SCHLAGE®

Wireless Access

READ FIRST WHEN INSTALLING A PIM-485-OTD-RS

Addendum

INSTALLING , CONFIGURING & OPERATING

PANEL INTERFACE MODULE

RS485

Recognition Systems Version

(PIM-485-OTD-RS)

The most current version of this document is available for download at:
http://www.ir-swa.com

Ingersoll Rand
Security Technologies

P/N: M053-027-D

Schlage
Ingersoll Rand Security Technologies
245 W. Roosevelt Road, Building 7, Suite 48
West Chicago, IL 60185
main: 800-313-2962 (630-876-5680)
technical support: 866-322-1237
fax: 630-293-4257
web: ir-swa.com

INSTALLATION & OPERATING INSTRUCTIONS

TABLE OF CONTENTS

1. Wireless Access System (WAS)

1.1 Overview

Every access control system that uses Wireless Access™ contains two different types of modules (Figure 1-1):

- at least one Wireless Panel Interface Module (WPIM), and
- at least one Wireless Access Point Module (WAPM)

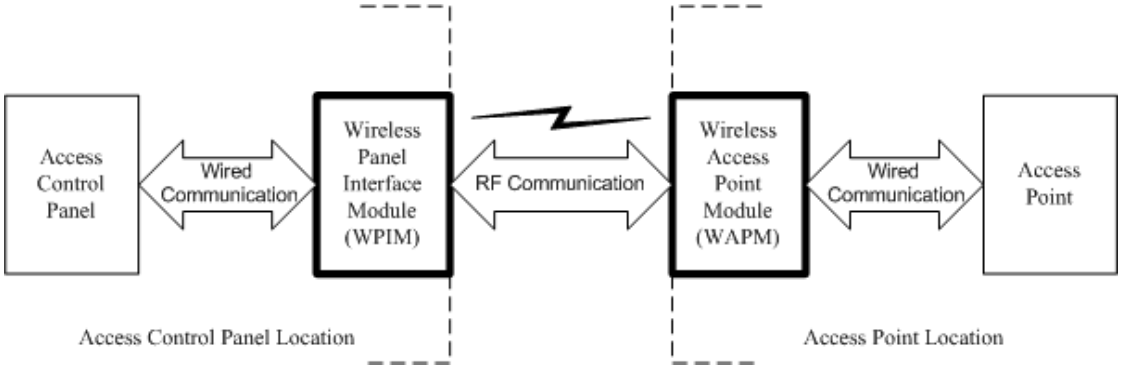

Figure 1-1 – Wireless Access System Block Diagram

The WPIM is wired to the access control panel and ideally is installed very close to the access control panel. The WPIMs installation location is determined by the location of the WAPMs with which it will communicate using RF.

The WAPM is installed at the access point where access will be controlled and/or monitored. Depending on the application and which WAPM is used, some wiring at the access control point may be required.

Regardless of which WPIM or WAPM module is used, the communication link between the WPIM and WAPM is always RF.

This manual describes the installation and operation of a Panel Interface Module-RS485-Recognition Systems (PIM-485-OTD-RS), a WPIM.

1.2 Panel Interface Module-RS485-Recognition Systems (PIM-485-OTD-RS)

The Panel Interface Module-RS485-Recogntion Systems (PIM-485-OTD-RS) is a product in the Schlage Wireless Panel Interface Module (WPIM) category. The PIM-485-OTD-RS is the wireless interface to any Access Control Panel (ACP) that has a Recognition Systems, Inc. hand geometry access control reader interface (Figure 1-2).

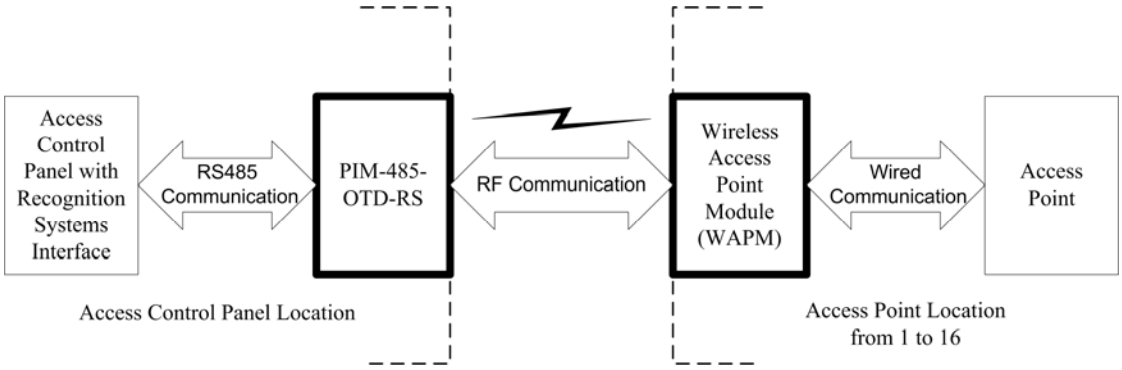

Figure 1-2 – PIM-485-OTD-RS Block Diagram

Each PIM-485-OTD-RS is connected via a 2 or 4 wire, polled, RS-485 interface to an ACP with a Recognition Systems interface.

Each PIM-485-OTD-RS can control from 1 to 16 WAPM's.

The Schlage Configuration & Demonstration Tool (CDT) is used to determine what and how many RS-485 polling addresses each PIM-485-OTD-RS will emulate.

NOTE: This manual is to be used in addition to the PIM Installation Manual (M053-001-xxx) and the Wireless Access System Configuring and Operating Manual (M053-007-xxx).

There are five steps to installing a PIM-485-OTD-RS:

1. Using the PIM Installation manual (M053-001-xxx) determine the optimum PIM-485-OTD-RS mounting location and permanently mount the PIM-485-OTD-RS in that location.
2. Using the Access Control Panel's (ACP) Installation Procedure mount and install the ACP and connect it to the PC that will be running the Access Control Software.
3. Using this manual, configure & connect the PIM-485-OTD-RS to the ACP.
4. Using the ACP's User's Manual configure the software to work with the PIM-485-OTD-RS.
5. Using this manual, link the PIM-485-OTD-RS to all the WAPMs it will control (section 2.3, page 10).

Table 1-1 and Table 1-2 show the PIM-485-OTD-RS sales models and their major specifications.

