Instruction Manual

Model 2282-122-23

Redundant Amplifier

July 2020, Rev. A

	AMP	ATTEN1	ATTEN2
POWER	STATUS	MODE	

MODEL 2282
REDUNDANT AMPLIFIER

CROSS TECHNOLOGIES INC.

POWER
ALARM
PS1
PS2

STATUS
ALARM
STDBY
ONLINE
1 2 BU

MODE
MANUAL
REMOTE
AUTO

	AMP	ATTEN1	ATTEN2
CH1	0.300	10.0	12.5
CH2	0.290	02.0	01.5
BU	0.310	08.0	12.0

MENU

EXECUTE
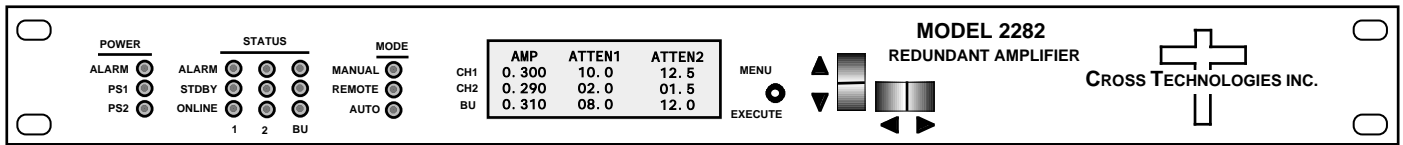
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CROSS TECHNOLOGIES, INC.

6170 Shiloh Road

Alpharetta, Georgia 30005

(770) 886-8005

FAX (770) 886-7964

Toll Free 888-900-5588

WEB www.crosstechnologies.com

E-MAIL info@crosstechnologies.com

INSTRUCTION MANUAL

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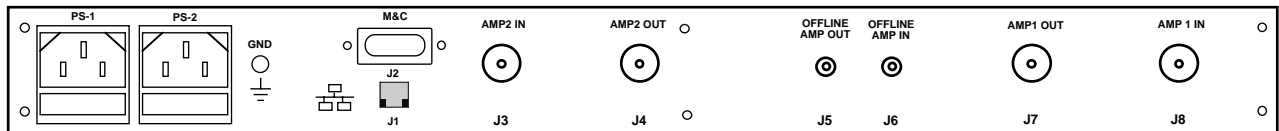
MODEL 2282-122-23 Redundant Amplifier

1.0 General

1.1 Equipment Description

The Model 2282-122-23 Redundant Amplifier, 0.95-2.15 GHz, +45 OIP3 (of the amplifiers), monitors and controls internal amplifiers configured in a 1:1 or 1:2 redundant configuration. Peregrine Model PE43704 variable attenuators can adjust the input and output signals into and out of the amplifiers by 30 dB in 0.5 ± 0.5 dB steps by the front panel controls and the M&C. Front panel LEDs indicate power, status (online, standby, alarm), and mode (auto, manual, remote). The amplifiers' current is measured and a fault is signaled if the current deviates from user selected thresholds. Multi-function switches select Auto, Manual or Remote operation, priorities for 1:2, and the signal path in the Manual mode. Remote operation via the RS232/RS485 M&C interface allows selection of priorities (1:2) and the signal path. Ethernet is available as an option. An LCD display shows each amplifier's current, and attenuator values. Form C relay contact closures indicate amplifier and power supply status. Connectors are type N, female for the RF in and out signals, DB9 for monitor and control. The 2282-122-23 is housed in a 1RU chassis and is powered by redundant power supplies fed by separate, fused 100-240 ±10% VAC AC input connectors.
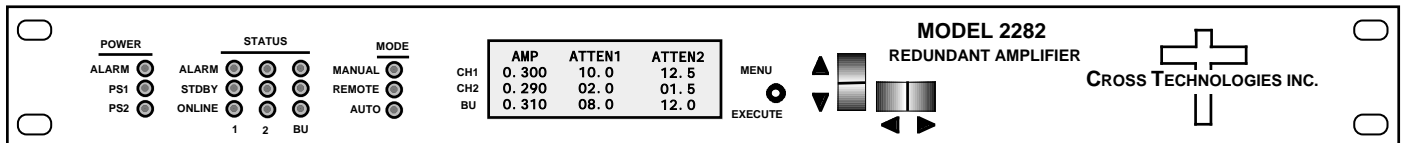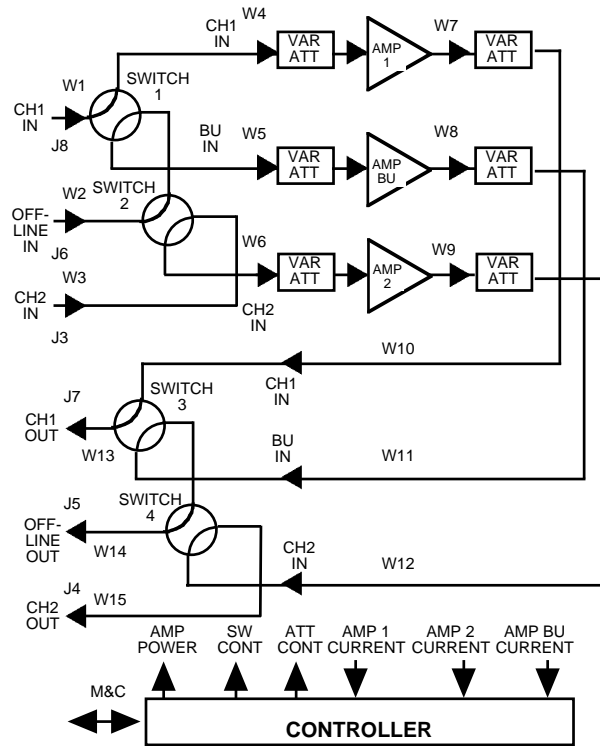
FRONT PANEL

REAR PANEL - Shown with optional Ethernet Connector (J1)

