



Blue Sky Network

# MESSAGING HUB PUBLIC APIs REFERENCE GUIDE

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13 Nov 2023	0.0	MZ	Initial Draft
21 Nov 2023	0.1	MZ	Public Release Draft
28 Nov 2023	0.2	MZ	Corrected pg. 6 hyperlink
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## INTRODUCTION

This guide explains how to use the SkyLink Messaging Hub, including how to create and manage API Keys and channels in the SkyLink Portal.

### About the Messaging Hub

The SkyLink Messaging Hub is a message relay and delivery service for SkyLink devices. Mobile-originated (MO) messages are delivered from devices either via IP data over the internet (via cellular) or over IMT. Mobile-terminated (MT) messages are sent to devices via IMT only.

**NOTE:** If IMT is not available, it will use IP data over satellite if the routing and firewall configurations allow it.

Messaging Hub messages are text only. When sending binary data, it must be encoded as text. Common binary-to-text encodings are Base64 and hex string.

### About Channels

Messaging Hub is built off the concept of channels, a list of delivery endpoints that allow each device to support multiple messaging use cases. Multiple channels can be configured per device profile.

As an example, a temperature sensor could be configured to communicate on channel 1 and a precipitation sensor could be configured to communicate on channel 2. In the SkyLink Portal, these 2 channels can be configured to deliver messages to different endpoints (one that processes temperature data and another that processes precipitation data).

The opposite is true as well – MT messages are available on their respective channels for whichever SkyLink-connected processors need them.

**NOTE:** To configure channels and their respective endpoints, see [SkyLink Portal - Channel Management](#).

## DELIVERY ENDPOINTS

Channels allow you to configure delivery endpoints to which the Messaging Hub system will deliver messages received from devices. We currently support the following endpoints:

- **Email** – messages will be emailed to the specified address as JSON file attachments.
- **HTTP(S)** – the message JSON will be delivered via POST to the specified URL.
- **TCP** – the message JSON will be delivered to the TCP address and port as text.

### Delivery Message JSON Format

```
{  
  "serial": string,  
  "payload": {  
    "cid": number,  
    "data": string  
  }  
}
```

## SKYLINK DEVICE API

SkyLink has 2 APIs currently available: a REST API and a WebSocket API. The REST API requires a connected service to repeatedly check for or send messages. The WebSocket API can send messages and deliver new ones to clients as they arrive.

Received messages will not be deleted from the queue automatically; be sure to delete a message once your application has received and processed it.

Sent messages will be deleted from the queue automatically. Messages are deleted once they have passed the channel's configured TTL value. Sent and failed messages will be deleted when the TTL time has expired or after 1 week, whichever happens first.

## REST API

The REST API is documented in both an OpenAPI specification and a Swagger UI that can be used to interact with the API. To access, connect to a SkyLink device and navigate to these URLs:

- OpenAPI specification: <http://my.skylink.net/hub/openapi>
- Swagger UI: <http://my.skylink.net/hub/ui/swagger>

The device specifications at the above URLs will always show the current firmware version. The endpoint listings on the next page may be out-of-date or incomplete.



Endpoint URL	HTTP Action	Request Data Format	Response	Notes
<a href="http://my.skylink.net/hub/v1/messages">http://my.skylink.net/hub/v1/messages</a>	GET		200 - Success <pre>{   messages: [     {       channel_id: number,       data: string,       message_id: number,       priority: ["standard", "high"],       status: ["received", "queued", "sent", "send_failed"]     }   ] }</pre> 401 - Not Authorized  500 - Server Error	Gets all received messages for all channels.
<a href="http://my.skylink.net/hub/v1/messages/send">http://my.skylink.net/hub/v1/messages/send</a>	POST	<pre>{   channel_id: number,   data: string,   priority: ["standard", "high"] }</pre>	201 - Message Sent <pre>{   message_id: number }</pre> 400 - Data Validation Error 401 - Not Authorized 404 - Channel Not Found 422 - Request Validation Failed	Sends a message.

