



ISY
Z-Wave Integration
Developer's Manual

Web Services SDK and REST Interface
Based on firmware 4.2.30

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Revision History

Date	Firmware	Description
2014/12/15	4.2.21	New Status/Error events
2014/10/20	4.2.17	Show node details/links/network information in progress event messages
2014/09/19	4.2.15	Added Repair Links command
2014/09/15	4.2.15	Added Barrier node type and UOM
2014/09/09	4.2.15	Added key protect/unprotect commands Added keyProtected to /get/status
2014/08/29	4.2.11	Added FortrezZ MIMOLite model type
2014/08/22	4.2.10	Additional node types and UOM REST command to dump device details
2014/07/24	4.2.7	REST command to remove unresponsive nodes
2014/06/24	4.2.5	REST commands
2013/12/14	4.1.2	Initial

1. Introduction

ISY is an award winning platform for automation and energy management. With the introduction of Z-Wave Integration Module (21100), ISY can now support Z-Wave devices as well as an additional protocol (such as INSTEON or Zigbee).

The concepts remain the same. Controls are the same as those already defined in base ISY framework with only some additions. Events are also the same as those already defined in base ISY with one addition.

As such, this document will only list Z-Wave only additions. The rest are all captured in ISY-WS-SDK-Manual (.docx and .pdf).

2. Getting Started

Communications and event infrastructure follow the same paradigm as those defined in ISY's WSDK Developer's guide. Additional events, Web Services, and REST interface are defined herein. If you have not yet reviewed ISY's WSDK Developer's guide, please send download from <http://www.universal-devices.com/isy-developers>.

If you do not already have Z-Wave dongle/module installed on your ISY, please consult <http://wiki.universal-devices.com/index.php?title=Z-Wave: Ordering/Assembly Instructions>.

Once you are successfully communicating with ISY and have Z-Wave Module installed, then:

1. Go to <http://isy:port/desc> (or <http://your.isy.ip.address:port/desc>)

You will be presented with the description of services provided by Orchestrator. In the <serviceList> element, look for **UDIZWaveWebServices** as the <serviceType>. What you are looking for is the URL for Web services binding. This URL is defined <SCPDURL> (see below):

```
<serviceList>
  <service>
    Default ISY Framework service descriptions
  </service>
  <service>
    <serviceType>UDIZWaveWebServices</serviceType>
    <serviceId>
      uuid:00:03:f4:03:65:96-UDIZWaveWebServices
    </serviceId>
    <SCPDURL>/zwaveServices.wsdl</SCPDURL>
    <controlURL>/zwaveServices</controlURL>
  </service>
</serviceList>
```

2. Now, all you need to do is point your SOAP client to:
[http://your.isy.ip.address:port/\[value for SCPDURL\]](http://your.isy.ip.address:port/[value for SCPDURL]) and import Z-Wave web services
3. Get ISY Configuration (GetISYConfig Web Service or /rest/config) and ensure that Z-Wave Integration module is installed (id = 21100). For more information on Configuration Resources and Modules, please consult ISY WSDK Developer's Guide
4. All Z-Wave web services are defined in the WSDL returned by step 2. All objects are defined in **zwobjs.xsd** and are imported into the WSDL
5. If you are using SOAP UI, you can immediately communicate and issue Z-Wave services to ISY

Please note that all requests require the Authorization header. Furthermore, if you wish to receive Z-Wave events, please do make sure that you have subscribed to ISY (please consult WSDK Developer's Guide).

For offline tests, the WSDL file is: *udizw1.ws (ISY) or udizw1.wsdl (Web)*.

3. Z-Wave Control Events

Control events sent by Z-Wave device use two addition attributes on the **action** tag, as follows:

<i>uom</i>	The unit of measure for the action value
<i>prec</i>	The precision of the action value indicating the number of implied decimal points. E.g. <action uom="33" prec="2">12345</action> The actual value is 123.45

e.g.

```
<Event seqnum="95" sid="uuid:26">
  <control>TPW</control>
  <action uom="33" prec="2">12345</action>
  <node>ZW022_143</node>
  <eventInfo/>
</Event>
```

4. Z-Wave Control Commands

4.1 SECMD – Secure Mode

SECMD is the only new command (Control), the possible actions for which are:

- 0 = Unlock (or unsecure the lock ... most locks throw deadbolt but Schlage does not)
- 1 = Lock (or secure the lock)

5. Z-Wave Events (control = “_21”)

In addition to all the events published by ISY framework, Z-Wave module has its own set of events that are specific to Z-Wave Operations.

