contain a firmware revision string which denotes the meter type and version (e.g. "7300V200" denotes version 200 of the ION7300 meter).

The firmware revision string is available via Modbus at a fixed location in the Modbus register map. While the string may vary in length from one revision to the next, the set of Modbus registers used to represent the string spans the maximum possible firmware revision string length. On the meter, the firmware revision string appears in Modbus Holding registers *41901* to *41912*.

The format of the firmware revision string in Modbus follows a 'C' style string convention: a series of bytes representing ASCII characters terminated by a 'null' byte (value 00 Hex). In Modbus, each 16-bit holding register contains two ASCII characters.

The following table shows how the Modbus encoding of the string "7300V200" appears.

Table 3: Modbus string encoding

Register	Value (Hex)	ASCII	
41901	3733	'7'	'3'
41902	3030	'0'	'0'
41903	5632	'V'	'2'
41904	3030	'0'	'0'
41905	0000	NUL	NUL

The remainder of the firmware revision string registers (in the above case, *41906* to *41912*) contains null values (0000 Hex).

ION External Control Registers

All ION external control registers in the meter can be read and written via Modbus. This section describes how the registers appear to the Modbus protocol. There are three types of external control registers:

- External Pulse Control Registers
- External Boolean Control Registers
- External Numeric Control Registers

External Pulse Registers

External Pulse registers interface to manually triggering events in the meter. For example, they can reset counters or timers, or pulse external equipment. All of the meter external pulse registers are available via Modbus.

Pulse registers are meaningful mainly for writing. Writing a nonzero value to a pulse register causes a pulse. Writing a zero value has no effect, but is acknowledged as a successful write operation. This feature provides the capability to 'skip' triggers when pulsing multiple registers in one request.

The meter's External Pulse registers are located in the Modbus register map from *42001* to *42032*.

Example:

A meter is pre-configured with external pulse modules. See "External Pulse Registers" on page 16.

The Modbus master requests to reset Min/Max, SWD, TD, and Integrators. The outgoing write request is to write 7 registers, starting at *42001*, with values 1, 0, 1, 1, 0, 0, and 1.

External Boolean Registers

ION External Boolean registers provide an interface to manually turn a signal ON or OFF. For example, these registers can enable or disable ION modules. The functionality depends on the meter configuration.

A value of one (1) for a Boolean register represents 'ON' or 'TRUE'. A value of zero (0) represents 'OFF' or 'FALSE'. Writing a value other than zero or one result in the value of one.

The meter's External Boolean registers are located in the Modbus register map from *42201* to *42212*.

External Numeric Registers

External Numeric registers can be set to a certain value. Consult meter's User Guide and the *ION Reference* for an example of how and where these registers might be used.

The External Numeric registers are 32-bit values are represented in 32-bit Signed Integer Format (see section 32-bit Integer Format of this document). Each External Numeric register spans two 16-bit Modbus registers. The first Modbus register of the pair represents the high order word of the 32-bit value. The second Modbus register represents the low order word. The 32-bit value read from or written to an External Numeric register via Modbus is represented as a 32-bit signed integer value, therefore the range of possible values is -2,147,483,648 to +2,147,483,647.

The meter's External Numeric registers are located in the Modbus register map from *42301* to *42308*.

Enumerated ION Module Setup Registers

The Enumerator setup register is a major class of setup registers in ION modules. Enumerated registers are used where there is a list of options to choose from. For example, the Power Meter Module has the following options for Volts Mode: 4W-WYE, DELTA, SINGLE, DEMO, DIRECT-DELTA, and 3W-WYE.

In Modbus protocol, Enumeration register lists are represented by a numeric relationship. For example, with the Power Meter Module *Volts Mode* register, the following relationship is defined:

0 = 4W-WYE
1 = DELTA
2 = SINGLE
3 = DEMO
4 = 3W-WYE
5 = DIRECT-DELTA

All Enumerated ION Module setup registers on the meter are included in the Modbus register map. The register map details how enumerations are represented numerically in Modbus for each register.

Enumerated ION Module setup registers are located in the Modbus register map in order of ION handles. The following formula shows the relationship:

EnumAddr = 44001 + dec(EnumHandle-7800 hex)

Example:

A meter has a Modbus Slave Module #1 that is configured to export data in Unsigned 32-bit Integer Format. The ION handle for the Modbus Slave Module #1 Format register is 7A53 hex. The enumeration for 'Unsigned 32B' is 2.

Register Address = 44001 + dec(7A53 hex - 7800 hex)
= 44001 + dec(0253 hex)
= 44001 + 595
= 44596

A write request of value 2 to register *44596* makes this configuration change.

Numeric Bounded ION Module Setup Registers

The Numeric Bounded setup register is another major class of setup registers in ION modules. Examples of numeric bounded setup registers include Power Meter Module PT/CT Ratios, Communications Module Unit ID, etc.

Numeric Bounded registers are represented in Modbus in Signed 32-bit Integer Format (see section 32-bit Integer Format), where each ION Numeric Bounded register spans two 16-bit Modbus registers. Because of the Modbus register format, an absolute boundary of -2,147,483,648 to +2,147,483,647 is imposed on Numeric Bounded ION Module setup registers. Even if the ION register bounds are beyond the 32-bit signed integer boundary, the bounds are effectively limited by Modbus capabilities.

All Numeric Bounded ION Module setup registers on the meter are included in the Modbus register map. The register map details the numeric bounds in Modbus for each register.

Like Enumerated ION Module setup registers, Numeric Bounded setup registers are located in the Modbus register map in order of ION handles. The following formula shows the relationship:

NBAddr = 46001 + 2 x dec(NBHandle-7000 hex)

Example:

A meter has a Modbus Slave Module #2 to be configured to export data to Modbus register base address 40027. Modbus Slave Module #1, with 16 ION inputs, is changed from 16 to 32 bit format, thus increasing the output register range of that module. Modbus Slave Module #2 must be configured to make room for the additional Modbus registers generated by Modbus Slave #1. The ION handle for the Modbus Slave Module #2 BaseAddr register is 7238 hex. To accommodate the 16 new output registers from Modbus Slave Module #1, the new BaseAddr for Modbus Slave Module #2 should be changed to 40043.

Register Address	= 46001 + dec(7238 hex - 7000 hex)	= 46001 + dec(238 hex)
		= 46001 + 1136
		= 47137

A write request of values 0 and 40043 to two registers starting at register *47137* make this configuration change.

Note in this example, if Modbus Slave Modules #3 and #4 were configured to export registers to an address range following Modbus Slave Module #2, they also must be reconfigured by a similar process.

Modbus Configuration

Modbus on the meter is configurable in two components:

- Protocol Configuration (Communications Module)
- Register Configuration (Modbus Slave Module)

Consult the *ION Reference* for a full functional description of the Communications and Modbus Slave Modules.

Modbus Protocol Configuration (Communications Module)

The meter Communications Module stores all setup information that applies to a serial protocol on a communications port. Setup registers in this module store both the protocol selected and all setup parameters for that protocol.

The setup registers for the Communications Modules on the meter are accessible via Modbus as fixed-location readable and writable registers: See sections Enumerated ION Module Setup Registers and Numeric Bounded ION Module Setup Registers of this document for format details of these Modbus registers.

Table 4: Modbus Configuration Parameters

SETUP REGISTER	MODBUS REGISTER(S)
CM1 Baud Rate	44392
CM1 Protocol	44592
CM1 RTS Delay	46977 to 46978
CM1 Unit ID	46979 to 46980
CM2 Baud Rate (ION7330 & ION7350 only)	44590
CM2 Protocol (ION7330 & ION7350 only)	44593
CM2 RTS Delay (ION7330 & ION7350 only)	47125 to 47126
CM2 Unit ID (ION7330 & ION7350 only)	47129 to 47130
IR1 Baud Rate	44591
IR1 Protocol	44594
IR1 RTS Delay	47127 to 47128
IR1 Unit ID	47131 to 47132

These registers are explained in the following sections.

Baud Rate

Each Communications Module on the meter has a *Baud Rate* register, which specifies the speed of serial communications.

The following values apply to all Communications Modules:

1 = 1200 Baud
2 = 2400 Baud
3 = 4800 Baud
4 = 9600 Baud
5 = 19200 Baud

Protocol

This register defines the serial protocol to be used on the communications port. Refer to "ION Setup Registers" on page 38.

Protocol	Value
ION	0
Modbus RTU	1
Factory	3
DNP	4
GPS: Truetime/Datum	6
GPS: Arbiter	7
GPS: Arbiter-Vorne	8
Modbus Master	9
Ethergate	100
Modemgate	101

RTS Delay

The RTS Delay parameter defines a delay between when the ION meter is ready to transmit data on the serial port and when it starts transmitting data.

The RTS Delay parameter applies to all Communications Modules, and is expressed in milliseconds. The valid value range is from 0 to 1000 ms.

Unit ID

The *Unit ID* register defines the slave address for the protocol being used on the communications port.

In Modbus protocol, the Unit ID parameter defines the slave address used in Modbus packets for the device in question.

Since this parameter applies to both ION and Modbus protocols, the valid range for the parameter is defined to fit both protocols. Thus the range is specified as 1 to 9999. However, since the slave address range specified for Modbus is smaller than that of the Unit ID setup register, ***the valid range of this parameter is limited to 1 to 247***.

Modbus Register Configuration (Modbus Slave Module)

The meter Modbus Slave Module provides a configurable interface to export ION data to the Modbus protocol. Consult the *ION Reference* for a full description of this module.

The Modbus Slave Module is configurable in two ways:

- ION Registers are 'linked' to the module
- the Modbus Slave Module setup is altered

The first type of configuration is beyond the scope of the Modbus protocol. The meter comes with a set of default linkages for Modbus Slave Modules that suit a wide range of applications.

The second type of Modbus Slave Module configuration is accomplished via the meter display, the ION protocol, or the Modbus protocol.

The setup registers for the Modbus Slave Modules on the meter are available via Modbus for control and interrogation. See sections Enumerated ION Module Setup Registers and Numeric Bounded ION Module Setup Registers of this document for format details of these Modbus registers.

SETUP REGISTER	MODBUS REGISTER(S)
MSR1 Format	44596
MSR1 BaseAddr	47135 to 47136
MSR1 Scaling	44600
MSR1 InFull	47151 to 47152
MSR1 InZero	47143 to 47144
MSR1 OutFull	47167 to 47168
MSR1 OutZero	47159 to 47160
MSR2 Format	44597
MSR2 BaseAddr	47137 to 47138
MSR2 Scaling	44601
MSR2 InFull	47153 to 47154
MSR2 InZero	47145 to 47146
MSR2 OutFull	47169 to 47170
MSR2 OutZero	47161 to 47162
MSR3 Format	44598
MSR3 BaseAddr	47139 to 47140
MSR3 Scaling	44602
MSR3 InFull	47155 to 47156
MSR3 InZero	47147 to 47148
MSR3 OutFull	47171 to 47172
MSR3 OutZero	47163 to 47164

SETUP REGISTER	MODBUS REGISTER(S)
MSR4 Format	44599
MSR4 BaseAddr	47141 to 47142
MSR4 Scaling	44603
MSR4 InFull	47157 to 47158
MSR4 InZero	47149 to 47150
MSR4 OutFull	47173 to 47174
MSR4 OutZero	47165 to 47166
MSR5 Format	45196
MSR5 BaseAddr	49915 to 49916
MSR5 Scaling	45202
MSR5 InFull	49939 to 49940
MSR5 InZero	49927 to 49928
MSR5 OutFull	49963 to 49964
MSR5 OutZero	49951 to 49952
MSR6 Format	45197
MSR6 BaseAddr	49917 to 49918
MSR6 Scaling	45203
MSR6 InFull	49941 to 49942
MSR6 InZero	49929 to 49930
MSR6 OutFull	49965 to 49966
MSR6 OutZero	49953 to 49954
MSR7 Format	45198
MSR7 BaseAddr	49919 to 49920
MSR7 Scaling	45204
MSR7 InFull	49943 to 49944
MSR7 InZero	49931 to 49932
MSR7 OutFull	49967 to 49968
MSR7 OutZero	49955 to 49956
MSR8 Format	45199
MSR8 BaseAddr	49921 to 49922
MSR8 Scaling	45205
MSR8 InFull	49945 to 49946
MSR8 InZero	49933 to 49934
MSR8 OutFull	49969 to 49970
MSR8 OutZero	49957 to 49958
MSR9 Format	45200
MSR9 BaseAddr	49923 to 49924
MSR9 Scaling	45206
MSR9 InFull	49947 to 49948

SETUP REGISTER	MODBUS REGISTER(S)
MSR9 InZero	49935 to 49936
MSR9 OutFull	49971 to 49972
MSR9 OutZero	49959 to 49960
MSR10 Format	45201
MSR10 BaseAddr	49925 to 49926
MSR10 Scaling	45207
MSR10 InFull	49949 to 49950
MSR10 InZero	49937 to 49938
MSR10 OutFull	49973 to 49974
MSR10 OutZero	49961 to 49962

Format

As described in section Modbus Slave Module Output Registers of this document, the Modbus Slave Modules can export ION data to Modbus Holding registers in a variety of formats. These formats are selectable via the Format setup register of the Modbus Slave Module. The following values are valid Format selections:

0 = Unsigned 16B
1 = Signed 16B
2 = Unsigned 32B
3 = Signed 32B
4 = Unsigned 32B-M10K
5 = Signed 32B-M10K
6 = Packed Boolean

BaseAddr

The BaseAddr setup register defines the starting Modbus register address to which the Modbus Slave Module exports ION data. The valid range for this setup register is 40001 to 41800.

Scaling

The Modbus Slave Module can scale and offset input values to fit within the output range for the selected format. The Scaling setup register selects if scaling (as defined by InZero, InFull, OutZero, and OutFull) is applied to the inputs. The following values are valid for the Scaling setup register:

0 = No
1 = Yes

InZero, InFull

If Scaling is set to YES for a Modbus Slave Module, the input values are scaled according to a formula derived partly from the InZero, InFull setup registers. Input values falling at or below InZero are represented as OutZero. Input values falling at or above InFull are represented as OutFull. Input values between InZero and InFull are represented as a proportionate value between OutZero and OutFull.

InZero and InFull are defined to range from $-1x10^{38}$ to $+1x10^{38}$, but via Modbus, these registers are represented in Signed 32-bit Integer format, so the integer bounds of -2,147,483,648 to +2,147,483,647 are imposed upon these registers.

OutZero, OutFull

If Scaling is set to YES, the input values to the Modbus Slave Module are scaled by a formula derived partly from OutZero, OutFull. The absolute range of these registers is -2, 147, 483, 647 to +2, 147, 483, 647, but the valid range varies depending on the selected Format for the Modbus Slave Module. The following chart shows the OutZero, OutFull ranges for the various Formats:

Table 6: Out Zero and Out Full ranges for Modbus formats

Format	Low Bound	High Bound
Unsigned 16B	0	+65535
Signed 16B	-32767	+32767
Unsigned 32B	0	+2,147,478,647
Signed 32B	-2,147,478,647	+2,147,478,647
Unsigned 32B-M10K	0	+65,535,999
Signed 32B-M10K	-32,767,999	+32,767,999
Packed Boolean	N/A	N/A

Appendix A: CRC-16 Calculation

This appendix describes the procedure for obtaining the CRC-16 error check field for a Modbus RTU frame.

Procedure

A frame can be considered as a continuous, serial stream of binary data (ones and zeros). The 16-bit checksum is obtained by multiplying the serial data stream by 2^{16} (10000000000000000) and then dividing it by the ***generator polynomial*** $x^{16}+x^{15}+x^2+1$, which can be expressed as the 16-bit binary number 11000000000000101. The quotient is ignored and the 16-bit remainder is the checksum, which is appended to the end of the frame.

In calculating the CRC, all arithmetic operations (additions and subtractions) are performed using MODULO TWO, or EXCLUSIVE OR operation. A step-by-step example shows how to obtain the checksum for a simple Modbus RTU frame.

