

SI-561

SpiderAlert Input Output Interface Unit

SpiderAlert®

Installation Instructions

1. INTRODUCTION

1.1 General Description

The SI-561 is a hard-wire input/output interface unit designed to operate via the SpiderAlert bus. It serves as an interface between 6 input sensors and the SpiderAlert bus, and it has 1 output circuit which can be remote controlled via the bus (see Figure 1-1). All the 6 inputs of the unit can be set for Normally Opened (N.O.) or Normally Closed (N.C.) sensors, by changing position of an internal input polarity jumper.

The unit utilizes the **SpiderAlert 1A** protocol and is therefore compatible only with control centers using the SLC-5 local control unit. The SI-561 is a SpiderAlert bus device, and is likewise identified by a factory programmed 8-bit ID number (in a 2-digit hexadecimal form).

Due to the bi-directional data communication feature of the **SpiderAlert 5** system, the SI-561 can send event codes from its inputs to the control center (SLC-5 Unit and head-end computer) and also responds to command codes received from the head-end computer.

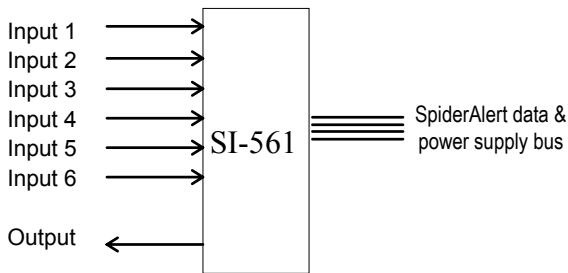


Figure 1-1. The SI-561 as a Hard-Wire Interface Unit

Just like all SpiderAlert bus devices, the SI-561 is a supervised unit - it sends out attendance report once every 90 seconds.

1.2 Packaging and Circuit Layout

The SI-561 printed circuit board is enclosed in a plastic cabinet that facilitates installation on a flat surface and protects the unit against tampering. The cabinet can be separated into two parts: the cover and the base (see Figure 1-2). Disassembly instructions are given in Sec. 5.

The base, which accommodates the printed circuit board, has various mounting and wiring knockouts as shown in Fig. 1-3.

The SI-561 is protected against tampering by an on-board tamper switch, which is actuated upon removal of the front cover (see Figure 1-3).

As shown in Figure 1-3, the SI-561 P.C. board allows access to mounting holes, and there is no need to remove it in order to install the base on the mounting surface.

The printed circuit board accommodates an input terminal block, data and power supply terminal block and a telephone type bus receptacle (TELCOM connector) (see Figure 1-4).

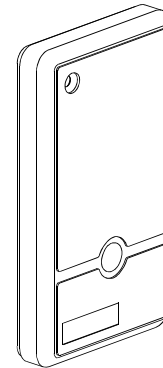


Figure 1-2. Unit's Case

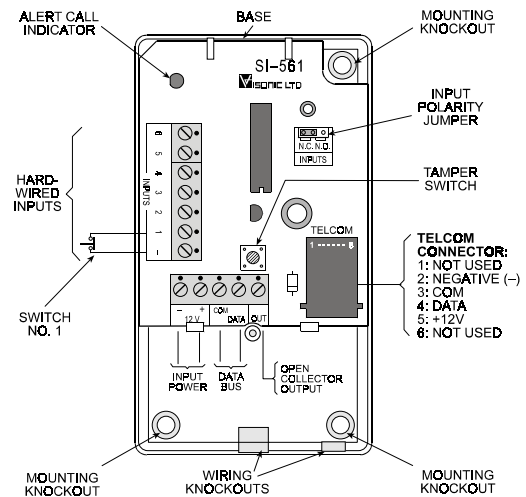


Figure 1-3. Unit's Base with SI-561 Installed

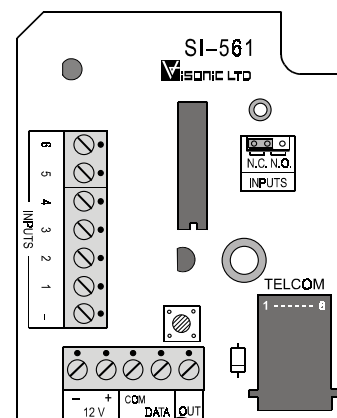


Figure 1-4. Printed Circuit Board Layout

2. SPECIFICATIONS

Number of Inputs: 6

Input polarity: Selectable N.O. or N.C.

