

AquiStar® PT2X (SDI-12 & Modbus®)

INTERFACE SPECIFICATION / MAY 2011 / 9B1320r4

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Specifications

Power supply voltage: 9.0 – 16.0VDC
Power supply current – Active: 3.5mA Typ. @ 12.0V
Power supply current – Sleep: 60uA Typ. @ 12.0V
Measurement Latency: Approx. 1.3s
Default SDI-12 Address: 0

SDI-12 Command Nomenclature

a= Sensor address
{crc} = SDI-12 compatible 3-character CRC
<cr> = ASCII carriage return character
<lf> = ASCII line feed character
highlighted values indicate variable data

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SDI-12 Commands

Setup Commands

Name	Command	Response
Sensor Identification	aI!	a13 INWUSA PT2X2.4ssssssssss<cr><lf> <i>Note: 2.4 will change to reflect current firmware revision, ssssssssss = device serial #</i>
Acknowledge Active	a!	a<cr><lf>
Address Query	?!	a<cr><lf>
Change Address	aAb!	b<cr><lf> Change address from a to b

Measurement Commands

Note: The default units setting for pressure is PSI. The default units setting for temperature is Celsius. To change these, use the Direct Read Units option under the Configure | Advanced menu in the Aqua4Plus Control Software.

Request Measurement

Name	Command	Response
Request measurement: <ul style="list-style-type: none"> temperature pressure 	aM!	atttn<cr><lf> "n" values available after "ttn" seconds Sample: a0022<cr><lf>
Read results	aD0!	aValue1Value2<cr><lf> Value1 = temperature Value2 = pressure Sample: a+22.0512+12.0512<cr><lf>
Request measurement: <ul style="list-style-type: none"> temperature 	aM1!	atttn<cr><lf> "n" values available after "ttn" seconds Sample: a0021<cr><lf>
Read results	aD0!	aValue1<cr><lf> Value1 = temperature Sample: a+22.0512<cr><lf>
Request measurement: <ul style="list-style-type: none"> pressure 	aM2!	atttn<cr><lf> "n" values available after "ttn" seconds Sample: a0021<cr><lf>
Read results	aD0!	aValue1<cr><lf> Value1 = pressure Sample: a12.0512<cr><lf>

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Request Measurement with CRC

Name	Command	Response
Request measurement w/CRC: <ul style="list-style-type: none"> temperature pressure 	aMC!	atttn<cr><lf> <i>"n" values available after "ttt" seconds</i> <i>Sample: a0022<cr><lf></i>
Read results	aD0!	aValue1Value2{crc}<cr><lf> <i>Value1 = temperature</i> <i>Value2 = pressure</i> <i>Sample: a+22.0512+12.0512{crc}<cr><lf></i>
Request measurement w/CRC: <ul style="list-style-type: none"> temperature 	aMC1!	atttn<cr><lf> <i>"n" values available after "ttt" seconds</i> <i>Sample: a0021<cr><lf></i>
Read results	aD0!	aValue1{crc}<cr><lf> <i>Value1 = temperature</i> <i>Sample: a+22.0512{crc}<cr><lf></i>
Request measurement w/CRC: <ul style="list-style-type: none"> pressure 	aMC2!	atttn<cr><lf> <i>"n" values available after "ttt" seconds</i> <i>Sample: a0021<cr><lf></i>
Read results	aD0!	aValue1{crc}<cr><lf> <i>Value1 = pressure</i> <i>Sample: a+12.0512{crc}<cr><lf></i>

Concurrent Measurement

Name	Command	Response
Request measurement: <ul style="list-style-type: none"> temperature pressure 	aC!	atttnn<cr><lf> <i>"nn" values available after "ttt" seconds</i> <i>Sample: a00202<cr><lf></i>
Read results	aD0!	aValue1Value2<cr><lf> <i>Value1 = temperature</i> <i>Value2 = pressure</i> <i>Sample: a+22.0512+12.0512<cr><lf></i>
Request measurement: <ul style="list-style-type: none"> temperature 	aC1!	atttnn<cr><lf> <i>"nn" values available after "ttt" seconds</i> <i>Sample: a00201<cr><lf></i>
Read results	aD0!	aValue1<cr><lf> <i>Value1 = temperature</i> <i>Sample: a+22.0512<cr><lf></i>
Request measurement: <ul style="list-style-type: none"> pressure 	aC2!	atttnn<cr><lf> <i>"nn" values available after "ttt" seconds</i> <i>Sample: a00201<cr><lf></i>
Read results	aD0!	aValue1<cr><lf> <i>Value1 = pressure</i> <i>Sample: a+12.0512<cr><lf></i>

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Concurrent Measurement with CRC

Name	Command	Response
Request measurement w/CRC: <ul style="list-style-type: none"> • temperature • pressure 	aCC!	atttnn<cr><lf> <i>"nn" values available after "ttt" seconds</i> <i>Sample: a00202<cr><lf></i>
Read results	aD0!	aValue1Value2{crc}<cr><lf> <i>Value1 = temperature</i> <i>Value2 = pressure</i> <i>Sample: a+22.0512+12.0512{crc}<cr><lf></i>
Request measurement w/CRC: <ul style="list-style-type: none"> • temperature 	aCC1!	atttnn<cr><lf> <i>"nn" values available after "ttt" seconds</i> <i>Sample: a00201<cr><lf></i>
Read results	aD0!	aValue1{crc}<cr><lf> <i>Value1 = temperature</i> <i>Sample: a+22.0512{crc}<cr><lf></i>
Request measurement w/CRC: <ul style="list-style-type: none"> • pressure 	aCC2!	atttnn<cr><lf> <i>"nn" values available after "ttt" seconds</i> <i>Sample: a00201<cr><lf></i>
Read results	aD0!	aValue1{crc}<cr><lf> <i>Value1 = pressure</i> <i>Sample: a+12.0512{crc}<cr><lf></i>

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Modbus Register Definitions

All Modbus data is accessed as holding registers (4xxxxxx), using the Read Holding Registers (command type 3) and Preset Multiple Holding Registers (command type 0x10) Modbus commands.

Parameter data

Modbus parameter data is returned as 32-bit IEEE floating point values. Each value is 32 bits in length, and therefore occupies two Modbus registers. As a result, the parameter registers must be read as pairs.

Modbus Register	Data Address	Description
462593-4	0xF480 (62592)	Temperature
462595-6	0xF482 (62594)	Pressure

Note: The default units setting for pressure is PSI. The default units setting for temperature is Celsius. To change these, use the Direct Read Units option under the Configure | Advanced menu in the Aqua4Plus Control Software.

Sensor configuration/control

Modbus registers are provided for the following configuration and control functions.

Modbus Register	Data Address	Description
462977=a	0xF600 (62976)	Set sensor Modbus address = a (Write Only)
464545=b	0xFC20 (64544)	Set Modbus baud rate according to b (Write Only) b=0:38400 b=1:19200 b=2:9600

When the device's Modbus address is changed by writing to 462977, the device will respond to the register write with its current address, before changing to the new address for subsequent register activity.

When the device's baud rate is changed by writing to 464545, the device will respond to the register write at the current baud rate, before changing to the new baud rate for subsequent activity.

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