Serial Communication Protocol
385-8002
Rev AU

CommSync II Product Family
(CommSync II, CommSync II-D, GSync, GSync II)

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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DATE	REVISIONS
03/06/2001	Rev A: Add SAASM-specific commands.
03/13/2001	Rev B: Add Time Code Module commands.
08/01/2001	Rev C: Add DTF-specific cmds, SAASM cmds, and correct typo's.
09/21/2001	Rev D: Add Input Module cmds.
12/17/2001	Rev E: Add Frequency cmds. Update commands/responses.
03/27/2002	Rev F: Add 1MHz Sine and TTL modules, and Ethernet I/O Ext Input Module (385-4038) command/responses
06/11/2002	Rev G: Incorporate commands for GSync. Add SNMP information.
07/16/2002	Rev H: Correct SSTA message for GSync and add module information.
10/30/2002	Rev J: Add table to clarify SSTA message for GSync. Add NTPC controls for GPS and manual time modes.
01/21/2003	Rev K: Add velocity (VELO) command.
02/24/2003	Rev L: Remove unused command (MODS). Correct typographical error in NOTE for UNSL command. Change NTPC command for new TFOM specification. Update CLKR command for Dual Clk Rate N.8 Modules.
04/10/2003	Rev M: Correct typo in TIME command. Add information for IRIG Input Module Add YEAR command
11/19/2003	Rev N: Add commands for SVER, DAFR commands Correct ETHM command. Correct typographical errors. Add Ethernet Telnet password commands
12/10/2003	Rev P: Add Telnet EXIT command
01/29/2004	Rev R: Add IRGC command. Update Position, and position mode commands.
02/04/2004	Rev S: Add ECHO command and MD5, Symmetric Ethernet functions
03/18/2004	Rev T: Remove ability to modify GPS position.
06/18/2004	Rev U: Add ability to set IRIG output mode (IRGM).
09/29/2004	Rev V: Add Cross-Discipline variable to DISC command, correct errors.
10/06/2004	Rev W: Correct typographical errors. Add information on DISC command.
10/28/2004	Rev Y: Add HQTC, and HQTS commands for Have Quick output modules
12/07/2004	Rev Z: Changed the definition of Cold Start command.
02/14/2005 04/18/2005	Rev AA: Updated IP addresses due to network modification. Rev AB: Add CLKN and PHAC commands for N.1 and Phase Aligned LPN Output modules
08/08/2005	Rev AC: Add EXTD command
01/03/2006	Rev AD: Add SAASM Hot Start (ENHS), and KDP version (KVER) commands
01/25/2006	Rev AE: Add DNTI, DNTG, DNTM, and DNTV commands to support the Dual NTP output module
01/25/2006	Rev AF: Added Note that the commands (DNTI, DNTG, and DNTM) will reset the port, inhibiting new commands until the port is ready.
05/25/2006	Rev AG: Added new Ethernet board commands, ADMC, and UPLD to support TFPT system firmware upgrades.
09/07/2006	Rev AH: Added RFC 1305 information to NTPC command description, and added control slot information for GSync-II and CommSync-II-D.
05/04/2007	Rev AJ: Added commands for 385-4090 Dual Ethernet module. Corrected description for EXTD, PRID commands, and TFOM range in TIME and SSTA msg
05/15/2007	Rev AK: Added STAT description
06/17/2007	Rev AL: Changed all commands to 4 char format, Corrected format errors
2/7/2008	Rev AM: Added $RSTG,K command and SAASM MPE firmware (407-3003) specific parameters, updated FEI-Zyfer address
03/27/2008	Rev AN:Correct the weblink to Zyfer support page in the web
01/08/09	Rev AP: Add PTP module specific commands
2/26/09	Rev AR: Add PTP Slave Specific commands, and Correct Typos
6/23/09	Rev AS: Add PTP OSTP Cmd, and Documented NMEA messages
02/02/10	Rev AU: Removed reference to cold start trap.

Table of Contents

CommSync II Product Family Communication - Introduction

The CommSync II/GSync systems have two serial communication ports.

The main serial/command port for CommSync II connects through the backplane to either a CMD I/O module (RS-232 interface) or an Ethernet I/O module. This port uses the proprietary ASCII FEI-Zyfer Command protocol, listed by command in this manual.

The second port is a Debug port. On the CommSync II and CommSync II-D the port is on the GTF/DTF front panel. For GSync and GSync II, the port is on the back panel. This port communicates via RS-232 uses the same ASCII FEI-Zyfer Command protocol, and provides a download/test port to the module.

Serial Communication Protocol

The communication protocol consists of ASCII character strings composing command/response sentences where each command can be queried for a response.

Each command sentence is starts with an ASCII '$', followed by the command word (4 ASCII characters) followed by the '*' character and a carriage return/linefeed (<cr/lf>).

Each response sentence begins with an ASCII '$' followed by the command word and response, and the '*' character. After the '*' delimiter, there is a 2-byte hexadecimal ASCII checksum (cs) followed by a carriage return and a linefeed (<cs|cr|lf>).

The checksum is calculated by X-ORing each successive byte in the message sentence between but not including the '$' and '*' characters. The checksum is not needed for sending commands to the GTF Module. However, the GTF Module will always include checksums in its sentences sent back through the communications port to the user.

Command Queuing

The GTF send and receive buffers are approximately 2048 bytes deep. This will allow several messages to be queued one after another, for multiple responses. If the receive buffer gets full, the remaining commands will be truncated. A default baud rate of 19200 or greater is recommended for optimum performance.

Unsolicited Response

Several commands can be enabled for an unsolicited output. By enabling the unsolicited flag, the requested data will output at periodic intervals or when new information is available. The unsolicited flag is enabled and disabled by use of the **UNSL** command. See the **UNSL** command for more information.

Redundant GTF/DTF Module Commands (CommSync II/CommSync II-D Only)

The GTF/DTF modules are self-contained GPS Time and Frequency sub-systems and, as such, will receive commands and operate on them independently of the other module. In order to maintain communication with both modules in a CommSync II system a primary and secondary command structure has been maintained.

The GTF/DTF module plugged into slot 1 (left slot, from the front) is defined as GTF/DTF#1 or the primary module, while the GTF/DTF plugged into slot 2 (right slot) is designated GTF/DTF#2 or the secondary module.

In most cases there will be three command sets. As an example the read internal temperature command TEMP, will output the temperature of the Online module. The independent commands TMP1 and TMP2 will respond with the internal temperature of the GTF/DTF in the respective slots.

Non-redundant GTF/DTF Module Commands (CommSync II, CommSync II-D or GSync, GSync II)

For non-redundant systems (a CommSync II with a single GTF/DTF, or a GSync system), all commands are directed to GTF/DTF#1. This module will always be the online module. Commands such as TIMD will be sent to and received from the single GTF/DTF. Commands directed to specific modules, such as TMD1, must use the primary module identification (such as “1” or “P”). Commands directed to secondary modules, such as TMD2 or SIGS, will be ignored.

NOTE: In non-redundant systems, references to “online module” always refer to GTF/DTF#1.

Windows/HyperTerminal Setup

In most Windows-based computers is a terminal program called HyperTerminal. The set up of HyperTerminal to communicate with a CommSync II/GSync is very simple.

The program is usually installed in the directory: C:\Program Files\Accessories\HyperTerminal

Double Click on the program “Hypertrm.exe” and a screen will appear asking for a connection description: Enter a name for the setup, and press OK.

On the next screen select Direct to Com 1 (or any available port on your PC) and press OK.

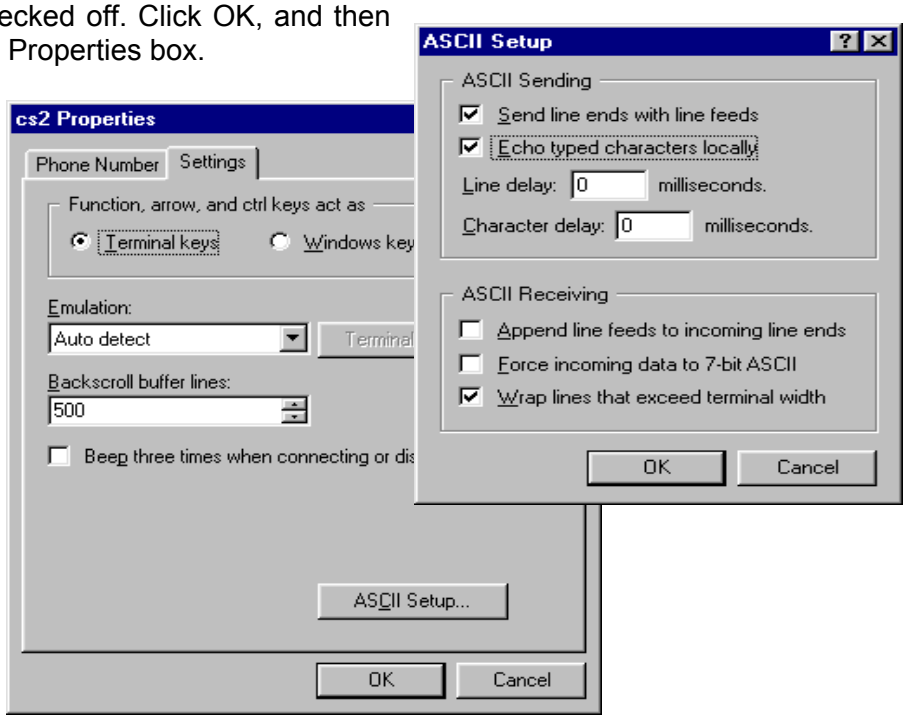
The next screen will request Port Settings. The default communication settings are 19200 Baud, 8 bit, no parity, and 1 stop bit.

Set the following:

Bits per second = 19200, Data Bits= 8, Parity= None, Stop Bits= 1, Flow Control= None

Finally, from the File pull down menu, select properties, Select the Settings tab, and press the ASCII Setup button. Verify that the Send line ends with line feeds box is checked off. Click OK, and then OK to the Properties box.

Verify you are



connected and enter the following command on the PC Key Board to test the HyperTerminal-to-CommSync II/GSync interface:

$PRID* <cr|lf>

This command will return the Product Identification Value. See PRID command for details.

Note: For non-redundant CommSync II and GSync systems, commands directed to GTF/DTF#2 will be ignored. Only commands for GTF/DTF#1 are valid in these systems.

Get Online GPS (Output) AGPS

Command: $AGPS*<cr|lf>

Response: $AGPS,N*<cs|cr|lf>

Description: Returns the current physical Online GTF/DTF number. As a clarification, GTF/DTF#1 refers to the module plugged into front panel slot 1 of the main frame and GTF/DTF#2 refers the module plugged into front panel slot 2.

Fields:	**Symbol**	**Range**	**Description**
	N	1 or 2	Physical GTF/DTF module.

Note: Online commands are only applicable to redundant CommSync II systems.

Set Online GTF/DTF Module (Input) AGPS

Command: $AGPS,n*<cr|lf>

Response: $AGPS,n*<cs|cr|lf>

Description: Sets Online GTF/DTF module, if selected GTF/DTF module is ready.

Fields:	**Symbol**	**Range**	**Description**
	N	1 or 2	Physical GTF/DTF module.

Note: This command is in effect for in all versions CommSyncII family firmware.

Antenna Cable Delay Value (Output) ANTD

Command: $ANTD*<cr|lf>

Response: $ANTD,N*<cs|cr|lf>

Description: Reads the antenna cable delay compensation value/internal timing offset of the online GTF module (For non-redundant CommSync II or GSync systems, this will be GTF#1).

Fields:	**Symbol**	**Range**	**Description**
	N	0 to 999999	nanoseconds

Set Antenna Cable Delay Value (Input/Output) ANT1/ANT2

Command: $ANTg,N*<cr|lf>

Command: $ANTg*<cr|lf>

Response: $ANTg,N*<cs|cr|lf>

Description: Sets/reads the GTF#1/GTF#2 antenna cable delay compensation in a GTF receiver.

Fields:	**Symbol**	**Range**	**Description**
	g	1-2	GTF number
	N	0 to 999999	nanoseconds

Example: $ANT1,234*<cr|lf>

Response: $ANT1,000234*<cs|cr|lf>

This example will set the antenna cable delay value to 234 nanoseconds for the GTF#1. Propagation delay for most cable is approximately 1.5 nanoseconds per foot. Thus, for a 100-foot cable the antenna cable delay value should be set to 150 ns.

Note: For GSync or non-redundant CommSync II system, use the ANT1 command. The ANT2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

GTF#1/GTF#2 Azimuth and Elevation (Output) **AZEL/AZL1/AZL2**

Command: $AZL1*<cr|lf>

Response: $AZL1,N,S,E,A, . . . S,E,A*<cs|cr|lf>

Description: Outputs the satellite PRN followed by the elevation in degrees above the horizon and azimuth in degrees relative to true north of the GTF#1/GTF#2 antenna. This command message contains data for up to twelve (12) satellites.

Fields:	**Symbol**	**Range**	**Description**
	N	00 to 12	Satellites in view
	S	00 to 32	Sat PRN number. A 00 will indicate that there is no information available.
	E	00 to 90	Elevation
	A	000 to 359	Azimuth

Note: For GSync or non-redundant CommSync II system, use the AZL1 command. The AZL2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Beep On/Off (Input) BEEP

Command: $BEEP,N*<cr|lf>

Response: $BEEP,N*<cs|cr|lf>

Description: This command enables or disables the 1PPS beep. The speaker is located on the KDC (Key Pad display) module. The command is received by either GTF and passed to the KDC.

Fields:	**Symbol**	**Range**	**Description**
	N	1 or 0	1 = On, 0 = Off

Note: This command has no effect in systems with no KeyPad Display.

Note: This command is in effect for in all versions CommSyncII family firmware.

1/2 Channel Clock Rate Control (ClkRt, Dual ClkRt, and N.8 Modules)(Input/Output) CLKR

Command: $CLKR*<cr|lf>

Response: $CLKR,S T R1 R2,S T R1 R2,…..*<cs|cr|lf>

Description: This command reads the output module slots and finds Clock Rate Output modules, and reports slot numbers, ID's, and rate selection registers.

Note: Single Clock Rate modules have only one register and will, therefore, only respond with R1. See Example.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	T	32-37	Output Module Identification
	R1	1-256	Register A Frequency output multiplier
	R2	1-256	Register B, Frequency output multiplier

Note: For N.8 versions, R1 and R2 range is 1 to 1024. See table below.

Example: $CLKR*<cr|lf>

Response: $CLKR,4 36 125 193,7 31 256*<cs|cr|lf>

In the example the system contains two Clock Rate modules. In Slot 4 is a Dual Clock Rate TTL Module, with Register A set for 1 MHz (125) and Register B set for 1.544 MHz (193). In slot 7 is a single Clock Rate Module, with its output set for 2.048 MHz (256). See Table below for Clock Rate Module ID values.

Setting Clock Rates CLKR

Command: $CLKR,S,R,V*<cr|lf>

Response: $CLKR,S,R,V*<cs|cr|lf>

Description: This command sets the Clock Rate registers to the desired output frequency, (F_{OUT} = 8 kHz times the variable 'V').

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	R	1-2	Register A/B Selection
	V	1-256	Frequency output multiplier

Note: For N.8 versions, V range is 1 to 1024. See table below.

Example: $CLKR,4,1,16*<cr|lf>

Description: This command is addressed to a Clock Rate Module in slot 4 and will set Register A to 128 kHz (8 kHz times 16).

ClkRt, Dual ClkRt, and N.8 Module IDs		
ID	P/N	Description
0x32	385-4016	Clock Rate Fiber Optic Output Module
0x34	385-4029	Dual Clock Rate TTL Output Module
0x35	385-4030	Dual Clock Rate RS-422 Output Module
0x36	385-4068	Dual Clock Rate N.8 TTL Output Module
0x37	385-4069	Dual Clock Rate N.8 RS-422 Output Module

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.20.00
SAASM Firmware 385-3021	V1.19.00
DTF Firmware 385-3031	V1.05.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

4/6 Channel Clock Rate Control (N.1 Modules)(Input/Output) CLKN

Command: $CLKN*<cr|lf>

Response: $CLKN,S T F*<cs|cr|lf>

Description: This command reads the output module slots and finds the N.1 Clock Rate Output modules, and reports slot numbers, ID's, and Module Fault Status.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	T	66-67	Output Module Identification
	F	66-67	Output Module Status

Example: $CLKN*<cr|lf>

Response: $CLKN,3 66 00,8 67 00,*<cs|cr|lf>

In the example the system contains two N.1 Clock Rate modules. In Slot 3 is a 4 channel N.1 Clock Rate Module, and in slot 8 is a 6 channel N.1 Clock Rate Module

Command: $CLKN,S,R*<cr|lf>

Response: $CLKN,S,R,F*<cs|cr|lf>

Description: This command sets or reads the frequency setting of the output module in the specified slot and channel, and returns the slot and channel numbers as well as rate selection.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	R	1-6	Output Channel
	F	1000-54000000	Output Frequency Selection

Note: N.1 Rate selectable from 1kHz to 54MHz in 10Hz increments

Command: $CLKN,3,3*<cr|lf>

Response: $CLKN,3,3,12000000*<cs|cr|lf>

Description: This command reads/sets the Clock Rate register 3 on the board in slot 3 to the desired output frequency, (12 MHz).

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	R	1-6	Register A/B Selection
	F	1000-54000000	Output Frequency Selection

CLOCK RATE MODULE IDs		
ID	P/N	Description
0x66	385-4072-01	4 channel, 1K-54M, BNC/TTL N.1 module
0x67	385-4072-02	6 channel, 1K-54M, DB9/RS422 N.1 module
0x67	385-4072-03	6 channel, 1K-54M, WireWrap/RS422 N.1 module
0x66	385-4072-04	4 channel, 1K-54M, TriAx/RS422 N.1 module

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.32.00
SAASM Firmware 385-3021	V1.30.00
DTF Firmware 385-3031	V1.11.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Disable Antenna Fault Reporting (Input) DAFR

Command: $DAFR,N*<cr|lf>

Response: $DAFR,N*<cs|cr|lf>

Description: This command enables or disables the antenna overcurrent and undercurrent fault. The fault will not be displayed in the SSTA message, on the GTF LEDs, or on the KDC Menu 0. The command disables or enables antenna fault reporting in both GTFs.

Fields:

Symbol	Range	Description
N	1 or 0	1 = Fault reporting disabled, 0 = Fault reporting enabled.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.21.00
SAASM Firmware 385-3021	V1.21.00
DTF Firmware 385-3031	Not Applicable
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

DAC Control (Output) DACV

Command: $DACV*<cr|lf>

Response: $DACV,N*<cs|cr|lf>

Description: Reads the DAC value of the GTF/DTF module.

Fields:	Symbol	Range	Description
	N	0 - 65535	DAC value, control voltage for oscillator. Center value of 32768.

GTF/DTF#1/GTF/DTF#2 DAC Control (Output) DACP/DACS

Command: $DACP,N*<cr|lf>

Command: $DACP*<cr|lf>

Response: $DACP,N*<cs|cr|lf>

Description: Reads GTF/DTF#1 DAC value. (For GTF/DTF#2 use DACS)

Fields:	Symbol	Range	Description
	N	0 - 65535	DAC value for oscillator where 32768 is center voltage

Note: The range shown (0-65535) is for the Xtal Oscillator option. With a Rubidium Oscillator the range is 0 to 32768, with a center value of 16384.

Note: For GSync or non-redundant CommSync II system, use the DACP command. The DACS command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Read Dual NTP IP Address cmd(Output) DNTI

Command: $DNTI*<cr|lf>

Response: $DNTI,s,id,st*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	id	5F	Output Module ID, Dual NTP = 0x5F
	st	00-FF	Output Module Status

Description: Reads Slot, Module ID, and Status for all Dual NTP module in a system

Command: $DNTI,s*<cr|lf>

Response: $DNTI,s,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	xxx.xxx.xxx.xxx		Port 0, IP address
	yyy.yyy.yyy.yyy		Port 1, IP address

Description: Reads IP Address setting for Dual NTP Modules (385-4087). The first set of numbers is the IP Address of Port 0, followed by the IP Address for Port 1.

Command: $DNTI,s,p*<cr|lf>

Response: $DNTI,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	p	0 or 1	Dual NTP port (0,1)
	xxx.xxx.xxx.xxx		IP address (Selected port)

Description: Reads IP Address setting (by port) for Dual NTP Modules (385-4087).

Set Dual NTP IP Address cmd(Output) DNTI

Command: $DNTI,s,p,xxx.xxx.xxx.xxx*<cr|lf>

Response: $DNTI,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	p	0 or 1	Dual NTP port (0,1)
	xxx.xxx.xxx.xxx		IP address

Description: Sets IP Address setting (by port) for Dual NTP Modules (385-4087).

Note: The configuration commands (DNTI, DNTG, and DNTM) will reset the port. This will inhibit new configuration commands until the port is ready (~ 20 seconds).

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.38.00
SAASM Firmware 385-3021	V1.36.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Read Dual NTP Network Gateway Address(Output) DNTG

Command: $DNTG*<cr|lf>

Response: $DNTG,s,id,st*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	id	5F	Output Module ID, Dual NTP = 0x5F
	st	00-FF	Output Module Status

Description: Reads Slot, Module ID, and Status for all Dual NTP module in a system

Command: $DNTG,s*<cr|lf>

Response: $DNTG,s,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	xxx.xxx.xxx.xxx		Port 0, Gateway address
	yyy.yyy.yyy.yyy		Port 1, Gateway address

Description: Reads Gateway Address setting for Dual NTP Modules (385-4087). The first set is the gateway setting for Port 0, followed by the gateway setting for Port 1.

Command: $DNTG,s,p*<cr|lf>

Response: $DNTG,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	p	0 or 1	Dual NTP port (0,1)
	xxx.xxx.xxx.xxx		Gateway (Selected port)

Description: Reads Gateway setting (by port) for Dual NTP Modules (385-4087).

Set Dual NTP Network Gateway Address(Output) DNTG

Command: $DNTG,s,p*<cr|lf>

Response: $DNTG,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	s	2-15	Output Module Slot Number
	p	0 or 1	Dual NTP port (0,1)
	xxx.xxx.xxx.xxx		IP address

Description: Sets Gateway setting (by port) for Dual NTP Modules (385-4087). The router/gateway address is needed to communicate to other LAN segments.

Note: The configuration commands (DNTI, DNTG, and DNTM) will reset the port. This will inhibit new configuration commands until the port is ready (~20 seconds).

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.38.00
SAASM Firmware 385-3021	V1.36.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Read Dual NTP NetMask(Output) DNTM

Command: $DNTM*<cr|lf>

Response: $DNTM,s,id,st*<cs|cr|lf>

Fields:	Symbol	Range	Description
	s	2-15	Output Module Slot Number
	id	5F	Output Module ID, Dual NTP = 0x5F
	st	00-FF	Output Module Status

Description: Reads Slot, Module ID, and Status for all Dual NTP module in a system

Command: $DNTM,s*<cr|lf>

Response: $DNTM,s,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Fields:	Symbol	Range	Description
	s	2-15	Output Module Slot Number
	xxx.xxx.xxx.xxx		Port 0, NetMask
	yyy.yyy.yyy.yyy		Port 1, NetMask

Description: Reads Netmask Address setting for Dual NTP Modules (385-4087). The first set of numbers is the Netmask set on Port 0, followed by the setting for Port 1.

Command: $DNTM,s,p*<cr|lf>

Response: $DNTM,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Fields:	Symbol	Range	Description
	s	2-15	Output Module Slot Number
	p	0 or 1	Dual NTP port (0,1)
	xxx.xxx.xxx.xxx		NetMask (Selected port)

Description: Reads NetMask setting (by port) for Dual NTP Modules (385-4087).

