Index

SILENT KNIGHT

MODEL 5260

PRINTER INTERFACE

INSTALLATION MANUAL

JUNE 1990

PART NUMBER 150591

Table of Contents

1 INTRODUCTION

The Model 5260 Printer Interface attaches to the Model 2820, 4720 or 5207 control panel expansion bus to print activity reports on a standard parallel or serial interface printer, or to send information to a serial computer port. Printing capability makes it possible to program the control panel for minimum reporting to the central station. This reduces phone line use and central station processing costs, while maintaining a permanent record of all activity. The 5260 provides users with the flexibility to print reports on the output device of their choice.

1.1 FEATURES

*IBM-compatible serial and parallel port connectors.

*STATUS and FAULT LEDs (light-emitting diodes).

*DIP (dual-inline package) switch option settings.

*English-language printout of date, time and event, arranged in columns.

*Buffered data (approximately 44 English events or 100 condensed format events--see section 3).

1.2 OPTIONS

*300- or 1200-BAUD serial communication. (In this case, BAUD means bits per second.)

*Supervised hardware and communications.

*Hardware or software serial handshaking.

*DIP (dual in-line package) switch option programming.

*Serial and/or parallel ports may be used (at the same time).

*English or condensed printout. Serial and parallel ports can use the same or different printout formats.

2 INSTALLATION

NOTE: The Model 5260 is not UL Listed.

2.1 MOUNTING THE 5260

Mount the 5260 close enough to the control panel that you will be able to connect the two using the supplied XBUS (expansion bus) cable (no farther than 4 feet).

2.2 SETTING THE DIP SWITCHES

Use a pen point to push the DIP switches (a set of 8 miniature switches on the 5260) to the desired settings. The DIP switches have the following effects described in table 2.2A.

NOTE: The DIP switches can also be changed while the unit is operating. This causes the new switch configuration to be printed.

TABLE 2.2A: DIP SWITCH SETTINGS

DIP SWITCH #	ON (UP)	OFF (DOWN)
1	Parallel printer will print events and will be SUPERVISED.	Parallel printer will print events, but will NOT be supervised.
	NOTE: When changing paper, you may turn switch 1 OFF temporarily, to prevent a trouble condition.	
2	Serial printer/computer will print/accept data and will be SUPERVISED.	Serial printer/computer will print/accept data but will NOT be supervised.
	NOTE: When servicing the serial device, you may turn switch 2 OFF temporarily, to prevent a trouble condition.	
3	Required setting for serial device with transmission speed of 300 BAUD.	Required setting for serial device with transmission speed of 1200 BAUD (preferred).
	NOTE: The serial device (computer or printer) must be set to the same BAUD rate as switch 3.	
4	Serial mode is E,8,2 (Even parity, 8 data, 2 stop bits).	Serial mode is N,8,2 (No parity, 8 data, 2 stop bits).
	NOTE: The serial device must be set to the same PARITY as switch 4.	

(table continued on next page)

(TABLE 2.2A, continued)

DIP SWITCH #	ON (UP)	OFF (DOWN)
5	Printer will skip over fan-fold perforations after printing 60 lines of data, leaving a top and bottom margin on each page.	Printer will print line after line, unless it has an automatic skip-on-perforation feature.
	NOTE: If you use this feature, you must position the paper and enable the Top-of-Form function on your printer.	*NOTE: If your printer has an automatic skip-on-perforation feature, leave switch 5 OFF.*
6	Parallel output will be in condensed format (NOT recommended). For communication with a computer only.	Recommended setting to produce Normal English parallel output.
7	Serial output will be in condensed format, similar to the SIA (Security Industry Association) event code format (see section 3). For communication with a computer only.	Recommended setting to produce Normal English serial output.
8	Turn switch 8 ON if you have accessed the control panel's EEPROM to select your Model 5260 options. *NOTE: Use of the EEPROM to select 5260 options is a feature that is not yet available.*	Recommended setting - 5260 options are selected using DIP switches, rather than by accessing the control panel's EEPROM.

2.3 PROGRAMMING

Program the control panel to use the PRINTER (see the control panel installation manual, under SYSTEM OPTIONS), just as if a Model 5255 On-Site Printer were being used.

