

DSGS Option 4 Interval Data Specifications

Version 1.0

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1 Introduction

This document defines the requirements for interval data submitted by DSGS Option 4 aggregators, for the purposes of performance calculations. This data format is also referred to as the Option 4 “Performance Report” in the DSGS Guidelines.

2 Data options

In Option 4, an aggregator must submit interval data for enrolled devices in one of two distinct ways, requirements for both of which are defined in this document:

1. Compressor **runtime data** (only permitted for Smart Thermostat devices when device-specific energy consumption data is not available). See Section 6 for data dictionary.
2. Device-specific **energy data** (load data). All other device types (including batteries or Electric Vehicle Supply Equipment (EVSE)) must use this format. See Section 7 for data dictionary.

Enrolled devices for a given aggregation must use the same data format option for the duration of the program season.

For compressor runtime data, please note the following:

- If compressor runtime data is provided, the estimated load will be calculated based on a *fixed multiplier* as defined in the DSGS guidelines. Specifically, runtime-based estimates of load shall use an assumed connected load of 2.5 kW for full or high speed and 1.25 kW for partial or low speed.
- The compressor runtime format defines two levels of cooling and two levels of heating: full/high (referred to as “Heat High” and “Cool High” in the data dictionary) and partial/low (referred to as “Heat Other” and “Cool Other” in the data dictionary). For example, in a typical multi-stage AC compressor, full or high speed would be the mode controlled by the Y2 wire and partial or low would be controlled by the Y1 wire.
- Runtime data must contain data from electric compressor-based HVAC systems only. No gas-powered heating device or electric resistance heating device data can be included.

- If the device is an AC unit (no heating function), then only the “Cool” data fields should be populated. The “Heat” fields should be left blank.
- If the device is a heat pump (with heating and cooling functions), then both the “Cool” and “Heat” data fields should be populated.
- The Option 4 guidelines require baselines to be calculated at a granularity of 15 minutes. Therefore, compressor runtime data must have at least that level of granularity. The supported interval lengths are 15-minute intervals or 5-minute intervals. File content requirements

There are several basic requirements for interval data submitted for Option 4, that apply to both compressor runtime data and energy data:

- **Separate files per UDC:** Aggregators must separate the interval data files into distinct files based on the utility (UDC) territory of the devices contained in them. For example, if an aggregator has enrolled devices in both SCE and SDG&E, they need to submit data separately: one or more files for the devices in SCE territory, and one or more files for the devices in SDG&E territory. See the “File naming requirements” subsection for details.
- **Data completeness:** It is the responsibility of the aggregator to ensure that interval data for all enrolled devices is submitted prior to the deadline (see the “Submission deadline” subsection). If enrolled devices are missing interval data after the deadline, their performance will not be counted in the aggregation’s performance for the intervals in question.
- **Data aggregation and identifiers:** Interval data must be compiled and submitted at the device level – the same level as used in the Option 4 participation reports. All identifiers in interval data files must match exactly with an identifier previously submitted in a participation report.

3 File submission

Submission deadline

Interval data files are required to be submitted **within 10 business days** after a program event or test event occurs during the program season. Data can be submitted in multiple batches prior to the deadline if necessary.

File upload instructions

Aggregators will upload interval data files through the Provider Portal (<https://app.olivineinc.com/i/dsgs>). Instructions:

1. Navigate to “**Submit Data File**” and select file for submission. Aggregators **must submit separate files per UDC**. Only one file can be submitted at a time.
2. Select “**Validate**” to receive feedback on file format and contents. Correct any formatting issues that are identified and re-upload a revised file. There are three possible results for meter data file validation:
 - a. “**File is Valid!**”: This means that the format is valid and all the data in the file is valid.