Sales Models	PIM-485-OTD-RS
Closed Enclosure	
Opened Enclosure	
Antenna	internal “c” or optional remote

Table 1-1 – PIM-485-OTD-RS Enclosure

MODEL	ENCLOSURE	MAXIMUM NUMBER OF WAPMs	LOCATION	ACCESS CONTROL PANEL INTERFACE/DESCRIPTION
PIM-485-OTD-RS	plastic	16	indoor	RS485
ANT-REM-IN	plastic	n/a	indoor	Optional remote indoor only omni-directional antenna
ANT-REM-I/O	plastic	n/a	indoor outdoor	Optional remote indoor/outdoor omni-directional antenna
ANT-REM-I/O+6DB	plastic	n/a	indoor outdoor	Optional remote directional panel antenna, 6 dB gain

Table 1-2- PIM-485-OTD-RS Sales Model Table

2. Installing the PIM-485-OTD-RS

2.1 Configuring the PIM-485-OTD-RS

The Schlage Wireless Access Configuration & Demonstration Tool (CDT, version 1.43 or higher) must be used to configure each PIM-485-OTD-RS to emulate the desired number and address of Recognition Systems Readers.

The PIM-485-OTD-RS must be connected to the PC running the CDT using a serial connection (either RS485 or RS232).

NOTE: When using an RS232 connection, any RS485 connection must be disconnected for the CDT to operate properly. Remember to re-connect the RS-485 when done configuring.

Once the PIM-485-OTD-RS is powered and connected to the PC and the CDT is running, press and hold either the SA or SB switch on the PIM-485-OTD-RS while pressing and releasing the Reset switch on the PIM-485-OTD-RS. Once the PIM-485-OTD-RS LED's CR7 & CR10 start to flash, the SA/SB switch can be released. This places the PIM-485-OTD-RS in the CDT communication mode. If the CDT is shut down and restarted, the PIM-485-OTD-RS must be reset as indicated above to return to the CDT communication mode.

2.1.1 PIM-485-OTD-RS Configuration

Once the CDT shows that the PIM-485-OTD-RS is connected, the Addresses tab on the CDT's PIM panel is used to configure the PIM-485-OTD-RS's emulation addresses. There are four fields on the Addresses tab: Unique, Addr Lo, Addr Hi, & PIM Addr. The Unique field shows the PIM-485-OTD-RS unique address and should never be changed without instructions from Schlage Technical Support. The Addr Lo indicates the lowest WAPM address that the PIM-485-OTD-RS will emulate and Addr Hi indicates the highest. The PIM Addr indicates the address that this PIM will respond to when PIM polling is used. Table 2-1 shows the allowable range of values for the Addr Lo, Addr Hi, & PIM Addr fields on the CDT Addresses tab.

PIM Model	Addr Lo	Addr Hi	PIM Addr
PIM-485-OTD-RS	0-254*	0-254*	0-254*

*address 255 (FFH) is reserved for the ACP address
address 170 (AAH) is reserved for broadcast messages

Table 2-1 – CDT Addr Lo & Addr Hi Fields Range of Values

After setting the Addr Lo, Addr Hi, & PIM Addr fields to the desired values, click the Set button to send these values to the PIM-485-OTD-RS.

Rule for setting PIM Addr:

- **For multiple PIM-485-OTD-RS's on the same communications port each PIM must have a unique PIM485 Addr**

Rules for setting Addr Lo & Addr Hi:

- **Addr Hi must always be equal to or greater than Addr Lo (Addr Hi >= Addr Lo)**
- **Addr Lo to Addr Hi cannot span more than 16 (Addr Hi – Addr Lo <= 15)**
- **For multiple PIM-485-OTD-RS's on the same communications port there cannot be any address overlap, in other words on the same communications port there can be only one PIM-485-OTD-RS emulating a specific reader address**
- **The reader addresses emulated by any one PIM-485-OTD-RS must be consecutive.**

- **Note address 170 (AAH) is reserved for broadcast messages, if the Addr Lo to Addr Hi range includes address 170 (AAH), then that PIM will control one less WAPM than normal.**

2.1.2 WAPM Card Conversion Configuration

The CDT is used to set the card conversion configuration for a Wireless Access Point Module (WA52XX, WA56XX, WA993, WRI, WPR, WSM, MIRL, or WEXK) to emulate a Recognition Systems Hand Geometry Unit.

Once the CDT shows that the PIM-485-OTD-RS is connected and after the desired WAPM has been linked to the PIM-485-OTD-RS, the WAPM Configuration tab on the CDT is used to select one of three card conversions: None, RS_485_26b, and RS_485_MAGCARD.

2.1.2.1 None

When the "None" card conversion is selected, the first 80 bits read from a card (Wiegand, proximity, or magnetic) are packed into the data1 and data2 fields of Identity Verified datalog, type 7, with byte9, bit 7 containing the first bit read (see Table 3-33, page 33 below).

NOTE: The Datalog format limits the card data to be transferred to 80 bits (10 bytes). Therefore this also becomes a limit when polling by WAPM. For version 1 of the PIM-OTD-495-RS this 80 bit limit still applies when polling by PIM. With the appropriate firmware and version 2 of the PIM-OTD the number of card data bits transferred will increase to 255.

2.1.2.2 RS_485_HID_26b

When the "RS_485_HID_26b" card conversion is selected, the 16 bit card number field (bits 10-25) of a standard 26 bit Wiegand formatted card are extracted, a BCD (binary coded decimal, 4 bits per digit)) conversion is done, the resulting five decimal 4 bit digits are right justified, and then packed into the data1 field of the Identity Verified datalog, type 7 (see Table 3-33, page 33 below). The data1 field is therefore the same as the Recognition Systems ID number using a "Wiegand 8-26" type reader. In addition the data2 field contains the first 40 bits read from the card (similar to the "None" conversion).

2.1.2.3 RS_485_MAGCARD

When the "RS_485_MAGCARD" card conversion is selected, the data read from the card is expected to be in ABA-Track 2 MagStripe format as specified in ISO 7811. The conversion takes the first 20 characters after the start sentinel character or until the end sentinel character is detected, the characters then has their parity stripped and the resulting 4 digit characters are packed into the data1 and data2 fields of Identity Verified datalog, type 7, with byte9, bits 7-4 containing the first character read after the start sentinel (see Table 3-33, page 33 below).

Field separators if present are included as a separate character.

If 19 characters are received between the start and stop sentinels, then the stop sentinel character is included as the 20th character. If 18 characters are received between the start and stop sentinels, then the stop sentinel character is included as the 19th and the LRC character as the 20th. If 17 or less characters are received between the start and stop sentinels, then the stop sentinel character and LRC character are appended to the end with any remaining unused characters being zero filled.

2.2 Connecting the PIM-485-OTD-RS to an ACP

The PIM-485-OTD-RS connects to an ACP using either a 2 or 4 wire RS485 asynchronous serial interface. The communication parameters are fixed at 9600 baud, 8 data bits, 1 stop bit, and no parity.

