56-0229 IPACU XML Services ICD rev.xB3

Overview

The XML-based message service is detailed in the following sections of this document. This service will be implemented on TCP port 50010 for socket access by internal and defined clients.
RESTFUL web services exist to provide HTTP (rather than socket) access to the IPACU.
All the XML messages are available via the URL http://{ip_address}/webservice.php. All XML requests from the web should be sent via the REST protocol using the http POST mechanism; and the POST body should contain only the XML request.
An IP AutoSwitch service for satellite switching listens on port 50009 for messages to/from the Diseqc capable device(s). This service only applies to the HD11 product.

Using Services

If a client request contains invalid XML, the service will immediately drop the TCP connection. In the System Service section there is a method named 'get_message_protocol_version'. It is used for retrieving the version and system identifiers for the messaging protocol that is installed. Using this method at startup can help ensure that only messages with valid XML are transmitted.

XML Request Format

New for 2.0 HD11 and V7 series
In general, the XML request format is

request format

```
<?xml version="1.0" encoding="UTF-8"?>
<ipacu_request >
 <message name="someMessageName" />
 – any message specific data goes here---
</ipacu_request>
```

Where 'someMessageName' is the name of the XML request message
Request details are defined in the following sections.

XML Response Format

New for 2.0 HD11 and V7 series
In general, the HD11 XML response format is

response format

```
<?xml version="1.0" encoding="UTF-8"?>
<ipacu_response>
 <message name="someMessageName" error="0" />
 – any message specific data goes here---
</ipacu_response>
```

If non-zero, the error attribute will contain a message indicating the error. In addition, the 'message-specific' data should be ignored when the error is non-zero.

Antenna Service

antenna_status

Supported on HD11 and V7IPACU
Description: Returns snapshot of current antenna system status
Request:

antenna_status request

```
<ipacu_request >
 <message name="antenna_status"/>
</ipacu_request>
```

Response:

antenna_status response

```
<ipacu_response>
 <message name="antenna_status" error="0"/>
 <gps>
  <state>ACQUIRED | ACQUIRING | ERROR</state>
  <lat>41.312934</lat>
  <lon>-71.175168</lon>
  <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
 </gps>
 <acu>
  <state>OK | FLASHING | CALGYRO | ERROR</state>
  <line1>Foo</line1>
  <line2>Bar</line2>
 </acu>
 <antenna>
  <state>
   INITIALIZING |
   WAITING FOR MODEM |   Note: VSAT only
```

```
   MODEM SAT SWITCH |  Note: VSAT only
   SEARCHING |
   TRACKING |
   IDLE |
   ERROR |
   CABLE UNWRAP
  </state>
  <rf>
   <snr>7</snr>    Note: HD11 only
   <bars>4</bars>   Note: HD11 only
   <rssi>4.3</rssi>  Note: VSAT only
   <hazard_zone>   Note: VSAT ONLY, indicates transmit disabled if ZONE1 or ZONE2
    NOTSET |  no hazard zones set
    ZONE1 |                 TX OFF in ZONE1
    ZONE2 |                 TX OFF in ZONE2
    ZONE1 and ZONE2 |       TX OFF in the overlap area of ZONE1 and ZONE2
    NONE  |                 TX not in Hazard Zone
    IGNORED   hazard zone override is enabled
    </hazard_zone>
  </rf>
  <brst>
   <hdg>123.6</hdg>
   <az_bow>10.0</az_bow>
   <az>190.0</az>   Note: if <hdg> present,this value incorporates azoffset (antenna
computed mounting angle) and is true
   <el>89.1</el>
   <tilt>-87.4</tilt>
   <azoff>180.0</azoff>
  </brst>
  <motor>
   <az>2.2</az>
   <cross_az>2.2</cross_az>
   <el>3.3</el>
   <skew>3.3</skew>
  </motor>
  <ant_err>0,0,0,0</ant_err>   Note: VSAT only
  <power_err>0</power_err>  Note: HD11 only
  <comms_err>0</comms_err>   Note: HD11 only
  <device_err>0</device_err>   Note: HD11 only
  <sys_err>0</sys_err>    Note: HD11 only
 </antenna>
 <satellite>
  <antSatID>26E</antSatID>  Note: HD11 only
  <name>BADR-5</name>
  <beam>CONUS-1</beam>   Note: VSAT only
                <region>North America</region>   Note: HD11 only
  <lon>-26.08</lon>
  <band>Ku</band>           Note: VSAT only
                <dlfreq>11960000</dlfreq>               Note: VSAT only
 </satellite>
 <modem>      Note: VSAT only (see modem_status for the complete list of states)
  <state>ONLINE</state>
  <ebno>5.0</ebno>
 </modem>
 <mta>      NOTE: VSAT only (see mta_status)
  <state>ONLINE | CONNECTING | UNAVAILABLE | UNKNOWN</state>
  <ports>
   <port>
    <addr>1</addr>
```

```
   <sip>REGISTERED | NOT_REGISTERED</sip>
   <status>
    AVAILABLE |
    DIALING |
    OFF HOOK |
    RINGING |
    IN USE |
                                        UNAVAILABLE |
    UNKNOWN
   </status>
   <mail>Y | N</mail>
  </port>
  <port>
   <addr>2</addr>
   <sip>REGISTERED | NOT_REGISTERED</sip>
   <status>
    AVAILABLE |
    DIALING |
    OFF HOOK |
    RINGING |
    IN USE |
                                        UNAVAILABLE |
    UNKNOWN
   </status>
   <mail>Y | N</mail>
  </port>
 </ports>
</mta>
<autoswitch>      Note: HD11 only
 <enable>Y | N<enable>
 <master>     Note: only if set
  <sn>123456789</sn>
  <sat>A | B | C | D</sat>
 </master>
</autoswitch>
<smartswitch>      Note: HD11 only
 <available>Y | N</available>
 <autoselect>Y | N</autoselect>
 <input>A | B</input>
 <output>1 | 2 | 3</output>
</smartswitch>
<dualdome>      Note: HD11 only
 <mode>SINGLE | MASTER | SLAVE</mode>
 <state>
  SINGLE |
  DISCOVER |
  SYNCH |
  NO_RF |
  FOLLOW |
  ACTIVE
```

```
  </state>
 </dualdome>
</ipacu_response
```

Field definitions (gps)
lat – GPS latitude in degrees (6 decimal places, North is +ve);
lon – GPS longitude in degrees (6 decimal places, East is +ve);
date – date reported by antenna GPSs (i.e. 05-OCT-2009)
time – time reported by antenna GPS (24-hour format)
Fields (flash)
State (OFF= no flash in progress; FLASHING= flash in progress,
CALGYRO=gyro calibration in progress
line1, line2 – text to be shown on FrontPanel, max 20 characters
Fields (system):
state = possible values are Initializing, Ready, Searching, Tracking, Idle, Error, Cable Unwrap
snr = signal noise ratio; unsigned integer
bars = number of bars for signal strength graph
az = azimuth angle
cross_az = cross azimuth angle
el = elevation angle
skew = skew angle
comms_err = bit field; if non-zero, indicates communications error
power_err = bit field, if non-zero, indicates power error
device_err = bit field, if non-zero, indicates device error
sys_err = bit field, if non-zero, indicates system error

antenna_versions

New for 2.0,supported on HD11 and V7IPACU
Description: returns system version information
Request:

antenna_versions request

```
<ipacu_request >
 <message name="antenna_versions"/>
</ipacu_request>
```

Response:

antenna_versions response

```
<ipacu_response >
 <message name="antenna_versions" error="0"/>
 <system>TVRO | VSAT</system>
 <part>04-1234</part>
 <current>102</current>
 <icm>Y | N</icm>
 <acu>
  <model>VSAT-IPACU | TVRO-IPACU</model>
  <part>04-1234</part>
  <rev>A</rev>
  <ver>1.00</ver>
```

```
 <sn>1.00123456789</sn>
</acu>
<au>
 <model>HD7 | HD11 | V7 | V7IP | V3 | V11</model>
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
 <sn>1.00987654321</sn>
</au>
<rf>
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
</rf>
<az_el>
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
</az_el>
<skew_xaz>
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
</skew_xaz>
<app>
 <rev>A</rev>
 <ver>1.00</ver>
</app>
<os>
 <rev>A</rev>
 <ver>1.00</ver>
</os>
<sat_list> Note: HD11 only
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
</sat_list>
<fpga>
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
</fpga>
<lnb>
 <ver>1.00</ver>
</lnb>
<sensor>
 <part>04-1234</part>
 <rev>A</rev>
 <ver>1.00</ver>
 <sn>NNNNNNNN</sn>
</sensor>
<gprs>
 <ip>10.221.0.123</ip>
 <ver>12.34.56</ver>
</gprs>
<modem>      Note: VSAT only
 <wan>10.60.123.321</wan>
 <sn>1234567</sn>
 <ver>1.0</ver>
```

```
 <sed>acbdef</sed>
 <sscf>123456</sscf>
</modem>
<mta>      Note: VSAT only
 <mac>172.31.255.6</mac>
 <ver>9.15.25</ver>
</mta>
<commbox>     Note: VSAT only
 <part>04-1234</part>
 <ver>100</ver>
```

```
  <sn>S0207102202AA-00000</sn>
 </commbox>
</ipacu_response>
```

Fields:
current – KVH master version of HD11 or the V7software suite
previous – the version of the software suite installed before the current version

icm - integrated commbox model chassis
acu – version of antenna control unit
au – version of antenna unit
rf – version of RF
az_el – version of AZ_EL Motor
skew_xaz – version of SKEW_XAZ_Motor
app – application version
os – (internal) operating system version
NOTE – As mentioned above, the field 'current' indicates the current software suite master version as installed on the product. This software suite consists of several components, each which has its own version.

modem_status

New for 2.0, supported on the V7 IPACU only

Description: Returns the current status information of the ViaSat modem
Request:

modem_status request

```
<ipacu_request >
 <message name="modem_status"/>
</ipacu_request>
```

