



## Serial Communication Protocol

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900 Series



Florite International, Inc.  
900 Series Instrument Serial Communication Protocol

D10146-041309

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## 1.0 Revision History

<u>Effective Date</u>	<u>Revision Enhancement</u>
05Jul2005	1. 900 Series protocol redactions
20Jul2005	1. Section 6.4 revised for legal output link values from 0-99
25Aug2005	1. Section 5.2.2 - response added parameter <28> Log Select 2. Section 6.3 - enhanced decimal point selection to now include three places 3. Section 6.3 - revised parameter <28> from Log Type to Log Select
06Sep2005	1. Posted version above to web site and customer documents
09Sep2005	1. Section 6.3 - added for parameter <18> hardware configuration "2" as leading zero suppression
06Jan2006	1. Section 5.6.5 - revised log send format

## 2.0 Purpose

The purpose of this document is to describe and detail the various aspects of providing 900 Series instrument commands and responses that result in operating value programming - fundamental to employing the system for acquiring and communicating measured information - and providing for process control output.

## 3.0 System Overview

The structural basis of this instrument class is a general platform into which are installed certain standard or special operating modules. This document focuses on standard universal input-output module offerings. The platform supports universal input measurements for current, volts, ohms and pulse-frequency; Control output signals for current, volts and isolated relay. The platform additionally supports the communication facilities.

## 4.0 Serial Command Organization

### 4.1 Command Structures

This protocol was selected to service the need for serial error control while operating in local or wide area networks to transfer information between a unit and host computer.

#### 4.1.1 Elements

The command format is a free form variable entry type, enabling expeditious economic means of achieving required programming results. Commands are comprised of the following structural elements:

4.1.1.1 Block Prelimiter - sentinel indicating start of multiple packets message

4.1.1.2 Packet Prelimiter - sentinel indicating start of a packet message

4.1.1.3 Information Frame - contains comma prelimited fields which start with the first character immediately following the message prelimitter and includes all successive characters up to and including a comma which immediately precedes the first ascii-hex character of the checksum.

4.1.1.4 Checksum - is two ascii-hex characters created for a mod256 negated sum of all message characters which is used by a host computer to check a packets validity.

4.1.1.5 Packet delimiter - sentinel indicating end of a packet message

4.1.1.6 Block Delimiter - sentinel indicating end of multiple packets message

4.1.2 Transfer - all messages are serial half duplex send-response types.

4.1.3 Mastering - the protocol initiator or originator is the master. The master is responsible for managing the communication link connection status. The wide area network link master is the party that first sends, or places a call to another, and is first to initiate the conversation.

## 4.2 Command Addressing

4.2.1 Units are assigned a unique [xxxxx] address from 0-65535 which must be pre-programmed prior to deployment in a network system. A units ports are designated with an appended [.xx] sub-address.

4.2.2 The five digit address may be omitted when operating a single un-network unit - but must be used in multiple unit networks to differentiate the units.

4.2.3 Command arguments are single ASCII (ascii) alpha non-case sensitive characters.

HOST SEND

AZ	xxxxxx	.xx	K	<cr>
				+ -- delimiter
				+-- argument
				+-- port sub-address
				+-- unit address
				+-- prelimiter

AZ [.xx] <argument> <cr> Non-networked port sub-addressed

AZ [xxxxxx.x] <argument> <cr> Networked port sub-addressed

AZ <cr> Restart command operation

RESPONSE - command argument dependent

## 5.0 Command Operation

### 5.1 General Commands

These commands are general basic utility types not described in any particular order.

#### 5.1.1 Reset Command

This command string terminates commands that may be presently in process and resets the command state machine operation to the initial ready state. It can be sent to units in a network to provide command state machine synchronization.

HOST SEND

<esc>AZ<cr>

UNIT RESPONSE



The responding unit checksum may be validated by the host who may request the information again should the received packet be in error.