Set Dual NTP IP Address cmd(Output) DNTM

Command: $DNTM,s,p*<cr|lf>

Response: $DNTM,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Fields:	Symbol	Range	Description
	s	2-15	Output Module Slot Number
	p	0 or 1	Dual NTP port (0,1)
	xxx.xxx.xxx.xxx		Net Mask

Description: Sets NetMask setting (by port) for Dual NTP Modules (385-4087).

Note: The configuration commands (DNTI, DNTG, and DNTM) will reset the port. This will inhibit new configuration commands until the port is ready (~20 seconds).

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.38.00
SAASM Firmware 385-3021	V1.36.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Read Dual NTP Module Firmware versions(Output) DNTV

Command: $DNTV,s*<cr|lf>

Response: $DNTI,s,v*<cs|cr|lf>

Fields:	Symbol	Range	Description
	s	2-15	Output Module Slot Number
	v	string	Dual NTP module firmware version.

Description: Reads firmware version of the Dual NTP Module board.

Command: $DNTV,s,p*<cr|lf>

Response: $DNTI,s,p,v*<cs|cr|lf>

Fields:	Symbol	Range	Description
	s	2-15	Output Module Slot Number
	p	0-1	Dual NTP Port number
	v	string	NTP module firmware version.

Description: Reads firmware version of the Dual NTP Module board.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.38.00
SAASM Firmware 385-3021	V1.35.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Internal(GPS)/External Discipline Control (Input/Output) **DIS1/DIS2**

Command: $DIS1*<cr|lf>

Response: $DIS1,N*<cs|cr|lf>

Description: Sets or reads GTF#1/GTF#2 Discipline Source mode

Description:

Symbol	Range	Description
N	G, S, E, or X	G = GPS Receiver 1PSS ref *(Default GTF) E = External 1PPS ref (Default DTF) S = Switch mode *(GTF only) X = Cross Discipline **(DTF only)

Note: In Switch mode, the GPS reference is the discipline source, if GPS is lost, the External source provides the reference.

Note: * These command parameters (G or S) are only applicable to GTF Modules with external input capability (385-4000 or 385-4100).

Note: ** This command parameter (X) is only applicable to a DTF Module (385-4060) in a redundant system Note: When Cross Discipline mode is selected the external input is disabled.

Note: For GSync or non-redundant CommSync II system, use the DIS1 command. The DIS2 command has no effect.

Note: The cross disciplining feature is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.28.00
SAASM Firmware 385-3021	V1.28.00
DTF Firmware 385-3031	V1.09.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

External Discipline Frequency Selection (Input/Output) **DIV1/DIV2**

Command: $DIV1*<cr|lf>

Response: $DIV1,N*<cs|cr|lf>

Description: Reads/sets DTF#1/DTF#2 Discipline Source.

Fields:	**Symbol**	**Range**	**Description**
	N	0 - 3	0 = External 1PPS ref 1 = External 1 MHz ref 2 = External 5 MHz ref 3 = External 10 MHz ref

Note: These commands are typically only used for the DTF Modules (385-4060). For GSync or non-redundant CommSync II system, use the DIV1 command. The DIV2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.13.00
SAASM Firmware 385-3021	V1.07.00
DTF Firmware 385-3031	V1.01.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

External 1 PPS Delay Adjustment EXTD

Command: $EXTD,N*<cr|lf>

Response: $EXTD,N*<cs|cr|lf>

Description: Set/Reads the external delay setting. This is used to compensate for external cable delays between the CommSync II or GSync system and the external reference source.

Fields: Symbol	Range	Description
N	0 to 9999	nanoseconds

Example: $EXTD,100*<cr|lf>

Response: $EXTD,100*<cs|cr|lf>

This example will set the external compensation delay of the input 1 PPS to 100 nanoseconds with respect to the GTF module.

Note: In a dual redundant system, each GTF/DTF must be set independently.

Note: In a dual redundant system, each GTF must be set independently.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.36.00
SAASM Firmware 385-3021	V1.32.00
DTF Firmware 385-3031	V1.13.00
SAASM Firmware 385-3077	V1.00.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Frequency Module Control (Input/Output) FREQ

Command: $FREQ*<cr|lf>

Response: $FREQ,S T F,S T F,…..*<cs|cr|lf>

Description: This command reads the output module slots and finds Frequency Synthesizer modules, and reports slot numbers, IDs, and frequency settings.

Fields:	Symbol	Range	Description
	S	1-15	Output Module Slot Number
	T	28-29	Output Module Identification
	F		Frequency Synth Status, where: Bit0= last cmd sent, where 0=freq set cmd 1=freq read cmd Bit4=Frequency mismatch fault Bit5=Frequency lock fault Bit6=POM communication fault Bit7=Frequency input fault

Example: $FREQ*<cr|lf>

Response: $FREQ,4 28 00,7 29 10.01*<cs|cr|lf>

In this example, the system contains two Frequency Synthesizer modules. In Slot 4 is a Frequency Synthesizer TTL module with no faults, and the last command set the frequency. In slot 7 is a Frequency Synthesizer Sine module with no faults, and the last command read the frequency.

Read Frequency Module (Input/Output) FREQ

Command: $FREQ,S*<cr|lf>

Response: $FREQ,S F*<cs|cr|lf>

Description: This command reads the frequency of the module in slot S.

Fields:	Symbol	Range	Description
	S	1-15	Output Module Slot Number
	F	0.000020000000 to 29.999999999999	Frequency output (MHz)

Example: $FREQ,4*<cr|lf>

Response: $FREQ,4 15.00000000*<cs|cr|lf>

Description: In this example, this command read the Frequency Synthesizer module in slot 4 and reported an output frequency of 15 MHz.

Frequency Module Control (continued) **FREQ**

Command: $FREQ,S,F*<cr|lf>

Response: $FREQ,S,F*<cs|cr|lf>

Description: This command sets the module to the desired output frequency in 0.01Hz increments.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	F	0.000020000000 to 29.999999999999	Frequency output (MHz)

Example: $FREQ,4,15.00000000*<cr|lf>

Description: This command will set the Frequency Synthesizer module in slot 4 to an output frequency of 15 MHz.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.14.00
SAASM Firmware 385-3021	V1.10.00
DTF Firmware 385-3031	V1.02.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

GPS engine type (output) GPSE

Command: $GPSE*<cr|lf>

Response: $GPSE,I,C,M,V*<cs|cr|lf>

Description: Reports the GPS engine ID, number of channels, manufacturer, and firmware revisions. .

Fields:	Symbol	Range	Description
	I	0 to 12	Zyfer Receiver ID code, where 2 = (SPS) Motorola UT+ 5 = (PPS) Trimble F22 (SAASM) 7 = (SPS) Navman Jupiter-T 8 = (SPS) Motorola M12 9 = (SPS) Trimble Res-T 10 = (PPS) Rockwell MPE-S (SAASM)
	C	8 to 12	Number of tracking channels
	M	Alphanumeric	ASCII string GPS engine manufacturer name
	V	varies	GPS engine firmware version.

Note: This command is in effect for in all versions CommSyncII family firmware.

Have Quick Output Module Clock Enable selection (Input/Output) HQTC

Command: $HQTC*<cr|lf>

Response: $HQTC,s,e1,e2,e3,e4*<cs|cr|lf>

Description: This command reads the output module slots and finds 385-4070-01 HaveQuick Output Modules. It reports their slot numbers and Clock Enable settings.

Fields:	**Symbol**	**Range**	**Description**
	s	1-15	Output Module Slot Number
	T	58	Have Quick Output Module Identification
	e	0,1	: Where 1= enable set, 0= enable cleared

Example: $HQTC*<cr|lf>

Response: $HQTC,8 58 1,0,0,0,10 58,0,1,1,1*<cs|cr|lf>

In the example the system contains two HaveQuick Ooutput Modules. The module in Slot 8 has the clokc enable #1 set and the other cleared. In Slot 10 the module is set with clock enable #1 cleared, and Clock Enables #2, #3, and #4 set.

Command: $HQTC,S,e1,e2,e3,e4*<cr|lf>

Response: $HQTC,S,T,e1,e2,e3,e4*<cs|cr|lf>

Description: This command sets the output format for the HaveQuick Module.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	T	00-FF	Output Module Identification
	e	0,1,x	: Where; 0 = Clock Enable Cleared 1 = Clock Enable Set x = no change

Example: $HQTC,8,x,1,x,0*<cr|lf>

Response: $HQTC,8,58,1,1,0,0*<cs|cr|lf>

The above command will set Clock enable #2, and clear Clock enable #4, with out changing Clock Enable #1, or #3.

Note: This command is applicable to systems with a 385-4070-01 module and is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.29.00
SAASM Firmware 385-3021	V1.29.00
DTF Firmware 385-3031	V1.10.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Have Quick Output Module HQ format command (Input/Output) HQTS

Command: $HQTS*<cr|lf>

Response: $HQTS,sTF,…*<cs|cr|lf>

Description: This command reads the output module slots and finds HaveQuick Output Modules. It reports their slot numbers and format setting.

Fields:	**Symbol**	**Range**	**Description**
	s	1-15	Output Module Slot Number
	T	58-59	Output Module Identification
	F	0-3	HaveQuick output format, where:
			0,1 = PTTI Have Quick per ICD-GPS-060
			2 = Have Quick II per STANAG 4246
			3 = Extended Have Quick per STANAG 4430

Example: $HQTS*<cr|lf>

Response: $HQTS,8 58 1,10 59 3*<cs|cr|lf>

In the example the system contains two HaveQuick Output Modules. In Slot 8 is a HaveQuick Output Module (385-4070-01) that is set to output the GPS-ICD-060, PTTI format.. In Slot 10 is a HaveQuick Output Module (385-4070-02) set to output Extended HaveQuick (per STANAG 4430)

Command: $HQTS,s,F*<cr|lf>

Response: $HQTS,sTF*<cs|cr|lf>

Description: This command sets the output format for the HaveQuick Module.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	T	58-59	Output Module Identification
	F	0-3	HaveQuick output format, where:
			0 = reserved for future expansion
			1 = PTTI Have Quick per ICD-GPS-060
			2 = Have Quick II per STANAG 4246
			3 = Extended Have Quick per STANAG 4430

Note: This command is applicable to systems with a 385-4070-xx module and is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.29.00
SAASM Firmware 385-3021	V1.29.00
DTF Firmware 385-3031	V1.10.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.03.00

Input Module Configuration (Output/Input) INPC

Command: $INPC*<cr|lf>

Response: $INPC,b,p,r,o,s*<cs|cr|lf>

Description: Reads input module configuration and status. The response will be a single INPC if only one input module is installed, or two INPCs if two modules are installed.

Fields:

Symbol	Range	Description
B	0 –1	Input Module select 0 = Primary Input module 1 = Secondary Input module Note: For CommSync II Primary Slot is 15, Secondary is Slot 14 For CommSync II-D Primary Slot is 8, Secondary is Slot 7 For GSync Primary Slot is 4, no Secondary Slot For GSync II Primary Slot is 8, no Secondary Slot
P	0 – 4	A/B input selection, where: 0 = Auto, 'A' input priority. 1 = Manual select input 'A' 2 = Manual select input 'B' 3 = Manual select IRIG B input (with 385-4040-xx only) 4 = Manual select PTP input (with 385-4097-xx only)
R	0 – 3	External input routing selection, where: 0 = none 1 = DTF#1 2 = DTF#2 3 = Both DTF#1 and DTF#2
o	0 – 3	External LOCK override (nominally 00), where: 0 = Override both A and B 1 = Enable LOCK input A 2 = Enable LOCK input B 3 = Enable both LOCK inputs
s (Read Only)	00-FF	Input Mod status, 4 ASCII (hex) bit position: (LSB) Bit 0 = [Ext. Lock A(4037/4038)] [Module Fault(4090/4097)] Bit 1 = Ext. Input A Present Bit 2 = [Ext. Lock B(4037/4038)] [PTP Slave 1PPS(4090/4097)] Bit 3 = Ext. Input B Present Bit 4 = Input Select (A = 0, B = 1) Bit 5 = DTF Select (00 = None, 01 = DTF#1) Bit 6 = DTF Select (10 = DTF#2, 11 = Both) (MSB) Bit 7 = System Fault

Input Module Configuration (Input) INPC

Command: $INPC,b,p,r,o*<cr|lf>

Response: $INPC,b,p,r,o,s*<cs|cr|lf>

Description: Sets input module configuration status. (See previous section for field descriptions.)

Note: For GSync or non-redundant CommSync II systems, the external input module must be installed in the Primary Slot (Slot 15-CommSync II, Slot 8-CommSync II-D, Slot 4-GSync, or Slot 8-GSync II). All commands must be addressed to b = 0 in these systems.

Note: These commands only apply to DTF-based systems or GTF systems using external inputs with input modules (such as 385-4037-02, 385-4038-03, or 385-4040).

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.13.00
SAASM Firmware 385-3021	V1.10.00
DTF Firmware 385-3031	V1.00.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

IRIG input control (Input) **IRGC**

Command: $IRGC*<cr|lf>

Command: $IRGC,N*<cr|lf>

Response: $IRGC,N*<cs|cr|lf>

Description: Enable external system time inputs. The default setting is GPS priority, the IRIG input module (385-4040-xx) or the PTP input module (385-4097-xx) will only set the system time when GPS time is not available. If IRIG input priority is set, the system time will be set from the 385-4040-xx IRIG input module. If PTP priority is set the system time will be set from the 385-4097-xx Ethernet/PTP input module.

Fields:	**Symbol**	**Range**	**Description**
	N	0 -> 2	0 = GPS priority, when set IRIG time is a backup 1 = IRIG input priority. 2 = PTP input priority.

Note: This command has no effect in systems without a 385-4040-xx, IRIG Input Module or a 385-4097-xx Ethernet/PTP input module.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.24.00
SAASM Firmware 385-3021	V1.24.00
DTF Firmware 385-3031	V1.07.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Set/Read Time Code Output Mode (Input/Output) IRGM

Command: $IRGM*<cr|lf>

Command: $IRGM,N<cr|lf>

Response: $IRGM,N<cs|cr|lf>

Description: In systems with Time Code Output Module (385-4020-xx), this command will set/read the mode of time output. The standard time output is UTC. This command will enable the time to be the same mode as the GTF Module (see TIMM).

Fields:	**Symbol**	**Range**	**Description**
	N	0 or 1	0 = IRIG output is UTC time (GTF default) 1 = IRIG output is the same as system time.

Note: This command has no effect in systems without a 385-4020-xx, IRIG Output Module.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.27.00
SAASM Firmware 385-3021	V1.24.00
DTF Firmware 385-3031	Not Applicable
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Lock Keypad Edit Key (Input) — LOCK

Command: $LOCK*<cr|lf>

Command: $LOCK,N*<cr|lf>

Response: $LOCK,N*<cs|cr|lf>

Description: Disables the keypad edit key. This is a KeyPad Display Module command. It is received by either GTF/DTF module and passed to the KDC module.

Fields:	**Symbol**	**Range**	**Description**
	N	0 or 1	0 = Unlock, 1 = Lock

Note: This command has no effect in systems with no KeyPad Display.

Note: This command is in effect for in all versions CommSyncII family firmware.

GPS / UTC Time Difference (Output) — LEAP

Command: $LEAP*<cr|lf>

Response: $LEAP,n,f*<cs|cr|lf>

Description: Reports the difference in seconds between GPS time and UTC time, and the GPS leap second pending flag.

Fields:	**Symbol**	**Range**	**Description**
	n	0-255	Difference in seconds between GPS and UTC time
	f	0,1	Leap second pending flag

Note: This command has no effect in DTF-based systems.

Note: This command is in effect for in all versions CommSyncII family firmware.

Phase Aligned Low Phase Noise Calibration command (Input/Output) PHAC

Command: $PHAC,S*<cr|lf>

Response: $PHAC,S,E,P,V,sp*<cs|cr|lf>

Description: Reads Calibration variables of a Phase Aligned Output Module in specific slot

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	E	0-1	0=Auto Adjust disabled, 1,2=not locked, 3=Locked
	P	0-255	Phase Adjust delay setting (1ns/step *)
	V	0.00-5.00	Phase Detect Voltage
	sp	0.00-5.00	Phase Alignment Set Point

Note: This command applies to the Phase Aligned Output modules (385-4078-xx -> 385-4080-xx) only.

Command: $PHAC,S,E,P,sp*<cr|lf>

Response: $PHAC,S,E,P,sp*<cs|cr|lf>

Description: Sets Calibration variables of a Phase Aligned Output Module in specific slot

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	E	0-1	0=Disable Auto Phase Adjust, 1=Enable
	P	0-255	Phase Adjust delay setting (1ns/step *)
	sp	0.00-5.00	Phase Alignment Set Point

Note: This command applies to the Phase Aligned Output modules only.

(385-4078-XX, 385-4079-XX, 385-4080-XX, 385-4081-XX)

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.35.00
SAASM Firmware 385-3021	V1.33.00
DTF Firmware 385-3031	V1.12.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Phase Aligned module Calibration Procedure:

Equipment needed: 2 Channel Storage Scope.
Set-up
Connect Channel 1 to 10MHz sine-wave output of the Phase Aligned module
Connect Channel 2 (Trigger) to 1PPS output (385-4010-05 output module recommended).
Set trigger on rising (on-time) edge of the 1PPS output.
Set horizontal Scale to 10ns/Div (Minimum)

1. Read the current PA_Dly setting, and issue the following command to turn AutoCal off
   $PHAC,7,0*<cr|lf>
   Response:
   $PHAC,7,0,50,1.055,1.057*<cs|cr|lf>

Note : monitor Stability with Fault LED
On Module fault, or PLL not locked
Blink Phase Adjust final adjustments
Off Output Stable,

2. On the Scope, Measure time difference from the 10MHz rising edge to the rising edge of the 1PPS sine wave output. [assume the 10MHz is 32ns ahead of the 1PPS)
   Note: If 10MHz rising edge falls after the 1PPS edge, the number would be negative.

3. Add the measurement from step 1 [+32ns] to the PA_Dly reading [50] (50+32=82) Send following command set the new delay value [82]:
   $PHAC,7,0,82*<cr|lf>
   Response:
   $PHAC,7,0,82,1.055,1.057*<cs|cr|lf>

4. Wait for the board to become stable (RED Fault LED off) and send the following command to read the Phase Detector voltage.
   $PHAC,7*<cr|lf>
   Response:
   $PHAC,7,0,82,2.007,1.057*<cs|cr|lf>

5. Send the following command to set the new set point: (2.007)
   $PHAC,7,1,82,2.007*<cr|lf>
   Response:
   $PHAC,7,0,82,2.007,2.005*<cs|cr|lf>

6. Verify time difference from 1PPS rising edge to the rising edge of the 10MHz sine wave output is less than <2ns. If not repeat step 2 -> 5.

Antenna Mask Angle (Input/Output) **MAG1/MAG2**

Command: $MAG1*<cr|lf>

Command: $MAG1,n*<cr|lf>

Response: $MAG1,n*<cs|cr|lf>

Description: Sets or reads the antenna mask angle in GTF#1.

Fields:	**Symbol**	**Range**	**Description**
	n	0 - 89	Degrees above the horizon

Command: $MAG2*<cr|lf>

Command: $MAG2,n*<cr|lf>

Response: $MAG2,n*<cs|cr|lf>

Description: Sets or reads the antenna mask angle in GTF#2.

Fields:	**Symbol**	**Range**	**Description**
	n	0 - 89	Degrees above the horizon

Note: This command will affect the tracking capability of the GPS receiver. Satellites that fall below the elevation mask angle set will not be used. The maximum recommended value for the mask angle is 10 degrees. Raising the elevation mask angle will force the receiver to use only satellites that are higher in the sky.

Note: For GSync or non-redundant CommSync II system, use the MAG1 command. The MAG2 command has no effect.

Note: This command has no effect in DTF-based systems.

Note: This command is in effect for in all versions CommSyncII family firmware.

Read Manual Time Mode (Output) MANM

Command: $MANM*<cr|lf>

Response: $MANM,n*<cs|cr|lf>

Description: Reads manual time mode status, where n = 1 is enabled, and n = 0 is disabled.

Set Manual Time Mode (Input) MANM

Command: $MANM,n,Y,M,D,h,m,s*<cr|lf>

Response: $MANM,n,Y,M,D,h,m,s*<cs|cr|lf>

Description: Enables/disables manual time mode; sets manual time.

Fields:	**Symbol**	**Range**	**Description**
	n	0 - 1	Enable/disable manual time mode (1 = enable, 0 = disable)
	Y	1970-2100	Year
	M	1-12	Month of year
	D	1-31	Day of month
	h	0-23	hour
	m	0-59	minute
	s	0-59	seconds

Note: Manual time will override GPS time.

Command: $MANM,n*<cr|lf>

Response: $MANM,n*<cs|cr|lf>

Description: Enable/disable manual time mode. If n = 0, manual time mode is disabled. If n = 1, manual time mode is enabled. If GTF module is in use and in a standard time mode (UTC, GPS, LUTC, LGPS) for time, when manual time mode is enabled, the GTF will set the current time to the current GPS time. The GTF will continue to keep its own time and ignore the internal GPS time. When manual time is disabled, the GTF module will revert to the previous time mode.

Note: The DTF system has no alternate time source. Once manual time mode is entered, it cannot return to run time mode.

Note: This command is in effect for in all versions CommSyncII family firmware.

Not Time-Lock Counter (Output) **NTL1/NTL2**

Command: $NTL1*<cr|lf>

Response: $NTL1,n*<cs|cr|lf>

Description: The command returns the number of seconds GTF/DTF#1 has been out of time or freq lock.

Fields:	**Symbol**	**Range**	**Description**
	n	2^{32} -1	Number of seconds out of time-lock

Command: $NTL2*<cr|lf>

Response: $NTL2,n*<cs|cr|lf>

Description: The command returns the number of seconds GTF/DTF#2 has been out of time or freq lock.

Fields:	**Symbol**	**Range**	**Description**
	N	2^{32} -1	Number of seconds out of time-lock

Note: For GSync or non-redundant CommSync II system, use the NTL1 command. The NTL2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Position Mode for Online GPS (Output) TRMO/PMD1/PMD2

Command: $TRMO*<cr|lf>

Response: $TRMO,X*<cs|cr|lf>

Description: Allows the user to read back the position mode of the GPS receiver for the online GTF module (GTF#1 for non-redundant systems).

Fields:	**Symbol**	**Range**	**Description**
	X	D	Dynamic
		S	Survey/Position average mode.
		K	Known/Fixed position mode.

Dynamic mode is for use in a moving platform or to determine the user's location.

In the Survey mode a 3-dimentional average position is computed using latitude, longitude and altitude values when the receiver is locked to GPS. The position solution is computed and averaged over time. At the end of the period the GTF Module will automatically enter the Known position mode using the most recently computed values.

Note: This command does not apply to GTF modules with a PPS GPS receiver. The PPS modules operate in Dynamic mode at all times.

Note: Position Mode commands have no effect in DTF-based systems.

Position Mode for GPS (Input/Output) PMD1/PMD2

Command: $PMD1,X*<cr|lt>

Command: $PMD1*<cr|lf>

Response: $PMD1,X*<cs|cr|lf>

Description: Allows the user to set or read back the mode of operation for the position solution for either the GTF#1/GTF#2 module.

Fields:	**Symbol**	**Range**	**Description**
	X	D	Dynamic
		S	Survey/Position average mode.
		K	Known/Fixed position mode.

Note: *The GTF modules, on power up, begin the Survey mode, and will transition automatically to Known/fixed position mode. It is recommended that the user allow the survey to complete this survey for the best performance of the system.*

Note: For GSync or non-redundant CommSync II system, use the PMD1 command. The PMD2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Latitude and Longitude and Elevation Position (Output) SPOS/POS1/POS2

Command: $SPOS*<cr|lf>

Response: $SPOS,D,M,H,$D_1$,$M_1$,$H_1$,A*<cs|cr|lf>

Description: Retrieves the latitude, longitude and altitude for the online GTF/DTF module (GTF#1 for non-redundant systems).

