ISY/Orchestrator
Developer's Manual

Web Services SDK and REST Interface
for INSTEON
Based on firmware 2.8.11

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1.0 Introduction

ISY is a sophisticated events based network platform which affords its clients unprecedented levels of integration and functionality. Now, with the introduction of WSDK, most of ISY functions are externalized as Web Services and defined in a well formed WSDL which can immediately be imported into an IDE of choice.

At a high level, ISY operates and may be communicated with in the following order:

1. Upon power up, ISY sends out broadcasts messages of its location to all the UPnP clients on the network

2. Interested clients may choose to:

    a. Search for a specific ISY (based on the device type it supports such as Insteon)
    b. Listen in for ISY generated announcements on the network
    c. Immediately start communicating with ISY using a predefined IP (static) address and port, if one is already known

3. Upon discovery of an ISY – regardless of the method chosen – communications with ISY takes place through Web Services/SOAP 1.2 calls:

    a. All requests need to have an HTTP Basic Authentication Header (Realm="/")
    b. Optionally ***subscribe*** to the ISY events from which time ISY continuously notifies the subscriber(s) of the changes in its state. Upon successful subscription, ISY publishes all its current states to the client so that the client and ISY are in synch at the moment of subscription. In this respect, then, the clients are started with the current state of ISY and are notified of all the changes as they occur and thus will never have to poll ISY

4. During application exit, the client must notify ISY that it wishes to terminate its session. This is achieved by issuing:

    a. Unsubscribing from ISY

5. During normal operations, the client *must* always respond back (immediately) with an Ack to ISY's Heartbeat events otherwise ISY assumes a client malfunction (the client didn't exit gracefully as outlined in step 4) and terminates the associated session

As mentioned before, ISY is event driven and thus every change in ISY is notified/published to all the ISY subscribed clients in real-time and almost immediately. In this respect, then, one could use the default ISY User Interface (a signed Java applet) to effect a change while using one's own client to view all the changes that are taking place (and vice versa).

2.0 Basic Concepts

2.1 Control

A *Control* is the logical representation of either a state or a function that may be performed on a physical device (or a scene) linked to ISY. For example, "DON" is the name of the *Control* which instructs ISY to turn a "Deivce On" while "ST" is the name of the *Control* which holds that *state* of a device.

In essence, then, Control is what "captures" and "controls" changes in the states of physically linked devices or groups/scenes. Since Controls may be associated with states, thus, all ISY publications (publish) to all clients contain a Control parameter which identifies "what changed".

For example, a CLISP (Climate SetPoint) Control not only allows the client to effect a SetPoint change on a linked Thermostat but also, as soon as the change takes effect (or the state changes), ISY notifies all the clients of the change in "CLISP" and the current value thereto (see section 2.2: Action) if any.

The most important attributes of a Control are:

A Name – this is the Control's only meaningful unit of communications with ISY such as "CLISP", "DON", "DIM", etc.

A Label – this is an optional label that the developer/manufacturer may ascribe to a Control such as "SetPoint", "On", "Dim", "Fast On", etc.

*Action*s – this is a list of optional while permissible actions which may be performed on a Control such as "50" which, when applied to "DON", means turn the "Device On to 50%". Or, when "HEAT" is applied to "CLIMD" (Climate Mode) it means change the thermostat "Mode to Heat". For more details, see section 2.2: Action.

2.2 Action

An *Action* is the permissible "value" which may be applied to a *Control*. A Control may have a set of permissible Actions which are captured by a list.

When communicating a state change request to ISY, Action may be null. This said, however, when ISY publishes (to its subscribers) changes to a Control – and if the Control is associated with some state – then this attribute holds the "current value" of the state. For example, when issuing a "DON" to ISY the "ST" Control (which is associated with a state) is updated and, as such, ISY shall notify all the subscribed clients of a change in "ST" with Action being the current value of "ST" such as "50"%.

The most important attributes of an Action are:

A Name – this is the Action's only meaningful unit of communications with ISY. Depending on the Control, this attribute may take the form of a free text/object field the value of which is filled in by ISY upon publications of events.

A Label – this is an optional label that the developer/manufacturer may ascribe to an Action such as "Heat".

2.3 Node

A Node is a logical representation of a physical device linked to ISY. So, for instance, KeypadLinc's button A is a node and so are its buttons B, C, D through H.

In essence – and when put in the context of a Control and Action – the Node is the only missing piece which, when all put together, enables effecting the desired change on a physical device linked to ISY.

The most important attributes of Node are:

An Address – this is the address which ISY uses to communicate with the actual physical device such as 4 E 52 1

A Name – this is the user friendly name which can be changed by any ISY client

States (device Variables) – this is the list of all the Controls for a Node and their current associated Actions (values)

A note on Insteon addresses:

Since, as mentioned before, every button is also considered a device within ISY, thus, each button shall have its own address conforming to the following syntax: X X X B – where X is the actual Insteon address for the device in hex and B is the button group number.

For instance, a 6 button KeypadLinc with address 04 E8 52 will have the following nodes within ISY:
4 E8 52 1 – the main [loaded] button
4 E8 52 A – Button A
4 E8 52 B – Button B
4 E8 52 C – Button C
4 E8 52 D – Button D

2.4 Group/Scene

A Group is a specialization of Node with the added capability of aggregating associated/linked Nodes. Just like a Node, a Group may also be used to effect a change in ISY. The only difference is that issuing a state change on a Group results in ISY sending notifications on the states of all the Nodes within that Group/Scene (if there were any changes).

2.5 Putting it Together

By having a triplet {control, action, [node or group/scene]} it's quite easy to effect change on the physical devices which are linked/attached to ISY. For instance:

1. To turn on the light at address 7 B0 B2 to 60%, a simple service call of the type *UDIService* ("DON", "60", "7 B0 B2 1"), is all it takes.

2. To turn off the scene at address 52626, a simple method call of the type *UDIService*("DOF", null, "52626"), is all it takes.

2.6 ISY Messages and Web Services

All messages, Web Services, Parameters, Objects, and Events are captured in a WSDL file stored on ISY.

3.0 Discovering ISY and its Resources

ISY Can be found using UPnP Search method. ISY also advertises its presence on the network every 30 seconds.

3.1 Discovering ISY Using UPnP Search

Send the following UDP Packet to UPnP Multicast group of 239.255.255.250 and port 1900

```
M-SEARCH * HTTP/1.1
HOST:239.255.255.250:1900
MAN:"ssdp.discover"
MX:1
ST:urn:udi-com:device:X_Insteon_Lighting_Device:1
```

Note: X_Insteon_Lighting_Device is the UPnP Device Type for INSTEON ISY devices

ISY replies with:

```
HTTP/1.1 200 OK
CACHE-CONTROL:max-age=30
EXT:
LOCATION:http://192.168.0.208/desc
SERVER:UCoS, UPnP/1.0, UDI/1.0
ST:urn:udi-com:device:X_Insteon_Lighting_Device:1
USN:uuid:00:03:f4:03:0f:61::urn:udi-
com:device:X_Insteon_Lighting_Device:1
```

3.2 Listening For ISY Advertisements on the Network

As mentioned before, ISY advertises its existence on the network every 30 seconds. To receive these notification events, join the UPnP Multicast group at 239.255.255.250 and port 1900. ISY advertisements are as follows:

1. Root Device

```
NOTIFY * HTTP/1.1
HOST:239.255.255.250:1900
CACHE-CONTROL:max-age=30
LOCATION:http://192.168.0.208/desc
NT:upnp:rootdevice
NTS:ssdp:alive
```

```
SERVER:UCoS, UPnP/1.0, UDI/1.0
USN:uuid:00:03:f4:03:0f:61::upnp:rootdevice
```

2. Service

```
NOTIFY * HTTP/1.1
HOST:239.255.255.250:1900
CACHE-CONTROL:max-age=30
LOCATION:http://192.168.0.208/desc
NT:urn:udi-com:service:X_Insteon_Lighting_Service:1
NTS:ssdp:alive
SERVER:UCoS, UPnP/1.0, UDI/1.0
USN:uuid:00:03:f4:03:0f:61::urn:udi-
com:service:X_Insteon_Lighting_Service:1
```

3. Device

```
NOTIFY * HTTP/1.1
HOST:239.255.255.250:1900
CACHE-CONTROL:max-age=30
LOCATION:http://192.168.0.208/desc
NT:urn:udi-com:device:X_Insteon_Lighting_Device:1
NTS:ssdp:alive
SERVER:UCoS, UPnP/1.0, UDI/1.0
USN:uuid:00:03:f4:03:0f:61::urn:udi-
com:device:X_Insteon_Lighting_Device:1
```