Response:

modem_status response

```
<ipacu_response>
 <message name="modem_status" error="0"/>
 <state>
        UPDATING |
        INITIALIZING |
  TRANSMIT DISABLED |
  WAITING FOR HUB COMM |
  ATTEMPTING LOGIN |
  ONLINE |
  OFFLINE |
  SWITCH SAT
 </state>
 <termid>xxx.xxx.xxx.xxx</termid>
 <uptime>{DDD:HH:MM:SS}</uptime>
 <acustate>
  OFFLINE, TxInhibit active |
  SIGNAL ACQUISITION, TxInhibit active |
  ONLINE, TxInhibit active |
  ONLINE, TxInhibit inactive |
 </acustate>
 <ebno>{int16 sig strength 0.1db}</ebno>
 <eirp>{uint16 0.1dbW}</eirp>
 <attenuator>{uint16}</attenuator>
 <amplitude>{uint16}</amplitude>
 <flrstate>
  UNLOCKED |
  LOCKED |
 </flrstate>
 <flrxipcnt>{uint32}</flrxipcnt>
 <flrxiperr>{uint32}</flrxiperr>
 <rldatarate>{uint32 bps}</rldatarate>
 <rltxcnt>{uint32}</rltxcnt>
 <txdsblpred>{ see note}</txdsblpred>
 <termstate>
  INITIAL PHASE |
  TRANSMIT DISABLED |
  TRANSMIT ENABLED |
  CW |
  ANTENNA POINTING
 </termstate>
 <loginstatus>{uint16 enum}<loginstatus>
 <logincnt>{uint32}</logincnt>
 <loginlast>{YYYY-MM-DDTHH:MM:SSZ}</loginlast>
 <loginfailcnt>{uint32}</loginfailcnt>
 <bbmsgcnt>{uint32}</bbmsgcnt>
 <lon>-105.00</lon>
 <downlinkfreq>11960000</downlinkfreq>
 <uptime></uptime>
 </ipacu_response>
```

NOTE:
txdsblpred = uint32 bitmapped
bit 31 – ATI tx status 0=disabled 1=enabled

bit 30 – Sat tx status 0=disabled 1=enabled
bit 29 – Sat handoff 0=no handoff avail 1=handoff avail
bit 19:10 - # of miles to nearest sat handoff
bit 9:0 - # of miles to nearest ATI disable

lon - satellite orbital slot, +ve value for East satellites, -ve value for West satellites, floating point value to 2 decimal places

termid - unique network-wide static IP address assigned to modem to identify the terminal from the KVH NOC side

downlinkfreq - down link frequency value (also known as forward link frequency) in kHz

modem_info

New for 2.0, supported on the V7 IPACU only

Description: Returns the current static information of the ViaSat modem. <sed> and <sscf> are reserved for future use.
Request:

modem_info request

```
<ipacu_request >
 <message name="modem_info"/>
</ipacu_request>
```

Response:

modem_info response

```
<ipacu_response>
 <message name="modem_info" error="0"/>
 <sn>AAAA</sn>
 <ver>String</ver>
 <wan>1.2.3.4</wan>
 <lan>10.10.10.10</lan>
 <mask>255.255.255.0</mask>
 <dhcp>DISABLED | ENABLED</dhcp>
 <sed>1234</sed>
 <sscf>1234</sscf>
</ipacu_response>
```

mta_status

Supported only on the V7 IPACU
Description: Returns the current status of the MTA VoIP telephone adaptor
Request:

mta_status request

```
<ipacu_request >
<message name="mta_status"/>
</ipacu_request>
```

Response:

mta_status response

```
<ipacu_response>
 <message name="mta_status" error="0"/>
 <state>ONLINE | CONNECTING | UNAVAILABLE | UNKNOWN</state>
 <ports>
  <port>
   <addr>1</addr>
   <sip>REGISTERED | NOT_REGISTERED</sip>
   <status>
    AVAILABLE |
    DIALING |
    OFF HOOK |
    RINGING |
    IN USE |
                                UNAVAILABLE |
    UNKNOWN
   </status>
   <mail>Y | N</mail>
  </port>
  <port>
   <addr>2</addr>
   <sip>REGISTERED | NOT_REGISTERED</sip>
   <status>
    AVAILABLE |
    DIALING |
    OFF HOOK |
    RINGING |
    IN USE |
                                UNAVAILABLE |
    UNKNOWN
   </status>
   <mail>Y | N</mail>
  </port>
 </ports>
</ipacu_response>NOTE:
```

MTA State:

ONLINE = MTA is registered with VOIP provider

CONNECTING = Modem is online and MTA is attempting to connect to VOIP provider

UNAVAILABLE = MTA is not able to connect to VOIP provider

UNKNOWN = undefined or no state received from MTA

Phone Line Status:

AVAILABLE = FXS_OnHook_State

DIALING = FXS_Dialing_State

DIALING = FXS_Setup_Link_State

OFF HOOK = FXS_DT_Timeout_State

RINGING = FXS_Ringing_State

RINGING = FXS_PSTN_RingBack_State

IN USE = FXS_Talking_State

UNAVAILABLE = SIP was not registered so line is not available for calls

UNKNOWN = undefined or no state received from MTA

get_mta_config

Supported only on the V7 IPACU
Description: Returns the current info of the MTA VoIP telephone adaptor
Request:

get_mta_config request

```
<ipacu_request >
 <message name="get_mta_config"/>
</ipacu_request>
```

Response:

get_mta_config response

```
<ipacu_response>
 <message name="get_mta_config" error="0"/>
 <sw_ver>1234</sw_ver>
 <mac>00:10:99:11:90:1a</mac>
 <wan>172.16.30.153</wan>
 <dns1>192.168.1.23</dns1>
 <dns2>192.168.1.24</dns2>
 <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
 <uptime>HH:MM:SS</uptime>
 <outbound_country>United States</outbound_country>
 <intl_prefix>011</intl_prefix>
 <activation>ACTIVATED | NOT_ACTIVATED</activation>
 <display>Y | N</display>
 <ports>
  <port>
   <addr>1</addr>
   <name>Bridge</name>
   <phones>
    <phone>
     <number>123-456-7890</number>
     <country>United States</country>
     <code>1</code>
    </phone>
    <phone>
     <number>12-12-34-34</number>
     <country>France</country>
     <code>3</code>
    </phone>
    </phones>
  </port>
  <port>
   <addr>2</addr>
   <name>Captain's quarters</name>
   <phones>
    <phone>
     <number>45-45-67-67</number>
     <country>France</country>
     <code>3</code>
    </phone>
    </phones>
  </port>
 </ports>
</ipacu_response>
```

NOTE:

set_mta_config

Supported only on the V7 IPACU
Description: Allows client to set MTA VoIP telephone adaptor settings
Request:

set_mta_config request

```
<ipacu_request >
 <message name="set_mta_config"/>
 <display>Y | N</display>
 <ports>
  <port>
   <addr>1</addr>
   <name>Bridge</name>
  </port>
  <port>
   <addr>2</addr>
   <name>Captain's quarters</name>
  </port>
 </ports>
</ipacu_request>
```

Response:

set_mta_config response

```
<ipacu_response>
 <message name="set_mta_config" error="0"/>
</ipacu_response>
```

NOTE:

get_commbox_config

Supported only on the V7 IPACU
Description: Returns the current info of the CommBox service
Request:

get_commbox_config request

```
<ipacu_request >
 <message name="get_commbox_config"/>
</ipacu_request>
```

Response:

get_commbox_config response

```
<ipacu_response>
 <message name="get_commbox_config" error="0"/>
 <display_button>Y | N</display_button>
</ipacu_response>
```

NOTE:

set_commbox_config

Supported only on the V7 IPACU
Description: Allows client to set CommBox service settings. This data must be persisted in the ACU and used on each start of ACU services.
Request:

set_commbox_config request

```
<ipacu_request >
 <message name="set_commbox_config"/>
 <display_button>Y | N</display_button>
</ipacu_request>
```

Response:

set_commbox_config response

```
<ipacu_response>
 <message name="set_commbox_config" error="0"/>
</ipacu_response>
```

NOTE:

get_antenna_config

*New for 2.0, Supported on HD11 and **not** V7IPACU*
Description: Sends antenna configuration parameters to the client.
Request:

get_antenna_config request

```
<ipacu_request >
<message name="get_antenna_config" />
</ipacu_request>
```

Response:

get_antenna_config response

```
<ipacu_response >
 <message name="get_antenna_config" error="0" />
 <sidelobe>ON | OFF</sidelobe>
 <sleep>ON | OFF</sleep>
</ipacu_response>
```

set_antenna_config

*New for 2.0, Supported on HD11 and **not** V7IPACU*
Description: Set configuration parameters in the antenna.
Request:

set_antenna_config request

```
<ipacu_request >
 <message name="set_antenna_config" />
 <sidelobe>ON | OFF</sidelobe>
 <sleep>ON | OFF</sleep>
</ipacu_request>
```

Response:

set_antenna_config response

```
<ipacu_response >
<message name="set_antenna_config" error="0" />
</ipacu_response>
```

get_vsat_beam_table

New for 2.0, supported on VSAT systems only

Description : Returns a lookup table of satellite beam names to display using orbital slot and down link (forward link) frequency as keys.

Request:

get_vsat_beam_table request

```
<ipacu_request >
 <message name="get_vsat_beam_table" />
</ipacu_request>
```

Response:

get_vsat_beam_table response

```
<ipacu_response>
 <message name="get_vsat_beam_table" error="0"/>
 <beams>
  <beam>
   <sat_orb_slot>-800</sat_orb_slot>
   <sat_fwd_link>127000</sat_fwd_link>
   <acu_desig>EME1</acu_desig>
   <web_desig>EMEA-1</web_desig>
   <satellite/>
   <band>Ku</band>
  </beam>
  <beam>
   <sat_orb_slot>-800</sat_orb_slot>
   <sat_fwd_link>126810</sat_fwd_link>
   <acu_desig>EME2</acu_desig>
   <web_desig>EMEA-2</web_desig>
    <satellite/>
   <band>Ku</band>
  </beam>
  <beam>
   <sat_orb_slot>-800</sat_orb_slot>
   <sat_fwd_link>126900</sat_fwd_link>
   <acu_desig>EME3</acu_desig>
   <web_desig>EMEA-3</web_desig>
   <satellite/>
   <band>Ku</band>
   </beam>
  <beam>
   <sat_orb_slot>-10500</sat_orb_slot>
   <sat_fwd_link>118890</sat_fwd_link>
   <acu_desig>CON3</acu_desig>
   <web_desig>CONUS-3</web_desig>
   <satellite></satellite>
   <band>Ku</band>
  </beam>
  <beam>
   <sat_orb_slot>-5300</sat_orb_slot>
   <sat_fwd_link>41232</sat_fwd_link>
   <acu_desig>AORC</acu_desig>
   <web_desig>AOR-C</web_desig>
   <satellite/>
   <band>C</band>
```

```
</beam>
<beam>
 <sat_orb_slot>6400</sat_orb_slot>
 <sat_fwd_link>41215</sat_fwd_link>
 <acu_desig>IORC</acu_desig>
 <web_desig>IOR-C</web_desig>
 <satellite/>
 <band>C</band>
</beam>
<beam>
 <sat_orb_slot>18000</sat_orb_slot>
 <sat_fwd_link>40660</sat_fwd_link>
 <acu_desig>PORC</acu_desig>
 <web_desig>POR-C</web_desig>
 <satellite/>
 <band>C</band>
</beam>
```

```
 </beams>
<ipacu_response>
```

NOTE - This response can include more or less fields depending on the number of satellite beams.

