

Servo Pump Controller Programmer Guide

Version 2.0
July 25, 2018
Part No. 22940003

for use with:

Control Software version 1.12.02
on
Servo Pump Controller - Full Control model, PN 22991005



prepared by GPD Global® Documentation Department



611 Hollingsworth Street
Grand Junction, CO, USA 81505
tel: +1.970.245-0408 • fax +1.970.245-9674
request@gpd-global.com • www.gpd-global.com

Copyright © 2018 GPD Global® • All Rights Reserved

Contents

Overview	1
About this Manual	1
Communications	2
Input / Output Signals	2
Connector Pin Outs	3
Ethernet TCP/IP	4
Programming	5
RS232 Programming	5
ASCII Commands	5
Command Structure	5
Responses	6
ASCII Command Set	7
Modbus TCP/IP Programming	10
Process Image Data	10
Process Image Types	10

Overview

The Servo Pump Controller provides control for operating any of the GPD Global fluid dispensing pumps with a servo motor.



About this Manual

This programmer guide provides details about communicating with and programming the controller.

For controller overview, set up, and operating instructions, refer to the *Servo Pump Controller User Guide* PN 22940001.

Communications

Input / Output Signals

IO is Opto-couple Isolated.

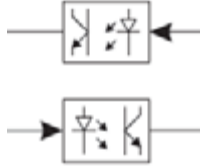
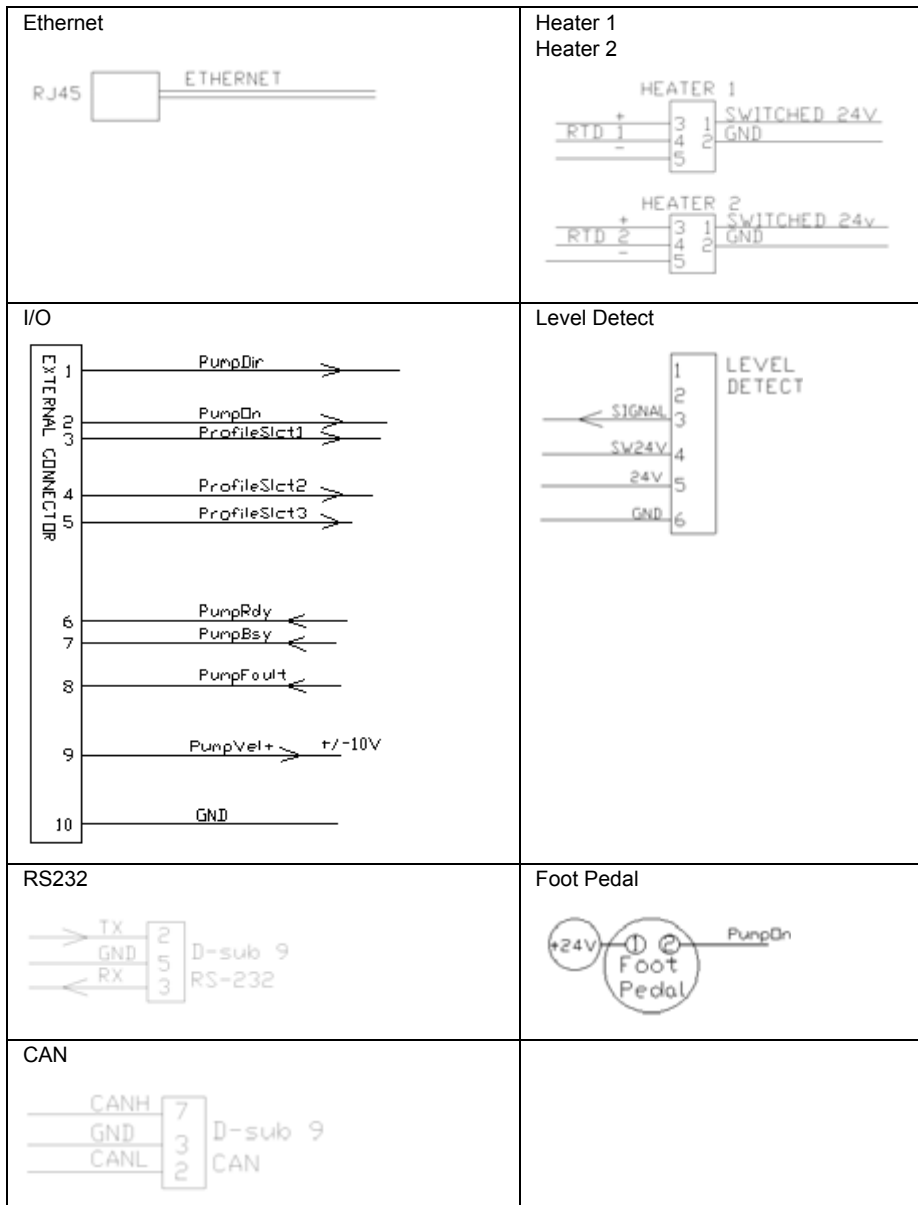


