

exactAIS Delivery

The service provided consists of the global collection and distribution of AIS messages from the two available AIS channels.

For a given customer, the service level purchased, and hence the subscription price, depends on several factors:

Area of Interest (AOI)	Describes which geographical area(s) is to be monitored. Customers can choose specific areas in accordance with the exactEarth Data Policy. Multiple Areas of Interest (AOI) can be supplied.
Data Licensing	The Data is provided under a Subscription Agreement which controls its use and there are 3 levels of Data Licenses available; User, Agency and Government Wide
Data Usage	Describes the various data usage scenarios for which to receive the exactAIS™ message feed; Operational (full use), Historical or View Only

exactAIS® Message Feed Feature Summary

exactAIS Message Feed provides the following AIS message content:

- All detected AIS position reports comprising ship ID (MMSI), GPS position, navigational status, course, speed and other information contained in the report
- All detected AIS static messages comprising ship name, ship type, IMO number, callsign, dimensions, destination and other information contained in the static message
- All detected Safety Text messages
- All detected AtoN messages
- All detected Application specific messages
- All detected Base Station position reports and commands

The exactAIS Message Feed service is provided to provide customers with data format and delivery flexibility in choosing options best suited to their needs.

The table below summarizes the data formats available and their respective delivery methods:

exactAIS Data	Delivery Method	Secure
	Secure Data Feed	

Format	FTP	
NMEA v4.0	Yes	Yes
OTH-Gold	Yes	Yes
XML	Yes	Yes
KML	No	Yes
CSV	No	Yes

Table 1: exactAIS Message Feed Data Formats and Delivery Methods

Message Feed Package Features

AIS Messages

The following table outlines the various AIS message types reported.

Message Categories	Contents	AIS Reporting Intervals (ITU 1371-4)
Position Reports (types 1,2,3,4, 18)	<ol style="list-style-type: none"> 1. Ship ID (MMSI) 2. GPS Position 3. Course 4. Speed 5. Rate of Turn 	<ol style="list-style-type: none"> 1. 2 seconds at full speed (>23 knots) 2. 6 seconds at speed of 14-23 knots 3. 10 seconds < 14 knots 4. 3 mins at anchor 5. 3 mins (Satellite pos rpt – 27)
Static/Voyage Reports (types 5, 24)	<ol style="list-style-type: none"> 1. MMSI 2. Name 3. IMO 4. Callsign 5. Length 6. Destination 7. ETA, etc 	<ol style="list-style-type: none"> 1. 6 minutes or when data amended
AtoNs (Aids to Navigation)	<ol style="list-style-type: none"> 1. MMSI 2. Type 	<ol style="list-style-type: none"> 1. 3 minutes

(type 21)	3. GPS Position 4. AtoN status, etc	
SAR Aircraft (type 9)	1. MMSI 2. Name 3. GPS position 4. Altitude 5. Speed	1. 10 seconds
Safety (12,13,14)	1. Various	1. As required
Binaries (6,7,8,25,26)	1. Various	1. As required

exactAIS Data Format Options

NMEA v4.0

All AIS messages are transmitted from the exactEarth Data Processing Centre using the industry standard NMEA (National Marine Electronics Association) 0183 v4.0 format. This is a standard format used between marine electronic devices. A sample of NMEA output is listed below:

```
\s:rEV03,c:1294912484*55\!AIVDM,1,1,,B,13gJ1kg00?NA77@ULmG8mqiB0<0f,0*21,1294912
```

Please note that the exactAIS™ message stream also provides a source identifier which includes the exactView™ satellite which received the message, as shown in the \s:rEV03 TAG block example below, and a timestamp for when the message was received on the satellite, as noted in the c:1294912484*55\ example. Both TAG blocks are added as a section preceding the NMEA sentence as follows:

```
\s:rEV03,c:1294912484*55\
```

OTH-Gold Format

AIS messages can be transmitted directly from the exactEarth Data Processing Centre using the OTH-Gold format. Information contained in the OTH message includes a combination of position, static and voyage related information. Data elements include ship's identification, GPS position, course, speed, rate of turn, ship name, navigational status, ship type, IMO number, ship length and time-stamp. A sample OTH-Gold message is included below.

```
CTC/T2969/UNEQUATED-SHIP NAME//SHIP/UNK//HK////18////////VRZO2  
XPOS/25004230Z6/FEB10/LL:211452.06N1-1575320.27W2/AIS////013.7T/3.1KTS////NTS RIG////////648FT
```

