MOORE
Process Automation Solutions

USER'S MANUAL ADDENDUM

UMA353-1-5
Rev: 1
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Controller Manual Addendum for MPU Controller Board Firmware V2.2

INVOLVED MANUALS

Model 352*Plus* Single-Loop Digital Controller User's Manual UM352P-1, Rev: 2
Model 353 Process Automation Controller User's Manual UM353-1, Rev: 7
Model 354N Universal Loop Controller User's Manual UM354N-1, Rev: 1

DISCUSSION

MPU Controller Board firmware version 2.2 provides three new operator display function blocks:

1. ODA - Operator Display for Analog Indication and Alarming
2. ODD - Operator Display for Discrete Indication and Control
3. ODP - Operator Display for Pushbutton

This addendum describes these three function blocks. It provides text and illustrations that supplement the material in the accompanying User's Manual. Three sections in the accompanying manual are affected:

- Section 3 Function Blocks
- Section 5 Network Communications
- Appendix A Network Communications

To parallel the structure of the User's Manual, this addendum is divided into the same three sections as shown above. In general, only new material is included in this addendum. For all other information, refer to the accompanying manual.

HOW TO USE THIS ADDENDUM

As mentioned above, this addendum is divided into three sections. Each section is briefly discussed here. A change bar in a page margin identifies new or revised material. The change bar is particularly useful where unchanged material and new/revised material are interspersed, as in Appendix A.

Section 3 Function Blocks - see Page 3

The three new function blocks are discussed in this addendum section. For information about all other function blocks refer to Section 3 in the body of the accompanying manual.

Section 5 Network Communications - see Page 9

This addendum section contains the four sections listed below. Refer to the body of the manual for sections not listed here.

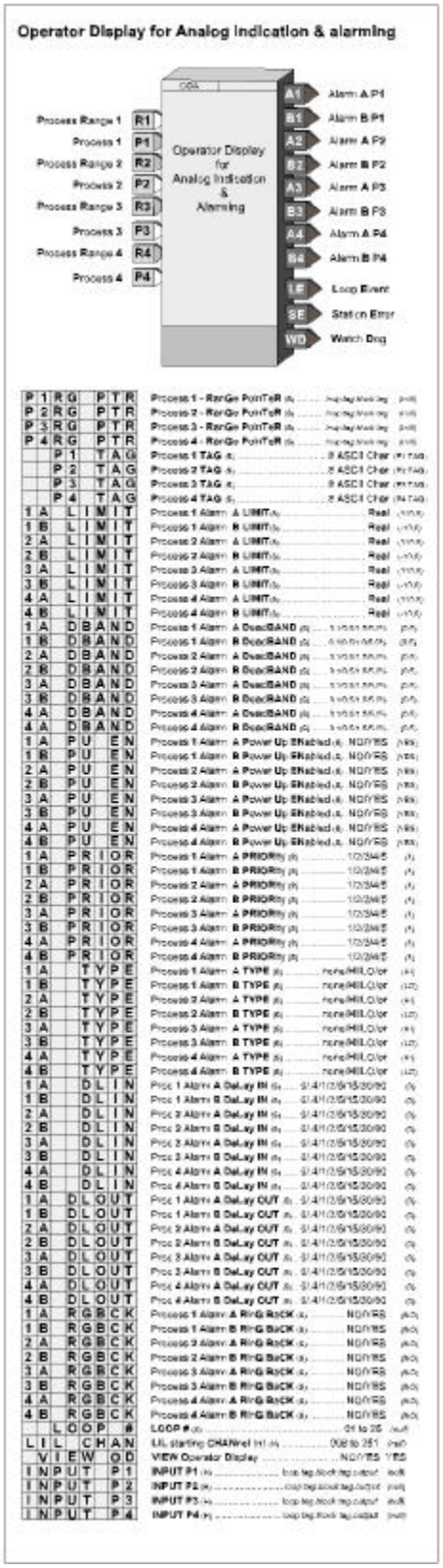
- Section 5.3.1 Station Data (supersedes the section in the body of the accompanying manual)
- Section 5.3.4 Analog Indicator Loop Data (new material)
- Section 5.3.5 Discrete Indicator Loop Data (new material)
- Section 5.3.6 Pushbutton Loop Data (new material)

Appendix A Network Communications - see Page 13

This addendum section contains Appendix sections A.0 Network Communications through A.4.8 Coil Loop Data. These appendix sections have been updated with material addressing the three display function blocks. These appendix sections supersede those in the body of the manual. The remainder of the network communications information in the body of the manual, from Section 4.9 PCOM Block Status through to the end of Appendix A, is unchanged.

SECTION 3 FUNCTION BLOCKS

This section provides the information required for implementing the three added operator display function blocks.



ODA - Operator Display for Analog Indication and Alarming (V2.2)

ODA function blocks are one of five operator displays that can be used on a one per loop basis to configure the local operator display functions as well as network parameters.

The ODA function block will display up to four Process variables, P1 to P4, in both analog bargraph and digital form. Two alarms are associated with each process variable and can be configured as HI or LO alarms. Each alarm function has associated block outputs that are high (1) when the alarm is active. Output LE is high (1) when a loop event is active. Output SE is high when a station error is active. The LOOP # parameters are used to index reads and writes to Modbus and LIL network parameters. See Appendix A for more information on network parameters.

The VIEW OD parameter, when set to YES, enables the operator display to be viewed and accessed locally. In cases where it is desired to view display or operation parameters only from a network workstation, the parameter should be set to NO.

Range pointers (i.e. R1 to R4) for all four process inputs must be configured to define the range of each of the variable inputs (i.e. P1 to P4). If these parameters are not configured, the bargraphs will be scaled using the engineering range of 0.00 to 100.00. This information also defines the scaling of the loop information provided to a remote workstation over the network (i.e. Modbus or LIL).

Each process variable can be displayed on the local faceplate using the D button. When first stepping into a loop using the Loop button, the loop tag will be displayed (e.g. AnDisp1). However, if there is a point within the loop that has an unacknowledged alarm, that point will be shown and the display will alternate between the point tag and the alarm condition (e.g. PI693/3B LO). Pressing the D button will scroll through the analog points showing the point tag (e.g. TI712) in the alphanumeric display and the value of the point in the digital display (e.g. 348.47). Pressing the UNITS button will display the units of the point. Pressing the Loop tag will return to displaying the loop tag.

Alarm Types

HI compares the process input with the limit setting and trips the alarm status high (1) when the process is equal to or higher than the limit setting. The alarm status will clear (0) when the process is less than the limit setting minus the deadband.

LO compares the process input with the limit setting and trips the alarm status high (1) when the process is equal to or less than the limit setting. The alarm status will clear (0) when the process is greater than the limit setting plus the deadband.

Alarms have priorities 1 to 5, with 1 the highest, and are reported to the operator faceplate in order of priority first and then in order of occurrence. Priority 1 causes the station bargraphs and condition (e.g. A1 HI) to flash and requires acknowledgment to stop flashing. Priority 2 also flashes the bargraphs and condition but stops flashing when the alarm clears (i.e. Self Clearing). Priority 3 causes the event LEDs (L and S) and condition to flash and stops only when the alarm is acknowledged. Priority 4 also causes the event LEDs and condition to flash but stops when the alarm clears. Priority 5 displays the alarm but does not require that it be acknowledged.

Alarm limits are in engineering units. A quickset ALARM feature is also available allowing alarm limits to be set quickly during operation. The settings are in engineering units but will also be displayed in % of range on the setpoint bargraph when viewing a point. Alarms are displayed as defined by the range pointer parameter. Alarms can be set to any engineering value within -10% to 110% of the range defined by the pointer. If a range is changed, the current alarm settings will be changed to be the same % within the new range. For example, if a HI alarm is currently set at 100.0 with a range of 0.0 to 100.0 and the range is changed to 300.0 to 400.0, the HI alarm will be moved to 400.0.

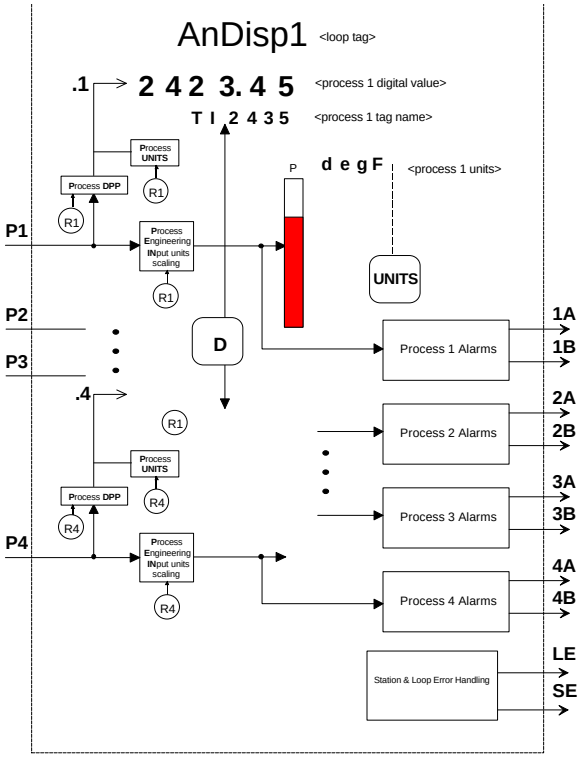
Each alarm can be enabled or disabled when in the quickset ALARM mode. The configuration allows an alarm to be enabled or disabled on a cold start. When an alarm is disabled it will not operate but will retain settings for return to the enabled mode. Complete operator faceplate functions, relating to alarms, are described in the sections describing the specific faceplate design. All alarms have the following features:

Deadband - requires that the signal either drop below or exceed the limit setting by the amount of the deadband before the alarm clears (goes low). The alarm deadband is set as a fixed % of the range pointer scale.

Delay-In Time - requires that the input remain above (or below) the limit setting for the delay time before the alarm trips (goes high). This can help prevent nuisance alarms that may be tripping due to process noise.

Delay-Out Time - requires that the input remain below (or above) the limit setting plus deadband for the delay time before the alarm will clear (goes low). This can help prevent inadvertent clearing of alarms due to process noise.

Ringback - causes a previously acknowledged alarm to require acknowledgment (priorities 1-4) when the alarm clears.



BLOCK DIAGRAM

ODD - Operator Display for Discrete Indication and Control (V2.2)

ODD function blocks are one of five operator displays that can be used on a one per loop basis to configure the local operator display functions as well as network parameters. A block diagram of the function block is on the next page.

The ODD function block displays up to 16 discrete variables. Each input has a corresponding block output that is equal to the input when the variable mode is in Auto. Each input variable can be assigned a mode. The value of the output can be changed while in Man by using the pulser and pressing the ACK button. When a variable is switched to Man it will always equal the input value until changed.

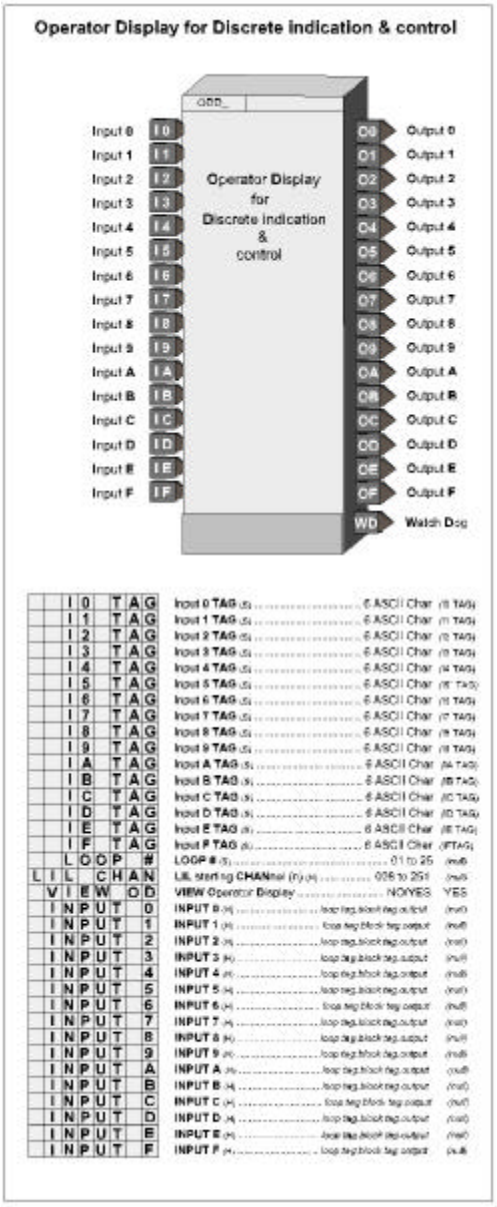
The LOOP # parameter is used to index reads and writes to Modbus and LIL network parameters. When using the LIL, the LIL CHAN parameter must also be configured. See Appendix A for more information on network parameters.

The VIEW OD parameter, when set to YES, enables the operator display to be viewed and accessed locally. In cases where it is desired to view display or operation parameters only from a network workstation, the parameter should be set to NO.

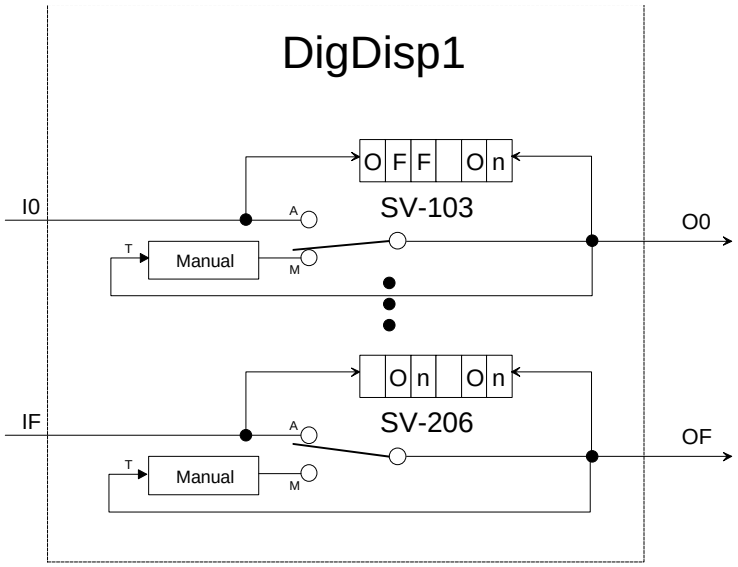
During a cold or warm start, each input variable will power up in the auto mode. During a hot start, the mode and manual value will equal the value prior to power down.

Each discrete input variable can be displayed on the local faceplate using the D button. When first stepping into a loop using the Loop button, the loop tag will be displayed (e.g. DigDisp1). Pressing the D button will scroll through the discrete points displaying the point tag (e.g. SV-103) in the alphanumeric and the value of the input on the left 3 positions of the digital display (e.g. On) and the output in the right-most 3 positions (e.g. OFF).

The A/M button will display the point mode and enable switching the point between auto and manual using the A/M button. The manual value can be changed by turning the pulser and pressing the ACK button. If the ACK button is not pressed within 4-5 seconds, the display will return to the actual output value.



		I	0		T	A	G	Input 0 TAG (S)	6 ASCII Char
		I	1		T	A	G	Input 1 TAG (S)	6 ASCII Char
		I	2		T	A	G	Input 2 TAG (S)	6 ASCII Char
		I	3		T	A	G	Input 3 TAG (S)	6 ASCII Char
		I	4		T	A	G	Input 4 TAG (S)	6 ASCII Char
		I	5		T	A	G	Input 5 TAG (S)	6 ASCII Char
		I	6		T	A	G	Input 6 TAG (S)	6 ASCII Char
		I	7		T	A	G	Input 7 TAG (S)	6 ASCII Char
		I	8		T	A	G	Input 8 TAG (S)	6 ASCII Char
		I	9		T	A	G	Input 9 TAG (S)	6 ASCII Char
		I	A		T	A	G	Input A TAG (S)	6 ASCII Char
		I	B		T	A	G	Input B TAG (S)	6 ASCII Char
		I	C		T	A	G	Input C TAG (S)	6 ASCII Char
		I	D		T	A	G	Input D TAG (S)	6 ASCII Char
		I	E		T	A	G	Input E TAG (S)	6 ASCII Char
		I	F		T	A	G	Input F TAG (S)	6 ASCII Char
		L	O	O	P		#	LOOP # (S)	01 to 25
L	I	L		C	H	A	N	LIL starting CHANnel (S) (H)	026 to 251
	V	I	E	W		O	D	VIEW Operator Display	NO/YES
		I	N	P	U	T	0	INPUT 0 (H)	
		I	N	P	U	T	1	INPUT 1 (H)	
		I	N	P	U	T	2	INPUT 2 (H)	
		I	N	P	U	T	3	INPUT 3 (H)	
		I	N	P	U	T	4	INPUT 4 (H)	
		I	N	P	U	T	5	INPUT 5 (H)	
		I	N	P	U	T	6	INPUT 6 (H)	
		I	N	P	U	T	7	INPUT 7 (H)	
		I	N	P	U	T	8	INPUT 8 (H)	
		I	N	P	U	T	9	INPUT 9 (H)	
		I	N	P	U	T	A	INPUT A (H)	
		I	N	P	U	T	B	INPUT B (H)	
		I	N	P	U	T	C	INPUT C (H)	
		I	N	P	U	T	D	INPUT D (H)	
		I	N	P	U	T	E	INPUT E (H)	
		I	N	P	U	T	F	INPUT F (H)	



Block Diagram

ODP - Operator Display for Pushbuttons (V2.2)

ODP function blocks are one of five operator displays that can be used on a one per loop basis to configure local operator display functions as well as network parameters. A block diagram of the function block is on the next page.