			<p>424 - IMT Topic Not Subscribed</p> <p>500 - Server Error</p>	
<p>http://my.skylink.net/hub/v1/messages/&lt;message-id&gt;</p>	<p>DELETE</p>		<p>204 - No Content - Deleted successfully</p> <p>401 - Not Authorized</p> <p>404 - Message Not Found</p> <p>500 - Server Error</p>	<p>Deletes the message with provided ID from the message queue.</p>
<p>http://my.skylink.net/hub/v1/channels</p>	<p>GET</p>		<p>200 - Success</p> <pre>{   channels: [     {       channel_id: number,       name: string,       ttl: number,       num_received: number,       num_queued: number,       num_sent: number,       num_failed: number     }   ] }</pre> <p>401 - Not Authorized</p> <p>404 - No channels configured</p> <p>500 - Server Error</p>	<p>Gets a list of all configured channels.</p> <p>Includes number of received messages.</p>

<p>http://my.skylink.net/hub/v1/channels/&lt;channel-id&gt;</p>	<p>GET</p>		<p>200 - Success  <pre>{   channel_id: number,   name: string,   ttl: number,   num_received: number,   num_queued: number,   num_sent: number,   num_failed: number }</pre> </p> <p>401 - Not Authorized</p> <p>404 - Channel Not Found</p> <p>500 - Server Error</p>	<p>Gets details of a specific channel.</p> <p>Includes number of received messages.</p>
<p>http://my.skylink.net/hub/v1/channels/&lt;channel-id&gt;/messages</p>	<p>GET</p>		<p>200 - Success  <pre>{   received_messages: [     {       channel_id: number,       message_id: number,       data: string,       priority: ["standard", "high"],       inserted_at: date,       updated_at: date     }   ],   sent_messages: [     {</pre> </p>	<p>Gets messages for specified channel ID.</p>

			<pre>channel_id: number, id: number, data: string, imt_message_id: number, last_attempt: date, modality: ["imt", "http"], priority: ["standard", "high"], status: ["queued", "queued_imt", "sent", "error", "expired", "failed"], error_message: string   null, retry_count: number, inserted_at: date, updated_at: date } ] }</pre> <p>401 - Not Authorized</p> <p>404 - Channel Not Found</p> <p>500 - Server Error</p>	<p>Includes both received and sent messages.</p> <p>Sent messages will be automatically deleted after being sent or retried for the maximum number of times.</p>
--	--	--	---	--

<p>http://my.skylink.net/hub/v1/channels/&lt;channel-id&gt;/messages/send</p>	<p>POST</p>	<pre>{   data: string,   priority:     ["standard",      "high"] }</pre>	<p>201 - Success  <pre>{   message_id: number }</pre></p> <p>400 - Data validation error</p> <p>401 - Not Authorized</p> <p>404 - Channel Not Found</p> <p>422 - Request Validation Failed</p> <p>424 - IMT Topic Not Subscribed</p> <p>500 - Server error</p>	<p>Sends a message for the specified channel ID.</p>
<p>http://my.skylink.net/hub/v1/channels/&lt;channel-id&gt;/messages</p>	<p>DELETE</p>		<p>204 - No Content - Deleted successfully</p> <p>401 - Not Authorized</p> <p>404 - Channel Not Found</p> <p>500 - Server error</p>	<p>Deletes all messages for the channel.</p>

## WebSocket API

WebSocket enables a two-way interactive communication session between client and server without having to poll the server for a reply. SkyLink utilizes the Phoenix Framework's channels for its WebSocket implementation.

### WEBSOCKET CLIENT LIBRARIES

Libraries exist for many programming languages to interact with this framework. It is highly recommended to use one of these libraries when connecting to SkyLink's WebSocket endpoint. Some example libraries are:

- Swift (iOS)
  - [SwiftPhoenix](#)
- Java (Android)
  - [JavaPhoenixChannels](#)
- Kotlin (Android)
  - [JavaPhoenixClient](#)
- C#
  - [PhoenixSharp](#)
- Elixir
  - [phoenix\\_gen\\_socket\\_client](#)
- NodeJS
  - [phoenix-channels](#)
- JavaScript (Browser)
  - [phoenix \(docs\)](#)
    - [via npm](#)

If a library for your language does not exist, or you cannot use a library, here is the [documentation to write your own client](#).

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## MESSAGING HUB WEBSOCKET API

**NOTE:** The Phoenix Framework’s WebSocket implementation – and therefore this guide - uses the term “channels”. Other implementations may use terms such as “topics”.

Use a client as described above to connect to the WebSocket endpoint.