Notes about making a RS485 connection: There is some confusion about the "A" and "B" designations for the RS485 signals. The EIA RS-485 Specification labels the data wires as "A" and "B" but many

RS485 products label their wires "+" and "–." Some products associate the "+" signal with "A", some with "B". The bottom line is that the "+" should always be connected to the "+" and the "–" to the "–" however it is designated. Reversing the polarity will not damage either RS485 device, it just won't communicate. So take your best guess (a 50/50 chance) about connecting "+" to "+" and "– " to "–" and if it doesn't work, switch them!

NOTE: If the PIM has a 9-PIN RS-232 connector, it is only to be used with the CDT (section 2.3.2).

2.2.1 PIM-485-OTD-RS using an Original PIM PCB

ACP RS-485 Connector	PIM-485-OTD-RS – J6
+	A
–	B

Table 2-2 – RS485 Connection: Original PIM PCB & ACP

2.2.2 PIM-485-OTD-RS using a RS485 PIM PCB configured for 2 wire communication

ACP RS-485 Connector	PIM-485-OTD-RS – J7
+	TA– & RA–
–	TB+ & RB+

Table 2-3 – RS485 Connection: RS485 PIM PCB & ACP

2.2.3 PIM-485-OTD-RS using a RS485 PIM PCB configured for 4 wire communication

ACP RS-485 Connector	PIM-485-OTD-RS – J7
R+	TA–
R–	TB+
T+	RA–
T–	RB+

Table 2-4 – RS485 Connection: RS485 PIM PCB & ACP

2.3 Linking the PIM-485-OTD-RS to WAPMs

2.3.1 How to Set an RF Channel

One of fifteen RF channels can be set using DIP switch SW7 on the PIM. Table 2-5 shows how to set SW7 to select the desired RF channel:

Channel	Switch 1	Switch 2	Switch 3	Switch 4
1	up	up	up	Up
1	up	up	up	down
2	up	up	down	Up
3	up	up	down	down
4	up	down	up	Up
5	up	down	up	down
6	up	down	down	Up
7	up	down	down	down
8	down	up	up	Up
9	down	up	up	down
10	down	up	down	Up
11	down	up	down	down
12	down	down	up	Up
13	down	down	up	down
14	down	down	down	Up

15	down	down	down	down

Table 2-5 – DIP Switch Setting to Select the RF Channel

NOTE: The first two switch settings select Channel 1.

2.3.2 Linking WAPM's using the Configuration & Demonstration Tool (CDT)

The Schlage Wireless Access Schlage Wireless Access Configuration & Demonstration Tool (CDT, version 1.43 or higher) can be used to link WAPM's to a PIM-485-OTD-RS.

The PIM-485-OTD-RS must be connected to the PC running the CDT using a serial connection (either RS485 or RS232).

NOTE: When using an RS232 connection, any RS485 connection must be disconnected for the CDT to operate properly. Remember to re-connect the RS-485 when done configuring.

Once the PIM-485-OTD-RS is powered and connected to the PC and the CDT is running, press and hold either the SA or SB switch on the PIM-485-OTD-RS while pressing and releasing the Reset switch on the PIM-485-OTD-RS. Once the PIM-485-OTD-RS LED's CR7 & CR10 start to flash, the SA/SB switch can be released. This places the PIM-485-OTD-RS in the CDT communication mode. If the CDT is shut down and restarted, the PIM-485-OTD-RS must be reset as indicated above to return to the CDT communication mode.

Once the PIM-485-OTD-RS is connected to the PC and the CDT is running, the Link tab on the CDT's PIM panel is used to control the PIM-485-OTD-RS's Link Mode. The Panel field must be set to indicate which WAPM is to be linked. Table 2-6 shows the allowable range of values for the Panel field on the CDT Link tab.

PIM Model	Panel Field
PIM-485-OTD-RS	0-254*

*address 255 (FFH) is reserved for the ACP address
address 170 (AAH) is reserved for broadcast messages

Table 2-6 – CDT Panel Field Range of Values for PIM Models

After setting the Panel field to the desired value for the WAPM being linked, click the Start button to place the PIM-485-OTD-RS into the link mode. Power up or reset the WAPM to initialize the linking process between the PIM-485-OTD-RS and the WAPM.

NOTE: For proper operation the Panel field must only be set to the range of values for which the PIM-485-OTD-RS has been configured to emulate (section 2.1).

The Stop button can be used to abort the PIM-485-OTD-RS link mode.

2.4 PIM-485-OTD-RS Alarms

Each WAPM linked to a PIM-485-OTD-RS can report five different types of alarms: low battery, reader tamper, loss of RF communications, lock motor stall, and PIM tamper. Refer to section 3.3.1 (page 22), section 3.3.2 (page 23), and section 3.4.4 (page 34) for details on how these five alarms are reported using the RS485 protocol.

NOTE: When a PIM tamper occurs and if polling is being done by WAPM, then a PIM tamper alarm will be reported for each WAPM linked to the PIM that has the PIM tamper. If polling by PIM, then a PIM tamper will only be reported once when that PIM is polled.

2.5 What Happens if the PIM-485-OTD-RS Loses DC Power

All of the configuration and linking information is stored in non-volatile memory in the PIM-485-OTD-RS. Therefore if PIM-485-OTD-RS DC power is lost or cycled, upon restoring DC power, the PIM will continue operation with the same configuration and linking information. **There is no need to re-configure or re-link.**

2.6 Using the PIM-485-OTD-RS Reset Switch

The Reset Switch, S3, is used if the PIM-485-OTD-RS does not seem to be working properly. Pressing the Reset Switch has the same effect as cycling DC power to the PIM-485-OTD-RS.

3. Protocol Commands, Responses, & Datalogs

This section is intended for reference and to document how the PIM-485-OTD-RS uses the Recognition Systems protocol. It is not a detailed description of the protocol, for protocol details please refer to the Recognition Systems Hand Geometry Unit Technical Manual, version 2.0 (70100-6006).

A subset of the Recognition Systems Hand Geometry Unit Protocol commands, responses, and datalogs are implemented in the PIM-485-OTD-RS.

The Recognition Systems protocol is a multi-drop, polling protocol where the ACP is the master and the PIM-485-OTD-RS's are the slaves. As master, the ACP initiates all communications using addressed commands and then waits for a response from the addressed PIM-485-OTD-RS.

The Recognition Systems protocol provides for polling by access point. Standard Recognition Systems commands and responses have been implemented to allow for polling by WAPM.

In larger systems where there maybe be up to 254 WAPM's on a RS-485 bus polling by WAPM would result in a long round trip polling time. In order to reduce the round trip polling time, the ability to poll by PIM is included. Modified Recognition Systems commands and responses have been implemented to poll by PIM.

