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Motion Sensor - MOSZB-130 MOSZB-14x

Technical manual

Revised 29.08.2025

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RoHS CE

1 Cautionary notes

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2 Features

2.1 Motion Sensor – MOSZB-130/140

The device enables you to detect movement and light as well as measuring temperature.

The sensor is battery powered and can be mounted in four different ways: flat on the wall, flat on the ceiling, in the corner (using a 45° bracket), or standing (on a shelf, table, or similar).

The sensor has 3 ZigBee end points, one for each sensor. The Occupancy end point contains 2 logic modules that combines' Occupancy with temperature and light sensor. Each end point can be used separately. Standard ZigBee ZCL "Configure Reporting" on change and on time is supported.

The motion sensor mini has the following HW variants

Model identifier	Occupancy Sensor	Light Sensor	Temperature Sensor	Tamper Switch
MOSZB-140	X	X	X	X
MOSZB-141	X			
MOSZB-142	X	X		X
MOSZB-143	X		X	X
MOSZB-144	X	X	X	
MOSZB-145	X			X
MOSZB-146	X		X	
MOSZB-147	X	X		

2.1.1 IAS Zone

The IAS Zone sensor is PIR based, sensing moving objects up to 9 meters from the sensor (6 meters when it is MOSZB-130). The end point is configured as Home Automation profile „IAS Zone". The IAS Zone End point is less sensitive than the Occupancy sensor endpoint. Therefore if the device is used as an alarm sensor the IAS Zone end point shall be used.

2.1.2 Occupancy

The occupancy sensor is PIR based, sensing moving objects up to 9 meters from the sensor (6 meters when it is MOSZB-130). The off-time is adjustable remotely via ZigBee. The end point is configured as Home Automation profile „Occupancy Sensor“.

2.1.3 Light

The light sensor is a low-accuracy sensor reporting light level. The end point is configured as Home Automation profile „Light Sensor“.

2.1.4 Temperature

The temperature sensor measures temperature with a resolution of 0.1°C. The end point is configured as the Home Automation profile „Temperature Sensor“.

2.2 Key features

Key features are:

- Alarm Sensor – IAS Zone
- Temperature sensor
- Occupancy sensor
- Light sensor
- ZigBee OTA cluster for firmware upgrades
- ZigBee HA 1.2 Certified application profile
- Standard ZigBee Home Automation security and stack settings are used.

3 Endpoints

The device implements the following standard HA devices on different end points.

3.1 ZigBee Device Object (ZDO)

- End point number 0x00
- Application profile Id 0x0000
- Application device Id 0x0000
- Supports all mandatory clusters

3.2 IAS Zone

- End point number 0x23
- Application profile Id 0x0104 (Home Automation)
- Application device Id 0x0402

3.3 Occupancy Sensor

- End point number 0x22, 0x28 and 0x29
- Application profile Id 0x0104 (Home Automation)
- Application device Id 0x0107

Each end point contains a logic module that can be configured to control the occupancy sensor signal base on the user defined settings for the temperature sensor input or the user defined settings for the light sensor input.

3.4 Temperature Sensor

- End point number 0x26
- Application profile Id 0x0104 (Home Automation)
- Application device Id 0x0302

3.5 Light Sensor

- End point number 0x27
- Application profile Id 0x0104 (Home Automation)
- Application device Id 0x0106

3.6 Onics Utility

- Application profile Id 0xC0C9 (Onics (Formerly Develco Products) private profile)
- Application device Id 0x0001
- Manufacture code for Onics (Formerly Develco Products) is 0x1015
- Private profile for internal Onics (Formerly Develco Products) use only.

Reference documents:

[Z1] Zigbee Specification Rxx

[Z2] Zigbee Cluster Library Specification Rx

[Z3] Base Device Behavior Specification

[Z4] PRO Base Device Behavior Specification

They can all be downloaded from:
https://csa-iot.org/developer-resource/specifications-download-request/

4 Supported Clusters

4.1 Common clusters for each end point

The ZCL "General Function Domain" clusters in this section are implemented as server clusters. Refer to ZigBee Cluster Library Specification Rx.
https://csa-iot.org/developer-resource/specifications-download-request/

4.1.1 Basic – Cluster id 0x0000

Only the first set has mandatory attributes, also the optional attributes that can be relevant to a Onics' (Formerly Develco Products) device are all in set 0x000.

