

Introduction

The EZ-Motion motion detector supports a rich set of Z-Wave commands that can enhance the users experience if properly supported by the application software. Software developers wishing to utilize all the features of EZ-Motion will find all of the necessary commands described here. The reader is assumed to be knowledgeable with the Z-Wave protocol and the Z-Wave Device Class Specification.

Basic Operation

The EZ-Motion battery powered motion detector can be used in its default configuration. However, to get the maximum benefit and reliable operation, the EZ-Motion should be configured once it has been installed.

When EZ-Motion detects motion, it will send a BASIC_SET ALL_ON Z-Wave command to any Z-Wave devices that have been “Associated” with it. Once the EZ-Motion as not detected any motion for twenty minutes it will send a BASIC_SET ALL_OFF command which will turn the lights off. Use the ASSOCIATION_SET commands to assign the desired NodeIDs to the EZ-Motion. You can assign up to 4 NodeIDs. Typically one of these would be an interface to a computer to provide status to the home management software. Once the EZ-Motion has been assigned NodeIDs to send the BASIC_SET commands to, it will the mesh-networking features of Z-Wave to guarantee delivery of the command.

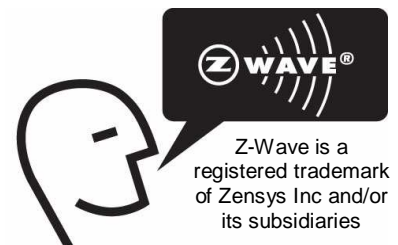
Once the EZ-Motion has detected motion and sent the BASIC_SET command, it will go to sleep and ignore the motion detector for about 1 minute. This insures that battery power is conserved in rooms with a lot of motion. The amount of motion can be requested using the SENSOR_MULTILEVEL_REPORT command (encapsulated in a MULTI_CHANNEL_REPORT).

The EZ-Motion can also be sent a MULTILEVEL_SENSOR_GET to determine the current illumination intensity and the temperature. Note that these commands must be encapsulated in the MULTI_INSTANCE commands to distinguish which sensor to report on.

Since the EZ-Motion is battery-powered, it is asleep most of the time. It cannot be used as a repeater in a Z-Wave network. It will not respond to any commands unless it is awake. The EZ-Motion will send a WAKE_UP_NOTIFICATION to the configured NodeID every time it wakes up. The amount of time between WAKE_UP_NOTIFICATIONs can be configured to be between 6 minutes and 25 Hours in tenths of an hour increments. When the WAKE_UP_NOTIFICATION has been received, software must quickly respond with any report requests or configuration commands as the EZ-Motion will go back to sleep in about 2.5 seconds. Note that the Z-Wave chip consumes approximately 1000 times more battery power when it is awake than when it is asleep. Battery life depends heavily on the amount of Z-Wave traffic to the EZ-motion. The less often the EZ-motion is awake and transmitting or receiving, the longer the battery will last.

When the blue “join” button (reset) is pressed, the EZ-Motion sends a NodeInfo packet asking to join a Z-Wave network. The EZ-Motion can either be “reset” to a HomeID of zero or it can join a network. All configuration settings in the EZ-Motion are reset to their factory defaults when the unit has been reset. The EZ-Motion remains awake for 10 minutes after the reset button is pressed so that it can be configured without having to wait for it to wake up.

Refer to the “EZ-Motion Users Manual” for more details on how to use the EZ-Motion 3-in-1 sensor.





Installation:

The EZ-Motion is shipped without batteries and needs 3 AAA batteries. To install the batteries, remove the cover by grasping the back of the unit and pulling on the tab on the bottom of the front cover. The front cover will snap on and off easily.

Place the 3 batteries in the **proper orientation** as shown on the battery holder.

Replace the cover and press and release the blue “Join” button. This will reset the unit and the LED should blink continuously. If the led is not blinking then reset the unit using a ZWave Primary Controller.

