Tiger Controller Family Training Notes

Reference Document

PXL-250/SB-293

This document provides an overview and basic training instructions for Keri Systems' Tiger Controller/*Doors32*™ software architecture and products. It is divided into four sections.

1. Information about Keri Systems, Inc.
2. Tiger Controller Family Features
3. Hardware Installation Checklist
4. *Doors32* Software Configuration Summary

For detailed product information, please refer to the following product documentation.

- PXL-250 Quick Start Guide – P/N: 01835-002
- SB-293 Quick Start Guide – P/N: 01837-003
- PXL-250/SB-293 Technical Reference Manual – P/N: 01836-003
- *Doors32* Installation Guide – P/N: 01821-004
- *Doors32* Users Guide – P/N: 01821-002

1.0 Keri Systems, Inc.

Keri Systems, Inc. manufactures access control products to help system integrators provide a solution for their customers. With expertise in proximity and an experienced staff, Keri Systems strives to fulfill four objectives:

1. Manufacture the simplest and easiest to install and operate hardware and software in the industry.
2. Build the highest quality products and demonstrate that quality with outstanding warranties.
3. Offer the lowest priced product for the features in the industry.
4. Provide excellent customer service to support the system integrator, both prior to and after the sale to the end-user customer.

2.0 Tiger Controller Family Features

This section provides a brief overview of the Tiger Controller product family features. Refer to Figure 1 on page 12 and Figure 2 on page 13 for the location of the controller features.

2.1 The PXL-250 Tiger Controller

The Tiger Controller contains the intelligence and necessary inputs/outputs to manage one door and two readers. The controller is unique in the industry by using four separate microprocessors to manage each of the major sections of the controller.

1. one for the Readers
2. one for all Inputs/Outputs
3. one for the RS-485 Network
4. one to coordinate all the microprocessors, make access decisions, and manage the RS-232 port when it is being used

In an access control system, from 1 to 128 PXL-250 controllers can be networked, controlling from 1 to 128 doors. With the addition of a SB-293 Satellite Board, each PXL-250 can manage a second door, one reader per door, for a possible total of 256 doors.

Standard features include:

Access Control

- one door (two doors if adding the SB-293 Satellite Board)
- two readers
  - proximity

  or
  - Wiegand compatible

Inputs and Outputs

- three inputs
  - door switch status
  - request to exit
  - global unlock or auxiliary RTE input (user configurable on the master controller)
- two 1A Form C output relays
  - one door lock relay to control virtually any electric strike or magnetic lock on the market – the lock LED on the controller is green when the relay is active
  - one alarm annunciation relay to annunciate door forced and/or door held open alarm conditions – the alarm LED on the controller is green when the relay is active

Quick Disconnect Wiring Connectors
- allows for quick removal of wiring connectors
- makes it easy to change/upgrade either the wiring or the controller board following system installation

Electrical Surge/Transient Protection
- Transorbs across all inputs and outputs (except relay outputs)
- MOVs across all relay outputs

Input Voltage Monitoring
- thermal fuse attached to the controller's input power connection – opens if there is a power problem
  - reversed +12 VDC power connection – the Fuse LED is red
  - general power problem – the Fuse LED is green
- over/under voltage monitor
  - if controller power is within acceptable levels – the Power LED is green
  - if an over or under voltage condition exists – the Power LED is red and the voltage measured is displayed on the controller address LEDs

Network Communications
- an RS-485 network communication port capable of linking up to 128 controllers on a single network up to 4,000 feet long
- an RS-232 serial port that automatically configures itself to communicate directly to a PC or communicate to a PC via modem
- to assist in monitoring and troubleshooting RS-232 communication issues, the following LEDs on the controller flicker corresponding to the state of the communication lines during data transfer
  - TXD – Transmit Data
  - RXD – Receive Data
  - DTR – Data Terminal Ready
  - CTS – Clear to Send