*All events are defined in **zwobjs.xsd**.

5.1 *System Status Events (action = "1.3")*

This event is published when something dongle status changes such as changes from primary to secondary or connection states..

EventInfo structure will be of the form:

```
<eventInfo>
    <zwave .... />
</eventInfo>
```

Where **zwave** is defined in:

Schema File	zwobjs.xsd
Namespace	uzw
Class	ZWaveStatusEventObject

5.2 *Discovery - Inactive (action = "2.1")*

This event is published when Z-Wave subsystem is not in discovery mode.

EventInfo structure will be of the form:

```
<eventInfo>
</eventInfo>
```

5.3 *Discovery - Inclusion (action = "2.2")*

This event is published when Z-Wave subsystem is in Inclusion mode.

EventInfo structure will be of the form:

```
<eventInfo>
</eventInfo>
```

5.4 *Discovery - Exclusion (action = "2.3")*

This event is published when Z-Wave subsystem is in Exclusion mode.

EventInfo structure will be of the form:

```
<eventInfo>
</eventInfo>
```

5.5 Discovery – Primary Replication (action = “2.4”)

This event is published when Z-Wave subsystem is the current primary controller and replicates to another controller to make it the new Primary.

EventInfo structure will be of the form:

```
<eventInfo>  
</eventInfo>
```

5.6 Discovery – Learn Mode (action = “2.5”)

This event is published when the Z-Wave subsystem is in learn mode

EventInfo structure will be of the form:

```
<eventInfo>  
</eventInfo>
```

5.7 General Status (action = “3.x.y”)

Reports status, generally a successful completion of a task.

3.1.0	Backup of Z-Wave dongle succeeded
3.2.0	Restore of Z-Wave dongle succeeded
3.3.0	Network Heal completed
3.4.0	Repair Links completed

EventInfo structure will be of the form:

```
<eventInfo>  
</eventInfo>
```

5.8 *General Error (action = "4.x.y")*

Reports an error, generally a failure of a task.

4.1.0	Secure inclusion if Z-Wave device was prevented by ISY (See /security/key/protect)
4.2.0	Secure inclusion of Z-Wave device failed
4.3.0	Backup of Z-Wave dongle failed
4.3.1	- Backup/Restore System is busy
4.3.2	- Failed to read data from the dongle
4.3.3	- Failed to write backup file to file system
4.4.0	Restore of Z-Wave dongle failed
4.4.1	- Backup/Restore System is busy
4.4.2	- No Backup file available
4.4.3	- Invalid/corrupt Backup file
4.4.4	- Could not Factory Reset the Z-Wave dongle
4.4.5	- Failed to write data to the Z-Wave dongle

EventInfo structure will be of the form:

<eventInfo>

</eventInfo>

6. Common REST Interface

/rest/nodes/<nodeAddress>

Returns information describing the specified node.

<i>nodeAddress</i>	The ISY address of the Z-Wave node (e.g. "ZW012_1")
---------------------------	---

Example response:

```
<nodeinfo>
...
<devtype>
<gen>4.64.3</gen>
<mfg>144.1.1</mfg>
<cat>111</cat>
<model>4</model>
</devtype>
...
</nodeinfo>
```

<i>devtype</i>	gen	The <i>basic.generic.specific</i> Z-Wave type as reported by the device
	mfg	The <i>ManufacturerID.ProductTypeID.ProductID</i> as reported by the device (for devices that provide this information)
	cat	The node type defining the subset of the device functionality provided by this node (See Node Types)
	model	A single number indicating the specific device model for some devices known by the ISY (e.g. A Schlage BE369 door lock) (See Model Types)

/rest/nodes/<nodeAddress>/cmd/<control>/<value>[?uom=<uom>][prec=<prec>]

Sets a new value for the specified driver control.