Fields:	Symbol	Range	Description
	D	0 - 89	Latitude degrees
	M	0.0 - 59.9999	Latitude minutes
	H	N or S	Hemisphere
	D_1	0 - 179	Longitude degrees
	M_1	0.0 - 59.9999	Longitude minutes
	H_1	E or W	Hemisphere
	A	-300.00 to 18000.00	Altitude in meters

Note: Position commands have no effect in DTF-based systems.

Latitude and Longitude and Elevation Position (Output) POS1/POS2

Command: $POS1,D,M,H,$D_1$,$M_1$,$H_1$,A*<cr|lf>

Command: $POS1*<cr|lf>

Response: $POS1,D,M,H,$D_1$,$M_1$,$H_1$,A*<cs|cr|lf>

Description: Reads the latitude, longitude and altitude of the GTF#1 or GTF#2 GPS receiver.

Fields:	Symbol	Range	Description
	D	0 - 89	Latitude degrees
	M	0.0 - 59.9999	Latitude minutes
	H	N or S	Hemisphere
	D_1	0 - 179	Longitude degrees
	M_1	0.0 - 59.9999	Longitude minutes
	H_1	E or W	Hemisphere
	A	-300 to 18000.00	Altitude in meters

Note: For GSync or non-redundant CommSync II system, use the POS1 command. The POS2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Product ID (Output) **PRID/PRD1/PRD2**

Command: $PRD1*<cr|lf>

Response: $PRD1,N,D,S*<cs|cr|lf>

Description: CommSync II(385-)/CommSync II-D(407-): Outputs the product ID, part number and serial number of GTF/DTF#1 or GTF/DTF#2.

Fields:	**Symbol**	**Range**	**Description**
	N	000 - 999	Product ID, (015 = CommSync II family)
	D	ASCII	Product part number
	S	0-16777216	GTF/DTF Serial Number, installed at factory

Description: GSync(391-)/or GSync II(402-): Outputs the product ID (N), Unit generic part number (D), OSC type (O), and serial number of unit.

Fields:	**Symbol**	**Range**	**Description**
	N	000 - 999	Product ID, (015 = CommSync II family)
	D	ASCII	Product part number
	O	ASCII	Primary Oscillator type, Rb, or OCXO
	S	0-16777216	GSync/Gsync II Serial Number, installed at factory

Note: This command is in effect for in all versions CommSyncII family firmware.

Reset GPS Receiver (Input) **RSG1/RSG2**

Command: $RSG1,x*<cr|lf>

Response: $RSG1,x*<cs|cr|lf>

Description: Reset the GPS receiver in GTF#1 with either a cold start or warm start .

Fields:	**Symbol**	**Range**	**Description**
	g	1-2	GTF number
	x	W, C, or K	'W' represents a warm start and 'C' represents a cold start, and K represents Clear Battery Backup memory.

Example: $RSG1,W*<cr|lf>

Response: $RSG1,W*<cs|cr|lf>

Warm Start: Re-initializes the GPS receiver in GTF#1, using stored almanac and ephemeris data.

Example: $RSG2,C*<cr|lf>

Response: $RSG2,C*<cs|cr|lf>

Cold Start: For UT+, JUPITER-T and M12+ (SPS receivers) resets and restarts receiver firmware in GTF#2.

Cold Start: For SAASM GPS receivers, resets and restarts the receiver firmware, in GTF#2, without clearing crypto-keys.

WARNING: Issuing a cold start will cause the receiver to restart, When this happens, the GTF with the reset receiver switches off-line. The module will not be available until the receiver has locked to the GPS satellites, and the module's timing and frequency are within system requirements. This process could require 10 to 20 minutes to complete.

Example: $RSG1,K*<cr|lf>

Response: $RSG1,K*<cs|cr|lf>

Cold Start GTF#1: For UT+, JUPITER-T and M12+ (SPS receivers) the (K)/(Clear Memory) command will the same effect as the RSTG,C command, issuing a cold start.

For SAASM GPS receivers, It will reset and restart the receiver firmware, and clear the battery backup memory in GTF#1, thereby erasing all parameters within the receiver, including the crypto-keys.

WARNING: ***The Kill command is only recommended when shutting down a Trimble SAASM receiver for a long periods of time (>2days). After a Kill command it is recommended that the user cycle GTF power to insure recovery.***

Note: The W, and C parameters are in effect for in all versions CommSyncII family firmware, the K (clear battery backup memory) have been in effect as of the following versions of SAASM firmware.

SAASM Firmware 385-3021	V1.27.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Satellite Signal Quality (Output) **SIGQ/SIGP/SIGS**

Command: $SIGP*<cr|lf>

Response: $SIGP,S,N,C,S,N,C, … … … … … ,S,N,C*<cs|cr|lf>

Description: Outputs satellite PRN, signal strength, and tracking mode.

Fields:	**Symbol**	**Range**	**Description**
	S	00 - 32	Satellite PRN number
	N	0 - 255	Signal strength (SN dB/Hz). Where 0 = no signal and ~60 represents maximum signal. (typical good values range from 35 to 50).
	C	0 - 2	Tracking mode. Where: 0 = Searching C/A 1 = Acquiring C/A 2 = Tracking C/A Using for Timing 3 = Tracking P code, for Timing** 4 = Tracking Y, code for Timing**

Note: Reports Signal Quality for 8 Satellites for C/A, 12 Satellites for PPS receiver.

Note: ** Tracking P/Y codes only apply to GTF modules with a PPS GPS receiver.

Note: For GSync or non-redundant CommSync II system, use the SIGP command. The SIGS command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

System Status (Output) **SSTA**

Command: $SSTA*<cr|lf>

Response: $SSTA,m,t,a,m1,t1,f1,m2,t2,f2,o1 . . . o16,Y,D,H,M,S*<cs|cr|lf>

Description: Outputs the current status of the system and plug-in modules. This response is output whenever there is a change in any status field. It is also available by sending the SSTA command.

See page 45 for detailed field description.

Note: The SSTA message which is, by default, automatically output when there is a change in status. This unsolicited output may be disabled with the following command:

$UNSL,SSTA,0*<cr|lf>

Example: $SSTA*<cr|lf>

Response: $SSTA,1,4,2,B1,4,0002,B1,4,0000,0140,0000,0000,0000,1900,1900,0000,
1500,0000,0000,0000,1100,0000,0000,0A,0140,1998,319,15,43,23*<cs|cr|lf>

Description: This response indicates that the system is time locked, With a TFOM of 4, GTF #2 Online. GTF #1 is in doing discipline and frequency locked in normal GPS operation, has a TFOM of 4, and has an alarm. The alarm is a 10 MHz fault. GTF#2 is time locked, with a TFOM of 4, and has no alarms. If a GTF module is removed, the status field will report 0FFF.

Of the 16 rear panel slots, the two AC power supplies (slots 1 and 16 = 0140) are good. In slots 5 and 6 (1900) are two Fiber Optic Output Modules reporting good status. Slot 7 has a 10 MHz RS-422 Output Module, slot 8 has a 5 MHz Sinewave Output Module, and slot 12 has a 10 MHz Sinewave Output Module, all reporting no faults.

The response also includes a time stamp of 3:43 and 23 seconds on the 319th day of 1998.

Note: For the GSync system, the SSTA response is modified to suit the system. The response will be:

$SSTA,M,T,m1,f1,o0,o1,02,o3,o4,Y,D,H,M,S*<cs|cr|lf>

Note that the Power Supply is listed as o0, and that data for GTF#2 is excluded from the response. See page 46

System Status – CommSync II **SSTA**

Symbol	Range	Description
M	0 – 6	System Operation Mode (Online module), where: 0=Warm-up, 1=Time Locked, 2=Coasting, 3=Acquire, 5=Alarm, 6=Frequency Locked
T	2 – 9	System Time Figure Of Merit (TFOM) (Online module)
A	1 –2	Online Module, where 1=GTF#1, 2=GTF# 2, 0,F=Online Fault
M1,2	0 – B	GTF#1/#2 FDM Modes,2 ASCII characters where: The char first represents the FDM state: 2 = Do Discipline, Recovery mode 3 = Measure/Evaluate System Stability 4 = Holdover/Coasting mode, GPS lost 5 = 1PPS Phase recovery mode, 100ns/S step 8 = Measure/Evaluate Osc stability A = Initialize filter variables B = Do Discipline, locked to reference The second represents the FDM learn status, where: 0 = Disc to GPS, Manual mode, no OSC learning 1 = Disc to GPS, Normal Operation, Using learned OSC comp. 2 = Disc to GPS, Learning Mode, factory test only 4 = Ext Disc, Manual mode, no OSC learning 5 = Ext Disc, Normal Operation, Using learned OSC comp. 6 = Ext Disc, Learning Mode, factory test only 8 = Cross-Disc, Manual mode, no OSC learning 9 = Cross-Disc, Normal Operation, Using learned OSC comp. A = Cross-Disc, Learning Mode, factory test only
	0-A	
t1,2	2 – 9	GTF#1/2 Time Figure Of Merit (TFOM)
f1,2	0 – F	GTF#1/2 Fault Status: 4 ASCII (hex) char where bit position: (LSB) 0 = Power Fault 1 = 10 MHz Fault 2 = GPS Communication Fault 3 = 1PPS Fault (Module Hard faults, will cause switchover (module fault LED)) 4 = Module not ready 5 = GPS not locked 6 = GPS Antenna over current 7 = GPS Antenna under current (Module functional warnings (ready/GPS)) 8 = DAC near limits 9 = Hold over integrity error 10 =Not Used 11 = intermod comm fault 12 = Rb Lock fault status 13 = External Input missing Fault 14-15 = External input divider sel 00= 1PPS, 01=1 MHz (MSB) 10= 5 MHz, 11=10 MHz (Module hardware warnings (14/15-DTF only))
o1…16	0000-FFFF	Option Module (1-16) status where the first byte represents Module ID The second Byte represents option module status.
Y,D, H,M,S	Time Stamp	Year, Day of Year Hours, Minutes, Seconds

System Status – GSync **SSTA**

Symbol	Range	Description
M	0 – 6	System Operation Mode, where: 0=Warm-up, 1=Time Locked, 2=Coasting, 3=Acquire, 5=Alarm, 6=Frequency Locked
T	2 – 9	System Time Figure Of Merit (TFOM)
M1	0 – B	GTF FDM Modes,2 ASCII characters where: The char first represents the FDM state: 2 = Do Disipline, Recovery mode 3 = Measure/Evaluate System Stability 4 = Holdover/Coasting mode, GPS lost 5 = 1PPS Phase recovery mode, 100ns/S step 8 = Measure/Evaluate Osc stability A = Initialize filter variables B = Do Discipline, locked to reference The second represents the FDM learn status, where: 0 = Disc to GPS, Manual mode, no OSC learning 1 = Disc to GPS, Normal Operation, Using learned OSC comp. 2 = Disc to GPS, Learning Mode, factory test only 4 = Ext Disc, Manual mode, no OSC learning 5 = Ext Disc, Normal Operation, Using learned OSC comp. 6 = Ext Disc, Learning Mode, factory test only 8 = Cross-Disc, Manual mode, no OSC learning 9 = Cross-Disc, Normal Operation, Using learned OSC comp. A = Cross-Disc, Learning Mode, factory test only
	0-A	
f1	0 – F	GTF Fault Status: 4 ASCII (hex) char where bit position: (LSB) 0 = Power Fault 1 = 10 MHz Fault 2 = GPS Communication Fault 3 = 1PPS Fault 4 = Module not ready 5 = GPS not locked 6 = GPS Antenna over current 7 = GPS Antenna under current 8 = DAC near limits 9 = Hold over integrity error 10 =Not Used 11 = intermod comm fault 12 = Rb Lock fault status 13 = External Input missing Fault 14-15 = External input divider sel 00= 1PPS, 01=1 MHz (MSB) 10= 5 MHz, 11=10 MHz (Module Hard faults, will cause switchover (module fault LED)) (Module functional warnings (ready/GPS)) (Module hardware warnings) (14/15-DTF only)
o0…o4	0000-FFFF	Option Module (0-4) status where the first byte represents Module ID The second Byte represents option module status. For GSync, o0 is the power supply and o1 - o4 are the option modules.
Y,D, H,M,S	Time Stamp	Year, Day of Year Hours, Minutes, Seconds

System Status (continued) **SSTA**

The following table contains ID and status codes for the modules currently available or in use.

MODULE ID CODES, FAULT STATUS, AND MENU MESSAGES FOR OPTION MODULES		
Module Name	ID	Fault/Status Byte
Slots 1 and 16 are dedicated for Power Supply Modules		
115-230VAC Power Supply	0x01	Bit6=VCC Fault (0=fault) Bit7=Reset Fault (24 VDC Output Fault) (1=fault) Nominal Operation = 0x40
+24 VDC Power Supply	0x02	
-48 VDC Power Supply	0x03	
+12 VDC Power Supply	0x04	Bit4=PS2 Fault (0=fault) Bit5=PS1 Fault (0=fault) Bit6=VCC Fault (0=fault) Bit7=Reset Fault (24 V Out Fault) (1=fault) Nominal Operation = 0x70
Slots 3 – 15 (1 – 4 for GSync) will accommodate any of the following output modules		
Fiber Optic Antenna Interface	0x0C	Bit7=Optic Input Fault Bit6=Power Fault
5 MHz Sinewave Output (13 dBm)	0x10	Bit7=Freq In Fault Bit6=Freq Out Fault
10 MHz Sinewave Output (13 dBm)	0x11	
5 MHz Sinewave Output (6 dBm)	0x12	
10 MHz Sinewave Output (6 dBm)	0x13	
5 MHz RS-422 Output	0x14	
10 MHz RS-422 Output	0x15	
5 MHz TTL Output	0x16	
10 MHz TTL Output	0x17	
5 MHz Fiber Optic Output	0x18	
10 MHz Fiber Optic Output	0x19	
5 MHz LPN Sinewave Output (13 dBm)	0x1A	Bit7=Freq In Fault Bit6=Sync Fault Bit5=Osc. End of Life Fault
10 MHz LPN Sinewave Output (13 dBm)	0x1B	
5 MHz LPN Sinewave Output (6 dBm)	0x1C	
10 MHz LPN Sinewave Output (6 dBm)	0x1D	
5 MHz LPN Sinewave Output (0 dBm)	0x1E	
10 MHz LPN Sinewave Output (0 dBm)	0x1F	
5 MHz TTL/ECL Output	0x20	Bit7=Freq In Fault Bit6=Freq Out Fault
10 MHz TTLECL Output	0x21	
1 PPS TTL Output	0x22	
1 MHz Sinewave Output (13 dBm)	0x23	
1 MHz Sinewave Output (6 dBm)	0x24	
1 MHz LPN Sinewave Output (13 dBm)	0x25	Bit7=Freq In Fault Bit6=Sync Fault Bit5=Osc. End of Life Fault
1 MHz LPN Sinewave Output (6 dBm)	0x26	
High Frequency Sinewave Output	0x27	
Frequency Synthesizer, TTL	0x28	Bit0= last cmd sent, where 0=freq set cmd, 1=freq read cmd Bit4=Frequency mismatch fault Bit5=Frequency lock fault Bit6=POM communication fault Bit7=Frequency input fault
Frequency Synthesizer, Sine	0x29	

MODULE ID CODES, FAULT STATUS, AND MENU MESSAGES FOR OPTION MODULES (cont,)		
Module Name	ID	Fault/Status Byte
Slots 3 – 15 (1 – 4 for GSync) will accommodate any of the following output modules (continued)		
1/5 MHz Dual LPN Sine Output (13 dBm)	0x2C	Bit7=Freq In Fault Bit6=Sync Fault Bit5=Osc. End of Life Fault
5/10 MHz Dual LPN Sine Output (13dBm)	0x2D	
1/5 MHz Dual LPN Sine Output (6 dBm)	0x2E	
5/10 MHz Dual LPN Sine Output (6 dBm)	0x2F	
Clock Rate TTL Output	0x30	(Fault in ID – if ID is ID+8 (hex) = Fault) Status Byte=Rate Multiplier (hex) (Freq. Out = 8 kHz x Rate Multiplier)
Clock Rate RS-422 Output	0x31	
Clock Rate Fiber Optic Output	0x32	
Dual Clock Rate TTL Output	0x34	(Fault in ID – if ID is ID+8 (hex) = Fault) Status Byte=Rate Multiplier (hex) (First Register Only)
Dual Clock Rate RS-422 Output	0x35	
Dual Clk Rate N.8 TTL Output	0x36	Bit 7: Fault bit, where 1 = fault Bit 6: Not used (0) Bits 3 through 5: MSB of Register 1 Bits 0 through 2: MSB of Register 2
Dual Clk Rate N.8 RS-422 Output	0x37	
T1/E1 Framed Output	0x40	0x80=Fault See Option Module User's Manual for additional status information
T1/E1 Quad Output	0x41	
Time Code/TOD	0x50	Bit0=Fault; Bit7=Time Invalid See Option Module User's Manual for additional status
Time Code	0x51	
1 MHz TTL Output	0x60	Bit7=Freq In Fault; Bit6=Freq Out Fault See Option Module User's Manual
Pulse Rate Output	0x61	
Slots 14 and 15 are designated for either output modules or command input modules		
RS-232 I/O (385-4005)	0x0A	Bus Status: Bit0=/online1, Bit1=/ready1, Bit2=fault1, Bit4=/online2, Bit5=/ready2, Bit6=fault2
RS-232 I/O External Input (385-4037)	0x0B	Bit 7=System Fault Bit 6,5=DTF Sel Bit 4=Input Sel Bit 3=B In Bit 2=B Lock; Bit 1=A in Bit 0=A Lock
Ethernet I/O External Input (385-4038)	0x0E	
Ethernet I/O (385-4024)	0x0F	Bus Status: Bit0=/online1, Bit1=/ready1, Bit2=fault1, Bit4=/online2, Bit5=/ready2, Bit6=fault2
Time Code Input (385-4040)	0x54	Bit 7=Board Fault Bit 6,5=DTF Sel Bit 4=Input Sel Bit 3=B In Bit 1=A in

Time Code Output Module Control (Input/Output) TCOD

Command: $TCOD*<cr|lf>

Response: $TCOD,S,T,h,m*<cs|cr|lf>

Description: This command reads the output module slots and finds Time Code Output Modules. It reports their slot numbers and time offset.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	T	00-FF	Output Module Identification
	h	-14 to +14	Hours Local Offset behind or ahead of UTC
	m	0 or 30	Minutes Local Time Offset from UTC

Example: $TCOD*<cr|lf>

Response: $TCOD,8 51 -8 0,10 50 +5 30*<cs|cr|lf>

In the example the system contains two IRIG Time Code Modules. In Slot 8 is a IRIG Time Code Output Module (385-4020-01) with a local time offset of -8 hours. The output will be UTC time -8 hours. In Slot 10 is a IRIG Time Code/TOD Output Module (385-4020-02) with a local time offset of +5 hours and 30 minutes. The output will be UTC time +5:30.

Command: $TCOD,S,h,m*<cr|lf>

Response: $TCOD,S,T,h,m*<cs|cr|lf>

Description: This command sets the time offset for the Time Code Module.

Fields:	**Symbol**	**Range**	**Description**
	S	1-15	Output Module Slot Number
	T	00-FF	Output Module Identification
	h	-14 to +14	Hours Local Offset behind or ahead of UTC
	m	0 or 30	Minutes Local Time Offset from UTC

Note: Time Code offsets apply to the 385-4020-xx IRIG modules only.

Note: This command is in effect for in all versions CommSyncII family firmware.

Internal Temperature (Output) TEMP/TMP1/TMP2

Command: $TEMP*<cr|lf>

Response: $TEMP,N*<cs|cr|lf>

Description: Reports the internal temperature of the online GTF/DTF module, or from the specified GTF/DTF module. Note: Temperature sensor mounted near the Oscillator.

Fields:	Symbol	Range	Description
	N	-25.0 ^{o} C to 85.0 ^{o} C	Temperature range

Note: For GSync or non-redundant CommSync II system, use the TMP1 command. The TMP2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Filtered Time Difference - GPS 1PPS to Oscillator 1PPS (Output) TIMD/TMD1/TMD2

Command: $TIMD*<cr|lf>

Response: $TIMD,N*<cs|cr|lf>

Description: Outputs the filtered time difference between REFERENCE 1 PPS and the online GTF/DTF module, or from the specified GTF/DTF module's 1PPS output in nanoseconds.

Fields:	Symbol	Range	Description
	N	-268435456 to 268435456	Time difference in nanoseconds

Note: Number valid only in Time Lock mode.

Note: For GSync or non-redundant CommSync II system, use theTMD1 command. The TMD2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Raw Time Difference - GPS 1PPS to Oscillator 1PPS (Output) TIMR/TMR1/TMR2

Command: $TIMR*<cr|lf>

Response: $TIMR,N*<cs|cr|lf>

Description: Outputs the raw time difference between REFERENCE 1 PPS and the online GTF/DTF module, or from the specified GTF/DTF module's 1PPS output in nanoseconds.

Fields:	Symbol	Range	Description
	N	-268435456 to 268435456	time difference in nanoseconds

Note: Number valid only in Time Lock mode.

Note: For GSync or non-redundant CommSync II system, use the TMR1 command. The TMR2 command has no effect.

Note: This command is in effect for in all versions CommSyncII family firmware.

Command: $TIME*<cr|lf>

Response: $TIME,Y,D,H,M,S,m,T,O*<cs|cr|lf>

Description: Retrieves the current time that the Online GTF/DTF has calculated (GTF#1 for non-redundant systems).

Fields:	**Symbol**	**Range**	**Description**
	Y		Year
	D	1 - 366	Day of Year
	H	0 - 23	Hour
	M	0 - 59	Minute
	S	0 - 59	Seconds
	m	1 - 9	Time Mode Where: 0 = RUN time (prior to time set) 1 = GPS Time 2 = UTC Time 3 = LUTC (Local UTC) Time 4 = LGPS (Local GPS) Time 5 = Manual Time (User set) 6 = IRIG Time (from IRIG Input Module) 9 = NTP Time (from NTP/Symmetric Mode) 10 = PTP Time (from IEEE-1588 PTP)
	T	2 - 9	TFOM (See Time Figure of Merit table)
	O	0 - 6	Operation Mode Where: 0 = Warm-up 1 = Time Locked 2 = Coasting 3 = Recovery 5 = Failed, GTF/DTF module 6 = Freq Lock (DTF locked mode)

Figure 1A: Time Figure of Merit (TFOM)

TFOM Value	Expected Time Error (ETE)
2	ETE < 10 ns
3	10 ns ≤ ETE < 100 ns
4	100 ns ≤ ETE < 1 μs
5	1 μs ≤ ETE < 10 μs
6	10 μs ≤ ETE < 100 μs
7	100 μs ≤ ETE < 1 ms
8	1 ms ≤ ETE < 10 ms
9	10 ms ≤ ETE

Note: This command is in effect for in all versions CommSyncII family firmware.

Time Mode (Input/Output) TIMM

Command: $TIMM,M,h,m*<cr|lf>

Command: $TIMM*<cr|lf>

Response: $TIMM,M,h,m*<cs|cr|lf>

Description: Reports or sets the time mode and local time offset for both GTF modules.

Fields:	**Symbol**	**Range**	**Description**
	M	0 - 9	Time Mode Where: 0 = Run Time[1] 1 = GPS Time 2 = UTC Time 3 = LUTC (Local UTC Time)[2] 4 = LGPS (Local GPS Time)[2] 5 = Manual Time[3] 6 = IRIG Time[4] 9 = NTP Time[4] 10 = PTP Time[4]
	h	- 14 to +14	Hours Local Offset behind or ahead of UTC
	m	0 or 30	Minutes Local Time Offset from UTC Note: 30 minute offset in positive (+) only.

