

Spire Aviation Data Description and Service Level Agreement

This data description (this “**Data Description**”) forms part of a contract between the Spire entity specified in the Order Form (“**Spire**”) and the entity specified in the Order Form as the customer for the Data (“**Customer**”).

The contract between Spire and Customer (this “**Agreement**”) consists of:

- A. The Order Form;
- B. The Spire Data Terms & Conditions (v1.6 dated 1 February 2021) (the “**Terms & Conditions**”); and
- C. This Data Description.

Capitalized terms not defined in this Data Description will have the meaning provided in the Terms & Conditions.

1. Data Services

1.1 Spire provides the following ways to access the Data depending on the terms of the Order Form:

(a) Real Time Data Service

- (i) Tracking Stream – a push feed of all new Target Updates;
- (ii) Tracking REST API – access to the most recent Target Updates as soon as available within a rolling 24-hour window;

(b) History Data Service

- (i) Recent History Data Service – access to Target Updates between 4 hours and 24 hours old;
- (ii) History Data Service – access to Target Updates more than 24 hours old the rolling period specified on the Order Form;

(c) One-off Historical Data Purchase

- (i) Historical ADS-B Target Updates down-sampled as specified in the Order Form;
- (ii) The following terms shall apply to the provisions of One-off Historical Data Purchase:
 - (x) The Historical Data is being provided to Customer for the payment of a one-off fee and the automatic renewal provisions in Clause 4.2 of the Terms & Conditions shall not be applicable; and
 - (y) Notwithstanding anything in Clause 17.5 of the Terms & Conditions requiring the deletion of the Data, Customer may retain and use any Historical Data received pursuant to the relevant Order Form provided such retention and use otherwise complies with the terms of the relevant Agreement.

(d) Flight Report

- (i) Flight Report History Data – a history of flights and related data during the time period specified on the Order Form.. The fields available for inclusion in a Flight Report are further described in [Paragraph 6.1](#); and
- (ii) Flight Report Subscription - a report giving details of all flights during a particular period.

The fields available for inclusion in a Flight Report are further described in [Paragraph 6.1](#).

1.2 “**Data Services**” means the services listed under Real Time Data Service and History Data Service above.

1.3 “**Target Update**” means an update of the location of an aircraft using Data created by combining recently received satellite or terrestrial ADS-B messages.

2. Data Fields & Filters

2.1 **Data Source.** Spire provides various types of Data depending on the terms of the Order Form:

- (a) Satellite-ADS-B Data – ADS-B Data collected by Spire’s constellation of satellites; and
- (b) Terrestrial-ADS-B Data – ADS-B Data collected by terrestrial receivers.

2.2 **Data Content.** For Real-Time Data Service and History Data Service only, Spire provides the following Data content options as specified on the Order Form:

- (a) **Basic** – contains Target Updates with Data available for ADS-B tracking

Field	Description
icao_address <i>string</i>	Hexadecimal representation of ICAO 24-bit address
Timestamp <i>timestamp</i>	timestamp when the message was received by ADS-B receiver
ingestion_time <i>timestamp</i>	Timestamp when the record was stored to the database
Source <i>string</i>	NULL For terrestrial, FM value for satellite
collection_type <i>string</i>	Collection type (“satellite” or “terrestrial”)
Callsign <i>string</i>	Communication callsign assigned as unique identifier to an aircraft
Squawk <i>string</i>	Mode-A squawk code
Latitude <i>float</i>	latitude in degrees, between -90 and 90 (both inclusive)
Longitude <i>float</i>	longitude in degrees, between -180 (exclusive) and 180 (inclusive)
altitude_baro <i>integer</i>	Barometric altitude in feet
on_ground <i>Boolean</i>	TRUE if the aircraft is on the ground, FALSE if is in the air, NULL if unknown

Heading <i>float</i>	aircraft heading in degrees (0 is North)
Speed <i>float</i>	Aircraft speed over ground represented in knots.
Vertical_rate <i>integer</i>	Ascend/descend rate in feet per second

- (b) **Standard** – includes all fields from the Basic option plus the following aircraft information fields depending on the terms of the Order Form:

(i) Tail Number Field

Field	Description
tail_number <i>string</i>	Aircraft registration

(ii) Aircraft Information Fields

Field	Description
aircraft_type_icao <i>string</i>	Aircraft type ICAO code
aircraft_type_name <i>string</i>	Aircraft model name

(iii) Airline Information Fields

Field	Description
airline_iata <i>string</i>	Airline IATA code
airline_name <i>string</i>	Airline commercial name

- (c) **Premium** – includes all fields from the Basic and Standard option plus the following flight information fields depending on the terms of the Order Form:

(i) Flight Number Field

Field	Description
flight_number <i>string</i>	Flight number (IATA format)