Automatic Network Ground Configuration
- automatic configuration of earth ground to one point to support network communications

Access Control Database Capacity
- a database capacity of more than 10,000 unique cardholders per controller, or
- with optional RAM expansion, more than 65,000 unique cardholders per controller
- transaction buffers capable of storing more than 3,500 selectable events per controller

Support for the Following Reader Technologies

- Keri Systems Proximity
- Wiegand Compatible
  - Bar Code
  - Biometrics
  - Keypad
  - Magnetic Stripe
  - Other Proximity

NOTE: The Wiegand Reader must send data according to the Security Industry Association's Wiegand Reader Interface Standard (document number AC-01D-96). Keri Systems, Inc. cannot guarantee the performance or reliability of Wiegand Readers that do not meet these guidelines.

2.2 The SB-293 Satellite Board

To extend the features and functionality of the PXL-250 Tiger Controller, Keri Systems offers the SB-293 Satellite board. The SB-293 is a cost-effective plug-in board that adds either second door control or general-purpose inputs and outputs.

The SB-293 Satellite Board adds the following features.

- eight additional general purpose inputs and four additional general purpose 1A Form C output relays
  - OR -
- second door access control (using one reader per door)
  - door switch status input
  - request to exit input
  - door lock output relay
  - door alarm output relay
  - six general purpose inputs (one input can be user configured as an auxiliary RTE input)
  - two general purpose Form C output relays (both outputs can be user configured for additional alarm annunciation)

The optional LCD-1 Alpha/Numeric Plug-In Display adds the following feature.

- access to built-in system diagnostics to aid in troubleshooting (highly recommended)

3.0 Proximity Readers

Five styles of MS-series proximity readers are supported. All five are available in attractive, weatherproof, shock resistant packages.

Table 1: Proximity Readers

Reader Model	Description	Read Range
MS-3000 MicroStar	mullion reader	up to 4 inches
MS-4000 ShootingStar	vandal-resistant reader	up to 1 inch
MS-5000 MiniStar	wall switch reader	up to 6 inches
MS-7000 SuperStar	medium range reader	up to 14 inches
MS-9000 MegaStar	long range reader	up to 18 inches at 12 VDC up to 23 inches at 24 VDC

4.0 Keri Systems' Architecture Advantages

The Keri Systems architecture provides several advantages for access control systems.

- The PC does not have to be online for system operation.
- It allows you to start with one door and add doors to meet your requirements.
- It provides "smart door" control, so any communication disruption has no impact on access.
- With "smart door" control, any hardware problems are limited to just one door and not the entire system.
- The hardware can be located either in a utility closet or near the door, taking advantage of wiring requirements, building layout, etc., to minimize installation costs.
- Multiple sites can be supported by using remote, dial-up support.
- Built-in diagnostics help troubleshoot problems should any occur.
- Designed for high quality and reliability in San Jose, CA (the Silicon Valley).

5.0 Hardware Installation Checklist

The installation checklist provides a simple list of items to check to ensure a smooth installation for the system integrator and the customer. Every piece of Keri Systems equipment is shipped with a Quick Start Guide that describes the product, the wiring connections, the power on procedure, and provides troubleshooting information. Please read all Quick Start Guides prior to installation. For additional information, the PXL-250 and SB-293 both have a very broad Technical Reference manual to answer virtually all questions relating to installing access control on a door.

5.1 Mounting the Controller

The PXL-250 controller can be located in a phone utility closet or above drop ceiling panels. This flexibility allows an installer to save installation costs due to building requirements such as plenum wiring, remote doors and/or locations, and other issues.

If the access control network is connected directly to a PC, the master PXL-250 controller must be within 100 feet of the PC for the RS-232 connection. Otherwise, line drivers will be needed to amplify the RS-232 signal. All slave controllers are networked from the master controller using twisted-pair wiring.

5.2 Prepare Power

Connect three wires to the Power Connector. Do **NOT** turn on power until all wiring is complete.