Steps for generating the CRC-16 checksum:

1. Drop the MSB (Most Significant Bit) of the generator polynomial and reversing the bit sequence to form a new polynomial. This yields the binary number 1010 0000 0000 0001, or A0 01 (hex).
2. Load a 16-bit register with initial value FF FF (hex).
3. Exclusive OR the first data byte with the low-order byte of the 16-bit register. Store the result in the 16-bit register.
4. Shift the 16-bit register one bit to the right.
5. If the bit shifted out to the right is one, Exclusive OR the 16-bit register with the new generator polynomial, store the result in the 16-bit registers. Return to step 4.
6. If the bit shifted out to the right is zero, return to step 4.
7. Repeat steps 4 and 5 until 8 shifts have been performed.
8. Exclusive OR the next data byte with the 16-bit register.
9. Repeat steps 4 through 7 until all bytes of the frame are Exclusive OR with the 16-bit register and shifted 8 times.
10. The content of the 16-bit register is the checksum and is appended to the end of the frame.

Pseudocode For CRC-16 Generation

For users familiar with computer programming, the following is the pseudocode for calculating the 16-bit Cyclic Redundancy Check.

```
Initialize a 16-bit register to FFFF Hex
        Initialize the generator polynomial to A001 Hex
FOR n=1 to # of bytes in packet
        BEGIN
                XOR nth data byte with the 16-bit register
                FOR bits_shifted = 1 to 8
                BEGIN
                        SHIFT 1 bit to the right
                        IF (bit shifted out EQUAL 1)
                                XOR generator polynomial with the 16-bit register
                                and store result in the 16-bit register
                END
        END
```

The resultant 16-bit register contains the CRC-16 checksum.

Appendix B: Modbus Slave Module Factory Default

NOTE

For Modbus Slave Module default settings specific to ION7300 series meters, consult the User Guide.

Appendix C: Data Record / Modbus Map

This appendix contains the Data Record/Modbus register map for ION7300 series meters.

Modbus Data Recorder Registers

ION meters provide data from Data Recorder Modules to be exported into Modbus Registers. The Register Map is a dynamic map and dependent on the configuration of Data Recorder Source inputs. Consult the *ION Reference* for a description of Data Recorder Modules.

Modbus Data Recorder Map

Modbus Register	Contents
43001 to 43011	Record Availability and Selection Block
43012 to 43125	Data Record Block
43126 to 43137	Reserved Registers
43138 to 43153	Source Input Handle ID

Modbus Data Recorder Retrieval

To retrieve Data Record via Modbus communications the following steps must be followed:

1. Ensure the Data Recorder is on line. See the *ION Reference* for Data Recorder Module descriptions.
2. Write the Data Recorder Module Number to Modbus Register 43001. If an invalid Data Recorder Module Number is written, a Modbus Exception is returned.
3. Determine a valid Starting Record with a Read of Modbus Registers 43001 through 43011. This returns the Modbus Record Availability and Selection. All valid Record Numbers lie in the range of the Oldest Record Number (Modbus Registers 43008 and 43009) and the Newest Record Number (Modbus Registers 43010 and 43011).
4. After a valid Record Number is determined write it to Modbus Registers 43002 and 43003 (Master's Request for Starting Record) so a valid data is cached and read back.
5. A Read returns the data for each available record starting at record number written to Modbus Registers 43002 and 43003. The number of records returned depends on the number of Source Inputs connected to the Data Recorder and the number of records available with respect to the Start Record.
6. Repeat steps 3 through 6 for new records.

NOTE

All data is cached and can be read back at any time until a new write is requested. Any setup changes in the Data Recorder Module clears all cached Data Records.

Modbus Record Availability and Selection Block Registers

Modbus Register	# of Modbus Registers	Description	Format	Properties
43001	1	Data Recorder Module Number - write to this register with the data recorder module number you want to access.	UINT16	Read / Write
43002, 43003	2	Master's Request for Starting Record - write to these registers with the starting record number. Write the high order word to register 43002 and the low order word to register 43003.	UINT32	Read / Write
43004	1	Number of Source Inputs - read this register to return the number of source input connected to the data recorder module (register 43001).	UINT16	Read
43005	1	Module Setup Count - read this register to return the module setup count. A change in the module setup count reflects a change in the data recorder module setup.	UINT16	Read
43006	1	Maximum Number of Records / Request - read this register to return the maximum number of records per request.	UINT16	Read
43007	1	Number of Available Records / Request - read this register to return the number of available record per request.	UINT16	Read
43008, 43009	2	Oldest Record Number - read these registers to return the oldest available record number. Register 43008 returns the high order word and register 43009 returns the low order word.	UINT32	Read
43010, 43011	2	Newest Record Number - read these registers to return the newest available record number. Register 43010 returns the high order word and register 43011 return the low order word.	UINT32	Read

Modbus registers 43001 through 43011 contain the Data Recorder Record information necessary to retrieve valid records. A valid Data Recorder Module Number must be written to Modbus Register 43001 prior to reading any Modbus Data Recorder Registers otherwise a Modbus exception will be returned.

Modbus Data Record Block Registers

Modbus registers 43012 through 43125 contain the Record Number, Time Stamp, and Source Input Data for each record retrieved. This Modbus mapping is dynamic dependant on the number of source inputs connected to the Data Recorder Module.

The Record Number is returned as an unsigned 32-bit value stored in two Modbus registers. The first register is the high order followed by the low order second register.

The Time Stamp Seconds is returned as an unsigned 32-bit value stored in two Modbus registers.

The first register is the high order followed by the low order second register. The format is UNIX time (UTC). Consult the *ION Reference* for a description of the Clock Module time format.

The Time Stamp MicroSeconds is returned as an unsigned 32-bit value stored in two Modbus registers. The first register is the high order followed by the low order second register. The format is absolute time in micro seconds.

The Source Input Data is returned as a Float value stored in two Modbus registers. The first register is the high order followed by the low order second register. The format is IEEE-754.

The following is an example of a Data Recorder Module with one source input connected (14 records maximum):

Modbus Register	# of Modbus Registers	Description	Format	Properties
43012	2	Record Number (x)	UINT32	Read
43014	2	UTC Seconds	UINT32	Read
43016	2	UTC MicroSeconds	UINT32	Read
43018	2	Source 1 Input Data	FLOAT	Read
43020	2	Record Number (x+1)	UINT32	Read
43022	2	UTC Seconds	UINT32	Read
43024	2	UTC MicroSeconds	UINT32	Read
43026	2	Source 1 Input Data	FLOAT	Read
43116	2	Record Number (x+13)	UINT32	Read
43118	2	UTC Seconds	UINT32	Read
43120	2	UTC MicroSeconds	UINT32	Read
43122	2	Source 1 Input Data	FLOAT	Read

The following is an example of a Data Recorder Module with 16 source inputs connected (3 records maximum):

Modbus Register	# of Modbus Registers	Description	Format	Properties
43012	2	Record Number (x)	UINT32	Read
43014	2	UTC Seconds	UINT32	Read
43016	2	UTC MicroSeconds	UINT32	Read
43018	2	Source 1 Input Data	FLOAT	Read
43020	2	Source 2 Input Data	FLOAT	Read
43022	2	Source 3 Input Data	FLOAT	Read
43024	2	Source 4 Input Data	FLOAT	Read
43026	2	Source 5 Input Data	FLOAT	Read
43028	2	Source 6 Input Data	FLOAT	Read

Modbus Register	# of Modbus Registers	Description	Format	Properties
43030	2	Source 7 Input Data	FLOAT	Read
43032	2	Source 8 Input Data	FLOAT	Read
43034	2	Source 9 Input Data	FLOAT	Read
43036	2	Source 10 Input Data	FLOAT	Read
43038	2	Source 11 Input Data	FLOAT	Read
43040	2	Source 12 Input Data	FLOAT	Read
43042	2	Source 13 Input Data	FLOAT	Read
43044	2	Source 14 Input Data	FLOAT	Read
43046	2	Source 15 Input Data	FLOAT	Read
43048	2	Source 16 Input Data	FLOAT	Read
43088	2	Record Number (x+2)	UINT32	Read
43090	2	UTC Seconds	UINT32	Read
43092	2	UTC MicroSeconds	UINT32	Read
43094	2	Source 1 Input Data	FLOAT	Read
43096	2	Source 2 Input Data	FLOAT	Read
43098	2	Source 3 Input Data	FLOAT	Read
43100	2	Source 4 Input Data	FLOAT	Read
43102	2	Source 5 Input Data	FLOAT	Read
43104	2	Source 6 Input Data	FLOAT	Read
43106	2	Source 7 Input Data	FLOAT	Read
43108	2	Source 8 Input Data	FLOAT	Read
43110	2	Source 9 Input Data	FLOAT	Read
43112	2	Source 10 Input Data	FLOAT	Read
43114	2	Source 11 Input Data	FLOAT	Read
43116	2	Source 12 Input Data	FLOAT	Read
43118	2	Source 13 Input Data	FLOAT	Read
43120	2	Source 14 Input Data	FLOAT	Read
43122	2	Source 15 Input Data	FLOAT	Read
43124	2	Source 16 Input Data	FLOAT	Read

Modbus Handle ID Registers

Modbus registers 43138 through 43153 contain the Handle ID's for the Source Inputs.

Modbus Register	# of Modbus Registers	Description	Format	Properties
43138	1	Source 1 Handle ID	UINT16	Read
43139	1	Source 2 Handle ID	UINT16	Read
43140	1	Source 3 Handle ID	UINT16	Read
43141	1	Source 4 Handle ID	UINT16	Read
43142	1	Source 5 Handle ID	UINT16	Read
43143	1	Source 6 Handle ID	UINT16	Read
43144	1	Source 7 Handle ID	UINT16	Read
43145	1	Source 8 Handle ID	UINT16	Read
43146	1	Source 9 Handle ID	UINT16	Read
43147	1	Source 10 Handle ID	UINT16	Read
43148	1	Source 11 Handle ID	UINT16	Read
43149	1	Source 12 Handle ID	UINT16	Read
43150	1	Source 13 Handle ID	UINT16	Read
43151	1	Source 14 Handle ID	UINT16	Read
43152	1	Source 15 Handle ID	UINT16	Read
43153	1	Source 16 Handle ID	UINT16	Read

Appendix D: Modbus Meter Time Set

This appendix details the Modbus Meter UNIX Time Set function of ION meters.

Modbus Meter Time Set

Unix Time (UTC) Seconds is an unsigned 32-bit value stored in two Modbus registers. The first register is the high order followed by the low order second register. Consult the *ION Reference* for a description of the Clock Module time format.

UTC microseconds is an unsigned 32-bit value stored in two Modbus registers. The first register is the high order followed by the low order second register. The format is absolute time in microseconds.

Only resolution by seconds is supported when setting Meter Time via Modbus.

Modbus Register	# of Modbus Registers	Description	Format	Properties
41926	2	UTC Seconds	UINT32	Read / Write
41928	2	UTC microseconds	UINT32	Read

Modbus Time Set

To set the meter time via Modbus communications:

1. Set the ION Clock Module *Time Sync Source* register to the Modbus communications port.
2. Write the UNIX time in seconds as an unsigned 32-bit value to Modbus Registers 41926 (high order) and 41927 (low order).

Appendix E: ION / Modbus Map

This appendix contains the ION/Modbus register map for ION7300 series meters.

Modbus Slave Module Registers

The meter provides Modbus Slave Modules that export real-time ION registers into Modbus Registers. The meaning and location of Modbus Slave Module output registers are determined by the configuration of the Modbus Slave Modules. Consult the *ION Reference* for a description of the Modbus Slave Modules.

Modbus Registers	ION Register
40001 to 41800	Modbus Slave Module Outputs

See the User Guide for specific Modbus Slave Modules default settings.

Firmware Revision String Registers

The meter provides a meter firmware revision string via a fixed group of holding registers. The values contained in these registers are ASCII characters, two per register. The ASCII characters, concatenated together, form a 'C' style string: a series of characters terminated by a null value (00 Hex).

Section Meter Firmware Revision of this manual describes the string format in further detail.

Modbus Registers	ION Register	ION Handle
41901 to 41912	FAC1 Revision	1303

ION External Control Registers

All ION external control registers are available to be read and written via Modbus. This section describes how the registers appear in the Modbus register map. There are three types of external control registers:

- External Pulse Control Registers
- External Boolean Control Registers
- External Numeric Control Registers

External Pulse Registers

External Pulse registers provide an interface for manually triggering events in the ION meter. For example, they can be used to reset counters or timers, or pulse external equipment. All of the meter external pulse registers are available via Modbus.

Pulse registers are meaningful for writing. Writing a nonzero value to a pulse register causes a pulse, writing a zero value has no effect, but is acknowledged as a successful write operation.

Modbus Register	ION Register	ION Handle	Default
42001	ExtPulse #1	68AE	Peak Dmd Rset
42002	ExtPulse #2	68AF	MnMx Rset
42003	ExtPulse #3	68B0	SWDemand Rset
42004	ExtPulse #4	68B1	TDemand Rset
42005	ExtPulse #5	68B2	
42006	ExtPulse #6	68B3	Harm MnMx Rset
42007	ExtPulse #7	68B4	Energy Rset
42008	ExtPulse #8	68B5	S Count Rset[a]
42009	ExtPulse #9	68B6	
42010	ExtPulse #10	68B7	
42011	ExtPulse #11	68B8	
42012	ExtPulse #12	68B9	
42013	ExtPulse #13	68BA	
42014	ExtPulse #14	68BB	Man Wfm Trg[b]
42015	ExtPulse #15	68BC	
42016	ExtPulse #16	68BD	
42017	ExtPulse #17	68BE	S Count Rset[c]
42018	ExtPulse #18	68BF	Dist Count Rset[d]
42019	ExtPulse #19	68C0	Master Rset[e]
42020	ExtPulse #20	68C1	
42021	ExtPulse #21	68C2	
42022	ExtPulse #22	68C3	
42023	ExtPulse #23	68C4	
42024	ExtPulse #24	68C5	
42025	ExtPulse #25	68C6	
42026	ExtPulse #26	68C7	
42027	ExtPulse #27	68C8	
42028	ExtPulse #28	68C9	
42029	ExtPulse #29	68CA	
42030	ExtPulse #30	68CB	
42031	ExtPulse #31	68CC	
42032	ExtPulse #32	68CD	

a. 7330 only
b. 7350 only
c. 7350 only
d. 7350 only
e. 7330 and 7350 only

External Boolean Registers

External Boolean registers provide an interface to manually turn a signal ON or OFF. For example, these registers could be used to enable or disable ION modules. The functionality depends on the meter's ION linkages.

A value of one for a Boolean register represents 'ON'. A value of zero represents 'OFF'. Writing a value other than zero or one results in the value of one being written.

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Default
42201	ExtBool #1	608F	✓	✓	✓	MnMx Enble
42202	ExtBool #2	6090	✓	✓	✓	Hist Log Enble[a]
42203	ExtBool #3	6091	✓	✓	✓	Energy Enble
42204	ExtBool #4	6092	✓	✓	✓	Under V Enble[b]
42205	ExtBool #5	6093	✓	✓	✓	EgyDmd Log Enbl[c]
42206	ExtBool #6	6094	✓	✓	✓	Under PF Enbl[d]
42207	ExtBool #7	6095	✓	✓	✓	Over kW Enble[e]
42208	ExtBool #8	6096	✓	✓	✓	Over Amp Enble[f]
42209	ExtBool #9	6097			✓	Wfm Rec Enbl[g]
42210	ExtBool #10	6098			✓	Sag/Swell Enbl[h]
42211	ExtBool #11	6099			✓	Over kW Enble[i]
42212	ExtBool #12	609A			✓	

a. ION7330 and ION7350 only
b. ION7330 and ION7350 only
c. ION7330 and ION7350 only
d. ION7330 and ION7350 only
e. ION7330 only
f. ION7330 and ION7350 only
g. ION7350 only
h. ION7350 only
i. ION7350 only

External Numeric Registers

External Numeric registers can be set to a certain value.

The External Numeric registers are 32-bit values that span two 16-bit Modbus registers. The first Modbus register of the pair represents the high order word of the 32-bit value. The second Modbus register represents the low order word. The 32-bit value read from or written to an External Numeric register via Modbus is represented as a 32-bit signed integer value, therefore the range of possible values is -2,147,483,648 to +2,147,483,647.

Modbus Registers	ION Register	ION Handle
42301 to 42302	ExtNum #1	5ADC
42303 to 42304	ExtNum #2	5ADD
42305 to 42306	ExtNum #3	5ADE
42307 to 42308	ExtNum #4	5ADF

ION Setup Registers

All ION module setup register that are of type ENUMERATED or NUMERIC BOUNDED are available to be read and written via Modbus. This section describes how the registers appear in the Modbus register map.