HOST SEND

AZI <cr>	Non-network
AZ [xxxxxx] I <cr>	Network

RESPONSE

AZ,00000,4,FLORITE,920MAX11,02,01.01.13,FD00,<sum><cr><lf>

FIELDS

AZ	Packet prelimiter
,00000	Unit address
,4	Response type
,FLORITE	Make
,990MAX11	Model
,06	Available port count
,01.01.13	Revision date yy-mm-dd
,FD00	Start vector
,<sum>	Negated mod256 sum
<cr><lf>	Packet delimiter

### 5.1.5 Serial Character Pacing Controls

These commands act to provide a means for the terminal or host to suspend character sending, or to re-enable the unit to continue to send. This facility is particularly useful when the unit is sending large data amounts such as with logged information.

The AZH command acts as an XOF to temporarily suspend the unit from sending further characters.

HOST SEND

AZH<cr>	Non-network
AZ [xxxxxx]<cr>	Network

RESPONSE

<none>

The AZS command acts as an XON to re-enable the unit to continue to send further characters.

HOST SEND

AZS<cr>	Non-network
AZ[xxxxxx]S<cr>	Network

## RESPONSE

<none>

### 5.1.6 Serial Message Error Control

These commands provide for error control of information packets sent by the unit. They are particularly useful when transferring information over wide area networks, and cause the unit to continue to send the next packet, or resend the previously sent packet.

The send-resend determination is made by the receiving host based on having computed a checksum from the received characters - then thereafter comparing its computed checksum with the checksum sent by the unit in the packet.

The unit must be pre-configured to enable the error control protocol.

#### 5.1.6.1 Positive Acknowledge Command

This command must be issued by the receiving host to enable the unit to send its packet which is next eligible. Should the unit not receive positive acknowledgement within four seconds, it will resend the previous packet up to four times before abandoning the send session.

#### HOST SEND

AZA<cr>

Non-network

AZ [xxxxxx] A <cr>

Network

#### RESPONSE

<none>

#### 5.1.6.2 Negative Acknowledge Command

This command may be issued from the terminal or host to cause the unit to resend its previous packet. Should the unit not receive negative acknowledgement prior to a lapse of four seconds - it will automatically resend the previous unacknowledged packet up to four times before abandoning the send session.

#### HOST SEND

AZN<cr>

Non-network

AZ [xxxxxx] N <cr>

Network

#### RESPONSE

<none>

## 5.2 Input Port Commands

### 5.2.1 Get Measured Values

This command is used to gather measured information from input ports.

#### HOST SEND

AZ [.xx] K <cr>

Non-network send one input ports packet values

AZ K <cr>

Non-network send all input port packets values with [Comport] set to [Report]

AZ [xxxxxx.xx] K <cr>

Network send one input ports packet values

AZ [xxxxxx] K <cr>

Network send all input ports packet values with [Comport] set to [Report]

#### RESPONSE - PACKET

AZ,00000.00,4,00000000.00,00000000.00,- 0000050.00,- 0000049.90,00024,<sum><cr><lf>

#### RESPONSE - BLOCK

<dle><stx>

AZ,00000.00,3,00000000.00,00000000.00,- 0000050.00,- 0000049.90,00024,<sum><cr><lf>

AZ,00000.00,4,00000000.00,00000000.00, 0000050.00, 0000049.90,00024,<sum><cr><lf>

AZ,00000.00,5,00000000.00,00000000.00,+0000050.00,+0000049.90,00024,<sum><cr><lf>

<dle><etx>

### 5.2.2 View Input Port Operating Values

This command enables a terminal operator to view the present state of all input port programmed values.

#### HOST SEND

AZ [.xx] V <cr>

Non-network

AZ [xxxxxx.x] V <cr>

Network

#### RESPONSE

##### PROGRAM VALUES - Port 1

< 0> Port Type In 0-20mA x12v

< 10> Time Base min

< 3> Decimal Point x.xx

< 4> Measure Units uuu

<27>	Scale Factor	0000001.000	
< 6>	Low Value	0000000.000	mA
< 7>	Low Units	00000000.00	uuu/m
< 8>	High Value	0000010.000	mA
< 9>	High Units	00000010.00	uuu/m
<11>	Rate Filter	+0	dBHz
<14>	Low Rate Lim	00000000.00	uuu/m
<15>	High Rate Lim	00000000.00	uuu/m
<26>	Rate Lim Dly	000	sec
<12>	Qty1 Limit	00000000.00	uuu
<13>	Qty2 Limit	00000000.00	uuu
<16>	Time Limit	0000	hrs
<18>	Comm Port	Sio Report	
<28>	Log Select	Rate	

### 5.2.3 Set Input Port Operating Values

Each of the input port programmed operating values can be individually queried or changed in accordance with Section 6.0.

