INSTEON

INSTEON Developer Notes
Open/Close Sensor (2843-xxx)

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Revision History

Release Date	Author	Description
10/04/2013	jtalmich	V0.1 for Open/Close Sensor

Device Description

Details

Device Name	Open/Close Sensor
Product SKU	2843-XXX
Product Website	http://www.smarthome.com/2843-222/INSTEON-Open/Close-Sensor/p.aspx
Category	0x10 – Security, Health, and Safety
Subcategory	0x02 (Open/Close Sensor – US 915 MHz) 0x06 (Open/Close Sensor – EU 869.85 MHz) 0x07 (Open/Close Sensor – AUS/NZ 921 MHz)
Tested Firmware Version	89
Supports SD Messaging	YES
Supports ED Messaging	YES
I2CS enabled (CS)	YES

Additional Details

The Open/Close Sensor is a battery-powered device, therefore it goes to sleep quickly to preserve battery-life. The Open/Close Sensor must be awake for it to transmit or receive messages.

All direct commands will be ignored if the sender's ID is not in the I2CS device's database with the exceptions below. The Open/Close Sensor will reply with a NAK and 0xFF in cmd2 to indicate that the ID is not in the database.

Example Standard Length Message

A Standard Length Message (SD) is comprised of exactly nine (9) bytes.

Byte(s)	Description	Example
1-3	Transmitting INSTEON Device ID	AA BB CC
4-6	Receiving INSTEON Device ID (Target Device)	11 22 33
7	Flag Byte (Message Type)	0F
8	Command 1	11
9	Command 2	FF

Standard Message Formatted	AA BB CC 11 22 33 0F 11 FF

The above example will send an ON(11) at Full(FF) command to device 11 22 33.*

*For a detailed explaination of INSTEON Messaging, please see the INSTEON Manual

Example Extended Length Message

An Extended Length Message (ED) is comprised of exactly nine (23) bytes.

Byte(s)	Description	Example
1-3	Transmitting INSTEON Device ID	AA BB CC
4-6	Receiving INSTEON Device ID (Target Device)	11 22 33
7	Flag Byte (Message Type)	1F
8	Command 1	20
9	Command 2	01
10-22	Data1 – Data13	00 00 00 00 00 00 00 00 00 00 00 00 00
23	Data14 (Checksum)	DF

Extended Message Formatted	AA BB CC 11 22 33 1F 20 01 00 00 00 00 00 00 00 00 00 00 00 00 00 DF

The above example will send an Set Operating Flags (20) of Programming Lock Off(01) command to device 11 22 33.*

*For a detailed explaination of INSTEON Messaging, please see the INSTEON Manual

Messages Sent From – Open/Close Sensor

When an INSTEON device is active to trigger a group message the messages are sent in the following order *depending on flag options for some devices

Message Sent (Type)	Example
Group Broadcast Message on Activation	AA BB CC 00 00 01 CF 11 01
Direct Message for CleanUp	AA BB CC 11 22 33 40 11 01
Group Broadcast Message Success Report	AA BB CC 11 01 01 CF 06 00

All INSTEON Devices will send a group message for a particular activation. For Multi Group devices, the Group number will change depending on the group that was activated. The CleanUp messages and Success Reports will be the same with exception to the Group Number.

Assign to ALL-Link Group

This command is sent after holding down the SET Button for 3 seconds on the device.

Command Name	Assign to ALL-Link Group
Message Length	Standard Message (SD)
Message Type	Broadcast
To Address (Hi Byte)	0x10
To Address (Mid Byte)	Device Subcategory
To Address (Low Byte)	Firmware Revision
Command 1	0x02
Command 2	Hardware Revision

Command Example:

Assign to ALL-Link Group	**AA BB CC 10 02 89 8B 02 00**

The above example is the command a Open/Close Sensor sends when it goes into Linking Mode after its SET Button has been pressed and held for about 3 seconds. The To Address contains the Device Category (0x10), Device Subcategory (0x02), and Firmware Revision (0x89). Command 2 conatins the Hardware Revision (0x00).

Docklight Example:

```
9/24/2013 13:35:04.138 [RX] - 02 50 21 7D B9 10 02 89 8B 02 00 INSTEON STD RX
Assign to ALL-Link Group/ID Request Response (Open/Close Sensor)
```

Success Report

This command is sent at the end of a group broadcast.