**WebSocket URL:** ws://my.skylink.net/hub/socket

Once connected, the WebSocket client should provide the ability to join a channel after you provide the channel name. WebSocket channel names follow this pattern: “channel:<channel-id>” where <channel-id> is the Messaging Hub channel ID.

Only messages sent to this ID will be delivered to the channel. If you would like to receive messages for any or all channels, join “channel:all”.

Upon joining a channel, all of its received messages will be delivered. After this, only new messages will be delivered. To receive all messages again, leave and rejoin the channel.

### Message Structure

```
{
  "messages": [
    {
      channel_id: number,
      message_id: number,
      data: string,
      priority: ["standard", "high"],
      inserted_at: date,
      updated_at: date
    }
  ]
}
```

## MESSAGING HUB EVENTS

The following events will be delivered by the Messaging Hub:

Event	Data	Notes
mo_message:new	<pre>{   channel_id: number,   data: string,   inserted_at: date,   last_attempt: date,   imt_message_id: uuid   null,   modality: null   'imt'   'http',   priority: ["standard", "high"],   status: 'queued'   'queued_imt'   'sent'   'error'   'expired'   'failed'   attempts: number,   error_message: null   string,   updated_at: date }</pre>	<p>A new message has been added to the send queue.</p> <p>Statuses:</p> <ul style="list-style-type: none"> <li>• queued - message has been added to the internal send queue</li> <li>• queued_imt - message has been queued in the modem's IMT buffer</li> <li>• sent - message was sent</li> <li>• error - an error has occurred while sending; see error_message</li> <li>• expired - send timeout reached</li> <li>• failed - system has failed to send the message</li> </ul>
mo_message:update	<pre>{   channel_id: number,   data: string,   inserted_at: date,   last_attempt: date,   imt_message_id: uuid   null,   modality: null   'imt'   'http',   priority: ["standard", "high"],   status: 'queued'   'queued_imt'   'sent'   'error'   'expired'   'failed' }</pre>	<p>Send queue message has been updated. This will happen as the message's status gets updated.</p>



	<pre> attempts: number, error_message: null   string, updated_at: date } </pre>	
mo_message:delete	<pre> { channel_id: number, data: string, inserted_at: date, last_attempt: date, imt_message_id: uuid   null, modality: null   'imt'   'http', priority: ["standard", "high"], status: 'queued'   'queued_imt'   'sent'   'error'   'expired'   'failed' attempts: number, error_message: null   string, updated_at: date } </pre>	Send queue message was deleted.
mt_message:new	<pre> { channel_id: number, message_id: number, data: string, priority: ["standard", "high"], inserted_at: date, updated_at: date } </pre>	A new message has been received.

mt_message:update	<pre>{   channel_id: number,   message_id: number,   data: string,   priority: ["standard", "high"],   inserted_at: date,   updated_at: date }</pre>	Received message has been updated. This event may never be received as received messages are not typically updated at this time after the new event has been sent. May be used in the future.
mt_message:delete	<pre>{   channel_id: number,   message_id: number,   data: string,   priority: ["standard", "high"],   inserted_at: date,   updated_at: date }</pre>	Received message was deleted.

MESSAGING HUB API COMMANDS

The WebSocket API currently supports the following commands:

Command	Data	Response	Notes
send:message	<pre>{   channel_id: number,   data: string,   priority: ["standard", "high"] }</pre>	<p>Success:</p> <pre>{   id: number,   channel_id: number,   imt_message_id: number   null,   data: string,   last_attempt: date   null,   modality: "http"   "imt"   null,   priority: "standard"   "high",   status: "queued"   "queued_imt"   "sent"   "error"   "expired"   "failed",   error_message: string   null,   attempts: number,   inserted_at: date,   updated_at: date }</pre> <p>Error:</p> <pre>{   "reason": string }</pre>	<p>Sends a message to the specified channel ID. An error is returned if the channel is not configured.</p> <p>A successful send command will generate a new MO message event for the channel. Subsequent events will be generated when the message is updated (modality and status). All events will include the same data as the success message.</p>

delete:message	<pre>{   "message_id": number }</pre>	<p>Success:</p> <pre>{   message_id: number,   channel_id: number,   data: string,   priority: "standard"   "high",   inserted_at: date,   updated_at: date }</pre> <p>Error:</p> <pre>{   "error": string }</pre>	Deletes the specified received message and returns the message object that was deleted.
delete:sent	<pre>{   "message_id": number }</pre>	<p>Success:</p> <pre>{   id: number,   channel_id: number,   imt_message_id: number   null,   data: string,   last_attempt: date,   modality: "http"   "imt",   priority: "standard"   "high",   status: "queued"   "queued_imt"   "sent"   "error"   "expired"   "failed",   error_message: string   null,   attempts: number,   inserted_at: date,   updated_at: date }</pre>	Deletes the specified message from the queue. If the message is in the queue or has an error or expired status, it will not be sent or retried.