3.3 Capturing ISY Resources

Regardless of how ISY is discovered, the LOCATION header defines where other ISY resource URIs are located (UPnP Description file). Simply do an HTTP Get on the URL defined by the LOCATION header. The following is an example of the contents of: **http://192.168.0.208/desc**; The most important elements are in **bold**:

```
<?xml version="1.0" ?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
<specVersion>
  <major>1</major>
  <minor>0</minor>
  </specVersion>
  <URLBase>http://192.168.0.208</URLBase>
  <device>
  <deviceType>urn:udi-com:device:X_Insteon_Lighting_Device:1</deviceType>
  <friendlyName>My Lighting</friendlyName>
  <manufacturer>Universal Devices Inc.</manufacturer>
  <manufacturerURL>http://www.universal-devices.com</manufacturerURL>
  <modelDescription>X_Insteon_Lighting_Device:1</modelDescription>
  <modelName>Insteon Web Control</modelName>
  <modelNumber>Insteon Web Control</modelNumber>
  <UDN>uuid:00:03:f4:03:0f:61</UDN>
  <UPC>uuid:00:03:f4:03:0f:61</UPC>
  <serviceList>
  <service>
  <serviceType>urn:udi-
com:service:X_Insteon_Lighting_Service:1</serviceType>
```

```
  <serviceId>urn:udi-com:serviceId:uuid:00:03:f4:03:0f:61</serviceId>
  <SCPDURL>/services.wsdl</SCPDURL>
   <controlURL>/services</controlURL>
   <eventSubURL>/eventing</eventSubURL>
  </service>
 … other services such as SEP
  </serviceList>
  <presentationURL>/</presentationURL>
  </device>
</root>
```

URLBase: is the absolute URL to ISY services. All the other URLs are relative to this URL

UDN: is the Unique Device Number which uniquely identifies ISY on the network

SCPDURL: is the location where the definition of ISY services are located (in WSDL).
Note: point your WebServices IDE to this URL to import all services. E.g. http://192.168.0.102:8080/services.wsdl

controlURL: is the URL to which all the Service requests are Posted

eventSubURL: is the URL to which clients subscribe and unsubscribe

3.4 ISY Configuration Resource

ISY Configuration Resource defines how ISY is presently configured. The most important feature of this resource is that it defines the permissible Controls/Actions which may be invoked in ISY. Here's the an example:

```
...
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
      -
      <deviceSpecs>
            <make>Universal Devices Inc.</make>
            <manufacturerURL>http://www.universal-
devices.com</manufacturerURL>
            <model>Insteon Web Controller</model>
            <icon>/web/udlogo.jpg</icon>
            <archive>/web/insteon.jar</archive>
            <chart>/web/chart.jar</chart>
            <queryOnInit>true</queryOnInit>
            <oneNodeAtATime>true</oneNodeAtATime>
      </deviceSpecs>
      <upnpSpecs>
            <upnpDevice>
                  <utype>X_Insteon_Lighting_Device</utype>
                  <version>1</version>
            </upnpDevice>
            <upnpService>
                  <utype>X_Insteon_Lighting_Service</utype>
                  <version>1</version>
            </upnpService>
      </upnpSpecs>
      <controls>
            <control>
                  <name>ST</name>
                  <label>Status</label>
                  <readOnly>true</readOnly>
                  <isQueryAble>true</isQueryAble>
                  <isNumeric>true</isNumeric>
                  <numericUnit>%</numericUnit>
            </control>
            <control>
                  <name>OL</name>
                  <label>On Level</label>
                  <readOnly>false</readOnly>
                  <isQueryAble>true</isQueryAble>
                  <isNumeric>true</isNumeric>
                  <numericUnit>%</numericUnit>
            </control>
            <control>
                  <name>RR</name>
                  <label>Ramp Rate</label>
                  <readOnly>false</readOnly>
                  <isQueryAble>true</isQueryAble>
                  <isNumeric>true</isNumeric>
                  <numericUnit>%</numericUnit>
```

```
</control>
<control>
      <name>DON</name>
      <label>On</label>
</control>
<control>
      <name>DFON</name>
      <label>Fast On</label>
</control>
<control>
      <name>DOF</name>
      <label>Off</label>
</control>
<control>
      <name>DFOF</name>
      <label>Fast Off</label>
</control>
<control>
      <name>BRT</name>
      <label>Brighten</label>
</control>
<control>
      <name>DIM</name>
      <label>Dim</label>
</control>
<control>
      <name>BMAN</name>
      <label>Fade Start</label>
</control>
<control>
      <name>SMAN</name>
      <label>Fade Stop</label>
</control>
<control>
      <name>BEEP</name>
      <label>Beep</label>
</control>
<control>
      <name>RESET</name>
      <label>Reset values</label>
</control>
<control>
      <name>CLISPH</name>
      <label>Heat Setpoint</label>
      <readOnly>false</readOnly>
      <isQueryAble>true</isQueryAble>
      <isNumeric>true</isNumeric>
      <numericUnit>F</numericUnit>
</control>
<control>
      <name>CLISPC</name>
      <label>Cool Setpoint</label>
      <readOnly>false</readOnly>
      <isQueryAble>true</isQueryAble>
      <isNumeric>true</isNumeric>
      <numericUnit>F</numericUnit>
```

```
</control>
<control>
	<name>CLIFS</name>
	<label>Fan State</label>
	<readOnly>false</readOnly>
	<isQueryAble>true</isQueryAble>
	<isNumeric>false</isNumeric>
	<actions>
		<action>
			<name>7</name>
			<label>On</label>
		</action>
		<action>
			<name>8</name>
			<label>Auto</label>
		</action>
	</actions>
</control>
<control>
	<name>CLIMD</name>
	<label>Thermostat Mode</label>
	<readOnly>false</readOnly>
	<isQueryAble>true</isQueryAble>
	<isNumeric>false</isNumeric>
	<actions>
		<action>
			<name>0</name>
			<label>Off</label>
		</action>
		<action>
			<name>1</name>
			<label>Heat</label>
		</action>
		<action>
			<name>2</name>
			<label>Cool</label>
		</action>
		<action>
			<name>3</name>
			<label>Auto</label>
		</action>
		<action>
			<name>4</name>
			<label>Fan</label>
		</action>
		<action>
			<name>5</name>
			<label>Program Auto</label>
		</action>
		<action>
			<name>6</name>
			<label>Program Heat</label>
		</action>
		<action>
			<name>7</name>
			<label>Program Cool</label>
```

```
            </action>
      </actions>
</control>
<control>
      <name>CLIHUM</name>
      <label>Humidity</label>
      <readOnly>true</readOnly>
      <isQueryAble>true</isQueryAble>
      <isNumeric>true</isNumeric>
      <numericUnit>%</numericUnit>
</control>
<control>
      <name>CLIHCS</name>
      <label>Heat/Cool State</label>
      <readOnly>true</readOnly>
      <isQueryAble>true</isQueryAble>
      <isNumeric>false</isNumeric>
      <actions>
            <action>
                  <name>0</name>
                  <label>Off</label>
            </action>
            <action>
                  <name>1</name>
                  <label>Heat On</label>
            </action>
            <action>
                  <name>2</name>
                  <label>Cool On</label>
            </action>
      </actions>
</control>
<control>
      <name>UOM</name>
      <label>Unit</label>
      <readOnly>true</readOnly>
      <isQueryAble>true</isQueryAble>
      <isNumeric>false</isNumeric>
      <actions>
            <action>
                  <name>1</name>
                  <label>Celsius</label>
            </action>
            <action>
                  <name>2</name>
                  <label>Fahrenheit</label>
            </action>
      </actions>
</control>
<control>
      <name>CPW</name>
      <label>Current Power Usage</label>
      <readOnly>true</readOnly>
      <isQueryAble>true</isQueryAble>
      <isNumeric>true</isNumeric>
      <numericUnit>W</numericUnit>
```

```
        </control>
        <control>
                <name>TPW</name>
                <label>Total Power Used</label>
                <readOnly>true</readOnly>
                <isQueryAble>true</isQueryAble>
                <isNumeric>true</isNumeric>
                <numericUnit>kWs</numericUnit>
        </control>
</controls>
<app>Insteon_UD994</app>
<app_version>2.8.11</app_version>
<platform>ISY-C-994</platform>
<build_timestamp>2011-01-20-01:09:20</build_timestamp>
<root>
        <id>00:03:f4:03:65:96</id>
        <name>Home Orchestrator 4</name>
</root>
<product>
        <id>1100</id>
        <desc>ISY 994i 1024</desc>
</product>
<features>
        <feature>
                <id>21010</id>
                <desc>Open Auto-DR</desc>
                <isInstalled>true</isInstalled>
                <isAvailable>true</isAvailable>
        </feature>
        <feature>
                <id>21011</id>
                <desc>Electricity Meter</desc>
                <isInstalled>true</isInstalled>
                <isAvailable>true</isAvailable>
        </feature>
        <feature>
                <id>21012</id>
                <desc>Gas Meter</desc>
                <isInstalled>false</isInstalled>
                <isAvailable>true</isAvailable>
        </feature>
        <feature>
                <id>21013</id>
                <desc>Water Meter</desc>
                <isInstalled>false</isInstalled>
                <isAvailable>false</isAvailable>
        </feature>
        <feature>
                <id>21020</id>
                <desc>Weather Information</desc>
                <isInstalled>true</isInstalled>
                <isAvailable>true</isAvailable>
        </feature>
        <feature>
                <id>21030</id>
                <desc>Network Modules</desc>
```

```
            <isInstalled>false</isInstalled>
            <isAvailable>false</isAvailable>
        </feature>
        <feature>
            <id>21040</id>
            <desc>Networking Module</desc>
            <isInstalled>true</isInstalled>
            <isAvailable>true</isAvailable>
        </feature>
        <feature>
            <id>21050</id>
            <desc>Utility Meter (Electricity)</desc>
            <isInstalled>false</isInstalled>
            <isAvailable>true</isAvailable>
        </feature>
        <feature>
            <id>21051</id>
            <desc>SmartMeter ESP</desc>
            <isInstalled>false</isInstalled>
            <isAvailable>false</isAvailable>
        </feature>
        <feature>
            <id>21060</id>
            <desc>A10/X10 for Insteon</desc>
            <isInstalled>false</isInstalled>
            <isAvailable>false</isAvailable>
        </feature>
        <feature>
            <id>21070</id>
            <desc>Portal Integration - Check-it.ca</desc>
            <isInstalled>true</isInstalled>
            <isAvailable>true</isAvailable>
        </feature>
        <feature>
            <id>21014</id>
            <desc>Current Cost Meter</desc>
            <isInstalled>false</isInstalled>
            <isAvailable>true</isAvailable>
        </feature>
        <feature>
            <id>21080</id>
            <desc>Broadband SEP Device</desc>
            <isInstalled>true</isInstalled>
            <isAvailable>true</isAvailable>
        </feature>
        <feature>
            <id>21071</id>
            <desc>Portal Integration - GreenNet.com</desc>
            <isInstalled>false</isInstalled>
            <isAvailable>true</isAvailable>
        </feature>
    </features>
    <triggers>true</triggers>
    <security>SSL</security>
    <isDefaultCert>false</isDefaultCert>
</configuration>
```

