Instruction Manual

Model 2582-123
Switch

May 2011,   Rev. E

```
                              1   2      BU
                        PROT  P   P       2      MENU    ▲  █            MODEL 2582
POWER      ALARMS   ONLINE / OFFLINE  MODE  A   M       M        ○      ▼    ██         SWITCH
○ ○   ○ ○   ○ ○   ○ ○   ○         STATUS        EXECUTE          ◄ ►              CROSS TECHNOLOGIES INC.
1  2   1  2   BU SW  1  2   BU
```

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INSTRUCTION MANUAL

MODEL 2582-123 Switch

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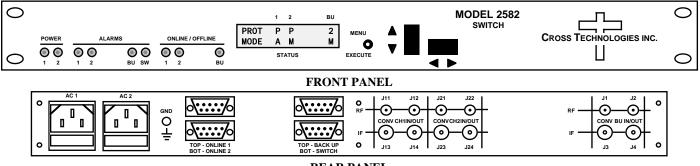
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MODEL 2582-123 Switch, 1 for 2

1.0 General

1.1 Equipment Description

The 2582-123, 1 for 2 Switch, provides Auto, Remote, or Manual backup protection for up to 2 block converters by relay switching the L-Band and RF signals from a backup unit to any of the 2 online units. The 2582-123 works with standard Cross Technologies' block up and downconverters by polling their monitor and control ports on a periodic basis. A defective unit's inputs and outputs are switched from the failed unit to the backup unit either automatically (when an alarm is detected from the failed unit), remotely or manually. Manual switching overrides Remote and Auto switching, while Remote switching overrides Auto switching. Manual selection is made by the front panel multi-function, push-button switches. Remote selection is made via a rear panel female DB9 connector. The 2582-123 is powered by redundant 100-240 (±10%) VAC power supplies and is housed in a 1 3/4" X 19" X 16" 1RU rack mount chassis.
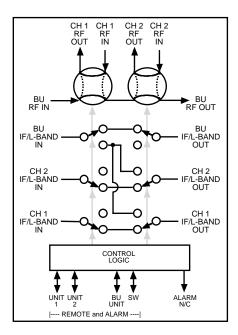

FIGURE 1.1   Front and Rear Panels

FIGURE 1.2   Block Diagram (Upconverter Scenario)

1.2 Technical Characteristics

TABLE 1.0   2582-123 Switch Specifications*

IF (L-band) / RF Switch Characteristics

Impedance	50 Ω
Return Loss	> 12 dB
Type	RF Transfer
Isolation	> 55 dB, DC to 1.5 GHz
	> 50 dB, to 2.2 GHz;
Switch time	≤ 100 milliseconds
Insertion Loss	≤ 1.5 dB, to 1.5 GHz;
	≤ 2.0 dB, to 2.2 GHz
Configuration	1 for 2, no termination

RF Switch Characteristics

Impedance	50 Ω
Return Loss	> 12 dB
Type	Relay
Isolation	> 60 dB, to 15 GHz
Switch time	≤100 milliseconds
Insertion Loss	≤ 1.5 dB, to 8 GHz;
	≤ 2.0 dB, to 15 GHz
Configuration	1 for 2, no termination

Controls, Indicators

Manual Selection	Push-button switches
Remote Selection	RS 232C (RS 422/485, **Option Q**), 9600 baud
Power	Green LEDs
Alarms	Red LEDs
Online/Offline	Green LEDs

Other

RF Connectors	SMA (female) 50Ω
L-Band Connectors	BNC (female) 50Ω (Option-SF 75Ω F-type)
Alarm/Remote Connectors	DB9 (female)
Size	19 inch, 1RU Standard Chassis, 1.75" High X 16.0" Deep
Power	100-240 ±10% VAC, 47-63 Hz, 45 watts max;
	Redundant Power Supplies

---

*+10˚C to +40˚C; Specifications subject to change without notice

1.3 Monitor and Control Interface

A) Remote serial interface

Protocol: RS-232C, 9600 baud rate, no parity, 8 data bits, 1 start bit, and 1 stop bit.
(RS-232C, RS-422, or **RS-485 - option Q**)

Connectors: Rear panel, DB-9 female

SWITCH 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

CH1,CH2,BU Pinouts (RS-232C/422/485)	
Pin	Function
1	Not Connected
2	Not Connected
3	Not Connected
4	Not Connected
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

B) Status Requests Table 1.1 lists the status requests for the 2582-123 and briefly describes them.

* PLEASE NOTE: The two character {aa} prefix, in the table below, should be used ONLY when RS-422/RS-485, (OPTION-Q), is selected.

