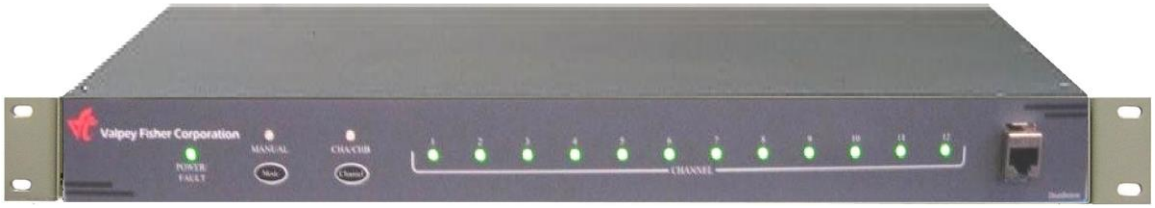
Precise Time and Frequency, Inc

ptf Distribution Amplifiers

with Remote Monitor/Control

(*ptf* 1203C-MC, 1204A-MC, 1205A-MC)

Operation and Maintenance Manual



Document #	11445
Revision	C

Certificate of Conformance

This certificate confirms that the following equipment:

Unit type: Distribution Amplifier with Remote M/C Interface

Serial Number: 911-01782-01

has successfully passed a FINAL ACCEPTANCE TEST and conforms in all respects of form, fit, and function to current specifications, including regulatory requirements and certifications.

Inspected and verified by: Date:

Julie Sawyer 01/19/2024

For Precise Time and Frequency, Inc

Declaration of Conformity

This certificate confirms that the following equipment:
Unit type: Distribution Amplifier with Remote Monitor/Control Interface
is in conformity with the relevant provisions of the following standard(s)
or other normative document(s):

EU EMC Directive 89/336/EEC:

EN55022	Limits and methods of measurements of radio disturbance characteristics of information technology equipment
EN61000-3-2 (2001)	Limits for harmonic current emissions (equipment input current up to and including 16A per phase)
EN61000-3-3 (1995)	Limitation of voltage fluctuations/flicker in low voltage supply systems for equipment with rated current # 16A
EN55024 (1998)	Information technology equipment – immunity characteristics - Limits and methods of measurement
EN61000-4-2 (1995)	Electrostatic discharge immunity
EN61000-4-3 (1997)	Radiated, radio frequency, electromagnetic field Immunity
EN61000-4-4 (1995)	Electrical fast transient/burst immunity
EN61000-4-5 (1995)	Surge Immunity
EN61000-4-6 (1996)	Immunity to conducted disturbances, induced by radio frequency fields
EN61000-4-8 (1994)	Power frequency magnetic field immunity
EN61000-4-11 (1994)	Voltage Dips, short interruptions and voltage variations immunity

EU Low Voltage Directive 72/23/EEC:

EN 60950-1 (2000)	Safety of Information Technology Equipment, including electrical business equipment

RoHS
EU ROHS directive compliance according to Directive 2011/65/EU

Introduction

Congratulations on your purchase of a ptf Distribution Amplifier with remote monitor and control interface!

This product meets the highest standards of quality and reliability, and Precise Time and Frequency, Inc wants to insure that you enjoy the maximum benefits and functionality that this unit can provide.

The technology within this unit uses the decades of experience in time and frequency applications of our engineering team, to provide a unit that is highly advanced, and gives a very powerful feature set in an inexpensive and compact package,

Operation of the unit is straightforward and the contents of this manual are designed to provide a basic understanding of the product, set-up and functionality, and procedures for maintenance and repair.

If you have any questions or concerns, please do not hesitate to contact our technical service department who will be pleased to provide assistance.

Please help us to live up to our stated objectives, our company motto is:

KNOW THE NEEDS AND EXPECTATIONS OF YOUR CUSTOMER…THEN DELIVER!

Once again, thank you for purchasing our product, and we look forward to you utilizing Precise Time and Frequency, Inc. for your future time and frequency instrumentation needs.

President
Precise Time and Frequency, Inc.

50L Audubon Road, Wakefield, MA 01880
Tel: (+1) 781 245 9090 Fax: (+1) 781 245 9099 e-mail: info@ptfinc.com www.ptfinc.com

CONTENTS

1. *ptf* 1203C-MC, 1204A-MC, 1205A-MC Distribution Amplifiers - Technical Overview

The ptf distribution amplifiers with remote monitor/control, come in three basic formats according to the application requirements and ordered options.

The Remote Monitor and Control interface can mange up to 36 outputs, however in the ptf 120X-MC application only 12 of the possible 36 outputs are implemented, under firmware control.

Remote monitoring and control is provided on Ethernet (Telnet/HTTP/SNMP) interfaces or an RS232C serial interface. The outputs types are preselected in firmware according to the model, either RF, Digital, or IRIG B.

Outputs are labeled 1 through 12. Each of the different distribution types is described below.

1.1. *RF Distribution*

The ***RF Distribution*** uses at its heart an RF design combining the latest technology in low noise components, with decades of experience in low noise layout design, to buffer high quality input signals while preserving the integrity and purity of input signal by minimizing any phase noise addition.

The unit uses two stages of input signal buffering to distribute the input signal to the separate outputs and insure maximum isolation between individual output signals.

In most applications the phase noise capability of the ***ptf RF Distribution*** will outperform the input signal performance to such a degree that no additive phase noise will be noticeable on the outputs.

