ARMSTRONG

Parallel Sensorless pump controller

Data points

ARMSTRONG

PARALLEL SENSORLESS
PUMP CONTROLLER

CONTENTS

4

SUMMARY

PARAMETERS TO BE DISPLAYED ON CONTROLLER

SYSTEM STATUS	INDIVIDUAL PUMP STATUS	INDIVIDUAL IVS102 STATUS
Total Sensorless flow	Speed Ref (%)	Current (Amps)
Sensorless head	Speed (%) (RPM)	Volt (VAC)
Total power	Run time (hrs)	Power (kW)
Pumps speed	Fault Num	Head
Alarm	Run status (running/stopped)	Flow
Wire to water efficiency (calculated)		
Number of pumps running		
Lead pump number		

PARAMETERS TO BE SET

FROM BAS OR CONTROLLER	FROM CONTROLLER	IVS102 READOUT FACTORS
Number of pumps	Number of standby pumps	Amps
Lead pump switch time (HRS)	Speed maximum ramp time (s)	Volts
Flow – design	Pump minumum speed (%)	kW
Head – design	Pump maximum speed (%)	Flow
Head zero flow (H_{min})	Motor rated speed (RPM)	Head
Flow – BEP	Hz	
Head – BEP	PID gain (Kc)	
Dead band	PID integral (Ti)	
Sensorless adjustment	BAS protocol (option)	
Enable signal to controller	BAS address (option)	
	BAS baud rate (option)	
	Head unit	
	Flow unit	

BAS DATA POINTS - MODBUS RTU

BUILDING AUTOMATION SYSTEM

Parallel Sensorless Modbus RTU - Communication interface Rev 13031

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	RANGE	REPRESENT	UNITS
552	Digital	R/W	Set pump 1 hand		Hand	Momentary
553	Digital	R/W	Set pump 1 off		Off	Momentary
554	Digital	R/W	Set pump 1 auto		Auto	Momentary
555	Digital	R/W	Set pump 2 hand		Hand	Momentary
556	Digital	R/W	Set pump 2 off		Off	Momentary
557	Digital	R/W	Set pump 2 auto		Auto	Momentary
558	Digital	R/W	Set pump 3 hand		Hand	Momentary
559	Digital	R/W	Set pump 3 off		Off	Momentary
560	Digital	R/W	Set pump 3 auto		Auto	Momentary
561	Digital	R/W	Set pump 4 hand		Hand	Momentary
562	Digital	R/W	Set pump 4 off		Off	Momentary
563	Digital	R/W	Set pump 4 auto		Auto	Momentary
564	Digital	R/W	Reserved			
565	Digital	R/W	Reserved			
566	Digital	R/W	Reserved			
567	Digital	R/W	Reserved			
568	Digital	R/W	Reserved			
569	Digital	R/W	Reserved			
570	Digital	R/W	Reserved			
571	Digital	R/W	Reserved			
572	Digital	R/W	Reserved			
573	Digital	R/W	Reserved			
574	Digital	R/W	Reserved			
575	Digital	R/W	Reserved			
576	Digital	R/W	Reserved			
577	Digital	R/W	Reserved			
578	Digital	R/W	Reserved			
579	Digital	R/W	Reserved			
580	Digital	R/W	Reserved			
581	Digital	R/W	Reserved			
582	Digital	R/W	Reserved			
583	Digital	R/W	Set alarm reset		Reset	Momentary

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
10401	Digital	R	System alarm	Ok	Alarm	Toggle
10402	Digital	R				
10403	Digital	R	Pump alarm	Ok	Alarm	Toggle
10404	Digital	R	Pump 1 in hand mode		Hand	Toggle
10405	Digital	R	Pump 1 in off mode		Off	Toggle
10406	Digital	R	Pump 1 in auto mode		Auto	Toggle
10407	Digital	R	Pump 2 in hand mode		Hand	Toggle
10408	Digital	R	Pump 2 in off mode		Off	Toggle
10409	Digital	R	Pump 2 in auto mode		Auto	Toggle
10410	Digital	R	Pump 3 in hand mode		Hand	Toggle
10411	Digital	R	Pump 3 in off mode		Off	Toggle
10412	Digital	R	Pump 3 in auto mode		Auto	Toggle
10413	Digital	R	Pump 4 in hand mode		Hand	Toggle
10414	Digital	R	Pump 4 in off mode		Off	Toggle
10415	Digital	R	Pump 4 in auto mode		Auto	Toggle
10416	Digital	R	Reserved			
10417	Digital	R	Reserved			
10418	Digital	R	Reserved			
10419	Digital	R	Reserved			
10420	Digital	R	Reserved			
10421	Digital	R	Reserved			
10422	Digital	R	Reserved			
10423	Digital	R	Reserved			
10424	Digital	R	Reserved			
10425	Digital	R	Reserved			
10426	Digital	R	Reserved			
10427	Digital	R	Reserved			
10428	Digital	R	Reserved			
10429	Digital	R	Reserved			
10430	Digital	R	Reserved			
10431	Digital	R	Reserved			
10432	Digital	R	Reserved			
10433	Digital	R	Reserved			
10434	Digital	R	Pump 1 run feedback	Stopped	Running	Toggle
10435	Digital	R	Pump 2 run feedback	Stopped	Running	Toggle
10436	Digital	R	Pump 3 run feedback	Stopped	Running	Toggle
10437	Digital	R	Pump 4 run feedback	Stopped	Running	Toggle
10438	Digital	R	Reserved			
10439	Digital	R	Reserved			
10440	Digital	R	Reserved			
10441	Digital	R	Reserved			
10442	Digital	R	Reserved			
10443	Digital	R	Reserved			