		<p>Error:</p> <pre>{   "error": string }</pre>	
clear:channel	<pre>{   "channel_id": number }</pre>	<p>Success: No data returned</p> <p>Error:</p> <pre>{   "error": string }</pre>	Deletes all received messages for the specified channel.

## MESSAGING HUB SEND API

The Messaging Hub API provides a programming interface to send Messaging Hub messages to IMT devices from the internet. There are 2 endpoints available: one to send messages and another to retrieve the status of the sent message.

API Keys, which are created in the SkyLink Portal, are required for authentication with the Messaging Hub Send API to send messages.

Endpoint URL	HTTP Action	Request Data Format	Response	Notes
<a href="https://messaging.skylink.net/api/v1/mt/send/serial/&lt;serial_number&gt;/priority/&lt;priority&gt;">https://messaging.skylink.net/api/v1/mt/send/serial/&lt;serial_number&gt;/priority/&lt;priority&gt;</a>	POST	<p>Message Body:</p> <pre>{   cid: number,   data: string }</pre> <p>Message Header:</p> <p>X-api-key : &lt;api-key&gt;</p> <p>Message Parameters:</p> <p>serial_number - Device serial number displayed on SkyLink Portal. It has the following format &lt;XXXX-XXXX&gt;. i.e., 0000-03DE</p> <p>priority - Acceptable values: "standard" or "high"</p>	<p>201 - Message Sent</p> <pre>{   "status": "OK",   "messageId": string,   "requestReference": string }</pre> <p>400 - Data Validation Error</p> <pre>{   "messageId": string,   "status": "Failed",   "message": string }</pre> <p>401 - Unauthorized</p> <p>403 - Forbidden</p> <pre>{   "messageId": string,   "status": "Forbidden",   "message": string }</pre>	Sends a message to the device with specified serial number with the specified channel ID and priority.

			<p>404 - Channel Not Found</p> <pre>{   "messageId": string,   "status": "NotFound",   "message": string }</pre> <p>500 - Server Error</p> <pre>{   "messageId": string,   "status": "Failed",   "message": string }</pre>	
<p><a href="https://messaging.skylink.net/api/v1/mt/status/serial/&lt;serial_number&gt;/requestReference/&lt;request_reference&gt;">https://messaging.skylink.net/api/v1/mt/status/serial/&lt;serial_number&gt;/requestReference/&lt;request_reference&gt;</a></p>	<p>GET</p>	<p>Message Header: X-api-key : &lt;api-key&gt;</p> <p>Message Parameters: serial_number - Device serial number displayed on SkyLink Portal. It has the following format &lt;XXXX-XXXX&gt;. i.e., 0000-03DE</p> <p>request_reference - Request reference UUID returned in the send message response.</p>	<p>201 - Message Status</p> <pre>{   "requestReference": string,   "status": "OK",   "data": {     "type": "mt",     "serial": string,     "messagePending": false   true,     "status": "queued_with_aws"   }   "success"     "message_discarded_on_overflow"     "message_expired"     "message_timed_out"     "message_cancelled"   "unprovisioned"     "subscription_invalid"   "topic_invalid"     "no_response_to_ring"     "not_registered"   "message_failed"  </pre>	<p>Retrieves status of previously sent MT message.</p>

			<pre>"crc_error_in_transfer"   "local_crc_error"   "delayed_access"   "service_disabled"   "registration_expired"   "malformed_json" , "messageId": string } }  401 - Unauthorized  403 - Forbidden {   "requestReference": string,   "status": "Forbidden",   "message": string }  404 - Message was not found {   "requestReference": string,   "status": "NotFound",   "message": string }  500 - Server Error {   "requestReference": string,   "status": "Failed",   "message": string } }</pre>	
--	--	--	---	--