NOTE 1: Before you connect the 5260 to the control panel, select the PRINTER option, and then remove power from the system. If you attach the 5260 before selecting the PRINTER option, the 5260 will not know the correct time and date. You must then re-enter the time and date.

NOTE 2 (Model 5207 only): The earth ground connection of the printer or computer will cause an earth ground fault trouble at the 5207 (P4 on the 5207's 7-segment LED display). To avoid this, deselect GROUND FAULT DET. in the 5207 options. If you do this, you must NOT use the 5207 Class A zones, because a ground fault in the zone wiring would not be detected.

2.4 CABLE CONNECTIONS

CAUTION: Remove power at the control panel before making any connections.

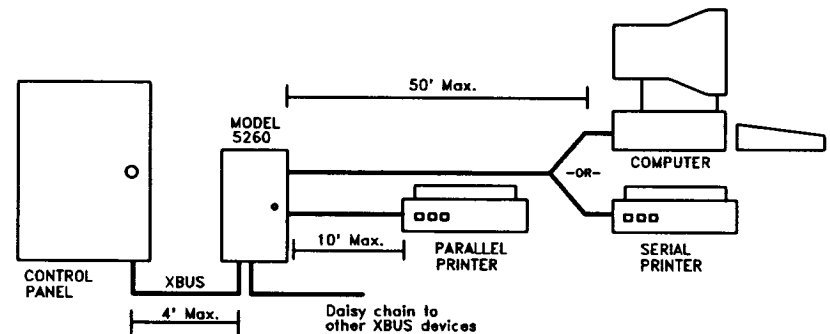Figure 2.4A shows how to wire the Model 5260.

FIGURE 2.4A: MODEL 5260 PRINTER INTERFACE INSTALLATION

2.4.1 XBUS CONNECTIONS

Use the 12-pin XBUS cable to connect the control panel to the 5260 (or daisy chain with other XBUS devices). The XBUS cable may be no longer than 4 feet long. A 24-inch cable is provided with the 5260, along with a second connector for daisy-chaining the 5260 to other expansion devices. The pin descriptions for the XBUS cable are listed in table 2.4.1A.

The Model 5260 draws 25 mA of current.

The 5260 circuit is fused on F3 on the Model 2820 and 4720 Control/Communicators, and on F8 on the Model 5207 Fire Control/Communicator.

WARNING: Incorrect connection of the XBUS cables may result in damage to the Model 5260 and/or the control panel.

TABLE 2.4.1A: MODEL 5260 XBUS CONNECTOR PIN DESCRIPTIONS

PIN #	FUNCTION	SIGNAL DIRECTION	NOMINAL VOLTAGE
1	Ground	Common	$0\,V_{DC}$
2	$+12\,V_{DC}$	In	$13\,V_{DC}$ (25 mA typical)
3	/reset	In	$5\,V_{DC}$
4	addr 0	In	$0 - 5\,V_{DC}$
5	addr 1	In	$0 - 5\,V_{DC}$
6	addr 2	In	$0 - 5\,V_{DC}$
7	C.handshake	In	$5\,V_{DC}$
8	Data 0	In/Out	$5\,V_{DC}$
9	Data 1	In/Out	$5\,V_{DC}$
10	Data 2	In/Out	$5\,V_{DC}$
11	Data 3	In/Out	$5\,V_{DC}$
12	X.handshake	In/Out	$5\,V_{DC}$

2.4.2 PARALLEL PORT CONNECTIONS

The parallel port supports 8-bit data transmission with strobe. The strobe signal pulses low when the 8 data signals are valid, clocking the data into the printer. The parallel port also supports monitoring of printer-busy (buffer full), printer-select and paper-out conditions. The output buffer capacity is 2K.

The 5260 has a 25-pin female D-type connector, just like the parallel port on an IBM PC, so you will need to purchase an IBM-to-Centronics cable.

Connect the parallel cable between the 5260 and the printer, using a cable no longer than 10 feet. The pin descriptions for the parallel connector are listed in table 2.4.2A.

NOTE: Do **NOT** use the Silent Knight Model 9007 Parallel Printer Cable.