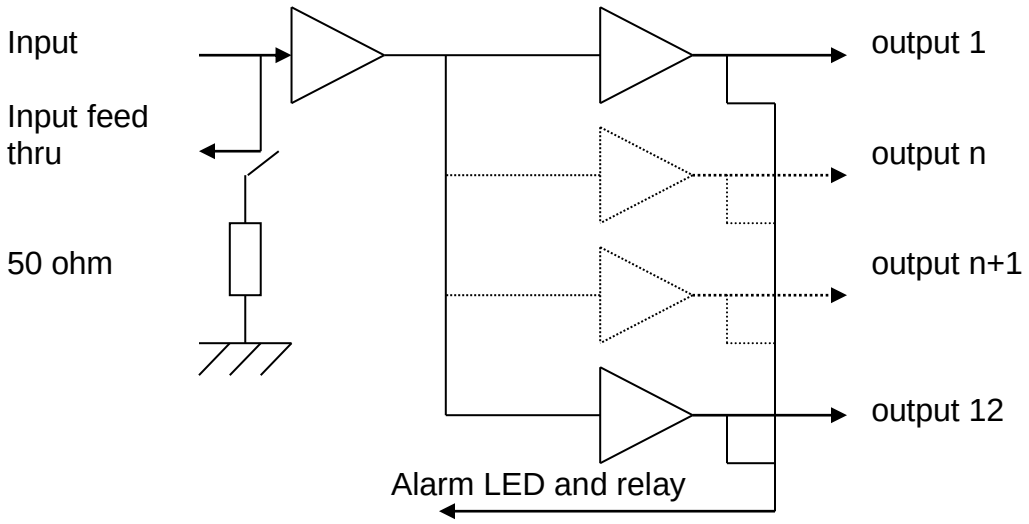


Figure 1. ***ptf RF Distribution*** Schematic

1.2. *ptf RF Distribution* - Specifications

Note: For specifications on the Remote Monitoring/Control Interface refer to section 5.

1.2.1. Electrical

RF Output

Frequency Range 900kHz to 50MHz

Level 1V rms (nominal)

Harmonic Distortion <-40 dB

Non-Harmonic Signals <-80 dB

Load Impedance 50.

Isolation >90 dB*

Connectors BNC

Additive SSB Phase Noise

(1 Hz bw) Offset from carrier

1 Hz	-120 dB
10 Hz	-135 dB
100 Hz	-145 dB
1,000 Hz	-155 dB
10,000 Hz	-160 dB

RF Input

Frequency Range 900kHz to 20MHz

Level 1 V rms (nominal)

1.3. **Digital Distribution**

The ***Digital Distribution*** uses at its heart an electronic design benefiting from the latest technology in high performance components. Through decades of timing design experience, the ptf team is able to reproduce precision pulse input signals with the minimum of propagation delays.

The unit uses two stages of input signal buffering to distribute the input signal to the separate outputs and ensure maximum isolation between individual output signals.

Particular attention has been given to insuring virtually no differential propagation delays between channels, resulting in channel-to-channel output coherence in the order of 2ns.

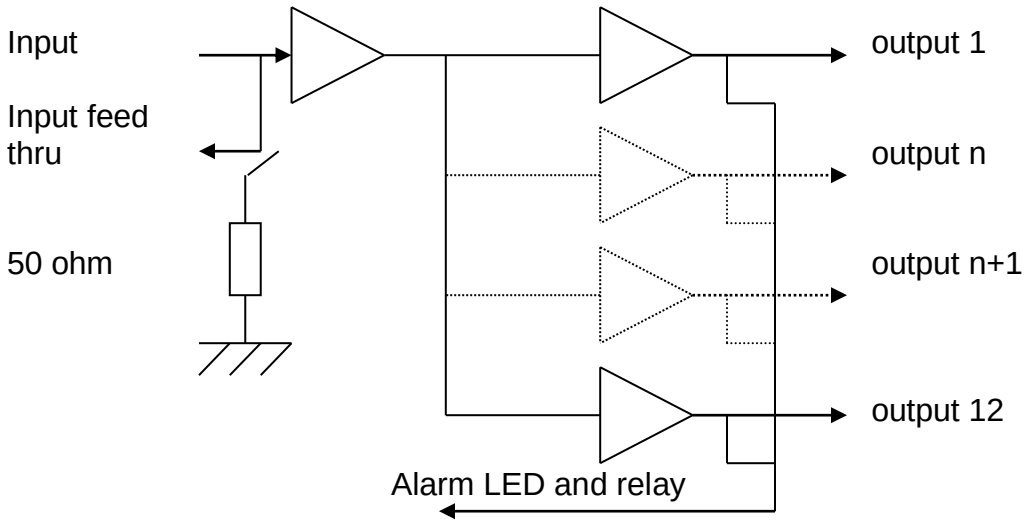


Figure 2. ***ptf Digital Distribution*** Schematic

1.3.1. Digital Distribution - Specifications

1.3.2. Electrical

Digital Output

Pulse Rate Range 1 pulse per hour to 1,000,000 pulses per second

Level 5V logic (under load)

Load Impedance 50 ohms.

Connectors BNC

Maximum Alarm setting

1.5 seconds between pulses

Pulse Input

Pulse Rate Range 1 pulse per hour to 1,000,000 pulses per second

Level 5 V logic (tolerant up to 10V)

Impedance 50 ohms

1.4. **IRIG B Distribution**

The ***IRIG Distribution*** uses a basic RF design of low noise components, with careful layout, to buffer the IRIG B (am) input signals. If distribution of IRIG B DCLS is required, the Digital Distribution design should be used.

The unit uses two stages of input signal buffering to distribute the input signal to the separate outputs and ensure maximum isolation between individual output signals.

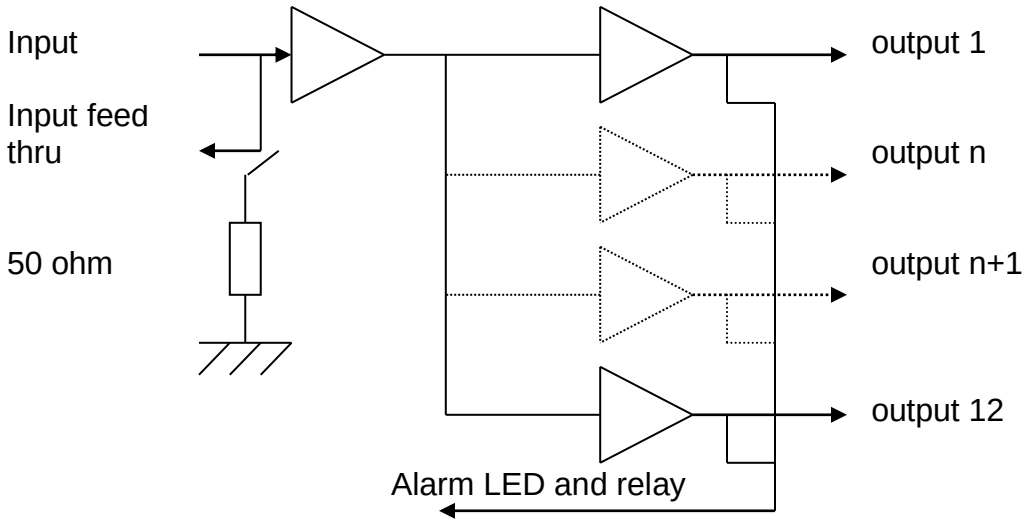


Figure 3. ***ptf IRIG Distribution*** Schematic

1.5. IRIG B Distribution - Specifications

1.5.1. Electrical

Time Code Output

Code Format	IRIG-B
Modulation Frequency	1kHz
Modulation Ratio	3:1
Amplitude	≤3V P-P into 50 Ω 50Ω source impedance
Connectors	BNC