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
10444	Digital	R	Reserved			
10445	Digital	R	Reserved			
10446	Digital	R	Reserved			
10447	Digital	R	Reserved			
10448	Digital	R	Reserved			
10449	Digital	R	Reserved			
10450	Digital	R	Reserved			
10451	Digital	R	Reserved			
10452	Digital	R	Reserved			
10453	Digital	R	Reserved			
10454	Digital	R	Reserved			
10455	Digital	R	Reserved			
10456	Digital	R	Reserved			
10457	Digital	R	Reserved			
10458	Digital	R	Reserved			
10459	Digital	R	Reserved			
10460	Digital	R	Reserved			
10461	Digital	R	Reserved			
10462	Digital	R	Reserved			
10463	Digital	R	Reserved			
10464	Digital	R	Reserved			
10465	Digital	R	Reserved			
10466	Digital	R	Reserved			
10467	Digital	R	Reserved			
10468	Digital	R	Pump 1 alarm	Ok	Alarm	Toggle
10469	Digital	R	Pump 2 alarm	Ok	Alarm	Toggle
10470	Digital	R	Pump 3 alarm	Ok	Alarm	Toggle
10471	Digital	R	Pump 4 alarm	Ok	Alarm	Toggle
10472	Digital	R	Reserved			
10473	Digital	R	Reserved			
10474	Digital	R	Reserved			
10475	Digital	R	Reserved			
10476	Digital	R	Reserved			
10477	Digital	R	Reserved			
10478	Digital	R	Pump 1 run feedback alarm	Ok	Alarm	Toggle
10479	Digital	R	Pump 2 run feedback alarm	Ok	Alarm	Toggle
10480	Digital	R	Pump 3 run feedback alarm	Ok	Alarm	Toggle
10481	Digital	R	Pump 4 run feedback alarm	Ok	Alarm	Toggle
10482	Digital	R	Reserved			
10483	Digital	R	Reserved			

Parallel Sensorless
pump controller

8

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
10484	Digital	R	Reserved			
10485	Digital	R	Reserved			
10486	Digital	R	Reserved			
10487	Digital	R	Reserved			
10488	Digital	R	Pump 1 drive fault	Ok	Alarm	Toggle
10489	Digital	R	Pump 2 drive fault	Ok	Alarm	Toggle
10490	Digital	R	Pump 3 drive fault	Ok	Alarm	Toggle
10491	Digital	R	Pump 4 drive fault	Ok	Alarm	Toggle
10492	Digital	R	Reserved			
10493	Digital	R	Reserved			
10494	Digital	R	Reserved			
10495	Digital	R	Reserved			
10496	Digital	R	Reserved			
10497	Digital	R	Reserved			
10498	Digital	R	Reserved			
10499	Digital	R	Reserved			
10500	Digital	R	Reserved			
10501	Digital	R	Reserved			
10502	Digital	R	Reserved			
10503	Digital	R	Reserved			
10504	Digital	R	Reserved			
10505	Digital	R	Reserved			
10506	Digital	R	Reserved			
10507	Digital	R	Reserved			
10508	Digital	R	Reserved			
10509	Digital	R	Reserved			
10510	Digital	R	Reserved			
10511	Digital	R	Reserved			
10512	Digital	R	Reserved			
10513	Digital	R	Reserved			
10514	Digital	R	Reserved			
10515	Digital	R	Reserved			
10516	Digital	R	Reserved			
10517	Digital	R	Reserved			
10518	Digital	R	Reserved			
10519	Digital	R	Reserved			

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	RANGE	REPRESENT	UNITS
30401	Analog	R	Reserved			
30402	Analog	R	Reserved			
30403	Analog	R	Reserved			
30404	Analog	R	Reserved			
30405	Analog	R	Reserved			
30406	Analog	R	Reserved			
30407	Analog	R	Reserved			
30408	Analog	R	Reserved			
30409	Analog	R	Reserved			
30410	Analog	R	Reserved			
30411	Analog	R	Reserved			
30412	Analog	R	Reserved			
30413	Analog	R	Reserved			
30414	Analog	R	Reserved			
30415	Analog	R	Reserved			
30416	Analog	R	Reserved			
30417	Analog	R	Reserved			
30418	Analog	R	Reserved			
30419	Analog	R	Reserved			
30420	Analog	R	Reserved			
30421	Analog	R	Reserved			
30422	Analog	R	Reserved			
30423	Analog	R	Reserved			
30424	Analog	R	Reserved			
30425	Analog	R	Reserved			
30426	Analog	R	Reserved			
30427	Analog	R	Reserved			
30428	Analog	R	Reserved			
30429	Analog	R	Reserved			
30430	Analog	R	Reserved			
30431	Analog	R	Reserved			
30432	Analog	R	Reserved			
30433	Analog	R	Reserved			
30434	Analog	R	Reserved			
30435	Analog	R	Reserved			
30436	Analog	R	Reserved			
30437	Analog	R	Reserved			
30438	Analog	R	Reserved			
30439	Analog	R	Reserved			
30440	Analog	R	Pump 1 speed	0 to 1000	0.0 to 100.0	%
30441	Analog	R	Pump 2 speed			
30442	Analog	R	Pump 3 speed			
30443	Analog	R	Pump 4 speed			