FIGURE 1.1   Front and Rear Panels

FIGURE 1.2   Block Diagram
2282-122-23

**2282-122-23 Redundant Amplifier
Block Diagram**

1.2 Technical Characteristics

TABLE 1.0	2282-122-23 Specifications*
Input Characteristics (RF)	
Impedance/Return Loss	50Ω/12dB
Frequency	0.95 to 2.15 GHz
Noise Figure, Maximum	10 dB at maximum gain
Output Characteristics (L-Band)	
Impedance/Return Loss	50Ω/9.5 dB
OIP3	+45 minimum
Output 1 dB compression	+28 dBm at maximum gain (of the amplifier)
Channel Charactersitics	
Gain, Maximum	+35 dB ± 2 dB, 0.95 to 2.15 GHz
Gain, Adjustment, each Att.	30 dB adjustment in 0.5 ± 0.5 dB Steps
Spuirous, 2nd harmonic	<-55 dBC in band, 0 dBm out, at 1 GHz
Variable Attenuator	Peregrine, PE43704
Frequency Response	± 1dB across band, ± 0.25 dB, any 40 MHz BW
Controls, Indicators	
Gain, Amp Select	Direct readout LCD; pushbutton switches or remote
Select and Mode	Green, Red, Yellow LEDs
Remote	RS232C/RS485/422, 9600 baud (Ethernet Optional)
Other	
RF in/Out	Type N (female), 50Ω
RF Off Line In/Out	SMA (female), 50Ω
Alarm/Remote Connector	DB9 - NO or NC contact closure on Alarm
Size	19 inch standard chassis 1.75" high X 19.0" deep
Power	100-240 ± 10% VAC, 47 - 63 Hz, 150 watts maximum
Remote M&C Ethernet Options	
W8-	Ethernet with Web Browser Interface
W18-	Ethernet with SNMP (and MIB) Interface
W28-	Ethernet with Direct TCP/IP Interface
Other Options: Call Cross Technologies, Inc.	
*+10˚C to +40˚C; Specifications subject to change without notice	2017 Cross Technologies, Inc.

1.3 Control & Operation

1.3.1 Switching Modes

There are three possible modes to control the RF switch position in the 2282-122-xx which are:

1. Manual
2. Remote
3. Auto

These three modes are defined below and described in detail in the following sections.

<u>Manual Mode</u>

Manual mode is enabled and disabled locally from the front panel only. Manual control will override both Remote and Auto control when enabled.

<u>Remote Mode</u>

Remote mode is enabled and disabled remotely from either serial M&C commands (RS232 or RS485) or Ethernet (webpage or SNMP) commands. Remote control will override Auto control but not Manual control.

<u>Auto Mode</u>

Auto mode is the default switch control mode and is enabled when Manual and Remote modes are disabled. When the unit is in Auto mode the switch position is automatically selected based on the state of each channel's alarm. For example, if channel 1 is alarmed and channel 3 (the backup channel) is not then the unit will automatically backup channel 1.

1.3.2 Manual (Switching) Mode

To override auto switching via the Front Panel Menu …

1) Place the unit in MANUAL MODE by selecting "YES" from the Enable Manual Mode menu.

```
ENABLE  MANUAL        R
MODE?   YES
```

The front panel MANUAL LED will illuminate red to indicate that the unit is in Manual mode.

2) Press the MENU/EXECUTE button to advance to the next menu. The LCD display will display the following message showing the current position of the switch:

```
SWITCH  POSITION=     R

BACKUP  CH1
```

3) You may now select switch positions using the UP/DOWN switch. For a 2282-122-23 controller, the switch position choices are: BACKUP CH1, BACKUP CH2, or BACKUP NONE.

4) Once the Switch position is selected, push the PROGRAM/EXECUTE switch to go to the next menu.

5) Use the LEFT/RIGHT switch to move the cursor to <u>R</u> (return), then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

1.3.3 REMOTE

To override auto switching remotely…

Note: If the unit is in Manual mode then the following remote commands will be ignored because Manual mode overrides Remote mode.

From the serial M&C Interface:

1) SET the unit's switch position by sending the following command …

{aaCAx}

where: x = 0 sets the switch to BACKUP NONE
x = 1 sets the switch to BACKUP CH1
x = 2 sets the switch to BACKUP CH2

Once the switch positon is selected remotely, the unit is in Remote mode and the front panel remote indicator will light. The unit will remain in Remote mode until one of the following occurs:
a. Switch reset command ({CB}) is issued.
b. Yes is selected from the front panel "RESET REMOTE MODE?" menu.

2) From the (optional) Ethernet Interface:
Webpage:
1. Select "Backup None", "Backup CH1", or "Backup CH2".
2. Click "Update Other"

SNMP:
1. Set ObjectID remoteSetPosition2282xx to 0, 1, or 2 to remotely set the switch position.
2. Set ObjectID resetSwitch2282xx to clear the Remote mode and return to Auto mode.
3. Set ObjectID switchPos to the desired position, either 1 (AMP1 to 1) or 2 (AMP2 to 1).

1.3.4 Auto Mode

Auto mode is the default mode of the controller. When in the Auto mode the controller is continuously monitoring the status of AMP1, AMP2, and AMP3. In 1:2 configurations, if a fault is detected from AMP1 or AMP2 then AMP3 is switched into the signal path of the faulted unit.

The status of each amp is determined by measuring the current drawn from each amp and comparing the measured value to a previously set nominal value. If the measured value deviates +/- 15% from the nominal (expected) value then the amp's status will be "Alarmed". When an amp's status is alarmed its respective alarm indicator will illuminate red. If the backup amp (AMP3) is not alarmed then the unit will switch it into the signal path of the faulted amp with the highest priority. There are two possible priority settings, Priority 1 and Priority 2. If Priority 1 is selected and both AMP1 and AMP2 are alarmed then AMP1 will be backed up. If Priority 2 is selected and both AMP1 and AMP2 are alarmed then AMP2 will be backed up.

1.3.5 Power Supply Alarm

The 2282-122-23 redundant power supplies include DC to DC converter modules. The outputs of each DC to DC converter are monitored. If any DC to DC converter fails the front panel LED above the power LEDs will illuminate and the rear panel contact closure will activate.

1.4 M&C Interface

1.4.1 Remote Serial Interface

Protocol: RS232C, 9600 baud rate, no parity, 8 data bits, 1 start bit, and 1 stop bit.
(RS232C, RS422, or RS485)

TABLE 1.2 J10 Pinouts (RS-232C/422/485*)	
Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

Connectors: Rear panel, DB9 female

1.4.2 Commands Table 1.2 lists the commands for the 2282-122-23 and briefly describes them. After a command is sent the 2282-122-23 sends a return ">" indicating the command has been received and executed.

General Command Format - The general command format is {aaCND...}, where:
>   { = start byte
>   aa = address of unit (only used if in RS485 mode)
>   C = 1 character, either C (command) or S (status)
>   N = 1 character command or status request
>   D = 1 character or more of data (depends on command)
>   } = stop byte

* PLEASE NOTE: The two character {aa}(OO-31) prefix, in the following table,
  should be used ONLY when RS-485,is selected.

