Wireless Installation Manual

900 MHz Wireless Baseboard

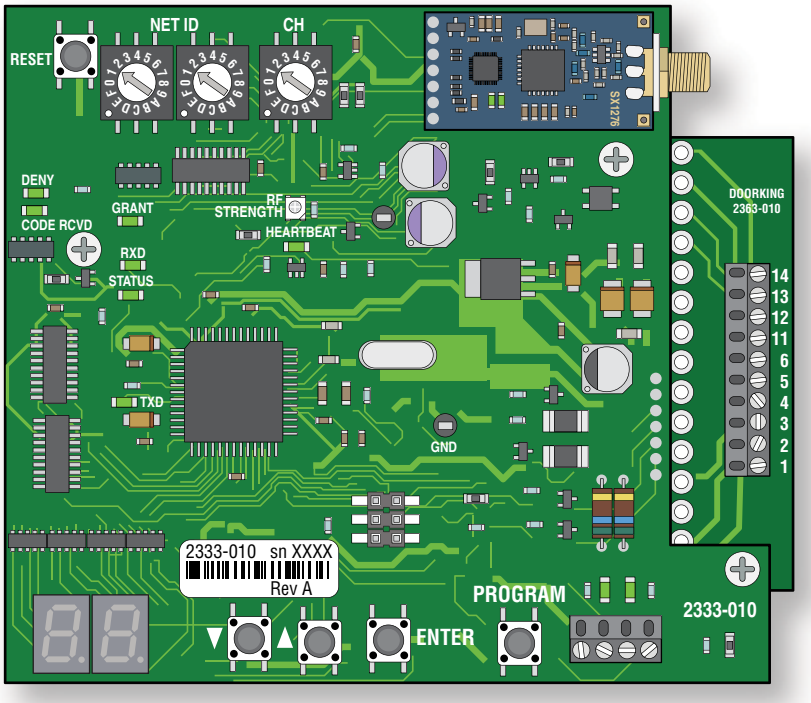
Use this manual for baseboard 2333-010 Revision A or higher.

2333-065 Issued 11-18

For Access Control System Models:
1833, 1835, 1837 and 1838 Multi-Door Access Controller

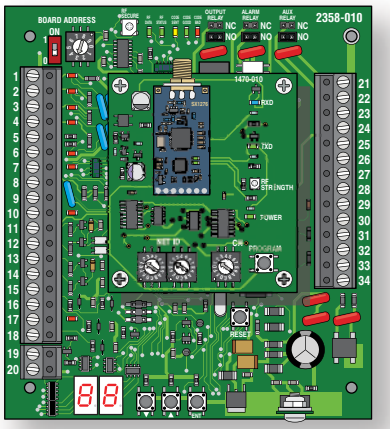
Allows Access Control System to wirelessly communicate with Up to 24 wireless tracker expansion boards.

This access control equipment must be installed inside of a controlled, protected or restricted area to comply with listing certification.



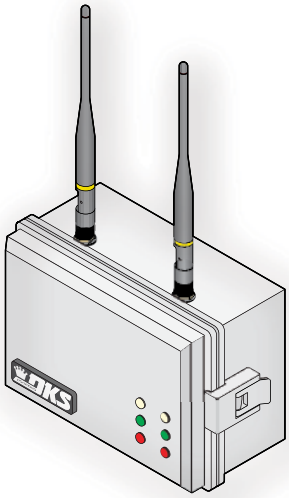
900 MHz Wireless Baseboard

Compatible ONLY with Tracker Expansion Board 2358-010 Revision N or higher.



Tracker Expansion Board with 900 MHz Wireless RF Remote Module
(Sold separately)

The 1830 Series Access Control System's Relay Strike Time MUST be set to "00" or the tracker expansion board will NOT function.



900 MHz Wireless Dual Band Repeater
(Sold separately)

Date Installed: _____

Installer/Company Name: _____

_____

Phone Number: _____

Circuit Board Serial Number and Revision Letter: _____

Leave Manual with Owner

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Version K

Intertek 9900288

Conforms To UL STD 294
Certified To CAN/ULC-S319-05

DOORKING®

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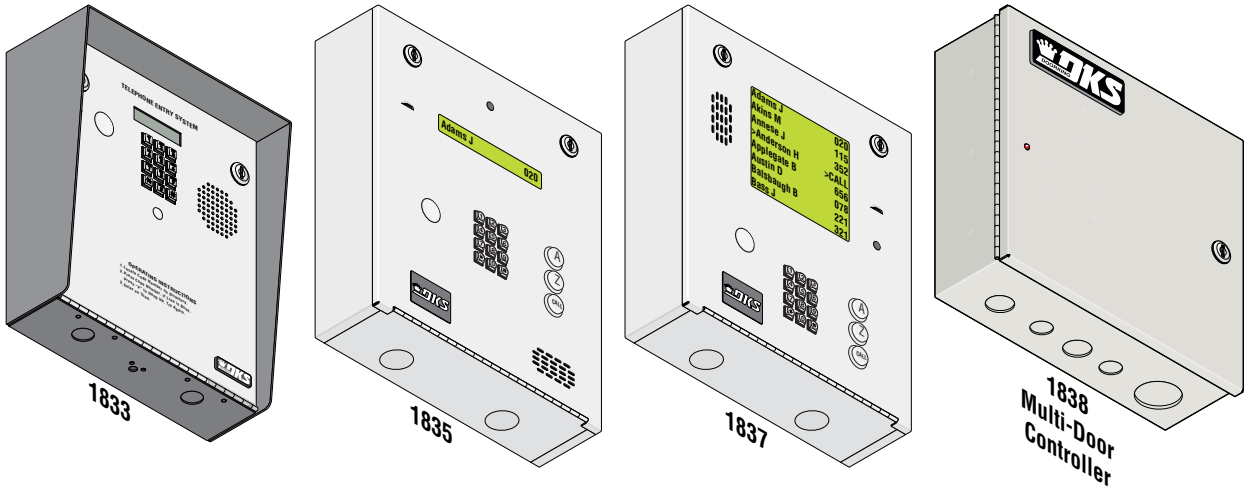
For Models:



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Important Notices

FCC – United States

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules and Regulations. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice:

DoorKing does not provide a power transformer on units sold outside of the United States. Use only transformers that are listed by a recognized testing laboratory to power the access control system. **An Inherently Protected Transformer must be used to power this device.** These systems require a 16.5-volt, 20 VA transformer.

Listing:

This product has been tested to and found to be in compliance with the UL 294 Safety Standard and Certified to CAN/ULC-S319-05 by Intertek Testing Services NA Inc. (a Nationally Recognized Testing Laboratory) and is ETL listed.

Performance Levels

Destructive Attack:	Level I
Line Security:	Level I
Endurance:	Level IV
Standby Power:	Level I (Level II with 12 VDC, .7 Ah, SLA battery, required for Canadian certification)
Single Point Locking Device with Key Locks:	Level I

Glossary for UL 294

ACCESS CONTROL SYSTEM: A collection of means, measures and specific practices that when combined, form or compose a systematic approach, which enables an authority to control access to areas and resources in a given physical facility. An access control system, within the field of physical security, is generally seen as the second layer in the security of a physical structure.

ALARM: A condition indicating a state of alert or tamper detection.

ALARM SIGNAL: A transmission of an alarm condition or alarm report.

CONTROLLED AREA: A room, office, building, facility, premises, or grounds to which access is monitored, limited, or controlled.

EQUIPMENT: Any part of an electronic access control system, such as access control units, reader interface modules, access point actuators, access point sensors, keypads, and the like.

PROTECTED AREA: A room, office, building, facility, premise or grounds to which access is monitored, and limited and/or controlled, whereby the authorized person of the Access Control System may grant access to non-authorized persons.

RESTRICTED AREA: A room, office, building, facility, premise or grounds to which access is monitored, and limited and strictly controlled, whereby only the administrator of the Access Control System shall issue credentials that will lead to access.

Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices are used in a normal manner with a well-constructed network, DoorKing wireless products should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. DoorKing, Inc. accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using DoorKing wireless products, or for failure of DoorKing wireless products to transmit or receive such data.

Safety and Hazards

Do not operate DoorKing wireless products in areas where cellular modems are not advised without proper device certifications. These areas include environments where cellular radio can interfere such as explosive atmospheres, medical equipment, or any other equipment which may be susceptible to any form of radio interference. DoorKing wireless products can transmit signals that could interfere with this equipment. Do not operate DoorKing wireless products in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, DoorKing wireless products
MUST BE POWERED OFF. When operating, DoorKing wireless products can transmit signals that could interfere with various onboard systems.

The driver or operator of any vehicle should not operate DoorKing wireless products while in control of a moving vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some states and provinces, operating such communications devices while in control of a vehicle is an offence.

FCC Regulations

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This device 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:

- Reorient or relocate 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/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user‘s authority to operate the equipment.

RF Exposure Information

This device meets the government's requirements for exposure to radio waves.

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment.

SECTION 1 - 900 MHz WIRELESS BASEBOARD INTRODUCTION

Use this manual for 900 MHz Wireless Baseboard 2333-010 Rev A or higher.

This access control equipment must be installed inside of a controlled, protected or restricted area to comply with listing certification. See glossary on page 2 for more information.