get_satellite_list

New for 2.0, supported on the HD11, this service is not implemented on the V7 series product
Description : Returns list of satellites based upon a set of filters.
The region filter takes values of "Europe", "North America", "Central/South America", "Asia", "Africa", and "Australia". This filter value has either a single value or a comma separated list of regions. When this filter is blank or not used, all satellites are returned in the response.
The list reported by the region filter may be further narrowed down by the 'user_choice_filter'. Note that using this additional filter may result in an empty satellite list when no satellite matches the combined filter criteria.
The user_choice_filter has four possible values: "enable", "favorite", "enable,favorite" or "favorite,enable" (equivalent to previous). The filter limits the list of satellites to those that are marked by the user as being enabled, favorite or both. When this filter is blank or not used the satellite list is not modified.
Request:

get_satellite_list request

```
<ipacu_request >
 <message name="get_satellite_list" />
 <region_filter>North America,Europe</region_filter>
 <user_choice_filter>enable,favorite</user_choice_filter>
</ipacu_request>
```

Response:

get_satellite_list response

```
<ipacu_response>
 <message name="get_satellite_list" error="0"/>
 <region_filter>North America,Europe</region_filter>
 <user_choice_filter>enable,favorite</user_choice_filter>
 <sat_list>
  <satellite>
   <listID>21</listID>
   <antSatID>61W</antSatID>
   <name>Amazonas-2</name>
   <region>North America</region>
   <lon>-61.00</lon>
   <enable>TRUE</enable>
   <favorite>TRUE</favorite>
   <select>TRUE</select>
   <triSatID>FALSE</triSatID>
  </satellite>
  <satellite>
   <listID>23</listID>
   <antSatID>119W</antSatID>
   <name>Echostar VII</name>
   <region>North America</region>
   <lon>-119.00</lon>
   <enable>TRUE</enable>
   <favorite>TRUE</favorite>
   <select>TRUE</select>
   <triSatID>FALSE</triSatID>
  </satellite>
 </sat_list>
<ipacu_response>
```

NOTE - This response can include more or less fields depending on the number of satellites included in those services.

select_satellite

New for 2.0, supported on the HD11, this service is not implemented on the V7 series product
Description: request to track satellite and make it current. Send either 'listID' or 'antSatID' in the request, DO NOT SEND BOTH. Reply will contain all identifiers.
Request:

select_satellite request

```
<ipacu_request >
 <message name="select_satellite"/>
 <listID>21</listID> OR
 <antSatID>61W</antSatID>
</ipacu_request>
```

Response:

select_satellite response

```
<ipacu_response >
 <message name="select_satellite" error="0" />
</ipacu_response>
```

set_satellite_identity

New for 2.0, supported on the HD11, this service is not implemented on the V7 series product
Description: set the satellite identifiers. Both the listID and the antSatID must be unique in the database. If not tri-sat mode, at least one of the lo1 or lo2 must not be OFF.
Request:

set_satellite_identity request

```
<ipacu_request >
 <message name="set_satellite_identity" />
 <listID>3</listID>
 <antSatID>101W</antSatID>
 <name>DTV101</name>
 <region>North America</region>
 <lon>-101.00</lon>
 <skew>0.00</skew>
 <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
 <enable>TRUE</enable>
 <favorite>TRUE</favorite>
 <select>TRUE</select>
 <triSatID>FALSE</triSatID>
 <lo1>11000</lo1>
 <lo2>10000</lo2>
 <kumode>N | W</kumode>
</ipacu_request>
```

Fields definition:
antSatID – satellite identifier with longitude, E/W and suffix
lon – the actual longitude of the satellite +/-180.00 degrees, +ve=East, -ve=West
suffix – suffix of available satellite – mostly needed in Europe empty in U.S.
name – descriptive satellite name
antSatID – unique satellite identifier
triSatID – flase if not tri-sat mode, otherwise specifies the Ku sat, Ka sat pair
enable – satellite is marked as enabled
favorite – satellite is marked as favorite
select – satellite is marked as selectable by the user to track
dt – timestamp of when this data was changed
skew – pre-skew angle for satellite inclination
lo1, lo2 – LNB Oscillators
kumode – narrow (N, default) or wide (W) beam
Response:

set_satellite_identity response

```
<ipacu_response>
 <message name="set_satellite_identity" error="0" />
</ipacu_response>
```

get_satellite_params

New for 2.0, supported on the HD11, this service is not implemented on the V7 series product
Description: get all satellite parameters for a specific satellite. Send either 'listID' or 'antSatID' in the request, DO NOT SEND BOTH.
Request:

get_satellite_params request

```
<ipacu_request >
 <message name="get_satellite_params" />
 <listID>1</listID> OR
 <antSatID>5WW</antSatID>
</ipacu_request>
```

Response:

get_satellite_params response

```
<ipacu_response>
 <message name="get_satellite_params" error="0" />
 <listID>4</listID>
 <antSatID>99W</antSatID>
 <name>DTV99</name>
 <region>North America</region>
 <lon>-99.00</lon>
 <skew>0.00</skew>
 <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
 <enable>FALSE</enable>
 <favorite>FALSE</favorite>
 <select>FALSE</select>
 <triSatID>FALSE</triSatID>
 <lo1>OFF</lo1>
 <lo2>10000</lo2>
 <kumode>N | W</kumode>
 <xponder>
  <id>1</id>
  <pol>V</pol>
  <band>L</band>
  <freq>11960</freq>
  <symRate>20000</symRate>
  <fec>3/4</fec>
  <netID>0xFFFE</netID>
  <modType>QDVB</modType>
 </xponder>
 <xponder>
  <id>4</id>
  <pol>V</pol>
  <band>H</band>
  <freq>11820</freq>
  <symRate>30000</symRate>
  <fec>2/3</fec>
  <netID>0xFFFE</netID>
  <modType>QDVB</modType>
 </xponder>
</ipacu_response>
```

set_satellite_params

New for 2.0, supported on the HD11, this service is not implemented on the V7 series product
Description: set the satellite parameters. Set 1 to 8 parameter banks at a time if not tri-sat mode satellite listing. Send either 'listID' or 'antSatID' in the request, DO NOT SEND BOTH.
Request:

set_satellite_params request

```
<ipacu_request >
 <message name="set_satellite_params" />
 <listID>1</listID> OR
 <antSatID>5.0WW</antSatID>
 <xponder>
  <id>4</id>
  <pol>V</pol>
  <band>H</band>
  <freq>11820</freq>
  <symRate>30000</symRate>
  <fec>2/3</fec>
  <netID>0xFFFE</netID>
  <modType>QDVB</modType>
 </xponder>
 <xponder>
  <id>1</id>
  <pol>V</pol>
  <band>L</band>
  <freq>11960</freq>
  <symRate>20000</symRate>
  <fec>3/4</fec>
  <netID>0xFFFE</netID>
  <modType>QDVB</modType>
 </xponder>
</ipacu_request>
```

Response:

set_satellite_params response

```
<ipacu_response>
 <message name="set_satellite_params" error="0" />
</ipacu_response>
```

reset_satellite_params

This service is not implemented on the V7 series product
Description: reset the satellite parameters to the defaults defined in the current software version. Send either 'listID' or 'antSatID' in the request, DO NOT SEND BOTH.
Request:

reset_satellite_params request

```
<ipacu_request >
 <message name="reset_satellite_params" />
 <listID>21</listID> - OR -
<antSatID>61W</antSatID>
</ipacu_request>
```

Response:

reset_satellite_params response

```
<ipacu_response>
 <message name="reset_satellite_params" error="0" />
</ipacu_response>
```

get_satellite_params_header

This service is not implemented on the V7 series product
Description: reset the satellite parameters to the defaults defined in the current software version. Send either 'listID' or 'antSatID' in the request, DO NOT SEND BOTH.
Request:

get_satellite_params_header request

```
<ipacu_request >
 <message name="get_satellite_params_header" />
</ipacu_request>
```

Response:

get_satellite_params_header response

```
<ipacu_response>
 <message name="get_satellite_params_header" error="0" />
 <part></part>
 <rev></rev>
 <rev_dt></rev_dt>
 <edit_dt></edit_dt>
 <master_part></master_part>
 <master_rev></master_rev>
</ipacu_response>
```

start_serial_log

Supported on HD11 and V7IPACU
Description : log serial data to a file
Request:

start_serial_log request

```
<ipacu_request >
 <message name="start_serial_log"/>
 <restart>Y | N</restart>
</ipacu_request>
```

Response:

start_serial_log response

```
<ipacu_response>
 <message name="start_serial_log" error="0"/>
</ipacu_response>
```

NOTE – Setting 'restart' to 'Y' will reset the antenna
NOTE – There is only one serial file. It is /var/log/ipacu.serial.log. This file will be overwritten as needed.
NOTE – The HD11 will determine the maximum size of this file. Once a new serial log has started, the HD11 writes to it until it is full. If service is already writing, and another 'start_serial_log' message is received, logging will restart immediately and the previous log will be overwritten.

serial_log_status

Supported on HD11 and V7IPACU
Description : serial log status
Request:

serial_log_start request

```
<ipacu_request >
 <message name="serial_log_status"/>
</ipacu_request>
```

Response:

serial_log_status response

```
<ipacu_response>
 <message name="serial_log_status" error="0" />
 <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
 <percent> 50</percent>
 <max>2048000</max>
 <current>1024000</current>
</ipacu_response>
```

Fields:
dt - serial log collection creation time
percent – percentage complete; rounded down to nearest integer
max – maximum number of bytes written to this log
current – current number of bytes currently contained in the log.

set_gps

New for 2.0,Supported on HD11 and V7IPACU
Description: This request may be used to temporarily set the GPS position. This value will only be used until the antenna GPS is able to determine its location.
Request:

set_gps request

```
<ipacu_request >
 <message name="set_gps"/>
 <lat>32.383228</lat>
 <lon>-65.123456</lon>
</ipacu_request>
```

Response:

set_gps response

```
<ipacu_response>
 <message name="set_gps" error="0"/>
</ipacu_response>
```

set_nmea_gprmc

New for 2.0,Supported on HD11 and V7IPACU
Description: This request may be used to **override** antenna GPS RMC message. The string sent should be the one received from a NMEA compliant GPS device. This is used to replace defective or missing data from antenna's GPS device. Once sent, the antenna will no longer use local GPS device until a power cycle is done. User should continue to send this message every 1-3 seconds once it has been determined it is necessary to override the antenna's GPS as this data is used to adjust antenna's skew axis for satellite inclination.
Request:

set_nmea_gprmc request

```
<ipacu_request >
 <message name="set_nmea_gprmc"/>
 <nmea>
  $GPRMC,040302.663,A,3939.7,N,10506.6,W,0.27,358.86,200804,,*1A
 </nmea>
</ipacu_request>
```

Response:

set_nmea_gprmc response

```
<ipacu_response>
 <message name="set_nmea_gprmc" error="0"/>
</ipacu_response>
```

get_nmea_heading

New for 2.0,Supported on HD11 and V7IPACU
Description: Get NMEA heading from attached compass. Result is sent to the antenna.
Request:

get_nmea_heading request

```
<ipacu_request >
 <message name="get_nmea_heading" />
</ipacu_request>
```

