



TeMeDa Push Service API Reference

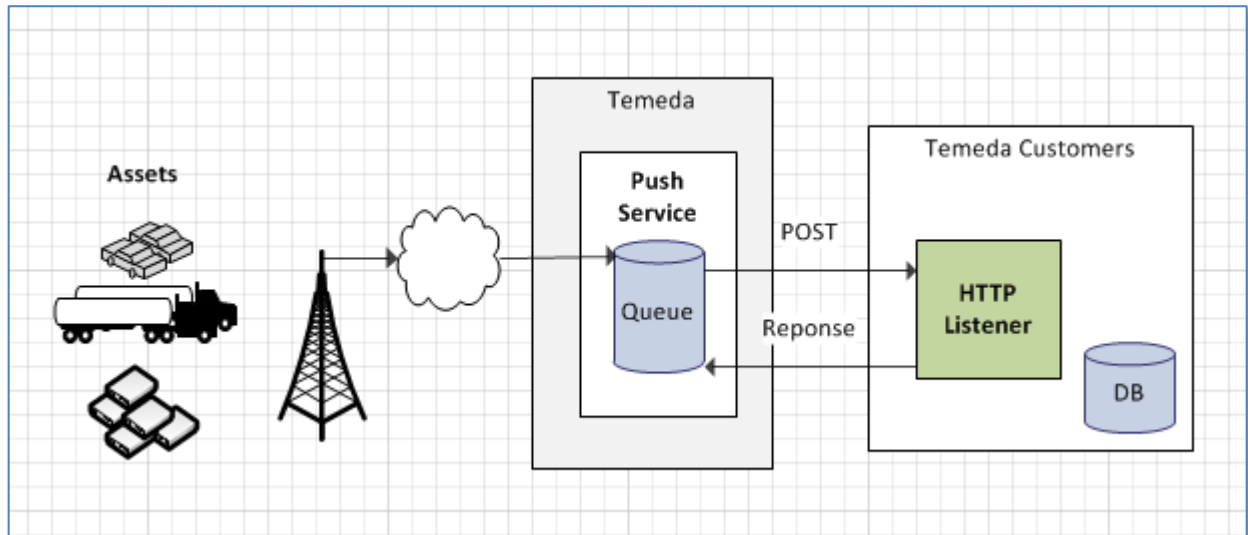
A restful API for receiving real-time telematics device data from the Temeda platform.

API Overview

The Temeda Data Push Service API is a simple to use web interface based upon HTTP GET/POST web operations compatible with just about any operating system platform and many programming languages. This interface is being offered for customers and service providers who intend to integrate their systems with Temeda and wish to receive real-time data updates as they occur within the Temeda telematics system.

The data push services provide the following data elements:

- Raw Data events (real-time telemetry data received from Temeda compatible gps/telematics devices).



Overview of the Temeda Push Service

Creating Your HTTP Listener Web Service:

To receive data push transmissions, you must first create a listening web service and provide Temeda staff with the following information:

- The URL to your base web service (i.e. 'https://my_site.com/my_service/')
- Credential information used for authentication with your web service
- Preferred data format: JSON or XML.
- Preferred max payload size: 10-500 records per HTTP Post

Authentication:

The Push Service supports the following authentication methods:

1. No Authentication
2. Basic Authentication
3. Bearer Token

Basic Authentication: When authenticating to your web service, the data push service will add the "Authorization" keyword to the HTTP header. As such, the value for the Authorization keyword will be "Basic" followed by a single space and then the base64 encoded user / password pair or the token you have provided.

For example, if your user name is 'jsmith' and your password is 'test123', the Push Service will encode 'jsmith:test123' into

base64 format and present the following HTTP header keyword/value pair:

Authorization: Basic anNtaXRoOnRlc3QxMjM=

Note: The colon character separates the user and password.