Table 1: External Input/Output Connector Pin Descriptions

Pin	I/O Description	I/O Function	I/O State
1	Digital Input	Pump Direction	
2	Digital Input	Pump On	
3	Digital Input	Profile Select 1	
4	Digital Input	Profile Select 2	Active: High (+24V)
5	Digital Input	Profile Select 3	Inactive: Open circuit
6	Digital Output	Pump Ready	
7	Digital Output	Pump Busy	
8	Digital Output	Pump Fault	
9	Reserved	Reserved	0 - 10 VDC
10	Ground	Ground	

Connector Pin Outs



Ethernet TCP/IP

The Ethernet TCP/IP communication port provides an additional means beyond the touch screen for reading and writing pump controller parameters. This method uses:

- Default IPv4 Address: 10.229.0.1
- Subnet Mask: 255.0.0.0
- Gateway: 10.0.0.30
- Log Destination IPv4 Address: 10.254.254.254

Programming

RS232 Programming

The RS232 communication port provides an additional means beyond the touch screen for reading and writing pump controller parameters. This method of communication uses a text based (ASCII character set) command and response protocol.

RS232 Settings

Baud	115200
Data Bits	8
Stop Bits	1
Parity	None

- [ASCII Commands](#) (pg 5)
- [ASCII Command Set](#) (pg 7)

ASCII Commands

Command Structure

The actual ASCII string for the commands / responses are shown in the tables below.

NOTE: - \n refers to a single newline character (ASCII character 10).

Writing a variable value

```
var=val\n
```

ex. writing a variable value

Command	Response
dfsp=100.0\n	v\n

Reading a variable value

```
var\n
```

ex. reading a variable value

Command	Response
dfsp\n	v 100.0\n

Bad command / response

ex. bad command

Command	Response
badcmd\n	e 1\n

Responses

Success Responses

Always begins with a **v** character.

v\n	the command succeeded
v xxx\n	the command succeeded and returned a value - value format is defined by the command

Error Response

e x\n	the command failed with error code x
-------	--------------------------------------

Error Codes

Error Code	Description	Example
1	Unknown command	badcmd\n
2	Malformed command	dfsp=\n
3	Value out of range	dfsp=-2.0\n
4	Write-only, value of variable cannot be read	abcd\n
5	Read-only, value of variable cannot be changed	pbsy=1\n

ASCII Command Set

ASCII Commands

Command	Description	R/W*	Notes
prdy	Pump ready	R	0=pump is not ready, 1=pump ready
pbsy	Pump busy	R	0=pump is not busy, 1=pump is busy
pflt	Pump fault	R	0=pump not in a fault state, 1=pump is in a fault state
pprs	Pump present	R	0=pump is not present/connected, 1=pump is present/connected
pion	Pump on	R	0=pump signal not active, 1=pump signal activated
prf1	Profile Select 1 signal	R	0=inactive, 1=active
prf2	Profile Select 2 signal	R	0=inactive, 1=active
prf3	Profile Select 3 signal	R	0=inactive, 1=active
unit	Unit Select signal	R	0=inactive, 1=active
pdir	Pump Direction signal	R	0=inactive, 1=active
pval	Pump valid and compatible with controller	R	0=pump invalid, 1=pump valid
pcnf	The currently active pump configuration	R/W	
dmod	The dispense mode	R/W	0=dot, 1=continuous, 65535=auto/wire mode
onst	Online state of the controller (online or offline)	R/W	1=Online, 0=Offline, transitions to Online clear faults
frun	Forces the pump to run with the current parameters	R/W	1=Run, 0=Idle
recp	The currently selected recipe	R/W	Zero based index, recp=0 is the first recipe

Pump EEPROM Data

ppn	Pump part number	R	
prbc	Pump rebuild count	R	
prbd	Pump rebuild date	R	Value is in Unix timestamp format
psn	Pump serial number	R	
psrd	Date pump was last serviced	R	Value is in Unix timestamp format

