

# **T-Link**

## **Ethernet Communicator**



**SG SECURITY**<sup>TM</sup>  
**COMMUNICATIONS**

A Division of Sur-Gard Security Systems Ltd.

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**Installation  
Manual**

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v 1.0

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### **FCC Compliance Statement**

**CAUTION:** Changes or modifications not expressly approved by the manufacturer could void your authority to use this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

The user may find the following booklet prepared by the FCC useful: "How to Identify and Resolve Radio/Television Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, Stock # 004-000-00345-4.

**Ethernet**

A local-area network (LAN) protocol developed by Xerox Corporation in cooperation with DEC and Intel in 1976. Ethernet uses a bus or star topology and supports data transfer rates of 10 Mbps. A newer version of Ethernet, called 100Base-T (or Fast Ethernet), supports data transfer rates of 100 Mbps. And the newest version, Gigabit Ethernet supports data rates of 1 gigabit (1,000 megabits) per second.

**IEEE**

Abbreviation of **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers, pronounced I-triple-E. Founded in 1963, the IEEE is an organization composed of engineers, scientists, and students. The IEEE is best known for developing standards for the computer and electronics industry.

**Intranet**

A network based on TCP/IP protocols (an internet) belonging to an organization, usually a corporation, accessible only by the organization's members, employees, or others with authorization.

**IP**

Abbreviation of **I**nternet **P**rotocol, pronounced as two separate letters. IP specifies the format of packets, and the addressing scheme. Most networks combine IP with a higher-level protocol called Transport Control Protocol (TCP), which establishes a virtual connection between a destination and a source.

IP by itself is something like the postal system. It allows you to address a package and drop it in the system, but there's no direct link between you and the recipient. TCP/IP, on the other hand, establishes a connection between two devices so that they can send messages back and forth for a period of time.

**IP Address**

An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255.

**LAN**

A computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a wide-area network (WAN).

**MAC**

Short for **Media Access Control** address, a hardware address that uniquely identifies each device of a network. The address is not programmable by the user and the manufacturer of the device must register with IEEE before receiving an assigned group of addresses.

**Network**

Two or more computer systems connected together.

**Packet**

A piece of a message transmitted over a packet-switching network. One of the key features of a packet is that it contains the destination address in addition to the data.

**Subnet**

A portion of a network that shares a common address component. On TCP/IP networks, subnets are defined as all devices whose IP addresses have the same prefix. Dividing a network into subnets is useful for both security and performance reasons.

**Subnet Mask**

A mask used to determine what subnet an **IP address** belongs to.

**TCP**

Abbreviation of **Transport Control Protocol**, and pronounced as separate letters. TCP is one of the main protocols in TCP/IP networks. Whereas the IP protocol deals only with packets, TCP enables two devices to establish a connection and exchange data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent.

**WAN**

A computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more local-area networks (LANs). Computers connected to a wide-area network are often connected through public networks, such as the telephone system. They can also be connected through leased lines or satellites.

**2.1 Connecting the T-Link to the Panel**

The power should be removed from the control panel before any connections are made to the T-Link. Connect the 12V and GND terminals to the panel's auxiliary power output. Connect the header cable from the T-Link's white panel connector to the PC-Link header of the control panel.

The black wire of the PC-Link cable is pin 1 on the Power864 PC5020 control panel PC-Link header. And the PC-Link header on the MAXSYS. PC4020 control panel will only accept the proper connection.

**2.2 Remote Control**

The panel and the DLS software will control this function. The module will be a conduit for the information. Commands can be sent from the DLS or SA software to allow control of the panel; Arm/Disarm, Bypass/Un-Bypass, Status Request.

**2.3 Programming**

Programming must be done via the keypad on the DSC control panel. T-Link programming cannot be done using DLS software.

**2.4 Unique IP Address Disclaimer**

Each T-Link on the same network module must have a unique IP address. This system is not compatible with any device that masks the IP address of the originating device. If such devices are present on the communication path the masking feature must be disabled for the T-Link modules. Since the MAC address of the unit is unique, this number can be used to create an exception rule.

**2.5 Mounting the Module**

For installation with the PC4020 control panel, refer to the PC4020 Installation Manual.

For installation with the PC5020 control panel, refer to the bracket instructions for mounting the unit.

## **2.6 Hardware Features of Transmitter**

### **2.6.1 LED**

There are three LED on the board to indicate connection and traffic.

#### **LED Diagnostics**

LED1 Ethernet Transmit

LED2 Ethernet Receive

LED3 Ethernet Collision

Both LED1 and LED2 are normally ON in their default state after power-up (i.e. when no Ethernet cable is connected, and there are no packets being transmitted or received, respectively). When a packet is transmitted, LED1 will go off for a period of about 100ms, and then on again (it will blink once). When a packet is received, LED2 will go off for a period of about 100ms, and then on again it will blink once). If both LED1 and LED2 are off after applying power, the T-Link is not operational.

### **2.6.2 Current Draw**

The maximum allowable current draw from the panel on the Auxiliary is 500 mA @ 12 VDC, Operational current draw of the T-Link is 150 mA.