### 5.2.4 Clear Accumulated Values

This command allows any one input port accumulated value to be independently reset to zero.

#### HOST SEND

AZ [.xx] Z n <cr>	Non-network
AZ [xxxxxx.xx] Z n <cr>	Network

n=0	Quantity 1
n=1	Quantity 2
n=2	Quantity 1, Quantity 2, Time
n=3	Time
n=4	Program values - set factory defaults

#### RESPONSE

<none>

## 5.3 Control Output Port Commands

### 5.3.1 View Control Output Port Values

This command enables a terminal operator to view the present state of all output port programmed values.

#### HOST SEND

AZ [.xx] V <cr>  
AZ [xxxxx.x] V <cr>

Non-network  
Network

## RESPONSE

### PROGRAM VALUES - Port 2

< 2> Control Type     Monitor  
< 0> Port Type        Out 0-10V <1  
< 1> Ctrl Amount     00000100.00    uuu/m  
<11> Pid Response    +0            dbHz  
< 7> Low Units        00000000.00    uuu/m  
< 6> Low Value        0000002.000    V  
< 9> High Units       00000010.00    uuu/m  
< 8> High Value       0000010.000    V

### 5.3.2 Set Control Output Port Values

Each of the output port programmed operating values can be individually queried or changed in accordance with Section 6.0.

### 5.3.3 Special Output Service Commands

These commands are provided to invoke certain special case output port operation.

#### 5.3.3.1 Batch Command

This command is used to start a new batch quantity process, or stop a batch process that may currently be in progress.

The output port [Control Function] must be programmed as [Batch], and the output must have a [Link] to an input port that is programmed to accumulate quantity.

## HOST SEND

AZ [.xx] F 0010.00<cr>	Non-network
AZ [.xx] F<cr>	Start port batch 10.00 units
	Stop port batch
AZ [xxxxx.xx] F 10.00 <cr>	Network
AZ [xxxxx.xx] F <cr>	Start port batch 10.00 units
	Stop port batch

## RESPONSE

AZ, [xxxxx.xx],5,FOK,DA,<cr><lf>	batch started
AZ, [xxxxx.xx],5,FDONE,4E,<cr><lf>	batch completed
AZ, [xxxxx.xx],5,FERROR,5D,<cr><lf>	command error

### 5.3.3.2 Manual Output Control

This command provides direct serial control over the state of an output port to cause the output to be either ON or OFF for the [Port Type]s as follows:

#### Relay

ON causes contacts closed  
OFF causes contacts open

#### Analog (Volts or mA)

ON causes the programmed High Value to be output  
OFF causes the programmed Low Value to be output

The output port [Control Function] must be programmed to [Manual] to enable direct output port control.

#### HOST SEND

AZ [.xx] O 0<cr>  
AZ [.xx] O 1<cr>

Non-network  
OFF  
ON

AZ [xxxxxx.xx] O 0<cr>  
AZ [xxxxxx.xx] O 1<cr>

Network  
OFF  
ON

#### RESPONSE

<none>

## 5.4 System Port Value Services

### 5.4.1 View System Port Operating Values

This command enables a terminal operator to view the present state of the system port programmed values.

The system port number is one greater than the maximum number of available ports for any particular instrument.

#### HOST SEND

AZ [.xx] V <cr>  
AZ [xxxxxx.x] V <cr>

Non-network  
Network

#### RESPONSE

PROGRAM VALUES - Port Sys

<17> Network Addr 00990  
<25> Log Freq 010 min

```

<22> Date-Time      08Jul05 17:42:21
<23> Report Start   10Jan06 00:00:00
<24> Report Freq    030 min
<19> Alarm Phone    0000000000000000
<20> Report Phone   0000000000000000
<21> Answer Rings   000

```

#### 5.4.2 Set System Port Operating Values

Each of the system port programmed operating values can be individually queried or changed in accordance with Section 6.0.