3.4.1 Modules (Features)

ISY allows for optional modules to be installed. The correct behavior of the client may depend on the installed modules such as Climate and A10/X10. Modules are identified by the **<feature>** element in the configuration resource (see section 3.4). As such, it's advised that the client code queries the modules to enable/disable functionality accordingly.

Currently available modules are listed herein under:

```
21010 - Open Auto-DR

21011 - Electricity Meter (Brultech)

21012 - Gas Meter

21013 - Water Meter

21014 - Current Cost Meter

21020 - Weather Information (WeatherBug)

21030 - Network Modules (NOT AVAILABLE)

21040 - Networking Module

21050 - Utility Meter (Electricity): Zigbee SEP

21051 - SmartMeter ESP

21060 - A10/X10 for Insteon

21070 - Portal Integration - Check-it.ca

21071 - Portal Integration - GreenNet.com

21080 - Broadband SEP Device
```

3.5 ISY Nodes Configuration Resource

ISY Nodes Configuration Resource defines all the Nodes/Scenes as configured in ISY with their relationships.

There are 3 types of nodes in ISY:
Node … identifies and end or virtual device or button (<node>)
Group ... identifies a scene or a logical grouping between devices (<group>)
Folder … identifies a logical grouping of nodes and groups without regards to their relationships

Note:
1. A **Node** can belong to multiple **Groups** acting as Controller or Responder
2. A **Node** can belong only to ONE and only ONE **Folder** or another **Node**
3. A **Group** can belong only to ONE and only ONE **Folder**
4. A **Folder** can belong only to ONE and only ONE **Folder**

3.5.1 Types of Nodes/Parents

```
UD_HIERARCHY_NODE_TYPE_NOTSET 0 (unknown)
UD_HIERARCHY_NODE_TYPE_NODE   1
UD_HIERARCHY_NODE_TYPE_GROUP  2
UD_HIERARCHY_NODE_TYPE_FOLDER 3
```

3.5.2 Node (<node>)

This element defines a configured node in ISY. A node is anything that can be impacted upon or if it can impact some change in the environment. As such, a node could be a KeypadLinc's button or a Thermostat.

<**node** flag="0">
<**address**>The address of the node</**address**>
<**name**>Friendly name</name>
<**parent** type="see 3.5.1">the address of the parent</**parent**>
<**type**>device type; see below</**type**>
<**enabled**>"true"|"false"</enabled>
<**deviceClass**>1024</**deviceClass**>
<**wattage**>2000</**wattage**>
<**dcPeriod**>60</**dcPeriod**>
</**node**>

"flag" Attribute

Defines the characteristics of the <node> as well as the <group> elements as follows (represented in decimal):

```
NODE_IS_INIT         0x01 //needs to be initialized
NODE_TO_SCAN         0x02 //needs to be scanned

//Node operations flags
NODE_IS_A_GROUP       0x04 //it's a group!
NODE_IS_ROOT    0x08 //it's the root group
NODE_IS_IN_ERR        0x10 //it's in error!

NODE_IS_NEW           0x20 //brand new node
NODE_TO_DELETE        0x40 //has to be deleted later
NODE_IS_DEVICE_ROOT   0x80 //root device such as KPL load
```

<deviceClass> Element *

Defines the class of device for energy management (as defined by SEP):

```
DC_HVAC                         0x0001
DC_STRIP_HEATER                 0x0002
DC_WATER_HEATER                 0x0004
DC_POOL_PUMP                    0x0008
DC_SMART_APPLIANCE              0x0010
DC_IRRIGATION_PUMP              0x0020
DC_MANAGED_LOAD                 0x0040
DC_SIMPLE                       0x0080
DC_EXTERIOR_LIGHTING            0x0100
DC_INTERIOR_LIGHTING            0x0200
DC_EV                           0x0400
DC_GENERATION_SYSTEM            0x0800
DC_WASHER                       0x1000
DC_DRYER                        0x2000
DC_OVEN                         0x4000
DC_FRIG                         0x8000
DC_ALL                          0xFFFF
```

*Available in Orchestrator/EMS models only

<dcPeriod> Element*

Defines the Duty Cycle period in minutes.

*Available in Orchestrator/EMS models only

<type> Element

Defines the type of node as follows:
device category.device subcategory.version.reserved

Device Categories:

```
DEV_CAT_CONTROLLER=DEV_CAT_ZERO,
DEV_CAT_DIM_LIGHT_CONTROL=0x01,
DEV_CAT_SWITCHED_LIGHT_CONTROL=0x02,
DEV_CAT_SWITCH_LIGHT_CONTROL=DEV_CAT_SWITCHED_LIGHT_CONTROL,
DEV_CAT_NETWORK_BRIDGE=0x03,
DEV_CAT_IRRIGATION_CONTROL=0x04,
DEV_CAT_CLIMATE_CONTROL=0x05,
DEV_CAT_POOL_CONTROL=0x06,
DEV_CAT_SENSOR_ACTUATOR=0x07,
DEV_CAT_HOME_ENTERTAINMENT=0x08,
DEV_CAT_ENERGY_MANAGEMENT=0x09,
DEV_CAT_APPLIANCE_CONTROL=0x0A,
DEV_CAT_PLUMBING=0x0B,
DEV_CAT_COMMUNICATION=0x0C,
DEV_CAT_COMPUTER_CONTROL=0x0D,
DEV_CAT_WINDOWS_COVERING=0x0E,
DEV_CAT_ACCESS_CONTROL=0x0F,
DEV_CAT_SECURITY_HEALTH_SAFETY=0x10,
DEV_CAT_SURVEILLANCE=0x11,
DEV_CAT_AUTOMOTIVE=0x12,
DEV_CAT_PET_CARE=0x13,
DEV_CAT_TOYS=0x14,
DEV_CAT_TIME_KEEPING=0x15,
DEV_CAT_HOLIDAY=0x16,
DEV_CAT_X10=0x71,
DEV_CAT_VIRTUAL=0x7F,
DEV_CAT_UNKNOWN=0xFE,
```

