ALLEGION

SCHLAGE

OEM 200

Developer guide

Contents

FCC Statements

FCC Compliance Statements

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

FCC Labeling Requirements

- Exterior of product must include “Contains Transmitter Module FCC ID: XPB-OEM 200-XXXX”where XXXX is the model included in the installation

OEM 200 Model	FCC Certification Number
80mm Multi-Tech	XPB-OEM 200-80MT
80mm Smart Only	XPB-OEM 200-80SM
90mm Multi-Tech	XPB-OEM 200-90MT
90mm Smart Only	XPB-OEM 200-90SM

FCC Integration Requirements

1. The FCC/IC Statements contained in this guide must also be included in the final product’s documentation.
2. Applicable standards are 15.225, 15.209, and RSS-210.
3. For the purposes of compliance testing, it may be necessary to put the OEM 200 Module into a ‘constant read’ mode. In order to achieve this, present an Anti-Passback configuration card within the first minute of the module being powered. If performed correctly, the module will reboot and presenting a credential will result in constant reading and rereading of a credential as long as it remains in the operating volume of the antenna. This differs from normal operation in that when a credential is polled for a second time under normal operation the credential data is not output as it is seen as redundant.
4. Take care to NOT to place the OEM 200 antenna boards near other wireless antennas as they may cause interference with each other and result in the need for additional RF testing. Preferred distance is three (3) inches from other wireless transceivers.
5. The OEM 200 is only FCC authorized for the specific rule parts listed on the grant (the applicable standards from note #2). The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

IC Statements

IC Compliance Statements

- This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
  6. This device may not cause interference.
  7. This device must accept any interference, including interference that may cause undesired operation of the device.
- L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
  1. L'appareil ne doit pas produire de brouillage;
  8. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

IC Labelling Requirements

- The host product shall be properly labelled to identify the modules within the host product.

The ISED certification label of a module shall be clearly visible at all times when installed in the host product; otherwise, the host product must be labelled to display the ISED certification number for the module, preceded by the word "contains" or similar wording expressing the same meaning, as follows:

Contains IC: XXXXXX-YYYYYYYYYY

Where XXXXX-YYYYYYYYYY is one of the ISED certification numbers form the following table

OEM 200 Model	ISED Certification Number
80mm Multi-Tech	8053B-OEM 20080MT
80mm Smart Only	8053B-OEM 20080SM
90mm Multi-Tech	8053B-OEM 20090MT
90mm Smart Only	8053B-OEM 20090SM

Contact information

Should a system design engineer or developer need assistance, they should contact technical support at:

Phone: 1-877-671-7011

www.allegion.com/us

Warnings and cautions

WARNING

Warnings indicate potentially hazardous conditions, which if not avoided or corrected, may cause death or serious injury.

CAUTION

Cautions indicate potentially hazardous conditions, which if not avoided or corrected, may cause minor or moderate injury. Cautions may also warn against unsafe practices.

NOTICE

Notices indicate a condition that may cause equipment or property damage only.

Introduction

General Description

The OEM 200 module is an embeddable RFID reader component useful for manufacturers creating custom RFID products. The OEM 200 module contains both 125 kHz proximity, 13.56 MHz contactless smart card capability and supports ISO Standard 14443 technologies.

The OEM 200 module provides compatibility with certain HID® proximity protocols, GE/CASI ProxLite®, AWID®, Lenel®, and many 13.56 MHz technologies including Schlage™ smart cards using MIFARE DESFire™ EV1 and MIFARE®. By offering 125 kHz and 13.56 MHz technology in a single compact reader module, the OEM 200 module gives a product the flexibility to be used in many of the most popular credential technology environments

The OEM 200 Module architecture consists of 2 PCB boards connected by a flexible ribbon cable - see **Figure 1.1**. The OEM 200 Main Board interfaces with the host device and provides a diagnostic LED interface. The OEM 200 Antenna connects to the Main Board and has both the 125 kHz and the 13.56 MHz antennas. There are two antenna sizes available; 80mm and 90mm antennas, and both antenna sizes come in multi-tech and smart only versions.

Successful integration of the OEM 200 into the host system is important to Allegion. Information about physical mounting of the OEM 200, read range performance, and environmental protection should be shared with Allegion to help ensure the successful operation of the OEM 200.

Figure 1.1: OEM 200 main board connected to an 80mm antenna board via 4 inch flexible cable (Top View)

Specifications

OEM 200 Main Board

All mounting holes are 3.175+/- 0.08 mm (0.125”) diameter. Dimensions shown below are in mm (inches).

Mounting holes	⌖	∅ 0.20	A	B	C

Board shape	⌓	∅ 0.20	A	B	C

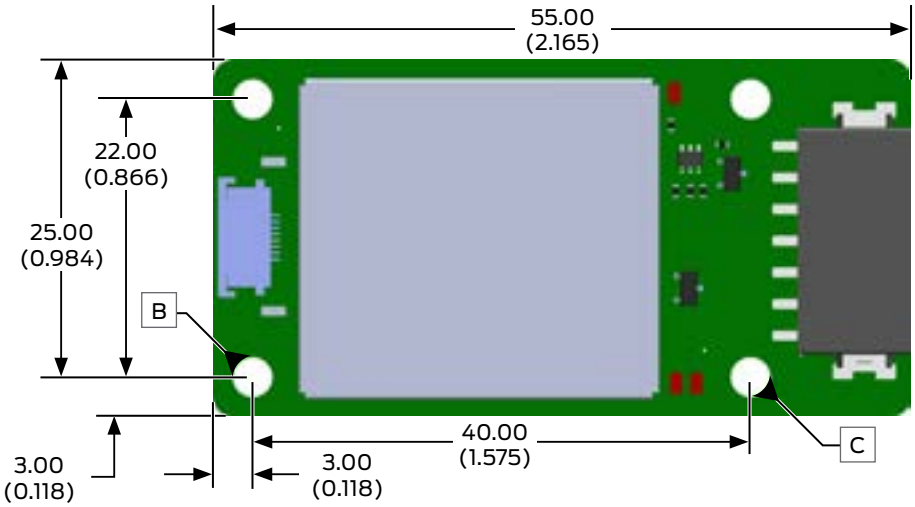


Figure 1.2: OEM 200 Main board area and mounting hole locations mm (inches).