## SKYLINK PORTAL

### Create an API Key

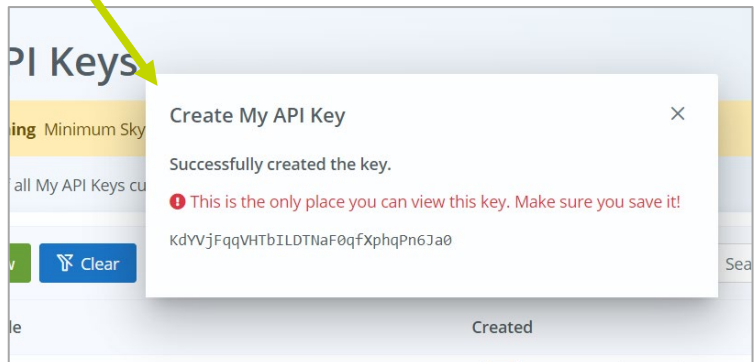
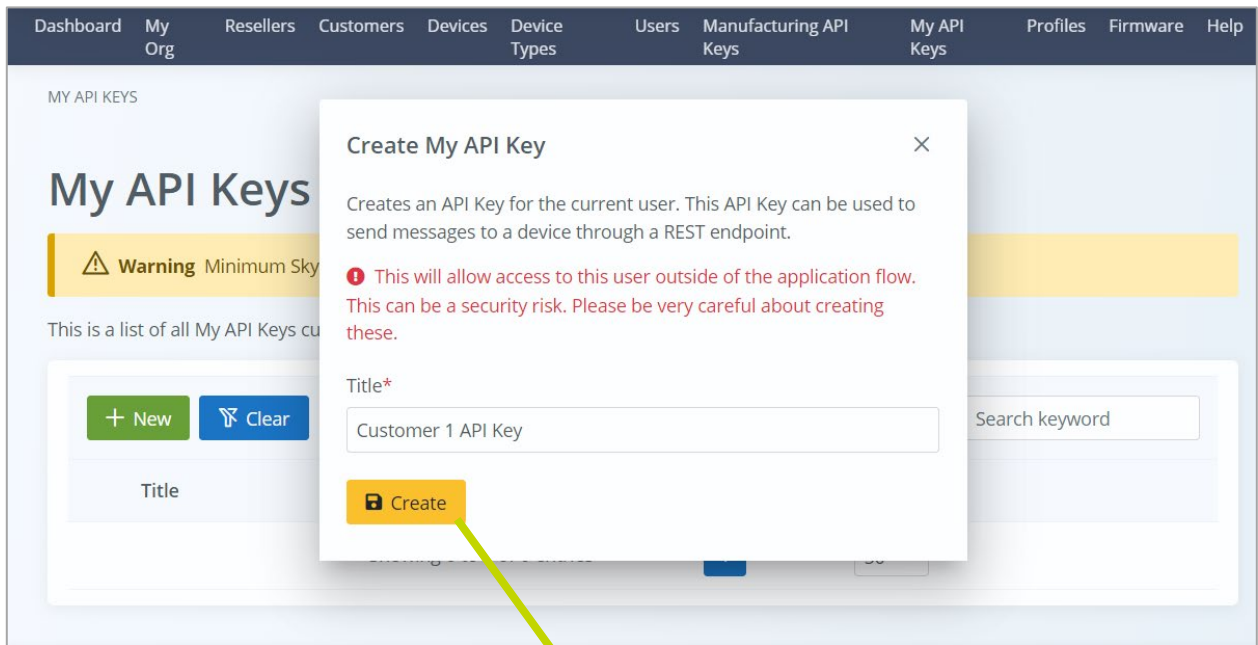
An API Key is used to authenticate the message sent from the customer’s application to a device(s).

The [Messaging Hub Send API](#) section describes *all* endpoints that need an API Key to be passed in the Message Header.

To create an API Key:

1. Under the desired user account, log in to the SkyLink Portal
2. Navigate to the My API Keys screen, where you can create, delete, and see a list of names for all existing API Keys.
3. Click on New, complete the mandatory Title field, then press ‘Create.’

**WARNING:** Once you click ‘Create,’ you will see that particular API Key ONLY once. Be sure to save it!



To remove or revoke an API Key, click the red X next to the desired API Key title.

