RACAL INSTRUMENTS™

1260-121A/B

12 CHANNEL PLUG-IN

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Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.

This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.

If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.

Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.

Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid “live” circuit points.

Before operating this instrument:

1. Ensure the proper fuse is in place for the power source to operate.

2. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

Do not operate until performance is checked by qualified personnel

.

Racal Instruments

EC Declaration of Conformity

We

Racal Instruments Inc.
4 Goodyear Street
Irvine, CA 92718

declare under sole responsibility that the

1260-121A 12-Channel Plug-In Module W/Screw Terminals
P/N 407740-001
1260-121B 12-Channel Plug-In Module W/Rack & Panel Connectors
P/N 407740-002

conforms to the following Product Specifications:

Safety: EN 61010-1

EMC: Immunity: EN61326, Class A, Table 1
Emissions: EN61326, Class A, Table 3

Supplementary Information:

The above specifications are met when the product is installed in a Racal Instruments certified enclosure, with faceplates installed over all unused slots, as applicable.

The product herewith complies with the requirements of EN61010-1 and EN61326.

Irvine, CA, February 22, 2001

Quality Manager

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DOCUMENT CHANGE HISTORY

Revision	Date	Description of Change
A	9/29/08	Revised per EO 29404 Revised format to current standards. Company name revised throughout manual. Manual now revision letter controlled. Added Document Change History Page v.

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Chapter 1
SPECIFICATIONS

Introduction

The 1260-121A/B is a plug-in switch module developed for the 1260-100 Adapt-a-Switch Carrier. The 1260-121A/B includes the following features:

- Standard Adapt-a-Switch plug-in design, providing for ease of replacement
- Data-Driven embedded descriptor, allowing immediate use with any Option-01T switch controller, regardless of firmware revision level.

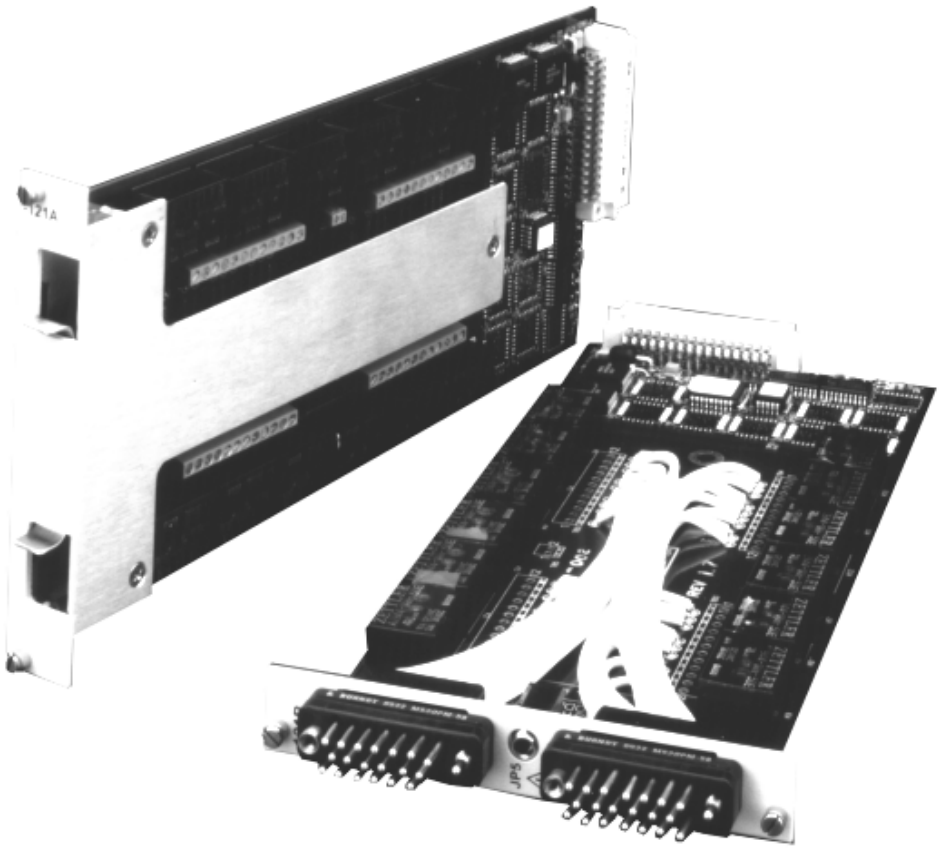

Figure 1-1, The 1260-121A/B

The 1260-121A/B is a 12-channel single-wire switch consisting of 12 individual SPDT relay switches. The version “A” has a screw terminal block interface and version “B” has Rack-and-Panel connectors. The 1260-121A/B plug-in fits into a 1260-100 Adapt-a-Switch Carrier.

Specifications

Bandwidth (-3dB)	Small signal: 35MHz Power: 400Hz	
Insertion Loss		
1 KHz	< -1dB	
Isolation		
1 KHz	> 100dB	
Crosstalk		
1 KHz	< -100dB	
Switching Voltage		
AC	250V, Max	
DC	125V, Max	
Switching Current		
AC	12A, Max. (1260-121A) 13A, Max. (1260-121B)	(see the **Mating Connectors** section in Chapter 2)
DC	10A, Max	
Switching Power		
AC	1250VA, Max	
DC	150W, Max	
Path resistance	< 0.5Ω (measured by voltage drop, 6VDC, 1A)	
Thermal EMF	< 20uV	
Capacitance		
Channel-Chassis	< 1pF	
Open-Channel	< 12pF	
Insulation resistance	$> 10^9\Omega$	
Relay Settling Time	< 10ms	
Shock	30g, 11ms, ½ sine wave	
Vibration	0.013in. P-P, 5-55Hz	
Bench Handling	4 in., 45°	

Cooling	See 1260-100 cooling data
Temperature	
Operating	0°C to +60°C
Non-operating	-40°C to +75°C
Relative Humidity	85% Max., non-condensing at < 30°C
Altitude	
Operating	10,000 feet
Non-operating	15,000 feet
Power Requirements	
+5VDC	0.9A Max.
Weight	13oz. (0.45kg)
MTBF	979,058 hours (MIL-HDBK-217E)

Power Dissipation

While the cooling of the Adapt-a-Switch carrier is dependent upon the chassis into which it is installed, the carrier can normally dissipate approximately 100 W. Care must be taken, then, in the selection and loading of the plug-in modules used in the carrier. It is not possible to fully load the carrier, energize every relay, and run full power through every set of contacts, all at the same time. In practice this situation would never occur.

