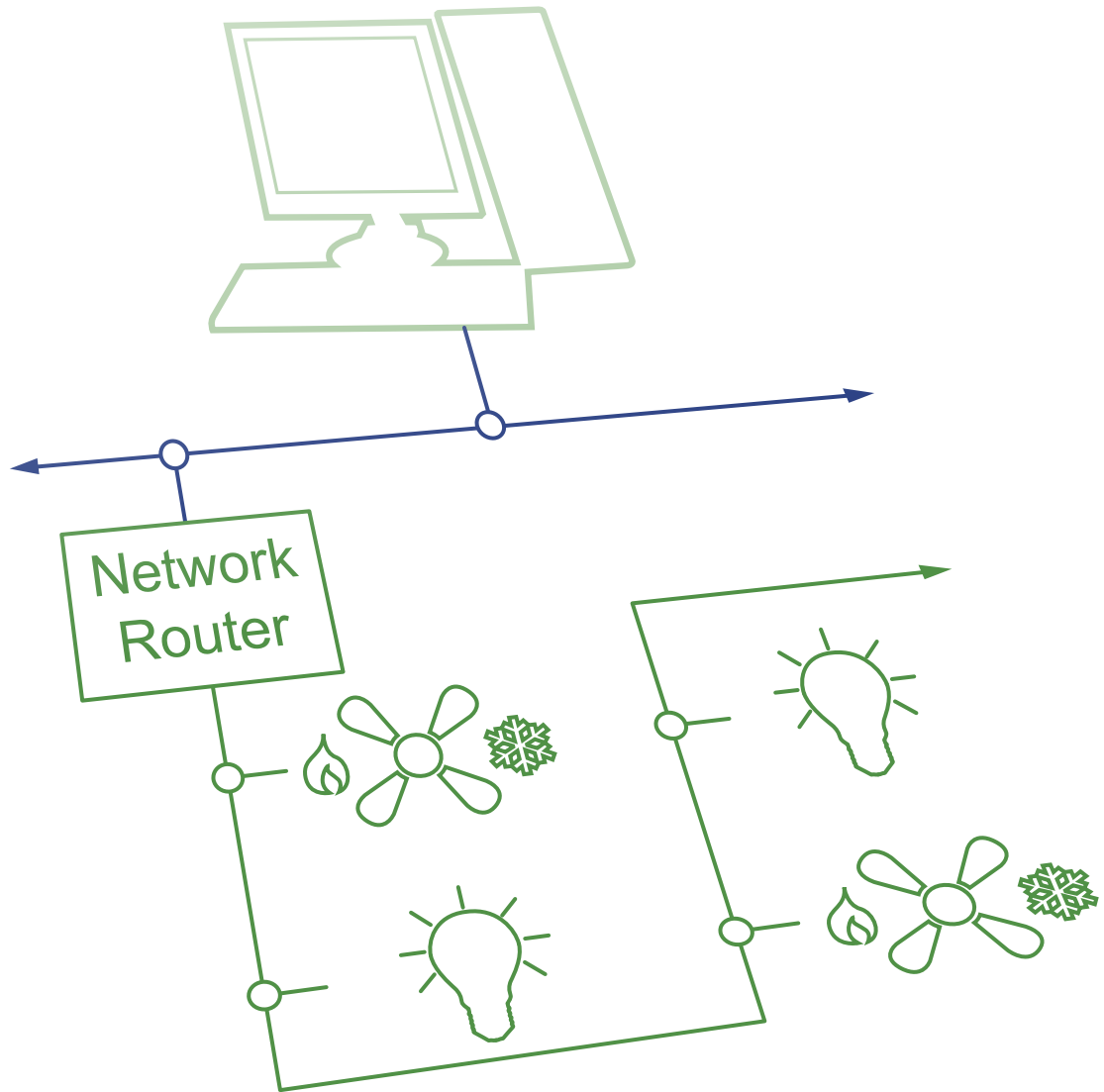


Integration Information and Point List (BACnet MSTP and P1)

Unified



Attention

This section serves as a notice of the immediate or potential dangers involved when working with the equipment described throughout this manual. Any person involved in installation, maintenance, or service of the equipment should first carefully examine the equipment and read the instructions contained in this manual to ensure that personal and/or equipment injury is avoided.

The following safety messages appear throughout this manual to alert of immediate or potential danger to life as well as property.



Note : Indicates an important note.



Tip : Indicates a helpful tip or trick.



Safety Reminder : Applicable safety instructions will be included with this symbol.



DANGER : Indicates an immediately hazardous situation which ,if not avoided, will result in serious injury or death.



WARNING : Indicates a potentially hazardous situation which ,if not avoided, may result in serious injury or death.



CAUTION : Indicates a potentially hazardous situation which ,if not avoided, may result in minor or moderate injury.

Disclaimer

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designated to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Instructions contained in this user's guide should be performed only by qualified persons in accordance with local and national codes. Blue Ridge Technologies International, LLC and its affiliates assume no responsibility for any consequences related to the improper use of this manual.



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Document Overview

This document provides Lx5 Controller integration information and point lists for BACnet MSTP as well as P1 data communication protocols. This information applies to the following Blue Ridge Technologies product:

Relay Panel (RP)
Retrofit-Kit (RK)
Retrofit Interior (RI)

Also applies to Lx5 equipped legacy products:

L2500, L2600, and L3500
LP3500
Qwik-Kit Pro

For Lx5 hardware details and configuration, including addressing, baud rates, and protocol selection, refer to the Lx5 Hardware User Guide.

For Lx5 programming including input/output configuration, group setup, input types, and timers, refer to the USB Tech Kit User Guide.

For physical installation of Lx5 based products, refer to the appropriate product Mounting Instructions or Installation Guide.