1. 12VDC, linear power supply
2. Electrical Ground
3. Earth Ground

Ground

The PXL-250 is a state-of-the-art electronic device using a 4-layer PC board. One layer is an electric ground plane. This ground plane is connected to earth ground via the earth ground connector on the Power Input Connector. The ground plane acts as a drain for electrical spikes entering the panel.

NOTE: System performance is degraded if the EARTH GROUND is not connected to a solid earth ground.

Power

A PXL-250 Controller with an SB-293 Satellite board and 2 MS-5000 Readers draws 670 mA max in a non-alarm state, with all options installed. Keri Systems strongly recommends using a Linear Power Supply (such as a KPS-5) to ensure clean, efficient power for the controller.

5.3 Mounting the Reader

Proximity Readers can be mounted on most wall surfaces, but there are two elements of which to be aware.

RF Interference – There should be no other RF generating device, such as a computer CRT or a power supply, located within 4 feet of the Reader or the PXL-250 Controller.

Metal – Metal shields the RF signals used by the Readers affecting Reader performance. Most proximity readers are not designed for mounting on or near metal. The MS-3000 is an exception; it is designed for mounting on a metal window or door mullion. The other Proximity Readers require some separation from metal.

5.4 Wiring

Readers

Proximity readers use a six-conductor, stranded, shielded cable with a shield wire. Wiegand readers require either six- or seven-conductor, stranded, shielded cable with a shield wire. AWG 24 wire will provide up to 500-foot run length between PXL-250 and Reader (The MS-7000 and MS-9000 Readers require 18 AWG wire).

RS-485 Network

The RS-485 network requires a twisted-pair, stranded, shielded cable with a shield wire. AWG 24 wire will provide up to 4,000 feet total network length.

RS-232 PC to Controller Direct Connection

The RS-232 PC to Controller direct connection requires a three-conductor, stranded, shielded cable with a shield wire. AWG 24 wire will provide up to 50 feet total connection length.

Electric Strike or Magnetic Lock

Using either electric strike or magnetic lock hardware, the PXL-250 controller is designed to provide a high level of transient protection to prevent these transients from entering the system. However, we still find that about 50% of locking hardware generates too much electrical noise. Transorbs are provided with the PXL-250 unit to be installed at the lock to reduce transient noise. If additional transient protection is necessary, Keri Systems offers an isolation relay that completely isolates the controller from transients. AWG 18, two-conductor, stranded wire, at a minimum, may be used. A heavier gauge may be required depending upon the current demands of the lock and the length of the wiring run.

Door Switch and Request-to-Exit Switch

Use AWG 22, two-conductor, stranded wire to connect these switches.

5.5 Final Hardware Setup

The last step of hardware installation is to clear the memory in the controller. This is be done to each controller in the network to ensure all controllers' memory is clean with no spurious information.

1. Put the JP-3 reset jumper on (see Figure 1on page 12).
2. Hold down the S1 button. It is located on the right side of the controller below the address LEDs.
3. Apply power and keep S1 down for at least 5 seconds or until the reader beeps twice.

The panel is now ready for programming. Use the S1 button and the LED address display to set the controller address. The PXL-250 connected to the PC or modem (known as the Master Controller) MUST be set to address 001.

5.6 Doors Data Entry

Refer to the *Doors32* Users Guide for detailed information on programming the Doors32 software. The next section provides a quick summary of the programming steps.

6.0 *Doors32* Software Configuration Summary

6.1 Doors Software Setup

The *Doors32* software is able to program from 1 to 255 remotely connected networks, each with 1 to 128 controllers. Connected directly or via modem, the *Doors32* software provides access control data management, plus the ability to extract event transactions and generate custom reports. All this functionality is designed with a simple, menu based interface.

The *Doors32* software was written from scratch, not ported from DOS like many competitors' software. It uses the simplest interface possible and takes advantage of the features of the Windows operating system. Everyone who has seen the software claims it is the easiest to use that they have ever seen.