Figure 1.3: Vertical height of tallest component off of the OEM 200 Main board mm (inches).

80mm Antenna

All mounting holes are 3.175 mm (0.125") diameter. The 80mm antenna also has 4 mounting square cutouts which can accept a custom bracket to ease the installation process. Dimensions shown below are in mm (inches). Mounting hardware including any bracketing used should be made of non-metallic materials. See **Mounting Consideration** on page 20.

Mounting holes	⌖	∅ 0.20	A	B	C

Board shape	⌓	∅ 0.20	A	B	C

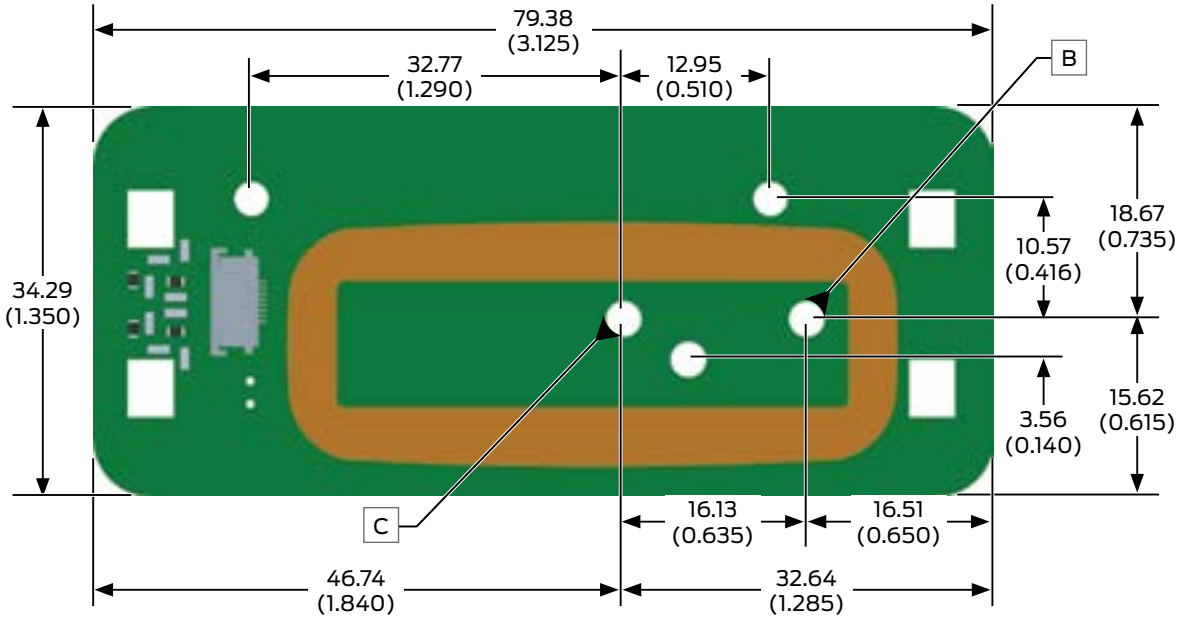


Figure 1.4: 80 mm Antenna Board: Dimensional area and mounting hole locations in mm (inches).

Figure 1.5: 80 mm Antenna Board: Vertical height of tallest component off of board in mm (inches).

90mm Antenna

All mounting holes are 3.175 mm (0.125”) diameter. Dimensions shown below are in mm (inches). Mounting hardware including any bracketing used should be made of non-metallic materials. See **Mounting Consideration** on page 20.

Mounting holes | ⌖ | ∅ 0.20 | A | B | C |

Board shape | ⌓ | ∅ 0.20 | A | B | C |

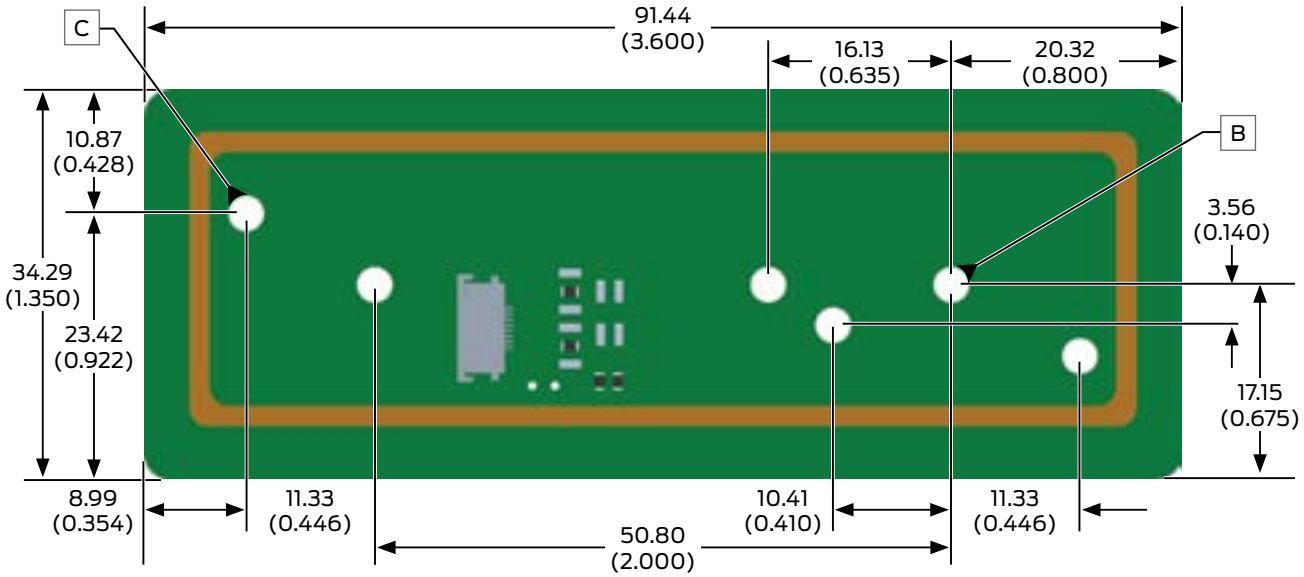


Figure 1.6: 90 mm Antenna Board: Dimensional area and mounting hole locations mm (inches).

Figure 1.7: 90 mm Antenna Board: Vertical height of tallest component off of the board mm (inches).