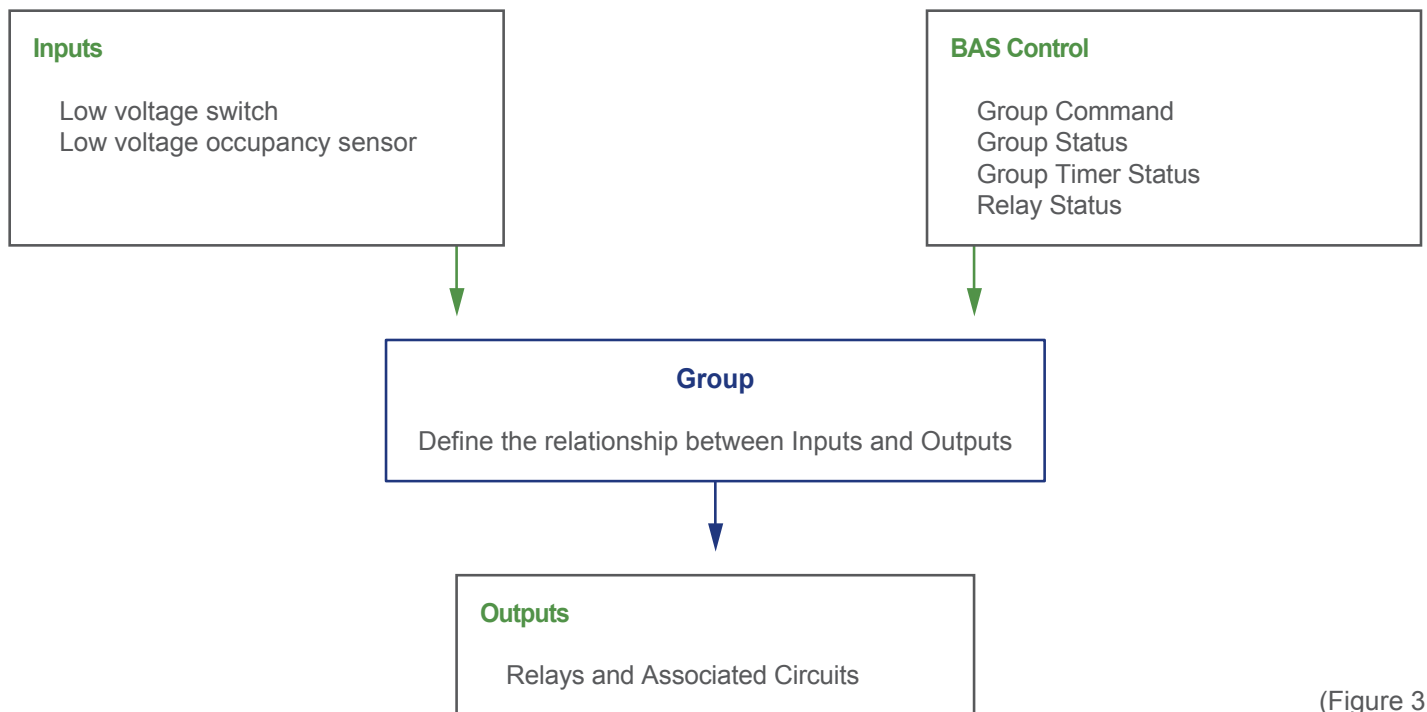


Before handling any components, the technician should be grounded to prevent circuit board damage. Circuit board parts are fragile handle with care.

Controller Communication Overview

The base for Lx5 operation is the Lighting Control Engine (LCE). LCE's essential function is to assign inputs to outputs utilizing a grouping method. Inputs (switches, occupancy sensors, etc) are assigned control of a Group. Each Group contains outputs (relays and related lighting circuits). Therefore, input commands and configurations are applied to outputs through Groups. *

The LCE facilitates BAS control in the same manner. This allows direct BAS control of individual Groups as well as certain Lx5 parameters. (Figure 1)



(Figure 3)

*Refer to USB Tech Kit User Guide for Group configuration instructions.

BACnet: Integration Overview

BACnet MSTP integration facilitates the following BAS functions in all Lx5 based products:

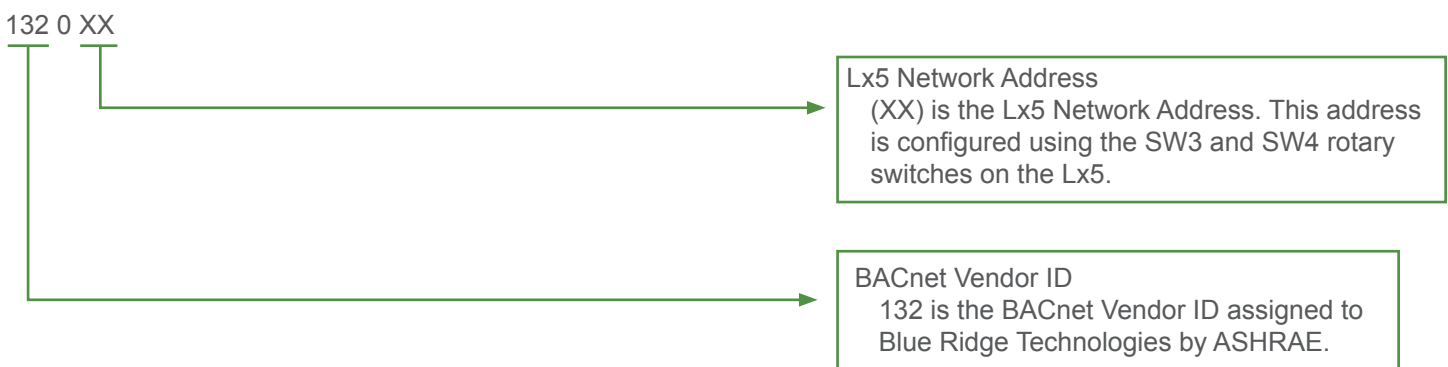
- Control Group-Multi-State Value
- Get Status of Group-Binary Value
- Get Status of Group-Multi-State Value
- Get Value of a Group Timer-Analog Value
- Get Value of Analog Input-Analog Value
- Set Minimum value of a sensor wired to an Analog Input-Analog Value
- Set Maximum value of a sensor wired to an Analog Input-Analog Value
- Get Status of a Relay-Binary Value

Complete the following steps before beginning integration.*

1. Complete the Switch Input and Group Programming Worksheets for each Lx5.**
2. Set the network address of each Lx5.
3. Confirm proper baud rate and protocol have been selected.
4. Verify the BAS network is connected to the Lx5 EIA-485 Terminal Block.
5. If an Lx5 is operated as an End-of-line device (first or last controller on a network) ensure provided network terminator BT485 is installed.

BACnet: Device ID

The BACnet Device ID allows the BAS to identify specific Lx5's on a BACnet network. This Device ID is composed of two elements the BACnet Vendor ID and Lx5 Network Address (1-99). Each Lx5 must have a unique Device ID on the BAS network. (Figure 2)



(Figure 4)

* Refer to Lx5 Hardware User Guide for network address, baud rate, protocol, and termination configuration instructions.