To properly evaluate the power dissipation of the plug-in modules, examine the path resistance, the current passing through the relay contacts, the ambient temperature, and the number of relays closed at any one time.

For example, if a 1260-121 module (containing 80 relays) has 25 relays closed, passing a current of 0.5 A, then:

Total power dissipation =
$[(\text{current})^2 * (\text{path resistance}) * 25] + (\text{quiescent power})$

By substituting the actual values:

Total power dissipation =
$[(0.5\ A)^2 * (1\ \Omega) * 25] + (0.75\ W) = 7\ W$ at 55°C

This is acceptable power dissipation for an individual plug-in module. If five additional modules are likewise loaded, then the overall carrier dissipation is approximately 36 W, which is well within the cooling available in any commercial VXIbus chassis. In practice, rarely are more than 25% of the module's relays energized simultaneously, and rarely is full rated current run

through every path. In addition, the actual contact resistance is typically one-half to one-fourth the specified maximum, and temperatures are normally not at the rated maximum. The power dissipated by each plug-in should be no more than 15 W if all six slots are used simultaneously. This yields the following guideline:

0.5 A	Max. 56 relays closed
1.0 A	Max. 14 relays closed
2.0 A	Max. 4 relays closed

Most users of a signal-type switch, such as the 1260-118, switch no more than a few hundred milliamperes and are able to energize all relays simultaneously, should they so desire. The numbers in the above table represent worst-case, elevated-temperature, end-of-life conditions.

Additionally, if fewer plug-in modules are used, more power may be dissipated by the remaining cards. By using a chassis with high cooling capacity, such as the 1261B, almost any configuration may be realized.

About MTBF

The 1260-121A/B MTBF is 979,058 hours, calculated in accordance with MIL-HDBK-217E, with the exception of the electromechanical relays. Relays are excluded from this calculation because relay life is strongly dependent upon operating conditions. Factors affecting relay life expectancy are:

1. Switched voltage
2. Switched current
3. Switched power
4. Maximum switching capacity
5. Maximum rated carrying current
6. Load type (resistive, inductive, capacitive)
7. Switching repetition rate
8. Ambient temperature

The most important factor is the maximum switching capacity, which is an interrelationship of maximum switching power, maximum switching voltage and maximum switching current. When a relay operates at a lower percentage of its maximum switching capacity, its life expectancy is longer. The maximum switching capacity specification is based on a resistive load, and must be further de-rated for inductive and capacitive loads.

For more details about the above life expectancy factors, refer to the data sheet for the switch plug-in module.

The relay used on the 1260-121A/B plug-in is part no. 310265-001. The relay manufacturer's specifications for this relay are:

Life Expectancy

Mechanical	10,000,000 operations
Electrical	100,000 operations at full rated load

For additional relay specifications, refer to the relay manufacturer's data sheet.

Ordering Information

Listed below are part numbers for both the 1260-121A and 1260-121B switch modules and available mating connector accessories. Each 1260-121B uses two mating connectors.

ITEM	DESCRIPTION	PART #
1260-121A Switch Module	1260-121A w/ Termination Block Interface	407740-001
	Consists of:	
	PCB Assembly	405167-001
	Manual for 1260-121A/B	980824-121
1260-121B Switch Module	1260-121B, 12 Channel SPDT, 10 A	407740-002
	Consists of:	
	PCB Assembly	405167-002
	Shipping Kit (mating connectors, manual)	407653-121B
20 Pin Mating Connector "B" Model Only	20 Pin Conn. Kit w/backshell & solder cup pins	407660
Cable Assy. 6ft, Sleeved "B" Model Only	18-Conductor Cable Assy, 6 Ft, 14 AWG (2 Req'd)	407657-018
Additional Manual	Manual for 1260-121A/B	980824-121

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Chapter 2

INSTALLATION INSTRUCTIONS

Unpacking and Inspection

1. Remove the 1260-121A/B module and inspect it for damage. If any damage is apparent, inform the carrier immediately. Retain shipping carton and packing material for the carrier's inspection.

2. Verify that the pieces in the package you received contain the correct 1260-121A/B module option and the 1260-121A/B Users Manual. Notify EADS North America Test and Services, if the module appears damaged in any way. Do not attempt to install a damaged module into a VXI chassis.

3. The 1260-121A/B module is shipped in an anti-static bag to prevent electrostatic damage to the module. Do not remove the module from the anti-static bag unless it is in a static-controlled area.

Reshipment Instructions

1. Use the original packing when returning the switching module to EADS North America Test and Services, for calibration or servicing. The original shipping carton and the instrument's plastic foam will provide the necessary support for safe reshipment.

2. If the original packing material is unavailable, wrap the switching module in an ESD Shielding bag and use plastic spray foam to surround and protect the instrument.

3. Reship in either the original or a new shipping carton.

Installation

Installation of the 1260-121A/B Switching Module into a 1260-100 Carrier assembly is described in the Installation section of the 1260-100 Adapt-a-Switch Carrier Manual.

Module Configuration

The 1260-121A/B is a 12-channel single-wire switch module consisting of twelve SPDT relay switches. This architecture permits the 1260-121A/B module to be organized via software in any configuration from twelve SPDT to one 12PDT, or any combination in between, by use of the *Include* command, without the use of hardware jumpers. This is the same as a 1-wire, 2-wire, …, n-wire switch.

In addition, by jumpering pins at the module connectors, the user can configure the module as a SP2T, SP3T, etc., up to a SP12T switch. This type of configuration is known as a multiplexer.

For a block diagram of the 1260-121A/B, see **Figure 2-1**.

