

# **Hi MATE AEMP2.0**

## **User Manual & Programmer Reference Guide**

Version 2.0

## Revision History

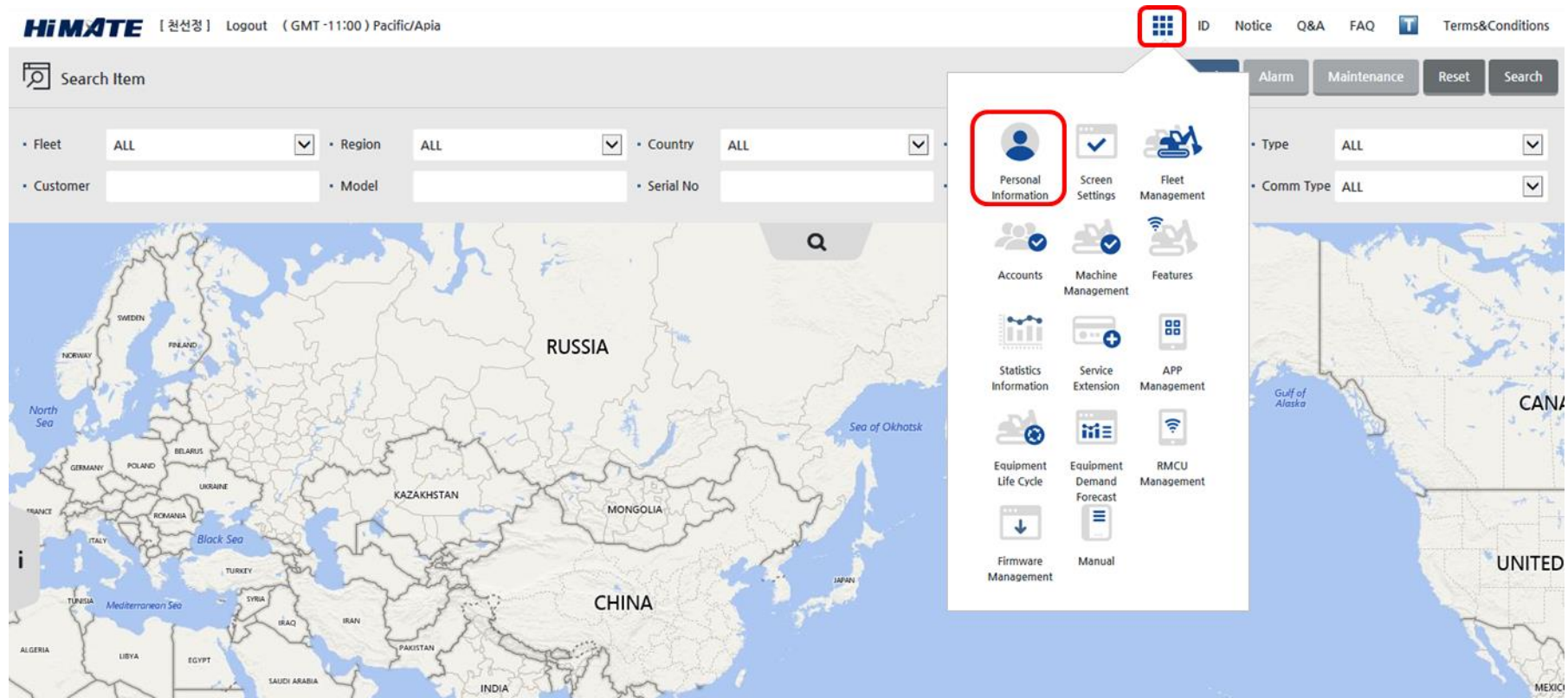
| Version | Date        | Details                                                                                                                                                                                                                                       |
|---------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.0     |             | Previous Versions<br>※ This version will be expired on 9 <sup>th</sup> October 2018.                                                                                                                                                          |
| 2.0     | 20/Sep/2018 | 1. Changed URL ( <a href="https://himate.hyundai-ce.com:8084">https://himate.hyundai-ce.com:8084</a> )<br>2. Added Faults(SPN, FMI), Actual Working Hours, Travelling Hours, Idling Hours, Breaker Hours, Crusher Hours, Engine Torque Hours. |