Perform the following steps for basic *Doors32* software configuration.

6.1.1 Log On to the System

The *Doors32* software uses both a User Name and a Password to allow entry to the system. To enter the program, enter the default User Name (Keri) and default password (Keri). For both the User Name and Password the "K" must be upper case and the "eri" lower case – user names and passwords are case sensitive.

You can create up to 32 operators with assignable privileges, and change the default User Name and Password using the Operator setup commands from the Setup > Operators menu option.

6.1.2 Define the Hardware

To simplify installation, the *Doors32* software has an Auto-Configuration feature in the Setup > System menu. Auto-Configuration communicates with all the controllers in the access control network, determining how many controllers are on the network (with their addresses) and whether or not they have satellite boards, and then automatically builds the Controller/Door database.

1. Select the Setup > System menu option.
2. Select the System Configuration tab. Set the communication port your PC uses. If remote dialup via modem is used enter the PC's phone number.
3. Select the Controllers tab. Click on the Auto-Configuration button. The Doors32 software connects to the access control network and then builds the Controller/Door database.
4. Select the Doors tab and enter the configuration information for each door.
5. Select the I/O Config tab to select and define the characteristics of the controllers' Inputs and Outputs.
6. Select the Link Config tab to define what the Inputs and Outputs control.

6.1.3 Setup the Timezones

Timezones are used three places in the Doors32 software.

1. Auto-Unlock time schedules - to control automatically unlocking doors.
2. Input and Output Links - defining when these links are active.
3. Access for Cardholders in Access Groups - defining the times-of-day when cardholders may or may not be granted access.

Consider the time periods when cardholders may need access and enter timezones according to these time periods. It is best to name the time zones exactly for the times they allow access, for instance "M-F, 8AM-5PM."

6.1.4 Setup the Access Groups for Cardholders

One of the hardest aspects of access control for end-users to grasp is the concept of Access Groups. While the system operator can say when a cardholder can get through what doors, at what time of day; staring at a large chart of all this information can be quite intimidating. To make this process easier, Keri Systems created what is known in Microsoft Windows™ terms as a "Wizard;" a routine that walks a user through a particular task.

The Access Group Wizard in *Doors32* consists of five data entry windows.

1. Introduction
2. Access Group selection and action selection
3. Door selection from icons
4. Matching Doors with selected Timezones
5. Access Group naming and saving

In this step, doors for particular access groups are selected, and then time zones are associated with them to later determine cardholder access privileges.

6.1.5 Enroll Cardholders

The cardholder enrollment process is done in three steps: enrolling the cards, assigning cardholder data) to each card/cardholder, and then enabling the cards.

The first step is to enroll the cards for the cardholders.

Cardholders can be enrolled and the cardholder database can be viewed in two methods. One method uses a fill-in-the-blank, dialog box set of windows. The second method uses a spreadsheet window.

Using the Dialog Box Windows

To enroll Keri System proximity cards or 26-bit Wiegand cards, simply enter the first and last card numbers (no more than 1,000 cards at a time, all cards must be consecutively numbered) and press **SAVE** (this is known as the "block enrollment" method).

Using the Spreadsheet Window

If you are using non-consecutively numbered cards you must enroll each card manually by presenting each card to the reader attached to the master controller, one-at-a-time. Press the **Start Enrollment** button on the Spreadsheet page and begin presenting cards. Press the **Stop Enrollment** button when all cards are presented.

The second step is to assign cardholder data to each card/cardholder. Enter each cardholder's name and assign an Access Group to each cardholder, using the Access Group pull-down list provided in both the spreadsheet and dialog box windows. When entering cardholder information, block copy commands are available in the spreadsheet window that allow you to select information that can be copied to a number of cardholders.

The third step is to turn each card on.

Finally, press **SAVE** to save the card enrollment information to the cardholder database.

