



Reshaping Security

**acre Security Integration  
Guide:**

**Aperio®  
AH40  
Wireless Hub**

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The controllers use equipment that generates, uses, and radiates radio frequency energy. If not installed and deployed in accordance with the guidelines of this installation manual, they may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be required to correct the interference at their own expense.

The Mercury controllers and subcontrollers shall be installed in accordance with this installation manual and in accordance with the National Electric Code (N.E.C), ANSI and NFPA 70 Regulations and recommendations.

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# AH40 Gateway



## *In This Chapter*

- ✓ AH40 Gateway Characteristics and General Information
- ✓ Initial Configuration of the AH40 Gateway
- ✓ Connecting and Configuring the Gateway and Lock sets in DNA Fusion

## **Aperio® AH40 IP Communication Hub**

The Aperio® AH40 is a IP Communications (Comm) Hub designed to work with the Aperio® devices and lock sets. The lock sets and Devices include smart cylinder locks, integrated lock/door sensor combo's, cabinet and handle lock/reader combo's. Please contact your local RSM for more information or the list of lock sets and devices offered by acre Security

## **Aperio® Hub Integration**

The Aperio® AH40 Ethernet Enabled Communication Hub functions as a bridge between ASSA-ABLOY/ Aperio® enabled locks and a variety of acre Security enabled access control systems such as DNA Fusion. This allows users of systems such as DNA Fusion operators to control the Aperio and ASSA-ABLOY (ASSA) locks remotely from the software.

The Mercury LP 1501, 1502, 2500 and 4502 controllers with the latest Firmware Version or 1.30.1.0663 or higher will support the Aperio® Hub integration. The controllers support Ethernet communication to up to 32 Subcontrollers and 64 ACMS. The Aperio® Hub communicates directly with Aperio®-enabled locks via an encrypted 2.46-Hz wireless link on 16 distinct channels using AES-128 Bit Encryption. Each Aperio® Hub includes mounting hardware and instruction manual.

When a cardholder presents a card to an ASSA/ Aperio® lock, the credential information is sent wirelessly to the Aperio® Hub. The hub then routes the information to the controller, which verifies the access rights. The resulting decision is communicated back to the Aperio® Hub, which either grants or denies access.

The integration process includes two (2) steps:

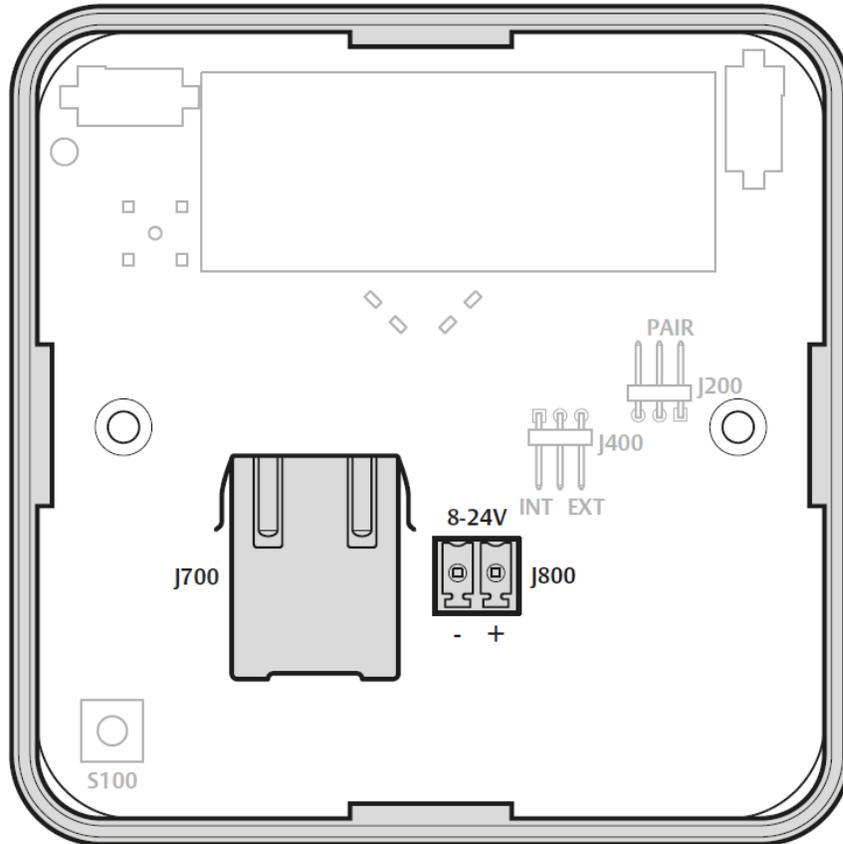
- Hardware Setup - Wire the Aperio® Hub using CAT-5e Ethernet Connection and power from either POE+ enabled switch devices or from a standalone power source.
- DNA Fusion Integration - After the hardware is connected, add the Aperio® Hub to DNA Fusion and build doors in sequence from the readers, inputs, and outputs associated with the Aperio® Hub.



## Aperio® Hardware Setup

### Connecting the AH40 Hub to the Local Area Network (LAN)

The AH40 communicates to the Mercury enabled Controller via a Networked Ethernet Connection. At a Minimum, the use of a CAT-5e connector complying with 10BASE-T / 100BASE-TX standard must be used. The connection can be achieved by connecting the Ethernet cable to the J700 connector located on the back of the device as pictured below.



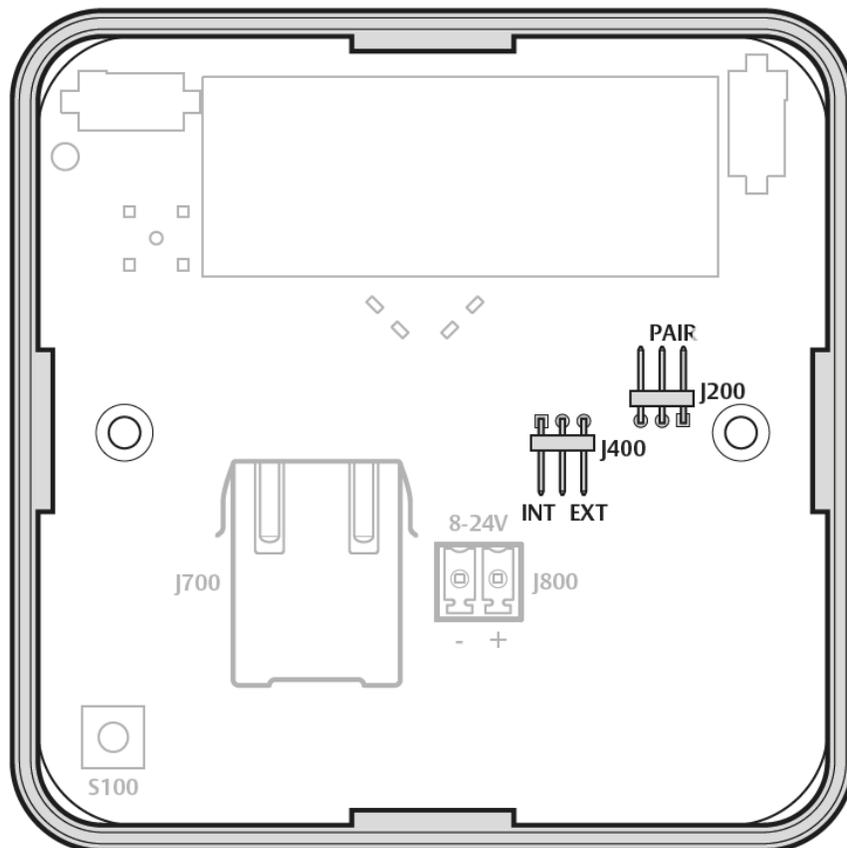
The device can be powered through the use of the J800 port connector to an external power source or by using a POE+ Enabled Switch. The Connection must be an IEEE 802.3.af compliant Power Sourcing Device. Recommended power source is 1.2w and less than 3 amps. If the possibility of surges over 3 amps exists then a over current protection device must be used.