Response:

get_nmea_heading response

```
<ipacu_response>
 <message name="get_nmea_heading" error="0" />
 <status>A | E | M | S | V</status>
 // A=Auto,E=Est,M=Man,S=Sim,V=Invalid
 <true>312.0</true>   // true heading
 <mag>329.1</mag>    // magnetic heading (with deviation)
 <sensor>329.1</sensor>    // 0-359.999, 0=north, 90=east …
 <dev>0.0E</dev>    // deviation, mag = sensor +/- dev
 <var>7.1W</var>    // variation, true = mag +/- var
      // if var/dev=E, add, if W, subtract
 <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
 <nmea>$HCHDG,319.1,,,7.1,W*3C</nmea> // string rcvd from device
 <preferred_source>HEHDG</preferred_source> // from acuserverices.conf file
 </ipacu_response>
```

set_nmea_heading

New for 2.0,Supported on HD11 and V7IPACU
Description: Set NMEA heading as backup to attached compass. Result is sent to antenna when compass is not operational.
Request:

set_nmea_heading request

```
<ipacu_request >
 <message name="set_nmea_heading" />
 <nmea>$HCHDG,319.1,,,7.1W*3C</nmea>
</ipacu_request>
```

Response:

set_nmea_heading response

```
<ipacu_response>
 <message name="set_nmea_heading" error="0" />
</ipacu_response>
```

reboot

New for 2.0,Supported on HD11 and V7IPACU
Description: used to reboot the product. If ALL are asked to reboot, it is expected that all sub-systems will be rebooted together; the SBC will first issue an antenna reboot before rebooting itself. An antenna reboot will force a power cycle to restart the antenna sub-system.
Request:

reboot request

```
<ipacu_request >
 <message name="reboot"/>
 <sys>
   ALL
   ANT
   SBC
   MTA (V7IPACU only)
 </sys>
</ipacu_request>
```

fields:
sys – defines which sub-systems will be re-booted. ALL for all, ANT for antenna only, SBC for Linux processor , and MTA for MTA only.
Response:

reboot response

```
<ipacu_response>
 <message name="reboot" error="0"/>
</ipacu_response>
```

calibrate_gyro

Supported on HD11 and V7IPACU
Description: calibrate gyro
Request:

calibrate_gyro request

```
<ipacu_request >
 <message name="calibrate_gyro"/>
</ipacu_request>
```

Response:

calibrate_gyro response

```
<ipacu_response>
 <message name="calibrate_gyro" error=0"/>
</ipacu_response>
```

reset_software

Supported on HD11 and V7IPACU
Description: Used to reset the software on the product to a prior revision. CURRENT updates any software with non-matching revision. ALL updates all software to CURRENT regardless of revision.
Request:

reset_software request

```
<ipacu_request >
 <message name="reset_software"/>
 <rollback>FACTORY | CURRENT |ALL</rollback>
</ipacu_request>
```

Response:

reset_software response

```
<ipacu_response>
 <message name="reset_software" error="0"/>
</ipacu_response>
```

power

New for 2.0,supported on the HD11and V7IPACU
Description: voltage level status
Request:

power request

```
<ipacu_request >
 <message name="power" />
</ipacu_request>
```

Response:

power response

```
<ipacu_response>
 <message name="power" error="0" />
 <acu>
  <input50v>48.0</input50v>
  <input24v>24.0</input24v>
  <five>4.8</five>
  <three_three>3.3</three_three>
  <output50v>48.0</output50v>
  <output24v>24.0</output24v>
 </acu>
 <au>
  <dc>48.0</dc>
  <motor>32</motor>
  <thirteen>13</thirteen> Note: V11 only
  <twelve>12</twelve> Note: HD11 and V11 only
  <ten>10</ten> Note: V7IPACU only
  <five>5</five>
  <two_five>2.5</two_five> Note: HD11 and V11 only
  <one_eight>1.8</one_eight> Note: V7IPACU only
  <one_five>1.5</one_five> Note: V7IPACU only
  <one_two>1.2</one_two> Note: HD11 only
  <lnb>5</lnb>
  <buc>25.3 VDC | off</buc> Note: V7IPACU only
 </au>
</ipacu_response>
```

ophours

New for 2.0,supported on the HD11 and the V7IPACU
Description: antenna unit operational hours
Request:

ophours request

```
<ipacu_request >
 <message name="ophours" />
</ipacu_request>
```

Response:

ophours response

```
<ipacu_response>
 <message name="ophours" error="0" />
 <hours>123</hours>
</ipacu_response>
```

get_lcd_brightness

New for 2.0,supported on the HD11 and the V7IPACU
Description: get LCD brightness settings
Request:

get_lcd_brightness request

```
<ipacu_request >
 <message name="get_lcd_brightness" />
</ipacu_request>
```

Response:

get_lcd_brightness response

```
<ipacu_response>
 <message name="get_lcd_brightness" error="0" />
 <brightness>LOW</brightness>
</ipacu_response>
```

Response detail:
"brightness" – possible values are "LOW", "MED", and "HIGH"

set_lcd_brightness

New for 2.0,supported on the HD11 and the V7IPACU
Description: set LCD brightness
Request:

set_lcd_brightness request

```
<ipacu_request >
 <message name="set_lcd_brightness" />
 <brightness>LOW | MED | HIGH</brightness>
</ipacu_request>
```

NOTE – possible values for 'brightness' are 'LOW', 'MED' and 'HIGH'
Response:

set_lcd_brightness response

```
<ipacu_response >
 <message name="set_lcd_brightness" error="0" />
</ipacu_response>
```

set_date_time

New for 2.0,supported on the HD11 and the V7IPACU
Description: Set SBC date and time
Request:

set_date_time request

```
<ipacu_request >
 <message name="set_date_time" />
 <dt>YYYY-MM-DDTHH:MM:SSZ</dt>
</ipacu_request>
```

NOTE - time is in 24-hour format
Response:

set_date_time response

```
<ipacu_response>
 <message name="set_date_time" error="0" />
</ipacu_response>
```

get_blockage_zones

New for 2.0,supported on the V7IPACU

Description: Gets the current values of all the programmed antenna blockage zones and their on/off state. The values are stored in the antenna and clients should get them from the antenna before modifying them.
Request:

get_blockage_zones request

```
<ipacu_request >
 <message name="get_blockage_zones" />
</ipacu_request>
```

Response:

get_blockage_zones response

```
<ipacu_response>
 <message name="get_blockage_zones" error="0" />
 <el_support>TRUE | FALSE</el_support>
 <total_zones>2</total_zones>
 <zone_list>
  <zone>
   <id>1</id>
   <state>ON | OFF</state>
   <az_min>0</az_min>
   <az_max>360</az_max>
   <el_min>-5</el_min>
   <el_max>10</el_max>
  </zone>
  <zone>
   <id>2</id>
   <state>ON | OFF</state>
   <az_min>233</az_min>
   <az_max>243</az_max>
   <el_min>0</el_min>
   <el_max>75</el_max>
  </zone>
 </zone_list>
</ipacu_response>
```

fields:
el_support – set to TRUE/FALSE to indicate if antenna supports elevation values
total_zones – the total number of zones supported by the antenna
id – zone number
state – whether the zone is currently in use or not
az_min, az_max – azimuth angle in degrees between 0.00 and 360.00.
el_min, el_max - elevation angle in degrees between -90.00 to +90.00 where 0 degrees is horizontal and positive is pointing up. The actual min and max are determined by the maximum look angle allowed by the antenna.

set_blockage_zones

New for 2.0,supported on the V7IPACU
Description: Sets the current values for one or more antenna blockage zones and their on/off states. The values are stored in the antenna and clients should get them from the antenna first before modifying them.
Request:

set_blockage_zones request

```
<ipacu_request >
 <message name="set_blockage_zones" />
 <zone_list>
  <zone>
   <id>2</id>
   <state>ON</state>
   <az_min>233</az_min>
   <az_max>243</az_max>
   <el_min>0</el_min>
   <el_max>75</el_max>
  </zone>
 </zone_list>
</ipacu_request>
```

Response:

set_blockage_zones response

```
<ipacu_response>
 <message name="set_blockage_zones" error="0" />
</ipacu_response>
```

Fields:
id – (required) zone number
state – (required) on/off for whether the zone is currently to be used or not
az_min, az_max – (optional) azimuth angle in degrees between 0 and 360. The az_min must be less than or equal to the az_max number.
el_min, el_max - (optional) elevation angle in degrees between -90 to +90 where 0 degrees is horizontal and positive is pointing up. The actual min and max are determined by the maximum look angle allowed by the antenna.

get_hazard_zones

New for 2.0,supported on the V7IPACU
Description: Gets the current values of all the programmed antenna hazard zones and their on/off state. The values are stored in the antenna and clients should get them from the antenna before modifying them.
Request:

get_hazard_zones request

```
<ipacu_request >
 <message name="get_hazard_zones" />
</ipacu_request>
```

Response:

get_hazard_zones response

```
<ipacu_response>
 <message name="get_hazard_zones" error="0" />
 <el_support>TRUE | FALSE</el_support>
 <mismatch>YES | NO</mismatch>
 <total_zones>2</total_zones>
 <acu_list>
  <override>ON | OFF</override>
  <zone>
   <id>1</id>
   <state>ON | OFF</state>
   <az_min>0</az_min>
   <az_max>360</az_max>
   <el_min>-5</el_min>
   <el_max>10</el_max>
  </zone>
  <zone>
   <id>2</id>
   <state>ON | OFF</state>
   <az_min>233</az_min>
   <az_max>243</az_max>
   <el_min>0</el_min>
   <el_max>75</el_max>
  </zone>
 </acu_list>
 <ant_list>
  <override>ON | OFF</override>
  <zone>
   <id>1</id>
   <state>ON | OFF</state>
   <az_min>0</az_min>
   <az_max>360</az_max>
   <el_min>-5</el_min>
   <el_max>10</el_max>
  </zone>
  <zone>
   <id>2</id>
   <state>ON | OFF</state>
   <az_min>233</az_min>
   <az_max>243</az_max>
   <el_min>0</el_min>
   <el_max>75</el_max>
  </zone>
 </ant_list>
</ipacu_response>
```

Fields:
el_support – set to TRUE/FALSE to indicate if antenna supports elevation values

override - set to ON/OFF. ON indicates antenna will transmit regardless of zone settings and antenna position. OFF indicates transmit according to zone settings.
mismatch - set to YES/NO. YES indicates hazard zone configure data do not match with hazard zone antenna readings. NO indicates hazard zone configure data match with hazard zone antenna readings.

total_zones – the total number of zones supported by the antenna

id – zone number
state – whether the zone is currently in use or not
az_min, az_max – azimuth angle in degrees between 0 and 360.
el_min, el_max - elevation angle in degrees between -90 to +90 where 0 degrees is horizontal and positive is pointing up. The actual min and max are determined by the maximum look angle allowed by the antenna.

set_hazard_zones

New for 2.0,supported on the V7IPACU
Description: Sets the current values for one or more antenna hazard zones and their on/off states. The values are stored in the antenna and clients should get them from the antenna first before modifying them.
Request:

set_hazard_zones request

```
<ipacu_request >
 <message name="set_hazard_zones" />
 <override>ON | OFF</override>
  <zone_list>
  <zone>
   <id>2</id>
   <state>ON</state>
  </zone>
  <zone>
   <id>1</id>
   <state>ON</state>
   <az_min>233.12</az_min>
   <az_max>243.12</az_max>
   <el_min>0.00</el_min>
   <el_max>75.00</el_max>
  </zone>
 </zone_list>
</ipacu_request>
```

Response:
<ipacu_response>
<message name="set_hazard_zones" error="0" />
</ipacu_response>
fields:

override – (optional) ON indicates antenna will transmit regardless of zone settings and antenna position. OFF indicates transmit according to zone settings.
id – (required) zone number
state – (required) on/off for whether the zone is currently to be used or not
az_min, az_max – (optional) azimuth angle in degrees between 0.00 and 360.00. The az_min must be less than or equal to the az_max number.
el_min, el_max - (optional) elevation angle in degrees between -90.00 to +90.00 where 0 degrees is horizontal and positive is pointing up. The actual min and max are determined by the maximum look angle allowed by the antenna.