TABLE 1.3 2282-122-2		
Command	Syntax *	Description
Set RF Switch Position	{aaCAx}	where:
		aa = unit address, range = OO to 31,only used if interface is RS485, otherwise omit.
		A = command code
		x = desired switch position, O, 1 or 2. Once the switch position is selected remotely,the unit is in.
		"Remote Mode" and the front panel remote indicator will light.
		The unit will remain in Remote Mode until one of the following occurs:
		1. A Switch Reset command ({CB}) is issued.
		2. The front panel Switch Reset button is pressed.
		If the switch is already in manual mode (i.e, the front panel toggle switch is in the CH1 or CH2 position) then the unit will ignore this command.
		example: {CR2}
		Will (remotely) set the switch to CH2. The unit will ignore this command if the unit is in manual mode.
		The unit will reply with the '>' character if the command is sucessfully processed because the Unit is in Manual Mode.
		The unit will reply with the '>' character if the command is sucessfully processed.
Set Priority	{aaCPx}	where:
		aa = unit address, range = OO to 31,only used if interface is RS485, otherwise omit.
		P = command code
		This command sets the auto switching priority to either 1 or 2, where x=1 or 2 respectively.
		example: {CP2}
		Will set the switch to prioritize channel 2 if both are alarmed.
		The unit will reply with the '>' character if the command is sucessfully processed.
Switch Reset	{aaCB}	where:
		aa = unit address, range = OO to 31, only used if interface is RS485, otherwise omit
		B = command code
		This command has the same effect as pressing the front panel Switch Reset button.
		example: {CB}
		Will return a unit to Auto mode if it is in Remote mode.
		Also, this command will reset the switch position if it is currently "latched" to CH2 in the Latch to CH2 mode (and if CH1 is not alarmed).
		The unit will reply with the '>' character if the command is sucessfully processed.

Commands continued from page 9...

Command	Syntax *	Description
TABLE 1.3 2282-122-23 Commands continued...		
Set Priority	{aaCPx}	where:
		aa = unit address, range = OO to 31,only used if interface is RS485,
		otherwise omit.
		P = command code
		This command sets the auto switching priority to either 1 or 2,
		where x=1 or 2 respectively.
		example: {CP2}
		Will set the switch to prioritize channel 2 if both are alarmed.
		The unit will reply with the '>' character if the command is
		sucessfully processed.
Switch Reset	{aaCB}	where:
		aa = unit address, range = OO to 31, only used if interface is RS485,
		otherwise omit
		B = command code
		This command has the same effect as pressing the front panel
		Switch Reset button.
		example: {CB}
		Will return a unit to Auto mode if it is in Remote mode.
		Also, this command will reset the switch position if it is currently
		"latched" to CH2 in the Latch to CH2 mode (and if CH1 is not alarmed).
		The unit will reply with the '>' character if the command is
		sucessfully processed.
Set Nominal Current	{aaCNx}	where:
		aa = unit address, range = OO to 31, only used if interface is RS485,
		otherwise omit
		N = command code
		x = desired amplifier channel to set
		This command will set channel x nominal current value to the
		actual value that is presently being measured.
		example: {CN2}
		Will measure the current drawn from channel 2's amplifier and set
		the nominal value to the measured value.
		The unit will reply with the '>' character if the command is
		sucessfully processed.

1.4.2 Status Requests Table 1.1 lists the status requests for the 2282-122-23 and briefly describes them.

* PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below,
should be used ONLY when RS-485, (OPTION-Q), is selected.

TABLE 1.4 2282-122-23 Status Requests/Inquiries		
Command	Syntax *	Description
Get Switch State	{aaSZ}	returns: {aaSZbc}
		where:
		aa = unit address, range = 00 to 31, only used if interface is RS485,
		otherwise omit.
		Z = command code
		b = Switch Position: 0(backup none), 1(backup 1), or 2(backup 2)
		c = Switch Mode: 'M' if in Manual Mode, 'R' if in Remote Mode,
		and 'A' if in Auto Mode.
		The unit will append the '>' character if the command is
		sucessfully processed.
Get Channel 1		returns: {aaS1bbbb,cccc,x}
Current and Status		where:
		aa = unit address, range = 00 to 31, only used if interface is RS485,
		otherwise omit.
		1 = command code
		bbbb = CH1 measured current (mA)
		cccc = CH1 nominal current (mA)
		x = 0 if CH1 is online, x = 1 if CH1 is on standby, x = 2 if CH1 is alarmed
		The unit will append the '>' character if the command is
		sucessfully processed.
Get Channel 2	{aaS2}	returns: {aaS2bbbb,cccc,x}
Current and Status		where:
		aa = unit address, range = 00 to 31, only used if interface is RS485,
		otherwise omit.
		2 = command code
		bbbb = CH2 measured current (mA)
		cccc = CH2 nominal current (mA)
		x = 0 if CH2 is online, x = 1 if CH2 is on standby, x = 2 if CH2 is alarmed
		The unit will append the '>' character if the command is
		sucessfully processed.
Get Channel 3	{aaS3}	returns: {aaS3bbbb,cccc,x}
Current and Status		where:
		aa = unit address, range = 00 to 31, only used if interface is RS485,
		otherwise omit.
		3 = command code
		bbbb = CH1 measured current (mA)
		cccc = CH1 nominal current (mA)
		x = 0 if CH3 is online, x = 1 if CH3 is on standby, x = 2 if CH3 alarmed

TABLE 1.4 2282-122-23 Status Requests/Inquiries continued...		
Command	Syntax *	Description
Get Model Number &	{aaSV}	returns: {aaSVxxxxxx ver y.yy}
Firmware Revision		where:
		aa = unit address, range = 00 to 31, only used if interface is RS485,
		otherwise omit
		V = command code
		xxxxx = Model Number Text
		y.yy = firmware revision
		The unit will append the '>' character if the command is
		sucessfully processed.

1.5   Environmental Use Information

A.   **Rack-Mounting** - To mount this equipment in a rack, please refer to the installation instructions located in the user manual furnished by the manufacturer of your equipment rack.

B.   **Mechanical loading** - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.

C.   **Elevated operating ambient temperature** - if installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra.

D.   **Reduced air flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Additional space between units may be required.

E.   **Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on over current protection and supply wiring. Appropriate consideration of equipment name plate rating should be used, when addressing this concern.