※ How to get an security credential key issues

1. Log into “Hi MATE” (<https://himate.hyundai-ce.com/>)



2. If you do not have a user ID, please sign up.
3. Go to “Personal Information”



4. Fill out “Request to User API” on the bottom (Company name & Access IP)

**Update My Account**

**Password**

Save Cancel

• Current Password  case sensitive

• New Password  8-12 characters, case sensitive

• Re-enter New Password  8-12 characters, case sensitive

**Account Information**

Save Cancel

• Name  CHEON SEON JEONG

• Country  South Korea

• State / Province

• City

• Telephone  3-6952 cannot include spaces

• Mobile  010-5012-7771 cannot include spaces

• E-Mail  seonjeong.cheon@hyundai-ce.com

**Request to Use API**

Save Cancel

• Using request ☐

• Company

• Access IP

• Certified Key

• Duration

• Status

Delete Account

5. Click on “Save” button to request to HHI. After HHI administrator approves, you will receive Authorization Key.

## Hi-mate AEMP 2.0 REST WEB API

1 URL : <https://himate.hyundai-ce.com:8084>

### 2 Web Service List

| Web Service                         | Description                     | URL                                                                                                                                                                                                                | Parameters                                | Return values                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Common                              | Machine Common info.            | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/ {MakeCode}/{Model} /{ SerialNumber}</a> | MakeCode,<br>Model,<br>SerialNumber       | UnitInstallDateTime<br>Make<br>Model<br>EquipmentID<br>SerialNumber<br>AverageLoadFactorLast24<br>Location<br>CumulativeActiveRegenerationHours<br>CumulativeIdleHours<br>CumulativeLoadCount<br>CumulativeOperatingHours<br>CumulativePowerTakeOffHours<br>CumulativePayloadTotals<br>Distance<br>EngineStatus<br>FuelUsed<br>FuelUsedLast24<br>FuelRemaining<br>MaximumSpeedLast24 |
| Common information of all equipment | A Max. of 15 equipment per page | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/{PageNumber}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/{PageNumber}</a>                                                                  | PageNumber                                | PageNumber<br>TotalListCount<br>Common information                                                                                                                                                                                                                                                                                                                                   |
| Header information of all equipment | Header information              | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/{StartDate}/{EndDate}</a>                                                | StartDate, EndDate<br>: format yyyy-MM-dd | Header List of Common<br>UnitInstallDateTime<br>Make<br>Model<br>EquipmentID                                                                                                                                                                                                                                                                                                         |

## Hyundai Construction Equipment

|                           |                                          |                                                                                                                                                                                                                                                                                                               |                                                                       |                                                                                                                                       |
|---------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
|                           |                                          |                                                                                                                                                                                                                                                                                                               |                                                                       | SerialNumbe                                                                                                                           |
| CumulativeOperating Hours | Cumulative operating hours               | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/CumulativeOperatingHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/CumulativeOperatingHours/{StartDate}/{EndDate}</a> | MakeCode, Model, SerialNumber, StartDate, EndDate : format yyyy-MM-dd | Datetime<br>Hour<br>ResetDatetime                                                                                                     |
| CumulativeLoadFactor      | Average daily load factor                | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/CumulativeLoadFactor/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/CumulativeLoadFactor/{StartDate}/{EndDate}</a>         | MakeCode, Model, SerialNumber, StartDate, EndDate : format yyyy-MM-dd | Datetime<br>Average daily load factor (LoadFactor)<br>ResetDatetime                                                                   |
| EngineStatus              | Is engine running                        | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/EngineStatus/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/EngineStatus/{StartDate}/{EndDate}</a>                         | MakeCode, Model, SerialNumber, StartDate, EndDate : format yyyy-MM-dd | Datetime<br>Engine running (Running)                                                                                                  |
| Faults                    | Description of fault                     | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/Faults/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/Faults/{StartDate}/{EndDate}</a>                                     | MakeCode, Model, SerialNumber, StartDate, EndDate : format yyyy-MM-dd | Datetime<br>Fault code identifier(identifier)<br><b>SPN</b><br><b>FMI</b><br>Description<br>Fault code severity(severity)<br>Language |
| FuelUsed                  | Amount of fuel used in the last 24 hours | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/FuelUsed/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/FuelUsed/{StartDate}/{EndDate}</a>                                 | MakeCode, Model, SerialNumber, StartDate, EndDate : format yyyy-MM-dd | Datetime<br>FuelUnits<br>FuelConsumed<br>ResetDateTime                                                                                |
| FuelRemaining             | Percent of fuel remaining                | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/FuelRemaining/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/FuelRemaining/{StartDate}/{EndDate}</a>                       | MakeCode, Model, SerialNumber, StartDate, EndDate : format yyyy-MM-dd | Datetime<br>Percent<br>FuelTankCapacityUnits<br>FuelTankCapacity                                                                      |
| Locations                 | Last known location                      | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/Locations/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/Locations/{StartDate}/{EndDate}</a>                               | MakeCode, Model, SerialNumber,                                        | Datetime<br>Latitude<br>Longitude                                                                                                     |