** Refer to USB Tech Kit User Guide for Switch Input and Group Programming Worksheets.

BACnet: Functions

Value Name	BACnet Object Type	Function	Valid Values	Value Definition
Group Schedule (Local) ¹ (schedule_schedule_GG)	Schedule	Read/Write	BACnet Schedule	
Group Command ¹ (cmd_GG)	Multi-State Value (BMSV)	Read/Write	1 2 3 4	Do Nothing ² Command Group OFF with Flash Warning ³ Command Group OFF Command Group ON
Group Status (ms_groupstat_GG)	Multi-State Value (BMSV)	Read Only	1 2 3 4 5 6 7	Group OFF due to serial command or local schedule Group ON due to serial command or local schedule Group OFF due to override switch Group ON due to override switch Group ON due to override switch with timer count Group ON due to manual override switch on Lx5 Group OFF due to manual override switch on Lx5
Group Status (b_groupstat_GG)	Binary Value (BBV)	Read Only	0 1	Group OFF Group ON
Group Timer Status (timer_GG)	Analog Value (BAV)	Read Only	0 - 64,800	Group timer count down value (seconds)
Relay Status (relayRRstat_61)	Binary Value (BBV)	Read Only	0 1	Relay OFF Relay ON
Analog Input Min Sensor Range (aiX_min)	Analog Value (BAV)	Read/Write	0-1000	Set Analog Input Minimum Value
Analog Input Max Sensor Range (aiX_max)	Analog Value (BAV)	Read/Write	0-1000	Set Analog Input Maximum Value
Analog Input Status Footcandles (aiX_fc_61)	Analog Value (BAV)	Read Only	0-1000	Analog Input Status - Footcandles
Analog Input Status Lux (aiX_lux_61)	Analog Value (BAV)	Read Only	0-1000	Analog Input Status - Lux



¹Using both the Group Schedule (local) and the Group Command on the same Group is not recommended and may create conflicts. When using the Group Command ensure that the Group Schedule (local) has no schedules programmed.

²Do Nothing (BACnet Null) is designed for use in a manual ON control sequence or in a control sequence that requires multiple OFF commands (sweeps).

³Off with Flash Warning does not require any local flash settings to be selected. This function will use the default flash warning parameters set in LPPK.

GG = Group Number 1 - 60 / RR = Relay Number 1 - 60 / X = Analog Input Number 1 - 6

BACnet: Serial Priorities

BACnet priorities regulate the relationship between the BAS components on a scale of 1-16 with 1 representing the highest priority. The Lx5 will minimize priority conflicts given the default priorities. Altering the default priorities listed below is not recommended.*

Commands	Group Setup	
	Serial On Priority Selected	Serial On Priority Deselected
BACnet Schedule (Local or Remote)	15	16
Lx5 Local Overrides (Wall Switch, Occupancy Sensor, Etc.)	16	16
BAS Manual Override (Operator Override)	8	8

BACnet: Event Alarms

Event Alarms ease trouble shooting allowing the Lx5 to alert the user to errors.

Name	Type	Object ID	Object Name
Common Alarms / Module Halted	EVT	BV:4000000	Module Halted Alarm
Common Alarms / All Programs Stopped	EVT	BV:4000001	All Programs Stopped Alarm
Common Alarms / Duplicate Address	EVT	BV:4000002	Duplicate Address Alarm
Common Alarms / Locked I/O	EVT	BV:4000003	Locked I/O Alarm
Common Alarms / Control Program	EVT	BV:4000004	Control Program Alarm
Common Alarms / Program Stopped	EVT	BV:4000005	Program Stopped Alarm

* Refer to USB Tech Kit User Guide for Serial On Priority configuration.

BACnet Points

Name	Type	Object ID	Object Name
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Group 1

Group Schedule (Local)	Schedule	Schedule:1	schedule_schedule_1
Group Status Binary	BBV	BV:101	b_groupstat_1
Group Command Multi State Value	BMSV	MSV:1	cmd_1
Group Status Multi State Value	BMSV	MSV:101	ms_groupstat_1
Group Timer	BAV	AV:1	timer_1

Group 2

Group Schedule (Local)	Schedule	Schedule:2	schedule_schedule_2
Group Status Binary	BBV	BV:102	b_groupstat_2
Group Command Multi State Value	BMSV	MSV:2	cmd_2
Group Status Multi State Value	BMSV	MSV:102	ms_groupstat_2
Group Timer	BAV	AV:2	timer_2

Group 3

Group Schedule (Local)	Schedule	Schedule:3	schedule_schedule_3
Group Status Binary	BBV	BV:103	b_groupstat_3
Group Command Multi State Value	BMSV	MSV:3	cmd_3
Group Status Multi State Value	BMSV	MSV:103	ms_groupstat_3
Group Timer	BAV	AV:3	timer_3

Group 4

Group Schedule (Local)	Schedule	Schedule:4	schedule_schedule_4
Group Status Binary	BBV	BV:104	b_groupstat_4
Group Command Multi State Value	BMSV	MSV:4	cmd_4
Group Status Multi State Value	BMSV	MSV:104	ms_groupstat_4
Group Timer	BAV	AV:4	timer_4

Group 5

Group Schedule (Local)	Schedule	Schedule:5	schedule_schedule_5
Group Status Binary	BBV	BV:105	b_groupstat_5
Group Command Multi State Value	BMSV	MSV:5	cmd_5
Group Status Multi State Value	BMSV	MSV:105	ms_groupstat_5
Group Timer	BAV	AV:5	timer_5

BACnet Points

Name	Type	Object ID	Object Name
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Group 6

Group Schedule (Local)	Schedule	Schedule:6	schedule_schedule_6
Group Status Binary	BBV	BV:106	b_groupstat_6
Group Command Multi State Value	BMSV	MSV:6	cmd_6
Group Status Multi State Value	BMSV	MSV:106	ms_groupstat_6
Group Timer	BAV	AV:6	timer_6

Group 7

Group Schedule (Local)	Schedule	Schedule:7	schedule_schedule_7
Group Status Binary	BBV	BV:107	b_groupstat_7
Group Command Multi State Value	BMSV	MSV:7	cmd_7
Group Status Multi State Value	BMSV	MSV:107	ms_groupstat_7
Group Timer	BAV	AV:7	timer_7

Group 8

Group Schedule (Local)	Schedule	Schedule:8	schedule_schedule_8
Group Status Binary	BBV	BV:108	b_groupstat_8
Group Command Multi State Value	BMSV	MSV:8	cmd_8
Group Status Multi State Value	BMSV	MSV:108	ms_groupstat_8
Group Timer	BAV	AV:8	timer_8

Group 9

Group Schedule (Local)	Schedule	Schedule:9	schedule_schedule_9
Group Status Binary	BBV	BV:109	b_groupstat_9
Group Command Multi State Value	BMSV	MSV:9	cmd_9
Group Status Multi State Value	BMSV	MSV:109	ms_groupstat_9
Group Timer	BAV	AV:9	timer_9

Group 10

Group Schedule (Local)	Schedule	Schedule:10	schedule_schedule_10
Group Status Binary	BBV	BV:110	b_groupstat_10
Group Command Multi State Value	BMSV	MSV:10	cmd_10
Group Status Multi State Value	BMSV	MSV:110	ms_groupstat_10
Group Timer	BAV	AV:10	timer_10