Parallel Sensorless
pump controller

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	RANGE	REPRESENT	UNITS
30444	Analog	R	Reserved			
30445	Analog	R	Reserved			
30446	Analog	R	Reserved			
30447	Analog	R	Reserved			
30448	Analog	R	Reserved			
30449	Analog	R	Reserved			
30450	Analog	R	Reserved			
30451	Analog	R	Reserved			
30452	Analog	R	Total head	0 to 32767	0 to 3276.7	kPa, psi, bar
30453	Analog	R	Pump 1 drive amp			Amp
30454	Analog	R	Pump 1 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
30455	Analog	R	Pump 1 drive power			kW
30456	Analog	R	Pump 1 drive speed feedback	0 to 1000	0.0 to 100.0	%
30457	Analog	R	Pump 2 drive amp			Amp
30458	Analog	R	Pump 2 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
30459	Analog	R	Pump 2 drive power			kW
30460	Analog	R	Pump 2 drive speed feedback	0 to 1000	0.0 to 100.0	%
30461	Analog	R	Pump 3 drive amp			Amp
30462	Analog	R	Pump 3 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
30463	Analog	R	Pump 3 drive power			kW
30464	Analog	R	Pump 3 drive speed feedback	0 to 1000	0.0 to 100.0	%
30465	Analog	R	Pump 4 drive amp			Amp
30466	Analog	R	Pump 4 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
30467	Analog	R	Pump 4 drive power			kW
30468	Analog	R	Pump 4 drive speed feedback	0 to 1000	0.0 to 100.0	%
30469	Analog	R	Reserved			
30470	Analog	R	Reserved			
30471	Analog	R	Reserved			
30472	Analog	R	Reserved			
30473	Analog	R	Reserved			
30474	Analog	R	Reserved			
30475	Analog	R	Reserved			
30476	Analog	R	Reserved			
30477	Analog	R	Reserved			
30478	Analog	R	Reserved			
30479	Analog	R	Reserved			

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	RANGE	REPRESENT	UNITS
30480	Analog	R	Reserved			
30481	Analog	R	Reserved			
30482	Analog	R	Reserved			
30483	Analog	R	Reserved			
30484	Analog	R	Reserved			
30485	Analog	R	Reserved			
30486	Analog	R	Reserved			
30487	Analog	R	Reserved			
30488	Analog	R	Reserved			
30489	Analog	R	Reserved			
30490	Analog	R	Reserved			
30491	Analog	R	Reserved			
30492	Analog	R	Reserved			
30493	Analog	R	Pump 1 head	0 to 32767	0.0 to 3276.7	kPa, psi, bar
30494	Analog	R	Pump 2 head			
30495	Analog	R	Pump 3 head			
30496	Analog	R	Pump 4 head			
30497	Analog	R	Reserved			
30498	Analog	R	Reserved			
30499	Analog	R	Reserved			
30500	Analog	R	Reserved			
30501	Analog	R	Reserved			
30502	Analog	R	Reserved			
30503	Analog	R	W to W efficiency	0 to 32767	0.0 to 3276.7	
30504	Analog	R	Total drive kW	0 to 32767	0.0 to 3276.7	
35401	Analog	R	Reserved			
35402	Analog	R	Reserved			
35403	Analog	R	Pump 1 flow	0 to 32767	0 to 32767	gpm, lps, m3/hr
35404	Analog	R	Pump 2 flow			
35405	Analog	R	Pump 3 flow			
35406	Analog	R	Pump 4 flow			
35407	Analog	R	Reserved			
35408	Analog	R	Reserved			
35409	Analog	R	Reserved			
35410	Analog	R	Reserved			
35411	Analog	R	Reserved			
35412	Analog	R	Reserved			
35413	Analog	R	Total Flow	0 to 7442	0 to 74420	m³/hr
35414	Analog	R	Pump 1 operating run hours		0 to 999	Hrs
35415	Analog	R	Pump 1 operating run khours		0 to 32000	Hrs x1000
35416	Analog	R	Pump 2 operating run hours		0 to 999	Hrs