NOTE

It is recommended that only one register be written for a Preset Multiple Register when writing ION Setup Registers only.

Enumerated Setup Registers

All ION module ENUMERATED setup registers are available to be read and written via Modbus. This section defines how the enumerated registers appear as Modbus registers.

How to interpret this table: Registers are ordered by Modbus register address and grouped by enumeration. For example, registers 44002-44004 use one enumeration list (0 = 'Normal', 1 = 'Inverted'). Similarly, the group of registers 44007-44010 use another enumeration list (0 = 'Pulse', 1 = 'KYZ').

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44001	PM Volts Mode	7800	✓	✓	✓	0='4W-WYE' 1='DELTA' 2='SINGLE' 3='DEMO' 4='3W-WYE' 5=' DIRECT-DELTA'
44002	PM I1Polarity	7801	✓	✓	✓	0='Normal'
44003	PM I2Polarity	7802	✓	✓	✓	1='Inverted'
44004	PM I3Polarity	7803	✓	✓	✓	...
44005	PM PhaseOrder	7804	✓	✓	✓	0='ABC' 1='ACB'
44006	PM Phase Lbls	7805	✓	✓	✓	0='ABC' 1='RST' 2='XYZ' 3='RYB' 4='123'
44007	DI1 Input Mode	7806		✓	✓	0='Pulse'
44008	DI2 Input Mode	7807		✓	✓	1='KYZ'
44009	DI3 Input Mode	7808		✓	✓	...
44010	DI4 Input Mode	7809		✓	✓	...
44011 to 44044	(unused)	780A –782B				
44045	DI1 EvLog Mode	782C		✓	✓	0='Log Off'
44046	DI2 EvLog Mode	782D		✓	✓	1='Log On'
44047	DI3 EvLog Mode	782E		✓	✓	...
44048	DI4 EvLog Mode	782F		✓	✓	...
44049 to 44082	(unused)	7830 - 7851				
44083	DI1 Polarity	7852		✓	✓	0='Non-Inverting'
44084	DI2 Polarity	7853		✓	✓	1='Inverting'
44085	DI3 Polarity	7854		✓	✓	...
44086	DI4 Polarity	7855		✓	✓	...
44087 to 44120	(unused)	7856 - 7877				
44121	DO1 EvLog Mode	7878	✓	✓	✓	0='Log Off'
44122	DO2 EvLog Mode	7879	✓	✓	✓	1='Log On'
44123	DO3 EvLog Mode	787A	✓	✓	✓	...
44124	DO4 EvLog Mode	787B	✓	✓	✓	...
44125	DO5 EvLog Mode	787C	✓	✓	✓	...
44126 to 44150	(unused)	787D - 7895				
44151	DO1 Polarity	7896	✓	✓	✓	0='Non-Inverting'
44152	DO2 Polarity	7897	✓	✓	✓	1='Inverting'
44153	DO3 Polarity	7898	✓	✓	✓	...
44154	DO4 Polarity	7899	✓	✓	✓	...
44155	DO5 Polarity	789A	✓	✓	✓	...

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44156 to 44180	(unused)	789B – 78B3				
44181	PU1 OutputMode	78B4	✓	✓	✓	0='Pulse'
44182	PU2 OutputMode	78B5	✓	✓	✓	1='KYZ'
44183	PU3 OutputMode	78B6	✓	✓	✓	...
44184	PU4 OutputMode	78B7	✓	✓	✓	...
44185	PU5 OutputMode	78B8	✓	✓	✓	...
44186 to 44190	(unused)	78B9 – 78BD				
44191	PU1 Polarity	78BE	✓	✓	✓	0='Non-Inverting'
44192	PU2 Polarity	78BF	✓	✓	✓	1='Inverting'
44193	PU3 Polarity	78C0	✓	✓	✓	...
44194	PU4 Polarity	78C1	✓	✓	✓	...
44195	PU5 Polarity	78C2	✓	✓	✓	...
44196 to 44216	(unused)	78C3 – 78D7				
44217	IN1 Mode	78D8	✓	✓	✓	0='Forward'
44218	IN2 Mode	78D9	✓	✓	✓	1='Reverse'
44219	IN3 Mode	78DA	✓	✓	✓	2='Absolute'
44220	IN4 Mode	78DB	✓	✓	✓	3='Net'
44221	IN5 Mode	78DC	✓	✓	✓	...
44222	IN6 Mode	78DD	✓	✓	✓	...
44223	IN7 Mode	78DE	✓	✓	✓	...
44224	IN8 Mode	78DF	✓	✓	✓	...
44225	IN9 Mode	78E0	✓	✓	✓	...
44226	IN10 Mode	78E1	✓	✓	✓	...
44227	IN11 Mode	78E2	✓	✓	✓	...
44228	IN12 Mode	78E3	✓	✓	✓	...
44229	IN13 Mode	78E4	✓	✓	✓	...
44230	IN14 Mode	78E5	✓	✓	✓	...
44231	IN15 Mode	78E6	✓	✓	✓	...
44232	IN16 Mode	78E7	✓	✓	✓	...
44233	SP1 Input Mode	78E8		✓	✓	0='Signed'
44234	SP2 Input Mode	78E9		✓	✓	1='Absolute'
44235	SP3 Input Mode	78EA		✓	✓	...
44236	SP4 Input Mode	78EB		✓	✓	...
44237	SP5 Input Mode	78EC		✓	✓	...
44238	SP6 Input Mode	78ED		✓	✓	...
44239	SP7 Input Mode	78EE		✓	✓	...
44240	SP8 Input Mode	78EF		✓	✓	...
44241	SP9 Input Mode	78F0		✓	✓	...
44242	SP10 Input Mode	78F1		✓	✓	...
44243	SP11 Input Mode	78F2		✓	✓	...

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44244	SP12 Input Mode	78F3		✓	✓	...
44245 to 44256	(unused)	78F4 – 78FF				
44257	SP1 Eval Mode	7900		✓	✓	0='LessThan'
44258	SP2 Eval Mode	7901		✓	✓	1='GreaterThan'
44259	SP3 Eval Mode	7902		✓	✓	...
44260	SP4 Eval Mode	7903		✓	✓	...
44261	SP5 Eval Mode	7904		✓	✓	...
44262	SP6 Eval Mode	7905		✓	✓	...
44263	SP7 Eval Mode	7906		✓	✓	...
44264	SP8 Eval Mode	7907		✓	✓	...
44265	SP9 Eval Mode	7908		✓	✓	...
44266	SP10 Eval Mode	7909		✓	✓	...
44267	SP11 Eval Mode	790A		✓	✓	...
44268	SP12 Eval Mode	790B		✓	✓	...
44269 to 44280	(unused)	790C – 7917				
44281	RE1 RecordMode	7918		✓	✓	0='Circular'
44282	RE2 RecordMode	7919		✓	✓	1='Stop-when-Full'
44283	RE3 RecordMode	791A			✓	...
44284	RE4 RecordMode	791B			✓	...
44285	RE5 RecordMode	791C			✓	...
44286	RE6 RecordMode	791D			✓	...
44287 to 44300	(unused)	791E – 792B				
44301	WRE1 RecordMode	792C			✓	0='Circular'
44302	WRE2 RecordMode	792D			✓	1='Stop-when-Full'
44303	WRE3 RecordMode	792E			✓	...
44304	WRE4 RecordMode	792F			✓	...
44305	WRE5 RecordMode	7930			✓	...
44306	WRE6 RecordMode	7931			✓	...
44307 to 44312	(unused)	7932 – 7937				
44313	WRE1 Format	7938			✓	0='64x16'
44314	WRE2 Format	7939			✓	1='32x12'
44315	WRE3 Format	793A			✓	2='32x28'
44316	WRE4 Format	793B			✓	3='16x24'
44317	WRE5 Format	793C			✓	4='16x48'
44318	WRE6 Format	793D			✓	...
44319 to 44344	(unused)	791E – 7957				
44345	PT1 Sync Mode	7958		✓	✓	0='No Trig on Sync'
44346	PT2 Sync Mode	7959		✓	✓	1='Trigger on Sync'
44347	PT3 Sync Mode	795A		✓	✓	
44348	PT4 Sync Mode	795B		✓	✓	

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44349	PT5 Sync Mode	795C		✓	✓	
44350	PT6 Sync Mode	795D		✓	✓	
44351	PT7 Sync Mode	795E		✓	✓	
44352	PT8 Sync Mode	795F		✓	✓	
44353	PT9 Sync Mode	7960		✓	✓	
44354	PT10 Sync Mode	7961		✓	✓	
44355 to 44364	(unused)	7962 – 796B				
44365	CN1 Count Mode	796C		✓	✓	0='Up'
44366	CN2 Count Mode	796D		✓	✓	1='Down'
44367	CN3 Count Mode	796E		✓	✓	...
44368	CN4 Count Mode	796F		✓	✓	...
44369	CN5 Count Mode	7970		✓	✓	...
44370	CN6 Count Mode	7971		✓	✓	...
44371	CN7 Count Mode	7972		✓	✓	...
44372	CN8 Count Mode	7973		✓	✓	...
44373	CN9 Count Mode	7974		✓	✓	...
44374	CN10 Count Mode	7975		✓	✓	...
44375	AN1 Mode	7976		✓	✓	0='AND'
44376	AN2 Mode	7977		✓	✓	1='NAND'
44377	AN3 Mode	7978		✓	✓	2='OR'
44378	AN4 Mode	7979		✓	✓	3='NOR'
44379	AN5 Mode	797A		✓	✓	
44380	AN6 Mode	797B		✓	✓	
44381	AN7 Mode	797C		✓	✓	
44382	AN8 Mode	797D		✓	✓	
44383	AN1 EvLog Mode	797E		✓	✓	0='Log Off'
44384	AN2 EvLog Mode	797F		✓	✓	1='Log On'
44385	AN3 EvLog Mode	7980		✓	✓	...
44386	AN4 EvLog Mode	7981		✓	✓	...
44387	AN5 EvLog Mode	7982		✓	✓	...
44388	AN6 EvLog Mode	7983		✓	✓	...
44389	AN7 EvLog Mode	7984		✓	✓	...
44390	AN8 EvLog Mode	7985		✓	✓	...
44391	CM1 Comm Mode	7986	✓	✓	✓	1='RS485'
44392	CM1 Baud Rate	7987	✓	✓	✓	1='1200' 2='2400' 3='4800' 4='9600' 5='19200'
44393	CM1 HshakeMode	7988	✓	✓	✓	0='RTS with Delay' 1='RTS/CTS'

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44394	CM1 RTS Level	7989	✓	✓	✓	0='Normal' 1='Inverted'
44395	CM1 CTS Level	798A	✓	✓	✓	0='Normal' 1='Inverted'
44396	FAC1 NomFreq	798B	✓	✓	✓	0='60Hz' 1='50Hz'
44397	(unused)	798C				
44398	ANI1 Port	798D	✓	✓	✓	0='Analog In 1'
44399	ANI2 Port	798E	✓	✓	✓	1='Analog In 2'
44400	ANI3 Port	798F	✓	✓	✓	2='Analog In 3'
44401	ANI4 Port	7990	✓	✓	✓	3='Analog In 4'
44402 to 44415	(unused)	7990 – 799E				
44416	ANO1 Port	799F	✓	✓	✓	0='Analog Out 1'
44417	ANO2 Port	79A0	✓	✓	✓	1='Analog Out 2'
44418	ANO3 Port	79A1	✓	✓	✓	2='Analog Out 3'
44419	ANO4 Port	79A2	✓	✓	✓	3='Analog Out 4'
44420 to 44445	(unused)	79A3 – 79BC				
44446	DO1 Port	79BD	✓	✓	✓	* Enumeration varies, depending on meter platform. Contact Technical Support for more information.
44447	DO2 Port	79BE	✓	✓	✓	*
44448	DO3 Port	79BF	✓	✓	✓	*
44449	DO4 Port	79C0	✓	✓	✓	*
44450	DO5 Port	79C1	✓	✓	✓	*
44451 to 44475	(unused)	79C2– 79DA				
44476	DI1 Port	79DB		✓	✓	*
44477	DI2 Port	79DC		✓	✓	*
44478	DI3 Port	79DD		✓	✓	*
44479	DI4 Port	79DE		✓	✓	*
44480 to 44513	(unused)	79DF – 7A00				
44514	PU1 Port	7A01	✓	✓	✓	0='NotUsed'
44515	PU2 Port	7A02	✓	✓	✓	1='PortD1'
44516	PU3 Port	7A03	✓	✓	✓	2='PortD2'
44517	PU4 Port	7A04	✓	✓	✓	3='PortD3'
44518	PU5 Port	7A05	✓	✓	✓	4='PortD4' 5='L1' 6='IR LED'
44519 to 44523	(unused)	7A06 – 7A0A				
44524	CAP1 Port	7A0B	✓	✓	✓	0='NotUsed'
44525	CAP2 Port	7A0C	✓	✓	✓	1='PortD1'
44526	CAP3 Port	7A0D	✓	✓	✓	2='PortD2'
44527	CAP4 Port	7A0E	✓	✓	✓	3='PortD3'

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44528	CAP5 Port	7A0F	✓	✓	✓	4='PortD4' 5='L1' 6='IR LED'
44529 to 44573	(unused)	7A10 – 7A3C				
44574	PG1 EvLog Mode	7A3D		✓	✓	0 = 'Log Off'
44575	PG2 EvLog Mode	7A3E		✓	✓	1 = 'Log On'
44576	PG3 EvLog Mode	7A3F		✓	✓	
44577	PG4 EvLog Mode	7A40		✓	✓	
44578	PG5 EvLog Mode	7A41		✓	✓	
44579	PG6 EvLog Mode	7A42		✓	✓	
44580	PG7 EvLog Mode	7A43		✓	✓	
44581	PG8 EvLog Mode	7A44		✓	✓	
44582 to 44586	(unused)	7A45 – 7A49				
44587	PM1 V1Polarity	7A4A	✓	✓	✓	0='Normal'
44588	PM1 V2Polarity	7A4B	✓	✓	✓	1='Inverted'
44589	PM1 V3Polarity	7A4C	✓	✓	✓	...
44590	CM2 Baud Rate	7A4D		✓	✓	1='1200'
44591	IR1 Baud Rate	7A4E	✓	✓	✓	2='2400' 3='4800' 4='9600' 5='19200'
44592 (7300)	CM1 Protocol	7A4F	✓	✓	✓	0='ION' 1='MODBUS' 3='FACTORY'
44592 (7330 & 7350)	CM1 Protocol	7A4F		✓	✓	0='ION' 1='MODBUS' 3='FACTORY' 4='DNP V3.00'
44593	CM2 Protocol	7A50		✓	✓	0='ION' 1='MODBUS' 3='FACTORY' 4='DNP V3.00'
44594 (7300)	IR1 Protocol	7A51	✓			0='ION' 1='MODBUS' 2='Infrared I/O' 3='Factory'
44594 (7330 & 7350)	IR1 Protocol	7A51		✓	✓	0='ION' 1='MODBUS' 2='Infrared I/O' 3='Factory' 4='DNP V3.00'
44595	(unused)	7A52				
44596	MSR1 Format	7A53	✓	✓	✓	0='Unsigned 16B'
44597	MSR2 Format	7A54	✓	✓	✓	1='Signed 16B'
44598	MSR3 Format	7A55	✓	✓	✓	2='Unsigned 32B'

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44599	MSR4 Format	7A56	✓	✓	✓	3='Signed 32B' 4='Unsigned 32B-M10K' 5='Signed 32B-M10K' 6='Packed Boolean'
44600	MSR1 Scaling	7A57	✓	✓	✓	0='No'
44601	MSR2 Scaling	7A58	✓	✓	✓	1='Yes'
44602	MSR3 Scaling	7A59	✓	✓	✓	...
44603	MSR4 Scaling	7A5A	✓	✓	✓	...
44604 to 44727	(unused)	7A5B – 7AD6				
44728	IN17 Mode	7AD7		✓	✓	0='Forward'
44729	IN18 Mode	7AD8		✓	✓	1='Reverse'
44730	IN19 Mode	7AD9		✓	✓	2='Absolute'
44731	IN20 Mode	7ADA		✓	✓	3='Net'
44732	IN21 Mode	7ADB		✓	✓	...
44733	IN22 Mode	7ADC		✓	✓	...
44734	IN23 Mode	7ADD		✓	✓	...
44735	IN24 Mode	7ADE		✓	✓	...
44736	IN25 Mode	7ADF		✓	✓	...
44737	IN26 Mode	7AE0		✓	✓	...
44738	IN27 Mode	7AE1		✓	✓	...
44739	IN28 Mode	7AE2		✓	✓	...
44740	IN29 Mode	7AE3		✓	✓	...
44741	IN30 Mode	7AE4		✓	✓	...
44742	CN11 Count Mode	7AE5		✓	✓	0='Up'
44743	CN12 Count Mode	7AE6		✓	✓	1='Down'
44744	CN13 Count Mode	7AE7		✓	✓	...
44745	CN14 Count Mode	7AE8		✓	✓	...
44746	CN15 Count Mode	7AE9		✓	✓	...
44747	CN16 Count Mode	7AEA		✓	✓	...
44748	CN17 Count Mode	7AEB		✓	✓	...
44749	CN18 Count Mode	7AEC		✓	✓	...
44750	CN19 Count Mode	7AED		✓	✓	...
44751	CN20 Count Mode	7AEE		✓	✓	...
44752	CN21 Count Mode	7AEF		✓	✓	...
44753	CN22 Count Mode	7AF0		✓	✓	...
44754	CN23 Count Mode	7AF1		✓	✓	...
44755	CN24 Count Mode	7AF2		✓	✓	...
44756	CN25 Count Mode	7AF3		✓	✓	...
44757	CN26 Count Mode	7AF4		✓	✓	...
44758	CN27 Count Mode	7AF5		✓	✓	...
44759	CN28 Count Mode	7AF6		✓	✓	...

