

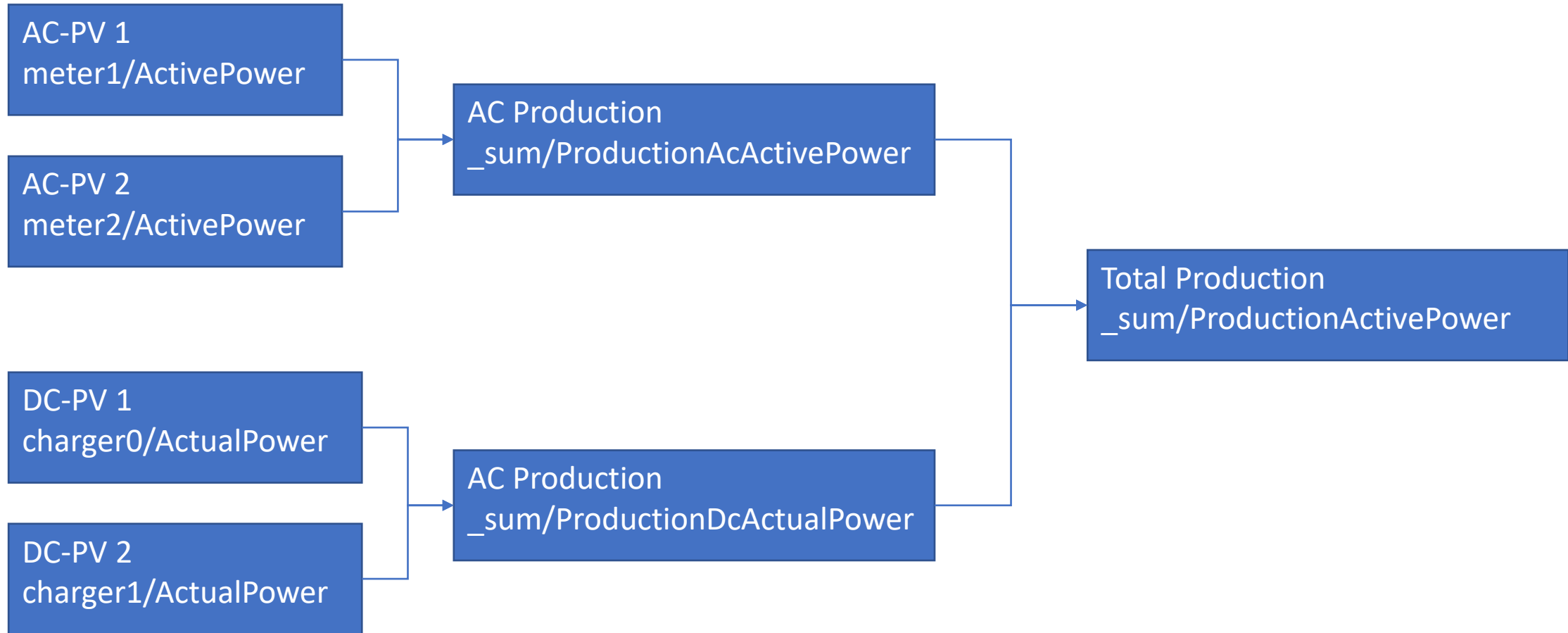
# OpenEMS

# Prediction Architecture

Project EMSIG

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# OpenEMS Production data



# OpenEMS Consumption data

- Consumption is not measured, but calculated:  
 $\text{Consumption} = \text{Storage Discharge} + \text{Grid Buy} + \text{Production AC}$