Time Code Input

Code Format	IRIG-B
Modulation Frequency	1kHz
Modulation Ratio	3:1
Amplitude	≤3V P-P
Impedance	50Ω /Hi Z switch (50KΩ)

2. General Specifications (All Distribution Modules)

2.1.1. Alarm Output (one per chassis)

Summary alarm indicates failure of any output signal
Non-alarm condition: Relay energized (fail safe)
Connector: 9 pin D-male

Alarm Indicator	Red LED on Front panel

2.1.2. Power Input

Standard AC power input:

Input voltage	85 to 264 V AC
Input Frequency range	45 to 65 Hz
Power Indicator	Green LED on Front Panel

2.1.3. Dimensions

Chassis	Height 3.5 Inches. (2U) Width 17 Inches (19 inch rack mounting) Depth 12 Inches Maximum.

2.1.4. Weight

Chassis	< 15 pounds

2.1.5. Environmental

Operating Temp:	-0 C to +55 C
Humidity	to 95% RH non-condensing

3. Monitor / Control Interfaces

The monitor and control interface allows full remote monitoring of input and output status for the distribution products. The unit is pre-configured to monitor 12 channels simultaneously. There is also a capability to control an option input auto switch.

The remote monitor/control interface allows selection (activation/de-activation) of individual inputs/outputs so that only those inputs/outputs being used will generate remote system alarms etc. In addition, the interface allows selection (activation/de-activation) of complete pcb assemblies for remote monitoring/control.

Monitoring and control of unit functionality is available through the following interfaces.

Local: Front panel, by means of LED indicators.
RS 232: Intended primarily for local use, accessed via a rear panel 9 pin D connector
Ethernet - 100 Base-T Ethernet , accessed via a rear panel RJ-45 jack including; Telnet: TCP/IP, HTTP web browser. SNMP: UDP

3.1. RS 232 Connections

The RS 232 connections are on the 9 pin D connector.

pin 2 Transmit pin 3 Receive pin 5 Ground

Default baud rate is 57600, 8 data,no parity, 1 stop bit, no hardware handshaking

3.2. Telnet

3.2.1. Command Format

The telnet interface is designed as a machine interface, and therefore characters sent to the unit are not echoed as this imposes undue difficulties on the transmitting device. If using telnet manually from a computer application such as HyperTerminal, it is recommended to set "local echo" on. Command format is of the form:

[Command][Space][Data][Enter]

Where;

Command is in the form DXX e.g. D01
Space is ASCII 32(decimal)
Data can be numbers, or characters according to the command
Enter is line feed/CR combination (ASCII 10 dec. and 13 dec.)

All entered characters are converted internally to UPPER CASE, therefore either upper or lower case characters can be used

There are also several special commands that are of the form;
[Command][Enter]
e.g. the Status command.

Available commands are shown in section 3.1.3

In addition typing;

[HELP][SPACE][COMMAND][ENTER]

or typing

[COMMAND][SPACE][?][ENTER]

Will display additional help information on the selected command.

3.2.2. Login

To login to the unit via the telnet interface, it is necessary to provide a user name and password. The default user name is **admin**. The password can be numbers only and the default password is **123456**.

3.2.3. Commands

Command	Description	Type	Range	Comments
D01	Auto-switch #1 Channel	String	Backup, Primary	
D02	Mode #1	String	Auto, Manual	
D03	Auto-switch #2 Channel	String	Backup, Primary	
D04	Mode #2	String	Auto, Manual	
D05	Auto-switch #3 Channel	String	Backup, Primary	
D06	Mode #3	String	Auto, Manual	
D07 to D16	Reserved			
D17	Date	String	MM/DD/YYYY	Only valid dates
D18	Time	String	HH:MM:SS	24 hour format
D19	IP	xxx.xxx.xxx.xxx	IP address	Default: 10.10.20.49
D20	NET MASK	xxx.xxx.xxx.xxx	Net Mask	Default: 255.255.255.0
D21	GATEWAY	xxx.xxx.xxx.xxx	Gateway	Default: 10.10.20.1
D22	DHCP	String	ON / OFF	
D23	PASSWORD	Number	1 > 2147483647	
D24	Set Default	Password	0 to 2147483647	Resets defaults
D25*	Clear Log	Number	1, 0	ptf hidden command
D26*	Print Log	Number	1	ptf hidden command
D27	Baud Rate	Number	9600 19200 57600	Baud rate for serial port Default: 57600
D28	IP SNMP MGR	xxx.xxx.xxx.xxx	IP	IP address of SNMP manager
D29	SNMP Traps	String	On / Off	Default: off
D30	IP NTP Ser	xxx.xxx.xxx.xxx	IP	
D31	NTP Update Interval	Integer	0 to 100000	0 = no NTP update Default: 86400
D32	Man Timeout	Integer	0 to 100000	Default: 1800
D33	TNET Port	Integer	1 to 65536	Default: 23
D34	TNET Timer	Integer	0 to 100000	Default: 0
D35*	Serial Events	String	On / Off	ptf hidden command
D36*	Telnet Events	String	On / Off	ptf hidden command
D37*	Default IP	IP	xxx.xxx.xxx.xxx	ptf hidden command unit will reset to this IP upon execution of default command
D38*	Def Net Mask	IP	xxx.xxx.xxx.xxx	ptf hidden command
D39*	Def Gateway	IP	xxx.xxx.xxx.xxx	ptf hidden command
D40*	RF Channels	Integer	1 to 3	ptf hidden command set pcb to RF type
D41*	Digital (1PPS) Channels	Integer	1 to 3	ptf hidden command Set pcb to digital type
D42*	IRIG Chans	Integer	1 to 3	ptf hidden command