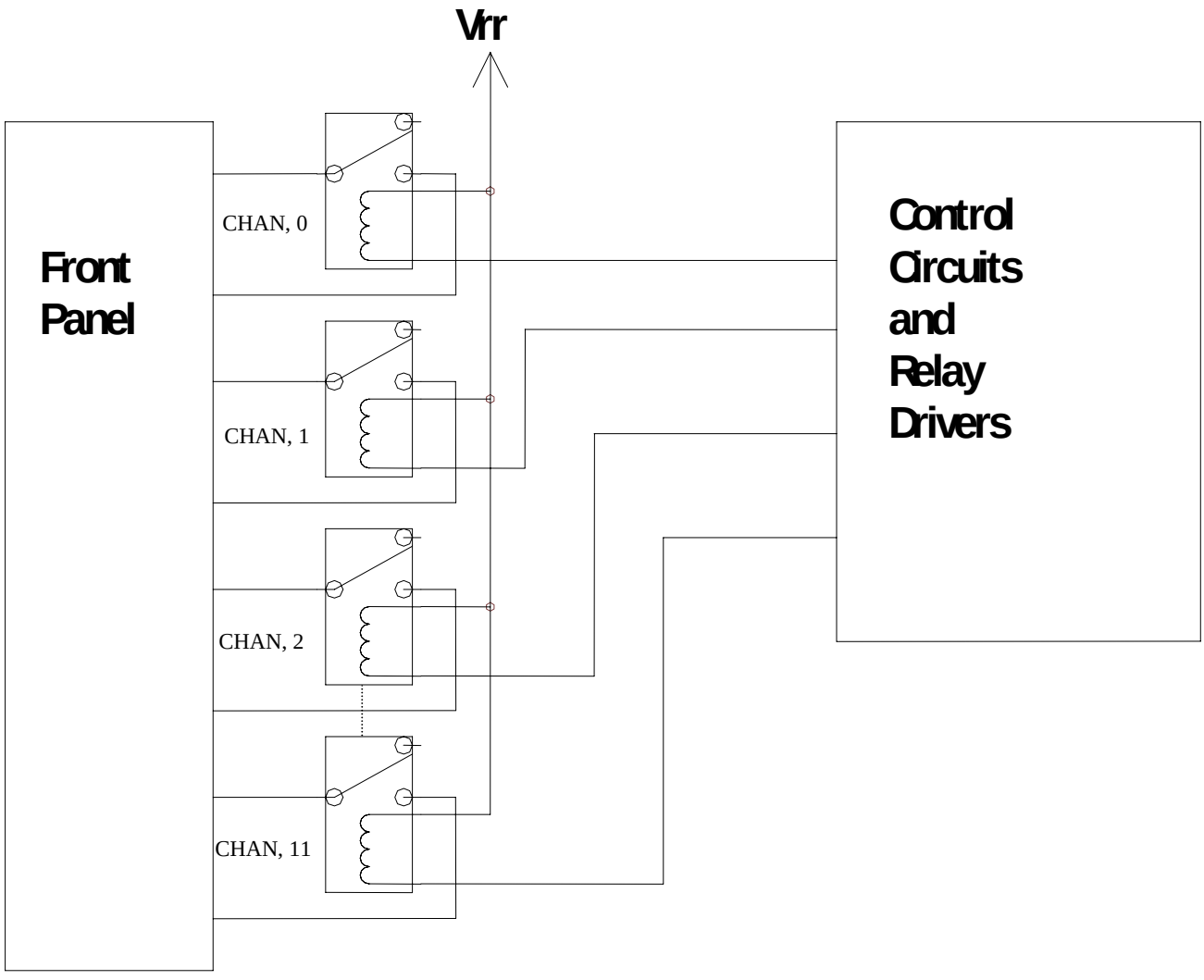

Figure 2-1, 1260-121A/B Block Diagram 1

Front Panel Connectors

The 1260-121A/B has two 20-pin front-panel connectors, labeled J200 and J202. It has one pin for each input and one for each output. See **Figure 2-2** for pin numbering. **Table 2-1** shows the mapping of channel numbers to connector pins. Information about available mating connectors is provided immediately after **Table 2-1**.

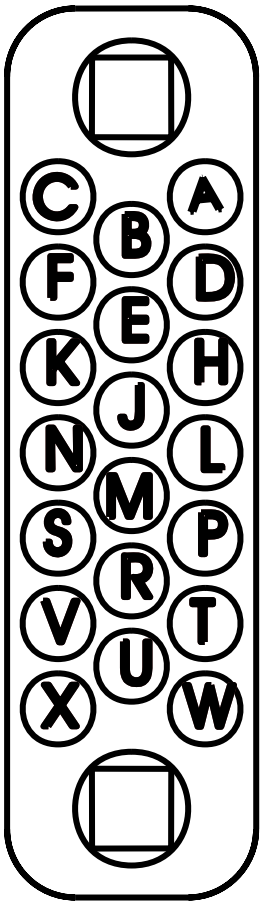

Figure 2-2, Front Panel Connector Pin Numbering

Table 2-1, 1260-121A/B Front-Panel Connections

Channel	Connector	Pin	Relay
0 In	J200	A	1
0 Out N.O.	J200	B	1
0 Out N.C.	J200	C	1
1 In	J200	D	2
1 Out N.O.	J200	E	2
1 Out N.C.	J200	F	2
2 In	J200	H	3
2 Out N.O.	J200	J	3
2 Out N.C.	J200	K	3
3 In	J200	L	4
3 Out N.O.	J200	M	4
3 Out N.C.	J200	N	4
4 In	J200	P	5
4 Out N.O.	J200	R	5
4 Out N.C.	J200	S	5
5 In	J200	T	6
5 Out N.O.	J200	U	6
5 Out N.C.	J200	V	6
6 In	J201	A	7
6 Out N.O.	J201	B	7
6 Out N.C.	J201	C	7
7 In	J201	D	8
7 Out N.O.	J201	E	8
7 Out N.C.	J201	F	8
8 In	J201	H	9
8 Out N.O.	J201	J	9
8 Out N.C.	J201	K	9
9 In	J201	L	10
9 Out N.O.	J201	M	10
9 Out N.C.	J201	N	10
10 In	J201	P	11
10 Out N.O.	J201	R	11
10 Out N.C.	J201	S	11
11 In	J201	T	12
11 Out N.O.	J201	U	12
11 Out N.C.	J201	V	12

Mating Connectors

Mating connector accessories are available for the 1260-121B:

20 Pin Connector Kit with backshell and pins
P/N 407660

20 Pin, 18 Conductor Cable Assembly, 6 Ft., 14 AWG
P/N 407657-018

The 20-pin connector kit consists of a connector housing, aluminum backshell, and twenty solder-cup pins. The pins are also available from Positronic in crimp versions and for smaller wire diameters.