- b. **“File is Partially Valid”**: This means that the format is valid, but some of the rows have errors. If aggregators submit without editing the file, only the valid rows will be ingested. The portal log will provide specifics.
 - c. **“Validation Failed”**: This means that the format is invalid, or that there are too many row-level errors to proceed. Attempting to submit this invalid file will result in a “Submission Failed” message. The aggregator must diagnose and correct the issue(s) and resubmit the data.
3. Select **“Submit”** once the file has been validated.
4. Contact DSGS Support (dsgs-support@olivineinc.com) with any questions or issues.

4 File format requirements

Separator

All values must be separated by a single tab character. Data submitted with a comma separating values will not be accepted.

File extension

For compressor runtime data, set the file extension to **“.oir”** to indicate that it meets the specifications for the Olivine Interval Runtime format. For energy data, set the file extension to **“.oid”** to indicate that it meets the specifications for the Olivine Interval Data format.

File Compression

Files can be compressed with gzip compression (.gz extension) to reduce file size and increase upload speed. Compression is highly encouraged but not required. Names of compressed files must end in **“.oid.gz”**.

Important: gzip is not the same as zip. Zip files will not be accepted.

File naming requirements

Required DSGS Option 4 interval data file naming pattern:

For compressor runtime data:

“<UDC>-DSGS_OPTION_4-<Provider ID>-RuntimeData-YYYYMMDDHHmmSS-<nnn>.oir”

For energy/load data:

“<UDC>-DSGS_OPTION_4-<Provider ID>-MeterData-YYYYMMDDHHmmSS-<nnn>.oid”

Additional Details:

- The filename must begin with the UDC followed by **“-DSGS_OPTION_4-”**.

- UDC is the Utility that operates the distribution grid for the devices contained in the file. Files must be separated by UDC. Please note **that no “&” characters** are permitted in the UDC value. Unless otherwise specified, the following three values are the only acceptable values for UDC:
 - SCE
 - SDGE
 - SP15¹
- Provider ID is the 3-letter ID assigned to the enrolled DSGS provider (eg. ABC)
- nnn = an optional 3-digit number, used to differentiate multiple files generated in the same second
- HH must be 24-hour format
- YYYYMMDDHHmmSS is the time at which the file was generated

Examples of valid Compressor Runtime data (.oir) filenames (where “ABC” is the Provider ID):

- SCE-DSGS_OPTION_4-ABC-RuntimeData-20261012000000.oir.gz
- SDGE-DSGS_OPTION_4-ABC-RuntimeData-20260920113454-001.oir
- SP15-DSGS_OPTION_4-ABC-RuntimeData-20260528170050-001.oir.gz

Examples of valid Energy data (.oid) filenames (where “ABC” is the Provider ID):

- SCE-DSGS_OPTION_4-ABC-MeterData-20260920110000.oid.gz
- SDGE-DSGS_OPTION_4-ABC-MeterData-20261012000000-001.oid
- SP15-DSGS_OPTION_4-ABC-MeterData-20260528170050-001.oid.gz

Sorting

The data must be sorted by Service Point ID, then Start Time (chronological order).

Duplicate Intervals

Files must not contain data for the same interval for the same device more than once.

Data consolidation and file size

If possible, interval data should be consolidated into a single file per UDC. However, multiple files are acceptable as well. If possible, files should be compressed using GZIP compression prior to upload. Individual files must not exceed 100 MB in size, after any compression is applied.

¹ South Path 15 (SP15) consists of the POU's of Anaheim, Azusa, Pasadena, Riverside, and Vernon

Sample files

Sample interval data files meeting the required formats have been provided alongside this document.

Miscellaneous

No double or single quote characters are permitted in the file contents.

5 Compressor Runtime Data Specification

Compressor Runtime Data Dictionary

The following table lists the required fields of the compressor runtime (.oir) data files. Each table row is a column in the data file. The header row in each file must contain the exact names listed in the "Column Name" values. All fields must be supplied, even if they are optional and their values are blank. All values provided must follow the corresponding specified description. The columns must appear from left to right in the order in which they appear in the table and be separated by **tab** characters.

