Smith Meter® AccuLoad® IV-SA Hardware Worksheet

AB06217 Issue/Rev. 0.0 (5/26)

This worksheet is provided to ensure that the AccuLoad IV-SA hardware contains enough I/O for the application. This worksheet should be filled out for every application. The AccuLoad IV-SA hardware is capable of controlling up to eighteen arms in straight arm loading applications and up to six products per arm in sequential blending and/or ratio blending applications. When configured for ratio blending, the AccuLoad IV-SA is capable of controlling six product streams per board set. Contact your local Guidant representative if you have any questions about this worksheet.

Frequency Inputs

	Board Sets																							
Frequency Inputs	***SAA***						***SAB***						***SAC***						***SAD***					
Product Meter Pulses	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
For dual pulse meters, two per meter	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
Density	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Additive Meter	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Flow Controlled Additive Meter (Single Pulse)	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Flow Controlled Additive Meter (Dual Pulse)	5	6	7	8			5	6	7	8			5	6	7	8			5	6	7	8		
Total	***12 or less***						***12 or less***						***12 or less***						***12 or less***					

A4I boards can be added to provide additional pulse inputs for additive meters. One A4I board adds 10 additional additive meter inputs per board set. Flow Controlled Additives must be wired to the A4M or A4B boards in the FCM.

Analog I/O

	Board Sets																							
Analog I/O	***SAA***						***SAB***						***SAC***						***SAD***					
Inputs																								
RTD (Temperature)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
4-20 mA (Temperature, Density, Pressure, General)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1-5 VDC (Temperature, Density, Pressure, General)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Outputs																								
4-20 mA (Valve Control, Flow Rate, General)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1-5 VDC (Valve Control, Flow Rate, General)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Total	***6 or less***						***6 or less***						***6 or less***						***6 or less***					

Digital Inputs—AC

	Board Sets			
Digital Inputs	***SAA***	***SAB***	***SAC***	***SAD***
AC				
Security	1 2	1 2	1 2	1 2
Arm Permissive (Maximum Two per Arm)	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9
Second High Flow Rate (One per Arm)	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Remote Start Arm	1 2 3 4 5 6	1 2 3 4	1 2 3 4 5 6	1 2 3 4 5 6
Remote Stop	1	1	1	1
Remote Stop Arm	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Transaction Reset (One per Arm)	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
General Purpose	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9
Print Tray Switch	1 2	1 2	1 2	1 2
Block Valve Feedback	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9
Piston Injector Feedback	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9
System Permissive	1 2 3	1 2 3	1 2 3	1 2 3
Swing Arm Side A	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Swing Arm Side B	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
DE Head Stop Flow	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
DE Head Low Flow	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
DE Head High Flow	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Bay A Permissive 1	1 2	1 2	1 2	1 2
Bay B Permissive 1	1 2	1 2	1 2	1 2
Meter Injector Prove	1	1	1	1
Total	***9 or less***	***9 or less***	***9 or less***	***9 or less***

Digital Inputs—DC

	Board Sets			
Digital Inputs	***SAA***	***SAB***	***SAC***	***SAD***
DC				
Security	1 2	1 2	1 2	1 2
Arm Permissive (Maximum Two per Arm)	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
Second High Flow Rate (One per Arm)	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Remote Start Arm	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Remote Stop	1	1	1	1
Remote Stop Arm	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Transaction Reset (One per Arm)	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
General Purpose	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34
Print Tray Switch	1 2	1 2	1 2	1 2
Block Valve Feedback	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34
Piston Injector Feedback	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 — 34
System Permissive	1 2 3	1 2 3	1 2 3	1 2 3
Swing Arm Side A	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Swing Arm Side B	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
DE Head Stop Flow	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
DE Head Low Flow	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
DE Head High Flow	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
Bay A Permissive 1	1 2	1 2	1 2	1 2
Bay B Permissive 1	1 2	1 2	1 2	1 2
Meter Injector Prove	1	1	1	1
Total	***• 14 or less standard • 24 or less with optional A4I • 34 or less with two optional A4I boards***	***• 14 or less standard • 24 or less with optional A4I • 34 or less with two optional A4I boards***	***• 14 or less standard • 24 or less with optional A4I • 34 or less with two optional A4I boards***	***• 14 or less standard • 24 or less with optional A4I • 34 or less with two optional A4I boards***

Eight shared digital I/O points are programmable between DC digital inputs and DC digital outputs. The number indicated here is the maximum if all programmed as inputs or all programmed as outputs.

Digital Outputs—AC

	Board Sets																							
Digital Outputs	***SAA***						***SAB***						***SAC***						***SAD***					
AC																								
Product Pumps (Sequential Blending, One per Arm)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Upstream Solenoids[2]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Downstream Solenoids[2]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Alarm Relay	1	2					1	2					1	2					1	2				
General Purpose	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18
	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
	25	26	27	—		67	25	26	27	—		67	25	26	27	—		67	25	26	27	—		67
Block Valve	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18
	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
	25	26	27	—		36	25	26	27	—		36	25	26	27	—		36	25	26	27	—		36
Stop Relay (One per Arm)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Additive Pumps[1]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18
	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
Piston Pumps	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18
	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
Metered Injectors (Solenoids)[1]	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Shared Additive Solenoids	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18	13	14	15	16	17	18
	19	20	21				19	20	21				19	20	21				19	20	21			
Shared Additive Flush	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Flow Controlled Additive Upstream Solenoids[2]	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Flow Controlled Additive Downstream Solenoids[2]	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Total	***• 27 or less standard • 47 or less with one optional A4I board • 67 or less with two optional A4I boards***						***• 27 or less standard • 47 or less with one optional A4I board • 67 or less with two optional A4I boards***						***• 27 or less standard • 47 or less with one optional A4I board • 67 or less with two optional A4I boards***						***• 27 or less standard • 47 or less with one optional A4I board • 67 or less with two optional A4I boards***					

1 Additive pumps and solenoid outputs are fixed on the A4I when more than four metered additives are programmed. It is recommended that if the A4I board is required for additional metered additives, that all additives be connected to the A4I board.