<i>nodeAddress</i>	The ISY address of the Z-Wave node (e.g. "ZW022_1")
<i>control</i>	The driver control (See Driver Controls)
<i>value</i>	The new value for the control
<i>uom</i>	Optional; The unit of measure of the value (See Units of Measure)
<i>prec</i>	Optional; The number of implied decimal places for the value. e.g. value=12345 prec=2 then actual value=123.45

e.g. Set heat setpoint to 14.5 C

/rest/nodes/ZW022_1/cmd/CLISPH/145?uom=4&prec=1

- Or -

/rest/nodes/ZW022_1/cmd/CLISPH/145?uom=C&prec=1

7. REST Interface

REST is an easy to use URL based command set which allows the developer to communicate and control Z-Wave services through ISY.

All REST commands use HTTP GET method.

If no Response is provided, then UDIDefaultResponse must be assumed:

WSDL:zw:UDIDefaultResponse

Notes:

- URL Prefix: **/rest/zwave**
- For optional values, the default value is shown in **bold**
- Objects are defined in **zwobjs.xsd**

7.1 Adding and Removing devices

/node/include?power=<boolean>&nwi=<boolean>

Add a device into the Z-Wave network.

power	Optional, True =High Power, False=Normal Power
nwi	Optional, True =Use network wide inclusion, False=Use Standard Inclusion

/node/exclude

Remove a device from the Z-Wave network.

/node/cancel

Cancel include/exclude/replication.

/node/<nodeAddress>/remove

Remove an unresponsive node from the Z-Wave network. If the node is responsive then it will not be removed.

nodeAddress	ISY node address of node to be removed e.g. "ZW005_1"
--------------------	---

7.2 *General commands*

/backup

Backs up the network information on the Z-Wave dongle to a file on the ISY.

/restore

Restores the Z-Wave dongle using the network information stored in the backup file on the ISY.

/sendPrimary

As Primary Controller, replicate to another controller and make it the new Primary Controller.

/learnMode

Go into Z-Wave learn mode (to replicate, be added/removed from Z-Wave network, etc.).

/security/key/protect

Prevents the ISY from sending any network keys to devices when they are included. This is a simple precaution that prevents the network keys from being transmitted to an unknown device that has been accidentally included (e.g. a neighbor puts his Z-Wave controller in learn mode after you put your ISY into include mode).

/security/key/unprotect

Allows the ISY to send network keys to devices when they are included. This is required, and is only required, when including secure devices.

/firmware/upgrade

Updates the Z-Wave dongle with new firmware.

/sync?[id=<nodeAddress>][uid=<zwaveNodeId>]

Synchronize ISY with info on Z-Wave dongle for the given node. Specify either id or uid. If neither is specified then sync all new & deleted nodes.

<i>nodeAddress</i>	Optional, ISY Node address e.g. "ZW005_1"
<i>zwaveNodeId</i>	Optional, Z-Wave node id e.g. 5

/sync/full?[id=<nodeAddress>][uid=<zwaveNodeId>]

Synchronize ISY with info on Z-Wave dongle for the given node. Specify either id or uid. If neither is specified then sync all nodes.

nodeAddress	Optional, ISY Node address e.g. "ZW005_1"
zwaveNodeId	Optional, Z-Wave node id e.g. 5

/heal/network?[id=<nodeAddress>][uid=<zwaveNodeId>]

Heal the Z-Wave network. Specify either id or uid. If neither is specified then heal the network communications between all nodes.

nodeAddress	Optional, ISY Node address e.g. "ZW005_1"
zwaveNodeId	Optional, Z-Wave node id e.g. 5

/repair/links?[id=<nodeAddress>]

Remove dead links (associations) from the specified device, or all Z-Wave devices if *id* is not specified.

nodeAddress	Optional, ISY Node address e.g. "ZW005_1"
--------------------	---

/factoryReset/dongle?[force=<boolean>]

Factory reset the Z-Wave.

force	Optional, True=Force factory reset, False =Factory reset if dongle is not part of existing Z-Wave network
--------------	--

/set/antenna/<antennaType>

Sets active antenna; switches between internal and external.

antennaType	0 - Internal Antenna, 1 – External Antenna
--------------------	--

/get/version

Get the Z-Wave dongle version information.

Example response:

```
<version bootloader="1.02" zwave="4.55" library="Static
Controller"/>
```


version	bootloader	Version of the low-level bootloader
	zwave	Z-Wave firmware version
	library	Name of the Z-Wave firmware library

/get/status

Get general Z-Wave dongle status information.