***Continued on the following page***

## AH40 Jumpers

The AH40 has two jumpers on the back of the device. The jumpers can only be accessed by removing the device from its wall mount. The Jumpers and description are as follows:

Jumpers	Description
J400 ANTENNA	Select external antenna by connecting the two right pins. Select internal antenna by connecting the two left pins.
J200 PAIR	Select pairing mode by connecting the two right pins.



*If the pairing jumper is removed within 10 seconds from boot up and the Hub LED is lit, all paired devices will be unpaired.*

## AH40 External Antenna

The AH40 has the ability to transmit information and form a wireless external connection with all locks using a 2.5 GHz connection along the 2400 – 2483,5 MHz frequency range using 16 individual channels. This connection is protected using an AES 128 bit encryption for every connection. The Wireless Transmission power is along 10 dBm/MHz and the peak value has been measured in accordance with EN ETSI 300 328 Maximum spectral density.

The AH40 comes out of the box with the ability to connect using a forward propagating antenna located inside the unit. It also has the ability to connect to an external antenna using the following steps.

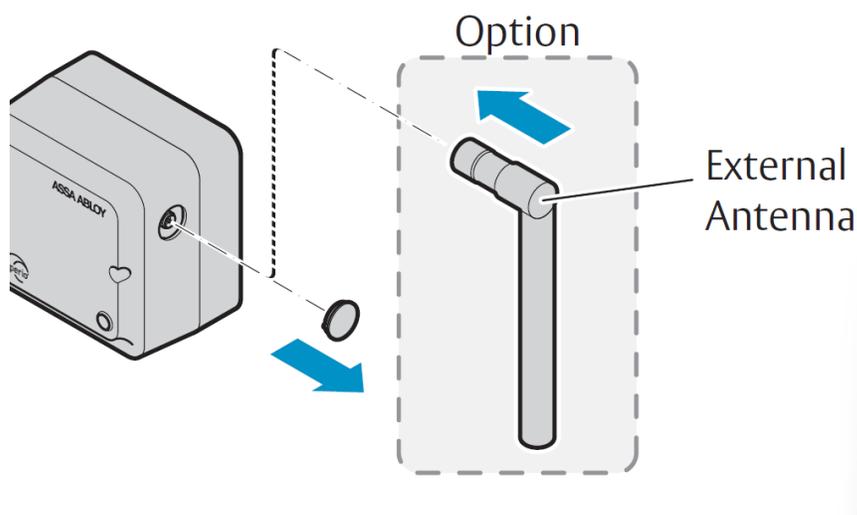
1. **Power Off** the AH40 Unit by **Disconnecting** the *Ethernet Cable* if powered using the POE method or *Power Connector* if using an external power source.
2. **Locate** the *External Antenna Plug* on the **Upper-Right** hand side of the unit. Gently **Pry** the cover from the unit using your finger nail or a flat head screw driver.



Care should be taken when prying off cover so that the connectors located under the cover

3. **Connect** the *external antenna* to the connector. The antenna is an Dipole antenna with a slight dead zone for signal propagation located on the top and bottom of the external antenna post. The antenna should be angled to be perpendicular to the wireless device locations it will be communicating with.

Once you have connected the external antenna. You will need to **Change** the *J400 Jumper* to **Connect** the *Right-Two* jumper pins when facing the unit from the back. You have now configured the unit to be used with an external Antenna. You may now reconnect the unit to power and remount the unit to its back plate as shown in the AH40 User manual From ASSA/Aperio®.



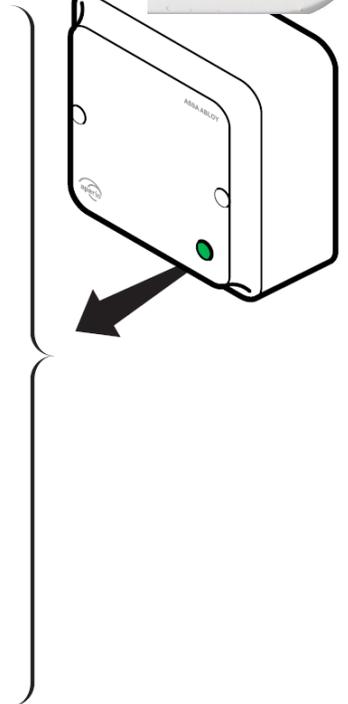
**Continued on the following page**

## AH40 Status Lights

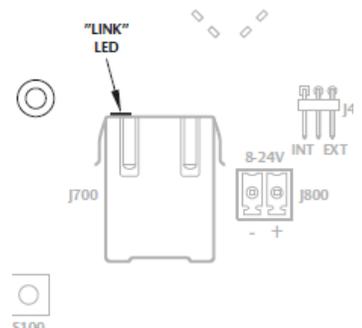
The AH40 comes with a two LED Status lights. The external status light is configured to provide status information pertaining to the operational status of the unit. The Status light scheme includes the details shown below.



Online		Green
Aperio® Lock Offline		Green + One Red Flash
EAC Offline		Green + Two Red Flashes
Aperio® Lock and EAC Offline		Green + Three Red Flashes
UHF Communication		Yellow + Off, Fast Flash
Pairing Active		Yellow



The second LED is located in the back of the unit and allows for an instant verification and assessment of the network connection status. For additional information pertaining to the Network Status LED please contact ASSA/Aperio® customer service.



## Configuring the AH40 with Aperio® USB (Dongle)

### Configuring the AH40

In order to properly configure the AH40 and connect it to your access control system, you are required to use the Aperio® USB or otherwise referred to as the USB radio dongle as well as the Aperio® Programming Application. The program application can be found at the following link:

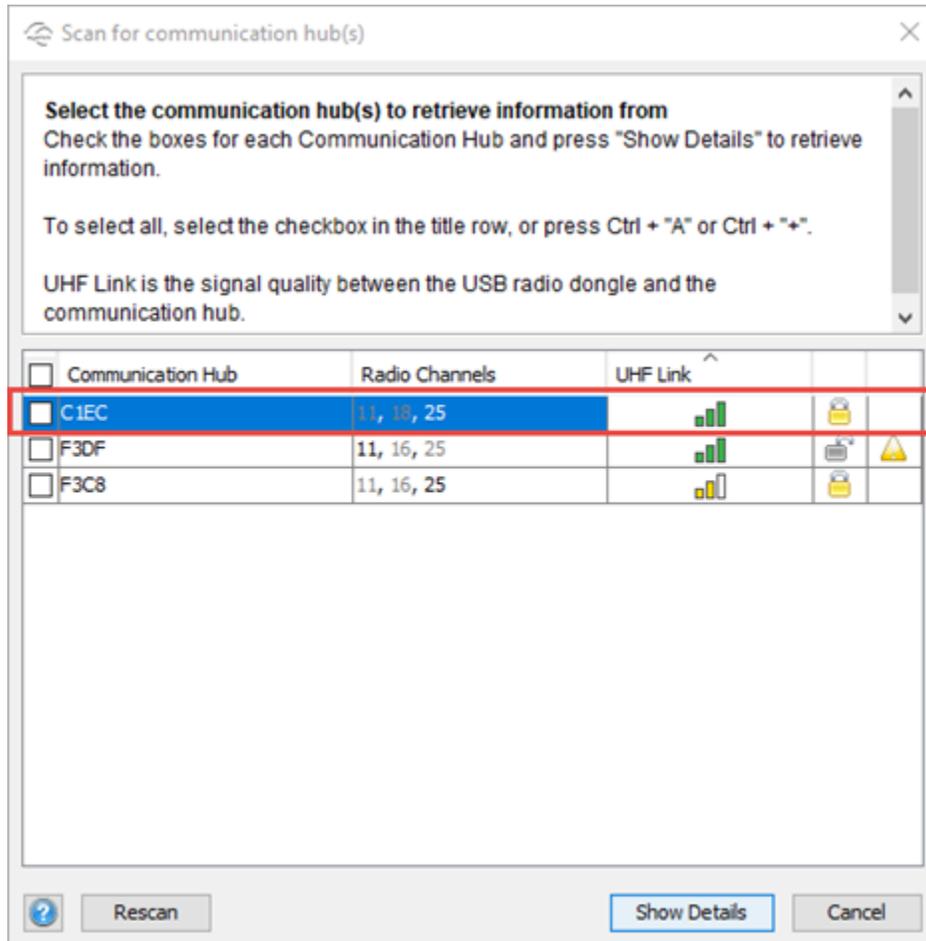
<https://assaablyresources.com.au/downloads/Aperio-software/setup-progapp-28.0.43-4cd7502.exe>