RMKS/NAV STATUS:UNDER WAY USING ENGINE
RMKS/RATEOFTURN:0.0 HEADING:16RMKS/MMSI:478917000 IMO:8301614

XML Format

AIS messages can be transmitted directly from the exactEarth Data Processing Centre using an XML-based format. Information contained in the XML syntax includes a combination of position, static and voyage related information. Data elements include ship's identification, GPS position, course, speed, rate of turn, ship name, navigational status, ship type, IMO number, ship length and time-stamp. A sample XML syntax is included below.

```
<Track>
  <DateTime>2011-01-13T13:17:02.325Z</DateTime>
  <CountryMID>303</CountryMID>
  <RegionID>27</RegionID>
  <TrackInfo>
    <TrackInfoVessel>
      <VesselId>
        <MMSI>367354000</MMSI>
      </VesselId>
      <VesselAIS>
        <VesselDataDynamic>
          <Coordinate>
            <LAT>53.8782833</LAT>
            <LON>-166.538633</LON>
          </Coordinate>
          <COG>178</COG>
          <SOG>0.1</SOG>
          <HDT>228</HDT>
          <ROT>0</ROT>
          <NavStatus>Engine</NavStatus>
          <PosAcc>Low</PosAcc>
        </VesselDataDynamic>
      </VesselAIS>
    </TrackInfoVessel>
  </TrackInfo>
</Track>
```

Google Earth KML Format

AIS messages can be transmitted directly from the exactEarth Data Processing Centre using the Google Earth KML format. Information contained in the KML syntax includes a combination of position, static and voyage related information. Data elements include ship's identification, GPS position, course, speed, rate of turn, ship name, navigational status, ship type, IMO number, ship length and time-stamp. A sample KML syntax is included below.

```

<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Folder>
    <name>exactEarth AIS Data</name>
    <description>AIS data formatted for use with Google Earth.</description>
    <Placemark>
      <name>240564000</name>
      <Point><coordinates>-1.40108333333,-31.1317166667,0</coordinates></Point>
      <description>MMSI: 240564000</description>
      <ExtendedData>
        <Data name="nav_status">
          <value>0</value>
        </Data>
        <Data name="rot">
          <value>0</value>
        </Data>
        <Data name="sog">
          <value>129</value>
        </Data>
        <Data name="course">
          <value>2810</value>
        </Data>
        <Data name="heading">
          <value>277</value>
        </Data>
      </ExtendedData>
    </Placemark>
  </Folder>
</kml>

```

CSV Format

AIS messages can be transmitted directly from the exactEarth Data Processing Centre using the Comma Separated Values (CSV) format. Information contained in the CSV row includes a combination of position, static and voyage related information. Data elements include ship's identification, GPS position, course, speed, rate of turn, ship name, navigational status, ship type, IMO number, ship length and time-stamp. A sample CSV formatted message is included below.

```

Stamp,UTC,UTCdisplay,MMSI,LAT,LONG,COG,Heading,ROT,SOG
20/03/2011,013149,01:31:49,734862330,-23.5373883333,-69.3473816667,306,365,-0.845129938728,10
20/03/2011,135606,13:56:06,717769104,37.88706,32.046745,65,361,2892.24593281,31
20/03/2011,153635,15:36:35,423376840,109.479383333,-27.732415,84,119,-1065.07500528,35
20/03/2011,074838,07:48:38,879109387,79.5940066667,-51.8314566667,389,403,409.042890344,81
20/03/2011,105912,10:59:12,872626816,94.1250933333,87.2365666667,366,212,2603.21149377,38
20/03/2011,190435,19:04:35,149759689,34.5435166667,132.951578333,368,108,2892.24593281,63
20/03/2011,190432,19:04:32,769075542,-69.3978666667,-191.932253333,362,146,-686.456792732,61
20/03/2011,203756,20:37:56,25041002,-90.2714883333,23.0509733333,102,426,1005.91590957,59
20/03/2011,204251,20:42:51,49967206,-24.8448233333,-49.402765,56,220,-2794.21085992,20