System Service Interface

get_message_protocol_version

New for 2.0, supported on HD11 and V7IPACU
Description: Return the version and system identifiers for the messaging protocol.
Request:

get_message_protocol_version request

```
<ipacu_request >
 <message name="get_message_protocol_version" error="0" />
</ipacu_request>
```

Response:

get_message_protocol_version response

```
<ipacu_response >
 <message name="get_message_protocol_version" error="0" />
 <version>2.0</version>
 <system>HD11</system>
</ipacu_response>
```

Note: other system values may include: V3, V7, V7IP, V11, HD7

get_vessel_config

New for 2.0, Supported on HD11 and V7IPACU
Description: Return the vessel name and mounting angle of the antenna enclosure.
Request:

get_vessel_config request

```
<ipacu_request >
 <message name="get_vessel_config" />
</ipacu_request>
```

Response:

get_vessel_config response

```
<ipacu_response >
 <message name="get_vessel_config" error="0" />
 <name>Olympic</name>
 <feet>321</feet>
 <antenna_mount>89.7</antenna_mount>
</ipacu_response>
```

set_vessel_config

New for 2.0, Supported on HD11 and V7IPACU
Description: Set the vessel name and mounting angle of the antenna enclosure.
Request:

set_vessel_config request

```
<ipacu_request >
 <message name="set_vessel_config" />
 <name>Britannic</name>
 <feet>321</feet>
 <antenna_mount>89.8</antenna_mount>
</ipacu_request>
```

Response:

set_vessel_config response

```
<ipacu_response >
 <message name="set_vessel_config" error="0" />
</ipacu_response>
```

get_eth

New for 2.0, Supported on HD11 only
Description: Get wired network settings. For the V7IPACU this is the setting for the IPACU router connection to the product's internal LAN Bridge.
Request:

get_eth request

```
<ipacu_request >
 <message name="get_eth" />
</ipacu_request>
```

Response:

get_eth response

```
<ipacu_response>
 <message name="get_eth" error="0" />
 <mode>OFF | STATIC | DYNAMIC</mode>
 <ip>192.168.0.3</ip>
 <netmask>255.255.255.0</netmask>
 <gateway>192.168.0.1</gateway>
 <broadcast>192.168.0.255</broadcast>
</ipacu_response>
```

set_eth

New for 2.0, Supported on HD11 only
Description: Set wired network interface parameters. For the V7IPACU this is the setting for the IPACU router connection to the product's internal LAN Bridge.
Request:

set_eth request

```
<ipacu_request >
 <message name="set_eth" />
 <mode> OFF | STATIC | DYNAMIC </mode>
 <ip>192.168.0.3</ip>
 <netmask>255.255.255.0</netmask>
 <gateway>192.168.0.1</gateway>
 <broadcast>192.168.0.255</broadcast>
</ipacu_request>
```

NOTE - If state is 'OFF or DYNAMIC', fields ip, netmask, gateway, broadcast will be ignored.
Response:

set_eth response

```
<ipacu_response>
 <message name="set_eth" error="0" />
</ipacu_response>
```

set_eth_factory

New for 2.0, Supported on HD11 only
Description: Set wired network interface parameters back to factory setting. For the V7IPACU this is the setting for the IPACU router connection to the product's internal LAN Bridge.
Request:

set_eth_factory request

```
<ipacu_request >
 <message name="set_eth_factory" />
</ipacu_request>
```

Response:

set_eth_factory response

```
<ipacu_response>
 <message name="set_eth_factory" error="0" />
</ipacu_response>
```

get_wlan

New for 2.0, Supported on HD11 and V7IPACU
Description: Get wireless settings.
Request:

get_wlan request

```
<ipacu_request >
 <message name="get_wlan" />
</ipacu_request>
```

NOTE – client should always look at the "mode" element first. The remaining part of the response will be tailored to this mode. For example, if mode="ADHOC", the response will include "adhoc_mode" element, but not the "if_mode" element.

Response: Note: No ADHOC or IF on V7IPACU, No AP for HD11

get_wlan response

```
<ipacu_response>
 <message name="get_wlan" error="0" />
 <mode>OFF | ADHOC| AP | IF</mode>
 <adhoc_mode>
  <security>
   <mode>OFF | WEP</mode>
   <key></key>
  </security>
  <ip>169.254.100.1</ip>
 </adhoc_mode>
 <ap_mode>
  <mode>BRIDGED</mode>
  <essid>ipacu</essid>
  <security>
   <mode>OFF | WPA_PSK</mode>
   <algorithm>TKIP</algorithm>  (TBD: should this be hidden)
   <key>passwordtext</key>
  </security>
  <ip>192.168.1.3</ip>
  <netmask>255.255.255.0</netmask>
  <gateway>192.168.1.1</gateway>
  <broadcast>192.168.1.255</broadcast>
 </ap_mode>
 <if_mode>
  <mode> STATIC | DYNAMIC</mode>
  <essid>ipacu</essid>
  <security>
   <mode>OFF | WPA_PSK</mode>
   <algorithm>TKIP</algorithm>
   <key>passwordtext</key>
  </security>
  <ip>192.168.1.3</ip>
  <netmask>255.255.255.0</netmask>
  <gateway>192.168.1.1</gateway>
  <broadcast>192.168.1.255</broadcast>
 </if_mode>
 <channel>11</channel>
 <band>b|g</band>
 </ipacu_response>
```

set_wlan

New for 2.0, Supported on HD11 and V7IPACU
Note: ADHOC and IF mode is not supported on the V7IPACU. AP mode is not supported on the HD11.
Description: Set wireless network interface. Send only the section(s) that need to be revised/altered.
Request:

set_wlan request

```
<ipacu_request>
 <message name="set_wlan" />
 <channel>11</channel>
 <band>b|g</band>
  <mode>OFF | ADHOC | IF | AP</mode>   NOTE: no ADHOC or IF on VSAT IPACU
 <adhoc_mode>     NOTE: used on HD11 only
  <security>
   <mode>OFF | WEP</mode>
   <key></key>
  </security>
  <ip>169.254.100.1</ip>
 </adhoc_mode>
 <if_mode>     NOTE: used on HD11 only
  <mode> STATIC | DYNAMIC</mode>
  <essid>ipacu</essid>
  <security>
   <mode>
    OFF | WPA_PSK | WPA2_PSK | WEP_1
   </mode>
   <algorithm>
    TKIP | AES | WEP_64 | WEP_128
   </algorithm>
   <key></key>
  </security>
  <ip>192.168.1.3</ip>
  <netmask>255.255.255.0</netmask>
  <gateway>192.168.1.1</gateway>
  <broadcast>192.168.1.255</broadcast>
 </if_mode>
 <ap_mode>     NOTE: used on VSAT only
  <essid>ipacu</essid>
  <security>
   <mode>
    OFF | WPA_PSK | WPA2_PSK | WEP
   </mode>
   <algorithm>
    TKIP | AES | WEP_64 | WEP_128
   </algorithm>
   <key>asbn235bsdjhw4fedfe</key>
  </security>
 </ap_mode>
</ipacu_request>
```

Response:
<ipacu_response>
<message name="set_wlan" error="0" />
</iacu_response>
NOTE – client should always look at the "mode" element first. The remaining part of the request should be tailored to this mode. For example, if mode="ADHOC", the request will include "adhoc_mode" element, but not the "if_mode" element.
NOTE 1 – if mode is 'OFF', all remaining fields will be ignored.

set_wlan_factory

New for 2.0, Supported on HD11 and V7IPACU
Description: set wireless network interface parameters back to factory settings
Request:

set_wlan_factory request

```
<ipacu_request>
 <message name="set_wlan_factory" />
</ipacu_request>
```

Response:

set_wlan_factory response

```
<ipacu_response>
 <message name="set_wlan_factory" error="0" />
</ipacu_response>
```

get_lan

New for 2.0, Supported only onV7IPACU
Description: This is the settings for the IPACU router's connection to the product's internal LAN Bridge. When the DHCP server is enabled this is also the gateway address for the LAN subnet.
Request:

get_lan request

```
<ipacu_request >
 <message name="get_lan" />
</ipacu_request>
```

Response:

get_lan response

```
<ipacu_response>
 <message name="get_lan" error="0" />
 <mode>
  <code>IPACU | LEGACY | STATIC</code>
  <label>IP-ACU Mode | Legacy Mode | IP-ACU Mode with Static Port</label>
 </mode>
</ipacu_response>
```

set_lan

New for 2.0, Supported onV7IPACU
Description: This is the setting for the IPACU router's connection to the product's internal LAN Bridge. When the DHCP server is enabled this is also the gateway address for the LAN subnet.
Request:

set_lan request

```
<ipacu_ request>
 <message name="set_lan" />
 <mode>
  <code>IPACU | LEGACY | STATIC</code>
 </mode>
</ipacu_ request>
```

Response:

set_lan response

```
<ipacu_ response>
 <message name="set_lan" error="0" />
</ipacu_ response>
```

broadband_status

New for 2.0, Supported only on the V7IPACU
Description: get the internet connection status of the broadband connection.
Request:

broadband_status request

```
<ipacu_request>
 <message name="broadband_status" />
</ipacu_request>
```