The Model 2333 900 MHz Wireless Baseboard allows models 1833, 1835, 1837 and 1838 to communicate with up to 48 access points wirelesssly. **A 1470 900 MHz Wireless RF Remote Module installed on EACH 2358 Tracker Expansion Board is REQUIRED at each access point (sold separately).**

Prior to beginning the installation, we suggest that you become familiar with the instructions, illustrations, and wiring guidelines in this manual. This will help insure that your installation is performed in an efficient and professional manner.

The proper installation is an extremely important and integral part of the overall wireless access control system. Check all local building ordinances and building codes prior to installion. Be sure your installation is in compliance with local codes.

IMPORTANT Wireless installation and programming of the access control system and wireless tracker expansion boards will vary from the 2358 HARDwired Tracker Expansion Board installation manual.

1.1 General Information

To utilize the 900 MHz Wireless Baseboard, **DoorKing Remote Account Manager for Windows software, V 6.4 or newer** is required to be installed on the user supplied PC. The chart below is to assist you in determining if you have the proper access control system to utilize the 900 MHz Wireless Baseboard.

Access Control Systems	
Model	**Control Board**
1833, 1835, 1837, *1838	183x-010 Series

* 1838 Multi-Door Access Controller ONLY. NOT for use with 1838 Access Plus.

Download **REMOTE ACCOUNT MANAGER** Software **FREE** at:
http://www.doorking.com/telephone/software

- 900 MHz Wireless baseboard and 900 MHz wireless tracker expansion boards provide a wireless link between card readers, keypads (or almost any 26, 30 or 31-bit wiegand device) and the 1830 series access controller.
- 900 MHz wireless tracker expansion boards can also be used with DKS gate operators to provide gate operator data to the access controller.
- 8 tracker expansion boards per wiegand input except in applications with **very limited entry access activity**, an additional 4 tracker expansion boards can be added using the “Zone Addressing” method, a total of 12 boards per wiegand input.
- Secure RF transmission with up to 1500 ft range.
- 900 MHz dual band repeater stations can be used when greater distances are required.
- 16 Channels and 256 Network IDs available.
- Encrypted.

1.2 900 MHz Wireless Communication Restrictions

There are layout limitations for this wireless system that must be observed to achieve optimal performance. Many variables can interfere with a wireless system, some are apparent (trees, buildings etc.) and others are unknown (background signal interference and adverse weather - rain). This wireless system works best when the antennas are in direct-line-of-sight with each other, in free air as high as possible above the ground. Antenna choice and location where the units will be installed are the **MOST** important part of the layout and will determine the performance of the wireless system (achieve a strong wireless signal). A wireless system that has access points close to the access control system and all antennas are in direct-line-of-sight will generally have a strong wireless signal. A wireless system that has access points far away, with limited antenna exposure to the access control system will generally not have as strong a signal and may require additional equipment to achieve a strong signal. It is highly recommended that **RANGE TESTING** is performed at each access point to test the signal strength of the wireless units **BEFORE** final installation occurs. You may have to move the unit around at the access point to achieve a stronger wireless signal. Temporary power for the units will be necessary while performing range testing. If a weak signal or no signal occurs when testing, a stronger antenna or a 900 MHz wireless dual band repeater may be necessary to achieve a strong wireless signal from each access point. An optional DKS 900 MHz wireless test range kit P/N 1514-140 (sold separately) is an easy way to show signal strengths at **ANY** location.

SECTION 2 - INSTALLATION

The 900 MHz wireless baseboard is installed directly on the 1830 series access controller's circuit board. A 900 MHz RF remote module needs to be installed on **EACH** tracker expansion board that is used at each access point. **8 tracker expansion boards** per wiegand input can be used except in applications with **very limited entry access activity**, an additional 4 tracker expansion boards can be added using the "Zone Addressing" method, a total of **12 boards per wiegand input**.
Selected models of proximity card readers are available with an enclosure that has ample room for a wireless tracker expansion board to be mounted inside the housing. This simplifies the installation of the card reader used with the wireless tracker expansion board.

2.1 900 MHz 2333 Wireless Baseboard Overview

Antenna Options

Cabinet Mounted
900 MHz Antenna Kit
P/N 1514-019

Range is Up to **1500 ft** direct-line-of-sight.

Externally Mounted
900 MHz Antenna Kit
P/N 1514-079

Range is Up to **1500 ft** direct-line-of-sight.

13 ft of cable out of **bottom** of cabinet

Important Antenna Note: Range **WILL VARY GREATLY** depending on individual setup: Antenna height above the ground, background signal interference, physical obstructions (trees, buildings etc.). Adverse weather (rain) **CAN** also affect antenna range.

900 MHZ Wireless
Dual Band Repeater
P/N 2332-080

Range is Up to **1500 ft** direct-line-of-sight.
See Section 5 for more information.

900 MHz
Disc Antenna
(Supplied)

Range is Up to **300 ft** direct-line-of-sight.

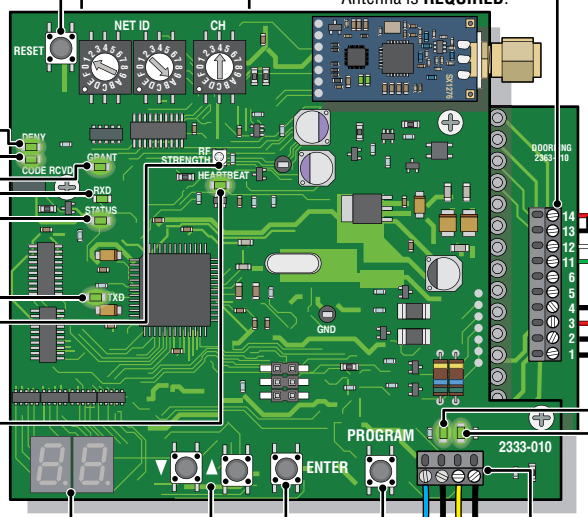
All tracker expansion boards and dual band repeaters **MUST** be set to **SAME NET ID** number and **SAME CH** number as the wireless baseboard.

Antenna is **REQUIRED**.

RESET Button - Press to reboot baseboard **ONLY**, will not reset access control board.

Normal Data Communication
- **Deny LED**
- **Code Rcvd LED**
- **Grant LED**
- **RXD LED**
- **Status LED**

- **TXD LED**
- **RF Strength** **ONLY** used for technican troubleshooting.
- **Heartbeat LED**



LED Display
Scroll Buttons
Enter Button
Program Button

Type of wiring to be used on ALL external devices:
A) Type **CL2**, **CL2P**, **CL2R**, or **CL2X**.
B) Other cable with **equivalent** or **better** electrical, mechanical, and flammability ratings.

10-Pin Terminal:

One 26-Bit wiegand access control device (card reader) or up to 8 tracker expansion board addresses 11-18 (**NOT** wireless) may be **HARD** wired to the 10-pin terminal (#11-12-13-14) for Gate/Door control if desired (**DO NOT** connect **HARDwired** tracker expansion boards or card reader to wiegand 1 (terminals 11-14) if **WIRELESS** baseboard will be using wiegand 1). The wiegand 1 input will activate whatever is wired to the access control system's Relay 1 for the access control system's programmed strike time.

14) +12 VDC Power
13) Common
12) DATA 1
11) DATA 0
→ **Optional -** Wiegand 1 HARDWIRE input: activates **Relay 1** for the access control system's programmed strike time.
Note: NOT available when using **wireless** tracker expansion board addresses 11-18.

6) 16 VAC Output
5) 16 VAC Output
→ **Optional -** Additional power for card readers that use lighting for outdoor use.

4) Standby Battery-NEG
3) Standby Battery-POS
→ **Optional -** maintains **ONLY** wiegand operation during power outage.

2) 16.5 VAC Input Power – 20 VA
1) 16.5 VAC Input Power – 20 VA
→ **REQUIRED**
(Powers RS-232, elevator control, wiegand and wireless baseboard)

Card Reader
DK Prox Reader

Wiegand Access Control Device
26, 30, 31-Bit Wiegand **HARD**wired **ONLY** when wiegand 1/relay 1 is **NOT** being used by wireless 2333 baseboard.

Blue - Beeper
Yellow - LED
Ground to Activate

Negative
Positive
Battery Standby Power
#3 & #4 - 12 VDC, .7 Ah, SLA Standby Battery Input
Standby battery power for Wiegand inputs **ONLY**. A separate standby battery is needed for the phone system. Battery must power system at least 30 minutes to comply with Canadian certification (Battery not supplied).

Connect Existing Aux Terminal Access Control System Power

1830 Relays LEDs
ON - Relay 1 Activated
ON - Relay 2 Activated

16.5 VAC 20 VA
Power Transformer REQUIRED
polarity does not matter.
18 AWG 100 ft max
16 AWG 200 ft max

Do Not Connect Power To A Receptacle Controlled By A Switch.

Relay 1
Relay 2
Wires go to main terminal relays on access control system board.

