



Traffic Signal Management and Surveillance System

TSCP Memory Map

TSMSS-TSCP MM

Version 1.05A

April 2013





TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Revision History

Date	Version	Description	Author
04/28/2011	1.00	First draft	James Lau
08/31/2011	1.02	First release	James Lau
12/13/2011	1.03	Added code 27 to TOD Functions Added plans 21 to 29	James Lau
11/6/2012	1.04	Added Max out and Gap out count Added RR Gate Port Added TSP input port and type	James Lau
4/2/13	1.05	Defined smaller message blocks for each page of the timing chart Added a new Page ID byte to reference the page of the timing chart Restarted the Message ID byte to reference each Message Block for a timing chart page Added Queue Jump to Page 13 Message Blocks	James Lau Patrick Leung
4/5/13	1.05A	Simplified version of the TSCP-2070-TSMSS v1.05 document	James Lau Patrick Leung



TSMSS Support of TSCP

Functional Description

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1. Introduction

Traffic Signal Control Program (TSCP) runs on the Model 2070 Traffic Controller and was designed for maximum backward capability, while looking forward by using National Transportation Communications for ITS Protocol Standards.

In order to fully integrate the TSCP with the Traffic Signal Management and Surveillance System (TSMSS) software, the TSMSS software shall supports the AB3418 protocol for communication to field controllers, and the TSMSS software shall allow reading and modification of TSCP timing and time-of-day parameters using both serial and TCP/IP communications protocols.

2. Requirements

2.1 The TSMSS shall support the following GET and SET AB3418, and AB3418E messages as described in section 4.

The following messages are currently defined for AB3418:

- Get Controller ID
- Set Time
- Set Pattern
- Get Short Status
- Get System Detector Data

The following messages are currently defined for AB3418E:

- Get Status8
- Get Long Status8
- Get Controller Timing Data
- Set Controller Timing Data

The following messages are defined in this document for AB3418E:

Page2TimingData

- Phase Configuration
- Special Flags
- Pedestrian Configuration

Page3TimingData

- Phase Timing Data
- Overlap Timing Data

Page4TimingData

- Coordination Timing Data - Local Plan 1 to 9

Page5TimingData

- Coordination Timing Data - Local Plan 11 to 19

Page6TimingData

- Coordination Timing Data - Local Plan 21 to 29

Page7TimingData

- Detector Configuration
- System Detector Configuration
- CIC Configuration

Page8TimingData



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- Time-of-Day Schedule
- Weekday Table Assignment

Page9TimingData

- Holiday Tables
- Time-of-Day Functions

Page10TimingData

- Serial Port Configuration
- Dial-Up Configuration
- Network Configuration
- Soft Logic

Page11TimingData

- Railroad Preemption
- Emergency Vehicle Preemption

Page12TimingData

- Controller Input Configuration
- Controller Output Configuration

Page13TimingData

- Yellow Yield Coordination
- Transit Priority

Get Status8E

Get Long Status8E

Timing Checksums

- 2.2 The TSMSS system shall be capable of using the AB3418, and AB3418E messages to GET and SET the TSCP Timing Parameters.
- 2.3 The TSMSS shall not transmit any value that is outside of the range for any parameter.
- 2.4 Checksums calculations shall use the standard 16 bit FCS method described in RFC 1662.
- 2.5 The TSMSS shall be capable of using the ftp's get command to copy the timing configuration file 'tscpdata.dat' from the remote 2070 controller to the local host machine using TCP/IP protocol over Ethernet.

3. Block Message Formats

All AB3418 messages use standard AB3418 framing. More information on AB3418 framing can be found in Standard Communications Protocol for Traffic Signals in California, Specification and Implementation Requirements.
(<http://www.dot.ca.gov/hq/traffops/electsys>).

3.1 All Block Messages shall follow the following format.

- Byte 1 - Start Flag 0x7E
- Byte 2 - Controller Address 1 to 255
- Byte 3 - Control Byte
 - 0x13 – single address Unnumbered Information (UI) control byte
 - 0x03 – broadcast Unnumbered Information (UI) control byte
 - 0x33 – single address Unnumbered Poll (UP) control byte
- Byte 4 - IPI (0xC0)
- Byte 5 - Message
- Byte 6 - Page ID, identifies the page on the Timing Chart
- Byte 7 - Block ID, identifies the Block Message # within the Page
- Variable Bytes - Packet Message Data (0 to n bytes)
- Byte - 16-bit FCS MSB (most significant byte of the Frame Check Sequence, bytes #2 to end of Packet Message Data)
- Byte - 16-bit FCS LSB (least significant byte of the Frame Check Sequence)
- Byte - End Flag 0x7E

3.2 The “Controller Address” (byte 2) in the block message is defined as follow:

Shifted the byte two bits to the left, and then add one to the result

Controller Address = (Local Address << 2) + 1

(master controller has the “controller address” assigned to 1,
broadcast address has the “controller address” assigned to 255,
controller #1 has the “controller address” assigned to 5,
controller #2 has the “controller address” assigned to 9,
etc...)

3.3 Byte Stuffing

If any of the bytes starting from byte 2 to end of Checksum byte contain the Flag Sequence (0x7e) or Control Escape (0x7d) characters, they are replaced by the 2-byte sequences 0x7d5e and 0x7d5d, respectively.

3.4 Bit numbering

Bits of all quantities are numbered, from right to left, starting with bit 0.

The left-most bit of the contents of a memory location is bit 7.

3.5 The order of byte transmission of multiple-byte data (i.e. ‘data type’ int, short) shall be from most significant byte (MSB) to least significant byte (LSB).



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4. Block Messages

- 4.1 The TSMSS shall support the following AB3418 and AB3418E messages using both serial and TCP/IP communications protocols.

PAGE 2-13 GET and SET MESSAGE BLOCKS

Message GET - 0x87

Message SET - 0x96



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Page2 GET Message Blocks

Page2 Block Messages Reference Table for GET

Block ID#	Block Description	Bytes	Timing Chart Reference
1	Phase Flags	31	Phases (2-1-1-1) Phase Recalls (2-1-1-2) Phase Locks (2-1-1-3) Phase Features (2-1-1-4) Startup (2-1-1-5)
2	Special Flags	37	Call To Phase (2-1-2-1) Flashing Colors (2-1-2-2) Special Operation (2-1-2-3) Protected Permissive (2-1-2-4)
3	Pedestrian Flags	18	Pedestrian (2-1-3)
4	Overlap Flags	34	Overlap (2-1-4)

Page2 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID	Timing Chart pg. 2	2
7	Block ID	1 = Phase Flags <ul style="list-style-type: none">• Phases• Phase Recalls• Phase Locks• Phase Features• Startup 2 = Special Flags <ul style="list-style-type: none">• Call To Phase• Flashing Colors• Special Operation• Protected Permissive	1 to 4



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Functional Description

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		3 = Pedestrian Flags 4 = Overlap Flags	
8	16-bit FCS MSB (most significant byte of the 16-bit Frame Check Sequence)		0 to 255
9	16-bit FCS LSB (least significant byte of the 16-bit Frame Check Sequence)		0 to 255
10	End Flag		0x7E

Page2 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Phase Flags			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		2
7	Block ID	Phase Flags <ul style="list-style-type: none"> • Phases • Phase Recalls • Phase Locks • Phase Features • Startup 	1
8	Permitted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
9	Restricted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Vehicle Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
11	Vehicle Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Red Detector Lock	Bits 0-7 ⇔ phases 1-8	0 to 255
15	Yellow Detector Lock	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Force/Max Lock	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Double Entry	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Rest In Walk	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
19	Rest In Red	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Walk 2	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
21	Max Green 2	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Max Green 3	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Startup – First Phases Green	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Startup – Yellow Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Startup – Vehicle Calls	Bits 0-7 ⇔ phases 1-8	0 to 255



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26	Startup – Pedestrian Calls	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
27	Startup Yellow Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63
28	Startup All-Red Time (0.1 Sec)		50 to 255
29	16-bit FCS MSB		0 to 255
30	16-bit FCS LSB		0 to 255
31	End Flag		0x7E

Page2 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Special Flags

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		2
7	Block ID	Special Flags <ul style="list-style-type: none"> • Call To Phase • Flashing Colors • Special Operation • Protected Permissive 	2
8	Call To Phase – Phase 1	Bits 0-7 ⇔ phases 1-8	0 to 255
9	Call To Phase – Phase 2	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Call To Phase – Phase 3	Bits 0-7 ⇔ phases 1-8	0 to 255
11	Call To Phase – Phase 4	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Call To Phase – Phase 5	Bits 0-7 ⇔ phases 1-8	0 to 255
13	Call To Phase – Phase 6	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Call To Phase – Phase 7	Bits 0-7 ⇔ phases 1-8	0 to 255
15	Call To Phase – Phase 8	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Omit On Green – Phase 1	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Omit On Green – Phase 2	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Omit On Green – Phase 3	Bits 0-7 ⇔ phases 1-8	0 to 255
19	Omit On Green – Phase 4	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Omit On Green – Phase 5	Bits 0-7 ⇔ phases 1-8	0 to 255
21	Omit On Green – Phase 6	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Omit On Green – Phase 7	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Omit On Green – Phase 8	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Yellow Flash – Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Yellow Flash - Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63
26	Flash In Red – Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Flash In Red - Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63



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28	Single Exit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
29	Driveway Signal Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Driveway Signal Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63
31	Leading Ped Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
32	Protected Permissive (Flashing Yellow Operation)	Bits 0-7 ⇔ phases 1-8	0 to 255
33	Cabinet - type		
34	Cabinet - config		
35	16-bit FCS MSB		0 to 255
36	16-bit FCS LSB		0 to 255
37	End Flag		0x7E

Page2 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Pedestrian Flags

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		2
7	Block ID	Pedestrian Flags	3
8	Pedestrian Circuits – Phase 1	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
9	Pedestrian Circuits – Phase 2	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
10	Pedestrian Circuits – Phase 3	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
11	Pedestrian Circuits – Phase 4	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	Pedestrian Circuits – Phase 5	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	Pedestrian Circuits – Phase 6	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
14	Pedestrian Circuits – Phase 7	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
15	Pedestrian Circuits – Phase 8	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
16	16-bit FCS MSB		0 to 255
17	16-bit FCS LSB		0 to 255
18	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

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Page2 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Overlap Flags			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		2
7	Block ID	Overlap Flags	4
8	Overlap A – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
9	Overlap A – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Overlap A – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
11	Overlap A – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Overlap B – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
13	Overlap B – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Overlap B – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
15	Overlap B – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Overlap C – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Overlap C – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Overlap C – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
19	Overlap C – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Overlap D – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
21	Overlap D – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Overlap D – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Overlap D – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Overlap E – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Overlap E – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
26	Overlap E – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Overlap E – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Overlap F – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
29	Overlap F – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Overlap F – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
31	Overlap F – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
32	16-bit FCS MSB		0 to 255
33	16-bit FCS LSB		0 to 255
34	End Flag		0x7E



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Page2 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS) Overlap

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		2
7	Block ID		1 to 4
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



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Page2 SET Message Blocks

Page2 Block Messages Reference Table for SET

Block ID#	Block Message	Bytes	Timing Chart Tables
1	Phase Flags	31	Phases (2-1-1-1) Phase Recalls (2-1-1-2) Phase Locks (2-1-1-3) Phase Features (2-1-1-4) Startup (2-1-1-5)
2	Special Flags	37	Call To Phase (2-1-2-1) Flashing Colors (2-1-2-2) Special Operation (2-1-2-3) Protected Permissive (2-1-2-4)
3	Pedestrian Flags	18	Pedestrian (2-1-3)
4	Overlap Flags	34	Overlap (2-1-4)

Page2 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD6
6	Page ID	Timing Chart pg. 2	2
7	Block ID	1 = Phase Flags <ul style="list-style-type: none">• Phases• Phase Recalls• Phase Locks• Phase Features• Startup 2 = Special Flags <ul style="list-style-type: none">• Call To Phase• Flashing Colors• Special Operation• Protected Permissive	1 to 4



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		3 = Pedestrian Flags 4 = Overlap Flags	
8	16-bit FCS MSB (most significant byte of the 16-bit Frame Check Sequence)		0 to 255
9	16-bit FCS LSB (least significant byte of the 16-bit Frame Check Sequence)		0 to 255
10	End Flag		0x7E

Page2 Timing Data – SET (TSMSS >>> TSCP) Phase Flags			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		2
7	Block ID	Phase Flags <ul style="list-style-type: none"> • Phases • Phase Recalls • Phase Locks • Phase Features • Startup 	1
8	Permitted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
9	Restricted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Vehicle Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
11	Vehicle Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Red Detector Lock	Bits 0-7 ⇔ phases 1-8	0 to 255
15	Yellow Detector Lock	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Force/Max Lock	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Double Entry	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Rest In Walk	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
19	Rest In Red	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Walk 2	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
21	Max Green 2	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Max Green 3	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Startup – First Phases Green	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Startup – Yellow Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Startup – Vehicle Calls	Bits 0-7 ⇔ phases 1-8	0 to 255



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26	Startup – Pedestrian Calls	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
27	Startup Yellow Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63
28	Startup All-Red Time (0.1 Sec)		50 to 255
29	16-bit FCS MSB		0 to 255
30	16-bit FCS LSB		0 to 255
31	End Flag		0x7E

Page2 Timing Data – SET (TSMSS >>> TSCP) Special Flags			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		2
7	Block ID	Special Flags <ul style="list-style-type: none"> • Call To Phase • Flashing Colors • Special Operation • Protected Permissive 	2
8	Call To Phase – Phase 1	Bits 0-7 ⇔ phases 1-8	0 to 255
9	Call To Phase – Phase 2	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Call To Phase – Phase 3	Bits 0-7 ⇔ phases 1-8	0 to 255
11	Call To Phase – Phase 4	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Call To Phase – Phase 5	Bits 0-7 ⇔ phases 1-8	0 to 255
13	Call To Phase – Phase 6	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Call To Phase – Phase 7	Bits 0-7 ⇔ phases 1-8	0 to 255
15	Call To Phase – Phase 8	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Omit On Green – Phase 1	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Omit On Green – Phase 2	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Omit On Green – Phase 3	Bits 0-7 ⇔ phases 1-8	0 to 255
19	Omit On Green – Phase 4	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Omit On Green – Phase 5	Bits 0-7 ⇔ phases 1-8	0 to 255
21	Omit On Green – Phase 6	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Omit On Green – Phase 7	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Omit On Green – Phase 8	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Yellow Flash – Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Yellow Flash - Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63
26	Flash In Red – Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Flash In Red - Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63



TSMSS Support of TSCP

Functional Description

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28	Single Exit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
29	Driveway Signal Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Driveway Signal Overlaps	Bits 0-5 ⇔ Overlaps A-F	0 to 63
31	Leading Ped Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
32	Protected Permissive (Flashing Yellow Operation)	Bits 0-7 ⇔ phases 1-8	0 to 255
33	Cabinet - type		
34	Cabinet - config		
35	16-bit FCS MSB		0 to 255
36	16-bit FCS LSB		0 to 255
37	End Flag		0x7E

Page2 Timing Data – SET (TSMSS >>> TSCP) Pedestrian Flags

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		2
7	Block ID	Pedestrian Flags	3
8	Pedestrian Circuits – Phase 1	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
9	Pedestrian Circuits – Phase 2	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
10	Pedestrian Circuits – Phase 3	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
11	Pedestrian Circuits – Phase 4	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	Pedestrian Circuits – Phase 5	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	Pedestrian Circuits – Phase 6	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
14	Pedestrian Circuits – Phase 7	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
15	Pedestrian Circuits – Phase 8	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
16	16-bit FCS MSB		0 to 255
17	16-bit FCS LSB		0 to 255
18	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

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Page2 Timing Data – SET (TSMSS >>> TSCP) Overlap Flags

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		2
7	Block ID	Overlap Flags	4
8	Overlap A – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
9	Overlap A – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Overlap A – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
11	Overlap A – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Overlap B – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
13	Overlap B – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Overlap B – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
15	Overlap B – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Overlap C – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Overlap C – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Overlap C – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
19	Overlap C – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Overlap D – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
21	Overlap D – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Overlap D – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Overlap D – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Overlap E – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Overlap E – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
26	Overlap E – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Overlap E – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Overlap F – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
29	Overlap F – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Overlap F – No Start Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
31	Overlap F – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
32	16-bit FCS MSB		0 to 255
33	16-bit FCS LSB		0 to 255
34	End Flag		0x7E



TSMSS Support of TSCP Functional Description

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Page2 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS) Overlap

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		2
7	Message ID – Phases Configuration		1 to 4
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page3 GET Message Blocks

Page3 Block Messages Reference Table for GET

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Phase 1 Timing	31	Phase Timing Phase (2-2) Ped/Bike (2-3)
2	Phase 2 Timing	31	
3	Phase 3 Timing	31	
4	Phase 4 Timing	31	
5	Phase 5 Timing	31	
6	Phase 6 Timing	31	
7	Phase 7 Timing	31	
8	Phase 8 Timing	31	
9	Overlap Timing Red Revert Time All-Red Sec/Minute Traffic Actuated Max 2 (Max/Gap Out)	32	Overlap Timing (2-4) Red Revert (2-5) All-Red Sec/Min (2-6) Max/Gap Out (2-7)

Page3 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x87 - GET
6	Page ID		3
7	Block ID	1 = phase 1 timing 2 = phase 2 timing 3 = phase 3 timing 4 = phase 4 timing 5 = phase 5 timing 6 = phase 6 timing 7 = phase 7 timing 8 = phase 8 timing 9 = Overlap timing <ul style="list-style-type: none"> • Red revert time • All-Red Sec/Min • Max/Gap Out 	1 to 9



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page3 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Phase Timing

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		3
7	Block ID	1 = phase 1 timing 2 = phase 2 timing 3 = phase 3 timing 4 = phase 4 timing 5 = phase 5 timing 6 = phase 6 timing 7 = phase 7 timing 8 = phase 8 timing	1 to 8
X = phase 1 to 8			
8	Phase X – Walk_1 Time		0 to 255
9	Phase X – Don't Walk Time		0 to 255
10	Phase X – Minimum Green Time		0 to 255
11	Phase X – Type 3 Detector Disconnect		0 to 255
12	Phase X – Max Initial Time		0 to 255
13	Phase X – Max Extension 1 Time		0 to 255
14	Phase X – Max Extension 2 Time		0 to 255
15	Phase X – Max Extension 3 Time		0 to 255
16	Phase X – Extension / Passage (0.1 Sec)		0 to 255
17	Phase X – Maximum Gap (0.1 Sec)		0 to 255
18	Phase X – Minimum Gap (0.1 Sec)		0 to 255
19	Phase X – Added Initial Per Vehicle (0.1 Sec)		0 to 255
20	Phase X – Reduced Gap By (0.1 Sec)		0 to 255
21	Phase X – Reduced Gap Every (0.1 Sec)		0 to 255
22	Phase X – Yellow (0.1 Sec)		30 to 60
23	Phase X – Red Clearance (0.1 Sec)		0 to 255
24	Phase X – Walk 2 Time		0 to 255
25	Phase X – Delay/Early Walk Time		0 to 255
26	Phase X – Solid Don't Walk Time		0 to 255
27	Phase X – Bike Green Time		0 to 255



TSMSS Support of TSCP Functional Description

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28	Phase X – Bike All-Red Time (0.1 Sec)		0 to 255
29	16-bit FCS MSB		0 to 255
30	16-bit FCS LSB		0 to 255
31	End Flag		0x7E

Page3 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Overlap Timing

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		3
7	Block ID		9
8	Overlap A – Green Time (0.1 Sec)		0 to 255
9	Overlap A – Yellow Time (0.1 Sec)		30 to 60
10	Overlap A – Red Clearance Time (0.1Sec)		0 to 255
11	Overlap B – Green Time (0.1 Sec)		0 to 255
12	Overlap B – Yellow Time (0.1 Sec)		30 to 60
13	Overlap B – Red Clearance Time (0.1Sec)		0 to 255
14	Overlap C – Green Time (0.1 Sec)		0 to 255
15	Overlap C – Yellow Time (0.1 Sec)		30 to 60
16	Overlap C – Red Clearance Time (0.1Sec)		0 to 255
17	Overlap D – Green Time (0.1 Sec)		0 to 255
18	Overlap D – Yellow Time (0.1 Sec)		30 to 60
19	Overlap D – Red Clearance Time (0.1Sec)		0 to 255
20	Overlap E – Green Time (0.1 Sec)		0 to 255
21	Overlap E – Yellow Time (0.1 Sec)		30 to 60
22	Overlap E – Red Clearance Time (0.1Sec)		0 to 255
23	Overlap F – Green Time (0.1 Sec)		0 to 255
24	Overlap F – Yellow Time (0.1 Sec)		30 to 60
25	Overlap F – Red Clearance Time (0.1Sec)		0 to 255
26	Red Revert Time (0.1 Sec)		20 to 255
27	Max out count		0 to 25
28	Gap out count		0 to 25
29	All-Red -Time Sec/Min (changes the All-Red time from second increments to minute increments). 0 = phases, bikes, and overlaps All Red time will be 0 to 25.5 seconds 1 = phases, bikes, and overlaps All Red time will be 0 to 25 minutes (i.e. 142 ⇔ 14 minutes 20 seconds)		0, 1



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

30	16-bit FCS MSB		0 to 255
31	16-bit FCS LSB		0 to 255
32	End Flag		0x7E

Page3 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS) Overlap

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		3
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page3 SET Message Blocks

Page3 Block Messages Reference Table for SET

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Phase 1 Timing	31	Phase Timing Phase (2-2) Ped/Bike (2-3)
2	Phase 2 Timing	31	
3	Phase 3 Timing	31	
4	Phase 4 Timing	31	
5	Phase 5 Timing	31	
6	Phase 6 Timing	31	
7	Phase 7 Timing	31	
8	Phase 8 Timing	31	
9	Overlap Timing Red Revert Time All-Red Sec/Minute Traffic Actuated Max 2 (Max/Gap Out)	32	Overlap Timing (2-4) Red Revert (2-5) All-Red Sec/Min (2-6) Max/Gap Out (2-7)

Page3 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET Response		0xD6
6	Page ID		3
7	Block ID	1 = phase 1 timing 2 = phase 2 timing 3 = phase 3 timing 4 = phase 4 timing 5 = phase 5 timing 6 = phase 6 timing 7 = phase 7 timing 8 = phase 8 timing 9 = Overlap timing <ul style="list-style-type: none"> • Red revert time • All-Red Sec/Min • Max/Gap Out 	1 to 9



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page3 Timing Data – SET (TSMSS >>> TSCP) Phase Timing			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		3
7	Block ID	1 = phase 1 timing 2 = phase 2 timing 3 = phase 3 timing 4 = phase 4 timing 5 = phase 5 timing 6 = phase 6 timing 7 = phase 7 timing 8 = phase 8 timing	1 to 8
X = phase 1 to 8			
8	Phase X – Walk_1 Time		0 to 255
9	Phase X – Don't Walk Time		0 to 255
10	Phase X – Minimum Green Time		0 to 255
11	Phase X – Type 3 Detector Disconnect		0 to 255
12	Phase X – Max Initial Time		0 to 255
13	Phase X – Max Extension 1 Time		0 to 255
14	Phase X – Max Extension 2 Time		0 to 255
15	Phase X – Max Extension 3 Time		0 to 255
16	Phase X – Extension / Passage (0.1 Sec)		0 to 255
17	Phase X – Maximum Gap (0.1 Sec)		0 to 255
18	Phase X – Minimum Gap (0.1 Sec)		0 to 255
19	Phase X – Added Initial Per Vehicle (0.1 Sec)		0 to 255
20	Phase X – Reduced Gap By (0.1 Sec)		0 to 255
21	Phase X – Reduced Gap Every (0.1 Sec)		0 to 255
22	Phase X – Yellow (0.1 Sec)		30 to 60
23	Phase X – Red Clearance (0.1 Sec)		0 to 255
24	Phase X – Walk 2 Time		0 to 255
25	Phase X – Delay/Early Walk Time		0 to 255
26	Phase X – Solid Don't Walk Time		0 to 255
27	Phase X – Bike Green Time		0 to 255



TSMSS Support of TSCP Functional Description

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28	Phase X – Bike All-Red Time (0.1 Sec)		0 to 255
29	16-bit FCS MSB		0 to 255
30	16-bit FCS LSB		0 to 255
31	End Flag		0x7E

Page3 Timing Data – SET (TSCP >>> TSMSS) Overlap Timing			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		3
7	Block ID		9
8	Overlap A – Green Time (0.1 Sec)		0 to 255
9	Overlap A – Yellow Time (0.1 Sec)		30 to 60
10	Overlap A – Red Clearance Time (0.1Sec)		0 to 255
11	Overlap B – Green Time (0.1 Sec)		0 to 255
12	Overlap B – Yellow Time (0.1 Sec)		30 to 60
13	Overlap B – Red Clearance Time (0.1Sec)		0 to 255
14	Overlap C – Green Time (0.1 Sec)		0 to 255
15	Overlap C – Yellow Time (0.1 Sec)		30 to 60
16	Overlap C – Red Clearance Time (0.1Sec)		0 to 255
17	Overlap D – Green Time (0.1 Sec)		0 to 255
18	Overlap D – Yellow Time (0.1 Sec)		30 to 60
19	Overlap D – Red Clearance Time (0.1Sec)		0 to 255
20	Overlap E – Green Time (0.1 Sec)		0 to 255
21	Overlap E – Yellow Time (0.1 Sec)		30 to 60
22	Overlap E – Red Clearance Time (0.1Sec)		0 to 255
23	Overlap F – Green Time (0.1 Sec)		0 to 255
24	Overlap F – Yellow Time (0.1 Sec)		30 to 60
25	Overlap F – Red Clearance Time (0.1Sec)		0 to 255
26	Red Revert Time (0.1 Sec)		20 to 255
27	Max out count		0 to 25
28	Gap out count		0 to 25
29	All-Red -Time Sec/Min (changes the All-Red time from second increments to minute increments). 0 = phases, bikes, and overlaps All Red time will be 0 to 25.5 seconds 1 = phases, bikes, and overlaps All Red time will be 0 to 25 minutes (i.e. 142 ⇔ 14 minutes 20 seconds)		0, 1



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

30	16-bit FCS MSB		0 to 255
31	16-bit FCS LSB		0 to 255
32	End Flag		0x7E

Page3 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS) Overlap

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		3
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page4 GET Message Blocks

Page4 Block Messages Reference Table for GET RESPONSE

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Coord. Plan 1 Timing	36	Local Plan 1...9 (7-1)
2	Coord. Plan 2 Timing	36	
3	Coord. Plan 3 Timing	36	
4	Coord. Plan 4 Timing	36	
5	Coord. Plan 5 Timing	36	
6	Coord. Plan 6 Timing	36	
7	Coord. Plan 7 Timing	36	
8	Coord. Plan 8 Timing	36	
9	Coord. Plan 9 Timing	36	
10	Master Timer Sync Free Plan Phase Flags Manual Plan	28	Master Timer Sync (7-A) Free (7-E) Manual Plan (4-1)
11	Special Function Override Detector Reset Local Manual	18	Special Function Override (4-2) Detector Reset (4-3) Local Manual (4-4)