4.1.1.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0	ZCLVersion	Uint8	Type range	M	
0x4	ManufacturerName	String	0-32 byte	O	4.1.1.1.1
0x5	ModelIdentifier	String	0-32 byte	O	4.1.1.1.2
0x6	DateCode	String	0-32 byte	O	
0x7	PowerSource	8 bit enum	Type range	M	

4.1.1.1.1 Manufacturer name

«Onics A/S" (Formerly "Develco Products A/S")

4.1.1.1.2 Model identifier

MOSZB-130 or MOSZB-140

The motion sensor mini has the following HW variants

Model identifier	Occupancy Sensor	Light Sensor	Temperature Sensor	Tamper Switch
MOSZB-140	X	X	X	X
MOSZB-141	X			
MOSZB-142	X	X		X
MOSZB-143	X		X	X

MOSZB-144	X	X	X	
MOSZB-145	X			X
MOSZB-146	X		X	
MOSZB-147	X	X		

4.1.1.1.3 Manufacture Specific Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x8000	PrimarySwVersion	OctetString		M	Read only
0x8100	LedControl	BitMap8		M	W/R Default value 0xFF

ZCL header setting – Manufactor code for Onics (Formerly Develco Products) is 0x1015

LEDControl

0x00 – Disable LED when movement is detected.

0x01 – Enables periodic fault flashes. These flashes are used to indicate e.g. low battery level.

0x02 – Enables green application defined LED. This is e.g. used to indicate motion detection.

4.1.2 Identify – Cluster id 0x0003

4.1.2.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	IdentifyTime	Uint16	Type range	M	

4.1.2.2 Commands

The identify cluster has 2 commands as server.

Id#	Name	Payload	Man/Opt	Relevance and ref.
0x00	Identify	Uint16 - Identify Time (seconds)	M	
0x01	Identify Query	none	M	

The identify cluster has 1 command as client.

Id#	Name	Payload	Man/Opt	Relevance and ref.
0x00	Identify Query Response	Uint16 - Identify Time (seconds)	M	

4.2 IAS Zone Device – EP 0x23

4.2.1 IAS Zone - Cluster id 0x0500

The IAS Zone cluster is described in ZigBee Cluster Library Specification Rx.

4.2.1.1 Attribute

Id#	Name	Type	Man/Opt	Relevance and ref.
0x0000	Zone State	8-bit Enumeration	M	
0x0001	Zone Type	16-bit Enumeration	M	Hard coded to 0x000D Motion Sensor
0x0002	Zone Status	Uint16	M	The following bits are supported: Bit0: Alarm 1 Bit2: Tamper Bit3: Battery Bit4: Supervision reports Bit5: Restore reports Bit6: Trouble Bit9: Battery defect,
0x0010	IAS CIE Address	Valid 64-bit IEEE address	M	
0x0011	ZoneID	Uint8	M	

4.2.1.1.1 Zone State

The device will automatically start to scan the network for an IAS Zone client in a predefine interval. When the client is found it will automatically attempt to enrol. When it has successfully enrolled the Zone Status command is send every 5 minutes.
The attribute value will change from not enrolled (0x00) to Enrolled (0x01).

4.2.1.1.2 IAS CIE Address

Attribute specifies the address that commands generated by the server shall be sent to.

To un-enroll the device the back end system has to write a new address into this attribute. Any value is valid. If the back end system writes an IEEE adr then it will try to enrol to this devices represented by the IEEE adr.

4.2.1.1.3 ZoneID

A unique reference number allocated by the CIE at zone enrollment time.

Used by IAS devices to reference specific zones when communicating with the CIE. The ZoneID of each zone stays fixed until that zone is unenrolled.

4.2.1.2 Commands

The IAS Zone cluster has 2 commands as server.

Id#	Name	Payload			Man/ Opt	Relevance and ref.
0x00	Zone Status Change Notification	Uint16 – bit mask			M	The status is report to the coordinator every 5 min
0x01	Zone Enroll Request	Bits	16	16	M	
		Data type	16 bit enum	UINT16		
		Field name	Zone type	Manufacturer code		

Init sequence – when the device has join the network it start to scan for an IAS zone client cluster. If a client is found a Zone enroll request command is send and a Zone Enroll response is expected. If it doesn't receive a response within 15 sec it gives up and will continue to scan x number of attempts. When the init sequence is over it will enter a state where it scans for a client every 12 hour.

The following bits are supported in Zone status:
Bit0: Alarm 1
Bit2: Tamper

Bit3: Battery
Bit4: Supervision reports
Bit5: Restore reports
Bit6: Trouble
Bit9: Battery defect,

Bit0, Bit2:

Note: How to clear an alarm in the "Zone status"
The sensor requests ZCL Default Response on the Zone Status Change notification, if any new Alarm bit has been set. Until the IAS CIE has acknowledged the received alarm by sending the mandated Default Response, the Alarm bits are not cleared – even if there is no longer an alarm situation on either tamper or movement. When the Default Response is received, a new Zone Status Change notification is sent with the Alarm bits cleared, if the alarm situation has disappeared since sending the Zone Status message with alarm set.

Bit3: When the battery is below 2.5 VDC. Battery bit is set high and "Zone Status" is transmitted to the coordinator.

Bit9: When the battery is defect the sensitivity of the motion detector is reduced to avoid false alarms. Therefore when this bit is true it is highly recommended that the battery is changed.

4.2.1.3 Manufacturer specific attributes

In order to access these attributes, the manufacturer code 0x1015 must be used.