Since Recognition Systems products maybe on the RS-485 bus with PIM's, the GET_OEM_CODE command and the OEM_CODE response have been implemented to determine if the device polled is a PIM.

NOTE: The data used in the OEM_CODE response has been arbitrarily selected by Schlage and has not been authorized by Recognition Systems as a unique OEM code.

While the PIM-485-OTD-RS supports both the CRC (2 byte) and CHECKSUM (1 byte) for the Frame Check Sequence. Schlage recommends that the CHECKSUM method be used for three reasons: 1. It is one byte instead of two resulting in a smaller packet size, 2. the packet size is small enough that a checksum provides adequate error detection, and 3. the CHECKSUM is much easier to calculate than the CRC.

ACP Command	PIM Response	How used
POLL_WAPM_CRC (page 15)	WAPM_STATUS (page 22)	WAPM polling with CRC
POLL_WAPM_CHECKSUM (page 15)	WAPM_STATUS (page 22)	WAPM polling with CHECKSUM
POLL_PIM_CRC (page 20)	PIM_STATUS_IDLE (page 23) PIM_STATUS_CHANGE (page 24) PIM_STATUS_CARDDATA (page 26)	PIM polling with CRC
POLL_PIM_CHECKSUM (page 20)	PIM_STATUS_IDLE (page 23) PIM_STATUS_CHANGE (page 24) PIM_STATUS_CARDDATA (page 26)	PIM polling with CHECKSUM
GET_WAPM_DATALOG (page 15)	NEXT_DATALOG (page 28)	send event details: card data, door alarms, request to exit, & troubles
GET_PREVIOUS_WAPM_DATALOG (page 16)	NEXT_DATALOG (page 28)	repeat sending event details in case of receiving error
WAPM_LOCK_CONTROL (page 16)	WAPM_STATUS (page 22)	control the lock/strike state: locked, momentary unlock, extended unlock
WAPM_TIMED_UNLOCK (page 17)	WAPM_STATUS (page 22)	momentary unlock specifying the unlock time (available in version 2 hardware only)
ABORT_LINK (page 22)	WAPM_STATUS (page 22)	abort a current linking mode
SET_LINK (page 21)	WAPM_STATUS (page 22)	initiate a linking mode
SET_POLL (page 21)	PIM_STATUS_IDLE (page 23)	sets WAPM addresses to which the PIM will respond
GET_OEM_CODE (page 22)	OEM_CODE (page 28)	to determine if the device is a PIM
GET_WAPM/PIM_ASSOCIATION (page 21)	WAPM/PIM_STATUS (page 30)	determine what PIM a WAPM is in
GET_PIM_INFORMATION (page 20)	PIM_CONFIGURATION (page 30)	get PIM configuration information
GET_WAPM_CONFIGURATION (page 17)	WAPM_CONFIGURATION (page 31)	to retrieve configuration data from a WAPM
SET_WAPM_CONFIGURATION (page 18)	WAPM_STATUS (page 22)	to send configuration data to a WAPM

Table 3-1 – Commands and Their Responses

3.1 Communication Packet Format

The protocol commands and responses both use the same communication packet format (Table 3-2).

Field	Description
Start of Frame	0AH indicates the start of a packet
Address	the address to which the packet is being sent
Type	the command or response type
Length	the number of bytes in the data field
Data	the data being sent – it may be 0 bytes
Frame Check Sequence	CRC (2 bytes) or CHECKSUM (1 byte)

Table 3-2 – Communication Packet Format

3.2 Command Formats

Commands are data packets sent from the ACP to the PIM-485-OTD-RS.

3.2.1 Commands for Addressing WAPM's

3.2.1.1 POLL_WAPM_CRC (same as SendStatusCRC)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	44H
4	Length	00H
5	Frame Check Sequence	CRC LSB
6		CRC MSB

Table 3-3 – POLL_WPAM_CRC Command Packet Format

3.2.1.2 POLL_WAPM_CHECKSUM (same as SendStatusChecksum)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	3BH
4	Length	00H
5	Frame Check Sequence	CHECKSUM

Table 3-4 – POLL_WAPM_CHECKSUM Command Packet Format

3.2.1.3 GET_WAPM_DATALOG (same as SendDatalog)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	4DH
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-5 – GET_WAPM_DATALOG Command Packet Format

3.2.1.4 GET_PREVIOUS_WAPM_DATALOG (same as SendPreviousDatalog)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	6DH
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-6 – GET_PREVIOUS_WAPM_DATALOG Command Packet Format

3.2.1.5 WAPM_LOCK_CONTROL (same as OutputControl)

Note: The WAPM_LOCK_CONTROL command will only work with a battery operated Wireless Access Point Module (WAPM: WA52xx, WA56xx, WA993, WPR2) when it is sent in response to having received a card swipe data command.

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	4FH
4	Length	01H
5	Data	1 = timed unlock using the re-latch time 2 = extended unlock (indefinite) 3 = re-lock 4 = turn on auxiliary relay (WRI-OUT only) 5 = turn off auxiliary relay (WRI-OUT only) 6 = reserved 7 = red led on (VIP only) 8 = red led off (VIP only) 9 = green led on (VIP only) 10 = green led off (VIP only) 11 = beeper on (VIP only) 12 = beeper off (VIP only)
6/7	Frame Check Sequence	CRC or CHECKSUM

Table 3-7 – WAPM_LOCK_CONTROL Command Packet Format

3.2.1.6 WAPM_TIMED_UNLOCK (similar to DisplayCodedMessage)

NOTES:

1. ***This command is only available in a version 2 of the PIM-485-OTD-RS & WAPMs.***
2. ***The WAPM_TIMED_UNLOCK command will only work with a battery operated Wireless Access Point Module (WAPM: WA52xx, WA56xx, WA993, WPR2) when it is sent in response to having received a card swipe data command.***

byte	Field	Data/Description	
1	Start of Frame	0AH	
2	WAPM Address	00H to FEh & not AAH	
3	Type	56H	
4	Length	02H	
5	Data	byte1	number of seconds to unlock
6		byte2	always 0
7/8	Frame Check Sequence	CRC or CHECKSUM	

Table 3-8 – WAPM_TIMED_UNLOCK Command Packet Format

3.2.1.7 GET_WAPM_CONFIGURATION (similar to SendUserRecord)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	38H
4	Length	05H
5	Data	WAPM Address (00H to 0FH)
6		0
7		0
8		0
9		0
10/11	Frame Check Sequence	CRC or CHECKSUM