Page4 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x87
6	Page ID		4
7	Block ID	1 = coordination Plan 1 timing 2 = coordination Plan 2 timing 3 = coordination Plan 3 timing 4 = coordination Plan 4 timing 5 = coordination Plan 5 timing 6 = coordination Plan 6 timing 7 = coordination Plan 7 timing 8 = coordination Plan 8 timing 9 = coordination Plan 9 timing	1 to 11



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

		10 = Master Timer Sync Free Plan Phase Flags Manual Plan	
		11 = Special Function Override Detector Reset Local Manual	
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
11	End Flag		0x7E

Page4 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Coord Plan 1 to 9

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		4
7	Block ID	1 = coordination Plan 1 timing 2 = coordination Plan 2 timing 3 = coordination Plan 3 timing 4 = coordination Plan 4 timing 5 = coordination Plan 5 timing 6 = coordination Plan 6 timing 7 = coordination Plan 7 timing 8 = coordination Plan 8 timing 9 = coordination Plan 9 timing	1 to 9
X = coord plan 1 to 9			
8	Coord Plan X – Cycle Length Time		30 to 240
9	Coord Plan X – Phase 1 Green Factor		0 to 255
10	Coord Plan X – Phase 2 Green Factor		0 to 255
11	Coord Plan X – Phase 3 Green Factor		0 to 255
12	Coord Plan X – Phase 4 Green Factor		0 to 255
13	Coord Plan X – Phase 5 Green Factor		0 to 255
14	Coord Plan X – Phase 6 Green Factor		0 to 255
15	Coord Plan X – Phase 7 Green Factor		0 to 255
16	Coord Plan X – Phase 8 Green Factor		0 to 255
17	Coord Plan X – Multiple Cycle (0.1) Setting of 0.5 will result in timing half the value of the plan cycle length Setting of 2.0 will double the plan cycle length		0, 5, 20



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

18	Coord Plan X – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
19	Coord Plan X – Offset B	must be less than the cycle length	0 to 239
20	Coord Plan X – Offset C	must be less than the cycle length	0 to 239
21	Coord Plan X – Permissive periods	must be less than the cycle length	0 to 239
22	Coord Plan X – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Coord Plan X – Sync Phases (phases that are to be Synchronized in the local plan)	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Coord Plan X – Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Coord Plan X – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
26	Coord Plan X – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Coord Plan X – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Coord Plan X – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
29	Coord Plan X – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Coord Plan X – Force Off Flag 0 = phases Green Factor (byte#9 to byte#16) represent green-factor values 1 = phases Green Factor (byte#9 to byte#16) represent force-offs values		0, 1
31	Spare (conditional)		0
32	Spare (ph3-ext)		0
33	Spare (ph7-ext)		0
34	16-bit FCS MSB		0 to 255
35	16-bit FCS LSB		0 to 255
36	End Flag		0x7E

Page4 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Master Timer Sync

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		4
7	Block ID	10 = Master Timer Sync Free Plan Phase Flags Manual Plan	10
8, 9	Master Timer Sync – plans 1 to 9 Sync Local Plan Master timer to Field Master Timer	Byte #8: Bit 0 ⇔ plan 9 Byte #9: Bits 0-7 ⇔ plans 1-8 u_int16	
10, 11	Master Timer Sync – plans 11 to 19	Byte #10: Bit 0 ⇔ plan 19	



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

	Sync Local Plan Master timer to Field Master Timer	Byte #11: Bits 0-7 ⇔ plans 11-18 u_int16	
12, 13	Master Timer Sync – plans 21 to 29 Sync Local Plan Master timer to Field Master Timer	Byte #12: Bit 0 ⇔ plan 29 Byte #13: Bits 0-7 ⇔ plans 21-28 u_int16	
14	Master Sub Master Configuration – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	Master Sub Master Configuration – Output Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
16	Free Plan – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Free Plan – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Free Plan – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
19	Free Plan – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Free Plan – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
21	Free Plan – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Free Plan – Conditional Service allow for odd number phases only	Bits 0-7 ⇔ phases 1-8	
23	Free Plan – Conditional Service Minimum Green		10 to 255
24	Manual Plan selection – Coordination Plan 0 = disable Manual Plan selection 1-9 = select coordination plans 1-9 11-19 = select coordination plans 11-19 21-29 = select coordination plans 21-29 254 = software Flashing operation 255 = Free operation Any other value = Free operation		0, 1 to 9, 11 to 19, 21 to 29, 251 to 255
25	Manual Plan selection – Plan Offset 10 = offset A 11 = offset B 12 = offset C		10 to 12
26	16-bit FCS MSB		0 to 255
27	16-bit FCS LSB		0 to 255
28	End Flag		0x7E

Page4 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Special Function

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

5	Message - GET Response		0xC7
6	Page ID		4
7	Block ID	11 = Special Function Override Detector Reset Local Manual	11
8	Special Function Override – Control 1 0 = Normal 1 = OFF		0 to 1
9	Special Function Override – Control 2		0 to 1
10	Special Function Override – Control 3		0 to 1
11	Special Function Override – Control 4		0 to 1
12	Local Manual Flag 0 = OFF 1 = ON		0 to 1
13	16-bit FCS MSB		0 to 255
14	16-bit FCS LSB		0 to 255
15	End Flag		0x7E

Page4 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		4
7	Block ID		1 to 11
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page4 SET Message Blocks

Page4 Block Messages Reference Table for SET

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Coord. Plan 1 Timing	36	Local Plan 1...9 (7-1)
2	Coord. Plan 2 Timing	36	
3	Coord. Plan 3 Timing	36	
4	Coord. Plan 4 Timing	36	
5	Coord. Plan 5 Timing	36	
6	Coord. Plan 6 Timing	36	
7	Coord. Plan 7 Timing	36	
8	Coord. Plan 8 Timing	36	
9	Coord. Plan 9 Timing	36	
10	Master Timer Sync Free Plan Phase Flags Manual Plan	28	Master Timer Sync (7-A) Free (7-E) Manual Plan (4-1)
11	Special Function Override Detector Reset Local Manual	18	Special Function Override (4-2) Detector Reset (4-3) Local Manual (4-4)

Page4 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET Response		0xD6
6	Page ID		4
7	Block ID	1 = coordination Plan 1 timing 2 = coordination Plan 2 timing 3 = coordination Plan 3 timing 4 = coordination Plan 4 timing 5 = coordination Plan 5 timing 6 = coordination Plan 6 timing 7 = coordination Plan 7 timing 8 = coordination Plan 8 timing 9 = coordination Plan 9 timing	1 to 11



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

		10 = Master Timer Sync Free Plan Phase Flags Manual Plan	
		11 = Special Function Override Detector Reset Local Manual	
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
11	End Flag		0x7E

Page4 Timing Data – SET (TSMSS >>> TSCP) Coord Plan 1 to 9			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		4
7	Block ID	1 = coordination Plan 1 timing 2 = coordination Plan 2 timing 3 = coordination Plan 3 timing 4 = coordination Plan 4 timing 5 = coordination Plan 5 timing 6 = coordination Plan 6 timing 7 = coordination Plan 7 timing 8 = coordination Plan 8 timing 9 = coordination Plan 9 timing	1 to 9
X = coord plan 1 to 9			
8	Coord Plan X – Cycle Length Time		30 to 240
9	Coord Plan X – Phase 1 Green Factor		0 to 255
10	Coord Plan X – Phase 2 Green Factor		0 to 255
11	Coord Plan X – Phase 3 Green Factor		0 to 255
12	Coord Plan X – Phase 4 Green Factor		0 to 255
13	Coord Plan X – Phase 5 Green Factor		0 to 255
14	Coord Plan X – Phase 6 Green Factor		0 to 255
15	Coord Plan X – Phase 7 Green Factor		0 to 255
16	Coord Plan X – Phase 8 Green Factor		0 to 255
17	Coord Plan X – Multiple Cycle (0.1) Setting of 0.5 will result in timing half the value of the plan cycle length Setting of 2.0 will double the plan cycle length		0, 5, 20



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

18	Coord Plan X – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
19	Coord Plan X – Offset B	must be less than the cycle length	0 to 239
20	Coord Plan X – Offset C	must be less than the cycle length	0 to 239
21	Coord Plan X – Permissive periods	must be less than the cycle length	0 to 239
22	Coord Plan X – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Coord Plan X – Sync Phases (phases that are to be Synchronized in the local plan)	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Coord Plan X – Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Coord Plan X – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
26	Coord Plan X – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Coord Plan X – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Coord Plan X – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
29	Coord Plan X – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Coord Plan X – Force Off Flag 0 = phases Green Factor (byte#9 to byte#16) represent green-factor values 1 = phases Green Factor (byte#9 to byte#16) represent force-offs values		0, 1
31	Spare (conditional)		0
32	Spare (ph3-ext)		0
33	Spare (ph7-ext)		0
34	16-bit FCS MSB		0 to 255
35	16-bit FCS LSB		0 to 255
36	End Flag		0x7E

Page4 Timing Data – SET (TSMSS >>> TSCP) Master Timer Sync

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		4
7	Block ID	10 = Master Timer Sync Free Plan Phase Flags Manual Plan	10
8, 9	Master Timer Sync – plans 1 to 9 Sync Local Plan Master timer to Field Master Timer	Byte #8: Bit 0 ⇔ plan 9 Byte #9: Bits 0-7 ⇔ plans 1-8 u_int16	



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

10, 11	Master Timer Sync – plans 11 to 19 Sync Local Plan Master timer to Field Master Timer	Byte #10: Bit 0 ⇔ plan 19 Byte #11: Bits 0-7 ⇔ plans 11-18 u_int16	
12, 13	Master Timer Sync – plans 21 to 29 Sync Local Plan Master timer to Field Master Timer	Byte #12: Bit 0 ⇔ plan 29 Byte #13: Bits 0-7 ⇔ plans 21-28 u_int16	
14	Master Sub Master Configuration – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	Master Sub Master Configuration – Output Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
16	Free Plan – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Free Plan – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Free Plan – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
19	Free Plan – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
20	Free Plan – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
21	Free Plan – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
22	Free Plan – Conditional Service allow for odd number phases only	Bits 0-7 ⇔ phases 1-8	
23	Free Plan – Conditional Service Minimum Green		10 to 255
24	Manual Plan selection – Coordination Plan 0 = disable Manual Plan selection 1-9 = select coordination plans 1-9 11-19 = select coordination plans 11-19 21-29 = select coordination plans 21-29 254 = software Flashing operation 255 = Free operation Any other value = Free operation		0, 1 to 9, 11 to 19, 21 to 29, 251 to 255
25	Manual Plan selection – Plan Offset 10 = offset A 11 = offset B 12 = offset C		10 to 12
26	16-bit FCS MSB		0 to 255
27	16-bit FCS LSB		0 to 255
28	End Flag		0x7E

Page4 Timing Data – SET (TSMSS>>> TSCP) Special Function			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		4
7	Block ID	11 = Special Function Override Detector Reset Local Manual	11
8	Special Function Override – Control 1 0 = Normal 1 = OFF		0 to 1
9	Special Function Override – Control 2		0 to 1
10	Special Function Override – Control 3		0 to 1
11	Special Function Override – Control 4		0 to 1
12	Local Manual Flag 0 = OFF 1 = ON		0 to 1
13	16-bit FCS MSB		0 to 255
14	16-bit FCS LSB		0 to 255
15	End Flag		0x7E

Page4 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		4
7	Block ID		1 to 11
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page5 GET Message Blocks

Page5 Block Messages Reference Table for GET RESPONSE

Block ID #	Block Message	Bytes	Timing Chart Tables
1	Coord. Plan 11 Timing	36	Local Plan 11...19 (7-2)
2	Coord. Plan 12 Timing	36	
3	Coord. Plan 13 Timing	36	
4	Coord. Plan 14 Timing	36	
5	Coord. Plan 15 Timing	36	
6	Coord. Plan 16 Timing	36	
7	Coord. Plan 17 Timing	36	
8	Coord. Plan 18 Timing	36	
9	Coord. Plan 19 Timing	36	

Page5 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID		5
7	Block ID	1 = coordination Plan 11 timing 2 = coordination Plan 12 timing 3 = coordination Plan 13 timing 4 = coordination Plan 14 timing 5 = coordination Plan 15 timing 6 = coordination Plan 16 timing 7 = coordination Plan 17 timing 8 = coordination Plan 18 timing 9 = coordination Plan 19 timing	1 to 9
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page5 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Coord Plan 11 to 19			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		5
7	Block ID	1 = coordination Plan 11 timing 2 = coordination Plan 12 timing 3 = coordination Plan 13 timing 4 = coordination Plan 14 timing 5 = coordination Plan 15 timing 6 = coordination Plan 16 timing 7 = coordination Plan 17 timing 8 = coordination Plan 18 timing 9 = coordination Plan 19 timing	1 to 9
X = coord plan 11 to 19			
8	Coord Plan X – Cycle Length Time		30 to 240
9	Coord Plan X – Phase 1 Green Factor		0 to 255
10	Coord Plan X – Phase 2 Green Factor		0 to 255
11	Coord Plan X – Phase 3 Green Factor		0 to 255
12	Coord Plan X – Phase 4 Green Factor		0 to 255
13	Coord Plan X – Phase 5 Green Factor		0 to 255
14	Coord Plan X – Phase 6 Green Factor		0 to 255
15	Coord Plan X – Phase 7 Green Factor		0 to 255
16	Coord Plan X – Phase 8 Green Factor		0 to 255
17	Coord Plan X – Multiple Cycle (0.1) Setting of 0.5 will result in timing half the value of the plan cycle length Setting of 2.0 will double the plan cycle length		0, 5, 20
18	Coord Plan X – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
19	Coord Plan X – Offset B	must be less than the cycle length	0 to 239
20	Coord Plan X – Offset C	must be less than the cycle length	0 to 239
21	Coord Plan X – Permissive periods	must be less than the cycle length	0 to 239
22	Coord Plan X – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Coord Plan X – Sync Phases (phases that are to be Synchronized in the local plan)	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Coord Plan X – Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Coord Plan X – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP Functional Description

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26	Coord Plan X – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Coord Plan X – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Coord Plan X – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
29	Coord Plan X – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Coord Plan X – Force Off Flag 0 = phases Green Factor is green-factor values 1 = phases Green Factor is force-offs values		0, 1
31	Spare (conditional)		0
32	Spare (ph3-ext)		0
33	Spare (ph7-ext)		0
34	16-bit FCS MSB		0 to 255
35	16-bit FCS LSB		0 to 255
36	End Flag		0x7E

Page5 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		5
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page5 SET Message Blocks

Page5 Block Messages Reference Table for SET

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Coord. Plan 11 Timing	36	Local Plan 11...19 (7-2)
2	Coord. Plan 12 Timing	36	
3	Coord. Plan 13 Timing	36	
4	Coord. Plan 14 Timing	36	
5	Coord. Plan 15 Timing	36	
6	Coord. Plan 16 Timing	36	
7	Coord. Plan 17 Timing	36	
8	Coord. Plan 18 Timing	36	
9	Coord. Plan 19 Timing	36	

Page5 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD6
6	Page ID		5
7	Block ID	1 = coordination Plan 11 timing 2 = coordination Plan 12 timing 3 = coordination Plan 13 timing 4 = coordination Plan 14 timing 5 = coordination Plan 15 timing 6 = coordination Plan 16 timing 7 = coordination Plan 17 timing 8 = coordination Plan 18 timing 9 = coordination Plan 19 timing	1 to 9
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

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Page5 Timing Data – SET (TSMSS >>> TSCP) Coord Plan 11 to 19			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		5
7	Block ID	1 = coordination Plan 11 timing 2 = coordination Plan 12 timing 3 = coordination Plan 13 timing 4 = coordination Plan 14 timing 5 = coordination Plan 15 timing 6 = coordination Plan 16 timing 7 = coordination Plan 17 timing 8 = coordination Plan 18 timing 9 = coordination Plan 19 timing	1 to 9
X = coord plan 11 to 19			
8	Coord Plan X – Cycle Length Time		30 to 240
9	Coord Plan X – Phase 1 Green Factor		0 to 255
10	Coord Plan X – Phase 2 Green Factor		0 to 255
11	Coord Plan X – Phase 3 Green Factor		0 to 255
12	Coord Plan X – Phase 4 Green Factor		0 to 255
13	Coord Plan X – Phase 5 Green Factor		0 to 255
14	Coord Plan X – Phase 6 Green Factor		0 to 255
15	Coord Plan X – Phase 7 Green Factor		0 to 255
16	Coord Plan X – Phase 8 Green Factor		0 to 255
17	Coord Plan X – Multiple Cycle (0.1) Setting of 0.5 will result in timing half the value of the plan cycle length Setting of 2.0 will double the plan cycle length		0, 5, 20
18	Coord Plan X – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
19	Coord Plan X – Offset B	must be less than the cycle length	0 to 239
20	Coord Plan X – Offset C	must be less than the cycle length	0 to 239
21	Coord Plan X – Permissive periods	must be less than the cycle length	0 to 239
22	Coord Plan X – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Coord Plan X – Sync Phases (phases that are to be Synchronized in the local plan)	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Coord Plan X – Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Coord Plan X – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

26	Coord Plan X – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Coord Plan X – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Coord Plan X – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
29	Coord Plan X – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Coord Plan X – Force Off Flag 0 = phases Green Factor is green-factor values 1 = phases Green Factor is force-offs values		0, 1
31	Spare (conditional)		0
32	Spare (ph3-ext)		0
33	Spare (ph7-ext)		0
34	16-bit FCS MSB		0 to 255
35	16-bit FCS LSB		0 to 255
36	End Flag		0x7E

Page5 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		5
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page6 GET Message Blocks

Page6 Block Messages Reference Table for GET RESPONSE

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Coord. Plan 21 Timing	36	Local Plan 21...29 (7-3)
2	Coord. Plan 22 Timing	36	
3	Coord. Plan 23 Timing	36	
4	Coord. Plan 24 Timing	36	
5	Coord. Plan 25 Timing	36	
6	Coord. Plan 26 Timing	36	
7	Coord. Plan 27 Timing	36	
8	Coord. Plan 28 Timing	36	
9	Coord. Plan 29 Timing	36	

Page6 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID		6
7	Block ID	1 = coordination Plan 21 timing 2 = coordination Plan 22 timing 3 = coordination Plan 23 timing 4 = coordination Plan 24 timing 5 = coordination Plan 25 timing 6 = coordination Plan 26 timing 7 = coordination Plan 27 timing 8 = coordination Plan 28 timing 9 = coordination Plan 29 timing	1-9
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page6 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Coord Plan 21 to 29			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		6
7	Block ID	1 = coordination Plan 21 timing 2 = coordination Plan 22 timing 3 = coordination Plan 23 timing 4 = coordination Plan 24 timing 5 = coordination Plan 25 timing 6 = coordination Plan 26 timing 7 = coordination Plan 27 timing 8 = coordination Plan 28 timing 9 = coordination Plan 29 timing	1 to 9
X = coord plan 21 to 29			
8	Coord Plan X – Cycle Length Time		30 to 240
9	Coord Plan X – Phase 1 Green Factor		0 to 255
10	Coord Plan X – Phase 2 Green Factor		0 to 255
11	Coord Plan X – Phase 3 Green Factor		0 to 255
12	Coord Plan X – Phase 4 Green Factor		0 to 255
13	Coord Plan X – Phase 5 Green Factor		0 to 255
14	Coord Plan X – Phase 6 Green Factor		0 to 255
15	Coord Plan X – Phase 7 Green Factor		0 to 255
16	Coord Plan X – Phase 8 Green Factor		0 to 255
17	Coord Plan X – Multiple Cycle (0.1) Setting of 0.5 will result in timing half the value of the plan cycle length Setting of 2.0 will double the plan cycle length		0, 5, 20
18	Coord Plan 21 – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
19	Coord Plan X – Offset B	must be less than the cycle length	0 to 239
20	Coord Plan X – Offset C	must be less than the cycle length	0 to 239
21	Coord Plan X – Permissive periods	must be less than the cycle length	0 to 239
22	Coord Plan X – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Coord Plan X – Sync Phases (phases that are to be Synchronized in the local plan)	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Coord Plan X – Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Coord Plan X – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP Functional Description

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26	Coord Plan X – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Coord Plan X – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Coord Plan X – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
29	Coord Plan X – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Coord Plan X – Force Off Flag 0 = phases Green Factor is green-factor values 1 = phases Green Factor is force-offs values		0, 1
31	Spare (conditional)		0
32	Spare (ph3-ext)		0
33	Spare (ph7-ext)		0
34	16-bit FCS MSB		0 to 255
35	16-bit FCS LSB		0 to 255
36	End Flag		0x7E

Page6 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		6
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page6 SET Message Blocks

Page6 Block Messages Reference Table for SET

Block ID #	Block Message Description	Bytes	Timing Chart Reference
1	Coord. Plan 21 Timing	36	Local Plan 21...29 (7-3)
2	Coord. Plan 22 Timing	36	
3	Coord. Plan 23 Timing	36	
4	Coord. Plan 24 Timing	36	
5	Coord. Plan 25 Timing	36	
6	Coord. Plan 26 Timing	36	
7	Coord. Plan 27 Timing	36	
8	Coord. Plan 28 Timing	36	
9	Coord. Plan 29 Timing	36	

Page6 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD6
6	Page ID		6
7	Block ID	1 = coordination Plan 21 timing 2 = coordination Plan 22 timing 3 = coordination Plan 23 timing 4 = coordination Plan 24 timing 5 = coordination Plan 25 timing 6 = coordination Plan 26 timing 7 = coordination Plan 27 timing 8 = coordination Plan 28 timing 9 = coordination Plan 29 timing	1 to 9
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page6 Timing Data – SET (TSMSS >>> TSCP) Coord Plan 21 to 29			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		6
7	Block ID	1 = coordination Plan 21 timing 2 = coordination Plan 22 timing 3 = coordination Plan 23 timing 4 = coordination Plan 24 timing 5 = coordination Plan 25 timing 6 = coordination Plan 26 timing 7 = coordination Plan 27 timing 8 = coordination Plan 28 timing 9 = coordination Plan 29 timing	1 to 9
X = coord plan 21 to 29			
8	Coord Plan X – Cycle Length Time		30 to 240
9	Coord Plan X – Phase 1 Green Factor		0 to 255
10	Coord Plan X – Phase 2 Green Factor		0 to 255
11	Coord Plan X – Phase 3 Green Factor		0 to 255
12	Coord Plan X – Phase 4 Green Factor		0 to 255
13	Coord Plan X – Phase 5 Green Factor		0 to 255
14	Coord Plan X – Phase 6 Green Factor		0 to 255
15	Coord Plan X – Phase 7 Green Factor		0 to 255
16	Coord Plan X – Phase 8 Green Factor		0 to 255
17	Coord Plan X – Multiple Cycle (0.1) Setting of 0.5 will result in timing half the value of the plan cycle length Setting of 2.0 will double the plan cycle length		0, 5, 20
18	Coord Plan X – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
19	Coord Plan X – Offset B	must be less than the cycle length	0 to 239
20	Coord Plan X – Offset C	must be less than the cycle length	0 to 239
21	Coord Plan X – Permissive periods	must be less than the cycle length	0 to 239
22	Coord Plan X – Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	Coord Plan X – Sync Phases (phases that are to be Synchronized in the local plan)	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Coord Plan X – Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
25	Coord Plan X – Omit Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



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26	Coord Plan X – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
27	Coord Plan X – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
28	Coord Plan X – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
29	Coord Plan X – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
30	Coord Plan X – Force Off Flag 0 = phases Green Factor is green-factor values 1 = phases Green Factor is force-offs values		0, 1
31	Spare (conditional)		0
32	Spare (ph3-ext)		0
33	Spare (ph7-ext)		0
34	16-bit FCS MSB		0 to 255
35	16-bit FCS LSB		0 to 255
36	End Flag		0x7E

Page6 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		6
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page7 GET Message Blocks

Page7 Block Messages Reference Table for GET RESPONSE

Block ID#	Block Description	Bytes	Timing Chart Reference
1	Detector 1 to 4	38	Detector Attributes (5-1) Detector Configuration (5-2)
2	Detector 5 to 8	38	
3	Detector 9 to 12	38	
4	Detector 13 to 16	38	
5	Detector 17 to 20	38	
6	Detector 21 to 24	38	
7	Detector 25 to 28	38	
8	Detector 29 to 32	38	
9	Detector 33 to 36	38	
10	Detector 37 to 40	38	
11	Detector 41 to 44	38	
12	Failure Times Failure Override System Detector Assignment	34	Failure Times (5-3) Failure Override (5-4) System Detector Assignment (5-5)
13	CIC Operation CIC Values Detector-to-Phase Assignment	35	CIC Operation (5-6-1) CIC Values (5-6-2) Detector-to-Phase Assignment (5-6-3)

Page7 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x87
6	Page ID		7
7	Block ID	1 = Detector 1 to 4 2 = Detector 5 to 8 3 = Detector 9 to 12 4 = Detector 13 to 16 5 = Detector 17 to 20 6 = Detector 21 to 24 7 = Detector 25 to 28 8 = Detector 29 to 32	1 to 13



TSMSS Support of TSCP

Functional Description

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		9 = Detector 33 to 36 10 = Detector 37 to 40 11 = Detector 41 to 44 12 = Failure Times Failure Override System Detector Assignment 13 = CIC Operation CIC Values Detector-to-Phase Assignment	
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page7 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Detector

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		7
7	Block ID	1 = Detector 1 to 4 2 = Detector 5 to 8 3 = Detector 9 to 12 4 = Detector 13 to 16 5 = Detector 17 to 20 6 = Detector 21 to 24 7 = Detector 25 to 28 8 = Detector 29 to 32 9 = Detector 33 to 36 10 = Detector 37 to 40 11 = Detector 41 to 44	1 to 11
Detector Attributes = Det Attrib Detector Configuration = Det Config			
X = detector 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41 X+1 = detector 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42 X+2 = detector 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43 X+3 = detector 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44			
8	Det X Attrib – Detector Type 0 = None		0 to 10