## Hyundai Construction Equipment

|                    |                                                        |                                                                                                                                                                                                                                                                                                   | StartDate, EndDate<br>: format yyyy-MM-dd                                         | Altitude<br>AltitudeUnits                                                                                                                                                                                             |
|--------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ActualWorkingHours | A day's working hours                                  | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/ActualWorkingHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/ActualWorkingHours/{StartDate}/{EndDate}</a> | MakeCode,<br>Model,<br>SerialNumber,<br>StartDate, EndDate<br>: format yyyy-MM-dd | Datetime<br>Hour<br>ResetDatetime                                                                                                                                                                                     |
| TravellingHours    | A day's travelling hours                               | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/TravellingHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/TravellingHours/{StartDate}/{EndDate}</a>       | MakeCode,<br>Model,<br>SerialNumber,<br>StartDate, EndDate<br>: format yyyy-MM-dd | Datetime<br>Hour<br>ResetDatetime                                                                                                                                                                                     |
| IdlingHours        | A day's idling hours                                   | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/IdlingHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/IdlingHours/{StartDate}/{EndDate}</a>               | MakeCode,<br>Model,<br>SerialNumber,<br>StartDate, EndDate<br>: format yyyy-MM-dd | Datetime<br>Hour<br>ResetDatetime                                                                                                                                                                                     |
| BreakerHours       | A day's breaker hours                                  | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/BreakerHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/BreakerHours/{StartDate}/{EndDate}</a>             | MakeCode,<br>Model,<br>SerialNumber,<br>StartDate, EndDate<br>: format yyyy-MM-dd | Datetime<br>Hour<br>ResetDatetime                                                                                                                                                                                     |
| CrusherHours       | A day's crusher hours                                  | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/CrusherHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/CrusherHours/{StartDate}/{EndDate}</a>             | MakeCode,<br>Model,<br>SerialNumber,<br>StartDate, EndDate<br>: format yyyy-MM-dd | Datetime<br>Hour<br>ResetDatetime                                                                                                                                                                                     |
| EngineTorqueHours  | Cumulative Engine torque hours (Distribution, Seconds) | <a href="https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/EngineTorqueHours/{StartDate}/{EndDate}">https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/{MakeCode}/{Model}/{SerialNumber}/EngineTorqueHours/{StartDate}/{EndDate}</a>   | MakeCode,<br>Model,<br>SerialNumber,<br>StartDate, EndDate<br>: format yyyy-MM-dd | Datetime<br>EngineTorqueHourT30<br>EngineTorqueHourT30_40<br>EngineTorqueHourT40_45<br>EngineTorqueHourT45_50<br>EngineTorqueHourT50_53<br>EngineTorqueHourT53_56<br>EngineTorqueHourT56_59<br>EngineTorqueHourT59_62 |



|  |  |  |  |                                                                                                                                                                                                                            |
|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  |  | EngineTorqueHourT62_65<br>EngineTorqueHourT65_68<br>EngineTorqueHourT68_71<br>EngineTorqueHourT71_74<br>EngineTorqueHourT74_77<br>EngineTorqueHourT77_80<br>EngineTorqueHourT80_90<br>EngineTorqueHourT90<br>ResetDatetime |
|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3 Description of return values