Number of Outputs: 1, open collector type, 100 mA max. Sinking current.

Unit ID number: 8-bit code (2 hexadecimal digits)

Communication Protocol: SpiderAlert 1A

Attendance Report Repetition Rate: once every 90 seconds.

Input Voltage: 10 -16 VDC.

Current Drain: Approximately 7 mA standby, 13 mA maximum.

Operating Temperature Range: -10°C to 49°C (14°F to 120°F)

Dimensions (H x W x D): 110x63x25 mm (4-5/16 x 2-1/2 x 1 in.)

Weight: 73 g (2.58 oz).

3. INPUTS AND OUTPUT

3.1 Input Circuits

Six input circuits are available for reporting alarms or other events to the head-end computer. Each input is assigned an ID code, which forms part of the data, sent to the head-end computer. The head-end computer software identifies the SI-561 unit that sent out an event code, the specific input of origin and the type of event (ALARM or RESTORE). Consecutively, a suitable message appears on the computer's monitor, the event is registered in the control center's event log and an automatic response is initiated (if so programmed - see Para. 3-2 below).

The outgoing message comprises the ID number of the particular SI-561, the "transmitter" identification and an event code. If several inputs change state simultaneously, the SI-561 will send out a separate message for each input.

The inputs may be connected to normally open (N.O.) pushbuttons, or to normally closed (N.C.) magnetic switches, motion detector contacts etc. (see Figure 5-5).

The unit reports the inputs state (Alarm or Restore), according to the inputs states and according to the input polarity jumper position, as follows:

A. Input polarity jumper in N.O. position:

When input x is shorted to (-) (ground) terminal, the unit reports that input x is in ALARM position.

When input x is opened, the unit reports that input x is in RESTORE position.

B. Input polarity jumper in N.C. position:

When input x is opened, the unit reports that input x is in ALARM position.

When input x is shorted to (-) (ground) terminal, the unit reports that input x is in RESTORE position.

This issue is surely clarified by the following table:

Event	Resultant message	
	Input polarity in N.C. position	Input polarity in N.O position
Input 1/2/3/4/5/6 is opened	input 1/2/3/4/5/6 is in ALARM position	input 1/2/3/4/5/6 is in RESTORE position
Input 1/2/3/4/5/6 is shorted	input 1/2/3/4/5/6 is in RESTORE position	input 1/2/3/4/5/6 is in ALARM position

3.2 Output Circuit

The SI-561 provides 1 output terminal (see Figures 1-1 & 1-4). The output circuit, which is of the open-collector type, is under control of the head-end computer software. It can be activated (pulled LOW), deactivated or pulsed LOW, manually or by automatic computer command. The output may be used to sound an alarm, to control lighting devices, to open a door controlled by an electrical door strike, or for many other tasks. Since the output cannot sink more than 100 mA, an interface relay might be required for controlling external devices.

3.3 Tamper Event Reporting

A normally closed tamper switch protects the SI-561 against tampering. Once the cover is removed, the unit will automatically send its own ID and a tamper alert to the head-end computer. When the cover is reinstalled, the unit automatically sends its own ID and a tamper restored message to the head-end computer.

4. DATA AND COMMAND TRANSFER ROUTINES

4.1 Input-Initiated Message Transfer

Message transfer upon disturbing an input circuit (the input deviates from the normal state) consists of the following stages:

A. Once an input loop disturbance is sensed, the SI-561 sends its own ID, the input's ID and a suitable event code over the bus.

B. The message is received and verified by the control center (SLC-5 plus associated computer) or by the bus repeater (if a bus repeater is used).

C. If the message proves valid, the SLC-5 controller (or the repeater) acknowledges its reception. The SI-561 red LED illuminates while it is engaged in message transfer, until an acknowledgement is received.

D. Once the SLC-5 (or repeater) acknowledges the message, the red LED light is extinguished.

4.2 Supervision Data Transfer

The SI-561 is programmed to send out attendance messages at regular intervals. An attendance message consists of the SI-561's

own ID and a special test code identifying the message as an **attendance report**. Once the SpiderAlert network is powered up, all bus devices, including the SI-561, go through the first cycle of attendance reports. The control unit (SLC-5) automatically "learns" the participating units' ID numbers, registers their IDs and creates a supervision list. After the first reporting cycle, the control center will expect regular attendance reports from each bus device on its list, including the SI-561.