TABLE 1.1 2582-123 Status Requests		
Command	Syntax *	Description
Command Status	{aaS1}	Returns {aaS1bcdefghij} where:
		• b = BACK-UP Status
		O = Normal, no channels backed up
		1 = CH1 is currently backed up
		2 = CH2 is currently backed up
		• c = CH1 Status -- O = protected, 1 = unprotected
		• d = CH1 Mode -- O = AUTO, 1 = MANUAL, 2 = REMOTE
		• e = CH2 Status -- O = protected, 1 = unprotected
		• f = CH2 Mode -- O = AUTO, 1 = MANUAL, 2 = REMOTE
		• g = CH1 Alarm -- O = normal, 1 = alarm
		• h = CH2 Alarm -- O = normal, 1 = alarm
		• i = BACK-UP Alarm -- O = normal, 1 = alarm
Min. Auto Switching Status	{aaS5}	Returns {aaS5b} where:
		• b = Minimum Auto Switching Mode Status
		O = Normal, Minimum Auto Switching OFF
		1 = Minimum Auto Switching ON

C) Commands Table 1.2 lists the commands for the 2582-123 and briefly describes them. After a command is sent the 2582-123 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 RS-485 mode, **option -Q only**)

        C = 1 character, either C (command) or S (status)

        N = 1-digit command or status number, 1 through 9

        D = 1 character or more of data (depends on command)

        } = stop byte

   * PLEASE NOTE: The two character {aa} prefix, in the table below, should be used
      ONLY when RS-422/RS-485, (OPTION-Q), is selected.

Table 1.2 2582-123 Commands		
Command	Syntax*	Description
Set CH1 Status and Mode	{aaC1xy}	where:
		• x = 0; CH1 Protected
		• x = 1; CH1 Unprotected
		• y = 0; set CH1 to AUTO mode
		• y = 1; switch BACK-UP to CH1
Set CH2 Status and Mode	{aaC2xy}	where:
		• x = 0; CH2 Protected
		• x = 1; CH2 Unprotected
		• y = 0; set CH2 to AUTO mode
		• y = 1; switch BACK-UP to CH2
Set Min. Auto Switching Mode	{aaC5x}	where:
		• x = 0; Minimum Auto Switching DISABLED
		• x = 1; Minimum Auto Switching ENABLED
Restore Switch Position	{aaC6x}	where:
		• x = 1; Restore Switch Position after the switch position
		changed in Minimum Auto Switching mode

2.0 Installation

2.1 Mechanical

The 2582-123 consists of one IF or L-Band Switching PCB, one Controller PCB, and two baseball switches housed in a 1 RU (1 3/4 inch high) by 16 inch deep chassis. Two redundant switching, ± 12, +24, +5 VDC power supplies provide power for the assembly. The 2582-123 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2582-123 is assembled.
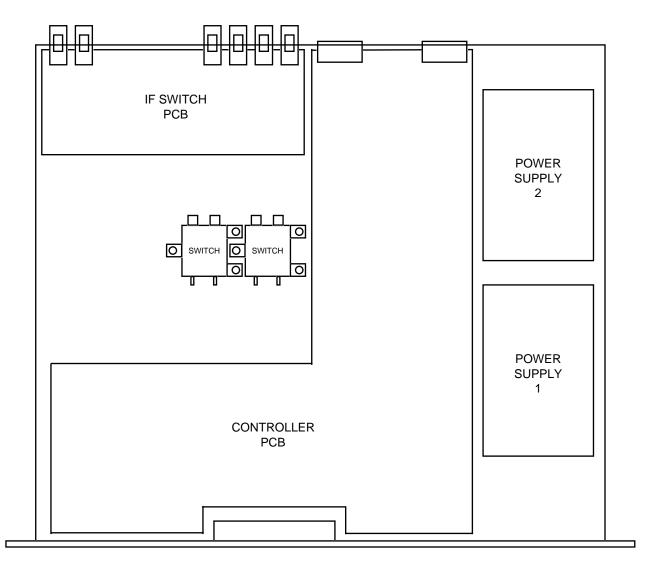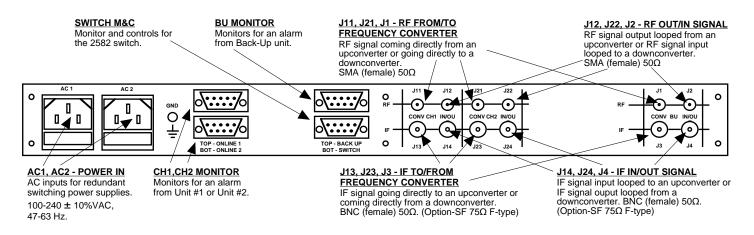