Electrical Specifications

Symbol	Parameter	Min	Typical	Max	Units
T	Operating Temperature	-35	0	65	oC
F	Frequency		125kHz and 13.56MHz		Hz
V_{in}	DC Voltage Input	5		16*	V
I_{AVG}	Average Current at 12V		50		mA
I_{MAX}	Max Current at 12V		100		mA
W_{OL}	Wiegand Output Logic Low	0		0.4	V
W_{OH}	Wiegand Output Logic High		5		V
TTL_{OL}	TTL Interface Logic Low	0		0.495	V
TTL_{OH}	TTL Interface Logic High	2.65	3.3	3.6	V
O_I	General Output Current			25	mA
O_{OL}	General Output Logic Low	0		0.495	V
O_{OH}	General Output Logic High	2.65	3.3	3.6	V
O_{PW}	General Output Pulse Width		150		ms

⚠ CAUTION

* Application of more that 16V may damage the device.

Interface Descriptions

Wiegand Output: Common data interface in an access control system consisting of D0 and D1 Wiegand communication lines. For more information see this basic reference: https://en.wikipedia.org/wiki/Wiegand_interface

TTL: Serial interface to enable bi-directional communication between the OEM 200 and the host device. For more information see this basic reference: https://en.wikipedia.org/wiki/Universal_asynchronous_receiver/transmitter. The OEM 200 internally utilizes 1kΩ pull-ups on the TTL interface.

General Output: Digital output that is normally low and goes high indicating that the OEM 200 successfully read a card. The Host device can use this signal to sound a buzzer or turn on a light.

Read Range

Card Read Range in Free Space*		
Card Frequency	**Card Type**	**Read Range**
125kHz	ASK, FSK	Up to 2.75 inches
13.56MHz	ISO 15693	Up to 2.75 inches
13.56MHz	ISO 14443A MIFARE Classic	Up to 3.25 inches
13.56MHz	ISO 14443A MIFARE DESFire EV1	Up to 1.25 inches
13.56MHz	ISO 14443A MIFARE Plus	Up to 1 inch

* Antenna location inside end product and surrounding materials will affect the read range performance. See **Mounting Consideration** on page 20.

Credential Specifications

Card Technologies Supported

125 kHz Technologies

- GE®/CASI® Proximity
- HID® Proximity (Except Long Format)
- AWID® Proximity
- LenelProx®

13.56 MHz Technologies

- ISO14443 MIFARE DESFire™ EV1 with PACSA enabled (format in the card – up to 48 bits)
- ISO14443 Secure MIFARE® Classic:
  - XceedID™ MIFARE® app enabled (format in the card – up to 48 bits)
  - OESM (dormant – ready to be enabled by end-user)
- ISO14443 MIFARE Plus
- ISO14443 PIV enabled 75-bit format (other formats available)
- iClass/Inside UID enabled 40-bit format
- ISO15693 UID enabled 40-bit format
- ISO14443 UID disabled (can be enabled if PIV, EV1, and MIFARE® are all disabled)
- Felica CSN
- aptiQmobile

⚠ CAUTION

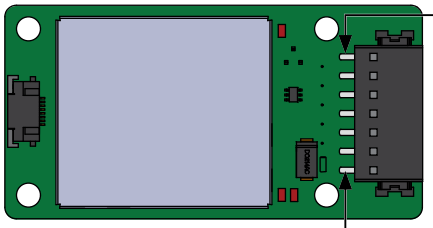
OEM 200 assemblies are susceptible to damage by Electrostatic Discharge (ESD).

Host Connector Specifications

Connection to the host device can be installed into the OEM 200's 7-position host connector without tools. The push-in spring connection can accept wire sizes of 20AWG to 26AWG with the insulator stripped 6 mm. To release a wire from the connector insert small screw driver with blade with a tip of 2mm into the slot directly above the wire terminal. This will release the spring clamp and free the wire from the connector.

Refer to Phoenix Contact p/n: 1771075 for more details. https://www.phoenixcontact.com/us/products/1771075

The wire length between the OEM 200 and host device is recommended to be 1 meter or less. However, if an application requires longer a cable distance consider the effects of voltage drop and signal integrity across a longer distance.



Pin	Signal	Connector
7	Wiegand D0	Host Connector J1
6	Wiegand D1	
5	Ground	
4	General Output	
3	TTL – TX	
2	TTL – RX	
1	Vin*	

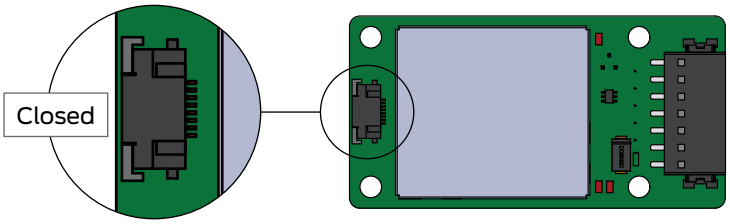
⚠ CAUTION

* Incorrect wiring may damage the device.

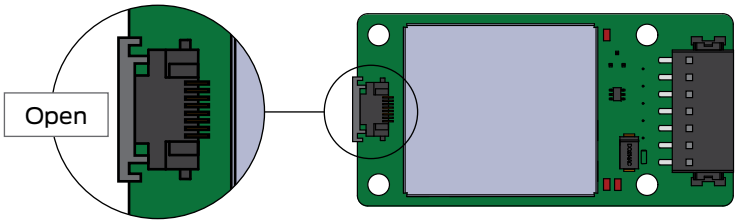
Antenna Connection

A four-inch flat flexible cable (FFC) is included with the OEM 200 to connect the main board to the antenna board. Verify that the antenna cable connection at the main board and antenna board are connected correctly. To do this, very gently tug the ribbon at each connector, being very careful not to dislodge the ribbon from the connector. The best verification step is to ensure the ribbon is securely fastened into both connectors and verify that card reads are successful.

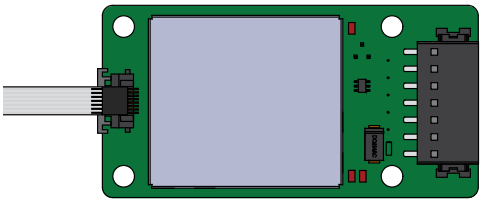
Step 1: Note that the cable locking mechanism on the connector is shipped in the closed position by default.