Id#	Name	Type	Relevance and ref.
0x8000	Zone Status Interval	Uint16	Interval between Zone Status Change Supervision reports. Default: 5 minutes.
0x8001	Alarm Off Delay	Uint16	The silent period needed before an alarm is cleared. Higher values may result in prolonged battery life. Default: 20 seconds (which is the smallest valid configuration)

4.2.2 Power Configuration - Cluster id 0x0001

The power configuration cluster is described in ZigBee Cluster Library Specification Rx.

4.2.2.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0020	BatteryVoltage	Uint8	0x00 - 0xFF	O	ZCL configure reporting is supported
0x0031	BatterySize	enum 8	CR123A (0x08) AA (0x03)	O	MOSZB-140 is using 2 x AA battery
0x0033	BatteryQuantity	Uint8	MOSZB130 = 1 MOSZB140 = 2	O	
0x0034	BatteryRatedVoltage	Uint8	CR123A is 30 AA is 15	O	Unit is in 100 mV
0x0036	BatteryVoltageMinThreshold	Uint8	12.5		Unit is in 100 mV
0x003E	BatteryAlarmState	Map32		O	Bit0: BatteryVoltageMinThreshold Is set if BatteryVoltage has been below BatteryVoltageMinThreshold or other internal circuits has deemed the supply to be inadequate. This bit will only reset after a power cycle. The condition will also be shown on the MMI LED, see MMI description. Reportable. Default Min 12 hours, max 12 hours

Note: The attribute “BatteryVoltage” is measuring the battery voltage, in units of 100mV.

4.2.3 Poll Control - Cluster id 0x0020

The poll control cluster is described in ZigBee Cluster Library Specification Rx.

This cluster provides a mechanism for the management of an end device's MAC Data Request rate. For the purposes of this cluster, the term "poll" always refers to the sending of a MAC Data Request from the end device to the end device's parent.

This cluster can be used for instance by a configuration device to make an end device responsive for a certain period of time so that the device can be managed by the controller.

4.2.3.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	Check-inInterval	Uint32	0x00 - 0xFF	M	Default value is 1 hour
0x0001	LongPoll Interval	Uint32		M	Default value is disabled
0x0002	ShortPollIntervall	Uint16		M	Default value is 3 seconds
0x0003	FastPollTimeout	Uint16		M	Default value is 5 minutes

Start up, auto scan for client poll control cluster on the coordinator. If it is support on the coordinator an auto bind is created and the Smoke Alarm will send a check-in command in the interval specified in attribute "Check-in Interval. The coordinator has to reply with a check-in response. The sensor supports the following commands send from the client (Typically the coordinator).

- 0x00 Check-in Response,
- 0x01 Fast Poll Stop,
- 0x02 Set Long Poll Interval,
- 0x03 Set Short Poll Interval,

If it doesn't find a poll client it will search again periodically.

4.2.4 OTA Upgrade – Cluster id 0x0019

The cluster provides a ZigBee standard way to upgrade devices in the network via OTA messages. The devices support the client side of the cluster.

When the devices has joined a network it will automatically auto scan for a OTA upgrade server in the network. If it finds a server an auto bind is created and ones every 24 hour it will automatically send its “current file version” to the OTA upgrade server. It is the server that initiates the firmware upgrade process.

4.2.4.1 Attributes

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	UpgradeServerID	IEEE Address	-	M	
0x0001	FileOffset	Uint32	Type range	O	
0x0002	CurrentFileVersion	Uint32	Type range	O	
0x0003	CurrentZigBeeStackVersion	Uint16	Type range	O	
0x0004	DownloadedFileVersion	Uint32	Type range	O	
0x0005	DownloadedZigBeeStackVersion	Uint16	Type range	M	
0x0006	ImageUpgradeStatus	8 bit enum	0x00 to 0xFF	O	
0x0007	Manufacturer ID	Uint16	Type range	O	
0x0008	Image Type ID	Uint16	Type range	O	
0x0009	MinimumBlockRequestDelay	Uint16	Type range	O	

