Troubleshooting and Diagnostics

The troubleshooting and diagnostics guide provides instructions to assist in tracking down the source of many basic controller installation problems. If there is a problem with a controller installation, please review these instructions and if a listed problem matches the controller's problem, review the possible causes and corrective actions for implementation.

Troubleshooting

Many of the troubleshooting instructions require a digital voltmeter (DVM) to verify source voltages and noise levels on the PXL-250 controller. Before beginning the troubleshooting process, please have a DVM on hand. Refer to Figure 9 for all wiring instructions.

Problem	Possible Cause	Corrective Action
The controller does not power-up (the power LED is not on, the LCD is blank).	1. No power or insufficient power has been applied to the system.	• Check the main power circuit breaker. • Verify the positive lead is on TB-2, pin1 and the negative lead is on TB-2, pin 2. • Measure the input voltage across pin1 (positive) and pin 2 (negative) of TB-2. This should read between 12 and 14 VDC. • Disconnect the power supply from the controller and verify the supply's voltage. This should read between 12 and 14 VDC.
The reader does not beep and/or the reader LED does not flash when a card is presented. OR The controller keeps resetting.	1. The reader is not wired correctly.	• Verify all TB-5 connections have been made on lead wire and not on wire insulation. • For a Keri Systems proximity reader, verify the following connections on TB-5. – reader/antenna lead is on pin 1 (Blue wire) – beeper lead is on pin 2 (Green wire) – reader power lead is on pin 3 (Red wire) – reader ground lead is on pin 4 (Black wire) – LED-1 lead is on pin 5 (Brown wire) – LED-2 lead is on pin 6 (White wire) – no connection on pin 7
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Problem	Possible Cause	Corrective Action
		• For a Wiegand device, verify the following connections on TB-5. – data 0 lead is on pin 1 (Green wire) – beeper lead is on pin 2 (see device's manual) – reader power lead is on pin 3 (Red wire) – reader ground lead is on pin 4 (Black wire) – LED-1 lead is on pin 5 (see device's manual) – LED-2 lead is on pin 6 (see device's manual) – data 1 lead is on pin 7 (White wire)
	2. Insufficient power to the reader.	• Measure the output voltage across the red and black power wires at the reader. This should read 12 VDC +/- 2 volts. • Refer to the Technical Reference manual and verify the reader cable length is not greater than the maximum allowed cable length.
	3. JP4 on the controller is installed incorrectly.	• For Keri Systems Proximity readers (and 12V Wiegand devices), verify that JP4 on the controller is installed across pins 1 and 2 to supply 12 VDC. • For 5V Wiegand devices, verify that JP4 on the controller is installed across pins 2 and 3 to supply 5 VDC.
	4. The controller is receiving transients.	• Verify a transorb has been installed across the electric lock device (for the lock relay) and across the alarm device (for the alarm relay). If so, install an isolation relay (Keri Systems p/n IRP-1) across the lock and alarm devices.
	5. The controller is mounted too close to an EMI source.	• Verify there is at least 4 feet or separation between the controller and the controller's power supply. Verify there are no other EMI sources in close proximity to the controller.
	6. A Wiegand receiver board has been plugged into a pre-revision 8 controller board	• Verify that the part number printed in the lower right-hand corner of the controller board is 04174-002, revision A or greater.
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Problem	Possible Cause	Corrective Action
The read range is very short.	1. There is a poor earth ground.	• Verify pin 3 of TB-2 is connected to a good earth ground.
	2. An electromagnetic interference (EMI) source is located near the reader.	• Follow the instructions in the diagnostic section and measure the reader signal strength. The measured value must be less than 500 mV. If it is not, an EMI source is affecting the reader. Relocate either the reader or the EMI source.
	3. The reader cable is not shielded or is located near an EMI source.	• Replace the unshielded cable with shielded cable. • Verify the reader cable is not routed in conduit along side power cables. • Follow the instructions in the diagnostic section and measure the reader signal strength. The measured value must be less than 500 mV. If it is not, an EMI source is affecting the reader. Relocate either the reader cable or the EMI source.
	4. A reader that was not designed to be mounted on a metal surface has been mounted on a metal surface.	• Remount the reader on a non-metallic surface. • Replace the reader with one designed for mounting on a metallic surface.
At power-up, the reader continuously beeps.	1. The door sense input is open (pins 1 and 2 of TB-4).	• If a door switch is installed, verify switch operation and verify the switch is installed across pins 1 and 2 of TB-4. • If a door switch is not being used, verify a jumper is installed across pins 1 and 2 of TB-4.
	2. The controller's RAM needs to be reset.	• Follow the instructions found in either the controller Quick Start Guide or Technical Reference for resetting the controller's RAM.
The controller cannot communicate with the *Doors*™ access control program.	1. The communication cable is loose or unplugged.	• Verify the communication cable is plugged in correctly.
	2. The controller to PC direct-connect cable is not correct.	• If the installation uses a Keri Systems cable, verify the correct cable has been installed. • If the installation uses a self-made cable, refer to the instructions in the Technical Reference manual and verify the cable has been wired correctly.
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Problem	Possible Cause	Corrective Action
	3. *Doors*™ is not configured to communicate through the proper COM port.	• Refer to the Doors™ program User's Guide or on-line help for COM port configuration instructions.
	4. The communication cable is connected to the wrong COM port.	• Verify the communication cable is connected to the correct COM port.
	5. There is an IRQ conflict.	• Consult a computer technician to resolve this problem.
	6. The COM port is not working.	• Consult a computer technician to resolve this problem.
The controller will not communicate with the modem.	1. The modem is turned off.	• Verify the modem's power is on.
	2. The modem was plugged into an active controller.	• Turn the power to both modem and controller off. Power the modem on and then the controller.
	3. The controller to modem cable is not correct.	• If the installation uses a Keri Systems cable, verify the correct cable has been installed. • If the installation uses a self-made cable, refer to the instructions in the Technical Reference manual and verify the cable has been wired correctly.
	4. The modem is the wrong type.	• Refer to the modem's manual and verify the modem is Hayes compatible, communicates at 9600 baud or greater, can be configured to turn error checking off, and has nonvolatile RAM backup.
The lock relay continually cycles on and off.	1. The firmware PROM is not seated properly.	• Refer to the instructions in the Technical Reference manual and verify the PROM is seated correctly.
The *Doors*™ access control program will not execute.	1. The PC does not have enough conventional memory available for the program.	• The PC must have at least 560K of conventional memory available for use by the *Doors*™ program. Refer to the PC's DOS manual for instructions on how to maximize conventional memory.
The PC will not communicate with the modem.	1. The modem is turned off.	• Verify the modem's power is on.
The PC will not communicate with the modem.	2. The modem is the wrong type.	• Refer to the modem's manual and verify the modem is Hayes compatible, communicates at 9600 baud or greater, can be configured to turn error checking off, and has nonvolatile RAM backup.
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Problem	Possible Cause	Corrective Action
	3. There is an IRQ conflict.	• Consult a computer technician to resolve this problem.
	4. The COM port is not working.	• Consult a computer technician to resolve this problem.
Some controllers on the network are not communicating with the *Doors*™ access control program.	1. There is an addressing conflict between the controllers.	Check the addressing on each controller on the network. Each controller must have a unique address. The master controller must have address 1.
	2. RAM is corrupted in one or more of the controllers.	In the Doors™ access control program, click on Setup/System/Controller Status. Systematically select each controller and click on the Status button. Note those controllers that do not respond or that respond incorrectly. These controllers must have their RAM reset. Refer to the Technical Reference manual for instructions on how to reset controller RAM.
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Diagnostics