F.   **Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).

G.   **Top Cover** - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw MUST BE RE-INSTALLED prior to Top Cover screw replacement. FAILURE TO DO this may cause INGRESS and/or EGRESS emission problems.

G.   **Top Cover** - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw MUST BE RE-INSTALLED prior to Top Cover screw replacement. FAILURE TO DO this may cause INGRESS and/or EGRESS emission problems.

2.0 Installation

2.1 Mechanical

The 2282-122-23 consists of one main controller PCB and three amplifier subboards housed in a 19 inch standard chassis, 1 3/4 inch high by 16 inch deep. Two redundant switching +15 VDC power supplies are diode "OR'ed to provide +14.5 VDC for the assembly. The 2282-122-23 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2282-122-23 is assembled.
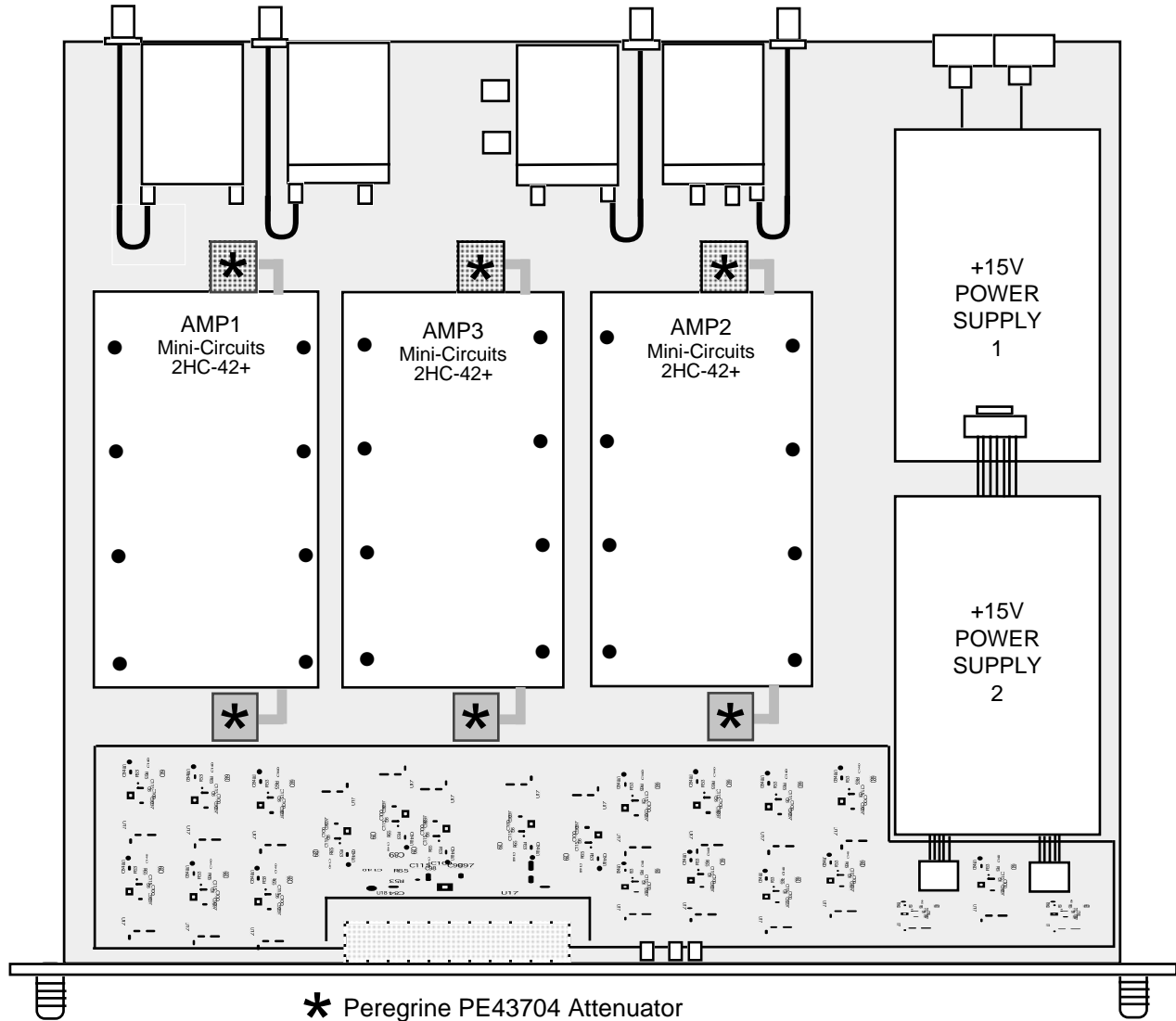

FIGURE 2.0   2282-122-23 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

Figure 2.1 shows the input and output connectors on the rear panel.

J2 - DB9
Monitor and
Control

J3
950-2150 MHz
AMP2In

J5
950-2150 MHz
AMP3 Out

J6
950-2150 MHz
AMP3 In

PS-1   PS- 2   GND   M&C   AMP2 IN   AMP2 OUT   OFFLINE AMP OUT   OFFLINE AMP IN   AMP1 OUT   AMP 1 IN

J2   J1   J3   J4   J5   J6   J7   J8

PS1, PS2 - POWER IN
AC inputs for redundant
switching power supplies
100-240 ±10% VAC,
47-60 Hz.

J1 -
Optional RJ45
Ethernet
Connector

J4
950-2150 MHz
AMP2 Out

J7
950-2150 MHz
AMP1 Out

J8
950-2150 MHz
AMP1 In

FIGURE 2.1   2282-122-23 Rear Panel I/O's

TABLE 2.1 J3A Monitor & Control Pinout	
Pin	**Function**
1	RS422/RS485 Tx-
2	RS232C Tx, RS422/RS485 Tx+
3	RS232C Rx, RS422/RS485 Rx+
4	RS422/RS485 Tx-
5	GND
6	Not Used
7	Not Used
8	Not Used
9	Not Used

*Remote Serial Interface
Interface: DB9 Male
Protocol: RS232C (RS232C/422/485), 9600 baud rate, no parity,
8 data bits, 1 start bit, 1 stop bit.