4-Pin Terminal:

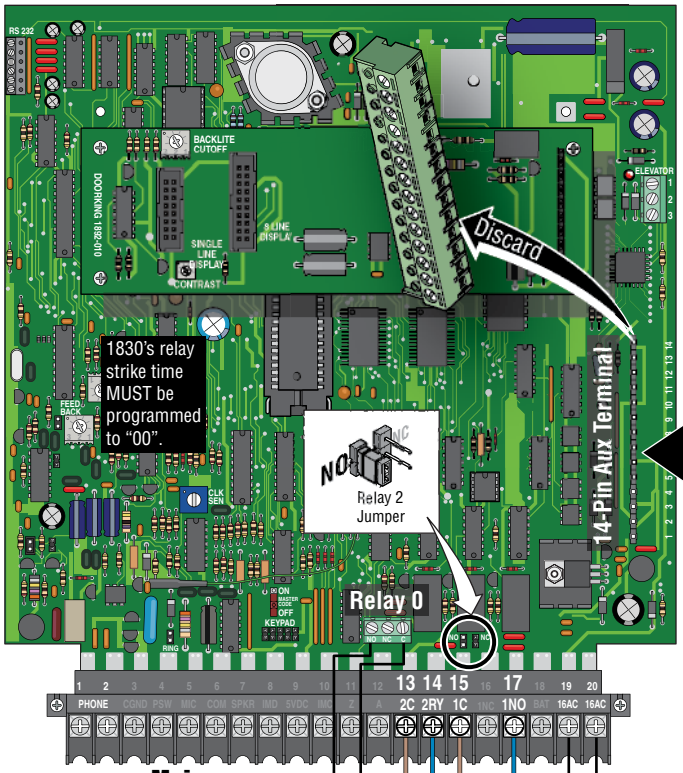
Must connect to access control system's **Relay 2** for **wireless** tracker expansion board addresses **3-10**.
Must connect to access control system's **Relay 1** for **wireless** tracker expansion board addresses **11-18**.

2.2 Install 2333 900 MHz Wireless Baseboard

Type of wiring to be used on ALL external devices:
A) Type **CL2**, **CL2P**, **CL2R**, or **CL2X**.
B) Other cable with **equivalent** or **better** electrical, mechanical, and flammability ratings.

This access control equipment must be installed inside of a controlled, protected or restricted area to comply with listing certification. See glossary on page 2 for more information.

1830 Series Access Control Board



Plug into 14-Pin Aux Terminal

The 900 MHz wireless baseboard **REPLACES** the 14-pin aux terminal on the access control system's board. The existing 16.5 VAC, 20 VA Aux terminal power transformer is **REQUIRED** and is reconnected to the 10-pin terminal #1-#2.

Antenna is **REQUIRED**. See previous page.

Main Terminal

Brown #13 | Blue #14 | Brown #15 | Blue #17

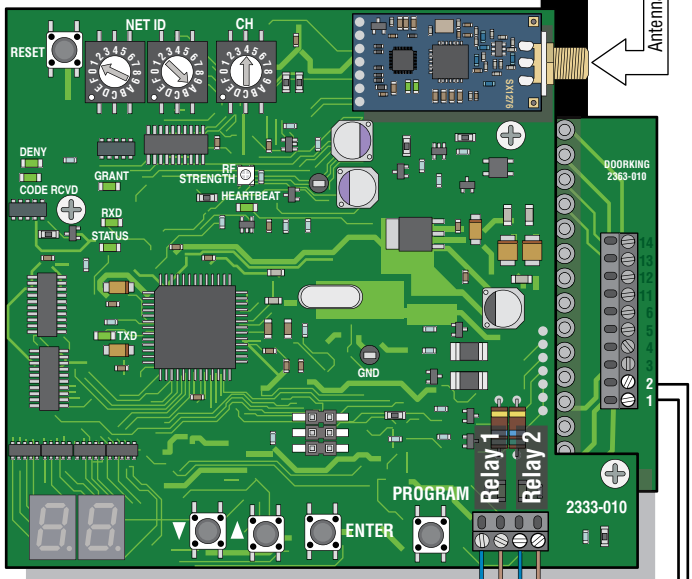
Main Power

Do Not Connect Power To A Receptacle Controlled By A Switch.

Main Door/Gate Relay 0

Note: Relay 1 or Relay 0 can be used as the **Primary** Relay that will open a visitor door or gate when the resident pushes "**9**" on their telephone.

900 MHz Wireless Baseboard



Note: Either or both 1830 Relays can used to control wireless tracker expansion board(s). **Normally OPEN** or **Normally CLOSED** can be used.

Relay 1

Relay 1 gets activated by **Wiegand 1** input.

Note: 1830 Relay 2 is typically used to control wireless tracker expansion board(s).

Relay 2

Relay 2 gets activated by **Wiegand 2** input (Typical install).

N.O. Blue
Com Brown

Existing 1830 series Aux Power Transformer

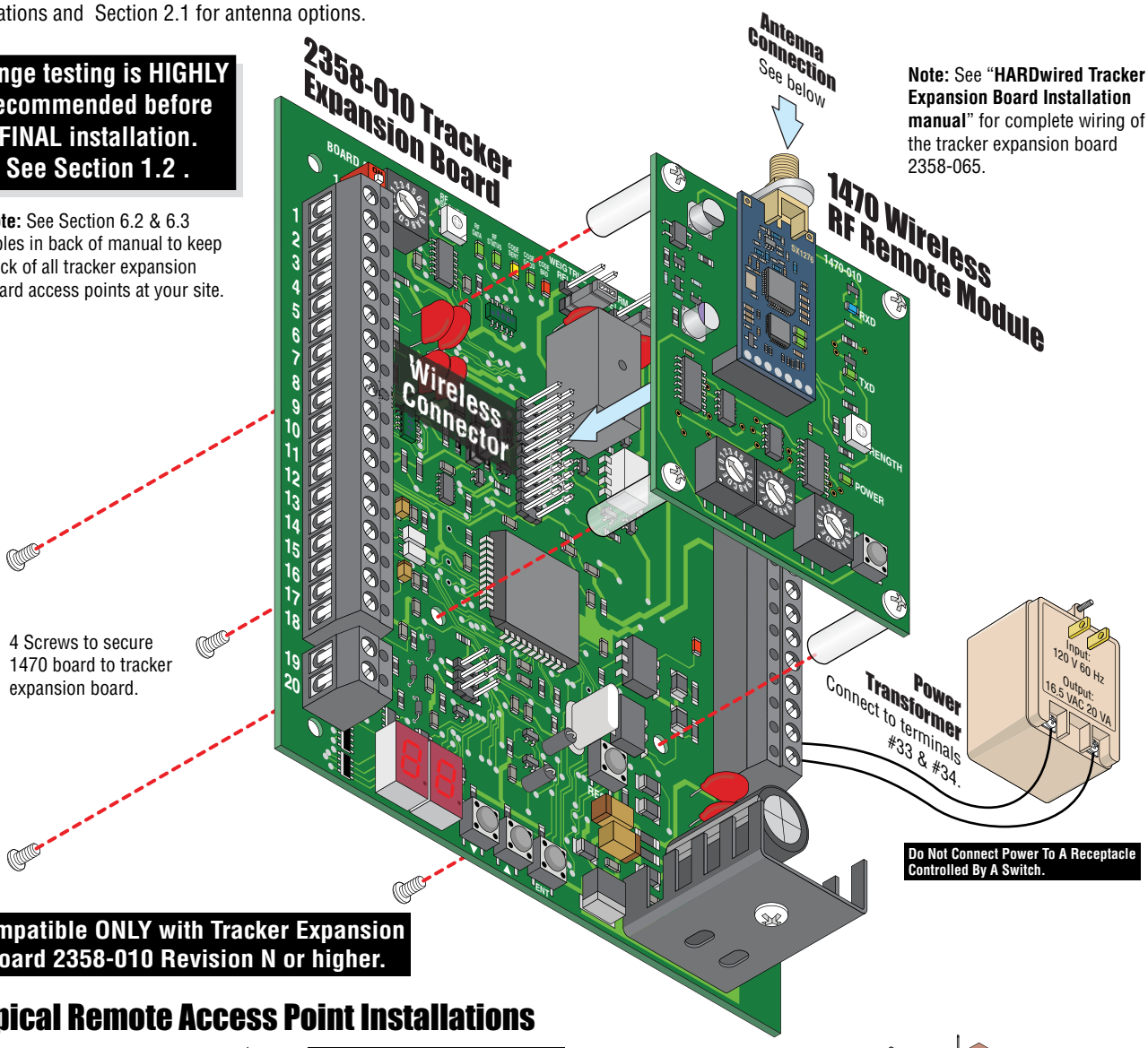
Do Not Connect Power To A Receptacle Controlled By A Switch.

2.3 Install 1470 900 MHz Wireless RF Remote Module

Plug the 1470 wireless RF remote module into the **wireless connector** and secure boards with 4 screws to the 2358 tracker expansion board. See the HARDwired tracker expansion board manual to connect desired options to terminals #1- #34 to manage a remote access point. **DO NOT CONNECT ANY WIRES TO TERMINALS #10, #17, #27, #28 or #29 (Used for HARDwire communication line ONLY).** Power transformer must connect to tracker expansion board #33 and #34 **(REQUIRED)**. Antenna is **REQUIRED**, see Section 1.2 for antenna limitations and Section 2.1 for antenna options.

Range testing is HIGHLY recommended before FINAL installation. See Section 1.2 .

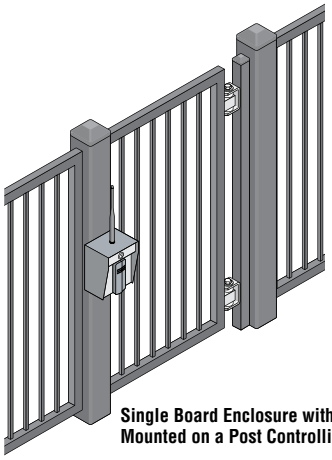
Note: See Section 6.2 & 6.3 tables in back of manual to keep track of all tracker expansion board access points at your site.