 For more information regarding the installation of the Aperio® Program Application please visit their website at [assaablyresources.com](http://assaablyresources.com) or contact their customer support.

Once the software is installed you will then be able to Plug-In the Aperio® USB and follow these directions to initially connect to the system.

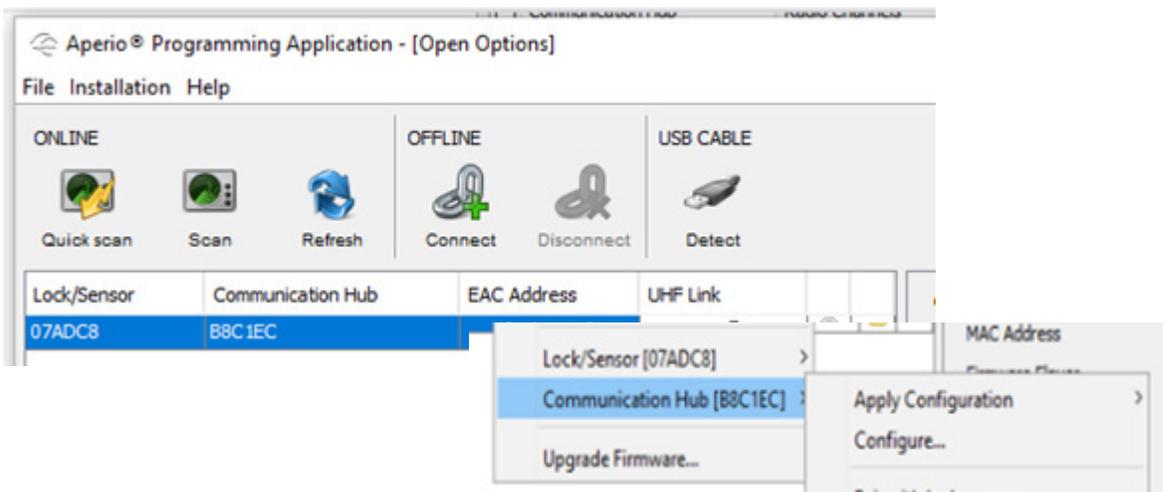
1. **Connect** and **Power Up** the AH40 hub. Once you have connected it and it has finished its power up sequence you may **Connect** the *Aperio® USB Dongle*.

2. **Open** the *Aperio® Program Application (App)* and **Select Quick Scan**. Your AH40 hub should be detected and listed in the program as shown below:

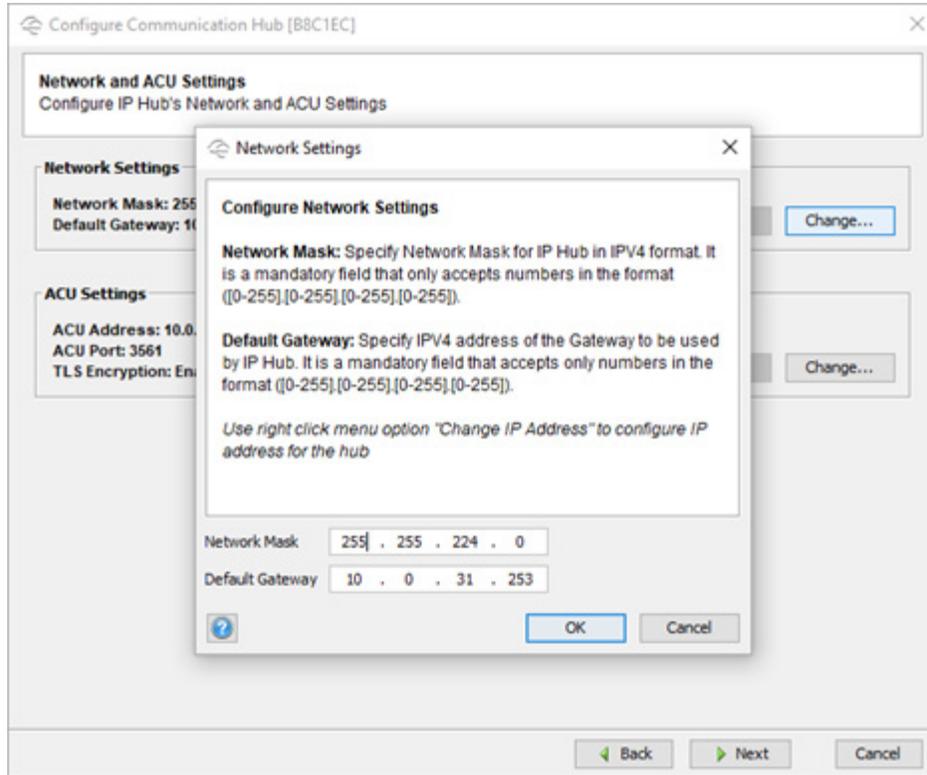


Click on *Show Details*

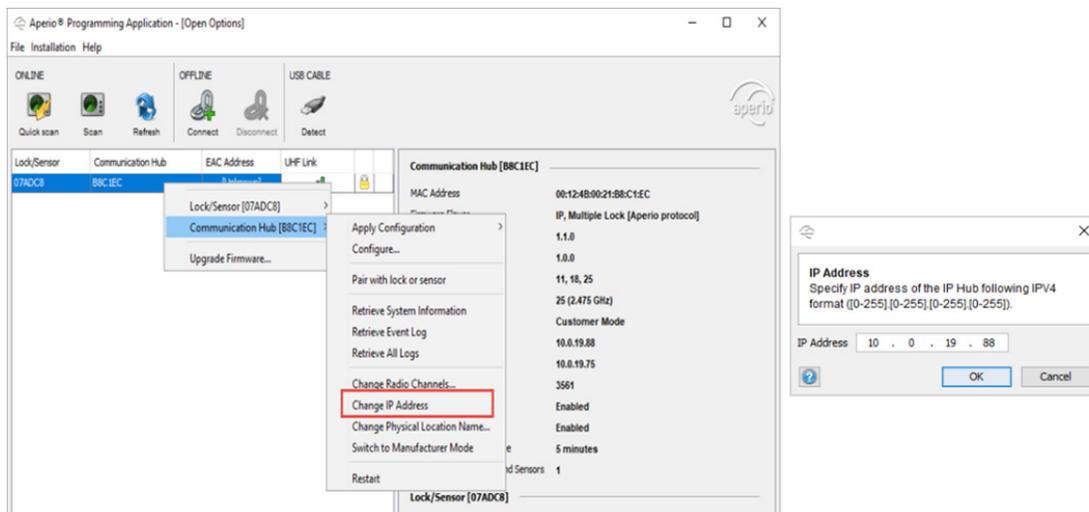
3. **Right-Click** on the *Hub Row* and **Select Communication Hub>Configure**.