Response:

broadband_status response

```
<ipacu_response>
 <message name="broadband_status" error="0" />
 <internet_access>ONLINE | OFFLINE</internet_access>
 <connection_profile>ViaSat</connection_profile>
</ipacu_response>
```

set_cell_modem

New for 2.0, Supported on the V7IPACU
Description: The gprsd daemon setting the status of the GPRS cell modem connection.
Request:

set_cell_modem request

```
<ipacu_request>
 <message name="set_cell_modem" />
</ipacu_request>
```

Response:

set_cell_modem response

```
<ipacu_response>
 <message name="set_cell_modem" error="0" />
 <sw_ver>100</sw_ver>
 <signal_strength>15</signal_strength>
 <status>
  UNAVAILABLE | NOSERVICE | REGISTERED | DIALING | CONNECTED
 </status>
</ipacu_response>
```

Field definitions:
status – current status of the modem

UNAVAILABLE - the gprsd daemon can not detect the GPRS modem module (possible low-level comms error or power disconnection)
NOSERVICE – no service
REGISTERED – registered on the network
DIALING – attempting to make connection
CONNECTED – currently communicating

cell_modem_status

New for 2.0, Supported on HD11 and the V7IPACU
Description: get status of GPRS cell modem connection.
Request:

cell_modem_status request

```
<ipacu_request>
 <message name="cell_modem_status" />
</ipacu_request>
```

Response:

cell_modem_status response

```
<ipacu_response>
 <message name="cell_modem_status" error="0" />
 <sw_ver>100</sw_ver>
 <signal_strength>15</signal_strength>
 <remote_ip>vvv.xxx.yyy.zzz</remote_ip>
 <status>
  UNAVAILABLE | NOSERVICE | REGISTERED | DIALING | CONNECTED
 </status>
</ipacu_response>
```

Field definitions:
remote_ip - the local IP address of the ACU used for the ppp connection over the GPRS cell network
status – current status of the modem

UNAVAILABLE - the gprsd daemon can not detect the GPRS modem module (possible low-level comms error or power disconnection)
NOSERVICE – no service
REGISTERED – registered on the network
DIALING – attempting to make connection
CONNECTED – currently communicating

cell_modem_dial_out

New for 2.0,supported on the HD11and implemented on the V7IPACU
Description: make outgoing GPRS cell modem connection. Causes the GPRS modem to make an internet connection and the SBC to establish an SSH connection to the KVH technical support center.
Request:

cell_modem_dial_out request

```
<ipacu_request >
 <message name="cell_modem_dial_out" />
 <command>DIALOUT | HANGUP</command>
</ipacu_request>
```

Response:

cell_modem_dial_out response

```
<ipacu_response >
 <message name="cell_modem_dial_out" error="0" />
</ipacu_response>
```

get_smartswitch_status

*New for 2.0, supported on the HD11 and **not** implemented on the V7IPACU*

Description: report A/B switch selection as well as receiver (1,2,3) selection.
Request:

get_smartswitch_status request

```
<ipacu_request >
 <message name="get_smartswitch_status" />
</ipacu_request>
```

Response:

get_smartswitch_status response

```
<ipacu_response>
 <message name="get_smartswitch_status" error="0" />
 <available>Y | N</available>
 <enable>Y | N</enable>
 <autoselect>Y | N</autoselect>
 <input>A | B</input>
 <output>1 | 2 | 3</output>
</ipacu_response>
```

Fields (smart switch)
available = A/B switch is present and detected
enable = below deck smart switch enabled/disabled status
autoselect = state of autoselect function, see set command below for explanation of use
input = current input RF source A or B
output = current output RF group 1, 2 or 3

set_smartswitch

*New for 2.0, supported on the HD11 and **not** implemented on the V7IPACU*
Description: make A/B switch selection as well as receiver (1,2,3) selection.
Request:

set_smartswitch request

```
<ipacu_request >
 <message name="set_smartswitch" />
 <enable>Y | N</enable>
 <autoselect>Y | N</autoselect>
 <input>A | B</input>
 <output>1 | 2 | 3</output>
</ipacu_request>
```

Response:

set_smartswitch response

```
<ipacu_response>
 <message name="set_smartswitch" error="0" />
</ipacu_response>
```

Fields (smart switch)
enabled = Enable use of below deck smart switch; if set to off, set autoswitch to input source A and output group 1; recommended usage is to always enable use by setting to 'Y'
autoselect = enable ACU to auto switch from A to B when detected RF signal strength is too low and from B to A when RF signal strength is back to normal
input = manual selection of input RF source A or B when autoselect is off
output = One of the three available output groups selected for output

set_smartswitch_config

*New for 2.0, supported on the HD11 and **not** implemented on the V7IPACU*
Description: configure below deck smart RF switch hardware.
Request:

set_smartswitch_config request

```
<ipacu_request >
 <message name="set_smartswitch_config" />
 <inA>
  <name>Right dome</name>
  <enable>Y | N</enable>
 </inA>
 <inB>
  <name>Left dome</name>
  <enable>Y | N</enable>
 </inB>
 <out1>
  <name>DTV</name>
  <enable>Y | N</enable>
 </out1>
 <out2>
  <name>DISH</name>
  <enable>Y | N</enable>
 </out2>
 <out3>
  <name>EUTEL</name>
  <enable>Y | N</enable>
 </out3>
</ipacu_request>
```

Response:

set_smartswitch_config response

```
<ipacu_response>
 <message name="set_smartswitch_config" error="0" />
</ipacu_response>
```

get_smartswitch_config

*New for 2.0, supported on the HD11 and **not** implemented on the V7IPACU*
Description: configure below deck smart RF switch hardware.
Request:

get_smartswitch_config request

```
<ipacu_request >
 <message name="get_smartswitch_config" />
</ipacu_request>
```

Response:

get_smartswitch_config response

```
<ipacu_response>
 <message name="get_smartswitch_config" error="0" />
 <inA>
  <name>Left dome</name>
  <enable>Y | N</enable>
 </inA>
 <inB>
  <name>Right dome</name>
  <enable>Y | N</enable>
 </inB>
 <out1>
  <name>DTV</name>
  <enable>Y | N</enable>
 </out1>
 <out2>
  <name> DISH</name>
  <enable>Y | N</enable>
 </out2>
 <out3>
  <name>EUTEL</name>
  <enable>Y | N</enable>
 </out3>
</ipacu_response>
```

set_dualdome_config

*New for 2.0, supported on the HD11 and **not** implemented on the V7IPACU*
Description: Sets configuration for dual dome support and is usually sent by client to the master ACU. Master ACU should send an equivalent command to the slave ACU when the state is modified. Client may also send this command directly to the slave but there may NOT be a reverse synch command from slave to master. This data is persisted in the ACU data store and restored on startup.
Request:

set_dualdome_config request

```
<ipacu_request >
 <message name="set_dualdome_config" />
 <mode>SINGLE | MASTER | SLAVE</mode>
 <master_ip>123.123.123.123</slave_ip>
 <slave_ip>123.123.123.123</slave_ip>
</ipacu_request>
```

Response:

set_dualdome_config response

```
<ipacu_response >
 <message name="set_dualdome_config" error="0" />
</ipacu_response>
```

NOTE: This command requires both master and slave ACUs to be powered on and operating in order to synchronize the states.

get_dualdome_status

*New for 2.0, supported on the HD11 and **not** implemented on the V7IPACU*
Description: Get configuration for dual dome support.
Request:

get_dualdome_status request

```
<ipacu_request >
 <message name="get_dualdome_status" />
</ipacu_request>
```

Response:

get_dualdome_status response

```
<ipacu_response>
 <message name="get_dualdome_status" error="0" />
 <mode>SINGLE | MASTER | SLAVE</mode>
 <master_ip>123.123.123.123</master_ip>
 <slave_ip>123.123.123.123</slave_ip>
 <state>
  SINGLE |
  DISCOVER |
  SYNCH |
  NO_RF |
  FOLLOW |
  ACTIVE
 </state>
</ipacu_response>
```

Field definitions:
mode – mode of ACU operation
SINGLE – stand-alone mode
MASTER – ACU provides synchronizing data to slave ACU
SLAVE – ACU receives synchronizing data from slave ACU
state –
SINGLE – stand-alone mode
DISCOVER – dual dome mode and communication partner not yet discovered
SYNCH – exchanging information with communication partner
NO_RF – no signal available from antenna
FOLLOW – tracking and RF signal available but not currently selected.
ACTIVE – RF signal available and currently selected

get_config_file

New for 2.0, supported on HD11 and implemented on the V7IPACU
Description: Return a specified config file
Request:

get_config_file request

```
<ipacu_request>
 <message name="get_config_file" />
 <filename></filename>
</ipacu_request>
```

filename - possible config file names are:
For HD11
satInfoWorkingCopy.xml, eth.conf, wlan.conf,
eth.factory.conf, wlan.factory.conf,
serial.conf, vessel.conf, autoswitch.conf,
smartswitch.conf, dualdome.conf
For V7IPACU
misc.conf
Response:

get_config_file response

```
<ipacu_response >
 <message name="get_config_file" error="0" />
 <content></content>
</ipacu_response>
```

set_config_file

New for 2.0, supported on HD11 and implemented on the V7IPACU
Description: Provide new content for a specified config file
Request:

set_config_file request

```
<ipacu_request>
 <message name="set_config_file" />
 <filename>fileToUpload</filename>
 </content>file contents here</content>
</ipacu_request>
```

For HD11
filename - possible config file names are:
satInfoWorkingCopy.xml, eth.conf, wlan.conf,
eth.factory.conf, wlan.factory.conf,
serial.conf, vessel.conf, autoswitch.conf,
smartswitch.conf, dualdome.conf
For V7IPACU
filename – misc.conf
Response:

set_config_file response

```
<ipacu_response >
 <message name="set_config_file" error="0" />
</ipacu_response>
```

NOTE – after config file changed, the application needs to be restarted for the changes to take effect.

set_config_turnkey

ICM or CBX-ACU only

Description: Record the turnkey config name in /kvh/acuservices.conf (persistent storage) and log the event to minorACUError.log. For DOME2 change the viasat modem contact IP to 192.168.0.2

Request:

set_config_turnkey

```
<ipacu_request>
 <message name="set_config_turnkey" />
 <turnkey_config>STANDARD|LEGACY|DUALDOME_PRIMARY|DUALDOME_SECONDARY|STATICIP</turnkey
_config>
</ipacu_request>
```

It is assumed that the sender has already sent the CBX WebServices "restore_configuration" message to COMMBOX and this message is to ONLY to synchronize acuservices with the change of COMMBOX turnkey config

NOTE: When turnkey_config is DUALDOME_SECONDARY then acuservices is reconfigured to contact the viasat modem at 192.168.0.2 and for all other configs is told to use 192.168.0.1

The /kvh/conf/acuservices.conf TURNKEY_CONFIG= entry is set to the <turnkey_config> string value

The following entry is added to the minorACUErrors.log

CBX: TURNKEY_CONFIG IS SET TO STANDARDILEGACYIDUALDOME_PRIMARYIDUALDOME_SECONDARYISTATICIP

Brief summary of turnkey modes (this summary is not the authoritative definition)