Example: $TIMM,3,09,30*<cr|lf>

Response: $TIMM,3,09,30*<cs|cr|lf>

This example will set the Time mode to Local UTC (LUTC) with a time zone offset of +9 hours and 30 minutes, (ACST, Australian Central Standard Time)

Note: This command is in effect for in all versions CommSyncII family firmware.

[1] Run Time mode is for DTF systems only (default mode)

[2] Local time offset is only used in LGPS or LUTC time modes.

[3] Manual time mode cannot be initiated by the TIMM command. It can only be entered by sending the MANM command.

[4] IRIG, PTP, or NTP time modes cannot be initiated by the TIMM command. See IRGC command for external time inputs.

Set or Clear Unsolicited Flag (Input/Flag) **UNSL**

Command: $UNSL,S*<cr|lf>

Response: $UNSL,S,C*<cs|cr|lf>

Description: Sets or clears the unsolicited flag for a particular command.

Fields:	**Symbol**	**Range**	**Description**
	S	Alphanumeric	Four character command
	C	1 or 0	1 enable unsolicited flag 0 disable unsolicited flag

Note: To disable all messages from output use the following statement:

$UNSL,XXXX,0*<cr|lf>

The following table describes all commands that have unsolicited flags:

Table: Unsolicited Commands

Interval in Seconds						
1	**2**	**5**	**10**	**30**	**86400**	**Any Time***
SIGQ SPOS TEMP TIMD TIMR TIME VELO		AZEL	TRMO PSTA			AGPS SSTA
*Anytime refers whenever a change in the status has occurred, from a fault condition on the SSTA to a user interaction from the keypad.						

Note: The SSTA message, by default, is set to unsolicited. This message will automatically be output when there is a change in status. The unsolicited SSTA output may be disabled with the following command:

$UNSL,SSTA,0*<cr|lf>

Note: For SSTA, the status (enabled or disabled) will be stored in the GTF/DTF. If the unit restarts, these settings will be reapplied. Thus, if, for instance, SSTA is set to unsolicited, it will come up as unsolicited when power is removed and reapplied.

Note: This command is in effect for in all versions CommSyncII family firmware.

Read Velocity (Output/Flag) — VELO/VEL1/VEL2

Command: $VELO*<cr|lf>

Response: $VELO,E,N,U,S*<cs|cr|lf>

Description: Retrieves the velocity of the online GTF/DTF module (GTF#1 for non-redundant systems).

Fields:	**Symbol**	**Range**	**Description**
	E	0 – 514.00	Eastern Velocity m/s, + for east, - for west
	N	0 – 514.00	Northern Velocity m/s, + for north, - for south
	U	0 – 514.00	Altitude Velocity m/s, + for up, - for down (For C/A Units : 0.00)
	S	00 – FF	Velocity Status (Hex)

C/A Status		
	(LSB)	Bit 0: Bad almanac
		Bit 1: Insufficient visible satellites (< 3)
		Bit 2: Spare
		Bit 3: Acquiring satellites
		Bit 4: 2D fix
		Bit 5: 3D fix
		Bit 6: Poor geometry (DOP > 12)
	(MSB)	Bit 7: Position propagate mode

SAASM Status	First Character	Second Character
	0 = Doing position fixes	0 = No position
	1 = Doing 1 SV timing fixes	1 = Initial position
	2 = Approximate timing	2 = Standby
	3 = No GPS timing yet	3 = Accurate
	4 = Need initialization	4 = 2D Auto fix
	5 = GDOP too high	5 = 2D Manual fix
	6 = Bad choice of timing SV	6 = 3D Auto fix
	7 = No satellites usable	7 = 3D Manual fix
	8 = Only 1 usable satellite	8 = Old position
	9 = Only 2 usable satellites	9 = Approximate
	A = Only 3 usable satellites	A = Average SV
	B = No integrity	B = Diagnostics
		C = Velocity aided
		D = Great Circle dead reckoning

Note: The VEL1 and VEL2 commands will only respond if the specified GTF (1 or 2) is online.

Note: Typical velocity valid for C/A version is 0x20 (3D position) (valid with position mode (PMDx) set to Dynamic).

Note: Typical velocity valid for SAASM version is 06 or 07 (doing position fixes in 3D).

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.19.00
SAASM Firmware 385-3021	V1.16.00
DTF Firmware 385-3031	Not Applicable
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Get Current Firmware Version (Output) VERS/VER1/VER2

Command: $VERS*<cr|lf>

Response: $VERS,V,D,T,P,M G*<cs|cr|lf>

Description: Outputs the current firmware version number of the online GTF/DTF module, or from the specified GTF/DTF module.

Fields:	Symbol	Range	Description
	V	XX.XX.XX	GTF/DTF Module Firmware Version
	D	month day year	Version Compile Date
	T	hr:min:sec	Version Compile Time
	P	alphanumeric	Firmware Part number
	M	alphanumeric	GPS engine manufacturer
	G	varies	GPS engine firmware version.

Note: This command is in effect for in all versions CommSyncII family firmware.

Get Key Pad Display module Current Firmware Version (Output) VERK

Command: $VERK*<cr|lf>

Response: $VERK,V,D,P*<cs|cr|lf>

Description: Outputs the current version number of the KeyPad Display Controller (KDC).

Fields:	Symbol	Range	Description
	V	XX.XX.XX	KDC Firmware Version
	D	month day year	Version Compile Date
	P	Alphanumeric	Firmware Part number

Note: This command has no effect in systems with no KeyPad Display.

Note: This command is in effect for in all versions CommSyncII family firmware.

Set Year (Input/Output) **YEAR**

Command: $YEAR,Y*<cr|lf>

Command: $YEAR*<cr|lf>

Response: $YEAR,Y*<cs|cr|lf>

Description: This command is for use in manual time or IRIG time modes. It sets the year to the 4-digit value of Y. Without the Y variable, the command reads the current year setting.

Note: The default value for year is 0000 on a DTF system, and should be set by the user to the current year if using manual time or IRIG time modes.

Note: The default value for year is the manufacture date on a GTF system, and is updated automatically to the current year, while locked to GPS.

Note: The year will increment with year roll over (IRIG day 365 or 366).

Note: This command should only be used when an IRIG Input Module (385-4040) is used to set the time in the system.

Note: This command is in effect as of the following versions of applicable firmware.

DTF Firmware 385-3031	V1.06.00
GTF Firmware 385-3022	V1.24.00
SAASM Firmware 385-3021	V1.24.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

NMEA Message support

The CommSync II Family supports several National Marine Electronics Assosiation (NMEA) message sentences per the NMEA 0183 Standard.

The NMEA message support is for outputs only, and is controlled as FEI-Zyfer unsolicited commands.

GPGGA Message GGGA

Command: $GGGA*<cr|lf>
Description: Outputs the NMEA message GPGGA

Command: $UNSL,GGGA,1*<cr|lf>
Description: Sets the unsolicited flag for GGGA . The message will be sent automatically once per second. Other UNSL flags whose values are stored in the EEROM will be disabled. This setting will remain in effect if the power is cycled or the GTF is restarted.

Command: $UNSL,GGGA,0*<cr|lf>
Description: Clears the unsolicited flag for GGGA.

Description: Details of the NMEA 183 message GPGGA.
Command: $GGGA*<cr|lf>
Response: $GPGGA,hhmmss.ss,ddmm.mmmm,x,DDDMM.MMMM,X,q,nn,y.y,a.a,u,,,,*<cs|cr|lf>

Fields:	Symbol	Range	Description
	hhmmss.ss		UTC time, Hours, Minutes, Seconds
	dd	0-89	latitude degrees
	mm.mmmm	00.000-59.999	latitude minutes
	x	N,S	North/South indicator
	DDD	0-179	longitude degrees
	MM.MMMM	00.000-59.999	longitude minutes
	X	E,W	East/West indicator
	q	0,1	GPS quality, 0=Invalid, 1=Valid SPS
	nn	00-12	number of satellites used
	y.y	0.0-99.9	horizontal dilution of precision
	a.a	0.0-17999.9	altitude
	u	M	altitude units

Note: Four fields at the end of the GPGGA message are unavailable and are left blank. They are: geoid separation, separation units, dgps age, and dgps station id.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.40.00
SAASM Firmware 385-3021	V1.24.00
Mk IV GTF/DTF Firmware 407-3001	V1.14.00
Mk IV SAASM Firmware 407-3002	V1.04.00
Mk IV SAASM Firmware 407-3003	V1.10.00

GPRMC Message **GRMC**

Command: $GRMC*<cr|lf>
Description: Outputs the NMEA message GPRMC

Command: $UNSL,GRMC,1*<cr|lf>
Description: Sets the unsolicited flag for GRMC. The message will be sent automatically once per second. Other UNSL flags whose values are stored in the EEROM will be disabled. This setting will remain in effect if the power is cycled or the GTF is restarted.

Command: $UNSL,GRMC,0*<cr|lf>
Description: Clears the unsolicited flag for GGGA.

Description: Details of the NMEA 183 message GPRMC.
Response:

$GPRMC,hhmmss.ss,a,ddmm.mmmm,x,DDDMM.MMMM,X,v.vv,d.d,ddmmyy,,*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	hhmmss.ss		UTC time, Hours, Minutes, Seconds
	a	A-V	status, A=Data Valid, V=Invalid
	dd	0-89	latitude degrees
	mm.mmmm	00.000-59.999	latitude minutes
	x	N,S	North/South indicator
	DDD	0-179	longitude degrees
	MM.MMMM	00.000-59.999	longitude minutes
	X	E,W	East/West indicator
	v.vv	0.00-999.99	Speed (in knots)
	d.d	01-31	heading degrees
	ddmmyy		UTC Day,Month,Year

Note: Two fields at the end of the GPRMC message are unavailable and are left blank. They are magnetic variation, and direction of magnetic variation.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.40.00
SAASM Firmware 385-3021	V1.24.00
Mk IV GTF/DTF Firmware 407-3001	V1.14.00
Mk IV SAASM Firmware 407-3002	V1.04.00
Mk IV SAASM Firmware 407-3003	V1.10.00

GPGLL Message **GGLL**

Command: $GGLL*<cr|lf>
Description: Outputs the NMEA message GPGLL

Command: $UNSL,GGLL,1*<cr|lf>
Description: Sets the unsolicited flag for GGLL. The message will be sent automatically once per second. This setting will remain in effect if the power is cycled or the GTF is restarted.

Command: $UNSL,GGLL,0*<cr|lf>
Description: Clears the unsolicited flag for GGLL.

Description: Details of the NMEA 183 message GPGLL.
Response: $GPGLL,ddmm.mmmm,x,DDDMM.MMMM,X,hhmmss.ss,y,z*<cs|cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	dd	0-89	latitude degrees
	mm.mmmm	00.000-59.999	latitude minutes
	x	N,S	North/South indicator
	DDD	0-179	longitude degrees
	MM.MMMM	00.000-59.999	longitude minutes
	X	E,W	East/West indicator
	hhmmss.ss		UTC time, Hours, Minutes, Seconds
	y	A-V	status, A=Data Valid, V=Invalid
	z	A	A= Autonomous Only

Example: $GGLL*<cr|lf>

Response: $GPGLL,3347.9384,N,11800.2927,W,162549.00,A,A*75

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.50.00
SAASM Firmware 385-3021	V1.46.00
Mk IV GTF/DTF Firmware 407-3001	V1.14.00
Mk IV SAASM Firmware 407-3002	V1.11.00
Mk IV SAASM Firmware 407-3003	V1.10.00

Command: $GGSV*<cr|lf>
Description: Outputs the NMEA message GPGSV. The GPGSV message is a series of up to three messages that contain the Signal Strength, Azimuth, and Elevation, for the SV's in view.

Command: $UNSL,GGSV,1*<cr|lf>
Description: Sets the unsolicited flag for GGSV. The message series will be sent automatically once per second. This setting will remain in effect if the power is cycled or the GTF is restarted.

Command: $UNSL,GGSV,0*<cr|lf>
Description: Clears the unsolicited flag for GGGA.

Description: Details of the NMEA 183 message GPGSV.
Response: $GPGSV,n,m,v,s1,e1,a1,q1,s2,e2,a2,q2,s3,e3,a3,q3,s4,e4,a4,q4*<cs|cr|lf>

Fields:	Symbol	Range	Description
	n	1-3	Total number of messages
	m	1-3	Message number
	v	1-12	Satellites in View
	s1	0-32	Cha1 SV number
	e1	0-89	Cha1 Elevation degrees
	a1	0 to 359	Cha1 Azimuth degrees
	q1	0 to 99	Cha1 SNR (C/No)
	s2	0-32	Cha2 SV number
	e2	0-89	Cha2 Elevation degrees
	a2	0 to 359	Cha2 Azimuth degrees
	q2	0 to 99	Cha2 SNR (C/No)
	s3	0-32	Cha3 SV number
	e3	0-89	Cha3 Elevation degrees
	a3	0 to 359	Cha3 Azimuth degrees
	q3	0 to 99	Cha3 SNR (C/No)
	s4	0-32	Cha4 SV number
	e4	0-89	Cha4 Elevation degrees
	a4	0 to 359	Cha4 Azimuth degrees
	q4	0 to 99	Cha4 SNR (C/No)

Example: $GGSV*<cr|lf>

Response: $GPGSV,3,1,9,02,65,038,45,04,21,046,45,05,69,300,45,09,22,210,45*4E

Response: $GPGSV,3,2,9,10,34,145,45,12,81,308,45,24,33,228,45,29,22,289,45*40

Response: $GPGSV,3,3,9,30,42,314,,,,,,,,,,,,*73

Response: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.50.00
SAASM Firmware 385-3021	V1.46.00
Mk IV GTF/DTF Firmware 407-3001	V1.14.00
Mk IV SAASM Firmware 407-3002	V1.11.00
Mk IV SAASM Firmware 407-3003	V1.10.00

Command: $GGSA*<cr|lf>
Description: Outputs the NMEA message GPGSA

Command: $UNSL,GGSA,1*<cr|lf>
Description: Sets the unsolicited flag for GGSA. The message will be sent automatically once per second. This setting will remain in effect if the power is cycled or the GTF is restarted.

Command: $UNSL,GGSA,0*<cr|lf>
Description: Clears the unsolicited flag for GGSA.

Description: Details of the NMEA 183 message GPGSA.
Command: $GGSA*<cr|lf>
Response: $GPGSA,m,s,c1,c2,c3,c4,c5,c6,c7,c8,c9,c10,c11,c12,P,H,V*<cs|cr|lf>

Fields:	Symbol	Range	Description	
	m	A	A= Auto select 2D/3D	
	s	1-3	Track status	1= No Fix 2= 2D Fix 3= 3D Fix
	c1	1-32	SV# used Ch1	Empty field indicates channel not used in solution
	c2	1-32	SV# used Ch2	
	c3	1-32	SV# used Ch3	
	c4	1-32	SV# used Ch4	
	c5	1-32	SV# used Ch5	
	c6	1-32	SV# used Ch6	
	c7	1-32	SV# used Ch7	
	c8	1-32	SV# used Ch8	
	c9	1-32	SV# used Ch9	
	c10	1-32	SV# used Ch10	
	c11	1-32	SV# used Ch11	
	c12	1-32	SV# used Ch12	
	P	0.0-99.9	PDOP	Empty filed indicates not available
	H	0.0-99.9	HDOP	
	V	0.0-99.9	VDOP	

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.50.00
SAASM Firmware 385-3021	V1.46.00
Mk IV GTF/DTF Firmware 407-3001	V1.14.00
Mk IV SAASM Firmware 407-3002	V1.11.00
Mk IV SAASM Firmware 407-3003	V1.10.00

Ethernet-Specific Commands

The following commands are for the operation of the Ethernet I/O Module, 385-4038, and 385-4090. These commands have no effect for the original Ethernet I/O Module, 385-4024.

Notes on the multiple slot/port designations:

The 385-4038 has one Ethernet port designated port 0.

The 385-4090 has two Ethernet ports, designated port 0 and port 1. Port 0 is closer to the LED's (top of board) and port 1 is next to it (bottom of board). If a command is for the 385-4090 (Dual port Ethernet module) it will contain the port specific designation for port 0 and port 1, for the 385-4038 (single port) port 0 will be assumed.

A redundant system may contain two Ethernet modules, designated Primary and Secondary. The Primary/Secondary slots are defined in the table below:

	Primary	***Secondary***
CommSync II	Slot 15	Slot 14
Gsync	Slot 4	Slot 3
Gsync II	Slot 8	Slot 7
CommSync II-D	Slot 8	Slot 7

Note: Before connecting to your local area network (LAN) you should first obtain an IP Address, Gateway, Net mask, numbers from your Network Administrator.

Note: The 385-4038 commands are in effect as of the following versions of applicable firmware.

DTF Firmware 385-3031	V1.06.00
GTF Firmware 385-3022	V1.16.00
SAASM Firmware 385-3021	V1.09.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware (F22) 407-3002	V1.01.00
Mk IV SAASM Firmware (MPE) 407-3003	V1.00.00

Note: The 385-4090 commands are in effect as of the following versions of applicable firmware.

DTF Firmware 385-3031	V1.18.00
GTF Firmware 385-3022	V1.44.00
SAASM Firmware 385-3021	V1.09.00
Mk IV GTF/DTF Firmware 407-3001	V1.06.00
Mk IV SAASM Firmware (F22) 407-3002	V1.05.00
Mk IV SAASM Firmware (MPE) 407-3003	V1.00.00

Note: The 385-4097 commands are in effect as of the following versions of applicable firmware.

DTF Firmware 385-3031	V1.23.00
GTF Firmware 385-3022	V1.50.00
SAASM Firmware 385-3021	V1.46.00
Mk IV GTF/DTF Firmware 407-3001	V1.13.00
Mk IV SAASM Firmware (F22) 407-3002	V1.11.00
Mk IV SAASM Firmware (MPE) 407-3003	V1.09.00

Set/Read Ethernet I/O IPv4 Address (Output) ETHI

Command: $ETHI*<cr|lf>

Response: $ETHI,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads port 0 IPv4 Addresses for Ethernet I/O Modules. The first IP Address is for port 0 of the primary module, and the second IP Address is for port 0 of the secondary module.

Command: $ETHI,s*<cr|lf>

Response: $ETHI,s,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads IPv4 Addresses for Ethernet I/O Modules by slot. The first IP Address is for port 0 of the selected module, and the second IP Address is for the port 1 (if applicable).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		IPv4 Address.(port 0)
	yyy…		IPv4 Address (Port1, 385-4090 only).

Note: The Primary/Secondary slots are defined as follows:

Primary module Slot: CommSync II-Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8.
Secondary module Slot (redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

Set Ethernet I/O IPv4 Address (Input, 385-4038) ETHI

Command: $ETHI,s,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHI,s,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets IPv4 Address for the single port 385-4038 Ethernet I/O Modules

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		IP Address.

Set Ethernet I/O IPv4 Address (Input, 385-4090) ETHI

Command: $ETHI,s,p,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHI,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets IPv4 Address for the dual port 385-4090 Ethernet I/O Modules.

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	p	0 or 1	Port 0 or 1
	xxx…		IPv4 Address.

Note: For IP address, Net mask, and Gateway changes the board will need to reset to make the change and restart after approximately 5 seconds.

Set/Read Ethernet I/O IPv4 NetMask (Output) — ETHM

Command: $ETHM*<cr|lf>

Response: $ETHM,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads the Net mask setting for port 0 IP Addresses for Ethernet I/O Modules. The first set of numbers is the Net mask port 0 of the primary module, and the second set of numbers is the Net mask for port 0 of the secondary module.

Command: $ETHM,s*<cr|lf>

Response: $ETHM,s,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads the Netmask for Ethernet I/O Modules by slot. The first Net mask is for port 0 of the selected module, and the second net mask is for the port 1 (if applicable).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		Net mask.(port 0)
	yyy…		Net mask (Port1, 385-4090 only).

Note: The Primary/Secondary slots are defined as follows:

Primary module Slot: CommSync II-Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8.
Secondary module Slot (redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

Set Ethernet I/O IPv4 NetMask (Input, 385-4038) — ETHM

Command: $ETHM,s,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHM,s,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets Netmask for the single port Ethernet I/O Modules (385-4038).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		Net mask.

Set Ethernet I/O IPv4 NetMask (Input, 385-4090) — ETHM

Command: $ETHM,s,p,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHM,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets Net mask for the dual port Ethernet I/O Modules (385-4090).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	p	0 or 1	Port 0 or Port 1
	xxx…		Net mask.

Note: IPv4 Address. For IP address, Net mask, and Gateway changes the board will need to reset to make the change and restart after approximately 5 seconds.

Set/Read Ethernet I/O IPv4 Gateway Address (Output, 385-4038/385-4090) ETHG

Command: $ETHG*<cr|lf>

Response: $ETHG,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads IPv4 Gateway Address for Ethernet I/O Modules (385-4038, or 385-4090). The first set of numbers is the Gateway Address of the primary module and the second set of numbers is the Gateway Address for the secondary module.

Description: The Primary/Secondary Slot are defined as follows: Primary Slot, CommSync II - Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8. Secondary slots (in redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

Note: The router/gateway address is needed to communicate to other LAN segments. The Gateway address must be set to address the router that connects these segments.

Set Ethernet I/O Gateway Address (Input, 385-4038/385-4090) ETHG

Command: $ETHG,s,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHG,s,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets Gateway Address for Ethernet I/O Modules (385-4038)

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		Gateway Address.

Note: The Primary/Secondary Slot are defined as follows: Primary Slot, CommSync II - Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, -GSync II-Slot 8. Secondary slots (in redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot7

Note: The board will reset to make this change and restart after approximately 5 seconds.

Note: The router/gateway address is needed to communicate to other LAN segments. The Gateway address must be set to address the router that connects these segments.

Set/Read Ethernet I/O Trap Destination Address (Output, 385-4038/385-4090) ETHT

Command: $ETHT*<cr|lf>

Response: $ETHT,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads IPv4 or IPv6 Trap Destination Address for Ethernet I/O Modules The first set of numbers is the Trap destination address for port 0 of the primary module, and the second set of numbers is the Trap Destination Address for port 0 for the secondary module.

Note: The Dual Port Ethernet Module can accept either a IPv4, or IPv6 Trap Destination Addresses. IPv6 does not apply to the 385-4038 Ethernet Module

Command: $ETHT,s*<cr|lf>

Response: $ETHT,s,xxx.xxx.xxx.xxx,yyy.yyy.yyy.yyy*<cs|cr|lf>

Description: Reads the Trap Destination Addresses for Ethernet I/O Modules by slot. The first Trap Destination Address is for port 0 of the selected module, and the second Trap Destination Address is for port 1 (if applicable).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		Trap Destination Address.(port 0)
	yyy…		Trap Destination Address (Port1, 385-4090 only).

Set Ethernet I/O Trap Destination Address (Input, 385-4038, IPv4 address only) ETHT

Command: $ETHT,s,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHT,s,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets Trap Address for Ethernet I/O Modules (385-4038).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xxx…		Requested Trap Address.

Set Ethernet I/O IPv4 Trap Destination Address (Input, 385-4090 only) ETHT

Command: $ETHT,s,p,xxx.xxx.xxx.xxx*<cr|lf>

Response: $ETHT,s,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Sets Trap Address for Ethernet I/O Modules (385-4090).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	p	0 or 1	Port 0 or Port 1
	xxx…		Requested Trap Address.

IPv4 and IPv6 Addressing notes

IPv4 Addressing:
An IPv4 address is a 32-bit value that is represented in 4 integer numbers, divided by a dot.
For example 192.168.5.123.

IPv4 Net mask
To make addresses manageable, they are typically split in two parts, the netbits (identifying the network), and the hostbits (identifying a device on a network or subnet). In both IPv4 and IPv6, the netbits are the most significant bits of an IP address while the hostbits are the balance.