Example response:

```
<zwave nodeid="1" primary="true" suc="false" sis="false"
networkEmpty="false" connected="true" extAntenna="true" />
```

zwave	nodeid	The Z-Wave node ID (sometimes referred to as unit id)
	primary	True then the dongle is the primary controller
	suc	True if the dongle is also a Static Update Controller (SUC)
	sis	True if the dongle is also a SUC ID Server (SIS)
	networkEmpty	True if the Z-Wave network is empty (i.e. no devices have been added to the network)
	connected	True if communications with the dongle are working
	extAntenna	True if the external antenna is being used instead of the internal antenna
	keyProtected	True if the network keys are protected during device inclusion

7.3 Node information

Additional node information describing Z-Wave node capabilities is made available in addition to the node types.

/node/<nodeAddress>/info/get

Returns information describing the specified node. If a node address of '0' is specified then it returns information for all Z-Wave nodes.

nodeAddress	The ISY address of the Z-Wave node (e.g. "ZW012_1"), or 0 for all Z-Wave nodes
--------------------	--

Example response:

```
<nodeinfo>
  <node id="ZW012_1" type="111">
    <sts>
      <st id="USRNUM" uom="70"/>
      <st id="BATLVL" uom="51"/>
      <st id="ST" uom="11"/>
    </sts>
    <ctls>
      <ctl id="ALARM" uom="15" mask="0x1bb7f7e"/>
    </ctls>
  </node>
</nodeinfo>
```

<i>node</i>	id	Address of the node
	type	Isy node type (See Node Types)
<i>sts</i>		The set of supported status driver controls and implied actions (e.g. The value CLISPH can both be shown and set)
<i>ctls</i>		A subset of supported control driver controls (i.e. for control conditions in programs)
<i>st/ctl</i>	id	A driver control (See Driver Controls)
	uom	Unit of measure used by the driver control (See Units of Measure)
	mask	A bitmask indicating the subset of values supported by the driver control, where value=1 is bit 0, value=2 is bit 1, etc. (if mask is not specified then all values are supported)

Note: This is an incomplete list as most controls and some actions are currently implied by the node type. In a future release, all status, action, and control values will be supplied.

/node/0/info/get/key

Returns a key that can be used to determine if the node information has changed since it was last retrieved. This allows clients to cache the node information, and only retrieve it again if the key has changed.

Example response:

```
<nodeinfokey>
D20981E852CA5018E39CC02959D054234570A32EA6EA192DDCBC3DCDB0104347
</nodeinfokey>
```

/node/show[/links]/network/all][id=<nodeAddress>][uid=<zwaveNodeId>]

- /show** - Shows Z-Wave device details
- /show/links** - Shows associations
- /show/network** - Shows neighboring devices
- /show/all** - Shows all information (details, links, and network)

e.g. node/show/links?id=ZW005_1

Sends detailed information about the Z-Wave device as progress messages (i.e. messages that appear in the Admin Console event viewer). If no device is specified then information for all nodes currently in the Z-Wave network are shown.

nodeAddress	Optional, ISY Node address e.g. "ZW005_1"
zwaveNodeId	Optional, Z-Wave node id e.g. 5

7.4 Device Configuration commands

/node/<nodeAddress>/config/set/<paramNum>/<value>[/<size>]
Set a Z-Wave device configuration value

/node/<nodeAddress>/config/query/<paramNum>
Query a Z-Wave device configuration value

7.5 Node Properties

/node/<nodeAddress>/set/time
Synchronizes the current time in the specified device with that of the ISY.

/node/<nodeAddress>/properties/set/<name>/<value>
Sets the value of a property for a given node.

<i>nodeAddress</i>	ISY Node address e.g. "ZW005_1"
<i>name</i>	Name of the property
<i>value</i>	New value for the property

/node/<nodeAddress>/properties/query[/<name>]

Queries the value of a property for a given node. If the name is not specified, then all properties from the node are queried.

<i>nodeAddress</i>	ISY Node address e.g. "ZW005_1"
<i>name</i>	Name of the property

Example response:

```
<ps>
  <p id="MODE">
    <val>0</val>
  </p>
  <p id="TIMEOUT">
    <val>1</val>
  </p>
</ps>
```

<i>p</i>	id	Name of the property
<i>val</i>		Value of the property

7.6 Schedule and Security Properties

Schedule and security property support, currently only applies to door locks.