Step 2: Gently pull grey cable locking mechanism away from connector to the open position as shown.

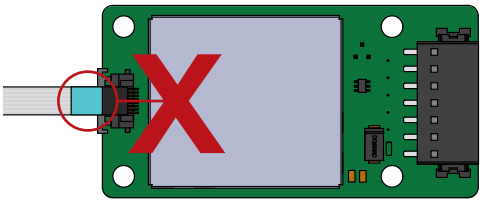


Step 3: Insert cable into connector with the blue reinforcement tape facing down.

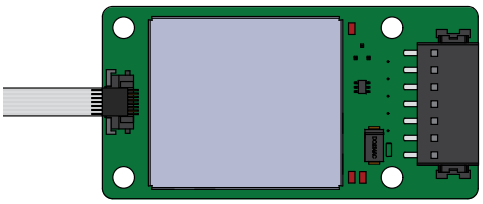


Step 4: Verify the cable is oriented correctly before proceeding.

This image shows the ribbon incorrectly inserted into the cable connector.

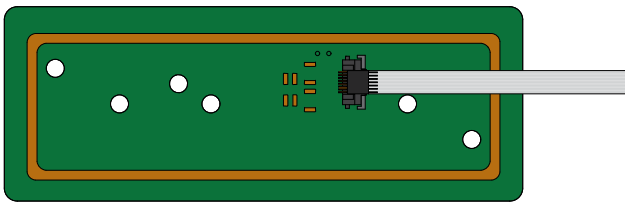


Step 5: While maintaining proper ribbon cable alignment in the connector, firmly push the grey cable locking mechanism to the closed position.



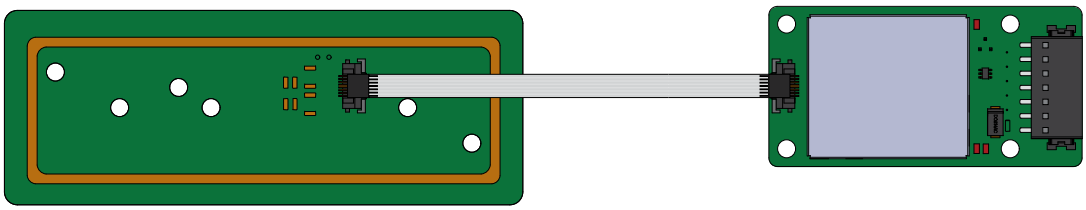
Step 6: Following steps 2 – 5 above, connect the other end of the ribbon cable to the antenna board.

90 mm antenna board shown.



Your completed OEM 200 assembly should look similar.

OEM 200-TTL Main Board coupled with a 90 mm antenna board shown.



Operational Behavior

Powering Up the OEM 200

The input voltage applied to J1 should be between 5V and 16V*. When power is applied to the OEM 200 Main Board, the red power LED1 will be on. See Diagnostic LEDs on page 12 for visual location of LED1.

* ⚠Caution: Application of more that 16V may damage the device.

Communication

The OEM 200 Module can communicate to the host device with either Wiegand output or a TTL serial interface using the OSDP protocol.

Wiegand is the default communication interface. If an OSDP session is initiated over the serial interface, the Wiegand interface will be disabled.

Default Serial Communication Parameters	
Address	0x00
Baud Rate	9600
Data Bits	8
Parity	No Parity
Stop Bits	1 Stop Bit

➔ See Appendix B: OSPD Communication on page 23 for supported OSPD messages

RF Field

The OEM 200 module has a 100 ms cycle time for polling for credentials. This cycle turns the 13.56MHz field on for 42 ms, the off for 18 ms. Then the 125 kHz field is turned on for 20 ms, then off for 20 ms. This cycle is continuously repeats while the OEM 200 is operating in a normal operational mode.

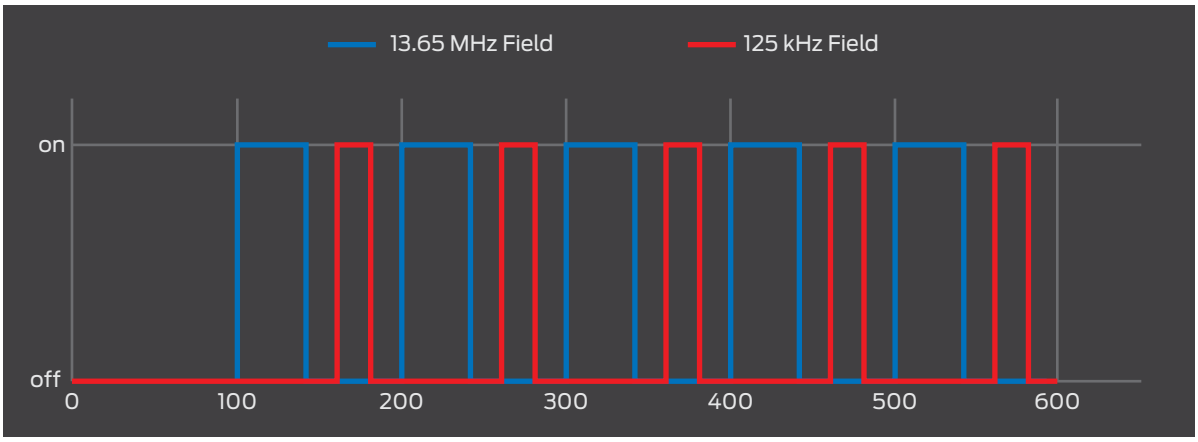
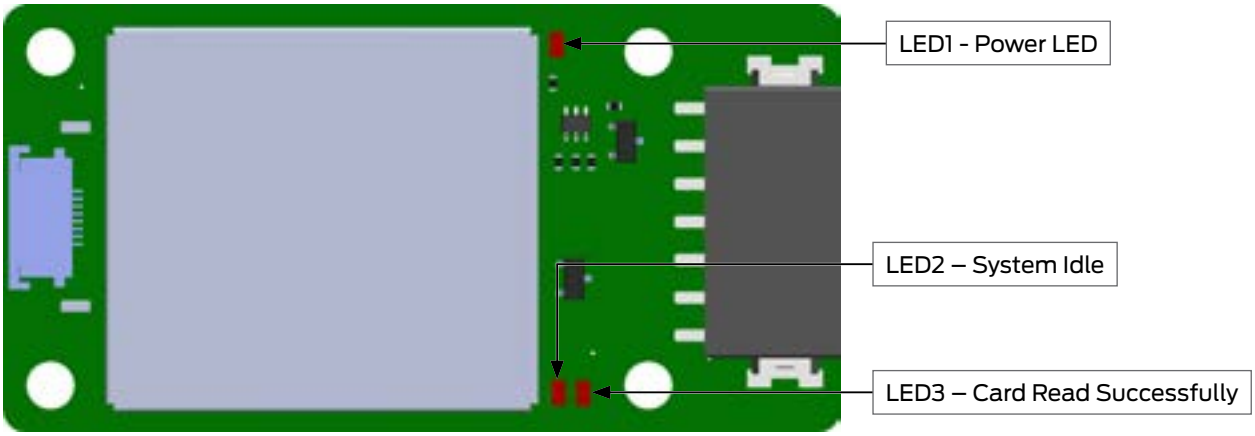