Using the ZWave Primary Controller, press and hold the Add Node button on the remote and then press and release the Join Button on the EZ-Motion. The EZ-Motion will then join the ZWave network and will be assigned a Node Identifier Number. (NodeID)

At this point the EZ-Motion will typically need to be configured to associate the Z-Wave nodes it should turn on or off when it detects motion. EZ-Motion will remain awake for about 10 minutes after pressing the Join button.

You can also adjust the sensitivity of the motion detector. During this time the LED will turn on anytime it detects motion. You can adjust the sensitivity of EZ-Motion to meet the requirements of the room you are installing EZ-Motion into by testing the amount of motion required to turn the LED on.

After the 10 minutes, EZ-Motion will enter its normal operating mode and conserve battery power by going to sleep except when it detects motion or at periodic intervals programmed with the WakeUp class commands. If you need additional time to complete the configuration, just press the join button again to wake EZ-Motion up for another 10 minutes.

Software Interface

The EZ-Motion will respond to a set of Z-Wave commands as described below. See the Z-Wave Device Class Specification and the Programmers Guide for more details.

EZ-Motion is battery powered and is typically asleep and not listening to commands. Every WakeUpInterval, it will wake up and issue a WAKE_UP_NOTIFICATION. The WAKE_UP_NOTIFICATION is sent as a broadcast unless configured with a specific NodeID. EZ-Motion will remain awake for about 2.5 seconds after the WAKE_UP_NOTIFICATION has been sent. Commands to be sent to the EZ-Motion must be sent shortly after the WAKE_UP_NOTIFICATION has been received.

BASIC_SET: Ignored

BASIC_GET: Returns a BASIC_REPORT of the Motion sensor.

BASIC REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_BASIC	
2		BASIC_REPORT	
3		Amount of Motion	The larger the value, the more motion has been detected. A value of 0 indicates no motion has been detected for the last WaitAllOff number of minutes. Amount Of Motion is the WaitAllOff value minus the number of minutes since motion was last detected. Thus, Amount Of Motion will be equal to WaitAllOff when motion is detected.



SENSOR_MULTILEVEL_GET: Returns SENSOR_MULTILEVEL_REPORT

Generally this should not be used. The MULTI_CHANNEL commands should be used to properly request the sensor instance requested.

SENSOR_MULTILEVEL_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_SENSOR_MULTILEVEL	
2		SENSOR_MULTILEVEL_REPORT	
3	02	SENSOR_TYPE_GENERIC	
4	09	Sensor Format	1 byte. Unitless value 0-255
5		MotionOffCount	WaitAllOff minus the number of minutes since motion was last detected. A value of 0 means there has been no motion.

MULTI_INSTANCE_GET: Returns a MULTI_INSTANCE_REPORT with the number of instances of each desired command class. Note that only SENSOR_MULTILEVEL will return a value of 3, all other command classes will return a value of 1.

MULTI_INSTANCE_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_INSTANCE	
2		MUTI_INSTANCE_REPORT	
3		cmdClassReported	For COMMAND_CLASS_SENSOR_MULTILEVEL a value of 3 is returned, all other classes return a value of 1. Only the multilevel sensor has multiple instances.

MULTI_INSTANCE vs. MULTI_CHANNEL Encapsulation

The MULTI_INSTANCE command encapsulation can be used with EZMotion but is not recommended. MULTI_CHANNEL Version 2 is the Zensys preferred command encapsulation and is strongly recommended. MUTL_INSTANCE support may eventually be deprecated by Zensys. Note that older EZMotions (prior to 1.07) do not support MULTI_CHANNEL.

Note: MULTI_INSTANCE commands are NOT recommended and are included here only for reference. They have been **GREYED** out to make it clearer that these commands should not be used.

MULTI_INSTANCE_CMD_ENDCAP: With an encapsulated SENSOR_MULTILEVEL_GET Returns MULTI_INSTANCE_ENCAP command with the desired Sensor instance SENSOR_MULTILEVEL_REPORT encapsulated within it. All other encapsulated commands are ignored.