/node/<nodeAddress>/security/user/<userNum>/set/code/<code>

Sets the access code for the specified user. Supported by all door locks.

<i>nodeAddress</i>	ISY Node address e.g. "ZW017_1"
<i>userNum</i>	Door Lock user number e.g. 3
<i>code</i>	The new access code e.g. 123456

/node/<nodeAddress>/security/user/<userNum>/set/role/<role>

Sets the user role for the specified user. Currently only supported by Kwikset locks.

<i>nodeAddress</i>	ISY Node address e.g. "ZW017_1"
<i>userNum</i>	Door Lock user number e.g. 3
<i>role</i>	The user role, either owner , guest , or worker .

/node/<nodeAddress>/security/user/<userNum>/enable/schedule

Enable the schedule for the specified user.

<i>nodeAddress</i>	ISY Node address e.g. "ZW017_1"
<i>userNum</i>	Door Lock user number e.g. 3

/node/<nodeAddress>/security/user/<userNum>/disable/schedule

Disable the schedule for the specified user.

<i>nodeAddress</i>	ISY Node address e.g. "ZW017_1"
<i>userNum</i>	Door Lock user number e.g. 3

/node/<nodeAddress>/security/user/<userNum>/delete/schedule/<slot>

Remove the schedule for the given user. This also changes the user role to *Guest*.

e.g. node/ZW017_1/security/user/3/delete/schedule/1

<i>nodeAddress</i>	ISY Node address e.g. "ZW017_1"
<i>userNum</i>	Door Lock user number e.g. 3
<i>slot</i>	The schedule slot to update. e.g. 1

/node/<nodeAddress>/security/user/<userNum>/set/schedule/<slot>?start=<datetime>&stop=<datetime>

Add or update a schedule for the given user. This also changes the user role to *Guest*. Currently only supported by Kwikset door locks.

e.g. node/ZW017_1/security/user/3/set/schedule/1?start=2014-05-23T08:45&stop=2014-05-23T18:55

nodeAddress	ISY Node address e.g. "ZW017_1"
userNum	Door Lock user number e.g. 3
slot	The schedule slot to update. Currently only slot 1 is supported by the door locks
start	The date and time the schedule starts. e.g. 2014-06-12T09:30
stop	The date and time the schedule stops. e.g. 2014-06-12T17:30

/node/<nodeAddress>/security/user/<userNum>/set/schedule/<slot>?start=<time>&stop=<time>&day=<dayOfWeek>

Add or update a schedule for the given user. This also changes the user role to *Worker*. Currently only supported by Kwikset door locks.

e.g.
/node/ZW017_1/security/user/1/set/schedule/2?start=09:05&stop=14:15&day=fri

nodeAddress	ISY Node address e.g. "ZW017_1"
userNum	Door Lock user number e.g. 3
slot	The schedule slot to update. Currently only slots 1 through 7 are supported by the door locks
start	The time the schedule starts e.g. 09:05
stop	The time the schedule stops e.g. 14:15
day	The day of the week the schedule runs. Possible values: mon tue wed thu fri sat sun

/node/<nodeAddress>/security/user/<userNum>/set/schedule/<slot>?start=<time>&duration=<timeDuration>&day=<daysOfWeek>

Add or update a schedule for the given user. Currently only supported by Yale door locks.

e.g.

/node/ZW012_1/security/user/3/set/schedule/1?day=SUN,WED&start=09:30&duration=03:00

<i>nodeAddress</i>	ISY Node address e.g. "ZW017_1"
<i>userNum</i>	Door Lock user number e.g. 3
<i>slot</i>	The schedule slot to update. Currently only slot 1 is supported by the door locks
<i>start</i>	The time the schedule starts e.g. 09:30
<i>duration</i>	The duration of time the schedule runs. e.g. 03:00
<i>day</i>	One or more days of the week the schedule runs. Possible values (separated by comma): mon tue wed thu fri sat sun

