Allegion Locks   6

Allegion Locks

The AD and NDE(B)/LE(B) Series electronic locks from Allegion® are designed to provide greater flexibility, functionality, and compatibility with existing access control systems. The series' modular design allows the locks to be customized to fit the needs of current and future field applications.

ACRE partners with Allegion to offer a complete door solution using one of 3 lock configurations: hardwired (AD-300) and/or wireless (AD-400/NDE(B)/LE(B)). With their open-architecture platform, the AD and NDE/LE Series locks can be seamlessly integrated into new and existing DNA Fusion access control systems.

AD-400 Networked Wireless Locks

The Allegion AD-400 is an open-architecture Wireless Access Point Module (WAPM) designed to interface with third-party panels via a PIM400-485 device.

See pages 6-3 through 6-22 for installation information.

AD-300 Networked Wired Locks

The Allegion AD-300 is an open-architecture product designed to interface with access control panels that use the RS-485 protocol.

See pages 6-23 through 6-34 for installation information.

NDE/LE (B) Networked Wireless Locks

The NDE(B) and LE(B) Series locks encompass the Contactless version of the wireless design. The Allegion NDE/LE series locks communicates with the Mercury LP Series controllers via the ENGAGE Gateway via an Ethernet cable or RS-485 2/4 wire connection.

See page 6-35 through 6-51 for installation information.
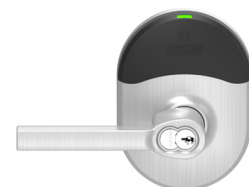
> ⓘ *To simplify installation, the AD Series combines all the hardware components required at the door—the electronic lock, credential reader, request-to-exit, door sensors, etc.—into a single, integrated product.*

> ✎ *The only difference between the NDE(B)/LE(B) locks and the NDE/LE lock designs is the addition of a wired door position sensor located under the latch and strike plate of the NDE(B)/LE(B) locks*

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AD-400 Wireless System

Wireless access solutions provide the benefits of access control without the wires. Unlike traditional wired openings that take several days to install, wireless access solutions can be installed in a fraction of the time.
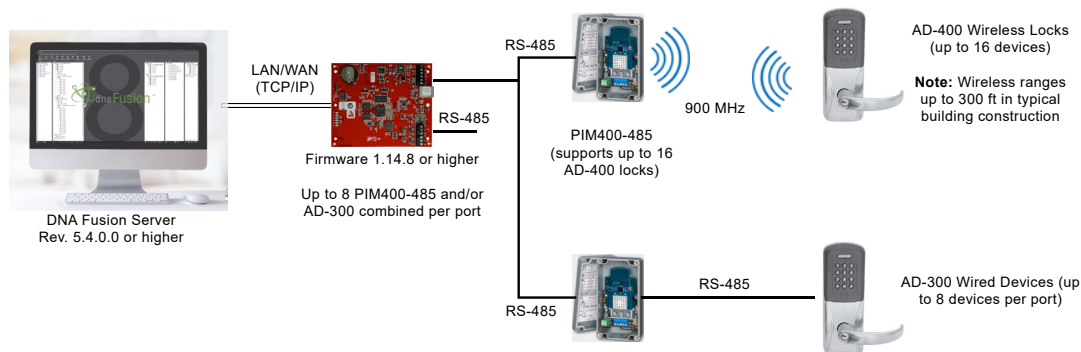
High-secure spread-spectrum transmissions encode signals using 128-bit keys.

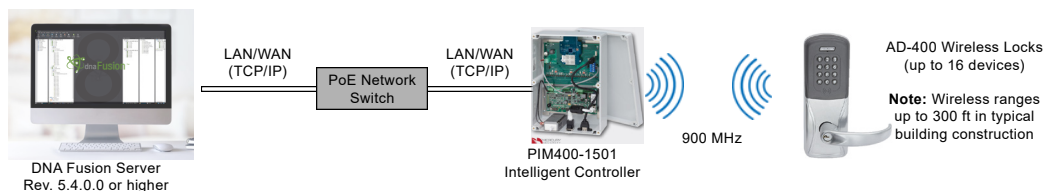A wireless access system contains two (2) different types of modules:

- Panel Interface Module (PIM)
- Wireless Access Point Module (WAPM)

The following diagrams illustrate wireless lock configurations using a PIM400-485 or PIM400-1501.

AD-400 Wireless with PIM 400-485

AD-400 Wireless with PIM 400-1501

Configuration Types

The AD-400 wireless locks can be configured with a PIM400-485 or a PIM400-1501. For information on using a PIM400-485 with a Wireless Gateway, see the Legacy Hardware Manual.

PIM400-485

The PIM400-485 interfaces with the LP2500, LP1501, and LP4502 via a wired RS-485 connection, and it receives card data via RF bit streams from the AD-400 wireless lock. The PIM400-485 receives authorization to unlock or open an ACM from the SSP controller; then, it transmits the command to the linked AD-400 lock.

One PIM supports up to 16 AD-400 locks in many combinations. However, if wiring to an LP1502 or legacy controller, only one PIM can be used per wireless reader gateway.

PIM400-1501

The PIM400-1501 combines the strength of the wireless PIM400-485 with the customized functionality of the LP1501 to provide an IP-addressable access control solution for up to 16 AD wireless devices. The PIM400-1501 is pre-wired with external RJ-45 and USB connections.

The device supports Power over Ethernet (PoE/+) or a 12 Vdc power supply. It also has the capacity to store 240,000 cardholders and 50,000 audit events.

Installation Overview

Location Placement

The PIM400-485 and PIM400-1501 communicate to the AD-400(s) using radio frequency (RF) signals, which are diminished by walls, distance, metal objects, and other barriers. Consider the following factors when installing the PIM400.

- Mount the PIM400 within 200 horizontal feet (61 meters) of each AD-400 wireless lock. Communication may be possible up to 1000 feet (305 meters) if clear line-of-sight is available in the building construction.

- Do NOT mount the AD-400(s) and the PIM400 on separate floors; this may diminish the signal and device functionality.

- Do NOT mount the PIM400 on a metal surface. Keep the PIM at least one inch away from any metal in all directions.

- The signal will not pass through metal walls or metal mesh inside the walls (stucco). Use a remote antenna module located outside the room when necessary.

- Moving vehicles will interrupt the signal; if vehicles may temporarily block the signal, reduce the placement distance by half.

- For optimal communication, mount the PIM400 so that the antenna is vertical.

> *Locations and wiring methods must be in accordance with the National Electrical Code (NEC), ANSI/NFPA 70.*

Pre-Installation Test

Once the locations for the PIM400 and AD-400(s) have been determined, test the performance prior to permanent installation.

1. Temporarily **mount** the AD-400(s) to the access control point (door, gate, etc.) as close as possible to its exact mounting location. Do NOT connect the power yet.

2. Temporarily **mount** the PIM400 as close to the exact mounting location and orientation as possible.

3. **Verify** that the antenna is in the horizontal position.

4. **Power** the PIM400 with a 12 or 24 Vdc power supply capable of delivering 250 mA.

   See Powering the PIM400-485/1501 instructions on page 6-5 or 6-13.

5. **Connect** the Handheld Device (HHD) with the Schlage Utility Software (SUS) to the PIM400.

   See Programming the PIM400-485/1501 instructions on page 6-6 or 6-14.

6. **Verify** that the access point is closed, then **install** the batteries or **connect** a 12 to 24 Vdc power supply to the AD-400(s).

   Each power supply must be capable of delivering 250 mA.

7. **Place** the AD-400(s) into Link Mode.

   See Linking the PIM400-485/1501 to an AD-400 Lock instructions on page 6-7 or 6-14.

> *The green LED on the AD-400(s) will flash to indicate that it has successfully linked to the PIM400. If linking is unsuccessful, move the PIM six to ten inches in any direction (up, down, sideways) and repeat Step 7 until all AD-400s link successfully.*

Installation

Once the PIM400 is successfully linked to the AD-400(s), proceed with permanently installing the components. See the Allegion PIM400-485/1501 User Guide for more information on drill holes and mounting procedures.

> *Avoid routing the wires near the internal antenna and the tamper detection mechanism. Improper wire routing may reduce RF performance and/or prevent tamper detection. Wire routing inside the enclosure should be as short as possible.*

PIM400-485

Each PIM400-485 is capable of communicating with a maximum of 16 AD-400 wireless locks and 64 doors (ACMs). The PIM and lock use 900 MHz spread-spectrum RF technology to communicate.

Internal Antenna

External Antenna Connector

Optical Transmitter (LED6)
Power/Tamper LED (LED1)

Link 1 LED (LED4)
Link 1 Button (SW1)
Power Connector (J2)
2|4 Wire Jumpers (P5)

Optical Receiver (U6)

Antenna Module

Link 2 LED (LED5)
Receive LED (LED2)
Transmit LED (LED3)

Reset Button (SW3)
Link 2 Button (S3)
USB Connector (J1)

Aux/Tamper
Connector (P6)
Not used

RS485
Connector (P4)

PIM400-485 (Version 2)

> (i) *The diagram above illustrates Version 2 of the PIM400-485. For Version 1 configuration information, refer to the Legacy Hardware Manual.*

Powering the PIM400-485

The PIM400-485 accepts a UL 294 power supply capable of sourcing at least 250 mA at 12 or 24 Vdc. Locate the power source as close to the PIM400-485 as possible. Connect the power supply with a minimum of 18 AWG wire and a maximum 1000-ft run length. Power input is non-polarized.

CONNECTOR	SIGNAL
J2	12 to 24 Vdc (+)
	DC Ground (-)

> ● *Connect a battery backup to the PIM-400 to prevent information from being lost if the power is interrupted.*

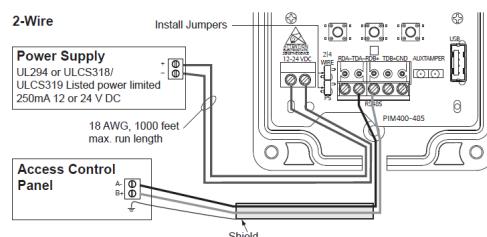### Connecting the PIM400-485 to the LP2500

The PIM400-485 communicates to the LP2500 via a 2-wire RS-485 interface on the P4 terminal block. The PIM will connect to the LP2500 on either of the controller's RS-485 downstream ports (Ports 2 and 3). Use twisted pair(s) (min. 24 AWG) with shield for communication.

1. **Set** the jumper on the LP2500 to OFF for the downstream port connected to the PIM400-485.

2. **Connect** the PIM400-485 to the LP2500 on Port 2 or 3 using the following table:

LP2500	PIM400-485	DESCRIPTION
TR+	RDA- (P4-1)	Receive Data (-)
TR-	RDB+ (P4-3)	Receive Data (+)
GND	GND (P4-5)	Ground

3. **Remove** the EOL Termination Jumper from the LP2500.

4. **Connect** the Handheld Device (HHD) with the Schlage Utility Software (SUS) to the PIM.

   The PIM is placed into Link Mode. Continue to Programming the PIM400-485 on page 6-6.

Connecting the PIM400-485 to the LP1501

The PIM400-485 communicates with the LP1501 via 2 wire RS-485 interface by wiring the PIM400-485 to the first reader port (TB2) of the LP1501.

1. **Connect** the PIM400-485 to the LP1501 using the following table.

> ⓘ For best results, the communication wiring should not exceed 1,000 feet. Use twisted pairs (min. 24 AWG) with shield.

LP1501	PIM400-485	DESCRIPTION
DAT	RDA- (P4-1)	Receive Data (-)
CLK	RDB+ (P4-3)	Receive Data (+)
GND	GND (P4-5)	Ground

2. **Connect** the Handheld Device (HHD) with the Schlage Utility Software to the PIM400.

   The PIM is set to Link Mode. Continue to Programming the PIM400-485 instructions below.

Connecting the PIM400-485 to the LP4502

The PIM400-485 communicates to the LP4502 via the TB-8/9 connector. Use twisted pair(s) (min. 24 AWG) with shield for communication.

1. **Connect** the PIM400-485 to the LP4502 using the following table.

   Use twisted pairs (min. 24 AWG) between the LP4502's TB-8/9 connection and the PIM's RS-485 connection. Install termination jumpers on end-of-line devices only.

TB-8/9	PIM	DESCRIPTION
DAT/D0	RDA- (P4-1)	Receive Data (-)
CLK/D1	RDB+ (P4-3)	Receive Data (+)
GND	GND (P4-5)	Signal Ground

2. **Connect** the Handheld Device (HHD) with the Schlage Utility Software to the PIM400.

   The PIM is set to Link Mode. Continue to Programming the PIM400-485 instructions below.

RS-485 Downstream Connection

If multiple PIM400-485s will share the same downstream port with other RS-485 devices, the PIMs must be addressed in consecutive order (e.g. Physical Address 1-10 for PIMs and 11-20 for other RS-485 devices). The same concept applies when configuring doors within the DNA Fusion software.

Programming the PIM400-485

To program the PIM400-485, the Handheld Device (HHD) must be coupled with the PIM device. See page 25 in the Schlage Utility Software Guide for more information.

1. **Verify** that the PIM400-485 is wired to the controller.

2. **Connect** the HHD to the PIM400-485 using the supplied USB cable.

3. **Log in** to the Schlage Utility Software (SUS) as a Manager.

   The PIM400-485 appears at the bottom.

4. **Select** Device Options.

5. **Select** PIM Properties.

6. From the Edit tab, **enter** a Unique ID (Address).

   This information will be used when configuring the PIM in the DNA Fusion software (Physical Address).

7. **Enter** the Low Door and High Door numbers to match the number of locks that will be linked.

   Each PIM must have a unique set of door numbers (maximum of 16 per PIM400-485).

   Example: LP2500 Controller

   - PIM400-485 #1: Low Door = 0 / High Door = 5

- PIM400-485 #2: Low Door = 6 / High Door = 10

When the doors are programmed in DNA Fusion, they will be ACM 1-10. Doors must be added in order of low to high from PIM #1 to PIM #2.