Device Subcategories:

```
/**
* DEV_CAT_CONTROLLER
*/
OLD_DEV_SCAT_ZERO=0x60,
DEV_SCAT_ZERO=0x00,
DEV_SCAT_CONTROLINC_2430=DEV_SCAT_ZERO /*was 0x04*/,
DEV_SCAT_ICON_REMOTELINC_2843=0x05,
DEV_SCAT_ICON_TABLETOP_2830=0x06,
DEV_SCAT_SIGNALINC_2442=0x09,
DEV_SCAT_POOLUX_LCD_CONTROLLER=0x0A,
DEV_SCAT_ACCESSPOINT=0x0B,
DEV_SCAT_IES_COLOR_TOUCHSCREEN=0x0C,

/**
* DEV_CAT_DIM_LIGHT_CONTROL
*/
DEV_SCAT_LAMPLINC_V2_2456D3=DEV_SCAT_ZERO,
DEV_SCAT_SWITCHLINC_V2_DIMMER_2476D=0x01,
DEV_SCAT_INLINE_DIMMABLE=0x02,
DEV_SCAT_ICON_SWITCH_DIMMER_2876D3=0x03,
DEV_SCAT_SWITCHLINK_V2_DIMMER_2476DH=0x04,
DEV_SCAT_KEYPADLINC_TIMER_2484DWH8=0x05,
DEV_SCAT_LAMPLINC_2_PIN=0x06,
DEV_SCAT_ICON_LAMPLINC_V2_2_PIN_2456D2=0x07,
```

```
DEV_SCAT_KEYPADLINC_DIMMER_2486D=0x09,
DEV_SCAT_ICON_INWALL_CONTROLLER_2886D=0x0A,
//DEV_SCAT_LAMPLINC_BI_PHY=0x0B,
DEV_SCAT_KEYPADLINC_DIMMER_2486DWH8=0x0C,
DEV_SCAT_SOCKETLINC_2454D=0x0D,
DEV_CAT_BIPHY_LAMPLINC_B2457D2=0x0E,
DEV_SCAT_ICON_SWITCHLINC_DIMMER_BELL_CANADA=0x13,
DEV_SCAT_TOGGLELINC_DIMMER_2466D=0x17,
DEV_SCAT_COMPANION_SWITCH_2474D=0x18,
DEV_SCAT_SWITCHLINC_DIMMER_W_SENSE_2476D=0x19,
DEV_SCAT_INLINELINC_DIMMER_2475D=0x1A,
DEV_SCAT_KEYPAD_LINC_DIMMER_2486D_6=0x1B,
DEV_SCAT_KEYPAD_LINC_DIMMER_2486D_8=0x1C,
DEV_SCAT_SWITCH_LINC_DIMMER_2476DH=0x1D,
DEV_SCAT_ICON_SWITCH_DIMMER_2876DB=0x1E,
DEV_SCAT_TOGGLELINC_DIMMER_2466D_2=0x1F,
DEV_SCAT_SWITCHLINC_DIMMER_2477D=0x20,
DEV_SCAT_LAMPLINC_2_PIN_DIMMER_2457D2X=0x22,

/**
* DEV_CAT_SWITCHED_LIGHT_CONTROL
*/
DEV_SCAT_KEYPADLINC_RELAY_2486SWH8=0x05,
DEV_SCAT_APPLIANCELINC_OUTDOOR_2456S3E=0x06,
DEV_SCAT_TIMERLINC_2456S3T=0x07,
DEV_SCAT_OUTLETLINC_2473=0x08,
DEV_SCAT_APPLIANCELINC_2456S3=0x09,
DEV_SCAT_SWITCHLINC_RELAY_2476S=0x0A,
DEV_SCAT_ICON_ON_OFF_SWITCH_2876S=0x0B,
DEV_SCAT_ICON_APPLIANCE_ADAPTER_2856S3=0x0C,
DEV_SCAT_TOGGLELINC_RELAY_2466S=0x0D,
DEV_SCAT_SWITCHLINC_RELAY_COUNTDOWN_TIMER_2476ST=0x0E,
DEV_SCAT_KEYPADLINC_RELAY_2486S=0x0F,
DEV_SCAT_INLINE_RELAY=0x10,
DEV_SCAT_EZSWITCH_30=0x11,
DEV_SCAT_COMPANION_SWITCH_2474S=0x12,
DEV_SCAT_ICON_SWTICHLINC_RELAY_BELL_CANADA=0x13,
DEV_SCAT_INLINE_RELAY_WITH_SENSE=0x14,
DEV_SCAT_SWITCHLINC_RELAY_W_SENSE_2476S=0x15,
DEV_SCAT_ICON_RELAY_2876SB=0x16,
DEV_SCAT_ICON_APPLIANCELINC_2856S3B=0x17,
DEV_SCAT_SWITCHLINC_RELAY_2494S220=0x18,
DEV_SCAT_SWITCHLINC_RELAY_2494S220_B=0x19,
DEV_SCAT_TOGGLELINC_RELAY_2466S_2=0x1A,
DEV_SCAT_SWITCHLINC_RELAY_REMOTE_CONTROL_2476S=0x1C,


/**
* DEV_CAT_NETWORK_BRIDGE
*/
DEV_SCAT_POWERLINC_SERIAL_2414S=0x01,
DEV_SCAT_POWERLINC_USB_2414U=0x02,
DEV_SCAT_ICON_POWERLINC_SERIAL_2814S=0x03,
DEV_SCAT_ICON_POWERLINC_USB_2814U=0x04,
DEV_SCAT_POWERLINE_MODEM=0x05,
DEV_SCAT_IRLINC=0x06,
```

```
DEV_SCAT_IRLINC_TX=0x07,
DEV_SCAT_POWERLINC_MODEM_USB=0x0B,
DEV_SCAT_EZX10RF=0x0D,
DEV_SCAT_EZX10IR=0x0F,

/**
* DEV_CAT_IRRIGATION_CONTROL
*/
DEV_SCAT_COMPACTA_EZRAIN_SPRINKLER_CONTROLLER=DEV_SCAT_ZERO,

/**
* DEV_CAT_CLIMATE_CONTROL
*/
DEV_SCAT_BROAN_SMSC080_EXHAUST_FAN=DEV_SCAT_ZERO,
DEV_SCAT_COMPACTA_EZTHERM=0x01,
DEV_SCAT_BROAN_SMSC110_EXHAUST_FAN=0x02,
DEV_SCAT_INSTEON_THERMOSTAT_ADAPTER=0x03,
DEV_SCAT_COMPACTA_EZTHERMX=0x04,
DEV_SCAT_BROAN_VENMAR_BEST=0x05,

/**
* DEV_CAT_POOL_CONTROL
*/
DEV_SCAT_COMPACTA_EZPOOL=DEV_SCAT_ZERO,
DEV_SCAT_COMPACTA_EZ_POOL=DEV_SCAT_COMPACTA_EZPOOL,

/**
* DEV_CAT_SENSOR_ACTUATOR
*/
//DEV_SCAT_IOLINC=DEV_SCAT_ZERO,
DEV_SCAT_IO_LINC_2450=DEV_SCAT_ZERO,
DEV_SCAT_COMPACTA_EZSENSE=0x01,
DEV_SCAT_COMPACTA_EZIO_8T=0x02,
DEV_SCAT_COMPACTA_EZIO=0x03,
DEV_SCAT_COMPACTA_EZIO_8=0x04,
DEV_SCAT_COMPACTA_EZSNS_RF=0x05,
DEV_SCAT_COMPACTA_EZISNS_RF=0x06,
DEV_SCAT_COMPACTA_EZIO_6I=0x07,
DEV_SCAT_COMPACTA_EZIO_4O=0x08,
DEV_SCAT_SYNCHRO_LINC=0x09,

/**
* DEV_CAT_ENERGY_MANAGEMENT
*/
DEV_SCAT_COMPACTA_EZENERGY=DEV_SCAT_ZERO,
DEV_SCAT_ONSITE_PRO_LEAK_DETECTOR=0x01,
DEV_SCAT_ONSITE_PRO_CONTROL_VALVE=0x02,
DEV_SCAT_IMETER_SOLO=0x07,
DEV_SCAT_DUAL_BAND_NO_RELAY_240V_2477SA1=0x0A,
DEV_SCAT_DUAL_BAND_NC_RELAY_240V_2477SA2=0x0B,


/*
* DEV_CAT_APPLIANCE_CONTROL
*/
```

```
/*
* DEV_CAT_PLUMBING
*/

/*
* DEV_CAT_COMMUNICATION
*/

/*
* DEV_CAT_COMPUTER_CONTROL
*/

/*
* DEV_CAT_WINDOWS_COVERING
*/
DEV_SCAT_SOMFY_DRAPE_CONTROLLER_RF=DEV_SCAT_ZERO,

/*
* DEV_CAT_ACCESS_CONTROL
*/
DEV_SCAT_WEILAND_CENTRAL_DRIVE_CONTROLLER=DEV_SCAT_ZERO,
DEV_SCAT_WEILAND_SECONDARY_CENTRAL_DRIVE=0x01,
DEV_SCAT_WEILAND_ASSIST_DRIVE=0x02,
DEV_SCAT_WEILAND_ELEVATION_DRIVE=0x03,
DEV_SCAT_MORNING_LINC=0x06,

/*
* DEV_CAT_SECURITY_HEALTH_SAFETY
*/
DEV_SCAT_MOTION_SENSOR_2420M=0x01,
DEV_SCAT_TRIGGER_LINC_2421=0x02,

/*
* DEV_CAT_SURVEILLANCE
*/

/*
* DEV_CAT_AUTOMOTIVE
*/

/*
* DEV_CAT_PET_CARE
*/

/*
* DEV_CAT_TOYS
*/

/*
* DEV_CAT_TIME_KEEPING
*/

/*
* DEV_CAT_HOLIDAY
*/
```

```
 // A10,X10
DEV_SCAT_X10=0x01,
DEV_SCAT_A10=0x02,
DEV_SCAT_VIRTUAL=0x7E,
DEV_SCAT_UNKNOWN=0xFE,
```

3.5.3 Group/Scene (<group>)

Same as node but defines a scene with a list of members and their relationships to the scene.

<**group** flag="see 3.5.2 (Node)">
    <**address**>The address of the group</**address**>
    <**name**>Friendly name</**name**>
    <**members**>
        <**link** type="relationship type">5 8A 37 1</**link**>
        <**link** type="relationship type">5 8A 37 3</**link**>
        …
    </members>
</group>

<members> Element

Is a list of members for the scene each one having different relationships defined by the **type** attribute of the **link** element.