STANDARD is the factory default

LEGACY is put all the backpanel ethernet ports into one bridge group with the ICM/CBX-ACU at 192.168.0.9 and contact the viasat modem at 192.168.0.1

DUALDOME_SECONDARY is put all the backpanel ethernet ports into one bridge group with the ICM/CBX-ACU at 192.168.0.10 and contact the viasat modem at 192.168.0.2

STATICIP is put eth0 and eth4 into one bridge group with the ICM/CBX-ACU at 192.168.0.9 and eth1,2,3 into a LAN bridge group with the ICM/CBX-ACU at 192.168.5.1

Note: DUALDOME_PRIMARY is the same a STATICIP, it is only included as a convenience as to guide the user in the dropbox menu (per the XDR -DUALDOME requirements)

Response:

set_config_turnkey response

```
<ipacu_response >
 <message name="set_config_turnkey" error="0" />
</ipacu_response>
```

error =15 - COMMBOX Webservices socket error
error= 17 - TOO_MANY_MSGS (new message while still waiting for previous CBX WebServices reply)
error =255 - General timeout

get_config_turnkey

ICM and CBX-ACU

Description: Return the CURRENT turnkey configuration, also advise the sender if there configurable LAN, WIFI or Webcache settings available

for the CURRENT turnkey configuration

Request:

get_config_turnkey request

```
<ipacu_request>
 <message name="get_config_turnkey" />
</ipacu_request>
```

Response:

get_config_turnkey response

```
<ipacu_response >
 <message name="get_config_turnkey" error="0" />
 <turnkey_config>STANDARD|STATICIP|DUALDOME_PRIMARY|DUALDOME_SECONDARY||LEGACY</turnke
y_config>
    <lan>Y|N</lan>
    <wifi>Y|N</wifi>
    <webcache>Y|N</webcache>
 </ipacu_response>
```

list_config_turnkey

ICM and CBX-ACU

Description: Return the list of available turnkey configurations and whether LAN, Wi-FI or WebCache is available for each

Request:

list_config_turnkey request

```
<ipacu_request>
 <message name="list_config_turnkey" />
</ipacu_request>
```

Response:

list_config_turnkey response

```
<ipacu_request>
 <message name="list_config_turnkey" />
<turnkey_list>
     <turnkey>
         <turnkey_config>STANDARD</turnkey_config>
         <lan>Y</lan>
         <wifi>Y</wifi>
         <webcache>Y</webcache>
     </turnkey>
      <turnkey>
         <turnkey_config>STATICIP</turnkey_config>
         <lan>Y</lan>
         <wifi>Y</wifi>
         <webcache>Y</webcache>
     </turnkey>
      <turnkey>
         <turnkey_config>DUALDOME_PRIMARY</turnkey_config>
         <lan>Y</lan>
         <wifi>Y</wifi>
         <webcache>Y</webcache>
     </turnkey>
      <turnkey>
         <turnkey_config>DUALDOME_SECONDARY</turnkey_config>
         <lan>N</lan>
         <wifi>N</wifi>
         <webcache>N</webcache>
     </turnkey>
     <turnkey>
         <turnkey_config>LEGACY</turnkey_config>
         <lan>N</lan>
         <wifi>N</wifi>
         <webcache>N</webcache>
     </turnkey>

</turnkey_list>

 </ipacu_request>
```

```
<turnkey_config>STANDARD|LEGACY|DUALDOME_PRIMARY|DUALDOME_SECONDARY|STATICIP</turnkey_config>
   <lan>Y|N</lan>
   <wifi>Y|N</wifi>
   <webcache>Y|N</webcache>
</ipacu_response>
```

get_serial_log

New for 2.0, supported on HD11 and implemented on the V7IPACU
Description: return the unit's serial log
Request:

get_serial_log request

```
<ipacu_request>
 <message name="get_serial_log" />
</ipacu_request>
```

Response:

get_serial_log response

```
<ipacu_response>
 <message name="get_serial_log" error="0" />
 <start_dt>YYYY-MM-DDTHH:MM:SSZ</start_dt>
 <content>log content goes here</content>
</ipacu_response>
```

NOTE – this function may be called at any time.
NOTE – time is in 24-hour format

get_event_history_log

New for 2.0, supported on HD11 and implemented on the V7IPACU
Description: retrieve contents of entire log file of historical events.
Request:

get_event_history_log request

```
<ipacu_request>
 <message name="get_event_history_log" />
</ipacu_request>
```

Response:

get_event_history_log response

```
<ipacu_response >
 <message name="get_event_history_log" error="0"/>
 <content>event history content goes here</content>
</ipacu_response>
```

get_recent_event_history

New for 2.0, supported on HD11and the V7IPACU
Description: Retrieve range of events from event history log.
Request:

get_recent_event_history request

```
<ipacu_request >
 <message name="get_recent_event_history"/>
 <begin_at_event>1</begin_at_event>
 <how_many_events>9</how_many_events>
</ipacu_request>
```

NOTE – The event log is retrieved in the order in which it is written. Event 1 fetches the oldest event, so if only the three most recent events are desired, it is necessary to first issue a "get_event_history_count" message to know how many events are available, subtract three from that number, and use that value as the "begin_at_event" value.
Response:

get_recent_event_history response

```
<ipacu_response>
 <message name="get_recent_event_history" error="0" />
 <event_list>
  <event>"this space available"</event>
  <event>"your message here"</event>
  <event>"et al."</event>
 </event_list>
</ipacu_response>
```

get_event_history_count

New for 2.0, supported on HD11 and the V7IPACU
Description: Retrieve total number of events from event history log.
Request:

get_event_history_count request

```
<ipacu_request >
 <message name="get_event_history_count"/>
</ipacu_request>
```

Response:

get_event_history_count response

```
<ipacu_response>
 <message name="get_event_history_count" error="0" />
 <event_count>42</event_count>
</ipacu_response>
```

upload_software

New for 2.0, supported on HD11 and VSAT

Description: After delivering a software file (can be binary image) using http: POST method, this function can be invoked to test and return the status of the file transfer. NOTE: This function is implemented in PHP and can only be accessed using the REST protocol, Socket–based clients cannot use this function.
Request:

upload_software request

```
<ipacu_request>
 <message name="upload_software" />
 <filename>fileToUpload</filename>
<ipacu_request>
```

Response:

upload_software response

```
<ipacu_response>
 <message name="upload_software" error="0" />
 <filename>HD11-100.KVH</filename>
 <filesize>2033</filesize>
</ipacu_response>
```

NOTE – this service is used to upload software to the IPACU. The software will not get updated until an 'install_software' message is sent by the client.

install_software

New for 2.0, supported on HD11 and V7IP.

Description : Confirm pending software update. Note: The flash_all tag is optional. When not sent or set to N the system only updates what is neccessary. When set to Y ALL is flashed.
Request:

install_software request

```
<ipacu_request>
 <message name="install_software" />
 <install>Y | N</install>
        <flash_all>Y | N</flash_all>
        <filename></filename>
</ipacu_request>
```

Response:

install_software response

```
<ipacu_response>
 <message name="install_software" error="0" />
</ipacu_response>
```

update_satellite_config

New for 2.0, supported on the HD11
Description: apply user customization settings and satellites from the current satellite library file to the new satellite parameters file and install this as the new current file.
Request:

update_satellite_config request

```
<ipacu_request >
 <message name="update_satellite_config" />
</ipacu_request>
```

Response:

update_satellite_config response

```
<ipacu_response>
<message name="update_satellite_config" error="0" />
</ipacu_response>
```

set_tx_inhibit_reason

New for X.x,supported on the V7IPACU
Description: Sets the Transmit Inhibit reason and associated timer values and sends a Modem Config message to the modem to simulate Tx Inhibit condition. This is used for testing only and can be reset to no Transmit inhibit condition with the same command. Normal system operation

will overwrite these debug settings.
Request:

set_tx_inhibit_reason request

```
<ipacu_request >
   <message name="set_tx_inhibit_reason" />
   <reason>0</reason>
   <timer>900</timer>
</ipacu_request>
```

Response:

set_tx_inhibit_reason response

```
<ipacu_response>
    <message name="set_tx_inhibit_reason" error="0" />
</ipacu_response>
```

Fields:
reason– (required) reason code for Tx Inhibit. Valid for 0 thru 8, as defined below

	Valid Reason Codes: 0 – No Transmit Inhibit Active 1 – Cable Unwrap 2 – Blockage 3 – RF Hazard Zone 4 – Sidelobe Check 5 – Elevation Limit 6 – Az/Skew Limit 7 – Gyro Cap 8 - Searching

timer – (required) Timer value in seconds for the associated reason used by modem to move to different satellite if Tx Inhibit condition persists after time period specified. Valid range 0 to 900 seconds.

move_to_next_satellite

New for X.x,supported on the V7IPACU
Description: Causes the modem to send the satellite parameters for the next satellite in the list.

Request:

move_to_next_satellite request

```
<ipacu_request >
    <message name="move_to_next_satellite" />
    <timer>1</timer>
</ipacu_request>
```

Response:

move_to_next_satellite response

```
<ipacu_response>
    <message name="move_to_next_satellite" error="0" />
</ipacu_response>
```

Fields:
time – (required) Timer value in seconds before moving to next satellite. Valid range 0 to 300 seconds.

FrontPanel Service

set_display

New for 2.0, supported on HD11 and the V7IPACU
Description: allows client to write message to LCD
Request:

set_display request

```
<ipacu_request >
 <message name="set_display" />
 <line1>message</line1>
 <line2>message</line2>
 <ttl>10</ttl>
 <action></action>
 <menus>NEXT</menus>
 <change>CHANGE</change>
 <accept>SELECT | DONE</accept>
 <exit>EXIT</exit>
</ipacu_request>
```

NOTE – LCD is limited to 20 characters per line.
NOTE – The message will be displayed on the LCD for N seconds, where N is defined by the element 'ttl'. This value must be greater than 0.
NOTE – the individual 'button' elements define the actual word to represent the button name as displayed on line 2 of the LCD; used for client to handle button events.
Response:

set_display response

```
<ipacu_response>
 <message name="set_display" error="0" />
 <action> SELECT | EXIT</action>
</ipacu_response>
```

NOTE – If 'error' is set to 'TIMEOUT', indicates ttl was not specified or 0; or requested button was not pressed.
NOTE – The 'action' element returns the string supplied in the request for the button type that was pressed.