You will now be able to **Modify** the AH40's *Network Settings* such as the *Network Mask* and *Gateway* to **Match** the existing (W)LAN Configuration. **Click OK**.

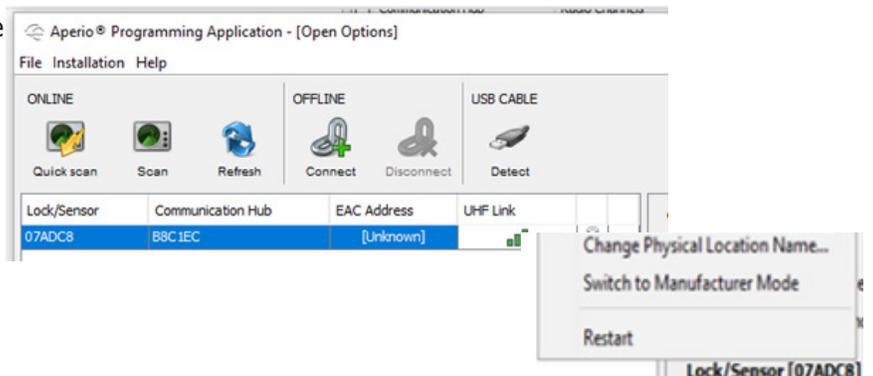


4. **Right-Click** on the AH40 Row and **Select Change IP Address**. **Add** the required IP Address provided by IT or the customer.



5. **Right-Click** on the AH40 Row and Make sure that it is in Manufacturer mode by **Selecting Switch to Manufacturer Mode**.

Next We will configure the address of the controller.



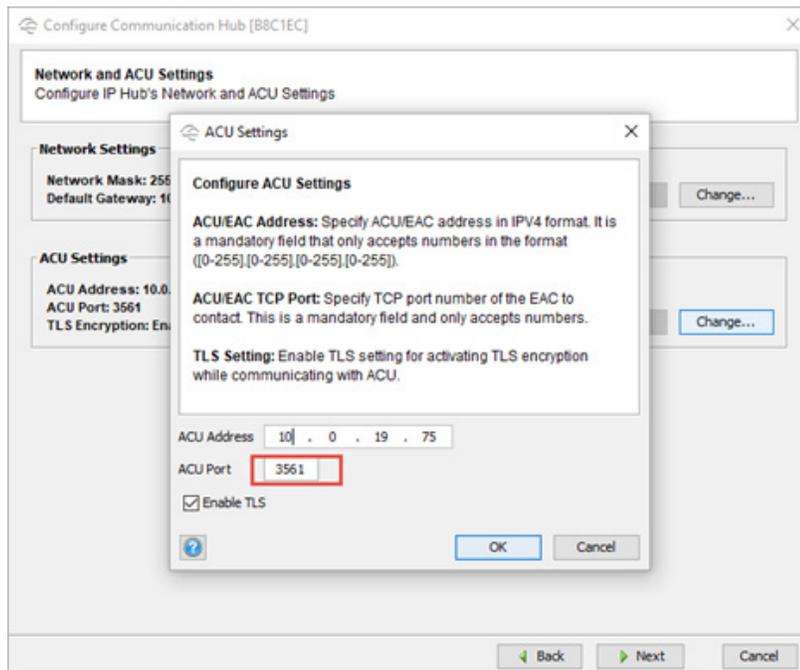
6. **Right-Click** on the *Hub Row* and **Select** *Communication Hub>Configure* if the window is not already open and **Click** on the *ACU Settings Change Button*.

The ACU Settings Window will open.

**Type In** the *ACU or Controller IP Address* as well as **Verify** that the *ACU Port is 3561* and **Check** the *Enable TLS* box.

7. **Click OK**.

We will now continue the installation by adding the Aperio® AH40 Hub as a Subcontroller in DNA Fusion

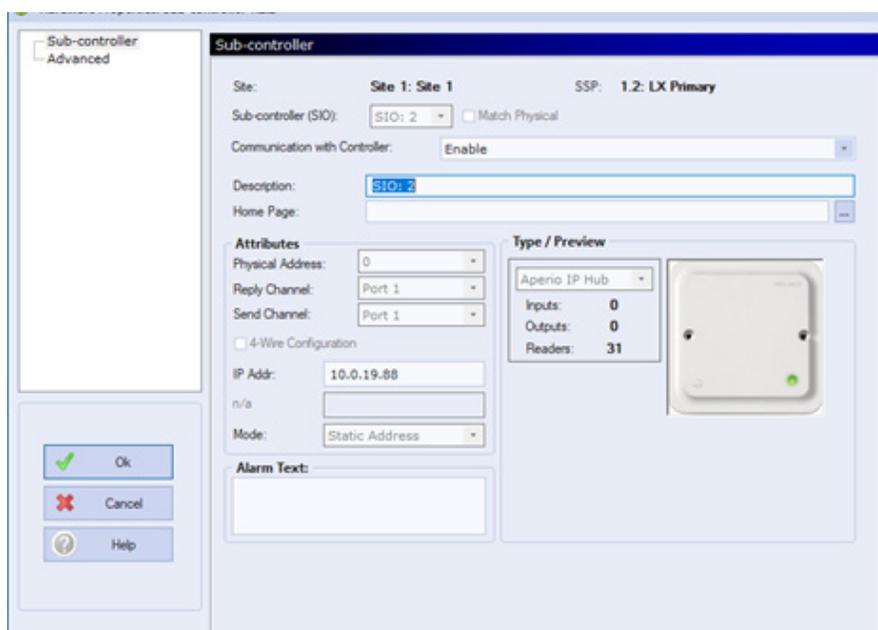


## Adding the AH40 Hub to DNA Fusion

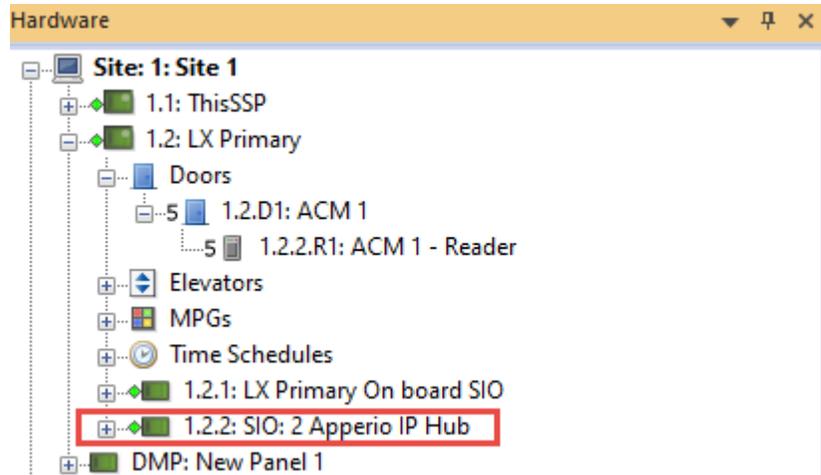
Once the initial hardware configuration has been completed, you will now need to add it to your access control system. For the purpose of this guide, we will be using DNA Fusion. To start, you will need to **Log In** to *DNA Fusion* using your *Username* and *Password*. Once in you will need to **Open** your *Hardware tree* and **Locate** the *Controller* that was used for the ACU Address in Step 6 on this page.

1. **Right-Click** on the *Controller* who's address was used in the ACU Step. **Select** *Add>Add Subcontroller...* A new window will appear.

