



WHITE PAPER

MANGO WEATHER MONITORING WHITE PAGE

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PURPOSE AND CONFIGURATION

The purpose of Mango Weather Monitoring is to provide a link to the National Weather Service API and allow selected weather alerts to raise Mango events. In this way, a Mango operator can monitor weather conditions at the required sites, and be prepared should atmospheric conditions have the potential to affect safety, equipment, or output. Each site can be configured to raise/ignore a distinct group of chosen weather alerts. This weather API can be deployed at the Edge or on a Cloud instance of Mango.

If additional sites need to be configured, simply re-run the import process using different `SITE_NAME`, `SITE_NUMBER`, `LATITUDE`, and `LONGITUDE` values for each additional site.

The default setting for this data source is to query the National Weather Service API every 30 minutes, at the top and bottom of the hour (XX:00 and XX:30). This can be modified.

This document will walk you through the process of adding the Mango Weather Monitoring data source to your Mango Series 4 system.

Location Information

Each site (location) that will be monitored must be represented by a data point within the Mango Weather Monitoring data source. Multiple sites can be monitored in the same installation, as long as each site number value used is unique.

To remove a site from weather monitoring, the location data point can be deleted or disabled. If this is done, the alert data points for this site should also be deleted or disabled, because if they aren't, they will all raise Configuration: Not Polling alarms after 24 hours.

There are two types of site data points: location and totalAlerts.

'Location' data point

Weather location data points must have the following features:

- **Site Name**
 - No punctuation
 - Spaces and underscores `_` are allowed
- **Tags**
 - **site:** Alphanumeric value unique to this location, often an ID number provided by the customer
 - No punctuation or spaces
 - Underscores `_` are allowed
 - **type:** This should be set to **location**
 - **latitude:** This should be set to the latitude part of the site's geocoordinates
 - **longitude:** This should be set to the longitude part of the site's geocoordinates
- **Event Detector**
 - **Validation Failure:** If the location data point is configured incorrectly, this will raise an event in Mango and the value of the location data point will contain the details of the misconfiguration.
 - Location missing latitude tag

- Location missing latitude tag
- Location missing longitude tag
- Missing site tag
- Alert misconfigured: An alert is enabled for this location, but the alert tag is missing from the alert data point
- API exception: An unexpected result was returned by the API. See the scripting log file for additional information for troubleshooting.

'TotalAlerts' data point

For each site in the data source, there will also be a data point that tracks the total number of active weather alerts for the site. The totalAlerts data point must have the following features:

- **Site Name**
 - No punctuation
 - Spaces and underscores _ are allowed
- **Tags**
 - **site:** Alphanumeric value unique to this location, often an ID number
 - No punctuation or spaces
 - Underscores _ are allowed
 - **type:** This should be set to **totalAlerts**

The data source will not link this data point to any event detectors or event handlers by default.

Weather Alerts

The National Weather Service currently provides monitoring for 129 different alerts across two platforms. This data source queries both the Forecast Zone and County alert platforms and can raise a distinct Mango event for each type of weather alert provided by the API. Each alert will be represented by two data points and two event detectors. Installing this data source will automatically create data points and event detectors for all alert types. To exclude one or more types of alerts from a specific site, the related alert data points can be disabled or deleted.

There are two data points for each weather alert category: alert and expiration.

Alert data points

If there is an Active weather alert at the site, the corresponding alert data point will have a non-zero value and will raise an event.

- **Tags**
 - **site:** Alphanumeric value unique to this location, often an ID number provided by the customer
 - No punctuation or spaces
 - Underscores _ are allowed
 - **type:** This should be set to **alert**
 - **alert:** This should be set to the case-sensitive alert name that is an exact match to the event name returned by the API
 - A list of Forecast Zone alerts can be found here: <https://api.weather.gov/alerts/types>
 - The County-level alerts are:
 - Severe Thunderstorm Warning
 - Tornado Warning
 - Flash Flood Warning
 - Special Marine Warning
 - Snow Squall Warning