M&C Cable Diagram - Cross Technologies Frequency Converters

Female DB-9
PC Com Port

Male DB-9
2015/16/17 M&C Port

1			RX	1
2	RX			2
3	TX		TX	3
4	DTR			4
5	SG		SG	5
6	DSR			6
7	RTS			7
8	CTS			8
9				9
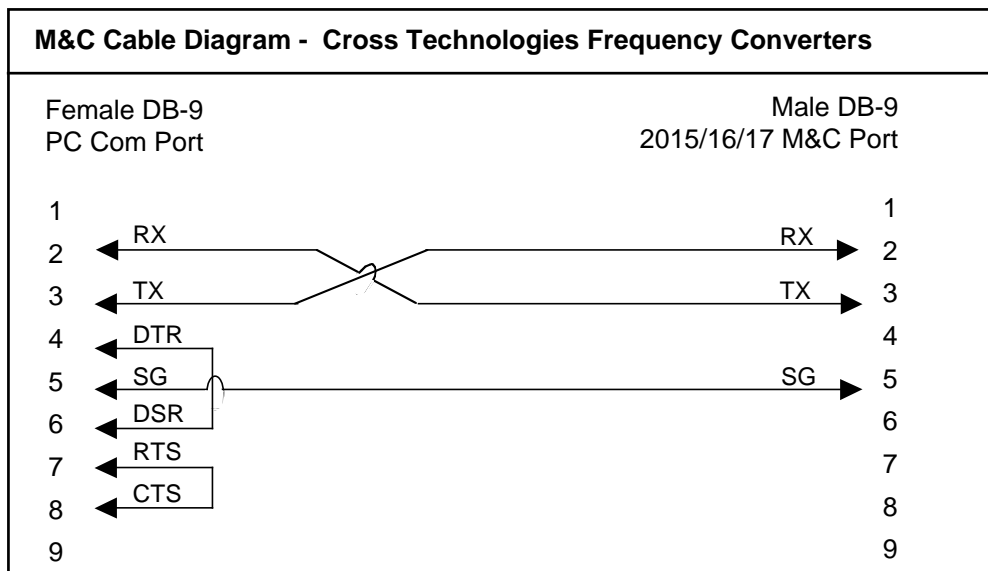
2.3 Front Panel Controls and Indicators

Figure 2.2 shows the front panel controls and indicators.

DS2 - AMP1 STATUS LEDs
Indicate whether AMP1 is
Online or in an Alarm state
or in standby.

DS3 - AMP2 STATUS LEDs
Indicate whether AMP2 is
Online or in an Alarm state
or in standby.

LCD DISPLAY
Displays measured current
in each unit/amp, and
attenuatioin.

S1 - MENU/EXECUTE BUTTON
Press this to get into Program mode
and to execute any changes.

	AMP	ATTEN 1	ATTEN 2
CH1	0. 300	10. 0	12. 5
CH2	0. 290	02. 0	01. 5
BU	0. 310	08. 0	12. 0

POWER — ALARM, PS1, PS2
STATUS — ALARM, STDBY, ONLINE — 1 2 BU
MODE — MANUAL, REMOTE, AUTO
MENU / EXECUTE

DS5 - POWER LEDs
Light Green when DC
power is present from PS1
and/or PS2. Alarm lights red
if an internal power supply
alarm.

DS4 - AMP3 STATUS LEDs
Indicate whether AMP3 is in
Standby (not backing up
AMP1 or AMP2), Online,
or in an Alarm state.

DS1 - MODE LEDs
Indicate if 2282 is in
MANUAL, REMOTE or
AUTO mode.

S2 - VERT. TOGGLE
Vertical toggle switch that
controls values in the Menu
items when in program mode.
Does not function in the normal
display mode

S3 - HORIZ. TOGGLE
Horizontal toggle switch
that controls which values
are being adjusted. Does
not function in the normal
display mode

FIGURE 2.2   2282-122-23 Front Panel Controls and Indicators

TABLE 2.2 LED Indicators	
LED	**Function**
ALARM	Illuminates RED when any power supply is in an alarm state
POWER1	Illuminates GREEN when power supply 1 is on
POWER2	Illuminates GREEN when power supply 2 is on
STATUS1, ALARM	Illuminates RED when a fault is detected from AMP1 monitor
STATUS1, STDBY	Illuminates YELLOW when on standby
STATUS1, ONLINE	Illuminates GREEN when AMP1 is online
STATUS2, ALARM	Illuminates RED when a fault is detected from AMP2 monitor
STATUS2, STDBY	Illuminates YELLOW when on standby
STATUS2, ONLINE	Illuminates GREEN when AMP2 is online
STATUSBU, ALARM	Illuminates RED when a fault is detected from BU monitor
STATUSBU, STDBY	Illuminates YELLOW when on standby
STATUSBU, ONLINE	Illuminates GREEN when BU is online
MANUAL	Illuminates RED when controller is in manual mode
REMOTE	Illuminates YELLOW when unit is in remote mode

2.4 Installation / Operation

2.4.1 Installing and Operating the 2282-122-23

1. Connect external Amplifier inputs and outputs to the 2282 via respective RF connectors (Figure 2.1).
2. Connect two 100-240 ±10% VAC, 47 - 63 Hz power cords to PS1 and PS2 on the back panel (Figure 2.1).
3. Be sure DS8 & DS9 (green, DC Power) are on and red Alarm indicators are off (Figure 2.2).
4. Set the current windows for AMP1, AMP2 and AMP3 if needed (See Section 2.5 Menu Settings).
5. <u>AC Fuses</u> **-** The fuses are 5 mm X 20 mm, 2 amp slow blow (Type T) and are inserted in the far slot in the drawer below the AC inputs as shown in Figure 2.3. There is a spare fuse in the near slot.
6. NOTE: If a fuse continues to open, the corresponding power supply is most likely defective.