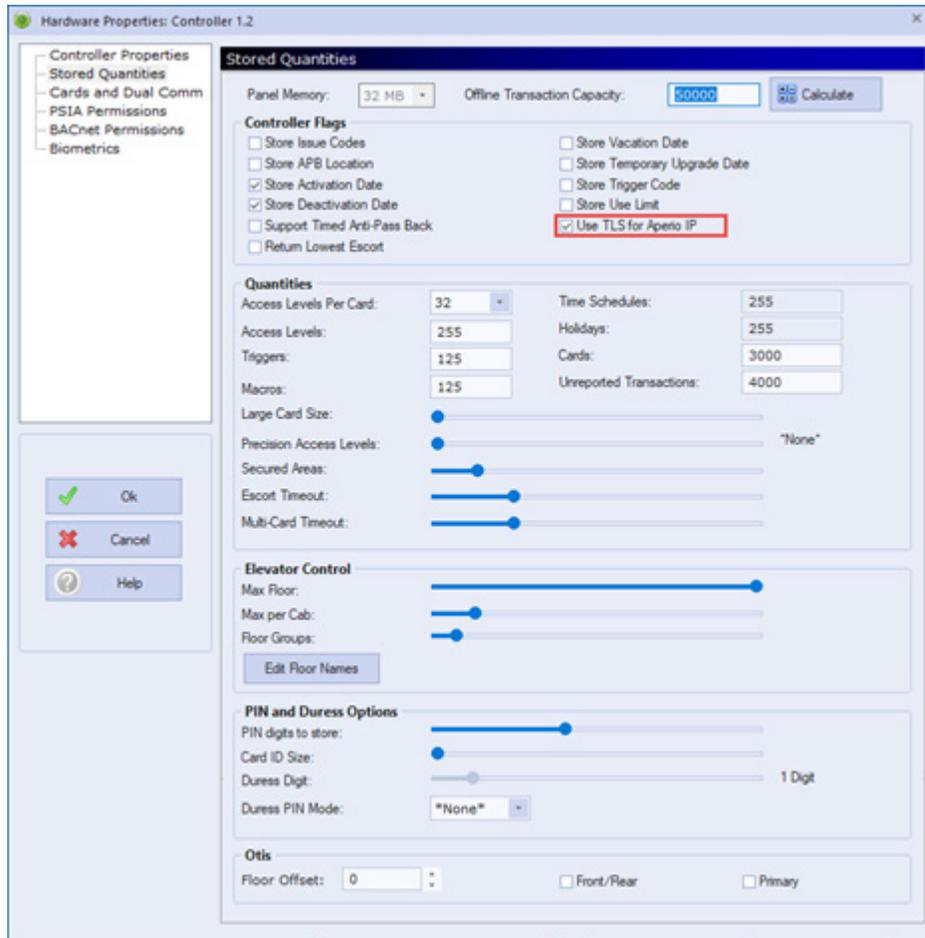
2. **Type In** the *Description* for the AH40 in its respective line (Name of the AH40 location or reference name). **Click** on the *Drop Down* under *Type/Preview* and **Select** the *Aperio® IP Hub*. **Type** in the *IP Address* used for the Hub in the *IP Addr:* line. **Click OK**.



3. **Verify** that the *AH40 Comes Online* and then **Double-Click** the *Controller* connected to the AH40 to open the *Controller Configuration window*.

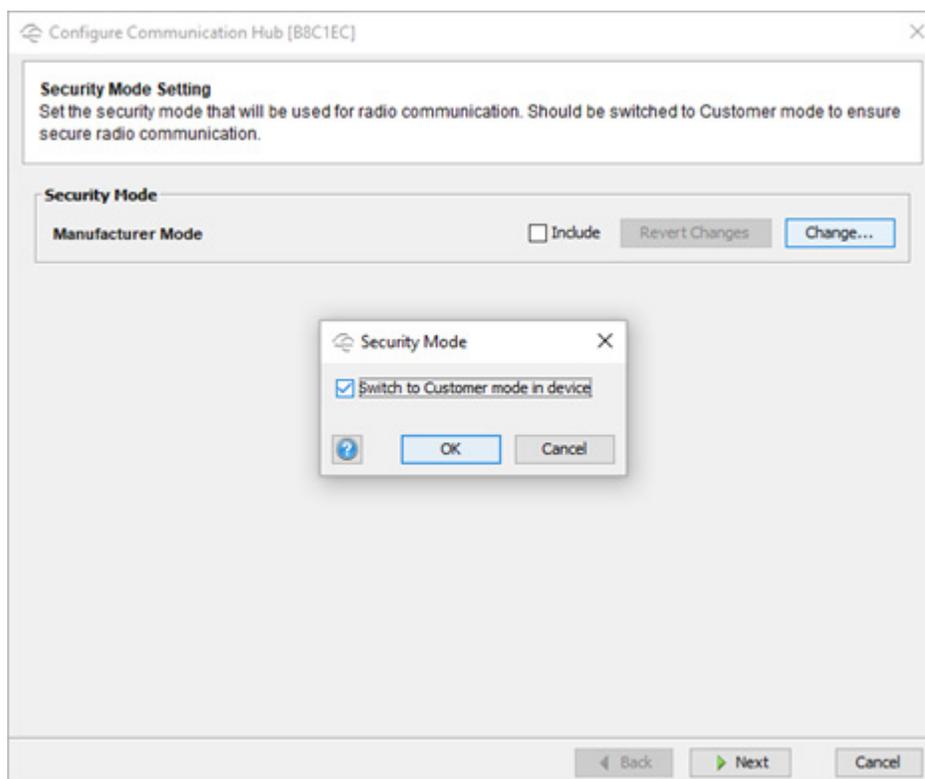


4. **Click** on *Stored Quantities* and then **Click** on the *Use TLS for Aperio IP* Check Box.



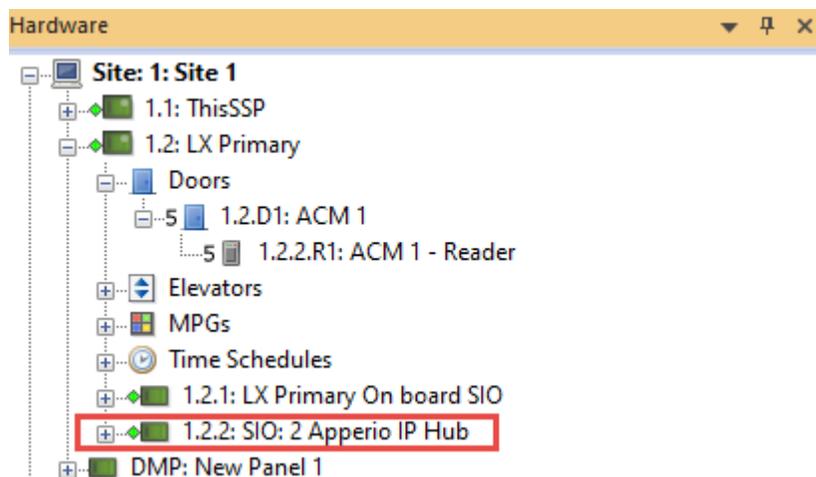
5. **Return** to the *Aperio® Program App* and **Right-Click** on the *AH40* just added to DNA and **Select** *Communication Hub>Switch to Customer Mode*. A New Window will appear.

6. **Click** on *Change* and then **Click** on *Switch to Customer mode in device*. **Click** *OK*. This will enable the use of the TLS encryption for communication with the LP series Mercury Controller (Series 3/Red Controller).



**The TLS settings will be restricted to TLS 1.1 and 1.2. Please talk to your network administrator to ensure that these settings will work with your current network security plan.**

**In some instances**, you may need to **Right-Click** on the *Controller* and **Select** *Controller Commands>Reset* prior to the controller and the AH40 both being registered as online after finishing the initial configuration. Please contact customer support if there are any issues in bringing the Controller and AH40 online.