TSMSS Support of TSCP

Functional Description

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	1 = Count 2 = Call 3 = Extend 4 = Count + Call 5 = Call + Extend 6 = Count + Call + Extend 7 = Count + Extend 8 = Limited 9 = Bicycle 10 = Pedestrian		
9	Det X Attrib – Phases Assignment Phases that are assigned to the detector	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Det X Attrib – Lock 0 = No 1 = Red 2 = Yellow		0 to 2
11	Det X Config – Delay Time		0 to 255
12	Det X Config – Extend Time (0.1 Sec)		0 to 255
13	Det X Config – Recall Time		0 to 255
Most Significant Digit = MS Digit Least Significant Digit = LS Digit			
14	Det X Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit e.g. 13 ⇔ port = 1, bit = 3	0 to 99
15	Det X+1 Attrib – Detector Type		0 to 10
16	Det X+1 Attrib – Phases Assignment	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Det X+1 Attrib – Lock		0 to 2
18	Det X+1 Config – Delay Time		0 to 255
19	Det X+1 Config – Extend Time (0.1 Sec)		0 to 255
20	Det X+1 Config – Recall Time		0 to 255
21	Det X+1 Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
22	Det X+2 Attrib – Detector Type		0 to 10
23	Det X+2 Attrib – Phases Assignment	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Det X+2 Attrib – Lock		0 to 2
25	Det X+2 Config – Delay Time		0 to 255
26	Det X+2 Config – Extend Time (0.1 Sec)		0 to 255
27	Det X+2 Config – Recall Time		0 to 255
28	Det X+2 Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99



TSMSS Support of TSCP

Functional Description

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29	Det X+3 Attrib – Detector Type		0 to 10
30	Det X+3 Attrib – Phases Assignment	Bits 0-7 ⇔ phases 1-8	0 to 255
31	Det X+3 Attrib – Lock		0 to 2
32	Det X+3 Config – Delay Time		0 to 255
33	Det X+3 Config – Extend Time (0.1 Sec)		0 to 255
34	Det X+3 Config – Recall Time		0 to 255
35	Det X+3 Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
36	16-bit FCS MSB		0 to 255
37	16-bit FCS LSB		0 to 255
38	End Flag		0x7E

Page7 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Failure

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		7
7	Block ID	Failure Times Failure Override System Detector Assignment	12
8	Detector Fail Maximum ON Time (Minute) Amount of time that is used to identify a detector failure		0 to 255
9	Detector Fail Reset Time (Minute)		0 to 255
10	Det Failure Override – Detector 1 - 8	Bits 0-7 ⇔ detectors 1-8	0 to 255
11	Det Failure Override – Detector 9 - 16	Bits 0-7 ⇔ detectors 9-16	0 to 255
12	Det Failure Override – Detector 17 - 24	Bits 0-7 ⇔ detectors 17-24	0 to 255
13	Det Failure Override – Detector 25 - 32	Bits 0-7 ⇔ detectors 25-32	0 to 255
14	Det Failure Override – Detector 33 - 40	Bits 0-3 ⇔ detectors 33-40	0 to 255
15	Det Failure Override – Detector 41 - 44	Bits 0-3 ⇔ detectors 41-44	0 to 255
16	System Det 1 – Detector Assignment Assign detector inputs to System Detector 1		0 to 40
17	System Det 2 – Detector Assignment Assign detector inputs to System Detector 2		0 to 40
18	System Det 3 – Detector Assignment		0 to 40
19	System Det 4 – Detector Assignment		0 to 40



TSMSS Support of TSCP

Functional Description

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20	System Det 5 – Detector Assignment		0 to 40
21	System Det 6 – Detector Assignment		0 to 40
22	System Det 7 – Detector Assignment		0 to 40
23	System Det 8 – Detector Assignment		0 to 40
24	System Det 9 – Detector Assignment		0 to 40
25	System Det 10 – Detector Assignment		0 to 40
26	System Det 11 – Detector Assignment		0 to 40
27	System Det 12 – Detector Assignment		0 to 40
28	System Det 13 – Detector Assignment		0 to 40
29	System Det 14 – Detector Assignment		0 to 40
30	System Det 15 – Detector Assignment		0 to 40
31	System Det 16 – Detector Assignment		0 to 40
32	16-bit FCS MSB		0 to 255
33	16-bit FCS LSB		0 to 255
34	End Flag		0x7E

Page7 Timing Data – GET RESPONSE (TSCP >>> TSMSS) CIC			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		7
7	Block ID	CIC Operation CIC Values Detector-to-Phase Assignment	13
8, 9	CIC Enable in Plans Byte #8: Bit 0 ⇔ plan 9 Byte #9: Bits 0-7 ⇔ plans 1-8	u_int16	
10	CIC Smoothing Volume (0.01)		0 to 255
11	CIC Smoothing Occupancy (0.01)		0 to 255
12	CIC Smoothing Demand (0.01)		0 to 255
13	CIC Multiplier Volume (0.1)		0 to 255
14	CIC Multiplier Occupancy (0.01)		0 to 255
15	CIC Exponent Volume (0.01)		0 to 255
16	CIC Exponent Occupancy (0.01)		0 to 255
17	CIC System Det 1 – Detector-to-Phase Assignment		0 to 8
18	CIC System Det 2 – Detector-to-Phase Assignment		0 to 8
19	CIC System Det 3 – Detector-to-Phase Assignment		0 to 8



TSMSS Support of TSCP Functional Description

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20	CIC System Det 4 – Detector-to-Phase Assignment	0 to 8
21	CIC System Det 5 – Detector-to-Phase Assignment	0 to 8
22	CIC System Det 6 – Detector-to-Phase Assignment	0 to 8
23	CIC System Det 7 – Detector-to-Phase Assignment	0 to 8
24	CIC System Det 8 – Detector-to-Phase Assignment	0 to 8
25	CIC System Det 9 – Detector-to-Phase Assignment	0 to 8
26	CIC System Det 10 – Detector-to-Phase Assignment	0 to 8
27	CIC System Det 11 – Detector-to-Phase Assignment	0 to 8
28	CIC System Det 12 – Detector-to-Phase Assignment	0 to 8
29	CIC System Det 13 – Detector-to-Phase Assignment	0 to 8
30	CIC System Det 14 – Detector-to-Phase Assignment	0 to 8
31	CIC System Det 15 – Detector-to-Phase Assignment	0 to 8
32	CIC System Det 16 – Detector-to-Phase Assignment	0 to 8
33	16-bit FCS MSB	0 to 255
34	16-bit FCS LSB	0 to 255
35	End Flag	0x7E

Page7 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		7
7	Block ID		1 to 13
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page7 SET Message Blocks

Page7 Block Messages Reference Table for SET

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Detector 1 to 4	38	Detector Attributes (5-1) Detector Configuration (5-2)
2	Detector 5 to 8	38	
3	Detector 9 to 12	38	
4	Detector 13 to 16	38	
5	Detector 17 to 20	38	
6	Detector 21 to 24	38	
7	Detector 25 to 28	38	
8	Detector 29 to 32	38	
9	Detector 33 to 36	38	
10	Detector 37 to 40	38	
11	Detector 41 to 44	38	
12	Failure Times Failure Override System Detector Assignment	34	Failure Times (5-3) Failure Override (5-4) System Detector Assignment (5-5)
13	CIC Operation CIC Values Detector-to-Phase Assignment	35	CIC Operation (5-6-1) CIC Values (5-6-2) Detector-to-Phase Assignment (5-6-3)

Page7 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET Response		0xD6
6	Page ID		7
7	Block ID	1 = Detector 1 to 4 2 = Detector 5 to 8 3 = Detector 9 to 12 4 = Detector 13 to 16 5 = Detector 17 to 20 6 = Detector 21 to 24 7 = Detector 25 to 28	1 to 13



TSMSS Support of TSCP Functional Description

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		8 = Detector 29 to 32 9 = Detector 33 to 36 10 = Detector 37 to 40 11 = Detector 41 to 44 12 = Failure Times Failure Override System Detector Assignment 13 = CIC Operation CIC Values Detector-to-Phase Assignment	
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page7 Timing Data – SET (TSMSS >>> TSCP) Detector			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		7
7	Block ID	1 = Detector 1 to 4 2 = Detector 5 to 8 3 = Detector 9 to 12 4 = Detector 13 to 16 5 = Detector 17 to 20 6 = Detector 21 to 24 7 = Detector 25 to 28 8 = Detector 29 to 32 9 = Detector 33 to 36 10 = Detector 37 to 40 11 = Detector 41 to 44	1 to 11
Detector Attributes = Det Attrib Detector Configuration = Det Config			
X = detector 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41 X+1 = detector 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42 X+2 = detector 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43 X+3 = detector 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44			



TSMSS Support of TSCP Functional Description

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8	Det X Attrib – Detector Type 0 = None 1 = Count 2 = Call 3 = Extend 4 = Count + Call 5 = Call + Extend 6 = Count + Call + Extend 7 = Count + Extend 8 = Limited 9 = Bicycle 10 = Pedestrian		0 to 10
9	Det X Attrib – Phases Assignment Phases that are assigned to the detector	Bits 0-7 ⇔ phases 1-8	0 to 255
10	Det X Attrib – Lock 0 = No 1 = Red 2 = Yellow		0 to 2
11	Det X Config – Delay Time		0 to 255
12	Det X Config – Extend Time (0.1 Sec)		0 to 255
13	Det X Config – Recall Time		0 to 255
Most Significant Digit = MS Digit Least Significant Digit = LS Digit			
14	Det X Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit e.g. 13 ⇔ port = 1, bit = 3	0 to 99
15	Det X+1 Attrib – Detector Type		0 to 10
16	Det X+1 Attrib – Phases Assignment	Bits 0-7 ⇔ phases 1-8	0 to 255
17	Det X+1 Attrib – Lock		0 to 2
18	Det X+1 Config – Delay Time		0 to 255
19	Det X+1 Config – Extend Time (0.1 Sec)		0 to 255
20	Det X+1 Config – Recall Time		0 to 255
21	Det X+1 Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
22	Det X+2 Attrib – Detector Type		0 to 10
23	Det X+2 Attrib – Phases Assignment	Bits 0-7 ⇔ phases 1-8	0 to 255
24	Det X+2 Attrib – Lock		0 to 2
25	Det X+2 Config – Delay Time		0 to 255
26	Det X+2 Config – Extend Time (0.1 Sec)		0 to 255
27	Det X+2 Config – Recall Time		0 to 255



TSMSS Support of TSCP

Functional Description

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28	Det X+2 Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
29	Det X+3 Attrib – Detector Type		0 to 10
30	Det X+3 Attrib – Phases Assignment	Bits 0-7 ⇔ phases 1-8	0 to 255
31	Det X+3 Attrib – Lock		0 to 2
32	Det X+3 Config – Delay Time		0 to 255
33	Det X+3 Config – Extend Time (0.1 Sec)		0 to 255
34	Det X+3 Config – Recall Time		0 to 255
35	Det X+3 Config – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
36	16-bit FCS MSB		0 to 255
37	16-bit FCS LSB		0 to 255
38	End Flag		0x7E

Page7 Timing Data – SET (TSMSS >>> TSCP) Failure

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		7
7	Block ID	Failure Times Failure Override System Det Assignment	12
8	Detector Fail Maximum ON Time (Minute) Amount of time that is used to identify a detector failure		0 to 255
9	Detector Fail Reset Time (Minute)		0 to 255
10	Det Failure Override – Detector 1 - 8	Bits 0-7 ⇔ detectors 1-8	0 to 255
11	Det Failure Override – Detector 9 - 16	Bits 0-7 ⇔ detectors 9-16	0 to 255
12	Det Failure Override – Detector 17 - 24	Bits 0-7 ⇔ detectors 17-24	0 to 255
13	Det Failure Override – Detector 25 - 32	Bits 0-7 ⇔ detectors 25-32	0 to 255
14	Det Failure Override – Detector 33 - 40	Bits 0-3 ⇔ detectors 33-40	0 to 255
15	Det Failure Override – Detector 41 - 44	Bits 0-3 ⇔ detectors 41-44	0 to 255
16	System Det 1 – Detector Assignment Assign detector inputs to System Detector 1		0 to 40
17	System Det 2 – Detector Assignment Assign detector inputs to System Detector 2		0 to 40



TSMSS Support of TSCP Functional Description

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18	System Det 3 – Detector Assignment		0 to 40
19	System Det 4 – Detector Assignment		0 to 40
20	System Det 5 – Detector Assignment		0 to 40
21	System Det 6 – Detector Assignment		0 to 40
22	System Det 7 – Detector Assignment		0 to 40
23	System Det 8 – Detector Assignment		0 to 40
24	System Det 9 – Detector Assignment		0 to 40
25	System Det 10 – Detector Assignment		0 to 40
26	System Det 11 – Detector Assignment		0 to 40
27	System Det 12 – Detector Assignment		0 to 40
28	System Det 13 – Detector Assignment		0 to 40
29	System Det 14 – Detector Assignment		0 to 40
30	System Det 15 – Detector Assignment		0 to 40
31	System Det 16 – Detector Assignment		0 to 40
32	16-bit FCS MSB		0 to 255
33	16-bit FCS LSB		0 to 255
34	End Flag		0x7E

Page7 Timing Data – SET (TSMSS >>> TSCP) CIC

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		7
7	Block ID	CIC Operation CIC Values Det-to-Phase Assignment	13
8, 9	CIC Enable in Plans Byte #8: Bit 0 ⇔ plan 9 Byte #9: Bits 0-7 ⇔ plans 1-8	u_int16	
10	CIC Smoothing Volume (0.01)		0 to 255
11	CIC Smoothing Occupancy (0.01)		0 to 255
12	CIC Smoothing Demand (0.01)		0 to 255
13	CIC Multiplier Volume (0.1)		0 to 255
14	CIC Multiplier Occupancy (0.01)		0 to 255
15	CIC Exponent Volume (0.01)		0 to 255
16	CIC Exponent Occupancy (0.01)		0 to 255
17	CIC System Det 1 – Detector-to-Phase Assignment		0 to 8



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18	CIC System Det 2 – Detector-to-Phase Assignment	0 to 8
19	CIC System Det 3 – Detector-to-Phase Assignment	0 to 8
20	CIC System Det 4 – Detector-to-Phase Assignment	0 to 8
21	CIC System Det 5 – Detector-to-Phase Assignment	0 to 8
22	CIC System Det 6 – Detector-to-Phase Assignment	0 to 8
23	CIC System Det 7 – Detector-to-Phase Assignment	0 to 8
24	CIC System Det 8 – Detector-to-Phase Assignment	0 to 8
25	CIC System Det 9 – Detector-to-Phase Assignment	0 to 8
26	CIC System Det 10 – Detector-to-Phase Assignment	0 to 8
27	CIC System Det 11 – Detector-to-Phase Assignment	0 to 8
28	CIC System Det 12 – Detector-to-Phase Assignment	0 to 8
29	CIC System Det 13 – Detector-to-Phase Assignment	0 to 8
30	CIC System Det 14 – Detector-to-Phase Assignment	0 to 8
31	CIC System Det 15 – Detector-to-Phase Assignment	0 to 8
32	CIC System Det 16 – Detector-to-Phase Assignment	0 to 8
33	16-bit FCS MSB	0 to 255
34	16-bit FCS LSB	0 to 255
35	End Flag	0x7E

Page7 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		7
7	Message ID		1 to 13
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

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Page8 GET Message Blocks

Page8 Block Messages Reference Table for GET RESPONSE

Block ID #	Block Description	Bytes	Timing Chart Reference
1	TOD Table1 Entry 1-4	26	Table 1 (8-2-1)
2	TOD Table1 Entry 5-8	26	Table 2 (8-2-2)
3	TOD Table1 Entry 9-12	26	Table 3 (8-2-3)
4	TOD Table1 Entry 13-16	26	Table 4 (8-2-4)
5	TOD Table2 Entry 1-4	26	Table 5 (8-2-5)
6	TOD Table2 Entry 5-8	26	Table 6 (8-2-6)
7	TOD Table2 Entry 9-12	26	
8	TOD Table2 Entry 13-16	26	
9	TOD Table3 Entry 1-4	26	
10	TOD Table3 Entry 5-8	26	
11	TOD Table3 Entry 9-12	26	
12	TOD Table3 Entry 13-16	26	
13	TOD Table4 Entry 1-4	26	
14	TOD Table4 Entry 5-8	26	
15	TOD Table4 Entry 9-12	26	
16	TOD Table4 Entry 13-16	26	
17	TOD Table5 Entry 1-4	26	
18	TOD Table5 Entry 5-8	26	
19	TOD Table5 Entry 9-12	26	
20	TOD Table5 Entry 13-16	26	
21	TOD Table6 Entry 1-4	26	
22	TOD Table6 Entry 5-8	26	
23	TOD Table6 Entry 9-12	26	
24	TOD Table6 Entry 13-16	26	
25	Weekday Table	17	Weekday Table Assignments (8-2-7)

Page8 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x33
4	IPI		0xC0



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

5	Message – GET		0x87
6	Page ID		8
7	Block ID	1 = TOD Table1 Entry 1-4 2 = TOD Table1 Entry 5-8 3 = TOD Table1 Entry 9-12 4 = TOD Table1 Entry 13-16 5 = TOD Table2 Entry 1-4 6 = TOD Table2 Entry 5-8 7 = TOD Table2 Entry 9-12 8 = TOD Table2 Entry 13-16 9 = TOD Table3 Entry 1-4 10 = TOD Table3 Entry 5-8 11 = TOD Table3 Entry 9-12 12 = TOD Table3 Entry 13-16 13 = TOD Table4 Entry 1-4 14 = TOD Table4 Entry 5-8 15 = TOD Table4 Entry 9-12 16 = TOD Table4 Entry 13-16 17 = TOD Table5 Entry 1-4 18 = TOD Table5 Entry 5-8 19 = TOD Table5 Entry 9-12 20 = TOD Table5 Entry 13-16 21 = TOD Table6 Entry 1-4 22 = TOD Table6 Entry 5-8 23 = TOD Table6 Entry 9-12 24 = TOD Table6 Entry 13-16 25 = Weekday Table	1 to 25
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page8 Timing Data – GET RESPONSE (TSCP >>> TSMSS) TOD Table			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		8
7	Block ID	1 = TOD Table1 Entry 1-4 2 = TOD Table1 Entry 5-8	1 to 24



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

		3 = TOD Table1 Entry 9-12 4 = TOD Table1 Entry 13-16 5 = TOD Table2 Entry 1-4 6 = TOD Table2 Entry 5-8 7 = TOD Table2 Entry 9-12 8 = TOD Table2 Entry 13-16 9 = TOD Table3 Entry 1-4 10 = TOD Table3 Entry 5-8 11 = TOD Table3 Entry 9-12 12 = TOD Table3 Entry 13-16 13 = TOD Table4 Entry 1-4 14 = TOD Table4 Entry 5-8 15 = TOD Table4 Entry 9-12 16 = TOD Table4 Entry 13-16 17 = TOD Table5 Entry 1-4 18 = TOD Table5 Entry 5-8 19 = TOD Table5 Entry 9-12 20 = TOD Table5 Entry 13-16 21 = TOD Table6 Entry 1-4 22 = TOD Table6 Entry 5-8 23 = TOD Table6 Entry 9-12 24 = TOD Table6 Entry 13-16	
<i>Time-of-Day = TOD</i>			
X = TOD Table 1 to 6 Y = Entry 1, 5, 9, 13 Y+1 = Entry 2, 6, 10, 14 Y+2 = Entry 3, 7, 11, 15 Y+3 = Entry 4, 8, 12, 16			
8	TOD Table X Entry Y Plan Start Hour		0 to 23
9	TOD Table X Entry Y Plan Start Minute		0 to 59
10	TOD Table X Entry Y Plan Number		0 to 255
11	TOD Table X Entry Y Plan Offset 10 = Offset A 11 = Offset B 12 = Offset C		10 to 12
12	TOD Table X Entry Y+1 Plan Start Hour		0 to 23
13	TOD Table X Entry Y+1 Plan Start Minute		0 to 59
14	TOD Table X Entry Y+1 Plan Number		0 to 255
15	TOD Table X Entry Y+1 Plan Offset		10 to 12
16	TOD Table X Entry Y+2 Plan Start Hour		0 to 23



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

17	TOD Table X Entry Y+2 Plan Start Minute		0 to 59
18	TOD Table X Entry Y+2 Plan Number		0 to 255
19	TOD Table X Entry Y+2 Plan Offset		10 to 12
20	TOD Table X Entry Y+3 Plan Start Hour		0 to 23
21	TOD Table X Entry Y+3 Plan Start Minute		0 to 59
22	TOD Table X Entry Y+3 Plan Number		0 to 255
23	TOD Table X Entry Y+3 Plan Offset		10 to 12
24	16-bit FCS MSB		0 to 255
25	16-bit FCS LSB		0 to 255
26	End Flag		0x7E

Page8 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Weekday Assign

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		8
7	Block ID	Weekday Table	25
8	Weekday Tables Assignment Monday		0 to 6
9	Weekday Tables Assignment Tuesday		0 to 6
10	Weekday Tables Assignment Wednesday		0 to 6
11	Weekday Tables Assignment Thursday		0 to 6
12	Weekday Tables Assignment Friday		0 to 6
13	Weekday Tables Assignment Saturday		0 to 6
14	Weekday Tables Assignment Sunday		0 to 6
15	16-bit FCS MSB		0 to 255
16	16-bit FCS LSB		0 to 255
17	End Flag		0x7E

Page8 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

6	Page ID		8
7	Message ID		1 to 25
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page8 SET Message Blocks

Page8 Block Messages Reference Table for SET

Block ID #	Block Message	Bytes	Timing Chart Tables
1	TOD Table1 Entry 1-4	26	Table 1 (8-2-1)
2	TOD Table1 Entry 5-8	26	Table 2 (8-2-2)
3	TOD Table1 Entry 9-12	26	Table 3 (8-2-3)
4	TOD Table1 Entry 13-16	26	Table 4 (8-2-4)
5	TOD Table2 Entry 1-4	26	Table 5 (8-2-5)
6	TOD Table2 Entry 5-8	26	Table 6 (8-2-6)
7	TOD Table2 Entry 9-12	26	
8	TOD Table2 Entry 13-16	26	
9	TOD Table3 Entry 1-4	26	
10	TOD Table3 Entry 5-8	26	
11	TOD Table3 Entry 9-12	26	
12	TOD Table3 Entry 13-16	26	
13	TOD Table4 Entry 1-4	26	
14	TOD Table4 Entry 5-8	26	
15	TOD Table4 Entry 9-12	26	
16	TOD Table4 Entry 13-16	26	
17	TOD Table5 Entry 1-4	26	
18	TOD Table5 Entry 5-8	26	
19	TOD Table5 Entry 9-12	26	
20	TOD Table5 Entry 13-16	26	
21	TOD Table6 Entry 1-4	26	
22	TOD Table6 Entry 5-8	26	
23	TOD Table6 Entry 9-12	26	
24	TOD Table6 Entry 13-16	26	
25	Weekday Table	17	Weekday Table Assignments (8-2-7)

Page8 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

5	Message – SET Response		0xD6
6	Page ID		8
7	Block ID	1 = TOD Table1 Entry 1-4 2 = TOD Table1 Entry 5-8 3 = TOD Table1 Entry 9-12 4 = TOD Table1 Entry 13-16 5 = TOD Table2 Entry 1-4 6 = TOD Table2 Entry 5-8 7 = TOD Table2 Entry 9-12 8 = TOD Table2 Entry 13-16 9 = TOD Table3 Entry 1-4 10 = TOD Table3 Entry 5-8 11 = TOD Table3 Entry 9-12 12 = TOD Table3 Entry 13-16 13 = TOD Table4 Entry 1-4 14 = TOD Table4 Entry 5-8 15 = TOD Table4 Entry 9-12 16 = TOD Table4 Entry 13-16 17 = TOD Table5 Entry 1-4 18 = TOD Table5 Entry 5-8 19 = TOD Table5 Entry 9-12 20 = TOD Table5 Entry 13-16 21 = TOD Table6 Entry 1-4 22 = TOD Table6 Entry 5-8 23 = TOD Table6 Entry 9-12 24 = TOD Table6 Entry 13-16 25 = Weekday Table	1 to 25
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page8 Timing Data – SET (TSMSS >>> TSCP) TOD Table			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		8
7	Block ID	1 = TOD Table1 Entry 1-4 2 = TOD Table1 Entry 5-8 3 = TOD Table1 Entry 9-12	1 to 24



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

		4 = TOD Table1 Entry 13-16 5 = TOD Table2 Entry 1-4 6 = TOD Table2 Entry 5-8 7 = TOD Table2 Entry 9-12 8 = TOD Table2 Entry 13-16 9 = TOD Table3 Entry 1-4 10 = TOD Table3 Entry 5-8 11 = TOD Table3 Entry 9-12 12 = TOD Table3 Entry 13-16 13 = TOD Table4 Entry 1-4 14 = TOD Table4 Entry 5-8 15 = TOD Table4 Entry 9-12 16 = TOD Table4 Entry 13-16 17 = TOD Table5 Entry 1-4 18 = TOD Table5 Entry 5-8 19 = TOD Table5 Entry 9-12 20 = TOD Table5 Entry 13-16 21 = TOD Table6 Entry 1-4 22 = TOD Table6 Entry 5-8 23 = TOD Table6 Entry 9-12 24 = TOD Table6 Entry 13-16	
<i>Time-of-Day = TOD</i>			
X = TOD Table 1 to 6 Y = Entry 1, 5, 9, 13 Y+1 = Entry 2, 6, 10, 14 Y+2 = Entry 3, 7, 11, 15 Y+3 = Entry 4, 8, 12, 16			
8	TOD Table T Entry Y Plan Start Hour		0 to 23
9	TOD Table T Entry Y Plan Start Minute		0 to 59
10	TOD Table T Entry Y Plan Number		0 to 255
11	TOD Table T Entry Y Plan Offset 10 = Offset A 11 = Offset B 12 = Offset C		10 to 12
12	TOD Table X Entry Y+1 Plan Start Hour		0 to 23
13	TOD Table X Entry Y+1 Plan Start Minute		0 to 59
14	TOD Table X Entry Y+1 Plan Number		0 to 255
15	TOD Table X Entry Y+1 Plan Offset		10 to 12
16	TOD Table X Entry Y+2 Plan Start Hour		0 to 23



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

17	TOD Table X Entry Y+2 Plan Start Minute		0 to 59
18	TOD Table X Entry Y+2 Plan Number		0 to 255
19	TOD Table X Entry Y+2 Plan Offset		10 to 12
20	TOD Table X Entry Y+3 Plan Start Hour		0 to 23
21	TOD Table X Entry Y+3 Plan Start Minute		0 to 59
22	TOD Table X Entry Y+3 Plan Number		0 to 255
23	TOD Table X Entry Y+3 Plan Offset		10 to 12
24	16-bit FCS MSB		0 to 255
25	16-bit FCS LSB		0 to 255
26	End Flag		0x7E

Page8 Timing Data – SET (TSMSS >>> TSCP) Weekday Assign			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		8
7	Block ID	Weekday Table	25
8	Weekday Tables Assignment Monday		0 to 6
9	Weekday Tables Assignment Tuesday		0 to 6
10	Weekday Tables Assignment Wednesday		0 to 6
11	Weekday Tables Assignment Thursday		0 to 6
12	Weekday Tables Assignment Friday		0 to 6
13	Weekday Tables Assignment Saturday		0 to 6
14	Weekday Tables Assignment Sunday		0 to 6
15	16-bit FCS MSB		0 to 255
16	16-bit FCS LSB		0 to 255
17	End Flag		0x7E

Page8 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	AB3418 Format	1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