8. Appendix

8.1 *Driver Controls*

The driver controls used by Z-Wave nodes

AIRFLOW	Air Flow
ALARM	Alarm
ANGLE	Angle Position
ATMPRES	Atmospheric Pressure
BARPRES	Barometric Pressure
BATLVL	Battery Level
BEEP	Beep
BMAN	Fade Start
BRT	Brighten
BUSY	Busy
CC	Current Current
CLIMD	Energy Mode
CLIFRS	Fan State
CLIFS	Fan Mode
CLIFSO	Fan Mode Override
CLIHCS	Heat/Cool State
CLIHUM	Humidity
CLIMD	Mode
CLISMD	Schedule Mode
CLISPC	Cool Setpoint
CLISPH	Heat Setpoint
CLITEMP	Temperature
CO2LVL	CO\u2082 Level
CPW	Current Power
CV	Current Voltage
DFOF	Fast Off
DFON	Fast On
DIM	Dim
DISTANC	Distance
DOF	Off
DON	On
ELECRES	Electrical Resistivity
ELECCON	Electrical Conductivity
ERR	Error
GPV	General Purpose
GVOL	Gas Volume
LUMIN	Luminance
MOIST	Moisture
OL	On Level
PCNT	Pulse Count
PF	Power Factor
PPW	Polarized Power
PULSCNT	Pulse Count
RAINRT	Rain Rate
RESET	Reset
ROTATE	Rotation

ISY Z-Wave Integration Developer's Manual : Web Services/REST SDK

RR	Ramp Rate
SECMD	Secure Mode
SEISINT	Seismic Intensity
SEISMAG	Seismic Magnitude
SMAN	Fade Stop
SOLRAD	Solar Radiation
SPEED	Speed
ST	Status
SVOL	Sound Volume
TANKCAP	Tank Capacity
TIDELVL	Tide Level
TIMEREM	Time Remaining
TPW	Total Power
UAC	User Number
UOM	Unit of Measure
UV	UV Light
USRNUM	User Number
VOCLVL	VOC Level
WEIGHT	Weight
WINDDIR	Wind Direction
WVOL	Water Volume

8.2 Units of Measure

The units of measure include the scientific units of measure as well as custom types. A unit of measure is a numeric type that fully defines a value. Values in square brackets are keywords that may be specified for the unit of measure instead of the numeric value when sending a request to ISY. The ISY will always return the numeric value for the unit of measure.

```

0 = Unit of measure is unknown
1 = ampere (amp) [amp, ampere]
2 = boolean
3 = btu/h [btuh]
4 = celsius (C) [C, celsius]
5 = centimeter (cm) [cm]
6 = cubic feet
7 = cubic feet per minute (cfm)
8 = cubic meter
9 = day
10 = days
11 = Deadbolt status \(See below\)
12 = decibel (db) [db]
13 = decibel A (dbA) [dbA]
14 = degree
15 = Door lock alarm \(See below\)
16 = european macroseismic
17 = Fahrenheit (F) [F]
18 = feet
19 = hour
20 = hours
21 = absolute humidity
22 = relative humidity
23 = inches of mercury (inHg)
24 = inches/hour
25 = index
26 = kelvin (K) [K]
27 = keyword
28 = kilogram (kg) [kg]
29 = kilovolt (kV)
30 = kilowatt (kW)
31 = kilopascal (kPa) [kpa]
32 = kilometers/hour (KPH)
33 = kilowatts/hour (kWH) [kwh]
34 = liedu
35 = liter (l)
36 = lux [lux]
37 = mercalli
38 = meter (m)
39 = cubic meters/hour
40 = meters/sec (m/s)
41 = milliamp (mA)
42 = millisecond (ms)
43 = millivolt (mV)
44 = minute
45 = duration in minutes
    
```