TABLE 2.4.2A: PARALLEL CONNECTOR PIN DESCRIPTIONS

PIN #	FUNCTION	SIGNAL DIRECTION	NOMINAL VOLTAGE
1	/strobe	Out	$5\,V_{DC}$
2	Data 0	Out	$0 - 5\,V_{DC}$
3	Data 1	Out	$0 - 5\,V_{DC}$
4	Data 2	Out	$0 - 5\,V_{DC}$
5	Data 3	Out	$0 - 5\,V_{DC}$
6	Data 4	Out	$0 - 5\,V_{DC}$
7	Data 5	Out	$0 - 5\,V_{DC}$
8	Data 6	Out	$0 - 5\,V_{DC}$
9	Data 7	Out	$0 - 5\,V_{DC}$
10	/ack	In	$5\,V_{DC}$
11	/busy	In	$5\,V_{DC}$
12	Paper end	In	$0\,V_{DC}$
13	Selected	In	$5\,V_{DC}$
14 - 17	N/A	(No connection)	N/A
18 - 25	Ground	Common	$0\,V_{DC}$

2.4.3 SERIAL PORT CONNECTIONS

The Model 5260 serial port conforms to EIA RS-232C, an Electronics Industry Association standard for serial interfacing over short distances (50 feet or less).

There are two types of RS-232 devices: DTE (data terminal equipment), typically a computer; and DCE (data communications equipment, or data circuit terminating equipment), typically a modem. The DTE should have a male connector (pins). The DCE should have a female connector (sockets).

The serial port on the Model 5260 is a 25-pin DTE connector, like the serial port on an IBM Personal Computer. To connect a **serial printer** to the Model 5260, use the same cable you would use to connect the printer to a PC. To connect a PC directly to the Model 5260, you will need to purchase a **null modem** cable (female at both ends), because you will be connecting a DTE to a DTE.

The RTS output (request-to-send--DTE pin 4) will be on whenever the 5260 is ready for serial input. The CTS input (clear-to-send--DTE pin 5, connected to RTS at the other end of the cable) must be on to enable serial output. The DTR output (data-terminal-ready--DTE pin 20, connected to the DSR--data-set-ready, DTE pin 6--input at the other end) will be on whenever the 5260 is operational.

In addition to hardware handshaking, the Model 5260 also supports XON/XOFF (DC1/DC3; ASCII 17/19). Sending XOFF to the 5260 will inhibit serial transmission until XON (or any other character) is sent. XOFF is used when the serial port cannot control its RTS (request-to-send) output.

When using XOFF, the CTS input must still be connected to a positive voltage, such as DTR.

*NOTE 1:   The serial port should be **half duplex,** and serial messages should **not** be sent back to the 5260. This capability is reserved for future use.*

NOTE 2:   ASCII (American Standard for Computer Information Interchange) is a set of binary codes that represent alphanumeric characters when data is being processed or transmitted.

The ASCII codes are 17 for XON and 19 for XOFF. DC1 and DC3 are the ASCII abbreviations for Device Control #1 and Device Control #3, which are usually used to represent XON/XOFF.

Table 2.4.3A shows examples of how a serial printer or computer might be connected to the Model 5260.

TABLE 2.4.3A: 5260 SERIAL CONNECTION EXAMPLES

EXTENSION CABLE

5260 PIN # (DTE)		PRINTER PIN # (DCE)	
m	f	m	f
N/A	1 —————— 1		
SO	2 ————▶ 2		SI
SI	3 ◀———— 3		SO
RTS	4 ————▶ 4		CTS
CTS	5 ◀———— 5		RTS
DSR	6 ◀———— 6		DTR
DTR	20 ————▶ 20		DSR
GND	7 —————— 7		GND

NULL MODEM CABLE

5260 PIN # (DTE)		COMPUTER PIN # (DTE)	
m	f	f	m
N/A	1 —————— 1		
SO	2 ——✕—— 2		SO
SI	3 ◀—✕—▶ 3		SI
RTS	4 ——✕—— 4		RTS
CTS	5 ◀—✕—▶ 5		CTS
DSR	6 ◀—✕—▶ 6		DSR
DTR	20 ——✕—— 20		DTR
GND	7 —————— 7		GND

m = male
f = female

CAUTION: Remember that male and female pinouts are mirror images of each other. The pin numbers are printed (very small) on the connectors.