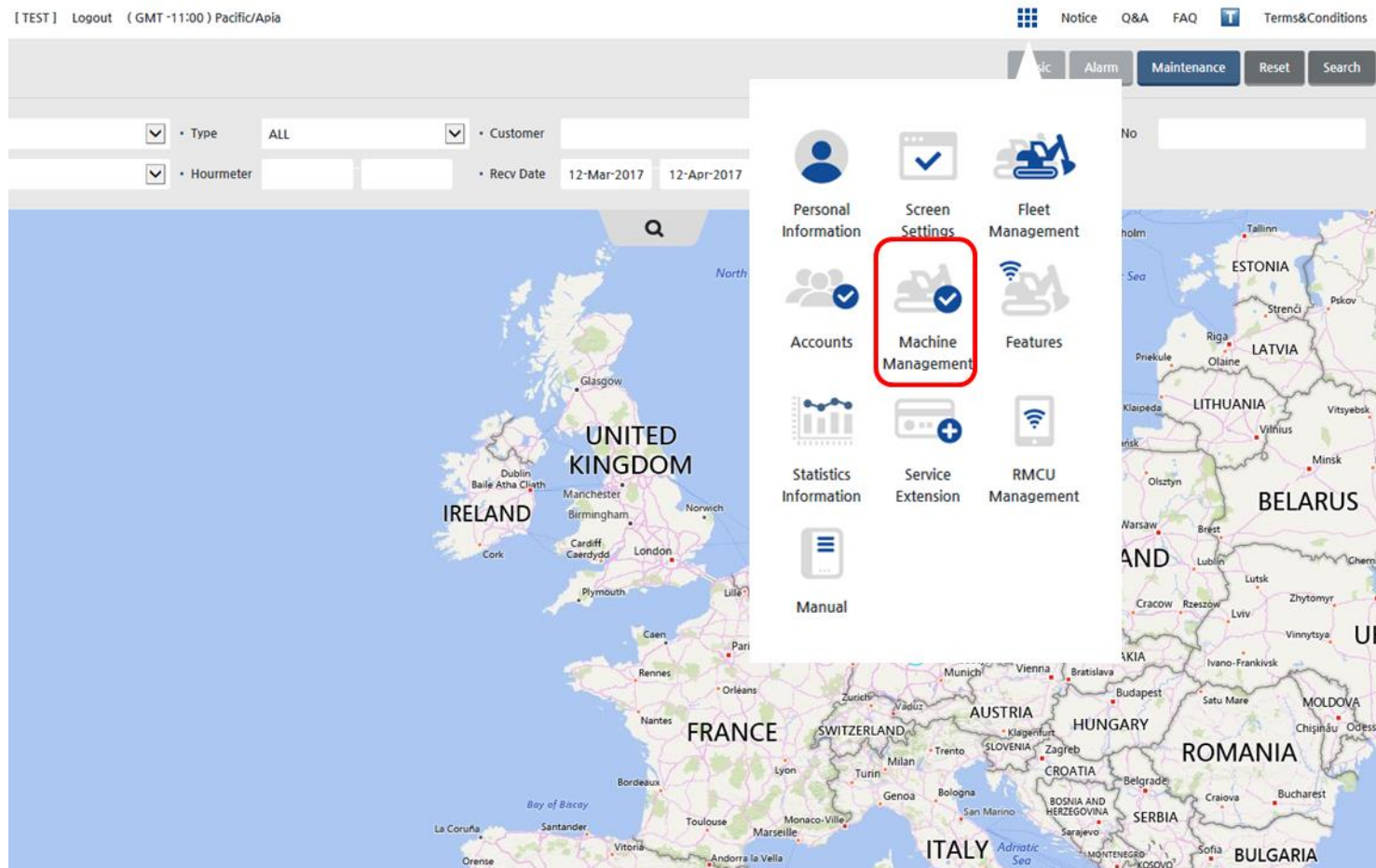
| Web Service | Return values                     | Description                                                                            | Remark  |
|-------------|-----------------------------------|----------------------------------------------------------------------------------------|---------|
| Common      | UnitInstallDateTime               | Time the machine was registered on Hi MATE system                                      |         |
|             | EquipmentID                       | The same with serial number                                                            |         |
|             | AverageLoadFactorLast24           | Last updated operating rate<br>: (Engine Run Hour – Idle Hour) / Engine Run Hour * 100 |         |
|             | Location                          | Last updated location                                                                  |         |
|             | CumulativeActiveRegenerationHours |                                                                                        | No Data |
|             | CumulativeIdleHours               |                                                                                        | No Data |
|             | CumulativeLoadCount               |                                                                                        | No Data |
|             | CumulativeOperatingHours          | Last updated cumulative operating hours (Hourmeter)                                    |         |
|             | CumulativePowerTakeOffHours       |                                                                                        | No Data |
|             | CumulativePayloadTotals           |                                                                                        | No Data |
|             | Distance                          |                                                                                        | No Data |
|             | EngineStatus                      | The engine running state on that day (Run = True)                                      |         |
|             | FuelUsed                          |                                                                                        | No Data |
|             | FuelUsedLast24                    | Last updated fuel usage during a day                                                   |         |
|             | FuelRemaining                     | Last updated machine fuel level percentage                                             |         |
|             | MaximumSpeedLast24                |                                                                                        | No Data |