- Dust Storm Warning
 - Dust Storm Advisory
 - Extreme Wind Warning
 - If an alert appears in both lists, one data point will be used and will combine the results from both
- **Event Detectors**
 - **Not Polling:** This event will be raised if an alert data point has not received an updated value in more than 24 hours. If this event is active, troubleshoot and resolve the underlying configuration problem.
 - **Alert Active:** This event will be raised if one or more of the selected alerts is active at the current location
 - The value of the alert data point will include the number of alerts that are currently active
 - Once all active alerts of the selected type have cleared, the Mango event will return to normal

Expiration data points

If there is an active weather alert at the site, the corresponding expiration data point will show the expiration time of the active alert. If there is more than one active alert of the same type, the expiration data point will be set to the expiration time of the last alert scheduled to expire by the National Weather Service.

Each expiration data point will have the following features:

- **Tags**
 - **site:** Alphanumeric value unique to this location, often an ID number
 - No punctuation or spaces
 - Underscores _ are allowed
 - **type:** This should be set to **expiration**
 - **alert:** This should be set to the case-sensitive alert name that is an exact match to the event name returned by the API

Troubleshooting

The Mango Weather Monitoring data source is configured to raise Mango events when it encounters unexpected situations. These events are all assigned to the Mango Weather Monitoring Configuration Alarms event handler. If a Configuration Alarm is raised, the value of the Location data point will be set to a brief description of the failure.

The Mango Weather Monitoring data source also writes log data to the Scripting log file. The default log level is set to Info, but additional log data will be available if the data source log level is set to Debug or Trace.

The most common issues are:

- **Site tag not found:** The location data point does not have a tag named “site”
 - Each location data point must have a site tag with a unique value. If this Mango installation doesn’t have a designated site number, use a placeholder value such as 123.
- **Latitude or Longitude tag not found:** The location data point does not have a tag named “latitude” or “longitude”
 - The API requires the latitude and longitude of the location to determine which alerts are active. These tags are required on the location data point.
- **Alert point with no alert tag value:** An alert data point has been created (type=alert) but does not have a tag named “alert”
 - The alert tag is required to map a specific type of weather alert to a single data point

- **API exception in logs:** An unexpected exception occurred when communicating with the National Weather Service API.
 - The Mango scripting log file should have additional information for troubleshooting
 - This could be caused by several different issues including:
 - Network outage when the data source attempted to query the API
 - API Outage at the National Weather Service
 - API response did not provide a Forecast Zone or County code because the latitude/longitude is invalid or outside the coverage area
 - Changes to the API specification by the National Weather Service that will require an update to the script

INSTALLATIONS

In most cases, one data source will monitor one location. If an additional location is to be added to an existing data source, repeat these steps with a different Site Name, Site Number, Latitude, and Longitude.

Mango Installation

Preparing the JSON import files

Each Mango installation will need its own custom copy of the mangoWeatherMonitoringImport.json file that is included in the package. This JSON file contains placeholders for the Site Number, Site Name, Latitude, and Longitude that must be replaced with the actual values for each monitored location. If this installation does not use a Site Name, you will need to customize the JSON file with appropriate placeholders. The data source will not function correctly without the site tag containing a unique value.

1. Make a site-specific copy of the mangoWeatherMonitoringImport.json file for importing
 - a. Find/Replace #SITENUMBER# with the actual site number
 - b. Find/Replace #SITENAME# with the actual site name
 - c. Find/Replace #LATITUDE# with the actual site latitude
 - d. Find/Replace #LONGITUDE# with the actual site longitude
 - e. If needed, create additional data point tags other than Site Name and Site Number in the JSON file to meet the needs of the specific project
2. Import the required Data Points
 - a. Import data points using the custom **mangoWeatherMonitoringImport.json**

Choose the Alerts

The import process will create a data point for every available type of weather alert. In some cases, it may not be necessary to monitor every alert type in every location. If an alert type is not needed for the current site, that alert data point can be deleted or disabled.

Configure the Event Handlers

This package includes two event handlers:

1. Mango Weather Monitoring Active Alerts
 - a. All events related to active weather alerts are assigned to this event handler
2. Mango Weather Monitoring Configuration Alarms
 - a. All events related to configuration issues or validation failures are assigned to this event handler

Configure these e-mail event handlers to deliver e-mails as needed.

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