8. If the reader mode will be set via DNA Fusion, **enable** the Wakeup on Radio feature.

    See page 6-19 for more information.

9. **Continue** to Linking the PIM400-485 to an AD-400 Lock on page 6-7.

Linking the PIM400-485 to an AD-400 Lock

The Schlage Utility Software (SUS) is used to place the PIM into Link Mode. For more information on the SUS, refer to the Schlage Utility Software User Guide.

> ✎ *Ensure that no other PIM400s are in Link Mode during this process; only one AD-400 can be linked at a time.*

1. With the PIM400 connected to the Handheld Device (HHD), **select** Device Options.

2. **Select** the PIM Properties option, then **select** the Link tab.

3. **Select** the Door Number from the drop-down list.

    The PIM400 will stay in Link Mode for up to 30 minutes.

4. **Open** the AD-400 door and **hold down** the inside lever to create a Request-to-Exit (REX) condition.

5. While holding the lever, **present** a card to the reader or, if using a keypad reader, **press** the "#" key.

6. **Hold** the lever down until the AD-400's Schlage button starts to blink red.

7. **Release** the inside lever.

    If successful, the Schlage button will blink green and the beeper will sound. If the link fails, the button will blink red 3 times and 5 short beeps will sound.

    The linked door will appear in the SUS and the PIM400-485 will automatically exit the Link Mode.

8. **Repeat** steps 1-7 to link all remaining AD-400 locks to the PIM400-485.

Adding the PIM400-485 in DNA Fusion

1. **Launch** DNA Fusion.

2. **Right-click** on the Controller (LP2500, LP1501, or LP4502) that is attached to the PIM400-485 and **select** Properties.

    The Controller Properties dialog opens.

3. In the Downstream Ports section, **set** the Baud Rate to 9600 for the port attached to the PIM400-485.

4. **Click** OK to save the settings.

5. **Right-click** on the Controller in the Hardware Browser and **select** Add then Add Subcontroller.

    The Subcontroller Properties dialog opens.

6. **Select** PIM400-485 from the Type / Preview drop-down.

7. **Verify** that the Physical Address (set in Step 6 of Programming the PIM400-485) and the SSP Relay Channel are correct.

    If needed, change the address and/or port to the correct settings.

8. **Click** OK to add the subcontroller to the system.

    The PIM Subcontroller appears in the Hardware Browser.
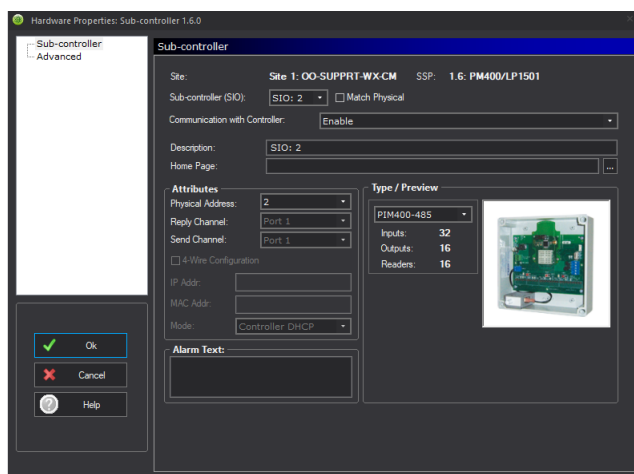
Configuring the Doors

It is important to configure the PIM400-485 objects in a sequential order. Program the first reader, output, and inputs until all doors linked to the PIM are programmed.

1. In the Hardware Browser, **expand** the PIM Subcontroller and **locate** the first Reader.

2. **Right-click** on the Reader and **select** Add Door / Use Default.

    The NEW Door dialog opens.

3. **Verify** that each door is assigned a reader, door contact, REX, and strike.

4. **Continue** adding doors in order (1-15) until all doors are configured.
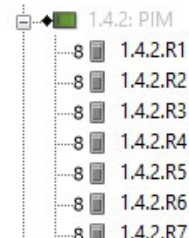
Status LEDs

LED	Description	Indicator
1	Power/Tamper Status	Solid Green = Power Applied Flashing Green = Tamper Detected
2 & 3	SSP Communication Status (Receive/Transmit)	Continuous Flash = Communication Activity
4 & 5	AD Lock Communication Status (Link 1/Link 2)	Link 1 (LED 4) Blinking = AD Lock is assigned an odd number Link 2 (LED 5) Blinking = AD Lock is assigned an even number

Jumper Settings

Jumper(s)	Set At	Description
P5	Both ON	RS-485 Port (P4) is 2-Wire Interface
	Both OFF	RS-485 Port (P4) is 4-Wire Interface

Wiring Connections

PIM CONNECTOR	PIM SIGNAL	SSP SIGNAL	DESCRIPTION
J1			USB Connector
J2	+	12 or 24 Vdc	Power Input
	-	DC Ground	
P4	RDA-	Receive Data (-)	RS-485 Communication Port
	TDA-	Transmit Data (-)	2-wire: Install both 2|4 jumpers (P5)
	RDB+	Receive Data (+)	4-wire: Remove both 2|4 jumpers (P5)
	TDB+	Transmit Data (+)	
	GND	Signal Ground	
P6			Aux/Tamper Connector (Not Used)

Buttons

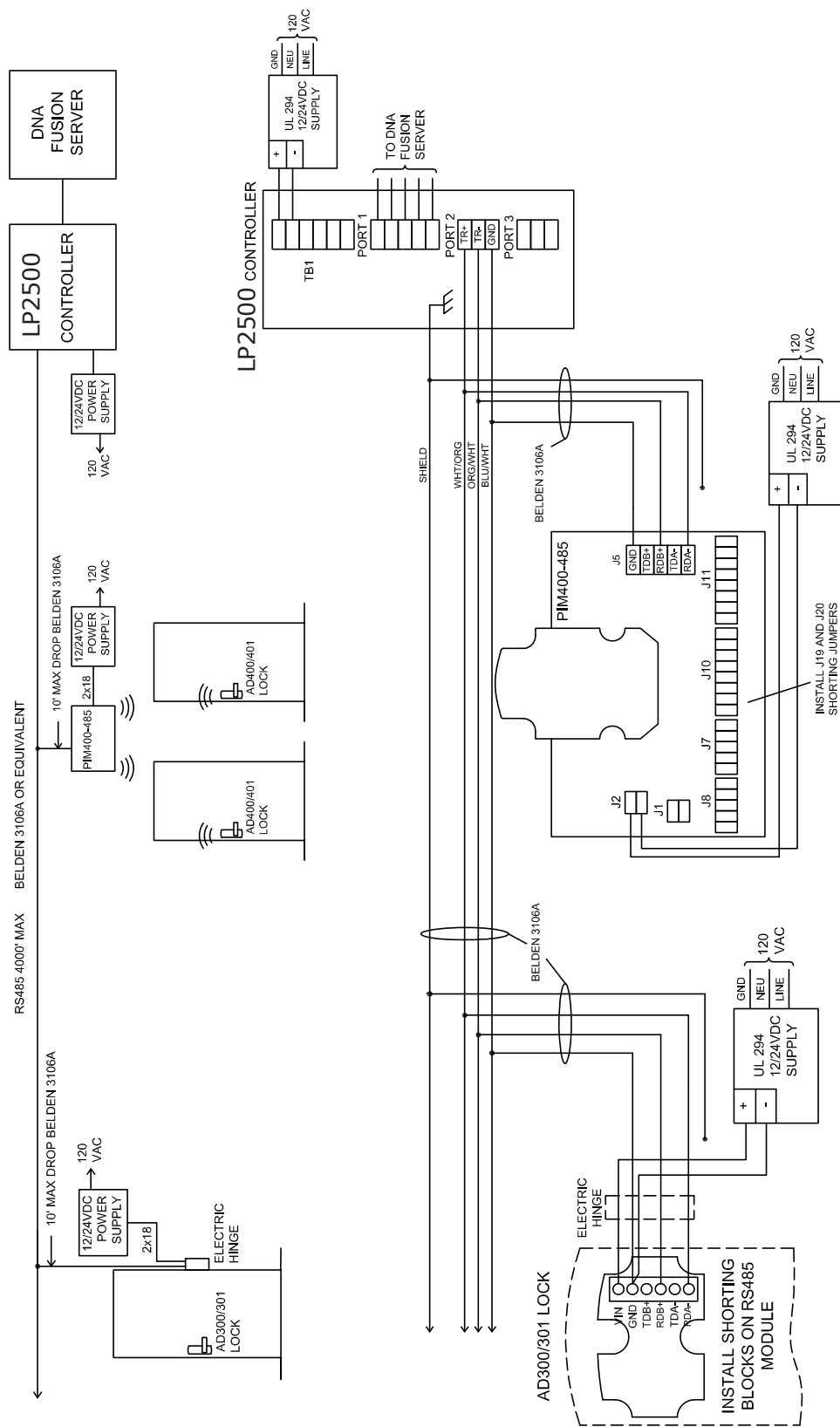| SWITCH	COMPONENT	DESCRIPTION
SW3	Reset Button	If pressed, resets the PIM400-485.

Factory Default Reset

If the PIM400-485 is reset to factory default settings, all configuration information will be deleted.

1. **Press** and **hold** the Link 1 and Link 2 buttons for about three (3) seconds.

   The red LEDs next to the Link buttons will flash while configuration takes place.

2. **Release** the Link buttons.

   The green LEDs next to the Link buttons will flash three (3) times when configuration is complete.

NOTES:

LP2500 with AD-400 & PIM400-485

LP2500 CONTROLLER

DNA FUSION SERVER

LP2500 CONTROLLER

TO DNA FUSION SERVER

UL 294 12/24VDC SUPPLY

GND / NEU / LINE 120 VAC

TB1 PORT 1 PORT 2 PORT 3

TR+ TR- GND

SHIELD

WHT/ORG ORG/WHT BLU/WHT

BELDEN 3106A

PIM400-485

GND TDB+ RDB+ TDA+ RDA- J5

J11 J10 J7 J8 J2 J1

INSTALL J19 AND J20 SHORTING JUMPERS

UL 294 12/24VDC SUPPLY

GND / NEU / LINE 120 VAC

BELDEN 3106A

ELECTRIC HINGE

AD300/301 LOCK

IN GND TDB+ RDB+ TDA+ RDA-

INSTALL SHORTING BLOCKS ON RS485 MODULE

UL 294 12/24VDC SUPPLY

GND / NEU / LINE 120 VAC

RS485 4000' MAX   BELDEN 3106A OR EQUIVALENT

10 MAX DROP BELDEN 3106A

12/24VDC POWER SUPPLY   120 VAC

10 MAX DROP BELDEN 3106A

12/24VDC POWER SUPPLY   120 VAC

PIM400-485   2x18

AD400/401 LOCK

AD400/401 LOCK

12/24VDC POWER SUPPLY   120 VAC

2x18

ELECTRIC HINGE

AD300/301 LOCK

OPERATION:
SSP-EP SUPPORTS TWO RS485 DATA LINES WITH UP TO EIGHT EITHER AD300/301 OR PIM400-485 COMBINED PER PORT AND A MAXIMUM OF SIXTY-FOUR READERS PER SSP-EP SPREAD ACROSS A MAXIMUM OF SIXTEEN PIM400-485 AND AD300/301 COMBINED.

SSP-EP PORT 1 CONNECTS DNA FUSION SERVER TO SSP-EP AND PORTS 2 AND 3 ARE RS485 DATA LINES.

EARTH GROUND SHIELD ON BELDEN 3106A CABLE AT SSP-EP CONTROLLER ONLY.

UL 294 POWER SUPPLIES USED SHOULD NOT BOND EARTH GROUND TO SIGNAL GROUND.

IF PLENUM RATED CABLE IS REQUIRED USE BELDEN 82842 OR EQUIVALENT.

NOTE: CONFIGURATION HAS NOT BEEN TESTED BY ALLEGION BUT HAS BEEN REVIEWED AND APPROVED BY OPEN OPTIONS. WIRING SHOWN REFLECTS WIRING FROM SSP-EP TO PIM400-485 AND AD300/301 ONLY. ADDITIONAL WIRING WILL BE REQUIRED THAT IS NOT SHOWN HERE, WIRING SHOWN REFLECTS WIRING FROM SSP-EP TO PIM400-485 AND AD300/301 ONLY.

NOTES:
1) ALL LOW VOLTAGE WIRING TO BE STANDARD, MULTI-CONDUCTOR COLOR CODED WITHOUT SPLICES.

2) WIRING TO CONFORM TO APPLICABLE NATIONAL, STATE AND LOCAL ELECTRICAL CODES.

3) REFER TO SPECIFIC PRODUCT INSTALLATION INSTRUCTIONS FOR SPECIFIC WIRING REQUIREMENTS.

4) THIS DRAWING IS FOR GRAPHICAL REPRESENTATION OF PRODUCTS DETAILED IN THE HARDWARE SET ONLY.

5) * CONDUCTOR COUNT TO BE DETERMINED BY ACCESS CONTROL PANEL PROVIDER.

TITLE: OPEN OPTIONS DNA FUSION FUSION SSP-EP AND AD300/301 OR PIM400-485 AD400/401	DWG NO: 9121114-5 OPENOP	REV E
	109600	
copyright 2013	DRAWN/CHECKED BY: BRENDA DOVE 08/01/12	
APPROVED BY: WILLIAM MURPHEY 06/11/13		
DATE DRAWN: 09-12-11	REVISION DATE: 11-05-13	

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PIM400-1501

The PIM400-1501 intelligent controller combines the PIM400-485 (Version 1) and LP1501 boards into a single product. It can be centrally managed by an IP network connection, which allows it to communicate over an existing network without the need for additional wiring requirements such as RS-232 or RS-485 cables. The PIM400-1501 is capable of managing a combination of AD-400 locksets, WPR400 portable readers, and WRI400 reader interfaces.