<link> Element

Defines members of a group/scene.

"type" Attribute defines the role a node plays in relationship to other nodes in a scene:

NODE_IS_CONTROLLER 0x10 (decimal 16)

Other values should be considered Responders.

3.5.4 Folder (<folder>)

Same as node but identifies a folder.

4.0 Communicating with ISY

To successfully communicate with ISY, the following steps must be taken

1. **Find ISY** and retrieve its resources by parsing the contents of the LOCATION header (see section 3)
    a. Capture <controlURL> which should be the URL used for all the subsequent Web Services invocations
    b. Capture <eventSubURL> which should be the URL used for subscribing/unsubscribing from ISY
    c. Point your WebServices IDE to SCPDURL to import web services

2. **Authenticate – no longer needed as of release 2.7.5**

    Instead, you will use the **HTTP Basic Authorization** header to send the credentials to ISY with each request.

    The format of the Authorization header is:
    Authorization: Base64(userid:password)

    Where, base64 converts the string representation of userid followed by ':' and followed by the password.

    As an example, the Authorization header for userid=admin , password= admin is:
    Base64(admin:admin)→ QWxhZGRpbjpvcGVuIHNlc2FtZQ==

    Therefore the Authorization header shall be:

    Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==

3. **Subscribe**

```
SUBSCRIBE /eventing HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 129
Content-Type: text/xml; charset="utf-8"
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
CALLBACK:<REUSE_SOCKET>
NT:upnp:event
TIMEOUT:Second-infinite
SOAPACTION:"urn:udi-com:service:X_Insteon_Lighting_Service:1#Subscribe"


<s:Envelope><s:Body><u:Subscribe xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"></u:Subscribe></s:Body></s:Envel
ope>
```

Note: you may provide a CALLBACK URL or you can keep this socket open (REUSE_SOCKET) to receive ISY events

4. Control Nodes/Scenes in ISY using UDIService

Simply provide the permissible values for <Control>, <Action>, and <Node>.

The <node> element is the address of the node/group to be impacted. The <flag> element **must be 4** if this is impacting a scene/group. Any other value is considered a node and not a group/scene.

Note: if you are using SOAP1.2 compliant IDE, **SOAPACTION** header is **not** required.

a. Turn Device Hall 2 On

```
POST /services HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 210
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
Content-Type: text/xml; charset="utf-8"
SOAPACTION:"urn:udi-
com:service:X_Insteon_Lighting_Service:1#UDIService"


<s:Envelope><s:Body><u:UDIService xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"><control>DON</control><actio
n></action><flag>65531</flag><node>7 B0 A5
1</node></u:UDIService></s:Body></s:Envelope>
```

b. Turn Device Hall 2 On to 46%

```
POST /services HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 213
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
Content-Type: text/xml; charset="utf-8"
SOAPACTION:"urn:udi-
com:service:X_Insteon_Lighting_Service:1#UDIService"


<s:Envelope><s:Body><u:UDIService xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"><control>DON</control><actio
n>117</action><flag>65531</flag><node>7 B0 A5
1</node></u:UDIService></s:Body></s:Envelope>
```

c. Turn Master Scene On Immediately (Fast On)

```
POST /services HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 203
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
Content-Type: text/xml; charset="utf-8"
SOAPACTION:"urn:udi-
com:service:X_Insteon_Lighting_Service:1#UDIService"


<s:Envelope><s:Body><u:UDIService xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"><control>DFON</control><acti
```

```
on></action><flag>4</flag><node>34612</node></u:UDIService></s:Body></
s:Envelope>
```

d. Increment Thermostat Setpoint

```
POST /services HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 209
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
Content-Type: text/xml; charset="utf-8"
SOAPACTION:"urn:udi-
com:service:X_Insteon_Lighting_Service:1#UDIService"


<s:Envelope><s:Body><u:UDIService xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"><control>BRT</control><actio
n></action><flag>65531</flag><node>0 0 11
1</node></u:UDIService></s:Body></s:Envelope>
```

e. Start Fading (Up) Ceiling 1

```
POST /services HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 212
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
Content-Type: text/xml; charset="utf-8"
SOAPACTION:"urn:udi-
com:service:X_Insteon_Lighting_Service:1#UDIService"


<s:Envelope><s:Body><u:UDIService xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"><control>BMAN</control><acti
on>1</action><flag>65531</flag><node>7 A5 95
1</node></u:UDIService></s:Body></s:Envelope>
```

For Fading Down, use <action>0</action>

f. Stop Fading Ceiling 1

```
POST /services HTTP/1.1
Host: 192.168.0.208:80
Content-Length: 211
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
Content-Type: text/xml; charset="utf-8"
SOAPACTION:"urn:udi-
com:service:X_Insteon_Lighting_Service:1#UDIService"


<s:Envelope><s:Body><u:UDIService xmlns:u="urn:udi-
com:service:X_Insteon_Lighting_Service:1"><control>SMAN</control><acti
on></action><flag>65531</flag><node>7 A5 95
1</node></u:UDIService></s:Body></s:Envelope>
```

5. Process Events/Notifications (see section 5)

ISY Events are of the form:

```
<?xml version="1.0"?><e:propertyset xmlns:e="urn:schemas-upnp-org:event-1-
0"><e:property><ST>0</ST></e:property><e:property><node>9 89 8B
5</node><eventInfo>Event Specific elements</eventInfo></e:property>
</e:propertyset>
```

Where the first <property> element contains the Control which was changed, in this case ST (status) and the Action for this Control, in this case 0. The <node> element defines the node which was impacted.

5.0 Events

Events are very important feature of ISY and are published to subscribers. There can be a maximum of 10 simultaneous subscribers subscribing to ISY and all will get event notifications in real time. The following is a list of event definitions:

5.1 Device Status (control = Device Property)

action = Property value

Node = The address of the device

5.2 Heartbeat (control = "_0")

action = Duration in seconds

node = null
eventInfo = null

5.3 Trigger Events (control = "_1")

action = "0" →Event Status

node = null
eventInfo = text

action = "1" →Get Status (notifies subscribers to refresh)

node = null
eventInfo = null

action = "2" →Key Changed

node = key
eventInfo = null

action = "3" →Info String

node = key
eventInfo = text

action = "5" → Schedule (schedule status changed)

node = key

eventInfo = null

5.4 Driver Specific Events (control = "_2")

Depends on the underlying protocol driver

5.5 Node Changed/Updated (control = "_3")

action = "NN" →Node Renamed

node = the address of the node
<**eventInfo**>
<**newName**>name</**newName**>
</**eventInfo**>

action = "NR" → Node Removed

node = the address of the node removed
eventInfo = null

action = "ND" → Node Added

node = the address of the node added
<**eventInfo**>
<**nodeName**>name</**nodeName**>
<**nodeType**>see 3.5.2</**nodeType**>
</**eventInfo**>

action = "NR" →Node Revised

node = the address of the node added
eventInfo = protocol specific

action = "MV" →Node Moved (into a scene)

node = the address of the **scene** to which the node was moved to
<**eventInfo**>
<**movedNode**>the address of the moved node</**movedNode**>
<**linkType**>controller/responder</**linkType**> (see 3.5.3)
</**eventInfo**>

action = "CL" →Link Changed (in a scene)

Not supported

action = "RG" →Removed From Group (scene)

node = the address of the group/scene
<**eventInfo**>
<**removedNode**>the address of the removed node</**removedNode**>
</**eventInfo**>

action = "EN" →Enabled

node = the address of the node that was enabled/disabled
<**eventInfo**>
<**enabled**>"true"|"false"</**enabled**>
</**eventInfo**>

action = "PC" →Parent Changed

node = the address of the node whose parent changed
<**eventInfo**>
<**node**>the address of the node</**node**>
<**nodeType**>see 3.5.1</**nodeType**>
<**parent**>the address of tne new parent (NULL if none)</**parent**>
<**parentType**>see 3.5.1</**parentType**>
</**eventInfo**>

action = "PI" →Power Info Changed

node = the address of the node whose power info changed
<eventInfo>
<deviceClass>see 3.5.1**</deviceClass>**
<wattage>see 3.5.1**</wattage>**
<dcPeriod>see 3.5.1**</dcPeriod>**
</eventInfo>

action = "DI" →Device ID Changed

Not implemented.

action = "DP" →Device Property Changed

UPB only

action = "GN" →Group Renamed

node = the address of the group
<**eventInfo**>
<**newName**>name</**newName**>
</**eventInfo**>

action = "GR" → Group Removed

node = the address of the group removed
eventInfo = null

action = "GD" → Group Added

node = the address of the node added
<**eventInfo**>
<**groupName**>name</**groupName**>
<**groupType**>see 3.5.2</**groupType**>
</**eventInfo**>

action = "FN" →Folder Renamed

node = the address of the folder
<**eventInfo**>
<**newName**>name</**newName**>
</**eventInfo**>

action = "FR" → Folder Removed

node = the address of the group removed
eventInfo = null

action = "FD" → Folder Added

node = the address of the folder added
eventInfo=null

action = "NE" → Node Error (Comm. Errors)

node = the address of the node with communications errors

action = "SN" → Discovering Nodes (Linking)

node = null

action = "SC" → Node Discovery Complete

node = null

action = "WR" → Network Renamed

node = the new name for network

action = "WH" → Pending Device Operation

node = the address of the node for which there's pending operations

action = "WD" → Programming Device

node = the address of the node to which programming/write operations are being carried out

