

Argo Trans

In this issue

MAIN STORY

New AGT-AL transmitter for container tracking **1**

TIP OF THE DAY

How to decode e-mail data **2**

ARGOS USERS

CCR tracks hazardous containers around the world with Argos **3**

ON THE WILD SIDE

Studying turtles with the Argos system **3**

NEWS

A close look at the 3rd generation of Argos payloads and what that will change **4**

Events

NACLS exhibits at the Inter-modal show in Atlanta, booth 626 (April 1999)

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New AGT-AL transmitter for tracking tank containers

The new AGT-AL is a transmitter designed specifically to be fitted on tank containers that require monitoring of several technical parameters.



The ACT-AL on a Eurovos tank



It is a natural evolution of the broadly used ACT-AL. There are three main improvements:

- **The AGT-AL is self-powered** which means it no longer needs an external power source. The ACT-AL did not have internal batteries since our first customers were tracking and monitoring refrigerated containers where power was available. However, we have noticed that all others required a battery pack. So we decided to put everything in a single package, making installation easier. The battery pack is the standard 15V/54AH alkaline battery pack that is used on the AGT-C. The battery life is up to two and a half years.

- **The sensor interface has improved** and can now accommodate a Pt100 temperature probe. The old ACT-AL had three analog inputs in voltage. Some

of our customers already have Pt100 temperature probes on their containers and we had to provide an interface board. Now, it is possible to connect the probe directly to the transmitter.

- **The AGT-AL has two different operating modes:** real-time or store and forward where it can transmit an hourly temperature measurement. In the first mode, it transmits the temperature reading when the satellite flies over. This is the ideal mode for customers requiring a daily reading. However other customers are mostly interested in getting a history of the temperature of the product to make sure that it was always at the right temperature during transport. This is particularly important for operators who want to prove to their customers that they provided top-class transport service. In this second mode of operations, the AGT-AL

records temperature readings and sends them in a full message once a day to reduce power consumption. The results: a continuous measurement of temperature and a record that can be archived for later use.

The AGT-AL has been improved to meet the demands of our customers.

The AGT-AL has been improved to meet the demands of our customers. It is easier to install, easier to connect sensors and has the ability to act as a temperature recorder. Its main uses should be on refrigerated or heated tank containers where the temperature of the product is important both to improve safety and to make sure the product quality remains stable. ■

How to decode e-mail data

Our ADS (Automatic Distribution Service) E-Mail service is a convenient way to receive Argos data. ADS automatically sends to one or several e-mail addresses Argos data, including position and sensor data when available. ADS can be set-up to send data either at pre-set times or when new data sets are available.

For example you can choose to receive every morning at 8AM the latest information available for your transmitters or all the information since the last e-mail. It is also possible to receive data as soon as it is computed in the Argos processing center which is interesting if you need information rapidly (for alarm monitoring for instance).

In an Argos e-mail, data is presented as it is in the Argos processing center. Here are two examples of messages, for the AGT and the ACT-AL. ■

NOTE

When the satellite flies over a transmitter, it needs to receive at least 4 messages to be able to compute the position of the transmitter. When this is not the case, we give the previous position available and the date/time of message may be different from the date/time of position.

E-mail is a convenient way to receive Argos information automatically and rapidly. Simple tools can be developed to process the messages and store the sensor data into spreadsheets like Excel. A future feature of Argotrans will deal with this topic.

Typical AGT message

```
12345 37.227N 122.568W 1 341/2122Z-341/2117
( 6) FC 0.12882E+2 0.11863E+2 00
```

- 12345 ID code of the transmitter
- 37.227N Latitude of the transmitter (here 37° and 227 thousands of degrees North)
- 122.568W Longitude of the transmitter (here 122° and 568 thousands of degrees West)
- 1 Quality of the position (3=150m accuracy, 2=350m accuracy, 1=500m accuracy, 0=1000m accuracy)
- 341/2122Z Date and Time of message (day of year/hours and minutes). Here, day 341 is 7th December and 2122 is 21:22 GMT
- 341/2117 Date and time of position (day of year/hours and minutes). Here, day 341 is 7th December and 2117 is 21:17 GMT
- (6) Repetition Index of message. 6 means that this message has been received 6 times in a row during the satellite pass. This message is completely error free whereas a message with an index of 1 may contain errors.