Table 3-9 – GET_WAPM_CONFIGURATION Command Packet Format

3.2.1.8 SET_WAPM_CONFIGURATION (similar to HereIsUserRecord)

NOTE: The SET_WAPM_CONFIGURATION command must only be sent when the Configuration Mode bit in the WAPM_STATUS, PIM_STATUS_CHANGE, or PIM_STATUS_CARDDATA for all WAPMs linked to the PIM are reset (0).

byte	Field	Data/Description	
1	Start of Frame	0AH	
2	WAPM Address	00H to FEh & not AAH	
3	Type	37H	
4	Length	10H	
5	Data	byte1	WAPM configuration data structure (see Table 3-11, page 19, below)
6		byte2	
7		byte3	
8		byte4	
9		byte5	
10		byte6	
11		byte7	
12		byte8	
13		byte9	
14		byte10	0
15		byte11	0
16		byte12	0
17		byte13	0
18		byte14	0
19		byte15	0
20		byte16	0
21/22	Frame Check Sequence	CRC or CHECKSUM	

Table 3-10 – SET_WPAM_CONFIGURATION Command Packet Format

byte	bit	function	Comments
byte1		Door unlock time	1-255 seconds (default=3)
byte2	0	Card format (depends on PIM type)	0=none 1=reverse 2=Northern #1 3=Northern #2 4=Northern #5 5=Northern #6
	1		
	2		
	3	Trouble level	not applicable on RS485 PIM
	4	Door open level	not applicable on RS485 PIM
	5	Deny access	1=enable deny access option, 0=disable deny access option
	6	Re-latch event	1=relatch on door open, 0=relatch on door close
	7	Relock method	1=relatch on door position change, 0=timer only
byte3		Heartbeat time (low byte)	number of 15 second intervals (low byte)
byte4		Heartbeat time (high byte)	number of 15 second intervals (high byte)
byte5	0	WA/WPR2 Reader type	1=iClass, 0=all others (default=0)
	1	Pre-alarm enable	1=enable, 0=disable
	2	Motor type for IRL/MIRL/WA	0=normal 1=Best/WEXK 2=Saflok MIRL mortise 3=Schlage 4=Schlage WA5600/WA993 & Marks MIRL cyl 5=Schlage WA5200
	3		
	4		
	5	Latch Type for WISI	1=strike, 0=relay
	6	Request to exit mode	1=normal, 0=inquiry
	7	Extended unlock	1=enabled, 0=disabled
byte 6	0	Retry times	1-15 (default=5)
	1		
	2		
	3		
	4	Door held open time	1-15 (seconds = 15 +(value*5))
	5		
	6		
	7		
byte 7	0	First Delay	0-15 (100 mS resolution) (default = 2 or 200 mS)
	1		
	2		
	3		
	4	Subsequent Delay	0-15 (100 mS resolution) (default = 2 or 200 mS)
	5		
	6		
	7		
byte 8		Cache memory bits per card	0-255, 0=cache disabled (default=0)
byte 9	0	reserved	
	1	reserved	
	2	reserved	
	3	reserved	
	4	Auto purge	1=disabled, 0=enabled (default=1)
	5	Failsafe mode	00=disabled, 01=fail unlocked, 10=fail locked (default=00)
	6		
	7	Cache memory mode	0=full card number, 1=facility code (default =0)

Table 3-11 – WAPM Configuration Data Structure

3.2.2 Commands for Addressing PIM's

3.2.2.1 POLL_PIM_CRC (similar to Calibrate)

byte	Field	Data/Description
1	Start of Frame	0AH
2	PIM Address	00H to FEh & not AAH
3	Type	3AH
4	Length	00H
5	Frame Check Sequence	CRC LSB
6		CRC MSB

Table 3-12 – POLL_PIM_CRC Command Packet Format

3.2.2.2 POLL_PIM_CHECKSUM (similar to SendExtendedUserRecord)

byte	Field	Data/Description
1	Start of Frame	0AH
2	PIM Address	00H to FEh & not AAH
3	Type	74H
4	Length	00H
5	Frame Check Sequence	CHECKSUM

Table 3-13 – POLL_PIM_CHECKSUM Command Packet Format

3.2.2.3 GET_PIM_INFO (similar to SendCalibrationData)

byte	Field	Data/Description
1	Start of Frame	0AH
2	PIM Address	00H to FEh & not AAH
3	Type	3CH
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-14 – GET_PIM_INFO Command Packet Format

3.2.2.4 GET_WAPM/PIM_ASSOCIATION (similar to EnterIdleMode2)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	65H
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-15 – GET_WAPM/PIM_ASSOCIATION Command Packet Format

3.2.2.5 SET_POLL (similar to EnrollUser)

Note: When using the SET_POLL command to set the polling addresses only one PIM-485-OTD-RS can be on the RS485 bus. All other PIM-485-OTD-RS's must be temporarily disconnected.

byte	Field	Data/Description
1	Start of Frame	0AH
2	PIM Address	00H to FEh & not AAH
3	Type	49H
4	Length	02H
5	Data	Low WAPM range (0 to FEH, not EEH)
6		High WAPM range (0 to FEH, not EEH)
7/8	Frame Check Sequence	CRC or CHECKSUM

Table 3-16 – SET_POLL Command Packet Format

3.2.2.6 SET_LINK (similar to EnterIdleMode)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	45H
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-17 – SET_LINK Command Packet Format

3.2.2.7 ABORT_LINK (same as Abort)

byte	Field	Data/Description
1	Start of Frame	0AH
2	WAPM Address	00H to FEh & not AAH
3	Type	32H
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-18 – ABORT_LINK Command Packet Format

3.2.2.8 GET_OEM_CODE (same as SendOEMCode)

byte	Field	Data/Description
1	Start of Frame	0AH
2	PIM Address	00H to FEh & not AAH
3	Type	6FH
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Table 3-19 – SEND_OEM_CODE Command Packet Format

3.3 Response Format

Responses are data packets sent from the PIM-485-OTD-RS to the ACP.