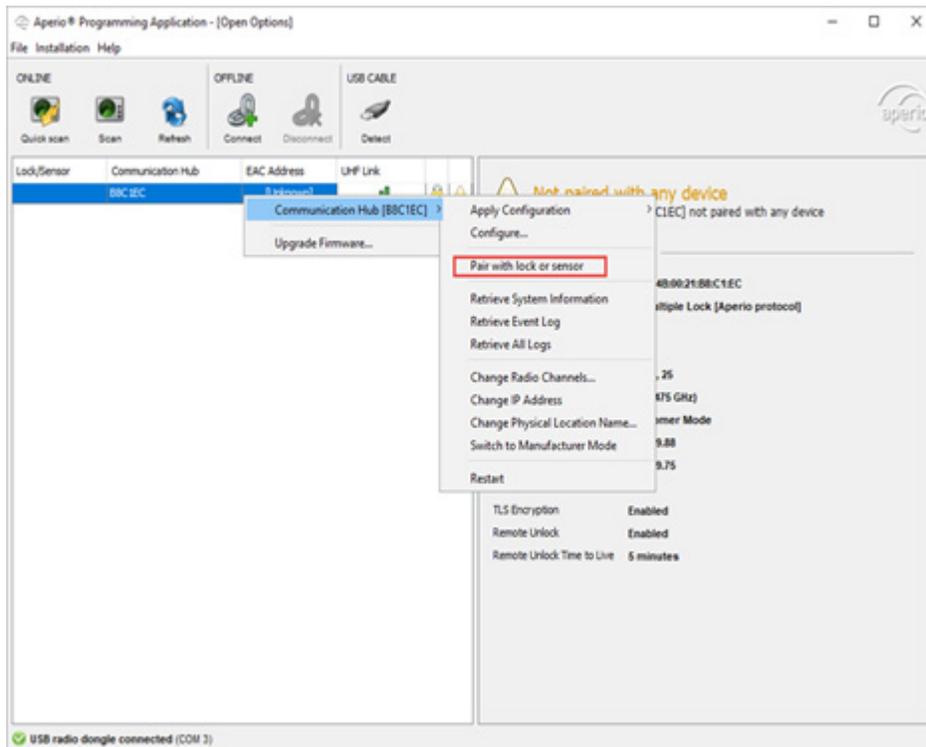
Next we will go over how to add locks or sensors to the AH40 and then pull the linked Locks and/or Sensors into DNA Fusion.

## Adding Locks to the Aperio® USB Application

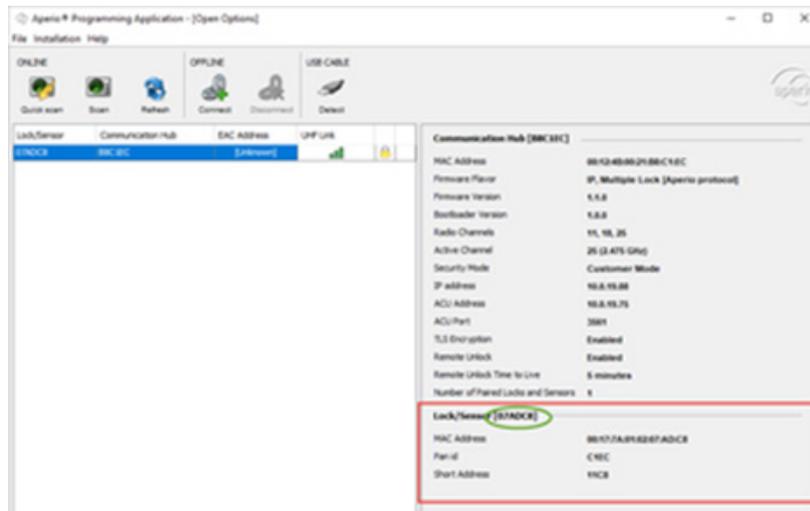
Prior to any locks and wireless devices being pulled into DNA Fusion, they will first need to be added and configured by using the App with the AH40 hub. **To do this, you will need to make sure the Aperio® Programming App and the USB (Dongle) are connected to the system.** Next we will walk through the adding of a Lock or Sensor.

! Prior to attempting to add a Lock, you will need to make sure that the lock has new batteries, the Cover Plate has been properly secured and the lock is functioning properly per manufacturers recommendations.

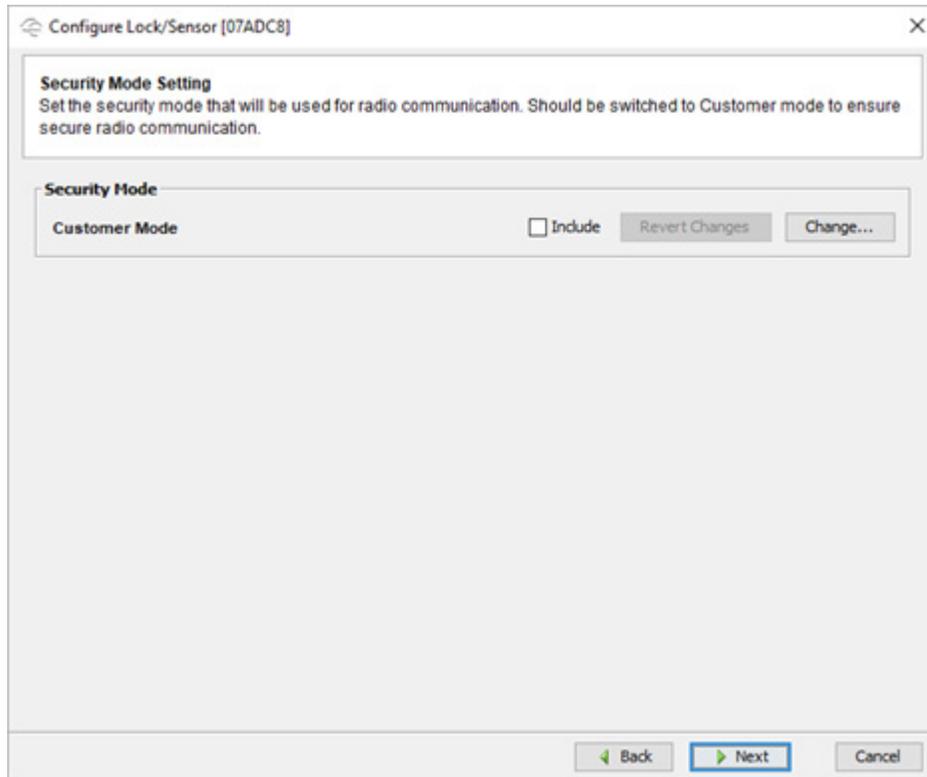
1. **Open** the *Aperio® App*, once in the App window and you have scanned for the AH40 hub, you can then **Right-Click** and **Select** *Communication Hub>Pair with lock or sensor* from the options list as shown below.



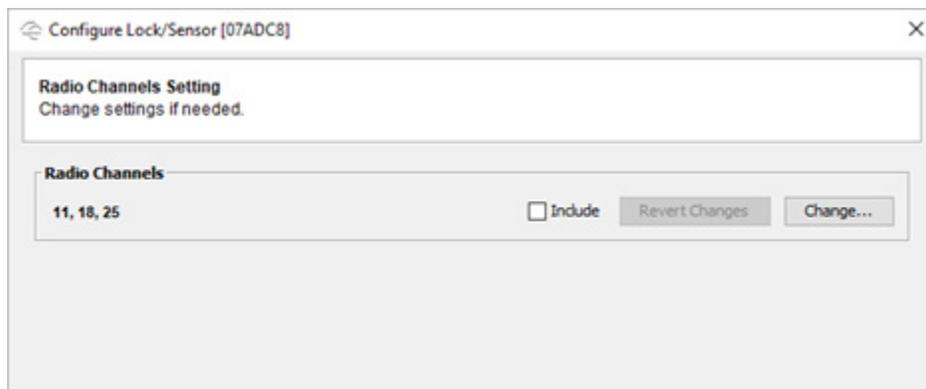
2. **Verify** that the *Lock has been Discovered* by the Hub and **Note** the **Lock ID** as seen in the green circle below.