46 = millimeters/hour (mm/hr)
 47 = month
 48 = miles/hour (MPH)
 49 = meters/second (MPS)
 50 = ohm [*ohm*]
 51 = percent
 52 = pound
 53 = Power Factor
 54 = Parts/Million (PPM)
 55 = pulse count
 56 = The raw value as reported by the device
 57 = second
 58 = Duration in seconds
 59 = seimens/meter
 60 = body wave magnitude scale
 61 = Richter scale
 62 = moment magnitude scale
 63 = surface wave magnitude scale
 64 = shindo
 65 = SML
 66 = Thermostat heat/cool state ([See below](#))
 67 = Thermostat mode ([See below](#))
 68 = Thermostat fan mode ([See below](#))
 69 = US gallon
 70 = User number
 71 = UV index
 72 = volt [*V, volt*]
 73 = watt [*W, watt*]
 74 = watts/square meter
 75 = weekday
 76 = Wind Direction in degrees
 77 = year
 78 = 0-Off 100-On
 79 = 0-Open 100-Close
 80 = Thermostat fan run state
 81 = Thermostat fan mode override
 82 = millimeter [*mm*]
 83 = kilometer
 84 = Secure Mode 0-Unlock 1-Lock
 85 = Ohm Meter (Electrical resistivity)
 86 = KiloOhm
 87 = cubic meter/cubic meter
 88 = Water activity
 89 = rotations/Minute (RPM)
 90 = Hertz (Hz)
 91 = Angle Position degrees relative to North Pole
 92 = Angle Position degrees relative to South Pole
 93 = Power Management Alarm ([See below](#))
 94 = Appliance Alarm ([See below](#))
 95 = Home Health Alarm ([See below](#))
 96 = VOC Level ([See below](#))
 97 = Barrier Status ([See below](#))

Special Values

11 = Deadbolt status

- 0 - Unlocked
- 100 - Locked
- 101 - Unknown
- 102 - Jammed

15 = Door lock alarm

- 1 - Master Code Changed
- 2 - Tamper Code Entry Limit
- 3 - Escutcheon Removed
- 4 - Key/Manually Locked
- 5 - Locked by Touch
- 6 - Key/Manually Unlocked
- 7 - Remote Locking Jammed Bolt
- 8 - Remotely Locked
- 9 - Remotely Unlocked
- 10 - Deadbolt Jammed
- 11 - Battery Too Low to Operate
- 12 - Critical Low Battery
- 13 - Low Battery
- 14 - Automatically Locked
- 15 - Automatic Locking Jammed Bolt
- 16 - Remotely Power Cycled
- 17 - Lock Handling Completed
- 19 - User Deleted
- 20 - User Added
- 21 - Duplicate PIN
- 22 - Jammed Bolt by Locking with Keypad
- 23 - Locked by Keypad
- 24 - Unlocked by Keypad
- 25 - Keypad Attempt outside Schedule
- 26 - Hardware Failure
- 27 - Factory Reset

66 = Thermostat heat/cool state

- 0 - Idle
- 1 - Heating
- 2 - Cooling
- 3 - Fan Only
- 4 - Pending Heat
- 5 - Pending Cool
- 6 - Vent
- 7 - Aux Heat
- 8 - 2nd Stage Heating
- 9 - 2nd Stage Cooling
- 10 - 2nd Stage Aux Heat
- 11 - 3rd Stage Aux Heat

67 = Thermostat mode

- 0 - Off
- 1 - Heat
- 2 - Cool
- 3 - Auto
- 4 - Aux/Emergency Heat

- 5 - Resume
- 6 - Fan Only
- 7 - Furnace
- 8 - Dry Air
- 9 - Moist Air
- 10 - Auto Changeover
- 11 - Energy Save Heat
- 12 - Energy Save Cool
- 13 - Away

68 = Thermostat fan mode

- 0 - Auto
- 1 - On
- 2 - Auto High
- 3 - High
- 4 - Auto Medium
- 5 - Medium
- 6 - Circulation
- 7 - Humidity Circulation

93 = Power Management Alarm

- 1 - Power Applied
- 2 - Ac Mains Disconnected
- 3 - Ac Mains Reconnected
- 4 - Surge Detection
- 5 - Volt Drop Or Drift
- 6 - Over Current Detected
- 7 - Over Voltage Detected
- 8 - Over Load Detected
- 9 - Load Error
- 10 - Replace Battery Soon
- 11 - Replace Battery Now
- 12 - Battery Is Charging
- 13 - Battery Is Fully Charged
- 14 - Charge Battery Soon
- 15 - Charge Battery Now