The ODP function block can provide up to 8 groups of two pushbuttons and one selector switch. Each group includes:

- One normally open pushbutton, identified as PB1 on the local faceplate and can have a 6-character tag to identify the button function on a HMI display.
- One normally closed pushbutton, identified as PB2 on the local faceplate and can also have a 6 char tag.
- One two-position selector switch identified as A/M on the local faceplate and can have a 6 char identification tag for switch position for display on an HMI.

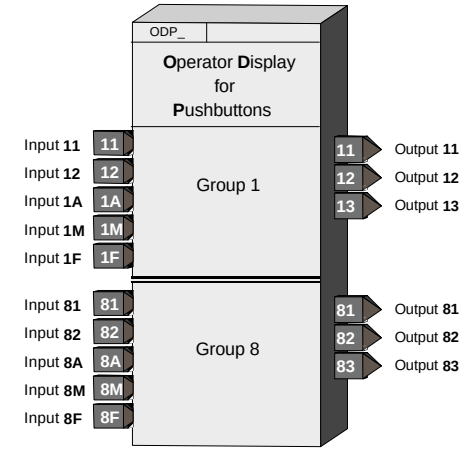
Each group also has a set of 6-character messages associated with the status of a feedback signal (1/0).

Each pushbutton has a configuration parameter that controls how long the button function will be held in. The default value is 1 second but can be set from 0.1 (or scan time if greater than 0.1) to 10 seconds.

The LOOP # parameter is used to index reads and writes to Modbus and LIL network parameters. When using the LIL, the LIL CHAN parameter must also be configured. See Appendix A for more information on network parameters.

The VIEW OD parameter, when set to YES, enables the operator display to be viewed and accessed locally. In cases where it is desired to view display or operation parameters only from a network workstation, the parameter should be set to NO.

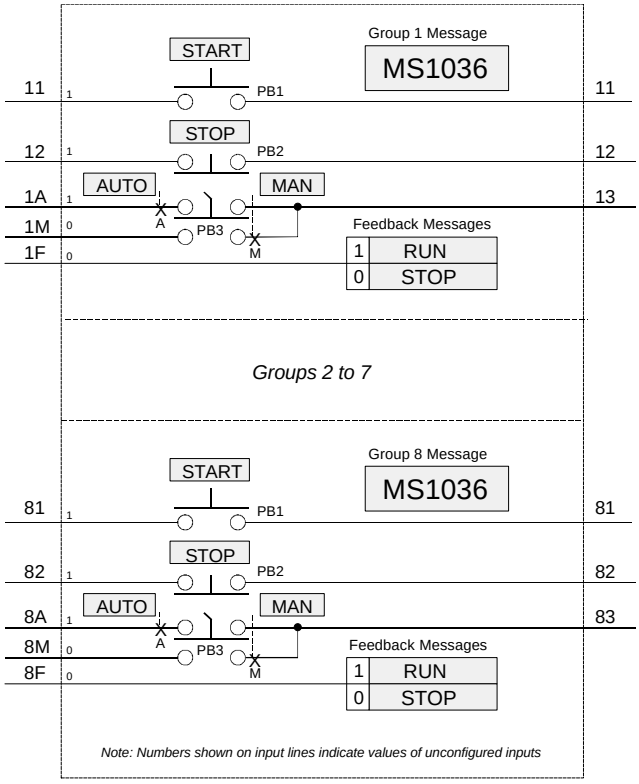
Operator Display for Pushbuttons



		G	1		T	A	G	Group 1 TAG (S)	6 ASCII Char (Group1)
G	1	P	1		T	A	G	Group 1 PB1 TAG (S)	6 ASCII Char (START)
G	1	P	1		H	I	T	Group 1 PB1 Hold In Time (S)	0.1 - 10 sec (1 sec)
G	1	P	2		T	A	G	Group 1 PB2 TAG (S)	6 ASCII Char (STOP)
G	1	P	2		H	I	T	Group 1 PB2 Hold In Time (S)	0.1 - 10 sec (1 sec)
G	1	S	A		T	A	G	Group 1 Switch Position A TAG (S)	6 ASCII Char (AUTO)
G	1	S	M		T	A	G	Group 1 Switch Position M TAG (S)	6 ASCII Char (MAN)
G	1	F	1		T	A	G	Group 1 Feedback 1 TAG (S)	6 ASCII Char (ON)
G	1	F	0		T	A	G	Group 1 Feedback 0 TAG (S)	6 ASCII Char (OFF)
		G	8		T	A	G	Group 8 TAG (S)	6 ASCII Char (Group8)
G	8	P	1		T	A	G	Group 8 PB1 TAG (S)	6 ASCII Char (START)
G	8	P	1		H	I	T	Group 8 PB1 Hold In Time (S)	0.1 - 10 sec (1 sec)
G	8	P	2		T	A	G	Group 8 PB2 TAG (S)	6 ASCII Char (STOP)
G	8	P	2		H	I	T	Group 8 PB2 Hold In Time (S)	0.1 - 10 sec (1 sec)
G	8	S	A		T	A	G	Group 8 Switch Position A TAG (S)	6 ASCII Char (AUTO)
G	8	S	M		T	A	G	Group 8 Switch Position M TAG (S)	6 ASCII Char (MAN)
G	8	F	1		T	A	G	Group 8 Feedback 1 TAG (S)	6 ASCII Char (ON)
G	8	F	0		T	A	G	Group 8 Feedback 0 TAG (S)	6 ASCII Char (OFF)
		L	O	O	P		#	LOOP # (S)	01 to 25 *(null)*
L	I	L		C	H	A	N	LIL starting CHANnel (n) (H)	008 to 251 *(null)*
	V	I	E	W		O	D	VIEW Operator Display	NO/YES YES
I	N	P	U	T		1	1	INPUT 11 (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		1	2	INPUT 12 (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		1	A	INPUT 1A (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		1	M	INPUT 1M (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		1	F	INPUT 1F (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		8	1	INPUT 81 (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		8	2	INPUT 82 (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		8	A	INPUT 8A (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		8	M	INPUT 8M (H)	*loop tag.block tag.output (null)*
I	N	P	U	T		8	F	INPUT 8F (H)	*loop tag.block tag.output (null)*

During a cold or warm start, the A/M switch will power up in the Auto position. During a hot start, the A/M switch will power up in the position prior to power down.

Each group can be displayed on the local faceplate using the D button. When first stepping into a loop using the Loop button, the loop tag will be displayed (e.g. PBDisp1). Pressing the D button will scroll through the groups displaying the group tag (e.g. MS1036) in the alphanumeric and the value of the feedback in the digital display (e.g. 1). The feedback message associated with this feedback value can be viewed on the local faceplate using the UNITS button. The A/M button will display the position of the group selector switch and enable switching the group selector switch between auto and manual.



Block Diagram

SECTION 5 NETWORK COMMUNICATIONS

This section supplements Section 5 Network Communications in the accompanying user's manual. For Sections 5.1, 5.2, 5.3, 5.3.2 and 5.3.3, refer to the accompanying user's manual. Section 5.3.1 below replaces that in the body of the UM. Sections 5.3.4 through 5.3.6 below are new sections describing the three new operator display blocks.

5.3.1 Station Data

Station data is fixed and occupies the first seven channels.

C\P	1	2	3	4	5	6	7	8	9	10`	11	12
1	GDS	RAM	CBT	CBSR	EBT	EBSR	RBT	RBSR	NBT	NBSR	OAT	OASR
2	ST	STAG						DRN	CFNR			
3	SSW	CWT	SA	CT	RTS	STY	STM	STD	STH	STMN	STSC	
4	SE	SN				AASEL						
5	NCL	C1S	C2S	C3S	C4S	C5S	C6S	C7S	C8S	C9S	C10S	C11S
6	NSL	S1S	S2S	S3S	S4S	S5S	S6S	S7S	S8S	S9S	S10S	S11S
7	LSLCP	CFN										

C\P	13	14	15	16	17	18	19	20	21	22	23	24
1	OBT	OBSR	OFT	KSR	CBDR	EBDR	RBDR	NBDR	OADR	OBDR	KDR	
2	SCR	NCR										
3												
4												
5	C12S	C13S	C14S	C15S	C16S	C17S	C18S	C19S	C20S	C21S	C22S	C23S
6	S12S	S13S	S14S	S15S	S16S	S17S	S18S	S19S	S20S	S21S	S22S	S23S
7												

LonWorks Remote Function Blocks I/O States N=Normal, M=Mode, F=Forced (see Appendix for details)

C\P	100	101	102	103	104	105	106	107	108	109	110	111
1	RTT1Y	RTT1M	RTT1D	RTT1HR	RTT1MN	RTT1SC	RTT1DA					
2	RTT2Y	RTT2M	RTT2D	RTT2HR	RTT2MN	RTT2SC	RTT2DA					
3	RTT3Y	RTT3M	RTT3D	RTT3HR	RTT3MN	RTT3SC	RTT3DA					

C\P	202	203	204	205	206	207	208	209	210	211	212	213
1	DID1N	DID1M	DID1F	DOD1N	DOD1M	DOD1F	DIS1N	DIS1M	DIS1F	DOS1N	DOS1M	DOS1F
2	DID2N	DID2M	DID2F	DOD2N	DOD2M	DOD2F	DIS2N	DIS2M	DIS2F	DOS2N	DOS2M	DOS2F
3	DID3N	DID3M	DID3F	DOD3N	DOD3M	DOD3F	DIS3N	DIS3M	DIS3F	DOS3N	DOS3M	DOS3F
4	DID4N	DID4M	DID4F	DOD4N	DOD4M	DOD4F	DIS4N	DIS4M	DIS4F	DOS4N	DOS4M	DOS4F
5	DID5N	DID5M	DID5F	DOD5N	DOD5M	DOD5F	DIS5N	DIS5M	DIS5F	DOS5N	DOS5M	DOS5F
6	DID6N	DID6M	DID6F	DOD6N	DOD6M	DOD6F	DIS6N	DIS6M	DIS6F	DOS6N	DOS6M	DOS6F
7												

5.3.4 Analog Indicator Loop Data

Analog Indicator loop data occupies six LIL channels. The starting channel is entered during configuration of the ODA operator display function block for each loop, as LIL CHAN (n). The first channel for each loop can be viewed in station data starting at channel 5/parameter 38. The station configuration entry (both local and graphical PC-based) will indicate the next available open space of six contiguous channels. Another starting channel can be entered but it is important to utilize the lowest total number of channels.

Channel locations n through n+5, in the table below, identify variables that will be available on the LIL for each analog indicator loop. All parameter 1 data (e.g. P-process) is global and is transmitted every 0.5 second. All other data is sent out on command.

C\P	1	2	3	4	5	6	7	8	9	10`	11	12
n	L#P1I	L#P1F		L#PIT			L#P1U					
n+1	L#P2I	L#P2F		L#P2T			L#P2U					
n+2	L#P3I	L#P3F		L#P3T			L#P3U					
n+3	L#P4I	L#P4F		L#P4T			L#P4U					
n+4	L#SW1	L#TAG										
n+5	L#SW2											

C\P	13	14	15	16	17	18	19	20	21	22	23	24
n	L#P1ALF		L#P1BLF		L#P2ALF		L#P2BLF		L#P3ALF		L#P3BLF	
n+1	L#P1A LI	L#P1B LI	L#P2A LI	L#P2B LI	L#P3ALI	L#P3B LI	L#P4A LI	L#P4B LI		L#Q1U		
n+2	L#P1A TI	L#P1B TI	L#P2A TI	L#2BTI	L#PATI	L#P3B T	L#P4A TI	L#P4B TI		L#Q2U		
n+3	L#P1A PI	L#P1B PI	L#P2A PI	L#P2B PI	L#P3API	L#P3B PI	L#P4A PI	L#P4B PI		L#Q3U		
n+4	L#P1MNF		L#P2MNF		L#P3MNF		L#P4MNF			L#Q4U		
n+5	L#P1MXF		L#P2MXF		L#P3MXF		L#P4MXF					

C\P	25	26	27	28	29	30	31	32	33	34	35	36
n	L#P4ALF		L#P4BLF									
n+1	L#Q1N				L#Q1F		L#Q1MNF		L#Q1MXF			
n+2	L#Q2N				L#Q2F		L#Q2MNF		L#Q2MXF			
n+3	L#Q3N				L#Q3F		L#Q3MNF		L#Q3MXF			
n+4	L#Q4N				L#Q4F		L#Q4MNF		L#Q4MXF			
n+5												

5.3.5 Discrete Indicator Loop Data

Discrete Indicator loop data occupies four LIL channels. The starting channel is entered during configuration of the ODD operator display function block for each loop, as LIL CHAN (n). The first channel for each loop can be viewed in station data starting at channel 6/parameter 38. The station configuration entry (both local and graphical PC-based) will indicate the next available open space of six contiguous channels. Another starting channel can be entered but it is important to utilize the lowest total number of channels.

Channel locations n through n+3, in the table below, identify variables that will be available on the LIL for each analog indicator loop. All parameter 1 data (e.g. discrete input states) is global and is transmitted every 0.5 second. All other data is sent out on command.

C\P	1	2	3	4	5	6	7	8	9	10	11	12
n	L#DISW	L#I0TAG			L#I3TAG			L#I6TAG			L#I9TAG	
n+1	L#DSSW	L#I1TAG			L#I4TAG			L#I7TAG			L#IATAG	
n+2	L#DOSW	L#I2TAG			L#I5TAG			L#I8TAG			L#IBTAG	
n+3	L#SW	L#TAG										

C\P	13	14	15	16	17	18	19	20	21	22	23	24
n		L#ICTAG										
n+1		L#IDTAG										
n+2		L#IETAG										
n+3		L#IFTAG										

5.3.6 Pushbutton Loop Data

Pushbutton loop data occupies two LIL channels. The starting channel is entered during configuration of the ODP operator display function block for each loop, as LIL CHAN (n). The first channel for each loop can be viewed in station data starting at channel 7/parameter 38. The station configuration entry (both local and graphical PC-based)

will indicate the next available open space of six contiguous channels. Another starting channel can be entered but it is important to utilize the lowest total number of channels.

Channel locations n through n+1, in the table below, identify variables that will be available on the LIL for each analog indicator loop. All parameter 1 data (e.g. discrete input states) is global and is transmitted every 0.5 second. All other data is sent out on command.

C\P	1	2	3	4	5	6	7	8	9	10	11	12
n	L#SW1	L#TAG										
n+1	L#SW2											

C\P	13	14	15	16	17	18	19	20	21	22	23	24
n	L#G1TAG			L#G1P1T			L#G1P2T			L#G1SAT		
n+1	L#G1F1T			L#G1FOT						L#G1SMT		

C\P	25	26	27	28	29	30	31	32	33	34	35	36
n	L#G2TAG			L#G2P1T			L#G2P2T			L#G2SAT		
n+1	L#G2F1T			L#G2FOT						L#G2SMT		

C\P	37	38	39	40	41	42	43	44	45	46	47	48
n	L#G3TAG			L#G3P1T			L#G3P2T			L#G3SAT		
n+1	L#G3F1T			L#G3FOT						L#G3SMT		

C\P	49	50	51	52	53	54	55	56	57	58	59	60
n	L#G4TAG			L#G4P1T			L#G4P2T			L#G4SAT		
n+1	L#G4F1T			L#G4FOT						L#G4SMT		

C\P	61	62	63	64	65	66	67	68	69	70	71	72
n	L#G5TAG			L#G5P1T			L#G5P2T			L#G5SAT		
n+1	L#G5F1T			L#G5FOT						L#G5SMT		

C\P	73	74	75	76	77	78	79	80	81	82	83	84
n	L#G6TAG			L#G6P1T			L#G6P2T			L#G6SAT		
n+1	L#G6F1T			L#G6FOT						L#G6SMT		

C\P	85	86	87	88	89	90	91	92	93	94	95	96
n	L#G7TAG			L#G7P1T			L#G7P2T			L#G7SAT		
n+1	L#G7F1T			L#G7FOT						L#G7SMT		

C\P	97	98	99	100	101	102	103	104	105	106	107	108
n	L#G8TAG			L#G8P1T			L#G8P2T			L#G8SAT		
n+1	L#G8F1T			L#G8FOT						L#G8SMT		

■

APPENDIX A NETWORK COMMUNICATIONS

This addendum section contains Appendix sections A.0 Network Communications through A.4.8 Coil Loop Data. These appendix sections have been updated with material addressing the three display function blocks. They sections supersede those in the body of the accompanying user's manual. The remainder of the network communications information in the body of the manual, from Section 4.9 PCOM Block Status through to the end of Appendix A, is unchanged.

A.1 INTRODUCTION

This section provides loop and station data mappings for both Modbus and LIL. Each controller has one RS232 port that always communicates via Modbus. On a 352P or 353, it is the connection located on the operator faceplate. On the model 354N it is the DB9 connector.

Each controller also has a multi-drop network connection that is either Modbus or LIL (when the optional LIL board is installed). The network typically interconnects:

- Model 352*Plus*, Model 353 or Model 354N Controllers and a computer running i|ware PC™, ProcessSuite™, MYCROADVANTAGE™ or other operator interface software

- Model 352*Plus*, Model 353 or Model 354N Controllers and an APACS® Model 39ACM Advanced Control Module

The network permits data to be uploaded from the station to the computer or workstation for process and alarm monitoring, additional processing of the data for inventory management and accounting, and process and equipment troubleshooting. Data can be downloaded to the station to change setpoint or valve value, change control mode, and acknowledge alarms.