6.1.6 Download Data to the Controller Network

Now that all the data to control the access control system has been entered, the data is ready to be downloaded via the RS-232 connection, either through a direct connection to the network or via modem. This download can occur two ways.

- The easiest is by clicking on the **Update Net** icon at the top of the *Doors32* window. This will download all database changes to the access control network. This approach reduces download time and sends only the changes that have been made to any of the *Doors32* databases.
- The most thorough method is to download all databases. Click on the Operate > Doors pull-down menu option. Click on the **Select All** button and then click on the **Update Doors** button. This sends the complete database set to all the controllers in the access control network. Typically this is done the first time a network is started, or if a controller has been replaced or cleared due to memory corruption.

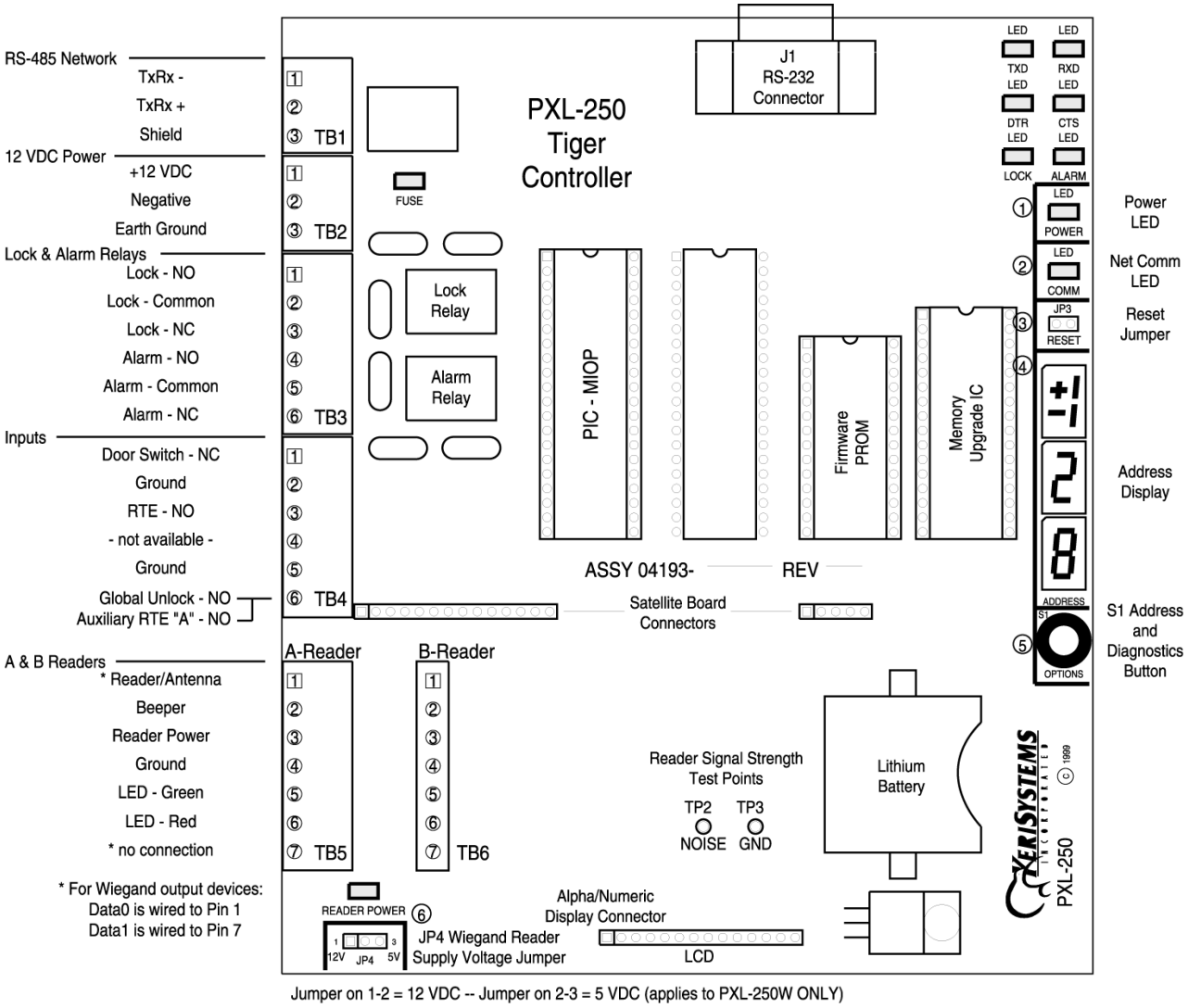

Figure 1: The PXL-250 Controller

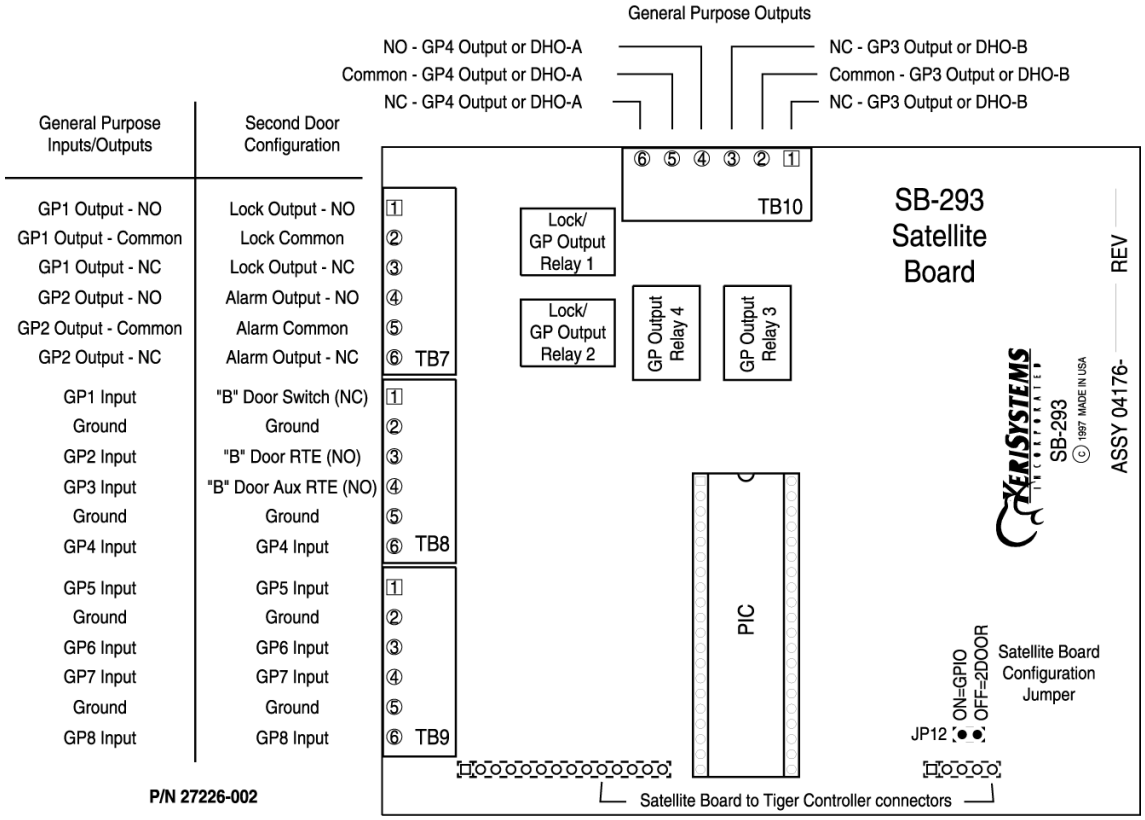

Figure 2: The SB-293 Satellite Board

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