Data Transmission Implementation:

The following are interface requirements and general notes that pertain to the Temeda data Push Service:

- If your web service cannot authenticate the data push request, your web service must return an HTTP 401/Unauthorized response.
- Upon successful completion of the POST operation, your web service must return a HTTP 20X response (200/OK, 201/Created, etc.).
- If Temeda receives a response code other than 200-204, the data will be re-queued and sent again in 5 minutes. If data transmission fails repeatedly, the process will re-queue every 5 minutes but will eventually drop items that are older than 72 hours old from initial failure. In order to prevent potential data loss, design your web service so that you are notified when errors occur and log the error packets.
- All date/time strings will be represented in UTC and formatted using the standard W3C time string format as: 'YYYY-MM-DDTHH:MM:SS.sss'
- Data elements (JSON or XML) that contain NULL values will be marked as 'null'.
- Design your web service to accept null for any data element.

Data Flow:

As each data point is transmitted from a supported Temeda telematics/gps device, the Temeda network receives and processes all elements of the data point and stores the resulting information in what's known as a "Raw Data" event. As each raw data element is processed, the events are collected into an array for a period of 5-10 seconds, then the array of data is pushed to the configured service URL as a HTTP POST operation. The data payload may be in either JSON or XML format, based on the customer's configuration. If no events occur in the 5-10 second timeframe, then no HTTP posts will occur (data is only pushed when data exists).

Note that all data packets transmitted from Temeda to the web service endpoint will be an array with at least 1 item in the array. If multiple events are queued rapidly, several raw data elements may be delivered in the same transmission payload. As not to overload the receiving web service, items will be grouped in batches of 50-500 to keep the overall payload size to a minimal.

Push Service Payload

Field Definitions:

Field	Description
Altitude	Altitude in meters.
Battery_Pct	Battery percentage (0-100).
Battery_Voltage	Battery voltage level (volts).
County	County (result of reverse geocoding).
Device_Sequence	Device transmission sequence number, unique to each device.
Engine_Running	True or False is engine is running.
Event_Timestamp	UTC date/time when the event was generated on the GPS device.
Extras	<p>Contains an object of name/value pairs for additional status fields that are reported by the GPS device.</p> <p>Sensor Data:</p> <p>DigitalInput1: 0 or 1 with idEvent_Code=16</p> <p>DigitalInput2: 0 or 1 with idEvent_Code=17</p> <p>DigitalInput3: 0 or 1 with idEvent_Code=18</p> <p>tempSensor1: Temperature Sensor in milli degrees centigrade</p> <p>maxspeedoverthreshold: meters per second</p> <p>overspeed1seconds: seconds over maxspeedoverthreshold</p>
GPS_Fix	Set to 1 if a GPS fix was acquired.
GPS_Odometer	GPS odometer in meters.
GPS_Speed	GPS speed in meters/sec.
GPS_Timestamp	GPS device timestamp pertaining to GPS event.
Heading	Heading in degrees (0-360).
House_Number	House Number (result of reverse geocoding).
In_Motion	True/false boolean for in motion (may also use Motion_Status).
Landmark_Name	Name of the associated landmark (if any).
Latitude	Latitude at time of event.
Longitude	Longitude at time of event.
Locality	Locality/City (result of reverse geocoding).
Motion_Status	1 = in motion, 0 = not in motion.

Postal_Code	Postal Code/Zip (result of reverse geocoding).
RSSI	Radio signal strength.
Region	Region/State (result of reverse geocoding).
Satellites	Number of satellites used for GPS location.
Serial_Number	Serial number of the GPS device formatted as 4 digit Temeda Prefix + dash + Serial#. Ex: 0001-1233400001 = MC-1 device, 0002-1233400005 = MC-3 device
Street	Street (result of reverse geocoding).
Total_Engine_Hours	Total Engine Hours (in seconds)
Total_Engine_Idle_Fuel	Total Engine Idle Fuel (ml)
Total_Engine_Idle_Time	Total Engine Idle Time (seconds)
Total_Fuel_Used	Total Fuel Used (ml)
VehicleBus	Object containing engine bus (ECM) name/value pairs. coolantTemp: degrees Celcius engineRPM: engine speed rotations per minute fuelLvl1: percent fuel tank1 (0-100) vin: vehicle identification number TotalDistance: engine odometer (meters) Note: TotalFuel, TotalHours, idleHours, idleFuel values are repeated here but should be taken from the associated root level fields (Total_Fuel_Used , Total_Engine_Hours, Total_Engine_Idle_Time, Total_Engine_Idle_Fuel).
idCustomer	Internal customer id used within Temeda.
idDevice	Internal device id used within Temeda.
idEvent_Code	Internal event code used within Temeda (see Event Codes Values in sample data below).
idLandmark	Internal landmark id used within Temeda.
idRaw_Data	Internal raw data id used within Temeda.
isoCountryCode	Two character ISO country code (result of reverse geocoding).