The mating connector pins are solder type. The corresponding removal tool is P/N 9081.

After wire attachment, the pin is inserted in the housing and will snap into place, providing positive retention. To ensure that the pin is locked into place, the assembler should pull on the wire after insertion.

The 20-Pin 18-Conductor Cable Assembly uses 14 AWG wire with crimp pins to mate with the 1260-121. The other cable end is un-terminated. Refer to **Table 2-1** for channel-to-pin mapping information. **Table 2-2** shows additional mating connectors and pins.

Table 2-2, Mating Connectors and Pins

P/N	Manufacturer	Mfr. P/N	Description
602349-120	Positronic	GMCT20F0E100J0	Insulator block (diallyl pthalate), 20-position. Mates with front-panel connector. Pins sold separately.
601850-900	Positronic	FC114N2	Female contact, crimp type, for 14 AWG wire. Mates with front-panel connector pins.
None	Positronic	FC116N2	Female contact, crimp type, for 16 AWG wire. Mates with front-panel connector pins.
None	Positronic	FS114N2	Female contact, solder type, for 14 AWG wire. Mates with front-panel connector pins.
None	Positronic	FS116N2	Female contact, solder type, for 16 AWG wire. Mates with front-panel connector pins.
602349-020	Burndy	MS20PM-58	Insulator block, 20-position. Part of front-panel connector assembly. Pins sold separately.
601349-900	Burndy	FS114N2	Male contact, 0.105” dia., crimp type, for 14 to 20 AWG wire. Part of front-panel connector assembly.

More About Maximum Current Ratings

The front panel connector and pins are rated for 10A DC per pin (13A AC for 1260-121B), with all channels conducting full-rated current. This keeps the temperature rise within 10°C. It should be noted that with all electromechanical relays, the higher the switched power (voltage times current), the shorter the useful life of the relays.

Definitions:

- *Max current carrying capacity*
  The maximum current that the relay can conduct if the relay is not switched while voltage is applied. The maximum current carrying capacity is affected by the size of the conducting section of the contact at its smallest area. The listed values are obtained from several tests in laboratories under room-temperature conditions (21°C). The contact is considered to be in free air. The maximum current carrying for the 1260-121A/B is 22 A.

- *Max operating current*
  The current the contacts can switch while conducting, without deteriorating. This depends on working conditions, such as dissipated heat, cooling provisions, ambient temperature, insulation material, etc. The maximum operating current for the 1260-121A/B is 13 A.

- *Recommended continuous current*
  The maximum current recommended for indefinitely-long time periods. The primary concern here is the heat generated in the relay. This specification can be applied for normal working conditions. The specification includes a safety margin. However, there are restrictions in the application of the given values. The most important restriction is the cross-sectional area of the connecting wire, insulation temperature range, and wire bundling. The recommended continuous current for the 1260-121A/B is 10 A.

Installation

To install the 1260-121A/B Switching Module into a 1260-100 Carrier, engage the printed circuit board into the grooves of the desired carrier slot. Slide the 1260-121A/B into the carrier until its connector mates with the connector on the carrier backplane. Push firmly to fully seat the connector. Tighten the two retaining screws at the top and bottom of the 1260-121A/B plug-in.

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Chapter 3
MODULE OPERATION

Operating Modes

The 1260-121 may be operated either in *message-based* mode or in *register-based* mode.

In the *message-based* mode, the 1260-01T switch controller interprets commands sent by the slot 0 controller, and determines the appropriate data to send to the control registers of the 1260-121 module.

Operating In Message-Based Mode

Channel Descriptors For The 1260-121

The standard 1260-01T commands are used to operate the 1260-121 module. These commands are described in the 1260-01T User's Manual.

Each 1260-01T relay command uses a *channel descriptor* to select the channel(s) of interest. The syntax for a channel descriptor is the same for all 1260 series modules. In general, the following syntax is used to select a single channel:

```
(@ <module address> ( <channel> ) )
```

Where:

- <module address> is the address of the 1260-121 module. This is a number is in the range from 1 through 12, inclusive.
- <channel> is the 1260-121 channel to operate. This is a number in the range from 0 through 11, inclusive.

Multiple individual channels may be specified using the following channel descriptor syntax:

```
@ <module address> ( <chan1> , <chan2>
, . . ., <chanN> ))
```

A range of channels may be specified using the following channel

descriptor syntax:

```
@ <module address> ( <first channel> :
<last channel> ))
```

The following examples illustrate the use of the channel descriptors for the 1260-121:

`OPEN (@8(0))`	Open channel 0 on the 1260-121 that has module address 8.
`CLOSE (@8(0,7))`	Close channels 0 and 7 on the 1260-121 that has module address 8.
`CLOSE (@2(7:11))`	Close channels 7 through 11 inclusive on the 1260-121 that has module address 2.

Reply To The MOD:LIST? Command

The chassis containing the 1260-121 returns a reply to the MOD:LIST? command. This reply is unique for each different 1260 series switch module. The syntax for the reply is:

<module address> : <module-specific identification string>

For the 1260-121 module the string value is:

```
1260-121 12-CHANNEL SPDT 10A SWITCH MODULE
```

Thus, for a 1260-121 whose module address is 2, the reply to this query would be:

```
2 : 1260-121 12-CHANNEL SPDT 10A SWITCH MODULE
```

Operating in Register-Based Mode

The 1260-121 offers register-based mode when installed in VXI platforms that support it. In register-based mode, the 1260-121 is operated by directly writing and reading to/from ports controlling up to eight relays each. To access the registers the following details must be assembled to generate an absolute address that can be wrote or read from:

The port and control registers are located in the VXIbus A24 Address Space. The A24 address for a port or control register depends on:

1. The A24 Address Offset assigned to the 1260-01T module by the Resource Manager program. The Resource Manager program is provided by the VXIbus slot-0 controller vendor. The A24 Address Offset is placed into the “Offset Register” of the 1260-01T by the Resource Manager.