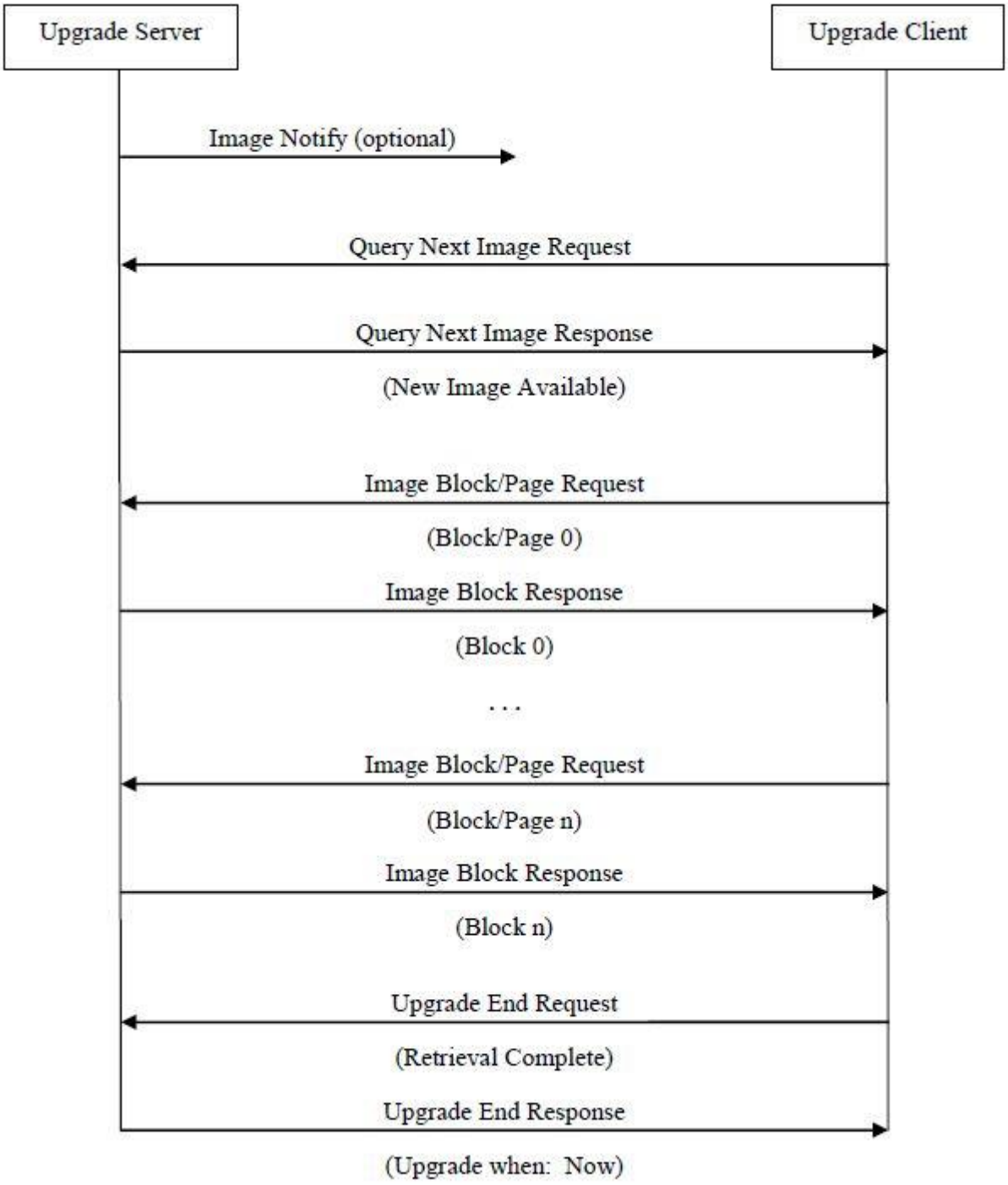
Above attribute description is to be found in section 6.7 “OTA Cluster Attributes” in ZigBee document – “Zigbee Cluster Library OTA Cluster (0x0019) Test Specification” provided by the Connectivity Standards Alliance.

4.2.4.2 Commands

The OTA Client cluster can send the following commands

Id#	Name	Man/Opt	Relevance and ref.
0x01	Query Next Image request	M	6.10.1 OTA Cluster Command Identifiers
0x03	Image Block Request	M	6.10.1 OTA Cluster Command Identifiers
0x06	Upgrade End Request	M	6.10.1 OTA Cluster Command Identifiers

4.2.4.3 OTA Upgrade Messages Diagram



4.2.5 Time – Cluster id 0x000A

The Time cluster is a general cluster for time it is based on a UTC time in seconds since 0 hrs 0 mins 0 sec on 1st January 2000. Refer to [Z2] for ZigBee specification of the time cluster.

The device will use this clusters as a client – provided that a suitable Time Server is available on the network (most likely on the Gateway).

4.2.5.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	Time	UTCTime (Uint32)	Type range	M	The module will periodically update its clock by synchronizing through this cluster
0x0001	TimeStatus	8 bit bitmap	00000xxx	M	

4.2.6 Binary Input Cluster - Cluster id 0x000F

The Binary input cluster is described in ZigBee Cluster Library Specification Rx.

4.2.6.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x001C	Description	String	Motion	O	
0x0051	OutOfService	Bool	False (0) or True (1)	M	If True, PresentValue will no longer follow the physical input, but will be writeable
0x0055	PresentValue	Bool	False (0) or True (1)	M	Reflects the state of the Motion sensor, unless it is disabled by setting the OutOfService attribute to True.