2 Upstream and downstream solenoids should be programmed and wired on A4M/A4B AccuLoad board sets (must be same board set as associated meter pulse input).

Digital Outputs—DC

	Board Sets																							
Digital Outputs	***SAA***						***SAB***						***SAC***						***SAD***					
DC																								
Product Pumps (Sequential Blend One per Arm)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5		1	2	3	4	5	
Upstream Solenoids[2]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Downstream Solenoids[2]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Arm Relay	1	2					1	2					1	2					1	2				
General Purpose	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11		7	8	9	10	11		7	8	9	10	11		7	8	9	10	11	
Block Valve	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11		7	8	9	10	11		7	8	9	10	11		7	8	9	10	11	
Stop Relay (One per Arm)	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Additive Pumps[3]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11		7	8	9	10	11		7	8	9	10	11		7	8	9	10	11	
Piston Injectors	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11		7	8	9	10	11		7	8	9	10	11		7	8	9	10	11	
Metered Injectors (Solenoids)	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Shared Additive Solenoids	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
	7	8	9	10	11		7	8	9	10	11		7	8	9	10	11		7	8	9	10	11	
Shared Additive Flush	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Flow Controlled Additive Upstream Solenoids[2]	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Flow Controlled Additive Downstream Solenoids[2]	1	2	3	4			1	2	3	4			1	2	3	4			1	2	3	4		
Total[4]	***11 or less***						***11 or less***						***11 or less***						***11 or less***					

2 Upstream and downstream solenoids should be programmed and wired on A4M/A4B AccuLoad board sets (must be the same board as associated meter pulse input).

3 Additive pumps and solenoid outputs are fixed on the A4I when more than four metered additives are programmed.

4 Eight shared digital I/O points are programmable between DC digital inputs and DC digital outputs. The number indicated here is the maximum if all programmed as inputs or all programmed as outputs.

Man Machine Interface

ALIII – MMI - ALXM - * - ** - ***

*	**
0	0
1	1

Refer to AccuLoad IV Specifications (SS06200) for all modeling codes (MMI, FCM, and Board Set Modeling).

Flow Control Module

ALIII – FCM - * - ** ***

*	**	***
SA2	1	0 - 50
SA4	2	
SA6	3	
SA8	4	
SA10		
SA12		
SA14		
SA16		
SA18		

Board Set Modeling

Note: Board Set consists of one A4M and one A4B prior to optional hardware.

A complete model number is required when ordering the AccuLoad IV Split Architecture.

When ordering a new AccuLoad IV-SA FCM or FMU, also specify a model code for each board set to be included, as below:

SA * - ** - A**** - ***

*	**	A****	***
A	ALX1	RTDs	Blank
B	ALX2	4-20 mA In	A – AICB Board
C	ALX3	4-20 mA Out	
D	ALX4	1-5 Vdc In	
	ALX5	1-5 Vdc Out	
	ALX6		

When adding an A4I board to the assembly, it can either be mounted locally or remotely. It is recommended that the A4I be mounted at or near the additive injector panel to save on wiring costs. All that is needed back to the AccuLoad IV is +24 VDC and a communication cable. Consideration should be given to mounting the A4I in the remote housing any time the additive panel is a considerable distance away from the AccuLoad. The cost of running +24 VDC and one communication wire versus the remote housing and all the additive wiring should be considered.

Expansion Kit Board Set

A complete model number is required when ordering the AccuLoad IV Split Architecture.

> NOTE: Board Set consists of one A4M and one A4B prior to optional hardware.

These kits include additional hardware to mount the board into the ALIV-FCM or your upgraded ALIII-FCM.

When expanding an AccuLoad IV SA system, specify the details using the following model code for each desired board set:

ALIV SAA ARM2 A00000 1

Model Designation

FMXSAB—Board set B
FMXSAC—Board set C
FMXSAD—Board set D

Firmware

ARM1	ARP1 (Pemex) One arm operation
ARM2	ARP2 (Pemex) Two arm operation
ARM3	ARP3 (Pemex) Three arm operation
ARM4	ARP4 (Pemex) Four arm operation
ARM5	ARP5 (Pemex) Five arm operation
ARM6	ARP6 (Pemex) Six arm operation

Hardware Option

0—None
1—A4I board

Analog Modules

Note: Maximum of six analog modules: For upgrade kits, existing analog modules in the AccuLoad III can be re-used in the AccuLoad IV FMU.

Digit 1—Number of RTDs
Digit 2—Number of 4-20mA inputs
Digit 3—Number of 4-20mA outputs
Digit 4—Number of 1-5 VDC inputs
Digit 5—Number of 1-5 VDC outputs

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