2. The <module address> of the 1260-121 module. This is a value in the range from 1 and 12 inclusive.

3. The 1260-121 port or control register to be written to or read from. Each register on the 1260-121 has a unique offset from the base address.

The base A24 address for the 1260-121 module may be calculated by:

> (A24 Offset of the 1260-01T) + (1024 x Module Address of 1260-121).

The A24 address offset is usually expressed in hexadecimal. A typical value of 204000_{16} is used in the examples that follow.

A 1260-121 with a module address of 7 would have the base A24 address computed as follows:

> Base A24 Address of 1260-121 = 204000_{16} + (400_{16} x 7_{10}) = $205C00_{16}$

The port and control registers for Adapt-a-Switch plug-ins and conventional 1260-Series modules are always on odd-numbered A24 addresses. For port registers, the 1260-121 reads and writes to the same location. For control registers, the 1260-121 writes to one location, but reads back from another. **Table 3-1 and 3-5** provides offsets relative to the base address of the module for all port and control registers of the 1260-121. To obtain the absolute address where data is to be written or read from, the base address is added to the offset:

> (Base A24 1260-121 Address) + offset = absolute address

So, for our example base A24 address computed earlier, the following absolute addresses would apply for the operations indicated:

205C01 Port A read or written at this location

205E01 ID register read at this location

Before explaining the particulars of reading and writing to port and control registers, it is necessary to understand how the registers interact with the 1260-121 relays. **Table 3-2 through 3-5** provides a detailed explanation of each register and how it interacts with the 1260-121 module.

Table 3-1, Register Offset Addresses of the 1260-121A/B Module

Register Name	Register Offsets to Add to Base Module Address	
	Write Location (hexadecimal)	Read Location (hexadecimal)
Port A	0x01	0x01
Port B	0x03	0x03
ID	Read Only	0x201
EPROM Descriptor	Read Only	0x203

Table 3-2, ID Register Functionality of the 1260-121A/B Module

Register Table		ID Register
Module Version	Bit	Functionality Description
All	0	Always Reads 0x00 (Read Only)
	1	
	2	
	3	
	4	
	5	
	6	
	7	

Table 3-3, Port A Register Functionality of the 1260-121A/B Module

Register Table		Port A	
Module Version	**Bit**	**Functionality Description**	
All	0	Relay 00	(0: relay open 1: relay closed)
	1	Relay 01	(0: relay open 1: relay closed)
	2	Relay 02	(0: relay open 1: relay closed)
	3	Relay 03	(0: relay open 1: relay closed)
	4	Relay 04	(0: relay open 1: relay closed)
	5	Relay 05	(0: relay open 1: relay closed)
	6	Relay 06	(0: relay open 1: relay closed)
	7	Relay 07	(0: relay open 1: relay closed)

Table 3-4, Port B Register Functionality of the 1260-121A/B Module

Register Table		Port B	
Module Version	**Bit**	**Functionality Description**	
All	0	Relay 08	(0: relay open 1: relay closed)
	1	Relay 09	(0: relay open 1: relay closed)
	2	Relay 10	(0: relay open 1: relay closed)
	3	Relay 11	(0: relay open 1: relay closed)
	4	(Not Used)	
	5	(Not Used)	
	6	(Not Used)	
	7	(Not Used)	

Note:

Open: Indicates C connected to NC with NO contact open
Closed: Indicates C connected to NO with NC contact open

Table 3-5, EPROM Descriptor Functionality of the 1260-121A/B Module

Register Table		EPROM Descriptor Register
Module Version	**Bit**	**Functionality Description**
All	0	Each time this register is read, it advances a memory pointer to the next memory location in the on-board EPROM. To reset this pointer to the beginning, read the ID register. This resets the memory pointer. The descriptor register contains a long string of data, typically used by the Adapt-a-Switch carrier for configuration purposes. Additionally, this data contains the card identification string for the specific type of card (i.e. 1260-121). These identification strings are located at EPROM memory locations 0x23 through 0x34.
	1	
	2	
	3	
	4	
	5	
	6	
	7	

Writing to a port location is a straightforward process. Setting a bit high in a port register causes the corresponding relay channel to close.

It is especially important to realize that a single write operation controls eight separate control lines or output devices simultaneously. Therefore if only a single bit change is desired, the following process must be observed.

1. Read the register, inverting the bit pattern.

2. Mask the appropriate bit with an 'AND' operation and a byte mask with all undesired bits set to a '1' and the desired bit set to a '0' or '1' depending on whether the bit is to be set or cleared in the desired register.

3. Write the masked data back into the register.

As simple as this may seem, a number of products reported as faulty and sent back for repair are typically the result of inappropriate register accesses.

Because of the 1260-121 relay driver architecture, registers A and B will read back inverted from what was written to them.

The VISA I/O library may be used to control the module. The VISA function `viOut8()` is used to write a single 8-bit byte to a control register, while `viIn8()` is used to read a single 8-bit byte from the control register. The following code example shows the use of `viOut8()` to update the 1260-121 module.