					Reportable. Default Min 1 sec, max 10 min
0x0067	Reliabillity	Enum8		O	8 – Process Error: Failure in the detection circuit 7 – Unreliable Other: Battery failure, sensitivity reduced. 0 – No Fault Detected Reportable.
0x006F	StatusFlag	Map8	0x00-0x0F	M	Bit1: Fault. If set, the source can be read in the Reliability attribute Reportable. Default Min 1 sec, max 10 min

4.3 Occupancy Sensor Device – EP 0x22, EP 0x28 and 0x29

Each end point contains a logic module that can be configured to control the occupancy sensor signal base on the user defined settings for the temperature sensor input or the user defined settings for the light sensor input.

The manufacture specific attributes in section 4.2.1.2 is used to configure the logic module.

4.3.1 Occupancy sensing - Cluster id 0x0406

The occupancy sensing cluster is described in ZigBee Cluster Library Specification Rx section 4.8.

4.3.1.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	Occupancy	8-bit Bitmap	0000000x	M	Reporting is supported
0x0001	Occupancy Sensor Type	8-bit Enumeration	0x00 – 0xfe	M	Hard coded to PIR sensor
0x0010	PIROccupiedTo UnoccupiedDelay	Uint16	Type range	O	The time delay, in seconds, before the

					PIR sensor changes to its unoccupied. Default – 240 sec
0x0011	PIRUnoccupiedToOccupiedDelay	Uint16	Type range	O	The time delay, in seconds, before the PIR sensor changes to its occupied Default – 0 sec
0x0012	PIRUnoccupiedToOccupiedThreshold	Uint8	Type range	O	Specifies the number of movement detection events that must occur before the PIR sensor changes to its occupied state. Default – 1 movement

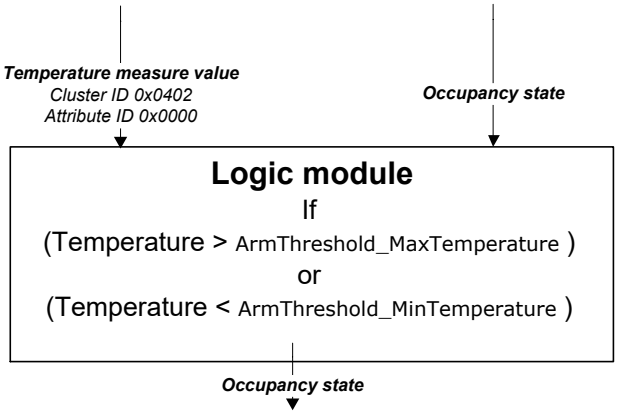
4.3.1.2 Manufacture Specific Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0xFC00	ArmThreshold_MinTemperature	Sint16	0x954d – 0x7ffe	M	Write/read is supported
0xFC01	ArmThreshold_MaxTemperature	Sint16	0x954d – 0x7ffe	M	Write/read is supported
0xFC02	*TargetLevel*	Uint16	0x0002 – 0xfffd	M	Write/read is supported

ZCL header setting – Manufactor code for Onics (Formerly Develco Products) is 0x1015

4.3.2 Occupancy Sensor using temperature sensor input

End point 0x22, 0x28 and 0x29 can be configured as a logic module that controls the occupancy sensor signal base on the user defined settings for the temperature sensor input.



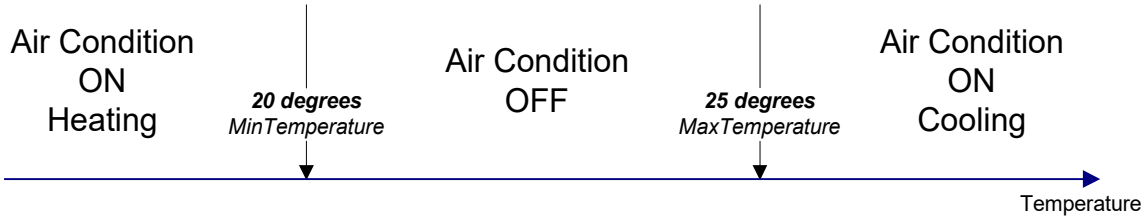
Use case – Energy savings in an office building

The device is installed to obtain energy savings in an office with an air condition. A ZigBee relay is installed to turn on the air condition when the occupancy sensor detects movements in the room. This functionality can be obtained by using the standard occupancy sensor functionality – Standard ZCL attributes.

Using the manufacture specific attributes in section 4.2.1.2 provide the user with an extra check before the air condition is turned on.

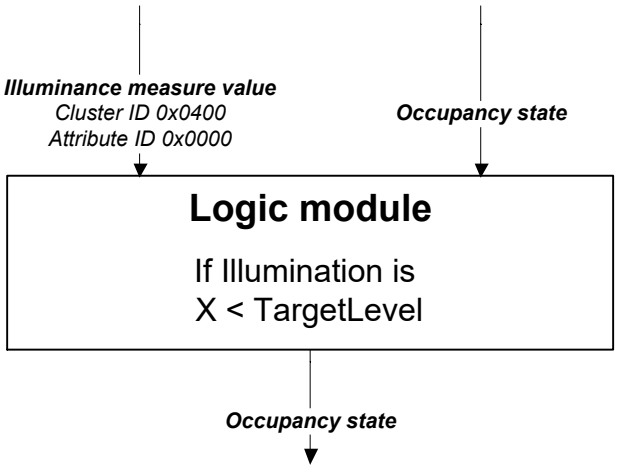
The installer can configure the ArmThreshold_MaxTemperature attribute to 25 degrees and when movements are detected in the room the relay only turns on the air condition when the temperature is above the MaxTemperature Setting (25 degrees).