The screenshot displays the 'My API Keys' management interface. At the top, there is a yellow warning banner that reads: 'Warning Minimum SkyLink firmware version needed for this feature: 2.33'. Below the banner, a text line states: 'This is a list of all My API Keys currently present in the system.' The main content area contains a table with two columns: 'Title' and 'Created'. The table has one row with the title 'Customer 1 API Key' and the creation date 'November 7, 2023'. A red circular icon with a white 'X' is positioned to the left of the title, indicating a removal or revoke action. A yellow arrow points to this red X icon. Above the table, there are two buttons: '+ New' (green) and 'Clear' (blue), and a search box labeled 'Search keyword'. At the bottom of the table, there is a pagination control showing 'Showing 1 to 1 of 1 entries' and a dropdown menu set to '50'.

## Channel Management

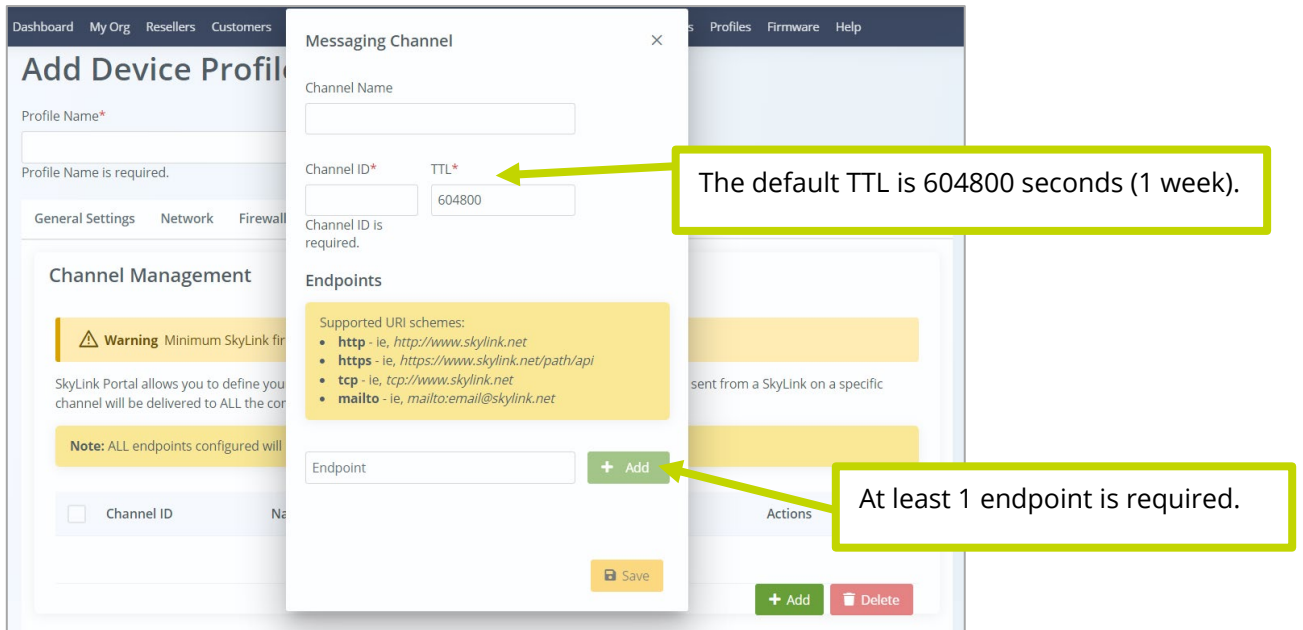
Messaging Hub channels can be added, edited, and deleted in the SkyLink Portal on the Profiles screen. Navigate to 'Device Profiles' and click on the 'Messaging Hub' tab.

To create a channel:

