

HELP CENTER ARTICLE

Historical Space Object Data Sample Guide

Learn what's included in the Historical Space Object Data sample package, understand each data format, and determine which products best fit your technical or research use case.

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This guide explains the contents of the sample dataset, how the included file formats relate to one another, and what to expect if you're interested in licensing the complete historical archive.

What this sample includes

This sample allows you to:

- Inspect the package organization and supported file formats.
- Understand the relationship between observed and derived orbital data.
- Test data ingestion within your own tools and workflows.
- Evaluate whether the historical data supports your research or operational use case.
- Prepare a scoped request for Slingshot Sales.

Note: This sample is intended for evaluation purposes only *and is subject to the [Slingshot Master Agreement](#)*. It is not a complete historical catalog, subscription, analytics-ready dataset, or guarantee of identical coverage across all objects and time periods.

Objects and Time Period in This Sample

Folder / NORAD ID	Object	Orbit Regime	Observation Coverage	Derived Products
7646	STARLETTE	LEO	14-20 September 2026	OPM state vectors and TLEs extend into 21 September
41866	GOES 16	GEO	14-20 September 2026	OPM state vectors and TLEs extend into 21 September

The formats represent the same objects and approximately the same time period, but they are not one-to-one duplicates. Each format answers a different technical question and may have a different record count or endpoint.

What This Sample Does Not Include

Unless separately stated, this sample does not include:

- the complete Slingshot historical archive;
- continuous coverage of either object;
- every available sensor or observation;
- an analytics-ready or blended CSV;
- full-catalog historical ephemerides;
- MFAST software or processing access;
- Portal, API, MCP, or SPU entitlements;
- conjunction assessment;
- TALOS;
- customer-specific analytics or reports;
- permission to redistribute the data; or
- permission to train or commercialize AI/ML models.

The native TDM, OPM, TLE, ICD, and image-chip formats are the supported sample deliverables. A blended analytics-ready CSV is not currently offered.

Package Contents

The ZIP is organized first by NORAD ID and then by data product:

```
<NORAD ID>/
├─ Observations/
│   ├── TDM/
│   └── ICD/
├─ State_Vectors/
├─ TLEs/
└─ Image_Chips/
```

Sample File Counts

Object	TDM Files	ICD Files	OPM State Vectors	TLE Files	PNG Image Chips
STARLETTE / 7646	27	27	43	29	186
GOES 16 / 41866	390	390	1,055	427	3,593
Total	417	417	1,098	456	3,779

Image-chip availability varies. A measurement may not always have an associated image chip, and some retained image chips may not appear as a delivered measurement record in this sample.

How the Formats Relate

The sample contains both **observed data** and **Slingshot-derived orbital products**.

Electro-optical sensor imagery



Image chip and angular measurement



TDM observation track



Slingshot processing / orbit estimation



OPM state vector and covariance



Compact orbit representation, where available



TLE

This is a conceptual relationship—not a guarantee that every TDM has exactly one OPM or TLE. Derived products may be produced at different epochs and cadences.

Use these identifiers to relate records:

- NORAD ID
- object name
- track ID
- observation ID
- state-vector epoch
- TLE epoch
- timestamp

Format Guide

TDM – Tracking Data Message

Location

<NORAD ID>/Observations/TDM/

File Extension

.tdm

Standard

CCSDS TDM Version 2.0

Purpose

Contains validated electro-optical observations collected by the Slingshot Global Sensor Network.

Common Uses

- Orbit determination
- Sensor analysis
- Track association
- Measurement quality analysis
- Research and algorithm development

Key Fields

- NORAD ID
- Track ID
- Observation ID
- Observation timestamp
- Right Ascension
- Declination
- Apparent Magnitude
- Measurement Uncertainty

File Naming

```
<NORAD-ID>_<TRACK-ID>.tdm
```

ICD – Interface Control Document

Location

```
<NORAD ID>/Observations/ICD/
```

File Extension

```
.icd
```

Purpose

The Interface Control Document (ICD) is the companion reference for the corresponding TDM file. It explains how Slingshot implements the CCSDS Tracking Data Message (TDM) standard and provides additional context for interpreting observation data.