JSON Example

```
[
{
  "Altitude": 5,
  "Battery_Voltage": 13.152,
  "County": "Queens County",
  "Event_Timestamp": "2016-07-14T19:27:26",
  "Extras": {
    "IdleTime": 38082719,
    "IgnitionOnUpTime": 106563510
  },
  "GPS_Fix": 1,
  "GPS_Odometer": 30948200,
  "GPS_Speed": 3.73,
  "Heading": 87,
  "House_Number": "34-01",
  "In_Motion": true,
  "Landmark_Name": null,
  "Latitude": 40.75202,
  "Locality": Foster City,
  "Longitude": -73.9294867,
  "Motion_Status": 1,
  "Postal_Code": "11101",
  "RSSI": 17,
  "Region": "NY",
  "Satellites": 9,
  "Serial_Number": "0002-1097990882",
  "Street": "Northern Blvd",
  "Total_Engine_Hours": 10656351,
  "Total_Engine_Idle_Fuel": null,
  "Total_Engine_Idle_Time": 2412,
  "Total_Fuel_Used": null,
  "VehicleBus": {
    "engineRPM": 647,
    "coolantTemp": 112,
    "totalHours": 10656351,
    "idleHours": 2412,
    "fuelLvl1": 80,
  },
  "idCustomer": 74,
  "idDevice": 2065,
  "idEvent_Code": 3,
  "idLandmark": null,
  "idRaw_Data": 401830164,
  "isoCountryCode": "US"
}]
```

XML Example

```
<?xml version="1.0" standalone="no"?>
<ArrayOfRaw_Data xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://schemas.datacontract.org/2004/07/Stage.Data">
  <Raw_Data>
    <Altitude>-3</Altitude>
    <Battery_Voltage>14.124</Battery_Voltage>
    <County>San Mateo County</County>
    <Event_Timestamp>2014-02-17T02:12:47</Event_Timestamp>
    <GPS_Fix>1</GPS_Fix>
    <GPS_Odometer>133093500</GPS_Odometer>
    <GPS_Speed>19.77</GPS_Speed>
    <Heading>305</Heading>
    <House_Number>720-724</House_Number>
    <In_Motion>true</In_Motion>
    <Landmark_Name>PJCC</Landmark_Name>
    <Latitude>37.5592783</Latitude>
    <Locality>Foster City</Locality>
    <Longitude>-122.2653766</Longitude>
    <Motion_Status>1</Motion_Status>
    <Postal_Code>94404</Postal_Code>
    <RSSI>30</RSSI>
    <Region>CA</Region>
    <Satellites>13</Satellites>
    <Serial_Number>0002-359999040426041</Serial_Number>
    <Street>Foster City Blvd</Street>
    <idCustomer>1</idCustomer>
    <idDevice>35</idDevice>
    <idEvent_Code>3</idEvent_Code>
    <idLandmark>6</idLandmark>
    <idRaw_Data>1142710</idRaw_Data>
    <isoCountryCode>US</isoCountryCode>
  </Raw_Data>
</ArrayOfRaw_Data>
```

Event Code Values

Event Code values: (idEvent_Code)