94 = Appliance Alarm

- 1 - Program Started
- 2 - Program In Progress
- 3 - Program Completed
- 4 - Replace Main Filter
- 5 - Failure To Set Target Temperature
- 6 - Supplying Water
- 7 - Water Supply Failure
- 8 - Boiling
- 9 - Boiling Failure
- 10 - Washing
- 11 - Washing Failure
- 12 - Rinsing
- 13 - Rinsing Failure
- 14 - Draining
- 15 - Draining Failure
- 16 - Spinning
- 17 - Spinning Failure
- 18 - Drying

```
    19 - Drying Failure
    20 - Fan Failure
    21 - Compressor Failure

95 = Home Health Alarm
    1 - Leaving Bed
    2 - Sitting On Bed
    3 - Lying On Bed
    4 - Posture Changed
    5 - Sitting On Edge Of Bed

96 = VOC Level
    1 - Clean
    2 - Slightly Polluted
    3 - Moderately Polluted
    4 - Highly Polluted

97 = Barrier Status
    0 - Closed
    1-99 - Percent Closed (1% = almost Closed, 99% = almost Open)
    100 - Open
    101 - Unknown
    102 - Stopped
    103 - Closing
    104 - Opening
```

8.3 Node Types

A Z-Wave device is represented by one or more ISY nodes. Each Z-Wave ISY node has a unique type that represents a subset of the features for the device. For example, a thermostat that also includes energy monitoring would have two nodes, one of node type 140-Thermostat, and the other 143-Energy Meter.

From 4_fam.xml <isyNodeTypes>

0 = Uninitialized	143 = Energy Meter
101 = Unknown	144 = Pulse Meter
102 = Alarm	145 = Water Meter
103 = AV Control Point	146 = Gas Meter
104 = Binary Sensor	147 = Binary Switch
105 = Class A Motor Control	148 = Binary Alarm
106 = Class B Motor Control	149 = Aux Alarm
107 = Class C Motor Control	150 = CO2 Alarm
108 = Controller	151 = CO Alarm
109 = Dimmer Switch	152 = Freeze Alarm
110 = Display	153 = Glass Break Alarm
111 = Door Lock	154 = Heat Alarm
112 = Doorbell	155 = Motion Sensor
113 = Entry Control	156 = Smoke Alarm
114 = Gateway	157 = Tamper Alarm
115 = Installer Tool	158 = Tilt Alarm
116 = Motor Multiposition	159 = Water Alarm
117 = Climate Sensor	160 = Door/Window Alarm
118 = Multilevel Sensor	161 = Test Alarm
119 = Multilevel Switch	162 = Low Battery Alarm
120 = On/Off Power Strip	163 = CO End Of Life Alarm
121 = On/Off Power Switch	164 = Malfunction Alarm
122 = On/Off Scene Switch	165 = Heartbeat
123 = Open/Close Valve	166 = Overheat Alarm
124 = PC Controller	167 = Rapid Temp Rise Alarm
125 = Remote	168 = Underheat Alarm
126 = Remote Control	169 = Leak Detected Alarm
127 = AV Remote Control	170 = Level Drop Alarm
128 = Simple Remote Control	171 = Replace Filter Alarm
129 = Repeater	172 = Intrusion Alarm
130 = Residential HRV	173 = Tamper Code Alarm
131 = Satellite Receiver	174 = Hardware Failure Alarm
132 = Satellite Receiver	175 = Software Failure Alarm
133 = Scene Controller	176 = Contact Police Alarm
134 = Scene Switch	177 = Contact Fire Alarm
135 = Security Panel	178 = Contact Medical Alarm
136 = Set-Top Box	179 = Wakeup Alarm
137 = Siren	180 = Timer
138 = Smoke Alarm	181 = Power Management
139 = Subsystem Controller	182 = Appliance
140 = Thermostat	183 = Home Health
141 = Toggle	184 = Barrier
142 = Television	

8.4 *Model Types*

The model of device is usually determined by comparing a series of manufacturer specific IDs. This list makes it easier to determine specific devices by assigning them a simple integer value.

```
From 4_fam.xml <isyDeviceModels>

1 = Schlage BE369
2 = Schlage BE469
3 = Schlage FE599
4 = Kwikset Door Lock
5 = Yale Door Lock
6 = FortrezZ Water Valve
7 = First Alert Smoke Detector
8 = First Alert CO and Smoke Detector
9 = Aeon Multisensor
10 = RCS PMC40
11 = FortrezZ MIMOLite
```