BACnet Points

Name	Type	Object ID	Object Name
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Group 11

Group Schedule (Local)	Schedule	Schedule:11	schedule_schedule_11
Group Status Binary	BBV	BV:111	b_groupstat_11
Group Command Multi State Value	BMSV	MSV:11	cmd_11
Group Status Multi State Value	BMSV	MSV:111	ms_groupstat_11
Group Timer	BAV	AV:11	timer_11

Group 12

Group Schedule (Local)	Schedule	Schedule:12	schedule_schedule_12
Group Status Binary	BBV	BV:112	b_groupstat_12
Group Command Multi State Value	BMSV	MSV:12	cmd_12
Group Status Multi State Value	BMSV	MSV:112	ms_groupstat_12
Group Timer	BAV	AV:12	timer_12

Group 13

Group Schedule (Local)	Schedule	Schedule:13	schedule_schedule_13
Group Status Binary	BBV	BV:113	b_groupstat_13
Group Command Multi State Value	BMSV	MSV:13	cmd_13
Group Status Multi State Value	BMSV	MSV:113	ms_groupstat_13
Group Timer	BAV	AV:13	timer_13

Group 14

Group Schedule (Local)	Schedule	Schedule:14	schedule_schedule_14
Group Status Binary	BBV	BV:114	b_groupstat_14
Group Command Multi State Value	BMSV	MSV:14	cmd_14
Group Status Multi State Value	BMSV	MSV:114	ms_groupstat_14
Group Timer	BAV	AV:14	timer_14

Group 15

Group Schedule (Local)	Schedule	Schedule:15	schedule_schedule_15
Group Status Binary	BBV	BV:115	b_groupstat_15
Group Command Multi State Value	BMSV	MSV:15	cmd_15
Group Status Multi State Value	BMSV	MSV:115	ms_groupstat_15
Group Timer	BAV	AV:15	timer_15

BACnet Points

Name	Type	Object ID	Object Name
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Group 16

Group Schedule (Local)	Schedule	Schedule:16	schedule_schedule_16
Group Status Binary	BBV	BV:116	b_groupstat_16
Group Command Multi State Value	BMSV	MSV:16	cmd_16
Group Status Multi State Value	BMSV	MSV:116	ms_groupstat_16
Group Timer	BAV	AV:16	timer_16

Group 17

Group Schedule (Local)	Schedule	Schedule:17	schedule_schedule_17
Group Status Binary	BBV	BV:117	b_groupstat_17
Group Command Multi State Value	BMSV	MSV:17	cmd_17
Group Status Multi State Value	BMSV	MSV:117	ms_groupstat_17
Group Timer	BAV	AV:17	timer_17

Group 18

Group Schedule (Local)	Schedule	Schedule:18	schedule_schedule_18
Group Status Binary	BBV	BV:118	b_groupstat_18
Group Command Multi State Value	BMSV	MSV:18	cmd_18
Group Status Multi State Value	BMSV	MSV:118	ms_groupstat_18
Group Timer	BAV	AV:18	timer_18

Group 19

Group Schedule (Local)	Schedule	Schedule:19	schedule_schedule_19
Group Status Binary	BBV	BV:119	b_groupstat_19
Group Command Multi State Value	BMSV	MSV:19	cmd_19
Group Status Multi State Value	BMSV	MSV:119	ms_groupstat_19
Group Timer	BAV	AV:19	timer_19

Group 20

Group Schedule (Local)	Schedule	Schedule:20	schedule_schedule_20
Group Status Binary	BBV	BV:120	b_groupstat_20
Group Command Multi State Value	BMSV	MSV:20	cmd_20
Group Status Multi State Value	BMSV	MSV:120	ms_groupstat_20
Group Timer	BAV	AV:20	timer_20

BACnet Points

Name	Type	Object ID	Object Name
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Group 21

Group Schedule (Local)	Schedule	Schedule:21	schedule_schedule_21
Group Status Binary	BBV	BV:121	b_groupstat_21
Group Command Multi State Value	BMSV	MSV:21	cmd_21
Group Status Multi State Value	BMSV	MSV:121	ms_groupstat_21
Group Timer	BAV	AV:21	timer_21

Group 22

Group Schedule (Local)	Schedule	Schedule:22	schedule_schedule_22
Group Status Binary	BBV	BV:122	b_groupstat_22
Group Command Multi State Value	BMSV	MSV:22	cmd_22
Group Status Multi State Value	BMSV	MSV:122	ms_groupstat_22
Group Timer	BAV	AV:22	timer_22

Group 23

Group Schedule (Local)	Schedule	Schedule:23	schedule_schedule_23
Group Status Binary	BBV	BV:123	b_groupstat_23
Group Command Multi State Value	BMSV	MSV:23	cmd_23
Group Status Multi State Value	BMSV	MSV:123	ms_groupstat_23
Group Timer	BAV	AV:23	timer_23

Group 24

Group Schedule (Local)	Schedule	Schedule:24	schedule_schedule_24
Group Status Binary	BBV	BV:124	b_groupstat_24
Group Command Multi State Value	BMSV	MSV:24	cmd_24
Group Status Multi State Value	BMSV	MSV:124	ms_groupstat_24
Group Timer	BAV	AV:24	timer_24

Group 25

Group Schedule (Local)	Schedule	Schedule:25	schedule_schedule_25
Group Status Binary	BBV	BV:125	b_groupstat_25
Group Command Multi State Value	BMSV	MSV:25	cmd_25
Group Status Multi State Value	BMSV	MSV:125	ms_groupstat_25
Group Timer	BAV	AV:25	timer_25

BACnet Points

Name	Type	Object ID	Object Name
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Group 26

Group Schedule (Local)	Schedule	Schedule:26	schedule_schedule_26
Group Status Binary	BBV	BV:126	b_groupstat_26
Group Command Multi State Value	BMSV	MSV:26	cmd_26
Group Status Multi State Value	BMSV	MSV:126	ms_groupstat_26
Group Timer	BAV	AV:26	timer_26

Group 27

Group Schedule (Local)	Schedule	Schedule:27	schedule_schedule_27
Group Status Binary	BBV	BV:127	b_groupstat_27
Group Command Multi State Value	BMSV	MSV:27	cmd_27
Group Status Multi State Value	BMSV	MSV:127	ms_groupstat_27
Group Timer	BAV	AV:27	timer_27

Group 28

Group Schedule (Local)	Schedule	Schedule:28	schedule_schedule_28
Group Status Binary	BBV	BV:128	b_groupstat_28
Group Command Multi State Value	BMSV	MSV:28	cmd_28
Group Status Multi State Value	BMSV	MSV:128	ms_groupstat_28
Group Timer	BAV	AV:28	timer_28

