

Mnemonic Limit Definitions

This page defines the format of the limit definitions used by the Data Viewer application.

A Limit Definition is a JSON object that describes limit thresholds for a single mnemonic telemetry value. The operator/user will be notified when a limit is triggered.

The top level object supports the following fields:

Field	Required	Value Format	Meaning
<code>limits</code>	Yes	JSON Array	Array of 1 or more limit objects. Each object defines a set of limit thresholds. If a Limit Definition does not define a context mnemonic, the array should contain a single object.
<code>cm</code>	No	String or integer	Context Mnemonic. The optional mnemonic that is used to determine if a limit should be checked. Can be provided as the mnemonic name or numeric ID. For example, you may want to only check a current limit when a temperature is between 25 and 30 celsius.

Each limit object supports the following fields:

Field	Required	Value Format	Meaning
<code>cr</code>	No	Single number or range syntax	Context range. Only used if <code>cm</code> is provided at the top level. If the context mnemonic equals this value or falls within this range, the limit will be checked. If <code>cm</code> is provided but <code>cr</code> is not, the limit object will be used as the "default" limit. Single number example: <code>1.5</code> the limit will be used when the context mnemonic's value equals <code>1.5</code> . Range example: <code>"5.2..10.3"</code> the limit will be used when the context mnemonic's value falls between 5.2 and 10.3, inclusive.
<code>ec</code>	No	Integer	Excursion count. Number of consecutive telemetry values that must exceed a threshold before the limit is triggered. Defaults to 2 if not provided.
<code>yh</code>	No	Number	Yellow high threshold. Triggers a yellow high alarm when the telemetry value is greater than or equal to this value for the required excursion count.

Field	Required	Value Format	Meaning
yl	No	Number	Yellow low threshold. Triggers a yellow low alarm when the telemetry value is less than or equal to this value for the required excursion count.
rh	No	Number	Red high threshold. Triggers a red high alarm when the telemetry value is greater than or equal to this value for the required excursion count.
rl	No	Number	Red low threshold. Triggers a red low alarm when the telemetry value is less than or equal to this value for the required excursion count.

Note: At least 1 of the threshold values must be defined

Example A:

- Limit definition for a BOARD_TEMP mnemonic
- Single limit with no context mnemonic
- Yellow high undefined
- Excursion count of 5 means the value must exceed the threshold for 5 consecutive values

```
{
  "limits": [
    {
      "ec": 5,
      "rh": 20,
      "yl": -5,
      "rl": -12
    }
  ]
}
```

The below visualizes how the limit thresholds are evaluated:

y-axis: Telemetry value

```

^
|
| RED HIGH alarm zone
| value >= 20 for 5 consecutive samples
20 +----- rh
|

```

```

|
|
| Nominal range
|
|
|
-5 +----- yl
| YELLOW LOW alarm zone
| value =< -5 for 5 consecutive samples
|
-12 +----- rl
| RED LOW alarm zone
| value =< -12 for 5 consecutive samples
|
+-----> x-axis: time / samples
|

```

Example B:

- Limit definition for a `CURRENT_MONITOR` mnemonic
- `BOARD_TEMP` context mnemonic is used to determine which limit should be checked
- Defines a "default" limit that is used when none of the context ranges are satisfied
- Defines a limit with a context range using the range syntax. If the `BOARD_TEMP` is `[0, 25]`, then this limit will be used.

```

{
  "cm": "BOARD_TEMP",
  "limits": [
    {
      "rh": 2.5,
      "yh": 2.0
    },
    {
      "cr": "0..25",
      "ec": 3,
      "rh": 2.3,
      "yh": 1.8
    }
  ]
}

```