Proprietary data transfers associated with configuration upload/download or on-line monitoring associated with the Moore i|config™ graphical configuration software are not described. Function blocks, parameters, and commands implemented with MPU Controller board firmware version 1.3 are identified, usually by "(V1.3)", those implemented by 2.0 as "V2.0" and those implemented by 2.2 as "V2.2".

A.2 CONNECTING TO APACS 39ACM, MYCROADVANTAGE, PROCESSSUITE, IWARE PC

A.2.1 APACS

A Model 39ACM (Advanced Control Module) supports both Modbus and LIL connections. Use the standard Modbus Master Function Block Library to communicate with a station. When requesting Modbus data, do not exceed 48 coils or 60 registers per request. A LIL function block library (P/N 15939-625V4.00 ACM Serial Communication FB Library LIL) that provides a method for connecting the ACM to standard LIL stations is available. The library includes a Model 352P/353/354 Loop block. The current release of the library maps the 352P/353/354 as having 3-loops located at channels 8, 13, and 18. Therefore, it is necessary to configure ODC function blocks for these channels. It is expected that later releases of the library will allow multiple loops, up to maximum allowed. Also, data from additional loops can be obtained by using a combination of other library functions such as LIL_GBL, LIL_NGBL, and LIL_CMD.

A.2.2 MYCROADVANTAGE

A.2.2.1 Model 320 Driver

MYCROADVANTAGE provides a LIL(320) driver that will communicate with stations on a Local Instrument Link (LIL). Standard, predefined parameter tables for many LIL products (e.g. Models 351 and 352) are within MYCROADVANTAGE to simplify configuration. MYCROADVANTAGE release 3.32 does not include a Model

352P/353/354 predefined parameter table. However, when up to three control loops are to be configured in a Model 352P, 353 or 354, use the Model 351 predefined parameter table and configure the ODC blocks in the loops to channels 8, 13, and 18. This method will work since the loop data in the controller is the same as a 351and is located at the same relative offsets as in a 351. Loops can also be configured individually. Details on the configuration can be found the MYCROADVANTAGE user manual.

A.2.2.2 Modbus Driver

MYCROADVANTAGE provides a Modbus driver for communicating with up to 32 stations through a single COM port. There are a few considerations when communicating with a Model 352P, 353 or 354 using the Modbus driver.

- Loop data is available as integer or floating point. When integer is used, more data is obtained with a single command, thus improving the communication throughput. When integer data is used, ranges can be scaled using 3:Linear function MX+B scaling.

- The MODBUS.DAT file must be modified. Under the section [Address Chunk Range], set "UseDefault=0", under section [Address Size], set "itChunkSize=48" and "WordChunkSize=60".

A.2.3 ProcessSuite

A.2.3.1 RealTime LIL I/O Server

An optional LIL RealTime I/O Server is available to communicate with the Model 320 ICI (Independent Computer Interface). The 320 communicates over the Local Instrument Link (LIL) with other stations that have the LIL option boards installed. Refer to the literature provided with the LIL RealTime I/O Server for proper operation. Optimize LIL performance by using Global Data, especially for data that is updated on each scan such as the process, setpoint, valve, loop status, and alarm I. Use individual parameter requests only to obtain data not required frequently (e.g. tuning parameters, range scaling).

A.2.3.2 Modbus I/O Server

A Modbus I/O Server comes with Process Suite and it can be used to communicate with the controller. Refer to the Modbus I/O Server instructions for operating details. Certain parameter settings are critical. In the Topic Definition, use the 584/984 slave type. Set the maximum coil reads to 48 and maximum register reads to 60. Maximum coil writes can be set to the minimum allowed value of 8 and register writes to 2.

A.2.4 iWARE PC

A.2.4.1 Modbus OPC Server

The iWARE PC Operator Interface software includes a Modbus OPC server that when connected to the controller can auto populate its database with the number and type of loops configured in the station. All tag names used in the OPC database will be the same as listed in this manual.

A.2.4.2 LIL OPC Server

The iWARE PC Operator Interface software includes an LIL OPC server that when connected to the controller can auto populate its database with the number and type of loops configured in the station. All tag names used in the LIL OPC database will be the same as listed in this manual.

Modbus Application Note: *Refer to application document AD353-108 for information on using Modbus communications with controller products.*

A.3 STATION DATA

A station contains some data that pertains to the entire station and some to individual loops. Station data, available over the network, is part of the station function block (STATN) configuration and is mapped to fixed locations in Modbus registers or coils and fixed channel/parameters when the optional LIL board is installed. Loop data (detailed in the next section) can be associated with a Controller "Control Loop" or a Sequencer "Sequencer Loop" as defined by the selection of the operator display: ODC "Operator Display for Controller" or ODS "Operator Display for Sequencer". Much of the analog data is available is two formats. The first is 16-bit values, scaled consistent with previous LIL products, enabling integration into existing LIL systems. This data type also provides Modbus masters, unable to handle 32-bit floating point, a method for obtaining data from the station.

The second is the standard 32-bit IEEE floating point format consistent with the actual data in the station. This data type is contained in two consecutive registers or parameters. When using Modbus the LSW is first and the MSW second. When using LIL, the first parameter contains the MSW and the second parameter the LSW. Boolean values are packed into 16-bit words for LIL use and are available in coils when using Modbus. String data, formatted as 2 ASCII characters per word with the left-most character in the most significant byte, containing tag, units, and message information is available with Modbus and LIL. Station data is 'Read Only' except for:

- SE (Station Error) parameter that allows a write of $0000 to reset the current error as an acknowledgment
- SSW (Station Status Word) parameter which allows writes to certain bits
- MTLP (Modbus Loop Trend Pointer, included in version 1.30 firmware) parameter
- AASEL (Active Acknowledged Station Error Log, included in version 1.30 firmware) parameter.

A.3.1 Integer Data (16-bit Integer)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
GDS	R	Global Data Size (LIL)	7-256 ($0007-$0100)	n/a	1/1
ST	R	Station Type	6 ($0006)	40001	2/1
SSW	R/W	Station Status Word	(see Station Status Word)	(see coils)	3/1
SE	R/W	Station Error	0-32767($00000-$7FFF)	40002	4/1
NCL	R	No. of Control Loops (# of ODC)	0-255($0000-$00FF)	40003	5/1
NSL	R	No. of Seq. Loops (# of ODS)	0-255($0000-$00FF)	40004	6/1
RAM	R	RAM Size (size in K bytes)	0-65535($0000-$FFFF)	40005	1/2
CBT	R	Controller Board Type	(see below)	40006	1/3
CBSR	R	Controller Board Software Rev. #	(see below)	40007	1/4
EBT	R	Exp. I/O Board Type	(see below)	40008	1/5
EBSR	R	Exp. I/O Board Software Rev. #	(see below)	40009	1/6
RBT	R	Remote I/O Board Type (A-1)	(see below)	40010	1/7
RBSR	R	Remote I/O (A-1) Software Rev. #	(see below)	40011	1/8
NBT	R	Network Board Type (B-1)	(see below)	40012	1/9
NBSR	R	Network (B-1) Software Rev. #	(see below)	40013	1/10
OAT	R	Option Board A Type (A-2)	(see below)	40014	1/11
OASR	R	Option A (A-2) Software Rev. #	(see below)	40015	1/12
OBT	R	Option Board B Type (B-2)	(see below)	40016	1/13
OBSR	R	Option B (B-2) Rev #	(see below)	40017	1/14
OFT	R	Operator Faceplate Type	(see below)	40018	1/15
DRN	R	Model 353 Database Rev. No.	0-32767($0000-$7FFF)	40019	2/8
CWT	R	Computer Watchdog Timer (sec)	0-1000 ($0000-$03F8)	40020	3/2
KSR	R	Kernal Software Rev. #	(see below)	40021	1/16
CT	R	Cycle Time (msec)	0-32767($00000-$7FFF)	40022	3/4
LxT	R	Loop - Type	($0000-$0005)	40023-40047	n/a
		(0-none,1-controller,2-sequencer, 3-analog ind. V2.2, 4-discrete ind. V2.2, 5-pushbuttons V2.2)			
MSLCP	R/W	Modbus Seq. Loop Config. Pt	0-25 ($0000-$0019)	40048	n/a
LSLCP	R/W	LIL Seq. Loop Config. Pointer	0-25 ($0000-$0019)	n/a	7/1
SA	R/W	Station Address	0-250 ($0000-$00FA)	40049	3/3
RTS	R/W	Front Port RTS	1-3 ($0001-$0003)	40050	3/5
		reserved		40051-40057	1/17-23
MLTP	R/W	Modbus Loop Trend Pointer *(V1.3)*	0-25 ($0000-$0019)	40058	n/a
NLTB	R	Number of Loop Trend Blocks *(V1.3)*	0-5 ($0000-$0005)	40059	n/a
AASEL	R/W	Active Ack'd Station Error Log *(V1.3)*	0-33767($0000-$7FFF)	40060	4/6

STY	R/W*(1)*	Standard Time in Years	1997-	40061	3/6	V2.0
STM	R/W*(1)*	Standard Time in Months	1-12	40062	3/7	V2.0
STD	R/W*(1)*	Standard Time in Days	1-31	40063	3/8	V2.0
STH	R/W*(1)*	Standard Time in Hours	0-23	40064	3/9	V2.0
STMN	R/W*(1)*	Standard Time in Minutes	0-59	40065	3/10	V2.0
STSC	R/W*(1)*	Standard Time in Seconds	0-59	40066	3/11	V2.0
NAL	R	No of Analog Ind. Loops (ODA)	0-255($0000-$00FF)	40067	5/37	V2.2
NDL	R	No of Discrete Ind. Loops (ODD)	0-255($0000-$00FF)	40068	6/37	V2.2
NDP	R	No of Pushbutton Loops (ODP)	0-255($0000-$00FF)	40069	7/37	V2.2

(1) The controller time should be changed one parameter at a time and then verified before writing the next parameter (i.e. for Modbus use command 06 and not command 16 and LIL use a single parameter send). The change to each parameter will take approximately 1 to 2 seconds each.

		spares	0($0000)	40070-40100	
C_S	R	Control Loop Starting Chan. LIL	5-250 ($0005-$00FA)	n/a	5/2-5/26
S_S	R	Seq. Loop Starting Chan. LIL	5-250 ($0005-$00FA)	n/a	6/2-6/26
A_S	R	Analog Indicator - Starting Chan. LIL	5-250 ($0005-$00FA)	n/a	5/38-5/62 V2.1
D_S	R	Discrete Indication - Starting Chan LIL	5-250 ($0005-$00FA)	n/a	6/38-6/62 V2.1
P_S	R	PB Indication - Starting Chan LIL	5-250 ($0005-$00FA)	n/a	7/38-7/62 V2.1
SCR	R	Starting Configuration Record	0- ($0000-)		2/13
NCR	R	Number of Configuration Records	0- ($0000-)		2/14

Software Revisions:

Development Release	MSB	128 to 255 ($80-$FF)
Major Rev.	MSB	1 to 127 ($00-$7F)*
Minor Rev.	LSB	0 to 255 ($00-$FF)

Hardware Type and Revisions:

Type	MSB	1 to 15 ($01-$0F)*
Rev.	LSB	1 to 15 ($01-$0F)

* A Major SW Rev. of 0 = no software included & a Hardware Type of 0 = not installed

A.3.2 Station String Data (8-bit ASCII Char - 2/Word*)*

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
STAG	R	Station Tag	12 ASCII Char	40101-40106	2/2-7
CFNR	R	Configuration File Name Reduced	8 ASCII Char	n/a	2/9-12
CFN	R	Configuration File Name	20 ASCII Char	40107-40116	7/2-7/12
SN	R	Station Serial No.	8 ASCII (0-99999999)	40117-40120	4/2-4/5
		spares	0($0000)	40121-40199	

A.3.3 Station Coil Data (1-bit)

Code	R/W	Description	Range	Coil (MB)	C/P (LIL)
ASE	R	1-Active Station Event	1/0	00001	3/1(0)
SEN	R/W	1-Station Event Not Ackl'd	1/0	00002	3/1(1)
FSB	R	1- Flashing Station Bargraph	1/0	00003	3/1(2)
SDV	R	1- Station Database Valid	1/0	00004	3/1(3)
CCL	R	Config Change Counter LSB(bit)	1/0	n/a	3/1(4)
CCH	R	Config Change Counter MSB(bit)	1/0	n/a	3/1(5)
		(			
SCH	R	1-Station Configuration Hold 1/0		00007	3/1(6)
SRB	R/W	1-Station Run Bit	1/0	00008	3/1(7)
OOS	R/W	1-Station Alarms Out of Service	1/0	00009	3/1(8) V2.0
		(spares)	0	00010-00014	3/1(9-10)
CC1	R/W	Config Change Bit #1	1/0	n/a	3/1(11)
CC2	R/W	Config Change Bit #2	1/0	n/a	3/1(12)
CC3	R/W	Config Change Bit #3	1/0	n/a	3/1(13)
SEB	R	1-Station Error Bit	1/0	00015	3/1(14)
		(spare)	0	00016	3/1(15)
		spares	0($0000)	00017-00071	

A.3.4 Station Status Word (SSW)

[channel 3/parameter 1]

BIT	Description	Value	Block	Read/Write	Output
0	Active Station Event (ASE)	1-Active Event		R	
1	Station Event Not Ack'd (SEN)	1-Not Acknowledged		R/W	
2	Flashing Bargraph (FSB)	1-Flashing Bargraph		R	
3	Database Valid (SDV)	1-Valid		R	
4	Config Change Counter LSB	1/0		R	
5	Config Change Counter MSB	1/0		R	
6	Configuration Hold (SCH)	1-Hold		R	
7	Station Run Bit (SRB)	1-Run		R	
8	Stations Alarms Out of Service	1-OOS		R/W	
9	(not used)	0		R	
10	(not used)	0		R	
11	Config. Change #1	1-Config. Changed		R/W	
12	Config. Change #2	1-Config. Changed		R/W	
13	Config. Change #3	1-Config. Changed		R/W	
14	Station Error Bit (SEB)	1-Error		R	
15	(not used)	0		R	

A.4 LOOP DATA

Loop data is grouped into several categories. The groupings are not as significant when using the LIL option as all LIL data has been mapped consistent with previous LIL products using Global and Non-Global data. However, when using Modbus, the groupings enable single data requests (up to 60 Words/Registers or 48 Coils) to obtain similar data with a single command. The loop will have different data if assigned as a controller type (i.e. using the ODC block), a sequencer type (i.e. using the ODS block), an Analog Indicator Display (i.e. using the ODA block), a Discrete Indicator Display (i.e. using the ODD block), or Pushbutton/Switch Operation (i.e. using the ODP block).

a) Dynamic data may change value on each controller scan and/or is not identified as being changed by the data base change bit (coil). This category of data usually needs to be updated by a workstation every few seconds.

b) Variable data changes periodically. It is usually associated with on-line operation at a workstation but may only need to be updated on a lower periodic basis or when a data base change is indicated.

c) Static data is similar to variable data but has a lower update requirement. The data may only need updating when a change is indicated or to verify a previous change made to a parameter.

d) String data contains tag names, units, and messages.