1260-121A/B Example Code

```
#include <visa.h>

/* This example shows a 1260-01T at logical address 16 and a VXI/MXI */
/* interface */
#define RI1260_01_DESC     "VXI::16"

/* For a GPIB-VXI interface, and a logical address of 77 */
/* the descriptor would be:  "GPIB-VXI::77" */


/* this example shows a 1260-121 with module address 7 */
#define MOD_ADDR_120  7


void example_operate_1260_121(void)
{
      ViUInt8 creg_val;
      ViBusAddress creg0_addr;
      ViBusAddress creg1_addr;
      ViSession hdl1260;    /* VISA handle to the 1260-01T */
      ViSession hdlRM;      /* VISA handle to the resource manager */
      ViStatus error;       /* VISA error code */

      /* open the resource manager */
      /* this must be done once in application program */
      error = viOpenDefaultRM (&hdlRM);

      if (error < 0) {
            /* error handling code goes here */
      }

      /* get a handle for the 1260-01T */
      error = viOpen (hdlRM, RI1260_01_DESC, VI_NULL,VI_NULL, &hdl1260);
      if (error < 0) {
            /* error handling code goes here */
      }


      /* form the offset for control register 0 */
      /* note that the base A24 Address for the 1260-01T */
      /* is already accounted for by VISA calls viIn8() and */
      /* viOut8() */
```

```
   /* module address shifted 10 places = module address x 1024 */
creg0_addr = (MOD_ADDR_120 << 10) + 1;
creg1_addr = creg0_addr + 2;

/* close channel 9 without affecting the state of */
/* channels 8, 9, 10, 11*/
error = viIn8 (hdl1260, VI_A24_SPACE, creg1_addr, &creg_val);
if (error < 0) {
     /* error handling code goes here */
}

/* invert the bits to get the present control register value */
creg_val = ~creg_val;

/* AND to leave every channel except 9 unchanged */
creg_val &= ~ (0x02);

/* OR in the bit to close channel 9 */
creg_val |= 0x02;

/* write the updated control register value */
error = viOut8 (hdl1260, VI_A24_SPACE, creg1_addr, creg_val);
if (error < 0) {
     /* error handling code goes here */
}

/* open channel 7 without affecting channels 0 through 6 */
error = viIn8 (hdl1260, VI_A24_SPACE, creg0_addr, &creg_val);
if (error < 0) {
     /* error handling code goes here */
}

/* invert the bits to get the present control register value */
creg_val = ~creg_val;

/* AND to leave every channel except 7 unchanged */
/* leave bit 7 clear to open channel 7 */
creg_val &= ~ (0x80);

/* write the updated control register value */
error = viOut8 (hdl1260, VI_A24_SPACE, creg0_addr, creg_val);
if (error < 0) {
     /* error handling code goes here */
}


/* close the VISA session */
```

```
      error = viClose( hdl1260 );
      if (error < 0) {
            /* error handling code goes here */
      }
}
```

EMERGENCY RESET

The Emergency Reset Feature provides a simple, reliable mechanism to open all relays quickly. This helps the system integrator maximize safety in a system that performs high-current switching.

The 1260-121A and 1260-121B each provide a connection for an emergency safety switch. The user provides the switch, and may mount it wherever desired so that it is easily and quickly accessible.

When the emergency reset switch is activated, the relays are immediately opened by hardware action alone. No software or firmware intervention is required. Even if the host computer or switch controller fails, the emergency reset function is still effective.

After the relays open in response to the emergency reset switch, they do not automatically return to their previous states when the switch is deactivated. The relays remain open until the user issues a command to close them.

Connecting the Safety Switch

Use a general-purpose mechanical switch. It need not have a high voltage or current rating. The signal passing through the switch is TTL compatible, and has a magnitude of 5 volts and a current of 0.5mA. The switch may be either normally-open or normally-closed.

For the 1260-121A, use insulated wire to connect the two switch contacts to the screw terminals marked “TB5” on the printed circuit board (PCB). Make the connections to pins 1 and 2. You may route the wire through the front-panel strain relief of the 1260-121A, along the same path as the relay contact wiring.

To connect the switch to the 1260-121B, use a standard miniature (IEC 3.5mm diameter) phone plug. Connect one side of the switch to the phone plug tip, and the other side to the phone plug sleeve. Insert the phone plug into the jack in the 1260-121B front panel.

Normally-Open and Normally-Closed Switches

The 1260-121 can work with either a normally-open or normally-closed switch. In the normally-open configuration, the 1260-121 detects an emergency reset when the switch is closed for more than 500ns. The normally-open configuration is the factory default. To verify that the 1260-121 is configured for a normally-open switch, ensure that no jumper or resistor is installed across the two pads comprising JP6 on the PCB (see **Figure 3-1, JP6 Configuration Jumper**).

In the normally-closed configuration, the 1260-121 detects an emergency reset condition when the switch contacts are opened for more than 500ns. To configure the 1260-121 for normally-closed operation (normally-closed switch), install a jumper across the two pads comprising JP6 on the 1260-121 printed circuit board (see **Figure 3-1, JP6 Configuration Jumper**). If possible, use a zero-ohm surface-mount resistor in the standard 0805 outline package. If such a resistor is not available, you may carefully solder a short piece of bare, solid, 28AWG wire across the two pads of JP6. Ensure that the wire does not contact any circuitry other than these two pads.