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44760	CN29 Count Mode	7AF7		✓	✓	...
44761	CN30 Count Mode	7AF8		✓	✓	...
44762	AN9 Mode	7AF9		✓	✓	0='AND'
44763	AN10 Mode	7AFA		✓	✓	1='NAND' 2='OR' 3='NOR'
44764 to 44773	(unused)	7AFB – 7B04				
44774	AN9 EvLog Mode	7B05		✓	✓	0='Log Off'
44775	AN10 EvLog Mode	7B06		✓	✓	1='Log On'
44776 to 44785	(unused)	7B07 – 7B10				
44786	AL Type	7B11		✓	✓	0='Pegasys' 1='ASCII'
44787 to 44795	(unused)	7B12 – 7B1A				
44796	AL ComPort	7B1B		✓	✓	0='Comm 1' 1='Comm 2' 2='Not a port'
44797 to 44805	(unused)	7B1C – 7B24				
44806	DSE1 StaticObj	7B25		✓	✓	0 = 'Binary Input'
44807	DSE2 StaticObj	7B26		✓	✓	1 = 'Binary Counter'
44808	DSE3 StaticObj	7B27		✓	✓	2 = 'Analog Input'
44809	DSE4 StaticObj	7B28		✓	✓	...
44810	DSE5 StaticObj	7B29		✓	✓	...
44811	DSE6 StaticObj	7B2A		✓	✓	...
44812	DSE7 StaticObj	7B2B		✓	✓	...
44813	DSE8 StaticObj	7B2C		✓	✓	...
44814	DSE9 StaticObj	7B2D		✓	✓	...
44815	DSE10 StaticObj	7B2E		✓	✓	...
44816	DSE11 StaticObj	7B2F		✓	✓	...
44817	DSE12 StaticObj	7B30		✓	✓	...
44818	DSE13 StaticObj	7B31		✓	✓	...
44819	DSE14 StaticObj	7B32		✓	✓	...
44820	DSE15 StaticObj	7B33		✓	✓	...
44821	DSE16 StaticObj	7B34		✓	✓	...
44822	DSE1 EventObj	7B35		✓	✓	0 = 'Enable Event Objects'
44823	DSE2 EventObj	7B36		✓	✓	1 = 'Disable Event Objects'
44824	DSE3 EventObj	7B37		✓	✓	...
44825	DSE4 EventObj	7B38		✓	✓	...
44826	DSE5 EventObj	7B39		✓	✓	...
44827	DSE6 EventObj	7B3A		✓	✓	...
44828	DSE7 EventObj	7B3B		✓	✓	...
44829	DSE8 EventObj	7B3C		✓	✓	...

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44830	DSE9 EventObj	7B3D		✓	✓	...
44831	DSE10 EventObj	7B3E		✓	✓	...
44832	DSE11 EventObj	7B3F		✓	✓	...
44833	DSE12 EventObj	7B40		✓	✓	...
44834	DSE13 EventObj	7B41		✓	✓	...
44835	DSE14 EventObj	7B42		✓	✓	...
44836	DSE15 EventObj	7B43		✓	✓	...
44837	DSE16 EventObj	7B44		✓	✓	...
44838	DSE1 FrozStaObj	7B45		✓		0 = 'Enable Frozen Static Objects'
44839	DSE2 FrozStaObj	7B46		✓	✓	1 = 'Disable Frozen Static Objects'
44840	DSE3 FrozStaObj	7B47		✓	✓	...
44841	DSE4 FrozStaObj	7B48		✓	✓	...
44842	DSE5 FrozStaObj	7B49		✓	✓	...
44843	DSE6 FrozStaObj	7B4A		✓	✓	...
44844	DSE7 FrozStaObj	7B4B		✓	✓	...
44845	DSE8 FrozStaObj	7B4C		✓	✓	...
44846	DSE9 FrozStaObj	7B4D		✓	✓	...
44847	DSE10 FrozStaObj	7B4E		✓	✓	...
44848	DSE11 FrozStaObj	7B4F		✓	✓	...
44849	DSE12 FrozStaObj	7B50		✓	✓	...
44850	DSE13 FrozStaObj	7B51		✓	✓	...
44851	DSE14 FrozStaObj	7B52		✓	✓	...
44852	DSE15 FrozStaObj	7B53		✓	✓	...
44853	DSE16 FrozStaObj	7B54		✓	✓	...
44854	DSE1 FrozEvtObj	7B55		✓	✓	1 = 'Disable Frozen Event Objects'
44855	DSE2 FrozEvtObj	7B56		✓	✓	...
44856	DSE3 FrozEvtObj	7B57		✓	✓	...
44857	DSE4 FrozEvtObj	7B58		✓	✓	...
44858	DSE5 FrozEvtObj	7B59		✓	✓	...
44859	DSE6 FrozEvtObj	7B5A		✓	✓	...
44860	DSE7 FrozEvtObj	7B5B		✓	✓	...
44861	DSE8 FrozEvtObj	7B5C		✓	✓	...
44862	DSE9 FrozEvtObj	7B5D		✓	✓	...
44863	DSE10 FrozEvtObj	7B5E		✓	✓	...
44864	DSE11 FrozEvtObj	7B5F		✓	✓	...
44865	DSE12 FrozEvtObj	7B60		✓	✓	...
44866	DSE13 FrozEvtObj	7B61		✓	✓	...
44867	DSE14 FrozEvtObj	7B62		✓	✓	...
44868	DSE15 FrozEvtObj	7B63		✓	✓	...
44869	DSE16 FrozEvtObj	7B64		✓	✓	...

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44870	DSE1 EventClassObj	7B65		✓	✓	0 = 'Class 1'
44871	DSE2 EventClassObj	7B66		✓	✓	1 = 'Class 2'
44872	DSE3 EventClassObj	7B67		✓	✓	2 = 'Class 3'
44873	DSE4 EventClassObj	7B68		✓	✓	...
44874	DSE5 EventClassObj	7B69		✓	✓	...
44875	DSE6 EventClassObj	7B6A		✓	✓	...
44876	DSE7 EventClassObj	7B6B		✓	✓	...
44877	DSE8 EventClassObj	7B6C		✓	✓	...
44878	DSE9 EventClassObj	7B6D		✓	✓	...
44879	DSE10 EventClassObj	7B6E		✓	✓	...
44880	DSE11 EventClassObj	7B6F		✓	✓	...
44881	DSE12 EventClassObj	7B70		✓	✓	...
44882	DSE13 EventClassObj	7B71		✓	✓	...
44883	DSE14 EventClassObj	7B72		✓	✓	...
44884	DSE15 EventClassObj	7B73		✓	✓	...
44885	DSE16 EventClassObj	7B74		✓	✓	...
44886	DSE1 ScalingObj	7B75		✓	✓	0 = 'ON'
44887	DSE2 ScalingObj	7B76		✓	✓	1 = 'OFF'
44888	DSE3 ScalingObj	7B77		✓	✓	...
44889	DSE4 ScalingObj	7B78		✓	✓	...
44890	DSE5 ScalingObj	7B79		✓	✓	...
44891	DSE6 ScalingObj	7B7A		✓	✓	...
44892	DSE7 ScalingObj	7B7B		✓	✓	...
44893	DSE8 ScalingObj	7B7C		✓	✓	...
44894	DSE9 ScalingObj	7B7D		✓	✓	...
44895	DSE10 ScalingObj	7B7E		✓	✓	...
44896	DSE11 ScalingObj	7B7F		✓	✓	...
44897	DSE12 ScalingObj	7B80		✓	✓	...
44898	DSE13 ScalingObj	7B81		✓	✓	...
44899	DSE14 ScalingObj	7B82		✓	✓	...
44900	DSE15 ScalingObj	7B83		✓	✓	...
44901	DSE16 ScalingObj	7B84		✓	✓	...
44902	DSI1 DNPOBJGrp	7B85		✓	✓	0 = 'Analog Output'
44903	DSI2 DNPOBJGrp	7B86		✓	✓	1 = 'Binary Output'
44904	DSI3 DNPOBJGrp	7B87		✓	✓	...
44905	DSI4 DNPOBJGrp	7B88		✓	✓	...
44906 to 44917	(unused)	7B89 – 7B94				
44918	DSO1 BinInStatic	7B95		✓	✓	0 = 'Single-Bit Binary Input' 1 = 'Binary Input With Status'

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
44919	DSO1 BinInEvents	7B96		✓	✓	0 = 'Binary Input Change Without Time' 1 = 'Binary Input Change With Time'
44920	DSO1 BinCntStatic	7B97		✓	✓	0 = '32-Bit Binary Counter' 1 = '32-Bit Binary Counter Without Flag' 2 = '16-Bit Binary Counter' 3 = '16-Bit Binary Counter Without Flag'
44921	DSO1 FrzCntStatic	7B98		✓	✓	0 = '32-Bit Frozen Counter' 1 = '32-Bit Frozen Counter Without Flag' 3 = '16-Bit Frozen Counter" 4 = '16-Bit Frozen Counter Without Flag'
44922	DSO1 FrzCntEvents	7B99		✓	✓	4 = 'Frozen Counter Events Not Supported'
44923	DSO1 CntChangeEvents	7B9A		✓	✓	0 = '32-Bit Counter Change Event Without Time' 2 = '16-Bit Counter Change Event Without Time'
44924	DSO1 AIStatic	7B9B		✓	✓	0 = '32-Bit Analog Input' 1 = '32-Bit Analog Input Without Flag' 2 = '16-Bit Analog Input' 3 = '16-Bit Analog Input Without Flag'
44925	DSO1 FrzAIStatic	7B9C		✓	✓	4 = 'Frozen Analog Inputs Not Supported'
44926	DSO1 FrzAIEvents	7B9D		✓	✓	4 = 'Frozen Analog Events Not Supported'
44927	DSO1 AIChangeEvents	7B9E		✓	✓	0 = '32-Bit Analog Change Event Without Time' 2 = '16-Bit Analog Change Event Without Time'
44928	DSO1 AOStatic	7B9F		✓	✓	1 = '16-Bit Analog Output Status'
44929	DSO1 DLAck	7BA0		✓	✓	0 = 'Always' 1 = 'Multi-Packet Only' 2 = 'Never'
44930 to 44951	(unused)	7BA1 – 7BB6				
44952	CL1 Time Sync Source	7BB7		✓	✓	0 = 'COM1' 1 = 'COM2' 2 = 'IR1'
44953	CL1 Time Sync Type	7BB8		✓	✓	0 = 'UTC' 1 = 'LOCAL'
44954	DIS1 Screen Type	7BB9	✓	✓	✓	0 = 'Disabled'
44955	DIS2 Screen Type	7BBA	✓	✓	✓	1 = 'One Parameter'
44956	DIS3 Screen Type	7BBB	✓	✓	✓	2 = 'Two Parameter'
44957	DIS4 Screen Type	7BBC	✓	✓	✓	3 = 'Three Parameter'
44958	DIS5 Screen Type	7BBD	✓	✓	✓	4 = 'Four Parameter'
44959	DIS6 Screen Type	7BBE	✓	✓	✓	
44960	DIS7 Screen Type	7BBF	✓	✓	✓	
44961	DIS8 Screen Type	7BC0	✓	✓	✓	
44962 to 45041	(unused)	7BC1 – 7C10				
45042	DOP1 Disp Update Time	7C11	✓	✓	✓	0 = '1 s' 1 = '2 s' 2 = '3 s' 3 = '4 s' 4 = '5 s' 5 = '6 s'
45043 to 45044	(unused)	7C12 – 7C13				
45045	DSI1 RelayMode	7C14		✓	✓	0 = '1 point per address'

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
45046	DSI2 RelayMode	7C15		✓	✓	1 = '2 points per address'
45047	DSI3 RelayMode	7C16		✓	✓	…
45048	DSI4 RelayMode	7C17		✓	✓	…
45049 to 45060	(unused)	7C18 – 7C23				
45061	CL1 Clock Source	7C24		✓	✓	0 = 'Internal'
45062	IN31 Mode	7C25		✓	✓	0 = 'Forward'
45063	IN32 Mode	7C26		✓	✓	0 = 'Reverse'
45064	IN33 Mode	7C27		✓	✓	0 = 'Absolute'
45065	IN34 Mode	7C28		✓	✓	0 = 'Net'
45066	IN35 Mode	7C29		✓	✓	…
45067 to 45101	(unused)	7C2A– 7C4C				
45102	DOP1 Auto Scroll	7C4D	✓	✓	✓	0 = 'Disable' 1 = '1 s' 2 = '2 s' 3 = '3 s' 4 = '4 s' 5 = '5 s' 6 = '6 s'
45103	DOP1 Display Mode	7C4E	✓	✓	✓	0 = 'Programmable' 1 = 'Fixed'
45104	PG9 EvLog Mode	7C4F		✓	✓	0 = 'Log Off'
45105	PG10 EvLog Mode	7C50		✓	✓	1 = 'Log On'
45106 to 45195	(unused)	7C51 – 7CAA				
45196	MSR5 Format	7CAB	✓	✓	✓	0='Unsigned 16B'
45197	MSR6 Format	7CAC	✓	✓	✓	1='Signed 16B'
45198	MSR7 Format	7CAD	✓	✓	✓	2='Unsigned 32B'
45199	MSR8 Format	7CAE	✓	✓	✓	3='Signed 32B'
45200	MSR9 Format	7CAF	✓	✓	✓	4='Unsigned 32B-M10K'
45201	MSR10 Format	7CB0	✓	✓	✓	5='Signed 32B-M10K' 6='Packed Boolean'
45202	MSR5 Scaling	7CB1	✓	✓	✓	0='No'
45203	MSR6 Scaling	7CB2	✓	✓	✓	1='Yes'
45204	MSR7 Scaling	7CB3	✓	✓	✓	…
45205	MSR8 Scaling	7CB4	✓	✓	✓	…
45206	MSR9 Scaling	7CB5	✓	✓	✓	…
45207	MSR10 Scaling	7CB6	✓	✓	✓	…
45208 to 45649	(unused)	7CB7 – 7E70				
45650	CAP1 Int Mode	7E71	✓	✓	✓	0='KYZ'
45651	CAP2 Int Mode	7E72	✓	✓	✓	1='Pulsing'
45652	CAP3 Int Mode	7E73	✓	✓	✓	
45653	CAP4 Int Mode	7E74	✓	✓	✓	
45654	CAP5 Int Mode	7E75	✓	✓	✓	
45655 to 45659	(unused)	7E75 – 7E7A				

Modbus Register	ION Register	ION Handle	ION7300	ION7330	ION7350	Enumeration
45660	CAP1 Output Mode	7E7B	✓	✓	✓	0='Non-Inverting'
45661	CAP2 Output Mode	7E7C	✓	✓	✓	1='Inverting'
45662	CAP3 Output Mode	7E7D	✓	✓	✓	
45663	CAP4 Output Mode	7E7E	✓	✓	✓	
45664	CAP5 Output Mode	7E7F	✓	✓	✓	

Numeric Bounded Setup Registers

All ION module NUMERIC BOUNDED setup registers are available to be read and written via Modbus. This section defines how these registers appear as Modbus registers.