FIGURE 2.0   2582-123 Mechanical Assembly

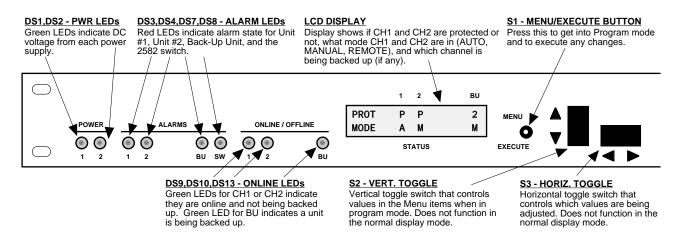## 2.2 Rear Panel Input/Output Signals - Figure 2.1 shows the input and output connectors on the rear panel.

SWITCH M&C
Monitor and controls for the 2582 switch.

BU MONITOR
Monitors for an alarm from Back-Up unit.

J11, J21, J1 - RF FROM/TO FREQUENCY CONVERTER
RF signal coming directly from an upconverter or going directly to a downconverter.
SMA (female) 50Ω

J12, J22, J2 - RF OUT/IN SIGNAL
RF signal output looped from an upconverter or RF signal input looped to a downconverter.
SMA (female) 50Ω

AC1, AC2 - POWER IN
AC inputs for redundant switching power supplies.
100-240 ± 10%VAC, 47-63 Hz.

CH1,CH2 MONITOR
Monitors for an alarm from Unit #1 or Unit #2.

J13, J23, J3 - IF TO/FROM FREQUENCY CONVERTER
IF signal going directly to an upconverter or coming directly from a downconverter.
BNC (female) 50Ω. (Option-SF 75Ω F-type)

J14, J24, J4 - IF IN/OUT SIGNAL
IF signal input looped to an upconverter or IF signal ouput looped from a downconverter. BNC (female) 50Ω. (Option-SF 75Ω F-type)

FIGURE 2.1   2582-123 Rear Panel I/O's

TABLE 2.1 SWITCH 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

*Remote Serial Interface
   Interface: DB-9 Male
   Protocol: RS-232C (RS-232C/422/485 **option Q only**), 9600 baud rate, no parity, 8 data bits, 1 start bit, 1 stop bit.

2.3 Front Panel Controls and Indicators - The following are the front panel controls and indicators.

DS1,DS2 - PWR LEDs
Green LEDs indicate DC voltage from each power supply.

DS3,DS4,DS7,DS8 - ALARM LEDs
Red LEDs indicate alarm state for Unit #1, Unit #2, Back-Up Unit, and the 2582 switch.

LCD DISPLAY
Display shows if CH1 and CH2 are protected or not, what mode CH1 and CH2 are in (AUTO, MANUAL, REMOTE), and which channel is being backed up (if any).

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

DS9,DS10,DS13 - ONLINE LEDs
Green LEDs for CH1 or CH2 indicate they are online and not being backed up. Green LED for BU indicates a unit is being backed up.

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.
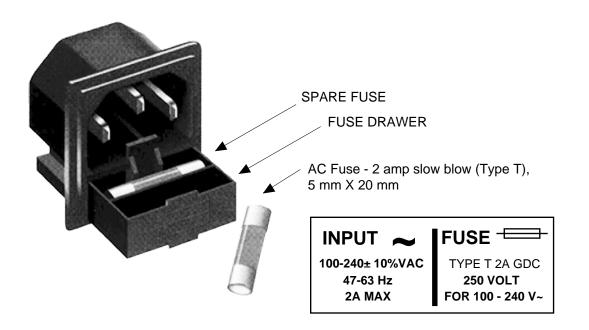
FIGURE 2.2   2582-123 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2582-123, Switch Section

1. Connect Block Converters (CH1, CH2, BU) to respective channels on the 2582 (Figure 2.1).
2. Connect Alarm cables from Block Converters to respective monitors on the 2582 (Figure 2.1).
3. Connect two 100-240 ± 10% VAC, 47 - 63 Hz power cords to AC1 and AC2 on the back panel (Figure 2.1).
4. Set which unit(s) you wish to protect and the mode for each unit (See Section 2.5 Menu Settings).
5. Be sure DS1 & DS2 (green, DC Power) are on and DS3, DS4, & DS5 (red, Alarm) are off (Figure 2.2).
6. <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. If a fuse continues to open, the corresponding power supply is most likely defective.