- Location = 0,
- Diagnostic = 1,
- ParkedToMoving = 2,
- InMotion = 3,
- MovingToParked = 4,
- DeviceBatteryLow= 9,
- DeviceBatteryState = 10,
- Running = 11,
- Vehicle1 = 12,
- Vehicle2 = 13,
- Vehicle3 = 14,
- VCM Detect = 15,
- Sensor1 = 16,
- Sensor2 = 17,
- Sensor3 = 18,
- DeviceHealth = 19,
- IgnitionOn = 20,
- IgnitionOff = 21,
- ExceptionSpeed = 22,
- ExceptionSpeedCleared = 23,
- RPMThresholdsReached = 24,
- RPMThresholdsCleared = 25,
- HarshBraking = 26,
- HarshAcceleration = 27,
- HarshManuever = 28,
- DTCsDetected= 29,
- DTCsCleared= 30,
- Idle = 31,
- IdleCleared = 32,
- TowDetected = 33,
- PowerOn/Boot = 39,
- ScanToolDetectReport = 40,
- LastGasp = 976,

Additional DTC Information:

With Temeda App version 2.4/DTC, we now parse the DTC values within the VehicleBus XML or JSON element for both J1939 and OBDII DTC events.

1. J1939DTC is now an object with the following properties:
 - a. conversionMethod
 - b. failureModelIdentifier
 - c. j1939DTCvalue (the original uint32 value prior to app2.4)
 - d. occurrenceCount
 - e. suspectParameterNumber
2. OBDIIDTC is now an object with the following properties:
 - a. faultCode
 - b. obdIIDTCvalue (the original uint32 value prior to app2.4)

Example JSON:

1) Single J1939 DTC

```
{
  "Altitude": null,
  "Battery_Voltage": null,
  "County": "Buncombe County",
  "Engine_Running": null,
  "Event_Timestamp": "2017-03-16T18:02:46",
  "Extras": {
  },
  "GPS_Fix": null,
  "GPS_Odometer": null,
  "GPS_Speed": null,
  "Heading": null,
  "House_Number": "575",
  "In_Motion": false,
  "Landmark_Name": null,
  "Latitude": 35.6832467,
  "Locality": "Asheville",
  "Longitude": -82.6130917,
  "Motion_Status": null,
  "Postal_Code": "28804",
  "RSSI": null,
  "Region": "NC",
  "Satellites": null,
  "Serial_Number": "0002-1196930099",
  "Street": "Goldview Rd",
  "Total_Engine_Hours": null,
  "Total_Engine_Idle_Fuel": null,
  "Total_Engine_Idle_Time": null,
  "Total_Fuel_Used": null,
  "VehicleBus": {
    "j1939DTC": [
      {
        "conversionMethod": 0,
        "failureModelIdentifier": 3,
        "j1939DTCvalue": 2114125901,
        "occurrenceCount": 126,
        "suspectParameterNumber": 77
      }
    ]
  },
  "idCustomer": 160,
  "idDevice": 1624,
  "idEvent_Code": 29,
  "idLandmark": null,
}
```

```
"idRaw_Data": 16942412,  
"isoCountryCode": "US"  
}
```

2) Multiple J1939 DTCs

```
{  
  "Altitude": null,  
  "Battery_Voltage": null,  
  "County": "Buncombe County",  
  "Engine_Running": null,  
  "Event_Timestamp": "2017-03-16T18:20:46",  
  "Extras": {  
  },  
  "GPS_Fix": null,  
  "GPS_Odometer": null,  
  "GPS_Speed": null,  
  "Heading": null,  
  "House_Number": "575",  
  "In_Motion": false,  
  "Landmark_Name": null,  
  "Latitude": 35.6832467,  
  "Locality": "Asheville",  
  "Longitude": -82.6130917,  
  "Motion_Status": null,  
  "Postal_Code": "28804",  
  "RSSI": null,  
  "Region": "NC",  
  "Satellites": null,  
  "Serial_Number": "0002-1196930099",  
  "Street": "Goldview Rd",  
  "Total_Engine_Hours": null,  
  "Total_Engine_Idle_Fuel": null,  
  "Total_Engine_Idle_Time": null,  
  "Total_Fuel_Used": null,  
  "VehicleBus": {  
    "j1939DTC": [  
      {  
        "conversionMethod": 0,  
        "failureModelIdentifier": 3,  
        "j1939DTCvalue": 16973921,  
        "occurrenceCount": 1,  
        "suspectParameterNumber": 97  
      },  
      {  
        "conversionMethod": 0,  
        "failureModelIdentifier": 23,  
        "j1939DTCvalue": 222,  
        "occurrenceCount": 21,  
        "suspectParameterNumber": 297  
      }  
    ]  
  },  
  "idCustomer": 160,  
  "idDevice": 1624,  
  "idEvent_Code": 29,  
  "idLandmark": null,  
  "idRaw_Data": 16942767,  
  "isoCountryCode": "US"  
}
```