4. **Right-Click** on the *Hub*, **Select** *Lock/Sensor>Configure* to enter the lock or sensor configuration window. Once in the Window, the lock will need to be **Set** to *Customer Mode* in Similar fashion as the Hub as shown below.



5. **Verify** that the *Lock or Sensor is on the Same Channels* as the Hub has been configured to communicate on. In this example, the channels are 11, 18, and 25. This allows for the segmenting of the network communications within the Hub's wireless network.

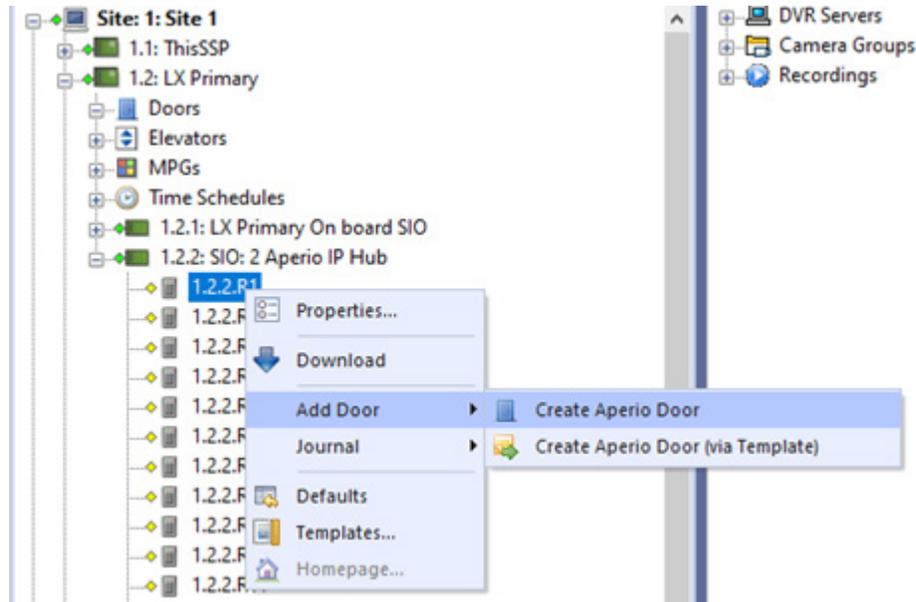


If performed correctly, the Hub status light will be Solid Green. If there is an error communicating between the Hub and the Lock or Sensor, the Hub status light will begin to blink the Red LED Three Times. Next we will import added Locks and Sensors into DNA.

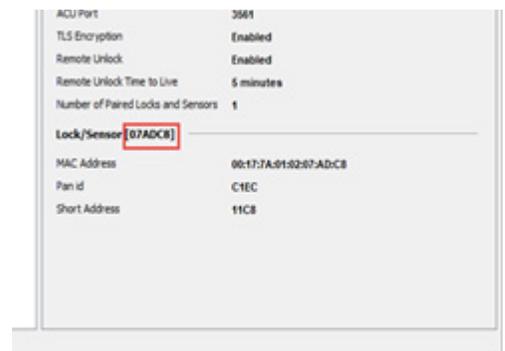
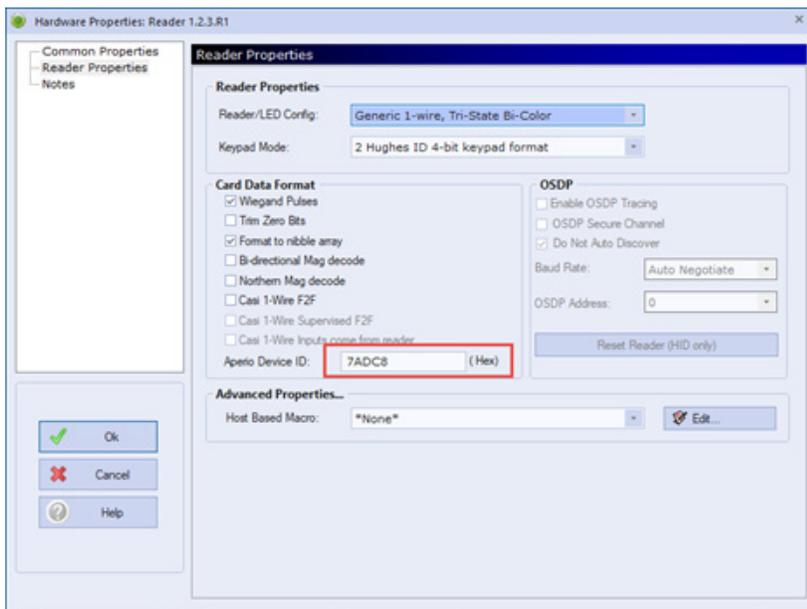
## Configuring Locks in DNA Fusion

Once you have added the locks to the AH40 Hub, you can now import them into the Access Control system. For this example, we will be adding the Locks added to the Hub inside of DNA Fusion.

1. **Open DNA Fusion** if the program is not already started. Once in DNA Fusion, you will need to **Open** the *Hardware Tree* and perform a **Right-Click** on the *Site* and **Select Refresh Status** from the list.
2. **Click** on the *Plus Sign* to the Left of the AH40 Hub (Subcontroller) to display your attached devices. **Right-Click** on the intended lock and **Select Add Door>Create Aperio Door** A new window will appear.



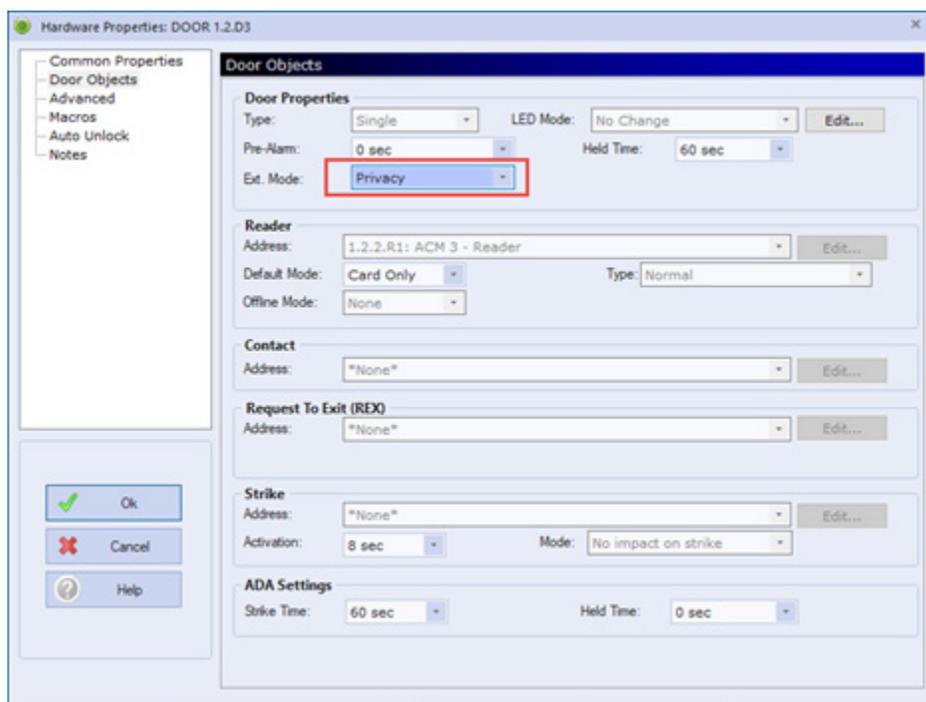
2. **Type In** the *Lock ID (Hexidecimal Format)* in the Reader Properties that was written down in Step 2 Page 11 in the Aperio Device ID as shown Below.