The PIM400-1501 is pre-wired with external RJ-45 and USB connections. To further simplify installation, the device can receive either Power over Ethernet (PoE/+) or a 12 Vdc power supply.
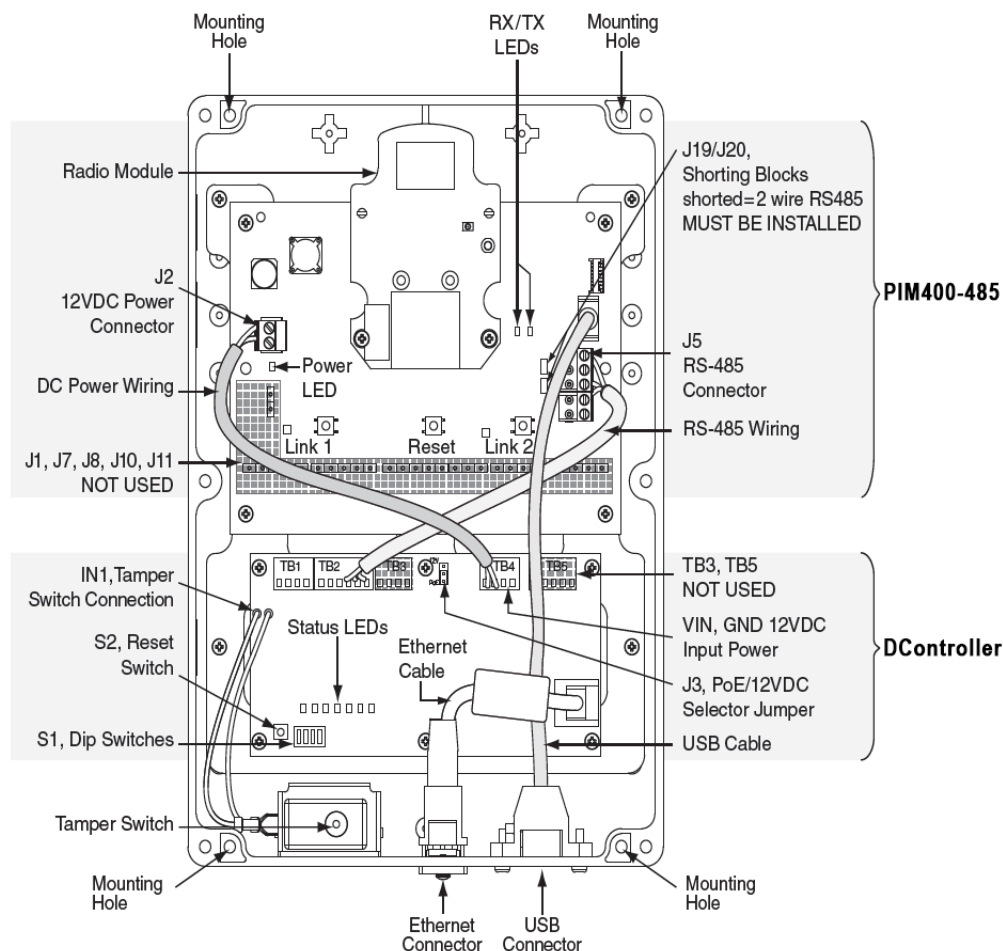
Powering the PIM400-1501

The PIM400-1501 accepts either PoE or a UL 294 Listed 12 Vdc power supply ± 10% 900 mA maximum. If using an external power supply, locate the power source as close to the PIM400-1501 as possible. Power connections should be made with a minimum of 18 AWG wire on the PIM's J2 connector.

> *Connect a battery backup to the PIM400-1501 to prevent information from being lost if the power is interrupted.*

Connecting the PIM400-1501 to DNA Fusion

The PIM400-1501 communicates to DNA Fusion via the Ethernet connector.

1. **Connect** the Cat5e Ethernet cable to the PIM400-1501.

    The green LED on the Ethernet port will light up when connected to a live network.

2. **Connect** the opposite Cat5e Ethernet connector to the network.

3. **Continue** to *Assigning an IP Address to the PIM400-1501* on page 6-14.

Assigning an IP Address to the PIM400-1501

After the PIM is connected to the network, it must be assigned an IP address using the MercZeroConf tool. The device will be displayed as an MSC Server. See page 2-3 for more information on the hardware discovery tools.

1. **Verify** that the PIM400-1501 is connected to the network.
2. **Set** DIP Switch 2 to the ON position and all other DIP switches to OFF.
3. **Open** the MercZeroConf tool and **locate** the PIM400-1501 using the MAC address.
4. **Double-click** on the PIM400-1501.
   The Configuration screen opens.
5. **Select** Network from the dialog menu.
   The Network Properties dialog opens.
6. **Select** the Use Static IP Configuration option and **enter** the IP Address, Subnet Mask, Default Gateway, and DNS Server Address information.
7. **Click** the Save Changes & Reboot button to apply the IP configuration to the controller.
   The PIM400-1501 reboots.
8. **Set** DIP Switch 1 to the ON position and all other DIP switches to the OFF position.
9. **Cycle** power to the PIM.

Programming the PIM400-1501

In order to program the PIM400-1501, it must be coupled with the Handheld Device (HHD) via the Schlage Utility Software (SUS). When the SUS is connected to the PIM400-1501, it interrupts the RS-485 communication between the PIM400-485 and DNA Fusion. The PIM400-1501 cannot control door access during this time.

1. **Plug** the HHD into the PIM1501-400 using the supplied USB cable.
2. **Log in** to the Schlage Utility Software (SUS) as a Manager.
   The PIM400-1501 appears at the bottom as a PIM400-485 RSI.
3. **Select** Device Options.
4. **Select** PIM Properties.
5. From the Edit tab, **enter** the RS-485 Address.
   This information will be used when configuring the PIM in the DNA Fusion software (Physical Address).
6. If needed, **enter** the Low Door and High Door numbers to match the number of locks to be linked.
   Each PIM must have a unique set of door numbers.
7. **Enable** the Wakeup on Radio feature.
   See page 6-19 for information on setting up the Wakeup On Radio feature.
8. **Continue** to Linking the PIM400-1501 to an AD-400 Lock instructions below.

Linking the PIM400-1501 to an AD-400 Lock

The Schlage Utility Software (SUS) is used to place the PIM into Link Mode. For more information on the SUS, refer to the Schlage Utility Software User Guide.

1. With the PIM400 connected to the Handheld Device (HHD), **select** Device Options.
2. **Select** the PIM Properties option, then **select** the Link tab.
3. **Select** the Door Number from the drop-down list.
   The PIM400 will stay in the link mode for up to 30 minutes.
4. **Open** the AD-400 door and **hold down** the inside lever to create a Request-to-Exit (REX) condition.
5. While holding the lever, **present** a card to the reader or, if using a keypad reader, **press** the "#" key.
6. **Hold** the lever down until the AD-400's Schlage button starts to blink red.
7. **Release** the inside lever.
   If successful, the Schlage button will blink green and the beeper will sound. If the link fails, the button will blink red 3 times and 5 short beeps will sound.
   The linked door will appear in the SUS and the PIM400 will automatically exit the Link Mode.
8. **Repeat** steps 1-7 to link all remaining AD-400 locks to the PIM400-1501.

Adding the PIM400-1501 to DNA Fusion

1. **Launch** DNAFusion.

2. From the Hardware Browser, **right-click** on the Site and **select** Add Channel.

   The Add Channel dialog appears.

3. **Configure** a TCP/IP channel and **click** OK.

4. **Right-click** on the Channel and **select** Add SSP.

   The Controller Properties dialog opens.
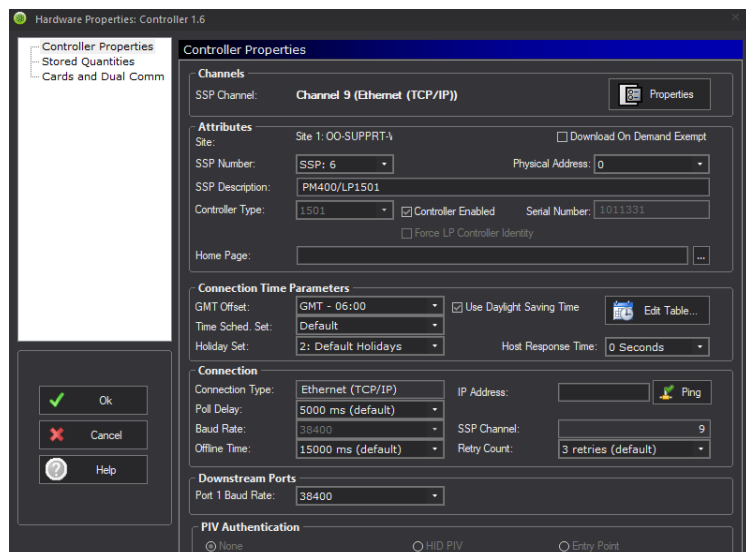
5. **Select** PIM400-1501 from the Controller Type drop-down.

6. **Enter** the IP Address of the PIM.

7. **Configure** the remaining properties as needed.

8. **Click** OK to save the settings.

   The PIM400-1501 appears in the Hardware Browser; **expand** the PIM400-1501 object to view the PIM400-485 subcontroller.

Adding the AD-400 Lock Doors

It is important to configure the PIM400-485 objects in a sequential order. Program the first reader, output, and inputs until all doors linked the PIM are programmed.

Identify a reader, door contact, REX, and strike for each AD-400 lock.

1. In the Hardware Browser, **expand** the PIM Subcontroller and **locate** the first Reader.

2. **Right-click** on the Reader and **select** Add Door / Use Default.

   The NEW Door dialog opens.

3. **Verify** that each door is assigned a reader, door contact, REX, and strike.

4. **Continue** adding doors in sequential order (1-15) until all doors are configured.
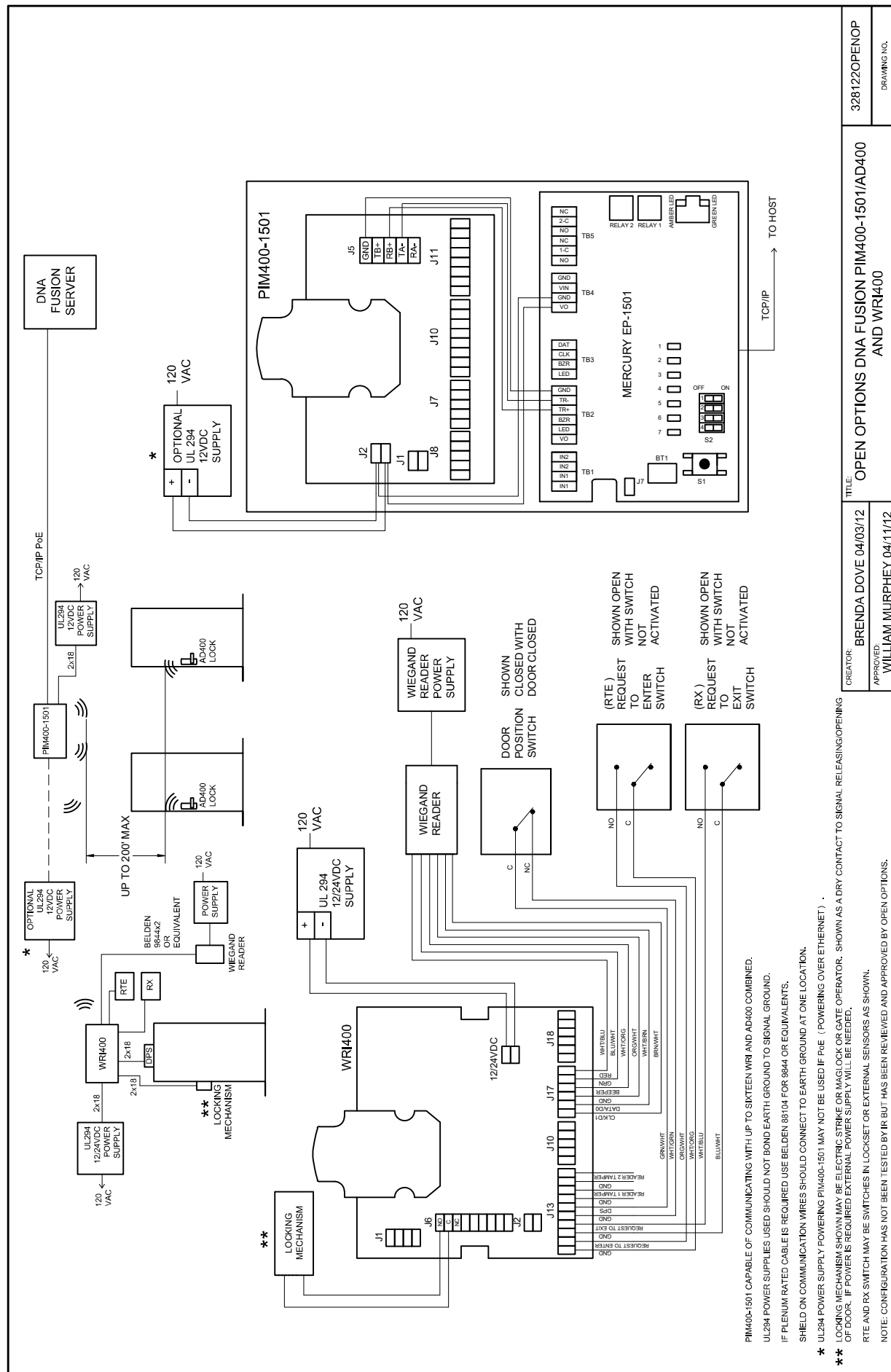
   > ✎ **Verify** *that no other PIM400s are in* Link Mode *during this process; only one AD-400 can be linked at a time.*

5. **Configure** the Door Properties and **click** OK.

   Each door is added to the Hardware Browser.