SensorMotion – Instance 1

MULTI_INSTANCE_ENCAP:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_INSTANCE	
2		MULTI_INSTANCE_CMD_ENCAP	
3	01	Instance number = 1	.
4		COMMAND_CLASS_SENSOR_MULTILEVEL	
5		SENSOR_MULTILEVEL_REPORT	
6	02	SENSOR_TYPE_GENERIC	
7	09	Sensor Format	1 byte. Unitless value 0-255
8		MotionOffCount	<u>WaitAllOff</u> minus the number of minutes since motion was last detected. A value of 0 means there has been no motion.

SensorIllumination – Instance 2

MULTI_INSTANCE_ENCAP:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_INSTANCE	
2		MULTI_INSTANCE_CMD_ENCAP	
3	02	Instance number = 2	.
4		COMMAND_CLASS_SENSOR_MULTILEVEL	
5		SENSOR_MULTILEVEL_REPORT	
6	03	SENSOR_TYPE_ILLUMINATION_INTENSITY	
7	01	Sensor Format	1 byte, value is a %
8		Value	Illumination Intensity value from 0-100%. This value is adjusted over time as the sensor experiences the minimum and maximum intensity values. The value should only be used as an approximation of the actual illumination intensity of the room.

SensorTemperature – Instance 3

MULTI_INSTANCE_ENCAP:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_INSTANCE	
2		MULTI_INSTANCE_CMD_ENCAP	
3		Instance number = 3	.
4		COMMAND_CLASS_SENSOR_MULTILEVEL	
5		SENSOR_MULTILEVEL_REPORT	
6		Sensor Type = SENSOR_TYPE_TEMPERATURE	
7	32	Sensor Format = TEMPERATURE_FORMAT	Fahrenheit with 1 digit of precision (tenths of a degree F)- 2 bytes of data
8		Temperature MSB	
9		Temperature LSB	This is a 16-bit 2s complement signed number. A value of 320 (0x140) is 32.0 degrees F. A value of -11 (0xFF5) is -1.1 F.

MULTI_CHANNEL_CMD_ENDCAP: With an encapsulated SENSOR_MULTILEVEL_GET Returns MULTI_CHANNEL_ENCAP command with the desired Sensor instance SENSOR_MULTILEVEL_REPORT encapsulated within it. All other encapsulated commands are ignored.

SensorMotion – Instance 1

MULTI_CHANNEL_ENCAP of a SENSOR_MULTILEVEL_REPORT

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_CHANNEL	
2		MULTI_CHANNEL_CMD_ENCAP	
3	01	Source EndPoint	01=Motion Sensor.
4		Destination Endpoint Number	Value sent as the Source EndPoint in the GET
5		COMMAND_CLASS_SENSOR_MULTILEVEL	
6		SENSOR_MULTILEVEL_REPORT	
7	02	SENSOR_TYPE_GENERIC	
8	09	Sensor Format	1 byte. Unitless value 0-255
9		MotionOffCount	WaitAllOff minus the number of minutes since motion was last detected. A value of 0 means there has been no motion.

SensorIllumination – Instance 2

MULTI_CHANNEL_ENCAP:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_CHANNEL	
2		MULTI_CHANNEL_CMD_ENCAP	
3	02	Source EndPoint	02=Illumination Sensor.
4		Destination EndPoint	
5		COMMAND_CLASS_SENSOR_MULTILEVEL	
6		SENSOR_MULTILEVEL_REPORT	
7	03	SENSOR_TYPE_ILLUMINATION_INTENSITY	
8	01	Sensor Format	1 byte, value is a %
9		Value	Illumination Intensity value from 0-100%. This value is adjusted over time as the sensor experiences the minimum and maximum intensity values. The value should only be used as an approximation of the actual illumination intensity of the room.