Figure 2.1: High and low frequency field polling cycle, time in milliseconds

Diagnostic LEDs

The OEM 200 Module has three LEDs used for debugging and diagnostics. LED behavior is described in the sections below.



Start-up sequence:

Upon power up, LED1 lights to signify that the OEM 200 is receiving power. Immediately following, the OEM 200 flashes both LED2 and LED3 for 1 second, then flashes LED2 for 0.5 seconds, then flashes both LED2 and LED3 for 1 second, then turns LED2 solid on to indicate the OEM 200 is ready for operation.

During normal operation the LEDs behave as described in the table below

Diagnostic LEDs	
LED	**Behavior**
LED1	Power LED: Turns on when unit is powered on
LED2	Diagnostic LED: LED2 is typically on. LED2 turns off when a card is being read.
LED3	Diagnostic LED: LED3 is typically off. LED3 turns on when a card is successfully read.

The diagnostic LEDs provide feedback information during the Power-On-Self-Test (POST). The table below describes the meanings of each flashing sequence.

Diagnostic LEDs after power on self-test (POST)		
LED 2	**LED 3**	**Meaning**
Solid	Off	Pass the self-test – Idle state
2 short flashes	1 long flash	Not valid personality
2 short flashes	2 long flashes	SAM communication failure
2 short flashes	3 long flashes	RC663 communication failure
4 short flashes	4 long flashes	SAM functional failure

General Output

The General Output is used to notify the host system of OEM 200 activity. A typical use for the General Output is to enable audio or visual user feedback to inform the user of OEM 200 activity. The General Output can be connected directly to a digital input on the host device or connected to an LED and/or buzzer. It is recommended to provide power to an LED or buzzer with a separate power source.

At power on start up the General Output sends out a single pulse for 200 ms.

After a Power-On-Self-Test (POST) the General Output sends out a pulse simultaneously with each short and long LED flash described in the table above.

During normal operation the General Output sends out a single 150 ms pulse when a card is read successfully.

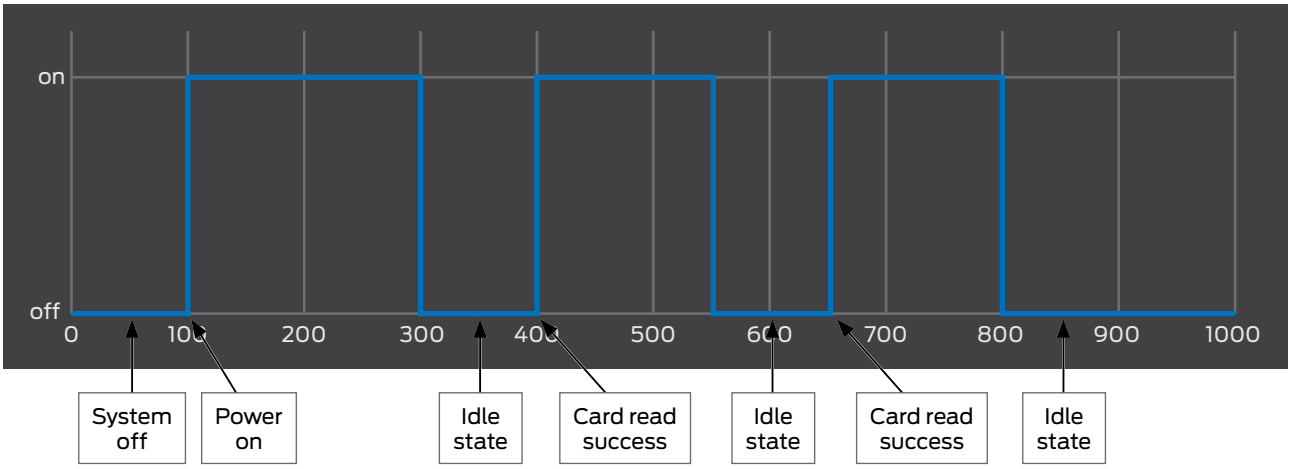


Figure 2.2: General output, time in milliseconds

Reader Configuration

The OEM 200 has the following default configuration parameters set when it leaves the factory.

Parameter	Default Value	Options	Units of Measure
General Output	1 = Enabled	0=Disabled	None
Secure Application 1	MSA On, HID On, AWID On, MFP On	All 16 permutations	None
Prox Report Delay	0= No delay	0.0 – 1.6s, in 0.2s intervals	seconds
OSDP Baud Rate	0=9600 Baud	9600 – 230,400 Baud	Bits per second
OSDP Address	0	0 - 127	Integer address
OSDP Secure Only	0 = Not secure only	1 = secure only	None
Wiegand Output	0= Enabled	1 = Disabled	None
Point of Sale Data Format	1=SMS Express Format	2=ID Only, 3=Hexadecimal	None

If necessary, changes to the default configurations can be achieved. Please contact your Allegion representative for more information.

Design Considerations

Allegion will require acceptable OEM 200 performance in the final integration. Reference legal contract agreement for details

Allegion requests the following information about the OEM 200 integration into the host device to ensure optimum performance of the OEM 200:

- Physical placement of antenna relative to card read location
- Demonstration of acceptable read range performance
- Environmental protection of the OEM 200 from moisture and contaminants

Cable

The OEM 200 comes with a 4 inch flat flex cable to connect the Main board to the Antenna board. For alternate cable length contact Allegion

Avoid creasing, pinching the cable. The cable should be relaxed without tension. Add strain relieve if needed.