Note: See "**HARDwired Tracker Expansion Board Installation manual**" for complete wiring of the tracker expansion board 2358-065.

Compatible ONLY with Tracker Expansion Board 2358-010 Revision N or higher.

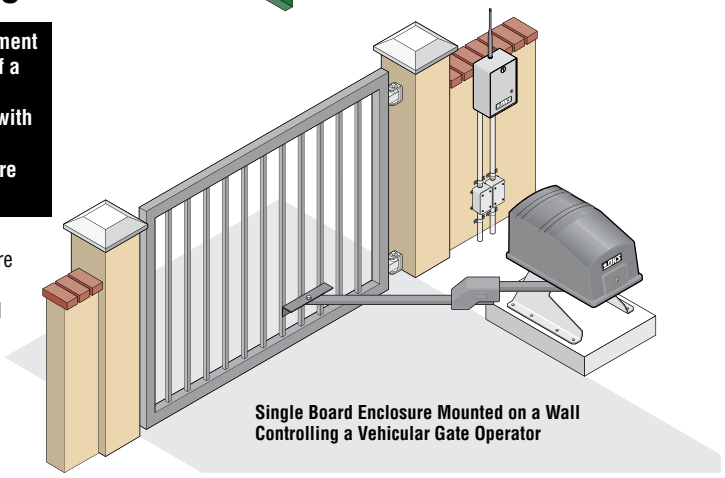
Typical Remote Access Point Installations



Single Board Enclosure with Built-In Card Reader Mounted on a Post Controlling a Pedestrian Gate/Door

This access control equipment must be installed inside of a controlled, protected or restricted area to comply with listing certification. See glossary on page 2 for more information.

IMPORTANT: Install the enclosure so the antenna is in a location that is **NOT** surrounded by metal and is in free air as high as possible above the ground.



Single Board Enclosure Mounted on a Wall Controlling a Vehicular Gate Operator

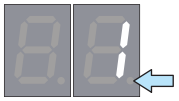
SECTION 3 - PROGRAMMING 900 MHz BASEBOARD

Before beginning any programming, the baseboard MUST be wired to a relay(s) and the board MUST have power.

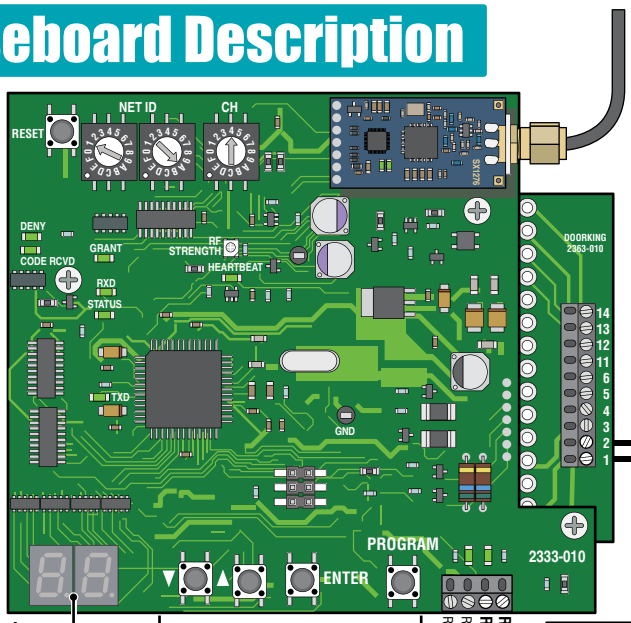
3.1 2333 Baseboard Description

IMPORTANT Display Decimal Point Note

When decimal point is displayed: Indicates you are **SELECTING** a program step.



When decimal point is **NOT** displayed: Indicates you are already **IN** a program step.



Do Not Connect Power To A Receptacle Controlled By A Switch.

REQUIRED
Connect Existing Auxiliary Terminal Access Control System Power

16.5 VAC 20 VA

Power Transformer

18 AWG 100 ft max
16 AWG 200 ft max

LED Display
Press any button to activate LED display.

Programming Buttons

Relay 2 (2C) Com
Relay 2 (2RY)
Relay 1 (1C) Com
Relay 1 (1NO or 1NC)

4-Pin Terminal:

RLY 2: Must connect to access control system's **Relay 2** for **wireless** tracker expansion board addresses **3-10**. Access control system's relay 2 jumper MUST be set to NO or NC.

RLY 1: Must connect to access control system's **Relay 1** for **wireless** tracker expansion board addresses **11-18**.

3.2 Programming Baseboard

Press **PROGRAM** button and then use ▼▲ scroll buttons to display desired "**Program Step**" number from list below.
Press **ENTER** button to enter selected program step number. Enter desired data using ▼▲ buttons. Press **ENTER** button to **enter** data and exit programming.

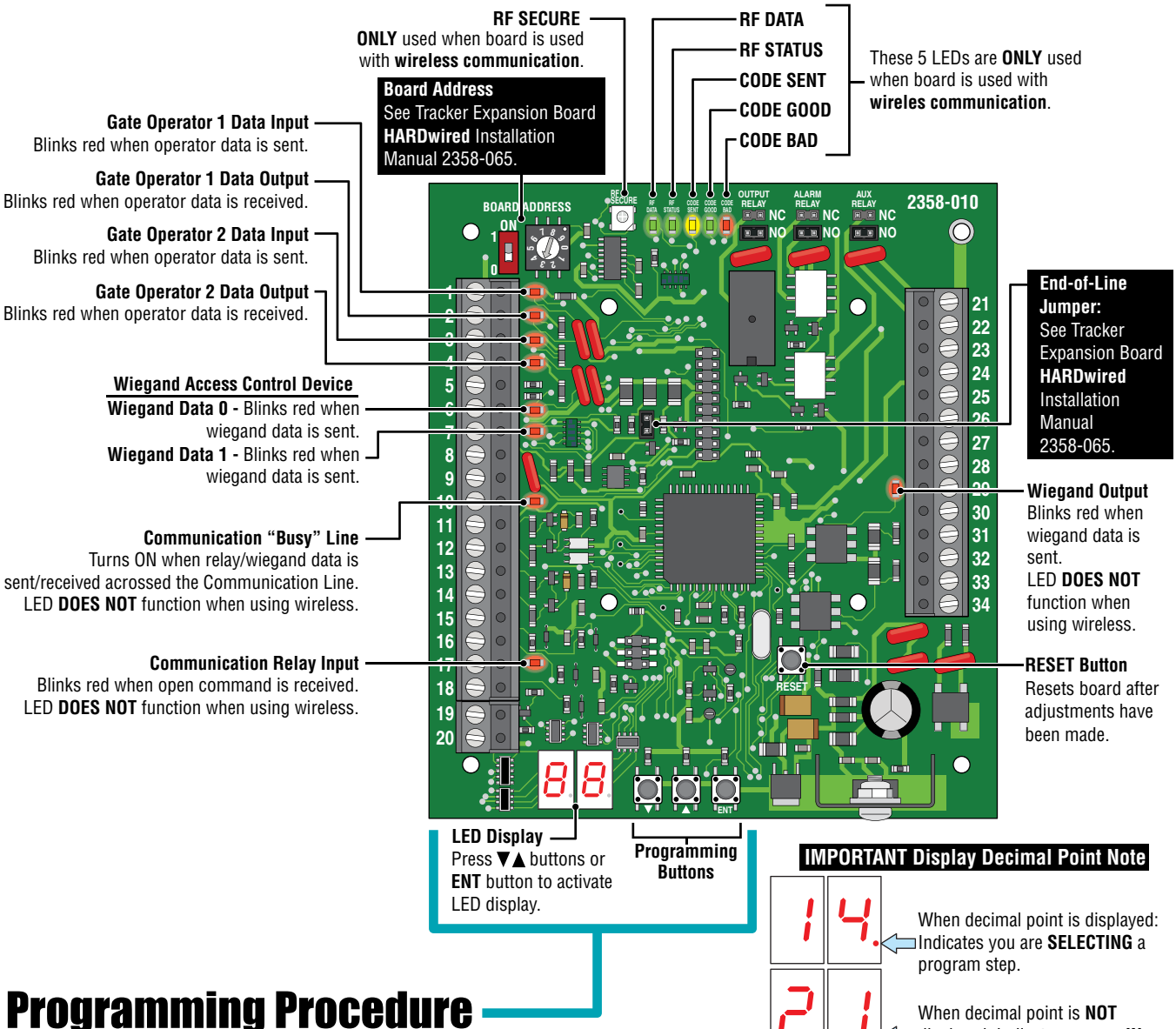
Program Step	Wireless Baseboard ONLY Programming Description and Setting Values
1	Display RF signal strength of tracker board(s) that have been programmed in program step 2. • 80 or lower - **GOOD**. • 81-85 - Unreliable signal strength. • 86-99 - **NO signal**.
2	Select tracker board(s) RF signal strength to be displayed in program step 1. Settable value is 0-18. **0** - signal from **any** tracker board address (**Default value**) **1** - tracker board addresses 3-10 **2** - tracker board addresses 11-18 **3** - tracker board address 3 ONLY **4** - tracker board address 4 ONLY etc… to: **18** - tracker board address 18 ONLY
3	Set the number of minutes to display RF signal strength. **Default value is 5 min.** Settable value is 1-30 min. **Note:** Avoid keeping the baseboard in "display mode" for a long period of time. While in this mode, it can miss the access requests of a busy network. Built in timer exits "display mode" when timer expires. Press **ENTER** button to exit display mode anytime before timer expires.
4	Restore or reset command for the below: **5** - Restore default values for programming steps 2 and 3. **7** - Initialize the RF remote module (reset 2333 baseboard is **required** after this command)
5	Action taken after the RF baseboard detects no traffic from the tracker board for more than number of minutes defined in program step 7. The below values are accepted for this programming step. **0** - Does nothing **1** - count the number of lost communication transactions (**Default value**) **2** - Reboot the RF module only **3** - Set RF module with net ID and channel selected **4** - Initialize RF module then reboot RF remote module **5** - Restore programming value, sets RF remote module net ID and CH, then reboots RF module **6** - Reboot 2333 baseboard **7** - Restore programming value, sets RF remote module net ID and CH, then reboots 2333 baseboard **Preset at Factory. Do Not Change. Contact DoorKing tech support.**
6	View the number of lost communication transactions with the tracker boards. Lost communication transactions is defined as: no RF traffic from tracker boards for two minutes plus the number of minutes set in program step 7. (number will display on screen after activation of wiegand device, card reader)
7	**Preset at Factory. Do Not Change. Contact DoorKing tech support.** Set the number of minutes to define a "no tracker board traffic" condition. **Default value is 11 min**. Settable value is 1-60 min.