SensorTemperature – Instance 3

MULTI_CHANNEL_ENCAP:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_CHANNEL	
2		MULTI_CHANNEL_CMD_ENCAP	
3	03	Source EndPoint	03=Temperature Sensor.
4		Destination EndPoint	
4		COMMAND_CLASS_SENSOR_MULTILEVEL	
5		SENSOR_MULTILEVEL_REPORT	
6		Sensor Type = SENSOR_TYPE_TEMPERATURE	
7	32	Sensor Format = TEMPERATURE_FORMAT	Fahrenheit with 1 digit of precision (tenths of a degree F)- 2 bytes of data
8		Temperature MSB	
9		Temperate LSB	This is a 16-bit 2s complement signed number. A value of 320 (0x140) is 32.0 degrees F. A value of -11 (0xFFFF5) is -1.1 F.

MULTI_CHANNEL_END_POINT_GET: Returns MULTI_CHANNEL_END_POINT_REPORT

MULTI_CHANNEL_END_POINT_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_CHANNEL	
2		MULTI_CHANNEL_END_POINT_REPORT	
3	40	Dynamic[7] Identical[6]	Bit 7=End point is Dynamic Bit 6=End Points are Identical – they are all the same command class and thus are identical.
4	3	endpoints	There are 3 endpoints

MULTI_CHANNEL_CAPABILITY_GET: Returns
MULTI_CHANNEL_CAPABILITY_REPORT

MULTI_CHANNEL_CAPABILITY_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_CHANNEL	
2		MULTI_CHANNEL_CAPABILITY_REPORT	
3		EndPoint	.
4		Generic Device Class	GENERIC_TYPE_SENSOR_MULTILEVEL
5		Specific Device Class	SPECIFIC_TYPE_ROUTING_SENSOR_MULTILEVEL
6-n		Command Classes	All supported command classes are then listed



MULTI_CHANNEL_END_POINT_FIND: Returns
MULT_CHANNEL_END_POINT_FIND_REPORT

MULTI_CHANNEL_END_POINT_FIND_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MULTI_CHANNEL	
2		MULTI_CHANNEL_END_POINT_FIND_REPORT	
3	0	ReportsToFollow	.
4		Generic Device Class	GENERIC_TYPE_SENSOR_MULTILEVEL
5		Specific Device Class	SPECIFIC_TYPE_ROUTING_SENSOR_MULTILEVEL
6	1	EndPoints	
7	2	EndPoints	
8	3	EndPoints	

VERSION_GET: Returns VERSION_REPORT

VERSION_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_VERSION	
2		VERSION_REPORT	
3		LIB_TYPE	
4		ZW_VERSION_MAJOR	
5		ZW_VERSION_MINOR	
6		MyVersion	Major release version of the firmware in EZMotion
7		MySubVersion	Minor release version of the firmware

CONFIGURATION_SET:

Byte	Hex	Name	Description
1		COMMAND_CLASS_CONFIGURATION	
2		CONFIGURATION_SET	
3		PARAMETER_NUMBER	1=Sensitivity 2=WaitAllOff 3=EnableLED 4=LightThreshold 5=NoSleep 6=OnValue
4		DEFAULT/SIZE	When Bit 7=1 (DEFAULT) the selected parameter to be returned to its original factory setting. Bits 2-0 are the SIZE field and must be set to 001 as the parameters are all a single byte.
5		Configuration Value	See below

Parameter #1 - Sensitivity: Range 0-255. Default=200. Sets the sensitivity of the motion detector. A value of 255 will cause the motion detector to be extremely sensitive and trigger on the slightest motion but may actually always see motion due to noise. A value of 0 will cause the motion detector to ignore all but the most extreme amounts of motion.

Parameter #2 - WaitAllOff: Range 0-255. Default=20. Number of minutes after sending an BASIC_ON before sending a BASIC_OFF when no motion has been detected. A value of 0 means that a BASIC_OFF is never sent. In this case, the lights will be turned on by EZMotion, but another application will have to turn the lights off. Note that this mode will result in many BASIC_ONs and will tend to use more battery power.



Parameter #3 - EnableLED: Range 0, 255. Default=255 (on). A value of zero disables the motion detector LED. A value of 255 turns on the LED when motion is detected. Turning off the LED will conserve battery power.