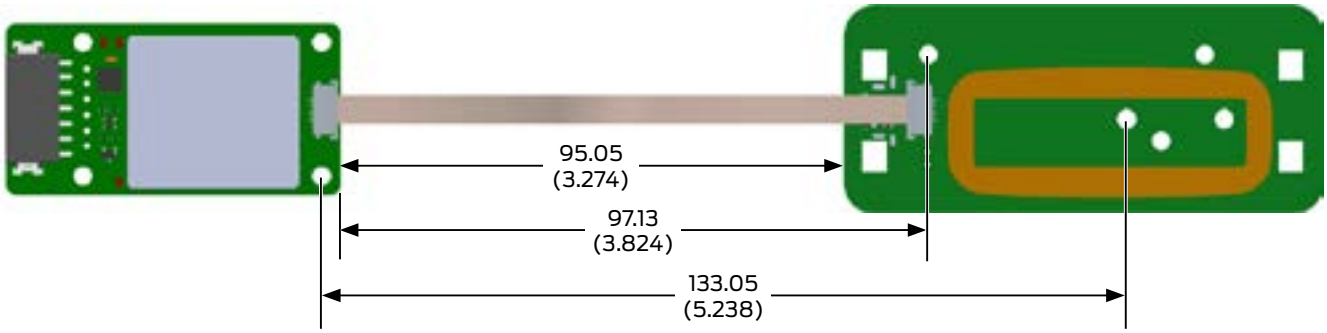


Figure 3.1: Dimensions of the OEM 200 Board connected to an 80 mm Antenna. Dimensions shown are in mm (inches).

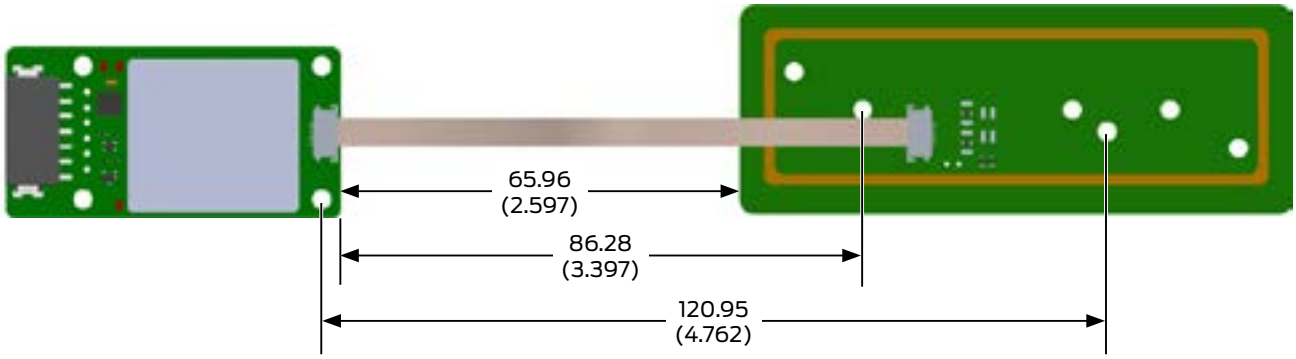


Figure 3.2: Dimensions of the OEM 200 Board connected to a 90 mm Antenna. Dimensions shown are in mm (inches).

Mounting Consideration

The OEM 200 Main board and Antenna board include 0.125 inch mounting holes that can be used to install the OEM 200 into the host device with standoffs, screws, or snap-in bracket (not supplied by Allegion). It is recommended to mount PCBs to a non-conductive dry surface using non-metallic fasteners.

Antenna board placement:

To maximize the read range performance of the OEM 200 place the Antenna Board as close as possible to the location where the credential will be presented. We recommend using non-metallic fasteners to mount the Antenna Board to the end product.

NOTICE

When mounting the Antenna Board we recommend keeping it at least 1 cm away from metal planes. A metal plane within 1 cm from the antenna board can lead to a significant drop in read range performance.

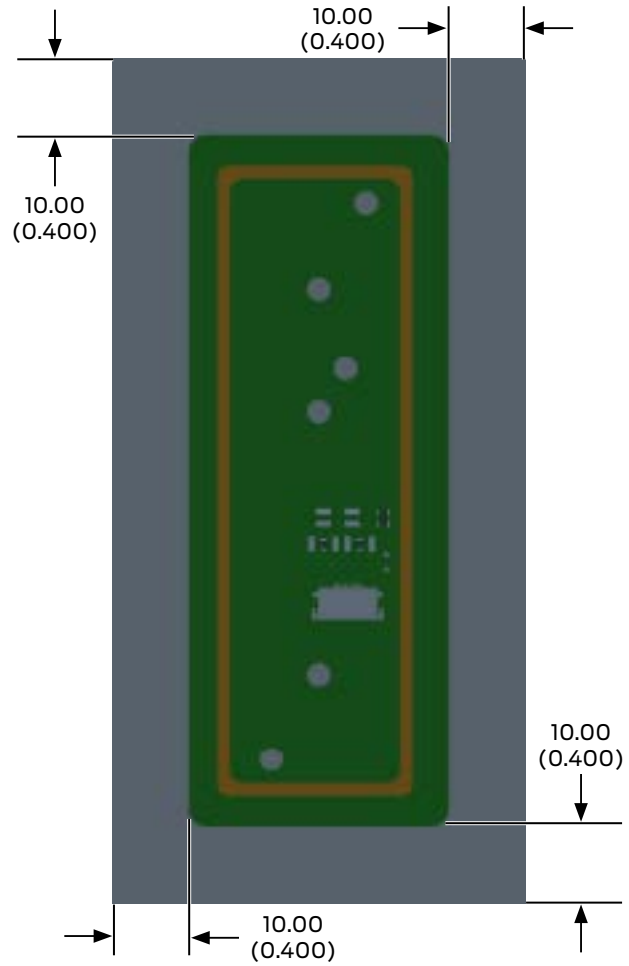


Figure 3.3: Front View: Keep antenna board 10 mm from metallic objects on all sides.