SECTION 4 - PROGRAMMING TRACKER EXPANSION BOARD

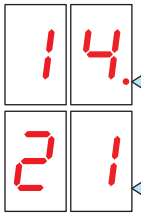
Before beginning any programming, the wireless tracker expansion board MUST have the 1470 RF remote module installed and be completely wired. Board MUST have power.

4.1 2358 Tracker Expansion Board Overview

WithOUT RF remote module (See next page and Section 2.3)



IMPORTANT Display Decimal Point Note



When decimal point is displayed: Indicates you are **SELECTING** a program step.

When decimal point is **NOT** displayed: Indicates you are **IN** a program step.

Programming Procedure

Basic Programming Sequence on EACH Board

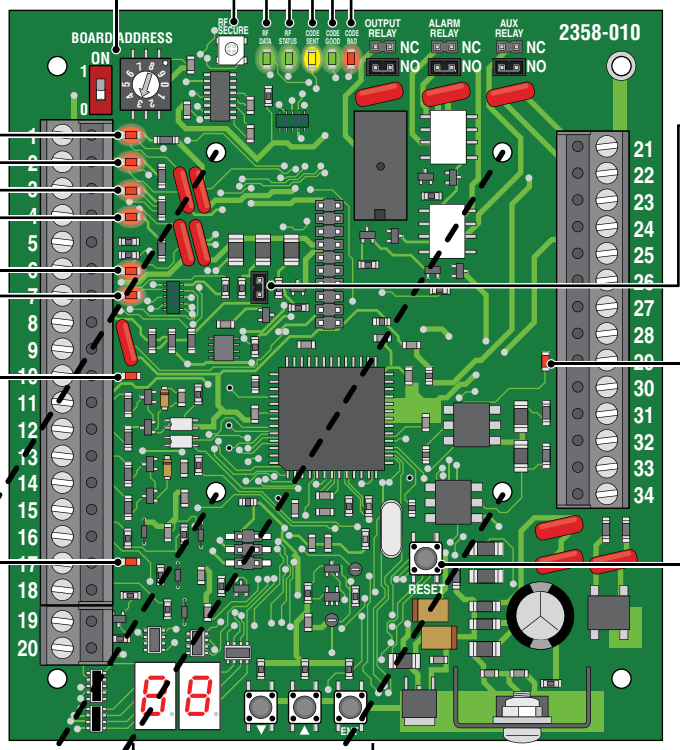
Follow these basic steps to perform desired programming, See programming options table for **PROGRAM STEPS** on pages 11 & 12. **EACH** tracker expansion board in the system **MUST** be physically programmed.

1. Press a button to activate LED display.
2. Press **ENT** button and then use ▼▲ scroll buttons to display desired "**Program Step**" number from list below.
3. Press **ENT** button to enter selected program step number. (LED display number will blink after **ENT** button has been pressed).
4. Select desired data while in program step using ▼▲ buttons.
5. Press **ENT** button to **enter** selected data. (Function has now been programmed into board).
6. Press **ENT** button **AGAIN** to **EXIT** programming **OR** after 10 seconds, board will **automatically EXIT** programming.

Note: Repeat these steps for all other desired wireless programming functions for **THIS** tracker expansion board. **Each** tracker expansion board will have to be **INDIVIDUALLY** programmed with desired functions.

4.2 900 MHz Wireless Tracker Expansion Board Description

Before beginning any programming, the wireless tracker expansion board MUST have the 1470 RF remote module installed and be completely wired. Board MUST have power.



RF SECURE
RED - NO wireless communication.
GREEN - Wireless communication.

Board Address:
See Tracker Expansion Board **HARDwired** Installation Owner's Manual 2358-065.

RF DATA - Blinks during wireless communication.

RF STATUS - Blinks during wireless communication.

CODE SENT - Blinks during wireless communication.

CODE GOOD - Blinks during wireless communication.

CODE BAD - Blinks during wireless communication.

Gate Operator 1 Data Input
Blinks red when operator data is sent.

Gate Operator 1 Data Output
Blinks red when operator data is received.

Gate Operator 2 Data Input
Blinks red when operator data is sent.

Gate Operator 2 Data Output
Blinks red when operator data is received.

Wiegand Access Control Device

Wiegand Data 0 - Blinks red when wiegand data is sent.

Wiegand Data 1 - Blinks red when wiegand data is sent.

Communication "Busy" Line
LED **DOES NOT** function when using wireless.

End-of-Line Jumper:
See Tracker Expansion Board **HARDwired** Installation Owner's Manual 2358-065.

Wiegand Output
LED **DOES NOT** function when using wireless.

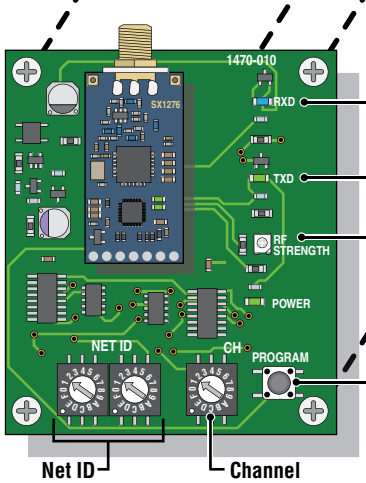
Communication Relay Input -
LED **DOES NOT** function when using wireless.

RESET Button
Resets board after adjustments have been made.

Programming - See previous page for BASIC programming and next 2 pages for programming options.

1470 900 MHz Wireless RF Remote Module

(See Section 2.3 for installation)



RXD - Blinks after program button is pressed and during wireless communication.

TXD - Blinks after program button is pressed and during wireless communication.

RF Strength -
ONLY used for technican troubleshooting.

PROGRAM Button
Press **AFTER** selecting **NET ID** and **CH** for the RF Remote Module **ONLY**.

Net ID
MUST be set to the same number as the wireless board it is communicating with.

Channel
MUST be set to the same number as the wireless board it is communicating with.

See Tracker Expansion Board **HARDwired** Installation Owner's Manual 2358-065 to connect desired devices to tracker expansion board to control an access point.

Programming Options on EACH Tracker Expansion Board

Select desired program steps and **PHYSICALLY** program **EACH** tracker expansion board being used with the access control system. "Basic programming sequence on EACH board" on page 9 explains how to program the functions into the board.