				set pcb to IRIG type
D43*	Switch active	Integer	1 to 3 (Input No.)	Sets input channel active
D44*	Switch inactive	Integer	1 to 3 (Input No.)	Sets input channel Inactive
D45*	RF Quad	Integer	1 to 9	Sets selected quad to RF
D46*	Digital Quad	Integer	1 to 9	Sets selected quad to Digital
D47*	IRIG Quad	Integer	1 to 9	Sets selected quad to IRIG
D48*	O/P channel active†	Integer	1 to 36	Enables channel LED indicator
D49*	O/P channel inactive†	Integer	1 to 36	Disables channel LED indicator
D50*	Input active	Integer	1 to 9	Set quad input active
D51*	Input inactive	Integer	1 to 9	Set quad input inactive
D52*	Quad active†	Integer	1 to 9	Set quad active
D53*	Quad inactive†	Integer	1 to 9	Set quad inactive
D54*	Link Switch 1	Integer	2, 3	Link switch 1 to switch 2 or 3
D55*	Unlink Switch 1	Integer	2, 3	Unlink switch 1 to switch 2 or 3
D56*	Link Switch 2	Integer	1, 3	Link switch 2 to switch 1 or 3
D57*	Unlink Switch 2	Integer	1, 3	Unlink switch 2 to switch 1 or 3
D58*	Link Switch 3	Integer	1, 2	Link switch 3 to switch 1 or 2
D59*	Unlink Switch 3	Integer	1, 2	Unlink switch 3 to switch 1 or 2
D60*	Analog multiplier	Integer	1 - 10	Analog multiplier for RF quads only
LOGOUT	Telnet	String	Logout	Logs out telnet session
HELP	Print Help	String	Help	Prints help menu
VER	Version	String	Ver	Displays s/w version
Macno	Macno	String	Macno	Display unit MAC #
Reset	Unit Reset	String	Reset	Restarts unit
Status	Status	String	Status	Give channel status

***The above commands are factory preset and should not be modified by the user.**

†Activates or deactivates the front panel LED to a particular channel (1 – 36). Does not deactivate signal output.

3.2.4. Help Screens

When used with a standard interface such as Hyper terminal, it can be helpful to be able to quickly see available commands and their formats.

The unit includes both a summary help screen, that provides a quick reference for available commands and reports the currently set values of the various parameters, and multi-line help for each of the individual commands.

The summary screen is accessed by typing;
[HELP][ENTER]
at the command prompt and the multi line help for a single command is accessed by typing either;
[HELP][SPACE][COMMAND][ENTER] or
[COMMAND][SPACE][?][ENTER]

Examples of the help screens as displayed on hyper terminal are shown below;

> help
All Commands Help. For more info on a single command type <help Dxx>

Name	*Cmd*	*Current Value*	*Name*	*Cmd*	*Current Value*
CH 1 Input	*D01*	*Primary*	*CH 1 Mode*	*D02*	*Auto*
CH 2 Input	*D03*	*unused*	*CH 2 Mode*	*D04*	*unused*
CH 3 Input	*D05*	*unused*	*CH 3 Mode*	*D06*	*unused*

DATE(UTC)	*D17*	*01/01/2005*	*TIME(UTC)*	*D18*	*13:31:57*
IP	*D19*	*010.010.020.058*	*NET MASK*	*D20*	*255.255.255.000*
GATEWAY	*D21*	*010.010.020.001*	*DHCP*	*D22*	*On*
PASSWORD	*D23*	******	*SET DEFAULT*	*D24*	*0*
BAUD RATE	*D27*	*57600*			
IP SNMP MGR	*D28*	*000.000.000.000*	*SNMP TRAPS*	*D29*	*Off*
IP NTP Serv	*D30*	*000.000.000.000*	*NTP u/d int*	*D31*	*86400*
MAN Timeout	*D32*	*1800*	*TNET PORT*	*D33*	*23*
TNET Timer	*D34*	*0*	*TELNET*	*LOGOUT*	
o/p Act.	*D48*	*F F F 0 0 0 0 0 0*	*o/p Inact.*	*D49*	*F F F 0 0 0 0 0 0*
PRINT HELP	*HELP*		*VERSION*	*VERS*	
Macno	*MACNO*		*Reset*	*RESET*	
Status	*STATUS*		*O/P Status*	*OPSTAT*	
Analog Vals	*ANSTAT*				

>

Summary Help Screen

> D17 ?
m/c
Name Cmd Current Value
DATE(UTC) D17 01/01/2005
Current date
Entry type is xx/xx/xxxx (month/day/year)
>

> D18 ?
m/c
Name Cmd Current Value
TIME(UTC) D18 13:45:00
Current time
Entry type is xx:xx:xx (hour:minute:seconds)
>

Expanded help on specific commands

3.2.5. Status Command

The Status command is provided as a means of obtaining a quick summary of the status of the unit, and provides summary information on each of the Auto switch channels, together with other settings such as the Manual mode and telnet timeouts, Ethernet status etc.

A sample Status screen is shown below;

> Status
ptf AutoSwitch/Distribution Software Version 2.3-2
Capabilities -> Normal + SNMP + TELNET + HTTP

Channel Type Mode Input Source Primary Status Backup Status
CH 1 IRIG Auto Primary FAULT FAULT
CH 2 unused
CH 3 unused

Manual Mode time-out 1800 seconds
Telnet time-out no time-out
Ethernet Link status UP
Started SNMP Server YES
Started HTTP Server YES
Started Telnet Server YES
Telnet session active YES
Telnet user name admin

Distribution Remote Monitor Interface Status Screen

For the *ptf* 1203C-MC, 1204A-MC and 1205A-MC, the unit is pre-configured to display row A only.

3.3. RS 232

3.3.1. Command Format

The RS232 command format has been designed to have an identical look and feel as the telnet interface. The main difference is that the RS232 is primarily provided for local control and therefore the commands are echoed.