FUSE DRAWER

SPARE FUSE

AC Fuse - 2 amp slow blow (Type T),
5 mm X 20 mm

INPUT $\sim$	FUSE
100-240± 10%VAC	TYPE T 2A GDC
47-63 Hz	250 VOLT
2A MAX	FOR 100 - 240 V~
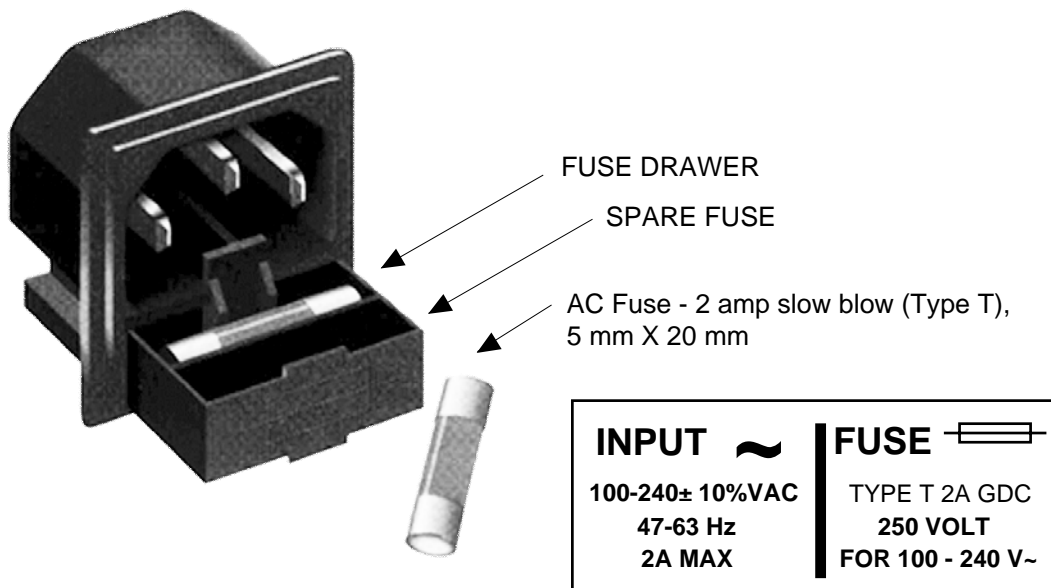
FIGURE 2.3   Fuse Location and Spare Fuse

2.5 Menu Settings

2.5.1 Functions

This section describes operation of the front panel controls. There are three operator switches, the
LCD display and alarm indicator LEDs. All functions for the equipment are controlled by these components.
The functions are (see Figure 2.4):

    Power Up
    Normal Display

    Menu 1 Enable Manual mode
    Menu 1a Manually Set Switch Position
    Menu 2 Set Channel 1 Attenuation
    Menu 3 Set Channel 2 Attenuation
    Menu 4 Set Channel 3 Attenuation
    Menu 5 Set AMP1 Current Window? Y/N
    If Y then --> **Menu 5a** Set Nominal current to Actual Measured value of AMP1 current? Y/N
    Menu 6 Set AMP2 Window? Y/N
    If Y then --> **Menu 6a** Set Nominal current to Actual Measured value of AMP2 current? Y/N
    Menu 7 Set AMP3 Window? Y/N
    If Y then --> **Menu 7a** Set Nominal current to Actual Measured value of AMP3 current? Y/N
    Menu 8 Set Priority
    Menu 9 Set Serial Interface
    Menu 10 Set RS485 Remote Address
    Menu 11 Display Internal PCB Temperature
    Menu 12 Change Network Settings (Ethernet option)
    If Y then --> **Menu 12a** Set IP Address
                Menu 12b Set Subnet Mask
                Menu 12c Set Gateway Address
                Menu 12d Restore Factory Network Settings
    Menu 13 Save Settings

    Save Menu When "R" is selected or when get to the end.

Alarm indications appear on the LEDs (See figure 2.2).

All program changes must start with the operation of the Menu/Execute switch and must also end with the
operation of the Menu/Execute switch verified by the "Save Settings?" Menu. If this sequence is not followed,
none of the changes will take effect. If programming is initiated and no operator action takes place for
approximately 30 seconds (before the final press of the Menu/Execute switch) the display will revert to its
previous status and you will need to start over.

2.5.2 Control Switches

1. <u>Menu/Execute</u> - Any change to the programming of the unit must be initiated by pressing the Menu/Execute switch and completed by pressing the Menu/Execute switch.
2. <u>Horizontal Switch</u> - This switch is mounted so its movement is horizontal and moves the cursor left or right.
3. <u>Vertical Switch</u> - This switch is mounted so its movement is vertical, and changes settings in each menu.

2.5.3. Power On Settings and LCD Menu
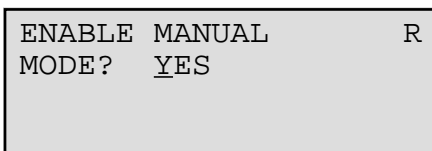
NOTE: The last status of a unit is retained even when power is removed. When power is restored, the unit will return to it's previous settings.

When power is first applied, the unit will read and display the internal network device's IP address if any ethernet options are installed. The model number and current firmware version will then be displayed for approximately 2 seconds. See figure 2.4 for display formats.

The unit is now operational and ready for any changes the operator may desire. The main display is formatted such that the first column displays the current drawn by each unit and the second column displays the attenuation setting for each channel.

2.5.4. Detailed Menu Descriptions

Menu 1: Enable Manual Mode

```
ENABLE  MANUAL       R
MODE?   YES
```

Select YES or NO with the UP/DOWN switches. If YES is selected than the unit will instantly be in Manual switching mode and the next menu will allow the operator to scroll through the three possible switch states which are: Backup None, Backup CH1, and Backup CH2. If NO is selected than the unit will not be in manual mode and the next menu will be set CH1 attenuation. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 1a: Manually Set Switch Position

```
SWITCH POSITION=     R

BACKUP CH1
```

Scroll through the three possible RF switch positions with the UP/DOWN switch. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 2: Set Channel 1 Attenuation
Menu 3: Set Channel 2 Attenuation
Menu 4: Set Channel 3 Attenuation

```
CH1 ATTENUATION      R
ATTEN1 = 10.0 dB
ATTEN2 = 12.5 dB
```

Each amplifier has an output attenuator. Menus 2 through 4 allow the operator to adjust each respective channel's input and output attenuation. ATTEN1 adjusts the input attenuator and ATTEN2 adjusts the output attenuator. These attenuators are adjustable from 0 to 30.0 dB in 0.5 dB steps. Use the LEFT/RIGHT switch to select a digit and use the UP/DOWN switch to adjust the value. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 5: Set AMP1 Window (Nominal Current)
Menu 6: Set AMP2 Window (Nominal Current)
Menu 7: Set AMP3 Window (Nominal Current)

```
SET AMP1  Y/N        R
WINDOW
```

Each amplifier's DC current is continously measured and compared to a nominal value that is set by the operator. If the measured current deviates from a +/- 15% window of the nominal (expected) value then the amplifier is determined to be in a faulted state and will alarm. The nominal current will not normally need adjustment unless an amplifier is swapped out. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 5a Set AMP1 Nominal Current to Actual Measured Value
Menu 6a Set AMP2 Nominal Current to Actual Measured Value
Menu 7a Set AMP3 Nominal Current to Actual Measured Value

```
AMP1 CURRENT        R
NOM=0.802
ACT=0.795
Set to actual?    Y/N
```