Common Uses

- Understanding the TDM file structure
- Interpreting measurement fields
- Identifying sensor and participant information
- Reviewing timestamp and measurement conventions
- Understanding Slingshot-specific implementation details

Key Contents

- TDM version and encoding
- File naming conventions
- Participant and sensor identifiers

- Measurement geometry
- Timestamp interpretation
- Angle and magnitude definitions
- Data quality conventions
- Delivery conventions

File Naming

`<NORAD-ID>_<TRACK-ID>.icd`

Good to know: Each TDM file in the sample has a matching ICD with the same Track ID. The ICD is documentation and does not contain observation data.

OPM – Orbit Parameter Message

Location

`<NORAD ID>/State_Vectors/`

File Extension

`.opm`

Standard

CCSDS Orbit Parameter Message (OPM) Version 3.0

Encoding

KVN (Keyword Value Notation)

Reference Frame

EME2000

Time System

UTC

Purpose

OPM files contain Slingshot-derived orbit state estimates generated from processed tracking observations. They provide an object's position, velocity, and—when available—covariance information at a specific epoch.

Common Uses

- Orbit state comparisons
- Orbit propagation and mission analysis
- Covariance and uncertainty analysis
- Maneuver reconstruction
- Digital twin initialization
- Validating customer ephemerides
- Importing into astrodynamics software

Key Fields

- Object name

- NORAD ID
- Epoch
- Position (X, Y, Z)
- Velocity (X, Y, Z)
- Reference frame
- Covariance matrix (when available)
- Processing timestamp
- Originator

File Naming

```
<NORAD-ID>_<EPOCH>.opm
```

Important: OPM files are derived products created from processed observations. They should not be interpreted as raw sensor measurements.

TLE – Two-Line Element

Location

```
<NORAD ID>/TLEs/
```

File Extension

```
.tle
```

Purpose

TLE files provide a compact orbital representation that is compatible with SGP4 propagation and many commercial and open-source orbital analysis tools.

Common Uses

- Orbit visualization
- SGP4 propagation
- Catalog interoperability
- Educational demonstrations
- Coarse orbit comparisons
- Systems that do not support CCSDS formats

Key Contents

- Object name
- NORAD Catalog Number
- TLE Line 1
- TLE Line 2
- Epoch
- Standard orbital elements

File Naming

```
<NORAD-ID>_<EPOCH>.tle
```

Important: TLEs are simplified, derived orbit representations intended for compatibility and propagation. They are not equivalent to the original observations or full OPM state estimates.

Image Chips

Location

<NORAD ID>/Image_Chips/<TRACK-ID>/

File Extension

.png

Image Size

32 × 32 pixels

Purpose

Image chips are cropped electro-optical images associated with individual observations when retained and available. They provide visual context for the underlying tracking measurements.

Common Uses

- Visual inspection of observations
- Image processing research
- Object detection validation
- Photometric analysis
- Educational demonstrations
- AI/ML evaluation (where separately licensed)

Key Information

- Observation ID
- Associated Track ID
- Observation imagery
- Linked to corresponding TDM observation records

File Naming

<OBSERVATION-ID>.png

Good to know: Image chips are not available for every observation. Some observations may not have an associated image, and some retained images may not appear as a delivered measurement record within the sample.

Which Format Should I Use?

Your Goal	Recommended Format(s)
Work with the original angular measurements	TDM + ICD
Perform your own orbit determination	TDM + ICD

Compare Slingshot's derived orbit with your own solution	TDM + OPM
Initialize a simulation or digital twin	OPM
Analyze uncertainty or covariance	OPM
Run quick SGP4 propagation or visualization	TLE
Inspect the source imagery	PNG image chips + TDM observation IDs
Evaluate the observed and derived sides together	TDM + OPM + TLE, joined by object and epoch
Perform object-characterization/image research	Image chips + TDM magnitude/geometry fields

Full Historical Archive – Current Scope

Current inventory estimates computed on 21 September 2026 are:

Scope Area	Current Estimate
Historical period	2015-2026
Unique resident space objects	29,374
Electro-optical observations	4,595,283,664 (~4.6B)
State vectors	153,337,287 (~153M)
Eligible fit_v2 TLEs	152,434,888 (~152M)
Sensor type	Electro-optical
Delivery	REST API, cloud bucket, or bulk export

These are current inventory estimates—not a guarantee that every record is licensable or included in every offer. Final availability depends on data rights, quality, object, year, format, delivery method, and the executed Order.