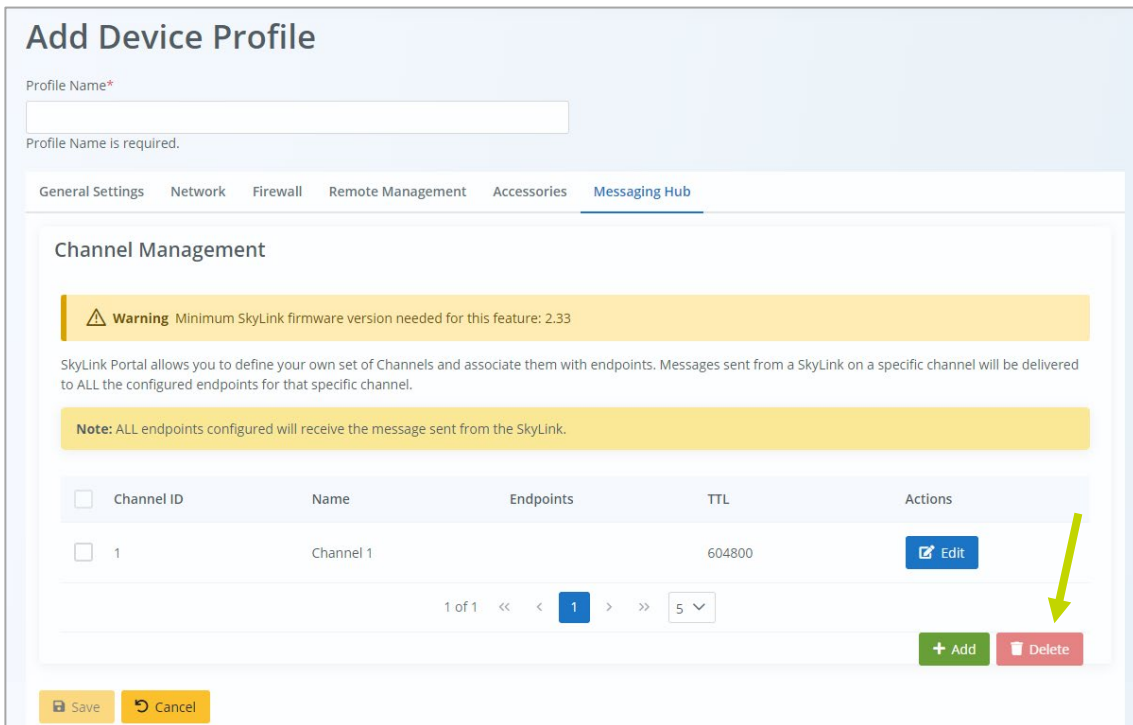
1. Click on the green 'Add' button.

The screenshot shows the 'Add Device Profile' interface in the SkyLink Portal. At the top, there is a navigation bar with various menu items including 'Dashboard', 'My Org', 'Resellers', 'Customers', 'Devices', 'Device Types', 'Users', 'Manufacturing API Keys', 'My API Keys', 'Profiles', 'Firmware', and 'Help'. Below this, the main heading is 'Add Device Profile'. There is a 'Profile Name\*' input field with a validation message 'Profile Name is required.' Below the input field, there are several tabs: 'General Settings', 'Network', 'Firewall', 'Remote Management', 'Accessories', and 'Messaging Hub' (which is selected and highlighted with a blue border). Under the 'Messaging Hub' tab, the 'Channel Management' section is visible. It contains a yellow warning box stating 'Warning Minimum SkyLink firmware version needed for this feature: 2.33'. Below the warning, there is a text block explaining that SkyLink Portal allows defining channels and associating them with endpoints, and that messages sent from a SkyLink on a specific channel will be delivered to all configured endpoints for that channel. A yellow note box states 'Note: ALL endpoints configured will receive the message sent from the SkyLink.' Below the note is a table with the following columns: 'Channel ID', 'Name', 'Endpoints', 'TTL', and 'Actions'. The table currently shows '1 of 1' items, with a blue box around the number '1'. There are navigation arrows and a dropdown menu showing '5'. At the bottom right of the table area, there are two buttons: a green '+ Add' button and a red 'Delete' button. A yellow arrow points to the '+ Add' button. At the bottom left of the page, there are 'Save' and 'Cancel' buttons.

2. Complete the optional and required fields.



3. Press 'Save.' A list of all channels will be displayed on the screen. To remove, select any or all desired channels and press 'Delete.' A dialog box will ask you to confirm the action.



**REMINDER:** After creating channels to a profile, you must associate that profile with a device so that the channels and other configurations are transmitted to it. Please see the SkyLink Cloud Services User Guide for more information.

## SUPPORT

Blue Sky Network is committed to providing the highest level of service and support. If you have any questions or concerns, please feel free to contact us by email or phone; contact information is available at the bottom of this page. For self-help, please visit <https://support.blueskynetwork.com/>.

Thank you for choosing Blue Sky Network!



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