Program Step	Description	Options	Selection Number	Function	Factory Default
1	Door Strike Timer	00 - 99		**Sets Strike Time for output relay (term 25 & 26)**	01: 1 second
			00	0.25 second strike time	
			01 - 99	Strike time in 1-second increments	
2	Free Exit Timer, Strike Time	00 - 99		**Set Strike Time for RX (Request to Exit) of output relay (input at term 18)**	01: 1 second
			00	0.25 second Egress Strike time	
			01 - 99	Egress Strike time in 1-second increments	
3	Door Ajar Timer	01 - 99		**Timer starts when valid access has been granted.**	12: 60 secs
			00	1 second Door Ajar Timer	
			01 - 99	Timer set in 5-second increments: 01 = 5 seconds, 10 = 50 seconds	
4	Aux Relay Timer	00 - 99		**Timer setting for Aux Relay activation in 5-second increments**	12: 60 secs
			00	1 second Door Ajar Timer	
			01 - 99	Timer set in 5-second increments: 01 = 5 seconds, 10 = 50 seconds	
5	Free Exit Timer, Aux Relay	00 - 99		**Set Strike Time for RX of Aux relay (ONLY available if Dual Door Mode step 12 is ON)**	01: 1 second
			00	0.25 second Egress Strike time	
			01 - 99	Egress Strike time in 1-second increments	
6	Free Exit, No Strike	0 - 1		**Set RX (Request to Exit) function. Activate Output Relay or do not Activate Output Relay**	01: Activate
			0	Do Not Activate Output Relay or Reader Beeper/LED when RX input is received	
			1	Activate Output Relay and Reader Beeper/LED for Free Exit Strike Time when RX received	
7	Not Used				
8	Door Switch Logic	0 or 1		**Sets type of Door Switch contacts**	0: N.O.
			0	N.O. contact from door switch with Door Closed (Circuit Open - CO)	
			1	N.C. contact from door switch with Door Closed (Circuit Close - CC)	
9	Auto Relock	0 or 1		**Turns on Auto Relock function (not available if Dual Door Mode, step 12 is ON)**	0: Disabled
			0	Output Relay is activated for Strike Time	
			1	Door Contact Switch required. If door returns to closed position during Strike Time door will "relock" after 1 second, even if strike time has not expired.	
10	Beeper / LED Hold Open	0 or 1		**Sets how BEEPER or LED will function during Hold Open**	0:
			0	When Hold Open occurs, Beeper or LED is active only during Strike Timer	
			1	When Hold Open occurs, Beeper or LED will remain active during Hold Open	
11	Hold Open or Hold Egress functions	0 or 1		**Sets how Aux & Alarm Relay responds during Hold Open or Hold Egress situation**	0: No Relay Function
			0	No Aux Relay functions. Alarm will be in "Reset". If Alarm Relay is set for "integral" mode, Alarm relay will not activate. If Alarm Relay set for "Bypass" mode, Alarm Relay will activate for Hold Open period or Extended Egress Hold.	
			1	Aux Relay will function for all settings. If Alarm Relay is set for "integral" mode, Alarm relay will not activate. If Alarm Relay set for "Bypass" mode, Alarm Relay will activate for Hold Open period or Extended Egress Hold.	
12	Dual Door Mode	0 or 1		**Sets Tracker to function as 2 Access Points (2 tracker addresses)**	0: Disabled
			0	Disabled, Tracker functions as single access point	
			1	Dual Mode: Tracker functions as set board address and next sequential address Card Read will be sent to controller as set board address, access is granted or denied Card then sent as set address +1, access granted or denied. Aux Relay becomes 2nd output relay. All other Aux Relay functions disabled. Door Contact switch becomes RX for 2nd address.	
13	Not Used				
14	Not Used				
15	Aux Relay Functions	0 - 12		**Sets function for Aux Relay**	0: Disabled
			0	Aux Relay Disabled	
			1	No Door Ajar Timer: Requires Door Contact Switch. Aux Relay activates when Door Not Closed.	
			2	No Door Ajar Timer, Pulse: Requires Door Contact Switch. Aux Relay "pulses" when Door Not Closed.	
			3	Door Ajar Timer: Requires Door Contact Switch. When door opens, start Door Ajar Timer. When timer expires Aux Relay activates for Aux Relay timer or until door closes, whichever occurs first.	
			4	Door Ajar Timer, Pulse: Requires Door Contact Switch. When door opens, start Door Ajar Timer. When timer expires Aux Relay Pulses for Aux Relay timer or until door closes, whichever occurs first.	
			5	Door Ajar, Pulse warning the ON: Requires Door Contact Switch. When door opens, Pulse Aux Relay and start Door Ajar Timer. When timer expires Aux Relay ON for Aux Relay timer or until door closes, whichever occurs first.	
			6	Door opens for any reason, Start Door Ajar timer and pulse Aux Relay. When Door Ajar timer expires, start Aux Timer and continue Pulsing Aux Relay. When Door Closes or both timers expire, turn off Aux Relay.	

Programming continued on next page

Program Step	Description	Options	Selection Number	Function	Factory Default
15	**Aux Relay Functions**	**0 - 12**	**7**	Aux Relay as 2nd Alarm Relay. Aux Relay will mirror Alarm Relay functions.	**0: Disabled**
			8	Aux Relay as 2nd Alarm Relay, PULSE. Aux relay will Pulse during any Alarm Relay activation.	
			9	Good Card: Aux Relay will activate for Aux Relay timer for any Access Granted Card	
			10	Any Card: Aux Relay will activate for Aux Relay Timer when any card has been presented.	
			11	Bad Card: Aux Relay will activate for Aux Relay timer when a card has been denied	
			12	Warn before Hold Open or Release of Hold Open: Aux relay will activate for Aux Relay timer when scheduled Hold Open begins or ends. Output Relay will be delayed until Aux Timer expires. Do not set Aux Timer above 60 seconds in this mode.	
16	**Alarm Relay Functions** **Door Operation Note:** **PROPER Condition:** The access control system **OR** request to exit device **HAS** activated the **OUTPUT RELAY** on the tracker expansion board and the door contact switch is **CLOSED** (Door is OPEN). This indicates that the door has been **PROPERLY OPENED**. **FORCED Condition:** The access control system **OR** request to exit device has **NOT** activated the **OUTPUT RELAY** on the tracker expansion board and the door contact switch is **CLOSED** (Door is OPEN). This indicates that the door has been **FORCED OPENED**.	**0 - 4**		**Sets function for Alarm Relay**	**0: Disabled**
			0	Aux Relay Disabled	
			1	**Bypass Mode:** Alarm Relay provides "Bypass" to Alarm Door Switch. With proper door input (access or egress) activate Alarm Relay, start Strike timer and Door Ajar timer. When Door Ajar timer expires, deactivate Alarm Relay.	
				If second Door Contact Switch is provided, generate transaction for Door Ajar and Door Closed following Door Forced condition. Also generate transaction for Door Forced condition.	
			2	**Integral Mode, Door Ajar Timer:** Door Contact Switch connected to Tracker, Alarm Relay provides connection directly to Alarm System. When door is opened for any reason, start Door Ajar timer. When Door Ajar timer expires and Door is still OPEN, activate Alarm Relay. Reset when door closes. Send Door Ajar and Door Close transactions.	
			3	**Integral Mode, Proper and Forced condition:** Door Contact Switch connected to Tracker, Alarm Relay provides connection directly to Alarm System. With proper door input (access or egress) start Strike timer and Door Ajar timer. When Door Ajar timer expires and Door is still OPEN, activate Alarm Relay. Reset when door closes.	
				If door is opened without proper condition, activate alarm relay. When door closes deactivate Alarm Relay. Send Door Ajar, Door Close and Door Forced transactions.	
			4	**Gate Alarm Function:** Alarm Relay will activate for 1 second when tracker board receives a "Gate Forced" or "Gate Obstructed" transaction from the operator control board.	
17	**Controller Check-In Time**	**0 - 99**	**5**	This function will set 'how often' the tracker board checks in with the controller for scheduled hold open times. Example: a hold open time is scheduled for 8:00 AM and the check-in time is set for 5. If the tracker board last checked in with the controller at 7:59 AM, the scheduled 8:00 AM hold open time will not initiate until 8:04 AM.	**5 Min Polling Cycle**
				Every time a tracker board polls the controller, this consumes time on the network – the more tracker boards on the network polling the controller may create a short delay on the tacker board network. To manage this, adjust how often the tracker boards check in to the controller board. Your options are Zero (0) to 99 minutes cycle.	
				If there are NO Hold-Open Schedules programmed for a specific Tracker Board address you can program this tracker board "Controller Check-In Time" (Step#17) to a Zero (0) minute Polling cycle.	

Programming continued on next page

Wireless Programming ONLY (1470 RF Remote Module)

Program Step	Description	Options	Selection Number	Function	Factory Default
18	**Low Byte MAC**	**1 - 99**	**5**	**Preset at Factory. Do Not Change. Contact DoorKing tech support.** Low Byte Value MAC address used only for 900MHz. Assigned during manufacturing.	**5**
19	**Reset to Factory Defaults**	**5**		**Sets all parameters to Factory Default**	
20	**View RF POT Setting**	**Adjustable**		**Sets maximum amount of allowable signal strength loss**	
21	**View RF Signal Strength**	**LED Display**		**Displays current signal strength between Baseboard and Tracker.** • 79 or lower - **GOOD**. (74-76 or lower preferred) • 80-85 - Unreliable signal strength. • 86-99 - **NO signal**.	
22	**Card Code Forwarding (Factory Set)**	**0 or 1**		**Sets Wireless Tracker to act as Repeater** **Do Not Change. Contact DoorKing tech support.**	**0: Off**
			0	Repeater Mode OFF	
			1	Repeater Mode ON	
23	**Same Zone Address Relay Delay**	**0 - 20**		**Adding relay control delay to Trackers using the same Zone Addresses** If more than one tracker board is set to the same address (zone addresses), then change this value to a unique number. Only program this for tracker boards with the same addresses. Start out with a value of 1 then increase the next board to 2, then the 3rd board to 3 etc... This will prioritize the relay access order of the same zone address boards.	**0**
24	**Lost Wireless Communication Options (Factory Set)** **Preset at Factory. Do Not Change. Contact DoorKing tech support.**	**0 - 5**		**When wireless communication is lost with the base for "X" number of minutes defined in step 17, this step will instruct the tracker board what action to take.**	**1: counts the number of lost com trans.**
			0	Does nothing	
			1	Counts the number of lost communication transactions	
			2	Reboot the RF module only	
			3	Set RF module with net ID and channel selected	
			4	Initialize RF module then reboot RF remote module	
			5	Restore programming value, sets RF remote module net ID and CH, then reboots RF module address boards.	
25	**View the Number of Lost Wireless Communications**	**0 - 99**		**View the number of lost communication transactions with the base.** Use the▼▲arrows buttons to change the value.	**0**
26	**Air Busy Wait Time (Factory Set)**	**0 - 20**	**2**	**Preset at Factory. Do Not Change. Contact DoorKing tech support.** This value is set to 2. No need to adjust.	**2**