Column Name	Type	Definition
Service Point ID	Text string	This is the same identifier as the Unique_ID from DSGS Enrolled Participation Reports. It is the identification number that uniquely identifies the individual device. This identifier must begin with the three-letter provider code, followed by a hyphen . All identifiers in interval data files must match exactly with an identifier previously submitted in a participation report. Example: <i>ABC-100002</i> or <i>ABC-651adc29-6814-4e5d-af1b-eccdb273eba9</i>
Parent ID	Text string	Must be populated with the exact same value as Service Point ID.
Start Time	DateTime with offset	This is the start time of the interval. See the "Date and Time Formatting" section for formatting requirements. Example: <i>2025-09-14T00:00:00-7:00</i>
End Time	DateTime with offset	This is the end time of the interval. See the "Date and Time Formatting" section for formatting requirements. Example: <i>2025-09-15T00:00:00-7:00</i>

		Note: The interval length is defined as the End Time minus the Start time. For Option 4, the preferred interval length is 15 minutes (900 seconds). The other acceptable interval length is 5 minutes (300 seconds).
Heat High	Number	The time duration (in seconds) within the interval that the device was running on high/full heating mode. Heating data can only be included if the device is a heat pump; gas heating and electric resistance heating data must not be included. If the device is not a heat pump, then all entries for this column should be blanks . A zero indicates that there was no high/full heating during the interval. In contrast, a blank indicates that the device does not have an eligible heating technology.
Heat Other	Number	The time duration (in seconds) within the interval that the device was running on low/partial heating mode. A zero indicates that there was no low/partial heating during the interval. In contrast, a blank indicates that the device does not have an eligible heating technology.
Cool High	Number	The time duration (in seconds) within the interval that the device was running on high/full cooling mode. A zero indicates that there was no high/full cooling during the interval. In contrast, a blank (in both this field and “Cool Other”) indicates there is missing data for that interval.
Cool Other	Number	The time duration (in seconds) within the interval that the device was running on low/partial cooling mode. A zero indicates that there was no low/partial cooling during the interval. In contrast, a blank (in both this field and “Cool High”) indicates there is missing data for that interval.

Interval requirements for runtime data

- Each row must contain only 1 interval.
- Heating data can only be included if the device is a heat pump; gas heating and electric resistance heating data must not be included. If the device is not a heat pump, then all entries for the two heating columns must be **blanks**.

- The **interval length** is defined as the End Time minus the Start time. For Option 4, the preferred interval length is 15 minutes (900 seconds). The other acceptable interval length is 5 minutes (300 seconds).
- Intervals must start and end on regular times. For example, for 15-minute intervals, the start and end times must fall on :00, :15, :30, and :45.
- The interval length must remain consistent over time for a given device.
- An interval can include non-zero values for multiple heating/cooling modes to indicate that there were multiple modes occurring during the time span.
- The sum of “Heat High”, “Heat Other”, “Cool High”, and “Cool Other” must be less than or equal to the interval length. For example, for 15-minute intervals, the sum of those four columns must be no greater than 900.
- Intervals must be included even if there was no heating or cooling during the interval. In that case, the values must be **zeros (not blanks)**.
- Blank values can be included to indicate missing data. **To indicate missing data, all four Heat/Cool values in a row must be blanks.** Blanks must be empty values, not any text such as “N/A”.
- Intervals that are not submitted at all will be treated as missing data as well.
- For aggregation purposes, missing data is treated as zero. However, if there is missing data for all devices in an aggregation for an event or baseline period, then the baseline may either fail or require an alternative day selection to be used.
- The numerical value must contain no more than 2 decimal places of precision.
- It is the responsibility of the aggregator to accurately compile the heating/cooling data into the interval periods.

6 Energy/Load Data Specification

This format applies to energy/load data for HVAC devices (without runtime data), water heater devices, EVSE, batteries, and other approved Option 4 devices. Any differences in requirements between each have been noted in the dictionary. This format can be used for both consumption-only energy data as well as net (both charge and discharge) energy data, if allowed based on the device type.