How to interpret this table: Registers are ordered by Modbus register address, and grouped by numeric bounds. Each ION register (32-bit integer) spans two 16-bit Modbus registers. The first Modbus register of the pair represents the high order word of the 32-bit value. The second Modbus register represents the low order word. The 32-bit value read from or written to a Numeric Bounded Setup register via Modbus is represented as a 32-bit signed integer value, therefore the range of possible values is -2,147,483,648 to +2,147,483,647.

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46001 to 46002	PM1 PT Prim	7000	✓	✓	✓	1	999999
46003 to 46004	PM1 PT Sec	7001	✓	✓	✓	1	999999
46005 to 46006	PM1 CT Prim	7002	✓	✓	✓	1	999999
46007 to 46008	PM1 CT Sec	7003	✓	✓	✓	1	999999
46009 to 46012	(unused)	7004 - 7005					
46013 to 46014	ANI1 Zero Scale	7006	✓	✓	✓	-1000000000	1000000000
46015 to 46016	ANI2 Zero Scale	7007	✓	✓	✓	-1000000000	1000000000
46017 to 46018	ANI3 Zero Scale	7008	✓	✓	✓	-1000000000	1000000000
46019 to 46020	ANI4 Zero Scale	7009	✓	✓	✓	-1000000000	1000000000
46021 to 46048	(unused)	700A - 7017					
46049 to 46050	ANI1 Full Scale	7018	✓	✓	✓	-1000000000	1000000000
46051 to 46052	ANI2 Full Scale	7019	✓	✓	✓	-1000000000	1000000000
46053 to 46054	ANI3 Full Scale	701A	✓	✓	✓	-1000000000	1000000000
46055 to 46056	ANI4 Full Scale	701B	✓	✓	✓	-1000000000	1000000000
46057 to 46284	(unused)	701C - 7029					
46085 to 46086	ANO1 Zero Scale	702A	✓	✓	✓	-1000000000	1000000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46087 to 46088	ANO2 Zero Scale	702B	✓	✓	✓	-1000000000	1000000000
46089 to 46090	ANO3 Zero Scale	702C	✓	✓	✓	-1000000000	1000000000
46091 to 46092	ANO4 Zero Scale	702D	✓	✓	✓	-1000000000	1000000000
46093 to 46144	(unused)	702E - 7047					
46145 to 46146	ANO1 Full Scale	7048	✓	✓	✓	-1000000000	1000000000
46147 to 46148	ANO2 Full Scale	7049	✓	✓	✓	-1000000000	1000000000
46149 to 46150	ANO3 Full Scale	704A	✓	✓	✓	-1000000000	1000000000
46151 to 46152	ANO4 Full Scale	704B	✓	✓	✓	-1000000000	1000000000
46153 to 46280	(unused)	704C - 708B					
46281 to 46282	DO1 PulseWidth	708C	✓	✓	✓	0	2000000
46283 to 46284	DO2 PulseWidth	708D	✓	✓	✓	0	2000000
46285 to 46286	DO3 PulseWidth	708E	✓	✓	✓	0	2000000
46287 to 46288	DO4 PulseWidth	708F	✓	✓	✓	0	2000000
46289 to 46290	DO5 PulseWidth	7090	✓	✓	✓	0	2000000
46291to 46340	(unused)	7091 - 70A9					
46341 to 46342	PU1 PulseWidth	70AA	✓	✓	✓	1	2000000
46343 to 46344	PU2 PulseWidth	70AB	✓	✓	✓	1	2000000
46345 to 46346	PU3 PulseWidth	70AC	✓	✓	✓	1	2000000
46347 to 46348	PU4 PulseWidth	70AD	✓	✓	✓	1	2000000
46349 to 46350	PU5 PulseWidth	70AE	✓	✓	✓	1	2000000
46351to 46360	(unused)	70AF - 70B3					
46361 to 46362	SWD1 Sub Intvl	70B4	✓	✓	✓	1	5940
46363 to 46364	SWD2 Sub Intvl	70B5	✓	✓	✓	1	5940
46365 to 46366	SWD3 Sub Intvl	70B6	✓	✓	✓	1	5940
46367 to 46368	SWD4 Sub Intvl	70B7	✓	✓	✓	1	5940
46369 to 46370	SWD5 Sub Intvl	70B8	✓	✓	✓	1	5940
46371 to 46372	SWD6 Sub Intvl	70B9	✓	✓	✓	1	5940
46373 to 46374	SWD7 Sub Intvl	70BA	✓	✓	✓	1	5940
46375 to 46376	SWD8 Sub Intvl	70BB	✓	✓	✓	1	5940
46377 to 46378	SWD9 Sub Intvl	70BC	✓	✓	✓	1	5940
46379 to 46380	SWD10 Sub Intvl	70BD	✓	✓	✓	1	5940
46381 to 46382	SWD11 Sub Intvl	70BE	✓	✓	✓	1	5940
46383 to 46384	SWD12 Sub Intvl	70BF	✓	✓	✓	1	5940
46385 to 46386	SWD13 Sub Intvl	70C0	✓	✓	✓	1	5940
46387 to 46388	SWD14 Sub Intvl	70C1	✓	✓	✓	1	5940
46389 to 46390	SWD15 Sub Intvl	70C2	✓	✓	✓	1	5940
46391 to 46392	SWD16 Sub Intvl	70C3	✓	✓	✓	1	5940

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46393 to 46394	SWD1 #SubIntvls	70C4	✓	✓	✓	1	15
46395 to 46396	SWD2 #SubIntvls	70C5	✓	✓	✓	1	15
46397 to 46398	SWD3 #SubIntvls	70C6	✓	✓	✓	1	15
46399 to 46400	SWD4 #SubIntvls	70C7	✓	✓	✓	1	15
46401 to 46402	SWD5 #SubIntvls	70C8	✓	✓	✓	1	15
46403 to 46404	SWD6 #SubIntvls	70C9	✓	✓	✓	1	15
46405 to 46406	SWD7 #SubIntvls	70CA	✓	✓	✓	1	15
46407 to 46408	SWD8 #SubIntvls	70CB	✓	✓	✓	1	15
46409 to 46410	SWD9 #SubIntvls	70CC	✓	✓	✓	1	15
46411 to 46412	SWD10 #SubIntvls	70CD	✓	✓	✓	1	15
46413 to 46414	SWD11 #SubIntvls	70CE	✓	✓	✓	1	15
46415 to 46416	SWD12 #SubIntvls	70CF	✓	✓	✓	1	15
46417 to 46418	SWD13 #SubIntvls	70D0	✓	✓	✓	1	15
46419 to 46420	SWD14 #SubIntvls	70D1	✓	✓	✓	1	15
46421 to 46422	SWD15 #SubIntvls	70D2	✓	✓	✓	1	15
46423 to 46424	SWD16 #SubIntvls	70D3	✓	✓	✓	1	15
46425 to 46426	SWD1 Pred Resp	70D4	✓	✓	✓	0	99
46427 to 46428	SWD2 Pred Resp	70D5	✓	✓	✓	0	99
46429 to 46430	SWD3 Pred Resp	70D6	✓	✓	✓	0	99
46431 to 46432	SWD4 Pred Resp	70D7	✓	✓	✓	0	99
46433 to 46434	SWD5 Pred Resp	70D8	✓	✓	✓	0	99
46435 to 46436	SWD6 Pred Resp	70D9	✓	✓	✓	0	99
46437 to 46438	SWD7 Pred Resp	70DA	✓	✓	✓	0	99
46439 to 46440	SWD8 Pred Resp	70DB	✓	✓	✓	0	99
46441 to 46442	SWD9 Pred Resp	70DC	✓	✓	✓	0	99
46443 to 46444	SWD10 Pred Resp	70DD	✓	✓	✓	0	99
46445 to 46446	SWD11 Pred Resp	70DE	✓	✓	✓	0	99
46447 to 46448	SWD12 Pred Resp	70DF	✓	✓	✓	0	99
46449 to 46450	SWD13 Pred Resp	70E0	✓	✓	✓	0	99
46451 to 46452	SWD14 Pred Resp	70E1	✓	✓	✓	0	99
46453 to 46454	SWD15 Pred Resp	70E2	✓	✓	✓	0	99
46455 to 46456	SWD16 Pred Resp	70E3	✓	✓	✓	0	99
46457 to 46458	TD1 Interval	70E4	✓	✓	✓	60	5940
46459 to 46460	TD2 Interval	70E5	✓	✓	✓	60	5940
46461 to 46462	TD3 Interval	70E6	✓	✓	✓	60	5940
46463 to 46464	TD4 Interval	70E7	✓	✓	✓	60	5940
46465 to 46466	TD5 Interval	70E8	✓	✓	✓	60	5940

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46467 to 46468	TD6 Interval	70E9	✓	✓	✓	60	5940
46469 to 46470	TD7 Interval	70EA	✓	✓	✓	60	5940
46471 to 46472	TD8 Interval	70EB	✓	✓	✓	60	5940
46473 to 46474	TD9 Interval	70EC	✓	✓	✓	60	5940
46475 to 46476	TD10 Interval	70ED	✓	✓	✓	60	5940
46477 to 46478	TD11 Interval	70EE	✓	✓	✓	60	5940
46479 to 46480	TD12 Interval	70EF	✓	✓	✓	60	5940
46481 to 46482	TD13 Interval	70F0	✓	✓	✓	60	5940
46483 to 46484	TD14 Interval	70F1	✓	✓	✓	60	5940
46485 to 46486	TD15 Interval	70F2	✓	✓	✓	60	5940
46487 to 46488	TD16 Interval	70F3	✓	✓	✓	60	5940
46489 to 46490	TD1 Time Const	70F4	✓	✓	✓	1	99
46491 to 46492	TD2 Time Const	70F5	✓	✓	✓	1	99
46493 to 46494	TD3 Time Const	70F6	✓	✓	✓	1	99
46495 to 46496	TD4 Time Const	70F7	✓	✓	✓	1	99
46497 to 46498	TD5 Time Const	70F8	✓	✓	✓	1	99
46499 to 46500	TD6 Time Const	70F9	✓	✓	✓	1	99
46501 to 46502	TD7 Time Const	70FA	✓	✓	✓	1	99
46503 to 46504	TD8 Time Const	70FB	✓	✓	✓	1	99
46505 to 46506	TD9 Time Const	70FC	✓	✓	✓	1	99
46507 to 46508	TD10 Time Const	70FD	✓	✓	✓	1	99
46509 to 46510	TD11 Time Const	70FE	✓	✓	✓	1	99
46511 to 46512	TD12 Time Const	70FF	✓	✓	✓	1	99
46513 to 46514	TD13 Time Const	7100	✓	✓	✓	1	99
46515 to 46516	TD14 Time Const	7101	✓	✓	✓	1	99
46517 to 46518	TD15 Time Const	7102	✓	✓	✓	1	99
46519 to 46520	TD16 Time Const	7103	✓	✓	✓	1	99
46521 to 46522	IN1 Divisor	7104	✓	✓	✓	1	1000000000
46523 to 46524	IN2 Divisor	7105	✓	✓	✓	1	1000000000
46525 to 46526	IN3 Divisor	7106	✓	✓	✓	1	1000000000
46527 to 46528	IN4 Divisor	7107	✓	✓	✓	1	1000000000
46529 to 46530	IN5 Divisor	7108	✓	✓	✓	1	1000000000
46531 to 46532	IN6 Divisor	7109	✓	✓	✓	1	1000000000
46533 to 46534	IN7 Divisor	710A	✓	✓	✓	1	1000000000
46535 to 46536	IN8 Divisor	710B	✓	✓	✓	1	1000000000
46537 to 46538	IN9 Divisor	710C	✓	✓	✓	1	1000000000
46539 to 46540	IN10 Divisor	710D	✓	✓	✓	1	1000000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46541 to 46542	IN11 Divisor	710E	✓	✓	✓	1	1000000000
46543 to 46544	IN12 Divisor	710F	✓	✓	✓	1	1000000000
46545 to 46546	IN13 Divisor	7110	✓	✓	✓	1	1000000000
46547 to 46548	IN14 Divisor	7111	✓	✓	✓	1	1000000000
46549 to 46550	IN15 Divisor	7112	✓	✓	✓	1	1000000000
46551 to 46552	IN16 Divisor	7113	✓	✓	✓	1	1000000000
46553 to 46554	IN1 Valu/Pulse	7114	✓	✓	✓	0	1000000000
46555 to 46556	IN2 Valu/Pulse	7115	✓	✓	✓	0	1000000000
46557 to 46558	IN3 Valu/Pulse	7116	✓	✓	✓	0	1000000000
46559 to 46560	IN4 Valu/Pulse	7117	✓	✓	✓	0	1000000000
46561 to 46562	IN5 Valu/Pulse	7118	✓	✓	✓	0	1000000000
46563 to 46564	IN6 Valu/Pulse	7119	✓	✓	✓	0	1000000000
46565 to 46566	IN7 Valu/Pulse	711A	✓	✓	✓	0	1000000000
46567 to 46568	IN8 Valu/Pulse	711B	✓	✓	✓	0	1000000000
46569 to 46570	IN9 Valu/Pulse	711C	✓	✓	✓	0	1000000000
46571 to 46572	IN10 Valu/Pulse	711D	✓	✓	✓	0	1000000000
46573 to 46574	IN11 Valu/Pulse	711E	✓	✓	✓	0	1000000000
46575 to 46576	IN12 Valu/Pulse	711F	✓	✓	✓	0	1000000000
46577 to 46578	IN13 Valu/Pulse	7120	✓	✓	✓	0	1000000000
46579 to 46580	IN14 Valu/Pulse	7121	✓	✓	✓	0	1000000000
46581 to 46582	IN15 Valu/Pulse	7122	✓	✓	✓	0	1000000000
46583 to 46584	IN16 Valu/Pulse	7123	✓	✓	✓	0	1000000000
46585 to 46586	SP1 High Limit	7124		✓	✓	-1000000000	1000000000
46587 to 46588	SP2 High Limit	7125		✓	✓	-1000000000	1000000000
46589 to 46590	SP3 High Limit	7126		✓	✓	-1000000000	1000000000
46591 to 46592	SP4 High Limit	7127		✓	✓	-1000000000	1000000000
46593 to 46594	SP5 High Limit	7128		✓	✓	-1000000000	1000000000
46595 to 46596	SP6 High Limit	7129		✓	✓	-1000000000	1000000000
46597 to 46598	SP7 High Limit	712A		✓	✓	-1000000000	1000000000
46599 to 46600	SP8 High Limit	712B		✓	✓	-1000000000	1000000000
46601 to 46602	SP9 High Limit	712C		✓	✓	-1000000000	1000000000
46603 to 46604	SP10 High Limit	712D		✓	✓	-1000000000	1000000000
46605 to 46606	SP11 High Limit	712E		✓	✓	-1000000000	1000000000
46607 to 46608	SP12 High Limit	712F		✓	✓	-1000000000	1000000000
46609to 46632	(unused)	7130 - 713B					
46633 to 46634	SP1 Low Limit	713C		✓	✓	-1000000000	1000000000
46635 to 46636	SP2 Low Limit	713D		✓	✓	-1000000000	1000000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46637 to 46638	SP3 Low Limit	713E		✓	✓	-1000000000	1000000000
46639 to 46640	SP4 Low Limit	713F		✓	✓	-1000000000	1000000000
46641 to 46642	SP5 Low Limit	7140		✓	✓	-1000000000	1000000000
46643 to 46644	SP6 Low Limit	7141		✓	✓	-1000000000	1000000000
46645 to 46646	SP7 Low Limit	7142		✓	✓	-1000000000	1000000000
46647 to 46648	SP8 Low Limit	7143		✓	✓	-1000000000	1000000000
46649 to 46650	SP9 Low Limit	7144		✓	✓	-1000000000	1000000000
46651 to 46652	SP10 Low Limit	7145		✓	✓	-1000000000	1000000000
46653 to 46654	SP11 Low Limit	7146		✓	✓	-1000000000	1000000000
46655 to 46656	SP12 Low Limit	7147		✓	✓	-1000000000	1000000000
46657to 46680	(unused)	7148 - 7153					
46681 to 46682	SP1 SusUntlON	7154		✓	✓	0	3600
46683 to 46684	SP2 SusUntlON	7155		✓	✓	0	3600
46685 to 46686	SP3 SusUntlON	7156		✓	✓	0	3600
46687 to 46688	SP4 SusUntlON	7157		✓	✓	0	3600
46689 to 46690	SP5 SusUntlON	7158		✓	✓	0	3600
46691 to 46692	SP6 SusUntlON	7159		✓	✓	0	3600
46693 to 46694	SP7 SusUntlON	715A		✓	✓	0	3600
46695 to 46696	SP8 SusUntlON	715B		✓	✓	0	3600
46697 to 46698	SP9 SusUntlON	715C		✓	✓	0	3600
46699 to 46700	SP10 SusUntlON	715D		✓	✓	0	3600
46701 to 46702	SP11 SusUntlON	715E		✓	✓	0	3600
46703 to 46704	SP12 SusUntlON	715F		✓	✓	0	3600
46705to 46728	(unused)	7160 - 716B					
46729 to 46730	SP1 SusUntlOFF	716C		✓	✓	0	3600
46731 to 46732	SP2 SusUntlOFF	716D		✓	✓	0	3600
46733 to 46734	SP3 SusUntlOFF	716E		✓	✓	0	3600
46735 to 46736	SP4 SusUntlOFF	716F		✓	✓	0	3600
46737 to 46738	SP5 SusUntlOFF	7170		✓	✓	0	3600
46739 to 46740	SP6 SusUntlOFF	7171		✓	✓	0	3600
46741 to 46742	SP7 SusUntlOFF	7172		✓	✓	0	3600
46743 to 46744	SP8 SusUntlOFF	7173		✓	✓	0	3600
46745 to 46746	SP9 SusUntlOFF	7174		✓	✓	0	3600
46747 to 46748	SP10 SusUntlOFF	7175		✓	✓	0	3600
46749 to 46750	SP11 SusUntlOFF	7176		✓	✓	0	3600
46751 to 46752	SP12 SusUntlOFF	7177		✓	✓	0	3600
46753to 46776	(unused)	7178 - 7183					