6	Page ID		8
7	Block ID		1 to 25
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page9 GET Message Blocks

Page9 Block Messages Reference Table for GET RESPONSE

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Floating Holiday 1-8	42	Floating Holiday Table (8-2-8)
2	Floating Holiday 9-16	42	
3	Fixed Holiday 1-8	42	Fixed Holiday Table (8-2-9)
4	Fixed Holiday 9-16	42	
5	Solar Clock Sabbatical Clock Daylight Saving	16	Solar Clock Data (8-4) Sabbatical Clock (8-5) Daylight Saving (8-6)
6	TOD Function 1-4	38	TOD Functions (8-3)
7	TOD Function 5-8	38	
8	TOD Function 9-12	38	
9	TOD Function 13-16	38	

Page9 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		87 - GET
6	Page ID		9
7	Block ID	1 = Floating Holiday 1-8 2 = Floating Holiday 9-16 3 = Fixed Holiday 1-8 4 = Fixed Holiday 9-16 5 = Solar Clock Sabbatical Clock Daylight Saving 6 = TOD Function 1-4 7 = TOD Function 5-8 8 = TOD Function 9-12 9 = TOD Function 13-16	1 to 9
8	16-bit FCS MSB		0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page9 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Float Holiday

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		9
7	Block ID	1 = Floating Holiday 1-8 2 = Floating Holiday 9-16	1 to 2
X = Floating Holiday Table 1, 9 X+1 = Floating Holiday Table 2, 10 X+2 = Floating Holiday Table 3, 11 X+3 = Floating Holiday Table 4, 12 X+4 = Floating Holiday Table 5, 13 X+5 = Floating Holiday Table 6, 14 X+6 = Floating Holiday Table 7, 15 X+7 = Floating Holiday Table 8, 16			
8	Floating Holiday X Month		0 to 12
9	Floating Holiday X Week		0 to 5
10	Floating Holiday X Day-of-Week Bit 0 – Mon Bit 1 – Tue Bit 2 – Wed Bit 3 – Thurs Bit 4 – Fri Bit 5 – Sat Bit 6 – Sun		0 to 127
11	Floating Holiday X Table		0 to 6
12	Floating Holiday X+1 Month		0 to 12
13	Floating Holiday X+1 Week		0 to 5
14	Floating Holiday X+1 Day-of-Week		0 to 127
15	Floating Holiday X+1 Table		0 to 6
16	Floating Holiday X+2 Month		0 to 12
17	Floating Holiday X+2 Week		0 to 5
18	Floating Holiday X+2 Day-of-Week		0 to 127



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

19	Floating Holiday X+2 Table		0 to 6
20	Floating Holiday X+3 Month		0 to 12
21	Floating Holiday X+3 Week		0 to 5
22	Floating Holiday X+3 Day-of-Week		0 to 127
23	Floating Holiday X+3 Table		0 to 6
24	Floating Holiday X+4 Month		0 to 12
25	Floating Holiday X+4 Week		0 to 5
26	Floating Holiday X+4 Day-of-Week		0 to 127
27	Floating Holiday X+4 Table		0 to 6
28	Floating Holiday X+5 Month		0 to 12
29	Floating Holiday X+5 Week		0 to 5
30	Floating Holiday X+5 Day-of-Week		0 to 127
31	Floating Holiday X+5 Table		0 to 6
32	Floating Holiday X+6 Month		0 to 12
33	Floating Holiday X+6 Week		0 to 5
34	Floating Holiday X+6 Day-of-Week		0 to 127
35	Floating Holiday X+6 Table		0 to 6
36	Floating Holiday X+7 Month		0 to 12
37	Floating Holiday X+7 Week		0 to 5
38	Floating Holiday X+7 Day-of-Week		0 to 127
39	Floating Holiday X+7 Table		0 to 6
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page9 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Fixed Holiday

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		9
7	Block ID	3 = Fixed Holiday 1-8 4 = Fixed Holiday 9-16	3 to 4
X = Fixed Holiday Table 1, 9			



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

X+1 = Fixed Holiday Table 2, 10 X+2 = Fixed Holiday Table 3, 11 X+3 = Fixed Holiday Table 4, 12 X+4 = Fixed Holiday Table 5, 13 X+5 = Fixed Holiday Table 6, 14 X+6 = Fixed Holiday Table 7, 15 X+7 = Fixed Holiday Table 8, 16			
8	Fixed Holiday X Month		0 to 12
9	Fixed Holiday X Day		0 to 31
10	Fixed Holiday X Day-of-Week Bit 0 – Mon Bit 1 – Tue Bit 2 – Wed Bit 3– Thurs Bit 4 – Fri Bit 5 – Sat Bit 6 – Sun		0 to 127
11	Fixed Holiday X Table		0 to 6
12	Fixed Holiday X+1 Month		0 to 12
13	Fixed Holiday X+1 Day		0 to 31
14	Fixed Holiday X+1 Day-of-Week		0 to 127
15	Fixed Holiday X+1 Table		0 to 6
16	Fixed Holiday X+2 Month		0 to 12
17	Fixed Holiday X+2 Day		0 to 31
18	Fixed Holiday X+2 Day-of-Week		0 to 127
19	Fixed Holiday X+2 Table		0 to 6
20	Fixed Holiday X+3 Month		0 to 12
21	Fixed Holiday X+3 Day		0 to 31
22	Fixed Holiday X+3 Day-of-Week		0 to 127
23	Fixed Holiday X+3 Table		0 to 6
24	Fixed Holiday X+4 Month		0 to 12
25	Fixed Holiday X+4 Day		0 to 31
26	Fixed Holiday X+4 Day-of-Week		0 to 127
27	Fixed Holiday X+4 Table		0 to 6
28	Fixed Holiday X+5 Month		0 to 12
29	Fixed Holiday X+5 Day		0 to 31
30	Fixed Holiday X+5 Day-of-Week		0 to 127
31	Fixed Holiday X+5 Table		0 to 6



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

32	Fixed Holiday X+6 Month		0 to 12
33	Fixed Holiday X+6 Day		0 to 31
34	Fixed Holiday X+6 Day-of-Week		0 to 127
35	Fixed Holiday X+6 Table		0 to 6
36	Fixed Holiday X+7 Month		0 to 12
37	Fixed Holiday X+7 Day		0 to 31
38	Fixed Holiday X+7 Day-of-Week		0 to 127
39	Fixed Holiday X+7 Table		0 to 6
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page9 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Alternative Clock

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		9
7	Block ID	Solar Clock Sabbatical Clock Daylight Saving	5
8	Solar Clock North Latitude		0 to 255
9	Solar Clock Longitude		0 to 255
10	Solar Clock Local Time Zone		8
11	Sabbatical Clock Sabbath Ped Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	Sabbatical Clock Holiday Ped Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	Daylight Saving 1 = Daylight Saving Time On 0 = Daylight Saving Time Off		0 or 1
14	16-bit FCS MSB		0 to 255
15	16-bit FCS LSB		0 to 255
16	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page9 Timing Data – GET RESPONSE (TSCP >>> TSMSS) TOD Function

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		9
7	Block ID	6 = TOD Function 1 to 4 7 = TOD Function 5 to 8 8 = TOD Function 9 to 12 9 = TOD Function 13 to 16	6 to 9
Time-of-Day = TOD			
X = TOD Function Table 1, 5, 9, 13 X+1 = TOD Function Table 2, 6, 10, 14 X+2 = TOD Function Table 3, 7, 11, 15 X+3 = TOD Function Table 4, 8, 12, 16			
8	TOD Function X Start Hour		0 to 23
9	TOD Function X Start Minute		0 to 59
10	TOD Function X End Hour		0 to 23
11	TOD Function X End Minute		0 to 59
12	TOD Function X Day-of-Week Bit 0 – Mon Bit 1 – Tue Bit 2 – Wed Bit 3 – Thurs Bit 4 – Fri Bit 5 – Sat Bit 6 – Sun		0 to 127
13	TOD Function X Action Code 0 – None 1 – Permitted 2 – Restricted 4 – Veh Min Recall 5 – Veh Max Recall 6 – Ped Recall 7 – Bike Recall 8 – Red Lock 9 – Yellow Lock 10 – Force/Max Lock 11 – Double Entry 12 – Y-Coord C 13 – Y-Coord D		0 to 26, 41, 42, 100 to 126, 141, 142, 200 to 226, 241, 242



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	14 – Free 15 – Flashing 16 – Walk 2 17 – Max Green 2 18 – Max Green 3 19 – Rest in Walk 20 – Rest in Red 21 – Free Lag Phases 22 – Special Functions 23 – Truck Priority 24 – Conditional Services 25 – Conditional Services 26 – Leading Ped 27 – Traffic Actuated Max2 41 – Protected Permissive 42 – Protected Permissive 100+Action Code = Phases removed 200+Action Code = Phases replaced		
14	TOD Function X Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
15	TOD Function X+1 Start Hour		0 to 23
16	TOD Function X+1 Start Minute		0 to 59
17	TOD Function X+1 End Hour		0 to 23
18	TOD Function X+1 End Minute		0 to 59
19	TOD Function X+1 Day-of-Week		0 to 127
20	TOD Function X+1 Action Code		0 to 26, 41, 42
21	TOD Function X+1 Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
22	TOD Function X+2 Start Hour		0 to 23
23	TOD Function X+2 Start Minute		0 to 59
24	TOD Function X+2 End Hour		0 to 23
25	TOD Function X+2 End Minute		0 to 59
26	TOD Function X+2 Day-of-Week		0 to 127
27	TOD Function X+2 Action Code		0 to 26, 41, 42
28	TOD Function X+2 Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
29	TOD Function X+3 Start Hour		0 to 23
30	TOD Function X+3 Start Minute		0 to 59
31	TOD Function X+3 End Hour		0 to 23
32	TOD Function X+3 End Minute		0 to 59
33	TOD Function X+3 Day-of-Week		0 to 127
34	TOD Function X+3 Action Code		0 to 26, 41, 42
35	TOD Function X+3 Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

36	16-bit FCS MSB		0 to 255
37	16-bit FCS LSB		0 to 255
38	End Flag		0x7E

Page9 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		9
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page9 SET Message Blocks

Page9 Block Messages Reference Table for SET

Block ID #	Block Message	Bytes	Timing Chart Tables
1	Floating Holiday 1-8	42	Floating Holiday Table (8-2-8)
2	Floating Holiday 9-16	42	
3	Fixed Holiday 1-8	42	Fixed Holiday Table (8-2-9)
4	Fixed Holiday 9-16	42	
5	Solar Clock Sabbatical Clock Daylight Saving	16	Solar Clock Data (8-4) Sabbatical Clock (8-5) Daylight Saving (8-6)
6	TOD Function 1-4	38	TOD Functions (8-3)
7	TOD Function 5-8	38	
8	TOD Function 9-12	38	
9	TOD Function 13-16	38	

Page9 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0x96
6	Page ID		9
7	Block ID	1 = Floating Holiday 1-8 2 = Floating Holiday 9-16 3 = Fixed Holiday 1-8 4 = Fixed Holiday 9-16 5 = Solar Clock Sabbatical Clock Daylight Saving 6 = TOD Function 1-4 7 = TOD Function 5-8 8 = TOD Function 9-12 9 = TOD Function 13-16	1 to 9
8	16-bit FCS MSB		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page9 Timing Data – SET (TSMSS >>> TSCP) Floating Holiday			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		9
7	Block ID	1 = Floating Holiday 1 to 8 2 = Floating Holiday 9 to 16	1 to 2
X = Floating Holiday Table 1, 9 X+1 = Floating Holiday Table 2, 10 X+2 = Floating Holiday Table 3, 11 X+3 = Floating Holiday Table 4, 12 X+4 = Floating Holiday Table 5, 13 X+5 = Floating Holiday Table 6, 14 X+6 = Floating Holiday Table 7, 15 X+7 = Floating Holiday Table 8, 16			
8	Floating Holiday X Month		0 to 12
9	Floating Holiday X Week		0 to 5
10	Floating Holiday X Day-of-Week Bit 0 – Mon Bit 1 – Tue Bit 2 – Wed Bit 3 – Thurs Bit 4 – Fri Bit 5 – Sat Bit 6 – Sun		0 to 127
11	Floating Holiday X Table		0 to 6
12	Floating Holiday X+1 Month		0 to 12
13	Floating Holiday X+1 Week		0 to 5
14	Floating Holiday X+1 Day-of-Week		0 to 127
15	Floating Holiday X+1 Table		0 to 6
16	Floating Holiday X+2 Month		0 to 12
17	Floating Holiday X+2 Week		0 to 5
18	Floating Holiday X+2 Day-of-Week		0 to 127



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

19	Floating Holiday X+2 Table		0 to 6
20	Floating Holiday X+3 Month		0 to 12
21	Floating Holiday X+3 Week		0 to 5
22	Floating Holiday X+3 Day-of-Week		0 to 127
23	Floating Holiday X+3 Table		0 to 6
24	Floating Holiday X+4 Month		0 to 12
25	Floating Holiday X+4 Week		0 to 5
26	Floating Holiday X+4 Day-of-Week		0 to 127
27	Floating Holiday X+4 Table		0 to 6
28	Floating Holiday X+5 Month		0 to 12
29	Floating Holiday X+5 Week		0 to 5
30	Floating Holiday X+5 Day-of-Week		0 to 127
31	Floating Holiday X+5 Table		0 to 6
32	Floating Holiday X+6 Month		0 to 12
33	Floating Holiday X+6 Week		0 to 5
34	Floating Holiday X+6 Day-of-Week		0 to 127
35	Floating Holiday X+6 Table		0 to 6
36	Floating Holiday X+7 Month		0 to 12
37	Floating Holiday X+7 Week		0 to 5
38	Floating Holiday X+7 Day-of-Week		0 to 127
39	Floating Holiday X+7 Table		0 to 6
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page9 Timing Data – SET (TSMSS >>> TSCP) Fixed Holiday			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		9
7	Block ID	3 = Fixed Holiday 1 to 8 4 = Fixed Holiday 9 to 16	3 to 4



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

X = Fixed Holiday Table 1, 9 X+1 = Fixed Holiday Table 2, 10 X+2 = Fixed Holiday Table 3, 11 X+3 = Fixed Holiday Table 4, 12 X+4 = Fixed Holiday Table 5, 13 X+5 = Fixed Holiday Table 6, 14 X+6 = Fixed Holiday Table 7, 15 X+7 = Fixed Holiday Table 8, 16			
8	Fixed Holiday X Month		0 to 12
9	Fixed Holiday X Day		0 to 31
10	Fixed Holiday X Day-of-Week Bit 0 – Mon Bit 1 – Tue Bit 2 – Wed Bit 3– Thurs Bit 4 – Fri Bit 5 – Sat Bit 6 – Sun		0 to 127
11	Fixed Holiday X Table		0 to 6
12	Fixed Holiday X+1 Month		0 to 12
13	Fixed Holiday X+1 Day		0 to 31
14	Fixed Holiday X+1 Day-of-Week		0 to 127
15	Fixed Holiday X+1 Table		0 to 6
16	Fixed Holiday X+2 Month		0 to 12
17	Fixed Holiday X+2 Day		0 to 31
18	Fixed Holiday X+2 Day-of-Week		0 to 127
19	Fixed Holiday X+2 Table		0 to 6
20	Fixed Holiday X+3 Month		0 to 12
21	Fixed Holiday X+3 Day		0 to 31
22	Fixed Holiday X+3 Day-of-Week		0 to 127
23	Fixed Holiday X+3 Table		0 to 6
24	Fixed Holiday X+4 Month		0 to 12
25	Fixed Holiday X+4 Day		0 to 31
26	Fixed Holiday X+4 Day-of-Week		0 to 127
27	Fixed Holiday X+4 Table		0 to 6
28	Fixed Holiday X+5 Month		0 to 12
29	Fixed Holiday X+5 Day		0 to 31
30	Fixed Holiday X+5 Day-of-Week		0 to 127



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

31	Fixed Holiday X+5 Table		0 to 6
32	Fixed Holiday X+6 Month		0 to 12
33	Fixed Holiday X+6 Day		0 to 31
34	Fixed Holiday X+6 Day-of-Week		0 to 127
35	Fixed Holiday X+6 Table		0 to 6
36	Fixed Holiday X+7 Month		0 to 12
37	Fixed Holiday X+7 Day		0 to 31
38	Fixed Holiday X+7 Day-of-Week		0 to 127
39	Fixed Holiday X+7 Table		0 to 6
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page9 Timing Data – SET (TSMSS >>> TSCP) Alternative Clock			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		9
7	Block ID	Solar Clock Sabbatical Clock Daylight Saving	5
8	Solar Clock North Latitude		0 to 255
9	Solar Clock Longitude		0 to 255
10	Solar Clock Local Time Zone		8
11	Sabbatical Clock Sabbath Ped Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	Sabbatical Clock Holiday Ped Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	Daylight Saving 1 = Daylight Saving Time On 0 = Daylight Saving Time Off		0 or 1
14	16-bit FCS MSB		0 to 255
15	16-bit FCS LSB		0 to 255
16	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page9 Timing Data – SET (TSMSS >>> TSCP) TOD Function			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		9
7	Block ID	6 = TOD Function 1 to 4 7 = TOD Function 5 to 8 8 = TOD Function 9 to 12 9 = TOD Function 13 to 16	6 to 9
<i>Time-of-Day = TOD</i>			
X = TOD Function Table 1, 5, 9, 13 X+1 = TOD Function Table 2, 6, 10, 14 X+2 = TOD Function Table 3, 7, 11, 15 X+3 = TOD Function Table 4, 8, 12, 16			
8	TOD Function X Start Hour		0 to 23
9	TOD Function X Start Minute		0 to 59
10	TOD Function X End Hour		0 to 23
11	TOD Function X End Minute		0 to 59
12	TOD Function X Day-of-Week Bit 0 – Mon Bit 1 – Tue Bit 2 – Wed Bit 3 – Thurs Bit 4 – Fri Bit 5 – Sat Bit 6 – Sun		0 to 127
13	TOD Function X Action Code 0 – None 1 – Permitted 2 – Restricted 4 – Veh Min Recall 5 – Veh Max Recall 6 – Ped Recall 7 – Bike Recall 8 – Red Lock 9 – Yellow Lock 10 – Force/Max Lock 11 – Double Entry 12 – Y-Coord C 13 – Y-Coord D		0 to 26, 41, 42, 100 to 126, 141, 142, 200 to 226, 241, 242



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	14 – Free 15 – Flashing 16 – Walk 2 17 – Max Green 2 18 – Max Green 3 19 – Rest in Walk 20 – Rest in Red 21 – Free Lag Phases 22 – Special Functions 23 – Truck Priority 24 – Conditional Services 25 – Conditional Services 26 – Leading Ped 27 – Traffic Actuated Max2 41 – Protected Permissive 42 – Protected Permissive 100+Action Code = Phases removed 200+Action Code = Phases replaced		
14	TOD Function X Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
15	TOD Function X+1 Start Hour		0 to 23
16	TOD Function X+1 Start Minute		0 to 59
17	TOD Function X+1 End Hour		0 to 23
18	TOD Function X+1 End Minute		0 to 59
19	TOD Function X+1 Day-of-Week		0 to 127
20	TOD Function X+1 Action Code		0 to 26, 41, 42
21	TOD Function X+1 Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
22	TOD Function X+2 Start Hour		0 to 23
23	TOD Function X+2 Start Minute		0 to 59
24	TOD Function X+2 End Hour		0 to 23
25	TOD Function X+2 End Minute		0 to 59
26	TOD Function X+2 Day-of-Week		0 to 127
27	TOD Function X+2 Action Code		0 to 26, 41, 42
28	TOD Function X+2 Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
29	TOD Function X+3 Start Hour		0 to 23
30	TOD Function X+3 Start Minute		0 to 59
31	TOD Function X+3 End Hour		0 to 23
32	TOD Function X+3 End Minute		0 to 59
33	TOD Function X+3 Day-of-Week		0 to 127
34	TOD Function X+3 Action Code		0 to 26, 41, 42
35	TOD Function X+3 Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

36	16-bit FCS MSB		0 to 255
37	16-bit FCS LSB		0 to 255
38	End Flag		0x7E

Page9 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		9
7	Block ID		1 to 9
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page10 GET Message Blocks

Page10 Block Messages Reference Table for GET RESPONSE

Block ID #	Block Description	Bytes	Timing Chart Reference
1	Communications - Serial Port #1	20	C2 (6-1-1)
2	Communications - Serial Port #2	20	C20 (6-1-2)
3	Communications - Serial Port #3	20	C21 (6-1-3)
4	Soft Logic 1-4	54	Soft Logic (6-2)
5	Soft Logic 5-8	54	
6	Soft Logic 9-12	54	
7	Soft Logic 13-16	54	
8	Communications - Callback Number 1	22	Callback Numbers (6-3)
9	Communications - Callback Number 2	22	
10	Communications - Callback Number 3	22	
11	Communications - Network	33	Network (6-4)

Page10 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID		10
7	Block ID	1 = Comm. - Serial Port #1 2 = Comm. - Serial Port #2 3 = Comm. - Serial Port #3 4 = Soft Logic 1 to 4 5 = Soft Logic 5 to 8 6 = Soft Logic 9 to 12 7 = Soft Logic 13 to 16 8 = Comm. - Callback No 1 9 = Comm. - Callback No 2 10 = Comm. - Callback No 3 11 = Comm. - Network	1 to 11
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Communications

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		10
7	Block ID	1 = Comm. Serial Port #1 2 = Comm. Serial Port #2 3 = Comm. Serial Port #3	1 to 3
X = serial port 1 to 3			
8	Serial Port X Local Address		0 to 63
9	Serial Port X Communication Protocol 0 = None 1 = AB3418 2 = Master 3 = Single 4 = Simplex 5 = Complex 6 = UTB 7 = WWV		0 to 7
10	Serial Port X Access Level 0 = None 1 = Status Only 2 = Status, Set Pattern, Time 3 = Status, Set Pattern, Time, Manual Plan		0 to 3
11	Serial Port X Baud Rate 0 = 1200 baud 1 = 2400 baud 2 = 4800 baud 3 = 9600 baud 4 = 19200 baud 5 = 38400 baud		0 to 5
12	Serial Port X Parity 0 = None 1 = Even 2 = Odd		0 to 2
13	Serial Port X Data Bits 0 = 5 data bits 1 = 6 data bits		0 to 3



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	2 = 7 data bits 3 = 8 data bits		
14	Serial Port X Stop Bits 0 = 1 stop bit 1 = 1.5 stop bits 2 = 2 stop bits		0 to 2
15	Serial Port X RTS On Delay Time (ms)		0 to 255
16	Serial Port X RTS Off Delay Time (ms)		0 to 255
17	Serial Port X Handshaking 0 = None 1 = Normal 2 = Auto 3 = Auto CTS 4 = Auto RTS		0 to 4
18	16-bit FCS MSB		0 to 255
19	16-bit FCS LSB		0 to 255
20	End Flag		0x7E

Page10 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Soft Logic

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		10
7	Block ID	4 = Soft Logic 1 to 4 5 = Soft Logic 5 to 8 6 = Soft Logic 9 to 12 7 = Soft Logic 13 to 16	4 to 7
X = Soft Logic Equation 1, 5, 9, 13 X+1 = Soft Logic Equation 2, 6, 10, 14 X+2 = Soft Logic Equation 3, 7, 11, 15 X+3 = Soft Logic Equation 4, 8, 12, 16			
8	Soft Logic Equation X Data 1 Word		
9	Soft Logic Equation X Data 1 Bit		
10	Soft Logic Equation X Opcode 1		1-6, 10-63
11	Soft Logic Equation X Data 2 Word		
12	Soft Logic Equation X Data 2 Bit		
13	Soft Logic Equation X Opcode 2		1-6, 10-63
14	Soft Logic Equation X Data 3 Word		



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

15	Soft Logic Equation X	Data 3 Bit		
16	Soft Logic Equation X	Opcode 3		1-6, 10-63
17	Soft Logic Equation X	Data 4 Word		
18	Soft Logic Equation X	Data 4 Bit		
19	Soft Logic Equation X+1	Data 1 Word		
20	Soft Logic Equation X+1	Data 1 Bit		
21	Soft Logic Equation X+1	Opcode 1		1-6, 10-63
22	Soft Logic Equation X+1	Data 2 Word		
23	Soft Logic Equation X+1	Data 2 Bit		
24	Soft Logic Equation X+1	Opcode 2		1-6, 10-63
25	Soft Logic Equation X+1	Data 3 Word		
26	Soft Logic Equation X+1	Data 3 Bit		
27	Soft Logic Equation X+1	Opcode 3		1-6, 10-63
28	Soft Logic Equation X+1	Data 4 Word		
29	Soft Logic Equation X+1	Data 4 Bit		
30	Soft Logic Equation X+2	Data 1 Word		
31	Soft Logic Equation X+2	Data 1 Bit		
32	Soft Logic Equation X+2	Opcode 1		1-6, 10-63
33	Soft Logic Equation X+2	Data 2 Word		
34	Soft Logic Equation X+2	Data 2 Bit		
35	Soft Logic Equation X+2	Opcode 2		1-6, 10-63
36	Soft Logic Equation X+2	Data 3 Word		
37	Soft Logic Equation X+2	Data 3 Bit		
38	Soft Logic Equation X+2	Opcode 3		1-6, 10-63
39	Soft Logic Equation X+2	Data 4 Word		
40	Soft Logic Equation X+2	Data 4 Bit		
41	Soft Logic Equation X+3	Data 1 Word		
42	Soft Logic Equation X+3	Data 1 Bit		
43	Soft Logic Equation X+3	Opcode 1		1-6, 10-63
44	Soft Logic Equation X+3	Data 2 Word		
45	Soft Logic Equation X+3	Data 2 Bit		
46	Soft Logic Equation X+3	Opcode 2		1-6, 10-63
47	Soft Logic Equation X+3	Data 3 Word		
48	Soft Logic Equation X+3	Data 3 Bit		
49	Soft Logic Equation X+3	Opcode 3		1-6, 10-63
50	Soft Logic Equation X+3	Data 4 Word		
51	Soft Logic Equation X+3	Data 4 Bit		
52	16-bit FCS MSB			0 to 255
53	16-bit FCS LSB			0 to 255
54	End Flag			0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Callback Numbers			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		10
7	Block ID	8 = Comm. Callback No 1 9 = Comm. Callback No 2 10 = Comm. Callback No 3	8 to 10
X = callback number 1 to 3			
8	Callback Number X Line Out		0 or 9
9	Callback Number X Local Toll		0 or 1
10	Callback Number X Long Distance		0 or 1
11	Callback Number X Delay/Callback Enable >0 = TSCP will wait for “Delay” seconds before callback to the remote host with the callback phone number 0 = call back features will be disabled. TSCP will send a string “user name ?” and “password ?” to remote host, and check against the callback phone numbers with the response that is sent back from the remote host and send back either “OK” or Failure” string to remote hose. Area code would be used as a “username” (3 bytes). Prefix and suffix would be used as a “password” (7 bytes).		0 to 255
12	Callback Number X Area Code	MSB	0 to 255
13	Callback Number X Area Code	LSB	0 to 255
14	Callback Number X Phone Number – Prefix	MSB	0 to 255
15	Callback Number X Phone Number – Prefix	LSB	0 to 255
16	Callback Number X Phone Number - Suffix	MSB	0 to 255
17	Callback Number X Phone Number - Suffix	2 nd MSB	0 to 255
18	Callback Number X Phone Number - Suffix	2 nd LSB	0 to 255
19	Callback Number X Phone Number - Suffix	LSB	0 to 255
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Network