```

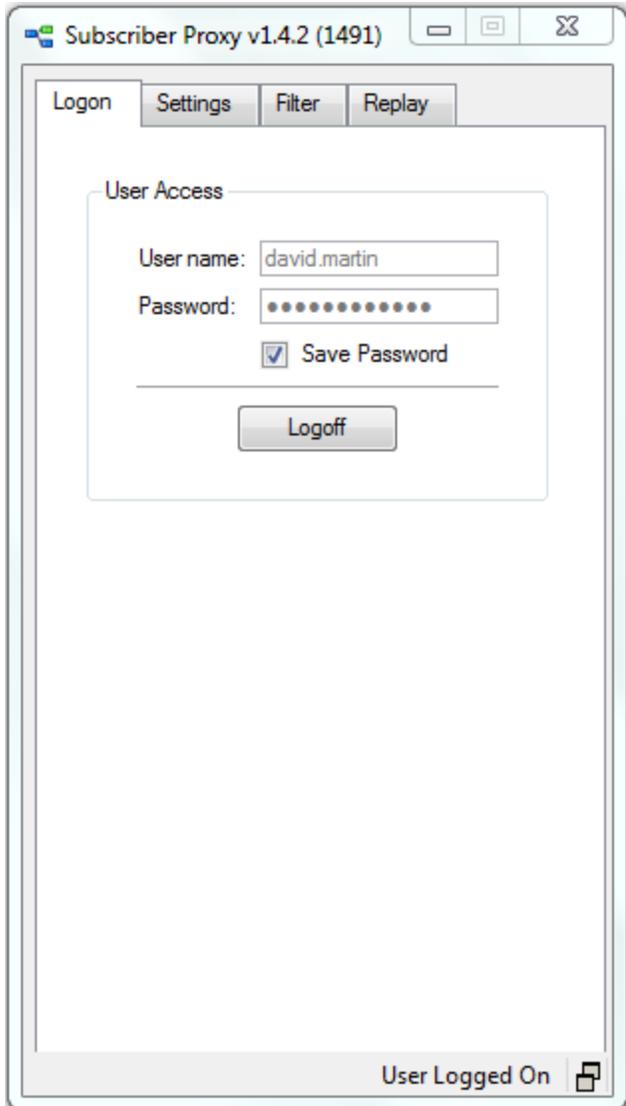
20/03/2011,033201,03:32:01,251191110,64.1342316667,-21.8272416667,305,163,0.0,0
20/03/2011,033201,03:32:01,316007862,48.12799,-69.7309666667,163,336,0.0,3
20/03/2011,033201,03:32:01,240847000,49.6107666667,-16.2384166667,38,40,0.0,13
20/03/2011,033201,03:32:01,309951000,38.8022116667,-74.0505533333,187,189,0.0,22
20/03/2011,033201,03:32:01,305178000,42.9731166667,-27.0931833333,227,230,0.0,14

exactAIS™ Data Delivery Options

Secure Data Feed

exactAIS messages can be streamed directly from the exactEarth Data Processing Centre (DPC) over an encrypted link using a TCP/IP socket based connection. ExactEarth provides software (called the exactAIS Subscriber Proxy) which is installed at the customer site and maintains a persistent connection to the DPC. This Proxy receives filtered AIS data according to customer's Area Of Interest and then routes it to another TCP/IP socket for ingestion into customer operational systems.

An example of the exactAIS Subscriber Proxy is shown below:



For customers with security policies that do not allow the installation of 3rd party software components, an option is available to stream the data directly from the exactEarth Data Processing Centre over a secure data link (point-to-point) provided by the customer.

Secure FTP

exactAIS messages can be written to files on a secure FTP server on a time limited basis and is hosted within the exactEarth Data Processing Centre (DPC) and accessed by the customer as required. The supported file formats include NMEA V4.0, OTH-Gold, XML, KML and CSV.

The files may be written on either a 24 hour aggregated basis, or when the customer's AOI is updated with new position reports. The files utilize a naming convention as follows:

24 Hour Aggregate – YYYYMMDD_all.XXX where YYYYMMDD represents the aggregate day of messages and XXX represents the file type extension based on selected data format.

AOI Update – YYYYMMDD_HHMMSS_SeqNo.XXX where YYYYMMDD_HHMMSS represents the date and time of messages and XXX represents the file type extension based on selected data format.

exactAIS Message Feed - Minimum System Requirements

The table below lists the Minimum System Requirements for the computer that will receive the exactAIS message feed.

Requirements	File-based Method	Data Streaming Method
Data Delivery Mechanism	Secure FTP software Login credentials provided by exactEarth Operations	Installation of exactAIS Client Proxy Software provided by exactEarth or customer provided point-to-point data link Login credentials provided by exactEarth Operations
Internet connection	Yes	Yes
Operating System	Any Windows, Linux or Unix OS	Windows XP and Windows 7
RAM (Memory)	0.5 GB	0.5 GB
Free disk space	250 MB	250 MB
Processor speed	1 GHZ	1 GHZ
Data Retrieval Method	Customer responsibility	Automatic polling and retrieval