   > ⓘ *Additional inputs and outputs are not available. The PIM400-1501 does not support wall-mount readers, AD-300s, or additional PIM400s.*

PIM400-1501 with AD-400 Connection

TITLE: OPEN OPTIONS DNA FUSION PIM400-1501/AD400 AND WRI400

DRAWING NO. 328122OPENOP

CREATOR: BRENDA DOVE 04/03/12

APPROVED: WILLIAM MURPHEY 04/11/12

PIM400-1501 CAPABLE OF COMMUNICATING WITH UP TO SIXTEEN WRI AND AD400 COMBINED.

UL294 POWER SUPPLIES USED SHOULD NOT BOND EARTH GROUND TO SIGNAL GROUND.

IF PLENUM RATED CABLE IS REQUIRED USE BELDEN 83104 FOR 9844 OR EQUIVALENTS.

SHIELD ON COMMUNICATION WIRES SHOULD CONNECT TO EARTH GROUND AT ONE LOCATION.

* UL294 POWER SUPPLY POWERING PIM400-1501 MAY NOT BE USED IF FoE (POWERING OVER ETHERNET) .

** LOCKING MECHANISM SHOWN MAY BE ELECTRIC STRIKE OR MAGLOCK OR GATE OPERATOR. SHOWN AS A DRY CONTACT TO SIGNAL RELEASING/OPENING OF DOOR. IF POWER IS REQUIRED EXTERNAL POWER SUPPLY WILL BE NEEDED.

RTE AND RX SWITCH MAY BE SWITCHES IN LOCKSET OR EXTERNAL SENSORS AS SHOWN.

NOTE: CONFIGURATION HAS NOT BEEN TESTED BY IR BUT HAS BEEN REVIEWED AND APPROVED BY OPEN OPTIONS.

DIP Switch Settings

The four DIP switches on S1 configure the operating mode of the PIM400-1501 processor. DIP switches are read on power-up except where noted. Pressing the S2 button causes the LP1501 portion of the PIM400-1501 to reset. The PIM400-485 portion has a separate reset button.

DESCRIPTION	S1	S2	S3	S4
Use normal operating mode.	OFF	OFF	OFF	OFF
After initialization, enable default User Name (admin) and Password (password). Switch is read on the fly; no need to reboot.	ON	OFF	OFF	OFF
Factory Default Network Connection Parameters • Network: Static IP Address = 192.168.0.251 • Subnet Mask: 255.255.0.0 • Default Gateway: 192.168.0.1 • DNS Server: 192.168.0.1 • Host Port: IP Server, No Encryption, Port 3001 • Communication Address: 0	OFF	ON	OFF	OFF
OEM Default Communication Parameters With the Schlage OEM code, the network connection parameters are set by DHCP. The DHCP host name is "MAC" followed by the 12-digit MAC address of the device (e.g., MACxxxxxxxxxxxx). If a different OEM code besides Schlage is loaded into the PIM400-1501, the OEM default communication parameters may be different than DHCP.	ON	ON	OFF	OFF
Disable TLS secure link; switch is only read when logging on.	OFF	OFF	ON	OFF
Enable auto DHCP assignment; assigns a default IP address to the controller.	ON	ON	ON	ON

All other switch settings are unassigned and reserved for future use.

Status LEDs

LP1501		
LED	**DESCRIPTION**	**INDICATOR**
1	Online/Offline and Battery Status	Online = 80% ON, Offline = 20% ON Double Flash = Low Battery
2	Host Communication Activity	Flashing = Host Activity
3	Readers (Combined) Reader 1 Activity	Clock/Data or D1/D0 Mode = Flashes when data is received on either port
		RS-485 = Flashes when data is transmitted on either port
YEL	On-Board Ethernet Speed (Yellow LED)	OFF = 10 Mbs, ON = 100 Mbs
GRN	On-Board Ethernet Activity (Green LED)	OFF= No Link, ON = Good Link Flashing = Ethernet Activity

Status LEDs (Cont.)

PIM400-485*		
LED	**DESCRIPTION**	**INDICATOR**
D3	Power/Tamper Status	Solid GREEN = Power Applied
1	Link 1 Status	Alternating RED/GREEN Flashing = Link Mode More GREEN Flashing than RED = Strong Wireless Link More RED Flashing than GREEN = Weak Wireless Link
2	Link 2 Status	LED 1: RED Flashing = Communicating with Even # AD400 Lock LED 2: RED Flashing = Communicating with Odd # AD400 Lock
D4/D5	Data Transmit/Receive (RX/TX)	RX and TX Flashing = RS-485 Communication with LP1501 / USB Communication with HHD RX and TX Alternating Flash = Coupling Mode

*The PIM400-1501 uses Version 1 of the PIM400-485. See page 6-8 for Version 2 status LEDs.

Reset/Coupling/Bulk Erase

SETTING	DESCRIPTION
Factory Default Reset	**Press** and **hold** the LINK1 and LINK2 buttons for three (3) seconds and **release**.
Coupling	**Press** and **hold** the LINK1 button, then **press** the LINK2 button three (3) times.
Bulk Erase Configuration Memory	With power OFF, **set** DIP switches 1 & 2 to ON and 3 & 4 to OFF. **Apply** power and change DIP switch 1 or 2 to OFF within ten (10) seconds.

Wakeup on Radio Feature

The Wakeup on Radio feature allows the DNA Fusion operator to momentarily unlock an AD-400 door.

1. With the HHD plugged into the PIM, **open** the Schlage Utility Software (SUS), **click** on Device Options and **select** PIM Properties.

2. **Click** the Edit tab and **verify** that the Wakeup feature is set to Enabled.

3. **Enable** the Dynamic Channel Switching feature and **click** the Save option to save the PIM settings.

4. **Close** the SUS and **disconnect** the HHD from the PIM.

5. **Launch** DNA Fusion and **click** the Triggers & Macros button on the Standard Toolbar.

   The Triggers & Macros Browser opens.

6. **Expand** the Macros option to the desired Controller.

7. **Right-click** on the Controller and **select** Add Macro from the context menu.

   The Macros Editor dialog opens.

8. **Enter** a Description and **click** the OK button.

9. **Right-click** on the Macro created in Step 8 and **select** Add Command.

   The Macros Editor dialog appears.

10. From the Command drop-down, **select** Reader Mode: Unlocked.

11. **Select** the desired door from the ACM drop-down list and **click** OK to save the macro command.
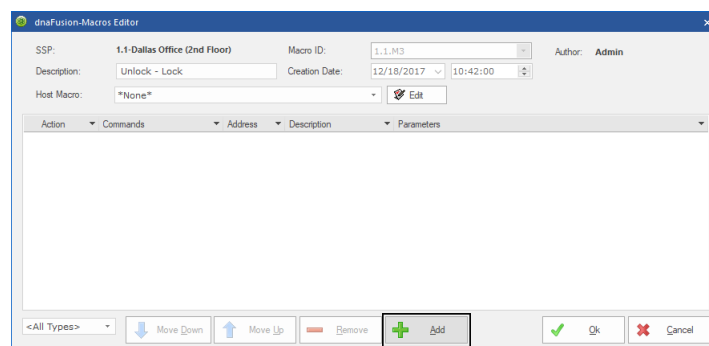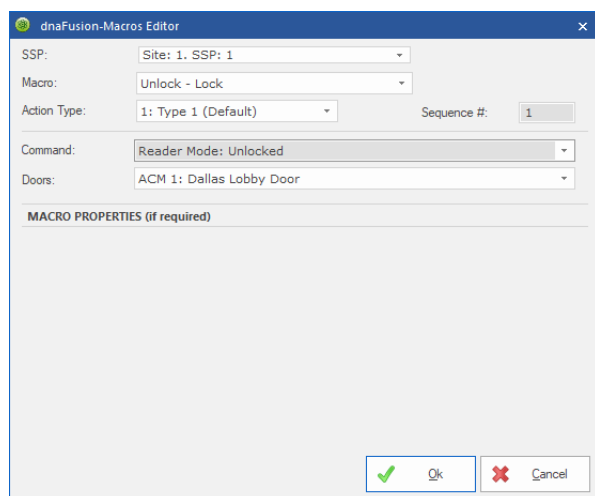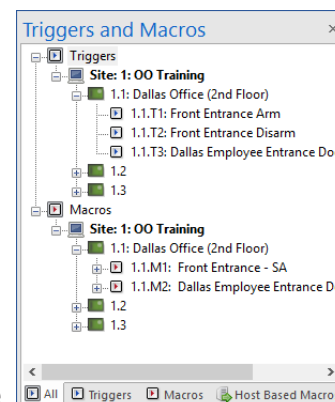
> *Alternatively,* **double-click** *on the* Macro *created in Step 8 to open the* Macros Editor *dialog and* **click** *the* Add *button to add the* Macro Command(s).

12. **Right-click** on the Macro created in Step 8 and **select** Add Command.

13. From the Command drop-down, **select** TM: Delay Command.

14. **Select** or **enter** a Delay time and **click** OK to save the command.

15. **Add** another Macro Command and **select** Reader Mode: Card Only (or the default door mode).

16. **Click** OK to save the command.

17. **Create** a Trigger to fire the macro. For more information, see Chapter 10 in the DNA Fusion User Manual.

   The door release type determines the Trigger Event. If an input point will be used, **select** MP: Monitor Point Active.

> *The* Cabinet Tamper *input on the PIM must be in a* Secure *state in order for the* Wakeup on Radio *feature to work properly. If the PIM is in a* Tamper *state, the* Wakeup *feature will not function properly.*

NOTES:

Specifications

The AD-400 interface is for use in low-voltage, Class 2 circuits only.

Electrical:	*Voltage:*	12 to 24 Vdc @ 250 mA max. / 1,000' max.
RS-485 Comm Cable:		4,000' (1,200 m) max., 24 AWG min.

Specifications are subject to change without notice.

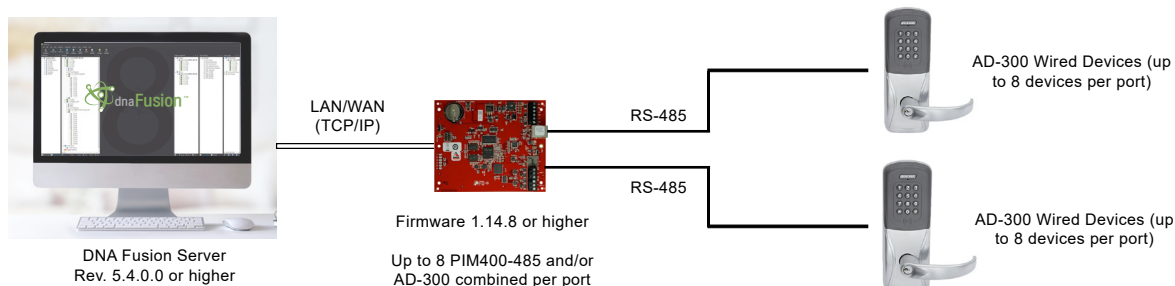For more information on the PIM-400 or AD-400, visit the following webpage:

https://us.allegion.com/en/home/products/brands/schlage.html

NOTES:

AD-300 Hardwired System

The AD-300 hardwired networked lock integrates with the Open Options LP2500 and LP4502 products and provides instant control of the access control system. A maximum of 16 AD-300 locks (8 per port) can be added to each controller.

The OptoHub, an eight-port optically isolated multiplexer, can be used with the LP2500 to provide a star configuration for communications.

AD-300 Hardwired with RS-485 Multidrop

DNA Fusion Server
Rev. 5.4.0.0 or higher

LAN/WAN
(TCP/IP)

Firmware 1.14.8 or higher

Up to 8 PIM400-485 and/or
AD-300 combined per port

RS-485

RS-485

AD-300 Wired Devices (up
to 8 devices per port)

AD-300 Wired Devices (up
to 8 devices per port)

AD-300 Hardwired with RS-485 OptoHub in Star Configuration

DNA Fusion Server
Rev. 5.4.0.0 or higher

LAN/WAN
(TCP/IP)

Firmware 1.14.8 or higher

Up to 8 PIM400-485 and/or
AD-300 combined per port

RS-485

RS-485

RS-485

RS-485

OptoHub
(Supports up to 8 AD-300
Locks and/or PIM400-485
devices combined per Hub)

AD-300 Wired Devices (up
to 8 devices per Hub)

AD-300 Wired Devices (up
to 8 devices per Hub)
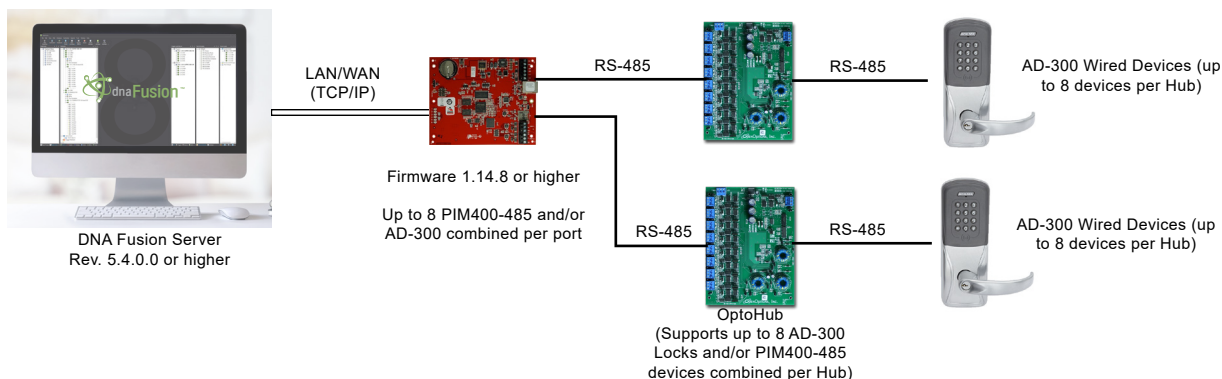
Configuration Types

The AD-300 locks can be connected to the DNA Fusion access control system by wiring them directly to the LP2500 or LP4502.