Satellite Selector IP AutoSwitch Service

NOTE: Not Implemented on the V7IPACU
This section describes the messages exchanged between the SatSelector devices, the ACU and the various clients.

autoswitch_register

Description: A periodic, every 60 seconds???, "I am alive" registration message. This same message is also sent when the device determines that it is not present on the "actives list" broadcast by the ACU. It is also immediately sent whenever the satellite selection changes or it detects that when it is the active satellite and the currently reported sat is not the same as the one it has requested.
Request:

autoswitch_register request

```
<ipacu_request >
 <message name="autoswitch_register" />
 <sn>123456789</sn>
 <ip>123.123.123.123</ip>
 <sat>A | B | C | D </sat>
</ipacu_request>
```

Response:

autoswitch_register response

```
<ipacu_response >
 <message name="autoswitch_register" error="0" />
</ipacu_response>
```

autoswitch_master

Description: request master status when user pushes the switch on the satellite selector. If not in the active list, this message can act as a registration message as well.
Request:

autoswitch_master request

```
<ipacu_request >
 <message name="autoswitch_master" />
 <sn>123456789</sn>
 <ip>123.123.123.123</ip>
 <sat>A | B | C | D </sat>
</ipacu_request>
```

Response:

autoswitch_master response

```
</ipacu_response>
 <message name="autoswitch_master" error="0" />
</ipacu_response>
```

get_autoswitch_active

Description: a periodic broadcast message, every 60 seconds???, that contains the list of active SatSelector devices discovered by the ACU. This message is also broadcast when a new device becomes the master device and/or when a device is either added to or deleted from the active list. The device should turn on the master indicator lamp when it detects that ACU has it registered as the master.
Request:

get_autoswitch_active request

```
<ipacu_request >
 <message name="get_autoswitch_active" />
</ipacu_request>
```

Response (or Broadcast):

get_autoswitch_active response

```
<ipacu_response>
 <message name="get_autoswitch_active" error="0" />
 <master>
  <sn>123456789</sn>
  <sat>A | B | C | D</sat>
 </master>
 <list>
  <sn>123456789</sn>
  <sn>987654321</sn>
 </list>
</ipacu_response>
```

NOTE: If there is no master, then the master block will sent as a null tag. The list will contain all active S/N including that of the master.

get_autoswitch_status

*New for 2.0,Supported on HD11 and***not***implemented for V7IPACU*
Description: directed request to get a list of SatSelector devices.
Request:

get_autoswitch_status request

```
<ipacu_request >
 <message name="get_autoswitch_status" />
</ipacu_request>
```

Response:

get_autoswitch_status reponse

```
<ipacu_response>
 <message name="get_autoswitch_status" error="0" />
 <available>Y | N<available>
 <enable>Y | N</enable>
 <master>
  <sn>123456789</sn>
  <sat>A | B | C | D</sat>
 </master>
 <service>1 | 2 | 3</service>
 <satellites>
  <A>
   <listID>64</listID>
   <antSatID>23E</antSatID>
   <name>BADR-5</name>
   <region>North America</region>
   <lon>23.000</lon>
   <enable>Y</enable>
   <favorite>Y</favorite>
  </A>
  <B>
   <listID>65</listID>
   <antSatID>40E</antSatID>
   <name>BADR-6</name>
   <region>North America</region>
   <lon>40.000</lon>
   <enable>Y</enable>
   <favorite>N</favorite>
  </B>
  <C>
   <listID>66</listID>
   <antSatID>33E</antSatID>
   <name>BADR-7</name>
   <region>North America</region>
   <lon>33.000</lon>
   <enable>Y</enable>
   <favorite>N</favorite>
  </C>
  <D/>
 </satellites>
</ipacu_response>
```

Fields:

service – which RF smart switch output service is active, default is 1

master – S/N of currently selected master (if any)
sn – KVH supplied serial number
name – optional name associated with device
ip – version 4 address, www.xxx.yyy.zzz
sat – most recently requested sat from SatSelector

set_autoswitch_service

*New for 2.0,supported on the HD11 and **not** implemented on the V7IPACU*
Description: Enable/disable the autoswitch service. Optionally, for each of the one to three RF service out channels, associate the four pre-programmed satellite choices. These same satellites should be programmed into all IRDs associated with the service. A satellite is designated by a satellite letter (A, B, C or D).
Request:

set_autoswitch_service request

```
<ipacu_request >
 <message name="set_autoswitch_service" />
 <enable>Y | N</enable>
 <services>
  <out1>
   <A>23E</A>
   <B>40E</B>
   <C>33E</C>
  </out1>
  <out3>
   <A>1W</A>
   <D>23E</D>
  </out3>
 </services >
</ipacu_request>
```

Response:

set_autoswitch_service response

```
<ipacu_response>
 <message name="set_autoswitch_service" error="0" />
</ipacu_response>
```

get_autoswitch_service

*New for 2.0,supported on the HD11 and **not** implemented on the V7IPACU*
Description: For each of the one to three RF service out channels, returns the four pre-programmed satellite choices. These same satellites should be programmed into all IRDs associated with the service. A satellite is designated by a satellite letter (A, B, C or D).
Request:

get_autoswitch_service request

```
<ipacu_request >
 <message name="get_autoswitch_service" />
</ipacu_request>
```

Response:

get_autoswitch_service response

```
<ipacu_response>
 <message name="get_autoswitch_service" error="0" />
 <available>Y | N<available>
 <enable>Y | N</enable>
 <service_list>
  <out1>
   <A>
    <listID>64</listID>
    <antSatID>23E</antSatID>
    <name>BADR-5</name>
    <region>North America</region>
    <lon>23.000</lon>
    <enable>Y</enable>
    <favorite>Y</favorite>
   </A>
   <B>
    <listID>65</listID>
    <antSatID>40E</antSatID>
    <name>BADR-6</name>
    <region>North America</region>
    <lon>40.000</lon>
    <enable>Y</enable>
    <favorite>N</favorite>
   </B>
   <C>
    <listID>66</listID>
    <antSatID>33E</antSatID>
    <name>BADR-7</name>
    <region>North America</region>
    <lon>33.000</lon>
    <enable>Y</enable>
    <favorite>N</favorite>
   </C>
   <D/>
  </out1>
  <out2/>
  <out3>
   <A>
    <listID>67</listID>
    <antSatID>1W</antSatID>
    <name>BADR-8</name>
    <region>North America</region>
    <lon>-1.000</lon>
    <enable>N</enable>
    <favorite>N</favorite>
```

```
</A>
<B/>
<C/>
<D>
 <listID>64</listID>
 <antSatID>23E</antSatID>
 <name>BADR-5</name>
 <region>North America</region>
 <lon>23.000</lon>
 <enable>Y</enable>
 <favorite>Y</favorite>
</D>
```

```
  </out3>
 </service_list >
</ipacu_response>
```

set_autoswitch_names

*New for 2.0,Supported on HD11 and***not***implemented for V7IPACU*
Description: Allows creation of a list of SatSelector devices identified by their serial numbers and an associated user friendly name.
Request:

set_autoswitch_names request

```
<ipacu_request >
 <message name="set_autoswitch_names" />
 <autoswitch_list>
  <autoswitch>
   <sn>123456789</sn>
   <name>Salon</name>
  </autoswitch>
  <autoswitch>
   <sn>123456789</sn>
   <name>Boudoir</name>
  </autoswitch>
 </autoswitch_list>
</ipacu_request>
```

Response:

set_autoswitch_names response

```
<ipacu_response>
 <message name="set_autoswitch_names" error="0" />
</ipacu_response>
```

Fields:
sn – KVH supplied serial number
name – a user supplied location or identity for the SatSelector device

Product Registration Data

This section describes the messages exchanged between the clients web browser/application and the ACU as well as any interaction between ACU and KVH portal or client and KVH portal. These message will collect user profiles and product usage details for use by KVH customer management for support and product development activities.

set_product_registration

New for 2.0, supported on HD11 and the V7IPACU

Description: allows client app/browser to set user information to ACU for storage and submission to KVH portal if and when an Internet connection is available.
Request:

set_product_registration request

```
<ipacu_request >
 <message name="set_product_registration" />
 <edit_dt>YYYY-MM-DDTHH:MM:SSZ</edit_dt>
 <user>
  <name></name>
  <salutation></salutation>
  <title/>
  <email></email>
  <company/>
  <addr1></addr1>
  <addr2/>
  <city></city>
  <state></state>
  <country></country>
  <zip></zip>
  <phone></phone>
  <mobile/>
  <fax/>
  <website/>
 </user>
 <dealer>
  <company></company>
  <state></state>
  <country></country>
  <installer_name/>
  <installer_email/>
  <installer_phone/>
 </dealer>
 <product>
  <market></market>
  <sector></sector>
  <platform/>
  <purch_dt>YYYY-MM-DD</purch_dt>
  <vessel_name/>
  <vessel_length/>
  <vessel_year/>
 </product>
</ipacu_request>
```

Response:

set_product_registration response

```
<ipacu_response >
 <message name="set_product_registration" error="0" />
</ipacu_response>
```

get_product_registration

New for 2.0, supported on HD11 and the V7IPACU
Description: allows client app/browser to get stored user information to ACU for storage and submission to KVH portal if and when an Internet connection is available.
Request:

get_product_registration request

```
<ipacu_request >
 <message name="get_product_registration" />
</ipacu_request>
```

Response:

get_product_registration response

```
<ipacu_response >
 <message name="get_product_registration" error="0" />
 <edit_dt>YYYY-MM-DDTHH:MM:SSZ</edit_dt>
 <reg_dt>YYYY-MM-DDTHH:MM:SSZ</reg_dt>
 <user>
  <firstname></firstname>
  <lastname></lastname>
  <salutation></salutation>
  <title/>
  <email></email>
  <company/>
  <addr1></addr1>
  <addr2/>
  <city></city>
  <state></state>
  <country></country>
  <zip></zip>
  <phone></phone>
  <mobile/>
  <fax/>
  <website/>
 </user>
 <dealer>
  <company></company>
  <state></state>
  <country></country>
  <installer_name/>
  <installer_email/>
  <installer_phone/>
 </dealer>
 <product>
  <acu_model>VSAT-IPACU | TVRO-IPACU</acu_model>
  <acu_sn></acu_sn>
  <ant_model>HD7 | HD11 | V7 | V7IP | V3 | V11</ant_model>
  <ant_sn><ant_sn>
  <market></market>
  <sector></sector>
  <line></line>
  <platform/>
  <purch_date>YYYY-MM-DD</purch_date>
  <vessel_name/>
  <vessel_length/>
  <vessel_year/>
 </product>
</ipacu_response>
```

set_product_registered

New for 2.0, supported on HD11 and the V7IPACU
Description: allows client app/browser to inform ACU that product registration was sent to KVH portal successfully.

Request:

set_product_registered request

```
<ipacu_request >
 <message name="set_product_registered" />
 <reg_dt>YYYY-MM-DDTHH:MM:SSZ</reg_dt>
</ipacu_request>
```

Response:

set_product_registered response

```
<ipacu_response >
 <message name="set_product_registered" error="0" />
</ipacu_response>
```

Register Product on Portal

Reference:
56-0245 IPACU KVH Portal Web Services ICD

RECEIVE ONLY