Error codes on LED Displays for Baseboard and Tracker Board

E1 - Relay connected to 4-pin terminal pins 1 & 2 is on for more than 5 seconds. Relay 1 in 1830 should be set for 00 seconds (0.25 second strike time)

E2 - Relay connected to 4-pin terminal pins 3 & 4 is on for more than 5 seconds. Relay 2 in 1830 should be set for 00 seconds (0.25 second strike time)

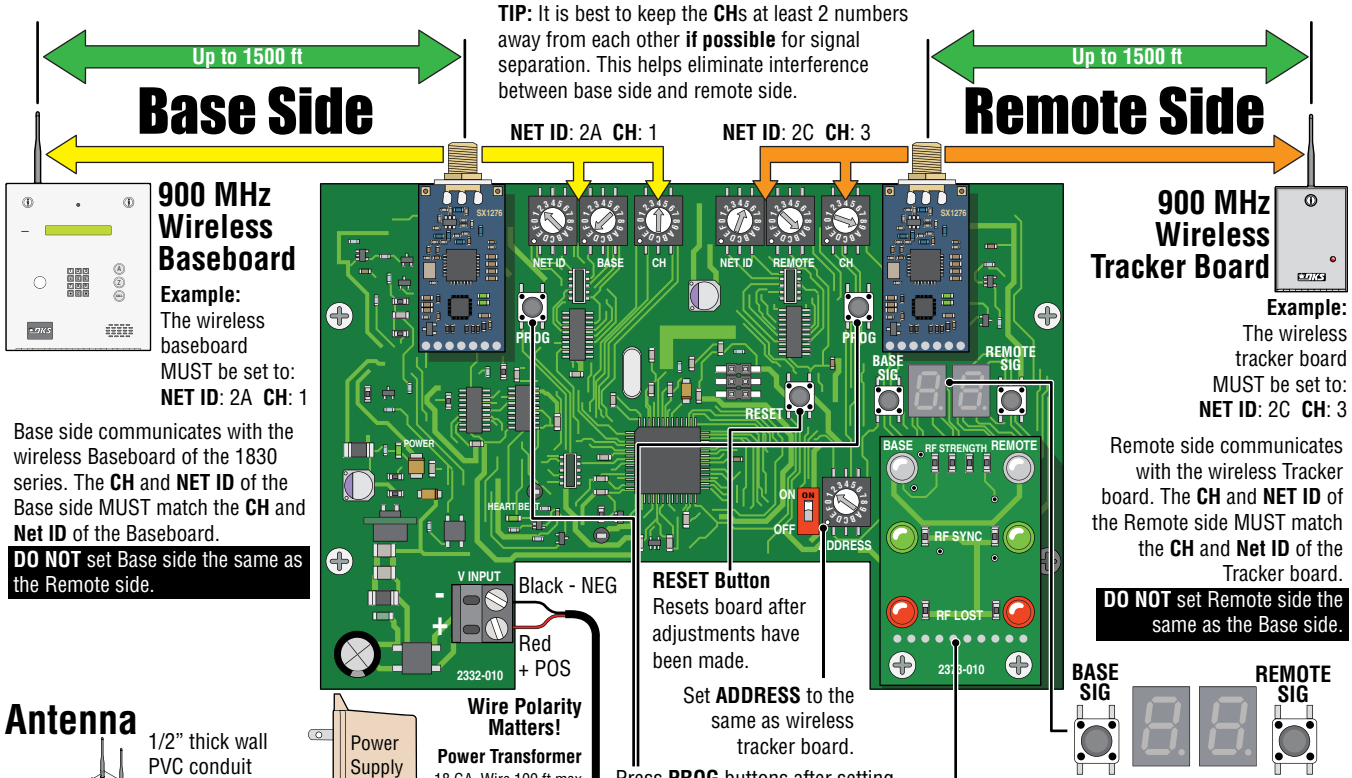
A1 - Board address is invalid for Tracker. Board address is improperly set as 0, 1, 2 or 19.

A2 - Dual Mode - Bad Address, 18 or 19 not allowed.

SECTION 5 - 900 MHz DUAL BAND REPEATER

The 900 MHz wireless dual band repeater (DBR) extends the wireless communication range between an access control system (900 MHz wireless baseboard) and 900 MHz wireless tracker expansion board. It gets installed between the wireless devices that are too far or obstructed from each other to reliably communicate with each other. It will receive a signal sent to it and repeat that signal to the next wireless device. Typically, 1 DBR is used in the same communication line of a tracker expansion board. The signal range of a DBR is **Up to 1500 ft direct-line-of-sight** with no signal interference. Contact DoorKing if more than 1 DBR will be needed in same communication line.

5.1 900 MHz Dual Band Repeater Overview



TIP: It is best to keep the **CH**s at least 2 numbers away from each other **if possible** for signal separation. This helps eliminate interference between base side and remote side.

900 MHz Wireless Baseboard

Example: The wireless baseboard MUST be set to: **NET ID**: 2A **CH**: 1

Base side communicates with the wireless Baseboard of the 1830 series. The **CH** and **NET ID** of the Base side MUST match the **CH** and **Net ID** of the Baseboard.

DO NOT set Base side the same as the Remote side.

900 MHz Wireless Tracker Board

Example: The wireless tracker board MUST be set to: **NET ID**: 2C **CH**: 3

Remote side communicates with the wireless Tracker board. The **CH** and **NET ID** of the Remote side MUST match the **CH** and **Net ID** of the Tracker board.

DO NOT set Remote side the same as the Base side.

Black - NEG

Red + POS

Wire Polarity Matters!

Power Supply 12VDC

Power Transformer
18 GA. Wire 100 ft max
16 GA. Wire 200 ft max

Do Not Connect Power To A Receptacle Controlled By A Switch.

RESET Button
Resets board after adjustments have been made.

Set **ADDRESS** to the same as wireless tracker board.

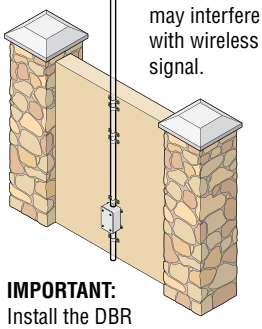
Press **PROG** buttons after setting the **CH** and **NET IDs** on **EACH** side.

BASE SIG
Press to display base side signal strength.

REMOTE SIG
Press to display remote side signal strength.

Antenna

1/2" thick wall PVC conduit recommended (not supplied). Metal conduit may interfere with wireless signal.

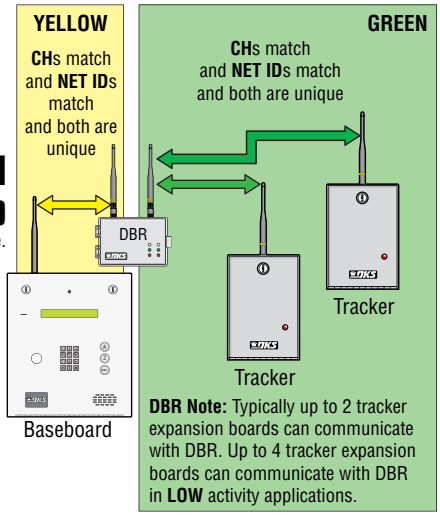


IMPORTANT: Install the DBR so the antenna is in a location that is **NOT** surrounded by metal and is in free air as high as possible above the ground. Minimum 15 ft above ground recommended.

Note: See Section 6.4 table in back of manual to keep track of all DBRs at your site.

Dual Band Repeater Setup

See next page for an example.



Note: DoorKing 900 MHz Wireless Test Range Kit (P/N 1514-140) self-powered test kit, sold separately.

DBR Note: Typically up to 2 tracker expansion boards can communicate with DBR. Up to 4 tracker expansion boards can communicate with DBR in **LOW** activity applications.

RF STRENGTH LEDs (Base/Remote)
Off in normal operation. When signal is displayed (press base/remote SIG button) it is either green-good, yellow-weak or red-NO. When signal is displayed, LED blinks until signal is received, once received, it stays lit.
Note: Signal display is terminated if either Base or Remote **PROGRAM** button is pressedor the number of minutes is reached as selected by the SIG button.

RF SYNC LEDs (Base/Remote)
Off in normal operation. Blinks green everytime data is received over the air.

RF LOST LEDs (Base/Remote)
Off in normal operation. Blinks when no air data is detected after six minutes and stays lit after NO air data is received for 10 min.