LP2500

The AD-300 locks are wired directly to the RS-485 downstream ports on the LP2500, and are programmed individually using the Schlage Handheld Device (HHD). See page 6-25 for more information.

LP4502

The AD-300 locks are wired directly to the TB-8/9 connection on the LP4502, and are programmed individually using the Schlage Handheld Device (HHD). See page 6-27 for more information.

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LP2500 to AD-300 Lock Installation

The AD-300 locks are wired directly to the downstream ports on the LP2500 and are programmed individually using the Handheld Device (HHD).

Communicating with the AD-300

1. **Install** the AD-300 lock.

   For more information, see the installation guide that was provided with the lock, or visit www.allegion.com/us (see Support > Schlage Electronics > Electronic Locks Technical Library).

2. **Verify** that the power supply is properly connected.

3. **Test** the lock for proper mechanical and electronic operation.

   See the Schlage AD-300 User Guide for more information.

4. **Connect** the lock to the LP2500.

   See the wiring instructions below.

5. **Configure** the lock using the Schlage Handheld Device (HHD).

   See the Schlage Utility Software User Guide for more information.

Connecting the AD-300 to the LP2500

1. **Remove** the End-of-Line (EOL) Termination jumper from the LP2500.

2. In DNA Fusion, **set** the LP2500's Baud Rate to 9,600 for the downstream port(s) connected to the AD-300 lock(s).

   See Adding the AD-300 Locks to DNA Fusion on page 6-26.

Wiring a Lock to the LP2500

Use shielded twisted-pair cables (min. 24 AWG) to connect the AD lock(s) to the LP2500 on Ports 2 and/or 3. The table below describes the wiring connections.

LP2500	AD-300	DESCRIPTION
TR+	TDB-	Transmit Data (+)
TR-	TDB+	Transmit Data (-)
GND	GND	Signal Ground

> (i) *When the lock is added to DNA Fusion, the selected port must match the configured port. Ports configured for Allegion locks will NOT communicate with Mercury subcontrollers.*

Powering the AD-300 Lock

The AD-300 must be used with a UL 294 Listed power supply capable of sourcing at least 250 mA @ 12 or 24 Vdc. Use twisted pairs (min. 18 AWG) for communication.

Connect the AD Lock to a power supply using the connections in the table below.

POWER SUPPLY	AD LOCK
+	VIN
GND	GND

See the Schlage AD-300 User Guide for more information.
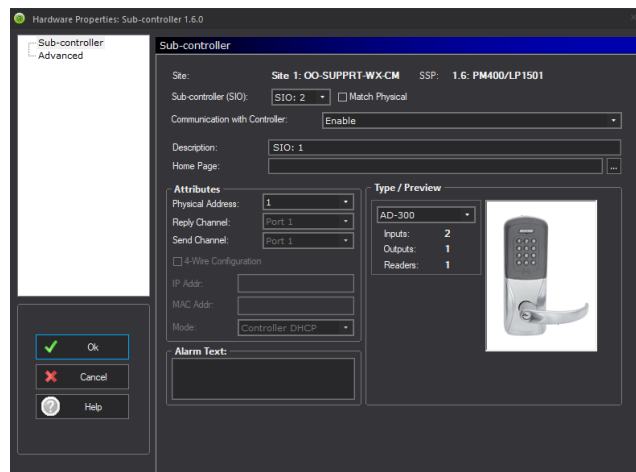
Programming the AD-300 Locks

In order to program the locks, the Handheld Device (HHD) must be coupled with the AD-300 lock. See page 19 in the SUS User Guide for more information.

1. **Verify** the wiring from the controller to the AD-300 lock.

2. **Plug** the HHD into the AD-300 using the supplied USB cable.

3. **Log in** to the Schlage Utility Software (SUS) as a Manager.

4. To begin the linking process, **press** the Schlage button on the AD-300 lock twice.

   The AD-300 will appear at the bottom of the screen.

5. **Select** Device Options.

6. **Select** Lock Properties.

   For setting definitions, see pages 26 through 28 in the SUS User Guide.

7. From the Edit tab, **select** a Unique RS-485 Address.

   This information will be used when configuring the PIM in the DNA Fusion software (Physical Address).

8. **Click** the Save button.

9. **Select** the Reader tab and make any necessary changes.

10. **Click** the Save button.

11. **Continue** to Adding the AD-300 Locks to DNA Fusion section below.

Adding the AD-300 Locks to DNA Fusion

After all the AD-300 locks have been programmed, they must be added to the DNA Fusion system.

1. **Launch** DNA Fusion.

2. **Right-click** on the LP2500 that is attached to the AD-300 lock(s) and **select** Properties.

   The Controller Properties dialog opens.

3. In the Downstream Ports section, **set** the Baud Rate to 9600 for the port(s) attached to the AD-300 lock(s).

4. **Click** OK to save the settings.

5. **Right-click** on the Controller in the Hardware Browser and **select** Add > Add Subcontroller.

   The Subcontroller Properties dialog opens.

6. **Select** AD-300 from the Type / Preview drop-down.

7. **Verify** that the Physical Address (set in Step 7 - Programming the AD-300 Locks) and the SSP Reply Channel are correct. If needed, change the address and/or port to the correct setting(s).

8. **Click** OK to add the subcontroller to the system.

   The AD-300 lock appears in the Hardware Browser.

Configuring the Doors

1. In the Hardware Browser, **expand** the AD-300 Subcontroller object.

2. **Right-click** on the Reader and **select** Add Door / Use Default.

   The NEW Door dialog opens.

3. **Configure** the Door Properties and **click** OK.

   The door is added to the DNA Fusion system.

LP4502 to AD-300 Lock Installation

The AD-300 locks are wired directly to the TB-8/9 connection on the LP4502 and are programmed individually using the Handheld Device (HHD).

Communicating with the AD-300

1. **Install** the AD-300 lock.

   For more information, see the installation guide that was provided with the lock, or visit www.allegion.com/us (see Support > Schlage Electronics > Electronic Locks Technical Library).

2. **Verify** that the power supply is properly connected.

3. **Test** the lock for proper mechanical and electronic operation.

   See the Schlage AD-300 User Guide for more information.

4. **Connect** the lock to the LP4502.

   See the wiring instructions below.

5. **Configure** the lock using the Schlage Handheld Device (HHD).

   See the Schlage Utility Software User Guide for more information.

> ! *A power supply is required to power the subcontrollers and door hardware.*

Wiring the Lock to the LP4502

Use shielded twisted-pair cables (min. 24 AWG) to connect the AD lock(s) to the LP4502's female TB-8/9 connection. The table below describes the wiring connections.

TB-8/9	AD-300	DESCRIPTION
DAT/D0	TDB+	Transmit Data (+)
CLK/D1	TDB-	Transmit Data (-)
GND	GND	Signal Ground

> (i) *When the lock is added to DNA Fusion, the selected port must match the configured port. Ports configured for Allegion locks will NOT communicate with Mercury subcontrollers.*

Powering the AD-300 Lock

The AD-300 must be powered by a UL 294 Listed power supply capable of sourcing at least 250 mA @ 12 or 24 Vdc. Use twisted pairs (min. 18 AWG) for communication.

Connect the AD Lock to a power supply as described in the table below.

POWER SUPPLY	AD LOCK
+	VIN
GND	GND

See the Schlage AD-300 User Guide for more information.
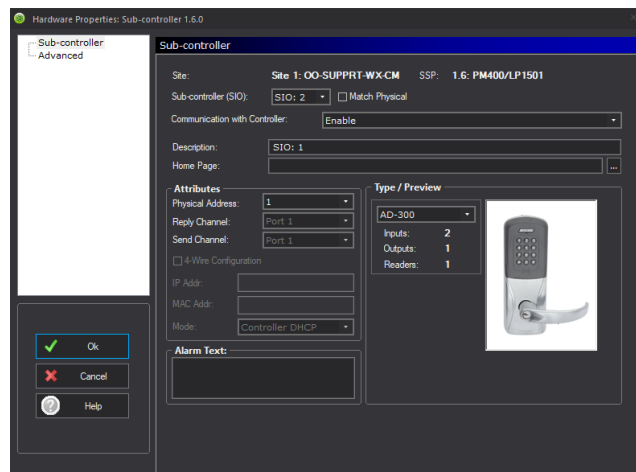
Programming the AD-300 Locks

In order to program the locks, the Handheld Device (HHD) must be coupled with the AD-300 lock. See page 19 in the SUS User Guide for more information.

1. **Verify** the wiring from the controller to the AD-300 lock.

2. **Plug** the HHD into the AD-300 using the supplied USB cable.

3. **Log in** to the Schlage Utility Software (SUS) as a Manager.

4. To begin the linking process, **press** the Schlage button on the AD-300 lock twice.

   The AD-300 will appear at the bottom of the screen.

5. **Select** Device Options.

6. **Select** Lock Properties.

   For setting definitions, see pages 26 through 28 in the SUS User Guide.

7. From the Edit tab, **select** a Unique RS-485 Address.

   This information will be used when configuring the PIM in the DNA Fusion software (Physical Address).

8. **Click** the Save button.

9. **Select** the Reader tab and make any necessary changes.

10. **Click** the Save button.

11. **Continue** to Adding the AD-300 Locks to DNA Fusion section below.

Adding the AD-300 Locks to DNA Fusion

After all the AD-300 locks have been programmed, they must be added to the DNA Fusion system.

1. **Launch** DNA Fusion.

2. **Right-click** on the LP2500 attached to the AD-300 lock(s) and **select** Properties.

   The Controller Properties dialog opens.

3. In the Downstream Ports section, **set** the Baud Rate to 9600 for the port(s) attached to the AD-300 lock(s).

4. **Click** OK to save the settings.

5. **Right-click** on the Controller in the Hardware Browser and **select** Add > Add Subcontroller.

   The Subcontroller Properties dialog opens.

6. **Select** AD-300 from the Type / Preview drop-down.

7. **Verify** that the Physical Address (set in Step 7 - Programming the AD-300 locks) and the SSP Reply Channel are correct. If needed, change the address and/or port to the correct settings.

8. **Click** OK to add the subcontroller to the system.

   The AD-300 lock appears in the Hardware Browser.
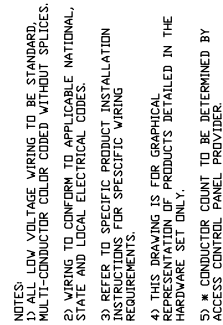
Configuring the Doors

1. In the Hardware Browser, **expand** the AD-300 Subcontroller object.

2. **Right-click** on the Reader and **select** Add Door / Use Default.

   The NEW Door dialog opens.

3. **Configure** the Door Properties and **click** OK.

   The door is added to the DNA Fusion system.

LP2500 with AD-300 Direct Connection

DNA FUSION SERVER

LP2500 CONTROLLER

12/24VDC POWER SUPPLY

120 VAC

RS485 4000' MAX   BELDEN 3106A OR EQUIVALENT

10' MAX DROP BELDEN 3106A

12/24VDC POWER SUPPLY

120 VAC

2x18

ELECTRIC HINGE

AD300/301 LOCK

10' MAX DROP BELDEN 3106A

PIM400-485

2x18

12/24VDC POWER SUPPLY

120 VAC

AD400/401 LOCK

AD400/401 LOCK

LP2500 CONTROLLER

TB1

PORT 1

TO DNA FUSION SERVER

PORT 2
TR+
TR-
GND
PORT 3

UL 294 12/24VDC SUPPLY

+   -

GND NEU LINE   120 VAC

SHIELD

WHT/ORG
ORG/WHT
BLU/WHT

BELDEN 3106A

PIM400-485

J5 GND TDB+ RDB+ TDA/- RD/A-
J11
J10
J7
J8
J2
J1

UL 294 12/24VDC SUPPLY

+   -

GND NEU LINE   120 VAC

INSTALL J19 AND J20 SHORTING JUMPERS

BELDEN 3106A

UL 294 12/24VDC SUPPLY

+   -

GND NEU LINE   120 VAC

ELECTRIC HINGE

VIN GND TDB+ RDB+ TDA- RD/A-

AD300/301 LOCK

INSTALL SHORTING BLOCKS ON RS485 MODULE

OPERATION:

SSP-EP SUPPORTS TWO RS485 DATA LINES WITH UP TO EIGHT EITHER AD300/301 OR PIM400-485 COMBINED PER PORT AND A MAXIMUM OF SIXTY-FOUR READERS PER SSP-EP SPREAD ACROSS A MAXIMUM OF SIXTEEN PIM400-485 AND AD300/301 COMBINED.

SSP-EP PORT 1 CONNECTS DNA FUSION SERVER TO SSP-EP AND PORTS 2 AND 3 ARE RS485 DATA LINES.

EARTH GROUND SHIELD ON BELDEN 3106A CABLE AT SSP-EP CONTROLLER ONLY.

UL 294 POWER SUPPLIES USED SHOULD NOT BOND EARTH GROUND TO SIGNAL GROUND.

IF PLENUM RATED CABLE IS REQUIRED USE BELDEN 82842 OR EQUIVALENT.

WIRING SHOWN REFLECTS WIRING FROM SSP-EP TO PIM400-485 AND AD300/301 ONLY. ADDITIONAL WIRING WILL BE REQUIRED THAT IS NOT BE SHOWN HERE.

NOTE: CONFIGURATION HAS NOT BEEN TESTED BY ALLEGION BUT HAS BEEN REVIEWED AND APPROVED BY OPEN OPTIONS.

NOTES:
1) ALL LOW VOLTAGE WIRING TO BE STANDARD, MULTI-CONDUCTOR COLOR CODED WITHOUT SPLICES.

2) WIRING TO CONFORM TO APPLICABLE NATIONAL, STATE AND LOCAL ELECTRICAL CODES.

3) REFER TO SPECIFIC PRODUCT INSTALLATION INSTRUCTIONS FOR SPECIFIC WIRING REQUIREMENTS.