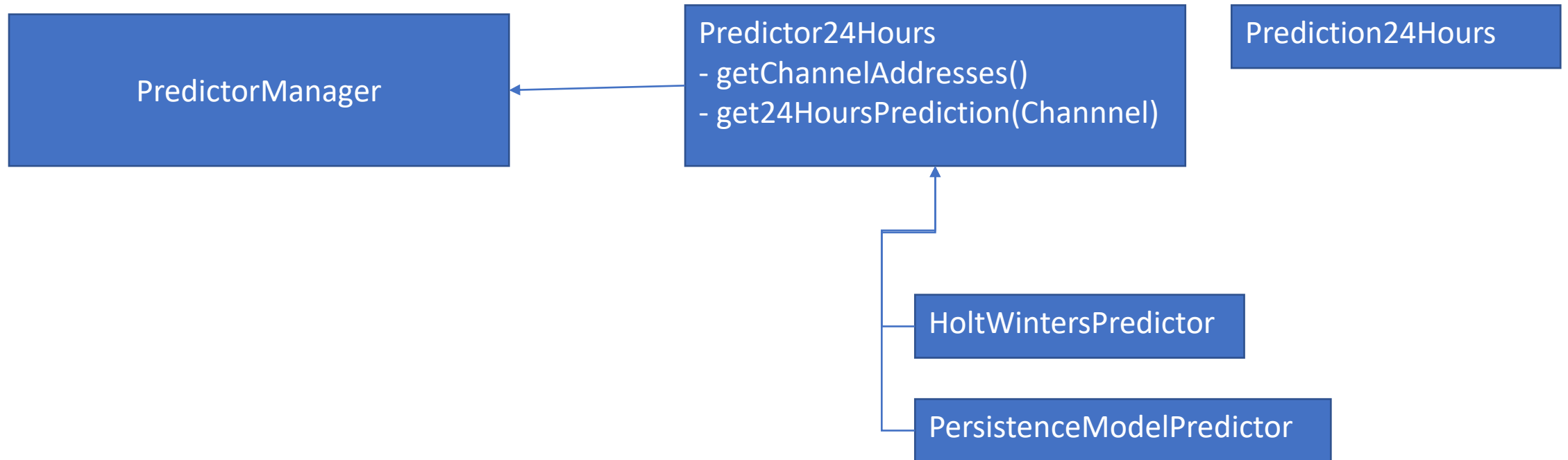
Total Consumption  
\_sum/ConsumptionActivePower

- Interesting for prediction: Non-Regulated Consumption  
 $\text{NRC} = \text{Total Consumption} - \text{Electric Vehicle Charging} - \text{Heat-Pump} - \dots$

# Use-Cases

- Get prediction for total production and total (NR) consumption for next 24 hours  
to be used by
  - „Netzdienliche Eigenverbrauchsoptimierung“  
(Predictive Delayed-Charge Controller)
  - „Hochlastzeitfenster“  
(Predictive Highloadtimeslot Controller)
  - Visualization in OpenEMS UI
  - Flexibility calculation
  - ...
- Sampling rate: 1 value per 15 minutes/1 hour

# Modular Predictors



# Example Predictor: Holt -Winters

meter: socomec: lgreennase

**Predictor Holt-Winters** ✕

Component-ID  ⋮  
Unique ID of this Component (id)

Alias  ⋮  
Human-readable name of this Component; defaults to Component-ID (alias)

Is enabled?   
Is this Component enabled? (enabled)

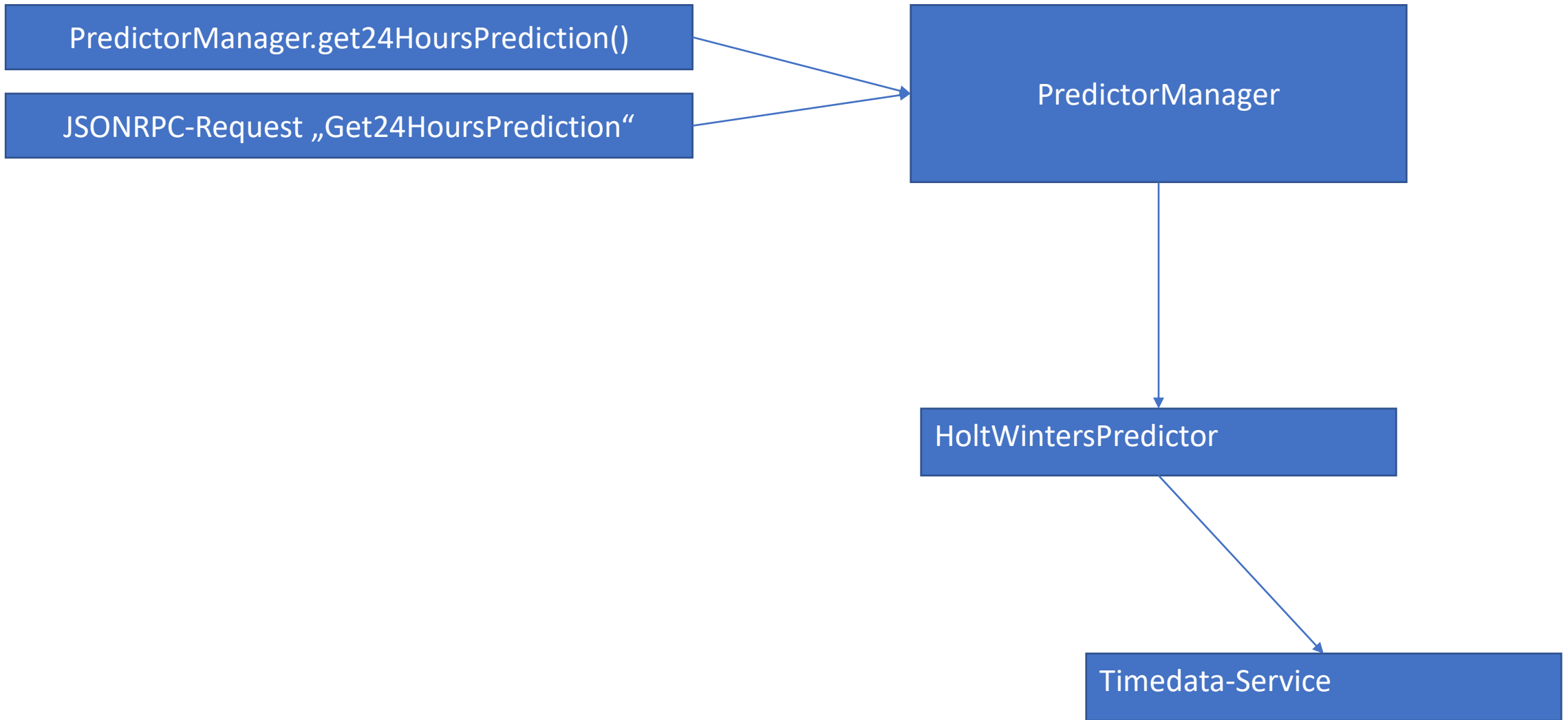
Channel-Addresses  ⋮ + -  
 ⋮ + -  
List of Channel-Addresses this Predictor is used for (channelAddresses)