In IPv4, this is defined by the net mask, which is used to mask the netbits field, for example a net mask of 255.255.255.0 will uses a 24-bits mask for the network, and balance (8-bits) for the devices, or subnet. Note: This is often referenced as the IP address/netbits, and example would be '192.168.5.123/24', where 192.168.5 represents the network and 123 is the device on the network..
Another example would be 255.255.248.0 which would use 21-bits for addressing the network, and 11-bits for the device, or subnet, or a '/21' network (21-bits/network, 11 bits/devices).

IPv6 addressing
An IPv6 address is a 128-bit value, that is represented as 8, (16 bit) hexadecimal numbers, divided by colons. For example: "FE80:0000:0000:0000:5EFE:0BFF:00E5:0001".
Note: In IPv6 addressing a number of consecutive zeros can be abbreviated by a double colon "::" (one time only) and the leading zeros within groups can be omitted, so the above IPv6 address would be represented by "FE80::5EFE:BFF:E5:1"

Note: A sequence of 4 bytes at the end of an IPv6 address can also be written in decimal, using dots as separators. This notation is often used with compatibility addresses, such as:
"FE80::5EFE:BFF:192.168.5.123"

IPv6 Net mask
In IPv6 addressing the net mask is represented by the number of bits in the net mask i.e in the IPv4 example above (255.255.248.0) there are 21-bits for addressing the network, leaving the rest as the device, or subnet bit range. In IPv6 addressing the netmask is the number of bits allocated to the network.
In the above example (FE80:0000:0000:0000:5EFE:0BFF:00E5:0001) a typical net mask would be 64. This would indicate that 'FE80:0000:0000:0000' represents the network, and 5EFE:0BFF:00E5:0001 is the address of the device.
Note: this would be referred to as (FE80:5EFE:BFF:E5:1/64)

Set/Read Ethernet I/O IPv6 Address (Output, 385-4090 only) **ET6I**

Command: $ET6I*<cr|lf>

Response: $ET6I,x:x:x:x:x:x:x:x,y:y:y:y:y:y:y:y*<cs|cr|lf>

Description: Reads port 0 IPv6 Addresses for Ethernet I/O Modules. The first IPv6 Address is for port 0 of the primary module, and the second IPv6 Address is for port 0 of the secondary module.

Command: $ETHI,s*<cr|lf>

Response: $ETHI,s,x:x:x;x:x:x:x:x,y:y:y:y:y:y:y:y*<cs|cr|lf>

Description: Reads IPv6 Addresses for Ethernet I/O Modules by slot. The first IPv6 Address is for port 0 of the selected module, and the second IPv6 Address is for the port 1.

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	x:x:x;x:x:x:x:x		IPv6 Address.(port 0)
	y:y:y:y:y:y:y:y		IPv6 Address (Port1).

Note: The Primary/Secondary slots are defined as follows:

Primary module Slot: CommSync II -Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8.
Secondary module Slot (redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

Set Ethernet I/O IPv6 Address (Input, 385-4090) **ET6I**

Command: $ET6I,s,p,x:x:x:x:x:x:x:x*<cr|lf>

Response: $ET6I,s,p,x:x:x:x:x:x:x:x*<cs|cr|lf>

Description: Sets IPv6 Address for the dual port 385-4090 Ethernet I/O Modules.

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	p	0 or 1	Port 0 or 1
	,x:x:x:x:x:x:x:x		IPv6 Address.

Note: The board will reset to make this change and restart after approximately 5 seconds.

Note: Either port can be set to either an IPv4 address or an IPv6 address

Set/Read Ethernet I/O IPv6 NetMask (Output 385-4090 only) ET6M

Command: $ET6M*<cr|lf>

Response: $ET6M,x,y*<cs|cr|lf>

Description: Reads the IPv6 Net mask setting for port 0 IP Addresses for Ethernet I/O Modules. The first value is the IPv6 Net mask port 0 of the primary module, and the second value is the IPv6 Net mask for port 0 of the secondary module.

Command: $ET6M,s*<cr|lf>

Response: $ET6M,s,x,y*<cs|cr|lf>

Description: Reads the Net mask for Ethernet I/O Modules by slot. The first Net mask is for port 0 of the selected module, and the second net mask is for the port 1.

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	x	1-127	IPv6 Net mask.(Port 0)
	y	1-127…	IPv6 Net mask (Port 1).

Note: The Primary/Secondary slots are defined as follows:

Primary module Slot: CommSync II -Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8.
Secondary module Slot (redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

Set Ethernet I/O IPv6 NetMask (Input, 385-4090 only) ET6M

Command: $ET6M,s,p,x*<cr|lf>

Response: $ET6M,s,p,x*<cs|cr|lf>

Description: Sets IPv6 Net mask for the dual port Ethernet I/O Modules (385-4090).

Fields:	**Symbol**	**Range**	**Description**
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	p	0 or 1	Port 0 or Port 1
	x	1-128…	IPv6 Net mask.

Note: The board will reset to make this change and restart after approximately 5 seconds.

Set/Read Ethernet I/O IPv6 Gateway Address (Output 385-4090 only) ET6G

Command: $ET6G*<cr|lf>

Response: $ET6G,x:x:x;x:x:x:x:x,y:y:y:y:y:y:y:y*<cs|cr|lf>

Description: Reads IPv6 Gateway Address for Ethernet I/O Modules 385-4090). The first set of numbers is the Gateway Address of the primary module and the second set of numbers is the Gateway Address for the secondary module.

Description: The Primary/Secondary Slot are defined as follows: Primary Slot, CommSync II - Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8. Secondary slots (in redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

Note: The router/gateway address is needed to communicate to other LAN segments. The Gateway address must be set to address the router that connects these segments.

Set Ethernet I/O IPv6 Gateway Address (Input, 385-4090 only) ET6G

Command: $ET6G,s,x:x:x:x:x:x:x:x *<cr|lf>

Response: $ET6G,s,x:x:x:x:x:x:x:x*<cs|cr|lf>

Description: Sets Gateway Address for Ethernet I/O Modules.

Fields:

Symbol	Range	Description
s	0 or 1	Primary(0) Slot or Secondary(1) Slot
x:x:x;x:x:x:x:x		IPv6 Gateway Address.

Note: The Primary/Secondary Slot are defined as follows: Primary Slot, CommSync II - Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, -GSync II-Slot 8. Secondary slots (in redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot7

Note: The board will reset to make this change and restart after approximately 5 seconds.

Note: The router/gateway address is needed to communicate to other LAN segments. The Gateway address must be set to address the router that connects these segments.

Read Ethernet I/O Firmware Version (Output) ETHV

Command: $ETHV*<cr|lf>

Response: $ETHV,xV,xD,xT,xP, yV,yD,yT,yP*<cs|cr|lf>

Description: Outputs the firmware version number of either the 385-4038 or the 385-4090 Ethernet I/O Modules.

Fields:	Symbol	Range	Description
	xV	XX.XX.XX	Primary Ethernet I/O Firmware Version
	xD	month day year	Version Compile Date (Primary)
	xT	hh:mm:ss	Version Compile Time (Primary)
	xP	Alphanumeric	Part number (Primary)
	yV	XX.XX.XX	Secondary Ethernet I/O Firmware Version
	yD	month day year	Version Compile Date (Secondary)
	yT	hh:mm:ss	Version Compile Time (Secondary)
	yP	Alphanumeric	Part number (Secondary)

Note: The 385-4038 firmware part number is typically 385-3044,

The 385-4090 firmware part number is typically 385-3095:

Read Ethernet I/O Firmware Version, by slot (Output) ETHV

Command: $ETHV,s*<cr|lf>

Response: $ETHV,s,xV,xD,xT,xP*<cs|cr|lf>

Description: Reads the Ethernet Firmware by slot.

Fields:	Symbol	Range	Description
	s	0 or 1	Primary(0) Slot or Secondary(1) Slot
	xV	XX.XX.XX	Selected Ethernet I/O Firmware Version
	xD	month day year	Version Compile Date
	xT	hh:mm:ss	Version Compile Time
	xP	Alphanumeric	Part number

Note: The Primary/Secondary slots are defined as follows:

Primary module Slot: CommSync II -Slot 15, CommSync II-D-Slot 8, GSync-Slot 4, GSync II-Slot 8.

Secondary module Slot (redundant systems only): CommSync II-Slot 14, CommSync II-D-Slot 7

With the release of 385-4038 firmware v1.03.00, and 385-4090 password control is available. The following commands will enable or disable password control, add or delete users, change passwords, and list users. Note that Ethernet I/O Modules are shipped (default) with password control disabled.

For additional configuration information, refer to the Option Module User's Manual, 385-8003, regarding the Ethernet I/O Module, 385-4038, and/or Dual Port Ethernet Module 385-4090.

The following commands are only available through the Telnet connection.

Password Control Enable/Disable (Input, Admin only) PSWC

Command: $PSWC,X*<cr|lf>

Response: None

Description: This command will enable or disable the password control feature of the Ethernet I/O Module. Note that the module will reset when the status of the password control is changed. In the 385-4038, when commanded via the Telnet the sesion will disconnect, the connection will need to be reestablished.

Fields:	**Symbol**	**Range**	**Description**
	X	0-1	0 = Disable, 1 = Enable

Note: This command is applicable to Ethernet I/O Modules 385-4038 and 385-4090, and can only be sent via a Telnet session. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.03.00
Ethernet Firmware 385-3095	V1.00.00

Note: Ethernet I/O Modules are normally delivered with password control disabled. The user will need to enable passwords, then access the module as "Admin", password "Zyfer", to set up users. The Administrator may add up to 4 users in addition to the Admin. See USRA, USRD, and USRL commands.

Note: When passwords control is enabled, the command to disable password control is only available to the Admin user. If the password control is disabled, then enabled, all (non-admin) users and passwords will be cleared. Only the Admin user will remain

Password Control Enable/Disable (Output, Admin only) PSWC

Command: $PSWC*<cr|lf>

Response: $PSWC,password control is S*<cs|cr|lf>

Description: The Ethernet I/O Module will respond with an indication of enabled or disabled password control

Fields:	**Symbol**	**Range**	**Description**
	S	Disabled/Enabled	Disabled or Enabled

Change Administrator Name/Password (Input, Admin only) ADMC

Command: $ADMC,AdminName,AdminPassword*<cr|lf>

Response: $ADMC,New Admin: AdminName*<cs|cr|lf>

Description: This command is applicable to Ethernet I/O Modules 385-4038 and 385-4090, and can only be sent via a Telnet session by the Administrator. The Administrator may change the default (Admin) name and password from the current setting to a new setting. The Admin name can be any alphanumeric character from 2 to 8 characters in length. The password can be any alphanumeric character from 1 to 8 characters in length. The Admin name and password are case sensitive. Spaces are ignored.

Fields:

Symbol	Range	Description
AdminName	Alphanumeric	New Administrator user name
AdminPassword	Alphanumeric	New Admin user password

Note: The Administrator user can add users, and perform firmware upgrades. These functions are not accessible to other Telnet users.

Note: It is recommended that the Administrator and each user change their password upon initial use for security purposes.

Note: This command is applicable to Ethernet I/O Modules 385-4038 and 385-4090 Dual Port Ethernet I/O Modules, with passwords enabled, and can only be sent via a Telnet session. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.15.00
Ethernet Firmware 385-3095	V1.00.00

Add a user (Input, Admin only) USRA

Command: $USRA,name,password*<cr|lf>

Response: $USRA, Add TelnetUser: (name,password)*<cs|cr|lf>

Description: To add a user, this command is followed by the name of the user and an initial password for the user). The User name can be any alphanumeric character from 2 to 8 characters in length. The user password can be any alphanumeric character from 1 to 8 characters in length. The user name and password are case sensitive. Spaces are ignored.. The name and password will be case sensitive. Spaces are ignored.

Note: This command is applicable to Ethernet I/O Modules 385-4038 and 385-4090, and can only be sent via a Telnet session. Administrator may add up to four additional users. This function is only available to the Administrator (Admin). It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.03.00
Ethernet Firmware 385-3095	V1.00.00

Delete a user (Input, Admin only) USRD

Command: $USRD,name*<cr|lf>

Response: $USRD,Delete TelnetUser: (name,password)*<cs|cr|lf>

Description: The user "name" will be deleted from the list of possible users.

Note: This command is applicable to Ethernet I/O Modules 385-4038 and 385-4090, and can only be sent via a Telnet session. Administrator may add up to four additional users. This function is only available to the Administrator (Admin). They have no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.03.00
Ethernet Firmware 385-3095	V1.00.00

Note: Admin is default user and cannot be deleted.

List user (Output, Admin only) USRL

Command: $USRL*<cr|lf>

Response: $USRL,User List: Admin, user1, user2, user3, user4*<cs|cr|lf>

Description: The Ethernet I/O Module will respond with a list of users, beginning with the Administrator.

Note: This command is applicable to Ethernet I/O Modules 385-4038 and 385-4090, and can only be sent via a Telnet session. This function is only available to the Administrator (Admin). They have no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.03.00
Ethernet Firmware 385-3095	V1.00.00

Change password (Input) **PSWD**

Command: $PSWD,O,N*<cr|lf>

Response: $PSWD: User: name, OldPswd: O & NewPswd: N *<cs|cr|lf>

Description: The user can change the password from the current setting to a new setting. The password can be any alphanumeric characters from 1 to 8 characters in length. The password will be case sensitive. Spaces are ignored.

Fields:	**Symbol**	**Range**	**Description**
	O	Alphanumeric	Old password
	N	Alphanumeric	New password

Note: The Administrator sets initial users and their passwords. The default password for Admin is "Zyfer". It is recommended that the Administrator and each user change their password upon initial use for security purposes.

Note: This command is applicable to Ethernet I/O Modules 385-4038, and 385-4090, and can only be sent via a Telnet session. They have no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.03.00
Ethernet Firmware 385-3095	V1.00.00

Read Telnet/SSH control setting (Output, 385-4090 only) NCON

Command: $NCON*<cr|lf>

Response: $NCON,as*<cs|cr|lf>

Description: Read the settings for remote access to the system.

Fields:	Symbol	Range	Description
	as	ACSII string	None = Telnet/SSH disabled Telnet = Telnet Enabled (Default) SSH = SSH (Secure Shell) enabled

Example: $NCON*<cr|lf>

Response: $NCON,TELNET*<cs|cr|lf>

Note: This command is applicable to 385-4090 Ethernet I/O Module only, and can only be sent via a Telnet or SSH session. This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3095 V1.00.00

Set Disable/Enable Telnet/SSH controls (Input, 385-4090 only) NCON

Command: $NCON,as*<cr|lf>

Response: $NCON,as*<cs|cr|lf>

Description: Sets/Enable/Disables Telnet or Secure Shell, allowing for remote access to the system via Telnet or Secure Shell

Fields:	Symbol	Range	Description
	as	ACSII string	None = Telnet/SSH disabled Telnet = Telnet Enabled (Default) SSH = SSH (Secure Shell) enabled

Example: $NCON,SSH*<cr|lf>

Response: $NCON,SSH*<cs|cr|lf>

Note: Note: A setting of 'None' will disable telnet or secure shell access to the CommSync II system. A setting of 'TELNET' will disable secure shell access, and a setting of 'SSH' will disable Telnet access.

Note: When SSH is enabled all Telnet command functions are available through an SSH client.

Note: This command is applicable to 385-4090 Ethernet I/O Module only, and can only be sent via a Telnet or SSH session. This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3095 V1.00.00

Note: If using a SSH (v1) client; MD5 authentication, and DES encryption is available. When using a SSH (v2) client; MD5, MD5-96, SHA1, SHA1-96 authentication is available, also DES, 3DES, BLOWFISH, ARCFOUR, or AES encryption is available. See Secure Shell client documentation for more info.

Exit Telnet Session (Input) **EXIT**

Command: $EXIT*<cr|lf>

Response: Telnet session will terminate.

Description: This command will terminate the Telnet session, if passwords are enabled.

Note: This command is only applicable to Ethernet I/O Modules 385-4038 and 385-4090. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.03.00
Ethernet Firmware 385-3095	V1.00.00

Telnet ECHO controls (Input/Output) **ECHO**

Command: $ECHO*<cr|lf>

Response: $ECHO,Telnet Echo is Off*<cs|cr|lf>

Description: This command allows for the Echo (response back) of characters as they are typed. This command should be used in conjunction with the Telnet echo controls offered in the Windows environment. This command is useful in a secure environment where passwords are not to be displayed as they are typed.

The default for this command is echo off. Echo off was chosen to minimize Ethernet traffic during a telnet session.

Fields:

Symbol	Range	Description
x	0 or 1	0 = echo off (default), 1 = echo on

Example: $ECHO,1*<cr|lf>

Response: $ECHO,Telnet Echo Switch To On*<cs|cr|lf>

Note: This command is applicable to Ethernet I/O Modules 385-4038, and 385-4090. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.05.00
Ethernet Firmware 385-3095	V1.00.00

Note: For Telnet in Windows 95/98 the Local Echo is controlled by a pull down menu selection: ->Terminal->Preferences, Click Local Echo.

Note: For Telnet in windows 2000 the LOCAL_ECHO parameter is set with the following command: Hold down the control key and the shift key and press the "+" key, then hold down the control key and press the "]" key. This switches the screen to telnet control. From the telnet control prompt enter either set/unset “LOCAL_ECHO" then press return two times. The screen will return to the telnet session on the second return.

NTP Server commands

Network Time Protocol (NTP) Time Source Control (Input/Output) NTPC

Important note: This command is effective for all Ethernet I/O Modules, including 385-4024, 385-4038, and 385-4090

Command: $NTPC*<cr|lf> (read setting only)

Command: $NTPC,n*<cr|lf>

Response: $NTPC,n*<cs|cr|lf>

Description: Sets or reads NTPC Source. If an Ethernet I/O Module is installed (control slots) this command will enable the NTP function to provide network time service. If NTPC is set to 1 the NTP functions will automatically begin, assuming the network has been initialized and time lock is validated within the Online GTF/DTF (GTF/DTF#1 for non-redundant CommSync II or GSync systems).

Fields:	**Symbol**	**Range**	**Description**
	n	0-3	0 = Disable Time source (no time provided, for test only) 1 = Enable NTP (UTC time, If TFOM ≤ 7)(RFC-1305) Standard NTP 2 = Enable NTP (Manual, IRIG or PTP Time Modes) 3 = Enable NTP (GPS time offsets, If TFOM ≤ 7) (see LEAP command for offset) 4 = Enable NTP UTC time (Output enabled all the time) (Note: must be set for Symmetric mode) 5 = Enable NTP GPS time (Output enabled all the time)

Note: Network Time Service (NTS) (per RFC 1305) provides Standardized UTC time. Public NTS servers, providing Network time utilize UTC (universal coordinated time). For normal client/server operation it is recommended that the module be set to 1 (UTC per RFC 1305).

Note: PTP per the IEEE-1588 specification provides UTC time. For a PTP Master system time NTPC setting must be set to 1 (UTC time) only. On a DTF Slave system, where time is received via PTP, the NTPC must be set to 2 for NTP operation.

Note: For symmetric (peer) operation the module must be set to 4. See $NTPM/$NTPO commands and MD5/Symmetric description for more information.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.24.00
SAASM Firmware 385-3021	V1.17.00
Mk IV GTF/DTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00

Read NTP Mode (Output, 385-4038 only) NTPM

Command: $NTPM*<cr|lf>

Response: $NTPM,x(Abbreviated text description)*<cs|cr|lf>

Description: Reads the current NTP mode

Fields:	**Symbol**	**Range**	**Description**
	x	2, or 3	2 = Server mode (default) 3 = Symmetric mode (Symmetric mode response includes peer and KeyID number)

Note: For Symmetric mode operation $NTPC must be set to 4 (Output enabled all the time.), and peers must use MD5 authentication, and share the same KeyID and encryption key with the peer. See MD5/Symmetric description for more information.

Note: This command is applicable to 385-4038 Ethernet I/O Module only, and can only be sent via a Telnet or SSH session.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3044 V1.05.00

Set NTP Mode (Input, 385-4038 only) NTPM

Command: $NTPM,m*<cr|lf>

Response: $NTPM,m(Abbreviated text description),k *<cs|cr|lf>

Description: Selects new NTP mode and MD5 Key ID

Fields:	**Symbol**	**Range**	**Description**
	m	2, or 3	Where: 2=Default: Primary Reference Server mode 3=Sync to NTP, become a 'peer', able to exchange time
	k	1-65535	MD5 Key ID (must match peer association)

Example: $ntpm,2*

Response: $NTPM,2 Default GTF Time*<cs|cr|llf>

Example: $ntpm,3,6*

Response: $NTPM,Symmetric Mode with IP:10.10.10.249 & Key:0x06*<cs|cr|llf>

Note: For Symmetric mode operation $NTPC must be set to 4 (Output enabled all the time.), and peers must use MD5 authentication, and share the same KeyID and encryption key with the peer. See MD5/Symmetric description for details.

Note: This command is only applicable through telnet to 385-4038 Ethernet I/O Module only. It has no effect in 385-4024 or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3044 V1.05.00

Read NTP Mode (Input/Output, 385-4090 only) NTPO

Command: $NTPO*<cr|lf>

Response: $NTPO, m (Abbreviated text description) *<cs|cr|lf>

Description: Reads the current NTP mode

Fields:	Symbol	Range	Description
	m	1 - 6	1 = NTP v3 Primary Reference Server (IPv4) 2 = NTP v3 Broadcast Mode (IPv4) 3 = NTP v3 Symmetric Mode (IPv4) 4 = SNTP v4 Primary Reference Server 5 = SNTP v4 IPv4 Broadcast Mode 6 = SNTP v4 IPv6 Broadcast Mode (Symmetric mode response includes peer and KeyID number)

Note: This command is only applicable through telnet to 385-4090(V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3095 V1.00.00

Set NTP Mode (Input, 385-4090 only) NTPO

Command: $NTPO,m*<cr|lf>

Response: $NTPO,m,(Abbreviated text description)*<cs|cr|lf>

Description: Selects new NTP mode

Fields:	Symbol	Range	Description
	m	1 - 6	1 = NTP v3 Primary Reference Server (IPv4) 2 = NTP v3 Broadcast Mode (IPv4) 3 = NTP v3 Symmetric Mode (IPv4) 4 = SNTP v4 Primary Reference Server 5 = SNTP v4 IPv4 Broadcast Mode 6 = SNTP v4 IPv6 Broadcast Mode (Symmetric mode response includes peer and KeyID number)

Example: $NTPO,3*<cr|lf>

$NTPO,3 NTP v3 Symmetric Mode with IP: 10.10.10.229 & Key:42*<cs|cr|lf>

Note: For Symmetric mode operation $NTPC must be set to 4 (Output enabled all the time.), and peers must use MD5 authentication, and share the same KeyID and encryption key with the peer. See MD5/Symmetric description for more information.

Note: NTP Broadcast interval is set by the NTPB commands, NTP broadcast addresses are set by the NTBI and NB6I commands.

Note: This command is only applicable through telnet to 385-4090 Ethernet I/O Modules only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3095 V1.00.00

Read NTP Broadcast configuration (Output, 385-4090 only) NTPB

Command: NTPB<cr|lf>

Response: NTPB,i,a*<cs|cr|lf>

Description: Read NTP/SNTP broadcast interval and Enable/Disable of MD5 authentication for broadcast mode (NTP v3).

Fields:	Symbol	Range	Description
	i	32 to 3600:	broadcast interval in seconds
	a	0 or 1:	Enable(1)/Disable(0,default) NTP v3 broadcast authentication

Note: To enable NTP broadcast mode see the $NTPO command, to set the MD5 authentication KeyID for NTP broadcast modes see the $NTPE command.

Note: NTP Modes are set by the NTPO command, NTP broadcast addresses are set by the NTBI and NB6I commands.

Note: This command is only applicable through telnet to 385-4090 Ethernet I/O Module only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3095 V1.00.00

Set NTP Broadcast configuration (Input/Output, 385-4090 only) NTPB

Command: NTPB,i,a<cr|lf>

Response: NTPB,i,a*<cs|cr|lf>

Description: Set NTP/SNTP broadcast interval and Enable/Disable of MD5 authentication for broadcast mode (NTP v3).