Command Name	Success Report
Message Length	Standard Message (SD)
Message Type	Broadcast
To Address (Hi Byte)	Cmd1 being cleaned up
To Address (Mid Byte)	Number of devices to be cleaned up
To Address (Low Byte)	Group number
Command 1	0x06
Command 2	Number of failed cleanups

Command Example:

Success Report	**AA BB CC 11 02 01 CB 06 01**

The above example is the message a Open/Close Sensor sends out after a group broadcast. The To Address contains the Cmd1 being cleaned up (0x11), number of devices to be cleaned up (0x02), and the group number (0x01). Command 2 contains the number of failed cleanups (0x01)

Docklight Example:

```
02 50 21 7D B9 11 02 01 CB 06 00  INSTEON STD RX
 Cleanup Report Zero Error Example (Cmd1=0x11, 2 Devices in Group, Group 1)
02 50 21 7D B9 11 02 01 CB 06 00  INSTEON STD RX
 Cleanup Report Zero Error Example (Cmd1=0x11, 2 Devices in Group, Group 1)

02 50 21 7D B9 11 02 01 CB 06 01  INSTEON STD RX
 Cleanup Report One Error Example (Cmd1=0x11, 2 Devices in Group, Group 1)
02 50 21 7D B9 11 02 01 CB 06 01 INSTEON STD RX
 Cleanup Report One Error Example (Cmd1=0x11, 2 Devices in Group, Group 1)
```

Entering Open State

This command is sent out when the Sensor is opened.

Command Name	Entering Open State
Message Length	Standard Message (SD)
Message Type	Broadcast
To Address	0x00 0x00 0x01
Command 1	0x11
Command 2	0x01

Command Example:

Entering Open State	**AA BB CC 00 00 01 CB 11 01**

The above example is the command a Open/Close Sensor sends out when the sensor is opened. The To Address Low Byte contains the group (0x01), and Cmd1 is the On command (0x11).

Docklight Example:

```
02 50 21 7D B9 00 00 01 CB 11 01  INSTEON STD RX
 Entering Open State
02 50 21 7D B9 00 00 01 CB 11 01  INSTEON STD RX
 Entering Open State
02 50 21 7D B9 1A 77 7B 41 11 01  INSTEON STD RX
```

Entering Closed State

This command is sent out when the sensor is closed.

Command Name	Entering Closed State
Message Length	Standard Message (SD)
Message Type	Broadcast
To Address (Hi Byte)	0x00 0x00 0x01
Command 1	0x13
Command 2	0x01

Command Example:

Entering Closed State	AA BB CC 00 00 01 CB 13 01

The above example is the command a Open/Close Sensor sends out when the sensor is closed. The To Address Low Byte contains the group (0x01), and Cmd1 is the Off command (0x13).

Docklight Example:

```
02 50 21 7D B9 00 00 01 CB 13 01  INSTEON STD RX
 Entering Closed State
02 50 21 7D B9 00 00 01 CB 13 01  INSTEON STD RX
 Entering Closed State
02 50 21 7D B9 1A 77 7B 41 13 01  INSTEON STD RX
```

Heartbeat

This command is sent about once every 24 hours as a check that the device still has power.

Command Name	Heartbeat
Message Length	Standard Message (SD)
Message Type	Broadcast
To Address (Hi Byte)	0x00 0x00 0x04
Command 1	0x11 =open; 0x13 = closed
Command 2	0x04

Command Example:

Heartbeat	**AA BB CC 00 00 04 CB 11 04**

The above example is the command a Open/Close Sensor sends out once about every 24 hours. The To Address Low Byte contains the group (0x04), and Cmd1 indicates the Open/Close Sensor is detecting open status (0x11).

Docklight Example:

```
02 50 21 77 FC 00 00 04 CB 11 04  INSTEON STD RX
 Heartbeat - Open State
02 50 21 77 FC 00 00 04 CB 11 04  INSTEON STD RX
 Heartbeat - Open State
02 50 21 77 FC 11 00 04 CB 06 00  INSTEON STD RX
02 50 21 77 FC 11 00 04 CB 06 00  INSTEON STD RX
```

Messages Sent To – Open/Close Sensor

INSTEON Engine Version

This command requests the INSTEON Engine version of the device.