## Hyundai Construction Equipment

|                                     |                                        |                                                                                        |         |
|-------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------|---------|
| Common information of all equipment | TotalListCount                         | The page of machine list                                                               |         |
|                                     | Common information                     | The data in the common                                                                 |         |
| CumulativeOperatingHours            | Hour                                   | The cumulative operating hours (Hourmeter) on that day                                 |         |
| CumulativeLoadFactor                | Average daily load factor (LoadFactor) | Last updated operating rate<br>: (Engine Run Hour - Idle Hour) / Engine Run Hour * 100 |         |
| EngineStatus                        | Engine running (Running)               | The engine running state on that day (Run = True)                                      |         |
| Faults                              | Fault code identifier(identifier)      | Packet type<br>- 41 : Warning<br>- 61 : DTC from MCU<br>- 71 : DTC from ECM            |         |
|                                     | SPN                                    | SPN code                                                                               |         |
|                                     | FMI                                    | FMI code                                                                               |         |
|                                     | Description                            | The information of fault code                                                          |         |
|                                     | Fault code severity(severity)          | The severity of fault code (level 1~4)                                                 |         |
|                                     | Language                               | The language of description                                                            |         |
| FuelUsed                            | FuelConsumed                           | A day's fuel usage on that day                                                         |         |
| FuelRemaining                       | Percent                                | The fuel level percentage on that day                                                  |         |
|                                     | FuelTankCapacityUnits                  |                                                                                        | No Data |
|                                     | FuelTankCapacity                       |                                                                                        | No Data |
| Locations                           | Latitude                               | The latitude on that day                                                               |         |
| Locations                           | Longitude                              | The longitude on that day                                                              |         |
|                                     | Altitude                               | The altitude in meters on that day                                                     |         |
| ActualWorkingHours                  | Hour                                   | A day's actual working hours on that day                                               |         |
| TravellingHours                     | Hour                                   | A day's travelling hours on that day                                                   |         |
| IdlingHours                         | Hour                                   | A day's idling hours on that day                                                       |         |
| BreakerHours                        | Hour                                   | A day's breaker hours on that day                                                      |         |
| CrusherHours                        | Hour                                   | A day's crusher hours on that day                                                      |         |
| EngineTorqueHours                   | EngineTorqueDistribution               | The distribution of engine torque percentage                                           |         |
|                                     | Hour(Seconds)                          | Cumulative engine torque seconds until that day                                        |         |

#### 4 How to check a machine 'SerialNumber'

- ① Select "Machine Management" (App List > Machine Management)



- ② If you select a machine serial number, a pop-up screen will be shown up. Please refer to the screen below.