Fields:	Symbol	Range	Description
	i	32 to 3600:	broadcast interval in seconds
	a	0,1:	Enable(1)/Disable(0,default) authentication (NTP v3 MD5 authentication)

Note: To enable NTP broadcast mode see the $NTPO command, to set the MD5 authentication KeyID for NTP broadcast modes see the $NTPE command.

Note: NTP Modes are set by the NTPO command, NTP broadcast addresses are set by the NTBI and NB6I commands.

Note: This command is only applicable through telnet to 385-4090 Ethernet I/O Module only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3095 V1.00.00

Read NTP IPv4 Broadcast IP address (Input, 385-4090 only) NTBI

Command: $NTBI,p*<cr|lf>

Response: $NTBI,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Reads IPv4 NTP broadcast address (per port) for the 385-4090 Ethernet modules.

Fields:	**Symbol**	**Range**	**Description**
	p	0 or 1	Port 0 or Port 1
	xxx…		IP Address.

Note: This command is only applicable through telnet to Ethernet I/O Modules 385-4090 only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3095 V1.00.00

Set NTP IPv4 Broadcast IP address (Input, 385-4090 only) NTBI

Command: $NTBI,p,xxx.xxx.xxx.xxx*<cr|lf>

Response: $NTBI,p,xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: -Sets a valid IPv4 broadcast address (per port) for the 385-4090 Ethernet modules.

Fields:	**Symbol**	**Range**	**Description**
	p	0 or 1	Port 0 or Port 1
	xxx…		IP Address.

Example: $NTBI,1,192.168.5.255*<cs|cr|lf>

$NTBI,1,192.168.5.255*<cs|cr|lf>

Note: To enable NTP broadcast mode see the $NTPO command.

Note: The Broadcast address is typically the top address in a subnet, for example, the broadcast address for IPv4 192.168.5.123, with a netmask of 255.255.255.0 (/24) would be 192.168.5.255.

Note: This command is only applicable through telnet to Ethernet I/O Modules 385-4090 only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3095 V1.00.00

Set/Read NTP IPv6 Multicast IP address (Input, 385-4090 only) NB6I

Command: $NB6I

Response: $NB6I,p,x:x:x:x:x:x:x:x*<cs|cr|lf>

Response: Sets IPv6 multicast address (per port) for the 385-4090 Ethernet I/O Modules.

Command: $NB6I,s,p,x:x:x:x:x:x:x:x*<cr|lf>

Fields:	**Symbol**	**Range**	**Description**
	p	0 or 1	Port 0 or 1
	,x:x:x:x:x:x:x:x		IPv6 Address.

Note: To enable SNTPv4 IPv6 broadcast mode see the $NTPO command.

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090 only. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3095 V1.00.00

MD5 NTP Authentication overview

With the release of Ethernet Module firmware version X1.04.05 the 385-4038 Ethernet I/O Module supports an optional MD5 authentication specified in the NTP Version 2 and 3 specifications. For normal Client/Server operations where authentication is not required, NTP operation remains the same. If the MD5 authentication packet is attached to the request the response will include the authentication message.
In authentication mode each NTP response packet transmitted has a 32-bit key ID and cryptographic hash appended to the packet contents. This appended message is computed using the Message Digest (MD5) algorithm. When a client or peer receives the message it will re-compute the hash and compare it with the one included in the packet.

In this mode peers which send unauthenticated packets are marked untrustworthy and unsuitable for synchronization. For authentication to work, the peers must share an encryption key and must associate the shared key with the same key ID. Several new CommSync II commands are added to manage the MD5 keys.

For the 385-4038 Ethernet module Two commands are provided to view and set MD5 keys for NTP:
NTPK: The entire key table is viewed.
NTPI: Individual keys additions or modifications.
For the 385-4090 Ethernet module Three commands are modes:
NTPK: The entire key table is viewed.
NTKA: Individual keys may be added .
NTKD: Individual keys may be deleted

Symmetric NTP mode overview

With the release of Ethernet Module firmware version X1.04.05 the 385-4038 Ethernet I/O Module supports a type of symmetric mode of operation as specified in the NTP RFC-1305. By default the CommSync II system operates as a primary reference source NTP server, providing time to clients as requested. Symmetric mode is intended for configurations where several high accuracy peers operate as back-ups for each other. Each peer operates with one (or more) primary reference sources and/or a subset of secondary servers. This allows the CommSync II system to synchronize peers to allow for a hierarchical NTP distribution network design. This hierarchy provides for a primary reference source (Stratum 1), such as a CommSync II, to synchronize several peers. Stratum 2 servers receive synchronization from Stratum 1 servers, Stratum 3 servers receive there synchronization from Stratum 2 servers, and so on.

While time locked to GPS the CommSync II system is a primary reference source (Stratum 1). If GPS lock is lost, the CommSync II system goes into holdover or coasting mode. In holdover the Stratum level is degraded (Stratum 2) to allow a peer to correct a time error (if required) via the symmetric mode.
Note: In Symmetric mode operation the NTPC control must be set to 4 ($NTPC,4*)
Note: To provide maximum security MD5 authentication must be in use to allow a peer to correct the CommSync II system time.

Two commands are provided to manage symmetric time modes.
NTPM (385-4038): Symmetric mode and key control.
NTPO and NTPE (385-4090): NTP mode and key control.
NTPJ (385-4038/385-4090) Symmetric peer address is set/modified.

Read MD5 Key Table(Output) **NTPK**

Command: $NTPK*<cr|lf>

Response: CS2 Ethernet NTP/MD5 Key Table: *<cs|cr|lf>

For the 385-4038, the key table is arranged in two columns containing 18 Key Locations, in [brackets], the KeyID number and the Key, in (parenthesis):

```
CS2 Ethernet NTP/MD5 Key Table: <cr|lf>
[ 1]{     6,    abcdefghijklmnopq},[ 2]{     7,            key2}<cr|lf>
[ 3]{     8,                 key3},[ 4]{     9,            key4}<cr|lf>
[ 5]{    10,                 key6},[ 6]{    11,            key7}<cr|lf>
[ 7]{    12,         123456789012},[ 8]{    13,            key9}<cr|lf>
[ 9]{    15,                 key5},[10]{    16,         key1234}<cr|lf>
[11]{    17,             key56789},[12]{    18,          123456}<cr|lf>
[13]{    19,               abcdef},[14]{     5,            key1}<cr|lf>
[15]{654321,12345678901234567890},[16]{ 65534,         keyword}<cr|lf>
[17]{    14,                 key8},[18]{    42,      ThisIsAKey}*<cs|cr|lf>
```

Note: This command is only applicable through telnet to Ethernet I/O Modules 385-4038 and 395-4090. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.05.00
Ethernet Firmware 385-3095	V1.00.00

Command: $NTPK*<cr|lf>

Response: CS2 Ethernet NTP/MD5 Key Table: *<cs|cr|lf>

For the 385-4090, the key table is output in a single column containing 18 Key Locations including the the KeyID number and the Key, in (parentheses):

```
CS2 Ethernet NTP/MD5 Key Table:
{     6,       abcdefghijklmnopq}
{     7,                    key2}
{     8,                    key3}
{     9,                    key4}
{    10,                    key6}
{    11,                    key7}
{    12,            123456789012}
{    13,                    key9}
{    15,                    key5}
{    16,                 key1234}
{    17,                key56789}
{    18,                  123456}
{    19,                  abcdef}
{     0,                        }
{     0,                        }
{     0,                        }
{     0,                        }
{     0,                        }
```

Set/modify MD5 Key (Input, 385-4038 only) **NTPI**

Command: $NTPI,L,ID,Key*<cr|lf>

Response: $NTPI,KeyTable[L]{ID,Key}*<cs|cr|lf>

Description: Sets or modifies Key Table entry

Fields:	**Symbol**	**Range**	**Description**
	L	1-18	Key Table data location
	ID	1-65535	Key ID number (integer)
	Key	ASCII text	MD5 Key 1-31 char ASCII string

Example: $NTPI,18,42,ThisIsAKey*<cr|lf>

Example: $NTPI,KeyTable[18]{42,ThisIsAKey}*<cs|cr|lf>

Description: In this example the key in location 18, was entered with an ID of 42 (decimal) and the key text of “ThisIsAKey”

Note: Key text can include any ASCII characters, but cannot contain spaces or control characters.

Note: For authentication the peers must share the KeyID and the encryption key.

Note: This command is only applicable through telnet to Ethernet I/O Modules 385-4038. It has no effect in 385-4024, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of Ethernet firmware.

Ethernet Firmware 385-3044 V1.05.00

Add MD5 Key (Input, 385-4090 only) NTKA

Command: $NTKA,ID,Key*<cr|lf>

Response: NTP/MD5 Key Table Entry Added: *<cs|cr|lf>

Description: Sets or modifies Key Table entry

Fields:	**Symbol**	**Range**	**Description**
	ID	1-65535	KeyID number (integer)
	Key	ASCII text	MD5 Key 1-31 char ASCII string

Example: $NTKA,42,ThisIsAKey*<cr|lf>

Example: NTP/MD5 Key Table Entry Added: *<cs|cr|lf>

{ 42, ThisIsAKey}<cs|cr|lf>

Description: In this example a key was added with a KeyID of 42 (decimal) and the key text of "ThisIsAKey"

Note: Key text can include any ASCII characters, but cannot contain spaces or control characters.

Note: For authentication the peers must share the KeyID and the encryption key.

Note: This command is only applicable through telnet to Ethernet I/O Modules 385-4090. It has no effect in 385-4024, or 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of Ethernet Module firmware:

Ethernet Firmware 385-3095 V1.00.00

Delete MD5 Key (Input, 385-4090 only) NTKD

Command: $NTKD,KeyID*<cr|lf>

Response: $NTKD,(ID)*<cs|cr|lf>

Description: Deletes a Key Table entry

Fields:	**Symbol**	**Range**	**Description**
	ID	1-65535	Key ID number (integer)
	Key	ASCII text	MD5 Key 1-31 char ASCII string

Example: $NTKD,1*

Response: NTP/MD5 Key Table Entry Deleted:

{ 42, ThisIsAKey}*<cs|cr|lf>

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.

Ethernet Firmware 385-3095 V1.00.00

Read NTP Peer Address (Output) NTPJ

Command: $NTPJ*<cr|lf>

Response: $NTPJ,Sync Time IP Addr: xxx.xxx.xxx.xxx*<cs|cr|lf>

Description: Reads current peer IP address

Example: $NTPJ*<cr|lf>

Example: $NTPJ,Sync Time IP Addr: 10.10.10.129*<cs|cr|lf>

Example: This command is only applicable through telnet to Ethernet I/O Modules 385-4038 and 385-4090. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.05.00
Ethernet Firmware 385-3095	V1.00.00

Set NTP Peer Address (Input) NTPJ

Command: $NTPJ,xxx.xxx.xxx.xxx*<cr|lf>

Response: $NTPJ,New NTP Sync Time IP Addr: xxx.xxx.xxx.xxx *<cs|cr|lf>

Description: Selects new peer IP address

Fields:

Symbol	Description
xxx.xxx.xxx.xxx	IP address

Example: $NTPJ,10.10.10.229*<cr|lf>

Example: $NTPJ,NEW NTP Sync Time IP Addr: 10.10.10.229*<cs|cr|lf>

Note: This command is only applicable through telnet to Ethernet I/O Modules 385-4038 and 385-4090. It has no effect in Ethernet I/O Module 385-4024.

Note: This command is in effect as of the following versions of applicable firmware.

Ethernet Firmware 385-3044	V1.05.00
Ethernet Firmware 385-3095	V1.00.00

Read NTP MD5 Key (Input, 385-4090 only) **NTPE**

Command: $NTPE*<cr|lf>

Response: $NTPE,(Abbreviated text description)*<cs|cr|lf>

Note: Displays the MD5 authentication KeyID for NTP v3 Symmetric mode or NTP v3 Broadcast modes

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00

Set NTP MD5 Key (Input, 385-4090 only) **NTPE**

Command: $NTPE,K *<cr|lf>

Response: $NTPE,K,(Abbreviated text description)*<cs|cr|lf>

Description: Sets the MD5 authentication KeyID for NTP v3 Symmetric mode or NTP v3 Broadcast modes

Fields:

Symbol	Range	Description
K	1 to 65535	MD5 authentication key ID number

Example: $NTPE,42*

$NTPE,NTP v3 MD5 Key ID:42*76<cs|cr|lf>

Note: For Symmetric mode operation $NTPC must be set to 4 (Output enabled all the time.), and peers must use MD5 authentication, and share the same KeyID and encryption key with the peer. See MD5/Symmetric description for more information.

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00

IEEE1588/2008 Precision Time Protocol (v2) (PTP)

The 385-4097-xx Dual Port Ethernet Module incorporates Precision Time Protocol (PTP) version 2 (IEEE 1588, 2008). PTP was designed specifically for small local area (LAN) networks where precise timing between devices is required.

The 385-4097 PTP features of the 385-4097-xx Module provides three basic functions.

1. (Master) When configured in a CommSyncII family, GPS based system (GTF), the module can function as a Precision Time Protocol Grandmaster. The Grandmaster will provide accurate time and frequency over a local area network.

2. (Slave) When configured in a CommSyncII family distribution system (DTF), or a backup to GPS in a GTF system, the module performs as a PTP slave, receiving accurate time and frequency reference over a local area network. This frequency reference can be used to discipline a DTF module to provide multiple time and frequency outputs.

3. (Measurement) When configured in a CommSyncII family, GPS based system (GTF), the module can function as a external Grandmaster measurement and verification tool.

Enable/Disable PTP operation (Input/Output)(Master/Slave) PTPE

Command: **Message:** $PTPE,A*<cs|cr|lf>

Description: The **$PTPE** command is used to enable PTP operation in the 385-4097 module.

Fields:	**Symbol**	**Range**	**Description**
	A	0-1	0: Disable (default) 1: Enable

Example: $PTPE,1*<cr|lf>

Response: $PTPE,1*<cs|cr|lf>

Description: Enable PTP operation in the Ethernet 385-4097 module.

Note: PTP is available from port 0 only.

Note: This command is only applicable through telnet to 385-4097 Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

PTP protocol operating mode (Input/Output)(Master/Slave) PTPM

Command: $PTPM,A*<cs|cr|lf>

Description: The **$PTPM** command is used to configure the module as a Master or Slave. In a typical GTF based system set the operation mode to '0' for (GrandMaster). Send the $PTPM,0*<cr|lf> command to set the PTP op-mode to Master.

Fields:	Symbol	Range	Description
	A	0-3	0: GrandMaster Mode(default) 1: Multicast Slave Mode 2: Unicast Slave Mode 3: Foreign Master Measurement Mode

Example: $PTPM,1*<cr|lf>*

Response: $PTPM,1*<cs|cr|lf>*:

Set PTP mode to Multicast Slave (normal Slave setting).

Note: For Grandmaster operation the GTF command **$NTPC** must be set to '1' (UTC enabled when GTF TFOM is <7). ($NTPC,1*<cr|lf>)

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

PTP Default Port Data Setting (Input)(Master/Slave) PSET

Command: **Message:** $PSET,s*<cs|cr|lf>

Description: Set PTP settings to factory defaults

Fields:

Symbol	Range	Description
S	d	Default port data setting for Master or Slave device

Sets the following parameters to the Factor defaults:

$MASD=0*

$SPRI=128,128*

$ANNR=1*

$SYNR=1*

$DELR=2*

Example: $PSET,d*

Response: $PSET,d PTP port data set to default*<cs|cr|lf>

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

PTP Announce Message Interval Rate (Input/Output)(Master/Slave) ANNR

Command: $ANNR,A*<cs|cr|lf>.

Description: Set Announce message rate. The announce message is used to establish the synchronization hierarchy between the PTP devices on the network.

Fields:	Symbol	Range	Description
	A	0 to +4	0 = message every second 1 = message every other second (default) 2 = message every 4 seconds 3 = message every 8 seconds 4 = message every 16 seconds

Example: $ANNR,0*<cr|lf>*

Response: $ANNR,0*<cs|cr|lf>

Set PTP Announce message to once per second

Note: All PTP devices on a network, both masters and slaves, must be configured with the same interval between announce messages. An error condition will exist if a PTP sub-domain contains devices using different announce rates, and these devices may behave as if they can't hear each other.

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

PTP Set Master Priority (Input/Output)(Master) SPRI

Command: $SPRI,A,B*<cs|cr|lf>

Description: Set Master Priority value. Applicable when there are multiple PTP masters on a common network.

Description: The Priority1 and Priority2 fields are contained in the PTP announce message. Within the Announce message several fields define the quality of the Maser Clock:

Priority1: A user configurable (SPRI cmd) (range 0 to 255, default 128)
ClockClass: Primary Clock when configured as Maser and TimeLocked.
ClockAccuracy: Defines the accuracy of a clock, based on GTF TFOM.
Priority2: user configurable (SPRI cmd) (range 0 to 255, default 128)
ClockIdentity: based on MAC address (used as a tie-breaker)

Fields:

Symbol	Range	Description
A	0-255	Master Priority1 value. Default is 128.
B	0-255	Master Priority2 value. Default is 128.

Example: $SPRI,129,120*<cr|lf>

Response: $SPRI,129,120*<cs|cr|lf>

Set PTP Master priority1 to 129, priority2 to 120

Note: PTP Priority definition, lower value = higher priority. A PTP slave device configured with priority superior to the master will not act as a slave device.

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

Set PTP Master Domain (Input/Output)(Master/Slave) MASD

Command: $MASD,A*<cs|cr|lf>

Description: Set PTP Master Domain value The Master Domain Number is a mechanism for limiting PTP operation and communications to a group of PTP devices on a given network. The Domain number allows for Multiple PTP domains to exist on a common network.

Fields:

Symbol	Range	Description
A	0-3	Master Domain value. (Default is 0)

Example: $MASD,1*<cr|lf>

Response: $MASD,1*<cs|cr|lf>

Set PTP Master Domain to 1

Note: The user should verify that the Domain number of all devices that are to be synchronized by the Master Clock are set to the same value.

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

PTP Sync Message Interval Rate (Input/Output)(Master) SYNR

Command: $SYNR,A*<cs|cr|lf>

Description: Set Sync message rate. The Sync message is sent from the Master to all related slave clocks at the defined interval.

Fields:	Symbol	Range	Description
	A	-7 to +4	-7 = system limit (approx100 msg/sec) -6 = 64 msg/sec -5 = 32 msg/sec -4 = 16 msg/sec -3 = 8 msg/sec -2 = 4 msg/sec -1 = 2 msg/sec 0 = 1 msg/sec 1 = 1 msg every other second (default) 2 = 1 msg every 4 seconds 3 = 1 msg every 8 seconds 4 = 1 msg every 16 seconds

Example: $SYNR,0*<cr|lf>

Response: $SYNR,0*<cs|cr|lf>

Set PTP Sync message to once per second.

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

Delay Request Interval Rate (Input/Output)(Master) DELR

Command: $DELR,A*<cs|cr|lf>

Description: PTP Maximum delay request interval is set into the Master. The Master communicates this maximum rate to the slave units.

Fields:	Symbol	Range	Description
	A	-4 to +4	-4 = 16 requests/second -3 = 8 requests/second -2 = 4 requests/second -1 = 2 requests/second 0 = 1 request/second 1 = 1 request every 2 seconds 2 = 1 request every 4 seconds (Default) 3 = 1 request every 8 seconds 4 = 1 request every 16 seconds

Example: $DELR,-2*<cr|lf>

Response: $DELR,-2*<cs|cr|lf>

Set max PTP delay request message from slave devices to 4 msg/second.

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

The **$DELR** command will set the maximum delay request rate to the Master. This is reflected to the Slave. The Default setting (2) is every four seconds.

PTP V2 One Step Mode (Input/Output)(Master) OSTP

Command: $OSTP,A*<cs|cr|lf>

Description: One-step" mode incorporates the transmit time message into the PTP SYNC packet by the NET-PHY. This eliminates the need for the FOLLOW_UP message sent by the Master in Standard Mode. There is no additional command needed for a Slaves unit.

Fields:	**Symbol**	**Range**	**Description**
	A	0	0 = Standard PTP (default) 1 = One-Step PTP (Sync w/TimeStamp)

Example: $OSTP,1*<cr|lf>

Response: $OSTP,1*<cs|cr|lf>

Turns on PTPV2 One-Step Mode

Note: This command is only applicable through telnet to 385-4097 (V1.03.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Add UniCast Master (Input/Output)(Slave) UCMA

Command: **Message:** $UCMA,ipAddr*<cs|cr|lf>

Description: The typical operation mode for a PTP slave is MultiCast (see PTPM configuration cmd) If UniCast is selected this command adds a UniCast Master IP address to the Slave Device Master Discovery list. A PTP Slave device in UniCast mode, can store up to 5 Master IP addresses in it's discovery list.

Fields:	**Symbol**	**Range**	**Description**
	ipAddr	xxx.xxx.xxx.xxx	Add an Unicast Master IPaddress Discovery List

Example: $UCMA,10.10.10.192*<cr|lf>

Response: $UCMA,10.10.10.192*<cs|cr|lf>

Add a Master IP address of 10.10.10.192 onto the Slave device's Unicast Master List.

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

Delete UniCast Master (Input/Output)(Slave) UCMD

Command: $UCMD,ipAddr*<cs|cr|lf>

Description: This command deletes a UniCast Master IP address from the Slave device's Discovery list

Fields:	**Symbol**	**Range**	**Description**
	ipAddr	xxx.xxx.xxx.xxx	Delete an Unicast Master IPaddress Discovery List

Example: $UCMD,10.10.10.192*<cr|lf>

Response: $UCMD,10.10.10.192*<cs|cr|lf>

Delete a Master IP address of 10.10.10.192 from the Slave device's Unicast Master List

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

List UniCast Master (Input/Output)(Slave) **UCML**

Command: $UCML*<cs|cr|lf>

Description: The typical operation mode for a PTP slave is MultiCast (see PTPM configuration cmd) If UniCast is selected this command displays all (5) UniCast Master IP addresses in the Slave Device Master Discovery list.

Example: $UCML*<cr|lf>

Response: $UCML,10.10.10.192,10.10.8.100,192.168.1.100,N/A,N/A*<cs|cr|lf>

Note: This command is only applicable through telnet to 385-4097 (V1.00.00) Ethernet I/O Modules only. It has no effect in 385-4024, 385-4038, or 385-4090 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of applicable firmware.
Ethernet Firmware 385-3114 V1.00.00

Display PTP clock ID (Master/Slave/Measurement, Output only) **CKID**

Command: $CKID*<cs|cr|lf>

Response: $CKID,C*<cs|cr|lf>

Description: Get Master/Slave PTP Clock ID (8 bytes in hex) value.

Outputs a unique identification for use in network management to identify the Master or Slave device clock ID.

Note: The Clock ID is generated from the Port MAC address

Fields:	**Symbol**	**Range**	**Description**
	C	**8 bytes(hex)**	**PTP Clock ID**

Example: $CKID*<cs|cr|lf>

Response: $CKID,0019DDFFFE000031*<cs|cr|lf>

Network Measurement Master Clock Accuracy (Measurement, Output only) DTIM

Command: $DTIM*<cs|cr|lf>

Response: $DTIM,s,C,yU,yT,N*<cs|cr|lf>

Description: Report latest Foreign Master and Reference differences.

The Foreign Master Measurement mode compares the difference between the internal GPS referenced CommSyncII family unit with the PTP output from an external (foreign) PTP Grandmaster Clock. The DTIM command reports Measurement sample number, GrandMaster Clock ID, the UTC/TAI time offsets (in seconds) and the 1PPS accuracy measurement (in nanoseconds).

Use in network measurement.