For the command format please refer to section 3.1.1

3.3.2. Login

As the RS232 is designed for local access, no login is required to access this capability as physical presence is assumed.

3.3.3. Commands

Available commands are the same as for the telnet interface.

3.3.4. Help Screens

The RS232 Help Screens are identical to those provided on the telnet interface.

3.3.5. Status Command

Format of the Status command is the same as the format for the telnet interface.

3.4. SNMP Agent

3.4.1. General

The distribution unit includes an SNMP agent (SNMPv1) using the standard UDP interface and providing basic information on the unit (location, capabilities etc.) together with traps on alarm conditions that are sent to the address set as the SNMP manager IP address.

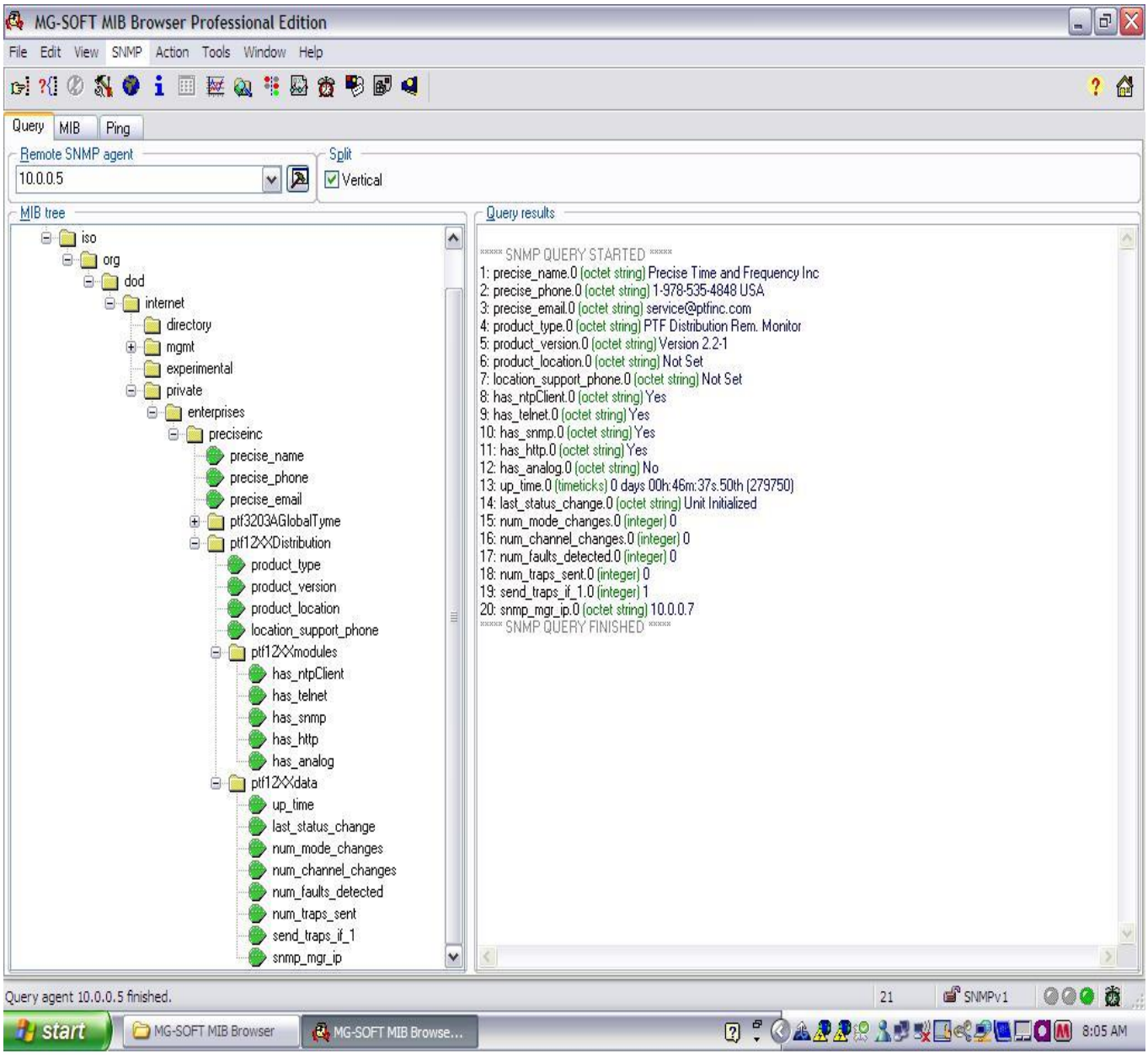
3.4.2. SNMP Queries and Traps

SNMP traps are available to provide summary event information to the SNMP manager. Specific traps available are;