Command Name	INSTEON Engine Version
Message Length	Standard Message (SD)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x0D
Command 2	0x00

Command Name	INSTEON Engine Version Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x0D
Command 2	0x02 (Indicates i2CS engine version)

Command Example:

INSTEON Engine Version **INSTEON Engine Version Response**	**AA BB CC 11 22 33 0F 0D 00** **11 22 33 AA BB CC 2B 0D 02**

The above example device 11 22 33 is asked what it's Engine Version is(0x0D 0x00). Device 11 22 33 then responds back that it has an i2CS engine version(0x02)..

Docklight Example:

```
9/24/2013 13:35:39.123 [RX] - 02 62 21 7D B9 0F 0D 00 06  INSTEON STD TX
02 50 21 7D B9 1A 77 7B 2B 0D 02  INSTEON STD RX
 i2CS Engine Version
```

Ping

This command checks that the device is able to respond over INSTEON.

Command Name	Ping
Message Length	Standard Message (SD)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x0F
Command 2	Ignored Value

Command Name	Ping Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x0F
Command 2	Same as what was received in Command 2

Command Example:

Ping **Ping Response**	**AA BB CC 11 22 33 0F 0F 00** **11 22 33 AA BB CC 2B 0F 00**

The above example is the communication that goes on between a Controller and the Open/Close Sensor when it is sent a Ping command. The device 11 22 33 is sent a Ping Command (0x0F). The device 11 22 33 then responds back to device AA BB CC with a Ping Response of the exact same thing it received in Command 1 and Command 2.

Docklight Example:

```
9/24/2013 13:35:40.329 [TX] - 02 62 21 7D B9 0F 0F 00
9/24/2013 13:35:40.355 [RX] - 02 62 21 7D B9 0F 0F 00 06  INSTEON STD TX
02 50 21 7D B9 1A 77 7B 2B 0F 00  INSTEON STD RX
 Ping Response
```

ID Request

This command asks for the device's Device category, Device Subcategory, Firmware Revision, and Hardware Revision. It is the same info the device sends when it goes into Linking Mode.

Command Name	ID Request
Message Length	Standard Message (SD)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x10
Command 2	Ignored Value

Command Name	ID Request Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x10
Command 2	Same as what was received in Command 2

Command Name	ID Request Data
Message Length	Standard Message (SD)
Message Type	Broadcast
Transmitting Device ID	Open/Close Sensor
To Address (Hi Byte)	Device Category
To Address (Mid Byte)	Device Subcategory
To Address (Low Byte)	Firmware Revision
Flags Byte	Message Type
Command 1	0x02
Command 2	Hardware Revision

Command Example:

ID Request **ID Request Response** **ID Request Data**	AA BB CC 11 22 33 0F 10 00 11 22 33 AA BB CC 2B 10 00 11 22 33 10 02 89 8B 02 00

The above example is the communication that goes on between a Controller and the Open/Close Sensor when it is sent an ID Request command. The device 11 22 33 is sent an ID Request Command (0x10). The device 11 22 33 then responds back to device AA BB CC with a ID Request Response of the exact same thing it received in Command 1 and Command 2. The device 11 22 33 then responds back with the ID Request Data of Device category (0x10), Device subcategory (0x02), Firmware Revision (0x89), and the Hardware Revision (0x00). Essentially the devices sends out the exact same thing it sends out when it goes into Linking Mode without going into Linking Mode.

Docklight Example:

```
9/24/2013 13:35:42.539 [TX] - 02 62 21 7D B9 0F 10 00
9/24/2013 13:35:42.561 [RX] - 02 62 21 7D B9 0F 10 00 06  INSTEON STD TX
02 50 21 7D B9 1A 77 7B 2B 10 00  INSTEON STD RX
 ID Request
02 50 21 7D B9 10 02 89 8B 02 00  INSTEON STD RX
 Assign to ALL-Link Group/ID Request Response (Open/Close Sensor)
02 50 21 7D B9 10 02 89 8B 02 00  INSTEON STD RX
 Assign to ALL-Link Group/ID Request Response (Open/Close Sensor)
```

Read Configuration Byte

This command asks the device for its Configuration Byte.