This menu is simply an indication of the present value of the nominal AMPx current, as well as the actual measured value of AMPx current. Select "Y" to reset the nominal value to the actual value that is presently being measured. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 8 Set Auto Switching Mode Priority

```
PRIORITY=1          R


```

The priority setting allows the operator to select which AMP will be backed up if both AMP1 and AMP2 are alarmed. Use the UP/DOWN switch to select the desired priority. Select "1" to set AMP1 as the top priority. Select "2" to set AMP2 as the top priority. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 9 Set Serial Interface

```
COMM INTERFACE       R
RS-232
```

Use the UP/DOWN switch to scroll through the available serial remote M&C interfaces (RS-232, RS-422, or RS-485). Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 10 Set RS485 Remote Address

```
ADDRESS=00           R
```

Use the up and down switches to set the RS-485 address of the unit. This only applies if the serial interface is set to RS-485. Do not include the address in M&C commands if the interface is not RS-485. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 11 Display Internal PCB Temperature

```
TEMPERATURE=         R
+31 DEGREES C
```

This menu displays the internal temperature of the unit in degrees celsius. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 12 Change Network Settings (Ethernet option)

```
CHANGE NETWORK      R
SETTINGS?   YES
```

Use the up and down switches to select "YES" or "NO". Select "YES" to advance to the network settings submenus. Select "NO" to skip past the netowrk settings submenus. Press PROGRAM/EXECUTE to proceed. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 12a Set IP Address

```
IP ADDRESS=         R
192.168.123.002
```

Use the LEFT/RIGHT switch to select a digit and use the UP/DOWN switch to adjust the value. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 12b Set Subnet Mask

```
SUBNET MASK=        R
255.255.255.000
```

Use the LEFT/RIGHT switch to select a digit and use the UP/DOWN switch to adjust the value. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 12c Set Gateway Address

```
GATEWAY ADDR=       R
000.000.000.000
```

Use the LEFT/RIGHT switch to select a digit and use the UP/DOWN switch to adjust the value. Push the PROGRAM/EXECUTE switch to go to the next menu. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Menu 12d Restore Factory Settings

```
RESTORE FACTORY      R
SETTINGS?    NO
```

Use the up and down switches to select "YES" or "NO". Select "YES" to restore the IP Address, subnet mask, and gateway address values to their factory settings. The factory settings are:

IP Address = 192.168.123.2

Subnet mask = 255.255.255.000

Gateway Address = 000.000.000.000

Press PROGRAM/EXECUTE to proceed. Use the LEFT/RIGHT switch to move the cursor to R, then push the PROGRAM/EXECUTE switch to jump to the SAVE SETTINGS menu.

Power Up

```
Reading IP Addr
```

**Display IP Address
(If Ethernet)**

```
=== IP ADDR ===
192.168.123.2
```

**Model Number and
Firmware Rev.**

```
2282-122-23W18
REV. 5.20
```

PUSH BUTTON

NORMAL DISPLAY

Normal Display

	AMP	ATTEN
CH1	0.339	14.5
CH2	0.342	12.5
BU	0.326	18.5

Menu 1
Enable Manual Mode

```
ENABLE MANUAL      R
MODE YES
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

Menu 1a
Manually Set Sitch
Position

```
SWITCH POSITION=   R
BACKUP CH1
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

Menu 2
Set CH1 Attenuation

```
CH1 ATTENUATION    R
ATTEN1 14.5 dB
ATTEN2 22.0 dB
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

Menu 3
Set CH2 Attenuation

```
CH2 ATTENUATION    R
ATTEN1 14.5 dB
ATTEN2 22.0 dB
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

Menu 4
Set CH3 Attenuation

```
CH3 ATTENUATION    R
ATTEN1 14.5 dB
ATTEN2 22.0 dB
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

Menu 5
Set AMP1 Current Window

```
SET AMP1      Y/N R
Window
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

Menu 5a
Set AMP1 Current Window

```
AMP1   CURRENT     R
NOM =  0.805
ACT =  0.793
SET to Actual?  Y/N
```

SCROLL <>
SCROLL ⬍   PUSH BUTTON

FIGURE 2.4   Menu Display and Sequences

| **Menu 6**<br>Set AMP2 Current Window | ```
SET AMP2    Y/N    R
Window
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 6**a<br>Set AMP2 Current Window | ```
AMP2    CURRENT    R
NOM =  0.805
ACT =  0.793
SET to Actual? Y/N
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 7**<br>Set AMP3 Current Window | ```
SET AMP3    Y/N    R
Window
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 7**a<br>Set AMP3 Current Window | ```
AMP3    CURRENT    R
NOM =  0.805
ACT =  0.793
SET to Actual? Y/N
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 8**<br>Set Priority | ```
PRIORITY=1    R
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 9**<br>Set Serial Interface | ```
COMM INTERFACE    R
RS-232
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 10**<br>Set RS485 Remote<br>Address | ```
ADDRESS=00    R
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 11**<br>Display Internal<br>PCB Temperature | ```
TEMPERATURE=    R
+31 DEGREES C
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 12**<br>Change Network Settings<br>(Ethernet option) | ```
CHANGE NETWORK    R
SETTINGS?    YES
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 12a**<br>Set IP Address | ```
IP ADDRESS    R
192.168.123.002
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 12b**<br>Set Subnet Mask | ```
SUBNET MASK=    R
255.255.255.000
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 12c**<br>Set Gateway Address | ```
GATEWAY ADDR=    R
000.000.000.000
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |
| **Menu 12d**<br>Restore Factory Settings | ```
RESTORE FACTORY    R
SETTINGS    NO
``` | SCROLL <><br>SCROLL ⌃⌄ | PUSH BUTTON |

3.0 ETHERNET Interface Installation and Operation   (Option W8, W18, W29 only)

The 2282-122-23 Block Downconverter is equipped with a 10/100 Base-T compatible Ethernet interface for control and monitoring of its operating parameters. An HTML script interface allows the user to monitor and control the converter using a standard web browser. SNMP (Simple Network Management Protocol) is also supported. Contact Cross Technologies for the SNMP MIB file.

3.1 Methods of Connection

Directly Connected to a PC:
For control from a local PC, attach the 2282-122-23's Ethernet port to the Ethernet network connector on the PC using a crossover RJ-45 cable.

LAN Connection
For LAN connections, attach the 2282-122-23 Ethernet port to the LAN using a normal RJ-45 cable.
Use any PC on the LAN to connect to the 2282-122-23.

3.2 Ethernet Configuration

Each 2282-122-23 must be configured with an appropriate IP address, Netmask, and Gateway assigned by your network manager. The 2282-122-23 is set at the factory with the following network settings:

> **Factory Network Settings**
> **IP Address:**   **192.168.123.2**
> **Subnet Mask**   **255.255.255.000**
> **Gateway**   **000.000.000.000**

The network settings may be changed via the front panel or from the web browser interface.

3.3 Web page M&C

Enter the following address in a web browser to access the M&C web page:

http://<ip address of 2282-122-23>/serial/0/setup.htm where <ip address> is the IP address of the unit.

Figure 3.3 shows the web page from a model 2282-122-23 frequency converter.

Figure 3.3 - Model 2282-122-23 Web page

3.4 SNMP Configuration

Setting of SNMP parameters such as Community Write and Community Read strings requires a *Telnet*® connection to port 9999. The following instructions explain how to establish such a *Telnet*® connection using Windows XP's Hyper Terminal utility.

Start the Hyper Terminal application and select "New Connection" from the "File" drop down menu. The next screen is a "Connect To" dialog box. Select TCP/IP (Winsock) from the "Connect" using drop down menu.

Enter the IP address of the 2282-122-23 in the "Host address:" field and 9999 in the "Port number" field. Figure 2-E shows an example of the Hyper Terminal settings required to access the SNMP configuration menu.

Figure 3.2: - Telnet® Settings in Hyper Terminal

Once the *Telnet*® connection is established you will be prompted to "Press Enter for Setup Mode." Press enter and a menu of device server configuration options will appear (see Figure 2-F). Select menu item 3, "SNMP configuration." You will be prompted to enter SNMP community read and write strings. After setting your desired community strings you will be prompted to "Enter IP addresses for SNMP traps" You must enter at least one and up to four IP addresses of SNMP managers that will access the unit. This is required even though SNMP traps are not implemented. The unit will not process SNMP SET and GET requests from an SNMP manager unless the IP address associated with that manager is entered in the device server.