A.4.1 Dynamic Loop Integer Data

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#PI	R	Process (%)	-3.3 to 103.3 ($0-$0FFF)	40201+10(#-1)	n/1
L#SI	R/W	Setpoint (%)	-3.3 to 103.3 ($0-$0FFF)	40202+10(#-1)	n+1/1
L#VI	R/W	Valve (%)	-3.3 to 103.3 ($0-$0FFF)	40203+10(#-1)	n+2/1
L#XI	R	X Variable (%)	-3.3 to 103.3 ($0-$0FFF)	40204+10(#-1)	n+3/24
L#YI	R	Y Variable (%)	-3.3 to 103.3 ($0-$0FFF)	40205+10(#-1)	n+4/24
L#RI	R/W	Ratio	0.00 to 38.40($80-$0F80)	40206+10(#-1)	n/7
L#BI	R/W	Bias	100-0-100 ($80-$0F80)	40207+10(#-1)	n/8
L#TLmI	R	Totalizer - 3 ms (whole) digits	0-999 ($0000-$03E7)	40208+10(#-1)	n+2/2
L#TLlI	R	Totalizer - 3 ls (whole) digits	0-999 ($0000-$03E7)	40209+10(#-1)	n+2/3
CLS	R/W	Control Loop Status	(see CLS)	(see coils)	n+3/1
ASW	R/W	Alarm Status Word	(see ASW)	(see coils)	n+4/1
L#PCSW	R	PCOM Block Status Word *(V1.3)*	1-7 ($0001-$0007)	40210+10(#-1)	z+2/1

Sequencer [ODS]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#SSNI	R	Sequencer Step No.	0-250 ($0000-$00FA)	40201+10(#-1)	n/1
L#SNSI	R	Sequencer Number of Steps	0-250 ($0000-$00FA)	40202+10(#-1)	n/4
L#SNGI	R	Sequencer Number of Groups	0-16 ($0000-$0010)	40203+10(#-1)	n/5
L#SLS	R/W	Sequencer Loop Status	(see SLS)	(see coils)	n+5/1
L#SNRI	R	Sequencer Number of Recipes	0-9 ($0000-$0009)	40204+10(#-1)	n/11
L#CRNI	R/W	Current Recipe Number	0-9 ($0000-$0009)	40205+10(#-1)	n+3/1
L#PCSW	R	PCOM Block Status Word *(V1.3)*	1-7 ($0001-$0007)	40206+10(#-1)	z+2/1
L#TACM	R	Total Active Conditional Msgs *(V1.3)*	0-64 $0000-$0040)	40207+10(#-1)	n/43
		(spare)	0 ($0000)	40208+10(#-1)	
…..	…..	…..	…..	…..	…..
		(spare)	0 ($0000)	40210+10(#-1)	

Analog Indicator [ODA] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#P1I	R	Process 1 (%)	-3.3 to 103.3 ($0-$0FFF)	40201+10(#-1)	n/1
L#P2I	R	Process 2 (%)	-3.3 to 103.3 ($0-$0FFF)	40202+10(#-1)	n+1/1
L#P3I	R	Process 3 (%)	-3.3 to 103.3 ($0-$0FFF)	40203+10(#-1)	n+2/1
L#P4I	R	Process 4 (%)	-3.3 to 103.3 ($0-$0FFF)	40204+10(#-1)	n+3/1
L#SW1	R/W	Status Word 1	(see SW1)	(see coils)	n+4/1
L#SW2	R/W	Status Word 2	(see SW1)	(see coils)	n+5/1

Discrete Indicator [ODD] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#DISW	R/W	Discrete Input Status Word	(see L#DISW)	(see coils)	n/1
L#DSSW	R/W	Discrete State Status Word	(see L#DSSW)	(see coils)	n+1/1
L#DOSW	R/W	Discrete Output Status Word	(see L#DOSW)	(see coils)	n+2/1
L#SW	R/W	Status Word	(see L#SW)	(see coils)	n+3/1

Discrete Indicator [ODP] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#SW1	R/W	Status Word 1	(see L#SW1)	(see coils)	n/1
L#SW2	R/W	Status Word 2	(see L#SW2)	(see coils)	n+1/1

A.4.2 Variable Loop Integer Data

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TSPI	R/W	Target Setpoint (%)	-3.3 to 103.3 ($0-$0FFF)	40451+30(#-1)	n+1/2
L#HLI	R/W	Setpoint High Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40452+30(#-1)	n+1/4
L#LLI	R/W	Setpoint Low Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40453+30(#-1)	n+1/5
L#RTI	R/W	Setpoint Ramp Time (min)	0-3840($0080-$0F80)	40454+30(#-1)	n+1/3
L#RRI	R/W	Setpoint Ramp Rate (%/min)	-3.3 to 103.3 ($0-$0FFF)	40455+30(#-1)	n+1/6
L#A1LI	R/W	Alarm 1 Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40456+30(#-1)	n+4/2
L#A2LI	R/W	Alarm 2 Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40457+30(#-1)	n+4/3
L#A3LI	R/W	Alarm 3 Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40458+30(#-1)	n+4/4
L#A4LI	R/W	Alarm 4 Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40459+30(#-1)	n+4/5
L#T1mI	R/W	Tot. Preset 1 - 3 ms whole digits	0-999 ($0000-$03E7)	40460+30(#-1)	n+2/4
L#T1lI	R/W	Tot. Preset 1 - 3 ls whole digits	0-999 ($0000-$03E7)	40461+30(#-1)	n+2/5
L#T2mI	R/W	Tot. Preset 2 - 3 ms whole digits	0-999 ($0000-$03E7)	404621+30(#-1)	n+2/6
L#T2lI	R/W	Tot. Preset 2 - 3 ls whole digits	0-999 ($0000-$03E7)	40463+30(#-1)	n+2/7
L#A1TW	R/W	Alarm 1 Type Word	(bit mapped - see ATW)	n/a	n+4/6
L#A2TW	R/W	Alarm 2 Type Word	(bit mapped - see ATW)	n/a	n+4/7
L#A3TW	R/W	Alarm 3 Type Word	(bit mapped - see ATW)	n/a	n+4/8
L#A4TW	R/W	Alarm 4 Type Word	(bit mapped - see ATW)	n/a	n+4/9
L#A1TI	R/W	Alarm 1 Type	0-6 ($0000-$0006)	40464+30(#-1)	n+4/37
L#A2TI	R/W	Alarm 2 Type	0-6 ($0000-$0006)	40465+30(#-1)	n+4/38
L#A3TI	R/W	Alarm 3 Type	0-6 ($0000-$0006)	40466+30(#-1)	n+4/39
L#A4TI	R/W	Alarm 4 Type	0-6 ($0000-$0006)	40467+30(#-1)	n+4/40
L#A1PI	R/W	Alarm 1 Priority	1-5 ($0000-$0005)	40468+30(#-1)	n+4/41
L#A2PI	R/W	Alarm 2 Priority	1-5 ($0000-$0005)	40469+30(#-1)	n+4/42
L#A3PI	R/W	Alarm 3 Priority	1-5 ($0000-$0005)	40470+30(#-1)	n+4/43
L#A4PI	R/W	Alarm 4 Priority	1-5 ($0000-$0005)	40471+30(#-1)	n+4/44
L#CAI	R/W	Controller Action	1-DIR, 0-REV	40472+30(#-1)	n+1/7
		(spare)	0 ($0000)	40473+30(#-1)	
…..	…..	…..	…..	…..	…..
		(spare)	0 ($0000)	40480+30(#-1)	

Sequencer [ODS] - (MASK Configurations)

Code	*R/W*	*Description*	*Range*	*Register (MB)*	*C/P (LIL)*
L#S001G0I	*R/W*	*Step 1 Group 0 Input Mask*	*$0000-$FFFF*	*40451+30(#-1)*	*1/154*
L#S001G0O	*R/W*	*Step 1 Group 0 Output Mask*	*$0000-$FFFF*	*40452+30(#-1)*	*1/170*
L#S001G1I	*R/W*	*Step 1 Group 1 Input Mask*	*$0000-$FFFF*	*40453+30(#-1)*	*1/155*
L#S001G1O	*R/W*	*Step 1 Group 1 Output Mask*	*$0000-$FFFF*	*40454+30(#-1)*	*1/171*
L#S001G2I	*R/W*	*Step 1 Group 2 Input Mask*	*$0000-$FFFF*	*40455+30(#-1)*	*1/156*
L#S001G2O	*R/W*	*Step 1 Group 2 Output Mask*	*$0000-$FFFF*	*40456+30(#-1)*	*1/172*
L#S002G0I	*R/W*	*Step 2 Group 0 Input Mask*	*$0000-$FFFF*	*40457+30(#-1)*	*2/154*
L#S002G0O	*R/W*	*Step 2 Group 0 Output Mask*	*$0000-$FFFF*	*40458+30(#-1)*	*2/170*
…..	…..	…..	…..	…..	…..
L#S005G0O	*R/W*	*Step 5 Group 0 Output Mask*	*$0000-$FFFF*	*40476+30(#-1)*	*5/170*
L#S005G1I	*R/W*	*Step 5 Group 1 Input Mask*	*$0000-$FFFF*	*40477+30(#-1)*	*5/155*
L#S005G1O	*R/W*	*Step 5 Group 1 Output Mask*	*$0000-$FFFF*	*40478+30(#-1)*	*5/171*
L#S005G2I	*R/W*	*Step 5 Group 2 Input Mask*	*$0000-$FFFF*	*40479+30(#-1)*	*5/156*
L#S005G2O	*R/W*	*Step 5 Group 2 Output Mask*	*$0000-$FFFF*	*40480+30(#-1)*	*5/172*

Analog Indicator [ODA] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#P1ALI	R/W	Process 1 Alarm A Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40451+30(#-1)	n+1/13
L#P1BLI	R/W	Process 1 Alarm B Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40452+30(#-1)	n+1/14
L#P2ALI	R/W	Process 2 Alarm A Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40453+30(#-1)	n+1/15
L#P2BLI	R/W	Process 2 Alarm B Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40454+30(#-1)	n+1/16
L#P3ALI	R/W	Process 3 Alarm A Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40455+30(#-1)	n+1/17
L#P3BLI	R/W	Process 3 Alarm B Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40456+30(#-1)	n+1/18
L#P4ALI	R/W	Process 4 Alarm A Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40457+30(#-1)	n+1/19
L#P4BLI	R/W	Process 4 Alarm B Limit (%)	-3.3 to 103.3 ($0-$0FFF)	40458+30(#-1)	n+1/20
L#P1ATI	R/W	Process 1 Alarm A Type	0-3 ($0000-$0006)	40459+30(#-1)	n+2/13
L#P1BTI	R/W	Process 1 Alarm B Type	0-3 ($0000-$0006)	40460+30(#-1)	n+2/14
L#P2ATI	R/W	Process 2 Alarm A Type	0-3 ($0000-$0006)	40461+30(#-1)	n+2/15
L#P2BTI	R/W	Process 2 Alarm B Type	0-3 ($0000-$0006)	40462+30(#-1)	n+2/16
L#P3ATI	R/W	Process 3 Alarm A Type	0-3 ($0000-$0006)	40463+30(#-1)	n+2/17
L#P3BTI	R/W	Process 3 Alarm B Type	0-3 ($0000-$0006)	40464+30(#-1)	n+2/18
L#P4ATI	R/W	Process 4 Alarm A Type	0-3 ($0000-$0006)	40465+30(#-1)	n+2/19
L#P4BTI	R/W	Process 4 Alarm B Type	0-3 ($0000-$0006)	40466+30(#-1)	n+2/20
L#P1API	R/W	Process 1 Alarm A Priority	1-5 ($0000-$0005)	40467+30(#-1)	n+3/13
L#P1BPI	R/W	Process 1 Alarm B Priority	1-5 ($0000-$0005)	40468+30(#-1)	n+3/14
L#P2API	R/W	Process 2 Alarm A Priority	1-5 ($0000-$0005)	40469+30(#-1)	n+3/15
L#P2BPI	R/W	Process 2 Alarm B Priority	1-5 ($0000-$0005)	40470+30(#-1)	n+3/16
L#P3API	R/W	Process 3 Alarm A Priority	1-5 ($0000-$0005)	40471+30(#-1)	n+3/17
L#P3BPI	R/W	Process 3 Alarm B Priority	1-5 ($0000-$0005)	40472+30(#-1)	n+3/18
L#P4API	R/W	Process 4 Alarm A Priority	1-5 ($0000-$0005)	40473+30(#-1)	n+3/19
L#P4BPI	R/W	Process 4 Alarm B Priority	1-5 ($0000-$0005)	40474+30(#-1)	n+3/20
…..	…..	…..	…..	…..	…..
		(spare)	0 ($0000)	40480+30(#-1)	

Discrete Indicator [ODD] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a					

Discrete Indicator [ODP] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a				****	

**** Registers (40451-40480) are reserved for ASCII Tags when the ODP display has been selected in configuration.

A.4.3 Static Loop Integer Data

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#PGI	R/W	Proportional Gain	-9.99 to -0.01 ($1419-$17FF) 0.01 to 9.99 ($1801$1BE7) -100.0 to -10.0 ($2418-$279C) 10.0 to 100.0 ($2864-$2BE8)	41201+30(#-1)	n/2
L#TII	R/W	Integral Time (min)	0.01 to 9.99 ($2081-$2467) 10.0 to 99.9 ($10E4-$1467) 100 to 3967 ($30E4-$3FFF)	41202+30(#-1)	n/3
L#TDI	R/W	Derivative Time (min)	0.00 to 9.99 ($2080-$2467) 10.0 to 100.0 ($10E4-$1468)	41203+30(#-1)	n/4
L#DGI	R/W	Derivative Gain	1.00 to 39.67 ($20E4--$2FFF)	41204+30(#-1)	n/5
L#MRI	R/W	Manual Reset (%)	0.0 to 100.0 ($0080-$0F80)	41205+30(#-1)	n/6
L#RHI	R	Range High	-1 to -32768 ($FFFF-$8000) 0 to 32767 ($0000-$7FFF)	41206+30(#-1)	n+3/10
L#RLI	R	Range Low	-1 to -32768 ($FFFF-$8000) 0 to 32767 ($0000-$7FFF)	41207+30(#-1)	n+3/11
L#DPPI	R	Decimal Point Position	0 to 5 ($0000-$0005)	41208+30(#-1)	n+3/12
L#PDPPI	R	Process DPP	0 to 5 ($0000-$0005)	41209+30(#-1)	n/34
L#VDPPI	R	Valve DPP	0 to 5 ($0000-$0005)	41210+30(#-1)	n+2/34
L#XDPPI	R	Variable X DPP	0 to 5 ($0000-$0005)	41211+30(#-1)	n+3/34
L#YDPPI	R	Variable Y DPP	0 to 5 ($0000-$0005)	41212+30(#-1)	n+4/34
		(spare)	0 ($0000)	41213+30(#-1)	
…..	…..	…..	…..	…..	…..
		(spare)	0 ($0000)	41230+30(#-1)	

Sequencer [ODS] - (MASK Configurations*)*

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#S006G0I	R/W	Step 6 Group 0 Input Mask	$0000-$FFFF	41201+30(#-1)	6/154
L#S006G0O	R/W	Step 6 Group 0 Output Mask	$0000-$FFFF	41202+30(#-1)	6/170
L#S006G1I	R/W	Step 6 Group 1 Input Mask	$0000-$FFFF	41203+30(#-1)	6/155
L#S006G1O	R/W	Step 6 Group 1 Output Mask	$0000-$FFFF	41204+30(#-1)	6/171
L#S006G2I	R/W	Step 6 Group 2 Input Mask	$0000-$FFFF	41205+30(#-1)	6/156
L#S006G2O	R/W	Step 6 Group 2 Output Mask	$0000-$FFFF	41206+30(#-1)	6/172
L#S007G0I	R/W	Step 7 Group 0 Input Mask	$0000-$FFFF	41207+30(#-1)	7/154
L#S007G0O	R/W	Step 7 Group 0 Output Mask	$0000-$FFFF	41208+30(#-1)	7/170
…..	…..	…..	…..	…..	…..
L#S009G2I	R/W	Step 9 Group 2 Input Mask	$0000-$FFFF	41223+30(#-1)	9/156
L#S009G2O	R/W	Step 9 Group 2 Output Mask	$0000-$FFFF	41224+30(#-1)	9/172
L#S010G0I	R/W	Step 10 Group 0 Input Mask	$0000-$FFFF	41225+30(#-1)	10/154
L#S010G0O	R/W	Step 10 Group 0 Output Mask	$0000-$FFFF	41226+30(#-1)	10/170
L#S010G1I	R/W	Step 10 Group 1 Input Mask	$0000-$FFFF	41227+30(#-1)	10/155
L#S010G1O	R/W	Step 10 Group 1 Output Mask	$0000-$FFFF	41228+30(#-1)	10/171
L#S010G2I	R/W	Step 10 Group 2 Input Mask	$0000-$FFFF	41229+30(#-1)	10/156
L#S010G2O	R/W	Step 10 Group 2 Output Mask	$0000-$FFFF	41230+30(#-1)	10/172

Analog, Discrete, & Pushbutton Indicators [ODA] ODD] [ODP]- (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a				****	

**** Registers (40451-40480) are reserved for ASCII Tags when the ODP display has been selected in configuration

A.4.4 Dynamic Loop Floating Point Data (32-bit IEEE*)*

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#PF	R	Process	Real	41951+20(#-1)	n/9-10
L#SF	R/W	Setpoint	Real	41953+20(#-1)	n+1/9-10
L#VF	R/W	Valve	Real	41955+20(#-1)	n+2/9-10
L#XF	R	X Variable	Real	41957+20(#-1)	n+3/25-26
L#YF	R	Y Variable	Real	41959+20(#-1)	n+4/25-26
L#RF	R/W	Ratio	Real	41961+20(#-1)	n/23-24
L#BF	R/W	Bias	Real	41963+20(#-1)	n/25-26
L#TLF	R	Totalizer	Real	41965+20(#-1)	n+3/13-14
		(spare)	($00000000)	41967+20(#-1)	
		(spare)	($00000000)	41969+20(#-1)	

Sequencer [ODS]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#SSNF	R/W	Sequencer Step No.*	Real	41951+20(#-1)	n/2-3
L#SAOF	R	Sequencer Analog Output	Real	41953+20(#-1)	n+1/2-3
L#SAOmF	R	Step Analog Out (most sig. word)#	Real	n/a	n+1/1
L#SAOlF	R	Step Analog Out (least sig. word)#	Real	n/a	n+2/1
L#SAEPF	R	Step Analog End Point	Real	41955+20(#-1)	n+1/4-5
L#SRTF	R/W	Step Remaining Time*	Real	41957+20(#-1)	n+3/2-3
L#SSTF	R	Sequencer Step Time	Real	41959+20(#-1)	n+3/4-5
L#SNSF	R	Sequencer Number of Steps	Real	41961+20(#-1)	n/6-7
L#SNGF	R	Sequencer Number of Groups	Real	41963+20(#-1)	n/8-9
L#SNRF	R	Sequencer Number of Recipes	Real	41965+20(#-1)	n+1/7-8
L#CRNF	R/W	Current Recipe Number @	Real	41967+20(#-1)	n+1/9-10
		(spare)	0($00000000)	41969+20(#-1)	

Analog Indicator [ODA] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#P1F	R	Process 1	Real	41951+20(#-1)	n/2-3
L#P2F	R	Process 2	Real	41953+20(#-1)	n+1/2-3
L#P3F	R	Process 3	Real	41955+20(#-1)	n+2/2-3
L#P4F	R	Process 4	Real	41957+20(#-1)	n+3/2-3
		(spare)	0($00000000)	41959/69+20(#-1)	

Discrete Indicator [ODD] & [ODP]- (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a					

* A Write command will force the Step or Remaining Time to the write value.