The T-Link module has a switched negative programmable output (50 mA @ 12 VDC). This output can be activated if the T-Link module loses communication with the receiver **OR** with the panel.

To simplify bench testing and increase diagnostic ability, and at the same time reduce traffic on the local LAN, as well as omit the need for available network hub ports, it is often beneficial to connect the T-Link and the receiver directly, using an Ethernet crossover cable (see Section 3.2 “Making an Ethernet Crossover Cable”). The diagnostic information for use with a crossover cable is outlined in this section.

Upon power-up of the T-Link (without the Ethernet cable connected), LED1 will blink periodically, approximately once every 12 seconds. This represents the T-Link attempting to send a TCP/IP socket connection request to the receiver. The T-Link will try to connect to the receiver until it succeeds. At the same time, LED2 will remain solid ON indicating that no packets are being received. If both LEDs do not exhibit this behavior, the T-Link is NOT functioning properly.

### **3.1 Troubleshooting**

If the receiver, either the Reporter IP or the DRLIP, is running, then within a few seconds of connecting the Ethernet cable, LED2 will blink once, after which point both LED1 and LED2 will enter a solid ON state. This represents a successful TCP/IP socket connection with the receiver. At this point, the Reporter IP or the DRLIP will be able to report that the T-Link is connected. Any subsequent alarm messages or other transmissions will result in both LED1 and LED2 blinking once each, simultaneously, for each message sent. This behavior represents the original message being sent/received and a response (i.e. an ACK) being received/sent.

If LED1 continues to blink once every 12 seconds, and LED2 remains solid on, then it signifies that no communication can be established with the receiver. In this case the receiver is not responding and accepting the socket connection request from the T-Link. This can be caused by the receiver being powered off, faulty cabling, or incorrect T-Link configuration (incorrect T-Link IP address, subnet mask, or receiver IP address).

If LED1 continues to blink once every 2 seconds, and LED2 also blinks once every 2 seconds, more or less in unison with LED1, then this usually represents a problem either with the receiver or the T-Link configuration. As an example, if the T-Link is connected to a PC upon which the Reporter IP is installed, but the Reporter IP application is not running at that instant, then this is the LED behavior that will be seen (assuming all other configuration information is correct). If the Reporter IP or embedded receiver is running, this could indicate an improper port setting in either the T-Link or the receiver. It could also indicate an improper receiver IP address, whereby the address entered into the T-Link is actually the address of another host on the network.

### **3.2 Making an Ethernet Crossover Cable**

An Ethernet crossover cable can be made by taking a standard Ethernet cable (which will have wires attached to pins 1, 2, 3 and 6 only on the 8 pin RJ45 connector) and swapping pin 1 with pin 3, and also swapping pin 2 with pin 6, on one end of the cable only. This effectively reverses the transmit and receive pairs, and allows two hosts to communicate without the use of a network hub.

### **3.3 Call Direction**

The call direction of the panel is fully compatible with the T-Link module. For example, if the telephone number one is programmed for the T-Link and the communication is lost the panel will use the back up telephone number to send the information to the central station. The communication format is per telephone number specific and therefore the landline communication format can be different than the T-Link's SIA Format.



Before programming the T-Link module, obtain the following items from the Network Administrator:

1. The IP address for the T-Link module. (Section [001])
2. The subnet mask for the T-Link module. (Section [002])
3. The IP address of the receiver. (Section [003])
4. The gateway of the receiver, if the receiver is connected through a gateway. (Section [004])

### **Programming via the PC4020 control panel**

- [00][04][00][00.1][00] telephone number must be programmed as CAAA.
- [00][04][01] T-Link active  
Option must be on for access to the T-Link module.
- [00][04][06] T-Link programming

### **Programming via the PC5020 control panel**

- [301] to [303] telephone numbers  
Program one of the telephone numbers as DCAA. The leading D is already placed in the string by the panel as the leading dial-tone search. The call direction and other options affecting the telephone communication will affect the T-Link communication. This allows for the TCP/IP communication to either be primary or back-up to the telephone line. See control panel's Installation Manual for detail on call direction.
- [380] Option 5 PC-Link Active  
Option must be ON to have access to the T-Link module.
- [851] T-Link Programming  
After making any changes in the T-Link programming, you **must** either
  - power the module down and then back up, or
  - enter 55 in section [999] of T-Link programming.

## **T-Link Programming Section**

### **[001] Module IP**

Unique IP address for the module. The network administrator will provide this information.

Default: 000 000 000 000

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### **[002] Subnet Mask**

Must equal the subnet mask for the local subnet. For any single subnet, there is only one valid subnet mask; all nodes on the same subnet will use the same subnet mask. The network administrator will provide this information.

Default: 000 000 000 000

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**[003] Receiver IP**

Program the IP of the central station receiver.

Default: 000 000 000 000

**[004] Receiver Gateway**

If the receiver is connected through a gateway (WAN network), this is the IP of the local gateway.

The IP address of the gateway must also be a valid IP address for the local subnet.

Default: 000 000 000 000

**[020] System Status**

If option [2] is on, the T-Link module will supervise communication with the receiver. If option [2] is off, no trouble will be generated if communication is lost with the receiver.