The archive may be scoped as:

- the full approved archive;
- one or more calendar years;
- selected objects;
- selected orbit regimes;
- selected data products; or
- a customer-defined research or mission dataset.

Interested in the Full Historical Archive?

If the sample meets your needs, Slingshot Sales can help scope a historical data package based on:

- Objects or orbit regimes

- Historical time period
- Data products
- Delivery method
- Licensing requirements
- AI/ML or research usage
- Security requirements

Download Sample Data

To download a sample of the historic bulk data please visit our **Marketplace** and select **"Historical Tracking Data - Bulk Access"**

Tracking



Historical Tracking Data – Bulk Access

Access years of historical space-tracking data from the Slingshot Global Sensor Network to accelerate research, develop models, investigate past events, and establish behavioral baselines.

- ✓ Historical observations dating back to 2015
- ✓ Purchase the full archive or select individual years
- ✓ Includes observations, state vectors, TLEs, and image chips

Contact for Pricing
Select >

You'll find the sample dataset download link in the product details

← Historical Tracking Data – Bulk Access

Starting at

[Contact for Pricing](#)

What's included

- ✓ Full archive or individual years of SGSN electro-optical data, dating back to 2015
- ✓ Data products available in TDM, OPM, TLE, and image chip formats (PNG or Base64)
- ✓ Multiple delivery options available upon request
- ✓ Flexible licensing options for research, development, and commercial applications



Want to see the data before you buy?

Preview representative SGSN data products, formats, and content.

[Download sample dataset](#)

[Contact Sales](#)



Available_Data_Sample

Name ^

- ✓  7646
 - >  Image_Chips
 - >  Observations
 - >  State_Vectors
 - >  TLEs
- ✓  41866
 - >  Image_Chips
 - >  Observations
 - >  State_Vectors
 - >  TLEs

Use the **Contact Sales** button on the Historical Data page or click the link below:

Contact Sales

In your request, reference **Historical Space Object Data – Bulk Access**.

What to Expect After Contacting Sales

1. Discovery and Qualification

Sales and Product will confirm:

- your use case
- buyer/program
- budget and timing
- requested scope
- intended data use and rights
- delivery and security needs
- whether the request is technically and legally supportable.

2. Coverage and Availability Review

Slingshot will evaluate:

- object and time coverage
- available data products
- data quality and provenance
- estimated record/file volume
- format and delivery feasibility
- applicable third-party or government restrictions
- whether processing or custom work is required.

3. Scope and Commercial Proposal

The proposal or Order Form will define:

- fixed historical start and cutoff dates
- included objects/regimes
- included products and formats
- known exclusions and limitations
- delivery method
- price and payment terms
- data-license rights and restrictions
- delivery date
- proof-of-delivery and acceptance terms

4. Contract and Compliance Review

Depending on the customer and use case, review may include:

- data rights
- AI/ML rights;
- academic publication
- export controls and foreign-person access
- government/FAR/DFARS terms
- UDL delivery
- security and classification
- partner/reseller rights
- customer cloud configuration

5. Delivery

The historical dataset will be delivered through the agreed method. The delivery package may include:

- secure link or cloud location
- data files
- delivery manifest
- file checksums
- schema/format documentation
- applicable ICDs
- known limitations
- license markings

Portal, SPUs, current/future data, processing, conjunction assessment, and other hosted services are separate unless expressly listed in the Order.

Important Data-Use Notice

Slingshot retains ownership of the sample and historical data.

Use of the sample is subject to the applicable Slingshot terms. Unless expressly authorized in writing, the sample may not be:

- resold, sublicensed, or redistributed
- posted to a public repository
- used to create a competing data product or catalog
- uploaded to a public or third-party AI system
- used to train or fine-tune an AI/ML model
- shared outside the approved organization or research program; or used as the sole basis for a safety-critical or operational decision.

For approved offers, the final Order Form will state the customer's specific license rights.

Need Help?

Questions about this sample or interested in licensing the complete historical archive?

- **Contact Sales:** <https://www.slingshot.space/contact-sales>
- **Help Center:** Browse additional documentation and FAQs.
- **Support:** Support@slingshotaerospace.com