Parameter #4 - LightThreshold: Range 0-100. Default=100 (disabled). Each time motion is detected, the current illumination level is measured in the room and if the illumination is below the threshold then the lights will be turned on (BASIC_SET ON). If the illumination is measured to be above the LightThreshold, then the lights will not be turned on. This feature enables the motion sensor to intelligently turn lights on in a room with significant natural sunlight. The lights are only turned on when the room is dark.

Parameter #5 – NoSleep: Range 0-255. Default=0. Setting the NoSleep parameter to be non-zero will cause EZMotion to never go to sleep. In a wall-powered configuration this mode can be used to keep it awake at all times so the sensors can be polled at anytime. When NoSleep is nonzero, the Listening bit is set in the NodeInfo frame. When the Listening bit is set, EZMotion is a routing node and participates in mesh-network routing of packets from other Z-Wave devices. Note that NoSleep is NOT reset to the default value when EZMotion is “reset” (IE: removed from a Z-Wave network). Generally this parameter is set at the factory and should not be altered by the user.

Parameter #6 – OnValue: Range 0-255. Default=255. When motion is detected, EZMotion will send a BASIC_SET command with this value. This allows the user to configure the value that the associated device will be set to when motion is detected.

Note that the configuration values above are set to their default when a node is reset.

CONFIGURATION_GET: will return a CONFIGURATION_REPORT.

CONFIGURATION_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_CONFIGURATION	
2		CONFIGURATION_SET	
3		PARAMETER_NUMBER	1=TRIGGER 2=WaitAllOff 3=EnableLED 4=LightThreshold 5=NoSleep 6=OnValue
4		DEFAULT/SIZE	Bits 2-0 are the SIZE field and must be set to 001 as the parameters are all a single byte.
5		Configuration Value	See above

WAKE_UP_INTERVAL_SET:

Byte	Hex	Name	Description
1		COMMAND_CLASS_WAKE_UP	
2		WAKE_UP_INTERVAL_SET	
3		SecondsMSB	Set the WakeUpInterval in seconds. Note that the EZ-Motion converts this time to 0.1-25.5 hours. This value is rounded off to the nearest tenth of an hour and clipped to 0.1 or 25.5 hours. This is a 3 byte value.
4		Seconds	
5		SecondsLSB	
6		NodeID	NodeID to send the WakeupNotification to. Defaults to 0xFF (broadcast). Typically this should be configured to a SUC or other node connected to a computer.

WAKE_UP_INTERVAL_GET: Returns a WAKE_UP_INTERVAL_REPORT

WAKE_UP_INTERVAL_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_WAKE_UP	
2		WAKE_UP_INTERVAL_SET	
3		SecondsMSB	WakeUpInterval
4		Seconds	
5		SecondsLSB	
6		NodeID	

Every WakeUpInterval the EZ-Motion will wake up and send a WakeUpNotification frame to the configured NodeID (broadcast by default). The WakeUpInterval has a direct impact on battery life. The WakeUpInterval should be set to 60 minutes or longer for >1 year of battery life.

WAKE_UP_NOTIFICATION:

Byte	Hex	Name	Description
1		COMMAND_CLASS_WAKE_UP	
2		WAKE_UP_NOTIFICATION	Tells the configured NodeID that the EZ-Motion is awake and can be polled for status or reconfigured.

Typically the configured NodeID will send a WAKE_UP_NO_MORE_INFORMATION frame to tell the EZ-Motion that there is no more data for it and that it can go to sleep. This will conserve battery power.

WAKE_UP_INTERVAL_CAPABILITIES_GET: returns a WAKE_UP_INTERVAL_CAPABILITIES_REPORT

WAKE_UP_INTERVAL_CAPABILITIES_REPORT_V2:

Byte	Hex	Name	Description
1		COMMAND_CLASS_WAKE_UP	
2		WAKE_UP_INTERVAL_CAPABILITIES_REPORT_V2	
3	00	Min WakeUp SecondsMSB	6 minutes
4	01	Min WakeUp Seconds	
5	68	Min WakeUp SecondsLSB	
6	01	Max WakeUP Sec MSB	25.0 Hours
7	5f	Max WakeUp Sec	
8	90	Max WakeUp Sec LSB	
9		Default WakeUp MSB	1 hour
10		Default WakeUp	
11		Default WakeUp LSB	
12	00	Wakeup Step Size MSB	6 minutes
13	01	WakeUp Step Size	
14	68	WakeUp Step Size LSB	

MANUFACTURER_SPECIFIC_GET: Returns a MANUFACTURER_SPECIFIC_REPORT.