The ArmThreshold_MinTemperature attribute can be used in winter season where the air condition shall warm up the room. The MinTemperature attribute is configured to 20 degrees and when movements are detected in the room and the temperature is below MinTemperature the air condition is turned on heating the room.



4.3.3 Occupancy Sensor using illumination sensor input

End point 0x22, 0x28 and 0x29 can be configured as a logic module that controls the occupancy sensor signal base on the user defined settings for the illumination sensor input.

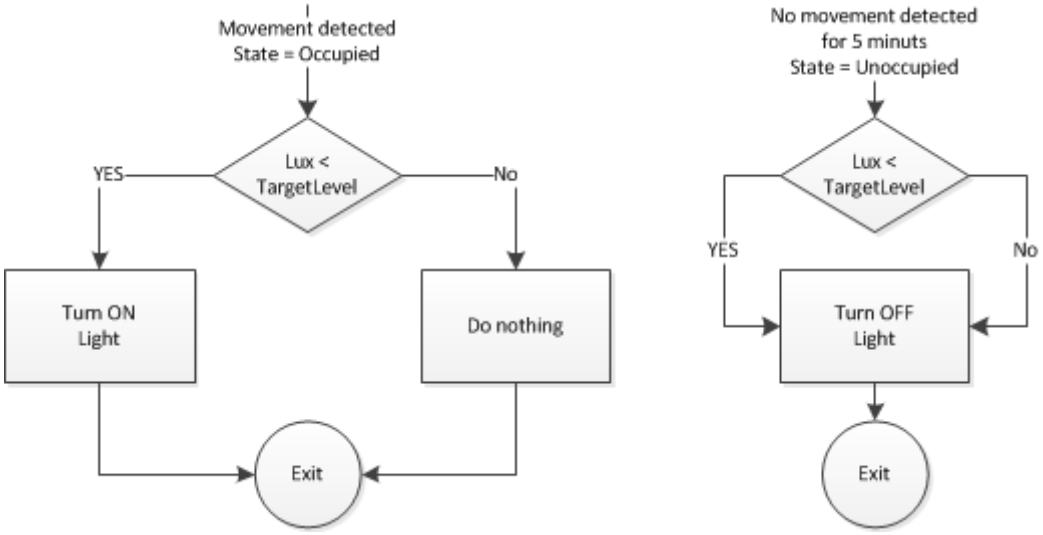


Use case – Energy savings in an office building

The device is installed to obtain energy savings in an office controlling the light. A ZigBee relay is installed to turn on the light when the occupancy sensor detects movements in the room. This functionality can be obtained by using the standard occupancy sensor Standard functionality - ZCL attributes.

Using the manufacture specific attributes in section 4.2.1.2 provide the user with an extra check before the air light is turned on.

The installer can configure the TargetLevel attribute to a user defined Lux level. When movements are detected in the room and the Lux level is below the TargetLevel the relay turns on the light.



4.4 Temperature Sensor Device – EP 0x26

4.4.1 Temperature Measurement – Cluster id 0x0402

The temperature measurement cluster is described in ZigBee Cluster Library Specification Rx section 4.4.

4.4.1.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	MeasuredValue	Sint16	MinValue to MaxValue	M	ZCL Reporting is support Onics (Formerly Develco Products) default is configured
0x0001	MinMeasuredValue	Sint16	0	M	
0x0002	MaxMeasuredValue	Sint16	5000	M	

4.4.1.1.1 MeasuredValue

The attribute is configured with the following default “ZCL configure reporting” setting.

- Min Reporting Interval: 0x003C [60 sec]
- Max Reporting Interval: 0x0258 [600 sec]
- Reportable Change: 0x000A [0.1 °C]

If the temperature value is stable it will be send every 10 minutes.

If the temperature changes more than 0.1 °C it will be reported but not faster than every 1 minute since last reporting value.
Note: Min reporting interval 0 sec is invalid when reportable change is configured.

4.4.1.1.2 MinMeasuredValue

The temperature sensor is NOT supporting temperature measurements below 0 degrees Celsius.

4.4.1.1.3 MaxMeasuredValue

The temperature sensor is NOT supporting temperature measurements above 50 degrees Celsius.

4.5 Light Sensor Device – EP 0x27

4.5.1 Illuminance Measurement - Cluster id 0x0400

The illuminance measurement cluster is described in ZigBee Cluster Library Specification Rx section 4.2.