Group 29

Group Schedule (Local)	Schedule	Schedule:29	schedule_schedule_29
Group Status Binary	BBV	BV:129	b_groupstat_29
Group Command Multi State Value	BMSV	MSV:29	cmd_29
Group Status Multi State Value	BMSV	MSV:129	ms_groupstat_29
Group Timer	BAV	AV:29	timer_29

Group 30

Group Schedule (Local)	Schedule	Schedule:30	schedule_schedule_30
Group Status Binary	BBV	BV:130	b_groupstat_30
Group Command Multi State Value	BMSV	MSV:30	cmd_30
Group Status Multi State Value	BMSV	MSV:130	ms_groupstat_30
Group Timer	BAV	AV:30	timer_30

BACnet Points

Name	Type	Object ID	Object Name
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Group 31

Group Schedule (Local)	Schedule	Schedule:31	schedule_schedule_31
Group Status Binary	BBV	BV:131	b_groupstat_31
Group Command Multi State Value	BMSV	MSV:31	cmd_31
Group Status Multi State Value	BMSV	MSV:131	ms_groupstat_31
Group Timer	BAV	AV:31	timer_31

Group 32

Group Schedule (Local)	Schedule	Schedule:32	schedule_schedule_32
Group Status Binary	BBV	BV:132	b_groupstat_32
Group Command Multi State Value	BMSV	MSV:32	cmd_32
Group Status Multi State Value	BMSV	MSV:132	ms_groupstat_32
Group Timer	BAV	AV:32	timer_32

Group 33

Group Schedule (Local)	Schedule	Schedule:33	schedule_schedule_33
Group Status Binary	BBV	BV:133	b_groupstat_33
Group Command Multi State Value	BMSV	MSV:33	cmd_33
Group Status Multi State Value	BMSV	MSV:133	ms_groupstat_33
Group Timer	BAV	AV:33	timer_33

Group 34

Group Schedule (Local)	Schedule	Schedule:34	schedule_schedule_34
Group Status Binary	BBV	BV:134	b_groupstat_34
Group Command Multi State Value	BMSV	MSV:34	cmd_34
Group Status Multi State Value	BMSV	MSV:134	ms_groupstat_34
Group Timer	BAV	AV:34	timer_34

Group 35

Group Schedule (Local)	Schedule	Schedule:35	schedule_schedule_35
Group Status Binary	BBV	BV:135	b_groupstat_35
Group Command Multi State Value	BMSV	MSV:35	cmd_35
Group Status Multi State Value	BMSV	MSV:135	ms_groupstat_35
Group Timer	BAV	AV:35	timer_35

BACnet Points

Name	Type	Object ID	Object Name
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Group 36

Group Schedule (Local)	Schedule	Schedule:36	schedule_schedule_36
Group Status Binary	BBV	BV:136	b_groupstat_36
Group Command Multi State Value	BMSV	MSV:36	cmd_36
Group Status Multi State Value	BMSV	MSV:136	ms_groupstat_36
Group Timer	BAV	AV:36	timer_36

Group 37

Group Schedule (Local)	Schedule	Schedule:37	schedule_schedule_37
Group Status Binary	BBV	BV:137	b_groupstat_37
Group Command Multi State Value	BMSV	MSV:37	cmd_37
Group Status Multi State Value	BMSV	MSV:137	ms_groupstat_37
Group Timer	BAV	AV:37	timer_37

Group 38

Group Schedule (Local)	Schedule	Schedule:38	schedule_schedule_38
Group Status Binary	BBV	BV:138	b_groupstat_38
Group Command Multi State Value	BMSV	MSV:38	cmd_38
Group Status Multi State Value	BMSV	MSV:138	ms_groupstat_38
Group Timer	BAV	AV:38	timer_38

Group 39

Group Schedule (Local)	Schedule	Schedule:39	schedule_schedule_39
Group Status Binary	BBV	BV:139	b_groupstat_39
Group Command Multi State Value	BMSV	MSV:39	cmd_39
Group Status Multi State Value	BMSV	MSV:139	ms_groupstat_39
Group Timer	BAV	AV:39	timer_39

Group 40

Group Schedule (Local)	Schedule	Schedule:40	schedule_schedule_40
Group Status Binary	BBV	BV:140	b_groupstat_40
Group Command Multi State Value	BMSV	MSV:40	cmd_40
Group Status Multi State Value	BMSV	MSV:140	ms_groupstat_40
Group Timer	BAV	AV:40	timer_40

BACnet Points

Name	Type	Object ID	Object Name
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Group 41

Group Schedule (Local)	Schedule	Schedule:41	schedule_schedule_41
Group Status Binary	BBV	BV:141	b_groupstat_41
Group Command Multi State Value	BMSV	MSV:41	cmd_41
Group Status Multi State Value	BMSV	MSV:141	ms_groupstat_41
Group Timer	BAV	AV:41	timer_41

Group 42

Group Schedule (Local)	Schedule	Schedule:42	schedule_schedule_42
Group Status Binary	BBV	BV:142	b_groupstat_42
Group Command Multi State Value	BMSV	MSV:42	cmd_42
Group Status Multi State Value	BMSV	MSV:142	ms_groupstat_42
Group Timer	BAV	AV:42	timer_42

Group 43

Group Schedule (Local)	Schedule	Schedule:43	schedule_schedule_43
Group Status Binary	BBV	BV:143	b_groupstat_43
Group Command Multi State Value	BMSV	MSV:43	cmd_43
Group Status Multi State Value	BMSV	MSV:143	ms_groupstat_43
Group Timer	BAV	AV:43	timer_43

Group 44

Group Schedule (Local)	Schedule	Schedule:44	schedule_schedule_44
Group Status Binary	BBV	BV:144	b_groupstat_44
Group Command Multi State Value	BMSV	MSV:44	cmd_44
Group Status Multi State Value	BMSV	MSV:144	ms_groupstat_44
Group Timer	BAV	AV:44	timer_44

Group 45

Group Schedule (Local)	Schedule	Schedule:45	schedule_schedule_45
Group Status Binary	BBV	BV:145	b_groupstat_45
Group Command Multi State Value	BMSV	MSV:45	cmd_45
Group Status Multi State Value	BMSV	MSV:145	ms_groupstat_45
Group Timer	BAV	AV:45	timer_45

BACnet Points

Name	Type	Object ID	Object Name
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Group 46

Group Schedule (Local)	Schedule	Schedule:46	schedule_schedule_46
Group Status Binary	BBV	BV:146	b_groupstat_46
Group Command Multi State Value	BMSV	MSV:46	cmd_46
Group Status Multi State Value	BMSV	MSV:146	ms_groupstat_46
Group Timer	BAV	AV:46	timer_46