TROUBLESHOOTING WITH A METER

With no cable, if pin 2 of a particular device is negative, then the connector is a DTE.

With a cable connected, both pins 2 and 3 should read negative, and both pins 4 and 5 should read positive.

NOTE: For 1200 BAUD, no parity, on port COM1, the computer should be set for MODE COM1,1200,N,8,1.

LONG DISTANCE SERIAL CABLING

The RS-232 cable can be up to 50 feet long. To go beyond 50 feet, you could use an adapter module at each end. These modules are called **short-haul modems,** and allow a cable length of over 1 mile. They can be found in most computer accessory supply catalogs.

Short-haul modem prices range from $70 to $200 each, and you will need one at each end of the long cable (typically 4 wires). The Telebyte Model 81F is a low-cost unit that is compatible with the 5260. To receive a Telebyte catalog, call 1-800-835-3298. (In New York, call 516-423-3232.)

NOTE: Only very low-power units can derive power from the 5260. For short-haul modems requiring more than 12 mA average current, use units with their own separate power supplies.

TABLE 2.4.3B: SERIAL CONNECTOR PIN DESCRIPTIONS

PIN #	FUNCTION	SIGNAL DIRECTION	NOMINAL VOLTAGE
1	(prot.gnd)	No connection	
2	/TX data	Out	$-10\ V_{DC}$
3	/RX data	In	$-10\ V_{DC}$
4	RTS	Out	$+10\ V_{DC}$
5	CTS	In	$+10\ V_{DC}$
6	(DSR)	No connection	
7	Ground	Common	$0\ V_{DC}$
8 - 19	N/A	No connection	
20	DTR	Out	$+10\ V_{DC}$
21 - 25	N/A	No Connection	

2.5 POWERING UP THE SYSTEM

After you have made all the connections and checked to see that they are tight, apply power to the control panel and set the time and date. (See the control panel's installation manual for instructions.)

3 COMMUNICATION FORMATS

The communication formats are selected by setting DIP switches 6 and 7 (see section 2.2). The parallel and serial ports may use the same or different formats.

3.1 NORMAL ENGLISH FORMAT

An example of the Normal English format, which is designed to be easy for the user to read, is shown below.

date	time	event	area/user/zone/station	
* MODEL 5260 * version . . .				
01-01-90	07:15:39	OPEN	ID	23
01-01-90	16:30:01	CLOSE	ID	23
01-01-90	23:29:05	BURGLARY *ALARM*		8
01-01-90	23:59:02	BURG ALRM RESTORE		8
01-02-90	00:47:17	OPEN - RESET	ID	1

Notes:

1. Lines beginning with * indicate power-up, an option change or an error message.

2. The **date** format is mm-dd-yy. The **time** format is hh:mm:ss, using military time.

3. The **event** format is similar to that printed at the central station Model 9000 Digital Alarm Receiver.

4. Some sensor types are abbreviated for nonalarm events.

3.2 CONDENSED FORMAT

The condensed data format is intended for input to a computer. It is similar to the SIA (Security Industry Association) format, can be transmitted faster and is easier for a computer program to handle.

A sample condensed format printout might look like the following:

```
*   MODEL 5260   *  version . . .
Nda01-01-90
Nti07:15:39
NOP23
Nti23:59:00
NCL23
Nti23:59:45
NBA8
Nti23:59:02
NBR8
Nda01-02-90
Nti00:05:17
NOR1
```

Notes:

1. Lines beginning with * are comments only.

2. All event records start with an **N**.

3. **da** indicates date and **tl** indicates time. All other codes are the SIA standard.

4. Date and time records are sent only if different from the previous date or time.

5. Each record ends with a **CR** and **LF** (carriage return and line feed--ASCII 13 and 10).

6. Printer troubles are sent as **XPSnnnn** where the numbers represent two hexadecimal bytes. Each bit corresponds to a different trouble condition, as shown in table 3.2A.