### 5.5 Communication Message Fundamentals

Messages between host and unit are either polled or un-polled, where the host is the polling party. The unit either responds to a host poll - or based on how the unit is programmed, it can send un-polled messages to the host to send information concerning either the occurrence of an event, or as a periodic report which is invoked based on a programmed scheduled frequency.

#### 5.5.1 Message Structure

A packet is a group of information from a single port. A block is a group of packets sent together to form a message, with examples as follows:

##### PACKET

```
AZ,00909.00,2,00000988.93,00162871.43,-0000003.27,+0000003.27,00022,Q,X,H,L,X,<sum><cr><lf>
```

##### BLOCK

```

<dle><stx>
AZ,00909.02,2,00000988.93,00162871.43,-0000003.27, 0000003.27,00022,Q,X,H,L,X,<sum><cr><lf>
AZ,00909.03,2,00000988.93,00162871.43, 0000003.27,+0000003.27,00022,Q,X,H,L,X,<sum><cr><lf>
<dle><etx>

```

#### 5.5.2 Message Format

##### BLOCK PRELIMITER

```
<dle><stx>
```

Start of multi-port block

##### PACKET PRELIMITER

```
AZ
```

Start of a port packet

ADDRESS - unit and port(s) providing the information

```
,xxxxx
```

unit address

```
.xx
```

port sub-address

TYPE - message purpose

Un-polled Types

,0		Alarm
,1		Report scheduled
,2	[QTY]+[RATE] keys	Com install test
,3	[ZERO]+[CHAN] keys	Service acknowledge
,6		Log data scheduled report

Polled Types

,4		Information request response
,5		Control batch status
,6		Log data request
,7		<reserved>
,8		<reserved>
,9		<reserved>

MEASURE - port values - sign convention as +, space(+), or -

,QTY1	Quantity 1
,QTY2	Quantity 2
,RATE	Rate-Value
,<reserved>	<reserved>
,HOURS	Time

ALARMS - based on programmed alarm limit values

,X	No alarm <default>
,Q	Quantity 1
,C	Quantity 2
,H	Rate-Value high
,L	Rate-Value low
,T	Time

CHECKSUM

,<sum>	Negated mod256 sum
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PACKET DELIMITER

<cr><lf>	Packet end
----------	------------

BLOCK DELIMITER

<dle><etx>	Block end
------------	-----------

### 5.5.3 Message Procedures - Wide Area Network

5.5.3.1 The unit performs an un-pollled link connection with the host and delays 10 seconds to insure the host link negotiation is complete which nominally requiring about 5 seconds before taking further action.

5.5.3.2 Prior to link negotiate delay expiration - the host may send an AZH (XOF) command causing the unit to suspend sending its un-pollled message until the host thereafter sends an AZS (XON) command releasing the suspend condition.

Once the unit is enabled to send - the host has become the line master and the field unit will stay connected for a maximum of 8 minutes, unless the link is first disconnected by the host.

5.5.3.3 The unit sends the message to the host that had originally been the cause to acquire the host link.

5.5.3.4 Four seconds are allowed for the host to receive the first information packet and acknowledge its receipt during which time the host compares the checksum sent by the unit against its own calculated value. The host then sends a positive acknowledge (AZA) to the unit if the checksums are equal, indicating the message was correctly received. Otherwise - the host may either not send a positive acknowledge, or send a negative acknowledge (AZN), either of which indicates the received packet was in error.

5.5.3.5 When the unit receives a AZN, or no positive host response in 4 seconds, the unit will resend the packet that was in error.

5.5.3.6 The object is to communicate the information to the host. The unit allows 3 more such tries to resend a particular packet - after which it will disconnect the link; reinitiate the entire send process after two minutes for a total of four such re-initiations; and if each continues to be unsuccessful - re-initiation of all of the above will occur every twenty-four hours thereafter.

### 5.6 Log Record Sub-System

A unit may optionally be installed with the log sub-system which allows periodic sampling of input port information that is then stored as sequential date-time stamped records in the logging memory.

This section describes the serial command operation for the logging sub-system of a unit. The ability of a unit to perform logging operation requires that the unit be installed with a logging memory, and for the sub-system to be configured to ON.