**Configuration Information**

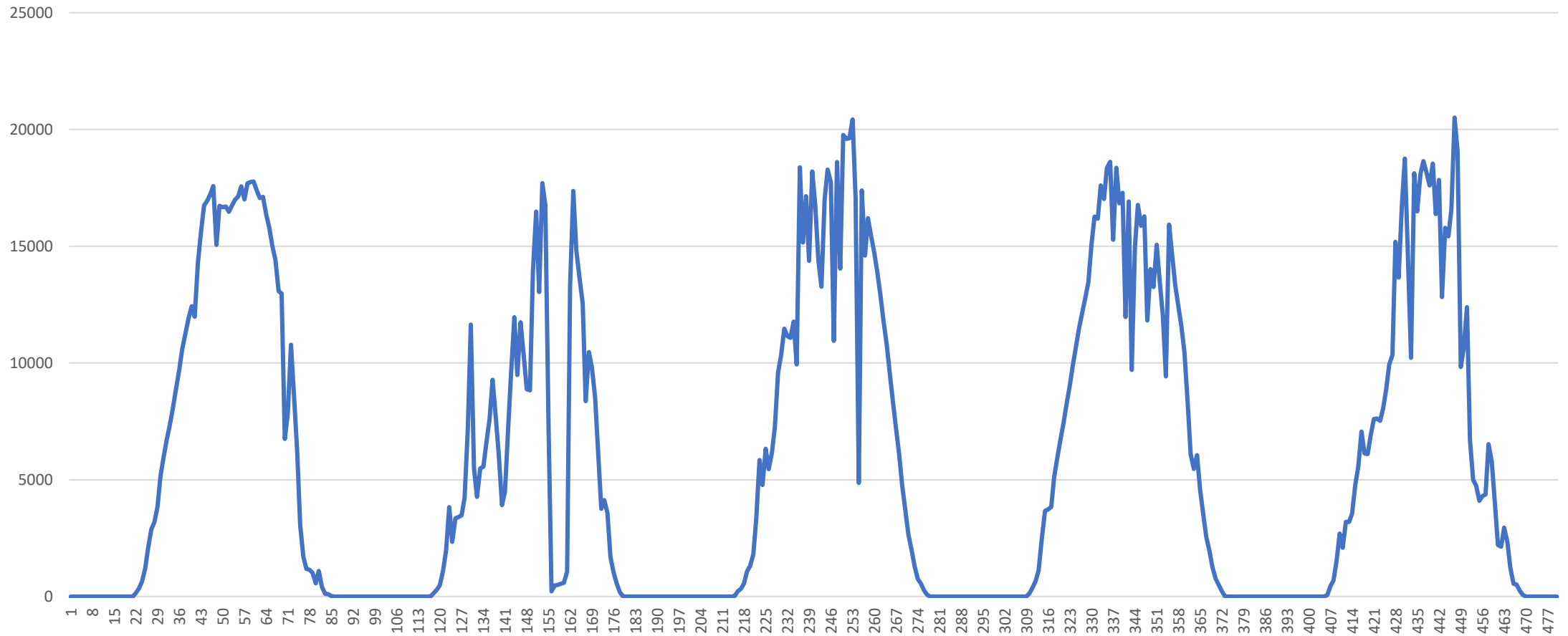
Persistent Identity (PID) Predictor.HoltWinters.174964dc-88b8-4318-bb95-2a2093bb0675