Fields:

Symbol	Range	Description
s	1-65535	Sample number
C	8 bytes(hex)	Foreign Master clock ID
y	+ or -	sign
U	1-10 digits	time difference in seconds
y	+ or -	sign
T	1-10 digits	time difference in seconds
Nns	9 digits	time difference in nanosecond

Example: $DTIM*<cs|cr|lf>

Response: $DTIM,0019DDFFFE000031,+0sec,+0sec,000000028ns*<cs|cr|lf>

Command: $DTIM,ALL*<cs|cr|lf>

Outputs a list of the last 10 measurements……

Example: $DTIM,ALL*<cs|cr|lf>

$DTIM,ALL*<cs|cr|lf>

Sample	CKID	UTCoffsetErr	TAI Err
104	0019DDFFFE000031	0sec	0sec, 000000024ns
105	0019DDFFFE000031	0sec	0sec, 000000032ns
106	0019DDFFFE000031	0sec	0sec, 000000021ns
107	0019DDFFFE000031	0sec	0sec, 000000035ns
108	0019DDFFFE000031	0sec	0sec, 000000026ns
109	0019DDFFFE000031	0sec	0sec, 000000031ns
110	0019DDFFFE000031	0sec	0sec, 000000028ns
111	0019DDFFFE000031	0sec	0sec, 000000033ns
112	0019DDFFFE000031	0sec	0sec, 000000037ns
113	0019DDFFFE000031	0sec	0sec, 000000030ns

SNMP Command Structure

When an Ethernet I/O Module (385-4038 or 385-4090) are used, the system has SNMP functionality. SNMP uses the standard MIB2 objects as well as the custom FEI-Zyfer MIB objects. The FEI-Zyfer MIB file is available at the online resource center at

http://www.fei-zyfer.com/support.htm

385-4038 SNMP trap functions

The 385-4038 Ethernet module SNMP trap function provides notification of three events. These traps are sent to the trap address. (See ETHT command for setting the trap address.) For these messages to be received, the user will require trap monitoring software.

A trap is sent at power up, or reset of the 385-4038 Ethernet I/O Module, (Warm Start/Warm Start GTF Start up)

A trap is sent if an attempt to read(get)/write(set) through SNMP without the required community name (public, zyferrd, or zyferwrt) (Authentication Failure message),

Any SSTA message sent from the GTF is output as a TRAP message. (refer to page 44 and following for information about the SSTA message).

For the 385-4038, the default trap address is 0.0.0.0. If the user requires that no messages be sent to the network, set the trap address to 127.0.0.1. This is the standard loop back address and should prevent automated messages from going out over the network

385-4090 SNMP trap functions

The 385-4090 SNMP trap functionality will provide traps in either SNMP v1,v2c, or SNMPv3 formats (see the SNMV commands for selection). It will provides notification of the three events above, and in addition can also send a verbose trap message indicating the status field that has changed. See the TSTA command for control of the trap outputs. The following traps will be sent:

For SNMP v1/v2c an attempt to write or read without the required community name (zyferrd, or zyferwrt) will result in an ‘Authentication Failure Trap’. Note: Community names can be changed with the $RNMP and the $WNMP commands. For SNMP v3 an attempt to write or read with an incorrect username, passphrase or key will also result in an ‘Authentication Failure Trap’.

Any SSTA message sent from the GTF is output as a TRAP message. (refer to page 44 and following for information about the SSTA message). ($TSTA,0* setting)

Any SSTA message sent by the GTF is interpreted and is output from the system as a descriptive, STAT TRAP message. ($TSTA,1* setting)

Any SSTA message sent by the GTF is both output as a TRAP message, and is output as a STAT TRAP message. ($TSTA,2* setting)

For the 385-4090, the default trap address is 127.0.0.1. This is the standard IPv4 loop back address and should prevent automated messages from going out over the network. (See ETHT command for setting the trap address.)

STAT output message description

The SSTA message is a comprehensive message reporting the status of both GTF modules, and all option modules; it is generated whenever there is a change in any status field.

The STAT message is more descriptive, than the coded SSTA message, and will output a change in the current status of any module in the system.
The STAT message is divided into three basic groups:
(1)System, (2)GTF Status or Fault, and (3)Power Supply or Output Module Status.
The SSTA and/or STAT trap selection is selected by the $TSTA command.
The STAT message can also be output through telnet and is selected by the $STAT command.

Note: The STAT message is only available through an SNMP Trap message or through a telnet session from Ethernet I/O Module 385-4090.

Set TRAP output selection (Input 385-4090 only) TSTA

Command: $TSTA*<cr|lf>

Command: $TSTA,x*<cr|lf>

Response: $TSTA,x*<cs|cr|lf>

Description: Reads/Sets the current SNMP Trap output setting.

Fields:	**Symbol**	**Range**	**Description**
	x	0,1,or 2	0 = SSTA message Traps only 1 = STAT message Traps Only 2 = Both SSTA and STAT Traps (Default)

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090 and 385-4097. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00
Ethernet Firmware 385-3114 V1.01.00

Set SSTA Verbose output (Telnet port, Input 385-4090 only) STAT

Command: $STAT*<cr|lf>

Command: $STAT,x*<cr|lf>

Response: $STAT,x*<cs|cr|lf>

Description: Reads/Sets the current telnet port SSTA/STAT output setting.

Fields:	**Symbol**	**Range**	**Description**
	x	0,1	0 = SSTA only (Default) 1 = Both SSTA and STAT messages

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090 and 385-4097. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00
Ethernet Firmware 385-3114 V1.01.00

1a System STAT message (Output only) **STAT,System Modes**

Response: $STAT,System,M,O,T*<cs|cr|lf>

Description: Outputs when there is a change in the current status of the system.

Fields: **Symbol** **Range**

M This string represent the system mode, and will be one of the following:

M	Meaning
Warm Up	System is in warm-up mode.
Time Locked	System is currently disciplining to GPS
Coasting	System is currently not disciplining to GPS or external reference (Holdover).
Acquire	System is currently disciplining to GPS in recovery from loss of either GPS or external reference.
Alarm	GTF Module is reporting a hard fault, unable to discipline.
Frequency Locked	System is currently disciplining to external reference

O This string represents which GTF is online, and will be one of the following:

O
GTF 1 Online
GTF 2 Online

T This string represents the current system TFOM value, and will be one of the following:

T	Estimated Time Error (ETE)
TFOM 2	ETE < 10 ns
TFOM 3	10 ns ≤ ETE < 100 ns
TFOM 4	100 ns ≤ ETE < 1 μs
TFOM 5	1 μs ≤ ETE < 10 μs
TFOM 6	10 μs ≤ ETE < 100 μs
TFOM 7	100 μs ≤ ETE < 1 ms
TFOM 8	1 ms ≤ ETE < 10 ms
TFOM 9	10 ms ≤ ETE

Example: $STAT,System,Warm Up,GTF 1 OnLine,TFOM 9*<cs|cr|lf>

Note: The STAT messages are only available with Ethernet I/O Module 385-4090.

1b. System STAT message (Output only) **STAT,System, GTF TFOMS**

Response: $STAT,System,GTFx T*<cs|cr|lf>

Description: Outputs when there is a change in the current TFOM of either GTF module.

Fields: **Symbol** **Range**

x

x	Meaning
1	GTF #1 is reporting TFOM
2	GTF #2 is reporting TFOM

T This string represents the GTFs current TFOM value, and will be one of the following:

T	**Estimated Time Error (ETE)**
TFOM 2	ETE < 10 ns
TFOM 3	10 ns ≤ ETE < 100 ns
TFOM 4	100 ns ≤ ETE < 1 μs
TFOM 5	1 μs ≤ ETE < 10 μs
TFOM 6	10 μs ≤ ETE < 100 μs
TFOM 7	100 μs ≤ ETE < 1 ms
TFOM 8	1 ms ≤ ETE < 10 ms
TFOM 9	10 ms ≤ ETE

Example: $STAT,System,GTF1 TFOM 3*<cs|cr|lf>

Note: The STAT messages are only available with Ethernet I/O Module 385-4090.

2a. GTF Status, STAT message (Output only) STAT,GTF

Response: $STAT,GTFx,M S*<cs|cr|lf>

Description: Outputs when there is a change in the GTF module status

Fields:

Symbol	Range
x	

x	Meaning
1	GTF #1 is reporting status
2	GTF #2 is reporting status

M Reports GTF FDM Mode. One of the following:
Evaluate System Stability
Do Discipline to
Locked to
Holdover, lost

S Reports GTF Discipline Source. One of the following:
GPS reference
External reference
Cross-Disp

Example: $STAT,GTF1,Locked to GPS reference*4B

$STAT,GTF2,Do Discipline to GPS reference*40

Note: The STAT messages are only available with Ethernet I/O Module 385-4090.

2b. GTF Fault Status, STAT message (Output only) STAT,GTF

Response: $STAT,GTFx,F*< cs|cr|lf>

Description: Outputs when there is a change in the GTF Fault status

Fields:

Symbol	Range
x	

x	Meaning
1	GTF #1 is reporting status
2	GTF #2 is reporting status

F A string which indicates whether a GTF fault is set or cleared, or when the external divider has been set:

GTF Fault Set	GTF Fault Cleared
Power Fault	Fault Cleared
10Mhz Fault	10MHz Fault Cleared
GPS Receiver Comm Fault	GPS Comm restored
1PPS Fault	1PPS Fault Cleared
Not Ready	Ready
GPS Not Locked	GPS Locked
Antenna Overcurrent	Antenna Overcurrent Cleared
Antenna Undercurrent	Antenna Undercurrent Cleared
DAC value is near Limits	DAC value is OK
Hold Over Integrity Warning	Hold Over Integrity OK
Inter Comm Fault	Inter Comm Fault Cleared
Rb Not Locked	Rb Locked
External Input Missing	External Input Present

External Divider Settings:
External divider set to 1PPS
External divider set to 1MHz
External divider set to 5MHz
External divider set to 10MHz

Example: $STAT,GTF1,1PPS Fault*7E

$STAT,GTF2,Ready*3E

$STAT,GTF1,External divider set to 1PPS*<cs|cr|lf>

Note: The STAT messages are only available with Ethernet I/O Module 385-4090.

3a. Power Supply STAT message (output only) **STAT,PwrSup**

Response: $STAT,PwrSupX,F*< cs|cr|lf>

Description: Outputs when there is a change in the System Power Supply status

Fields:

Symbol	Range
X	
F	Reports Power supply status. One of the following: Faulted Fault Cleared Missing

X	Meaning
1	Power Supply #1 is reporting status
2	Power Supply #2 is reporting status

Example: $STAT,PwrSup1,Faulted*<cs|cr|lf>

$STAT,PwrSup2,Fault Cleared*<cs|cr|lf>

Note: The STAT messages are only available with Ethernet I/O Module 385-4090.

3b. Output module STAT message (Output only) **STAT,Slot**

Response: $STAT,Slot#,M F*<cs|cr|lf> where:

Description: Outputs when there is a change in an Output Module status. There are differing specific output messages for different families of output modules. The differences are in the "F" field (Module Fault) strings.

Fields:

Symbol	Range
#	slot number
M	Module name
F	Generic string (for all modules)

Set	Cleared
Added	Removed
Not Ready	Ready
Faulted	Fault Cleared

F Fault messages Specific to External input modules (385-4037/385-4038/385-4040/385-4090)

Set	Cleared
System Faulted	System Fault Cleared

F Fault messages Specific to Frequency output modules (385-4007/385-4009/385-4010/385-4011)

Set	Cleared
Frequency in Fault	Fault Cleared
Synchronization Fault	Fault Cleared

F Fault messages Specific to LPN Frequency output modules (385-4028/385-4036/385-4046/385-4048/385-4067/385-4078/ 385-4079/385-4081/385-4083)

Set	Cleared
Osc. End of Life Fault	Fault Cleared
Frequency in Fault	Fault Cleared
Synchronization Fault	Fault Cleared

F Fault messages Specific to Time (IRIG/HQ/DualNTP) modules (385-4020/385-4070/385-4074/385-4087)

Set	Cleared
Time Fault	Fault Cleared

Note: Name may be omitted if module is removed.

Example: $STAT,Slot4 Removed*<cs|cr|lf>

$STAT,Slot3 N.1 6 Channel Clock Rate Output Module Added*<cs|cr|lf>
$STAT,Slot5 (Time Code (IRIG-B) Module) Time Fault*<cs|cr|lf>

Note: The STAT messages are only available with Ethernet I/O Module 385-4090.

Set/read SNMP Version (Input/Output, 385-4090 only) SNMV

Command: $SNMV*

Command: $SNMV,v*<cr|lf>

Response: $SNMV,v*<cs|cr|lf>

Description: The SNMP Version can be selected (SNMPv1, v2c, or v3).

Fields:	**Symbol**	**Range**	**Description**
	v	1,2,3	1=SNMPv1, 2=SNMPv2c, 3=SNMPv3

Note: Selection will disable other versions, for example the Default SNMPv1 selected, Version 2c, and version 3 are disabled. If version 3 is selected, then SNMPv1 and SNMPv2 are disabled.

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following version of Ethernet firmware.

Ethernet Firmware 385-3095 V1.00.00

Set Read/Get community name (input, 385-4090 only) RNMP

Command: $RNMP,O,N*<cr|lf>

Response: $RNMP:O Changed to N *<cs|cr|lf>

Description: The user can change the community name from the current default setting (zyferrd) to a new community name, such as public. In SNMPv1 or v2c the community name is often used as a password. The Community Name can be any alphanumeric character string, from 1 to 39 characters in length, is case sensitive. Spaces are ignored.

Fields:

Symbol	Range	Description
O	Alphanumeric	Old Community Name
N	Alphanumeric	New Community Name

Note: The Default community name for SNMP get/walk functions "zyferrd". It is recommended that the Administrator change the community name for security purposes.

Note: This command is applicable for SNMPv1 and SNMPv2c on Ethernet I/O Modules 385-4090 only and can only be sent via a Telnet session. They have no effect in 385-4024 and 385-4038 Ethernet I/O Modules.

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00

Set Write/Set community name (input, 385-4090 only) WNMP

Command: $WNMP,O,N*<cr|lf>

Response: $WNMP: O Changed to N*<cs|cr|lf>

Description: The user can change the community name from the current default setting (zyferwrt) to a new community name for SNMPv1/v2c write (set) functions.

Fields:

Symbol	Range	Description
O	Alphanumeric	Old Community Name
N	Alphanumeric	New Community Name

Note: The Default community name for SNMP set functions is "zyferwrt". It is recommended that the Administrator change the community name for security purposes.

Note: This command is applicable for SNMPv1 and SNMPv2c on Ethernet I/O Modules 385-4090 only, and can only be sent via a Telnet session. They have no effect in 385-4024 and 385-4038 Ethernet I/O Modules.

Note: This command is only applicable through telnet to Ethernet I/O Module 385-4090. It has no effect on Ethernet I/O Modules 385-4024 and 385-4038.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00

Set/Read SNMPv3 security levels/options (385-4090 SNMPv3 only) SNMK

Command: $SNMK,l*

Response: $SNMK,l,u,ap,pp*<cs|cr|lf>

Description: Set/Read SNMPv3 MD5/SAH1 Username, authentication Passphrase and encryption Passphrase . In SMNPv3 security (both authentication and encryption) protocol options have been added. For authentication either MD5 or SHA1 is available. For privacy DES encryption is utilized. For each option a default Username, Authentication Passphrase, and Encryption Passphrase are provided.

Fields:

Symbol	Range	Description
l	0-4	security level, where: 0 = No Authentication /No encryption 1 = MD5 Authentication /No encryption 2 =/SHA1 Authentication /No encryption 3 = MD5 Authentication /DES encryption 4 =/SHA1 Authentication /DES encryption
u	Username	(level 0 default= nosecUser) (level 1 default=md5user) (level 2 default=shauser) (level 3 default=md5user) (level 4 default=shadesuser) Must be 1 characters minimum, 16 characters maximum
ap	Authentication Passphrase	(levels 1-4 default = authpass) Must be 8 characters minimum, 16 characters maximum
pp	Privacy Passphrase	(levels 3-4 default = privpass) Must be 8 characters only

Example: (Read) $SNMK,3*<cr|lf>

Response: $SNMK,3,md5desuser,authpass,privpass*<cs|cr|lf>

Description: The example Reads the current USERNAME, authentication PASSPHASE and privacy PASSPHRASE for security level 3 (MD5/DES).

Example: (Set) $snmk,3,newmd5desuser,new_auth,new_priv*<|cr|lf>

Response: $Setting in progress, Please wait...up to 15sec*<cs|cr|lf>

$SNMK,3,newmd5desuser,new_auth,new_priv*<cs|cr|lf>

Description: The example Sets a new USERNAME(newmd5desuser), authentication PASSPHASE(new_auth) and privacy PASSPHRASE(new_priv) for security level 3 (MD5/DES).

Description: Security level 0 (No Authentication /No encryption) is read only, get(read) is allowed, set(write) is not allowed. See the VACM command for security level inclusion(enable)/exclusion(disable).

Note: This command is applicable for SNMPv3 access on Ethernet I/O Modules 385-4090 only. Can only be sent via a Telnet session. It has no effect in 385-4024 and 385-4038 Ethernet I/O Modules.

View SNMPv3 Access Control Mode (385-4090 SNMPv3 only) VACM

Command: $VACM*<cr|lf>

Response: $VACM,m,e,as*2C

Response: The user view SNMP (v3 only) Access Control Mode setting. The VACM settings determine whether access to MIB objects are allowed, based on security levels. Each security level can be either 'included'(enabled) or 'excluded'(disabled), further an OID may be entered, and if 'included'(enabled) only MIB objects below the specified OID will be allowed. This will restrict the access to a subset of the managed objects.

Description: The Access Control Mode is the security level

Description: , used in conjunction with $VACM command to set security keys/ and access controls.

Fields:	**Symbol**	**Range**	**Description**
	m	0-4	security level, where: 0 = No Authorization/No encryption 1 = MD5 Authorization/No encryption 2 = SHA1 Authorization/No encryption 3 = MD5 Authorization/DES encryption 4 = SHA1 Authorization/DES encryption
	e	OID (40 max)	Starting point for inclusion (1 = all,default)
	as	ASCII string	"included" or "excluded" where: Included = Access from specified OID and above Excluded = No access allowed at this security level.

Example: (Read) $VACM,3*<cr|lf>

Response: $VACM,3,1,included*<cs|cr|lf>

Description: The example indicates that for level 3, all MIB objects (OID 1 and above) are allowed.

Example: (Set) $VACM,4,1,excluded*:cr|lf>

Response: $VACM,4,1,excluded*<cs|cr|lf>

Description: This example sets level 4 as disabled, or excluded from access..

Example: (Set) $VACM,2,1.3.6.1.4.1.9448.15,included*<cr|lf>

Response: $VACM,2,1.3.6.1.4.1.9448.15,included*<cs|cr|lf>

Description: This example sets level 2 with only ZYFER-MIB::CommsyncSys MIB objects included for access, excluding access to MIBII objects.

Note: This command is applicable for SNMPv3 on Ethernet I/O Modules 385-4090 only. Command an only be sent via a Telnet session. It has no effect in 385-4024 and 385-4038 Ethernet I/O Modules.

Note: This command is in effect as of the following versions of Ethernet firmware.
Ethernet Firmware 385-3095 V1.00.00

FEI-Zyfer MIB structure:

SNMPcommand IPAddress p OID.0 y z

The SNMP command will be either a get (to read) or a set (to write). The IP Address is the address of the Ethernet I/O Module (provided with the module or set by the user – see ETHx commands). The IP Address is followed by the required community name (public, zyferrd, or zyferwrt). The community name for an SNMP read access (get) is either "public" or "zyferrd". The community name for an SNMP write access (set) is "zyferwrt". The OID corresponds to commands from the section above. However, not all commands are available. See the SNMP Commands Table below for available OIDs. If performing a set, y would be the command syntax (such as s for string or i for integer) See the SNMP Commands Table for command syntax requirement. The final variable, z, would be the new value being sent in a set command. This value essentially corresponds to the command structures above. See the table below for command variables.

FEI-Zyfer MIB Structure:

zyfer	(enterprises 9448)
Commsync 2	(zyfer 15)
CommsyncSys	(Commsync2 1)
GTF	(Commsync2 2)
GTF1	(GTF 1)
GTF2	(GTF 2)
OutMod	(Commsync2 3)
NTPMod	(OutMod 1)
ModSMod	(OutMod 2)
TimeCodeMod	(OutMod 3)
ClockMod	(OutMod 4)
InputMod	(OutMod 5)
FreqMod	(OutMod 6)
HQMod	(OutMod 7)
N1Mod	(OutMod 8)
SMNPAgent	(Commsync2 4)

The table following table lists all available commands via the FEI-Zyfer custom MIB. They are listed by their associated OIDs. The column "r/w" indicates whether the command can be written or whether it is read only. The "Cnv" column lists the convention used. The conventions are S = string, I = integer, and G = gauge. For S, the response will be in quotation marks. Note that when sending a write command in string format, the quotation marks are not required. For I, the response will be a single digit. For G, the response will be a count.

SNMP Command table

SNMP COMMAND TABLE[1]										
1 CommsyncSys					3 OutMod					
Sys Status		r/w	Cnv	Notes	OutMods			r/w	Cnv	Notes
1.1	AGPS	r/w	S	2	3.1	NTPC*		r/w	S	
1.2	SSTA	r	S		3.2	MODS*		R	S	
					3.3	TCOD*		R	S	6
1.8	SPOS	r	S	3	3.3.2	TCOD2		r/w	S	7
					3.3…	TCOD…		r/w	S	7
1.17	TEMP	r	I		3.3.15	TCOD15		r/w	S	7
1.18	PRID	r	S							
1.19	VERK	r	S	4	3.4	CLKR*		R	S	6
1.20	NTLC	r	G		3.4.2	CLKR2		r/w	S	7
					3.4…	CLKR…		r/w	S	7
1.25	LEAP	r	S	3	3.4.15	CLKR15		r/w	S	7
1.26	TIME	r	S							
1.27	TIMM	r/w	S		3.5	INPC*		R	S	6
					3.5.1	INP0		r/w	S	8
					3.5.2	INP1		r/w	S	8
					3.6	FREQ*		R	S	6
					3.6.2	FREQ2		r/w	S	7
					3.6…	FREQ…		r/w	S	7
					3.6.15	FREQ15		r/w	S	7
					3.7	HQMod	HQTS*	R	S	6
					3.7.2	HQMod2	HQTS2	r/w	S	10
					3.7…			r/w	S	10
					3.7.15	HQMod15	HQTS15	r/w	S	10
					3.7.16	HQMod16	HQTC	R	S	6
					3.7.17	HQMod17	HQTC2	r/w	S	10
					3.7…			r/w	S	10
					3.7.31	HQMod31	HQTC15	r/w	S	10
					3.8.	N1Mod	CLKN*	R	S	6
					3.8.2	N1Mod2	CLKN,2,x	r/w	S	11
					3.8…	N1Mod		r/w	S	11
					3.8.15	N1Mod15	CLKN15,x	r/w	S	11
2 GTF										
GTF1		r/w	Cnv	Notes	GTF2		r/w	Cnv	Notes	
2.1.3	ANT1	r/w	I	3	2.2.3	ANT2	r/w	I	1,3	
2.1.4	MAG1	r/w	I	3	2.2.4	MAG2	r/w	I	1,3	
2.1.5	SIGP	r	S	3	2.2.5	SIGS	R	S	1,3	
2.1.6	AZL1	r	S	3	2.2.6	AZL2	R	S	1,3	
2.1.7	PMD1	r/w	S	3	2.2.7	PMD2	r/w	S	1,3	
2.1.8	POS1	r	S	3	2.2.8	POS2	R	S	1,3	
2.1.9	RSG1	r/w	S	3	2.2.9	RSG2	r/w	S	1,3	
2.1.11	DIS1	r/w	S	3	2.2.11	DIS2	r/w	S	1,3	
2.1.12	DIV1	r/w	I		2.2.12	DIV2	r/w	I	1	
2.1.13	DACP	r	I		2.2.13	DACS	R	I	1	
2.1.14	TMD1	r	I		2.2.14	TMD2	R	I	1	
2.1.15	TMR1	r	I		2.2.15	TMR2	R	I	1	
2.1.17	TMP1	r	I		2.2.17	TMP2	R	I	1	
2.1.18	PRD1	r	S		2.2.18	PRD2	R	S	1	
2.1.19	VER1	r	S		2.2.19	VER2	R	S	1	
2.1.20	NTL1	r	G		2.2.20	NTL2	R	G	1	
2.1.25	PST1	r	S	9	2.2.25	PST2	R	S	1,9	
2.1.26	CVS1	r	S	9	2.2.26	CVS2	R	S	1,9	
2.1.27	SVS1	r	S	9	2.2.27	SVS2	R	S	1,9	

*not available in 385-4090

Notes:

[1] For non-redundant CommSync II systems or for GSync systems, use Sys Status commands, OutMods commands, and GTF1 commands. GTF2 commands have no effect in GSync systems.