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	RANGE	REPRESENT	UNITS
35417	Analog	R	Pump 2 operating run khours	0 to 32000		Hrs x1000
35418	Analog	R	Pump 3 operating run hours	0 to 999		Hrs
35419	Analog	R	Pump 3 operating run khours	0 to 32000		Hrs x1000
35420	Analog	R	Pump 4 operating run hours	0 to 999		Hrs
35421	Analog	R	Pump 4 operating run khours	0 to 32000		Hrs x1000
35422	Analog	R	Reserved			
35423	Analog	R	Reserved			
35424	Analog	R	Reserved			
35425	Analog	R	Reserved			
35426	Analog	R	Reserved			
35427	Analog	R	Reserved			
35428	Analog	R	Reserved			
35429	Analog	R	Reserved			
35430	Analog	R	Reserved			
35431	Analog	R	Reserved			
35432	Analog	R	Reserved			
35433	Analog	R	Number of pump running	0 to 4		
35434	Analog	R	Lead pump ID	0 to 4		
40551	Analog	R/W	Reserved			
40552	Analog	R/W	Reserved			
40553	Analog	R/W	Reserved			
40554	Analog	R/W	Reserved			
40555	Analog	R/W	Reserved			
40556	Analog	R/W	Reserved			
40557	Analog	R/W	Reserved			
40558	Analog	R/W	Reserved			
40559	Analog	R/W	Reserved			
40560	Analog	R/W	Reserved			
40561	Analog	R/W	Reserved			
40562	Analog	R/W	Reserved			
40563	Analog	R/W	Reserved			
40564	Analog	R/W	Reserved			
40565	Analog	R/W	Reserved			
40566	Analog	R/W	Reserved			
40567	Analog	R/W	Reserved			
40568	Analog	R/W	Reserved			

MODBUS ADDRESS	SIGNAL TYPE	READ/WRITE	DESCRIPTION	RANGE	REPRESENT	UNITS
40569	Analog	R/W	Pump 1 hand speed	0 to 1000	0.0 to 100.0	%
40570	Analog	R/W	Pump 2 hand speed			
40571	Analog	R/W	Pump 3 hand speed			
40572	Analog	R/W	Pump 4 hand speed			
40573	Analog	R/W	Reserved			
40574	Analog	R/W	Reserved			
40575	Analog	R/W	Reserved			
40576	Analog	R/W	Reserved			
40577	Analog	R/W	Reserved			
40578	Analog	R/W	Reserved			
40579	Analog	R/W	Reserved			
40580	Analog	R/W	Design flow	0 to 9999	0.0 to 9999	m^3/hr
40581	Analog	R/W	Design head	0 to 9999	0.0 to 999.9	kPa, psi, bar
40582	Analog	R/W	Zero flow head			
40583	Analog	R/W	Flow BEP	0 to 9999	0.0 to 9999	m^3/hr
40584	Analog	R/W	Head BEP	0 to 9999	0.0 to 999.9	kPa, psi, bar
40585	Analog	R/W	Dead Band	0 to 5	0 to 0.5	
40586	Analog	R/W	Sensorless map factor	0 to 5	0 to 5	%
40587	Analog	R/W	Number of pumps	0 to 6	0 to 6	
40588	Analog	R/W	Lead pump switch time	0 to 99	0 to 99	Days
40589	Analog	R/W	Reserved			
40590	Analog	R/W	Reserved			
40591	Analog	R/W	Reserved			
40592	Analog	R/W	Reserved			
40593	Analog	R/W	Reserved			
40594	Analog	R/W	Reserved			
40595	Analog	R/W	Reserved			
40596	Analog	R/W	Reserved			

BAS DATA POINTS - BACNET

BUILDING AUTOMATION SYSTEM - BACNET MSTP

Parallel Sensorless communication interface Rev 13031 (Device ID: 77000)

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
DO	400	D400	System alarm	Ok	Alarm	Toggle
DO	401	D401	Reserved			
DO	402	D402	Pump alarm	Ok	Alarm	Toggle
DO	403	D403	Pump 1 in hand mode		Hand	Toggle
DO	404	D404	Pump 1 in off mode		Off	Toggle
DO	405	D405	Pump 1 in auto mode		Auto	Toggle
DO	406	D406	Pump 2 in hand mode		Hand	Toggle
DO	407	D407	Pump 2 in off mode		Off	Toggle
DO	408	D408	Pump 2 in auto mode		Auto	Toggle
DO	409	D409	Pump 3 in hand mode		Hand	Toggle
DO	410	D410	Pump 3 in off mode		Off	Toggle
DO	411	D411	Pump 3 in auto mode		Auto	Toggle
DO	412	D412	Pump 4 in hand mode		Hand	Toggle
DO	413	D413	Pump 4 in off mode		Off	Toggle
DO	414	D414	Pump 4 in auto mode		Auto	Toggle
DO	415	D415	Reserved			
DO	416	D416	Reserved			
DO	417	D417	Reserved			
DO	418	D418	Reserved			
DO	419	D419	Reserved			
DO	420	D420	Reserved			
DO	421	D421	Reserved			
DO	422	D422	Reserved			
DO	423	D423	Reserved			
DO	424	D424	Reserved			
DO	425	D425	Reserved			
DO	426	D426	Reserved			
DO	427	D427	Reserved			
DO	428	D428	Reserved			
DO	429	D429	Reserved			
DO	430	D430	Reserved			
DO	431	D431	Reserved			
DO	432	D432	Reserved			
DO	433	D433	Pump 1 run feedback	Stopped	Running	Toggle
DO	434	D434	Pump 2 run feedback	Stopped	Running	Toggle