@ The current recipe can be changed if the Sequencer is in the HOLD mode.

A.4.5 Variable Loop Floating Point Data (32-bit IEEE)

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TSPF	R/W	Target Setpoint	Real	42451+60(#-1)	n+1/13-14
L#HLF	R/W	Setpoint High Limit	Real	42453+60(#-1)	n+1/17-18
L#LLF	R/W	Setpoint Low Limit	Real	42455+60(#-1)	n+1/19-20
L#RTF	R/W	Setpoint Ramp Time (min)	Real	42457+60(#-1)	n+1/15-16
L#RRF	R/W	Setpoint Ramp Rate (units/min)	Real	42459+60(#-1)	n+1/21-22
L#A1LF	R/W	Alarm 1 Limit	Real	42461+60(#-1)	n+4/13-14
L#A2LF	R/W	Alarm 2 Limit	Real	42463+60(#-1)	n+4/15-16
L#A3LF	R/W	Alarm 3 Limit	Real	42465+60(#-1)	n+4/17-18
L#A4LF	R/W	Alarm 4 Limit	Real	42467+60(#-1)	n+4/19-20
L#T1F	R/W	Totalizer Preset 1	Real	42469+60(#-1)	n+3/15-16
L#T2F	R/W	Totalizer Preset 2	Real	42471+60(#-1)	n+3/17-18
L#Q1F	R/W	Quickset Hold 1	Real	42473+60(#-1)	n+1/41-42
L#Q2F	R/W	Quickset Hold 2	Real	42475+60(#-1)	n+2/41-42
L#BHLF	R/W	Batch Switch High Limit	Real	42477+60(#-1)	n+1/35-36
L#BLLF	R/W	Batch Switch Low Limit	Real	42479+60(#-1)	n+2/35-36
L#BPLF	R/W	Batch Switch Pre-Load	Real	42481+60(#-1)	n+3/35-36
L#BGF	R/W	Batch Switch Gain	Real	42483+60(#-1)	n+4/35-36
		(spares)	($00000000)	42485-42509+60(#-1)	

Sequencer (Timers - Running Values) [ODS]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)*
L#DYT01ET	R	DYT01 Elapsed Time	Real	42451+60(#-1)	n/61-62
L#DYT01RT	R/W	DYT01 Remaining Time	Real	42453+60(#-1)	n/63-64
L#OST01ET	R	OST01 Elapsed Time	Real	42455+60(#-1)	n+1/61-62
L#OST01RT	R/W	OST01 Remaining Time	Real	42457+60(#-1)	n+1/63-64
L#RCT01ET	R	RCT01 Elapsed Time	Real	42459+60(#-1)	n+2/61-62
L#RCT01RT	R/W	RCT01 Remaining Time	Real	42461+60(#-1)	n+2/63-64
L#ROT01ET	R	ROT01 Elapsed Time	Real	42463+60(#-1)	n+3/61-62
L#ROT01RT	R/W	ROT01 Remaining Time	Real	42465+60(#-1)	n+3/63-64
L#DYT02ET	R	DYT02 Elapsed Time	Real	42467+60(#-1)	n/65-66
L#DYT02RT	R/W	DYT02 Remaining Time	Real	42469+60(#-1)	n/67-68
L#OST02ET	R	OST02 Elapsed Time	Real	42471+60(#-1)	n+1/65-66
L#OST02RT	R/W	OST02 Remaining Time	Real	42473+60(#-1)	n+1/67-68
L#RCT02ET	R	RCT02 Elapsed Time	Real	42475+60(#-1)	n+2/65-66
L#RCT02RT	R/W	RCT02 Remaining Time	Real	42477+60(#-1)	n+2/67-68
L#ROT02ET	R	ROT02 Elapsed Time	Real	42479+60(#-1)	n+3/65-66
L#ROT02RT	R/W	ROT02 Remaining Time	Real	42481+60(#-1)	n+3/67-68
L#DYT03ET	R	DYT03 Elapsed Time	Real	42483+60(#-1)	n/69-70
L#DYT03RT	R/W	DYT03 Remaining Time	Real	42485+60(#-1)	n/71-72
L#OST03ET	R	OST03 Elapsed Time	Real	42487+60(#-1)	n+1/69-70
L#OST03RT	R/W	OST03 Remaining Time	Real	42489+60(#-1)	n+1/71-72
L#RCT03ET	R	RCT03 Elapsed Time	Real	42491+60(#-1)	n+2/69-70
L#RCT03RT	R/W	RCT03 Remaining Time	Real	42493+60(#-1)	n+2/71-72
L#ROT03ET	R	ROT03 Elapsed Time	Real	42495+60(#-1)	n+3/69-70
L#ROT03RT	R/W	ROT03 Remaining Time	Real	42497+60(#-1)	n+3/71-72
		(spares)		42499-42509+60(#-1)	

* In addition to the timers listed here the LIL will map 1 through 21 (see LIL overview for exact locations).

Analog Indicator [ODA]- (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#P1ALF	R/W	Process 1 Alarm A Limit	Real	42451+60(#-1)	n/13-14
L#P1BLF	R/W	Process 1 Alarm B Limit	Real	42453+60(#-1)	n/15-16
L#P2ALF	R/W	Process 2 Alarm A Limit	Real	42455+60(#-1)	n/17-18
L#P2BLF	R/W	Process 2 Alarm B Limit	Real	42457+60(#-1)	n/19-20
L#P3ALF	R/W	Process 3 Alarm A Limit	Real	42459+60(#-1)	n/21-22
L#P3BLF	R/W	Process 3 Alarm B Limit	Real	42461+60(#-1)	n/23-24
L#P4ALF	R/W	Process 4 Alarm A Limit	Real	42463+60(#-1)	n/25-26
L#P4BLF	R/W	Process 4 Alarm B Limit	Real	42465+60(#-1)	n/27-28
L#Q1F	R/W	Quickset Hold 1	Real	42467+60(#-1)	n+1/29-30
L#Q2F	R/W	Quickset Hold 2	Real	42469+60(#-1)	n+2/29-30
L#Q3F	R/W	Quickset Hold 3	Real	42471+60(#-1)	n+3/29-30
L#Q4F	R/W	Quickset Hold 4	Real	42473+60(#-1)	n+4/29-30
		(spares)	($00000000)	42475-42509+60(#-1)	

Discrete Indicator [ODD] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a					

Pushbutton/Switch Indicator [ODP] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a				****	

**** Registers (40451-40480) are reserved for ASCII Tags when the ODP display has been selected in configuration.

A.4.6 Static Loop Floating Point Data (32-bit IEEE*)*

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#PGF	R/W	Proportional Gain	0.001 - 100.0	43951+60(#-1)	n/13-14
L# TIF	R/W	Integral Time	0.001 - 4000.0 min	43953+60(#-1)	n/15-16
L#TDF	R/W	Derivative Time	0.00 - 100.00 min	43955+60(#-1)	n/17-18
L#MRF	R/W	Manual Reset	0.00 - 100.00	43957+60(#-1)	n/21-22
L#ADF	R/W	Autotune Deviation	auto(0), 2.5-25%	43959+60(#-1)	n/37-38
L#AHF	R/W	Autotune Hysteresis	auto(0), 0.5 - 10.0%	43961+60(#-1)	n/39-40
L#ASF	R/W	Autotune Step (initial)	5 - 40%	43963+60(#-1)	n/41-42
L#APGF	R	Autotune Proportional Gain	0.001 - 1000.0	43965+60(#-1)	n/43-44
L#ATIF	R	Autotune Integral Time	0.001 - 4000.0 min	43967+60(#-1)	n/45-46
L#ATDF	R	Autotune Derivative Time	0.00 - 100.00 min	3969+60(#-1)	n/47-48
L#HDF	R/W	On-Off Controller HI Deviation	Real	43971+60(#-1)	n/11-12
L#LDF	R/W	On-Off Controller LO Deviation	Real	43973+60(#-1)	n+1/11-12
L#DBF	R/W	On-Off Controller DEADBAND	Real	43975+60(#-1)	n+2/11-12
L#PMNF	R/W	Process MIN SCALE	Real	43977+60(#-1)	n/27-28
L#PMXF	R/W	Process MAX SCALE	Real	43979+60(#-1)	n/29-30
L#VMNF	R/W	Valve MIN SCALE	Real	43981+60(#-1)	n+2/27-28
L#VMXF	R/W	ValveMAX SCALE	Real	43983+60(#-1)	n+2/29-30
L#XMNF	R/W	X Variable MIN SCALE	Real	43985+60(#-1)	n+3/27-28
L#XMXF	R/W	X Variable MAX SCALE	Real	43987+60(#-1)	n+3/29-30
L#YMNF	R/W	Y Variable MIN SCALE	Real	43989+60(#-1)	n+4/27-28
L#YMXF	R/W	Y Variable MAX SCALE	Real	43991+60(#-1)	n+4/29-30
L#Q1MNF	R/W	Quickset 1 MIN SCALE	Real	43993+60(#-1)	n+1/43-44
L#Q1MXF	R/W	Quickset 1 MAX SCALE	Real	43995+60(#-1)	n+1/45-46
L#Q2MNF	R/W	Quickset 2 MIN SCALE	Real	43997+60(#-1)	n+2/43-44
L#Q2MXF	R/W	Quickset 2 MAX SCALE	Real	44009+60(#-1)	n+2/45-46
L#DGF	R/W	Derivative Gain	1.00 - 30.00	44001+60(#-1)	n/19-20
		(spares)	($00000000)	44003-44009+60(#-1)	

Sequencer [ODS]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#S001TIM	R/W	Step 1 Time Period (min)	Real	43951+60(#-1)	1/150-151
L#S001AEP	R/W	Step 1 Analog End Point	Real	43953+60(#-1)	1/152-153
L#S002TIM	R/W	Step 2 Time Period (min)	Real	43955+60(#-1)	2/150-151
L#S002AEP	R/W	Step 2 Analog End Point	Real	43957+60(#-1)	2/152-153
L#S003TIM	R/W	Step 3 Time Period (min)	Real	43959+60(#-1)	3/150-151
L#S003AEP	R/W	Step 3 Analog End Point	Real	43961+60(#-1)	3/152-153
L#S004TIM	R/W	Step 4 Time Period (min)	Real	43963+60(#-1)	4/150-151
L#S004AEP	R/W	Step 4 Analog End Point	Real	43965+60(#-1)	4/152-153
L#S005TIM	R/W	Step 5 Time Period (min)	Real	43967+60(#-1)	5/150-151
L#S005AEP	R/W	Step 5 Analog End Point	Real	43969+60(#-1)	5/152-153
L#S006TIM	R/W	Step 6 Time Period (min)	Real	43971+60(#-1)	6/150-151
L#S006AEP	R/W	Step 6 Analog End Point	Real	43973+60(#-1)	6/152-153
L#S007TIM	R/W	Step 7 Time Period (min)	Real	43975+60(#-1)	7/150-151
L#S007AEP	R/W	Step 7 Analog End Point	Real	43977+60(#-1)	7/152-153
L#S008TIM	R/W	Step 8 Time Period (min)	Real	43979+60(#-1)	8/150-151
L#S008AEP	R/W	Step 8 Analog End Point	Real	43981+60(#-1)	8/152-153
L#S009TIM	R/W	Step 9 Time Period (min)	Real	43983+60(#-1)	9/150-151
L#S009AEP	R/W	Step 9 Analog End Point	Real	43985+60(#-1)	9/152-153
L#S010TIM	R/W	Step 10 Time Period (min)	Real	43987+60(#-1)	10/150-151
L#S010AEP	R/W	Step 10 Analog End Point	Real	43989+60(#-1)	10/152-153
		(spares)		44991-44009+60(#-1)	

Controller [ODA] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#Q1MNF	R/W	Quickset 1 MIN SCALE	Real	43951+60(#-1)	n+1/31-32
L#Q1MXF	R/W	Quickset 1 MAX SCALE	Real	43953+60(#-1)	n+1/33-34
L#Q2MNF	R/W	Quickset 2 MIN SCALE	Real	43955+60(#-1)	n+2/31-32
L#Q2MXF	R/W	Quickset 2 MAX SCALE	Real	43957+60(#-1)	n+2/33-34
L#Q3MNF	R/W	Quickset 3 MIN SCALE	Real	43959+60(#-1)	n+3/31-32
L#Q3MXF	R/W	Quickset 3 MAX SCALE	Real	43961+60(#-1)	n+3/33-34
L#Q4MNF	R/W	Quickset 4 MIN SCALE	Real	43963+60(#-1)	n+4/31-32
L#Q4MXF	R/W	Quickset 4 MAX SCALE	Real	43965+60(#-1)	n+4/33-34
L#P1MNF	R	Process 1 MIN SCALE	Real	43967+60(#-1)	n+4/13-14
L#P1MXF	R	Process 1 MAX SCALE	Real	43969+60(#-1)	n+5/13-14
L#P2MNF	R	Process 2 MIN SCALE	Real	43971+60(#-1)	n+4/15-16
L#P2MXF	R	Process 2 MAX SCALE	Real	43973+60(#-1)	n+5/15-16
L#P3MNF	R	Process 3 MIN SCALE	Real	43975+60(#-1)	n+4/17-18
L#P3MXF	R	Process 3 MAX SCALE	Real	43977+60(#-1)	n+5/17-18
L#P4MNF	R	Process 4 MIN SCALE	Real	43979+60(#-1)	n+4/19-20
L#P4MXF	R	Process 4 MAX SCALE	Real	43981+60(#-1)	n+5/19-20
	(spares)		($00000000)	43983-44009+60(#-1)	

Discrete Indicator [ODD] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a					

Pushbutton/Switch Indicator [ODP] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
n/a					

A.4.7 String Loop Data (8-bit ASCII Char - 2/Word*)*

Controller [ODC]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TAG	R	Loop Tag	12 ASCII Char	45451+100(#-1)	n+3/2-7
L#PUR	R/W	Process Units - Reduced	4 ASCII Char	45457+100(#-1)	n+3/8-9
L#PU	R/W	Process Units	6 ASCII Char	45459+100(#-1)	n/31-33
L#VU	R/W	Valve Units	6 ASCII Char	45462+100(#-1)	n+2/31-33
L#XU	R/W	X Variable Units	6 ASCII Char	45465+100(#-1)	n+3/31-33
L#YU	R/W	Y Variable Units	6 ASCII Char	45468+100(#-1)	n+4/31-33
L#TLU	R/W	Totalizer Units	6 ASCII Char	45471+100(#-1)	n+3/19-21
L#Q1N	R	Quickset Hold 1 Name	8 ASCII Char	45474+100(#-1)	n+1/37-40
L#Q1U	R/W	Quickset Hold 1 Units	6 ASCII Char	45478+100(#-1)	n+3/37-39
L#Q2N	R	Quickset Hold 2 Name	8 ASCII Char	45481+100(#-1)	n+2/37-40
L#Q2U	R/W	Quickset Hold 2 Units	6 ASCII Char	45485+100(#-1)	n+3/40-42
L#LHM	R/W	Left Horizontal Bar Message	5 ASCII Char	45488+100(#-1)	n+2/13-15
L#RHM	R/W	Right Horizontal Bar Message	5 ASCII Char	45491+100(#-1)	n+2/16-18
		(spares)	($0000)	45492-45550+100(#-1)	

Sequencer [ODS]

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TAG	R	Loop Tag *(V2.2)***	12 ASCII Char	45451+100(#-1)	n/37-42
L#PMSG	R	Primary Message *(V1.3)*	8 ASCII Char	45457+100(#-1)	n+1/37-41
L#SMSG	R	Secondary Message *(V1.3)*	12 ASCII Char	45461+100(#-1)	n+2/37-42
L#CMSGa	R	Conditional Message a * *(V1.3)*	16 ASCII Char	45467+100(#-1)	n+3/37-44
L#CMSGb	R	Conditional Message b * *(V1.3)*	16 ASCII Char	45475+100(#-1)	n+4/37-44
L#CMSGc	R	Conditional Message c * *(V1.3)*	16 ASCII Char	45483+100(#-1)	n+5/37-44
L#CMSGd	R	Conditional Message d * *(V1.3)*	16 ASCII Char	45491+100(#-1)	n/49-56
L#CMSGe	R	Conditional Message e * *(V1.3)*	16 ASCII Char	45499+100(#-1)	n+1/49-56
L#CMSGf	R	Conditional Message f * *(V1.3)*	16 ASCII Char	45507+100(#-1)	n+2/49-56
L#CMSGg	R	Conditional Message g * *(V1.3)*	16 ASCII Char	45515+100(#-1)	n+3/49-56
L#CMSGh	R	Conditional Message h * *(V1.3)*	16 ASCII Char	45523+100(#-1)	n+4/49-56
L#CMSGi	R	Conditional Message i * *(V1.3)*	16 ASCII Char	45531+100(#-1)	n+5/49-
56L#RMSG	R	Recipe Message *(V2.2)***	12 ASCII Char	45539+100(#-1)	n/25-30
		(spares)	($0000)	45532-45550+100(#-1)	

* Conditional messages are stacked in the order of occurrence. The 9 most recent active conditional messages can be viewed over LIL or Modbus.