[2] For non-redundant CommSync II systems or for GSync systems, this is a read-only command.

[3] These commands are for GPS-based systems. Distribution systems do not use these commands.

[4] Use this command if KeyPad/Display is present. The command will be ignored if no KeyPad/Display is installed.

[5] This command is currently used only in redundant, DTF-based CommSync II systems.

[6] This command functions precisely as the read-only version associated with it. See commands associated with slot numbers for specific information of the module in a given slot.

[7] This command functions as the command followed by a comma and a slot number. e.g., the CLKR4 command in this table is equivalent to $CLKR,4* via serial communications. See the CLK serial command for more information.

[8] The INP0 command functions the same as the $INPC,0* command. The INP1 command functions the same as the $INPC,1* command.

[9] These commands are used for PPS specific functions within the SAASM-based systems.

[10] This command functions as the command followed by a comma and a slot number. e.g., the HQTx4 command in this table is equivalent to $HQTx* via serial communications. See the HQTC, and HQTS serial commands for more information.

[11] This command functions as the command followed by a comma and a slot number. e.g., the CLKN4,x command in this table is equivalent to $CLKN,4,x* via serial communications. See the CLKN serial command for more information.

UpDate system firmware(Input, 385-4038/385-4090/385-4097) UPLD

Command: $UPLD,Host,Filename,T*<cr|lf>

Response: $UPLD,Host,Filename,T*<cs|cr|lf>

Description: Runs Remote Upload functions to upgrade GTF/DTF and KDC firmware

Fields:	**Symbol**	**Range**	**Description**
	Host	xxx.xxx.xxx.xxx	TFPT server IP address
	Filename	ACSII string	Filename of download file
	T	1,2, or K	1, 2 = specific GTF K = KeyPad Display (KDC) E = 385-4090/4097 Ethernet Module only

Note: The 385-4038 firmware is upgraded with the AutoUpdate utility.

Note: See TFTP Remote UpGrade Instructions (385-8088) for specific instructions

Note: If passwords are enabled, only the administrator user can perform the TFTP remote system upgrade, This function is not available to other telnet users.

Description: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3022	V1.39.00
SAASM Firmware 385-3021	V1.37.00
GTF Firmware 385-3022	V1.14.00
Mk IV GTF Firmware 407-3001	V1.01.00
Mk IV SAASM Firmware 407-3002	V1.01.00
Mk IV SAASM Firmware 407-3003	V1.00.00
Ethernet Firmware 385-3044	V1.15.00 (385-4038)
Ethernet Firmware 385-3095	V1.00.00 (385-4090)
Ethernet Firmware 385-3114	V1.00.00 (385-4097)

They have no effect in Ethernet I/O Module 385-4024.

UpDate system firmware controls(Input) UPLD

Command: $UPLD,Cmd,T*<cr|lf>

Response: $UPLD,Cmd,T*<cs|cr|lf>

Description: Used to Abort Upload, or Run GTF/DTF after Abort.

Fields:	**Symbol**	**Range**	**Description**
	Cmd	ABORT or RUN	ABORT or RUN only
	T	1,2, or K	1, 2 = specific GTF K = KeyPad Display (KDC)

Note: If Upload has been started, the $UPLD,ABORT* command will cause the upload function to stop. This will leave the target module in the BOOT state.

Note: If the Target module is in the boot state, the $UPLD,RUN,T* (T=target module) command will restart the target firmware.

Note: See TFTP Remote UpGrade Instructions (385-8088) for specific instructions

PPS (SAASM) Commands **

The following commands are used for PPS specific functions within the SAASM versions of the GTF modules (385-4002, 385-4102, 407-4102, 391-5xx, and 401-5xx) (containing SAASM PPS GPS receiver).

Antenna Enable/Disable ** (Input/output) **ANB1/ANB2**

Command: $ANB1,a,b*<cr|lf>

Response: $ANB1,a,b*<cs|cr|lf>

Description: Read/Set the GPS PPS to use L1 or L2 signals.

Note: If an L1 only GPS antenna is used it is recommended that the L2 antenna signal be banned.

Fields:	**Symbol**	**Range**	**Description**
	a	0,1,x	L1 signal control, where; 0 = Disable L1 tracking 1 = Enable L1 tracking x = no change
	b	0,1,x	L2 signal control, where; 0 = Disable L2 tracking 1 = Enable L2 tracking x = no change

Command: $ANB1,1,0*<cr|lf>

Response: $ANB1,1,0*<cr|lf>

Description: Sets the SAASM receiver to ban L2 signal reception

Command: $ANB2*<cr|lf>

Response: $ANB2,1,1*<cs|cr|lf>

Description: This command polled GTF#2 and reported that both L1 and L2 signals were enabled.

Note: If SAASM reciever is to be used with an L1 antenna, with the keys loaded (tracking Y code) it is recommended that the L2 signal reception be banned with the $ANB1,1,0* command.

Note: $ANBn,0,0* (Disable both L1/L2) is an invalid command and will result one or both L1 or L2 being enabled. It is not recommended for normal use.

Note: For GSync or non-redundant CommSync II system, use the ANB1 command. The ANB2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021	V1.07.00
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

PPS initialization command (Input)** **DRY1/DRY2**

Command: $DIRn,C,D*<cr|lf>

Response: $DIRn,C,D*<cs|cr|lf>

Description: Read/Set the GPS PPS receiver to specific acquisition modes.

Fields:	**Symbol**	**Range**	**Description**
	n	1-2	1=GTF #1, 2=GTF#2
	C	0-TBD	Command level, where; 0 = No change 1 = Set Receiver to Navigation 2 = Set Receiver to Init/Stand-by
	D	0-2	Anti-Spoof Mode 0 = A/S OFF 1 = A/S ON (mixed P-Y) 2 = A/S ON (Y-only)

Example: $DRY1,1,0*<cr|lf>

Response: $DRY1,1,0*<cs|cr|lf>

Description: Will set the SAASM receiver to navigation mode, with anti spoof turned off on GTF#1. This is the default mode, for tracking C/A signal.

Example: $DRY2,1,1*<cr|lf>

Response: $DRY2,1,1*<cs|cr|lf>

Note: Will turn on anti-spoof modes (for Mixed P-Y signals) on GTF#2.

Note: For GSync or non-redundant CommSync II system, use the DRY1 command. The DRY2 command has no effect.

Note: The default state for the Trimble Force22 receiver is A/S off, the default state for the Rockwell MPE-S receiver is A/S on.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021	V1.07.00
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

Hot Start Enable command (Input) **ENH1/ENH2**

Command: $ENHn,x*<cr|lf>

Response: $ENHn,x*<cs|cr|lf>

Description: Enable Hot Start sequence (See 385-8006 Hot Start Procedure for details).

Fields:	**Symbol**	**Range**	**Description**
	n	1-2	1=GTF #1, 2=GTF#2
	C	0-1	Command level, where; 0 = Disable Hot Start 1 = Enable Hot Start Sequnce

Example: $ENH1,1*<cr|lf>

Response: $ENH1,1*<cs|cr|lf>

Description: Will set the GTF with the SAASM receiver to Hot Start sequence, If required will set the SAASM receiver to INIT mode to receive Time, Position, and Almanac parameters from and external source, such as a PLGR

Note: See Hot Start Procedure document (385-8006) for more information.

Note: ENH1 and ENH2 commands are to be used through the I/O port (rear panel).

Note: For GSync or non-redundant CommSync II system, use the ENH1 command. The ENH2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021	V1.34.00
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

PPS receiver Status (Output)** **PSTA/PST1/PST2**

Command: $PST1*<cr|lf>

Response: $PST1,A,G,P,S,t,a,p*<cs|cr|lf>

Description: Outputs the current status of the PPS GPS receiver.

Fields:	**Symbol**	**Range**	**Description**
	A	0-4	Anti-Spoof mode 0 = Anti-Spoof Off (C/A) 1 = Anti-Spoof On (Mixed P-Y) 2 = Anti-Spoof On (Y only)
	G	0-6	GPS/Receiver Mode 0 = Reset Mode 1 = Initialize Mode 2 = Navigate/Acquisition Mode 3 = StandBy Mode 4 = Navigate/not ready 5 = Navigate 6 = Navigate/Outage
	P	0-5	GPS/PPS mode 0 = PPS off (Tracking C/A) 1-4 = Invalid 5 = PPS GPS (Tracking C/A, P-Y)
	S	0-2	CV Keyload Status 0 = No Key Loaded 1 = Valid Key Loaded 2 = Key Loaded/Need validation 3 = KDP Faulted
	t	0-1	Valid Time, 0 = not valid
	a	0-1	Valid Almanac, 0 = not valid
	p	0-1	Valid Position, 0 = not valid

Example: $PST1*<cr|lf>

Response: $PST1,0,5,5,1,1,1,1*<cs|cr|lf>

Description: The above message is reporting Anit-spoof is off (default), in nav mode, PPS, with a valid key, and has valid time, almanac, and position.

Response: $PST1,0,5,0,0,1,1,1*<cs|cr|lf>

Description: The above message is reporting Anit-spoof is off (default), in nav mode, PPS is off, there is no key loaded, and has valid time, almanac, and position.

Note: For GSync or non-redundant CommSync II system, use the PST1 command. The PST2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021	V1.07.00
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

Satellite Signal Status** (Output) SVS1/SVS2

Command: $SVS1*<cr|lf>

Command: $SVS2*<cr|lf>

Response: $SVS1,S,A,D,C,S,A,D,C … … … … … ,S,A,D,C *<cs|cr|lf>

Description: Outputs satellite PRN, Acquisition Status, Downlink Frequency, and GPS code type.

Fields:	**Symbol**	**Range**	**Description**
	S	00 - 32	Satellite PRN number
	A	0-6	Acquisition Status, where 0 = Never Acquired 1 = Search 2 = Acquired 3 = Temporary loss of track 4 = SV tracking lost 5 = Fail to Acquire 6 = diagnostic
	D	0 - 3	Down-Link Frequency. Where: 0 = L1 1 = L2 2 = L1 (primary) L2 (secondary) 3 = L2 (primary) L1 (secondary)
	C	0 - 2	GPS code type. Where: 0 = C/A code 1 = P code 2 = Y code

Note: For GSync or non-redundant CommSync II system, use the SVS1 command. The SVS2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021	V1.07.00
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

CV/KDP Status** (Output) CVS1/CVS2

Command: $CVSn*<cr|lf>

Response: $CVSn,K,A,S,M,hh,V,T,nn,a,c,r,m*<cs|cr|lf>

Description: Outputs the current status of the CV/KDP status of the PPS GPS receiver. Outputs whenever there is a change in any status field.

Fields:

	Symbol	Range	Description
n	1-2	1=GTF #1, 2=GTF#2	
K	0-2	key_status	Force22 <V2.13 0 = None, 1 = Insufficient, 2 = Ok Force22 >V2.13/MPE-S :N/A(See Note Below)
A	0,1	alert_status,	Force22 <V2.13 0 = CV/MD OK, 1= about to expire Force22 >V2.13/MPE-S :N/A(See Note Below)
S	0-6	auth_status	0 = Unknown 1 = Invalid 2 = No Key 3 = CVw/GUV loaded, but no CVd yet 4 = CVd is present 5 = Nav Data still needed, no CVd yet 6 = CVd in use, but new Nav needed soon
M	0-2	md_status	0 = CVRMDZ not set (Typical, default) 1 = N/A 2 = Specified but could not be changed
hh	0-FFFF	number of hours until CVRMDZ expires (FFFF = CVRMDZ not set)	
V	0-5	verify_status; Force22 <V2.13, Force22 >V2.13/MPE-S :N/A(See Note Below)	0 = No CVw/GUV key 1 = Have keys but no CVd yet 2 = Have keys but CVd incorrect 3 = Have CVd but unverified 4 = Have CVd but verification failed 5 = Have CVd and verification passed
T	0-4	key_type;	Force22 <V2.13 Force22 >V2.13/MPE-S :N/A(See Note Below) 0 = None 1 = UnKnown 2 = CVw(s) 3 = GUV 4 = CVws) & GUV
nn	0-FF	number_of_CVds	Force22 <V2.13; GUV = 0-2 CVds Force22 >V2.13/MPE-S :N/A(See Note Below)
a	0-1	key_alert_status, set when new CVw/GUV to expire; Force22 >V2.13 :N/A	
c	0-1	CVd_alert_status, set when the CVd to expire; Force22 >V2.13/MPE-S :N/A	
r	0-1	mdz_alert_status, set when RMDZ/NRMDZ to expire; Force22 >V2.13 :N/A	
m	0-1	md_alert_status, set when the CV Mdur to expire; Force22 >V2.13/MPE-S :N/A	

Note: For GSync or non-redundant CommSync II system, use the CVS1 command. The CVS2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021:	V1.07.00
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

Note: Note (Force22 >V2.13/MPE-S:N/A) In units with GTF Firmware V1.34.00 or greater, and Trimble Force22 firmware >V2.13 or Rockwell MPE-S receiver this parameter has been deleted

SAASM Block1 and Block2 data** (Output) SAB1/SAB2

Command: $SABn*<cr|lf>

Response: $SABn,K,P,A,G,KF,B,s,z,D,F ,O,w,g,Cw1…Cw12,Lw,GI1,GI2,CS,o1…o5* <cs|cr|lf>

Description: Outputs the current SAASM Block 1 and Block 2 status PPS GPS receiver.

Fields:	Symbol	Range	Description
	n	1-2	1=GTF #1, 2=GTF#2
	K	0-1	have_key; 1 = KDP loaded with CV(s), Force22 >V2.13/MPE-S :N/A
	P	0-1	PPS_mode, 0 = C/A mode; 1 = in PPS mode
	A	0-1	key_sufficient; 1 = True, Force22 >V2.13/MPE-S :N/A
	G	0-2	GUV_user, 0="N/A", 1="Yes", 2="No" /MPE-S :N/A
	KF	0-16535	kdp_failure_cnt /MPE-S :N/A
	B	0-5	KDP_status; /MPE-S :N/A 0="UNKNOWN/ILLEGAL" 1="NOT INITIALIZED" 2="ZEROIZED" 3="ALARM" 4="STUCK" 5="OK" (Nominal)
	s	0-1	any_zeroize_failure /MPE-S :N/A
	z	0-1	zeroize_failure /MPE-S :N/A
	D	0-3	data_port_status; /MPE-S :N/A 0="No CV entry since KDP was initialized", 1="Good CV entry", 2="CV with bad parity entry", 3="Invalid CV entry"
	F	0-3	fill_port_status; /MPE-S :N/A 0="No CV entry since KDP was initialized", 1="Good CV entry", 2="CV with bad parity entry", 3="Invalid CV entry"
	O	0-3	OTAR_entry_status /MPE-S :N/A 0="No CV entry since KDP was initialized", 1="Good CV entry", 2="CV with bad parity entry", 3="Invalid CV entry"
	w	0-12	num_CVw /MPE-S :N/A
	g	0-2	num_GUV /MPE-S :N/A
	Cw	0-1023	CVw_week[12 entries](-1 if CVw not loaded)
	Lw	0-1023	Last_CVw_week (-1 if CVw not loaded)
	GI1	00-FFFF	GUV1_issue/status (FFFF = no GUV)
	GI2	00-FFFF	GUV2_issue/status (FFFF = no GUV)
	CS	0-7	CVd_status; /MPE-S :N/A 0="CVD IN USE", 1="CVD SPARE 1", 2="CVD SPARE 2", 3="NO CVD NO SF", 4="NO CVD OLD SF", 5="NO CVD WRONG CVW", 6="NO CVD WRONG GUV", 7="NO CVD NO KEY"
	o	ZTime_t	OTAR_load_slots[5 groups, 2 fields each](Note fields in hex) /MPE-S :N/A

Note: For GSync or non-redundant CommSync II system, use the SAB1 command. The SAB2 command has no effect.

Note: Note (Force22 >V2.13/MPE-S:N/A) In units with GTF Firmware V1.34.00 or greater, and Trimble Force22 firmware >V2.13 or Rockwell MPE-S receiver this parameter has been deleted

SAASM Receiver Version ** (Output) SVR1/SVR2

Command: $SVR1*<cr|lf>

Response: $SVR1*,CA,BR,SG,SY,SR,ksn,h,s,v,C,U,S*<cs|cr|lf>

Response: Outputs SAASM receiver firmware and hardware versions.

Fields:

Symbol	Range	Description
CA	vv.vv mm/dd/yy	Receiver Core app firmware and date
BR	vv.vv mm/dd/yy	** Force22 ≤V2.11:Receiver BOOT Code Firmware version ** Force22 >V2.13/MPE-S:N/A
SG	vv.vv mm/dd/yy	**Force22 ≤ V2.11:N/A SAASM (Green) Firmware version ** Force22 >-V2.13/MPE-S:N/A
SY	vv.vv mm/dd/yy	** Force22 ≤-V2.11: SAASM (Yellow) Firmware version ** Force22 >-V2.13/MPE-S:N/A
SR	vv.vv mm/dd/yy	** Force22 ≤-V2.11: SAASM (Red) firmware version ** Force22 >-V2.13/MPE-S:N/A
ksn	sssssss	KDP Serial number
h	hh	KDP Hardware type (0=KDP,2=KDP 2)
s	ab	SAASM Firmware type (1=DTSW, 3=OPSW)
v	vvvv	SAASM Firmware version
S	ssss	SAASM Type (Crypto net)

Example: ** Force22 <2.13: $SVR2,2.08 3/07/03,4.02 3/07/03,02.08.000 Mar 7 2003 13:22:07,02.08.000 Mar 7 2003 13:21:36,02.08.000 Mar 7 2003 13:21:05,0000150,2,03,0101,0004*

Example: ** Force22 >2.13: $SVR2,2.19 U Dec 15 2005, 0002485,2,03,0101,0004,872,0004*

Example: ** MPE-S: $SVR1,091-2744-001,07021024003,2,03,0101,0004*6E

Note: For GSync or non-redundant CommSync II system, use the SVR1 command. The SVR2 command has no effect.

Note: This command is in effect as of the following versions of applicable firmware.

GTF Firmware 385-3021:	V1.07.00
Force22 >2.13: GTF Firmware 385-3021	V1.34.00.
Mk IV GTF Firmware 407-3002	V1.01.00
Mk IV GTF Firmware 407-3003	V1.00.00

Note: Note (>FORCE22-V2.13:N/A) In units that contain Hot Start Feature, with GTF Firmware V1.34.00 or greater, and SAASM Force22 firmware V2.13 or greater these fields have been deleted

Index of Commands by Function

System monitor and control functions:

AGPS	Online GTF/DTF Module (1 or 2).
BEEP	Beep (On/Off) KDC control
INPC	I/O External Input Module configuration
EXTD	System External 1 PPS delay adjustment
DIS1/DIS2	Internal/External Discipline control
DIV1/DIV2	IExternal Discipline Frequency selecction
LOCK	Lock Keypad (On/Off) KDC control
IRGC	Control for IRIG input
MANM	Manual Time Mode, sets both modules.
TIME	Time output
TIMM	Time Mode, sets both modules.
LEAP	GPS / UTC Time Difference
NTL1, NTL2	Not Time-Lock Counter
PRD1, PRD2	Product Identification
SSTA	System Status message
TMP1, TMP2	Internal Temperature monitor
UNSL	Set or Clear Unsolicited Flag
VER1, VER2, VERK	Get Current Firmware Version
YEAR	Set Year, for non GPS systems

Module Specific commands:

CLKN	N.1 Module Control
CLKR	Clock Rate Module Control
DNTI	Dual NTP Module IP Address
DNTG	Dual NTP Module Gateway Address
DNTM	Dual NTP Module NetMask
DNTV	Version of Dual NTP Module Firmware
FREQ	Frequency Synthesizer command
HQTC	Have Quick Module Clock Enable
HQTS	Have Quick Module HQ Format
IRGM	Mode of IRIG output.
PHAC	Phase Aligned LPN Output module calibration
TCOD	Time Code Output Module Control

Frequency Discipline monitor:

TMD1,TMD2	Time difference, filtered
TMR1,TMR2	Time difference, raw
DACP, DACS	DAC Monitor

GPS receiver monitor and control functions:

ANT1, ANT2	Antenna Cable Delay
MAG1, MAG2	Antenna Mask Angle
DAFR	Antenna Fault Reporting enable/disable
GPSE	GPS Engine Type/Version
PMD1, PMD2	Position Mode (S,K,D)
POS1, POS2	Position, Latitude/Longitude and Elevation
SIGP, SIGS	Satellite Signal quality
AZL1, AZL2	Azimuth and Elevation
RSG1, RSG2	Reset GPS receiver
VEL1, VEL2	Velocity Output

PPS GPS Specific monitor and control functions:

ANB1, ANB2	L1/L2 Antenna selection
DRY1/DRY2	PPS initialization
ENH1/ENH2	SAASM Hot Start enable
PSTA/PST1/PST2	PPS receiver Status
SVS1/SVS2	PPS Satellite Signal Status
CVS1/CVS2	Crypto-Variable Status
SBD1/SBD2	SAASM Block data
SVR1/SVR2	SAASM Receiver Firmware Version

Ethernet-specific functions:

ETHI	Ethernet IPv4 Address (385-4038/385-4090 only)
ET6I	Ethernet IPv6 Address (385-4090 only)
ETHG	Ethernet IPv4 Gateway Address (385-4038/385-4090 only)
ET6G	Ethernet IPv6 Gateway Address (385-4090 only)
ETHM	Ethernet IPv4 NetMask (385-4038/385-4090 only)
ET6M	Ethernet IPv6 NetMask (385-4090 only)
ETHT	Ethernet Trap IPv4 Address (385-4038/385-4090 only)
ETHV	Version of Ethernet Firmware
PSWC	Ethernet Password Control (385-4038/385-4090 only)
ADMC	Change Admin name/password
PSWD	Change Ethernet Password (385-4038/385-4090 only)
USRA	Add User (385-4038/385-4090 only)
USRD	Delete User (385-4038/385-4090 only)
USRL	List Users (385-4038/385-4090 only)
NCON	TELNET/SSH Enable/Disable
EXIT	Terminate Telnet session (385-4038/385-4090 only)
ECHO	Enable/Disable character echo (385-4038/385-4090 only)
NTPC	NTP time source control (385-4038/385-4090 only)
NTPK	Read MD5 Key Table (385-4038/385-4090 only)
NTPI	Set/Modify MD5 Key Table (385-4038 only)
NTKA	Add/Modify MD5 Key (385-4090 only)
NTKD	Delete MD5 Key (385-4090 only)
NTPJ	Set/Read NTP Peer Address (385-4038/385-4090 only)
NTPM	Set/Read NTP Mode (385-4038)
NTPO	Set/Read NTP Mode (385-4090)
NTPB	Set/Read NTP broadcast mode (385-4090)
NTBI	Set/Read NTP IPv4 broadcast address (385-4090)
NB6I	Set/Read NTP IPv6 broadcast address (385-4090)