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		10
7	Block ID	Comm. - Network	11
8	TCP/IP Communication Local Address		
9	TCP/IP Communication Protocol 0 = None 1 = AB3418 3 = Single		0, 1, 3
10	TCP/IP Communication Port	MSB	0 to 255
11	TCP/IP Communication Port	2 nd MSB	0 to 255
12	TCP/IP Communication Port	2 nd LSB	0 to 255
13	TCP/IP Communication Port	LSB	0 to 255
14	IP Mode 0 = Static IP 1 = Dynamic IP		0, 1
15	IP Address Field1 Address = Field4.Field3.Field2.Field1		0 to 255
16	IP Address Field2		0 to 255
17	IP Address Field3		0 to 255
18	IP Address Field4		0 to 255
19	Netmask Field1 Netmask = Field4.Field3.Field2.Field1		0 to 255
20	Netmask Field2		0 to 255
21	Netmask Field3		0 to 255
22	Netmask Field4		0 to 255
23	Broadcast Field1 Broadcast = Field4.Field3.Field2.Field1		0 to 255
24	Broadcast Field2		0 to 255
25	Broadcast Field3		0 to 255
26	Broadcast Field4		0 to 255
27	Gateway Field1		0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	Gateway: Field4.Field3.Field2.Field1		
28	Gateway Field2		0 to 255
29	Gateway Field3		0 to 255
30	Gateway Field4		0 to 255
31	16-bit FCS MSB		0 to 255
32	16-bit FCS LSB		0 to 255
33	End Flag		0x7E

Page10 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		10
7	Block ID		1 to 11
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 SET Message Blocks

Page10 Block Messages Reference Table for SET

Block ID #	Block Message	Bytes	Timing Chart Tables
1	Communications - Serial Port #1	20	C2 (6-1-1)
2	Communications - Serial Port #2	20	C20 (6-1-2)
3	Communications - Serial Port #3	20	C21 (6-1-3)
4	Soft Logic 1-4	54	Soft Logic (6-2)
5	Soft Logic 5-8	54	
6	Soft Logic 9-12	54	
7	Soft Logic 13-16	54	
8	Communications - Callback Number 1	22	Callback Numbers (6-3)
9	Communications - Callback Number 2	22	
10	Communications - Callback Number 3	22	
11	Communications - Network	33	Network (6-4)

Page10 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xD6
6	Page ID		10
7	Block ID	1 = Comm. - Serial Port #1 2 = Comm. - Serial Port #2 3 = Comm. - Serial Port #3 4 = Soft Logic 1 to 4 5 = Soft Logic 5 to 8 6 = Soft Logic 9 to 12 7 = Soft Logic 13 to 16 8 = Comm. - Callback No 1 9 = Comm. - Callback No 2 10 = Comm. - Callback No 3 11 = Comm. - Network	1 to 11
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 Timing Data – SET (TSMSS >>> TSCP) Communications			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		10
7	Block ID	1 = Comm. Serial Port #1 2 = Comm. Serial Port #2 3 = Comm. Serial Port #3	1 to 3
X = serial port 1 to 3			
8	Serial Port X Local Address		0 to 63
9	Serial Port X Communication Protocol 0 = None 1 = AB3418 2 = Master 3 = Single 4 = Simplex 5 = Complex 6 = UTB 7 = WWV		0 to 7
10	Serial Port X Access Level 0 = None 1 = Status Only 2 = Status, Set Pattern, Time 3 = Status, Set Pattern, Time, Manual Plan		0 to 3
11	Serial Port X Baud Rate 0 = 1200 baud 1 = 2400 baud 2 = 4800 baud 3 = 9600 baud 4 = 19200 baud 5 = 38400 baud		0 to 5
12	Serial Port X Parity 0 = None 1 = Even 2 = Odd		0 to 2
13	Serial Port X Data Bits 0 = 5 data bits 1 = 6 data bits		0 to 3



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

	2 = 7 data bits 3 = 8 data bits		
14	Serial Port X Stop Bits 0 = 1 stop bit 1 = 1.5 stop bits 2 = 2 stop bits		0 to 2
15	Serial Port X RTS On Delay Time (ms)		0 to 255
16	Serial Port X RTS Off Delay Time (ms)		0 to 255
17	Serial Port X Handshaking 0 = None 1 = Normal 2 = Auto 3 = Auto CTS 4 = Auto RTS		0 to 4
18	16-bit FCS MSB		0 to 255
19	16-bit FCS LSB		0 to 255
20	End Flag		0x7E

Page10 Timing Data – SET (TSMSS >>> TSCP) Soft Logic

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		10
7	Block ID	4 = Soft Logic 1 to 4 5 = Soft Logic 5 to 8 6 = Soft Logic 9 to 12 7 = Soft Logic 13 to 16	4 to 7
X = Soft Logic Equation 1, 5, 9, 13 X+1 = Soft Logic Equation 2, 6, 10, 14 X+2 = Soft Logic Equation 3, 7, 11, 15 X+3 = Soft Logic Equation 4, 8, 12, 16			
8	Soft Logic Equation X Data 1 Word		
9	Soft Logic Equation X Data 1 Bit		
10	Soft Logic Equation X Opcode 1		1-6, 10-63
11	Soft Logic Equation X Data 2 Word		
12	Soft Logic Equation X Data 2 Bit		
13	Soft Logic Equation X Opcode 2		1-6, 10-63
14	Soft Logic Equation X Data 3 Word		



TSMSS Support of TSCP Functional Description

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15	Soft Logic Equation X	Data 3 Bit		
16	Soft Logic Equation X	Opcode 3		1-6, 10-63
17	Soft Logic Equation X	Data 4 Word		
18	Soft Logic Equation X	Data 4 Bit		
19	Soft Logic Equation X+1	Data 1 Word		
20	Soft Logic Equation X+1	Data 1 Bit		
21	Soft Logic Equation X+1	Opcode 1		1-6, 10-63
22	Soft Logic Equation X+1	Data 2 Word		
23	Soft Logic Equation X+1	Data 2 Bit		
24	Soft Logic Equation X+1	Opcode 2		1-6, 10-63
25	Soft Logic Equation X+1	Data 3 Word		
26	Soft Logic Equation X+1	Data 3 Bit		
27	Soft Logic Equation X+1	Opcode 3		1-6, 10-63
28	Soft Logic Equation X+1	Data 4 Word		
29	Soft Logic Equation X+1	Data 4 Bit		
30	Soft Logic Equation X+2	Data 1 Word		
31	Soft Logic Equation X+2	Data 1 Bit		
32	Soft Logic Equation X+2	Opcode 1		1-6, 10-63
33	Soft Logic Equation X+2	Data 2 Word		
34	Soft Logic Equation X+2	Data 2 Bit		
35	Soft Logic Equation X+2	Opcode 2		1-6, 10-63
36	Soft Logic Equation X+2	Data 3 Word		
37	Soft Logic Equation X+2	Data 3 Bit		
38	Soft Logic Equation X+2	Opcode 3		1-6, 10-63
39	Soft Logic Equation X+2	Data 4 Word		
40	Soft Logic Equation X+2	Data 4 Bit		
41	Soft Logic Equation X+3	Data 1 Word		
42	Soft Logic Equation X+3	Data 1 Bit		
43	Soft Logic Equation X+3	Opcode 1		1-6, 10-63
44	Soft Logic Equation X+3	Data 2 Word		
45	Soft Logic Equation X+3	Data 2 Bit		
46	Soft Logic Equation X+3	Opcode 2		1-6, 10-63
47	Soft Logic Equation X+3	Data 3 Word		
48	Soft Logic Equation X+3	Data 3 Bit		
49	Soft Logic Equation X+3	Opcode 3		1-6, 10-63
50	Soft Logic Equation X+3	Data 4 Word		
51	Soft Logic Equation X+3	Data 4 Bit		
52	16-bit FCS MSB			0 to 255
53	16-bit FCS LSB			0 to 255
54	End Flag			0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 Timing Data – SET (TSMSS >>> TSCP) Callback Numbers			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		10
7	Block ID	8 = Comm. Callback No 1 9 = Comm. Callback No 2 10 = Comm. Callback No 3	8 to 10
X = callback number 1 to 3			
8	Callback Number X Line Out		0 or 9
9	Callback Number X Local Toll		0 or 1
10	Callback Number X Long Distance		0 or 1
11	Callback Number X Delay/Callback enable >0 = TSCP will wait for “Delay” seconds before callback to the remote host with the callback phone number 0 = call back features will be disabled. TSCP will send a string “user name ?” and “password ?” to remote host, and check against the callback phone numbers with the response that is sent back from the remote host and send back either “OK” or Failure” string to remote hose. Area code would be used as a “username” (3 bytes). Prefix and suffix would be used as a “password” (7 bytes).		0 to 255
12	Callback Number X Area Code	MSB	0 to 255
13	Callback Number X Area Code	LSB	0 to 255
14	Callback Number X Phone Number – Prefix	MSB	0 to 255
15	Callback Number X Phone Number – Prefix	LSB	0 to 255
16	Callback Number X Phone Number - Suffix	MSB	0 to 255
17	Callback Number X Phone Number - Suffix	2 nd MSB	0 to 255
18	Callback Number X Phone Number - Suffix	2 nd LSB	0 to 255
19	Callback Number X Phone Number - Suffix	LSB	0 to 255
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page10 Timing Data – SET (TSMSS >>> TSCP) Network

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		10
7	Block ID	Comm. - Network	11
8	TCP/IP Communication Local Address		
9	TCP/IP Communication Protocol 0 = None 1 = AB3418 3 = Single		0, 1, 3
10	TCP/IP Communication Port	MSB	0 to 255
11	TCP/IP Communication Port	2 nd MSB	0 to 255
12	TCP/IP Communication Port	2 nd LSB	0 to 255
13	TCP/IP Communication Port	LSB	0 to 255
14	IP Mode 0 = Static IP 1 = Dynamic IP		0, 1
15	IP Address Field1 Address = Field4.Field3.Field2.Field1		0 to 255
16	IP Address Field2		0 to 255
17	IP Address Field3		0 to 255
18	IP Address Field4		0 to 255
19	Netmask Field1 Netmask = Field4.Field3.Field2.Field1		0 to 255
20	Netmask Field2		0 to 255
21	Netmask Field3		0 to 255
22	Netmask Field4		0 to 255
23	Broadcast Field1 Broadcast = Field4.Field3.Field2.Field1		0 to 255
24	Broadcast Field2		0 to 255
25	Broadcast Field3		0 to 255
26	Broadcast Field4		0 to 255
27	Gateway Field1		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

	Gateway: Field4.Field3.Field2.Field1		
28	Gateway Field2		0 to 255
29	Gateway Field3		0 to 255
30	Gateway Field4		0 to 255
31	16-bit FCS MSB		0 to 255
32	16-bit FCS LSB		0 to 255
33	End Flag		0x7E

Page10 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		10
7	Block ID		1 to 11
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 GET Message Blocks

Page11 Block Messages Reference Table for GET RESPONSE

Block ID#	Block Description	Bytes	Timing Chart Reference
1	RR1 Phase Flag	22	RR1 Phase Flags (3-1-2)
2	RR1 Ped Flag	22	RR1 Pedestrian Flags (3-1-3)
3	RR1 Overlap Flag	22	RR1 Overlap Flags (3-1-4)
4	RR1 Exit Parameter	14	RR1 Exit Parameters (3-1-5)
5	RR1 Configuration	22	RR1 Timing (3-1-1) RR1 Configuration (3-1-6)
6	RR2 Phase Flag	22	RR2 Phase Flags (3-2-2)
7	RR2 Ped Flag	22	RR2 Pedestrian Flags (3-2-3)
8	RR2 Overlap Flag	22	RR2 Overlap Flags (3-2-4)
9	RR2 Exit Parameter	14	RR2 Exit Parameters (3-2-5)
10	RR2 Configuration	22	RR2 Timing (3-2-1) RR2 Configuration (3-2-6)
11	Emergency Vehicle A	18	EVA (3-A)
12	Emergency Vehicle B	18	EVB (3-B)
13	Emergency Vehicle C	18	EVC (3-C)
14	Emergency Vehicle D	18	EVD (3-D)

Page11 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID		11
7	Message ID	1 = RR1 Phase Flag 2 = RR1 Ped Flag 3 = RR1 Overlap Flag 4 = RR1 Exit Parameters 5 = RR1 Configuration 6 = RR2 Phase Flag 7 = RR2 Ped Flag 8 = RR2 Overlap Flag 9 = RR2 Exit Parameters	1 to 14



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

		10 = RR2 Configuration 11 = Emergency Veh A 12 = Emergency Veh B 13 = Emergency Veh C 14 = Emergency Veh D	
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page11 Timing Data – GET RESPONSE (TSCP >>> TSMSS) RR Phase Flag

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		11
7	Block ID	RR Phase Flag	1 or 6
<i>Railroad Preemption = RR</i>			
<i>X = RR1 or RR2</i>			
8	RR X Clear 1 Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
9	RR X Clear 1 Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
10	RR X Clear 1 Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
11	RR X Clear 2 Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
12	RR X Clear 2 Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
13	RR X Clear 2 Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
14	RR X Clear 3 Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
15	RR X Clear 3 Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
16	RR X Clear 3 Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
17	RR X Hold Step Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
18	RR X Hold Step Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
19	RR X Hold Step Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 Timing Data – GET RESPONSE (TSCP >>> TSMSS) RR Ped Flag

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		11
7	Block ID	RR Ped Flag	2 or 7
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Clear 1 Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
9	RR X Clear 1 Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
10	RR X Clear 1 Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
11	RR X Clear 2 Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	RR X Clear 2 Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	RR X Clear 2 Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
14	RR X Clear 3 Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
15	RR X Clear 3 Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
16	RR X Clear 3 Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
17	RR X Hold Step Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
18	RR X Hold Step Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
19	RR X Hold Step Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 Timing Data – GET RESPONSE (TSCP >>> TSMSS) RR Overlap Flags

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		11
7	Block ID	RR Overlap Flag	3 or 8
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Clear 1 Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
9	RR X Clear 1 Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
10	RR X Clear 1 Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
11	RR X Clear 2 Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
12	RR X Clear 2 Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
13	RR X Clear 2 Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
14	RR X Clear 3 Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
15	RR X Clear 3 Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
16	RR X Clear 3 Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
17	RR X Hold Step Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
18	RR X Hold Step Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
19	RR X Hold Step Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E

Page11 Timing Data – GET RESPONSE (TSCP >>> TSMSS) RR Exit Param

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		11
7	Block ID	RR Exit Parameters	4 or 9
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Exit Step Phases Green	Bits 0-7 ⇔ phases 1-8	5 to 255
9	RR X Exit Step Overlaps Green	Bits 0-5 ⇔ Overlaps A-F	0 to 63



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

10	RR X Exit Step Vehicle Call	Bits 0-7 ⇔ phases 1-8	0 to 255
11	RR X Exit Step Pedestrian Call	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	16-bit FCS MSB		0 to 255
13	16-bit FCS LSB		0 to 255
14	End Flag		0x7E

Page11 Timing Data – GET RESPONSE (TSCP >>> TSMSS) RR Configuration

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		11
7	Block ID	RR Configuration	5 or 10
<i>Railroad Preemption = RR</i>			
<i>X = RR1 or RR2</i>			
8	RR X Delay Time (0.1 Sec)		0 to 255
9	RR X Clear 1 Track Clearance Time		5 to 255
10	RR X Clear 2 Track Clearance Time		0 to 255
11	RR X Clear 3 Track Clearance Time		0 to 255
12	RR X Hold Step Hold Time		0 to 255
13	RR X Exit Time		0 to 255
14	RR X Minimum Green Time		0 to 255
15	RR X Pedestrian Clear Time		0 to 255
<i>Most Significant Digit = MS Digit</i> <i>Least Significant Digit = LS Digit</i>			
16	RR X Configuration Input Port Assignment	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
17	RR X Configuration Gate Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
18	RR X Configuration Latching 0 = No 1 = Yes		0, 1
19	RR X Configuration Power-Up 0 = Flashing 1 = Dark		0, 1
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Emrg Vehicle

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC7
6	Page ID		11
7	Block ID	11 = Emergency Vehicle A 12 = Emergency Vehicle B 13 = Emergency Vehicle C 14 = Emergency Vehicle D	11 to 14
Emergency Vehicle Preemption = EV			
X = EVA to EVD			
8	EV X Delay Time		0 to 255
9	EV X Clear Time		5 to 255
10	EV X Maximum Clearance Time		0 to 255
11	EV X Clearance Phase Green	Bits 0-7 ⇔ phases 1-8	0 to 255
12	EV X Clearance Overlap Green	Bits 0-5 ⇔ Overlaps A-F	0 to 63
13	EV X Input Port Assignment	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
14	EV X Latching 0 = No 1 = Yes		0, 1
15	EV X Phase Termination 0 = Force-Off 1 = Advance		0, 1
16	16-bit FCS MSB		0 to 255
17	16-bit FCS LSB		0 to 255
18	End Flag		0x7E

Page11 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7



TSMSS Support of TSCP

Functional Description

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6	Page ID		11
7	Block ID		1 to 14
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 SET Message Blocks

Page11 Block Messages Reference Table for SET

Block ID#	Block Description	Bytes	Timing Chart Reference
1	RR1 Phase Flag	22	RR1 Phase Flags (3-1-2)
2	RR1 Ped Flag	22	RR1 Pedestrian Flags (3-1-3)
3	RR1 Overlap Flag	22	RR1 Overlap Flags (3-1-4)
4	RR1 Exit Parameter	14	RR1 Exit Parameters (3-1-5)
5	RR1 Configuration	22	RR1 Timing (3-1-1) RR1 Configuration (3-1-6)
6	RR2 Phase Flag	22	RR2 Phase Flags (3-2-2)
7	RR2 Ped Flag	22	RR2 Pedestrian Flags (3-2-3)
8	RR2 Overlap Flag	22	RR2 Overlap Flags (3-2-4)
9	RR2 Exit Parameter	14	RR2 Exit Parameters (3-2-5)
10	RR2 Configuration	22	RR2 Timing (3-2-1) RR2 Configuration (3-2-6)
11	Emergency Vehicle A	18	EVA (3-A)
12	Emergency Vehicle B	18	EVB (3-B)
13	Emergency Vehicle C	18	EVC (3-C)
14	Emergency Vehicle D	18	EVD (3-D)

Page11 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD6
6	Page ID		11
7	Block ID	1 = RR1 Phase Flag 2 = RR1 Ped Flag 3 = RR1 Overlap Flag 4 = RR1 Exit Parameters 5 = RR1 Configuration 6 = RR2 Phase Flag 7 = RR2 Ped Flag 8 = RR2 Overlap Flag 9 = RR2 Exit Parameters	1 to 14



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

		10 = RR2 Configuration 11 = Emergency Veh A 12 = Emergency Veh B 13 = Emergency Veh C 14 = Emergency Veh D	
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page11 Timing Data – SET (TSMSS >>> TSCP) RR Phase Flag			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		11
7	Block ID	RR Phase Flag	1 or 6
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Clear 1 Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
9	RR X Clear 1 Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
10	RR X Clear 1 Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
11	RR X Clear 2 Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
12	RR X Clear 2 Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
13	RR X Clear 2 Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
14	RR X Clear 3 Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
15	RR X Clear 3 Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
16	RR X Clear 3 Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
17	RR X Hold Step Green Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
18	RR X Hold Step Yellow Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
19	RR X Hold Step Red Flash Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 Timing Data – SET (TSMSS >>> TSCP) RR Ped Flag

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		11
7	Block ID	RR Ped Flag	2 or 7
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Clear 1 Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
9	RR X Clear 1 Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
10	RR X Clear 1 Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
11	RR X Clear 2 Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	RR X Clear 2 Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
13	RR X Clear 2 Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
14	RR X Clear 3 Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
15	RR X Clear 3 Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
16	RR X Clear 3 Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
17	RR X Hold Step Ped Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
18	RR X Hold Step Ped Flashing Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
19	RR X Hold Step Ped Solid Don't Walk Phases	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page11 Timing Data – SET (TSMSS >>> TSCP) RR Overlap Flags			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		11
7	Block ID	RR Overlap Flag	3 or 8
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Clear 1 Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
9	RR X Clear 1 Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
10	RR X Clear 1 Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
11	RR X Clear 2 Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
12	RR X Clear 2 Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
13	RR X Clear 2 Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
14	RR X Clear 3 Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
15	RR X Clear 3 Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
16	RR X Clear 3 Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
17	RR X Hold Step Overlap Green Hold	Bits 0-5 ⇔ Overlaps A-F	0 to 63
18	RR X Hold Step Overlap Yellow Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
19	RR X Hold Step Overlap Red Flash	Bits 0-5 ⇔ Overlaps A-F	0 to 63
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E

Page11 Timing Data – SET (TSMSS >>> TSCP) RR Exit Param			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		11
7	Block ID	RR Exit Parameters	4 or 9
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Exit Step Phases Green	Bits 0-7 ⇔ phases 1-8	5 to 255
9	RR X Exit Step Overlaps Green	Bits 0-5 ⇔ Overlaps A-F	0 to 63



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

10	RR X Exit Step Vehicle Call	Bits 0-7 ⇔ phases 1-8	0 to 255
11	RR X Exit Step Pedestrian Call	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
12	16-bit FCS MSB		0 to 255
13	16-bit FCS LSB		0 to 255
14	End Flag		0x7E

Page11 Timing Data – SET (TSMSS >>> TSCP) RR Configuration			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		11
7	Block ID	RR Configuration	5 or 10
Railroad Preemption = RR			
X = RR1 or RR2			
8	RR X Delay Time (0.1 Sec)		0 to 255
9	RR X Clear 1 Track Clearance Time		5 to 255
10	RR X Clear 2 Track Clearance Time		0 to 255
11	RR X Clear 3 Track Clearance Time		0 to 255
12	RR X Hold Step Hold Time		0 to 255
13	RR X Exit Time		0 to 255
14	RR X Minimum Green Time		0 to 255
15	RR X Pedestrian Clear Time		0 to 255
Most Significant Digit = MS Digit Least Significant Digit = LS Digit			
16	RR X Configuration Input Port Assignment	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
17	RR X Configuration Gate Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
18	RR X Configuration Latching 0 = No 1 = Yes		0, 1
19	RR X Configuration Power-Up 0 = Flashing 1 = Dark		0, 1
20	16-bit FCS MSB		0 to 255
21	16-bit FCS LSB		0 to 255
22	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page11 Timing Data – SET (TSMSS >>> TSCP) Emrg Vehicle

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET		0x96
6	Page ID		11
7	Block ID	11 = Emergency Vehicle A 12 = Emergency Vehicle B 13 = Emergency Vehicle C 14 = Emergency Vehicle D	11 to 14
Emergency Vehicle Preemption = EV			
X = EVA to EVD			
8	EV X Delay Time		0 to 255
9	EV X Clear Time		5 to 255
10	EV X Maximum Clearance Time		0 to 255
11	EV X Clearance Phase Green	Bits 0-7 ⇔ phases 1-8	0 to 255
12	EV X Clearance Overlap Green	Bits 0-5 ⇔ Overlaps A-F	0 to 63
13	EV X Input Port Assignment	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
14	EV X Latching 0 = No 1 = Yes		0 or 1
15	EV X Phase Termination 0 = Force-Off 1 = Advance		0 or 1
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page11 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

5	Message – SET Error Response		0xF6
6	Page ID		11
7	Block ID		1 to 14
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page12 GET Message Blocks

Page12 Block Messages Reference Table for GET RESPONSE

Block ID#	Block Description	Bytes	Timing Chart Reference
1	Inputs	33	7 Wire I/C (2-1-5-1) Manual Control (2-1-5-2) Cabinet Status (2-1-5-3) Special Function (2-1-5-4) Battery Backup (2-1-5-5) Y-Coordination (2-1-5-6)
2	Outputs	31	Loadswitch Assignments (2-1-6)

Page12 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID		12
7	Block ID	1 = Inputs • 7 Wire I/C • Manual Control • Cabinet Status • Special Function • Battery • Y-Coordination 2 = Outputs	1 to 2
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page12 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Inputs

Byte #	Description	Notes	Range
1	Start Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		12
7	Block ID	Inputs <ul style="list-style-type: none"> • 7 Wire I/C • Manual Control • Cabinet Status • Special Function • Battery • Y-Coordination 	1
8	Seven-Wire Interconnect Enable 0 = No 1 = Yes		0 or 1
9	7-Wire I/C Maximum Reset Line On Time		0 to 255
10	7-Wire I/C Maximum Reset Line Off Time		0 to 255
11	7-Wire I/C Input Port Assignment Reset 1 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
12	7-Wire I/C Input Port Assignment Reset 2 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
13	7-Wire I/C Input Port Assignment Reset 3 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
14	7-Wire I/C Input Port Assignment Free Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	7-Wire I/C Input Port Assignment Dial 2 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
16	7-Wire I/C Input Port Assignment Dial 3 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
17	Manual Control Input Configuration Manual Advance	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
18	Manual Control Input Configuration Advance Enable	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
19	Cabinet Status Input Configuration Flash Bus	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
20	Cabinet Status Input Configuration Door Ajar	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
21	Cabinet Status Input Configuration Flash Sense	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
22	Cabinet Status Input Configuration Stop Time	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

23	Special Function Input Configuration Input 1	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
24	Special Function Input Configuration Input 2	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
25	Special Function Input Configuration Input 3	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
26	Special Function Input Configuration Input 4	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
27	Battery Backup Input Port Assignment	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
28	Battery Backup Operation Mode 0 = Normal 1 = Flashing		0 or 1
29	Yellow Yield Input Port Assignment Port C	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
30	Yellow Yield Input Port Assignment Port D	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
31	CRC-16 Checksum MSB		0 to 255
32	CRC-16 Checksum LSB		0 to 255
33	End Flag		0x7E

Page12 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Outputs

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		12
7	Block ID	Outputs	2
8	Output Assignment Loadswitch 1 Loadswitch Codes: 0 = No Output 1-8 = Vehicle Phases 1-8 9-14 = Overlaps A-F 21-28 = Pedestrian Phases 1-8 41-47 = Special Functions		0 to 14, 21 to 28, 41 to 47, 51 to 57, 71, 72