Servo Controller Parameters

dfsp	Dot Forward Speed ($^{\circ}/s$)	R/W	Positive non-zero number
dfac	Dot Forward Acceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
dfdc	Dot Forward Deceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
dfrt	Dot Forward Rotation ($^{\circ}$)	R/W	Positive non-zero number
drsp	Dot Reverse Speed ($^{\circ}/s$)	R/W	Positive non-zero number
drac	Dot Reverse Acceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
drdc	Dot Reverse Deceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
drrot	Dot Reverse Rotation ($^{\circ}$)	R/W	Positive number
drdl	Dot Reverse Delay (ms)	R/W	Non-negative number
cfsp	Continuous Forward Speed ($^{\circ}/s$)	R/W	Positive non-zero number
cfac	Continuous Forward Acceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
cfdc	Continuous Forward Deceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
crsp	Continuous Reverse Speed ($^{\circ}/s$)	R/W	Positive non-zero number
crac	Continuous Reverse Acceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
crdc	Continuous Reverse Deceleration ($^{\circ}/s^2$)	R/W	Positive non-zero number
crrot	Continuous Reverse Rotation ($^{\circ}$)	R/W	Positive number
crdl	Continuous Reverse Delay (ms)	R/W	Non-negative number

*R/W: R = readable, W = writeable

ASCII Commands (cont'd)

Command	Description	R/W*	Notes
prvs	Servo pump total revolutions	R	Valid only with EEPROM pumps
NCM Controller Parameters			
dopt	Dot Open Time (100us)	R/W	Positive non-zero number
dclt	Dot Close Time (100us)	R/W	Positive non-zero number
dshc	Dot Shot Count	R/W	Positive non-zero number
pshc	NCM pump total shot count	R	Valid only with EEPROM pumps
copt	Continuous Open Time (100us)	R/W	Positive non-zero number
cclt	Continuous Close Time (100us)	R/W	Positive non-zero number
Body Temperature			
btrd	Body Temperature Ready	R	0=not ready, 1=ready
bten	Body Temperature Enable	R/W	0=disable, non-zero=enabled
brx	Body RTD Present	R	0=no rtd, 1=rtd detected
btmp	Body Temperature (°C)	R	Positive Number
btsp	Body Temperature Setpoint (°C)	R/W	Positive Number
btlo	Body Temperature Minimum (°C)	R/W	Positive Number
bthi	Body Temperature Maximum (°C)	R/W	Positive Number
btpp	Body Temperature, PID Proportional Gain	R/W	
btpi	Body Temperature, PID Integral Gain	R/W	
btpd	Body Temperature, PID Derivative Gain	R/W	
btpt	Body Temperature, PID Time base (ms)	R/W	non-zero
btpw	Body Temperature, PWM Period (ms)	R/W	non-zero
btpr	Body Temperature, sample rate (ms)	R/W	non-zero
btfb	Body Temperature, filter band	R/W	
btfl	Body Temperature, filter length		
Body Pressure			
bard	Body Air Pressure Ready	R	0=not ready, 1=ready
baps	Body Air Pressure (kPa)	R	Positive Number
bast	Body Air Set Point (kPa)	R/W	Positive Number
bhip	Body Max Air Pressure (kPa)	R/W	Positive Number
blp	Body Min Air Pressure (kPa)	R/W	Positive Number
Reservoir			
rlvd	Reservoir Level Detect Enable	R/W	0=disable, non-zero=enabled
rlvs	Reservoir Level Detect Status	R	0=not active, 1=active
rmix	Reservoir Mixer Enable	R/W	0=disable, non-zero=enabled
Reservoir Temperature			
rtrd	Reservoir Temperature Ready	R	0=not ready, 1=ready
rten	Reservoir Temperature Enable	R/W	0=disable, non-zero=enabled
rtrx	Reservoir RTD Present	R	0=no rtd, 1=rtd detected
rtmp	Reservoir Temperature (°C)	R	Positive Number
rtsp	Reservoir Temperature Setpoint (°C)	R/W	Positive Number
rtlo	Reservoir Temperature Minimum (°C)	R/W	Positive Number
rthi	Reservoir Temperature Maximum (°C)	R/W	Positive Number
rtp	Reservoir Temperature, PID Proportional Gain	R/W	

*R/W: R = readable, W = writeable

ASCII Commands (cont'd)

Command	Description	R/W*	Notes
rtpi	Reservoir Temperature, PID Integral Gain	R/W	
rtpd	Reservoir Temperature, PID Derivative Gain	R/W	
rtpt	Reservoir Temperature, PID Period (ms)	R/W	non-zero
rtpw	Reservoir Temperature, PWM Period (ms)	R/W	non-zero
rtpr	Reservoir Temperature, sample rate (ms)	R/W	non-zero
rtfb	Reservoir Temperature, filter band	R/W	
rtfl	Reservoir Temperature, filter length	R/W	

Reservoir Pressure

rard	Reservoir Air Ready	R	0=not ready, 1=ready
raps	Reservoir Air Pressure (kPa)	R	Positive Number
rast	Reservoir Air Set Point (kPa)	R/W	Positive Number
rhip	Reservoir Max Air Pressure (kPa)	R/W	Positive Number
rlp	Reservoir Min Air Pressure (kPa)	R/W	Positive Number
dadl	Disable Air Delay (ms)	R/W	Non-negative number
wnvr	Writes current configuration parameters to non volatile ram	R/W	0=no action, non-zero=performs write

*R/W: R = readable, W = writeable

Modbus TCP/IP Programming

This device implements the Modbus® TCP/IP protocol which provides an additional communication interface to the Servo Pump Controller through the Ethernet connection.