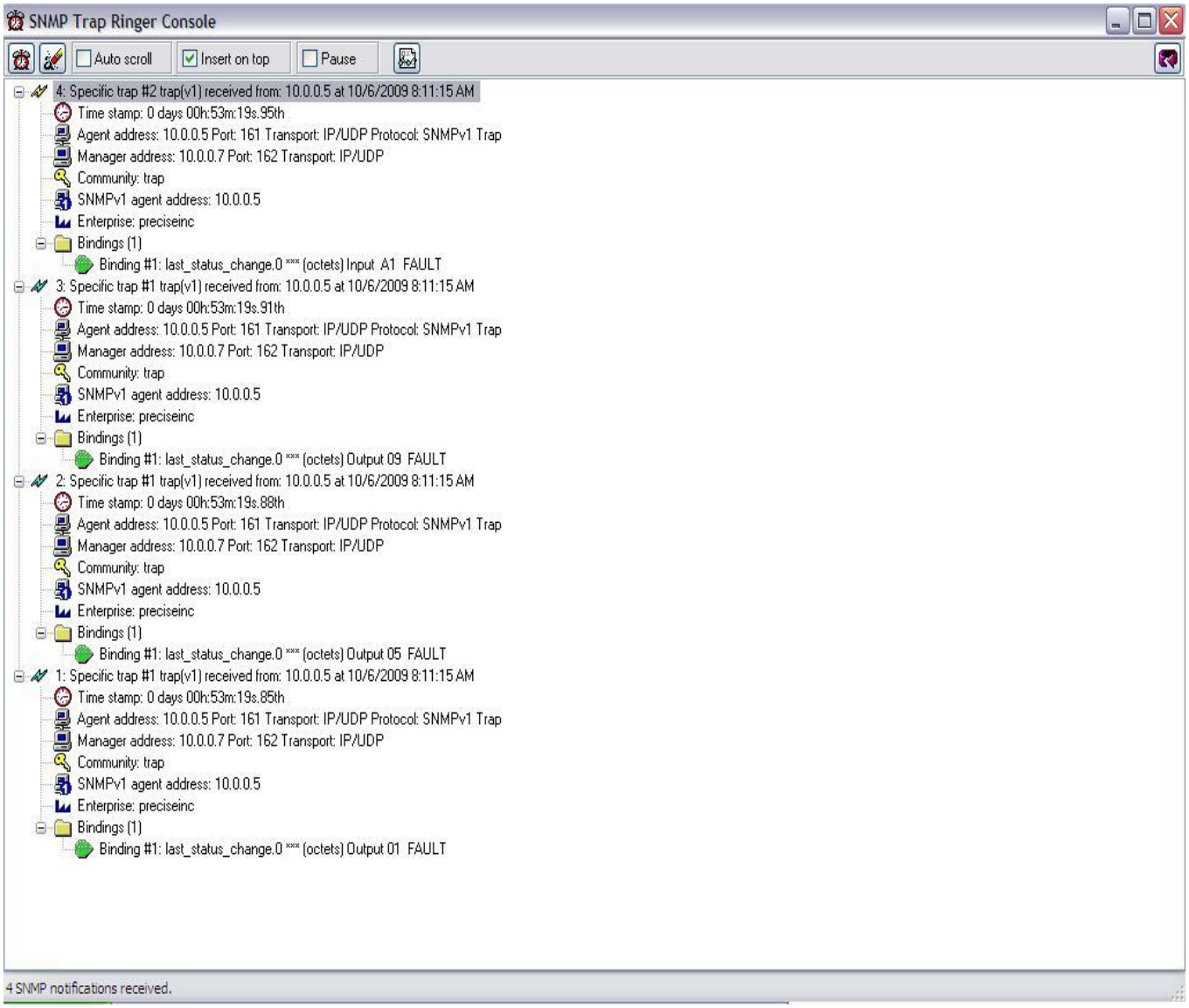
Trap#1	Output Mode Change (Fault/Okay)
Trap#2	Input Mode Change (Fault/Okay)

Traps can be enabled or disabled from either the telnet or the serial Monitor/Control interface.

Screen shots of the SNMP Query screen and trap ringer console after initiating a number of “trap” events, are shown below;



SNMP Query Screen



SNMP Trap Ringer Screen

3.5. Web Browser

The web browser interface provides a sub-set of the RS232 and Telnet commands, accessed through a standard web browser such as Internet Explorer (version 5 or higher recommended), or Firefox

3.5.1. Login

To connect to the unit via a web browser type the unit IP address in the address window as follows;

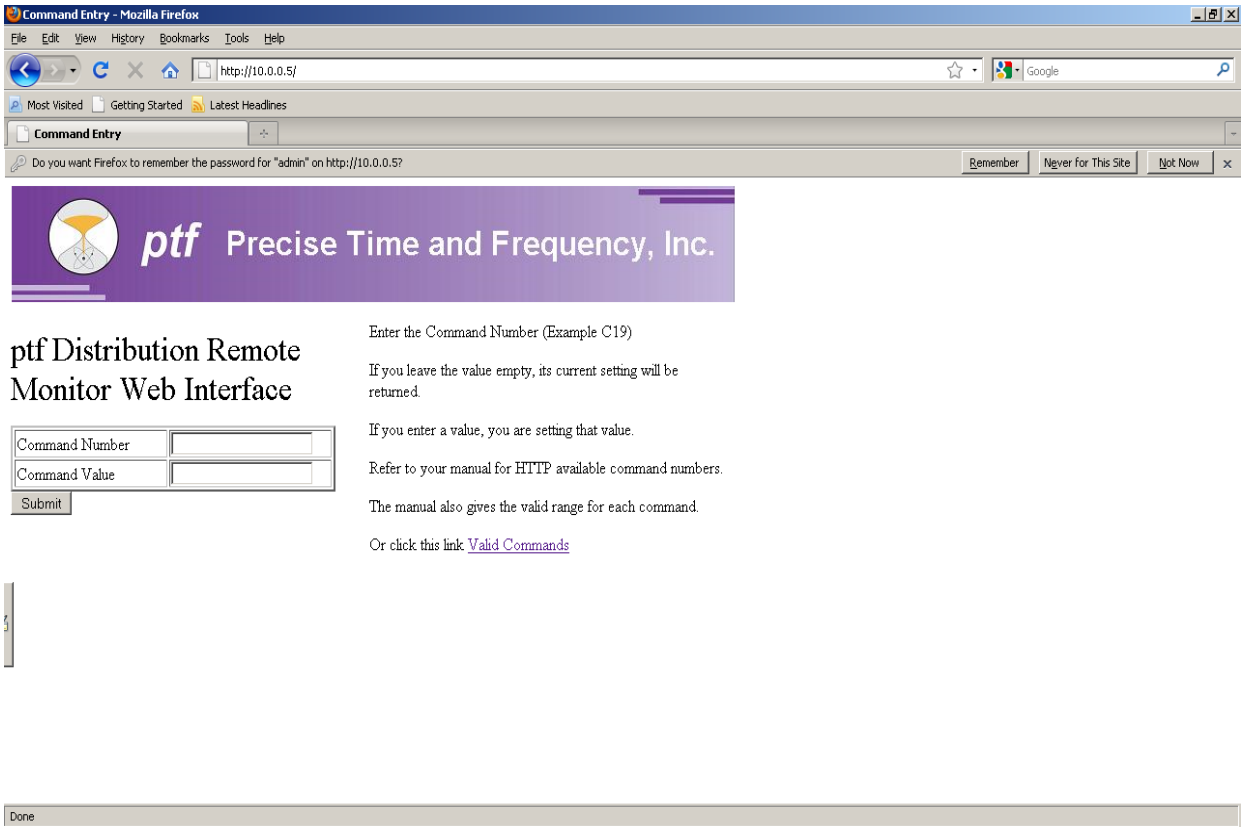
http://10.10.20.49/ where 10.10.20.49 is the unit IP address

The unit will respond with a login screen, shown below;

The user name is always **admin**, and the password is the system password (default **123456**)

3.5.2. Command Entry Page

Upon receiving a valid login, the unit will serve up the Command Entry page where valid commands can be entered. A list of valid commands is shown in a following section, or can be called up on a link from the Command Entry page.