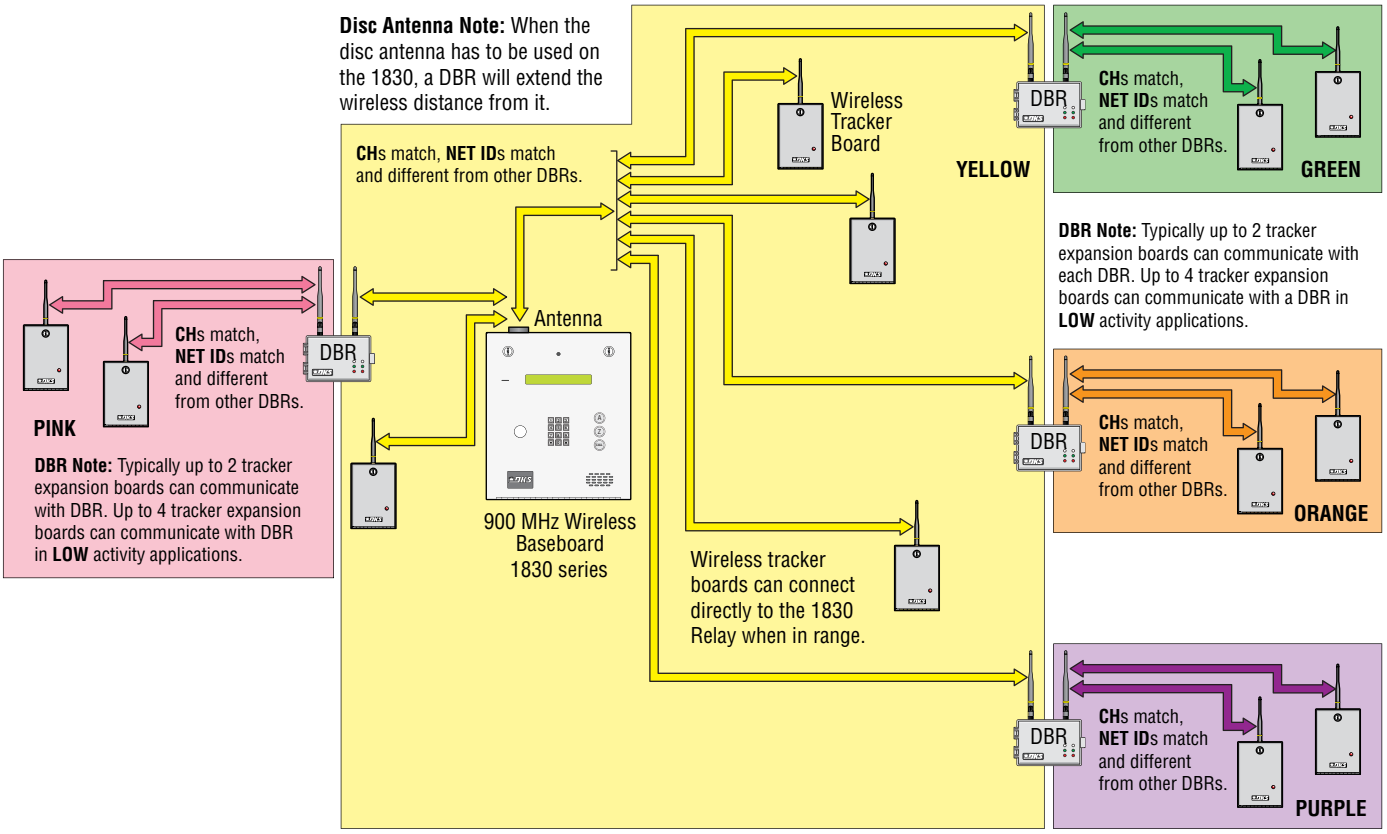
This access control equipment must be installed inside of a controlled, protected or restricted area to comply with Listing certification. See glossary on page 2 for more information.

Range testing is HIGHLY recommended before FINAL installation. See Section 1.2 .

5.2 Examples of Dual Band Repeater Layouts

There are many combinations of wireless configurations that a DBR can extend the signal distance between.

Relay 2/Wiegand 2 Wireless input. Board Addresses 3-10. Zone Addresses can be used if needed.



Note: Relay 1/Wiegand 1 input terminal is available on the 1830 baseboard to HARDwire or Wirelessly connect tracker boards if desired.

SECTION 6 - TROUBLESHOOTING

Before beginning any troubleshooting, check all wiring and look for any loose connections. Double check your wiring! The tracker expansion board in some applications may have over 20 wires connected directly to the board terminal strips. Be sure that you have a good VOM (Volt-Ohm-Meter) to assist you when checking voltages and continuity.

Check the programming to be sure that the tracker expansion board is setup to operate as desired. If more that one tracker expansion board is connected in the system, be sure the board addresses are set correctly.

Be sure that the tracker board is powered (16 VAC, 20 VA). The LEDs should be ON when power is applied to the tracker expansion board. Battery Standby Power may be connected to the baseboard as shown in section 2.1.

6.1 Wiegand Device Data

The wiegand device (card reader, RF receiver, digital, etc.) must output data in the **26, 30, 31-bit** wiegand format. **The tracker expansion board is not capable of receiving any other wiegand format.**

The wiegand device must be connected to terminals #6-#7-#8-#9 as described in section 3.3 of this manual.

Two wiegand devices may be connected in parallel to the wiegand input on the tracker expansion board. Be aware that both devices will appear to the access control system and the Remote Account Manager software as the **same device**.

Power for the wiegand devices is provided on terminals #8 (common) and #9 (+10 to +12 VDC). To check this power:

1. Set your VOM to the 50-volt DC range.
2. Connect the positive lead (red) to #9 and the negative lead (black) to #8. The meter should indicate +10 to +12 volts DC.

The tracker expansion board outputs data on terminals #27-#28-#29. When the tracker expansion board is sending data to the access control system on these lines, the LED near these terminals will light. The voltage to operate these terminals comes from the access control system. Normal voltage on these terminals is +4.5 to +5 volts DC. To check this voltage:

1. Set your VOM to the 50-volt DC range.
2. Connect the negative (black) lead to #27 and then check #28 and #29 with the positive (red) lead. The meter should indicate +4.5 to +5 volts DC.

The data from the wiegand devices is inputed to the tracker expansion board on terminals #6 and #7. The normal voltage for these terminals are +4.5 to + 5 volts DC. This can be checked by connecting the negative (black) lead of your meter to #8 and then checking for voltage with the positive (red) lead on terminals #6 and #7.

When a wiegand device sends data to the tracker expansion board on terminals #6 and #7, the LED's associated with these terminals will flash. **These flashes are very fast and may be difficult to see.** If a 26, 30, 31-bit wiegand input is received, the tracker expansion board makes the lines on terminals #2 and #4 busy to prevent the gate operators from sending any transactions. It then checks for a busy signal on terminal #10. If this pin is not busy, the tracker expansion board will make this pin busy itself and then wiegand out the data to the access control system (If terminal #10 is busy, the tracker expansion board simply waits for this terminal to go un-busy and then sends the data). After the tracker expansion board sends the data, it will wait for a reply from the access control system (The wiegand output LED will flash when the data is sent to the access control system). Once the data is received by the access control system, the access control system will make the decision to grant or deny access. If the decision is to **deny access**, the tracker expansion board will release the busy signal on terminal #10, and will not activate it's output relay. If the decision is to **grant access**, the access control system will activate its relay, which causes the tracker expansion board to activate its output relay, and then releases the busy signal on terminal #10 allowing other tracker expansion boards to communicate with the access control system.

The above operating sequence takes place in less than one second. In applications where the system is operating at its maximum (48 tracker expansion boards), and in the unlikely event that all devices are activated at precisely the same moment in time, there could be a delay of a few seconds for the last tracker expansion board to activate its output relay if the access control system decides to grant access to the person using the device connected to this tracker expansion board.

6.2 Tracker Expansion Board "RELAY 2" Configuration

Filling out this form will allow you to better keep track of the entire system at a glance. This will assist you when programming the system and/or any maintenance information about the system that may be required in the future.

Board	NET ID	CH	Board Address	Location and/or Description	Board Serial # and Rev Letter
# 1					
# 2					
# 3					
# 4					
# 5					
# 6					
# 7					
# 8					
# 9					
# 10					
# 11					
# 12					
# 13					
# 14					
# 15					
# 16					
# 17					
# 18					
# 19					
# 20					
# 21					
# 22					
# 23					
# 24					

6.3 Tracker Expansion Board "RELAY 1" Configuration

Filling out this form will allow you to better keep track of the entire system at a glance. This will assist you when programming the system and/or any maintenance information about the system that may be required in the future.

Board	NET ID	CH	Board Address	Location and/or Description	Board Serial # and Rev Letter
# 1					
# 2					
# 3					
# 4					
# 5					
# 6					
# 7					
# 8					
# 9					
# 10					
# 11					
# 12					
# 13					
# 14					
# 15					
# 16					
# 17					
# 18					
# 19					
# 20					
# 21					
# 22					
# 23					
# 24					

6.4 Dual Band Repeater Configurations

Filling out this form will allow you to better keep track of the dual band repeaters at a glance. This will assist you when programming the system and/or any maintenance information about the system that may be required in the future.

DBR	Base Connection Location and/or Description	Base		Remote			Remote Connection Location and/or Description	Serial # and Rev Letter
		NET ID	CH	NET ID	CH	Board Address		
# 1								
# 2								
# 3								
# 4								
# 5								
# 6								
# 7								
# 8								
# 9								
# 10								
# 11								

Notes:

Wireless Installation Manual

900 MHz Wireless Baseboard

Use this manual for baseboard 2333-010 Revision A or higher.

2333-065 Issue 11-18

For Access Control System Models:
1833, 1835, 1837 and 1838 Multi-Door Access Controller

Allows Access Control System to wirelessly communicate with Up to 24 wireless tracker expansion boards.

This access control equipment must be installed inside of a controlled, protected or restricted area to comply with listing certification.

www.doorking.com

Version K

Intertek 9900288

Conforms To UL STD 294

DoorKing, Inc.
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