3.3.1 WAPM_STATUS (similar to HereIsStatus response)

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	30H
4	Length	03H
5	Data	Byte1
6		Byte2
7		Byte3
8/9	Frame Check Sequence	CRC or CHECKSUM

Table 3-20 – WAPM_STATUS Packet Format

byte	bit	function	Comments
byte1	0	Reader tamper	1 = the polled WAPM has a reader tamper
	1	Low Battery	1 = the polled WAPM has a low battery
	2	Loss of RF Communications	1 = the polled WAPM has a loss of RF
	3	PIM Tamper	1 = the PIM door is open
	4	Cache Status	1 = enabled, 0 = disabled
	5	Motor Stall	1= the polled WAPM's lock motor is stalled
	6		
	7		
byte2	0		
	1		
	2		
	3		
	4	Datalog Ready	1 = the polled WAPM has a datalog ready
	5	Configuration Mode	1 = the polled WAPM is in configuration mode[1]
	6	Link Mode Enabled	1 = the polled PIM/WAPM is in link mode
	7		
byte3	0	Trouble	1 = the polled WAPM has trouble (i.e. byte1<>0)
	1		
	2	Door Position Switch	1 = closed, 0 = open (polled WAPM)
	3		
	4	Request to Exit Switch	1 = inactive, 0 = active (polled WAPM)
	5	Wireless: Request to Enter Switch VIP: LBM Status	Wireless: 1 = active, 0 = inactive (polled WAPM) VIP: 1 = bolt extended, 0 = bolt retracted
	6	Key Switch	1 = key being used, 0 = key not being used
	7	Lock State	1 = unlocked, 0 = locked (polled WAPM)

Table 3-21 – WAPM_STATUS byte1, byte2, & byte3 Definitions

[1] The Configuration Mode bit is set after the PIM receives a SET_WAPM_CONFIGURATION command and remains set until that WAPM communicates with the PIM. A subsequent SET_WAPM_CONFIGURATION command must not be sent until the Configuration Mode bit is cleared for all WAPMs linked to that PIM.

3.3.2 PIM_STATUS_IDLE (similar to HereIsExtendedUserRecord)

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFH
3	Type	31H
4	Length	00H
5/6	Frame Check Sequence	CRC or CHECKSUM

Figure 3-1 – PIM_STATUS_IDLE Packet Format

3.3.3 PIM_STATUS_CHANGE (similar to HereIsExtendedUserRecord)

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFH
3	Type	31H
4	Length	05H
5	Data	Byte1
6		Byte2
7		Byte3
8		Byte4
9		Byte5
10/11	Frame Check Sequence	CRC or CHECKSUM

Figure 3-2 – PIM_STATUS_CHANGE Packet Format

byte	bit	function	comments
byte1		WAPM address	If FFH, then PIM has nothing new to report and byte2, byte3, byte4, byte5 will all be 0. If 00H to FEH (not AAH), then byte2, byte3, byte4 contain the status for that WAPM.
byte2	0	Reader tamper	1 = the byte1 WAPM has a reader tamper
	1	Low Battery	1 = the byte1 WAPM has a low battery
	2	Loss of RF Communications	1 = the byte1 WAPM has a loss of RF
	3	PIM Tamper	1 = the polled PIM's door is open
	4	Cache Status	1 = enabled, 0 = disabled
	5	Motor Stall	1 = the byte1 WAPM's lock motor is stalled
	6		
	7		
byte3	0	Request to Exit Active	These bits are set when a changed of state occurs in the byte1 WAPM, similar to datalogs that occur when polling by WAPM
	1	WAPM forced	
	2	WAPM Open Too Long	
	3	Tamper Active	
	4		
	5	Configuration Mode	1 = the polled WAPM is in configuration mode[1]
	6	Link Mode Enabled	1 = the byte1 WAPM of the PIM is in link mode
	7		
byte4	0	Trouble	1 = the byte1 WAPM has trouble (i.e. byte2<>0)
	1		
	2	Door Position Switch	1 = closed, 0 = open (byte1 WAPM)
	3		
	4	Request to Exit Switch	1 = inactive, 0=active (byte1 WAPM)
	5	Wireless: Request to Enter Switch VIP: LBM Status	Wireless: 1 = active, 0 = inactive (polled WAPM) VIP: 1 = bolt extended, 0 = bolt retracted
	6	Key Switch	1 = key being used, 0 = key not being used
	7	Lock State	1 = unlocked, 0 = locked (byte1 WAPM)
byte5		More Events	0 = polled PIM does not have more events to report 0 <> polled PIM has more events to report and should be polled again

Table 3-22 – PIM_STATUS_CHANGE byte1 - byte5 Definitions

[1] The Configuration Mode bit is set after the PIM receives a SET_WAPM_CONFIGURATION command and remains set until that WAPM communicates with the PIM. A subsequent SET_WAPM_CONFIGURATION command must not be sent until the Configuration Mode bit is cleared for all WAPMs linked to that PIM.

3.3.4 PIM_STATUS_CARDDATA (similar to HereIsExtendedUserRecord)

byte	Field	Data/Description	
1	Start of Frame	0AH	
2	Address	FFH	
3	Type	31H	
4	Length	01H to 26H	
5	Data	byte1	See Table 3-24 below, for a detailed description of the byte1-byte38 formats
6		byte2	
7		byte3	
8		byte4	
9		byte5	
10		byte6	
11		byte7	
• • •		• • •	
42		byte38	
43/44	Frame Check Sequence	CRC or CHECKSUM	

Table 3-23– PIM_STATUS_CARDDATE Packet Format

byte	bit	function	comments
byte1		WAPM address	if FFH, then PIM has nothing new to report and byte2, byte3, byte4, byte5 will all be 0. if 00H to FEH (not AAH), then byte2, byte3, byte4 contain the status for that WAPM
byte2	0	Reader tamper	1 = the byte1 WAPM has a reader tamper
	1	Low Battery	1 = the byte1 WAPM has a low battery
	2	Loss of RF Communications	1 = the byte1 WAPM has a loss of RF
	3	PIM Tamper	1 = the polled PIM's door is open
	4	Cache Status	1 = enabled, 0 = disabled
	5	Motor Stall	1= the byte1 WAPM's lock motor is stalled
	6		
	7		
byte3	0	Request to Exit Active	These bits are set when a changed of state occurs in the byte1 WAPM, similar to datalogs that occur when polling by WAPM
	1	WAPM forced	
	2	WAPM Open Too Long	
	3	Tamper Active	
	4		
	5	Configuration Mode	1 = the polled WAPM is in configuration mode[1]
	6	Link Mode Enabled	1 = the byte1 WAPM of the PIM is in link mode
	7		
byte4	0	Trouble	1 = the byte1 WAPM has trouble (i.e. byte2<>0)
	1		
	2	Door Position Switch	1 = closed, 0 = open (byte1 WAPM)
	3		
	4	Request to Exit Switch	1=inactive, 0=active (byte1 WAPM)
	5	Wireless: Request to Enter Switch VIP: LBM Status	Wireless: 1 = active, 0 = inactive (polled WAPM) VIP: 1 = bolt extended, 0 = bolt retracted
	6	Key Switch	1 = key being used, 0 = key not being used
	7	Lock State	1 = unlocked, 0 = locked (byte1 WAPM)
byte5		More Events	0 = polled PIM does not have more events to report 0 <> polled PIM has more events to report and should be polled again
byte6		Card data bit count	number of data bits in card data (8-252)
byte7		msb of byte7 is first bit of carddata read from card	Card data read at WAPM, either Wiegand or magnetic data, up to the first 255 bits, format depends on which card conversion is being used refer to section 2.1.2 page 9 above.
• • •		• • •	
byte38		number of bytes of card data depends on number of bits read from card	

Table 3-24 – PIM_STATUS_CARDDATA byte1 – byte38 Definitions

[1] The Configuration Mode bit is set after the PIM receives a SET_WAPM_CONFIGURATION command and remains set until that WAPM communicates with the PIM. A subsequent SET_WAPM_CONFIGURATION command must not be sent until the Configuration Mode bit is cleared for all WAPMs linked to that PIM.