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
DO	435	D435	Pump 3 run feedback	Stopped	Running	Toggle
DO	436	D436	Pump 4 run feedback	Stopped	Running	Toggle
DO	437	D437	Reserved			
DO	438	D438	Reserved			
DO	439	D439	Reserved			
DO	440	D440	Reserved			
DO	441	D441	Reserved			
DO	442	D442	Reserved			
DO	443	D443	Reserved			
DO	444	D444	Reserved			
DO	445	D445	Reserved			
DO	446	D446	Reserved			
DO	447	D447	Reserved			
DO	448	D448	Reserved			
DO	449	D449	Reserved			
DO	450	D450	Reserved			
DO	451	D451	Reserved			
DO	452	D452	Reserved			
DO	453	D453	Reserved			
DO	454	D454	Reserved			
DO	455	D455	Reserved			
DO	456	D456	Reserved			
DO	457	D457	Reserved			
DO	458	D458	Reserved			
DO	459	D459	Reserved			
DO	460	D460	Reserved			
DO	461	D461	Reserved			
DO	462	D462	Reserved			
DO	463	D463	Reserved			
DO	464	D464	Reserved			
DO	465	D465	Reserved			
DO	466	D466	Reserved			
DO	467	D467	Pump 1 alarm	Ok	Alarm	Toggle
DO	468	D468	Pump 2 alarm	Ok	Alarm	Toggle
DO	469	D469	Pump 3 alarm	Ok	Alarm	Toggle
DO	470	D470	Pump 4 alarm	Ok	Alarm	Toggle
DO	471	D471	Reserved			
DO	472	D472	Reserved			
DO	473	D473	Reserved			
DO	474	D474	Reserved			

Parallel Sensorless
pump controller

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
DO	475	D475	Reserved			
DO	476	D476	Reserved			
DO	477	D477	Pump 1 run feedback alarm	Ok	Alarm	Toggle
DO	478	D478	Pump 2 run feedback alarm	Ok	Alarm	Toggle
DO	479	D479	Pump 3 run feedback alarm	Ok	Alarm	Toggle
DO	480	D480	Pump 4 run feedback alarm	Ok	Alarm	Toggle
DO	481	D481	Reserved			
DO	482	D482	Reserved			
DO	483	D483	Reserved			
DO	484	D484	Reserved			
DO	485	D485	Reserved			
DO	486	D486	Reserved			
DO	487	D487	Pump 1 drive fault	Ok	Alarm	Toggle
DO	488	D488	Pump 2 drive fault	Ok	Alarm	Toggle
DO	489	D489	Pump 3 drive fault	Ok	Alarm	Toggle
DO	490	D490	Pump 4 drive fault	Ok	Alarm	Toggle
DO	491	D491	Reserved			
DO	492	D492	Reserved			
DO	493	D493	Reserved			
DO	494	D494	Reserved			
DO	495	D495	Reserved			
DO	496	D496	Reserved			
DO	497	D497	Reserved			
DO	498	D498	Reserved			
DO	499	D499	Reserved			
DO	500	D500	Reserved			
DO	501	D501	Reserved			
DO	502	D502	Reserved			
DO	503	D503	Reserved			
DO	504	D504	Reserved			
DO	505	D505	Reserved			
DO	506	D506	Reserved			
DO	507	D507	Reserved			
DO	508	D508	Reserved			
DO	509	D509	Reserved			
DO	510	D510	Reserved			
DO	511	D511	Reserved			
DO	512	D512	Reserved			
DO	513	D513	Reserved			
DO	514	D514	Reserved			

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	OFF STATE (0)	ON STATE (1)	TYPE
DO	515	D515	Reserved			
DO	516	D516	Reserved			
DO	517	D517	Reserved			
DO	518	D518	Reserved			