Energy/Load Data Dictionary

The following table lists the required fields of the energy interval (.oid) data files. Each table row is a column in the data file. The header row in each file must contain the exact names listed in the "Column Name" values. All fields must be supplied, even if they are optional and their values are blank. All values provided must follow the corresponding specified description. The columns must appear from left to right in the order in which they appear in the table and be separated by **tab** characters.

Column Name	Type	Definition
Service Point ID	Text string	This is the same identifier as the Unique_ID from DSGS Enrolled Participation Reports. It is the identification number that uniquely identifies the individual device. This identifier must begin with the three-letter provider code, followed by a hyphen . All identifiers in interval data files must match exactly with an identifier previously submitted in a participation report. Example: <i>ABC-100002</i> or <i>ABC-651adc29-6814-4e5d-af1b-eccdb273eba9</i>
Parent ID	Text string	Must be populated with the exact same value as Service Point ID.
Channel Number	N/A	Leave empty.
Kind	Text string	For Option 4, this field must be populated with the following: " 2 1 " (the vertical lines are "pipe" characters).
UOM	Text string	The unit of measure of the interval value. Must be either kWh or kW. Not case sensitive. kWh energy values are preferred, but kW <i>average</i> power values are also supported.
Flow Direction	Text string	Batteries/EVSE: Populate with "Net". See the "Sign Convention and Data Precision" section below for details. HVAC/Water Heater/Other Eligible Devices: Leave empty.
Interval Length	Integer	The interval length in seconds. Populate with "900" to indicate that each interval is 15 minutes long (preferred). Populate with "300" to indicate that each interval is 5 minutes long (also supported).
Start Time	DateTime with offset	This is the start time of the first interval in the row. See the "Date and Time Formatting" section for formatting requirements. Example: 2025-09-14T00:00:00-7:00
End Time	DateTime with offset	This is the end time of the last interval in the row. See the "Date and Time Formatting" section for formatting requirements. Example: 2025-09-15T00:00:00-7:00
Count	Integer	Total number of energy interval values in the row. This depends on the format of the data (see the "Number of Intervals per Row" section below).

		For example: Count must be 96 if the data is in the “one day per row” format and the intervals are 15-minute intervals.
<i>Interval values (optional column name(s) in header row)</i>	Decimal with no more than 6 digits of precision	<p>Interval value(s) representing the energy (or average power) consumed during the interval. There can be multiple columns, representing successive intervals (see “Number of Intervals per Row” section below). The number of interval values per row must match the Count field. Header row values are optional for the interval values. The header can be blank, removed, or set to something like “interval_01, interval_02”, etc.</p> <p><i>Important: Zeros indicate no energy consumed by the device during the interval. Blanks indicate missing data. If the Flow Direction field is set to blank, then interval values must be positive (indicating energy consumption). If the Flow Direction field is set to “Net” (for batteries or EVSE), then the interval values can be either positive (energy consumption / battery charge) or negative (energy export / battery discharge).</i></p>

Number of Intervals per Row

The format supports one or more intervals per row. For DSGS Option 4, these two formats are acceptable:

- **One day per row:** One calendar day (in PDT) of a device’s interval data per row (i.e., 96 15-minute values per row or 288 5-minute values per row).
- **Wide format:** All of a device’s intervals for the lookback period (defined in the “Lookback Period” section below) in a single row.

Missing Interval Values

Individual interval values can be left empty to indicate missing data. When data is aggregated (summed) across multiple devices, blanks are treated as zeros. However, if there is missing data for all devices in an aggregation for an event or baseline period, then the baseline may either fail or require an alternative day selection to be used.

Sign Convention and Data Precision

For batteries and EVSE, interval values with positive numbers indicate net battery charge and those with negative numbers indicate net battery discharge. Zeros indicate that there was no net charge or discharge in that period. Note that “Flow Direction” field must be set to “Net”. Depending on the technology, data can include only positive values (eg. EVSE with managed/smart charging) or included both positive and negative values (eg. stationary batteries with exports, or EVSE with V2H/V2G

exports). Interval values must be decimal numbers with no more than 6 digits of precision. No scientific notation is permitted.