```
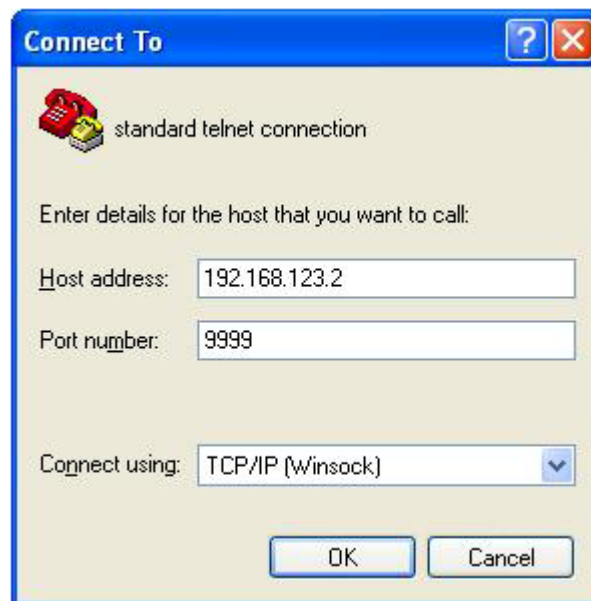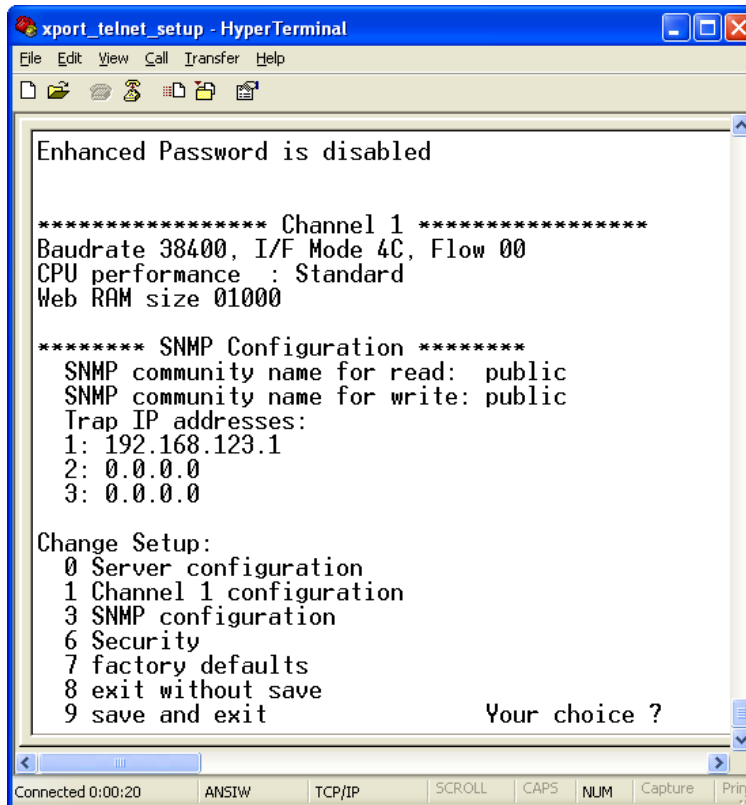xport_telnet_setup - HyperTerminal
File  Edit  View  Call  Transfer  Help

Enhanced Password is disabled


****************** Channel 1 ******************
Baudrate 38400, I/F Mode 4C, Flow 00
CPU performance  : Standard
Web RAM size 01000

******** SNMP Configuration ********
  SNMP community name for read:  public
  SNMP community name for write: public
  Trap IP addresses:
  1: 192.168.123.1
  2: 0.0.0.0
  3: 0.0.0.0

Change Setup:
  0 Server configuration
  1 Channel 1 configuration
  3 SNMP configuration
  6 Security
  7 factory defaults
  8 exit without save
  9 save and exit              Your choice ?

Connected 0:00:20    ANSIW    TCP/IP    SCROLL  CAPS  NUM  Capture  Print
```

Figure 3.3 - Device Server Configuration Menu

CROSS TECHNOLOGIES, INC.

6170 Shiloh Road

Alpharetta, Georgia 30005

(770) 886-8005

FAX (770) 886-7964

Toll Free 888-900-5588

WEB www.crosstechnologies.com

E-MAIL info@crosstechnologies.com

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