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	RANGE	REPRESENT	UNITS
DI	550	D550	Remote start	Stop	Start	Toggle
DI	551	D551	Set pump 1 hand		Hand	Momentary
DI	552	D552	Set pump 1 off		Off	Momentary
DI	553	D553	Set pump 1 auto		Auto	Momentary
DI	554	D554	Set pump 2 hand		Hand	Momentary
DI	555	D555	Set pump 2 off		Off	Momentary
DI	556	D556	Set pump 2 auto		Auto	Momentary
DI	557	D557	Set pump 3 hand		Hand	Momentary
DI	558	D558	Set pump 3 off		Off	Momentary
DI	559	D559	Set pump 3 auto		Auto	Momentary
DI	560	D560	Set pump 4 hand		Hand	Momentary
DI	561	D561	Set pump 4 off		Off	Momentary
DI	562	D562	Set pump 4 auto		Auto	Momentary
DI	563	D563	Reserved			
DI	564	D564	Reserved			
DI	565	D565	Reserved			
DI	566	D566	Reserved			
DI	567	D567	Reserved			
DI	568	D568	Reserved			
DI	569	D569	Reserved			
DI	570	D570	Reserved			
DI	571	D571	Reserved			
DI	572	D572	Reserved			
DI	573	D573	Reserved			
DI	574	D574	Reserved			
DI	575	D575	Reserved			
DI	576	D576	Reserved			
DI	577	D577	Reserved			
DI	578	D578	Reserved			
DI	579	D579	Reserved			
DI	580	D580	Reserved			
DI	581	D581	Reserved			
DI	582	D582	Set alarm reset		Reset	Momentary
AO	400	AO400	Reserved			
AO	401	AO401	Reserved			
AO	402	AO402	Reserved			

Parallel Sensorless
pump controller

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	RANGE	REPRESENT	UNITS
AO	403	AO403	Reserved			
AO	404	AO404	Reserved			
AO	405	AO405	Reserved			
AO	406	AO406	Reserved			
AO	407	AO407	Reserved			
AO	408	AO408	Reserved			
AO	409	AO409	Reserved			
AO	410	AO410	Reserved			
AO	411	AO411	Reserved			
AO	412	AO412	Reserved			
AO	413	AO413	Reserved			
AO	414	AO414	Reserved			
AO	415	AO415	Reserved			
AO	416	AO416	Reserved			
AO	417	AO417	Reserved			
AO	418	AO418	Reserved			
AO	419	AO419	Reserved			
AO	420	AO420	Reserved			
AO	421	AO421	Reserved			
AO	422	AO422	Reserved			
AO	423	AO423	Reserved			
AO	424	AO424	Reserved			
AO	425	AO425	Reserved			
AO	426	AO426	Reserved			
AO	427	AO427	Reserved			
AO	428	AO428	Reserved			
AO	429	AO429	Reserved			
AO	430	AO430	Reserved			
AO	431	AO431	Reserved			
AO	432	AO432	Reserved			
AO	433	AO433	Reserved			
AO	434	AO434	Reserved			
AO	435	AO435	Reserved			
AO	436	AO436	Reserved			
AO	437	AO437	Reserved			
AO	438	AO438	Reserved			
AO	439	AO439	Pump 1 speed	0 to 1000	0.0 to 100.0	%
AO	440	AO440	Pump 2 speed			
AO	441	AO441	Pump 3 speed			
AO	442	AO442	Pump 4 speed			
AO	443	AO443	Reserved			
AO	444	AO444	Reserved			
AO	445	AO445	Reserved			

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	RANGE	REPRESENT	UNITS
AO	446	AO446	Reserved			
AO	447	AO447	Reserved			
AO	448	AO448	Reserved			
AO	449	AO449	Reserved			
AO	450	AO450	Reserved			
AO	451	AO451	Total head	0 to 32767	0 to 3276.7	kPa, psi, bar
AO	452	AO452	Pump 1 drive amp			Amp
AO	453	AO453	Pump 1 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
AO	454	AO454	Pump 1 drive power			kW
AO	455	AO455	Pump 1 drive speed feedback	0 to 1000	0.0 to 100.0	%
AO	456	AO456	Pump 2 drive amp			Amp
AO	457	AO457	Pump 2 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
AO	458	AO458	Pump 2 drive power			kW
AO	459	AO459	Pump 2 drive speed feedback	0 to 1000	0.0 to 100.0	%
AO	460	AO460	Pump 3 drive amp			Amp
AO	461	AO461	Pump 3 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
AO	462	AO462	Pump 3 drive power			kW
AO	463	AO463	Pump 3 drive speed feedback	0 to 1000	0.0 to 100.0	%
AO	464	AO464	Pump 4 drive amp			Amp
AO	465	AO465	Pump 4 drive volt AC	0 to 10000	0.0 to 1000.0	VAC
AO	466	AO466	Pump 4 drive power			kW
AO	467	AO467	Pump 4 drive speed feedback	0 to 1000	0.0 to 100.0	%
AO	468	AO468	Reserved			
AO	469	AO469	Reserved			
AO	470	AO470	Reserved			
AO	471	AO471	Reserved			
AO	472	AO472	Reserved			
AO	473	AO473	Reserved			
AO	474	AO474	Reserved			
AO	475	AO475	Reserved			
AO	476	AO476	Reserved			
AO	477	AO477	Reserved			
AO	478	AO478	Reserved			
AO	479	AO479	Reserved			
AO	480	AO480	Reserved			
AO	481	AO481	Reserved			
AO	482	AO482	Reserved			
AO	483	AO483	Reserved			
AO	484	AO484	Reserved			
AO	485	AO485	Reserved			
AO	486	AO486	Reserved			
AO	487	AO487	Reserved			
AO	488	AO488	Reserved			