Command Name	Read Configuration Byte
Message Length	Standard Message (SD)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x1F
Command 2	0x00

Command Name	Read Configuration Byte Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller

Flags Byte	Message Type
Command 1	0x1F
Command 2	Configuration Byte: bit 0 = Cleanup Report bit 1 = Don't Read the Jumper bit 2 = 2 Groups bit 3 = Repeat Open bit 4 = Repeat Closed bit 5 = LED On/Off bit 6 = Link to FF Group bit 7 = Programming Lock (0x43 is the default Config Byte)

Command Example:

Read Configuration Byte **Read Configuration Byte Response**	**AA BB CC 11 22 33 0F 1F 00** **11 22 33 AA BB CC 2B 1F 43**

The above example device 11 22 33 is sent a command that asks it for its Configuration Byte(Command 1 = 0x1F, Command 2 = 0x00). Device 11 22 33 then responds back with its Configuration Byte (0x43). This means that device 11 22 33 has Programming Lock Off, Link to FF Group On, LED On, Repeat Closed Off, Repeat Open Off, 2 Groups Off, Don't Read the Jumper On, and Cleanup Report On.

Docklight Example:

```
9/25/2013 10:32:33.354 [TX] - 02 62 21 7D B9 0F 1F 00
9/25/2013 10:32:33.367 [RX] - 02 62 21 7D B9 0F 1F 00 06  INSTEON STD TX
 Read Config Byte
                             02 50 21 7D B9 1A 77 7B 2B 1F 43  INSTEON STD RX
```

Database Delta

This command asks the device for its current Database Delta Number. The Database Delta increments with any database write. The Database Delta is cleared on power cycle.

Command Name	Database Delta
Message Length	Standard Message (SD)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x1F
Command 2	0x01

Command Name	Database Delta Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x1F
Command 2	Database Delta

Command Example:

Database Delta **Database Delta Response**	**AA BB CC 11 22 33 0F 1F 01** **11 22 33 AA BB CC 2B 1F 02**

The above example device 11 22 33 is sent a command that asks it for its Database Delta (Command 1 = 0x1F, Command 2 = 0x01). Device 11 22 33 then responds back with its Database Delta (0x02). This means that device 11 22 33 has had two Database writes since its last power cycle.

Docklight Example:

```
9/13/2013 10:21:54.135 [TX] - 02 62 29 70 02 0F 1F 01
9/13/2013 10:21:54.161 [RX] - 02 62 29 70 02 0F 1F 01 06  INSTEON STD TX
                              02 50 29 70 02 1A 77 7B 2B 1F 01  INSTEON STD RX Database Delta
```

Remote Enter Linking Mode

This command puts the device into Linking Mode

Command Name	Remote Enter Linking Mode
Message Length	Extended Message (SD)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x09
Command 2	Group Number
Data 1 – Data 13	Ignored Value
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Remote Enter Linking Mode Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x09
Command 2	Same as what was received in Command 2

Command Name	Assign to ALL-Link Group
Message Length	Standard Message (SD)
Message Type	Broadcast
Transmitting Device ID	Open/Close Sensor
To Address (Hi Byte)	Device Category
To Address (Mid Byte)	Device Subcategory
To Address (Low Byte)	Firmware Revision
Flags Byte	Message Type
Command 1	0x02
Command 2	Hardware Revision

Command Example:

Remote Enter Linking Mode **Remote Enter Linking Mode Response** **Assign to ALL-Link Group**	**AA BB CC 11 22 33 1F 09 01 00 00 00 00** **00 00 00 00 00 00 00 00 00 F7** **11 22 33 AA BB CC 2B 09 01** **11 22 33 01 3B C7 8B 02 00**

The the above example, device 11 22 33 is sent a command that tells it to go into Linking Mode (0x09) and to link to Group 1(0x01). Device 11 22 33 will ACK the command and then goes into Linking Mode.

Docklight Example:

```
9/25/2013 10:34:26.27 [TX] - 02 62 21 7D B9 1F 09 01 00 00 00 00 00 00 00 00 00 00 00 00 F6
9/25/2013 10:34:26.29 [RX] - 02 62 21 7D B9 1F 09 01 00 00 00 00 00 00 00 00 00 00 00 00 F6 06
INSTEON EXT TX
 Remote Enter Linking Mode
02 50 21 7D B9 1A 77 7B 2B 09 01  INSTEON STD RX
02 50 21 7D B9 10 08 89 8B 02 00  INSTEON STD RX
                          Assign to ALL-Link Group/ID Request Response (Open/Close Sensor)
```

Remote Exit Linking Mode

This command tells the device to exit linking mode.