Group 47

Group Schedule (Local)	Schedule	Schedule:47	schedule_schedule_47
Group Status Binary	BBV	BV:147	b_groupstat_47
Group Command Multi State Value	BMSV	MSV:47	cmd_47
Group Status Multi State Value	BMSV	MSV:147	ms_groupstat_47
Group Timer	BAV	AV:47	timer_47

Group 48

Group Schedule (Local)	Schedule	Schedule:48	schedule_schedule_48
Group Status Binary	BBV	BV:148	b_groupstat_48
Group Command Multi State Value	BMSV	MSV:48	cmd_48
Group Status Multi State Value	BMSV	MSV:148	ms_groupstat_48
Group Timer	BAV	AV:48	timer_48

Group 49

Group Schedule (Local)	Schedule	Schedule:49	schedule_schedule_49
Group Status Binary	BBV	BV:149	b_groupstat_49
Group Command Multi State Value	BMSV	MSV:49	cmd_49
Group Status Multi State Value	BMSV	MSV:149	ms_groupstat_49
Group Timer	BAV	AV:49	timer_49

Group 50

Group Schedule (Local)	Schedule	Schedule:50	schedule_schedule_50
Group Status Binary	BBV	BV:150	b_groupstat_50
Group Command Multi State Value	BMSV	MSV:50	cmd_50
Group Status Multi State Value	BMSV	MSV:150	ms_groupstat_50
Group Timer	BAV	AV:50	timer_50

BACnet Points

Name	Type	Object ID	Object Name
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Group 51

Group Schedule (Local)	Schedule	Schedule:51	schedule_schedule_51
Group Status Binary	BBV	BV:151	b_groupstat_51
Group Command Multi State Value	BMSV	MSV:51	cmd_51
Group Status Multi State Value	BMSV	MSV:151	ms_groupstat_51
Group Timer	BAV	AV:51	timer_51

Group 52

Group Schedule (Local)	Schedule	Schedule:52	schedule_schedule_52
Group Status Binary	BBV	BV:152	b_groupstat_52
Group Command Multi State Value	BMSV	MSV:52	cmd_52
Group Status Multi State Value	BMSV	MSV:152	ms_groupstat_52
Group Timer	BAV	AV:52	timer_52

Group 53

Group Schedule (Local)	Schedule	Schedule:53	schedule_schedule_53
Group Status Binary	BBV	BV:153	b_groupstat_53
Group Command Multi State Value	BMSV	MSV:53	cmd_53
Group Status Multi State Value	BMSV	MSV:153	ms_groupstat_53
Group Timer	BAV	AV:53	timer_53

Group 54

Group Schedule (Local)	Schedule	Schedule:54	schedule_schedule_54
Group Status Binary	BBV	BV:154	b_groupstat_54
Group Command Multi State Value	BMSV	MSV:54	cmd_54
Group Status Multi State Value	BMSV	MSV:154	ms_groupstat_54
Group Timer	BAV	AV:54	timer_54

Group 55

Group Schedule (Local)	Schedule	Schedule:55	schedule_schedule_55
Group Status Binary	BBV	BV:155	b_groupstat_55
Group Command Multi State Value	BMSV	MSV:55	cmd_55
Group Status Multi State Value	BMSV	MSV:155	ms_groupstat_55
Group Timer	BAV	AV:55	timer_55

BACnet Points

Name	Type	Object ID	Object Name
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Group 56

Group Schedule (Local)	Schedule	Schedule:56	schedule_schedule_56
Group Status Binary	BBV	BV:156	b_groupstat_56
Group Command Multi State Value	BMSV	MSV:56	cmd_56
Group Status Multi State Value	BMSV	MSV:156	ms_groupstat_56
Group Timer	BAV	AV:56	timer_56

Group 57

Group Schedule (Local)	Schedule	Schedule:57	schedule_schedule_57
Group Status Binary	BBV	BV:157	b_groupstat_57
Group Command Multi State Value	BMSV	MSV:57	cmd_57
Group Status Multi State Value	BMSV	MSV:157	ms_groupstat_57
Group Timer	BAV	AV:57	timer_57

Group 58

Group Schedule (Local)	Schedule	Schedule:58	schedule_schedule_58
Group Status Binary	BBV	BV:158	b_groupstat_58
Group Command Multi State Value	BMSV	MSV:58	cmd_58
Group Status Multi State Value	BMSV	MSV:158	ms_groupstat_58
Group Timer	BAV	AV:58	timer_58

Group 59

Group Schedule (Local)	Schedule	Schedule:59	schedule_schedule_59
Group Status Binary	BBV	BV:159	b_groupstat_59
Group Command Multi State Value	BMSV	MSV:59	cmd_59
Group Status Multi State Value	BMSV	MSV:159	ms_groupstat_59
Group Timer	BAV	AV:59	timer_59

Group 60

Group Schedule (Local)	Schedule	Schedule:60	schedule_schedule_60
Group Status Binary	BBV	BV:160	b_groupstat_60
Group Command Multi State Value	BMSV	MSV:60	cmd_60
Group Status Multi State Value	BMSV	MSV:160	ms_groupstat_60
Group Timer	BAV	AV:60	timer_60

BACnet Points

Name	Type	Object ID	Object Name
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Sensor Values

Analog Input 1 (Foot-Candles)	BAV	AV:101	ai1_fc_61
Analog Input 1 (LUX)	BAV	AV:111	ai1_lux_61
Analog Input 1 Min. Sensor Range	BAV	AV:121	ai1_min
Analog Input 1 Max. Sensor Range	BAV	AV:131	ai1_max
Analog Input 2 (Foot-Candles)	BAV	AV:102	ai2_fc_61
Analog Input 2 (LUX)	BAV	AV:112	ai2_lux_61
Analog Input 2 Min. Sensor Range	BAV	AV:122	ai2_min
Analog Input 2 Max. Sensor Range	BAV	AV:132	ai2_max
Analog Input 3 (Foot-Candles)	BAV	AV:103	ai3_fc_61
Analog Input 3 (LUX)	BAV	AV:113	ai3_lux_61
Analog Input 3 Min. Sensor Range	BAV	AV:123	ai3_min
Analog Input 3 Max. Sensor Range	BAV	AV:133	ai3_max
Analog Input 4 (Foot-Candles)	BAV	AV:104	ai4_fc_61
Analog Input 4 (LUX)	BAV	AV:114	ai4_lux_61
Analog Input 4 Min. Sensor Range	BAV	AV:124	ai4_min
Analog Input 4 Max. Sensor Range	BAV	AV:134	ai4_max
Analog Input 5 (Foot-Candles)	BAV	AV:105	ai5_fc_61
Analog Input 5 (LUX)	BAV	AV:115	ai5_lux_61
Analog Input 5 Min. Sensor Range	BAV	AV:125	ai5_min
Analog Input 5 Max. Sensor Range	BAV	AV:135	ai5_max
Analog Input 6 (Foot-Candles)	BAV	AV:106	ai6_fc_61
Analog Input 6 (lux)	BAV	AV:116	ai6_lux_61
Analog Input 6 Min. Sensor Range	BAV	AV:126	ai6_min
Analog Input 6 Max. Sensor Range	BAV	AV:136	ai6_max