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46777 to 46778	SP1 EvPriority	7184		✓	✓	0	255
46779 to 46780	SP2 EvPriority	7185		✓	✓	0	255
46781 to 46782	SP3 EvPriority	7186		✓	✓	0	255
46783 to 46784	SP4 EvPriority	7187		✓	✓	0	255
46785 to 46786	SP5 EvPriority	7188		✓	✓	0	255
46787 to 46788	SP6 EvPriority	7189		✓	✓	0	255
46789 to 46790	SP7 EvPriority	718A		✓	✓	0	255
46791 to 46792	SP8 EvPriority	718B		✓	✓	0	255
46793 to 46794	SP9 EvPriority	718C		✓	✓	0	255
46795 to 46796	SP10 EvPriority	718D		✓	✓	0	255
46797 to 46798	SP11 EvPriority	718E		✓	✓	0	255
46799 to 46800	SP12 EvPriority	718F		✓	✓	0	255
46801to 46824	(unused)	7190 - 719B					
46825 to 46826	RE1 Depth	719C		✓	✓	0	2000000000
46827 to 46828	RE2 Depth	719D		✓	✓	0	2000000000
46829 to 46830	RE3 Depth	719E			✓	0	2000000000
46831 to 46832	RE4 Depth	719F			✓	0	2000000000
46833 to 46834	RE5 Depth	71A0			✓	0	2000000000
46835 to 46836	RE6 Depth	71A1			✓	0	2000000000
46837to 46864	(unused)	71A2 - 71CF					
46865 to 46866	WRE1 Depth	71B0			✓	0	2000000000
46867 to 46868	WRE2 Depth	71B1			✓	0	2000000000
46869 to 46870	WRE3 Depth	71B2			✓	0	2000000000
46871 to 46872	WRE4 Depth	71B3			✓	0	2000000000
46873 to 46874	WRE5 Depth	71B4			✓	0	2000000000
46875 to 46876	WRE6 Depth	71B5			✓	0	2000000000
46877to 46888	(unused)	71B6 - 71BB					
46889 to 46890	PT1 Period	71BC		✓	✓	1	2000000
46891 to 46892	PT2 Period	71BD		✓	✓	1	2000000
46893 to 46894	PT3 Period	71BE		✓	✓	1	2000000
46895 to 46896	PT4 Period	71BF		✓	✓	1	2000000
46897 to 46898	PT5 Period	71C0		✓	✓	1	2000000
46899 to 46900	PT6 Period	71C1		✓	✓	1	2000000
46901 to 46902	PT7 Period	71C2		✓	✓	1	2000000
46903 to 46904	PT8 Period	71C3		✓	✓	1	2000000
46905 to 46906	PT9 Period	71C4		✓	✓	1	2000000
46907 to 46908	PT10 Period	71C5		✓	✓	1	2000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
46909 to 46928	(unused)	71C6 - 71CF					
46929 to 46930	OS1 Duration	71D0		✓	✓	1	2000000
46931 to 46932	OS2 Duration	71D1		✓	✓	1	2000000
46933 to 46934	OS3 Duration	71D2		✓	✓	1	2000000
46935 to 46936	OS4 Duration	71D3		✓	✓	1	2000000
46937 to 46938	OS5 Duration	71D4		✓	✓	1	2000000
46939 to 46940	OS6 Duration	71D5		✓	✓	1	2000000
46941 to 46942	OS7 Duration	71D6		✓	✓	1	2000000
46943 to 46944	OS8 Duration	71D7		✓	✓	1	2000000
46945 to 46946	OS9 Duration	71D8		✓	✓	1	2000000
46947 to 46948	OS10 Duration	71D9		✓	✓	1	2000000
46949 to 46952	(unused)	71DA - 71DB					
46953 to 46954	CN1 Multiplier	71DC		✓	✓	-1000000000	1000000000
46955 to 46956	CN2 Multiplier	71DD		✓	✓	-1000000000	1000000000
46957 to 46958	CN3 Multiplier	71DE		✓	✓	-1000000000	1000000000
46959 to 46960	CN4 Multiplier	71DF		✓	✓	-1000000000	1000000000
46961 to 46962	CN5 Multiplier	71E0		✓	✓	-1000000000	1000000000
46963 to 46964	CN6 Multiplier	71E1		✓	✓	-1000000000	1000000000
46965 to 46966	CN7 Multiplier	71E2		✓	✓	-1000000000	1000000000
46967 to 46968	CN8 Multiplier	71E3		✓	✓	-1000000000	1000000000
46969 to 46970	CN9 Multiplier	71E4		✓	✓	-1000000000	1000000000
46971 to 46972	CN10 Multiplier	71E5		✓	✓	-1000000000	1000000000
46973 to 46974	EL1 Depth	71E6		✓	✓	0	20000
46975 to 46976	EL1 Protection	71E7		✓	✓	128	128
46977 to 46978	CM1 RTS Delay	71E8	✓	✓	✓	0	1
46979 to 46980	CM1 Unit ID	71E9	✓	✓	✓	1	9999
46981 to 46982	(unused)	71EA					
46983 to 46984	FAC1 Vnominal	71EB	✓	✓	✓	1	999999
46985 to 46986	FAC1 Inominal	71EC	✓	✓	✓	1	999999
46987 to 46990	(unused)	71ED - 71EE					
46991 to 46992	FAC1 V1cal	71EF	✓	✓	✓	0	2
46993 to 46994	FAC1 V2cal	71F0	✓	✓	✓	0	2
46995 to 46996	FAC1 V3cal	71F1	✓	✓	✓	0	2
46997 to 46998	FAC1 I1cal	71F2	✓	✓	✓	0	2
46999 to 47000	FAC1 I2cal	71F3	✓	✓	✓	0	2
47001 to 47002	FAC1 I3cal	71F4	✓	✓	✓	0	2
47003 to 47010	(unused)	71F5 - 71F8					

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47011 to 47012	FAC1 CT1aSmooth	71F9	✓	✓	✓	-1	1
47013 to 47014	FAC1 CT1bSmooth	71FA	✓	✓	✓	-1	1
47015 to 47016	FAC1 CT1cSmooth	71FB	✓	✓	✓	-1	1
47017 to 47018	FAC1 CT2aSmooth	71FC	✓	✓	✓	-1	1
47019 to 47020	FAC1 CT2bSmooth	71FD	✓	✓	✓	-1	1
47021 to 47022	FAC1 CT2cSmooth	71FE	✓	✓	✓	-1	1
47023 to 47024	FAC1 CT3aSmooth	71FF	✓	✓	✓	-1	1
47025 to 47026	FAC1 CT3bSmooth	7200	✓	✓	✓	-1	1
47027 to 47028	FAC1 CT3cSmooth	7201	✓	✓	✓	-1	1
47029 to 47030	FAC1 i1Off	7202	✓	✓	✓	0	1
47031 to 47032	FAC1 i2Off	7203	✓	✓	✓	0	1
47033 to 47034	FAC1 i3Off	7204	✓	✓	✓	0	1
47035 to 47036	(unused)	7205					
47037 to 47038	FAC1 V_force	7206	✓	✓	✓	0	1
47039 to 47040	FAC1 I_force	7207	✓	✓	✓	0	1
47041 to 47064	(unused)	7208 - 7213					
47065 to 47066	SAG1 Swell Limit	7214			✓	100	1000
47067 to 47068	(unused)	7215					
47069 to 47070	SAG1 Sag Limit	7216			✓	0	100
47071 to 47076	(unused)	7217 - 7219					
47077 to 47078	SAG1 Nom Voltage	721A			✓	100	1000000
47079 to 47080	(unused)	721B					
47081 to 47082	SAG1 EvPriority	721C			✓	0	255
47083 to 47084	(unused)	721D					
47085 to 47086	IN1 RollValue	721E	✓	✓	✓	0	2147483647
47087 to 47088	IN2 RollValue	721F	✓	✓	✓	0	2147483647
47089 to 47090	IN3 RollValue	7220	✓	✓	✓	0	2147483647
47091 to 47092	IN4 RollValue	7221	✓	✓	✓	0	2147483647
47093 to 47094	IN5 RollValue	7222	✓	✓	✓	0	2147483647
47095 to 47096	IN6 RollValue	7223	✓	✓	✓	0	2147483647
47097 to 47098	IN7 RollValue	7224	✓	✓	✓	0	2147483647
47099 to 47100	IN8 RollValue	7225	✓	✓	✓	0	2147483647
47101 to 47102	IN9 RollValue	7226	✓	✓	✓	0	2147483647
47103 to 47104	IN10 RollValue	7227	✓	✓	✓	0	2147483647
47105 to 47106	IN11 RollValue	7228	✓	✓	✓	0	2147483647
47107 to 47108	IN12 RollValue	7229	✓	✓	✓	0	2147483647
47109 to 47110	IN13 RollValue	722A	✓	✓	✓	0	2147483647

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47111 to 47112	IN14 RollValue	722B	✓	✓	✓	0	2147483647
47113 to 47114	IN15 RollValue	722C	✓	✓	✓	0	2147483647
47115 to 47116	IN16 RollValue	722D	✓	✓	✓	0	2147483647
47117 to 47118	CL1 TZ Offset	722E		✓	✓	-43200	46800
47119 to 47120	CL1 DST Start	722F		✓	✓	0	2147483647
47121 to 47122	CL1 DST End	7230		✓	✓	86400	2147483647
47123 to 47124	CL1 DST Offset	7231		✓	✓	-10800	10800
47125 to 47126	CM2 RTS Delay	7232		✓	✓	0	1
47127 to 47128	IR1 RTS Delay	7233	✓	✓	✓	0	1
47129 to 47130	CM2 Unit ID	7234		✓	✓	1	9999
47131 to 47132	IR1 Unit ID	7235	✓	✓	✓	1	9999
47133 to 47134	(unused)	7236					
47135 to 47136	MSR1 BaseAddr	7237	✓	✓	✓	40001	41800
47137 to 47138	MSR2 BaseAddr	7238	✓	✓	✓	40001	41800
47139 to 47140	MSR3 BaseAddr	7239	✓	✓	✓	40001	41800
47141 to 47142	MSR4 BaseAddr	723A	✓	✓	✓	40001	41800
47143 to 47144	MSR1 InZero	723B	✓	✓	✓	-2147483648	2147483647
47145 to 47146	MSR2 InZero	723C	✓	✓	✓	-2147483648	2147483647
47147 to 47148	MSR3 InZero	723D	✓	✓	✓	-2147483648	2147483647
47149 to 47150	MSR4 InZero	723E	✓	✓	✓	-2147483648	2147483647
47151 to 47152	MSR1 InFull	723F	✓	✓	✓	-2147483648	2147483647
47153 to 47154	MSR2 InFull	7240	✓	✓	✓	-2147483648	2147483647
47155 to 47156	MSR3 InFull	7241	✓	✓	✓	-2147483648	2147483647
47157 to 47158	MSR4 InFull	7242	✓	✓	✓	-2147483648	2147483647
47159 to 47160	MSR1 OutZero	7243	✓	✓	✓	-2147483647	2147483647
47161 to 47162	MSR2 OutZero	7244	✓	✓	✓	-2147483647	2147483647
47163 to 47164	MSR3 OutZero	7245	✓	✓	✓	-2147483647	2147483647
47165 to 47166	MSR4 OutZero	7246	✓	✓	✓	-2147483647	2147483647
47167 to 47168	MSR1 OutFull	7247	✓	✓	✓	-2147483647	2147483647
47169 to 47170	MSR2 OutFull	7248	✓	✓	✓	-2147483647	2147483647
47171 to 47172	MSR3 OutFull	7249	✓	✓	✓	-2147483647	2147483647
47173 to 47174	MSR4 OutFull	724A	✓	✓	✓	-2147483647	2147483647
47175 to 47546	(unused)	724B - 7304					
47547 to 47548	EL1 Cutoff	7305		✓	✓	0	255
47549 to 47550	IN17 Divisor	7306		✓	✓	1	1000000000
47551 to 47552	IN18 Divisor	7307		✓	✓	1	1000000000
47553 to 47554	IN19 Divisor	7308		✓	✓	1	1000000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47555 to 47556	IN20 Divisor	7309		✓	✓	1	1000000000
47557 to 47558	IN21 Divisor	730A		✓	✓	1	1000000000
47559 to 47560	IN22 Divisor	730B		✓	✓	1	1000000000
47561 to 47562	IN23 Divisor	730C		✓	✓	1	1000000000
47563 to 47564	IN24 Divisor	730D		✓	✓	1	1000000000
47565 to 47566	IN25 Divisor	730E		✓	✓	1	1000000000
47567 to 47568	IN26 Divisor	730F		✓	✓	1	1000000000
47569 to 47570	IN27 Divisor	7310		✓	✓	1	1000000000
47571 to 47572	IN28 Divisor	7311		✓	✓	1	1000000000
47573 to 47574	IN29 Divisor	7312		✓	✓	1	1000000000
47575 to 47576	IN30 Divisor	7313		✓	✓	1	1000000000
47577 to 47578	IN17 Valu/Pulse	7314		✓	✓	0	1000000000
47579 to 47580	IN18 Valu/Pulse	7315		✓	✓	0	1000000000
47581 to 47582	IN19 Valu/Pulse	7316		✓	✓	0	1000000000
47583 to 47584	IN20 Valu/Pulse	7317		✓	✓	0	1000000000
47585 to 47586	IN21 Valu/Pulse	7318		✓	✓	0	1000000000
47587 to 47588	IN22 Valu/Pulse	7319		✓	✓	0	1000000000
47589 to 47590	IN23 Valu/Pulse	731A		✓	✓	0	1000000000
47591 to 47592	IN24 Valu/Pulse	731B		✓	✓	0	1000000000
47593 to 47594	IN25 Valu/Pulse	731C		✓	✓	0	1000000000
47595 to 47596	IN26 Valu/Pulse	731D		✓	✓	0	1000000000
47597 to 47598	IN27 Valu/Pulse	731E		✓	✓	0	1000000000
47599 to 47600	IN28 Valu/Pulse	731F		✓	✓	0	1000000000
47601 to 47602	IN29 Valu/Pulse	7320		✓	✓	0	1000000000
47603 to 47604	IN30 Valu/Pulse	7321		✓	✓	0	1000000000
47605 to 47606	IN17 RollValue	7322		✓	✓	0	2147483647
47607 to 47608	IN18 RollValue	7323		✓	✓	0	2147483647
47609 to 47610	IN19 RollValue	7324		✓	✓	0	2147483647
47611 to 47612	IN20 RollValue	7325		✓	✓	0	2147483647
47613 to 47614	IN21 RollValue	7326		✓	✓	0	2147483647
47615 to 47616	IN22 RollValue	7327		✓	✓	0	2147483647
47617 to 47618	IN23 RollValue	7328		✓	✓	0	2147483647
47619 to 47620	IN24 RollValue	7329		✓	✓	0	2147483647
47621 to 47622	IN25 RollValue	732A		✓	✓	0	2147483647
47623 to 47624	IN26 RollValue	732B		✓	✓	0	2147483647
47625 to 47626	IN27 RollValue	732C		✓	✓	0	2147483647
47627 to 47628	IN28 RollValue	732D		✓	✓	0	2147483647