#### 5.6.1 Serial Control Commands

Serial control commands duplicate the manual key log control functions.

#### 5.6.1.1 Start Logging

This operation automatically clears existing records and starts logging new records at the present date-time.

KEYS - [START]

HOST SEND

AZG2<cr>

Non-network

AZ [xxxxxx] G 2<cr>

Network

RESPONSE

<none>

#### 5.6.1.2 Send Log Records

This operation stops logging, if not already stopped, and sends all records from the date-time this logging session was started.

KEYS - [RATE] <pending revision>

HOST SEND

AZG0<cr>

Non-network

AZ [xxxxxx] G 0<cr>

Network

RESPONSE

<none>

#### 5.6.1.3 Clear Log Records

This operation causes all previous records to be deleted from the log memory.

KEYS - [ZERO]

HOST SEND

AZG1<cr>

Non-network

AZ [xxxxxx] G 1<cr>

Network

RESPONSE

<none>

#### 5.6.1.4 Stop Logging

This operation causes the logging process to stop with all existing log records retained for host acquisition.

KEYS - [STOP]

### HOST SEND

AZG3<cr>  
AZ [xxxxx] G 3<cr>

Non-network  
Network

### RESPONSE

<none>

#### 5.6.2 Record Pacing Controls

The log send process can be paced using the above described pacing commands.

#### 5.6.3 Error Control

The log send process can be error controlled using the above described error control commands.

#### 5.6.4 Compression

The log send process can have the value portions of records sent as compressed signed binary which doubles the time required to send records.

#### 5.6.5 Log Record Send Structure

Log records are sent in block structured format for easy Excel import as follows:

#### BLOCK

```

<dle><stx>Addr,Port,Type,Value,Units,Date,Time<cr><lf>
00990,,Stamp,,,07Jan06,07:12:39<cr><lf>> ← Starting Time Stamp
00990,01,Qty1,00000183.33, ml,07Jan06,07:12:39<cr><lf>
00990,02,Rate,00000000.28, øC,07Jan06,07:12:39<cr><lf>
00990,08,Qty2,00000247.15,gal,07Jan06,07:12:39<cr><lf>
00990,01,Qty1,00000183.33, ml,07Jan06,07:12:41<cr><lf>
00990,02,Rate,00000000.28, øC,07Jan06,07:12:41<cr><lf>
00990,08,Qty2,00000247.15,gal,07Jan06,07:12:41<cr><lf>
00990,,Stamp,,,07Jan06,07:12:58<cr><lf> ← Time Stamp Change Record
00990,01,Qty1,00000188.42, ml,07Jan06,07:12:58<cr><lf>
00990,02,Rate,00000000.29, øC,07Jan06,07:12:58<cr><lf>
00990,08,Qty2,00000247.15,gal,07Jan06,07:12:58<cr><lf>
00990,01,Qty1,00000188.42, ml,07Jan06,07:13:00<cr><lf>
00990,02,Rate,00000000.29, øC,07Jan06,07:13:00<cr><lf>
00990,08,Qty2,00000247.16,gal,07Jan06,07:13:00<cr><lf>
<dle><etx>

```

#### COLUMNS

Addr	Unit network address
Port	Measure input port number
Type	Measure description
Value	Numeric value
Units	Measure units
Date,Time	Sample date-time stamp 24 hr format
Stamp	Revised date-time stamp

### 5.6.6 Clock Time Stamp Record

The logging function may be in process when power to the logger is lost. When power is restored - the logger checks whether it was logging before the time power was lost. If logging was previously in process - a clock record of the present date-time is inserted into the logging memory to indicate that all records sequentially following the clock record, have occurred at the programmed logging rate after the time indicated by the inserted clock record.

Clock records are sent sequentially in time order integrated with sample data frames. They are sent as uncompressed characters without prefix, or with a compressed 8000h prefix.

## 6.0 Serial Programming

This section is organized into reading and programming values. The [index] is a numeric designator which is unique for a particular value type that is desired to be read or programmed.