5.6 System Configuration Updated (control = "_4")

action = "0" → Time Changed

action = "1" → Time Configuration Changed

action = "2" → NTP Settings Updated

action = "3" → Notifications Settings Updated

action = "4" → NTP Communications Error

action = "5" → Batch Mode Updated

node = null
<**eventInfo**>
    <**status**>"1"|"0"</**status**>
</**eventInfo**>

action = "6" → Battery Mode Programming Updated

node = null
<**eventInfo**>
    <**status**>"1"|"0"</**status**>
</**eventInfo**>

5.7 System Status Updated (control = "_5")

node = null

action = "0" → Not Busy

action = "1" → Busy

action = "2" → Idle

action = "3" → Safe Mode

5.8 Internet Access Status (control = "_6")

action = "0" → Disabled

action = "1" → Enabled

node = null
<**eventInfo**>external URL</**eventInfo**>

action = "2" → Failed

5.9 Progress Report (control = "_7")

node = null
eventInfo = text

action = "1" → Update

action = "2.1" → Device Adder Info (UPB Only)

action = "2.2" → Device Adder Warn (UPB Only)

action = "2.3" → Device Adder Error (UPB Only)

5.10 Security System Event (control = "_8")

node = null
eventInfo = null

action = "0" → Disconnected

action = "1" → Connected

action = "DA" → Disarmed

action = "AW" → Armed Away

action = "AS" → Armed Stay

action = "ASI" → Armed Stay Instant

action = "AN" → Armed Night

action = "ANI" → Armed Night Instant

action = "AV" → Armed Vacation

5.11 System Alert Event (control = "_9")

Not implemented and should be ignored

5.12 OpenADR and Flex Your Power Events (control = "_10")

action = "1" → Open ADR Error

node = null
eventInfo = null

action = "2" → Open ADR Price Updated

node = null
<**eventInfo**>
<**bPrice**>base price</**bPrice**>
<**cPrice**>Open ADR current price</**cPrice**>
<**when**>date when this price is valid</**when**>
</**eventInfo**>

action = "3" → Open ADR Pending State Updated

node = null
<**eventInfo**>
    <**bPrice**>base price</**bPrice**>
    <**cPrice**>Open ADR current price</**cPrice**>
    <**when**>date when this price is valid</**when**>
</**eventInfo**>

action = "5" → Flex Your Power Error

node = null
eventInfo = null

action = "6" → Flex Your Power Status Updated

node = null
<**eventInfo**>
    <**active**>whether or event has been issued</**active**>
</**eventInfo**>

5.13 Climate Events (control = "_11")

*Requires WeatherBug Module

action = "0" → Error

node = null
eventInfo = null

action = "1" → Temperature

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "2" → Temperature High

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "3" → Temperature Low

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "4" → Feels Like

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "5" → Temperature Rate

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "6" → Humidity

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "7" → Humidity Rate

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "8" → Pressure

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "9" → Pressure Rate

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "10" → Dew Point

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "11" → Wind Speed

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "12" → Average Wind Speed

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "13" → Wind Direction

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "14" → Average Wind Direction

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "15" → Gust Wind Speed

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "16" → Gust Wind Direction

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "17" → Rain Today

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "18" → Ambient Light

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "19" → Ambient Light Rate

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "20" → Rain Rate

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

action = "21" → Max Rain Rate

node = null
<**eventInfo**>
    <**value**>The value for this event</**value**>
    <**unit**>The unit of measure for this value</**unit**>
</**eventInfo**>

5.14 AMI/SEP Events (control = "_12")

Only applicable to Orchestrator Series!
See OR-WS-SDK-Manual-Energy Management.pdf.

If you do not have this manual, please send an email to support@universal-devices.com.

5.15 External Energy Monitoring Events (control = "_13")

ISY/Orchestrator Series currently support Brultech ECM1240 Energy Monitors.

action = "1" → Number of Channels

node = null
<**eventInfo**>
    <**numChannels**>The number of monitored channels</**numChannels**>
</**eventInfo**>

action = "2" → Channel Report

node = null
<**eventInfo**>
    <**channel** num="channel num" sampling=" ">
        <power unit="unit">Instantaneous</power>
        <total unit="unit">Total accumulative</total>
        <voltage unit="unit">voltage</voltage>
        <current unit="unit">current</current>
        <polarized unit="unit">polarized power</polarized>
    </**channel**>
</**eventInfo**>

action = "7" → Raw Packet

node = null
<**eventInfo**>
    Raw binary packet directly from Brultech
</**eventInfo**>

5.16 UPB Device Status Events (control = "_16")

Only applicable to UPB enabled units.

action = "1" → Device Signal Report

action = "2" → Device Signal Report Removed

5.17 Gas Meter Events (control = "_17")

Only applicable to Orchestrator Series.

action = "1" → Status

node = null
<**eventInfo**>
<**total**>The actual meter value</**total**>
<**lastReadTS**>Timestamp of the last read</**lastReadTS**>
</**eventInfo**>

action = "2" → Error

node = null
eventInfo = null

6.0 REST Interface

REST is an easy to use URL based command set which allows the developer to communicate and control ISY.

Except for uploading configuration files, all REST commands use HTTP GET method.

6.1 Batch Commands

/rest/batch

Returns the Batch mode:

```
<batch><status>[0|1]</status></batch>
```

/rest/batch/on

Turns on Batch mode. Does not write changes to device. Only internal configuration files are updated

/rest/batch/Off

Turns off Batch mode. Writes all pending changes to devices and no longer buffers changes

/rest/batteryPoweredWrites

Returns the status of Battery Powered device operations

```
<batteryPoweredWrites>

      <status>[0|1]</status>

</batteryPoweredWrites>
```

/rest/batteryPoweredWrites/on

Writes all pending changes to battery powered devices when Batch mode is off

/rest/batteryPoweredWrites/off

Does not write changes to battery powered devices when batch is off

6.2 Configuration

For schema, please review the WSDL.

/rest/config

Returns the configuration of the system with permissible commands

/rest/sys

Returns system configuration

/rest/time

Returns system time

/rest/network

Returns network configuration

/rest/subscriptions

Returns the state of subscriptions

6.3 Nodes

For schema, please review the WSDL.

/rest/nodes

Returns nodes, scenes, types, and their status

/rest/nodes/devices

Returns only devices and their status but no scenes

/rest/nodes/scenes

Returns only scenes but no devices

/rest/nodes/<node-id>

Returns all the attributes & property values for a specific node

/rest/nodes/<node-id>?member=true|false

Works on a scene only. Using members=true includes all the scene members in the result

6.4 X10

/rest/X10/<Housecode[Unitcode]>/<X10 command>
UnitCode and X10 command are both optional

6.5 Properties

/rest/nodes/<node-id>/<property>
Returns the specific property value for a given node id

/rest/nodes/<node-id>/set/<property>/<value>
Set a value such as OL/250

/rest/nodes/<node-id>/write
Writes all pending changes to the device

/rest/nodes/<node-id>/cmd/<command_name>/<param1>/<param2>/.../<param5>
eg:
/rest/nodes/<node-id>/cmd/DOF - turn off a device or a scene
/rest/nodes/<node-id>/cmd/DON/128 - turn on a scene to 50%

6.6 Status

/rest/status
Returns the status for all the nodes

/rest/status/<node-id>
Returns the status for the given node

6.7 Query

/rest/query
Queries all the nodes

/rest/query/<node-id>
Queries the given node

6.8 Programs

/rest/programs/<pgm-id>/<pgm-cmd>
e.g. /rest/program/0032/runThen -- Runs a command for a single program

/rest/programs/<pgm-id>
Returns single program, or folder with folders/programs within it

/rest/programs/<pgm-id>?folderContents=false
Returns single program or folder

/rest/programs/<pgm-id>?subfolders=true
Returns single program, or folder with folders/programs within it recursively

/rest/programs
Returns all the programs in the root folder e.g. same as /rest/programs/<root-pgm-id>

/rest/programs?folderContents=false
Returns root folder only (same as /rest/programs/<root-pgm-id>?folderContents=false)

/rest/programs?subfolders=true
Returns all programs & folders (same as /rest/programs/<root-pgm-id>?subfolders=true)

Defaults:
folderContents=true, subfolders=false

pgm-cmd:
run|runThen|runElse|stop|enable|disable|enableRunAtStartup|disableRunAtStartup
'runIf' is supported as well, but 'run' should be used instead.