The process image can be accessed via Modbus® TCP/IP using the following address scheme:

- 00000 to 09999 : Coil addressing
- 10000 to 19999 : Discrete input addressing
- 30000 to 39999 : Input register addressing
- 40000 to 49999 : Holding register addressing

Process Image Data

Use this process image data when communicating with the Servo Pump Controller via its Ethernet connection. Refer to [Common Process Image](#) (pg 11).

Process Image Types

Content in the Process Image Types file provides reference information for data in the [Process Image Data](#) (pg 10) file. Refer to [Process Image Types](#) (pg 15).

Common Process Image

As of 06/29/2018

Name	Description	Address	Type
PartNumber	The GPD part number of the device	400000	GPDPartNumber
SerialNumber	The unique serial number of the device	400010	GPDSerialNumber
DeviceName	A name describing the device	400020	ZString
Manufacturer	The manufacturer of the device	400030	ZString
ModelId	The model identifier of the device	400040	ZString
FirmwareVersion	Firmware version of the device	400050	ZString
DeviceFunction	The overall function (or purpose) of the device	400060	ZString
NetIPAddr	The IP address of the device	400070	IPv4Address
NetSubnet	The subnet mask of the device	400080	IPv4Address
NetGateway	The network gateway for the device	400090	IPv4Address
NetDNS	The network DNS for the device	400100	IPv4Address
LogDest	The network destination for log messages	400110	IPv4Address
BoardTemp	The board temperature, from temperature sensor on device circuit board	400120	Temperature
ScriptSize	The size of the PAWN script currently loaded on the device	400122	UInt16
ScriptVersion	The version of the script currently loaded, should be set in the application script	400123	ZString
ScriptId	The script identifier of the currently loaded script, this should be used to uniquely identify a compiled script	400143	ZString
ScriptPartNumber	The part number of the currently loaded application script.	400170	ZString
LibVersion	The library version of the firmware	400180	ZString
ErrorMsg	A description of the last error condition as indicated in Error	400200	ZString
TRISA	PORTA pin directions	400293	UInt16
TRISB	PORTB pin directions	400294	UInt16
TRISC	PORTC pin directions	400295	UInt16
TRISD	PORTD pin directions	400296	UInt16
TRISE	PORTE pin directions	400297	UInt16
TRISF	PORTF pin directions	400298	UInt16
TRISG	PORTG pin directions	400299	UInt16
RA0	The state of PORT RA0	400300	Boolean
RA1	The state of PORT RA1	400301	Boolean
RA2	The state of PORT RA2	400302	Boolean
RA3	The state of PORT RA3	400303	Boolean
RA4	The state of PORT RA4	400304	Boolean
RA5	The state of PORT RA5	400305	Boolean
RA6	The state of PORT RA6	400306	Boolean
RA7	The state of PORT RA7	400307	Boolean
RA8	The state of PORT RA8	400308	Boolean
RA9	The state of PORT RA9	400309	Boolean
RA10	The state of PORT RA10	400310	Boolean
RA11	The state of PORT RA11	400311	Boolean
RA12	The state of PORT RA12	400312	Boolean
RA13	The state of PORT RA13	400313	Boolean
RA14	The state of PORT RA14	400314	Boolean
RA15	The state of PORT RA15	400315	Boolean
RB0	The state of PORT RB0	400316	Boolean
RB1	The state of PORT RB1	400317	Boolean
RB2	The state of PORT RB2	400318	Boolean
RB3	The state of PORT RB3	400319	Boolean
RB4	The state of PORT RB4	400320	Boolean
RB5	The state of PORT RB5	400321	Boolean
RB6	The state of PORT RB6	400322	Boolean
RB7	The state of PORT RB7	400323	Boolean
RB8	The state of PORT RB8	400324	Boolean
RB9	The state of PORT RB9	400325	Boolean
RB10	The state of PORT RB10	400326	Boolean
RB11	The state of PORT RB11	400327	Boolean
RB12	The state of PORT RB12	400328	Boolean
RB13	The state of PORT RB13	400329	Boolean
RB14	The state of PORT RB14	400330	Boolean
RB15	The state of PORT RB15	400331	Boolean
RC0	The state of PORT RC0	400332	Boolean
RC1	The state of PORT RC1	400333	Boolean
RC2	The state of PORT RC2	400334	Boolean
RC3	The state of PORT RC3	400335	Boolean
RC4	The state of PORT RC4	400336	Boolean
RC5	The state of PORT RC5	400337	Boolean
RC6	The state of PORT RC6	400338	Boolean
RC7	The state of PORT RC7	400339	Boolean
RC8	The state of PORT RC8	400340	Boolean
RC9	The state of PORT RC9	400341	Boolean
RC10	The state of PORT RC10	400342	Boolean
RC11	The state of PORT RC11	400343	Boolean
RC12	The state of PORT RC12	400344	Boolean
RC13	The state of PORT RC13	400345	Boolean