** Version 1.3 included the Recipe Message at 45451.. Version 2.2 moved the Recipe Message to a new location and placed the Loop Tag in place of the Recipe Message

Analog Indicator [ODA] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TAG	R	Loop Tag	12 ASCII Char	45451+100(#-1)	n+4/2-7
L#P1T	R	Process 1 Tag	6 ASCII Char	45457+100(#-1)	n/4-6
L#P1U	R/W	Process 1 Units	6 ASCII Char	45460+100(#-1)	n/7-9
L#P2T	R	Process 2 Tag	6 ASCII Char	45463+100(#-1)	n+1/4-6
L#P2U	R/W	Process 2 Units	6 ASCII Char	45466+100(#-1)	n+1/7-9
L#P3T	R	Process 3 Tag	6 ASCII Char	45469+100(#-1)	n+2/4-6
L#P3U	R/W	Process 3 Units	6 ASCII Char	45472+100(#-1)	n+2/7-9
L#P4T	R	Process 4 Tag	6 ASCII Char	45475+100(#-1)	n+3/4-6
L#P4U	R/W	Process 4 Units	6 ASCII Char	45478+100(#-1)	n+3/7-9
L#Q1N	R	Quickset Hold 1 Name	8 ASCII Char	45481+100(#-1)	n+1/25-28
L#Q1U	R/W	Quickset Hold 1 Units	6 ASCII Char	45485+100(#-1)	n+1/22-24
L#Q2N	R	Quickset Hold 2 Name	8 ASCII Char	45488+100(#-1)	n+2/25-28
L#Q2U	R/W	Quickset Hold 2 Units	6 ASCII Char	45492+100(#-1)	n+2/22-24
L#Q3N	R	Quickset Hold 3 Name	8 ASCII Char	45495+100(#-1)	n+3/25-28
L#Q3U	R/W	Quickset Hold 3 Units	6 ASCII Char	45499+100(#-1)	n+3/22-24

L#Q4N	R	Quickset Hold 4 Name	8 ASCII Char	45502+100(#-1)	n+4/25-28
L#Q4U	R/W	Quickset Hold 4 Units	6 ASCII Char	45506+100(#-1)	n+4/22-24
		(spares)	($0000)	45509-45550+100(#-1)	

Discrete Indicator [ODD] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TAG	R	Loop Tag	12 ASCII Char	45451+100(#-1)	n+3/2-7
L#I0T	R	Input 0 Tag	6 ASCII Char	45457+100(#-1)	n/2-4
L#I1T	R	Input 1 Tag	6 ASCII Char	45460+100(#-1)	n+1/2-4
L#I2T	R	Input 2 Tag	6 ASCII Char	45463+100(#-1)	n+2/2-4
L#I3T	R	Input 3 Tag	6 ASCII Char	45466+100(#-1)	n/5-7
L#I4T	R	Input 4Tag	6 ASCII Char	45469+100(#-1)	n+1/5-7
L#I5T	R	Input 5 Tag	6 ASCII Char	45472+100(#-1)	n+2/5-7
L#I6T	R	Input 6 Tag	6 ASCII Char	45475+100(#-1)	n/8-10
L#I7T	R	Input 7 Tag	6 ASCII Char	45478+100(#-1)	n+1/8-10
L#I8T	R	Input 8 Tag	6 ASCII Char	45481+100(#-1)	n+2/8-10
L#I9T	R	Input 9 Tag	6 ASCII Char	45484+100(#-1)	n/11-13
L#IAT	R	Input A Tag	6 ASCII Char	45487+100(#-1)	n+1/11-13
L#IBT	R	Input B Tag	6 ASCII Char	45490+100(#-1)	n+2/11-13
L#ICT	R	Input C Tag	6 ASCII Char	45493+100(#-1)	n/14-16
L#IDT	R	Input D Tag	6 ASCII Char	45496+100(#-1)	n+1/14-16
L#IET	R	Input E Tag	6 ASCII Char	45499+100(#-1)	n+2/14-16
L#IFT	R	Input F Tag	6 ASCII Char	45502+100(#-1)	n+3/14-16
		(spares)	($0000)	45505-45550+100(#-1)	

Discrete Indicator [ODP] - (V2.2)

Code	R/W	Description	Range	Register (MB)	C/P (LIL)
L#TAG	R	Loop Tag	12 ASCII Char	45451+100(#-1)	n/2-7
L#G1Tag	R	Group 1 Tag	6 ASCII Char	45457+100(#-1)	n/13-15
L#G1P1T	R	Group 1 PB1 Tag	6 ASCII Char	45460+100(#-1)	n/16-18
L#G1P1T	R	Group 1 PB2 Tag	6 ASCII Char	45463+100(#-1)	n/19-21
L#G1SAT	R	Group 1 Switch Position A Tag	6 ASCII Char	45466+100(#-1)	n/22-24
L#G1SMT	R	Group 1 Switch Position M Tag	6 ASCII Char	45469+100(#-1)	n+1/22-24
L#G1F1T	R	Group 1 Feedback 1 Tag	6 ASCII Char	45472+100(#-1)	n+1/13-15
L#G1F0T	R	Group 1 Feedback 0 Tag	6 ASCII Char	45475+100(#-1)	n+1/16-18
L#G2Tag	R	Group 2 Tag	6 ASCII Char	45478+100(#-1)	n/25-27
L#G2P1T	R	Group 2 PB1 Tag	6 ASCII Char	45481+100(#-1)	n/28-30
L#G2P1T	R	Group 2 PB2 Tag	6 ASCII Char	45484+100(#-1)	n/31-33
L#G2SAT	R	Group 2 Switch Position A Tag	6 ASCII Char	45487+100(#-1)	n/34-36
L#G2SMT	R	Group 2 Switch Position M Tag	6 ASCII Char	45490+100(#-1)	n+1/34-36
L#G2F1T	R	Group 2 Feedback 1 Tag	6 ASCII Char	45493+100(#-1)	n+1/25-27
L#G2F0T	R	Group 2 Feedback 0 Tag	6 ASCII Char	45496+100(#-1)	n+1/28-30
L#G3Tag	R	Group 3 Tag	6 ASCII Char	45499+100(#-1)	n/37-39
L#G3P1T	R	Group 3 PB1 Tag	6 ASCII Char	45502+100(#-1)	n/40-42
L#G3P1T	R	Group 3 PB2 Tag	6 ASCII Char	45505+100(#-1)	n/43-45
L#G3SAT	R	Group 3 Switch Position A Tag	6 ASCII Char	45508+100(#-1)	n/46-48
L#G3SMT	R	Group 3 Switch Position M Tag	6 ASCII Char	45511+100(#-1)	n+1/46-48
L#G3F1T	R	Group 3 Feedback 1 Tag	6 ASCII Char	45514+100(#-1)	n+1/37-39
L#G3F0T	R	Group 3 Feedback 0 Tag	6 ASCII Char	45517+100(#-1)	n+1/40-42
L#G4Tag	R	Group 4 Tag	6 ASCII Char	45520+100(#-1)	n/49-51
L#G4P1T	R	Group 4 PB1 Tag	6 ASCII Char	45523+100(#-1)	n/52-54
L#G4P1T	R	Group 4 PB2 Tag	6 ASCII Char	45526+100(#-1)	n/55-57
L#G4SAT	R	Group 4 Switch Position A Tag	6 ASCII Char	45529+100(#-1)	n/58-60
L#G4SMT	R	Group 4 Switch Position M Tag	6 ASCII Char	45532+100(#-1)	n+1/58-60
L#G4F1T	R	Group 4 Feedback 1 Tag	6 ASCII Char	45535+100(#-1)	n+1/49-51
L#G4F0T	R	Group 4 Feedback 0 Tag	6 ASCII Char	45538+100(#-1)	n+1/52-54

L#G5Tag	R	Group 5 Tag	6 ASCII Char	40451+30(#-1)	n/61-63
L#G5P1T	R	Group 5 PB1 Tag	6 ASCII Char	40454+30(#-1)	n/64-66
L#G5P1T	R	Group 5 PB2 Tag	6 ASCII Char	40457+30(#-1)	n/67-69
L#G5SAT	R	Group 5 Switch Position A Tag	6 ASCII Char	40460+30(#-1)	n/70-72
L#G5SMT	R	Group 5 Switch Position M Tag	6 ASCII Char	40463+30(#-1)	n+1/70-72
L#G5F1T	R	Group 5 Feedback 1 Tag	6 ASCII Char	40466+30(#-1)	n+1/61-63
L#G5F0T	R	Group 5 Feedback 0 Tag	6 ASCII Char	40469+30(#-1)	n+1/64-66
		Spares		40472-40480	

Note: These Modbus groupings normally used for Variable Loop Integer Data with displays other than ODP

L#G6Tag	R	Group 6 Tag	6 ASCII Char	41201+30(#-1)	n/73-75
L#G6P1T	R	Group 6 PB1 Tag	6 ASCII Char	41204+30(#-1)	n/76-78
L#G6P1T	R	Group 6 PB2 Tag	6 ASCII Char	41207+30(#-1)	n/79-81
L#G6SAT	R	Group 6 Switch Position A Tag	6 ASCII Char	41210+30(#-1)	n/82-84
L#G6SMT	R	Group 6 Switch Position M Tag	6 ASCII Char	41213+30(#-1)	n+1/82-84
L#G6F1T	R	Group 6 Feedback 1 Tag	6 ASCII Char	41216+30(#-1)	n+1/73-75
L#G6F0T	R	Group 6 Feedback 0 Tag	6 ASCII Char	41219+30(#-1)	n+1/76-78
		spares		41222-41230	

Note: These Modbus groupings normally used for Static Loop Integer Data with displays other than ODP

L#G7Tag	R	Group 7 Tag	6 ASCII Char	42451+60(#-1)	n/85-87
L#G7P1T	R	Group 7 PB1 Tag	6 ASCII Char	42454+60(#-1)	n/88-90
L#G7P1T	R	Group 7 PB2 Tag	6 ASCII Char	42457+60(#-1)	n/91-93
L#G7SAT	R	Group 7 Switch Position A Tag	6 ASCII Char	42460+60(#-1)	n/94-96
L#G7SMT	R	Group 7 Switch Position M Tag	6 ASCII Char	42463+60(#-1)	n+1/94-96
L#G7F1T	R	Group 7 Feedback 1 Tag	6 ASCII Char	42466+60(#-1)	n+1/85-87
L#G7F0T	R	Group 7 Feedback 0 Tag	6 ASCII Char	42469+60(#-1)	n+1/88-90
L#G8Tag	R	Group 8 Tag	6 ASCII Char	42472+60(#-1)	n/97-99
L#G8P1T	R	Group 8 PB1 Tag	6 ASCII Char	42475+60(#-1)	n/100-102
L#G8P1T	R	Group 8 PB2 Tag	6 ASCII Char	42478+60(#-1)	n/103-105
L#G8SAT	R	Group 8 Switch Position A Tag	6 ASCII Char	42481+60(#-1)	n/106-108
L#G8SMT	R	Group 8 Switch Position M Tag	6 ASCII Char	42484+60(#-1)	n+1/106-108
L#G8F1T	R	Group 8 Feedback 1 Tag	6 ASCII Char	42487+60(#-1)	n+1/97-99
L#G8F0T	R	Group 8 Feedback 0 Tag	6 ASCII Char	42490+60(#-1)	n+1/100-102
		spares		42493-42509	

Note: These Modbus groupings normally used for Variable Loop Floating Point Data with displays other than ODP

A.4.8 Coil Loop Data (1-bit)

Controller [ODC]

Code	R/W	Description	Range	Coil(MB)	C/P (LIL)
L#A	R/W	1-Auto 0-Manual	1/0	00296+48(#-1)	n+3/1(0)
L#L	R/W	1-Local	1/0	00297+48(#-1)	n+3/1(1)
L#SS	R	1-AM block in STANDBY	1/0	00298+48(#-1)	n+3/1(2)
L#E	R/W	1-External Set	1/0	00299+48(#-1)	n+3/1(3)
L#CN	R/W	1-Console	1/0	00300+48(#-1)	n+3/1(4)
L#CM	R/W	1-Computer	1/0	00301+48(#-1)	n+3/1(5)
L#RS	R/W	1-Ramping Setpoint	1.0	00302+48(#-1)	n+3/1(6)
L#OR	R	1-Override	1/0	00303+48(#-1)	n+3/1(7)
L#EM	R	1-Emergency Manual	1/0	00304+48(#-1)	n+3/1(8)
L#CH	R	1-Configuration Hold	1/0	00305+48(#-1)	n+3/1(9)
L#HL	R	1-HI Setpoint Limit	1/0	00306+48(#-1)	n+3/1(10)
L#LL	R	1-LO Setpoint Limit	1/0	00307+48(#-1)	n+3/1(11)
L#OS	R/W	1-Alarms - Out of Service	1/0	00308+48(#-1)	n+3/1(12)
L#U1S	R	1-U1 Status Active	1/0	00309+48(#-1)	n+3/1(13)
L#U2S	R	1-U2 Status Active	1/0	00310+48(#-1)	n+3/1(14)
L#AT	R/W	1-Autotune	1/0	00311+48(#-1)	n+3/1(15)
L#A1	R	1-Alarm 1 is Active	1/0	00312+48(#-1)	n+4/1(0)
L#N1	R/W	1-Alarm 1 is Not Acknowledged	1/0	00313+48(#-1)	n+4/1(1)
L#E1	R/W	1-Alarm 1 is Enabled	1/0	00314+48(#-1)	n+4/1(2)
L#A2	R	1-Alarm 2 is Active	1/0	00315+48(#-1)	n+4/1(3)
L#N2	R/W	1-Alarm 2 is Not Acknowledged	1/0	00316+48(#-1)	n+4/1(4)
L#E2	R/W	1-Alarm 2 is Enabled	1/0	00317+48(#-1)	n+4/1(5)
L#A3	R	1-Alarm 3 is Active	1/0	0318+48(#-1)	n+4/1(6)
L#N3	R/W	1-Alarm 3 is Not Acknowledged	1/0	00319+48(#-1)	n+4/1(7)
L#E3	R/W	1-Alarm 3 is Enabled	1/0	00320+48(#-1)	n+4/1(8)
L#A4	R	1-Alarm 4 is Active	1/0	00321+48(#-1)	n+4/1(9)
L#N4	R/W	1-Alarm 4 is Not Acknowledged	1/0	00322+48(#-1)	n+4/1(10)
L#E4	R/W	1-Alarm 4 is Enabled	1/0	00323+48(#-1)	n+4/1(11)
L#OS	R/W	1-Alarms - Out of Service	1/0	00324+48(#-1)	n+4/1(12)
L#CC	R	1-Configuration has Changed	1/0	00325+48(#-1)	n+4/1(13)
L#NA	R/W	1-Unacknowledged Loop Event	1/0	00326+48(#-1)	n+4/1(14)
L#AE	R	1-Active Loop Event	1/0	00327+48(#-1)	n+4/1(15)
L#NSS	R/W	1-Not Ack'd STANDBY *(V1.3)*	1/0	00328+48(#-1)	n+4/10(0)
L#NOR	R/W	1-Not Ack'd Override *(V1.3)*	1/0	00329+48(#-1)	n+4/10(1)
L#NEM	R/W	1-Not Ack'd Emergency Man *(V1.3)*	1/0	00330+48(#-1)	n+4/10(2)
L#NHL	R/W	1-Not Ack'd HI Setpoint Limit *(V1.3)*	1/0	00331+48(#-1)	n+4/10(3)
L#NLL	R/W	1-Not Ack'd LO Setpoint Limit *(V1.3)*	1/0	00332+48(#-1)	n+4/10(4)
L#NU1	R/W	1-Not Ack'd U1 Status *(V1.3)*	1/0	00333+48(#-1)	n+4/10(5)
L#NU2	R/W	1-Not Ack'd U2 Status *(V1.3)*	1/0	00334+48(#-1)	n+4/10(6)
L#NW1	R/W	1-Not Ack'd W1 Status *(V1.3)*	1/0	00335+48(#-1)	n+4/10(7)
L#NW2	R/W	1-Not Ack'd W2 Status *(V1.3)*	1/0	00336+48(#-1)	n+4/10(8)
L#NW3	R/W	1-Not Ack'd W3 Status *(V1.3)*	1/0	00337+48(#-1)	n+4/10(9)
L#NE1	R/W	1-Not Ack'd E1 Status *(V1.3)*	1/0	00338+48(#-1)	n+4/10(10)
L#NE2	R/W	1-Not Ack'd E2 Status *(V1.3)*	1/0	00339+48(#-1)	n+4/10(11)
L#NE3	R/W	1-Not Ack'd E3 Status *(V1.3)*	1/0	00340+48(#-1)	n+4/10(12)
L#XAT	W	1-Transfer Autotune Parameters *(V1.3)*	1/0	00341+48(#-1)	n+4/10(13)
L#PB1C	R/W	PB1SW Input MD (*) *(V1.3)*	1/0	00342+48(#-1)	n+4/10(14)
L#PB2C	R/W	PB2SW Input MD (*) *(V1.3)*	1/0	00343+48(#-1)	n+4/10(15)

* These bits indicate the status of the switch input MD. A write of a "1" will have the same effect as pressing and releasing the button on the faceplate. If the action of the switch is sustained the switch will change position. If the action is momentary the switch will close for one scan cycle.