### 6.1 Read a Programmed Value

#### HOST SEND

AZ [.xx]	P[index] ? <cr>	Non-network
AZ [xxxxxx.xx]	P[index] ? <cr>	Network

#### RESPONSE

<200ms delay>  
AZ,xxxxxx.xx,4,Pyy,<present value>,<cksm><cr><lf>

A received response indicates that no error condition was detected.

#### EXAMPLE

AZ,00123.08,4,P08,04.000,DF<cr><lf>

### 6.2 Program a New Value

#### HOST SEND

AZ [.xx]	P[index] = <new value> <cr>	Non-network
AZ [xxxxxx.xx]	P[index] = <new value> <cr>	Network

#### RESPONSE

<200ms delay>  
AZ,xxxxxx.xx,4,Pyy,<new value>,<cksm><cr><lf>

A correct received response indicates that no error condition was detected.

Software should validate the responding units message check-sum, followed by the unit message address, port number, value index, and the new value to determine that the desired value was successfully programmed.

### 6.3 Input Port Values

Index	Value Title	Value	Range	Notes
Input port function with universal input module installed				
0	Port Type	0	Off	1 or 2 ascii chars
		6	Input 0-20mA	1 ascii char min
		7	Input 0-10V	
		8	Input 0-4096mV	
		9	Input Ohms	
		:	Input TTD	
		;	Input Pulse-Freq	
		<	Input Digital	
	Input Excitation			1 ascii char optional
		0	+5v	
		1	+12v	
		2	Vin	
NOTE: excitation will be zero when only type byte is received				
3	Measurement magnitude range Decimal Point	0-3	xxx./xx.x/x.xx/.xxx	1 ascii char
4	Character string identifying the physical measurement type Measure Units	uuu	<see Data Sheet>	1-3 ascii chars auto right justified
5	Pulse-frequency measurement conversion constant determining the pulse per rate-value proportionality Pulse Constant	xxxxxxx.xxx	0.001 to 9,999,999.999	1-11 ascii chars fix dp
6	Analog interpolator representing the smallest measured electrical signal Low Value	xx.xxx	0.000 to 20.000	1-6 ascii chars fix dp

Analog interpolator representing the engineering value of the smallest measured electrical signal  
 7 Low Units xxxxxxxxxxxx 0 to 1,999,999,999 - 999,999,999 1-11 ascii chars var dp

Analog interpolator representing the greatest measured electrical signal  
 8 Hi Value xx.xxx 0.000 to 20.000 1-6 ascii chars fix dp

Analog interpolator representing the engineering value of the greatest measured electrical signal  
 9 Hi Units xxxxxxxxxxxx 0 to 1,999,999,999 - 999,999,999 1-11 ascii chars var dp

Measurement per unit time relationship  
 10 Rate Time Base 0 Scalar 1 ascii char  
 1 sec  
 2 min  
 3 hrs  
 4 day

Low pass filter  
 11 Rate Filter 0-9 +0 to -20 1 ascii char fix dbHz

Alarm limit value for quantity 1  
 12 Qty 1 Lim xxxxxxxxxxxx 0 to 9,999,999,999 1-11 ascii chars var dp

Alarm limit value for quantity 2  
 13 Qty 2 Lim <same as 12>

Rate-value representing a measured amount below which a low alarm condition is detected  
 14 Low Rate Lim xxxxxxxxxxxx 0 to 1,999,999,999 - 999,999,999 1-11 ascii chars var dp

Rate-value representing a measure amount above which a high alarm condition is detected  
 15 High Rate Lim xxxxxxxxxxxx 0 to 1,999,999,999 - 999,999,999 1-11 ascii chars var dp

NOTE: Rate-value measurements are four quadrant bipolar - with both low and high able to be programmed to operate together in an exclusive fashion. However, when the low value is set to be less than the high value - inclusive detection is enabled.