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	41 = Protected Permissive Flashing Phase 1 43 = Protected Permissive Flashing Phase 3 45 = Protected Permissive Flashing Phase 5 47 = Protected Permissive Flashing Phase 7 51-57 = Special Functions 71-72 = Seven Wire I/C		
9	Output Assignment Loadswitch 2		
10	Output Assignment Loadswitch 3		
11	Output Assignment Loadswitch 4		
12	Output Assignment Loadswitch 5		
13	Output Assignment Loadswitch 6		
14	Output Assignment Loadswitch 7		
15	Output Assignment Loadswitch 8		
16	Output Assignment Loadswitch 9		
17	Output Assignment Loadswitch 10		
18	Output Assignment Loadswitch 11		
19	Output Assignment Loadswitch 12		
20	Output Assignment Loadswitch 13		
21	Output Assignment Loadswitch 14		
22	Output Assignment Loadswitch 15		
23	Output Assignment Loadswitch 16		
24	Output Assignment Loadswitch 17		
25	Output Assignment Loadswitch 18		
26	Output Assignment Loadswitch 19		
27	Output Assignment Loadswitch 20		
28	Output Assignment Loadswitch 21		
29	CRC-16 Checksum MSB		0 to 255
30	CRC-16 Checksum LSB		0 to 255
31	End Flag		0x7E

Page12 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Error Response		0xE7
6	Page ID		12
7	Block ID		1 to 2
8	Error Number		
9	Index Number		



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page12 SET Message Blocks

Page12 Block Messages Reference Table for SET

Block ID#	Block Description	Bytes	Timing Chart Reference
1	Inputs	33	7 Wire I/C (2-1-5-1) Manual Control (2-1-5-2) Cabinet Status (2-1-5-3) Special Function (2-1-5-4) Battery Backup (2-1-5-5) Y-Coordination (2-1-5-6)
2	Outputs	31	Loadswitch Assignments (2-1-6)

Page12 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD6
6	Page ID		12
7	Block ID	1 = Inputs • 7 Wire I/C • Manual Control • Cabinet Status • Special Function • Battery • Y-Coordination 2 = Outputs	1 to 2
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page12 Timing Data – SET (TSMSS >>> TSCP) Inputs

Byte #	Description	Notes	Range
1	Start Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		12
7	Block ID	Inputs <ul style="list-style-type: none"> • 7 Wire I/C • Manual Control • Cabinet Status • Special Function • Battery • Y-Coordination 	1
8	Seven-Wire Interconnect Enable 0 = No 1 = Yes		0 or 1
9	7-Wire I/C Maximum Reset Line On Time		0 to 255
10	7-Wire I/C Maximum Reset Line Off Time		0 to 255
11	7-Wire I/C Input Port Assignment Reset 1 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
12	7-Wire I/C Input Port Assignment Reset 2 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
13	7-Wire I/C Input Port Assignment Reset 3 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
14	7-Wire I/C Input Port Assignment Free Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	7-Wire I/C Input Port Assignment Dial 2 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
16	7-Wire I/C Input Port Assignment Dial 3 Line	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
17	Manual Control Input Configuration Manual Advance	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
18	Manual Control Input Configuration Advance Enable	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
19	Cabinet Status Input Configuration Flash Bus	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
20	Cabinet Status Input Configuration Door Ajar	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
21	Cabinet Status Input Configuration Flash Sense	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
22	Cabinet Status Input Configuration Stop Time	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

23	Special Function Input Configuration Input 1	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
24	Special Function Input Configuration Input 2	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
25	Special Function Input Configuration Input 3	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
26	Special Function Input Configuration Input 4	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
27	Battery Backup Input Port Assignment	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
28	Battery Backup Operation Mode 0 = Normal 1 = Flashing		0, 1
29	Yellow Yield Input Port Assignment Port C	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
30	Yellow Yield Input Port Assignment Port D	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
31	CRC-16 Checksum MSB		0 to 255
32	CRC-16 Checksum LSB		0 to 255
33	End Flag		0x7E

Page12 Timing Data – SET (TSCP >>> TSMSS) Outputs

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		12
7	Block ID	Outputs	2
8	Output Assignment Loadswitch 1 Loadswitch Codes: 0 = No Output 1-8 = Vehicle Phases 1-8 9-14 = Overlaps A-F 21-28 = Pedestrian Phases 1-8 41-47 = Special Functions		0 to 14, 21 to 28, 41 to 47, 51 to 57, 71, 72



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	41 = Protected Permissive Flashing Phase 1 43 = Protected Permissive Flashing Phase 3 45 = Protected Permissive Flashing Phase 5 47 = Protected Permissive Flashing Phase 7 51-57 = Special Functions 71-72 = Seven Wire I/C		
9	Output Assignment Loadswitch 2		
10	Output Assignment Loadswitch 3		
11	Output Assignment Loadswitch 4		
12	Output Assignment Loadswitch 5		
13	Output Assignment Loadswitch 6		
14	Output Assignment Loadswitch 7		
15	Output Assignment Loadswitch 8		
16	Output Assignment Loadswitch 9		
17	Output Assignment Loadswitch 10		
18	Output Assignment Loadswitch 11		
19	Output Assignment Loadswitch 12		
20	Output Assignment Loadswitch 13		
21	Output Assignment Loadswitch 14		
22	Output Assignment Loadswitch 15		
23	Output Assignment Loadswitch 16		
24	Output Assignment Loadswitch 17		
25	Output Assignment Loadswitch 18		
26	Output Assignment Loadswitch 19		
27	Output Assignment Loadswitch 20		
28	Output Assignment Loadswitch 21		
29	CRC-16 Checksum MSB		0 to 255
30	CRC-16 Checksum LSB		0 to 255
31	End Flag		0x7E

Page12 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		12
7	Block ID		1 to 2
8	Error Number		
9	Index Number		



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page13 GET Message Blocks

Page13 Block Messages Reference Table for GET RESPONSE

Block ID#	Block Message	Bytes	Timing Chart Tables
1	Yellow Yield Coordination	42	Y-Coord Plans (7-C,D)
2	Transit Priority Plan 1-3	43	Local Plans (3-E) <ul style="list-style-type: none"> • 1 – Local Plans 1-9 • 2 – Local Plans 11-19
3	Transit Priority Plan 4-6	43	
4	Transit Priority Plan 7-9	43	
5	Transit Priority Plan 11-13	43	
6	Transit Priority Plan 14-16	43	
7	Transit Priority Plan 17-19	43	
8	Transit Priority Queue Jump.	28	Transit Priority Configuration (3-E-A) Queue Jump (3-E-B) Free Plans (3-E-E)
9	Access Utilities	13	Access Utilities (9-5)
10	Truck Priority	21	Truck Priority (3-F)

Page13 Timing Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message – GET		0x87
6	Page ID		13
7	Block ID	1 = Yellow Yield Coordination 2 = Transit Priority Plan 1-3 3 = Transit Priority Plan 4-6 4 = Transit Priority Plan 7-9 5 = Transit Priority Plan 11-13 6 = Transit Priority Plan 14-16 7 = Transit Priority Plan 17-19 8 = Transit Priority Queue Jump 9 = Access Utilities 10 = Truck Priority	1 to 10
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page13 Timing Data – GET RESPONSE (TSCP >>> TSMSS) YL Yield Coord.

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		13
7	Block ID	Yellow Yield Coord.	1
Yellow Yield Coordination = YY Coord			
8	YY Coord Plan C Long Green Time		0 to 239
9	YY Coord Plan C No Green Time		0 to 239
10	YY Coord Plan C Offset Time		0 to 239
11	YY Coord Plan C Permissive Time		0 to 239
12	YY Coord Plan C Phase 1 Force-Off		0 to 255
13	YY Coord Plan C Phase 2 Force-Off		0 to 255
14	YY Coord Plan C Phase 3 Force-Off		0 to 255
15	YY Coord Plan C Phase 4 Force-Off		0 to 255
16	YY Coord Plan C Phase 5 Force-Off		0 to 255
17	YY Coord Plan C Phase 6 Force-Off		0 to 255
18	YY Coord Plan C Phase 7 Force-Off		0 to 255
19	YY Coord Plan C Phase 8 Force-Off		0 to 255
20	YY Coord Plan C Sync Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
21	YY Coord Plan C Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
22	YY Coord Plan C Min Recall Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	YY Coord Plan C Restricted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
24	YY Coord Plan D Long Green Time		0 to 239
25	YY Coord Plan D No Green Time		0 to 239
26	YY Coord Plan D Offset Time		0 to 239
27	YY Coord Plan D Permissive Time		0 to 239
28	YY Coord Plan D Phase 1 Force-Off		0 to 255
29	YY Coord Plan D Phase 2 Force-Off		0 to 255
30	YY Coord Plan D Phase 3 Force-Off		0 to 255
31	YY Coord Plan D Phase 4 Force-Off		0 to 255
32	YY Coord Plan D Phase 5 Force-Off		0 to 255
33	YY Coord Plan D Phase 6 Force-Off		0 to 255
34	YY Coord Plan D Phase 7 Force-Off		0 to 255
35	YY Coord Plan D Phase 8 Force-Off		0 to 255
36	YY Coord Plan D Sync Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

37	YY Coord Plan D Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
38	YY Coord Plan D Min Recall Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
39	YY Coord Plan D Restricted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page13 Timing Data – GET RESPONSE (TSCP >>> TSMSS) TSP Plan

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		13
7	Block ID	2 = Transit Priority Plan 1-3 3 = Transit Priority Plan 4-6 4 = Transit Priority Plan 7-9 5 = Transit Priority Plan 11-13 6 = Transit Priority Plan 14-16 7 = Transit Priority Plan 17-19	2 to 7
Transit Priority = TSP			
X = TSP Plan 1, 4, 7, 11, 14, 17 X+1 = TSP Plan 2, 5, 8, 12, 15, 18 X+2 = TSP Plan 3, 6, 9, 13, 16, 19			
8	TSP Plan X Max Early Green Value		0 to 240
9	TSP Plan X Max Green Extension Value		0 to 240
10	TSP Plan X Inhibit Cycles		0 to 255
11	TSP Plan X Phase 1 Green Factor or Force Off		0 to 255
12	TSP Plan X Phase 2 Green Factor or Force Off		0 to 255
13	TSP Plan X Phase 3 Green Factor or Force Off		0 to 255
14	TSP Plan X Phase 4 Green Factor or Force Off		0 to 255
15	TSP Plan X Phase 5 Green Factor or Force Off		0 to 255
16	TSP Plan X Phase 6 Green Factor or Force Off		0 to 255
17	TSP Plan X Phase 7 Green Factor or Force Off		0 to 255
18	TSP Plan X Phase 8 Green Factor or Force Off		0 to 255
19	TSP Plan X+1 Max Early Green Value		0 to 240
20	TSP Plan X+1 Max Green Extension Value		0 to 240
21	TSP Plan X+1 Inhibit Cycles		0 to 255
22	TSP Plan X+1 Phase 1 Green Factor or Force Off		0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

23	TSP Plan X+1 Phase 2 Green Factor or Force Off		0 to 255
24	TSP Plan X+1 Phase 3 Green Factor or Force Off		0 to 255
25	TSP Plan X+1 Phase 4 Green Factor or Force Off		0 to 255
26	TSP Plan X+1 Phase 5 Green Factor or Force Off		0 to 255
27	TSP Plan X+1 Phase 6 Green Factor or Force Off		0 to 255
28	TSP Plan X+1 Phase 7 Green Factor or Force Off		0 to 255
29	TSP Plan X+1 Phase 8 Green Factor or Force Off		0 to 255
30	TSP Plan X+2 Max Early Green Value		0 to 240
31	TSP Plan X+2 Max Green Extension Value		0 to 240
32	TSP Plan X+2 Inhibit Cycles		0 to 255
33	TSP Plan X+2 Phase 1 Green Factor or Force Off		0 to 255
34	TSP Plan X+2 Phase 2 Green Factor or Force Off		0 to 255
35	TSP Plan X+2 Phase 3 Green Factor or Force Off		0 to 255
36	TSP Plan X+2 Phase 4 Green Factor or Force Off		0 to 255
37	TSP Plan X+2 Phase 5 Green Factor or Force Off		0 to 255
38	TSP Plan X+2 Phase 6 Green Factor or Force Off		0 to 255
39	TSP Plan X+2 Phase 7 Green Factor or Force Off		0 to 255
40	TSP Plan X+2 Phase 8 Green Factor or Force Off		0 to 255
41	16-bit FCS MSB		0 to 255
42	16-bit FCS LSB		0 to 255
43	End Flag		0x7E

Page13 Timing Data – GET RESPONSE (TSCP >>> TSMSS) TSP Queue Jump

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		13
7	Block ID	Transit Priority Config Queue Jump Free Plans	8
Transit Priority = TSP			
8, 9	TSP Enable in Plans (plan 1 to 9) Byte #8: Bit 0 ⇔ plan 9 Byte #9: Bits 0-7 ⇔ plans 1-8	u_int16	
10, 11	TSP Enable in Plans (plan 11 to 19) Byte #10: Bit 0 ⇔ plan 19 Byte #11: Bits 0-7 ⇔ plans 11-18	u_int16	



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

12	TSP Free Plan Max Green Hold Time		0 to 255
13	TSP Free Plan Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
14	TSP Direction A input port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	TSP Direction A type 0 = opticom 1 = GPS 2 = Detector		0, 1
16	TSP Direction B input port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
17	TSP Direction B type 0 = opticom 1 = GPS 2 = Detector		0, 1
18	Queue Jump A output port: GO indicator		0 to 99
19	Queue Jump A output port: STOP indicator		0 to 99
20	Queue Jump A qjump_phase Phase to hold		0 to 255
21	Queue Jump A qjump_green GO queue green time		0 to 255
22	Queue Jump B output port: GO indicator		0 to 99
23	Queue Jump B output port: STOP indicator		0 to 99
24	Queue Jump B qjump_phase Phase to hold		0 to 255
25	Queue Jump B qjump_green GO queue green time		0 to 255
26	16-bit FCS MSB		0 to 255
27	16-bit FCS LSB		0 to 255
28	End Flag		0x7E

Page13 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Access Utilities

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		13
7	Block ID	Access Utilities	9
8, 9	Password Menu Change Password	u_int16	
10	Password Menu Password Timeout (Minutes)		1 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

11	16-bit FCS MSB		0 to 255
12	16-bit FCS LSB		0 to 255
13	End Flag		0x7E

Page13 Timing Data – GET RESPONSE (TSCP >>> TSMSS) Truck Priority

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC7
6	Page ID		13
7	Block ID	Truck Priority	10
Transit Priority = TSP			
8	Truck Priority Passage Time (0.1 Sec)		0 to 255
9	Truck Priority Det 2 Carryover Time (0.1 Sec)		0 to 255
10	Truck Priority Truck Clearance Time		0 to 255
11	Truck Priority Next Priority Time		0 to 255
12	Truck Priority Hold Phases Green	Bits 0-7 ⇔ phases 1-8	
13	Truck Priority Detector 2 Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
14	Truck Priority Detector 3 Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	Truck Priority Detector 4 Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
16	Truck Priority Sign Output Port Valid flashing sign outputs are: 22 = ped 2 yellow 24 = ped 4 yellow 26 = ped 6 yellow 28 = ped 8 yellow 0 = disables the output to the sign	MS Digit ⇔ Port LS Digit ⇔ Bit	0, 22, 24, 26, 28
17	Truck Priority Slave Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
18	Truck Priority Slave Output Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
19	16-bit FCS MSB		0 to 255
20	16-bit FCS LSB		0 to 255
21	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Page13 Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE7
6	Page ID		13
7	Block ID		1 to 10
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Page13 SET Message Blocks

Page13 Block Messages Reference Table for SET

Block Message#	Block Message	Bytes	Timing Chart Tables
1	Yellow Yield Coordination	42	Y-Coord Plans (7-C,D)
2	Transit Priority Plan 1-3	43	Local Plans (3-E) <ul style="list-style-type: none">• 1 – Local Plans 1-9• 2 – Local Plans 11-19
3	Transit Priority Plan 4-6	43	
4	Transit Priority Plan 7-9	43	
5	Transit Priority Plan 11-13	43	
6	Transit Priority Plan 14-16	43	
7	Transit Priority Plan 17-19	43	
8	Transit Priority Queue Jump.	28	Transit Priority Configuration (3-E-A) Queue Jump (3-E-B) Free Plans (3-E-E)
9	Access Utilities	13	Access Utilities (9-5)
10	Truck Priority	21	Truck Priority (3-F)

Page13 Timing Data – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD6
6	Page ID		13
7	Message ID	1 = Yellow Yield Coordination 2 = Transit Priority Plan 1-3 3 = Transit Priority Plan 4-6 4 = Transit Priority Plan 7-9 5 = Transit Priority Plan 11-13 6 = Transit Priority Plan 14-16 7 = Transit Priority Plan 17-19 8 = Transit Priority Queue Jump 9 = Access Utilities 10 = Truck Priority	1 to 10



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Page13 Timing Data – SET (TSMSS >>> TSCP) YL Yield Coord.

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		13
7	Block ID	Yellow Yield Coord.	1
<i>Yellow Yield Coordination = YY Coord</i>			
8	YY Coord Plan C Long Green Time		0 to 239
9	YY Coord Plan C No Green Time		0 to 239
10	YY Coord Plan C Offset Time		0 to 239
11	YY Coord Plan C Permissive Time		0 to 239
12	YY Coord Plan C Phase 1 Force-Off		0 to 255
13	YY Coord Plan C Phase 2 Force-Off		0 to 255
14	YY Coord Plan C Phase 3 Force-Off		0 to 255
15	YY Coord Plan C Phase 4 Force-Off		0 to 255
16	YY Coord Plan C Phase 5 Force-Off		0 to 255
17	YY Coord Plan C Phase 6 Force-Off		0 to 255
18	YY Coord Plan C Phase 7 Force-Off		0 to 255
19	YY Coord Plan C Phase 8 Force-Off		0 to 255
20	YY Coord Plan C Sync Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
21	YY Coord Plan C Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
22	YY Coord Plan C Min Recall Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
23	YY Coord Plan C Restricted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
24	YY Coord Plan D Long Green Time		0 to 239
25	YY Coord Plan D No Green Time		0 to 239
26	YY Coord Plan D Offset Time		0 to 239
27	YY Coord Plan D Permissive Time		0 to 239
28	YY Coord Plan D Phase 1 Force-Off		0 to 255
29	YY Coord Plan D Phase 2 Force-Off		0 to 255
30	YY Coord Plan D Phase 3 Force-Off		0 to 255
31	YY Coord Plan D Phase 4 Force-Off		0 to 255
32	YY Coord Plan D Phase 5 Force-Off		0 to 255
33	YY Coord Plan D Phase 6 Force-Off		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

34	YY Coord Plan D Phase 7 Force-Off		0 to 255
35	YY Coord Plan D Phase 8 Force-Off		0 to 255
36	YY Coord Plan D Sync Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
37	YY Coord Plan D Lag Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
38	YY Coord Plan D Min Recall Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
39	YY Coord Plan D Restricted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
40	16-bit FCS MSB		0 to 255
41	16-bit FCS LSB		0 to 255
42	End Flag		0x7E

Page13 Timing Data – SET (TSMSS >>> TSCP) TSP Plan

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		13
7	Block ID	2 = Transit Priority Plan 1-3 3 = Transit Priority Plan 4-6 4 = Transit Priority Plan 7-9 5 = Transit Priority Plan 11-13 6 = Transit Priority Plan 14-16 7 = Transit Priority Plan 17-19	2 to 7
Transit Priority = TSP			
X = TSP Plan 1, 4, 7, 11, 14, 17 X+1 = TSP Plan 2, 5, 8, 12, 15, 18 X+2 = TSP Plan 3, 6, 9, 13, 16, 19			
8	TSP Plan X Max Early Green Value		0 to 240
9	TSP Plan X Max Green Extension Value		0 to 240
10	TSP Plan X Inhibit Cycles		0 to 255
11	TSP Plan X Phase 1 Green Factor or Force Off		0 to 255
12	TSP Plan X Phase 2 Green Factor or Force Off		0 to 255
13	TSP Plan X Phase 3 Green Factor or Force Off		0 to 255
14	TSP Plan X Phase 4 Green Factor or Force Off		0 to 255
15	TSP Plan X Phase 5 Green Factor or Force Off		0 to 255
16	TSP Plan X Phase 6 Green Factor or Force Off		0 to 255
17	TSP Plan X Phase 7 Green Factor or Force Off		0 to 255
18	TSP Plan X Phase 8 Green Factor or Force Off		0 to 255
19	TSP Plan X+1 Max Early Green Value		0 to 240



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

20	TSP Plan X+1	Max Green Extension Value	0 to 240
21	TSP Plan X+1	Inhibit Cycles	0 to 255
22	TSP Plan X+1	Phase 1 Green Factor or Force Off	0 to 255
23	TSP Plan X+1	Phase 2 Green Factor or Force Off	0 to 255
24	TSP Plan X+1	Phase 3 Green Factor or Force Off	0 to 255
25	TSP Plan X+1	Phase 4 Green Factor or Force Off	0 to 255
26	TSP Plan X+1	Phase 5 Green Factor or Force Off	0 to 255
27	TSP Plan X+1	Phase 6 Green Factor or Force Off	0 to 255
28	TSP Plan X+1	Phase 7 Green Factor or Force Off	0 to 255
29	TSP Plan X+1	Phase 8 Green Factor or Force Off	0 to 255
30	TSP Plan X+2	Max Early Green Value	0 to 240
31	TSP Plan X+2	Max Green Extension Value	0 to 240
32	TSP Plan X+2	Inhibit Cycles	0 to 255
33	TSP Plan X+2	Phase 1 Green Factor or Force Off	0 to 255
34	TSP Plan X+2	Phase 2 Green Factor or Force Off	0 to 255
35	TSP Plan X+2	Phase 3 Green Factor or Force Off	0 to 255
36	TSP Plan X+2	Phase 4 Green Factor or Force Off	0 to 255
37	TSP Plan X+2	Phase 5 Green Factor or Force Off	0 to 255
38	TSP Plan X+2	Phase 6 Green Factor or Force Off	0 to 255
39	TSP Plan X+2	Phase 7 Green Factor or Force Off	0 to 255
40	TSP Plan X+2	Phase 8 Green Factor or Force Off	0 to 255
41	16-bit FCS MSB		0 to 255
42	16-bit FCS LSB		0 to 255
43	End Flag		0x7E

Page13 Timing Data – SET (TSMSS >>> TSCP) TSP Queue Jump			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		13
7	Block ID	Transit Priority Config Queue Jump Free Plans	8
Transit Priority = TSP			
8, 9	TSP Enable in Plans (plan 1 to 9) Byte #8: Bit 0 ⇔ plan 9 Byte #9: Bits 0-7 ⇔ plans 1-8	u_int16	



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

10, 11	TSP Enable in Plans (plan 11 to 19) Byte #10: Bit 0 ⇔ plan 19 Byte #11: Bits 0-7 ⇔ plans 11-18	u_int16	
12	TSP Free Plan Max Green Hold Time		0 to 255
13	TSP Free Plan Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
14	TSP Direction A input port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	TSP Direction A type 0 = opticom 1 = GPS 2 = Detector		0, 1
16	TSP Direction B input port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
17	TSP Direction B type 0 = opticom 1 = GPS 2 = Detector		0, 1
18	Queue Jump A output port: GO indicator		0 to 99
19	Queue Jump A output port: STOP indicator		0 to 99
20	Queue Jump A qjump_phase Phase to hold		0 to 255
21	Queue Jump A qjump_green GO queue green time		0 to 255
22	Queue Jump B output port: GO indicator		0 to 99
23	Queue Jump B output port: STOP indicator		0 to 99
24	Queue Jump B qjump_phase Phase to hold		0 to 255
25	Queue Jump B qjump_green GO queue green time		0 to 255
26	16-bit FCS MSB		0 to 255
27	16-bit FCS LSB		0 to 255
28	End Flag		0x7E

Page13 Timing Data – SET (TSMSS >>> TSCP) Access Utilities			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		13



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

7	Block ID	Access Utilities	9
8, 9	Password Menu Change Password	u_int16	
10	Password Menu Password Timeout (Minutes)		1 to 255
11	16-bit FCS MSB		0 to 255
12	16-bit FCS LSB		0 to 255
13	End Flag		0x7E

Page13 Timing Data – SET (TSCP >>> TSMSS) Truck Priority			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x96
6	Page ID		13
7	Block ID	Truck Priority	10
8	Truck Priority Passage Time (0.1 Sec)		0 to 255
9	Truck Priority Det 2 Carryover Time (0.1 Sec)		0 to 255
10	Truck Priority Truck Clearance Time		0 to 255
11	Truck Priority Next Priority Time		0 to 255
12	Truck Priority Hold Phases Green	Bits 0-7 ⇔ phases 1-8	
13	Truck Priority Detector 2 Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
14	Truck Priority Detector 3 Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
15	Truck Priority Detector 4 Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
16	Truck Priority Sign Output Port Valid flashing sign outputs are: 22 = ped 2 yellow 24 = ped 4 yellow 26 = ped 6 yellow 28 = ped 8 yellow 0 = disables the output to the sign	MS Digit ⇔ Port LS Digit ⇔ Bit	0, 22, 24, 26, 28
17	Truck Priority Slave Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
18	Truck Priority Slave Output Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
19	16-bit FCS MSB		0 to 255
20	16-bit FCS LSB		0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

21	End Flag		0x7E
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Page13 Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF6
6	Page ID		13
7	Message ID		1 to 10
8	Error Number		
9	Index Number		
10	16-bit FCS MSB		0 to 255
11	16-bit FCS LSB		0 to 255
12	End Flag		0x7E



LEGACY GET and SET MESSAGES



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Timing Checksums – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET Timing Checksums		0x8B
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Timing Checksums – GET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address (AB3418 Format)		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET Timing Checksums Response		0xCB
6	Page2 Timing CRC-16 Checksum MSB		0 to 255
7	Page2 Timing CRC-16 Checksum LSB		0 to 255
8	Page3 Timing CRC-16 Checksum MSB		0 to 255
9	Page3 Timing CRC-16 Checksum LSB		0 to 255
10	Page4 Timing CRC-16 Checksum MSB		0 to 255
11	Page4 Timing CRC-16 Checksum LSB		0 to 255
12	Page5 Timing CRC-16 Checksum MSB		0 to 255
13	Page5 Timing CRC-16 Checksum LSB		0 to 255
14	Page6 Timing CRC-16 Checksum MSB		0 to 255
15	Page6 Timing CRC-16 Checksum LSB		0 to 255
16	Page7 Timing CRC-16 Checksum MSB		0 to 255
17	Page7 Timing CRC-16 Checksum LSB		0 to 255
18	Page8 Timing CRC-16 Checksum MSB		0 to 255
19	Page8 Timing CRC-16 Checksum LSB		0 to 255
20	Page9 Timing CRC-16 Checksum MSB		0 to 255
21	Page9 Timing CRC-16 Checksum LSB		0 to 255
22	Page10 Timing CRC-16 Checksum MSB		0 to 255
23	Page10 Timing CRC-16 Checksum LSB		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