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47629 to 47630	IN29 RollValue	732E		✓	✓	0	2147483647
47631 to 47632	IN30 RollValue	732F		✓	✓	0	2147483647
47633 to 47634	CN11 Multiplier	7330		✓	✓	-1000000000	1000000000
47635 to 47636	CN12 Multiplier	7331		✓	✓	-1000000000	1000000000
47637 to 47638	CN13 Multiplier	7332		✓	✓	-1000000000	1000000000
47639 to 47640	CN14 Multiplier	7333		✓	✓	-1000000000	1000000000
47641 to 47642	CN15 Multiplier	7334		✓	✓	-1000000000	1000000000
47643 to 47644	CN16 Multiplier	7335		✓	✓	-1000000000	1000000000
47645 to 47646	CN17 Multiplier	7336		✓	✓	-1000000000	1000000000
47647 to 47648	CN18 Multiplier	7337		✓	✓	-1000000000	1000000000
47649 to 47650	CN19 Multiplier	7338		✓	✓	-1000000000	1000000000
47651 to 47652	CN20 Multiplier	7339		✓	✓	-1000000000	1000000000
47653 to 47654	CN21 Multiplier	733A		✓	✓	-1000000000	1000000000
47655 to 47656	CN22 Multiplier	733B		✓	✓	-1000000000	1000000000
47657 to 47658	CN23 Multiplier	733C		✓	✓	-1000000000	1000000000
47659 to 47660	CN24 Multiplier	733D		✓	✓	-1000000000	1000000000
47661 to 47662	CN25 Multiplier	733E		✓	✓	-1000000000	1000000000
47663 to 47664	CN26 Multiplier	733F		✓	✓	-1000000000	1000000000
47665 to 47666	CN27 Multiplier	7340		✓	✓	-1000000000	1000000000
47667 to 47668	CN28 Multiplier	7341		✓	✓	-1000000000	1000000000
47669 to 47670	CN29 Multiplier	7342		✓	✓	-1000000000	1000000000
47671 to 47672	CN30 Multiplier	7343		✓	✓	-1000000000	1000000000
47673 to 47676	(unused)	7344 - 7345					
47677 to 47678	AL1 Priority	7346		✓	✓	0	255
47679 to 47756	(unused)	7347 - 736D					
47757 to 47758	WRE1 TrigDelay	736E			✓	0	2000
47759 to 47760	WRE2 TrigDelay	736F			✓	0	2000
47761 to 47762	WRE3 TrigDelay	7370			✓	0	2000
47763 to 47764	WRE4 TrigDelay	7371			✓	0	2000
47765 to 47766	WRE5 TrigDelay	7372			✓	0	2000
477967to 47768	WRE6 TrigDelay	7373			✓	0	2000
47669 to 47784	(unused)	7374 - 737B					
47785 to 47786	DSE1 BasePoint	737C		✓	✓	0	60
47787 to 47788	DSE2 BasePoint	737D		✓	✓	0	60
47789 to 47790	DSE3 BasePoint	737E		✓	✓	0	60
47791 to 47792	DSE4 BasePoint	737F		✓	✓	0	60
47793 to 47794	DSE5 BasePoint	7380		✓	✓	0	60

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47795 to 47796	DSE6 BasePoint	7381		✓	✓	0	60
47797 to 47798	DSE7 BasePoint	7382		✓	✓	0	60
47799 to 47800	DSE8 BasePoint	7383		✓	✓	0	60
47801 to 47802	DSE9 BasePoint	7384		✓	✓	0	60
47803 to 47804	DSE10 BasePoint	7385		✓	✓	0	60
47805 to 47806	DSE11 BasePoint	7386		✓	✓	0	60
47807 to 47808	DSE12 BasePoint	7387		✓	✓	0	60
47809 to 47810	DSE13 BasePoint	7388		✓	✓	0	60
47811 to 47812	DSE14 BasePoint	7389		✓	✓	0	60
47813 to 47814	DSE15 BasePoint	738A		✓	✓	0	60
47815 to 47816	DSE16 BasePoint	738B		✓	✓	0	60
47817 to 47818	DSE1 DeadBand	738C		✓	✓	0	2147483647
47819 to 47820	DSE2 DeadBand	738D		✓	✓	0	2147483647
47821 to 47822	DSE3 DeadBand	738E		✓	✓	0	2147483647
47823 to 47824	DSE4 DeadBand	738F		✓	✓	0	2147483647
47825 to 47826	DSE5 DeadBand	7390		✓	✓	0	2147483647
47827 to 47828	DSE6 DeadBand	7391		✓	✓	0	2147483647
47829 to 47830	DSE7 DeadBand	7392		✓	✓	0	2147483647
47831 to 47832	DSE8 DeadBand	7393		✓	✓	0	2147483647
47833 to 47834	DSE9 DeadBand	7394		✓	✓	0	2147483647
47835 to 47836	DSE10 DeadBand	7395		✓	✓	0	2147483647
47837 to 47838	DSE11 DeadBand	7396		✓	✓	0	2147483647
47839 to 47840	DSE12 DeadBand	7397		✓		0	2147483647
47841 to 47842	DSE13 DeadBand	7398		✓	✓	0	2147483647
47843 to 47844	DSE14 DeadBand	7399		✓	✓	0	2147483647
47845 to 47846	DSE15 DeadBand	739A		✓	✓	0	2147483647
47847 to 47848	DSE16 DeadBand	739B		✓	✓	0	2147483647
47849 to 47850	DSE1 IONZero	739C		✓	✓	-2147483647	2147483647
47851 to 47852	DSE2 IONZero	739D		✓	✓	-2147483647	2147483647
47853 to 47854	DSE3 IONZero	739E		✓	✓	-2147483647	2147483647
47855 to 47856	DSE4 IONZero	739F		✓	✓	-2147483647	2147483647
47857 to 47858	DSE5 IONZero	73A0		✓	✓	-2147483647	2147483647
47859 to 47860	DSE6 IONZero	73A1		✓	✓	-2147483647	2147483647
47861 to 47862	DSE7 IONZero	73A2		✓	✓	-2147483647	2147483647
47863 to 47864	DSE8 IONZero	73A3		✓	✓	-2147483647	2147483647
47865 to 47866	DSE9 IONZero	73A4		✓	✓	-2147483647	2147483647
47867 to 47868	DSE10 IONZero	73A5		✓	✓	-2147483647	2147483647

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47869 to 47870	DSE11 IONZero	73A6		✓	✓	-2147483647	2147483647
47871 to 47872	DSE12 IONZero	73A7		✓	✓	-2147483647	2147483647
47873 to 47874	DSE13 IONZero	73A8		✓	✓	-2147483647	2147483647
47875 to 47876	DSE14 IONZero	73A9		✓	✓	-2147483647	2147483647
47877 to 47878	DSE15 IONZero	73AA		✓	✓	-2147483647	2147483647
47879 to 47880	DSE16 IONZero	73AB		✓	✓	-2147483647	2147483647
47881 to 47882	DSE1 IONFull	73AC		✓	✓	-2147483647	2147483647
47883 to 47884	DSE2 IONFull	73AD		✓	✓	-2147483647	2147483647
47885 to 47886	DSE3 IONFull	73AE		✓	✓	-2147483647	2147483647
47887 to 47888	DSE4 IONFull	73AF		✓	✓	-2147483647	2147483647
47889 to 47890	DSE5 IONFull	73B0		✓	✓	-2147483647	2147483647
47891 to 47892	DSE6 IONFull	73B1		✓	✓	-2147483647	2147483647
47893 to 47894	DSE7 IONFull	73B2		✓	✓	-2147483647	2147483647
47895 to 47896	DSE8 IONFull	73B3		✓	✓	-2147483647	2147483647
47897 to 47898	DSE9 IONFull	73B4		✓	✓	-2147483647	2147483647
47899 to 47900	DSE10 IONFull	73B5		✓	✓	-2147483647	2147483647
47901 to 47902	DSE11 IONFull	73B6		✓	✓	-2147483647	2147483647
47903 to 47904	DSE12 IONFull	73B7		✓	✓	-2147483647	2147483647
47905 to 47906	DSE13 IONFull	73B8		✓	✓	-2147483647	2147483647
47907 to 47908	DSE14 IONFull	73B9		✓	✓	-2147483647	2147483647
47909 to 47910	DSE15 IONFull	73BA		✓	✓	-2147483647	2147483647
47911 to 47912	DSE16 IONFull	73BB		✓	✓	-2147483647	2147483647
47913 to 47914	DSE1 DNPZero	73BC		✓	✓	-2147483647	2147483647
47915 to 47916	DSE2 DNPZero	73BD		✓	✓	-2147483647	2147483647
47917 to 47918	DSE3 DNPZero	73BE		✓	✓	-2147483647	2147483647
47919 to 47920	DSE4 DNPZero	73BF		✓	✓	-2147483647	2147483647
47921 to 47922	DSE5 DNPZero	73C0		✓	✓	-2147483647	2147483647
47923 to 47924	DSE6 DNPZero	73C1		✓	✓	-2147483647	2147483647
47925 to 47926	DSE7 DNPZero	73C2		✓	✓	-2147483647	2147483647
47927 to 47928	DSE8 DNPZero	73C3		✓	✓	-2147483647	2147483647
47929 to 47930	DSE9 DNPZero	73C4		✓	✓	-2147483647	2147483647
47931 to 47932	DSE10 DNPZero	73C5		✓	✓	-2147483647	2147483647
47933 to 47934	DSE11 DNPZero	73C6		✓	✓	-2147483647	2147483647
47935 to 47936	DSE12 DNPZero	73C7		✓	✓	-2147483647	2147483647
47937 to 47938	DSE13 DNPZero	73C8		✓	✓	-2147483647	2147483647
47939 to 47940	DSE14 DNPZero	73C9		✓	✓	-2147483647	2147483647
47941 to 47942	DSE15 DNPZero	73CA		✓	✓	-2147483647	2147483647

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
47943 to 47944	DSE16 DNPZero	73CB		✓	✓	-2147483647	2147483647
47945 to 47946	DSE1 DNPFull	73CC		✓	✓	-2147483647	2147483647
47947 to 47948	DSE2 DNPFull	73CD		✓	✓	-2147483647	2147483647
47949 to 47950	DSE3 DNPFull	73CE		✓	✓	-2147483647	2147483647
47951 to 47952	DSE4 DNPFull	73CF		✓	✓	-2147483647	2147483647
47953 to 47954	DSE5 DNPFull	73D0		✓	✓	-2147483647	2147483647
47955 to 47956	DSE6 DNPFull	73D1		✓	✓	-2147483647	2147483647
47957 to 47958	DSE7 DNPFull	73D2		✓	✓	-2147483647	2147483647
47959 to 47960	DSE8 DNPFull	73D3		✓	✓	-2147483647	2147483647
47961 to 47962	DSE9 DNPFull	73D4		✓	✓	-2147483647	2147483647
47963 to 47964	DSE10 DNPFull	73D5		✓	✓	-2147483647	2147483647
47965 to 47966	DSE11 DNPFull	73D6		✓	✓	-2147483647	2147483647
47967 to 47968	DSE12 DNPFull	73D7		✓	✓	-2147483647	2147483647
47969 to 47970	DSE13 DNPFull	73D8		✓	✓	-2147483647	2147483647
47971 to 47972	DSE14 DNPFull	73D9		✓	✓	-2147483647	2147483647
47973 to 47974	DSE15 DNPFull	73DA		✓	✓	-2147483647	2147483647
47975 to 47976	DSE16 DNPFull	73DB		✓	✓	-2147483647	2147483647
47977 to 47978	DSI1 DNPPoint	73DC		✓	✓	0	15
47979 to 47980	DSI2 DNPPoint	73DD		✓	✓	0	15
47981 to 47982	DSI3 DNPPoint	73DE		✓	✓	0	15
47983 to 47984	DSI4 DNPPoint	73DF		✓	✓	0	15
47985 to 48008	(unused)	73E0 - 73EB					
48009 to 48010	DSO1 BinInEvDepth	73EC		✓	✓	50	50
48011 to 48012	DSO1 FrzCntEvDepth	73ED		✓	✓	0	0
48013 to 48014	DSO1 CntChangeEvDepth	73EE		✓	✓	50	50
48015 to 48016	DSO1 FrzAIEvDepth	73EF		✓	✓	0	0
48017 to 48018	DSO1 AIChangeEvDepth	73F0		✓	✓	50	50
48019 to 48020	DSO1 SelectTimeout	73F1		✓	✓	0	30
48021 to 48022	DSO1 TimeSyncPeriod	73F2		✓	✓	1	86400
48023 to 48024	DSO1 ALFragSize	73F3		✓	✓	15	2048
48025 to 48026	DSO1 DLTimeout	73F4		✓	✓	1	30
48027 to 48028	DSO1 DLNumRetries	73F5		✓	✓	0	15
48029 to 48178	(unused)	73F6 - 7440					
48179 to 48180	CN1 Preset	7441		✓	✓	-1000000000	1000000000
48181 to 48182	CN2 Preset	7442		✓	✓	-1000000000	1000000000
48183 to 48184	CN3 Preset	7443		✓	✓	-1000000000	1000000000
48185 to 48186	CN4 Preset	7444		✓	✓	-1000000000	1000000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
48187 to 48188	CN5 Preset	7445		✓	✓	-1000000000	1000000000
48189 to 48190	CN6 Preset	7446		✓	✓	-1000000000	1000000000
48191 to 48192	CN7 Preset	7447		✓	✓	-1000000000	1000000000
48193 to 48194	CN8 Preset	7448		✓	✓	-1000000000	1000000000
48195 to 48196	CN9 Preset	7449		✓	✓	-1000000000	1000000000
48197 to 48198	CN10 Preset	744A		✓	✓	-1000000000	1000000000
48199 to 48200	CN11 Preset	744B		✓	✓	-1000000000	1000000000
48201 to 48202	CN12 Preset	744C		✓	✓	-1000000000	1000000000
48203 to 48204	CN13 Preset	744D		✓	✓	-1000000000	1000000000
48205 to 48206	CN14 Preset	744E		✓	✓	-1000000000	1000000000
48207 to 48208	CN15 Preset	744F		✓	✓	-1000000000	1000000000
48209 to 48210	CN16 Preset	7450		✓	✓	-1000000000	1000000000
48211 to 48212	CN17 Preset	7451		✓	✓	-1000000000	1000000000
48213 to 48214	CN18 Preset	7452		✓	✓	-1000000000	1000000000
48215 to 48216	CN19 Preset	7453		✓	✓	-1000000000	1000000000
48217 to 48218	CN20 Preset	7454		✓	✓	-1000000000	1000000000
48219 to 48220	CN21 Preset	7455		✓	✓	-1000000000	1000000000
48221 to 48222	CN22 Preset	7456		✓	✓	-1000000000	1000000000
48223 to 48224	CN23 Preset	7457		✓	✓	-1000000000	1000000000
48225 to 48226	CN24 Preset	7458		✓	✓	-1000000000	1000000000
48227 to 48228	CN25 Preset	7459		✓	✓	-1000000000	1000000000
48229 to 48230	CN26 Preset	745A		✓	✓	-1000000000	1000000000
48231 to 48232	CN27 Preset	745B		✓	✓	-1000000000	1000000000
48233 to 48234	CN28 Preset	745C		✓	✓	-1000000000	1000000000
48235 to 48236	CN29 Preset	745D		✓	✓	-1000000000	1000000000
48237 to 48238	CN30 Preset	745E		✓	✓	-1000000000	1000000000
48239 to 48240	CN1 RollValue	745F		✓	✓	-1000000000	1000000000
48241 to 48242	CN2 RollValue	7460		✓	✓	-1000000000	1000000000
48243 to 48244	CN3 RollValue	7461		✓	✓	-1000000000	1000000000
48245 to 48246	CN4 RollValue	7462		✓	✓	-1000000000	1000000000
48247 to 48248	CN5 RollValue	7463		✓	✓	-1000000000	1000000000
48249 to 48250	CN6 RollValue	7464		✓	✓	-1000000000	1000000000
48251 to 48252	CN7 RollValue	7465		✓	✓	-1000000000	1000000000
48253 to 48254	CN8 RollValue	7466		✓	✓	-1000000000	1000000000
48255 to 48256	CN9 RollValue	7467		✓	✓	-1000000000	1000000000
48257 to 48258	CN10 RollValue	7468		✓	✓	-1000000000	1000000000
48259 to 48260	CN11 RollValue	7469		✓	✓	-1000000000	1000000000