4.5.1.1 Attribute

Id#	Name	Type	Range	Man/ Opt	Relevance and ref.
0x0000	MeasuredValue	Uint16	MinValue to MaxValue	M	ZCL Reporting is support Onics (Formerly Develco Products) default is configured
0x0001	MinMeasuredValue	Uint16	0x0002 – 0xfffd	M	
0x0002	MaxMeasuredValue	Uint16	0x0001 – 0xfffe	M	
0x0004	LightSensorType	8-bit Enumeration	0x00 – 0xff	O	

4.5.1.1.1 MeasuredValue

The attribute is configured with the following default “ZCL configure reporting” setting.

- Min Reporting Interval: 0x0000 [0 sec]

- Max Reporting Interval: 0x0258 [600 sec]
- Reportable Change: 0xFFFF [Disabled]

The illumination value is sent every 10 minutes according to above settings.

The measured value can be converted into a lux.

Lux = 10^((y-1)/10000)

4.5.1.1.2 MinMeasuredValue

The minimum Lux value supported by the device is 3 Lux.

Converting 3 Lux into min measured value: 10000*LOG(3)+1 = 4772

Min measured value in Hex = 0x12A4

4.5.1.1.3 MaxMeasuredValue

The maximum Lux value supported by the device is 70.000 Lux. Converting 70.000 Lux into max measured value: =10000*LOG(70000)+1 =48452

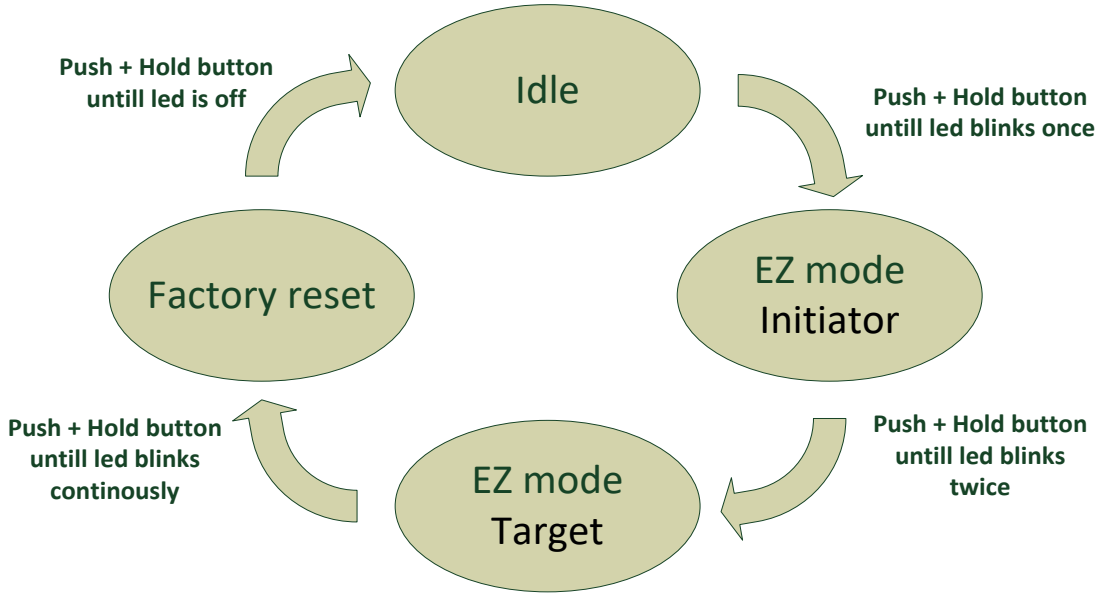
Max measured value in Hex = 0xBD43

5 MMI user guide

5.1 Push Button Menu

Pushing the button on a device provides the user with several possibilities.

Pushing the button for longer (push, hold for a few seconds, and release) allows the user to set the device into a desired mode. A mode change happens at 5 second interval. Below, these modes are illustrated in a state chart.



When cycling through the menu modes, the state is indicated by a number of 100ms blinks on the LED. The device is supporting the ZigBee standardized EZ- mode Commissioning.

5.1.1 EZ mode - Initiator

If the devices is not on the network EZ-Mode Network Steering is invoked when the user enter this menu. The led blinks once every 1 sec until the devices has joined the network. If the device was already on the network it will broadcast the PermitJoin messages. It is the trust center policy that decides if the device is allowed to join the network.

When the device has joined the network EZ-Mode Finding and Binding is invoked and the device start to blink every 3 sec until a cluster match is found. When a match is found or the cluster

examine is finished the blinking stops and the device sends a messages to the target device to stop the identify time.

The following clusters are support in EZ-mode finding and binding:

- Temperature cluster
- Power configuration cluster
- Occupancy sensing cluster
- Illuminance Measurement cluster

The EZ-mode time is hard coded to 3 minutes. This is the Minimum and recommended PermitJoin time broadcast for EZ-Mode Network Steering and minimum IdentifyTime set for EZ-Mode Finding and Binding. If the user enters the menu again another 3 minutes is started.