Entering a valid command number in the Command Number entry box, with no value in the Command Value box, will return the current value of the parameter. Entry a valid command in the Command Entry box and a value within the valid range in the Command Value box will set the new entered value into the selected parameter.

Two special commands exist, Status and Reset, they do not require a value entry. Status will return current unit status, while reset will initiate a unit reset after a wait period of 5 seconds.

3.5.3. Status Command Screen

The Status Command screen is shown below;

Command: status
AutoSwitch/Distribution Version 2.3-2
Capabilities -> SNMP HTTP TELNET
Auto Switch Status
Channel__Type____Mode___Input Source__Primary Status__Backup Status
CH 1____IRIG___Auto____Primary_____FAULT_____FAULT
CH 2____inactive
CH 3____inactive
Digital Output/Input Status O=Okay F=Fault I=Inactive
|-------quad 1 ---IRIG-------| |-------quad 2 ---IRIG-------| |-------quad 3 ---IRIG-------|
|------o/p's-------|-i/p---aux--| |------o/p's-------|-i/p--aux--| |------o/p's-------|--i/p--aux--|
|--01-02-03-04--|--X----X--| |--05-06-07-08--|--X----X--| |--09-10-11-12--|--X----X--|
_ _F _F _F _F ___F ___O ___F _F _F _F ___F ___O ___F _F _F _F ___F ___O
Another Command

3.5.4. Valid Commands

Valid commands for the web browser interface are shown below;

AutoSwitch/Distribution Commands available via Http

Return to Command Page

Cmd	Read R / Write W	Description	Min, Max or String Values
D01	R/W	Channel 1 Input	Primary or Backup(must be in manual to select)
D02	R/W	Channel 1 Mode	Auto or Manual
D03	R/W	Channel 2 Input	Primary or Backup(must be in manual to select)
D04	R/W	Channel 2 Mode	Auto or Manual
D05	R/W	Channel 3 Input	Primary or Backup(must be in manual to select)
D06	R/W	Channel 3 Mode	Auto or Manual
D17	R	Date(UTC)	
D18	R	Time(UTC)	
D19	R/W	Ip Address xxx.xxx.xxx.xxx	000.000.000.000 to 255.255.255.255
D20	R/W	Netmask xxx.xxx.xxx.xxx	000.000.000.000 to 255.255.255.255
D21	R/W	Gateway xxx.xxx.xxx.xxx	000.000.000.000 to 255.255.255.255
D22	R/W	DHCP Off or On	On or Off
D23	R/W	Password	Numbers only
D27	R/W	Serial Port Baud Rate	9,600, 19200, or 57600
D28	R/W	IP SNMP Manager	000.000.000.000 to 255.255.255.255
D29	R/W	SNMP Traps	On or Off
D30	R/W	Manual Timeout (switch Auto/Manual mode)	0=No timeout, to 100000 (seconds)
D31	R/W	NTP update interval	0=No update, minimum 2 max 100000(seconds)
D32	R/W	Manual Timeout Period	0=No Timeout to 100000 (seconds)
D33	R/W	Telnet Port Number	Default 23
D34	R/W	Telnet Session Timeout Period	0=No Timeout to 100000 (seconds)
STATUS	R	Unit Version Capabilities and Status	
LOGOUT	R	Logout Telnet Session	
RESET	R	System Reset	

3.6. Local (Front Panel)

3.6.1. Monitors

The front panel has a green LED indicator for power and a red LED as a summary fault indicator. The summary fault indicator will be illuminated if there is an input fault or any of the outputs are faulted.

Using the Remote Monitor/Control to make an input or output inactive does not affect the operation of the local fault indication.

A local summary alarm monitor is also provided on a 9 pin D type connector located on the unit rear panel. The output is on clean relay contacts

4. Unpacking/Inspection/Installation

4.1. Unpacking/Inspection

The ***ptf*** Distribution amplifier together with accessories is shipped in a custom designed package. Upon receipt the equipment should first be visually inspected for any signs of visible damage.

If visible damage is apparent immediate notification should be given to both Precise Time and Frequency, Inc., and the carrier responsible for shipment. Do not discard the shipping container, which should be made available for inspection by the carrier.

For purposes of unit reference, the unit serial number located on the rear panel of the unit should be quoted in all communications.

4.2. Chassis Installation

The chassis is supplied with rack ears ready for simple installation into a standard 19-inch rack frame/cabinet.

For adequate support when mounted into the rack, a rear supporting bar or tray should be used as the rack ears are designed to secure the unit in the rack, NOT to support the full weight of the unit.

Attention should be given to the internal rack environment to insure the unit operates within it's specified operating temperature range of 0 to 50 deg. C also noting that the unit relies upon convection for cooling, so there should be sufficient air flow to accommodate this.

4.3. Power Connection

Power is supplied by connecting the supplied ac power cable to and AC source, at 120 or 230 V AC, +/-15%. The AC input is a universal input – no range switching is required.

4.4. Input/Output Connections

5. Maintenance

5.1. Overview

The ***ptf Distribution Amplifiers*** use state-of-the art solid state and semi-conductor, primarily surface mount, components.

All of the components are selected for their inherent high reliability, and as advanced techniques with highly sophisticated equipment, are used for assembly and test of the unit.

Due to the above, no periodic maintenance of the unit is required, and the units can be expected to deliver many years of trouble-free operation.

Any maintenance or service of the unit should be performed at a Precise Time and Frequency, Inc. authorized facility, to ensure the appropriate equipment and expertise is available.