TABLE 3.2A: PRINTER TROUBLES

BIT #	TYPE OF TROUBLE
15	Serial out trouble
14	Parallel out trouble
13	Out of paper
12	XBUS input buffer full
11	Serial input buffer full
10	Serial output buffer full
9	Parallel output buffer full
8..2	N/A
1	XBUS trouble
0	XBUS output buffer full

EXAMPLE: **XPS2000** means "out of paper" (bit 13 set).

4 OPERATION

The 5260 can only print information sent by the control panel. The 5260 will not print the ID of the user who bypasses a zone, and it will not print events controlled by the Model 4150 Auxiliary Control Module (auxiliary relay access, to open a door, turn on a fan, etc.; or analog events such as temperature or humidity changes). Events that are printed include openings, closings, tests, door access, system troubles and restores; and zone bypasses, troubles, alarms and restores.

4.1 LED INDICATORS

STATUS LED (green):   Winks once per second to indicate normal operation.

FAULT LED (red):

Flashing: Trouble is present, but audible annunciation has not begun, and the control panel is not yet displaying a trouble message. There is a **60-second delay** to prevent false trouble annunciations in the following situations:

1. Printer off line (not selected by (SELECT) or (ON LINE) button on printer) or busy too long.
2. XOFF or CTS off, preventing transmission (see section 2.4.3).
3. Serial cable unplugged.
4. If the serial printer turns off the RTS signal when out of paper, a flashing **FAULT** LED could indicate that the serial printer is out of paper. If the CTS signal does not change when the paper runs out, there will be no annunciation of a serial printer paper-out condition.

There is **no delay** in the following situations:

1. Parallel printer out of paper or cable unplugged.
2. XBUS failure.
3. Buffer overflow.

Steady: Trouble is present. The control panel will annunciate and display the nature of the problem.

4.2 POWER-UP

When power is applied to the control panel, the following activities will occur:

1. The printer will print a message indicating the 5260 configuration.

   EXAMPLE: The following message shows that the Model 5260 contains the 9310.C microchip, and DIP switches 1 (parallel printer supervised) and 7 (condensed serial output) are ON.

   *MODEL 5260 * version 9310.C * switches 1——7-

2. The control panel will display a request for the user to set the time (as usual) and the date.
3. The new date and time will be printed, and any subsequent events will be printed.
4. The 5260 **STATUS** LED (green) will flash briefly every second, during normal operation.

4.3 PRINTER TROUBLE

The 5260 **FAULT** LED (red) will flash for 60 seconds when either the serial or parallel printer stops taking data. This would normally occur if the (PRINTER SELECT) switch were off. After 60 seconds, the **FAULT** LED will remain on.

There is no delay if the parallel printer runs out of paper. When the **FAULT** LED is on steadily, the control panel will display ▮TROUBLE: PAPER▮. This type of trouble condition is annunciated locally, but not reported to the central station. The local annunciation can be inhibited temporarily by switching OFF the supervision DIP switches.

Failure of the Model 5260 itself (for example, if the XBUS cable comes unplugged) will be displayed as ▮TROUBLE: DEVICE▮ and reported to the central station.

4.4 PRINTED MESSAGES

The 5260 allows the messages listed in table 4.4A to be printed. (The actual messages that can be printed in an installation are determined by the individual control/communicator.)

NOTE: The zone types shown in parentheses ( ) could be any of the following: HOLDUP, FIRE, MED, PANIC, BURG, TAMPER, GAS, SPRNKL, WATER, HEAT, COLD, UNDEF. The # sign indicates zone, keystation ID, phone line, access code, or expansion device number(s).