Check the “Machine No”

The screenshot displays the 'Machine Management' interface. At the top, there are tabs for 'Machine Info.', 'Dealership Info.', 'Information Lost.', and 'My Machines Service'. Below these, a breadcrumb trail shows 'Basic Information > Machine Management'. A search bar with 'Search', 'Activation', and 'Print' buttons is present. The main area contains filters for 'Type' (ALL), 'Model', 'Serial No', and 'RCMU M/N'. There are also checkboxes for 'Hi MATE Service', 'Rent Machine', 'Used Machine', and 'MCU Replace'. A 'Sort by' dropdown is set to 'Model' with 'descending' order selected. A table lists machines, with the first entry 'HL740TM-9A' and serial number '0001' highlighted. A red box around the serial number has a red arrow pointing to the 'Machine No' field in the 'Detail Information' pop-up. This field contains 'HHKH'. Other fields in the detail view include 'Sales Model' (HL7), 'Engine Maker' (Cummins), 'RCMU Modem No' (KQ01), 'E-Mail' (KQ0100008451HCE1211X1@ORBCOMM2.NET), 'Dealer Code' (EU406), 'Region' (Europe), 'Delivery Date' (27-Feb-2015), 'Service Start Date' (28-May-2014), 'Dealer Name' (HYUNDAI BAUMASCHIN), 'Country' (Germany), 'Customer No', and 'Service End Date' (28-May-2016). A note at the bottom right states '\* Indicates a required field'. At the bottom of the pop-up, there are 'Save' and 'Close' buttons. Below the pop-up, there are fields for 'MCU Serial No', 'Input Date', 'Last Hourmeter', and 'Replace Date', along with a 'Replace MCU' button. A table at the very bottom has columns for 'No', 'Replace Date', 'MCU Serial No', 'Hourmeter' (Hour, Sec), and 'Input' (Name, Date).

- ③ Use the “<https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/{startDate}/{endDate}>”, you get the machine header list of your owned equipment.

### 5 Precautions

- ① Implementers will control access via Basic Access Authentication using HTTPS.
- ② Date & Time are expressed as : YYYY-MM-DD
- ③ Any endpoint providing time-series data will contain a maximum of thirty days of data from the current UTC date. The Snapshot endpoints will show the latest value received and will not be subject to the thirty day maximum.

### 6 Example of access control & Authentication key

The specification requires two representation formats : XML version 1.0

XML version 1.0 is used. The recommended encoding is UTF-8.

```
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>AEMP2_API_Sample2</title>
<script type="text/javascript">
```

```
window.onload = function(){
  var xhttp = new XMLHttpRequest();
```

```
  var connectUrl = "https://himate.hyundai-ce.com:8084/api/AEMP2.0/Fleet/Equipment/Makecode/Model/HHKHW600EF0000048/Locations/2016-10-01/2016-10-30";
```

```
  var auth_key = "DEW23FGZm2Xcxqvlejkmg==";
  xhttp.open("POST", connectUrl);
  xhttp.setRequestHeader("HHLAEMP2.0_KEY", auth_key);
```

```
xhttp.setRequestHeader("Accept", "application/xml")
xhttp.onreadystatechange = function(){
    if(xhttp.readyState == 4 && xhttp.status == 200){
        console.log(xhttp.responseText);
        alert(xhttp.responseText);
    }
    } else if (xhttp.readyState == 4 && xhttp.status == 500) {
        console.log("ReadyState: "+xhttp.readyState+", status: "+xhttp.status);
        console.log(xhttp.responseText);
        alert(xhttp.responseText);
    } else {
        console.log("ReadyState: " + xhttp.readyState + ", status: " + xhttp.status);
        alert("ReadyState: " + xhttp.readyState + ", status: " + xhttp.status);
    }
}
xhttp.send();
}
</script>
</head>
<body></body>
</html>
```

※ Accept type can be selected by “application/xml” or “application/json”.

Depending on the format you can get it with XML or JSON.