Control Loop Status Word (*L#*CLS) - channel n+3/parameter 1

BIT	Description	Value	Block	Read/Write	Output
0	Auto/Manual (A)	1-Auto 0-Manual	A/M	R/W	
1	Local Loop (L)	1-Local	ODC	R/W	L
2	Standby Sync (SS)	1-Standby	A/M	R	
3	External/Internal (E)	1-External 0-Internal	E/I	R/W	ES
4	Console (CN)	1-Console	ODC	R/W	CN
5	Computer (CM)	1-Computer	ODC	R/W	CM
6	Ramping Setpoint (RS)	1-Ramping Setpoint	SETPT	R/W	RS
7	Override (OR)	1-Override	ORSL	R	OS
8	Emergency Manual (EM)	1-Emergency Manual	A/M	R	
9	Configuration Hold (CH)	1-Configuration Hold		R	
10	HI Setpoint Limit (HL)	1-HI Setpoint Limit	SPLIM	R	HS
11	LO Setpoint Limit (LL)	1-LO Setpoint Limit	SPLIM	R	LS
12	Alarms are Out of Service (OS)	1-Out of Service	ALARM	R/W	
13	U1 Status Active (U1S)	1- U1 Active	ODC	R	
14	U2 Status Active (U2S)	1- U2 Active	ODC	R	
15	Autotune is active (AT)	1-Autotune		R/W	

Control Loop Alarm Status Word (*L#*ASW) - channel n+4/parameter 1

BIT	Description	Value	Block	Read/Write	Output
0	Alarm 1 is Active (A1)	1-Active	ALARM	R	
1	Alarm 1 is Not Acknowledged (N1)	1-Not Acknowledged	ALARM	R/W	
2	Alarm 1 is Enabled (E1)	1-Enabled	ALARM	R/W	
3	Alarm 2 is Active (A2)	1-Active	ALARM	R	
4	Alarm 2 is Not Acknowledged (N2)	1-Not Acknowledged	ALARM	R/W	
5	Alarm 2 is Enabled (E2)	1-Enabled	ALARM	R/W	
6	Alarm 3 is Active (A3)	1-Active	ALARM	R	
7	Alarm 3 is Not Acknowledged (N3)	1-Not Acknowledged	ALARM	R/W	
8	Alarm 3 is Enabled (E3)	1-Enabled	ALARM	R/W	
9	Alarm 4 is Active (A4)	1-Active	ALARM	R	
10	Alarm 4 is Not Acknowledged (N4)	1-Not Acknowledged	ALARM	R/W	
11	Alarm 4 is Enabled (E4)	1-Enabled	ALARM	R/W	
12	Alarms are Out of Service (OS)	1-Out of Service	ALARM	R/W	
13	Configuration has Changed (CC)	1-Loop Configured		R	
14	Unacknowledged Loop Event (NA)	1-Unacknowledged Event		R/W	
15	Active Loop Event (AE)	1- Active Loop Event		R	

Extended Control Loop Status Word (L#ECLS) - channel n+4/parameter 10

BIT	Description	Value	Block	Read/Write	Output
0	Not Ack'd STANDBY	1-Not Acknowledged	A/M	R/W	
1	Not Ack'd Override	1-Not Acknowledged	A/M	R/W	
2	Not Ack'd Emergency Manual	1-Not Acknowledged	A/M	R/W	
3	Not Ack'd HI Setpoint Limit	1-Not Acknowledged	SPLIM	R/W	
4	Not Ack'd LO Setpoint Limit	1-Not Acknowledged	SPLIM	R/W	
5	Not Ack'd User 1 Status	1-Not Acknowledged	ODC	R/W	
6	Not Ack'd User 2 Status	1-Not Acknowledged	ODC	R/W	
7	Not Ack'd Autotune W1 Warning	1-Not Acknowledged	PID	R/W	
8	Not Ack'd Autotune W2 Warning	1-Not Acknowledged	PID	R/W	
9	Not Ack'd Autotune W3 Warning	1-Not Acknowledged	PID	R/W	
10	Not Ack'd Autotune E1 Warning	1-Not Acknowledged	PID	R/W	
11	Not Ack'd Autotune E2 Warning	1-Not Acknowledged	PID	R/W	
12	Not Ack'd Autotune E3 Warning	1-Not Acknowledged	PID	R/W	
13	Transfer Autotune Parameters	1-Transfer	PID	W	
14	PB1SW Input MD (*)	1-High, 0-Low	PB1SW	R/W	
15	PB2SW Input MD (*)	1-High, 0-Low	PB2SW	R/W	

* These bits indicate the status of the switch input MD. A write of a "1" will have the same effect as pressing and releasing the button on the faceplate. If the action of the switch is sustained the switch will change position. If the action is momentary, the switch will close for one scan cycle.

Sequencer Loop [ODS]

Code	R/W	Description	Range	Coil (MB)	C/P (LIL)
L#HS	R	1-Hold Sequencer	1/0	00296+48(#-1)	n+4/1(0)
L#L	R/W	1-Loop Local	1/0	00297+48(#-1)	n+4/1(1)
L#RSQ	W	1-Reset Sequencer	1/0	00298+48(#-1)	n+4/1(2)
L#TC	R	1-Track	1/0	00299+48(#-1)	n+4/1(3)
L#CN	R/W	1-Console	1/0	00300+48(#-1)	n+4/1(4)
L#CM	R/W	1-Computer	1/0	00301+48(#-1)	n+4/1(5)
L#SSF	W	1-Step Forward (normal 0)	1/0	00302+48(#-1)	n+4/1(6)
L#SSB	W	1-Step Backward (normal 0)	1/0	00303+48(#-1)	n+4/1(7)
		(spare)	1/0	00304+48(#-1)	n+4/1(8)
L#CH	R	1-Configuration Hold	1/0	00305+48(#-1)	n+4/1(9)
L#SSC	R	1-Steps Completed	1/0	00306+48(#-1)	n+4/1(10)
		(spare)	0	00307+48(#-1)	n+4/1(11)
		(spare)	0	00308+48(#-1)	n+4/1(12)
L#PB1	R	PB1SW Input MD (*) *(V1.3)*	1/0	00309+48(#-1)	n+4/1(13)
L#PB2	R	PB2SW Input MD (*) *(V1.3)*	1/0	00310+48(#-1)	n+4/1(14)
L#PB3	R	PB3SW Input MD (*) *(V1.3)*	1/0	00311+48(#-1)	n+4/1(15)
L#A1	R	1-Alarm 1 is Active	1/0	00312+48(#-1)	n+5/1(0)
L#N1	R/W	1-Alarm 1 is Not Acknowledged	1/0	00313+48(#-1)	n+5/1(1)
L#E1	R/W	1-Alarm 1 is Enabled	1/0	00314+48(#-1)	n+5/1(2)
L#A2	R	1-Alarm 2 is Active	1/0	00315+48(#-1)	n+5/1(3)
L#N2	R/W	1-Alarm 2 is Not Acknowledged	1/0	00316+48(#-1)	n+5/1(4)
L#E2	R/W	1-Alarm 2 is Enabled	1/0	00317+48(#-1)	n+5/1(5)
L#A3	R	1-Alarm 3 is Active	1/0	00318+48(#-1)	n+5/1(6)
L#N3	R/W	1-Alarm 3 is Not Acknowledged	1/0	00319+48(#-1)	n+5/1(7)
L#E3	R/W	1-Alarm 3 is Enabled	1/0	00320+48(#-1)	n+5/1(8)
L#A4	R	1-Alarm 4 is Active	1/0	00321+48(#-1)	n+5/1(9)
L#N4	R/W	1-Alarm 4 is Not Acknowledged	1/0	00322+48(#-1)	n+5/1(10)
L#E4	R/W	1-Alarm 4 is Enabled	1/0	00323+48(#-1)	n+5/1(11)
L#OS	R/W	1-Alarms - Out of Service	1/0	00324+48(#-1)	n+5/1(12)
L#CC	R	1-Configuration has Changed	1/0	00325+48(#-1)	n+5/1(13)
L#NA	R/W	1-Unacknowledged Loop Event	1/0	00326+48(#-1)	n+5/1(14)
L#AE	R	1-Active Loop Event	1/0	00327+48(#-1)	n+5/1(15)
		(spare)	0	00328+48(#-1)	

* These bits indicate the status of the switch input MD. A write of a “1” will have the same effect as pressing and releasing the button on the faceplate. If the action of the switch is sustained the switch will change position. If the action is momentary the switch will close for one scan cycle.

Sequencer Loop Status Word (L#***SLS) - channel n+4/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Hold Sequencer (HS)	1-Hold	PRSEQ	R	
1	Local (L)	1-Local	ODS	R/W	L
2	Reset Sequencer (RSQ)	1-Reset	PRSEQ	W	
3	Track Command (TC)	1-Track	PRSEQ	R	
4	Console (CN)	1-Console	ODS	R/W	CN
5	Computer CM)	1-Computer	ODS	R/W	CM
6	Step Forward (SSF)	1-Step	PRSEQ	W	
7	Step Backward (SSB)	1-Step	PRSEQ	W	
8					
9	Configuration Hold (CH)	1-Configuration Hold		R	
10	Steps Completed (SSC)	1- Steps Complete	PRSEQ	R	
11					
12					
13	PB1SW Input MD (PB1)	1/0 (write of 1 presses PB)	PB1SW	R/W	
14	PB2SW Input MD (PB2)	1/0 (write of 1 presses PB)	PB2SW	R/W	
15	PB3SW Input MD (PB3)	1/0 (write of 1 presses PB)	PB2SW	R/W	

Sequencer Loop Alarm Status Word (L#***ASW) - channel n+5/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Alarm 1 is Active (A1)	1-Active	ALARM	R	
1	Alarm 1 is Not Acknowledged (N1)	1-Not Acknowledged	ALARM	R/W	
2	Alarm 1 is Enabled (E1)	1-Enabled	ALARM	R/W	
3	Alarm 2 is Active (A2)	1-Active	ALARM	R	
4	Alarm 2 is Not Acknowledged (N2)	1-Not Acknowledged	ALARM	R/W	
5	Alarm 2 is Enabled (E2)	1-Enabled	ALARM	R/W	
6	Alarm 3 is Active (A3)	1-Active	ALARM	R	
7	Alarm 3 is Not Acknowledged (N3)	1-Not Acknowledged	ALARM	R/W	
8	Alarm 3 is Enabled (E3)	1-Enabled	ALARM	R/W	
9	Alarm 4 is Active (A4)	1-Active	ALARM	R	
10	Alarm 4 is Not Acknowledged (N4)	1-Not Acknowledged	ALARM	R/W	
11	Alarm 4 is Enabled (E4)	1-Enabled	ALARM	R/W	
12	Alarms are Out of Service (OS)	1-Out of Service	ALARM	R/W	
13	Configuration has Changed (CC)	1-Loop Configured		R	
14	Unacknowledged Loop Event (NA)	1-Unacknowledged Event		R/W	
15	Active Loop Event (AE)	1- Active Loop Event		R	

Analog Indicator [ODA] - (V2.2)

Code	R/W	Description	Range	Coil(MB)	C/P (LIL)
L#P1AA	R	1-Process 1 Alarm A is Active	1/0	00296+48(#-1)	n+4/1(0)
L#P1AN	R/W	1-Process 1 Alarm A is Not Acknowledged	1/0	00297+48(#-1)	n+4/1(1)
L#P1AE	R/W	1-Process 1 Alarm A is Enabled	1/0	00298+48(#-1)	n+41(2)
L#P1BA	R	1-Process 1 Alarm B is Active	1/0	00299+48(#-1)	n+4/1(3)
L#P1BN	R/W	1-Process 1 Alarm B is Not Acknowledged	1/0	00300+48(#-1)	n+4/1(4)
L#P1BE	R/W	1-Process 1 Alarm B is Enabled	1/0	00301+48(#-1)	n+4/1(5)
L#P2AA	R	1-Process 2 Alarm A is Active	1/0	00302+48(#-1)	n+4/1(6)
L#P2AN	R/W	1-Process 2 Alarm A is Not Acknowledged	1/0	00303+48(#-1)	n+4/1(7)
L#P2AE	R/W	1-Process 2 Alarm A is Enabled	1/0	00304+48(#-1)	n+4/1(8)
L#P2BA	R	1-Process 2 Alarm B is Active	1/0	00305+48(#-1)	n+4/1(9)
L#P2BN	R/W	1-Process 2 Alarm B is Not Acknowledged	1/0	00306+48(#-1)	n+4/1(10)
L#P2BE	R/W	1-Process 2 Alarm B is Enabled	1/0	00307+48(#-1)	n+4/1(11)
L#OS	R/W	1-Alarms - Out of Service	1/0	00308+48(#-1)	n+4/1(12)
L#PB1	R/W	PB1SW Input MD (*) *(V1.3)*	1/0	00309+48(#-1)	n+4/1(13)
L#PB2	R/W	PB2SW Input MD (*) *(V1.3)*	1/0	00310+48(#-1)	n+4/(14)
L#PB3	R/W	PB3SW Input MD (*) *(V1.3)*	1/0	00311+48(#-1)	n+4/1(15)
L#P3AA	R	1-Process 3 Alarm A is Active	1/0	00312+48(#-1)	n+5/1(0)
L#P3AN	R/W	1-Process 3 Alarm A is Not Acknowledged	1/0	00313+48(#-1)	n+5/1(1)
L#P3AE	R/W	1-Process 3 Alarm A is Enabled	1/0	00314+48(#-1)	n+5/1(2)
L#P3BA	R	1-Process 3 Alarm B is Active	1/0	00315+48(#-1)	n+5/1(3)
L#P3BN	R/W	1-Process 3 Alarm B is Not Acknowledged	1/0	00316+48(#-1)	n+5/1(4)
L#P3BE	R/W	1-Process 3 Alarm B is Enabled	1/0	00317+48(#-1)	n+5/1(5)
L#P4AA	R	1-Process 4 Alarm A is Active	1/0	00318+48(#-1)	n+1/1(6)
L#P4AN	R/W	1-Process 4 Alarm A is Not Acknowledged	1/0	00319+48(#-1)	n+5/1(7)
L#P4AE	R/W	1-Process 4 Alarm A is Enabled	1/0	00320+48(#-1)	n+5/1(8)
L#P4BA	R	1-Process 4 Alarm B is Active	1/0	00321+48(#-1)	n+5/1(9)
L#P4BN	R/W	1-Process 4 Alarm B is Not Acknowledged	1/0	00322+48(#-1)	n+5/1(10)
L#P4BE	R/W	1-Process 4 Alarm B is Enabled	1/0	00323+48(#-1)	n+5/1(11)
L#OS	R/W	1-Alarms - Out of Service	1/0	00324+48(#-1)	n+5/1(12)
L#CC	R	1-Configuration has Changed	1/0	00325+48(#-1)	n+5/1(13)
L#NA	R/W	1-Unacknowledged Loop Event	1/0	00326+48(#-1)	n+5/1(14)
L#AE	R	1-Active Loop Event	1/0	00327+48(#-1)	n+5/1(15)

* These bits indicate the status of the switch input MD. A write of a “1” will have the same effect as pressing and releasing the button on the faceplate. If the action of the switch is sustained the switch will change position. If the action is momentary the switch will close for one scan cycle.