TABLE 4.4A: SYSTEM MESSAGES

5260 PRINTER INTERFACE		STATUS OF CONTROL/COMMUNICATOR
ZONE MESSAGES:		
HOLDUP *ALARM*	#	
MEDICAL *ALARM*	#	
BURGLARY *ALARM*	#	
GAS *ALARM	#	
SPRINKLER *ALARM* (5207 only)	#	Zone in alarm.
UNDEFINED *ALARM*	#	
WATER *ALARM*	#	
HEAT *ALARM*	#	
COLD *ALARM*	#	
(BURG) ALARM RESTORE	#	Alarm reset/shutdown.
(BURG) TEST	#	Zone being tested (5207 only).
(BURG) BYPASS	#	Zone bypassed.
(BURG) UNBYPASS	#	Zone unbypassed.
(BURG) SUPERVISORY	#	RF transmitter low battery.
(BURG) SUPR RESTORE	#	Transmitter battery replaced.
(BURG) TROUBLE	#	Loop faulted or transmitter failed.
(BURG) TRBL RESTORE	#	Loop fault or transmitter repaired.
SYSTEM MESSAGES:		
BATT TROUBLE	0	System low battery.
BATT TRBL RESTORE	0	Battery voltage back to normal.
A.C. TROUBLE	0	AC building power off.
A.C. TRBL RESTORE	0	AC building power back on.
TELCO TROUBLE	#	Phone line # not working.
TELCO TRBL RESTORE	#	Phone line # back to normal.
DATA LOST PH#	#	Previous events could not be reported and the data was lost.

(TABLE 4.4A continued)

5260 PRINTER INTERFACE		STATUS OF CONTROL/COMMUNICATOR
SYSTEM MESSAGES, continued		
AUTO TEST	ID #	Automatic dialer test.
TEST	#	Manual test by access code #.
EXP TEST	#	XBUS device test.
SYSTEM TROUBLE	#	Bell/Power trouble (5207 only).
SYSTEM RESTORE	#	Bell/Power problem corrected (5207 only).
KEYSTATION TROUBLE	#	Keystation # not working.
KEYSTATION RESTORE	#	Keystation # problem corrected.
AUTO CLOSE		System automatically armed.
CLOSE	ID #	System armed by access code #.
FORCED CLOSE	ID #	System armed by access code #, with zone(s) bypassed.
SUPERVISORY CLOSE		System failed to open (still armed).
AUTO OPEN		System automatically disarmed.
OPEN	ID #	System disarmed by access code #.
OPEN - RESET	ID #	Alarm reset by access code #.
SUPERVISORY OPEN		System failed to close (still disarmed).
DOOR ACCESS AT STATION	ID # #	Door access granted to code #, at this station.
DOOR LEFT OPEN	#	Door propped open at this station.
DOOR FORCED	#	Door opened at this station without valid access code.
DURESS		Duress signaled by access code user.
AREA CLOSE	#	Area # armed.
AREA OPEN	#	Area # disarmed.

5 TROUBLESHOOTING

Refer to table 5A for help in troubleshooting an installation that includes a Model 5260 Printer Interface.

TABLE 5A: MODEL 5260 TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSES/REMEDIES
Keystation displays: **TROUBLE: DEVICE 1**	1. XBUS not connected. 2. XBUS connected incorrectly. 3. CPU chip (Model 9359) in 5260 is faulty.
STATUS LED does not flash.	1. No power from XBUS. 2. Memory chip installed incorrectly. 3. Memory chip defective.
Keystation displays: **TROUBLE: PAPER** (5260 FAULT LED on).	1. Printer out of paper. 2. Printer has been off line ([ONLINE] or [SELECT] button off) or busy for 60 seconds or more. 3. Unused port has supervision ON (DIP switch 1 or 2).
FAULT LED on steadily (no trouble display at keystation). Printer prints: *XBUS TROUBLE	Control panel not programmed for PRINTER enable.
Parallel printer does not print anything.	1. Printer select ([ON LINE] or [SELECT] button) is OFF. (Try with supervision switch--DIP switch 1--OFF.) 2. Defective cable.
Serial printer does not print anything.	1. Wrong type of cable used. 2. CTS signal not connected (see TROUBLESHOOTING WITH A METER at the end of section 2.4.3).
Serial printer prints garbage.	1. BAUD rate settings do not match. 2. Parity option settings do not match.
Serial port works only when NOT supervised.	CTS signal not connected. (Try placing a jumper between pins 4 and 5 of the serial port connector.)
EARTH GROUND FAULT message printed when 5260 is used with Model 5207 Fire Control/Communicator. **P1** appears on 5207's 7-segment LED display.	Deselect the GROUND FAULT DET. option on the 5207, and do NOT use the Class A zones on the 5207.

NOTE 1: If you're not getting any output from the 5260, try turning off the