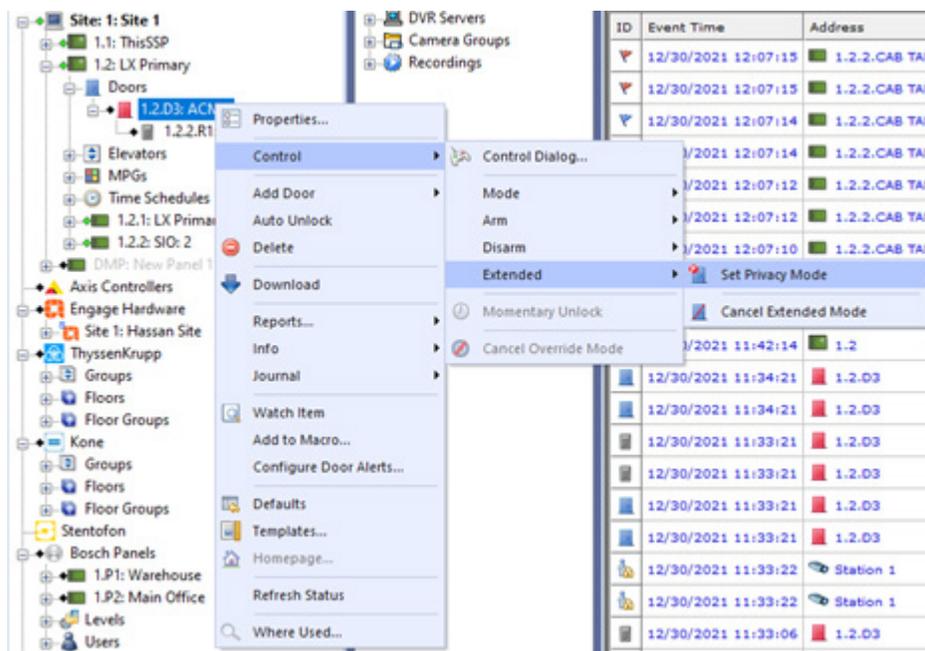
Once you have **Clicked OK**, you will now be able to test the connection and configuration by Swiping a Badge with Known Access at the reader. You will be notified of the Transaction Event in the Events Viewer as well as get the temporary unlock of the door per the Door reader configuration settings.

## Configuring Privacy Mode

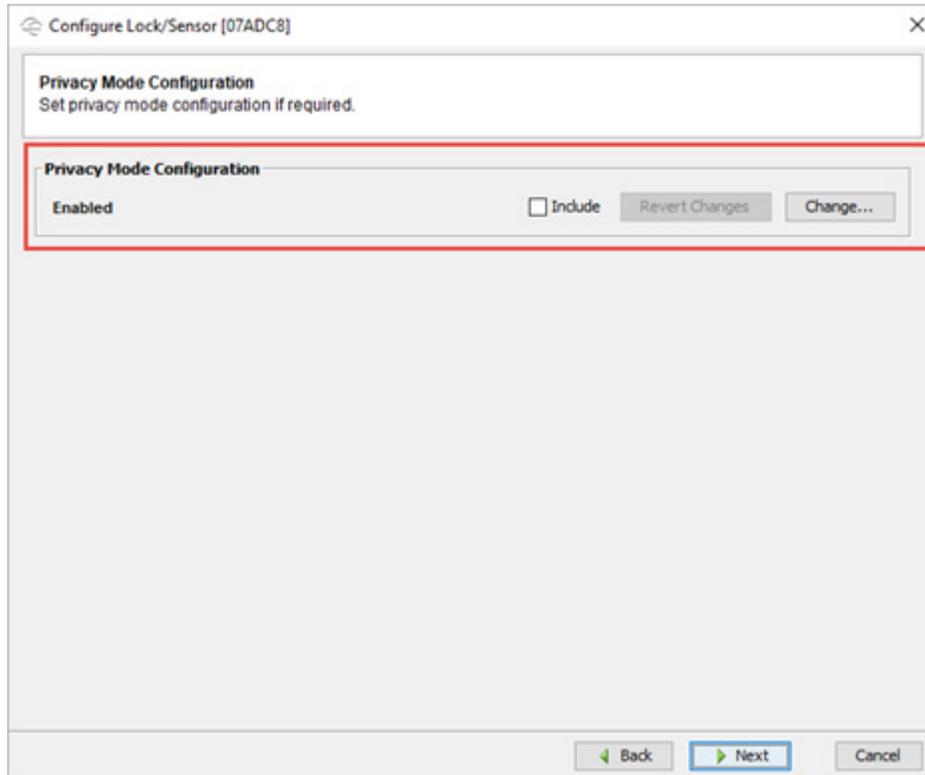
Setting Up Privacy Mode can be done **One of Two ways**, the first way consists of **Double-Clicking** on the **Reader** requiring privacy mode, **Select Door Objects**, and then **Select Privacy** from the **Drop-Down Menu** for **Ext. Mode**.



The second way consists of **Right-Clicking** the **Door** and **Select Control>Extended>Set Privacy Mode**.



Regardless of the way chosen to implement Privacy Mode you will need to **Open** the *Aperio Hardware App* (with Aperio USB plugged in) and **Click** on *Configure Lock or Sensor>Privacy Mode Configuration*. Once the window is open, you will need to **Click** *Change* and **Select** *Enabled*.



The Privacy Mode allows the end user to press a button on the inside part of compatible locks that overrides the lock sets' function similar to a Lockdown situation until the user presses the button a second time to allow the lock to go back to its normal state or function. For more information on this setting or to check for compatibility contact your lock manufacturer.

***Continued on the following page***

## Technical Data

### **Physical Dimensions:**

82 mm x 82 mm x 37 mm (H x W x T)

### **Power Supply:**

8-24 VDC or Power over Ethernet (PoE)

### **Power Rating:**

The power supply shall be able to deliver minimum, 1.2 W and be 3 A over current protected. Wire requirements 16-22 AWG.

PoE IEEE 802.3.af compliant class 1 Powered device (PD)

### **Ethernet:**

10BASE-T / 100BASE-TX Local Area Network

### **Radio Standard:**

IEEE 802.15.4 (2400 – 2483,5 MHz), 16 channels (11-26), AES 128 bit encryption

### **Receiver Sensitivity:**

-100 dBm

### **Wireless Transmit Power:**

10 dBm/MHz. Peak value from average detector according to EN ETSI 300 328 Maximum spectral density.

### **Wireless Operating Range:**

Indoors up to 25 m depending upon installed environment.

### **Internal Antenna:**

Two port cross polarized patch antenna.

### **External Antenna:**

One reverse polarity SMA external antenna connector. AH40 is certified to be used with ASSA ABLOY external antenna AH ANTENNA 1. If other external antenna is used it must be of same type (dipole) and not have larger antenna gain than 3.6 dBi.

### **Operating Temperature:**

5 °C to 35 °C

### **Humidity:**

< 95 % non-condensing

### **IP Classification:**

IP20

### **Safety, Radio and EMC:**

IEC 62368-1:2014, EN 62368-1:2014 + A11:2017

UL/CSA 62368-1:2014, EN 301 489-1 V2.1.1

EN 301 489-17 V3.2.0, EN 300 328 V2.2.2

EN 50130-4:2011 + A1:2014, EN 62311

FCC 47CFR Part 15 subpart B and subpart C, ISED RSS-247 and ICES-003

AS/NZS 4268