Parallel Sensorless
pump controller

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	RANGE	REPRESENT	UNITS
AO	489	AO489	Reserved			
AO	490	AO490	Reserved			
AO	491	AO491	Reserved			
AO	492	AO492	Pump 1 head			
AO	493	AO493	Pump 2 head			
AO	494	AO494	Pump 3 head	0 to 32767	0 to 3276.7	kPa, psi, bar
AO	495	AO495	Pump 4 head			
AO	496	AO496	Reserved			
AO	497	AO497	Reserved			
AO	498	AO498	Reserved			
AO	499	AO499	Reserved			
AO	500	AO500	Reserved			
AO	501	AO501	Reserved			
AO	502	AO502	W to W efficiency	0 to 32767	0.0 to 3276.7	
AO	503	AO503	Total drive kW			
AI	551	AO551	Reserved			
AI	552	AO552	Reserved			
AI	553	AO553	Reserved			
AI	554	AO554	Reserved			
AI	555	AO555	Reserved			
AI	556	AO556	Reserved			
AI	557	AO557	Reserved			
AI	558	AO558	Reserved			
AI	559	AO559	Reserved			
AI	560	AO560	Reserved			
AI	561	AO561	Reserved			
AI	562	AO562	Reserved			
AI	563	AO563	Reserved			
AI	564	AO564	Reserved			
AI	565	AO565	Reserved			
AI	566	AO566	Reserved			
AI	567	AO567	Reserved			
AI	568	AO568	Reserved			
AI	569	AO569	Pump 1 hand speed			
AI	570	AO570	Pump 2 hand speed			
AI	571	AO571	Pump 3 hand speed	0 to 1000	0.0 to 100.0	%
AI	572	AO572	Pump 4 hand speed			
AI	573	AO573	Reserved			
AI	574	AO574	Reserved			
AI	575	AO575	Reserved			
AI	576	AO576	Reserved			
AI	577	AO577	Reserved			

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	RANGE	REPRESENT	UNITS
AI	578	A0578	Reserved			
AI	579	A0579	Reserved			
AI	580	A0580	Design flow	0 to 9999	0.0 to 9999	m³/hr
AI	581	A0581	Design head	0 to 9999	0.0 to 999.9	kPa, psi, bar
AI	582	A0582	Zero flow head			
AI	583	A0583	Flow BEP	0 to 9999	0.0 to 9999	m³/hr
AI	584	A0584	Head BEP	0 to 9999	0.0 to 999.9	kPa, psi, bar
AI	585	A0585	Dead band	0 to 5	0 to 0.5	
AI	586	A0586	Sensorless map factor	0 to 5	0 to 5	%
AI	587	A0587	Reserved			
AI	588	A0588	Reserved			
AI	589	A0589	Reserved			
AI	590	A0590	Reserved			
AI	591	A0591	Reserved			
AI	592	A0592	Reserved			
AI	593	A0593	Reserved			
AI	594	A0594	Reserved			
AI	595	A0595	Reserved			
AI	596	A0596	Reserved			
AO	5408	A5408	Reserved			
AO	5409	A5409	Reserved			
AO	5410	A5410	Reserved			
AO	5411	A5411	Reserved			
AO	5412	A5412	Total Flow	0 to 7442	0 to 74420	m³/hr
AO	5413	A5413	Pump 1 operating run hours	0 to 999	Hrs	
AO	5414	A5414	Pump 1 operating run khours	0 to 32000	Hrs x1000	
AO	5415	A5415	Pump 2 operating run hours	0 to 999	Hrs	
AO	5416	A5416	Pump 2 operating run khours	0 to 32000	Hrs x1000	
AO	5417	A5417	Pump 3 operating run hours	0 to 999	Hrs	
AO	5418	A5418	Pump 3 operating run khours	0 to 32000	Hrs x1000	
AO	5419	A5419	Pump 4 operating run hours	0 to 999	Hrs	
AO	5420	A5420	Pump 4 operating run khours	0 to 32000	Hrs x1000	
AO	5421	A5421	Reserved			
AO	5422	A5422	Reserved			
AO	5423	A5423	Reserved			
AO	5424	A5424	Reserved			
AO	5425	A5425	Reserved			
AO	5426	A5426	Reserved			
AO	5427	A5427	Reserved			
AO	5428	A5428	Reserved			
AO	5429	A5429	Reserved			
AO	5430	A5430	Reserved			

Parallel Sensorless
pump controller

SIGNAL TYPE	INSTANCE	NAME	DESCRIPTION	RANGE	REPRESENT	UNITS
AO	5431	A5431	Reserved			
AO	5432	A5432	Reserved			
AO	5433	A5433	Number of pump running	0 to 4		
AO	5434	A5434	Lead pump ID	0 to 4		