Beginning with controller firmware revision 6.2.11, built into every PXL-250 controller is a set of diagnostic programs designed to assist in field verification of basic reader and controller functions.

- Receiver A Signal Quality Test
- Receiver B Signal Quality Test
- PXL-250 Inputs Test
- SB-293 Inputs Test (this diagnostic routine is displayed, but is not yet available)

Available beginning with firmware revision 6.2.20.

- Network Error Rate (available only on the master controller – address #1)

To use the diagnostic routines the controller must have an LCD-1 Alpha/Numeric Display installed at J6. To access the diagnostics, click the S1 button (see Figure 1) until the following screen appears on the LCD display (each click rotates the display between time, date, firmware revision, unit number, and diagnostics).

* KERI SYSTEMS *
TEST

Figure 1 – Diagnostics Entry Screen

Now double-click S1 and the first diagnostic test appears on the display. Clicking S1 once advances to the next test. Double-clicking S1 enters the test identified on the display.

Receiver A and B Signal Quality Tests

The receiver input signal quality tests provide a measure of the strength of the signal and the amount of interference in the signal received by a PXL-250 controller from the A-Reader or B-Reader. There are two methods for measuring receiver input signal quality: the on-board diagnostics and measuring with a DVM (instructions for measuring with a DVM are provided in a separate section, later in this document, for installations without an LCD-1 display).

NOTE: The Receiver Signal Quality Tests are only valid for Keri Systems proximity readers. These tests are not valid for Wiegand readers or for proximity readers from other manufacturers.

The steps for performing the Receiver A and Receiver B Signal Quality Tests are identical. The following instructions may be applied to either test.

1. Once in the diagnostic routines, single-click S1 until the Receiver A/Receiver B Signal Quality Test header appears on the LCD display (see Figure 2).