SPARE FUSE

FUSE DRAWER

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

INPUT ～	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

     Power Up
     Normal Display

     Menu 1 Set CH1 Protected/Unprotected
     Menu 2 Set CH1 Mode (MANUAL overrides REMOTE which overrides AUTO)
     Menu 3 Set CH2 Protected/Unprotected
     Menu 4 Set CH2 Mode (MANUAL overrides REMOTE which overrides AUTO)
     Menu 5 Set Remote mode
     Menu 6 Set RS-485 address
     Menu 7 Set Minimum Auto Switching Mode ON and OFF
     Menu 8 Restore Switch Position in Minimum Auto Switching Mode

     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 12 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. Power On Settings

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 LCD display goes through three steps.
>   1. The LCD goes black to show all segments are functioning.
>   2. The software version will be displayed.

```
            1      2                 BU
   ┌──────────────────────────────────────┐
   │                                        │
   │  REV 1.00                              │
   │                                        │
   │                                        │
   └──────────────────────────────────────┘
                 STATUS
```

>   3. The present protection state and mode of each channel/unit are shown.

```
            1      2                 BU
   ┌──────────────────────────────────────┐
   │  PROT        P    P                    │
   │                                        │
   │  MODE        A    A             A      │
   │                                        │
   └──────────────────────────────────────┘
                 STATUS
```

The unit is now operational and ready for any changes the operator may desire.

2.5.3 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.

2.5.4 Alarm Indications

An alarm condition will occur if the corresponding unit's local oscillator phase lock loop (PLL) comes out of lock (when connected properly).

Power Up

ON POWER UP

```
┌─────────────────────────────┐
│ REV 1.00                    │
│                             │
└─────────────────────────────┘
```

NORMAL DISPLAY

```
              1    2    3    4    BU
┌─────────────────────────────┐
│ PROT     P    P    P    P    │
│ MODE     A    A    A    A    A│
└─────────────────────────────┘
```

Normal Display

PUSH BUTTON

STATUS

PUSHING MENU/EXECUTE SEQUENCE

Menu 1 Set CH1 protection

```
┌─────────────────────────────┐
│ CH1 = _                  R  │
│ Protected                   │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 2 Set CH1 mode

```
┌─────────────────────────────┐
│ CH1 = _                  R  │
│ Auto                        │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 3 Set CH2 protection

```
┌─────────────────────────────┐
│ CH2 = _                  R  │
│ Protected                   │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 4 Set CH2 mode

```
┌─────────────────────────────┐
│ CH2 = _                  R  │
│ Auto                        │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 5 Set Remote Mode

```
┌─────────────────────────────┐
│ RS 485   OFF             R  │
│                             │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 6 Set RS-485 Address

```
┌─────────────────────────────┐
│ ADDRESS = OO             R  │
│                             │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 7 Set Min. Auto Switching

```
┌─────────────────────────────┐
│ Minimum Auto             R  │
│ Switching=ON                │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Menu 8 Restore Switch

```
┌─────────────────────────────┐
│ Restore Sw=OFF  R           │
│                             │
└─────────────────────────────┘
```
SCROLL <>
SCROLL ⌃⌄   PUSH BUTTON

Save? When "R" is selected from any above menu or at the end

```
┌─────────────────────────────┐
│ SAVE SETTINGS?    Y N        │
│                             │
└─────────────────────────────┘
```
SCROLL <>   PUSH BUTTON

FIGURE 2.4   Menu Display and Sequences

2.5.5 Minimum Auto Switching Mode

Enabling and Disabling

The Minimum Auto Switching mode is enabled and disabled via a front panel menu.

The Minimum Auto Switching mode can also be enabled and disabled via the following M&C command:

> {C5x}

> Where x=1 to enable and x=0 to disable.

The status of the 2582-3xxx's Minimum Auto Switching mode setting can be queried by sending the following command:

> {S5}

> Which returns {S5x} where x=1 if enabled and x=0 if disabled.

Operation

In the Minimum Auto Switching mode the switch will remain in a backup state after an alarm event - even if the alarm event that caused the unit to switch has been cleared. The main display will show an "H" under the BU MODE after an alarm causes the switch to change states while in the Minimum Auto Switching mode. The unit can be restored to the normal state via a front panel restore command or an M&C restore command. The front panel Restore Switch menu appears after the Minimum Auto Switching mode ON/OFF menu only if the Minimum Auto Switching mode is on. The switch can also be Restored via the following M&C command:

> {C6x}

> Where x=1 to Restore.

NOTE: The switch will automatically restore - as soon as the alarm event that caused the unit to switch has been cleared - *IF* the Minimum Auto Switching mode is disabled either via the front panel setting or by the M&C command.

3.0 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 unit 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 REINSTALLED prior to Top Cover screw replacement. FAILURE TO DO this may cause INGRESS and/or EGRESS emission problems.

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