BACnet Points

Name	Type	Object ID	Object Name
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Relay Status

Relay 1 Status	BBV	BV:201	relay1stat_61
Relay 2 Status	BBV	BV:202	relay2stat_61
Relay 3 Status	BBV	BV:203	relay3stat_61
Relay 4 Status	BBV	BV:204	relay4stat_61
Relay 5 Status	BBV	BV:205	relay5stat_61
Relay 6 Status	BBV	BV:206	relay6stat_61
Relay 7 Status	BBV	BV:207	relay7stat_61
Relay 8 Status	BBV	BV:208	relay8stat_61
Relay 9 Status	BBV	BV:209	relay9stat_61
Relay 10 Status	BBV	BV:210	relay10stat_61
Relay 11 Status	BBV	BV:211	relay11stat_61
Relay 12 Status	BBV	BV:212	relay12stat_61
Relay 13 Status	BBV	BV:213	relay13stat_61
Relay 14 Status	BBV	BV:214	relay14stat_61
Relay 15 Status	BBV	BV:215	relay15stat_61
Relay 16 Status	BBV	BV:216	relay16stat_61
Relay 17 Status	BBV	BV:217	relay17stat_61
Relay 18 Status	BBV	BV:218	relay18stat_61
Relay 19 Status	BBV	BV:219	relay19stat_61
Relay 20 Status	BBV	BV:220	relay20stat_61
Relay 21 Status	BBV	BV:221	relay21stat_61
Relay 22 Status	BBV	BV:222	relay22stat_61
Relay 23 Status	BBV	BV:223	relay23stat_61
Relay 24 Status	BBV	BV:224	relay24stat_61
Relay 25 Status	BBV	BV:225	relay25stat_61
Relay 26 Status	BBV	BV:226	relay26stat_61
Relay 27 Status	BBV	BV:227	relay27stat_61
Relay 28 Status	BBV	BV:228	relay28stat_61
Relay 29 Status	BBV	BV:229	relay29stat_61
Relay 30 Status	BBV	BV:230	relay30stat_61
Relay 31 Status	BBV	BV:231	relay31stat_61
Relay 32 Status	BBV	BV:232	relay32stat_61
Relay 33 Status	BBV	BV:233	relay33stat_61
Relay 34 Status	BBV	BV:234	relay34stat_61
Relay 35 Status	BBV	BV:235	relay35stat_61
Relay 36 Status	BBV	BV:236	relay36stat_61

BACnet Points

Name	Type	Object ID	Object Name
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Relay Status

Relay 37 Status	BBV	BV:237	relay37stat_61
Relay 38 Status	BBV	BV:238	relay38stat_61
Relay 39 Status	BBV	BV:239	relay39stat_61
Relay 40 Status	BBV	BV:240	relay40stat_61
Relay 41 Status	BBV	BV:241	relay41stat_61
Relay 42 Status	BBV	BV:242	relay42stat_61
Relay 43 Status	BBV	BV:243	relay43stat_61
Relay 44 Status	BBV	BV:244	relay44stat_61
Relay 45 Status	BBV	BV:245	relay45stat_61
Relay 46 Status	BBV	BV:246	relay46stat_61
Relay 47 Status	BBV	BV:247	relay47stat_61
Relay 48 Status	BBV	BV:248	relay48stat_61
Relay 49 Status	BBV	BV:249	relay49stat_61
Relay 50 Status	BBV	BV:250	relay50stat_61
Relay 51 Status	BBV	BV:251	relay51stat_61
Relay 52 Status	BBV	BV:252	relay52stat_61
Relay 53 Status	BBV	BV:253	relay53stat_61
Relay 54 Status	BBV	BV:254	relay54stat_61
Relay 55 Status	BBV	BV:255	relay55stat_61
Relay 56 Status	BBV	BV:256	relay56stat_61
Relay 57 Status	BBV	BV:257	relay57stat_61
Relay 58 Status	BBV	BV:258	relay58stat_61
Relay 59 Status	BBV	BV:259	relay59stat_61
Relay 60 Status	BBV	BV:260	relay60stat_61

P1: Integration Overview

The Lx5 Controller with P1 / FLN integration is certified by Siemens and utilizes Siemens Application Number 2747. Refer to Siemens Application Notes for more information.

P1 integration facilitates the following BAS functions in all Lx5 based products:

- Control Groups-Digital Output
- Get Value of Analog Input-Analog Input
- Get Status of a Range of Relays-Analog Input

RK4 and RK5 allow these additional P1 BAS functions:

- Get Status of Bad Relays (Range)-Analog Input

The Lx5 offers direct communication with P1. Complete the following steps before beginning integration.*

1. Complete the Switch Input and Group Programming Worksheets for each Lx5. **
2. Set the network address of each Lx5.
3. Confirm proper baud rate and protocol have been selected.
4. Verify the BAS network is connected to the Lx5 EIA-485 Terminal Block.
5. If an Lx5 is operated as an End-of-line device (first or last controller on a network) ensure provided network terminator BT485 is installed.

P1: Address

The Controller Address (1-99) allows the BAS to identify specific Lx5's on a FLN. This address is configured using the SW3 and SW4 rotary switches. Each Lx5 must have a unique address on the FLN.

P1: Functions

Value Name	Point Type	Function	Valid Values	Value Definition
Group Command	Digital Output (DO)	Read/Write	0 1	Command Group OFF Command Group ON
Analog Input	Analog Input (AI)	Read Only	0 - 1024	Analog Input Value
Relay Status Range	Analog Input (AI)	Read Only	0 - 255	Value represents an 8 relay range. ¹
Bad Relay Status Range	Analog Input (AI)	Read Only	0 - 255	Value represents an 8 relay range. ¹



¹The returned value represents an 8-bit binary number. Each bit indicates the state of one relay in the range. The demultiplex method is utilized to discern the meaning of the returned value. (See page 28 for the Demultiplex Key)

* Refer to Lx5 Hardware User Guide for network address, baud rate, protocol, and termination configuration instructions.