* KERI SYSTEMS *
RCVR A/B

Figure 2 – Receiver A/B Signal Quality Test Entry Screen

2. Double-click to enter the diagnostic routine. The following information appears on the LCD display.

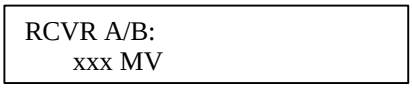

Figure 3 – Receiver A/B Input Signal Quality

3. Monitor the MV reading over a period of time. The reading fluctuates as the signal strength fluctuates. Determine an average value for this reading.

The average value should be around 500 mV. This indicates the PXL-250 controller is receiving a reader signal with little electrical interference.

A higher reading indicates the controller is receiving electrical interference that may affect the reader's signal. The higher the reading, the more interference is being received which directly affects the reader's read range.

A lower reading indicates the controller is receiving a weak signal from the reader. The lower the reading, the weaker the signal being received, which directly affects the reader's read range.

PXL-250 Inputs Test

The PXL-250 Inputs Test allows an operator to verify the basic operation of all inputs on the PXL-250.

1. Once in the diagnostic routines, single-click S1 until the PXL-250 Inputs Test header appears on the LCD display (see Figure 4).

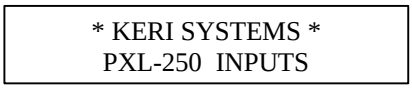

Figure 4 – PXL-250 Inputs Test Entry Screen

2. Double-click to enter the diagnostic routine. Information appears on the LCD display corresponding to input status (see Figure 5); inputs that are in their normal, inactive state are displayed on the LCD, inputs that are in their active state are not displayed (see Table 2).

Figure 5 – PXL-250 Inputs

Input	Normal State
AUX	Normally Open
RTE	Normally Open
DR1	Normally Closed
TMP	Normally Closed

Table 2 – Normal States for Inputs

3. To test an input, change its state. When an input is inactive, its header name appears on the LCD display. When an input is active, its header name disappears from the LCD display.

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Net Error Rate Test (Master Controller ONLY)

The net error rate test allows an operator to monitor the communication between controllers to see if any network communication errors are occurring during master/slaves polling cycles. This can help verify the integrity of the controller communication network.

A polling cycle is defined as the set of network communications between the master controller as it contacts each slave controller in the access control network, one-at-a-time, monitoring slave controller status.

1. Once in the diagnostic routines, single-click S1 until the Net Error Rate Test header appears on the LCD display (see Figure 6).

```
* KERI SYSTEMS *
NET ERROR RATE
```

Figure 6 – Net Error Rate Screen

2. Double-click to enter the diagnostic routine. Three sets of numbers appear on the LCD display (see Figure 7). Each set of numbers corresponds to different kind of network error count.

```
* KERI SYSTEMS *
##    ##    ##
```

Figure 7 – Net Error Rate Fields

3. The first set is a count of the number of network errors that have occurred on the current polling cycle. If network errors are occurring during the current polling cycle, this counter will increase until the end of the polling cycle. When a new polling cycle begins this number resets to zero.
4. The second set is a count of the highest number of network errors that have occurred on any single polling cycle since the test began.
5. The third set is a count of the total number of network errors that have occurred over all polling cycles since the test began.

NOTE: A number of network errors will be reported during an auto-configuration initiated by the Doors/Doors32 program. This is due to the master controller polling all 128 possible controllers on the network to determine which controllers are actually connected. Errors during an auto-configuration cannot be considered valid errors.