Analog Indicator Loop Status Word (L#***W1) - channel n+4/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	P1 Alarm A is Active (A1)	1-Active	ALARM	R	
1	P1 Alarm A is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
2	P1 Alarm A is Enabled (E1)	1-Enabled	ALARM	R/W	
3	P1 Alarm B is Active (A1)	1-Active	ALARM	R	
4	P1 Alarm B is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
5	P1 Alarm B is Enabled (E1)	1-Enabled	ALARM	R/W	
6	P2 Alarm A is Active (A1)	1-Active	ALARM	R	
7	P2 Alarm A is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
8	P2 Alarm A is Enabled (E1)	1-Enabled	ALARM	R/W	
9	P2 Alarm B is Active (A1)	1-Active	ALARM	R	
10	P2 Alarm B is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
11	P2 Alarm B is Enabled (E1)	1-Enabled	ALARM	R/W	
12	Alarms are Out of Service (OS)	1-Out of Service	ALARM	R/W	
13	PB1SW Input MD (PB1)	1/0 (write of 1 presses PB)	PB1SW	R/W	
14	PB2SW Input MD (PB2)	1/0 (write of 1 presses PB)	PB2SW	R/W	
15	PB3SW Input MD (PB3)	1/0 (write of 1 presses PB)	PB2SW	R/W	

Analog Indicator Loop Alarm Status Word (L#***SW2) - channel n+5/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	P3 Alarm A is Active (A1)	1-Active	ALARM	R	
1	P3 Alarm A is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
2	P3 Alarm A is Enabled (E1)	1-Enabled	ALARM	R/W	
3	P3 Alarm B is Active (A1)	1-Active	ALARM	R	
4	P3 Alarm B is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
5	P3 Alarm B is Enabled (E1)	1-Enabled	ALARM	R/W	
6	P4 Alarm A is Active (A1)	1-Active	ALARM	R	
7	P4 Alarm A is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
8	P4 Alarm A is Enabled (E1)	1-Enabled	ALARM	R/W	
9	P4 Alarm B is Active (A1)	1-Active	ALARM	R	
10	P4 Alarm B is Not Ack'd (N1)	1-Not Acknowledged	ALARM	R/W	
11	P4 Alarm B is Enabled (E1)	1-Enabled	ALARM	R/W	
12	Alarms are Out of Service (OS)	1-Out of Service	ALARM	R/W	
13	Configuration has Changed (CC)	1-Loop Configured		R	
14	Unacknowledged Loop Event (NA)	1-Unacknowledged Event		R/W	
15	Active Loop Event (AE)	1- Active Loop Event		R	

Digital Indicator [ODD] - (V2.2)

Code	R/W	Description	Range	Coil(MB)	C/P (LIL)
L#D0I	R	Discrete 0 Input 1-ON 0-OFF	1/0	00296+48(#-1)	n/1(0)
L#D1I	R	Discrete 1 Input 1-ON 0-OFF	1/0	00297+48(#-1)	n/1(1)
L#D2I	R	Discrete 2 Input 1-ON 0-OFF	1/0	00298+48(#-1)	n/1(2)
L#D3I	R	Discrete 3 Input 1-ON 0-OFF	1/0	00299+48(#-1)	n/1(3)
L#D4I	R	Discrete 4 Input 1-ON 0-OFF	1/0	00300+48(#-1)	n/1(4)
L#D5I	R	Discrete 5 Input 1-ON 0-OFF	1/0	00301+48(#-1)	n/1(5)
L#D6I	R	Discrete 6 Input 1-ON 0-OFF	1/0	00302+48(#-1)	n/1(6)
L#D7I	R	Discrete 7 Input 1-ON 0-OFF	1/0	00303+48(#-1)	n/1(7)
L#D8I	R	Discrete 8 Input 1-ON 0-OFF	1/0	00304+48(#-1)	n/1(8)
L#D9I	R	Discrete 9 Input 1-ON 0-OFF	1/0	00305+48(#-1)	n/1(9)
L#DAI	R	Discrete A Input 1-ON 0-OFF	1/0	00306+48(#-1)	n/1(10)
L#DBI	R	Discrete B Input 1-ON 0-OFF	1/0	00307+48(#-1)	n/1(11)
L#DCI	R	Discrete C Input 1-ON 0-OFF	1/0	00308+48(#-1)	n/1(12)
L#DDI	R	Discrete D Input 1-ON 0-OFF	1/0	00309+48(#-1)	n/1(13)
L#DEI	R	Discrete E Input 1-ON 0-OFF	1/0	00310+48(#-1)	n/1(14)
L#DFI	R	Discrete F Input 1-ON 0-OFF	1/0	00311+48(#-1)	n/1(15)
L#D0S	R/W	Discrete 0 Status 1-Auto 0-Manual (*)	1/0	00312+48(#-1)	n+1/1(0)
L#D1S	R/W	Discrete 1 Status 1-Auto 0-Manual (*)	1/0	00313+48(#-1)	n+1/1(1)
L#D2S	R/W	Discrete 2 Status 1-Auto 0-Manual (*)	1/0	00314+48(#-1)	n+1/1(2)
L#D3S	R/W	Discrete 3 Status 1-Auto 0-Manual (*)	1/0	00315+48(#-1)	n+1/1(3)
L#D4S	R/W	Discrete 4 Status 1-Auto 0-Manual (*)	1/0	00316+48(#-1)	n+1/1(4)
L#D5S	R/W	Discrete 5 Status 1-Auto 0-Manual (*)	1/0	00317+48(#-1)	n+1/1(5)
L#D6S	R/W	Discrete 6 Status 1-Auto 0-Manual (*)	1/0	00318+48(#-1)	n+1/1(6)
L#D7S	R/W	Discrete 7 Status 1-Auto 0-Manual (*)	1/0	00319+48(#-1)	n+1/1(7)
L#D8S	R/W	Discrete 8 Status 1-Auto 0-Manual (*)	1/0	00320+48(#-1)	n+1/1(8)
L#D9S	R/W	Discrete 9 Status 1-Auto 0-Manual (*)	1/0	00321+48(#-1)	n+1/1(9)
L#DAS	R/W	Discrete A Status 1-Auto 0-Manual (*)	1/0	00322+48(#-1)	n+1/1(10)
L#DBS	R/W	Discrete B Status 1-Auto 0-Manual (*)	1/0	00323+48(#-1)	n+1/1(11)
L#DCS	R/W	Discrete C Status 1-Auto 0-Manual (*)	1/0	00324+48(#-1)	n+1/1(12)
L#DDS	R/W	Discrete D Status 1-Auto 0-Manual (*)	1/0	00325+48(#-1)	n+1/1(13)
L#DES	R/W	Discrete E Status 1-Auto 0-Manual (*)	1/0	00326+48(#-1)	n+1/1(14)
L#DFS	R/W	Discrete F Status 1-Auto 0-Manual (*)	1/0	00327+48(#-1)	n+1/1(15)
L#D0O	R/W	Discrete 0 Output 1-ON 0-OFF	1/0	00328+48(#-1)	n+2/1(0)
L#D1O	R/W	Discrete 1 Output 1-ON 0-OFF	1/0	00329+48(#-1)	n+2/1(1)
L#D2O	R/W	Discrete 2 Output 1-ON 0-OFF	1/0	00330+48(#-1)	n+2/1(2)
L#D3O	R/W	Discrete 3 Output 1-ON 0-OFF	1/0	00331+48(#-1)	n+2/1(3)
L#D4O	R/W	Discrete 4 Output 1-ON 0-OFF	1/0	00332+48(#-1)	n+2/1(4)
L#D5O	R/W	Discrete 5 Output 1-ON 0-OFF	1/0	00333+48(#-1)	n+2/1(5)
L#D6O	R/W	Discrete 6 Output 1-ON 0-OFF	1/0	00334+48(#-1)	n+2/1(6)
L#D7O	R/W	Discrete 7 Output 1-ON 0-OFF	1/0	00335+48(#-1)	n+2/1(7)
L#D8O	R/W	Discrete 8 Output 1-ON 0-OFF	1/0	00336+48(#-1)	n+2/1(8)
L#D9O	R/W	Discrete 9 Output 1-ON 0-OFF	1/0	00337+48(#-1)	n+2/1(9)
L#DAO	R/W	Discrete A Output 1-ON 0-OFF	1/0	00338+48(#-1)	n+2/1(10)
L#DBO	R/W	Discrete B Output 1-ON 0-OFF	1/0	00339+48(#-1)	n+2/1(11)
L#DCO	R/W	Discrete C Output 1-ON 0-OFF	1/0	00340+48(#-1)	n+2/1(12)
L#DDO	R/W	Discrete D Output 1-ON 0-OFF	1/0	00341+48(#-1)	n+2/1(13)
L#DEO	R/W	Discrete E Output 1-ON 0-OFF	1/0	00342+48(#-1)	n+2/1(14)
L#DFO	R/W	Discrete F Output 1-ON 0-OFF	1/0	00343+48(#-1)	n+2/1(15)
L#PB1	R/W	PB1SW Input MD (*)	1/0	08701+16(#-1)	n+3/1(0)
L#PB2	R/W	PB2SW Input MD (*)	1/0	08702+16(#-1)	n+3/1(1)
		(spares)		08703-08716+16(#-1)	

* L#PB1 & L#PB2 - writing a "1" to the controller will have the same affect as pushing the button on the faceplate of the controller. If the action of the switch is sustained the switch will change position. If the action is momentary the switch will close for one scan cycle. Reading the bits indicates the status of the switch MD input
* L#DnS - writing a "1" toggles the switch, Reading "1" indicates Auto Status, reading "0" indicate Man status.

Digital Indicator Loop Status Word (L#DISW***) - channel n/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Discrete 0 Input Value	1 - ON 0 - OFF	ODD	R	
1	Discrete 1 Input Value	1 - ON 0 - OFF	ODD	R	
2	Discrete 2 Input Value	1 - ON 0 - OFF	ODD	R	
3	Discrete 3 Input Value	1 - ON 0 - OFF	ODD	R	
4	Discrete 4 Input Value	1 - ON 0 - OFF	ODD	R	
5	Discrete 5 Input Value	1 - ON 0 - OFF	ODD	R	
6	Discrete 6 Input Value	1 - ON 0 - OFF	ODD	R	
7	Discrete 7 Input Value	1 - ON 0 - OFF	ODD	R	
8	Discrete 8 Input Value	1 - ON 0 - OFF	ODD	R	
9	Discrete 9 Input Value	1 - ON 0 - OFF	ODD	R	
10	Discrete A Input Value	1 - ON 0 - OFF	ODD	R	
11	Discrete B Input Value	1 - ON 0 - OFF	ODD	R	
12	Discrete C Input Value	1 - ON 0 - OFF	ODD	R	
13	Discrete D Input Value	1 - ON 0 - OFF	ODD	R	
14	Discrete E Input Value	1 - ON 0 - OFF	ODD	R	
15	Discrete F Input Value	1 - ON 0 - OFF	ODD	R	

Digital Indicator Loop Status Word (L#DSSW***) - channel n+1/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Discrete 0 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
1	Discrete 1 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
2	Discrete 2 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
3	Discrete 3 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
4	Discrete 4 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
5	Discrete 5 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
6	Discrete 6 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
7	Discrete 7 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
8	Discrete 8 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
9	Discrete 9 Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
10	Discrete A Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
11	Discrete B Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
12	Discrete C Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
13	Discrete D Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
14	Discrete E Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	
15	Discrete F Status (*)	1 - AUTO 0 - MANUAL	ODD	R/W	

* A mask on command will toggle the position of the Auto/Man switch

Digital Indicator Loop Status Word (L#DOSW***) - channel n+2/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Discrete 0 Output Value	1 - ON 0 - OFF	ODD	R/W	O0
1	Discrete 1 Output Value	1 - ON 0 - OFF	ODD	R/W	O1
2	Discrete 2 Output Value	1 - ON 0 - OFF	ODD	R/W	O2
3	Discrete 3 Output Value	1 - ON 0 - OFF	ODD	R/W	O3
4	Discrete 4 Output Value	1 - ON 0 - OFF	ODD	R/W	O4
5	Discrete 5 Output Value	1 - ON 0 - OFF	ODD	R/W	O5
6	Discrete 6 Output Value	1 - ON 0 - OFF	ODD	R/W	O6
7	Discrete 7 Output Value	1 - ON 0 - OFF	ODD	R/W	O7
8	Discrete 8 Output Value	1 - ON 0 - OFF	ODD	R/W	O8
9	Discrete 9 Output Value	1 - ON 0 - OFF	ODD	R/W	O9
10	Discrete A Output Value	1 - ON 0 - OFF	ODD	R/W	OA
11	Discrete B Output Value	1 - ON 0 - OFF	ODD	R/W	OB
12	Discrete C Output Value	1 - ON 0 - OFF	ODD	R/W	OC
13	Discrete D Output Value	1 - ON 0 - OFF	ODD	R/W	OD
14	Discrete E Output Value	1 - ON 0 - OFF	ODD	R/W	OE
15	Discrete F Output Value	1 - ON 0 - OFF	ODD	R/W	OF

Digital Indicator Loop Status Word (L#S***W) - channel n+3/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	PB1SW Input MD (PB1)	1/0 (write of 1 presses PB)	PB1SW	R/W	
1	PB2SW Input MD (PB2)	1/0 (write of 1 presses PB)	PB2SW	R/W	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Pushbutton/Switch Indicator [ODP] - (V2.2)

Code	R/W	Description	Range	Coil(MB)	C/P (LIL)
L#G1P1	W	Group 1 - Press PB1 (*)	1	00296+48(#-1)	n/1(0)
L#G1P2	W	Group 1 - Press PB2 (*)	1	00297+48(#-1)	n/1(1)
L#G1S3	R/W	Group 1 - Auto/Man Switch (*)	1/0	00298+48(#-1)	n/1(2)
L#G1FS	R	Group 1 Feedback Status	1/0	00299+48(#-1)	n/1(3)
L#G2P1	W	Group 2 - Press PB1 (*)	1	00300+48(#-1)	n/1(4)
L#G2P2	W	Group 2 - Press PB2 (*)	1	00301+48(#-1)	n/1(5)
L#G2S3	R/W	Group 2 - Auto/Man Switch (*)	1/0	00302+48(#-1)	n/1(6)
L#G2FS	R	Group 2 - Feedback Status	1/0	00303+48(#-1)	n/1(7)
L#G3P1	W	Group 3 - Press PB1 (*)	1	00304+48(#-1)	n/1(8)
L#G3P2	W	Group 3 - Press PB2 (*)	1	00305+48(#-1)	n/1(9)
L#G3S3	R/W	Group 3 - Auto/Man Switch (*)	1/0	00306+48(#-1)	n/1(10)
L#G3FS	R	Group 3 - Feedback Status	1/0	00307+48(#-1)	n/1(11)
L#G4P1	W	Group 4 - Press PB1 (*)	1	00308+48(#-1)	n/1(12)
L#G4P2	W	Group 4 - Press PB2 (*)	1	00309+48(#-1)	n/1(13)
L#G4S3	R/W	Group 4 - Auto/Man Switch (*)	1/0	00310+48(#-1)	n/1(14)
L#G4FS	R	Group 4 - Feedback Status	1/0	00311+48(#-1)	n/1(15)
L#G5P1	W	Group 5 - Press PB1 (*)	1	00312+48(#-1)	n+1/1(0)
L#G5P2	W	Group 5 - Press PB2 (*)	1	00313+48(#-1)	n+1/1(1)
L#G5S3	R/W	Group 5 - Auto/Man Switch (*)	1/0	00314+48(#-1)	n+1/1(2)
L#G5FS	R	Group 5 - Feedback Status	1/0	00315+48(#-1)	n+1/1(3)
L#G6P1	W	Group 6 - Press PB1 (*)	1	00316+48(#-1)	n+1/1(4)
L#G6P2	W	Group 6 - Press PB2 (*)	1	00317+48(#-1)	n+1/1(5)
L#G6S3	R/W	Group 6 - Auto/Man Switch (*)	1/0	00318+48(#-1)	n+1/1(6)
L#G6FS	R	Group 6 - Feedback Status	1/0	00319+48(#-1)	n+1/1(7)
L#G7P1	W	Group 7 - Press PB1 (*)	1	00320+48(#-1)	n+1/1(8)
L#G7P2	W	Group 7 - Press PB2 (*)	1	00321+48(#-1)	n+1/1(9)
L#G7S3	R/W	Group 7 - Auto/Man Switch (*)	1/0	00322+48(#-1)	n+1/1(10)
L#G7FS	R	Group 7 - Feedback Status	1/0	00323+48(#-1)	n+11(11)
L#G8P1	W	Group 8 - Press PB1 (*)	1	00324+48(#-1)	n+1/1(12)
L#G8P2	W	Group 8 - Press PB2 (*)	1	00325+48(#-1)	n+1/1(13)
L#G8S3	R/W	Group 8 - Auto/Man Switch (*)	1/0	00326+48(#-1)	n+1/1(14)
L#G8FS	R	Group 8 - Feedback Status	1/0	00327+48(#-1)	n+1/1(15)

* L#GnS3 - reading a "1" indicates a switch position of Auto and reading a "0" indicates Man. Writing a "1" to the controller will toggle the state of the Auto/Man switch.

*L#GnP1 & L#GnP2 - writing a "1" to the controller will have the same affect as pushing the button on the faceplate of the controller. If the action of the switch is sustained the switch will change position. If the action is momentary the switch will close for one scan cycle.

Digital Indicator Loop Status Word (L#SW1***) - channel n/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Group 1 - Press PB1	(mask on presses PB)	ODP	W	
1	Group 1 - Press PB2	(mask on presses PB)	ODP	W	
2	Group 1 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
3	Group 1 - Feedback Status	1 - True 0- False	ODP	R	
4	Group 2 - Press PB1	(mask on presses PB)	ODP	W	
5	Group 2 - Press PB2	(mask on presses PB)	ODP	W	
6	Group 2 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
7	Group 2 - Feedback Status	1 - True 0- False	ODP	R	
8	Group 3 - Press PB1	(mask on presses PB)	ODP	W	
9	Group 3 - Press PB2	(mask on presses PB)	ODP	W	
10	Group 3 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
11	Group 3 - Feedback Status	1 - True 0- False	ODP	R	
12	Group 4 - Press PB1	(mask on presses PB)	ODP	W	
13	Group 4 - Press PB2	(mask on presses PB)	ODP	W	
14	Group 4 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
15	Group 4 - Feedback Status	1 - True 0- False	ODP	R	

Digital Indicator Loop Status Word (L#SW2***) - channel n+1/parameter 1***

BIT	Description	Value	Block	Read/Write	Output
0	Group 5 - Press PB1	(mask on presses PB)	ODP	W	
1	Group 5 - Press PB2	(mask on presses PB)	ODP	W	
2	Group 5 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
3	Group 5 - Feedback Status	1 - True 0- False	ODP	R	
4	Group 6 - Press PB1	(mask on presses PB)	ODP	W	
5	Group 6 - Press PB2	(mask on presses PB)	ODP	W	
6	Group 6 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
7	Group 6 - Feedback Status	1 - True 0- False	ODP	R	
8	Group 7 - Press PB1	(mask on presses PB)	ODP	W	
9	Group 7 - Press PB2	(mask on presses PB)	ODP	W	
10	Group 7 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
11	Group 7 - Feedback Status	1 - True 0- False *	ODP	R	
12	Group 8 - Press PB1	(mask on presses PB)	ODP	W	
13	Group 8 - Press PB2	(mask on presses PB)	ODP	W	
14	Group 8 - Auto/Man Switch	1 - Auto 0- Manual *	ODP	R/W	
15	Group 8 - Feedback Status	1 - True 0- False	ODP	R	

* A mask on command will toggle the position of the Auto/Man switch

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