Command Name	Remote Exit Linking Mode
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x08
Command 2	Ignored Value
Data 1 – Data 13	Ignored Value
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Remote Exit Linking Mode Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x08
Command 2	Same as what was received in Command 2

Command Example:

Remote Exit Linking Mode **Remote Exit Linking Mode Response**	**AA BB CC 11 22 33 1F 08 00 00 00 00 00** **00 00 00 00 00 00 00 00 00 F8** **11 22 33 AA BB CC 2B 08 00**

The above example device 11 22 33 is sent a command that tells it to exit Linking Mode (0x08).

Docklight Example:

```
9/19/2013 10:26:57.901 [TX] - 02 62 29 70 02 1F 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F8
9/19/2013 10:26:57.926 [RX] - 02 62 29 70 02 1F 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F8
                              06  INSTEON EXT TX
                              02 50 29 70 02 1A 77 7B 2B 08 00 INSTEON STD RX
```

Get for Group/Button

This command asks the device for its Group/Button Data

Command Name	Get for Group/Button
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00
Data 1	0x00 -> 0xFF (Group/Button)
Data 2 – Data 14	0x00

Command Name	Get for Group/Button Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00

Command Name	Get for Group/Button Data
Message Length	Extended Message (ED)
Message Type	Broadcast
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00
Data 1	Same as what was received in Data 1
Data 2	0x01
Data 3	LED Intensity (Default is 0x64)
Data 4	0x01
Data 5	0x23
Data 6	Configuration Byte
Data 7 – Data 14	Ignored Values

Command Example:

Get for Group/Button **Get for Group/Button Response** **Get for Group/Button Data**	**AA BB CC 11 22 33 1F 2E 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00** **11 22 33 AA BB CC 2B 2E 00** **11 22 33 AA BB CC 1B 2E 00 01 01 64 01 23 43 00 00 00 00 00 00 00 00**

The above example, device 11 22 33 is sent a command that asks for its Get for Group/Button Data for Group 1(0x2E 0x00 0x01). Device 11 22 33 responds back with an LED brightness at default(0x64) and a Configuration Byte also at default(0x43).

Docklight Example:

```
9/24/2013 13:57:44.40 [TX] - 02 62 21 7D B9 1F 2E 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00
9/24/2013 13:57:44.42 [RX] - 02 62 21 7D B9 1F 2E 00 01 00 00 00 00 00 00 00 00 00 00 00 00 06
INSTEON EXT TX
 Read Data

9/24/2013 13:57:44.952 [RX] - 02 50 21 7D B9 1A 77 7B 2B 2E 00  INSTEON STD RX
02 51 21 7D B9 1A 77 7B 1B 2E 00 01 01 64 01 23 43 00 00 00 00 00 00 00 00  INSTEON EXT RX
                              Return of Data
```

Set LED Brightness

This command sets the device's LED Brightness.

Command Name	Set LED Brightness
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00
Data 1	0x00 -> 0xFF (Group/Button)
Data 2	0x02
Data 3	0x00 -> 0xFF (Brightest)
Data 4 – Data 13	0x00
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Set LED Brightness Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00

Command Example:

Set LED Brightness **Set LED Brightness Response**	**AA BB CC 11 22 33 1F 2E 00 01 02 FF 00 00 00 00 00 00 00 00 00 D0** **11 22 33 AA BB CC 2B 2E 00**

The above example, device 11 22 33 is sent a command that sets its LED Brightness to its max brightness(0x2E 0x00 0x01 0x02 0xFF).

Docklight Example:

```
9/24/2013 16:01:34.55 [TX] - 02 62 21 7D B9 1F 2E 00 01 02 FF 00 00 00 00 00 00 00 00 00 00 D0
9/24/2013 16:01:34.57 [RX] - 02 62 21 7D B9 1F 2E 00 01 02 FF 00 00 00 00 00 00 00 00 00 00 D0 06
INSTEON EXT TX
 LED Brightness (Brightest)
                            02 50 21 7D B9 1A 77 7B 2B 2E 00  INSTEON STD RX
```

Stay Awake

This command tells the device to stay awake for the specified amount of time.