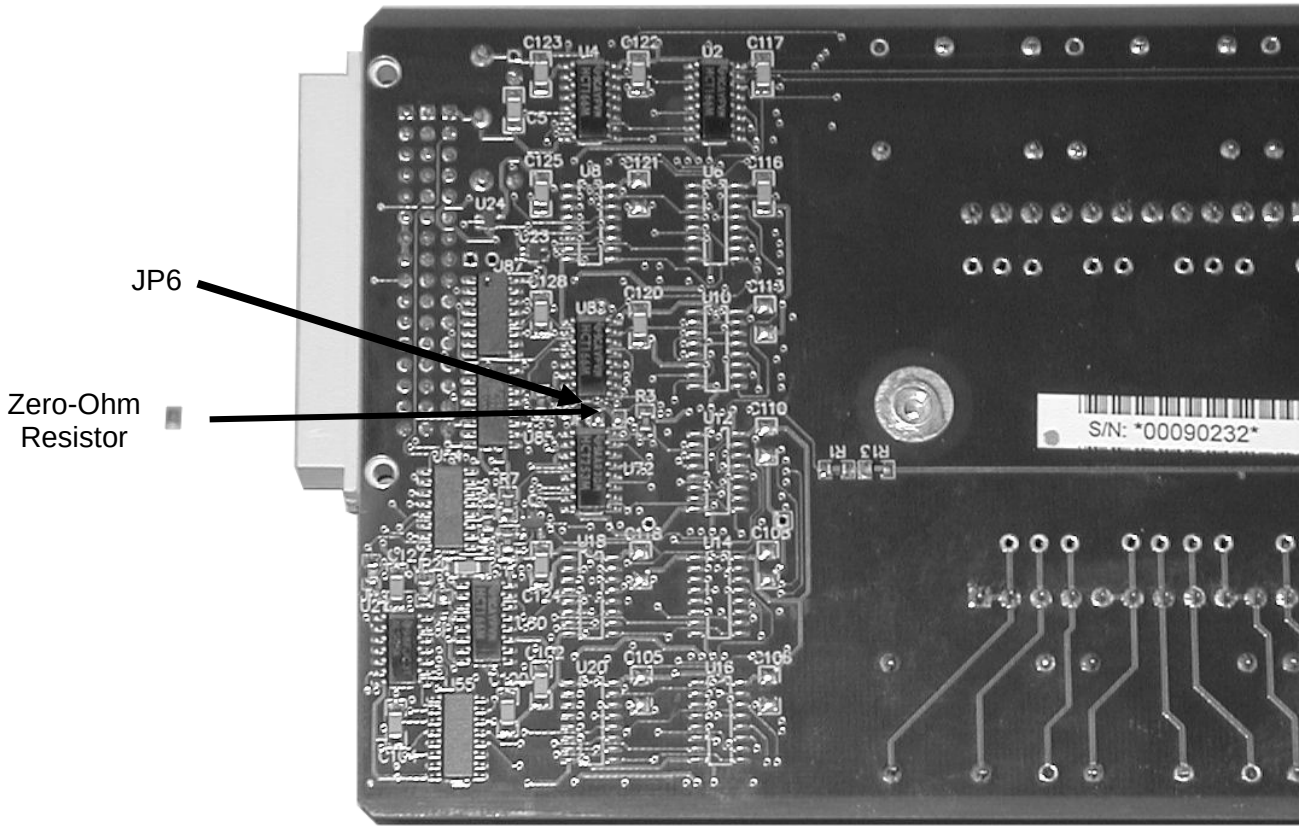

Figure 3-1, JP6 Configuration Jumper

Local and Global Reset Options

The scope of the reset can be set to either local or global. With a global reset, an emergency reset detected by one switch module will reset ALL other switch modules that are connected to the same controller (e.g. Option-01T Controller or 1256 Switching System). To configure the 1260-121 for the global reset option, install a jumper across the two pins comprising JP7 on the PCB (see **Figure 3-2, JP7 Configuration Jumper**).

If the 1260-121 is configured for the local reset option (the factory default), the emergency reset switch will affect only the module to which it is connected. All relays of that module will open when the switch is activated. Relays on other switch modules remain unaffected. The local reset option is configured by not installing a jumper at JP7 on the PCB (see **Figure 3-2, JP7 Configuration Jumper**).

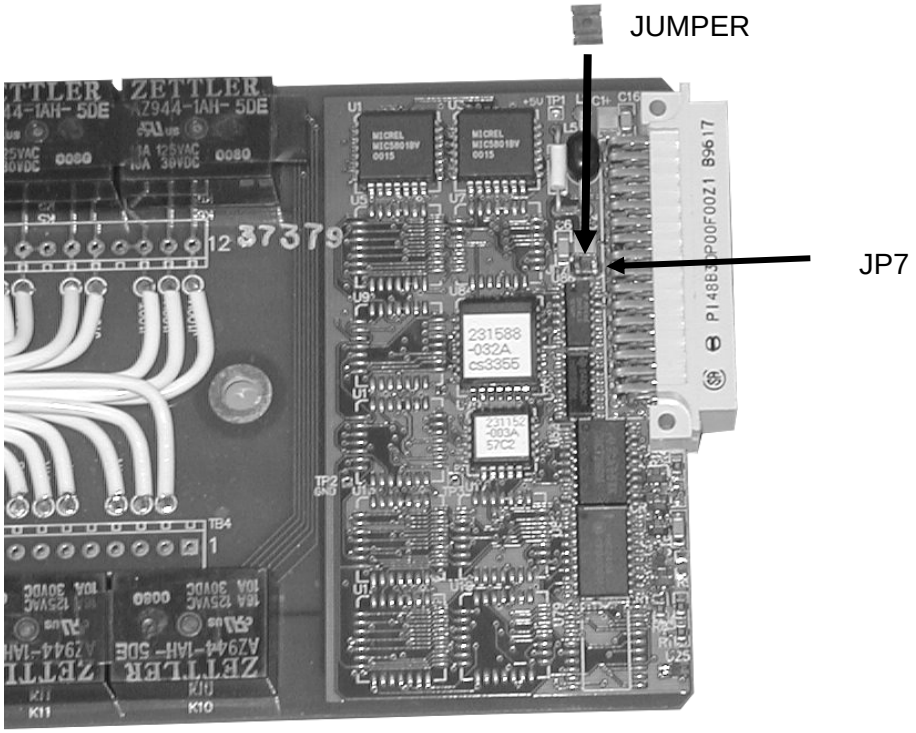

Figure 3-2, JP7 Configuration Jumper

Momentary vs. Latching Switches

Latching switches, also referred to as toggle switches, remain in one position (open or closed) until deliberately set to the other position. Momentary switches, on the other hand, change positions when activated, then return automatically to the normal position when released. Either type of switch may be used as a safety switch, depending upon the desired result.

A latching (toggle) switch, when activated, causes all relays to open. It also prevents any closure of relays until the switch is manually returned to its normal position. The switch modules ignore any commands sent to them while the switch is activated.

A momentary switch, when activated, also causes all relays to open. However, the switch returns to its normal position when released, and relay operations can then resume. Although the relays do not automatically return to their previous states when the switch is released, they resume normal operation, and respond to all commands.

A latching (toggle) switch provides the maximum safety by not only opening the relays, but preventing them from being closed again until the safety switch is manually returned to the normal position.