MANUFACTURER_SPECIFIC_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_MANUFACTURER_SPECIFIC	
2		MANUFACTURER_SPECIFIC_REPORT	
3	00	MANUFACTURER_ID1	
4	1E	MANUFACTURER_ID2	0x001E is Express Controls
5	00	MFG_PRODUCT_TYPE1	
6	02	MFG_PRODUCT_TYPE2	
7	00	MFG_PRODUCT_ID1	
8	01	MRF_PRODUCT_ID2	

BATTERY_GET: Returns a BATTERY_REPORT.

BATTERY_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_BATTERY	
2		BATTERY_REPORT	
3		Battery Level	Percentage of battery remaining. New batteries will give a value of 100%. The unit may still communicate at a battery level of 0 but it will be unreliable. Note that the battery level will remain at close to 100% and then drop relatively quickly as the batteries wear out. This is due to the way batteries typically operate.

ASSOCIATION_SET:

Byte	Hex	Name	Description
1		COMMAND_CLASS_ASSOCIATION	
2		ASSOCIATION_SET	
3		GroupID	Ignored – Only 1 group supported
4		NodeID	Add this NodeID to the association group All BASIC_SET commands are sent to this NodeID

Send multiple ASSOCIATION_SET commands to set multiple NodeIDs (up to 4).

ASSOCIATION_GET: Returns an ASSOCIATION_REPORT.

ASSOCIATION_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_ASSOCIATION	
2		ASSOCIATION_REPORT	
3		GroupID	The Grouping Identifier from the ASSOCIATION_GET will be returned. There is only 1 group supported.
4	4	MaxNodesSupported	Number of NodeIDs supported – always 4
5	0	Reports To Follow	This packet is all we need
6		NodeID1	Only returned if a valid value has been programmed
7		NodeID2	Only returned if a valid value has been programmed
8		NodeID3	Only returned if a valid value has been programmed
9		NodeID4	Only returned if a valid value has been programmed

ASSOCIATION_REMOVE:

Byte	Hex	Name	Description
1		COMMAND_CLASS_ASSOCIATION	
2		ASSOCIATION_REMOVE	
3		GroupID	Ignored as EZ-Motion has only 1 groupID.
4		NodeIDs	NodeID to be removed from the ASSOCIATION group. If no NodeIDs are sent the entire list is reset to the default.

ASSOCIATION_GROUPINGS_GET: Returns ASSOCIATION_GROUPINGS_REPORT

Byte	Hex	Name	Description
1		COMMAND_CLASS_ASSOCIATION	
2		ASSOCIATION_GROUPINGS_GET	

ASSOCIATION_GROUPINGS_REPORT:

Byte	Hex	Name	Description
1		COMMAND_CLASS_ASSOCIATION	
2		ASSOCIATION_GROUPINGS_REPORT	
3	1	Supported Groupings	EZ-Motion only supports 1 GroupID

NODE_NAMING_NODE_NAMING_GET: Returns NODE_NAMING_NAME_REPORT

Byte	Hex	Name	Description
1		COMMAND_CLASS_NODE_NAMING	
2		NODE_NAMING_NODE_NAME_GET	

NODE_NAMING_NODE_NAMING_REPORT

Byte	Hex	Name	Description
1		COMMAND_CLASS_NODE_NAMING	
2		NODE_NAMING_NODE_NAME_REPORT	
3		Char Presentation	0=ASCII 1=Extended ASCII 2=Unicode
4-20		NULL terminated string of characters.	Default is a NULL string of 16 characters. Note that 16 characters are always returned in this field. Unprogrammed values are 0.