Command Name	Stay Awake
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00
Data 1	0x00 -> 0xFF (Group/Button)
Data 2	0x04
Data 3	0x00 -> 0xFF (Amount of seconds to stay awake)
Data 4 – Data 13	0x00
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Stay Awake Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00

Command Example:

Stay Awake **Stay Awake Response**	**AA BB CC 11 22 33 1F 2E 00 01 04 F0 00 00 00 00 00 00 00 00 00 00 DD** **11 22 33 AA BB CC 2B 2E 00**

The above example, device 11 22 33 is sent a command that tells it to stay awake for about 4 minutes(0x2E 0x00 0x01 0x04 0xF0).

Docklight Example:

```
9/24/2013 16:03:57.50 [TX] - 02 62 21 7D B9 1F 2E 00 01 04 F0 00 00 00 00 00 00 00 00 00 00 DD
9/24/2013 16:03:57.51 [RX] - 02 62 21 7D B9 1F 2E 00 01 04 F0 00 00 00 00 00 00 00 00 00 00 DD 06
INSTEON EXT TX
 Stay Awake - 4 Minutes
02 50 21 7D B9 1A 77 7B 2B 2E 00  INSTEON STD RX
```

Set Configuration Byte

This command sets the Configuration Byte to the specified settings.

Command Name	Set Configuration Byte
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00
Data 1	0x00 -> 0xFF (Group/Button)
Data 2	0x05
Data 3	Configuration Byte: bit 0 = Cleanup Report bit 1 = Don't Read the Jumper bit 2 = 2 Groups bit 3 = Repeat Open bit 4 = Repeat Closed bit 5 = LED On/Off bit 6 = Link to FF Group bit 7 = Programming Lock (0x43 is the default Config Byte)
Data 4 – Data 13	0x00
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Set Configuration Byte Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2E
Command 2	0x00

Command Example:

Set Configuration Byte **Set Configuration Byte Response**	AA BB CC 11 22 33 1F 2E 00 01 05 43 00 00 00 00 00 00 00 00 00 00 DD 11 22 33 AA BB CC 2B 2E 00

The above example, device 11 22 33 is sent a command that tells it to set its configuration to its default settings(0x2E 0x00 0x01 0x05 0x43).

Docklight Example:

```
9/25/2013 11:05:49.52 [TX] - 02 62 21 7D B9 1F 2E 00 01 05 43 00 00 00 00 00 00 00 00 00 00 7D
9/25/2013 11:05:49.54 [RX] - 02 62 21 7D B9 1F 2E 00 01 05 43 00 00 00 00 00 00 00 00 00 00 7D 06
INSTEON EXT TX
                             02 50 21 7D B9 1A 77 7B 2B 2E 00  INSTEON STD RX
```

Appendix

Checksum Information

For Set Database, Set Properties and 0x20, Data14 will contain a 2s compliment of cmd1 through 2nd to last data record in the last data record.

Example of Checksum:

Message for Checksum Example	**AA BB CC 11 22 33 1F 2E 00 01 05 FF 00 00 00 00 00 00 00 00 00 00 DD**

The above example, device 11 22 33 is sent a command that requires a checksum in Data 14. The checksum is calculated by summing all the values from Command 1 to Data 13(0x2E + 0x01 + 0x05 + 0xFF = 0x133). We then calculate the compliment of the last byte(0x33 compliment = 0xCC). Then we add 1(0x01) to find the checksum for Data 14(0xCC + 0x01 = checksum = 0xCD).

Memory Map

All-Link Database (AL /L) Overview

The AL /L starts at the top of external (serial) EEPROM and grows downward. In the INSTEON LED Bulb, top of memory is 0x0FFF. Each AL /L Record is 8 bytes long, so the first record starts at 0x0FF8, the second record starts at 0x0FF0, and so on down to 0x0300 for a total of 416 links. In what follows, the 3-byte INSTEON Address contained in a record is called the *Device ID* or sometimes just the *ID*. The high byte (MSB) of the Device ID is *ID2*, the middle byte is *ID1*, and the low byte (LSB) is *ID0*.