Name	Description	Address	Type
RC14	The state of PORT RC14	400346	Boolean
RC15	The state of PORT RC15	400347	Boolean
RD0	The state of PORT RD0	400348	Boolean
RD1	The state of PORT RD1	400349	Boolean
RD2	The state of PORT RD2	400350	Boolean
RD3	The state of PORT RD3	400351	Boolean
RD4	The state of PORT RD4	400352	Boolean
RD5	The state of PORT RD5	400353	Boolean
RD6	The state of PORT RD6	400354	Boolean
RD7	The state of PORT RD7	400355	Boolean
RD8	The state of PORT RD8	400356	Boolean
RD9	The state of PORT RD9	400357	Boolean
RD10	The state of PORT RD10	400358	Boolean
RD11	The state of PORT RD11	400359	Boolean
RD12	The state of PORT RD12	400360	Boolean
RD13	The state of PORT RD13	400361	Boolean
RD14	The state of PORT RD14	400362	Boolean
RD15	The state of PORT RD15	400363	Boolean
RE0	The state of PORT RE0	400364	Boolean
RE1	The state of PORT RE1	400365	Boolean
RE2	The state of PORT RE2	400366	Boolean
RE3	The state of PORT RE3	400367	Boolean
RE4	The state of PORT RE4	400368	Boolean
RE5	The state of PORT RE5	400369	Boolean
RE6	The state of PORT RE6	400370	Boolean
RE7	The state of PORT RE7	400371	Boolean
RE8	The state of PORT RE8	400372	Boolean
RE9	The state of PORT RE9	400373	Boolean
RE10	The state of PORT RE10	400374	Boolean
RE11	The state of PORT RE11	400375	Boolean
RE12	The state of PORT RE12	400376	Boolean
RE13	The state of PORT RE13	400377	Boolean
RE14	The state of PORT RE14	400378	Boolean
RE15	The state of PORT RE15	400379	Boolean
RF0	The state of PORT RF0	400380	Boolean
RF1	The state of PORT RF1	400381	Boolean
RF2	The state of PORT RF2	400382	Boolean
RF3	The state of PORT RF3	400383	Boolean
RF4	The state of PORT RF4	400384	Boolean
RF5	The state of PORT RF5	400385	Boolean
RF6	The state of PORT RF6	400386	Boolean
RF7	The state of PORT RF7	400387	Boolean
RF8	The state of PORT RF8	400388	Boolean
RF9	The state of PORT RF9	400389	Boolean
RF10	The state of PORT RF10	400390	Boolean
RF11	The state of PORT RF11	400391	Boolean
RF12	The state of PORT RF12	400392	Boolean
RF13	The state of PORT RF13	400393	Boolean
RF14	The state of PORT RF14	400394	Boolean
RF15	The state of PORT RF15	400395	Boolean
RG0	The state of PORT RG0	400396	Boolean
RG1	The state of PORT RG1	400397	Boolean
RG2	The state of PORT RG2	400398	Boolean
RG3	The state of PORT RG3	400399	Boolean
RG4	The state of PORT RG4	400400	Boolean
RG5	The state of PORT RG5	400401	Boolean
RG6	The state of PORT RG6	400402	Boolean
RG7	The state of PORT RG7	400403	Boolean
RG8	The state of PORT RG8	400404	Boolean
RG9	The state of PORT RG9	400405	Boolean
RG10	The state of PORT RG10	400406	Boolean
RG11	The state of PORT RG11	400407	Boolean
RG12	The state of PORT RG12	400408	Boolean
RG13	The state of PORT RG13	400409	Boolean
RG14	The state of PORT RG14	400410	Boolean
RG15	The state of PORT RG15	400411	Boolean
AnalogInCh0	The normalized value of the analog input channel 0	400412	Float
AnalogInCh1	The normalized value of the analog input channel 1	400414	Float
AnalogInCh2	The normalized value of the analog input channel 2	400416	Float
AnalogInCh3	The normalized value of the analog input channel 3	400418	Float
AnalogInCh4	The normalized value of the analog input channel 4	400420	Float
AnalogInCh5	The normalized value of the analog input channel 5	400422	Float
AnalogInCh6	The normalized value of the analog input channel 6	400424	Float
AnalogInCh7	The normalized value of the analog input channel 7	400426	Float
AnalogOutCh0	The normalized value of the analog output channel 0	400428	Float
AnalogOutCh1	The normalized value of the analog output channel 1	400430	Float