Attendance reports received at regular (correct) intervals are acknowledged by the control center but are not displayed by the head-end computer. However, attendance reports received for the first time or after a break in communication between the SI-561 and the control center will be displayed on the head-end computer screen.

Once an attendance report from a specific SI-561 fails to come in within 4 minutes from the last report, a suitable warning appears on the computer's monitor. If attendance reports from a certain unit or from a group of units stop, the reason might be discontinuity in the data bus (an "open" bus), unit failure or sabotage.

4.3 Command Transfer

Command transfer from the control center to the output circuit of the SI-561 consists of the following stages:

A. The head end computer attendant (or the computer software, if programmed to do so) sends a digital command code over

the bus. The code specifically identifies the target unit, and the desired activation mode.

B. Upon receiving the command code, the target unit will acknowledge and the target output will be activated in the mode dictated by the code.

5. INSTALLATION

5.1 Mounting

The SI-561 is supplied in a plastic box, as shown and explained in Sec. 1, Para. 1-2. To install the plastic box, proceed as follows:

A. Remove the cap and the screw securing the box cover to the base (see Figure 5-1).

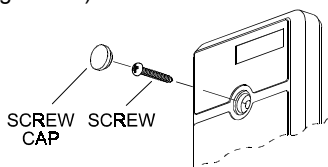


Figure 5-1. Separating the Cover from the Base

B. Separate the cover from the base.

C. Knock out the mounting knockouts of the base (see figure 1-3).

D. Hold the base against the mounting surface and mark (on the mounting surface) the points for drilling (see mounting holes in Figure 1-3).

E. Drill the mounting holes in the mounting surface and insert wall anchors if necessary. Bring the wires into the base through the wiring holes or wiring knockouts. Attach the base to the mounting surface with two long screws.

F. Set the Input Polarity Jumper (see figure 1-3) to N.O. or N.C. position, according to the sensors type.

G. Complete the wiring as described in Sections 5.2-5.4.

5.2 Connection to the SpiderAlert Bus

The SI-561 may be connected to the SpiderAlert bus either via the 4 terminals shown in Figure 5-2, or via the telephone type bus port, which is a TELCOM 4-position RJ-11 receptacle shown in figures 5-2 & 5-3.

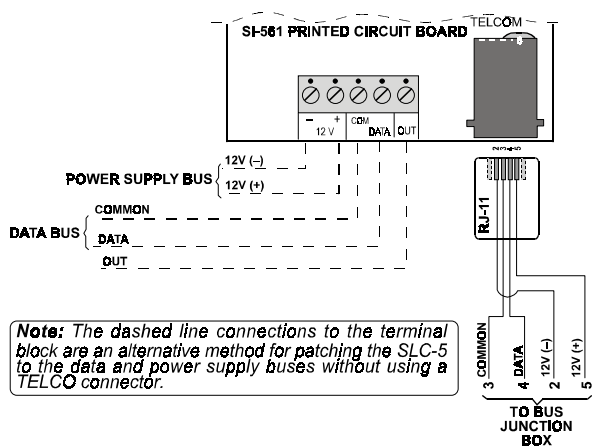


Figure 5-2. Bus Data and Power Supply Wiring

Warning! One of the data terminals is marked **COM**, indicating connection to the common (negative) lead of the data bus. The other terminal marked **DATA** must be connected to the second lead of the data bus. As long as the data bus is free, the data lead is kept **HIGH** by a pull-up resistor in the SLC-5 Local Control Unit. **Make sure not to reverse the bus wires!**

If you prefer the quick attach/detach feature of telephone-type connectors, you will need a 4-pin RJ-11 mating plug that is commonly called "TELCO plug" (see Figure 5-3 for plug shape and pin assignments).

If an RJ-11 (TELCO) plug is used for connecting the SI-561 to the SpiderAlert bus, the following items would be required:

- An unspecified length of 4-lead, color-coded modular cable for producing a patch cord connecting the SI-561 BUS port to the bus junction box.
- Two 4-position RJ-11 plugs, to terminate both ends of the patch cord.
- A crimping tool for RJ-11 plugs.