EEPROM Structure Overview

Location	Comments
0x0FF8	All-Link Database Record
0x0FF0	Ack
0x0FD8	Open/Close Sensor
.....	Controller
0x0300	Last Record, 416 total links allowed
0x02xx	Addressing below 0x0300 is ignored by the database

AL /L Record Format

INSTEON Open/Close Sensor AL Record Format

Database entries with Record Control Bit 6: 0 = Responder and Group 1 will control the local load.

Field	Description
Record Control	Record Control Flag Bits: Bit7: 1 = Record is in use, 0 = Record is available Bit 6: 0 = Responder to (Slave of) Device ID Bit 5: Not Used Bit 4 & Bit 3: SmartHops (Keeps track of what the start hop should be) Bit 2: Not Used Bit 1: 1 = Record has been used before, 0 = High Water Mark Bit 0: Not Used
Group	All-Link Group Number this Device ID belongs to
ID	Device ID
Data 1	On Level
Data 2	Ramp Rate
Data 3	Not Used

To add a record to an AL /L, you search for an existing record that is marked available. (Available means the same as empty, unused or deleted.) If none is available, you create a new record at the end of the AL /L.

An unused record will have bit 7 of the *Record Control* byte set to zero. The last record in an AL /L will have bit 1 of the *Record Control* byte set to zero.

Overwriting an Empty AL /L Record

If you found an empty record, you simply overwrite it with your new record data.

Change bit 7 of the *Record Control* byte from zero to one to show that the record is now in use.

Set bit 6 of the *Record Control* byte to one if the device containing the AL /L is an INSTEON Controller of the INSTEON Responder Device whose *ID* is in the record. If instead the device containing the AL /L is an INSTEON Responder to the INSTEON Controller Device whose *ID* is in the record, then clear bit 6 of the *Record Control* byte to zero. In other words, within an AL /L, setting bit 6 means “I’m a Controller,” and clearing bit 6 means “I’m a Responder.”

Put the ALL-Link Group number in the *Group* field, and put the *Device ID* in the *ID* field. Finally, set the *Data 1*, *Data 2*, and *Data 3* fields appropriately for the *Record Class* you are storing.

Creating a New AL /L Record

To create a new record at the end of the AL /T, find the record with bit 1 of the *Record Control* byte set to zero, indicating that it is the last record in the AL /L. Flip that bit to one.

Get Database

This command asks the device for a record in its database or the entire database.

Command Name	Get Database
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x2F
Command 2	0x00
Data 1	Ignored Value
Data 2	0x00
Data 3	0x00 -> 0xFF (Hi Byte Address)
Data 4	0x00 -> 0xFF (Lo Byte Address)
Data 5	0x00 -> 0xFF (# of Records, 0x00 dumps all records)
Data 6 – Data 14	Ignored Value

Command Name	Get Database Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2F
Command 2	0x00

Command Name	Get Database Data
Message Length	Extended Message (ED)
Message Type	Broadcast
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2F
Command 2	0x00
Data 1	0x00
Data 2	0x01
Data 3	0x00 -> 0xFF (Hi Byte Address)
Data 4	0x00 -> 0xFF (Lo Byte Address)
Data 5	0x00
Data 6	Link Type Byte: Bit 0 = 0 Bit 1 = High Water (Marks the highest record used in the database) Bit 2 = 0 Bit 3 & Bit 4 = SmartHop (Keeps track of what the start hop should be) Bit 5 = 1 Bit 6 = Controls Me=0; I Control=1 Bit 7 = Inactive=0; Active=1
Data 7	Group Number of Link
Data 8	Linked Device ID (Hi Byte)
Data 9	Linked Device ID (Mid Byte)
Data 10	Linked Device ID (Lo Byte)
Data 11	On-Level of Link
Data 12	Ramp Rate of Link
Data 13	Ignored Value
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Empty Record
Message Length	Extended Message (ED)
Message Type	Broadcast
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2F
Command 2	0x00
Data 1	0x00
Data 2	0x01
Data 3	0x00 -> 0xFF (Hi Byte Address)
Data 4	0x00 -> 0xFF (Lo Byte Address)
Data 5	0x00
Data 6	0x00
Data 7	0x00
Data 8	0x00
Data 9	0x00
Data 10	0x00
Data 11	0x00
Data 12	0x00
Data 13	0x00
Data 14	Calculated Checksum (See below in Checksum Information)