6.9 Modules

/rest/electricity
Returns electricity module info and specifically Energy Monitor, Open ADR and Flex Your Power status

/rest/climate –
Returns climate module info

/rest/networking/resources
Returns the networking resources configuration

/rest/networking/resources/<resource_id>
Calls and executes net resource

/rest/networking/wol
Returns the networking Wake On LAN configuration

/rest/networking/wol/<wol_id>
Calls and executes the WOL resource

6.10 Security

/rest/security
Returns security module info

-- For Security Reasons, the following have been disabled --

/rest/security/<code>/arm/stay

/rest/security/<code>/arm/away

/rest/security/<code>/disarm

6.11 Energy Management AMI/Smart Grid/SEP

Please see the Energy Management section.

6.12 Gas

/rest/gmeter
Returns the status of the gas meter

/rest/gmeter/log
Returns gas meter log

/rest/gmeter?reset=true
Clears all gas meter log entries

6.13 Logs

/rest/log

Returns system/event log

/rest/log?reset=true

Clears all system log entries

/rest/log/error

Return error log

/rest/log/error?reset=true

Clears all error log entries

7.0 Logs

You can retrieve logs by using REST commands (see section 6.13)
/rest/log – retrieves system log
/rest/log/error – retrieves error log

All logs are tab delimited with an new line (\n) at the end of each line.

7.1 System Log (/rest/log)

System log has the following format:
Node – the address of the node to which the log belongs
Control – the control that was impacted and which caused the log entry
Action – the value of the control
Time – in NTP format with epoch of 36524 (see section 7.3)
UID – the user or task which initiated the event
{
SYSTEM_USER=0 | *SYSTEM_DRIVER_USER*=1 | *WEB_USER*=2, *SCHEDULER_USER*=3 | *D2D_USER*=4, *ELK_USER*=5 | *SEP_DEVICE_UMETER_USER*=6 | *SEP_DEVICE_UPRICE_USER* | *SEP_DEVICE_UMSG_USER* | *SEP_DEVICE_UDR_USER* | *GAS_METER_USER*
}
Log Type – the type of entry … for a list of errors/types **see section 7.4**

To clear System Log, use **/rest/log/reset=true**.

7.2 Error Log (/rest/log/error)

Error log has the following format:
Time – in NTP format with epoch of 36524 (see section 7.3)
UID – the user or task which initiated the event
{
SYSTEM_USER=0 | *SYSTEM_DRIVER_USER*=1 | *WEB_USER*=2, *SCHEDULER_USER*=3 | *D2D_USER*=4, *ELK_USER*=5 | *SEP_DEVICE_UMETER_USER*=6 | *SEP_DEVICE_UPRICE_USER* | *SEP_DEVICE_UMSG_USER* | *SEP_DEVICE_UDR_USER* | *GAS_METER_USER*
}
Log Type – the type of entry … for a list of errors/types **see section 7.4**
Error Message – free form text

To clear Error Log, use **/rest/log/error/reset=true**.

7.3 Converting NTP Formatted Time

For efficiency, Time in the log is an unsigned integer (4 Bytes) formatted using NTP with the following parameters:

EPOCH_OFFSET = 36524 (01/01/200)
SEC_IN_DAY=86400
EPOCH_YEAR = 2000
EPOCH_DAY = 1
EPOCH_MONTH = 1
YEAR_STARTS_WITH_DAY=1

There are very many code libraries that support conversion from NTP/UTC time to a Time structure. This said, the following code snippet should get you started

```
        /**
         * Returns a <code>DateTime</code> object from an NTP
         * representation of date/time
         * @param cv - the NTP representation of date/time
         * @param bt - the <code>DateTime</code> object which is
         * returned (may be empty)
         * @param epochOffset - the offset to be used from epoch ;
         * USE EPOCH_OFFSET
         * @return a <code>DateTime</code> object converted from NTP
         */
        public static DateTime FromNTP( long cv, DateTime bt, long
epochOffset )
        {

           int w;
           long x = epochOffset*SEC_IN_DAY;
           long  tv = ( cv - x );
           long tmp = 0;

           bt.dow = (int)( ( ( cv / SEC_IN_DAY ) + 1 ) % 7 );

           for ( w = EPOCH_YEAR; tmp <= tv; w++ )
           {
              tmp += DAYS_IN_YEAR( w ) * SEC_IN_DAY;
           }

           w--;

           tmp -= DAYS_IN_YEAR( w ) * SEC_IN_DAY;


           bt.year = w;
           tv -= tmp; /* Now we are ready for days */

           bt.day_of_year = (int)( tv / SEC_IN_DAY ) ;

           //+ YEAR_STARTS_WITH_DAY ) %
```

```
                //    ( IsLeap( bt.year ) ? 366 : 365 );
    tv = tv % SEC_IN_DAY;

    bt.hour = (int) tv / 3600;
    bt.min = (int)( tv / 60 ) % 60;
    bt.sec =(int) tv % 60;

    bt = FixMonthDay( bt );
    if (YEAR_STARTS_WITH_DAY == 1)
      bt.day_of_year++;
    return bt;
}

 /**
  * Fixes the day/month combination
  * @param bt - a <code>DateTime</code> object
  * @return the fixed <code>DateTime</code> object
  */
 public static DateTime FixMonthDay( DateTime bt )
 {
    bt.month = 0;
    bt.day = 0;
    long dn = bt.day_of_year;

    if ( IsLeap( bt.year ) )
    {
       if ( dn == 59 )
       {
          bt.month = 2;
          bt.day = 29;
          return bt;
       }
       else if ( dn > 59 )
       {
          dn--;
       }
    }

    /* Now we find the month */
    for ( bt.month = 1; bt.month < 12 && monthdays[bt.month + 1]
      <= dn; bt.month++ )
      ;



    bt.day = (int) dn - monthdays[bt.month] + 1;
      /* Month starts with 1 not 0 */
    return bt;
}
```

```
/**
  * Returns whether or not the year is a leap year
  * @param year - the year
  * @return - true if leap year, false otherwise
  */
 public static boolean IsLeap( int year )
{
    return ( ( year % 4 ) == 0 );
}
```