4) THIS DRAWING IS FOR GRAPHICAL REPRESENTATION OF PRODUCTS DETAILED IN THE HARDWARE SET ONLY.

5) * CONDUCTOR COUNT TO BE DETERMINED BY ACCESS CONTROL PANEL PROVIDER.

TITLE: OPEN OPTIONS DNA FUSION SSP-EP AND AD300/301 OR PIM400-485 AD400/401

109600

copyright 2013

DWG NO: 912114-5 OPENOP

DRAWN/CHECKED BY: BRENDA DOVE 08/01/12

REV E

DATE DRAWN:	REVISION DATE:	APPROVED BY:
09-12-11	11-05-13	WILLIAM MURPHEY 06/11/13

LP2500 with OptoHub and AD-300 Direct Connection

TITLE: OPEN OPTIONS DNA FUSION SSP-EP OPTO HUB AND AD300

DWG NO.: 912115-5 OPENOP

109494

REV: E

DRAWN/CHECKED BY: BRENDA DOVE 09/21/11

copyright 2013

DATE DRAWN: 09-21-11 | REVISION DATE: 11-07-13 | APPROVED BY: WILLIAM MURPHY 11/04/11

OPERATION:
EACH OPTO HUB SUPPORTS UP TO EIGHT AD300 LOCKS EACH OR A MAXIMUM TOTAL OF SIXTEEN AD300 LOCKS OR PIM400-485 PER SSP-EP.

WIRING SHOWN REFLECTS WIRING FROM OPTOHUB TO AD300 AND PIM400-485 ONLY. ADDITIONAL WIRING WILL BE REQUIRED THAT IS NOT BE SHOWN HERE.

EARTH GROUND SHIELD ON BELDEN 3106A AT OPTOHUB ONLY.

UL294 POWER SUPPLIES USED SHOULD NOT BOND EARTH GROUND TO SIGNAL GROUND.

IF PLENUM RATED CABLE IS REQUIRED USE BELDEN 82842 OR EQUIVALENT.

NOTE: CONFIGURATION HAS NOT BEEN TESTED BY ALLEGION, BUT HAS BEEN REVIEWED AND APPROVED BY OPEN OPTIONS.

NOTES:
1) ALL LOW VOLTAGE WIRING TO BE STANDARD, MULTI-CONDUCTOR COLOR CODED WITHOUT SPLICES.

2) WIRING TO CONFORM TO APPLICABLE NATIONAL, STATE AND LOCAL ELECTRICAL CODES.

3) REFER TO SPECIFIC PRODUCT INSTALLATION INSTRUCTIONS FOR SPESCIFIC WIRING REQUIREMENTS.

4) THIS DRAWING IS FOR GRAPHICAL REPRESENTATION OF PRODUCTS DETAILED IN THE HARDWARE SET ONLY.

5) * CONDUCTOR COUNT TO BE DETERMINED BY ACCESS CONTROL PANEL PROVIDER.

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NOTES:

Specifications

The AD-300 interface is for use in low-voltage, Class 2 circuits only.

Electrical:	*Voltage:*	12 to 24 Vdc @ 250 mA max. / 1,000' max.
RS-485 Comm Cable:		4,000' (1,200 m) max., 24 AWG min.

Specifications are subject to change without notice.

For more information on the AD-300 series, visit the following webpage:

https://us.allegion.com/en/home/products/brands/schlage.html

NOTES:

ENGAGE™ Gateway

The ENGAGE Gateway is a Bluetooth (BTE) 4.0 offered by Allegion/Schlage in order to control the NDE(B) and LE(B) series of locks. It operates using Line of Sight (LOS) wireless communication in the 2.5Ghz frequency range. Each ENGAGE Gateway is able to support any combination of 10 NDE(B)/LE(B) locks per gateway. The device is capable of connecting to any 12/24 Vdc power with 100 mA through either the included power supply or using a separate power supply through the controller PDU. It is recommended that a site survey be completed prior to the final installation of each ENGAGE Gateway in order to ensure proper communication between the gateway and each of the 10 locks. While Individual locks can be paired separate from the gateway, the gateway assists when dealing with larger installations with a greater number of locks.

- A maximum of 16 Gateways can be connected to each controller with a maximum of 64 locks total.

- RS-485 wire combined length can not be greater than 4000 ft.

- It is recommended that a CAT5e/6 ethernet cable be used if connecting the gateway through a router with a total cable length no greater than 328 ft.

The gateway can be connected to any of the various Mercury LP controllers by means of a network connection through the ENGAGE Gateway ethernet port or using standard RS-485 communication. The proper operation and communication between the ENGAGE gateway and the Bluetooth/Wi-Fi enabled NDE(B)/LE(B) locks will be affected based on the number of walls and barriers, density and composition of these walls and barriers and any other radio signals in the area. Consider the following factors when installing the ENGAGE Gateway.

- In typical building environments, up to 30' line of sight to the door can be achieved with the 2.4GHz Bluetooth low energy.

- Do not mount the locks/devices and the Gateway on different floors. The signal will be degraded and functionality can be severely limited. The signal will not pass through metal walls or metal mesh inside the walls (stucco). Use a remote antenna module located outside the room when necessary.

- Do not mount the Gateway on a metal surface. A separation of at least one inch must be maintained in all directions from any metal.

- Signal will not pass-through metal walls or metal mesh in the walls (stucco) or any outdoor surfaces.

- For enhanced communication, mount the ENGAGE Gateway so that the antenna is vertical for the best signal propagation.

- Place a minimum of 10 feet between the ENGAGE Gateway and any other 2.4 GHz RF signal source such as a WiFi enabled 2.5 GHz router.

Pre-Installation Test

Once the locations for the ENGAGE Gateway and the NDE(B)/LE(B) Locks(s) have been determined, test the performance prior to permanent installation.

1. **Mount** the NDE(B)/LE(B) Lock(s) temporarily to the access control point (door, gate, etc.) as close as possible to its exact mounting location. Do NOT connect the power yet.

2. **Mount** the ENGAGE Gateway temporarily as close to the exact mounting location and orientation as possible.

3. **Verify** that the antenna is in the horizontal position.

4. **Power** the ENGAGE Gateway with a 12 to 24 Vdc power supply capable of delivering 100 mA.

   See Powering the ENGAGE Gateway instructions on page 6-36.

5. **Connect** the Handheld Cellular Device (HHD) with the Allegion ENGAGE application (App) to the ENGAGE Gateway.

> *See Programming the ENGAGE Gateway instructions on page 6-38 or 6-39.*

6. **Verify** that the access point is closed, then install the batteries to the NDE(B)/LE(B) Lock(s). Each power supply must be capable of delivering 100 mA.

7. **Place** the NDE(B)/LE(B) Lock(s) into *Link Mode*.

> *See Linking the ENGAGE Gateway to an NDE(B)/LE(B) Lock instructions on page 6-42 or 6-43.*

Installation

Once the ENGAGE Gateway is successfully linked to the required NDE(B)/LE(B) Lock(s) and final location is selected, proceed with permanently installing the components.

> *See the Allegion ENGAGE Gateway User Guide for more information on drill holes and mounting procedures.*

Powering the ENGAGE™ Gateway

The ENGAGE Gateway accepts a UL 294 power supply capable of sourcing at least 100 mA at 12 or 24 Vdc. Locate the power source as close to the ENGAGE Gateway as possible. Connect the power supply with a minimum of 18 AWG wire and a maximum 1000-ft run length or using the supplied optional power supply included with the gateway. Power input is non-polarized.

Power Supply	ENGAGE Gateway
+	+
GND	-

12-24VDC

+ -

ACP DC power input

Power port
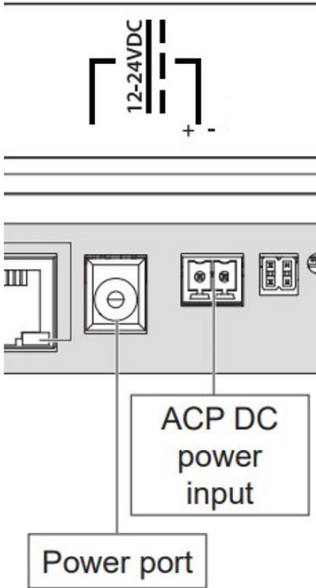
Connecting the ENGAGE™ Gateway to a LP1502 Controller

The ENGAGE Gateway can communicate to the LP1502 via a 2-wire RS-485 interface on the P4 terminal block. The Gateway will connect to the LP1502 on the controller's RS-485 downstream port (Ports 2). Use twisted pair(s) (min. 24 AWG) with shield for communication.

Set the jumper on the LP1502 to OFF for the downstream port connected to the Gateway.

Connect the Gateway to the LP1502 on Port 2 using the following table:

2-Wire

LP1501 CONTROLLER	ENGAGE GATEWAY	DESCRIPTION
GND	GND	Signal Ground
	TX+	Transmit Data (+)
TR-	RX+	Receive Data (+)
TR+	TX-	Transmit Data (-)
	RX-	Receive Data (-)
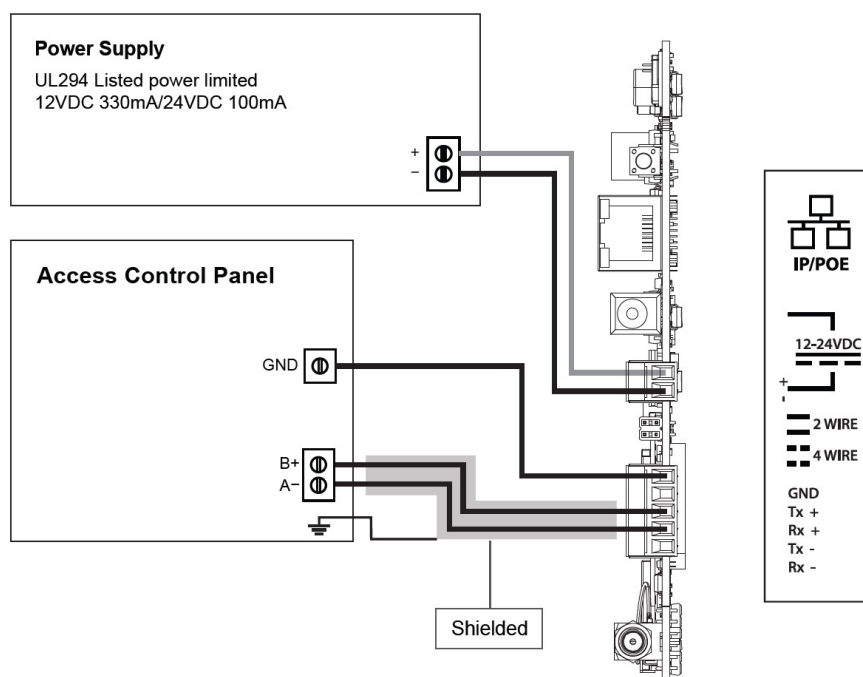
2 Wire Diagram

Remove the EOL Termination Jumper from the LP Series Mercury Controller (If Applicable).

Power on the HHD with the Allegion ENGAGE app and open the app. You will be prompted to create an account with *Username* and *Password* if you have already not done so.

> (i) *A "Parent Account" must be created in order to operate the ENGAGE Gateway and NDE(B)/ LE(B) locks. Please contract Technical support for more information on setting up this account.*

The gateway is placed into Link Mode. Continue to Programming the ENGAGE Gateway.

Programming and Configuration

The ENGAGE Gateway is configured via the Allegion ENGAGE app available on IOS and Android devices. This will allow for the configuration of the IP address and hardware linked to the gateway.

Configuring Over RS-485 2-Wire Connection

1. **Open** the Allegion ENGAGE app on the HHD
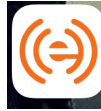
2. **Enter** Username (Email) and Password or create an account if necessary.

EMAIL

PASSWORD   SHOW

3. **Click** or **Select** the addition sign (+) to add a new or select an existing site.

〈 Back   Sites   +

Q Search Site

4. **Select** new or an existing site and click the addition sign (+) to add new device.

08:46

All Devices   In Range   +

Q Search Devices

> ! *The gateway must be in discovery mode with the status light flashing blue, if not gateway must be reset to factory settings by pressing reset button located to the left of the ethernet port and hold until the status light blinks Green 2 times and remains solid. Release the reset button.*

5. **Select** the ENGAGE Gateway. The application will start searching for available gateways. You may select the gateway to be added at this time.

RM/RU

Gateway
GWE

LE

Select a Gateway

ENGAGE Gateway
B1000000000003E4

6. **Confirm** existing configuration if adding existing gateway or if a new gateway "Assign Name".

Give the device a name

Device Name
Dev Gateway

7. **Click** *Advanced* under *Device Configuration* and **Assign** the IP information as well as subnet as required based on local network operating procedures.

> *You can also update firmware over BTE connection at this time.*

Configuring Over Ethernet or Wireless Connection

The ENGAGE Gateway can additionally be configured using an ethernet connection to an existing wired network or by connecting the gateway using an existing wireless network.

The site will need to be added using the previously listed steps (1-7) prior to being added to DNA Fusion.

You may also verify the existing network address through the gateway using the Allegion ENGAGE app or by running the *MercZeroConf* tool in DNA Fusion if the application is unavailable when commissioning an existing site. It is located under the Toolbar's "Tools" section in *Built-in Tools*.

When commissioning a gateway through RS-485, the gateway is treated as a "Subcontroller". When adding the site through a wireless connection the gateway is treated more as a "Reader".

Adding Wired Gateway to DNA Fusion

1. **Open** DNA Fusion.

2. **Right-Click** the site Controller under Hardware Tree in DNA Fusion.

3. **Select** Add-subcontroller

4. **Configure** Site Hardware Properties.