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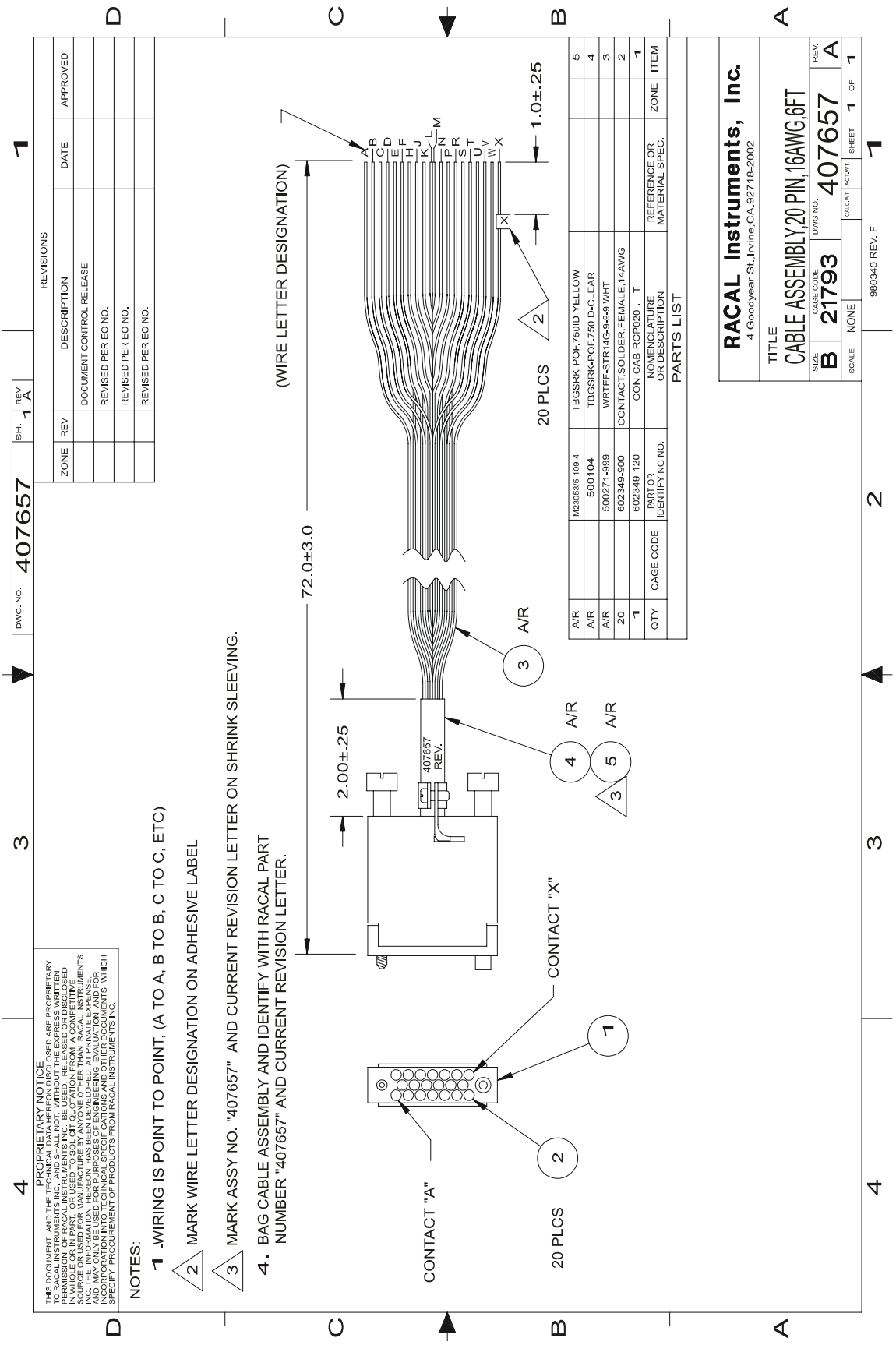
Chapter 4
OPTIONAL HARNESS ASSEMBLIES

Assembly 407660 Low Level Cd
U/M EA 20 PIN CONN KIT W/BACKSHELL-E Rev Date 7/14/98 Revision A

#	Component	Description	U/M	Qty Reqd	Engineer Txt
	602349-120	CON-CAB-RCP020-.---T	-E EA	1.00000	
	602349-900	CONTACT,SOLDER,FEMALE,14AWG	-E EA	20.00000	


DWG. NO. 407657
SH. 1
REV. A
REVISIONS
ZONE REV DESCRIPTION DATE APPROVED
DOCUMENT CONTROL RELEASE
REVISED PER EO NO.
REVISED PER EO NO.
REVISED PER EO NO.
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NOTES:
1. WIRING IS POINT TO POINT, (A TO A, B TO B, C TO C, ETC)
2 MARK WIRE LETTER DESIGNATION ON ADHESIVE LABEL
3 MARK ASSY NO. "407657" AND CURRENT REVISION LETTER ON SHRINK SLEEVING.
4. BAG CABLE ASSEMBLY AND IDENTIFY WITH RACAL PART NUMBER "407657" AND CURRENT REVISION LETTER.
72.0±3.0
(WIRE LETTER DESIGNATION)
A B C D E F H J K L M N P R S T U V W X
1.0±.25
20 PLCS
2.00±.25
407657 REV.
CONTACT "A"
CONTACT "X"
20 PLCS
A/R
A/R
A/R
A/R
A/R
PARTS LIST
ITEM ZONE REFERENCE OR MATERIAL SPEC. NOMENCLATURE OR DESCRIPTION PART OR IDENTIFYING NO. CAGE CODE QTY
1 CON-CAB-RCP020-*-T 602349-120 21793 20
2 WRTEF-STR14G-9-9 WHT 500271-999 21793 A/R
3 CONTACT,SOLDER,FEMALE,14AWG 602349-900 21793 A/R
4 TBGSRK-POF.750ID-CLEAR 500104 21793 A/R
5 TBGSRK-POF.750ID-YELLOW M23053/5-109-4 21793 A/R
RACAL Instruments, Inc.
4 Goodyear St.,Irvine,CA,92718-2002
TITLE
CABLE ASSEMBLY,20 PIN,16AWG,6FT
SIZE B CAGE CODE 21793 DWG NO. 407657 REV. A
SCALE NONE CALC.WT ACT.WT SHEET 1 OF 1
980340 REV. F

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Chapter 5

PRODUCT SUPPORT

Product Support

EADS North America Test and Services, has a complete Service and Parts Department. If you need technical assistance or should it be necessary to return your product for repair or calibration, call 1-800-722-3262. If parts are required to repair the product at your facility, call 1-949-859-8999 and ask for the Parts Department.

When sending your instrument in for repair, complete the form in the back of this manual.

For worldwide support and the office closest to your facility, refer to the website for the most complete information http://www.eads-nadefense.com.

Warranty

Use the original packing material when returning the 1260-121A/B to EADS North America Test and Services, for calibration or servicing. The original shipping container and associated packaging material will provide the necessary protection for safe reshipment.

If the original packing material is unavailable, contact EADS North America Test and Services, Customer Service at 1-800-722-3262 for information.

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