Name	Description	Address	Type
AnalogOutCh2	The normalized value of the analog output channel 2	400432	Float
AnalogOutCh3	The normalized value of the analog output channel 3	400434	Float
AnalogOutCh4	The normalized value of the analog output channel 4	400436	Float
AnalogOutCh5	The normalized value of the analog output channel 5	400438	Float
AnalogOutCh6	The normalized value of the analog output channel 6	400440	Float
AnalogOutCh7	The normalized value of the analog output channel 7	400442	Float
AnalogInCh8	The normalized value of the analog input channel 8	400444	Float
AnalogInCh9	The normalized value of the analog input channel 9	400446	Float
AnalogInCh10	The normalized value of the analog input channel 10	400448	Float
AnalogInCh11	The normalized value of the analog input channel 11	400450	Float
AnalogInCh12	The normalized value of the analog input channel 12	400452	Float
AnalogInCh13	The normalized value of the analog input channel 13	400454	Float
AnalogInCh14	The normalized value of the analog input channel 14	400456	Float
AnalogInCh15	The normalized value of the analog input channel 15	400458	Float
LogEnable	Enables or disables log messages, 0 = disabled, non-zero = enabled	400500	Boolean
LogLevel	The log level threshold for log messages	400501	LogLevel
Reset	Resets/Restarts the device when value 0xA55A is written	400502	UInt16
BootloaderStart	Restarts the device in bootloader mode when value 0xA55A is written, enabling the device to have it's firmware updated	400503	UInt16
WriteNVRAM	Writes current configuration parameters to non volatile ram when value 0xA55A is written	400504	UInt16
Safe	Forces the system/hardware to go to a safe state	400505	Boolean
Error	The error code of the system/device (0 = no error)	400506	Int16