NODE_NAMING_NODE_NAMING_SET

Byte	Hex	Name	Description
1		COMMAND_CLASS_NODE_NAMING	
2		NODE_NAMING_NODE_NAME_SET	
3		Char Presentation	0=ASCII 1=Extended ASCII 2=Unicode
4-20		Up to 16 Bytes	String of characters in Char Presentation format. Only the first 16 bytes are stored.

NODE_NAMING_NODE_LOCATION: The NODE_NAMING_NODE_LOCATION GET/SET/REPORT commands are identical to the NODE_NAMING_NODE_NAME except a separate string of 16 bytes is stored for the location. The default string is again 16 NULL bytes.



NO_OPERATION: Ignored

Recommended Operating Settings

EZ-Motion will function with the factory defaults but will function significantly better if several configuration values are set by the user.

It is assumed that there is an Intelligent Controller somewhere in the system that can provide a GUI similar to the diagram shown here. The Intelligent Controller is typically a PC or other web-based device connected to a ZWave Controller such as the EZController.

The “Motion Sensitivity” is set using the Configuration Set command with parameter #1 (Sensitivity). Note that the actual value to be programmed is 0-255 which is more resolution than the average user needs. The range can be reduced to typically 5 or 10 valid values which are either scaled to the 0-255 range or a lookup of “good” values can be determined. In this

Item	Value
Motion Sensitivity	1-10, 3=pet immune, 10=very sensitive
Nodes to be controlled	Up to 4 NodeIDs
Minutes of no motion before turning off	5-255 minutes
Illumination Threshold	0-100%
Heartbeat time	1-255 Tenths of hour

example, simply multiplying the users value by 25 will result in a good range of values. Note that the values at the top end of the scale (255) result in bigger changes in the sensitivity than the lower values. You may want to use a logarithmic scale or a simple look-up-table. Note that really large values of sensitivity (>200) will result in EZ-Motion always detecting motion even when there is none when battery powered.

The “Node to be controlled” is set using the Association Set command. One of the values will probably want to be a SUC or other type of node that is connected to the Intelligent Controller. Some applications may want all commands routed thru the controller so this option may not be presented to the user.

The “Minutes of no Motion” is set using the Configuration Set command with parameter #1 (WaitAllOff). Limiting the user to values of more than 5 insures that the lights do not turn on and off when the user is sitting relatively still in a room and thus the EZ-Motion has a hard time detecting the motion.

The “Illumination Threshold” is set using the Configuration Set command with Parameter #4 (LightThreshold). A “good” value is usually 20%.

The “Heartbeat Time” is set using the Wake_Up_Interval_Set command. Limiting the user to a reasonable minimum value of 30 minutes will insure reasonable battery life.

Other configuration values could be provided to the user in an “Advanced” menu.

It is CRITICAL to assign a Return Route to the SUC (or interface to the Intelligent Controller) since it is often not in direct range of the EZ-Motion. A **ZW_AssignReturnRoute** command should be sent to the EZ_Motion for all nodes in the association group and especially for the SUC. The ZW_AssignReturnRoute will program the shortest route possible between the EZ-Motion and the SUC and store it in the EZ-Motion. This must only be done after a full rediscovery of the network has been performed after all nodes are in their final location to insure the proper routes are programmed. If EZMotion is unable to reach the WakeUpNodeID, it will automatically initiate a network rediscovery process to try to discover a new route. This process will shorten the battery life. Pre-programming a reliable return route is very important.



Troubleshooting

Symptom	Solution
Unit doesn't work	Replace all batteries with brand new ones.
LED doesn't turn on after pressing reset	Insure that battery holders are making good contact to all batteries. Replace the batteries
LED detects motion after pressing reset but doesn't communicate with network.	Reset the unit. The LED will blink when it has been reset. You can then Add it to the network and the LED will stop blinking and instead will turn on when it detects motion.
Turns on the wrong lights	Reset the unit. Reassign the Association NodeIDs.