5. **Add** locks as needed by Right-Clicking the gateway and "Add Door" from Gateway and then "Link Door to NDE".
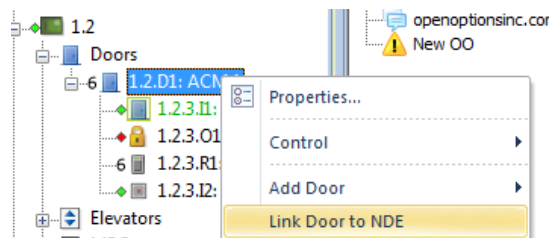
6. **Click** Start Link once door is in link mode and complete the step to link door. The door LED will flash Green and Beep 3 times if completed successfully.
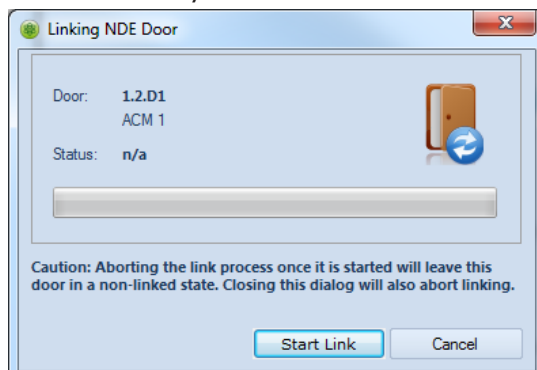
> (i) *Aborting the Link Process once it is started will leave the door in an non-linked state. Ensure that the door is ready to link by holding the lever and badging a card. Please see the NDE(B)/LE(B) user manual for more information.*

Adding Wireless Gateway to DNA Fusion

1. **Open** DNA Fusion.

2. **Right-Click** the ENGAGE icon under Hardware in DNA Fusion
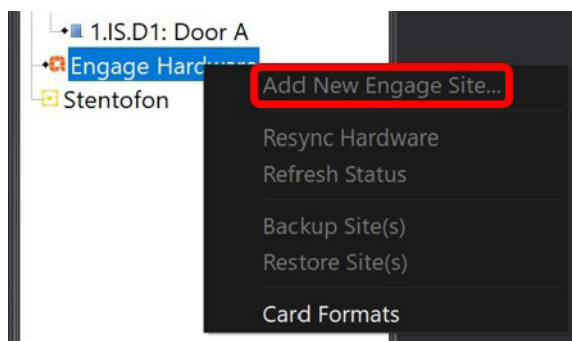
3. **Select** Add-Site and complete site creation.
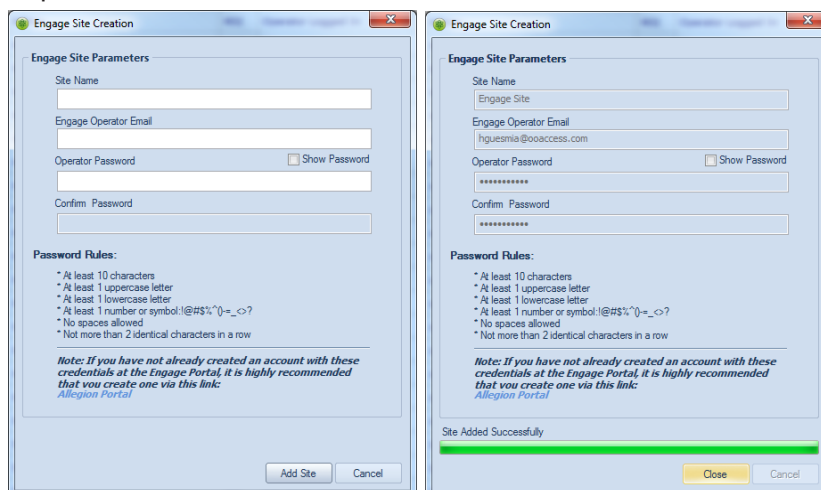
4. **Configure** Site IP Address to match existing information on the ENGAGE Gateway. You may additionally choose to add the site via DNS and machine name.
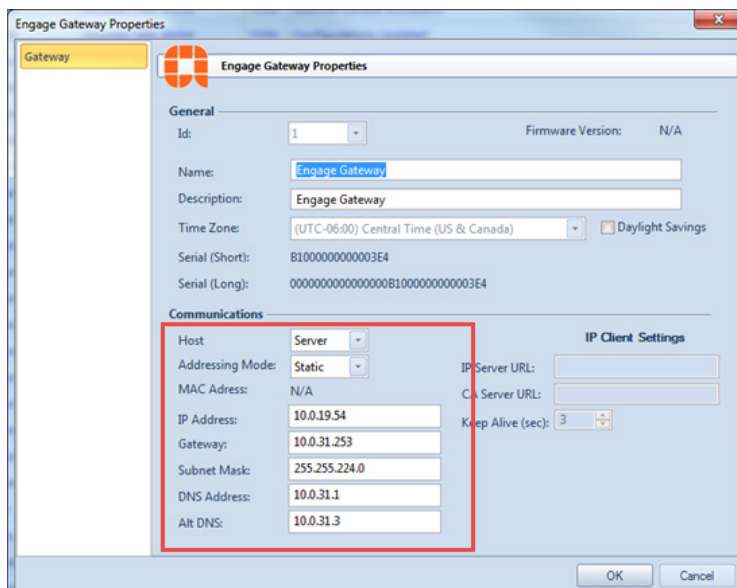
5. **Right-Click** The Engage Hardware icon after restarting DNA Fusion and **Click** "Resync Hardware" if hardware that has been already added to the gateway does not populate or after adding all hardware to gateway.
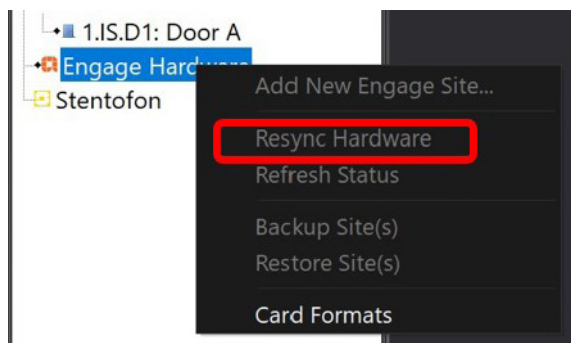
6. **Right-Click** Gateway and **Select** "Link Doors", DNA Fusion will search added doors for unlinked hardware and allow you to select which unlinked hardware you would like to link.

7. **Click** "Link Selected Door(s)" once all doors have been selected.

Adding Doors to Gateway

1. **Open** the Allegion ENGAGE app on the HHD.
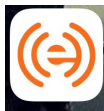
2. **Select** Site Location.

3. **Click** "Add Device" and select "Ok" on the "Commission Device" prompt after ensuring the device is in link mode. (*See NDE(B)/LE(B) User Manual for steps to complete this*)
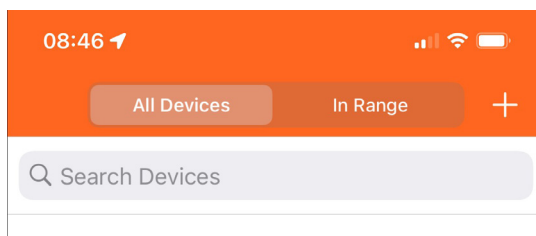
4. **Select** correct device from available device list.
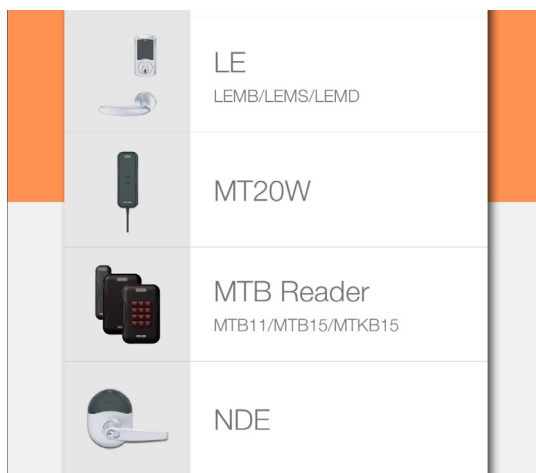
5. **Confirm** that the lock you are adding is flashing red and press "Yes".
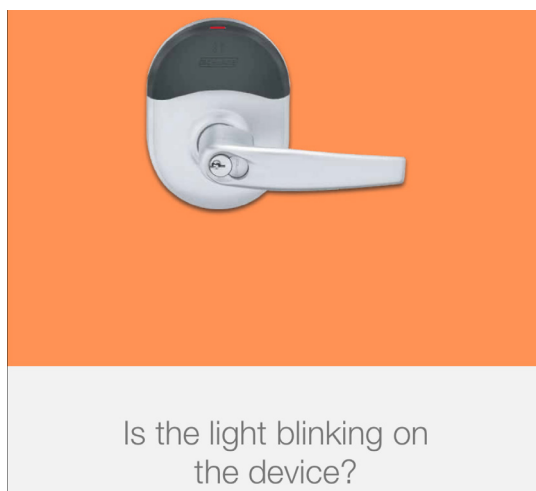
6. **Enter** Device Name and lock type as well as configure settings.
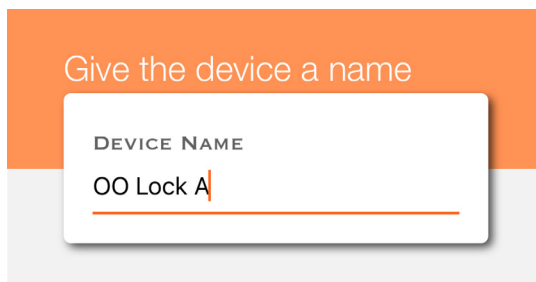
7. **Calibrate** Door Position sensor if needed.

8. **Click** "Ok" once you have calibrated the Door Position Sensor Successfully.

9. **Skip** Wi-Fi setup.

Back	Skip

Select the Wi-Fi

No saved network found.
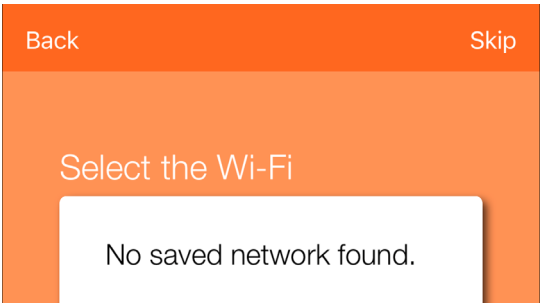
Set up is now complete.

Reset Button

Button	Component	Description
RESET	Reset Button	If pressed and held, resets the ENGAGE Gateway.

Factory Default Reset

If the ENGAGE Gateway is reset to factory default settings, all configuration information will be deleted.

1. **Press and hold** the Reset button for about 5 seconds.

The Green LED on the front of the Gateway will flash two times and stay solid green once reset has been completed successfully. Release the reset button.

The ENGAGE Gateway will now go through a power up sequence and the front light will turn amber and then blue when the gateway is ready to commence BTE or wireless communication. This sequence may take up to 5 minutes.

Specifications

The ENGAGE Gateway interface is for use in low-voltage, Class 2 circuits only.

Electrical:	*Voltage:*	12 to 24 Vdc @ 100 mA max.
RS-485 Comm Cable:		1,000' (300 m) max., 24 AWG min.

Specifications are subject to change without notice.

For more information on the ENGAGE Gateway, visit the following webpage:

https://us.allegion.com/en/home/products/brands/schlage.html

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Schlage NDE(B)™ and LE(B)™ Series Locks

The ENGAGE Gateway is a Bluetooth (BTE) 4.0 offered by Allegion/Schlage in order to control the NDE(B) and LE(B) series of locks. It operates using Line of Sight (LOS) wireless communication in the 2.5Ghz frequency range. Each ENGAGE Gateway is able to support any combination of 10 NDE(B)/LE(B) locks per gateway. The device is capable of connecting to any 12/24 Vdc power with 100 mA through either the included power supply or using a separate power supply through the controller PDU. It is recommended that a site survey be completed prior to the final installation of each ENGAGE Gateway in order to ensure proper communication between the gateway and each of the 10 locks. While Individual locks can be paired separate from the gateway, the gateway assists when dealing with larger installations with a greater number of locks.

- A maximum of 10 locks can be added per ENGAGE Gateway not to exceed a total of 68 locks total per DNA Fusion Build when connected through the gateway.

The locks can be configured and connected to DNA Fusion through a WiFi connection or by being added to a ENGAGE Gateway.

- In typical building environments, up to 30' line of sight to the gateway can be achieved with the 2.4GHz BTE low energy.

- Do not mount the locks/devices and the Gateway on different floors. The signal will be degraded and functionality can be severely limited.

- Signal will not pass-through metal walls or metal mesh in the walls (stucco) or any outdoor surfaces.

Connecting NDE(B)/LE(B) locks using a Wireless Network

Schlage NDE(B)/LE(B) Series locks can be commissioned using a wireless network and connected using DNA Fusion. The Wireless locks must be initially configured on the Allegion ENGAGE app on a HHD prior to being added to DNA Fusion. The following steps will assist you in adding a lock and initial configuration.
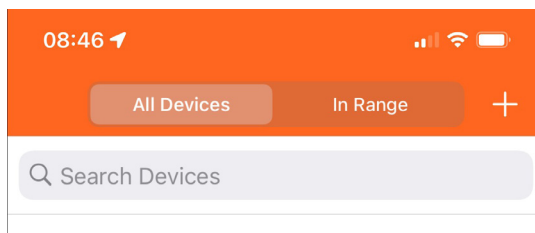
Adding Doors to Gateway

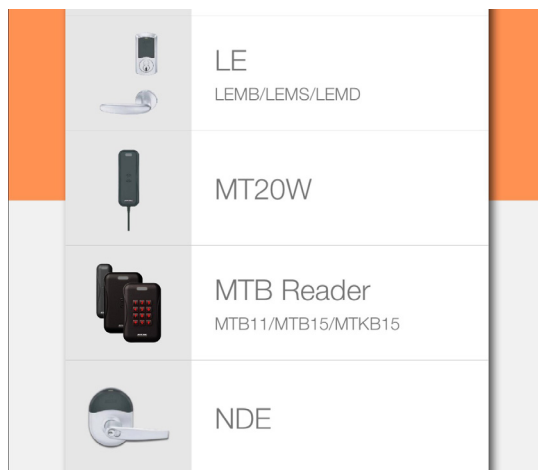1. **Open** the Allegion ENGAGE app on the HHD.
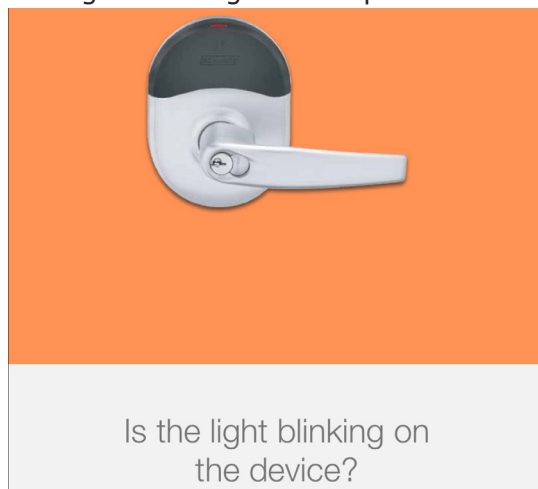
2. **Select** Site Location.