3) Single OBDII DTC

```
{
  "Altitude": null,
  "Battery_Voltage": null,
  "County": "Buncombe County",
  "Engine_Running": null,
  "Event_Timestamp": "2017-03-16T19:15:46",
  "Extras": {
  },
  "GPS_Fix": null,
  "GPS_Odometer": null,
  "GPS_Speed": null,
  "Heading": null,
  "House_Number": "575",
  "In_Motion": false,
  "Landmark_Name": null,
  "Latitude": 35.6832467,
  "Locality": "Asheville",
  "Longitude": -82.6130917,
  "Motion_Status": null,
  "Postal_Code": "28804",
  "RSSI": null,
  "Region": "NC",
  "Satellites": null,
  "Serial_Number": "0002-1196930099",
  "Street": "Goldview Rd",
  "Total_Engine_Hours": null,
  "Total_Engine_Idle_Fuel": null,
  "Total_Engine_Idle_Time": null,
  "Total_Fuel_Used": null,
  "VehicleBus": {
    "obdIIDTC": [
      {
        "faultCode": "P0171",
        "obdIIDTCvalue": 369
      }
    ]
  },
  "idCustomer": 160,
  "idDevice": 1624,
  "idEvent_Code": 29,
  "idLandmark": null,
  "idRaw_Data": 16943778,
  "isoCountryCode": "US"
}
```

Version B Example: Include Asset/Device Information:

```
[
  {
    "RawData": {
      "Altitude": 5,
      "Battery_Voltage": 13.152,
      "County": "Queens County",
      "Event_Timestamp": "2016-07-14T19:27:26",
      "Extras": {
        "IdleTime": 38082719,
        "IgnitionOnUpTime": 106563510
      },
      "GPS_Fix": 1,
      "GPS_Odometer": 30948200,
      "GPS_Speed": 3.73,
      "Heading": 87,
      "House_Number": "34-01",
      "In_Motion": true,
      "Landmark_Name": null,
      "Latitude": 40.75202,
      "Locality": "Foster City",
      "Longitude": -73.9294867,
      "Motion_Status": 1,
      "Postal_Code": "11101",
      "RSSI": 17,
      "Region": "NY",
      "Satellites": 9,
      "Serial_Number": "0006-1097990882",
      "Street": "Northern Blvd",
      "Total_Engine_Hours": 10656351,
      "Total_Engine_Idle_Fuel": null,
      "Total_Engine_Idle_Time": 2412,
      "Total_Fuel_Used": null,
      "VehicleBus": {
        "engineRPM": 647,
        "coolantTemp": 112,
        "totalHours": 10656351,
        "idleHours": 2412,
        "fuelLv11": 80
      },
      "idCustomer": 74,
      "idDevice": 2065,
      "idEvent_Code": 3,
      "idLandmark": null,
      "idRaw_Data": 401830164,
      "isoCountryCode": "US"
    },
    "Asset": {
      "idAsset": 1798,
      "Asset_Label": "Joe's Truck",
      "Asset_Description": "here is a description",
      "EquipmentID": "123456",
      "Year": 2004,
      "Make": "Toyota",
      "Model": "Sequoia",
      "Hier_ParentAccount_Name": "John Deere",
      "Hier_Level2_Name": "A Customer Name",
      "Hier_ParentAccount_Id": 1678,
      "Hier_Level2_Id": 1801,
      "Device": {
        "idDevice": 2016,
        "Serial_Number_Displayed": "1097990882",
        "Device_Type": "Calamp",
        "Estimated_GPS_Odometer": 30948200,
        "Estimated_Engine_Hours": 10656351
      }
    }
  }
]
```