7.4 Log/Error Types

```
SYSTEM_STARTUP=1,
SYSTEM_SHUTDOWN=2,
WARNING=3,
INFO=4,
LOG=5,
UD_SEP_SUBSYS_STARTUP=6,
REQUEST_FAILED_ERROR=-1,
DEVICE_COMMUNICATION_ERROR=-2,
DEVICE_RETURNED_INVALID_NODE=-3,
DEVICE_RETURNED_INVALID_ADDRESS=-4,
/* communication error */
ERROR_LOGGER_STARTUP=-5,
MAIN_HAML_DRIVER_NOT_FOUND=-10,
MAIN_LOCAL_DEVICE_BLANK=-20,
SYSTEM_NO_NETWORK_CONNECTION=-100,
SYSTEM_WEBSERVER_SELECT_FAILED=-101,
HAML_DRIVER_LISTENER_NOT_REGISTERED=-500,
HAML_PARSER_UNDEFINED_ELEMENT=-1000,
HAML_PARSER_ONDATA=-1001,
UPNP_DRIVER_NO_DEVICES_CONFIGURED=-5001,
UPNP_DRIVER_SERIAL_READER_FAILED=-5002,
UPNP_DRIVER_MAX_DEVICES=-5003,
UPNP_SERVICE_TYPE_SEARCH_NS=-5004,
UPNP_SUBSCRIPTION_NOT_FOUND_FOR_RENEWAL=-5005,
UPNP_SUBSCRIPTION_NOT_FOUND_FOR_CANCELATION=-5006,
UPNP_INVALID_SUBSCRIPTION_URL=-5007,
UPNP_INVALID_SUBSCRIPTION_CALLBACK=-5008,
UPNP_MAX_SUBSCRIBERS=-5009,
UPNP_SUBSCRIBER_TCP_CONNECT_FAILURE=-5010,
/* tried to connect to the subscriber's ip/port
 but timed out*/
PROCESS_DEVICE_STATE_CHANGE_SID_NOT_FOUND=-5011,
UPNP_SUBSCRIBER_NOREPLY_TO_EVENT_1=-5012,
/* subscriber didn't reply to the event:couldn't write header
*/
UPNP_SUBSCRIBER_NOREPLY_TO_EVENT_2=-5013,
/* subscriber didn't reply to the event:couldn't write body */
UPNP_SUBSCRIBER_NOREPLY_TO_EVENT_3=-5014,
/* subscriber didn't reply to the event:read time out*/
UPNP_CONTROL_MALFORMED_SOAP_REQUEST_1=-5015,
/* missing body; we got a malformed control request */
```

```
UPNP_CONTROL_MALFORMED_SOAP_REQUEST_2=-5016,
/* chopped off URL */
OS_DUPLICATE_TASK_PRIORITY=-6000,
OS_OPEN_SERIAL_FAILED=-6001,

D2D_PARSER_ERROR=-7020,
NOTIFICATIONS_MAIL_TO_ADDRESS_REQUIRED=-7029,
NOTIFICATIONS_SEND_MAIL_FAILED=-7030,
D2D_EXPECTED_D2D_TAG=-7050,
// Expected D2D tag, but got something different
D2D_UNEXPECTED_TAG_IN_SENSE=-7051,
// Found an unexpected tag in the XML stream
D2D_UNEXPECTED_TAG_IN_CONDITION=-7052,
// Found an unexpected tag in the XML stream

DIAG_PARSER_ERROR=-7501,
// Error in UPBDiagParser
LINK_PARSER_ERROR=-7601,
// Error in UPBLinkDevices

PNP_SECURITY_NOT_VERIFIED=-10100,
SSL_DECODING_LENGTHS_FAILED=-10001,
SSL_DECODING_PMOD_FAILED=-10002,
SSL_DECODING_PEXP_FAILED=-10003,
SSL_DECODING_PRI_EXP_FAILED=-10004,
SSL_DECODING_PRI_P_FAILED=-10005,
SSL_DECODING_PRI_Q_FAILED=-10006,
SSL_DECODING_PRI_X1_FAILED=-10007,
SSL_DECODING_PRI_X2_FAILED=-10008,
SSL_DECODING_COEFF_FAILED=-10009,
SSL_DECODING_CERT_FAILED=-10010,
SSL_REQUEST_NOT_AUTHENTICATED=-10011,
SECURE_SESSION_DOES_NOT_EXIST=-10026,
/* a secure session was requested that does not exist*/
SECURE_SESSIONS_EXHAUSTED=-10027,
/* no more secure sessions available*/



AUTHENTICATION_UNSUPPORTED_UID_LEN=-10101,
AUTHENTICATION_UNSUPPORTED_PWD_LEN=-10102,
AUTHENTICATION_USER_ID_DOES_NOT_EXIST=-10103,
AUTHENTICATION_USER_ID_PWD_NOT_PRESENT=-10104,
AUTHENTICATION_WRONG_PASSWORD=-10105,
AUTHENTICATION_FAILED=-10106,
HTTP_AUTH_DECODING_FAILED=-10107,
SECURITY_INITIALIZATION_FAILED=-11000,
TIMED_OUT_WAITING_FOR_CRITICAL_SECION=-12000,
ERROR_LEAVING_CRITICAL_SECTION_NOT_OWNED=-12001,
CONTENT_LEN_NOT_EQUAL_TO_HEADER_CONTENT_LEN=-13000,
XML_MALFORMED_TAG=-14001,            //@05
XML_MALFORMED_END_TAG=-14002,        //@05
XML_NO_START_TAG=-14003,             //@05
XML_NO_TAG_NAME=-14004,              //@05
XML_START_END_NAME_MISMATCH=-14005,  //@05
MALFORMED_UPNP_HEADERS=-20000,
```

```
MAIL_SERVER_CONNECT_ERROR=-50000,
SMTP_SERVER_FAILURE=-50001,
MAIL_SERVER_DNS_ERROR=-50010,
MAIL_MAX_FROM_LEN=-50011,
MAIL_MAX_SUBJECT_LEN=-50012,
MAIL_MAX_TO_LEN=-50013,
NTP_CONFIG_SERVER_NO_HOST_PARAM=-60000,
NTP_CONFIG_SERVER_ADDRESS_RESOLUTION_FAILED=-60001,
NTP_CONFIG_SERVER_NO_INTERVAL_PARAM=-60002,
NTP_SERVER_NOT_RESPONDING=-60006,
NTP_SERVER_CONNECT_ERROR=-60007,
OUT_OF_MEMORY=-70000,

IGD_FAILED_PARSING_DESCRIPTION_URL=-80000,
IGD_FAILED_RETRIEVING_DESCRIPTION_FILE=-80001,
IGD_FAILED_RETRIEVING_URL_BASE=-80002,
IGD_FAILED_PARSING_URL_BASE=-80003,
IGD_FAILED_RETRIEVING_WAN_CONNECTION_DEVICE=-80004,
IGD_FAILED_RETRIEVING_CONTROL_URL=-80005,
IGD_FAILED_PARSING_CONTROL_URL=-80006,
IGD_FAILED_RETRIEVING_EXTERNAL_IP=-80007,
IGD_NO_RESPONSE_FROM_GATEWAY=-80008,
IGD_FAILED_STRIPPING_HTTP_HEADERS=-80009,
IGD_FAILED_DELETING_PORT_FORWARD_MAP=-80010,
IGD_FAILED_ADDING_PORT_FORWARD_MAP=-80011,
IGD_FAILED_GETTING_SPECIFIC_ENTRY=-80012,

CRC_INVALID_ORDER=-90001,
CRC_INVALID_POLYNOM=-90002,
CRC_INVALID_CRC_INIT=-90003,
CRC_INVALID_CRC_XOR=-90004,

LOGGER_DIRECTORY_CREATION_FAILED=-100000,
LOGGER_SD_IS_NOT_INSTALLED=-100001,
LOGGER_LOG_FILE_OPEN_FAILED=-100002,


FILE_TO_STRING_OPEN_FAILED=-110000,
FILE_TO_STRING_MEM_ALLOC_FAILED=-110001,
SD_DRIVE_FORMAT_FAILED_1=-110002,
/*f_format failed */
SD_DRIVE_FORMAT_FAILED_2=-110003,
/*couldn't write the config.ud file*/
SD_DRIVE_MOUNT_FAILED_1=-110004,
/*mount after format failed*/
SD_DRIVE_MOUNT_FAILED_2=-110005,
/*initial mount failed*/

SEND_FILE_OPEN_FAILED=-110006,
SEND_FILE_READ_FAILED=-110007,
RECEIVE_FILE_WRITE_FAILED=-110008,
RECEIVE_FILE_OPEN_FAILED=-110009,
SD_DRIVE_DIRECTORY_CREATION_FAILED=-110010,
SD_DRIVE_CONFIG_FILE_OPEN_WRITE_FAILED=-110011,
SD_DRIVE_CONFIG_FILE_OPEN_READ_FAILED=-110012,
SD_DRIVE_CONFIG_WRITE_FAILED=-110013,
```

```
SD_DRIVE_CONFIG_READ_FAILED=-110014,
STRING_TO_FILE_OPEN_FAILED=-110015,
STRING_TO_FILE_WRITE_FAILED=-110016,
FILE_TO_STRING_READ_FAILED=-110017,
REMOVE_FILE_FAILED=-110018,
REMOVE_DIR_FAILED=-110019,
FLUSH_FILE_FAILED=-110020,
CLOSE_FILE_FAILED=-110021,
OPEN_FILE_FAILED=-110022,
FLUSH_FILE_SYSTEM_FAILED=-110023,
FILESYSTEM_INIT_FAILED=-110024,
FILESYSTEM_CRIT_FAILED=-110025,

FIRMWARE_UPDATE_OPEN_FILE_FAILED=-120000,
FIRMWARE_UPDATE_HEADER_READ_FAILED=-120001,
FIRMWARE_UPDATE_CHECKSUM_FAILED=-120002,
FIRMWARE_UPDATE_MALLOC_FAILED=-120003,
FIRMWARE_UPDATE_DATA_READ_FAILED=-120004,

ELK_CONFIG_PARSER_ERROR=-130000,

HTTP_CLIENT_DNS_ERROR=-140000,
HTTP_CLIENT_BASE64_ENCRYPTION_FAILED=-140001,
HTTP_CLIENT_CONNECTION_TIMED_OUT=-140002,
HTTP_CLIENT_WRITE_HEADER_FAILED=-140003,
HTTP_CLIENT_WRITE_BODY_FAILED=-140004,
HTTP_CLIENT_READ_RESPONSE_FAILED=-140005,
HTTP_CLIENT_HEADER_NO_STATUS=-140006,
HTTP_CLIENT_RESOURCE_MOVED=-140007,
HTTP_CLIENT_REQUEST_FAILED=-140008,
HTTP_CLIENT_NO_NETWORK=-140009,
TCP_CLIENT_WRITE_FAILED=-150000,

UDP_CLIENT_DNS_ERROR=-150100,

PROTOCOL_READER_READ_ERROR=-160000,
PROTOCOL_READER_BUFFER_OVERFLOW=-160001,
PROTOCOL_READER_REOPEN_ERROR=-160002,

WEB_MODULE_NO_FREE_SPACE=-170000,
SYSTEM_ACCESS_LOG=-170001,


/**
 * SEP Device Errors
 */
SEP_NETWORK_SCAN_ERROR=-180000,
SEP_NETWORK_KEY_EST_ERROR=-180001,
SEP_NETWORK_DISCOVERY_ERROR=-180002,
SEP_NETWORK_SYNCH_ERROR=-180003,
SEP_MODULE_RESET_ERROR=-180004,
SEP_MODULE_INVALID_CALL_ERROR=-180005,
SEP_MODULE_UNKNOWN_ERROR=-180006,

UDERR_ISY_API_NO_SPACE=-190001,
UDERR_ISY_API_INVALID_8_3_FILENAME=-190002,
```

```
    UDERR_ISY_API_INVALID_PGM_FILENAME=-190003,
    UDERR_ISY_API_INCORRECT_PGM_KEY=-190004,
    UDERR_ISY_API_INVALID_PGM_URL_SEARCH_STRING=-190005,

    DEVICE_DRIVER_ERROR_MSG=-200000,
    CALL_HOME_PORTAL_NO_FD=-210001,
```