24	Page11 Timing CRC-16 Checksum MSB		0 to 255
25	Page11 Timing CRC-16 Checksum LSB		0 to 255
26	Page12 Timing CRC-16 Checksum MSB		0 to 255
27	Page12 Timing CRC-16 Checksum LSB		0 to 255
28	Page13 Timing CRC-16 Checksum MSB		0 to 255
29	Page13 Timing CRC-16 Checksum LSB		0 to 255
30	16-bit FCS MSB		0 to 255
31	16-bit FCS LSB		0 to 255
32	End Flag		0x7E

Timing Checksums – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Timing Checksums Error Response		0xEB
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get Controller Identification – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x81
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get Controller Identification – GET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
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TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC1
6	Number of bytes in message bytes 7 to (N+9)		
7	Number of bytes in manufacturer's ID		
8 to m-1	ASCII string with manufacturer's ID		
m	Number of bytes in model ID		
m+1 to N-1	ASCII string with model ID		
N	Number of bytes in protocol revision ID	= 9	
N+1 to N+9	ASCII string with protocol revision ID		"AB3418 V3"
	16-bit FCS MSB		0 to 255
	16-bit FCS LSB		0 to 255
	End Flag		0x7E

Get Controller Identification – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Error Response		0xE1
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Set Time (Broadcast) – SET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	Broadcast address 0xFF	255
3	Control		0x13
4	IPI		0xC0
5	Message	Broadcast message with no response	0xA2 - SET
6	Day of Week		1 to 7



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	1 = Sunday		
7	Month 1 = January		1 to 12
8	Day of month		1 to 31
9	Year Last two digits of year 0 = 2000 94 = 2094		0 to 99
10	Hour		0 to 23
11	Minute		0 to 59
12	Second		0 to 59
13	Tenth Second		0 to 9
14	16-bit FCS MSB		0 to 255
15	16-bit FCS LSB		0 to 255
16	End Flag		0x7E

Set Time – SET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message		0x92 - SET
6	Day of Week 1 = Sunday		1 to 7
7	Month 1 = January		1 to 12
8	Day of month		1 to 31
9	Year Last two digits of year 0 = 2000 94 = 2094		0 to 99
10	Hour		0 to 23
11	Minute		0 to 59
12	Second		0 to 59
13	Tenth Second		0 to 9
14	16-bit FCS MSB		0 to 255
15	16-bit FCS LSB		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

16	End Flag		0x7E
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Set Time – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD2
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Set Time – SET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Set Time Error Response		0xF2
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Set Pattern (Broadcast) – SET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address	Broadcast address 0xFF	255
3	Control		0x13
4	IPI		0xC0
5	Message - SET	Broadcast message with no response	0xA3
6	Pattern number	Plan 10 and 20 are	0 to 27,



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

	0 = Standby 1 – plan 1, offset A 2 – plan 1, offset B 3 – plan 1, offset C 4 – plan 2, offset A 5 – plan 2, offset B 6 – plan 2, offset C . . 25 – plan 9, offset A 26 – plan 9, offset B 27 – plan 9, offset C 31 – plan 11, offset A 32 – plan 11, offset B 33 – plan 11, offset C . . 55 – plan 19, offset A 56 – plan 19, offset B 57 – plan 19, offset C 61 – plan 21, offset A 62 – plan 21, offset B 63 – plan 21, offset C . . 85 – plan 29, offset A 86 – plan 29, offset B 87 – plan 29, offset C 251 - 253 reserved 254 = Flash 255 = Free	skipped	31 to 57, 61 to 87, 251 to 255
7	16-bit FCS MSB		0 to 255
8	16-bit FCS LSB		0 to 255
9	End Flag		0x7E

Set Pattern – SET (TSMSS >>> TSCP)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

3	Control		0x13
4	IPI		0xC0
5	Message - SET		0x93
6	Pattern number 0 = Standby 1 – plan 1, offset A 2 – plan 1, offset B 3 – plan 1, offset C 4 – plan 2, offset A 5 – plan 2, offset B 6 – plan 2, offset C . . 25 – plan 9, offset A 26 – plan 9, offset B 27 – plan 9, offset C 31 – plan 11, offset A 32 – plan 11, offset B 33 – plan 11, offset C . . 55 – plan 19, offset A 56 – plan 19, offset B 57 – plan 19, offset C 61 – plan 21, offset A 62 – plan 21, offset B 63 – plan 21, offset C . . 85 – plan 29, offset A 86 – plan 29, offset B 87 – plan 29, offset C 251 - 253 reserved 254 = Flash 255 = Free	Plan 10 and 20 are skipped	0 to 27, 31 to 57, 61 to 87, 251 to 255
7	16-bit FCS MSB		0 to 255
8	16-bit FCS LSB		0 to 255
9	End Flag		0x7E

Set Pattern – SET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
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TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Response		0xD3
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Set Pattern – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Set Pattern Error Response		0xF3
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get Short Status – GET (TSMSS >>> TSCP)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x84
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get Short Status – GET RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC4
6	Green Phases for phases 1-8 Bits 0-7 ⇔ phases 1-8 Bit set true for phase green		0 to 255
7	Controller Status Bit 0 = in preempt Bit 1 = cabinet flash Bit 2 = passed local zero since last request Bit 3 = in local override mode Bit 4 = coordination alarm pending Bit 5 = detector fault pending Bit 6 = non-critical alarm pending Bit 7 = critical alarm pending		0 to 255
8	Current Pattern Number		0 to 255
9	16-bit FCS MSB		0 to 255
10	16-bit FCS LSB		0 to 255
11	End Flag		0x7E

Get Short Status – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Get Short Status Error Response		0xE4
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get System Detector Data – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
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TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x85
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get System Detector Data – GET RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC5
6	Byte count of following data (not including bytes #1 to #6)	N-6	0 to 255
7	SEQ# Sequence number of this sample (number increases each sample period)		
	PERIOD Sample (collection) period in seconds for this data sample		1 to 255
	# DET Number of system detectors in sample		0 to 125
	VOL #1 Volume from system detector #1		
	OCC #1 Occupancy from system detector #1 The occupancy byte is encoded as a percentage from 0 to 100% with a resolution of 0.5%. 0-200 = Detector occupancy in 0.5% increments 210 = Stuck ON fault 211 = Stuck OFF fault 212 = Open Loop fault 213 = Shorted Loop fault 214 = Excessive Inductance fault 215 = Over count fault		
...	... other detectors' volume & occupancy		
N-1	VOL #X		



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

	Volume from system detector #X (last detector)	
N	OCC #X Occupancy from system detector #X (last detector)	
	16-bit FCS MSB	0 to 255
	16-bit FCS LSB	0 to 255
	End Flag	0x7E

Get System Detector Data – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE5
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get Status8 – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message		0x86 - GET
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get Status8 – GET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xC6
6	Flag Bit 0 = focus mode Bit 2 = advance input status Bit 3 = spare 3 input status Bit 4 = spare 2 input status Bit 5 = spare 1 input status Bit 7 = transit vehicle call		0 to 255
7	Controller Status Format identical to AB3418 Get Short Status “status” byte Controller Status Bit 0 = in preempt Bit 1 = cabinet flash Bit 2 = passed local zero since last request Bit 3 = in local override mode Bit 4 = coordination alarm pending Bit 5 = detector fault pending Bit 6 = non-critical alarm pending Bit 7 = critical alarm pending		0 to 255
8	Current Pattern Number		0 to 255
9	GreenYellowOverlap Bits 0-3 ⇔ Green overlaps A-D Bits 4-7 ⇔ Yellow overlaps A-D		1
10	Preemption Bits 0-3 ⇔ EV A-D Bits 4-5 ⇔ RR 1-2 Bit 6 - pattern transition Bit 7 – Transit Vehicle Priority		0 to 255
11	Phase Call	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Ped Call	Bits 0-7 ⇔ ped 1-8	0 to 255
13	Active Phase Bit set true for phase active	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Interval Bits 0-3 ⇔ Ring A interval Bits 4-7 ⇔ Ring B interval Interval encoding is as follows: 0x00 = Walk 0x01 = Don't Walk 0x02 = Min Green 0x04 = Added Initial		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

	0x05 = Passage 0x06 = Max Gap 0x07 = Min Gap 0x08 = Red Rest 0x09 = Preemption 0x0A = Stop Time 0x0B = Red Revert 0x0C = Max Termination 0x0D = Gap Termination 0x0E = Force Off 0x0F = Red Clearance		
15	Presence1 detectors	Bits 0-7 ⇔ Detector 1-8	0 to 255
16	Presence2 detectors	Bits 0-7 ⇔ Detector 9-16	0 to 255
17	Presence3 detectors	Bits 0-7 ⇔ Detector 17-24	0 to 255
18	Presence4 detectors	Bits 0-3 ⇔ Detector 25-28 Bits 4-7 ⇔ unused	0 to 255
19	Master Cycle Clock	Counts up to cycle length	0 to 255
20	Local Cycle Clock	Counts up to cycle length	0 to 255
21	16-bit FCS MSB		0 to 255
22	16-bit FCS LSB		0 to 255
23	End Flag		0x7E

Get Status8 – GET ERROR RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – Get Status8 Error Response		0xE6
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get Status8E – GET (TSMSS >>> TSCP)

Byte #	Description	Notes	Range
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TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET		0x88
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get Status8E – GET RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC8
6	Time Stamp – Hour		0 to 23
7	Time Stamp - Minute		0 to 59
8	Time Stamp - Second		0 to 59
9	Flag Bit 0 = focus mode Bit 2 = advance input status Bit 3 = spare 3 input status Bit 4 = spare 2 input status Bit 5 = spare 1 input status Bit 7 = transit vehicle call		0 to 255
10	Controller Status Format identical to AB3418 Get Short Status “status” byte		0 to 255
11	Current Pattern Number		0 to 255
12	Green Overlaps Bits 0-5 ⇔ Green Overlaps A-F		0 to 63
13	Yellow Overlaps Bits 0-5 ⇔ Yellow Overlaps A-F		0 to 63
14	Preemption Bits 0-3 ⇔ EV A-D Bits 4-5 ⇔ RR 1-2 Bit 6 - pattern transition Bit 7 – Transit Vehicle Priority		0 to 255
15	Phase Call	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Ped Call	Bits 0-7 ⇔ ped 1-8	0 to 255
17	Active Phase	Bits 0-7 ⇔ phases 1-8	0 to 255

	Bit set true for phase active		
18	Interval Bits 0-3 ⇔ Ring A interval Bits 4-7 ⇔ Ring B interval Interval encoding is as follows: 0x00 = Walk 0x01 = Don't Walk 0x02 = Min Green 0x04 = Added Initial 0x05 = Passage 0x06 = Max Gap 0x07 = Min Gap 0x08 = Red Rest 0x09 = Preemption 0x0A = Stop Time 0x0B = Red Revert 0x0C = Max Termination 0x0D = Gap Termination 0x0E = Force Off 0x0F = Red Clearance		0 to 255
19	Presence1 detectors	Bits 0-7 ⇔ Detector 1-8	0 to 255
20	Presence2 detectors	Bits 0-7 ⇔ Detector 9-16	0 to 255
21	Presence3 detectors	Bits 0-7 ⇔ Detector 17-24	0 to 255
22	Presence4 detectors	Bits 0-7 ⇔ Detector 25-32	0 to 255
23	Presence5 detectors	Bits 0-7 ⇔ Detector 33-40	0 to 255
24	Master Cycle Clock	Counts up to cycle length	0 to 255
25	Local Cycle Clock	Counts up to cycle length	0 to 255
26	Bus ID (MSB high-order byte of the BusID)		0 to 255
27	Bus ID (LSB low-order byte of the BusID)		0 to 255
	Bus Direction 5 = Phase2 opticom ON 13 = Phase2 opticom OFF 21 = Phase6 opticom ON 17 = Phase6 opticom OFF		0 to 255
28	Bus Type 0 = no Priority 1 = Early Green 2 = Green Extension		0 to 255
29	spare		0
30	spare		0
31	spare		0
32	16-bit FCS MSB		0 to 255



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

33	16-bit FCS LSB		0 to 255
34	End Flag		0x7E

Get Status8E – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Status8E Error Response		0xE8
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get Long Status8 – GET (TSMSS >>> TSCP)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message		0x8C - GET
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get Long Status8 – GET RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message		0xCC- GET Response



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

6	Flag Bit 0 = focus mode Bit 2 = advance input status Bit 3 = spare 3 input status Bit 4 = spare 2 input status Bit 5 = spare 1 input status Bit 7 = transit vehicle call		0 to 255
7	Controller Status Format identical to AB3418 Get Short Status “status” byte		0 to 255
8	Current Pattern Number		0 to 255
9	GreenYellowOverlap Bits 0-3 ⇔ Green overlaps A-D Bits 4-7 ⇔ Yellow overlaps A-D		
10	Preemption Bits 0-3 ⇔ EV A-D Bits 4-5 ⇔ RR 1-2 Bit 6 - pattern transition Bit 7 - Transit Vehicle Priority		0 to 255
11	Phase Call	Bits 0-7 ⇔ phases 1-8	0 to 255
12	Ped Call	Bits 0-7 ⇔ ped 1-8	0 to 255
13	Active Phase Bit set true for phase active	Bits 0-7 ⇔ phases 1-8	0 to 255
14	Interval Bits 0-3 ⇔ Ring A interval Bits 4-7 ⇔ Ring B interval Interval encoding is as follows: 0x00 = Walk 0x01 = Don't Walk 0x02 = Min Green 0x04 = Added Initial 0x05 = Passage 0x06 = Max Gap 0x07 = Min Gap 0x08 = Red Rest 0x09 = Preemption 0x0A = Stop Time 0x0B = Red Revert 0x0C = Max Termination 0x0D = Gap Termination 0x0E = Force Off 0x0F = Red Clearance		0 to 255
15	Presence1 detectors	Bits 0-7 ⇔ Detector 1-8	0 to 255
16	Presence2 detectors	Bits 0-7 ⇔ Detector 9-16	0 to 255



TSMSS Support of TSCP

Functional Description

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17	Presence3 detectors	Bits 0-7 ⇔ Detector 17-24	0 to 255
18	Presence4 detectors	Bits 0-3 ⇔ Detector 25-28 Bits 4-7 ⇔ unused	0 to 255
19	Master Cycle Clock	Counts up to cycle length	0 to 255
20	Local Cycle Clock	Counts up to cycle length	0 to 255
21	SEQ# Sequence number of this sample (number increases each sample period)		
22	VOL #1 Volume from system detector #1		
23	OCC #1 Occupancy from system detector #1 The occupancy byte is encoded as a percentage from 0 to 100% with a resolution of 0.5%. 0-200 = Detector occupancy in 0.5% increments 210 = Stuck ON fault 211 = Stuck OFF fault 212 = Open Loop fault 213 = Shorted Loop fault 214 = Excessive Inductance fault 215 = Over Count fault		
24	Volume from system detector #2		
25	Occupancy from system detector #2		
26	Volume from system detector #3		
27	Occupancy from system detector #3		
28	Volume from system detector #4		
29	Occupancy from system detector #4		
30	Volume from system detector #5		
31	Occupancy from system detector #5		
32	Volume from system detector #6		
33	Occupancy from system detector #6		
34	Volume from system detector #7		
35	Occupancy from system detector #7		
36	Volume from system detector #8		
37	Occupancy from system detector #8		
38	16-bit FCS MSB		0 to 255
39	16-bit FCS LSB		0 to 255
40	End Flag		0x7E

Get Long Status8 – ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xEC
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Get Long Status8E – GET (TSMSS >>> TSCP)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message		0x8D - GET
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Get Long Status8E – GET RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Response		0xCD
6	Time Stamp – Hour		0 to 23
7	Time Stamp - Minute		0 to 59
8	Time Stamp - Second		0 to 59
9	Flag Bit 0 = focus mode Bit 2 = advance input status Bit 3 = spare 3 input status		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

	Bit 4 = spare 2 input status Bit 5 = spare 1 input status Bit 7 = transit vehicle call		
10	Controller Status Format identical to AB3418 Get Short Status "status" byte		0 to 255
11	Current Pattern Number		0 to 255
12	Green Overlaps Bits 0-5 ⇔ Green Overlaps A-F		0 to 63
13	Yellow Overlaps Bits 0-5 ⇔ Yellow Overlaps A-F		0 to 63
14	Preemption Bits 0-3 ⇔ EV A-D Bits 4-5 ⇔ RR 1-2 Bit 6 - pattern transition Bit 7 - Transit Vehicle Priority		0 to 255
15	Phase Call	Bits 0-7 ⇔ phases 1-8	0 to 255
16	Ped Call	Bits 0-7 ⇔ ped 1-8	0 to 255
17	Active Phase Bit set true for phase active	Bits 0-7 ⇔ phases 1-8	0 to 255
18	Interval Bits 0-3 ⇔ Ring A interval Bits 4-7 ⇔ Ring B interval Interval encoding is as follows: 0x00 = Walk 0x01 = Don't Walk 0x02 = Min Green 0x04 = Added Initial 0x05 = Passage 0x06 = Max Gap 0x07 = Min Gap 0x08 = Red Rest 0x09 = Preemption 0x0A = Stop Time 0x0B = Red Revert 0x0C = Max Termination 0x0D = Gap Termination 0x0E = Force Off 0x0F = Red Clearance		0 to 255
19	Presence1 detectors	Bits 0-7 ⇔ Detector 1-8	0 to 255
20	Presence2 detectors	Bits 0-7 ⇔ Detector 9-16	0 to 255
21	Presence3 detectors	Bits 0-7 ⇔ Detector 17-24	0 to 255
22	Presence4 detectors	Bits 0-7 ⇔ Detector 25-32	0 to 255
23	Presence5 detectors	Bits 0-7 ⇔ Detector 33-40	0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

24	Master Cycle Clock	Counts up to cycle length	0 to 255
25	Local Cycle Clock	Counts up to cycle length	0 to 255
26	SEQ# Sequence number of this sample (number increases each sample period)		
27	VOL #1 Volume from system detector #1		
28	OCC #1 Occupancy from system detector #1 The occupancy byte is encoded as a percentage from 0 to 100% with a resolution of 0.5%. 0-200 = Detector occupancy in 0.5% increments 210 = Stuck ON fault 211 = Stuck OFF fault 212 = Open Loop fault 213 = Shorted Loop fault 214 = Excessive Inductance fault 215 = Over Count fault		
29	Volume from system detector #2		
30	Occupancy from system detector #2		
31	Volume from system detector #3		
32	Occupancy from system detector #3		
33	Volume from system detector #4		
34	Occupancy from system detector #4		
35	Volume from system detector #5		
36	Occupancy from system detector #5		
37	Volume from system detector #6		
38	Occupancy from system detector #6		
39	Volume from system detector #7		
40	Occupancy from system detector #7		
41	Volume from system detector #8		
42	Occupancy from system detector #8		
43	Volume from system detector #9		
44	Occupancy from system detector #9		
45	Volume from system detector #10		
46	Occupancy from system detector #10		
47	Volume from system detector #11		
48	Occupancy from system detector #11		
49	Volume from system detector #12		
50	Occupancy from system detector #12		
51	Volume from system detector #13		



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

52	Occupancy from system detector #13		
53	Volume from system detector #14		
54	Occupancy from system detector #14		
55	Volume from system detector #15		
56	Occupancy from system detector #15		
57	Volume from system detector #16		
58	Occupancy from system detector #16		
59	Bus ID (MSB high-order byte of the BusID)		
60	Bus ID (LSB low-order byte of the BusID)		
61	Bus Direction 5 = Phase2 opticom ON 13 = Phase2 opticom OFF 21 = Phase6 opticom ON 17 = Phase6 opticom OFF		
62	Bus Type 0 = no Priority 1 = Early Green 2 = Green Extension		
63	spare		0
64	spare		0
65	spare		0
66	16-bit FCS MSB		0 to 255
67	16-bit FCS LSB		0 to 255
68	End Flag		0x7E

Get Long Status8E – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xED
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

Get Controller Timing Data – GET (TSMSS >>> TSCP)

**This message retrieves the local controller's memory in 1 to 32 byte increments.
See Memory-Mapped below for the definition of each of the memory location.**

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x33
4	IPI		0xC0
5	Message - GET Request		0x89
6	Memory Address MSB (Page) Starting memory address (high-order byte)		0 to 255
7	Memory Address LSB (Cell) Starting memory address (low-order byte)		0 to 255
8	Number of memory cells requested		1 to 32
9	16-bit FCS MSB		0 to 255
10	16-bit FCS LSB		0 to 255
11	End Flag		0x7E

Get Controller Timing Data – GET RESPONSE (TSCP >>> TSMSS)

Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - GET Response		0xC9
6	Memory Address MSB Starting memory address (high-order byte) Page		0 to 255
7	Memory Address LSB Starting memory address (low-order byte) Cell Offset		0 to 255
8	N number of memory cells		1 to 32
9	Cell_contents1 Contents of memory cell at "Cell Offset" + 0 bytes		0 to 255
10	Cell_contents2 Contents of memory cell at "Cell Offset" + 1 bytes		0 to 255
	:		0 to 255
	:		0 to 255



TSMSS Support of TSCP

Functional Description

TSMSS-2070-TSCP

$Y = 8 + N * I - I + I$			
Y	Cell_contentsN Contents of memory cell at “Cell Offset” + (N-1) bytes		0 to 255
Y+1	16-bit FCS MSB		0 to 255
Y+2	16-bit FCS LSB		0 to 255
Y+3	End Flag		0x7E

Get Controller Timing Data – GET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – GET Error Response		0xE9
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E

Set Controller Timing Data – SET (TSMSS >>> TSCP)			
This variable length message sets the local controller’s timing data (stored in memory). See Memory-Mapped below for the definition of each of the memory location.			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Request		0x99
6	N Number of cells that this message contains		1 to 16
7	Cell Address1 MSB (Page)		0 to 255
8	Cell Address1 LSB (Cell)		0 to 255
9	Cell Contents1 Contents of cell at “Cell Address1”	u_int8	0 to 255
10	Cell Address2 MSB (Page)		0 to 255
11	Cell Address2 LSB (Cell)		0 to 255
12	Cell Contents2	u_int8	0 to 255

	Contents of cell at "Cell Address1"		
	:		
	:		
$Y = 6 + N \cdot 3 - 3 + 1$			
Y	Cell AddressN MSB (Page)		0 to 255
Y+1	Cell AddressN LSB (Cell)		0 to 255
Y+2	Cell ContentsN Contents of cell at "Cell AddressN"	u_int8	0 to 255
Y+3	16-bit FCS MSB		0 to 255
Y+4	16-bit FCS LSB		0 to 255
Y+5	End Flag		0x7E

Set Controller Timing Data – SET RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message - SET Response		0xD9
6	16-bit FCS MSB		0 to 255
7	16-bit FCS LSB		0 to 255
8	End Flag		0x7E

Set Controller Timing Data – SET ERROR RESPONSE (TSCP >>> TSMSS)			
Byte #	Description	Notes	Range
1	Start Flag		0x7E
2	Controller Address		1 to 255
3	Control		0x13
4	IPI		0xC0
5	Message – SET Error Response		0xF9
6	Error Number		
7	Index Number		
8	16-bit FCS MSB		0 to 255
9	16-bit FCS LSB		0 to 255
10	End Flag		0x7E



TSMSS Support of TSCP Functional Description

TSMSS-2070-TSCP

Memory-Mapped for “Get/Set Controller Timing Data” message			
Memory Location	Description	Notes	Range
PAGE E			
0x00EA	Overlap A – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00EB	Overlap B – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00EC	Overlap C – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00ED	Overlap D – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00EE	Overlap E – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00EF	Overlap F – Not On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00F5	PED 2 Output	Pedestrian Circuit Bits 0-7 ⇔ phases 1-8	0 to 255
0x00F6	PED 6 Output	Pedestrian Circuit Bits 0-7 ⇔ phases 1-8	0 to 255
0x00F7	PED 4 Output	Pedestrian Circuit Bits 0-7 ⇔ phases 1-8	0 to 255
0x00F8	PED 8 Output	Pedestrian Circuit Bits 0-7 ⇔ phases 1-8	0 to 255
0x00F9	N / A		
0x00FA	Overlap A – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00FB	Overlap B – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00FC	Overlap C – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00FD	Overlap D – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00FE	Overlap E – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x00FF	Overlap F – On With Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
PAGE F			
0x0110	Phase 1 – Walk_1 Time		0 to 255
0x0111	Phase 1 – Don’t Walk Time		0 to 255
0x0112	Phase 1 – Minimum Green Time		0 to 255
0x0113	Phase 1 – Type 3 Detector Disconnect		0 to 255
0x0114	Phase 1 – Added Initial Per Vehicle		0 to 255
0x0115	Phase 1 – Extension / Passage (0.1 Sec)		0 to 255
0x0116	Phase 1 – Maximum Gap (0.1 Sec)		0 to 255
0x0117	Phase 1 – Minimum Gap (0.1 Sec)		0 to 255
0x0118	Phase 1 – Max Extension 1 Time		0 to 255
0x0119	Phase 1 – Max Extension 2 Time		0 to 255
0x011A	Phase 1 – Max Extension 3 Time		0 to 255
0x011B	N / A		
0x011C	Phase 1 – Reduced Gap By (0.1 Sec)		0 to 255



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0x011D	Phase 1 – Reduced Gap Every (0.1 Sec)		0 to 255
0x011E	Phase 1 – Yellow (0.1 Sec)		3 to 6
0x011F	Phase 1 – Red Clearance (0.1 Sec)		0 to 255
0x0120	Phase 2 – Walk_1 Time		0 to 255
0x0121	Phase 2 – Don't Walk Time		0 to 255
0x0122	Phase 2 – Minimum Green Time		0 to 255
0x0123	Phase 2 – Type 3 Detector Disconnect		0 to 255
0x0124	Phase 2 – Added Initial Per Vehicle		0 to 255
0x0125	Phase 2 – Extension / Passage (0.1 Sec)		0 to 255
0x0126	Phase 2 – Maximum Gap (0.1 Sec)		0 to 255
0x0127	Phase 2 – Minimum Gap (0.1 Sec)		0 to 255
0x0128	Phase 2 – Max Extension 1 Time		0 to 255
0x0129	Phase 2 – Max Extension 2 Time		0 to 255
0x012A	Phase 2 – Max Extension 3 Time		0 to 255
0x012B	N / A		
0x012C	Phase 2 – Reduced Gap By (0.1 Sec)		0 to 255
0x012D	Phase 2 – Reduced Gap Every (0.1 Sec)		0 to 255
0x012E	Phase 2 – Yellow (0.1 Sec)		3 to 6
0x012F	Phase 2 – Red Clearance (0.1 Sec)		0 to 255
0x0130	Phase 3 – Walk_1 Time		0 to 255
0x0131	Phase 3 – Don't Walk Time		0 to 255
0x0132	Phase 3 – Minimum Green Time		0 to 255
0x0133	Phase 3 – Type 3 Detector Disconnect		0 to 255
0x0134	Phase 3 – Added Initial Per Vehicle		0 to 255
0x0135	Phase 3 – Extension / Passage (0.1 Sec)		0 to 255
0x0136	Phase 3 – Maximum Gap (0.1 Sec)		0 to 255
0x0137	Phase 3 – Minimum Gap (0.1 Sec)		0 to 255
0x0138	Phase 3 – Max Extension 1 Time		0 to 255
0x0139	Phase 3 – Max Extension 2 Time		0 to 255
0x013A	Phase 3 – Max Extension 3 Time		0 to 255
0x013B	N / A		
0x013C	Phase 3 – Reduced Gap By (0.1 Sec)		0 to 255
0x013D	Phase 3 – Reduced Gap Every (0.1 Sec)		0 to 255
0x013E	Phase 3 – Yellow (0.1 Sec)		3 to 6
0x013F	Phase 3 – Red Clearance (0.1 Sec)		0 to 255
0x0140	Phase 4 – Walk_1 Time		0 to 255
0x0141	Phase 4 – Don't Walk Time		0 to 255
0x0142	Phase 4 – Minimum Green Time		0 to 255
0x0143	Phase 4 – Type 3 Detector Disconnect		0 to 255
0x0144	Phase 4 – Added Initial Per Vehicle		0 to 255