(ii) Flight Schedule Fields

Field	Description
departure_airport_icao <i>string</i>	Departure airport ICAO code
departure_airport_iata <i>string</i>	Departure airport IATA code
arrival_airport_icao <i>string</i>	Arrival airport ICAO code
arrival_airport_iata <i>string</i>	Arrival airport IATA code
departure_utc_offset <i>string</i>	Departure local time UTC offset
arrival_utc_offset <i>string</i>	Arrival local time UTC offset
departure_scheduled_time <i>timestamp</i>	Departure local scheduled time
arrival_scheduled_time <i>timestamp</i>	Arrival local scheduled time

(iii) Flight Analytics Fields

Field	Description
departure_estimated_time <i>timestamp</i>	Departure local estimated time
arrival_estimated_time <i>timestamp</i>	Arrival local estimated time
takeoff_time <i>timestamp</i>	Aircraft local takeoff time
landing_time <i>timestamp</i>	Aircraft local landing time

- 2.3 For the avoidance of doubt, each Target Update shall contain as a minimum of the following data fields: ICAO address, timestamp, latitude and longitude. All other fields are populated and updated when the information is known, and data for those fields cannot be guaranteed.

- 2.4 **Data Filters.** Spire provides the Data either globally, per aircraft, per airport, per Flight Information Region, for a custom area, or for the regions described in [Annex A](#).

3. **Data Access**

- 3.1 In relation to the Real-time Data Service, Customer shall not exceed the number of simultaneous Permitted Stream Connections specified in the Order Form.

- 3.2 In the event Customer exceeds the number of simultaneous Permitted Stream Connections specified in the Order Form, Spire may immediately suspend Customer's access to the Data in accordance with Clause 15 of the Terms & Conditions.

- 3.3 In relation to the Tracking REST API Real-Time Data Service and the History Data Services, Customer shall not exceed the number of Permitted REST API Calls specified in the Order Form.

- 3.4 In the event Customer exceeds the Permitted REST API Calls specified in the Order Form, Spire may:

- (a) charge an amount of EUR 25 (or the equivalent in USD, GBP or SGD as the case may be) per call in excess of the Permitted REST API Calls; and/or
- (b) limit Customer's access to the Data.

- 3.5 It is Customer's responsibility to monitor the number of API calls it makes.

4. **Service Levels - SLs**

- 4.1 Spire will use commercially reasonable efforts to achieve the service levels set out below ("SLs") for the Data Services, as measured by reference to Spire's business records but excluding:

- (a) commercially reasonable planned downtime;
- (b) the failure of equipment, applications and other systems not under the direct control of Spire or its subcontractors; and
- (c) other circumstances beyond Spire's reasonable control

(collectively, "Excluded Events").

Service Item	Service Level
System Uptime	Monthly average of more than 99.9% “Uptime” means the average time that ADS-B Data was online and available in any given month, as recorded by Spire.
Data Volume global Satellite	An average of more than 400,000 Target Updates per day during a calendar month. The performance against the SL shall be calculated by dividing (1) the total number of Target Updates delivered to Spire’s APIs in a calendar month; by (2) the total number of days in that calendar month.

5. Service Levels - Remedies

- 5.1 In the event that Spire fails to meet the SLs in a given calendar month, but ignoring any failure to the extent attributable to Excluded Events, Customer shall be entitled to receive a number of additional free days access to the Data at the end of the Initial Term or any Renewal Term as applicable (the “Service Level Credit”) calculated as follows:

Performance compared to SL (on average during the month) (=X)	Service Level Credit days
100% or more	No credit
Between 50% and 100%	15 days
Below 50%	1 month

Example for the “Data Volume global Satellite” SL: If the average number of Target Updates delivered per day to Spire’s APIs in a calendar month is equal to 380,000 Target Updates, the Customer shall receive a Service Level Credit of 15 days.

*Example for the “API uptime” SL (1): If the average uptime of the API in a calendar month is equal to 99.93%, the performance against the SL will be calculated as follows:
(99.93/99.9) * 100 = 100.03% of the SL*

The customer shall receive no Service Level Credit

- 5.2 In order to obtain a Service Level Credit in any given calendar month, Customer must send Spire a written notice within 30 days following the end of such calendar month specifying:
- (a) the Data in relation to which Customer is claiming the credit;
 - (b) the dates and or times in which the Data or availability of the Data failed to achieve the applicable SL; and
 - (c) the amount of the Service Level Credit that Customer believes it is owed.
- 5.3 Spire shall check any claim for a Service Level Credit against its business records in order to determine whether (1) the Data has met the SLs; and (2) whether

Customer is entitled to a Service Level Credit. Spire’s determination shall be binding in the absence of fraud or manifest error.