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
48261 to 48262	CN12 RollValue	746A		✓	✓	-1000000000	1000000000
48263 to 48264	CN13 RollValue	746B		✓	✓	-1000000000	1000000000
48265 to 48266	CN14 RollValue	746C		✓	✓	-1000000000	1000000000
48267 to 48268	CN15 RollValue	746D		✓	✓	-1000000000	1000000000
48269 to 48270	CN16 RollValue	746E		✓	✓	-1000000000	1000000000
48271 to 48272	CN17 RollValue	746F		✓	✓	-1000000000	1000000000
48273 to 48274	CN18 RollValue	7470		✓	✓	-1000000000	1000000000
48275 to 48276	CN19 RollValue	7471		✓	✓	-1000000000	1000000000
48277 to 48278	CN20 RollValue	7472		✓	✓	-1000000000	1000000000
48279 to 48280	CN21 RollValue	7473		✓	✓	-1000000000	1000000000
48281 to 48282	CN22 RollValue	7474		✓	✓	-1000000000	1000000000
48283 to 48284	CN23 RollValue	7475		✓	✓	-1000000000	1000000000
48285 to 48286	CN24 RollValue	7476		✓	✓	-1000000000	1000000000
48287 to 48288	CN25 RollValue	7477		✓	✓	-1000000000	1000000000
48289 to 48290	CN26 RollValue	7478		✓	✓	-1000000000	1000000000
48291 to 48292	CN27 RollValue	7479		✓	✓	-1000000000	1000000000
48293 to 48294	CN28 RollValue	747A		✓	✓	-1000000000	1000000000
48295 to 48296	CN29 RollValue	747B		✓	✓	-1000000000	1000000000
48297 to 48298	CN30 RollValue	747C		✓	✓	-1000000000	1000000000
48299 to 48394	(unused)	747D - 74AC					
48395 to 48396	EB1 EvPriority	74AD		✓	✓	0	127
48397 to 48398	EB2 EvPriority	74AE		✓	✓	0	127
48399 to 48400	EB3 EvPriority	74AF		✓	✓	0	127
48401 to 48402	EB4 EvPriority	74B0		✓	✓	0	127
48403 to 48404	EB5 EvPriority	74B1		✓	✓	0	127
48405 to 48406	EB6 EvPriority	74B2		✓	✓	0	127
48407 to 48408	EB7 EvPriority	74B3		✓	✓	0	127
48409 to 48410	EB8 EvPriority	74B4		✓	✓	0	127
48411 to 48458	(unused)	74B5 - 74CC					
48459 to 48460	EN1 EvPriority	74CD		✓	✓	0	127
48461 to 48462	EN2 EvPriority	74CE		✓	✓	0	127
48463 to 48464	EN3 EvPriority	74CF		✓	✓	0	127
48465 to 48466	EN4 EvPriority	74D0		✓	✓	0	127
48467 to 48474	(unused)	74D1 - 74D4					
48475 to 48476	EP1 EvPriority	74D5		✓	✓	0	127
48477 to 48478	EP2 EvPriority	74D6		✓	✓	0	127
48479 to 48480	EP3 EvPriority	74D7		✓	✓	0	127

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
48481 to 48482	EP4 EvPriority	74D8		✓	✓	0	127
48483 to 48484	EP5 EvPriority	74D9		✓	✓	0	127
48485 to 48486	EP6 EvPriority	74DA		✓	✓	0	127
48487 to 48488	EP7 EvPriority	74DB		✓	✓	0	127
48489 to 48490	EP8 EvPriority	74DC		✓	✓	0	127
48491 to 48492	EP9 EvPriority	74DD		✓	✓	0	127
48493 to 48494	EP10 EvPriority	74DE		✓	✓	0	127
48495 to 48496	EP11 EvPriority	74DF		✓	✓	0	127
48497 to 48498	EP12 EvPriority	74E0		✓	✓	0	127
48499 to 48500	EP13 EvPriority	74E1		✓	✓	0	127
48501 to 48502	EP14 EvPriority	74E2		✓	✓	0	127
48503 to 48504	EP15 EvPriority	74E3		✓	✓	0	127
48505 to 48506	EP16 EvPriority	74E4		✓	✓	0	127
48507 to 48508	EP17 EvPriority	74E5		✓	✓	0	127
48509 to 48510	EP18 EvPriority	74E6		✓	✓	0	127
48511 to 48512	EP19 EvPriority	74E7		✓	✓	0	127
48513 to 48514	EP20 EvPriority	74E8		✓	✓	0	127
48515 to 48516	EP21 EvPriority	74E9		✓	✓	0	127
48517 to 48518	EP22 EvPriority	74EA		✓	✓	0	127
48519 to 48520	EP23 EvPriority	74EB		✓	✓	0	127
48521 to 48522	EP24 EvPriority	74EC		✓	✓	0	127
48523 to 48524	EP25 EvPriority	74ED		✓	✓	0	127
48525 to 48526	EP26 EvPriority	74EE		✓	✓	0	127
48527 to 48528	EP27 EvPriority	74EF		✓	✓	0	127
48529 to 48530	EP28 EvPriority	74F0		✓	✓	0	127
48531 to 48532	EP29 EvPriority	74F1		✓	✓	0	127
48533 to 48534	EP30 EvPriority	74F2		✓	✓	0	127
48535 to 48536	EP31 EvPriority	74F3		✓	✓	0	127
48537 to 48538	EP32 EvPriority	74F4		✓	✓	0	127
48539 to 48730	(unused)	74F5 - 7554					
48731 to 48732	SWD17 Sub Intvl	7555		✓	✓	1	5940
48733 to 48734	SWD18 Sub Intvl	7556		✓	✓	1	5940
48735 to 48736	SWD19 Sub Intvl	7557		✓	✓	1	5940
48737 to 48738	SWD20 Sub Intvl	7558		✓	✓	1	5940
48739 to 48740	SWD21 Sub Intvl	7559		✓	✓	1	5940
48741 to 48742	SWD22 Sub Intvl	755A		✓	✓	1	5940
48743 to 48744	SWD23 Sub Intvl	755B		✓	✓	1	5940

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
48745 to 48746	SWD24 Sub Intvl	755C		✓	✓	1	5940
48747 to 48748	SWD25 Sub Intvl	755D		✓	✓	1	5940
48749 to 48750	SWD26 Sub Intvl	755E		✓	✓	1	5940
48751 to 48752	SWD27 Sub Intvl	755F		✓	✓	1	5940
48753 to 48754	SWD28 Sub Intvl	7560		✓	✓	1	5940
48755 to 48756	SWD29 Sub Intvl	7561		✓	✓	1	5940
48757 to 48758	SWD30 Sub Intvl	7562		✓	✓	1	5940
48759 to 48778	(unused)	7563 - 756C					
48779 to 48780	SWD17 #SubIntvls	756D		✓	✓	1	15
48781 to 48782	SWD18 #SubIntvls	756E		✓	✓	1	15
48783 to 48784	SWD19 #SubIntvls	756F		✓	✓	1	15
48785 to 48786	SWD20 #SubIntvls	7570		✓	✓	1	15
48787 to 48788	SWD21 #SubIntvls	7571		✓	✓	1	15
48789 to 48790	SWD22 #SubIntvls	7572		✓	✓	1	15
48791 to 48792	SWD23 #SubIntvls	7573		✓	✓	1	15
48793 to 48794	SWD24 #SubIntvls	7574		✓	✓	1	15
48795 to 48796	SWD25 #SubIntvls	7575		✓	✓	1	15
48797 to 48798	SWD26 #SubIntvls	7576		✓	✓	1	15
48799 to 48800	SWD27 #SubIntvls	7577		✓	✓	1	15
48801 to 48802	SWD28 #SubIntvls	7578		✓	✓	1	15
48803 to 48804	SWD29 #SubIntvls	7579		✓	✓	1	15
48805 to 48806	SWD30 #SubIntvls	757A		✓	✓	1	15
48807 to 48826	(unused)	757B - 7584					
48827 to 48828	SWD17 Pred Resp	7585		✓	✓	0	99
48829 to 48830	SWD18 Pred Resp	7586		✓	✓	0	99
48831 to 48832	SWD19 Pred Resp	7587		✓	✓	0	99
48833 to 48834	SWD20 Pred Resp	7588		✓	✓	0	99
48835 to 48836	SWD21 Pred Resp	7589		✓	✓	0	99
48837 to 48838	SWD22 Pred Resp	758A		✓	✓	0	99
48839 to 48840	SWD23 Pred Resp	758B		✓	✓	0†	99
48841 to 48842	SWD24 Pred Resp	758C		✓	✓	0	99
48843 to 48844	SWD25 Pred Resp	758D		✓	✓	0	99
48845 to 48846	SWD26 Pred Resp	758E		✓	✓	0	99
48847 to 48848	SWD27 Pred Resp	758F		✓	✓	0	99
48849 to 48850	SWD28 Pred Resp	7590		✓	✓	0	99
48851 to 48852	SWD29 Pred Resp	7591		✓	✓	0	99
48853 to 48854	SWD30 Pred Resp	7592		✓	✓	0	99

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
48855 to 48898	(unused)	7593 - 75A8					
48899 to 48900	DOP1 Backlight Timeout	75A9	✓	✓	✓	60	60000
48901 to 49230	(unused)	75AA - 764E					
49231 to 49232	IN31 Divisor	764F		✓	✓	1	1000000000
49233 to 49234	IN32 Divisor	7650		✓	✓	1	1000000000
49235 to 49236	IN33 Divisor	7651		✓	✓	1	1000000000
49237 to 49238	IN34 Divisor	7652		✓	✓	1	1000000000
49239 to 49240	IN35 Divisor	7653		✓	✓	1	1000000000
49241 to 49350	(unused)	7654 - 768A					
49351 to 49352	IN31 Valu/Pulse	768B		✓	✓	0	1000000000
49353 to 49354	IN32 Valu/Pulse	768C		✓	✓	0	1000000000
49355 to 49356	IN33 Valu/Pulse	768D		✓	✓	0	1000000000
49357 to 49358	IN34 Valu/Pulse	768E		✓	✓	0	1000000000
49359 to 49360	IN35 Valu/Pulse	768F		✓	✓	0	1000000000
49361 to 49470	(unused)	7690 - 76C6					
49471 to 49472	IN31 RollValue	76C7		✓	✓	0	2147483647
49473 to 49474	IN32 RollValue	76C8		✓	✓	0	2147483647
49475 to 49476	IN33 RollValue	76C9		✓	✓	0	2147483647
49477 to 49478	IN34 RollValue	76CA		✓	✓	0	2147483647
49479 to 49480	IN35 RollValue	76CB		✓	✓	0	2147483647
49481 to 49814	(unused)	76CB - 7772					
49815 to 49816	CAP1 Pulse Width	7773	✓	✓	✓	10	1000
49817 to 49818	CAP2 Pulse Width	7774	✓	✓	✓	10	1000
49819 to 49820	CAP3 Pulse Width	7775	✓	✓	✓	10	1000
49821 to 49822	CAP4 Pulse Width	7776	✓	✓	✓	10	1000
49823 to 49824	CAP5 Pulse Width	7777	✓	✓	✓	10	1000
49825 to 49834	(unused)	7778 - 777C					
49835 to 49836	CAP1 Kh	777D	✓	✓	✓	0	1000000000
49837 to 49838	CAP2 Kh	777E	✓	✓	✓	0	1000000000
49839 to 49840	CAP3 Kh	777F	✓	✓	✓	0	1000000000
49841 to 49842	CAP4 Kh	7780	✓	✓	✓	0	1000000000
49843 to 49844	CAP5 Kh	7781	✓	✓	✓	0	1000000000
49845 to 49914	(unused)	7782 - 77A4					
49915 to 49916	MSR5 BaseAddr	77A5	✓	✓	✓	40001	41800
49917 to 49918	MSR6 BaseAddr	77A6	✓	✓	✓	40001	41800
49919 to 49920	MSR7 BaseAddr	77A7	✓	✓	✓	40001	41800
49921 to 49922	MSR8 BaseAddr	77A8	✓	✓	✓	40001	41800

Modbus Registers	ION Register	ION Handle	ION7300	ION7330	ION7350	Low Bound	High Bound
49923 to 49924	MSR9 BaseAddr	77A9	✓	✓	✓	40001	41800
49925 to 49926	MSR10 BaseAddr	77AA	✓	✓	✓	40001	41800
49927 to 49928	MSR5 InZero	77AB	✓	✓	✓	-2147483648	2147483647
49929 to 49930	MSR6 InZero	77AC	✓	✓	✓	-2147483648	2147483647
49931 to 49932	MSR7 InZero	77AD	✓	✓	✓	-2147483648	2147483647
49933 to 49934	MSR8 InZero	77AE	✓	✓	✓	-2147483648	2147483647
49935 to 49936	MSR9 InZero	77AF	✓	✓	✓	-2147483648	2147483647
49937 to 49938	MSR10 InZero	77B0	✓	✓	✓	-2147483648	2147483647
49939 to 49940	MSR5 InFull	77B1	✓	✓	✓	-2147483648	2147483647
49941 to 49942	MSR6 InFull	77B2	✓	✓	✓	-2147483648	2147483647
49943 to 49944	MSR7 InFull	77B3	✓	✓	✓	-2147483648	2147483647
49945 to 49946	MSR8 InFull	77B4	✓	✓	✓	-2147483648	2147483647
49947 to 49948	MSR9 InFull	77B5	✓	✓	✓	-2147483648	2147483647
49949 to 49950	MSR10 InFull	77B6	✓	✓	✓	-2147483648	2147483647
49951 to 49952	MSR5 OutZero	77B7	✓	✓	✓	-2147483647	2147483647
49953 to 49954	MSR6 OutZero	77B8	✓	✓	✓	-2147483647	2147483647
49955 to 49956	MSR7 OutZero	77B9	✓	✓	✓	-2147483647	2147483647
49957 to 49958	MSR8 OutZero	77BA	✓	✓	✓	-2147483647	2147483647
49959 to 49960	MSR9 OutZero	77BB	✓	✓	✓	-2147483647	2147483647
49961 to 49962	MSR10 OutZero	77BC	✓	✓	✓	-2147483647	2147483647
49963 to 49964	MSR5 OutFull	77BD	✓	✓	✓	-2147483647	2147483647
49965 to 49966	MSR6 OutFull	77BE	✓	✓	✓	-2147483647	2147483647
49967 to 49968	MSR7 OutFull	77BF	✓	✓	✓	-2147483647	2147483647
49969 to 49970	MSR8 OutFull	77C0	✓	✓	✓	-2147483647	2147483647
49971 to 49972	MSR9 OutFull	77C1	✓	✓	✓	-2147483647	2147483647
49973 to 49974	MSR10 OutFull	77C2	✓	✓	✓	-2147483647	2147483647

PowerLogic ION7300 Series
Modbus Protocol

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Getting technical support:
Contact your local Schneider Electric sales representative for assistance or go to the www.powerlogic.com website.

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