6. MIB/SMI Files For SNMP Manager

6.1. MIB File

The following text file is the MIB file for the SNMP Manager;

```
-- ************************************************************
-- ************************************************************
-- -- Copyright 2009 Precise Time and Frequency Inc
--
-- DESCRIPTION:
--    This file contains the ptf 12XX Distribution Remote Monitor private MIB.
--
-- ************************************************************
-- ************************************************************


PRECISE12XXv2-MIB DEFINITIONS ::= BEGIN


IMPORTS
  OBJECT-TYPE
    FROM RFC-1212
  preciseinc
-- ptf12XXdistribution,
-- ptf12XXmodules,
-- ptf12XXdata
  FROM Precise-SMI;


        -- 1.3.6.1.4.1.18507.8
  ptf12XXDistribution OBJECT IDENTIFIER ::= { preciseinc 8 }

   -- Note, leaf nodes under ptfproduct 1-4 are
   -- prod type
  -- prod version
  -- prod location
  -- prod local support phone
  -- then comes modules folder
   -- 1.3.6.1.4.1.18507.8.7.5
   ptf12XXmodules OBJECT IDENTIFIER ::= { ptf12XXDistribution 7 }

    -- 1.3.6.1.4.1.18507.8.8.8
   ptf12XXdata OBJECT IDENTIFIER ::= { ptf12XXDistribution 8 }
```

```
-- 1.3.6.1.4.1.18507.1
precise_name OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-only
  STATUS mandatory
  ::= { preciseinc 1 }

 -- 1.3.6.1.4.1.18507.2
precise_phone OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-only
  STATUS mandatory
  ::= { preciseinc 2 }

-- 1.3.6.1.4.1.18507.3
precise_email OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-only
  STATUS mandatory
  ::= { preciseinc 3 }

-- So it goes private-enterprises-preciseinc - ptfproduct -producttype
-- assume only one 'product' or device  handled by one resident snmp agent
-- on that product
-- 1.3.6.1.4.1.18507.8.1
product_type OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXDistribution 1 }

-- 1.3.6.1.4.1.18507.8.2
product_version OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXDistribution 2 }

-- 1.3.6.1.4.1.18507.8.3
product_location OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-write
  STATUS mandatory
  ::= { ptf12XXDistribution 3 }
```

```
    -- 1.3.6.1.4.1.18507.8.4
    location_support_phone OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-write
      STATUS mandatory
      ::= { ptf12XXDistribution 4 }

    -- 1.3.6.1.4.1.18507.8.7.1
    has_ntpClient OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-only
      STATUS mandatory
      ::= { ptf12XXmodules 1 }

    -- 1.3.6.1.4.1.18507.8.7.2
    has_telnet OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-only
      STATUS mandatory
      ::= { ptf12XXmodules 2 }

    -- 1.3.6.1.4.1.18507.8.7.3
    has_snmp OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-only
      STATUS mandatory
      ::= { ptf12XXmodules 3 }

    -- 1.3.6.1.4.1.18507.8.7.4
    has_http OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-only
      STATUS mandatory
      ::= { ptf12XXmodules 4 }


    -- 1.3.6.1.4.1.18507.8.7.5
    has_analog OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-only
      STATUS mandatory
      ::= { ptf12XXmodules 5 }

--
--
--
```

```
-- 1.3.6.1.4.1.18507.8.8.1
up_time OBJECT-TYPE
  SYNTAX   TimeTicks
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXdata 1}

-- 1.3.6.1.4.1.18507.8.8.2
last_status_change OBJECT-TYPE
  SYNTAX OCTET STRING
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXdata 2}

-- 1.3.6.1.4.1.18507.8.8.3
num_mode_changes OBJECT-TYPE
  SYNTAX   Counter
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXdata 3 }

-- 1.3.6.1.4.1.18507.8.8.4
num_channel_changes OBJECT-TYPE
  SYNTAX   Counter
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXdata 4 }

-- 1.3.6.1.4.1.18507.8.8.5
num_faults_detected OBJECT-TYPE
  SYNTAX   Counter
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXdata 5 }


-- 1.3.6.1.4.1.18507.8.8.6
num_traps_sent OBJECT-TYPE
  SYNTAX   Counter
  ACCESS read-only
  STATUS mandatory
  ::= { ptf12XXdata 6 }


--
```

```
-- Command and Control
--

    -- 1.3.6.1.4.1.18507.8.8.7
    send_traps_if_1 OBJECT-TYPE
      SYNTAX   Counter
      ACCESS read-write
      STATUS mandatory
      ::= { ptf12XXdata 7 }

    -- 1.3.6.1.4.1.18507.8.8.8
    snmp_mgr_ip OBJECT-TYPE
      SYNTAX OCTET STRING
      ACCESS read-write
      STATUS mandatory
      ::= { ptf12XXdata 8 }

END
```

6.2. SMI File

The following text file contains the ptf SMI (Structure of Management Information) file for the SNMP manager;

```
-- ****************************************************************
-- Precise-SMI.txt:  Precise Time and Frequency Enterprise
--                   Structure of Management Information
--
-- September 2003  Les Herbst
--
-- Copyright (c) 2003 by PTF Inc
-- All rights reserved.
--
-- ****************************************************************

Precise-SMI DEFINITIONS ::= BEGIN

IMPORTS
        OBJECT-TYPE
                FROM RFC-1212
        enterprises,
                FROM RFC1155-SMI;
--
-- Node Definitions
--

        -- 1.3.6.1.4.1.18507
        preciseinc OBJECT IDENTIFIER ::= { enterprises 18507 }



END
```

7. Contact Information – Technical Assistance

   The Precise Time and Frequency, Inc service department normal hours of operation are from Monday to Friday, between the hours of 8.00 a.m. and 5.00 p.m. US Eastern Standard Time.

   24 hour, 7-day technical assistance is available under special contract.

   Before returning any equipment for service or repair please contact our service department for an RMA number.

   Tel: (+1) 781 245 9090
   Fax: (+1) 781 245 9099
   E-mail: service@ ptfinc.com

   Shipping address is:

   Precise Time and Frequency, Inc.
   50L Audubon Road
   Wakefield, MA 01880
   USA

   Attn: Service Manager

   Billing address is:

   Precise Time and Frequency, Inc.
   50L Audubon Road
   Wakefield, MA 01880
   USA

   Attn: Accounts