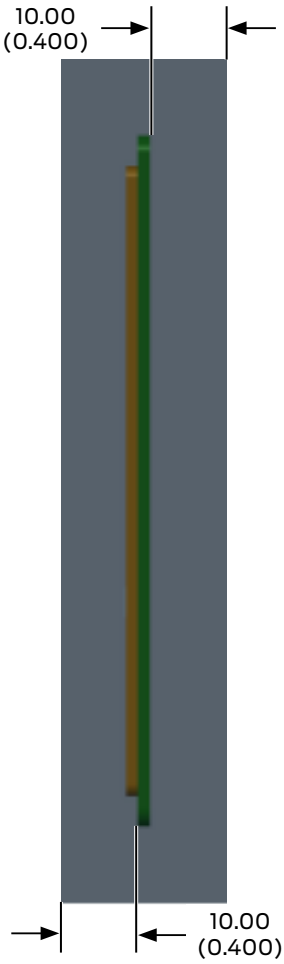


Figure 3.4: Side View: Minimize distance between card presentation and antenna board.

Design the antenna board mounting location such that the user presents the card maximizing alignment of the antenna board. This will help to maximize the read range of the system. Often equipment manufacturers will provide some decal or feature that helps users to see how card orientation is expected to be presented.

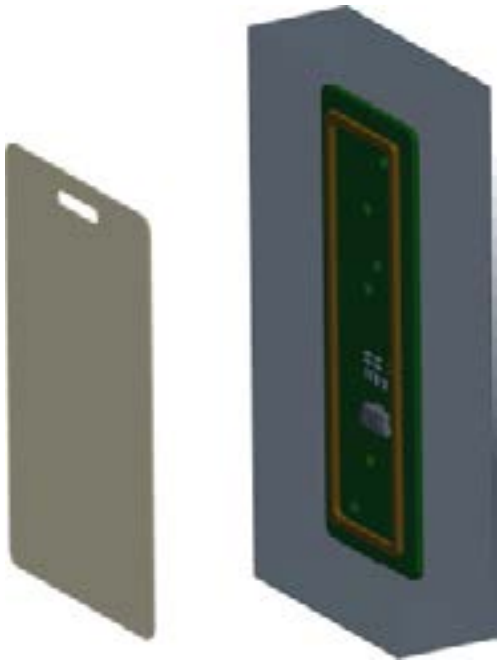


Figure 3.5: Read range will be maximized when the center of the card aligns with the center of the antenna board and the long edges of both are kept parallel.

Figure 3.6: The above image shows good alignment between the card being presented and antenna board.

Environmental

The OEM 200, like nearly all electronics, is susceptible to damage by environment factors. The end product must provide environmental protection from moisture and contamination.

Environmental Factor*	Minimum	Maximum	Nominal
Temperature	-35C (-31F)	65C (149F)	24C (75F)
Humidity	0 %RH	95% RH	55% RH

* Though not all are listed here, there are other environmental factors which could impact the system performance and long term reliability of the end product. Pay careful consideration to other environmental factors such as shock, vibration, radiation, UV exposure, etc.

Electrostatic Discharge (ESD) Precautionary Statement

Electrostatic discharge can damage the OEM 200 assembly. Use caution and focus on these areas when handling and installing the OEM 200 assembly into the end product. The OEM 200 must be handled in an ESD safe environment during assembly of the OEM 200 into an end product. It is recommended that best practices for ESD control be followed whenever handling the OEM 200. Refer to JEDEC 625 for best practices for ESD controls.

- Eliminate static charges from the workplace and ensure proper ESD precautions are used prior to handling electronic assemblies. This is accomplished by grounding operators, equipment, and devices (components and computer boards).
- It is recommended that the OEM 200 be powered off during handling and installation processes.
- Ensure that components and assemblies have proper shielding from static fields when installed into the end product. Proper grounding prevents static charge buildup and electrostatic potential differences. The end product must provide proper ESD protection to the OEM 200 system for operation in the field

EMI Design Consideration

The OEM 200 Module has been pre-scanned and is compliant to FCC part 15 for North America and EN300330 for Europe. Although the OEM 200 Module does meet the EMC regulations for noise emissions as stated above, care must be taken when integrating it into a larger system. A key design tip is to avoid routing the OEM 200 host or antenna cables over or near clock sources, power sources, or high speed signals. A general rule of thumb is to keep the cables routed at least 2 cm away from these types of signals. The further away the better.

Allegion has obtained an EMI scan report for the OEM 200 and this report can be made available upon request. Please contact your Allegion representative for more information. Since the OEM 200 Module may be used in a variety of applications, the responsibility to conform to local regulations is left to the customer. For OEM 200 EMI testing guidance please contact your Allegion representative.

Troubleshooting

Issue	Potential Causes	Action
Cannot read smart or prox card or degraded smart or prox card read range	Antenna cable is disconnected	Make sure Antenna cable is fully engaged with connectors on the Main Board and Antenna Board
		Verify LEDs flash when a smart or prox card is presented
	Antenna Board is near metal object	Separate Antenna Board from metal object and verify read range performance.
		Move Antenna away from metal object if possible
	Main Board is not powered on	Check that power supply is providing power
		Verify LED1 on bottom of Main Board is on
Card data is not received on host's Wiegand interface	Wiring connection is loose or disconnected	Verify Wiegand wiring connection is secure
	An OSDP session is established (which disables Wiegand output)	End the OSDP session or disconnect RS-485
OSDP communication	Wiring connection is loose or disconnected	Verify communication wiring connection is secure
	Communication settings do not match between OEM 200 and host	Verify host communication settings are the expected settings.
		Revert OEM 200 back to default communication and re-establish connection
	Improper use of the OSDP protocol.	Refer to the OSDP protocol standard.
General Output signal not received by host device	Wiring connection is loose or disconnected	Verify General Output wiring connection is secure

Appendix A: Terms and Abbreviations

125 kHz: Radio waves operating at 125 thousand cycles per second. This technology has historically been the standard in proximity card/reader but is beginning to be replaced by faster, more secure 13.56 MHz technology.

13.56 MHz: Radio waves operating at 13.56 million cycles per second allowing read/write and secure, encrypted card and reader communication. Because of the faster communication (compared to 125 kHz proximity technology) between a card and reader, this technology is better suited for biometrics and secure, authenticated transactions.