5.1.2 EZ mode - Target

If the devices is not on the network EZ-Mode Network Steering is invoked when the user enter this menu. The led blinks twice every 1 sec until the devices has joined the network. If the device was already on the network it will broadcast the PermitJoin messages. It is the trust center policy that decides if the device is allowed to join the network.

When the device has joined the network identify mode is invoke and the device start to blink twice every 3 sec until identify mode is stopped or after the EZ-mode time has expired. If the user enters the menu again another 3 minutes is started.

5.1.3 Factory reset

To allow a device to join a network, one either has to power up a device that has not previously joined a network or push the button until the Reset To Factory default mode is indicated – and subsequently release the button. This will cause the device to reset to its factory default state and scan for a suitable coordinator.

5.2 Action on Power On

As a general rule, all end devices and routers that have not previously joined a network (or have been reset to factory default) will start up and search for a network with join permit open. In this mode, the LED will flash once every second.

Once the device has joined the network, is will start scanning for an OTA server, Time server, Poll control client, OccupancySensor client and an IAS Zone client.

If a device has joined a network and is powered down, it will attempt to rejoin this network upon power up. For the first 30 seconds hereafter, the device will be available for communication. This time can be expanded using the poll control cluster functionality.

6 General network behaviour

6.1 Installation

When the device is virgin and powered for the first time it will start looking for a ZigBee PAN Coordinator or router to join. The device will scan each ZigBee channel starting from 11 to 24. The LED will flash once every second until it joins a device.

#Scan mode - 1	#Sleep mode	#Scan mode - 2	#Sleep mode	#Scan mode - 2
Scan all 16 ZigBee channel until join network or 15 minutes	MCU is in sleep mode (Radio off) 15 minutes	Scan all 16 ZigBee ch x 1 or until join network ~ 30 seconds	MCU is in sleep mode (Radio off) 15 minutes	Scan all 16 ZigBee ch x 1 or until join network ~ 30 seconds

The device will start up using scan mode 1. To increase battery lifetime when the device is joining a network for the first time a scan mode 2 will be used after scan mode 1 has expired. Scan mode 1 it will only be executed one time when the device is powered. If the user invokes EZ-mode it will start scanning the next 3 minutes.

In section 5 “MMI” it is explained how to put the device into a join or leave network mode.

Network settings are stored in NV-memory are after a power cycle the device re-join the same network.

If the device has to join a new PAN coordinator the MMI menu supports a **“Reset To Factory Fresh Settings”** mode. This will erase all current network information.

6.2 Normal – Keep alive

The device is sending a “keep alive” message to the PAN coordinator every 15 minute to verify that the device is still connected to the network.

6.2.1 Network lost

If no “keep alive” responses are received 5 times in a row (Worst case 1h15m), the devices will start scanning as specified in the table below.

When the device is in scan mode the RED LED will flash once every second until it re-joins the network.

According to the ZigBee specification TX is NOT allowed to be enabled all the time and a TX silent period has to be defined.

#Scan mode - 1	#Sleep mode	#Scan mode - 2	#Sleep mode	#Scan mode - 2
Scan current channel 3 times Scan remaining 15 channel 1 time Scan all 16 ch 3 times	MCU is in sleep mode (Radio off) 15 minutes	Scan current ch 3 times Scan remaining 15 channel 1 time	MCU is in sleep mode (Radio off) 15 minutes	Scan current channel 3 times Scan remaining 15 channel 1 time

6.3 Low battery

The current battery voltage can be read from the power configuration cluster described in section 4.3.1. The attribute “BatteryVoltage” is measuring the battery voltage, in units of 100mV.

Low batt LED indication – RED LED will blink twice every 60 seconds.

7 Specifications

General	
Dimensions (Wx H x D)	MOSZB-130 is 82 x 82 x 28 mm MOSZB-140 is 70 x 70 x 21 mm
Colour	White
Battery	CR123, exchangeable 2 x AA, exchangeable
Battery life	3 years, reporting every 2 minutes Battery level and low battery warning can be reported
Radio	Sensitivity: -92 dBm
	Output power: +3 dBm (EU)
Environment	Operation temperature 0 to +50°C
Occupancy	
Range	MOSZB-130 ~6m MOSZB-140 ~9m
View angle	45° up/down, left/right
Off-time	Configurable 2 s - 65,000 s
Light	
Resolution	3 to 70.000 Lux
Common light source illuminance (lux)	
	Street light: 20
	Dusk: 1 to 100
	Living room: 50 to 200
	Office: 200 to 600
	Operating room: 5 k to 10 k
	Cloudy: 2 k to 10 k
	Hazy: 25 k to 50 k
	Bright sun: 50 k to 100
Reporting	Configurable

Temperature	
Range	0 to +50°C
Resolution	0.1°C
Accuracy	Typically ±0.5°C and Max ±2°C

8 Contact Information

Technical support: Please contact Onics for support.
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Sales: Please contact Onics for information on prices, availability, and lead time.
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