Exiting Diagnostics

1. Single-click S1 until the Exit header appears on the LCD display (see Figure 8).

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* KERI SYSTEMS *
EXIT
```

Figure 8 – Exit Diagnostics Screen

2. Double-click to exit the diagnostic routine.

Receiver Signal Quality Test – DVM

The receiver input signal quality tests provide a measure of the strength of the signal and the amount of interference in the signal received by a PXL-250 controller from the A-Reader or B-Reader. There are two methods for measuring receiver input signal quality: the on-board diagnostics and measuring with a DVM (the on-board diagnostics method is described earlier in this document).

Reader "A" Measurement (refer to Figure 9)

1. Remove TB-6 from the receiver board.
2. Disconnect the wire at TB-6, pin 1.
3. Loosen the wire connection at TB-5, pin 1 and attach a jumper wire between TB-6, pin 1 and TB-5, pin 1.
4. Tighten both connections and reinstall TB-6 on the receiver board.
5. Set the DVM to a range that allows it to read between 500 mV to 2 volts DC.
6. Connect the ground lead of the DVM to TP-2 on the receiver board.
7. Connect the positive lead of the DVM to TP-1 on the receiver board.
8. Take the reading from the DVM.

Reader "B" Measurement (refer to Figure 9)

1. Remove TB-6 from the receiver board.
2. Disconnect the wire at TB-5, pin 1.
3. Loosen the wire connection at TB-6, pin 1 and attach a jumper wire between TB-6, pin 1 and TB-5, pin 1.
4. Tighten both connections and reinstall TB-6 on the receiver board.
5. Set the DVM to a range that allows it to read between 500 mV to 2 volts DC.
6. Connect the ground lead of the DVM to TP-2 on the receiver board.
7. Connect the positive lead of the DVM to TP-1 on the receiver board.
8. Take the reading from the DVM.

Be sure to remove the jumper wire between TP-6, pin1 and TP-5, pin1. Be sure to restore the "A" reader lead to TB-5, pin 1 and the "B" reader lead to TB-6, pin 1.

The average value should be around 500 mV. This indicates the PXL-250 controller is receiving a reader signal with little electrical interference.

A higher reading indicates the controller is receiving electrical interference that may affect the reader's signal. The higher the reading, the more interference is being received which directly affects the reader's read range.

A lower reading indicates the controller is receiving a weak signal from the reader. The lower the reading, the weaker the signal being received, which directly affects the reader’s read range.

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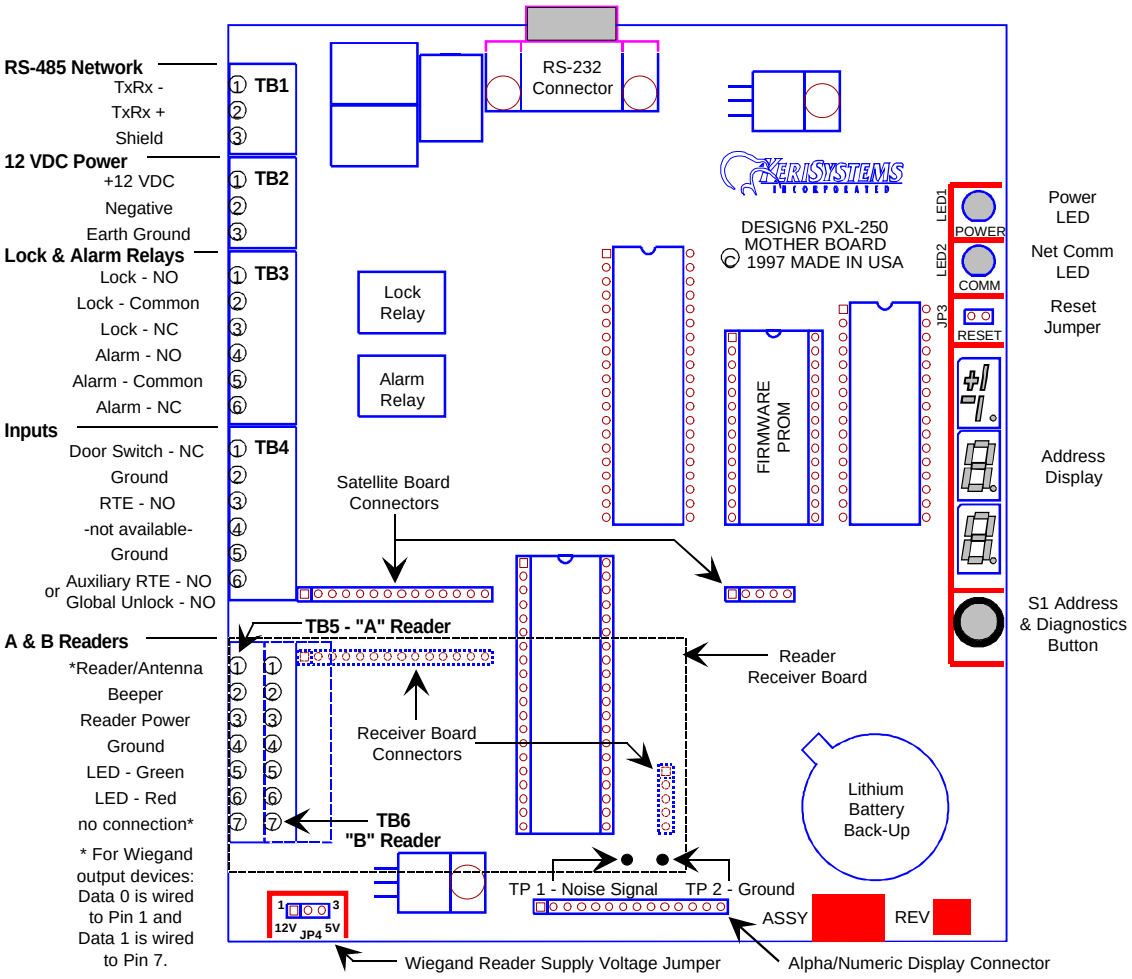

Figure 9 – The PXL-250 Controller