Common Process
As of 07/25/2018

Name	Description	Address	Type
PumpPartNumber	The part number of the currently connected pump	400600	ZString
PumpSerialNumber	The serial number of the currently connected pump	400610	ZString
PumpModel	The model of the currently connected pump	400620	ZString
PumpConfig	The currently active pump configuration	400800	ZString
ScreenshotEnable	Creates a screenshot of the HMI saved to SD card	400970	UInt16
ScreenshotFile	The filename on SD card where the screenshot will be saved.	400980	ZString
EncoderResolution	Number of encoder counts per revolution of the motor	401000	Count
FinalDriveRatio	The motor to auger gear ratio, how many revolutions of the motor equals one auger revolution	401002	Float
RsvrTempRTDPresent	Indicates if an RTD is currently connected to the controller for the reservoir	401004	Boolean
BodyTempRTDPresent	Indicates if an RTD is currently connected to the controller for the pump body	401005	Boolean
RsvrTemp	The current temperature of the reservoir the RTD value	401006	Temperature
BodyTemp	The current temperature of the pump body	401008	Temperature
BodyTempReady	The body temperature is within specifications	401010	Boolean
ForceRun	Forces the pump to run with the current parameters	401011	Boolean
PumpOn	Signals the controller to begin running the pump	401012	Boolean
PumpDirection	Indicates the current direction to drive the pump	401013	Boolean
PumpProfileSelect1	Pump control profile select #1, the profile is selected by the three profile select inputs (8 possible profiles)	401014	Boolean
PumpProfileSelect2	Pump control profile select #2, the profile is selected by the three profile select inputs (8 possible profiles)	401015	Boolean
PumpProfileSelect3	Pump control profile select #3, the profile is selected by the three profile select inputs (8 possible profiles)	401016	Boolean
PumpPresent	Indicates if the controller detects that a pump is present	401017	Boolean
reserved1	Reserved register	401018	Boolean
LvlDtct	The status of the level detect sensor	401019	Boolean
RsvrTempReady	The reservoir temperature is within specifications	401020	Boolean
OnlineState	Online state of the controller (online or offline)	401021	Boolean
reserved2	Reserved register	401022	Boolean
reserved3	Reserved register	401023	Boolean
reserved4	Reserved register	401024	Boolean
RsvrAirPressure	The current air pressure of the reservoir	401025	Pressure
PumpReady	Indicates if the pump is ready to be driven	401027	Boolean
PumpBusy	Indicates if the pump is busy performing an operation	401028	Boolean
PumpFault	Indicates if the pump is in a fault state	401029	Boolean
RsvrHeaterOn	Controls the reservoir heater	401030	Boolean
BodyHeaterOn	Controls the pump body heater	401031	Boolean
SystemAirOn	Controls the system air solenoid	401032	Boolean
RsvrTempProp	Reservoir Temperature, Proportional Gain	401033	Float
RsvrTempIntg	Reservoir Temperature, Integral Gain	401035	Float
RsvrTempDeriv	Reservoir Temperature, Derivative Gain	401037	Float
RsvrTempPIDPeriod	Reservoir Temperature, PID Period (ms)	401039	UInt16
RsvrTempPWMPeriod	Reservoir Temperature, PWM Period (ms)	401040	UInt16
RsvrTempSampleRate	Reservoir Temperature, sample rate (ms)	401041	UInt16
BodyTempProp	Body Temperature, Proportional Gain	401042	Float
BodyTempIntg	Body Temperature, Integral Gain	401044	Float
BodyTempDeriv	Body Temperature, Derivative Gain	401046	Float
BodyTempPIDPeriod	Body Temperature, PID Period (ms)	401048	UInt16
BodyTempPWMPeriod	Body Temperature, PWM Period (ms)	401049	UInt16
BodyTempSampleRate	Body Temperature, sample rate (ms)	401050	UInt16
RsvrTempDutyCycle	Reservoir Temperature, current heater output duty cycle	401051	Float
BodyTempDutyCycle	Body Temperature, current heater output duty cycle	401053	Float
RsvrTempPowerGain	Reservoir Temperature, gain for the PID control output	401055	Float
BodyTempPowerGain	Body Temperature, gain for the PID control output	401057	Float
RsvrTempRTDAlpha	The reservoir RTD alpha value	401059	Float
BodyTempRTDAlpha	The pump body RTD alpha value	401061	Float
BodyAirReady	Indicates if the current body air pressure is within specifications	401070	Boolean
RsvrAirReady	Indicates if the current reservoir air pressure is within specifications	401071	Boolean
BodyTempOffset	Offset applied to the pump body temperature value	401074	Float
RsvrTempOffset	Offset applied to the reservoir temperature value	401078	Float
BodyTempFilterBand	The band width of the software filter for the pump body temperature	401080	Float
BodyTempFilterLength	The sample length of the software filter for the pump body temperature	401082	UInt16
RsvrTempFilterBand	The band width of the software filter for the reservoir temperature	401083	Float
RsvrTempFilterLength	The sample length of the software filter for the reservoir temperature	401085	UInt16
PrevDispenseType	The dispense mode used in the previous dispense cycle	401086	UInt16
RsvrAirOffset	Offset applied to the reservoir air pressure value	401087	Float
DisableAirDelay	The amount of time (ms) that must pass after a dispense before the system air will disable	401100	UInt16
DotForwardAccel	The forward motion motor acceleration used when dispensing a dot	401101	RotationalAcceleration
DotForwardDecel	The forward motion motor deceleration used when dispensing a dot	401103	RotationalAcceleration
DotForwardSpeed	The forward motion motor speed used when dispensing a dot	401105	RotationalSpeed
DotForwardRotation	The amount of rotation the auger will rotate when the motor is driven in the forward direction while dispensing a dot	401107	Angle
DotReverseAccel	The reverse motion motor acceleration used when dispensing a dot	401109	RotationalAcceleration
DotReverseDecel	The reverse motion motor deceleration used when dispensing a dot	401111	RotationalAcceleration
DotReverseSpeed	The reverse motion motor speed used when dispensing a dot	401113	RotationalSpeed
DotReverseRotation	The amount of rotation the auger will rotate when the motor is driven in the reverse direction while dispensing a dot	401115	Angle
DotReverseDelay	The amount of time (ms) that must pass after the forward rotation of the auger before rotating in the reverse direction while	401117	UInt16
ContForwardAccel	The forward motion motor acceleration used when dispensing continuously	401118	RotationalAcceleration
ContForwardDecel	The forward motion motor deceleration used when dispensing continuously	401120	RotationalAcceleration