If option [3] is on, the T-Link module will supervise the communication with the panel. If option [3] is off and also the communication is lost with the panel, no trouble event will be transmitted from the T-Link to the receiver.

| <b>Default</b> |                          |                | <b>Option ON</b>    | <b>Option OFF</b> |
|----------------|--------------------------|----------------|---------------------|-------------------|
| OFF            | <input type="checkbox"/> | Option 1       | Future Use          | Disabled          |
| ON             | <input type="checkbox"/> | Option 2       | Receiver Supervised | Disabled          |
| ON             | <input type="checkbox"/> | Option 3       | Panel Supervised    | Disabled          |
| OFF            | <input type="checkbox"/> | Options 4 to 8 | Future Use          | Disabled          |

**[021] Programmable Output**

To control the PGM, program the following section with the correct option. When the condition occurs the PGM will trigger to ground for the duration of the trouble.

Default: 00

Options:

00 No trigger

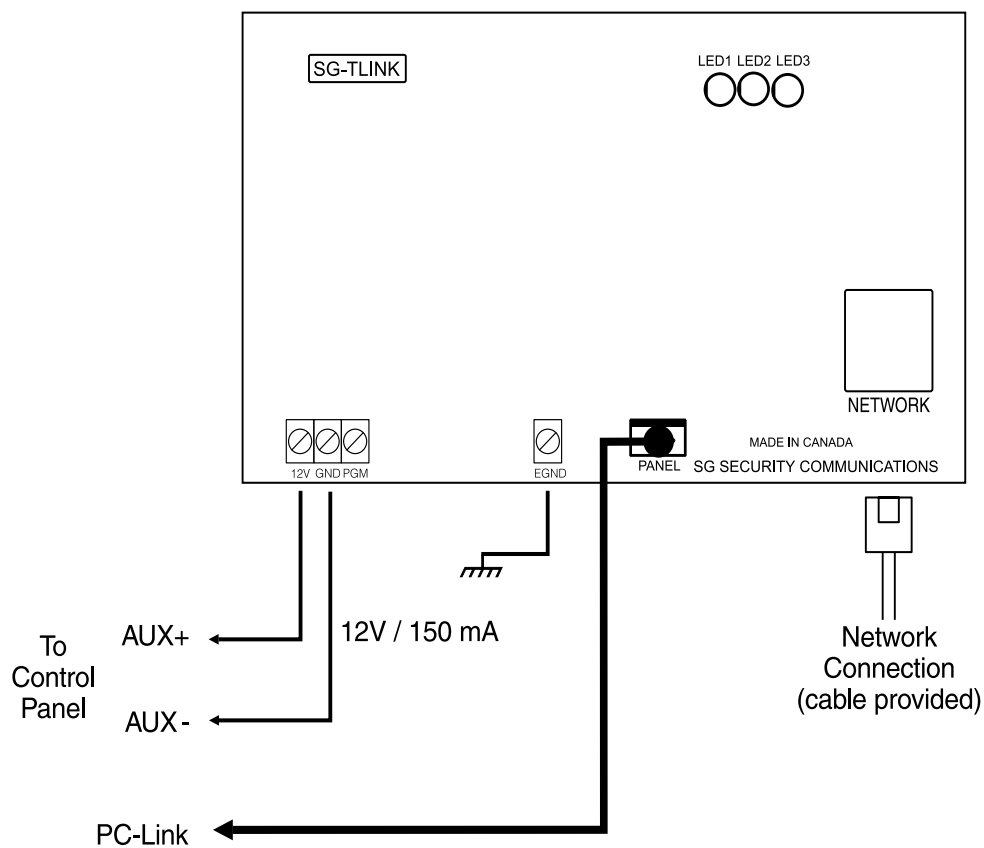
01 Receiver Absent

02 Panel Absent

**[999] Default / Restart**

Enter 00 to default the unit to factory settings.

Enter 55 to restart the unit. A restart is needed for the programming changes to take effect.



**How to contact us:****•Sales**

For information about additional products, please call our sales number: 1-800-418-7618, fax us at 905-760-3030 or e-mail us at [sales@sur-gard.com](mailto:sales@sur-gard.com).

**•Technical Support**

If you have questions or problems when using this product, you can call Technical Support. If you are within the United States or Canada, you can get support by dialing 1-800-503-5869, or e-mail us at [support@sur-gard.com](mailto:support@sur-gard.com).

**•Internet**

Visit our new Sur-Gard web site. You can search the SG technical information database and read information about our new products. You can also send us any questions you may have. Our address is [www.sur-gard.com](http://www.sur-gard.com).

**Limited Warranty**

SG Security Communications warrants that for a period of twelve months from the date of purchase, the product shall be free of defects in materials and workmanship under normal use and that in fulfillment of any breach of such warranty, SG Security Communications shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not to damage incurred in shipping or handling, or damage due to causes beyond the control of SG Security Communications, such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of SG Security Communications. This warranty contains the entire warranty. SG Security Communications neither assumes responsibility for, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

In no event shall SG Security Communications be liable for any direct, indirect or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation or operation or failure of this product.

**Warning:** SG Security Communications recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.