3. **Click** the addition sign (+) to "Add Device" after ensuring the device is in link mode. (*See NDE(B)/LE(B) User Manual for steps to complete this*)
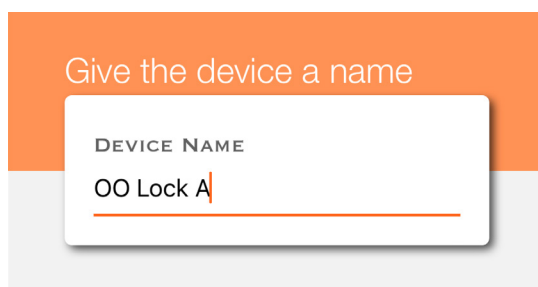
4. **Select** correct device from available device list.

5. **Confirm** that the lock you are adding is flashing red and press "Yes".

Is the light blinking on the device?

6. **Enter** Device Name and lock type as well as configure settings.

Give the device a name

DEVICE NAME

OO Lock A

7. **Calibrate** Door Position sensor for NDE(B)/LE(B) Locks.

8. **Click** "Ok" once you have calibrated the Door Position Sensor Successfully.

9. **Select Next** and configure the Wireless network. The IP address or DNS name of the Machine to which the lock will be connected must be typed in at this time.

Add a new network

Configure the Wi-Fi

WI-FI SSID

Open   WPA2   WPA2(...)   WEP

USERNAME

PASSWORD   SHOW

KEYINDEX

1

Save Network Info

Test Wi-Fi Connection

Save Network

HOST CONFIGURATION

Config:

IP   DNS

Server: api.allegionengage.com

Security:

Secured   Unsecured

Add another NDE device

Finish

10. Device setup is now complete. You will be required to **Restart** DNA Fusion as well as **Right-Clicking** the "Engage Hardware" tab under the hardware tree and **Selecting** "Resync Hardware" before final changes to hardware are fully applied.

Engage Hardware
Th   Add New Engage Site
      Resync Hardware
      Refresh Status
Bo   Backup Site(s)

Updating Firmware on NDE(B)/LE(B) Lock

The Firmware can be updated via DNA Fusion and through the Allegion ENGAGE App.

## Updating through DNA Fusion

1. **Select** hardware requiring update.
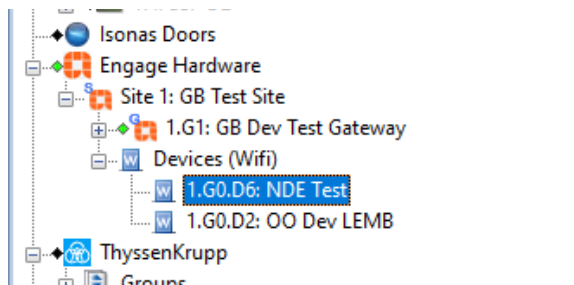
2. **Right-Click** on selected hardware and **Select** "Firmware Update".
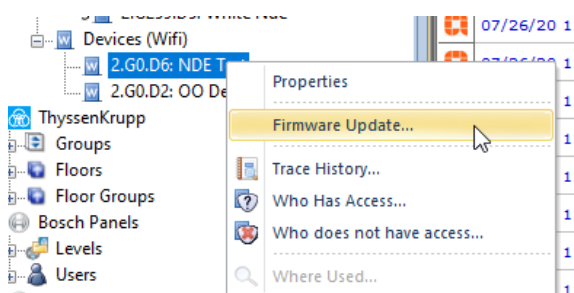
3. **Select** time and date for "Firmware Update" to be implemented and **Select** "Ok". The firmware will be pushed to all selected controllers at that time. While Firmware URL can be adjusted if all locks are of the same type (NDE(B)/LE(B)), if a mix of different types of locks are selected, firmware URL can not be specified.
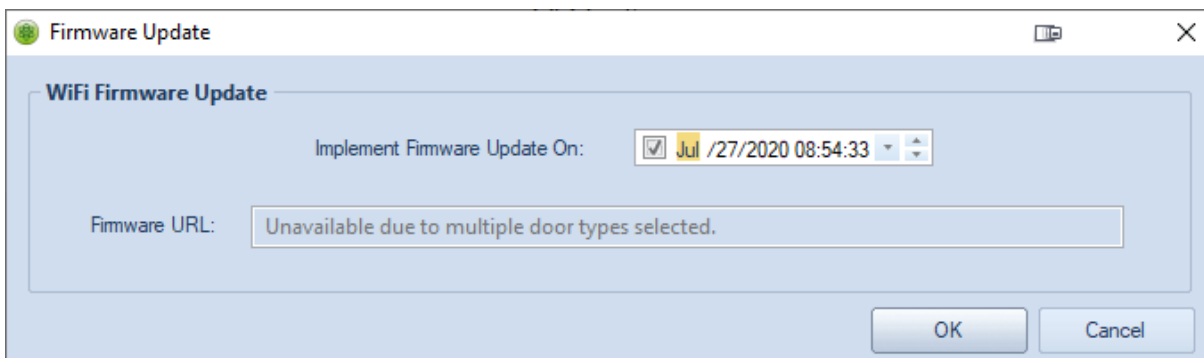
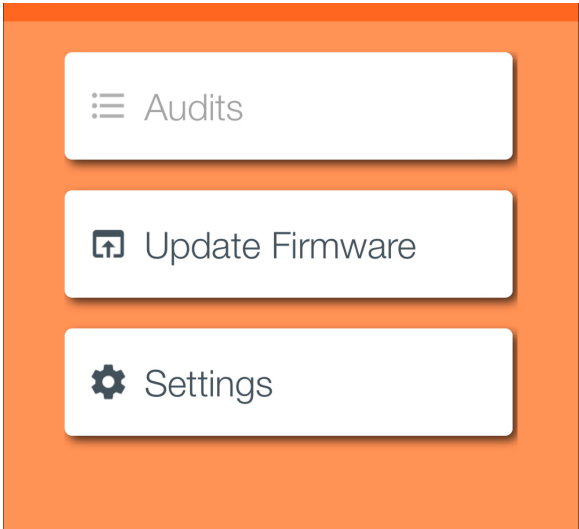## Updating Through Allegion ENGAGE™ App

1. **Select** Site.

2. **Turn** the inside handle on lock to initiate BTE communication.
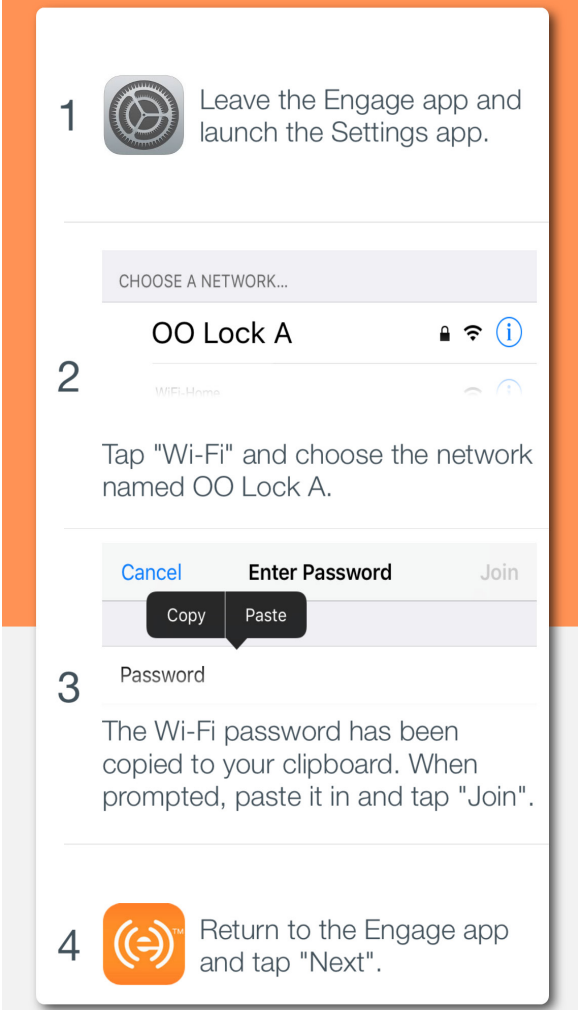
3. **Select** lock requiring update.
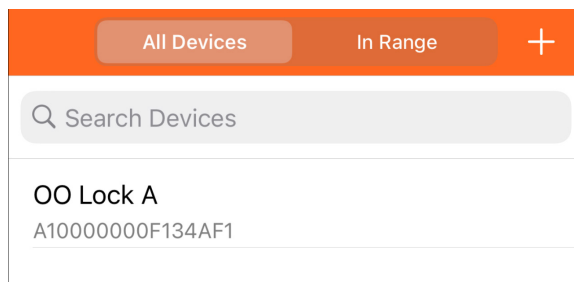
4. **Select** "Update Firmware" once Connection has been established with lock. Lock will state current connection status at the bottom of the screen for your HHD.
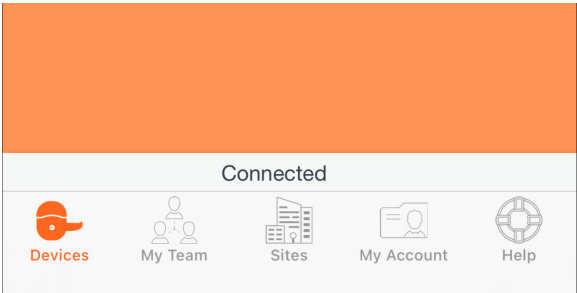
5. **Connect** to lock through WiFi settings on your HHD. The lock's WiFi password will have already been copied to your device clipboard by the app and can be pasted in the "Password" setting for the lock's WiFi connection to your phone.

6. **Maintain** network connection to lock until completed.

Transferring firmware
Please remain on this screen until the
firmware download completes.
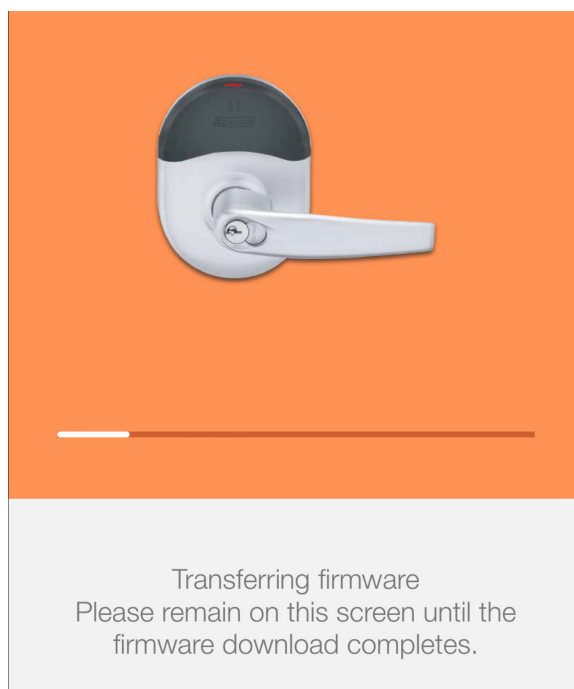
7. Wait for lock to power cycle, this may take up to 5 minutes, and confirm version of firmware installed on lock.

Reset Button

Button	Component	Description
RESET	Reset Button	If pressed and held, resets the ENGAGE Gateway.

Factory Reset NDE Door Lock

A Factory Default Reset (FDR) will return the NDEB lock settings to the original settings as shipped from the factory. Removes configurations, databases, and requires the lock to be re-captured. To perform a FDR, please complete the following steps:

1. **Press and hold** the FDR Button for 5 seconds located under the battery cover flap.

   The green "Access Granted" light will blink twice and the device will beep twice when properly completed.

2. **Turn** the inside lever 3 times within 20 seconds. The "Access Denied" red light will blink and the device may beep for every time the inside lever is turned depending on user applied settings.

3. **Re-install** the battery cover and place the retaining screw in place to re-initiate wireless communication.

> (i) *Battery Cover must be installed in order to enable wireless communication via BTE or Wi-Fi. Please see NDE(B)/LE(B) user manual for more information regarding lock wireless comms.*

4. **Recapture** the device using the "Allegion ENGAGE" app after turning the inside lever to initiate wireless communication. The lock will attempt to look for your device for 2 minutes after turning the inside lever.

Specifications

The ENGAGE Gateway interface is for use in low-voltage, Class 2 circuits only.

Electrical:	*Batteries*	4xAA, Single door entry a day for 2 yrs with 1 check in a day with system. Extra Door turn diminishes lifespan by approx. 2 months per turn.

Specifications are subject to change without notice.

For more information on the ENGAGE Gateway, visit the following webpage:

https://us.allegion.com/en/home/products/brands/schlage.html

NOTES:

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