Name	Description	Address	Type
ContForwardSpeed	The forward motion motor speed used when dispensing continuously	401122	RotationalSpeed
ContReverseAccel	The reverse motion motor acceleration used after a continuous dispense has stopped	401124	RotationalAcceleration
ContReverseDecel	The reverse motion motor deceleration used after a continuous dispense has stopped	401126	RotationalAcceleration
ContReverseSpeed	The reverse motion motor speed used after a continuous dispense has stopped	401128	RotationalSpeed
ContReverseRotation	The amount of rotation the auger will automatically rotate after the continuous dispense has stopped	401130	Angle
ContReverseDelay	The amount of time (ms) that must pass after the continuous dispense has stopped before rotating the auger in the reverse	401132	UInt16
ContUseAnalogSpeed	Indicates if the speed values for ContForwardSpeed and ContReverseSpeed come from the analog input	401133	Boolean
BodyTempEnable	Enables the pump body temperature control	401134	Boolean
BodyTempSetpoint	The current setpoint for the pump body temperature	401135	Temperature
RsrvrTempEnable	Enables the reservoir temperature control	401137	Boolean
RsrvrTempSetpoint	The current setpoint for the reservoir temperature	401138	Temperature
RsrvrAirMaxPressure	The maximum allowable air pressure for the reservoir	401140	Pressure
RsrvrAirMinPressure	The minimum allowable air pressure for the reservoir	401142	Pressure
RsrvrLvlDtctEnable	Enables the level detection for the reservoir	401144	Boolean
RsrvrMixerEnable	Enables the reservoir mixer	401145	Boolean
DispenseMode	Indicates the dispense mode type to use	401146	UInt16
RsrvrTempMin	The minimum temperature value of the reservoir to be considered within 'tolerance'	401147	Temperature
RsrvrTempMax	The maximum temperature value of the reservoir to be considered within 'tolerance'	401149	Temperature
BodyTempMin	The minimum temperature value of the pump body to be considered within 'tolerance'	401151	Temperature
BodyTempMax	The maximum temperature value of the pump body to be considered within 'tolerance'	401153	Temperature
RsrvrAirSetPoint	The set point for the reservoir air pressure	401155	Pressure

Process Image Types

Process Image Types

As of 04/06/2016

PI Type	OPC Type	Unit	Range	Description	Notes
UInt16	Word		$0 \leq N \leq 65535$	16 bit unsigned integer	
Int16	Short		$-32768 \leq N \leq 32767$	16 bit signed integer	
UInt32	DWord		$0 \leq N \leq 4294967295$	32 bit unsigned integer	
Int32	Long		$-2147483648 \leq N \leq 2147483647$	32 bit signed integer	
Float	DWord		$2E-38 \leq N \leq 2E38$	single precision floating point	
Count	DWord		$0 \leq N \leq 4294967295$	32 bit signed number	
Name(N)	String.N		[A-Za-z\b]	A string of characters of max length N, null terminated ASCII string	
Boolean	Short		true false		
ZString(N)	String.N	byte	^\{0,N\}\$		Note that the zero terminator may not be present at MODBUS/OPC protocol levels.
GPD Part Number	String.10		^[0-9]{4}-[0-9]{4}(-[0-9]+)?\$		
GPD Serial Number	String.10		^[0-9]{7,9}\$	NNN = product code, nnnn = sequential machine id e.g. 2220281 222=uMAX 0281=machine #281	
IPv4 Address	String.16		^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$ ¹	standard octet dotted notation	e.g. 192.18.0.1
Distance	Float	mm	$\pm 10E38$		
Duration	DWord	ms	$0 \leq N \leq 4294967295$	a span of time (ms)	
Angle	Float	°	$\pm 360^\circ$		
Speed	float	mm/s	$\pm 10E38$		
Acceleration	Float	mm/s ²	$\pm 10E38$		
RotationalSpeed	Float	° n/s	$\pm 10E38$		
RotationalAcceleration	Float	° n/s ²	$\pm 10E38$		
Temperature	Float	°C	$\pm 10E38$		
Pressure	Float	kPa	$\pm 10E38$		
LogLevel	Word		0-8	Log message levels	0=emergency, 1=alert, 2=critical, 3=error, 4=warning, 5=notice, 6=info, 7=debug, 8=trace
CultureInfo	String.6	https://msdn.microsoft.com/en-us/library/ee825488(v=cs.20).aspx	^[a-z]{2}-[A-Z]{2}\$	Cultural information for localization, the two character language code followed by the two character country code	example. 'en-US'
¹ the given regex is a simplistic match - it does not enforce ranges on the octets. A more accurate version is this: <code>^(?:25[0-5] 2[0-4][0-9] [01]?[0-9][0-9]?)\.(?:25[0-5] 2[0-4][0-9] [01]?[0-9][0-9]?)\$</code>					