** Refer to USB Tech Kit User Guide for Switch Input and Group Programming Worksheets.

P1 Points

Point Number	Point Type	Point Name	Slope	Intercept	Range
1	AO	Controller Address	1	0	(1-99)
2	AO	Application	1	0	2747
3	DO	Group 01	1	0	(0-1)
4	DO	Group 02	1	0	(0-1)
5	DO	Group 03	1	0	(0-1)
6	DO	Group 04	1	0	(0-1)
7	DO	Group 05	1	0	(0-1)
8	DO	Group 06	1	0	(0-1)
9	DO	Group 07	1	0	(0-1)
10	DO	Group 08	1	0	(0-1)
11	DO	Group 09	1	0	(0-1)
12	DO	Group 10	1	0	(0-1)
13	DO	Group 11	1	0	(0-1)
14	DO	Group 12	1	0	(0-1)
15	DO	Group 13	1	0	(0-1)
16	DO	Group 14	1	0	(0-1)
17	DO	Group 15	1	0	(0-1)
18	DO	Group 16	1	0	(0-1)
19	DO	Group 17	1	0	(0-1)
20*	AO	Override Time	1	0	(0-255)
21	DO	Group 18	1	0	(0-1)
22	DO	Group 19	1	0	(0-1)
23	DO	Group 20	1	0	(0-1)
24	DO	Group 21	1	0	(0-1)
25	DO	Group 22	1	0	(0-1)
26	DO	Group 23	1	0	(0-1)
27	DO	Group 24	1	0	(0-1)
28	DO	Group 25	1	0	(0-1)
29*	DO	Night / Day	1	0	Night / Day
30	DO	Group 26	1	0	(0-1)
31	DO	Group 27	1	0	(0-1)
32	DO	Group 28	1	0	(0-1)
33	DO	Group 29	1	0	(0-1)
34	DO	Group 30	1	0	(0-1)
35	DO	Group 31	1	0	(0-1)
36	DO	Group 32	1	0	(0-1)

* P1 required point. Refer to Siemens Application 2747 for additional information.

P1 Points

Point Number	Point Type	Point Name	Slope	Intercept	Range
37	DO	Group 33	1	0	(0-1)
38	DO	Group 34	1	0	(0-1)
39	DO	Group 35	1	0	(0-1)
40	DO	Group 36	1	0	(0-1)
41	DO	Group 37	1	0	(0-1)
42	DO	Group 38	1	0	(0-1)
43	DO	Group 39	1	0	(0-1)
44	DO	Group 40	1	0	(0-1)
45	DO	Group 41	1	0	(0-1)
46	DO	Group 42	1	0	(0-1)
47	DO	Group 43	1	0	(0-1)
48	DO	Group 44	1	0	(0-1)
49	DO	Group 45	1	0	(0-1)
50	DO	Group 46	1	0	(0-1)
51	DO	Group 47	1	0	(0-1)
52	DO	Group 48	1	0	(0-1)
53	DO	Group 49	1	0	(0-1)
54	DO	Group 50	1	0	(0-1)
55	DO	Group 51	1	0	(0-1)
56	DO	Group 52	1	0	(0-1)
57	DO	Group 53	1	0	(0-1)
58	DO	Group 54	1	0	(0-1)
59	DO	Group 55	1	0	(0-1)
60	DO	Group 56	1	0	(0-1)
61	DO	Group 57	1	0	(0-1)
62	DO	Group 58	1	0	(0-1)
63	DO	Group 59	1	0	(0-1)
64	DO	Group 60	1	0	(0-1)
65	AI	Analog Input 01	1	0	(0-1024)
66	AI	Analog Input 02	1	0	(0-1024)
67	AI	Analog Input 03	1	0	(0-1024)
68	AI	Analog Input 04	1	0	(0-1024)
69	AI	Analog Input 05	1	0	(0-1024)
70	AI	Analog Input 06	1	0	(0-1024)
71	AI	Bad Relays (1-8)	1	0	(0-255)
72	AI	Bad Relays (9-16)	1	0	(0-255)

P1 Points

Point Number	Point Type	Point Name	Slope	Intercept	Range
73	AI	Bad Relays (17-24)	1	0	(0-255)
74	AI	Bad Relays (25-32)	1	0	(0-255)
75	AI	Bad Relays (33-40)	1	0	(0-255)
76	AI	Bad Relays (41-48)	1	0	(0-255)
77	AI	Bad Relays (49-56)	1	0	(0-255)
78	AI	Bad Relays (57-60)	1	0	(0-255)
79	AI	Relay Status (1-8)	1	0	(0-255)
80	AI	Relay Status (9-16)	1	0	(0-255)
81	AI	Relay Status (17-24)	1	0	(0-255)
82	AI	Relay Status (25-32)	1	0	(0-255)
83	AI	Relay Status (33-40)	1	0	(0-255)
84	AI	Relay Status (41-48)	1	0	(0-255)
85	AI	Relay Status (49-56)	1	0	(0-255)
86	AI	Relay Status (57-60)	1	0	(0-255)
99*	AO	Error Status	1	0	(0-255)

* P1 required point. Refer to Siemens Application 2747 for additional information.

P1: Demultiplex Key

Values returned for Relay Status Range or Bad Relay Status Range represents an 8-bit binary number. Each bit indicates the state of one relay in the range. The demultiplex method is utilized to discern the meaning of the returned value.

1. Determine which Bit Values are required to achieve a sum equal to the returned value.
2. Convert the Bit Values to a converted value. Bit values utilized to achieve the sum convert to "1" while unused bit values convert to "0".
3. Use the Demultiplex Key to match the converted value and status with the associated relay.

Bit Position	8	7	6	5	4	3	2	1
Bit Value	128	64	32	16	8	4	2	1
Converted Value (0=OFF or Good) (1=ON or Bad)	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1

Relay Range 1-8	8	7	6	5	4	3	2	1
Relay Range 9-16	16	15	14	13	12	11	10	9
Relay Range 17-24	24	23	22	21	20	19	18	17
Relay Range 25-32	32	31	30	29	28	27	26	25
Relay Range 33-40	40	39	38	37	36	35	34	33
Relay Range 41-48	48	47	46	45	44	43	42	41
Relay Range 49-56	56	55	54	53	52	51	50	49
Relay Range 57-60	n/a	n/a	n/a	n/a	60	59	58	57

Example:

A value of 123 is returned by the Lx5 for a Relay Status Range (9-16).
 $64+32+16+8+2+1=123$

Bit Position	8	7	6	5	4	3	2	1
Bit Value	128	64	32	16	8	4	2	1
Converted Value (0=OFF or Good) (1=ON or Bad)	0	1	1	1	1	0	1	1
Relay Range 9-16	16	15	14	13	12	11	10	9

Relays 15, 14, 13, 12, 10, and 9 are ON
 Relays 16 and 11 are OFF



Enter the returned value into a binary calculator and simply match the converted value to the appropriate relay range in the Demultiplex Key. It is much quicker!