ASK: Amplitude Shift Keying or modulation – Refers to the process of altering the height of the radio waves to signify the zeros and ones in the binary communication – ASK is the most common form of modulation used in RFID. It is used in both ISO 14443 and ISO 15693 specifications for reader to card communication.

CSN: Card Serial Number. Also known as the UID or Unique Identifier which is specified in the ISO specifications.

DESFire: A flexible, high security, ISO 14443 compliant, contactless smart card technology by NXP.

ESD: Electrostatic Discharge

Firmware: Software in the form of ROM or EEPROM that does not lose memory when power is not maintained.

FSK: Frequency Shift Keying or modulation – the process of altering the frequency of radio waves to signify the zeros and ones in the binary communication.

ISO 14443: International standard regulating contactless, proximity technology, typically representing a read range distance up to 10 centimeters. The advantage products utilizing ISO 14443 have over those utilizing ISO 15693 is that the transaction speed is faster, making security and transaction speed superior for large packets of information such as biometric templates. ISO 14443 is actually divided into two sub-divisions of the standard, A & B. Without going into great detail, ISO 14443A has grown to be the leading standard for access control and transportation and 14443B for banking.

ISO 15693: International standard regulating contactless, vicinity technology, typically representing a distance over 10 centimeters. The advantage ISO 15693 has over ISO 14443 is greater convenience due to longer read ranges and less power consumption.

MIFARE®: A proprietary contactless and dual interface smart card chip technology produced by NXP. Mifare is a well proven RF communication technology for transmitting data between a card and a reader device and is fully compliant with ISO 14443A.

MIFARE® Plus: A high security, ISO 14443 compliant, contactless smart card technology by NXP.

Modulation: The changing of radio waves in a specific manner in order to represent data.

OSDP: Open Supervised Device Protocol is a communication protocol for interfacing one or more Peripheral Devices to a Control Panel.

Protocol: How computers talk to each other – a communication system.

Proximity: A card/credential and reader system utilizing RFID technology in which the credential and reader utilize microprocessors and antennas to communicate without having to come in contact with one another. This technology is usually associated with 125 kHz frequency readers, the historical standard RFID technology in access control.

RS485: Standards for serial multipoint communications lines. These standards represent faster, two-way communication lines rather than the standard Wiegand one-way communication lines prevalent in the access control industry.

Smart Card: A card or credential that contains a built-in microprocessor and memory used for identification and transactions in a number of applications (security, financial, etc.). The card has read/write capability to transfer data from a reader typically to a panel or computer.

UID: See CSN above

Wiegand Format: The most common data format in an access control system consisting of 26 bits of information.

Appendix B: OSDP Communication

OSPD is a master-slave half-duplex protocol where a Control Panel (CP) sends commands to a Peripheral Device (PD) and the PD generates a response. The OEM 200 always behaves as a Peripheral Device

The OEM 200 conforms to rev 2.1.7 of the OSDP standard. The OEM 200 supports secure and non-secure OSDP communication. All responses from the OEM 200 are preceded by 0xFFFF.

Please refer to the OSDP protocol standard maintained by the Security Industry Association: https://www.securityindustry.org/Pages/Standards/OSDP.aspx

Default Serial Communication Parameters	
OSDP Address	0x00
Baud Rate	9600
Data Bits	8
Parity	No Parity
Stop Bits	1 Stop Bit

➔ Note: OSDP Secure is not recommended for use with this product. This is a single threaded application and with the latency of smart card reads bandwidth limitations could be a concern.

Also due to the extended latency of reading smart card technologies, we recommend setting the Control Device parameter of “Maximum Response Timeout” to 500 ms minimum.

OSDP Messages Supported by the OEM 200		
COMMANDS		
Name	**Command Number**	**Description**
osdp_POLL	0x60	Poll
osdp_ID	0x61	ID Report Request
osdp_CAP	0x62	PD Capabilities Request
osdp_LSTAT	0x64	Local Status Report Request
osdp_LED	0x69	Reader Led Control Command
osdp_BUZ	0x6A	Reader Buzzer Control Command
osdp_COMSET	0x6E	PD Communication Configuration Command
osdp_KEYSET	0x75	Encryption Key Set Command
osdp_CHLNG	0x76	Challenge and Secure Session Initialization Rq.
osdp_SCRYPT	0x77	Server Cryptogram
REPLIES		
Name	**Command Number**	**Description**
osdp_ACK	0x40	Command accepted, nothing else to report
osdp_NAK	0x41	Command not processed
osdp_PDID	0x45	PD ID Report
osdp_PDCAP	0x46	PD Capabilities Report
osdp_LSTATR	0x48	Local Status Report
osdp_RAW	0x50	Reader Data – Raw bit image of card data
osdp_COM	0x54	PD Communications Configuration Report
osdp_CCRYPT	0x76	Client's ID, Random Number, and Cryptogram
osdp_RMAC_I	0x78	Initial R-MAC

Appendix C: System Performance Requirements

Measurements Required per Integration Agreement

Successful integration of the OEM 200 into the host system is important to Allegion. Information about physical mounting of the OEM 200, read range performance, and environmental protection should be shared with Allegion to help ensure the successful operation of the OEM 200.

Allegion requires that all integrated OEM 200 systems adhere to the below minimum functional performance requirement. Please refer to your Developer's Agreement for details.

Read Range Performance Minimum Requirement		
Card Frequency	**Card Type**	**Read Range***
125kHz	ASK, FSK	0.375 in minimum, preferred – 0.5 in or greater
13.56MHz	ISO 15693	0.375 in minimum, preferred – 0.5 in or greater
13.56MHz	ISO 14443A MIFARE Classic	0.375 in minimum, preferred – 0.5 in or greater
13.56MHz	ISO 14443A MIFARE DESFire EV1	0.375 in minimum, preferred – 0.5 in or greater
13.56MHz	ISO 14443A MIFARE Plus	0.375 in minimum, preferred – 0.5 in or greater

* Card Read Range as operated in end product

➔ Antenna location inside end product and surrounding materials will affect the read range performance. See **Mounting Consideration** on page 20.

About Allegion

Allegion (NYSE: ALLE) is a global pioneer in seamless access, with leading brands like CISA®, Interflex®, LCN®, Schlage®, SimonsVoss® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion secures people and assets with a range of solutions for homes, businesses, schools and institutions. Allegion had $2.7 billion in revenue in 2018, and sells products in almost 130 countries.

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