For HVAC, Water Heater devices, and other eligible Option 4 devices, interval values must be ≥ 0 , indicating energy consumed. Note that the "Flow Direction" field must be set to a blank. Interval values must be decimal numbers with no more than 6 digits of precision. No scientific notation is permitted.

Interval Length and Interval Start and End Times

15-minute data is preferred (Interval Length of 900 seconds), but 5-minute data (Interval Length of 300 seconds) is also acceptable. The Start Time and End Time values must be timestamps that fall on the regular intervals (eg. :00, :15, :30, :45 for 15-minute data), and all data must be accurately compiled into the interval periods.

File Header Row

Files must include a header row, containing a tab-delimited list of the exact names specified in the "Column Name" values of the table in the "Data Dictionary" section. Names of columns containing interval values are optional and will be ignored by the importer.

Units of Measure

The following units of measure are currently supported:

Value	Description
kWh	Energy in Kilowatt-hours. This is the preferred UOM.
kW	Average power in Kilowatts.

7 Date and Time Formatting

Required Format

The start and end time fields (for both compressor runtime and energy data) must be formatted as described in this section.

Exactly the components shown here must be present, with exactly this punctuation:

YYYY-MM-DDThh:mmTZD or **YYYY-MM-DDThh:mm:ssTZD**

- YYYY: Four-digit year
- MM: Two-digit month (01 - 12)

- DD: Two-digit day (01 - 31)
- hh: Two-digit hour (00 - 23)
- mm: Two-digit minute (00 – 59)
- ss: Two-digit second (00 – 59). This is optional.
- TZD: The time zone designator (Z or +hh:mm or -hh:mm). For example, Pacific Daylight Time (PDT) can be indicated with the “-07:00” suffix to indicate 7 hours behind UTC.

Notes

- The “T” appears literally in the string, to indicate the beginning of the time element.
- Preferably times will be expressed in the local time zone with the correct offset, but UTC is acceptable.
- All parts are required, except *seconds*, which is optional.
- Always include leading zeros to the month, day, hour, minute and (if present) second.
- There must be no spaces between any of the elements.
- The format is based on ISO 8601, but the Olivine specification is stricter.

Examples

The following examples correspond to the same time (May 23, 2026 at 2:15 PM Pacific Time):

```
2026-05-23T14:15-07:00
2026-05-23T14:15:00-07:00
2026-05-23T21:15Z
```

8 Lookback Period, Data Completeness and Data Quality

Lookback Period

Interval data must include the complete event date(s) plus the immediate 28 calendar days preceding the event date(s). This ensures there is sufficient data to calculate the baseline as specified in the DSGS guidelines.

Data Completeness

It is the responsibility of the aggregator to ensure that interval data for all enrolled devices is submitted prior to the deadline (10 business days after a program event or test event). Olivine can provide a basic missing data report upon request.

Data Quality

It is the responsibility of the aggregator to ensure that the interval data submitted is accurate and representative of the true energy usage and/or runtime data of the devices. Aggregators should screen

for spikes or other anomalies in the data prior to upload. As stated in the DSGS guidelines, interval data is subject to CEC audit.

Data Corrections and Updates

Aggregators can submit corrections to interval data files by uploading a new file to the provider portal and notifying DSGS support that the data uploaded is a correction to previous data. Corrections will be accepted by default if they are submitted prior to the normal monthly deadline. If Olivine provides feedback to the aggregator indicating that there is substantial missing, invalid, or incorrect interval data, **the aggregator has 7 business days to resubmit corrected/updated data.**

Only Option 4 interval data submitted as part of the in-season reporting will be used for final calculation of demonstrated capacity and incentives. **No interval data can be submitted as part of the end-of-season claim process.**