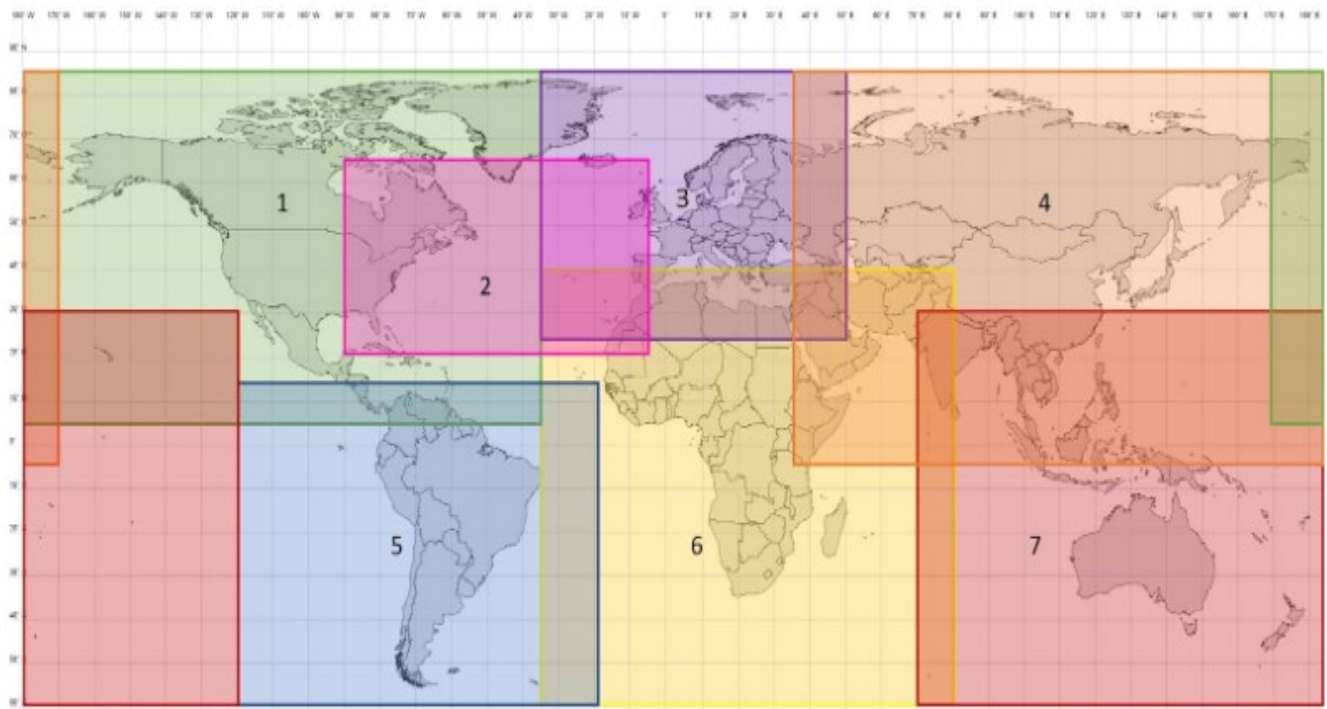
- 5.4 The aggregate maximum number of days of additional access to the Data granted as Service Level Credits for any failures in to meet the SLs in a calendar month shall not exceed the number of days in that calendar month. Service Level Credits may not be exchanged for, or converted to, monetary amounts
- 5.5 In the event that Customer receives the maximum Service Level Credit for any 6 consecutive calendar monthly periods, then Customer shall be entitled to terminate this Agreement.
- 5.6 Customer agrees that (a) the Service Level Credits; and (b) Customer’s right to terminate in Paragraph 5.5 are Customer’s sole and exclusive remedy, and Spire’s sole and exclusive liability, for:
- (a) downtime in the availability of the Data; and
 - (b) failure of the Data to meet any expectations and performance level.

6. Flight Report

- 6.1 The fields available for inclusion in a Flight Report (subject to the terms of the Order Form) are described below.

Field	Description
aircraft_type_icao <i>string</i>	Aircraft type (ICAO code)
callsign <i>string</i>	Communication callsign assigned as unique identifier to an aircraft
date <i>timestamp</i>	Date of the flight
flight_number <i>string</i>	Flight number (IATA format)
icao_address <i>string</i>	Hexadecimal representation of ICAO 24 – bit address
tail_number <i>string</i>	Aircraft registration
observation_time_from <i>timestamp</i>	First observation data of the flight through satellite and terrestrial data.
observation_time_to <i>timestamp</i>	Last observation data of the flight through satellite and terrestrial data.
departure_airport_icao <i>string</i>	Origin airport ICAO code
arrival_airport_icao <i>string</i>	Destination airport ICAO code
departure_scheduled_time <i>timestamp</i>	Scheduled departure time.
arrival_scheduled_time <i>timestamp</i>	Scheduled arrival time.

Annex A - Regions



Regions 1. N. America/C. America/Caribbean 2. Atlantic 3. Europe 4. Asia 5. S. America 6. Africa 7. S.W. Pacific