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0x0145	Phase 4 – Extension / Passage (0.1 Sec)		0 to 255
0x0146	Phase 4 – Maximum Gap (0.1 Sec)		0 to 255
0x0147	Phase 4 – Minimum Gap (0.1 Sec)		0 to 255
0x0148	Phase 4 – Max Extension 1 Time		0 to 255
0x0149	Phase 4 – Max Extension 2 Time		0 to 255
0x014A	Phase 4 – Max Extension 3 Time		0 to 255
0x014B	N / A		
0x014C	Phase 4 – Reduced Gap By (0.1 Sec)		0 to 255
0x014D	Phase 4 – Reduced Gap Every (0.1 Sec)		0 to 255
0x014E	Phase 4 – Yellow (0.1 Sec)		3 to 6
0x014F	Phase 4 – Red Clearance (0.1 Sec)		0 to 255
0x0150	Phase 5 – Walk_1 Time		0 to 255
0x0151	Phase 5 – Don't Walk Time		0 to 255
0x0152	Phase 5 – Minimum Green Time		0 to 255
0x0153	Phase 5 – Type 3 Detector Disconnect		0 to 255
0x0154	Phase 5 – Added Initial Per Vehicle		0 to 255
0x0155	Phase 5 – Extension / Passage (0.1 Sec)		0 to 255
0x0156	Phase 5 – Maximum Gap (0.1 Sec)		0 to 255
0x0157	Phase 5 – Minimum Gap (0.1 Sec)		0 to 255
0x0158	Phase 5 – Max Extension 1 Time		0 to 255
0x0159	Phase 5 – Max Extension 2 Time		0 to 255
0x015A	Phase 5 – Max Extension 3 Time		0 to 255
0x015B	N / A		
0x015C	Phase 5 – Reduced Gap By (0.1 Sec)		0 to 255
0x015D	Phase 5 – Reduced Gap Every (0.1 Sec)		0 to 255
0x015E	Phase 5 – Yellow (0.1 Sec)		3 to 6
0x015F	Phase 5 – Red Clearance (0.1 Sec)		0 to 255
0x0160	Phase 6 – Walk_1 Time		0 to 255
0x0161	Phase 6 – Don't Walk Time		0 to 255
0x0162	Phase 6 – Minimum Green Time		0 to 255
0x0163	Phase 6 – Type 3 Detector Disconnect		0 to 255
0x0164	Phase 6 – Added Initial Per Vehicle		0 to 255
0x0165	Phase 6 – Extension / Passage (0.1 Sec)		0 to 255
0x0166	Phase 6 – Maximum Gap (0.1 Sec)		0 to 255
0x0167	Phase 6 – Minimum Gap (0.1 Sec)		0 to 255
0x0168	Phase 6 – Max Extension 1 Time		0 to 255
0x0169	Phase 6 – Max Extension 2 Time		0 to 255
0x016A	Phase 6 – Max Extension 3 Time		0 to 255
0x016B	N / A		
0x016C	Phase 6 – Reduced Gap By (0.1 Sec)		0 to 255
0x016D	Phase 6 – Reduced Gap Every (0.1 Sec)		0 to 255



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0x016E	Phase 6 – Yellow (0.1 Sec)		3 to 6
0x016F	Phase 6 – Red Clearance (0.1 Sec)		0 to 255
0x0170	Phase 7 – Walk_1 Time		0 to 255
0x0171	Phase 7 – Don't Walk Time		0 to 255
0x0172	Phase 7 – Minimum Green Time		0 to 255
0x0173	Phase 7 – Type 3 Detector Disconnect		0 to 255
0x0174	Phase 7 – Added Initial Per Vehicle		0 to 255
0x0175	Phase 7 – Extension / Passage (0.1 Sec)		0 to 255
0x0176	Phase 7 – Maximum Gap (0.1 Sec)		0 to 255
0x0177	Phase 7 – Minimum Gap (0.1 Sec)		0 to 255
0x0178	Phase 7 – Max Extension 1 Time		0 to 255
0x0179	Phase 7 – Max Extension 2 Time		0 to 255
0x017A	Phase 7 – Max Extension 3 Time		0 to 255
0x017B	N / A		
0x017C	Phase 7 – Reduced Gap By (0.1 Sec)		0 to 255
0x017D	Phase 7 – Reduced Gap Every (0.1 Sec)		0 to 255
0x017E	Phase 7 – Yellow (0.1 Sec)		3 to 6
0x017F	Phase 7 – Red Clearance (0.1 Sec)		0 to 255
0x0180	Phase 8 – Walk_1 Time		0 to 255
0x0181	Phase 8 – Don't Walk Time		0 to 255
0x0182	Phase 8 – Minimum Green Time		0 to 255
0x0183	Phase 8 – Type 3 Detector Disconnect		0 to 255
0x0184	Phase 8 – Added Initial Per Vehicle		0 to 255
0x0185	Phase 8 – Extension / Passage (0.1 Sec)		0 to 255
0x0186	Phase 8 – Maximum Gap (0.1 Sec)		0 to 255
0x0187	Phase 8 – Minimum Gap (0.1 Sec)		0 to 255
0x0188	Phase 8 – Max Extension 1 Time		0 to 255
0x0189	Phase 8 – Max Extension 2 Time		0 to 255
0x018A	Phase 8 – Max Extension 3 Time		0 to 255
0x018B	N / A		
0x018C	Phase 8 – Reduced Gap By (0.1 Sec)		0 to 255
0x018D	Phase 8 – Reduced Gap Every (0.1 Sec)		0 to 255
0x018E	Phase 8 – Yellow (0.1 Sec)		3 to 6
0x018F	Phase 8 – Red Clearance (0.1 Sec)		0 to 255
0x01E0	N / A		
0x01E1	RR1 Preemption Track Clearance Time		
0x01E2	EVA Preemption Delay Time		
0x01E3	EVA Preemption Hold Time		
0x01E4	EVB Preemption Delay Time		
0x01E5	EVB Preemption Hold Time		



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0x01E6	EVC Preemption Delay Time		
0x01E7	EVC Preemption Hold Time		
0x01E8	EVD Preemption Delay Time		
0x01E9	EVD Preemption Hold Time		
0x01EA	EV Preemption Max Time		
0x01EB	RR2 Preemption Track Clearance Time		
0x01F0	Permitted Phases	Bits 0-7 ⇔ phases 1-8	0 to 255
0x01F1	Red Detector Lock	Bits 0-7 ⇔ phases 1-8	
0x01F2	Yellow Detector Lock	Bits 0-7 ⇔ phases 1-8	
0x01F3	Vehicle Recall	Bits 0-7 ⇔ phases 1-8	
0x01F4	Pedestrian Recall Bits 0-7 ⇔ Pedestrian Phases 1-8		
0x01F5	Pedestrian Permitted Phases Bits 0-7 ⇔ Pedestrian Phases 1-8 This applied to C8.4 firmware		
0x01F6	Overlap A	Bits 0-7 ⇔ phases 1-8	
0x01F7	Overlap B	Bits 0-7 ⇔ phases 1-8	
0x01F8	Double Entry	Bits 0-7 ⇔ phases 1-8	
0x01F9	Max2 Extension Phases	Bits 0-7 ⇔ phases 1-8	
0x01FA	Lag Phases	Bits 0-7 ⇔ phases 1-8	
0x01FB	Red Rest	Bits 0-7 ⇔ phases 1-8	
0x01FC	Non Actuated	Bits 0-7 ⇔ phases 1-8	
0x01FD	Max3 Extension Phases	Bits 0-7 ⇔ phases 1-8	
0x01FE	Startup Yellow Phases	Bits 0-7 ⇔ phases 1-8	
0x01FF	First Phases Green	Bits 0-7 ⇔ phases 1-8	
PAGE D			
0x02D1	Coordination Plan 1 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D2	Coordination Plan 2 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D3	Coordination Plan 3 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D4	Coordination Plan 4 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D5	Coordination Plan 5 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D6	Coordination Plan 6 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D7	Coordination Plan 7 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D8	Coordination Plan 8 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02D9	Coordination Plan 9 Coord Max Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E1	Coordination Plan 1 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E2	Coordination Plan 2 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E3	Coordination Plan 3 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E4	Coordination Plan 4 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E5	Coordination Plan 5 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255



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0x02E6	Coordination Plan 6 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E7	Coordination Plan 7 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E8	Coordination Plan 8 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02E9	Coordination Plan 9 Coord Min Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x02F1	Coordination Plan 1 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F2	Coordination Plan 2 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F3	Coordination Plan 3 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F4	Coordination Plan 4 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F5	Coordination Plan 5 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F6	Coordination Plan 6 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F7	Coordination Plan 7 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F8	Coordination Plan 8 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
0x02F9	Coordination Plan 9 Coord PED Recall	Bits 0-7 ⇔ Ped Phases 1-8	0 to 255
PAGE C			
0x0310	Coordination Plan 1 Cycle Length		30 to 240
0x0311	Coordination Plan 1 Phase 1 Green Factor		0 to 255
0x0312	Coordination Plan 1 Phase 2 Green Factor		0 to 255
0x0313	Coordination Plan 1 Phase 3 Green Factor		0 to 255
0x0314	Coordination Plan 1 Phase 4 Green Factor		0 to 255
0x0315	Coordination Plan 1 Phase 5 Green Factor		0 to 255
0x0316	Coordination Plan 1 Phase 6 Green Factor		0 to 255
0x0317	Coordination Plan 1 Phase 7 Green Factor		0 to 255
0x0318	Coordination Plan 1 Phase 8 Green Factor		0 to 255
0x0319	Coordination Plan 1 Multi-Cycle (0.1)		0, 5, 20
0x031A	Coord Plan 1 – Offset A Is the point in time relative to the Master Cycle timer when the Local Cycle timer will be at zero	must be less than the cycle length	0 to 239
0x031B	Coord Plan 1 – Offset B	must be less than the cycle length	0 to 239
0x031C	Coord Plan 1 – Offset C	must be less than the cycle length	0 to 239
0x031D	Coordination Plan 1 Spare (ph1-ext)		0
0x031E	Coordination Plan 1 Spare (ph1-ext)		0
0x031F	Coordination Plan 1 Offset Interrupt Time		
0x0320	Coordination Plan 2 Cycle Length		30 to 240
0x0321	Coordination Plan 2 Phase 1 Green Factor		0 to 255
0x0322	Coordination Plan 2 Phase 2 Green Factor		0 to 255
0x0323	Coordination Plan 2 Phase 3 Green Factor		0 to 255
0x0324	Coordination Plan 2 Phase 4 Green Factor		0 to 255
0x0325	Coordination Plan 2 Phase 5 Green Factor		0 to 255
0x0326	Coordination Plan 2 Phase 6 Green Factor		0 to 255



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0x0327	Coordination Plan 2	Phase 7 Green Factor	0 to 255
0x0328	Coordination Plan 2	Phase 8 Green Factor	0 to 255
0x0329	Coordination Plan 2	Multi-Cycle (0.1)	0, 5, 20
0x032A	Coordination Plan 2	Offset A	0 to 239
0x032B	Coordination Plan 2	Offset B	0 to 239
0x032C	Coordination Plan 2	Offset C	0 to 239
0x032D	Coordination Plan 2	Spare (ph2-ext)	0
0x032E	Coordination Plan 2	Spare (ph2-ext)	0
0x032F	Coordination Plan 2	Offset Interrupt Time	
0x0330	Coordination Plan 3	Cycle Length	30 to 240
0x0331	Coordination Plan 3	Phase 1 Green Factor	0 to 255
0x0332	Coordination Plan 3	Phase 2 Green Factor	0 to 255
0x0333	Coordination Plan 3	Phase 3 Green Factor	0 to 255
0x0334	Coordination Plan 3	Phase 4 Green Factor	0 to 255
0x0335	Coordination Plan 3	Phase 5 Green Factor	0 to 255
0x0336	Coordination Plan 3	Phase 6 Green Factor	0 to 255
0x0337	Coordination Plan 3	Phase 7 Green Factor	0 to 255
0x0338	Coordination Plan 3	Phase 8 Green Factor	0 to 255
0x0339	Coordination Plan 3	Multi-Cycle (0.1)	0, 5, 20
0x033A	Coordination Plan 3	Offset A	0 to 239
0x033B	Coordination Plan 3	Offset B	0 to 239
0x033C	Coordination Plan 3	Offset C	0 to 239
0x033D	Coordination Plan 3	Spare (ph3-ext)	0
0x033E	Coordination Plan 3	Spare (ph3-ext)	0
0x033F	Coordination Plan 3	Offset Interrupt Time	
0x0340	Coordination Plan 4	Cycle Length	30 to 240
0x0341	Coordination Plan 4	Phase 1 Green Factor	0 to 255
0x0342	Coordination Plan 4	Phase 2 Green Factor	0 to 255
0x0343	Coordination Plan 4	Phase 3 Green Factor	0 to 255
0x0344	Coordination Plan 4	Phase 4 Green Factor	0 to 255
0x0345	Coordination Plan 4	Phase 5 Green Factor	0 to 255
0x0346	Coordination Plan 4	Phase 6 Green Factor	0 to 255
0x0347	Coordination Plan 4	Phase 7 Green Factor	0 to 255
0x0348	Coordination Plan 4	Phase 8 Green Factor	0 to 255
0x0349	Coordination Plan 4	Multi-Cycle (0.1)	0, 5, 20
0x034A	Coordination Plan 4	Offset A	0 to 239
0x034B	Coordination Plan 4	Offset B	0 to 239
0x034C	Coordination Plan 4	Offset C	0 to 239
0x034D	Coordination Plan 4	Spare (ph4-ext)	0
0x034E	Coordination Plan 4	Spare (ph4-ext)	0
0x034F	Coordination Plan 4	Offset Interrupt Time	



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0x0350	Coordination Plan 5	Cycle Length	30 to 240
0x0351	Coordination Plan 5	Phase 1 Green Factor	0 to 255
0x0352	Coordination Plan 5	Phase 2 Green Factor	0 to 255
0x0353	Coordination Plan 5	Phase 3 Green Factor	0 to 255
0x0354	Coordination Plan 5	Phase 4 Green Factor	0 to 255
0x0355	Coordination Plan 5	Phase 5 Green Factor	0 to 255
0x0356	Coordination Plan 5	Phase 6 Green Factor	0 to 255
0x0357	Coordination Plan 5	Phase 7 Green Factor	0 to 255
0x0358	Coordination Plan 5	Phase 8 Green Factor	0 to 255
0x0359	Coordination Plan 5	Multi-Cycle (0.1)	0, 5, 20
0x035A	Coordination Plan 5	Offset A	0 to 239
0x035B	Coordination Plan 5	Offset B	0 to 239
0x035C	Coordination Plan 5	Offset C	0 to 239
0x035D	Coordination Plan 5	Spare (ph5-ext)	0
0x035E	Coordination Plan 5	Spare (ph5-ext)	0
0x035F	Coordination Plan 5	Offset Interrupt Time	
0x0360	Coordination Plan 6	Cycle Length	30 to 240
0x0361	Coordination Plan 6	Phase 1 Green Factor	0 to 255
0x0362	Coordination Plan 6	Phase 2 Green Factor	0 to 255
0x0363	Coordination Plan 6	Phase 3 Green Factor	0 to 255
0x0364	Coordination Plan 6	Phase 4 Green Factor	0 to 255
0x0365	Coordination Plan 6	Phase 5 Green Factor	0 to 255
0x0366	Coordination Plan 6	Phase 6 Green Factor	0 to 255
0x0367	Coordination Plan 6	Phase 7 Green Factor	0 to 255
0x0368	Coordination Plan 6	Phase 8 Green Factor	0 to 255
0x0369	Coordination Plan 6	Multi-Cycle (0.1)	0, 5, 20
0x036A	Coordination Plan 6	Offset A	0 to 239
0x036B	Coordination Plan 6	Offset B	0 to 239
0x036C	Coordination Plan 6	Offset C	0 to 239
0x036D	Coordination Plan 6	Spare (ph6-ext)	0
0x036E	Coordination Plan 6	Spare (ph6-ext)	0
0x036F	Coordination Plan 6	Offset Interrupt Time	
0x0370	Coordination Plan 7	Cycle Length	30 to 240
0x0371	Coordination Plan 7	Phase 1 Green Factor	0 to 255
0x0372	Coordination Plan 7	Phase 2 Green Factor	0 to 255
0x0373	Coordination Plan 7	Phase 3 Green Factor	0 to 255
0x0374	Coordination Plan 7	Phase 4 Green Factor	0 to 255
0x0375	Coordination Plan 7	Phase 5 Green Factor	0 to 255
0x0376	Coordination Plan 7	Phase 6 Green Factor	0 to 255
0x0377	Coordination Plan 7	Phase 7 Green Factor	0 to 255



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0x0378	Coordination Plan 7 Phase 8 Green Factor		0 to 255
0x0379	Coordination Plan 7 Multi-Cycle (0.1)		0, 5, 20
0x037A	Coordination Plan 7 Offset A		0 to 239
0x037B	Coordination Plan 7 Offset B		0 to 239
0x037C	Coordination Plan 7 Offset C		0 to 239
0x037D	Coordination Plan 7 Spare (ph7-ext)		0
0x037E	Coordination Plan 7 Spare (ph7-ext)		0
0x037F	Coordination Plan 7 Offset Interrupt Time		
0x0380	Coordination Plan 8 Cycle Length		30 to 240
0x0381	Coordination Plan 8 Phase 1 Green Factor		0 to 255
0x0382	Coordination Plan 8 Phase 2 Green Factor		0 to 255
0x0383	Coordination Plan 8 Phase 3 Green Factor		0 to 255
0x0384	Coordination Plan 8 Phase 4 Green Factor		0 to 255
0x0385	Coordination Plan 8 Phase 5 Green Factor		0 to 255
0x0386	Coordination Plan 8 Phase 6 Green Factor		0 to 255
0x0387	Coordination Plan 8 Phase 7 Green Factor		0 to 255
0x0388	Coordination Plan 8 Phase 8 Green Factor		0 to 255
0x0389	Coordination Plan 8 Multi-Cycle (0.1)		0, 5, 20
0x038A	Coordination Plan 8 Offset A		0 to 239
0x038B	Coordination Plan 8 Offset B		0 to 239
0x038C	Coordination Plan 8 Offset C		0 to 239
0x038D	Coordination Plan 8 Spare (ph8-ext)		0
0x038E	Coordination Plan 8 Spare (ph8-ext)		0
0x038F	Coordination Plan 8 Offset Interrupt Time		
0x0390	Coordination Plan 9 Cycle Length		30 to 240
0x0391	Coordination Plan 9 Phase 1 Green Factor		0 to 255
0x0392	Coordination Plan 9 Phase 2 Green Factor		0 to 255
0x0393	Coordination Plan 9 Phase 3 Green Factor		0 to 255
0x0394	Coordination Plan 9 Phase 4 Green Factor		0 to 255
0x0395	Coordination Plan 9 Phase 5 Green Factor		0 to 255
0x0396	Coordination Plan 9 Phase 6 Green Factor		0 to 255
0x0397	Coordination Plan 9 Phase 7 Green Factor		0 to 255
0x0398	Coordination Plan 9 Phase 8 Green Factor		0 to 255
0x0399	Coordination Plan 9 Multi-Cycle (0.1)		0, 5, 20
0x039A	Coordination Plan 9 Offset A		0 to 239
0x039B	Coordination Plan 9 Offset B		0 to 239
0x039C	Coordination Plan 9 Offset C		0 to 239
0x039D	Coordination Plan 9 Spare (ph9-ext)		0
0x039E	Coordination Plan 9 Spare (ph9-ext)		0
0x039F	Coordination Plan 9 Offset Interrupt Time		



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0x712C	Bus ID (MSB high-order byte of the BusID)		
0x712D	Bus ID (LSB low-order byte of the BusID)		
0x71EE	Bus Direction 5 = Phase2 opticom ON 13 = Phase2 opticom OFF 21 = Phase6 opticom ON 17 = Phase6 opticom OFF		
0x71EF	Bus Type 0 = no Priority 1 = Early Green 2 = Green Extension		
0x71D2	Phase2 Headway Time Limit (minute)		
0x71D4	Phase4 Headway Time Limit (minute)		
0x71D6	Phase6 Headway Time Limit (minute)		
0x71D8	Phase8 Headway Time Limit (minute)		
0x7200	Red Revert Time		
0x7201	All-Red Time to Seconds (changes the All-Red time from 1/10 seconds increments to 1 second increments). 0 = phases and overlaps All Red Time will be 0 to 25.5 seconds 1 = phases and overlaps All Red Time will be 0 to 255 seconds		0, 1
0x7202	Max out count		0 to 50
0x7203	Gap out count		0 to 50
0x7206	Master Sub Master Configuration – Input Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
0x7207	Master Sub Master Configuration – Output Port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
0x7208	Free Plan – Lag Phases	Bits 0-7 ⇔ phases 1-8	
0x7209	Free Plan – Omit Phases	Bits 0-7 ⇔ phases 1-8	
0x720A	Free Plan – Vehicle Minimum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x720B	Free Plan – Vehicle Maximum Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x720C	Free Plan – Pedestrian Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
0x720D	Free Plan – Bicycle Recall	Bits 0-7 ⇔ phases 1-8	0 to 255
0x720E	Free Plan – Conditional Service allow for odd number phases only	Bits 0-7 ⇔ phases 1-8	
0x720F	Free Plan – Conditional Service Minimum Green		10 to 255
0x7210	Manual Plan selection – Coordination Plan 0 = disable Manual Plan selection 1-9 = select coordination plans 1-9 11-19 = select coordination plans 11-19 254 = software Flashing operation		0, 1 to 9, 11 to 19, 251 to 255



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	255 = Free operation Any other vale = Free operation		
0x7211	Manual Plan selection – Plan Offset 10 = offset A 11 = offset B 12 = offset C		10 to 12
0x7212	Special Function Override – Control 1 0 = Normal 1 = OFF		0 to 1
0x7213	Special Function Override – Control 2		0 to 1
0x7214	Special Function Override – Control 3		0 to 1
0x7215	Special Function Override – Control 4		0 to 1
0x7216	Local Manual Flag 0 = OFF 1 = ON		0 to 1
0x7217	Detector Fail Maximum ON Time (Minute) Amount of time that is used to identify a detector failure		0 to 255
0x7218	Detector Fail Reset Time (Minute)		0 to 255
0x7219	Det Failure Override – Detector 1 - 8	Bits 0-7 ⇔ detectors 1-8	0 to 255
0x721A	Det Failure Override – Detector 9 - 16	Bits 0-7 ⇔ detectors 9-16	0 to 255
0x721B	Det Failure Override – Detector 17 - 24	Bits 0-7 ⇔ detectors 17-24	0 to 255
0x721C	Det Failure Override – Detector 25 - 32	Bits 0-7 ⇔ detectors 25-32	0 to 255
0x721D	Det Failure Override – Detector 33 - 40	Bits 0-3 ⇔ detectors 33-40	0 to 255
0x721E	Det Failure Override – Detector 41 - 44	Bits 0-3 ⇔ detectors 41-44	0 to 255
0x721F	Solar Clock North Latitude		0 to 255
0x7220	Solar Clock Longitude		0 to 255
0x7221	Solar Clock Local Time Zone		8
0x7222	Sabbatical Clock Sabbath Ped Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
0x7223	Sabbatical Clock Holiday Ped Recall	Bits 0-7 ⇔ Pedestrian Phases 1-8	0 to 255
0x7224	Daylight Saving 1 = Daylight Saving Time On 0 = Daylight Saving Time Off		0 or 1
0x7225	TSP Enable in Plans (plan 1 to 9)		
0x7226	Cell 0x7225: Bit 0 ⇔ plan 9 Cell 0x7226: Bits 0-7 ⇔ plans 1-8		
0x7227	TSP Enable in Plans (plan 11 to 19)		
0x7228	Cell 0x7227: Bit 0 ⇔ plan 19 Cell 0x7228: Bits 0-7 ⇔ plans 11-18		
0x7229	TSP Free Plan Max Green Hold Time		0 to 255
0x7230	TSP Free Plan Hold Phases	Bits 0-7 ⇔ phases 1-8	0 to 255



TSMSS Support of TSCP

Functional Description

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0x7231 0x7232	Master Timer Sync – plans 1 to 9 Sync Local Plan Master timer to Field Master Timer	Cell 0x7202: Bit 0 ⇔ plan 9 Cell 0x7203: Bits 0-7 ⇔ plans 1-8	
0x7233 0x7234	Master Timer Sync – plans 11 to 19 Sync Local Plan Master timer to Field Master Timer	Cell 0x7204: Bit 0 ⇔ plan 19 Cell 0x7205: Bits 0-7 ⇔ plans 11-18	
0x7235 0x7236	Master Timer Sync – plans 21 to 29 Sync Local Plan Master timer to Field Master Timer	Cell 0x7204: Bit 0 ⇔ plan 29 Cell 0x7205: Bits 0-7 ⇔ plans 21-28	
0x7237	TSP Direction A input port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
0x7238	TSP Direction A type 0 = opticom 1 = GPS		0, 1
0x7239	TSP Direction B input port	MS Digit ⇔ Port LS Digit ⇔ Bit	0 to 99
0x7240	TSP Direction B type 0 = opticom 1 = GPS		0, 1

Error Codes		
Description	Notes	Value
ERROR_NO_ERROR	No message error	0
ERROR_TOO_BIG	Not used at this time	1
ERROR_NO_SUCH_NAME	Message type not supported	2
ERROR_BAD_VALUE	Value in info field invalid	3
ERROR_READ_ONLY	Not used at this time	4
ERROR_GEN_ERR	Used for length of packet invalid	5
ERROR_MESS_LEN	Number of bytes for Error message	6
ERROR_INVALID_PLAN	Invalid plan	10
ERROR_INVALID_PACKET_SIZE	Invalid packet size	11
ERROR_OUT_OF_RANGE	Out of range	12
ERROR_UNKNOWN_MSG	Unknown message	13