Factory Persistent Identifier (Factory PID) Predictor.HoltWinters

Configuration Binding



# Input data from Timedata-Service





# JSONRPC-Request to PredictorManager

The screenshot shows a REST client interface for a "DRAFT" request named "Get State". The request is a POST to the URL "http://localhost:8084/jsonrpc" (length: 29 byte(s)). The headers are set to "Basic YWRtaW46YV" for authorization and "application/json" for content type. The body is a JSON object representing a component JSON API request.

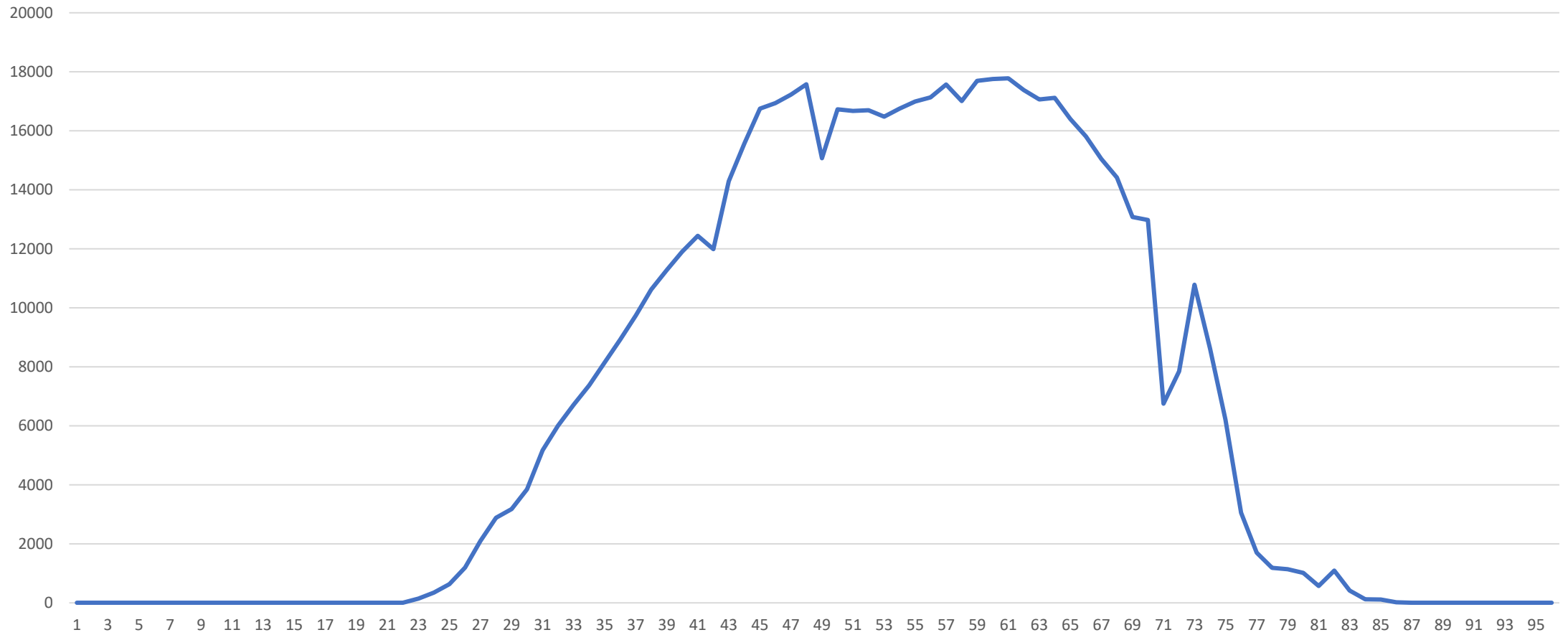
**Request Details:**

- Method:** POST
- URL:** http://localhost:8084/jsonrpc
- Headers:**
  - Authorization: Basic YWRtaW46YV
  - Content-Type: application/json
- Body (JSON):**

```
1 {
2   "method": "componentJsonApi",
3   "params": {
4     "componentId": "_predictorManager",
5     "payload": {
6       "method": "get24HourPrediction",
7       "params": {
8         "channel": "meter1/ActivePower"
9       }
10    }
11  }
12 }
```



# Result



# Work in progress:

- <https://github.com/OpenEMS/openems/pull/1327>