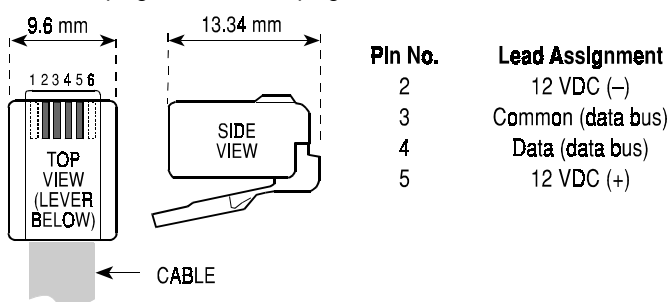


Figure 5-3. Four-Position RJ-11 Plug and Pins Assignments

To complete the connection to the bus, proceed as follows:

A. Identify the 4 wires of each bus and connect them to the numbered terminals within the junction box, maintaining the order required for correct patching (see Figure 5-4).

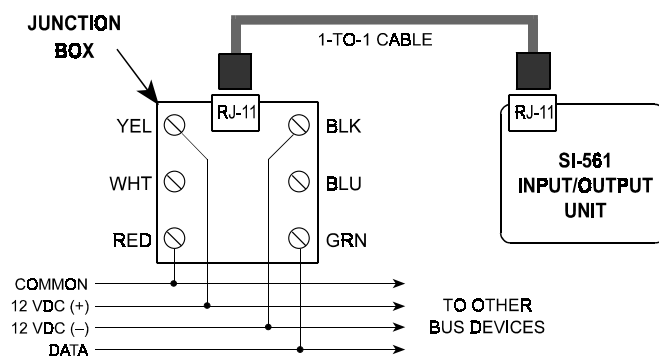


Figure 5-4. Bus Connection via a Junction Box

B. Prepare a RJ-11 to RJ-11 patch cord, long enough to bridge the distance from the bus receptacle of the SI-561 to the junction box. Make sure a "one-for-one" configuration is obtained, where pin 2 is connected to pin 2, pin 3 to pin 3, etc.

CAUTION: Do not use a ready-made TELCO RJ-11 to RJ-11 patch cord, because it very rarely has the above mentioned "one for one" design.

5.3 Input Loop Wiring

It is possible to connect 6 Normally Opened (N.O.) or Normally Closed (N.C.) sensors, between the input terminals and the (-) terminal, as shown in figure 5-5.

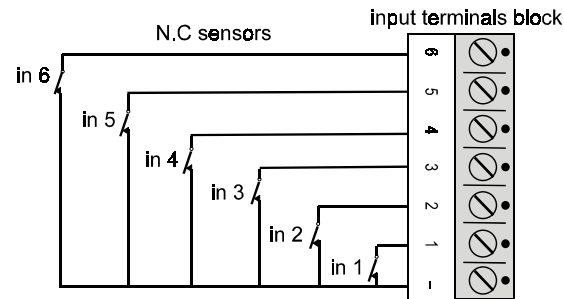
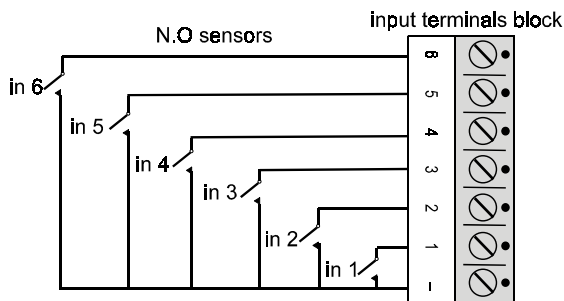


Figure 5-5. Input Connections for N.O./N.C. Sensors

5.4 Output Circuit Wiring

The output terminal is suitable for operating a low current 12VDC buzzer, a LED, or an auxiliary relay that draws less than 100 mA current.

Connect the relay's operating coil, 12VDC buzzer or LED, as shown in figure 5-6.

Cautions

1. When using 12VDC buzzer, pay attention to the proper polarity.
2. When using a LED, pay attention to the proper polarity and make sure to connect 1K Ω resistor in series with the LED.

LED or buzzer which is connected to the output terminal, will light or beep, respectively, by manually entered or automatic command received from the head end computer. If relays are connected to the output terminal, they will be energized or de-energized by similar commands. The relay contacts may be wired to open or close doors, control lighting fixtures, sound an alarm, switch wireless transmitters or CCTV on and off, etc.

Data & power supply terminal board

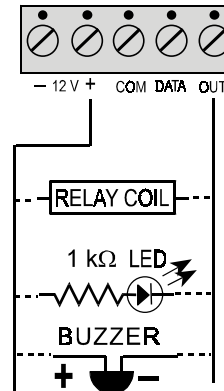


Figure 5-6. Output Connections

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