BAS DATA POINTS – LONWORKS

PARALLEL SENSORLESS - BUILDING AUTOMATION SYSTEM REV 13031

LonWorks Communication Interface - FTT-10

NO	TYPE	NAME NV	TYPE NV	DIRECTION	RES/UNIT	UNITS
1	ANL	nvoTotalDrvkW	28	Output	0.1 kW	
2	ANL	nvoNumOfRun	8	Output	1	
3	ANL	nvoLeadPump	8	Output	1	gpm, lps, m³/hr
4	ANL	nvoDrv1Amp	1	Output	0.1 Amp	
5	ANL	nvoDrv1Kw	28	Output	0.1 kW	
6	ANL	nvoDrv2Amp	1	Output	0.1 Amp	
7	ANL	nvoDrv2Kw	28	Output	0.1 kW	
8	ANL	nvoDrv3Amp	1	Output	0.1 Amp	
9	ANL	nvoDrv3Kw	28	Output	0.1 kW	
10	ANL	nvoDrv4Amp	1	Output	0.1 Amp	
11	ANL	nvoDrv4Kw	28	Output	0.1 kW	
12	ANL	nvoP1Speed	34	Output	0.1%	
13	ANL	nvoP2Speed	34	Output	0.1%	
14	ANL	nvoP3Speed	34	Output	0.1%	
15	ANL	nvoP4Speed	34	Output	0.1%	
16	ANL	nvoWord1	83	Output	1 bit	
17	ANL	nvoWord2	83	Output	1 bit	
18	ANL	nvoWord3	83	Output	1 bit	
19	ANL	nvoWord4	83	Output	1 bit	
20	ANL	nvoWord5	83	Output	1 bit	
21	ANL	nvoWWEff	8	Output	1 bit	
22	ANL	nviHeadDes	30	Input	0.1 Unit	
23	ANL	nviZeroFlowHead	30	Input	0.1 Unit	
24	ANL	nviHeadBEP	30	Input	0.1 Unit	
25	ANL	nviFlowBEP	15	Input	0.1 Unit	
26	ANL	nviStageDeadBand	8	Input	0.1 Unit	
27	INT	nviStageFactor	8	Input	1	
28	INT	nvoSystemHead	15	Output	1 Unit	
29	INT	nvoSysFlow	8	Output	1	
30	INT	nvoLeadPump	8	Output	1	
31	INT	nviDesFlow	8	Input	1	
32	INT	nviNoOfPumps	8	Input	1	
33	INT	nviPmpSwitchTime	8	Input	1	
34	DGT	nviRemStart	95	Input	On/Off	
35	DGT	nviAlarmReset	95	Input	On/Off	

24

NAME NV	
nvoWord1 Bit:	Pump 1 in hand
	Pump 1 in off
	Pump 1 in auto
	Pump 2 in hand
	Pump 2 in off
	Pump 2 in auto
	Pump 3 in hand
	Pump 3 in off
	Pump 3 in auto
	Pump 4 in hand
	Pump 4 in off
	Pump 4 in auto
	Reserved
	Reserved
	Reserved
	Reserved

NAME NV	
nvoWord2 Bit:	Reserved
	Reserved
	Pump 1 run feedback alarm
	Pump 2 run feedback alarm
	Pump 3 run feedback alarm
	Pump 4 run feedback alarm
	Reserved
	Reserved
	Pump 1 drive fault
	Pump 2 drive fault
	Pump 3 drive fault
	Pump 4 drive fault
	Reserved
	Reserved
	Pump 1 no flow alarm
	Pump 2 no flow alarm

NAME NV	
nvoWord3 Bit:	Pump 3 no flow alarm
	Pump 4 no flow alarm
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	System alarm
	Pump alarm
	Reserved
	Reserved
	Pump 1 run feedback
	Pump 2 run feedback

NAME NV	
nvoWord4 Bit:	Pump 3 run feedback
	Pump 4 run feedback
	Reserved
	Reserved
	Pump 1 alarm
	Pump 2 alarm
	Pump 3 alarm
	Pump 4 alarm
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved
	Reserved

	NAME NV
nvoWord5 Bit:	Reserved
	Reserved
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare
	Spare

TORONTO

23 BERTRAND AVENUE
TORONTO, ONTARIO
CANADA
M1L 2P3
+1 416 755 2291

BUFFALO

93 EAST AVENUE
NORTH TONAWANDA, NEW YORK
U.S.A.
14120-6594
+1 716 693 8813

BIRMINGHAM

HEYWOOD WHARF, MUCKLOW HILL
HALESOWEN, WEST MIDLANDS
UNITED KINGDOM
B62 8DJ
+44 (0) 8444 145 145

MANCHESTER

WOLVERTON STREET
MANCHESTER
UNITED KINGDOM
M11 2ET
+44 (0) 8444 145 145

BANGALORE

#59, FIRST FLOOR, 3RD MAIN
MARGOSA ROAD, MALLESWARAM
BANGALORE, INDIA
560 003
+91 (0) 80 4906 3555

SHANGHAI

NO. 1619 HU HANG ROAD, XI DU TOWNSHIP
FENG XIAN DISTRICT, SHANGHAI
P.R.C.
201401
+86 21 3756 6696

ARMSTRONG FLUID TECHNOLOGY
ESTABLISHED 1934

ARMSTRONGFLUIDTECHNOLOGY.COM

MAKING ENERGY MAKE SENSE™