3.3.5 NEXT_DATALOG (same as HereIsNextDatalog response)

byte	Field	Data/Description	
1	Start of Frame	0AH	
2	Address	FFH	
3	Type	38H	
4	Length	12H	
5	Data	byte1	See section 3.4, below, for a detailed description of the byte1-byte18 formats
6		byte2	
7		byte3	
8		byte4	
9		byte5	
10		byte6	
11		byte7	
12		byte8	
13		byte9	
14		byte10	
15		byte11	
16		byte12	
17		byte13	
18		byte14	
19		byte15	
20		byte16	
21		byte17	
22		byte18	
23/24	Frame Check Sequence	CRC or CHECKSUM	

Table 3-25 – NEXT_DATALOG Packet Format

3.3.6 OEM_CODE (same as HereIsOEM Code response)

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	4FH
4	Length	02H
5	Data	57H (ascii ‘W’)
6		41H (ascii ‘A’)
7/8	Frame Check Sequence	CRC or CHECKSUM

Table 3-26 – PIM OEM_CODE Packet Format

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	4FH
4	Length	02H
5	Data	56H (ascii ‘V’)
6		31H (ascii ‘1’)
7/8	Frame Check Sequence	CRC or CHECKSUM

Table 3-27 – VIP5100 OEM_CODE Packet Format

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	4FH
4	Length	02H
5	Data	56H (ascii ‘V’)
6		35H (ascii ‘5’)
7/8	Frame Check Sequence	CRC or CHECKSUM

Table 3-28 – VIP5500 OEM_CODE Packet Format

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	4FH
4	Length	02H
5	Data	56H (ascii ‘V’)
6		39H (ascii ‘9’)
7/8	Frame Check Sequence	CRC or CHECKSUM

Table 3-29 – VIP993 OEM_CODE Packet Format

3.3.7 WAPM/PIM_STATUS

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	39H
4	Length	02H
5	Data	WAPM address (00H to FEh & not AAH)
6		PIM address (00H to FEh & not AAH)
7/8	Frame Check Sequence	CRC or CHECKSUM

Table 3-30 – WAPM/PIM STATUS Packet Format

3.3.8 PIM_CONFIGURATION

byte	Field	Data/Description
1	Start of Frame	0AH
2	Address	FFh
3	Type	53H
4	Length	06H
5	Data	Low byte of PIM RF address
6		High byte of PIM RF address
7		Type of PIM
8		Low WAPM range (0 to FEH, not EEH)
9		High WAPM range (0 to FEH, not EEH)
10		PIM RF Channel
11/12	Frame Check Sequence	CRC or CHECKSUM

Table 3-31 – PIM CONFIGURATION Packet Format

3.3.9 WAPM_CONFIGURATION (similar to HereIsUserRecord response)

byte	Field	Data/Description	
1	Start of Frame	0AH	
2	WAPM Address	FFH	
3	Type	32H	
4	Length	10H	
5	Data	byte1	WAPM configuration data structure (see Table 3-11, page 19, above)
6		byte2	
7		byte3	
8		byte4	
9		byte5	
10		byte6	
11		byte7	
12		byte8	
13		byte9	
14		byte10	0
15		byte11	0
16		byte12	0
17		byte13	0
18		byte14	0
19		byte15	0
20		byte16	0
21/22	Frame Check Sequence	CRC or CHECKSUM	

Figure 3-3 – WAPM_CONFIGURATION Packet Format

3.4 Datalog Formats

This section details the data field portion of a NEXT_DATALOG response from the PIM-485-OTD-RS to the ACP.

NOTE: The data field portion of the NEXT_DATALOG response is always 18 bytes long.

NOTE: The PIM-485-OTD-RS does not do any time stamping, therefore the time stamp field is always 0 filled.

3.4.1 Transaction Buffer Empty

The Transaction Buffer Empty datalog is sent when a WAPM receives a GET_WAPM_DATALOG or GET_PREVIOUS_WAPM_DATLAOG command from the ACP and the WAPM has no datalog to send. In other words, the WAPM had not set the "Datalog Ready" bit in the WAPM_STATUS or PIM_STATUS response.

byte	field	description
byte1	address	address of WAPM generating datalog
byte2	timestamp	0
byte3		0
byte4		0
byte5		0
byte6		0
byte7		0
byte8	format	00H
byte9	data1	0
byte10		0
byte11		0
byte12		0
byte13		0
byte14	data2	0
byte15		0
byte16		0
byte17		0
byte18		0

Table 3-32 – Transaction Buffer Empty Datalog

3.4.2 Identity Verified

The Identity Verified datalog is sent when a card has been swiped or presented at the WAPM's card ready. This datalog contains the data read from the card.

byte	field	description
byte1	address	address of WAPM generating datalog
byte2	timestamp	0
byte3		0
byte4		0
byte5		0
byte6		0
byte7		0
byte8	format	07H
byte9	data1	Card data read at WAPM, either Wiegand or magnetic data, first 80 bits, format depends on which card conversion is being used, refer to section 2.1.2, page 9 above.
byte10		
byte11		
byte12		
byte13		
byte14	data2	
byte15		
byte16		
byte17		
byte18		

Table 3-33 – Identity Verified Datalog

3.4.3 Door Forced Open

The Door Forced Open datalog is sent when a door position switch has indicated that the door has been opened (i.e. door position switch goes from low to high) when was not shunted and it was locked.

byte	field	description
byte1	address	address of WAPM generating datalog
byte2	timestamp	0
byte3		0
byte4		0
byte5		0
byte6		0
byte7		0
byte8	format	0DH
byte9	data1	0
byte10		0
byte11		0
byte12		0
byte13		0
byte14	data2	0
byte15		0
byte16		0
byte17		0
byte18		0

Table 3-34 – Door Forced Open Datalog

3.4.4 Tamper Activated

The Tamper Activated datalog is sent when a WAPM has detected one of five different types of trouble that need attention. This datalog contains information identifying the exact cause of the trouble.