Command Example:

Get Database **Get Database Response** **Get Database Data** **Empty Record**	**AA BB CC 11 22 33 1F 2F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00** **11 22 33 AA BB CC 2B 2F 00** **11 22 33 AA BB CC 11 2F 00 00 01 0F FF 00 A2 00 11 CC AB FF 1F 01 79** **11 22 33 AA BB CC 11 2F 00 00 01 0F F7 00 00 00 00 00 00 00 00 00 CA**

The above example, device 11 22 33 is sent a command that asks it for its entire database (0x2F 0x00 0x00 0x00 0x00 0x00 0x00). Device 11 22 33 Acks the command then sends out its first database record (0x0F 0xFF). The next spot is an empty record so the device stops sending out its database (0x0F 0xF7).

Docklight Example:

```
9/23/2013 16:29:24.266 [TX] - 02 62 29 70 02 1F 2F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
9/23/2013 16:29:24.279 [RX] - 02 62 29 70 02 1F 2F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                              06  INSTEON EXT TX Get Database
                              02 50 29 70 02 1A 77 7B 2B 2F 00  INSTEON STD RX
                              02 51 29 70 02 1A 77 7B 11 2F 00 00 01 0F FF 00 A2 00 11 CC AB FF
                              1F 01 79  INSTEON EXT RX
                              02 51 29 70 02 1A 77 7B 11 2F 00 00 01 0F F7 00 AA 00 1C 30 B4 00
                              1C 00 04  INSTEON EXT RX
                              02 51 29 70 02 1A 77 7B 11 2F 00 00 01 0F EF 00 AA 01 18 94 F1 00
                              1F 00 6B  INSTEON EXT RX
                              02 51 29 70 02 1A 77 7B 11 2F 00 00 01 0F E7 00 AA 01 1A 77 7B 00
                              00 00 23  INSTEON EXT RX
                              02 51 29 70 02 1A 77 7B 11 2F 00 00 01 0F DF 00 00 00 00 00 00 00
                              00 00 E2  INSTEON EXT RX
```

Set Database

This command writes a record to the device's database.

Command Name	Set Database
Message Length	Extended Message (ED)
Message Type	Direct
Transmitting Device ID	Controller
Receiving Device ID	Open/Close Sensor
Flags Byte	Message Type
Command 1	0x2F
Command 2	0x00
Data 1	Ignored Value
Data 2	0x02
Data 3	0x00 -> 0xFF (Hi Byte Address)
Data 4	0x00 -> 0xFF (Lo Byte Address)
Data 5	0x01 -> 0x08 (# of bytes to write, over 0x08 is an error and ignored)
Data 6	
Data 7	Group Number of Link
Data 8	Linked Device ID (Hi Byte)
Data 9	Linked Device ID (Mid Byte)
Data 10	Linked Device ID (Lo Byte)
Data 11	On-Level of Link
Data 12	Ramp Rate of Link
Data 13	Ignored Value
Data 14	Calculated Checksum (See below in Checksum Information)

Command Name	Set Database Response
Message Length	Standard Message (SD)
Message Type	Ack
Transmitting Device ID	Open/Close Sensor
Receiving Device ID	Controller
Flags Byte	Message Type
Command 1	0x2F
Command 2	0x00

Command Example:

Set Database **Set Database Response**	**AA BB CC 11 22 33 1F 2F 00 00 02 0F F7** **08 AA 00 18 A1 C5 00 1C 00 7D** **11 22 33 AA BB CC 2B 2F 00**

The above example, device 11 22 33 is sent a command that writes a record to its database at location 0x0F 0xF7 (0x2F 0x00 0x00 0x02 0x0F 0xF7)

Docklight Example:

```
9/24/2013 09:41:43.127 [TX] - 02 62 29 70 02 1F 2F 00 00 02 0F F7 08 AA 00 18 A1 C5 00 1C 00 7D
9/24/2013 09:41:43.146 [RX] - 02 62 29 70 02 1F 2F 00 00 02 0F F7 08 AA 00 18 A1 C5 00 1C 00 7D
                              06  INSTEON EXT TX Set Database
                              02 50 29 70 02 1A 77 7B 2B 2F 00  INSTEON STD RX
```