Hobbs hour meter alarm limit used for maintenance, service or operation  
 16 Time Limit xxxx 0-9,999 1-4 ascii chars fix hrs

Un-polled port designation for use in sending messages for alarms, reports and log records

18	Comm Port		1-4 ascii chars
	Serial Non-polled		1 ascii char
	0	Off	
	1	Sio Alarm	
	2	Lan Alarm	
	3	WAN Alarm	
	4	Sio Report	
	5	Lan Report	
	6	WAN Report	

Hardware configuration and facility attributes

	System Configuration		1-3 ascii numeric bit mapped chars
	1	Log	0=off, 1=on
	2	Lead Zero Suppress	0=none, 1=suppress
	4	Error control	0=off , 1=on
	8	Compression	0=ascii, 1=sign bin
	16	Security	0=off , 1=on
	32	Port lock	0=off , 1=on
	64	Bulk batch	0=off , 1=on
	128	Audio	0=on, 1=off

Time required for a rate-value alarm to be persistent prior to declaring an alarm condition

26	Rate Limit Dly	xxx	0-255	1-3 ascii chars fix sec
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Reference or scale constant multiply used for application dependent measured value re-proportioning

27	ReferenceValue	xxxxxxx.xxx	0-9,999,999.999	1-11 ascii chars fix dp
	Scale Factor			

Selection for measured value type desired to be incorporated in log records

28	Log Select		1 ascii char
	0	Off	
	1	Rate-Value	
	2	Quantity 1	

3 Quantity 2

#### 6.4 Output Port Values

Index	Value Title	Value	Range	Notes
Output port function with universal output module installed in the port.				
0	Port Type	0	Off	1 or 2 ascii chars 1 ascii char min
		1	Output 20mA Source	
		2	Output 20mA Sink	
		3	Output 10V	
		4	Output Relay	
		5	Output Dig	
	Output Link	0	Plc custom	1 or 2 ascii char(s)
		1-99	Input port number	
Rate, value or quantity used as target for batching, dosing, PID and manual set-point control processes				
1	Ctrl Amount	xxxxxxxxxx	0 to 1,999,999,999 -999,999,999	1-11 ascii char var dp
Selection of output control types				
2	Control Type	0	Monitor	1 ascii char
		1	Manual	
		2	Batch	
		3	Dose	
		4	Pid	
		5	Digital	
Analog de-interpolator representing the smallest electrical signal to be output				
6	Low Value	xx.xxx	0.000 to 20.000	1-6 ascii chars fix dp
Analog de-interpolator representing the engineering value of the smallest electrical signal to be output				
7	Low Units	xxxxxxxxxx	0 to 1,999,999,999 - 999,999,999	1-11 ascii chars var dp
Analog de-interpolator representing the greatest electrical signal to be output				
8	Hi Value	xx.xxx	0.000 to 20.000	1-6 ascii chars fix dp

Analog de-interpolator representing the engineering value of the greatest electrical signal to be output  
 9 Hi Units xxxxxxxxxxxx 0 to 1,999,999,999 - 999,999,999 1-11 ascii chars var dp

Qik-Tune value determining match to the controlled plant bandwidth  
 11 Pid Response 0-9 +0 to -20 1 ascii char fix dBHz

### 6.5 System Port Values

Index	Value Title	Value	Range	Notes
Unit base address for communication activities				
17	Network Addr	xxxxxx	0-65535	1-5 ascii chars
Host address for communicating alarm conditions				
19	Alarm Phone	xxxxxxxxxxxxxxxx	<see Data Sheet>	1-16 ascii chars auto right justified
Host address for communicating reports and log records				
20	Report Phone	<same as 19>		
Wide area PSTN media access rings				
21	Answer Rings	xxx	0-255	1-3 ascii chars count
Clock Date-Time				
22	Date-Time			dd mon yy hh mm ss
	Day	dd	01-31	2 ascii chars
	Month	mon	01-12	2 ascii chars
	Year	yy	00-99	2 ascii chars
	Hrs	hh	00-23	2 ascii chars
	Min	mm	00-59	2 ascii chars
	Sec	ss	00-59	2 ascii chars
Host report processing beginning date-time				
23	Report Start	<same as 22>		
Recurring period for sending un-pollled value information to host				
24	Report Freq	<nnn><unit>		4 ascii chars
		nnn	000-999	3 ascii chars

	unit	
0	sec	1 ascii char
1	min	
2	hrs	
3	day	
4	mon	

Recurring period for acquiring measured input port information for inclusion in log records  
25            Log Freq            <same format as 24>

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