byte		field	description
byte1		address	address of WAPM generating datalog
byte2		timestamp	0
byte3			0
byte4			0
byte5			0
byte6			0
byte7			0
byte8		format	0EH
byte9	0	data1	Reader Tamper
	1		Low Battery
	2		Loss of RF Communication
	3		PIM Tamper
	4		
	5		Motor Stall
	6		
	7		
byte10			0
byte11			0
byte12			0
byte13			0
byte14		data2	0
byte15			0
byte16			0
byte17			0
byte18			0

Table 3-35 – Tamper Activated Datalog

3.4.5 Request to Exit Activated

The Request to Exit Activated Verified datalog is sent when the WAPM's request to exit switch is activated (i.e. closed, goes from high to low).

byte	field	description
byte1	address	address of WAPM generating datalog
byte2	timestamp	0
byte3		0
byte4		0
byte5		0
byte6		0
byte7		0
byte8	format	12H
byte9	data1	0
byte10		0
byte11		0
byte12		0
byte13		0
byte14	data2	0
byte15		0
byte16		0
byte17		0
byte18		0

Table 3-36 – Request to Exit Activated Datalog

3.4.6 Door Open Too Long

The Door Open too Long datalog is sent by the WAPM when the WAPM's door is held open too long after being unlocked.

byte	field	description
byte1	address	address of WAPM generating datalog
byte2	timestamp	0
byte3		0
byte4		0
byte5		0
byte6		0
byte7		0
byte8	format	1FH
byte9	data1	0
byte10		0
byte11		0
byte12		0
byte13		0
byte14	data2	0
byte15		0
byte16		0
byte17		0
byte18		0

Table 3-37 – Door Open Too Long Datalog

4. Contacting Schlage Wireless Access

For questions regarding Schlage Wireless Access:

www.ir-swa.com

main: 800-313-2962 (630-876-5680)
technical support: 866-322-1237
fax: 630-293-4257

5. FCC Compliance & Warnings

5.1 FCC Compliance

- This device has been authorized by the FCC Rules and Industry Canada.
- This device complies with the limits for a Class B digital device and a Class B intentional radiator, pursuant to Part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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.
- The Wireless Access System Component must be installed by qualified professionals or contractors in accordance with FCC part 15.203, Antenna Requirements.
- Do not use any antenna other than the one provided with the unit.

5.2 ACA Compliance

- The Australian version of the Panel Interface Module (AUPIM-TD2, AUPIM-TD4, AUPIM-485-OTD, or AUPIM-EXP) has been authorized by the Australian Communications Authority (ACA).

5.3 UL Compliance

- The Panel Interface Module (PIM-485-OTD) is listed under UL294 as an access control system accessory.
- Access equipment manufactured and/or sold by Schlage, is not rated for, or intended for use in life safety installations.
- For UL installations use Schlage Power Supply, model 593PI-12DC UL listed class 2 power supply.
- For UL installations the Panel Interface Module enclosure (PIM-485-OTD) must be mounted in a secure area.
- The Panel Interface Module's (PIM-485-OTD) maximum standby current at 12 VDC is 70mA.

5.4 Warnings

- RF Exposure - To comply with FCC RF exposure requirements for mobile transmitting devices this transmitter should only be used or installed at locations where there is normally at least a 20 cm separation between the antenna and all persons.
- Do not co-locate and operate in conjunction with any other antenna or transmitter.
- Changes or modifications not expressly approved by Schlage could void the user's authority to operate the equipment.

6. Revision History

Version	Date	Changes
X001	12/19/02	preliminary in house release for comments
X001.1	12/20/02	added card conversion sections, added single channel selection section
001	12/20/02	added HID to card conversion name, released for publication
002	02/06/03	changed WA logo, corrected OUTPUT_CONTROL command section, consistently used "byte" instead of "data", added checksum as frame check method, changed some command/response names for better correlation with Wireless Access terminology, added PIM polling, added commands: POLL_WAPM_CHECKSUM, POLL_PIM, WAPM_TIMED_UNLOCK, GET_OEM_CODE, GET_WAPM_CONFIGURATION, & SET_WAPM_CONFIGURATION added responses: OEM_CODE, WAPM_CONFIGURATION, PIM_STATUS_IDLE, PIM_STATUS_CHANGE, & PIM_STATUS_CARDDATA
003	04/24/03	removed Datalog flag from PIM_STATUS_CHANGE & PIM_STATUS_CARDDATA responses, added Request to Exit Active, WAPM Forced, WAPM Open Too Long, & Tamper Active flags to PIM_STATUS_CHANGE & PIM_STATUS_CARDDATA responses added commands: POLL_PIM_CRC, POLL_PIM_CHECKSUM, SET_LINK, SET_POLL, GET_WAPM/PIM_ASSOCIATION, & GET_PIM_INORMATION added responses: WAPM/PIM_STATUS & PIM_CONFIGURATION
004	05/05/03	PIM Configuration packet: changed PIM Address byte to PIM RF Channel byte, corrected several figure/table captions
005	05/18/04	updated block diagrams, updated remote antenna models, added PIM tamper reporting note, noted that WAPM_TIMED_UNLOCK command is available in version 2 PIMs & WAPMs, deleted battery references in Warning section, changed TOC to show 3 levels, added note about card data bits transferred
A	01/24/05	Ir'ized manual
B	09/29/05	Implemented SET_POLL, GET_WAPM_CONFIGURATION, & SET_WAPM_CONFIGURATION commands and WAPM_CONFIGURATION response, added WAPM configuration data structure, changed PIM model number references to PIM-485-OTD-RS, re-formatted table of contents to show 4 levels, corrected FCC statement (may not cause…), changed various nomenclature and contact info throughout manual, added VIP OEM_CODE responses, added VIP red led/green led/beeper control subcommands to WAPM_LOCK_CONTROL command, added VIP LBM Status & Key Switch status bits to WAPM_STATUS/PIM_STATUS_CHANGE/PIM_STATUS_CARDDATA responses
C	02/12/08	Changed various nomenclature and contact information, made minor edits and corrections, added Schlage logo, changed Ingersoll-Rand to Ingersoll Rand, changed Security & Safety to Security Technologies, removed address from cover page, changed wyreless to wireless, removed all ™'s, changed www.wyrelessaccess.com to www.ir-swa.com, changed technical support # to 866-322-1237, added notes to WAPM_LOCK_CONTROL & WAPM_TIMED_UNLOCK commands, corrected documentation error in polarity of DPS in WAPM_STATUS & PIM_STATUS_CHANGE responses, added Request to Enter to WAPM_STATUS/PIM_STATUS_CHANGE/PIM_STATUS_CARDDATA responses
D	04/01/08	Added Cache Status and Configuration Mode bit definitions to WAPM_STATUS/PIM_STATUS_CHANGE/PIM_STATUS_CARDDATA responses