Here starts the data message

- FC Hexadecimal value ; not used
- 0.12882E+2 Battery voltage, here 12,88V
- 0.11863E+2 Temperature, here 11,8°C (NB: it can be provided in degrees F)
- 00 Hexadecimal value ; not used

Typical ACT-AL message

```
67890 49.045N 5.558E 1 182/1209Z-182/1205
( 3) FC 0.15000E+2 0.15000E+2 0.25000E+2
00 01 00 01
00 E3
```

- 67890 transmitter ID
- 49.045N latitude (degrees. Thousands of degrees)
- 5.558E longitude
- 1 location class
- 182/1209Z date/time of message
- 182/1205 date/time of position
- (3) number of times the message was received during the pass

Here starts the data message

- FC not used
- 0.15000E+2 Sensor one. In this example, a temperature sensor is used and the value is 15,0°C
- 0.15000E+2 Sensor two. In this example, a temperature sensor is used and the value is 15,0°C
- 0.25000E+2 Sensor three. In this example, a temperature sensor is used and the value is 25,0°C
- 00 not used
- 01 00 01 3 digital switches with values of 1,0 and 1 (ON/OFF/ON)
- 00 not used
- E3 CRC

Depending on the number of analog and digital inputs used, the format of the message may vary.

CCR tracks tank containers around the world with Argos

CCR is one of the three biggest tank container leasing companies in the world. It owns more than 9000 ISO tank containers and swapbodies as well as more than 9200 small tanks or IBCs. These containers are used for a variety of applications such as foodstuff and hazmats transport. CCR is headquartered in France and has offices throughout Europe,



in the United States and in Singapore.

CCR has been a leader in satellite tracking technology. It first used the Argos system for an R&D project funded by the French ministry of transport in 1994. The demonstration, involving five tank containers carrying oxygen peroxide for a French chemical manufacturer, successfully demonstrated the proof of concept: it was actually possible to easily track tank containers wherever they were going.

Since that time a lot of progress has been made and CCR has several hundred tank containers equipped with Argos transmitters.

Today, CCR offers to its customers, as an option, the possibility to lease a tank with an Argos transmitter. Tank containers can then be monitored remotely, providing position information as well as other data such as temperature of the



An AGT transmitter installed on a CCR tank container

product, when required.

CCR can then provide Argos information to its customers through a variety of means. For instance, it is possible to get a daily fax that will include the container BIC code, the position in terms of proximity (the closest city or town) and the date and time of the position. Another possibility is to use the CCR WEB site that gives statistical information as well. This is a complete set of fleet management tools that have

been developed to help CCR's customers improve their operations. Several chemical companies are currently using these tools. ■

You can find more information on CCR on their **WEB site**: www.ermewa.com or contact CCR in **Paris** at +33 1 47 78 62 45, vprince_ccr@ermewa.fr or in **Houston** at +1 713 621 78 43, lan@ermewa_usa.com

On the Wild Side

Studying turtles with Argos

Animal Tracking is one of the oldest applications of the Argos system.

Wildlife biologists are using Argos to plot the migrations of various animals such as cranes, caribous or marine mammals. Argos also helps to collect data such as heart rate, body temperature and flight altitude for birds. This information is critical for conservation programs and cannot be collected by any other mean.

The sea turtle is one of the many animals that are studied with Argos. In 1997, nine Argos transmitters were used to track green turtles (*Chelonia Mydas*) in various islands of the Indian Ocean. The team of the *Ifremer* (the French Oceanographic Research Institute) at *La Réunion* has used Argos in an innovative way to demonstrate the capability of young turtles (five

years old) to readapt to wildlife after being bred in captivity.

This research project also aims to:

- find the main migration paths used by young and adult turtles;
- localize their feeding areas both in coastal areas (mainly grassbeds where adults find food) and in the open ocean (where young turtles can find sponges, snails, small crabs and jellyfish);
- study the behavior of the animals during migrations, feeding and reproduction.

This experiment has already brought interesting data. Scientists used Argos results to analyze the turtles behavior. A small number of satellite messages show that when a turtle is close to the coastline, it spends very little time at the surface. As soon as the turtle moves away from the shore, more messages



A wireless seaturtle

are received. The animal is more "active" and scientists suspect that it rests at the surface.

Through a better understanding of the turtles, these research projects aim to put in place development plans to help save these animals and their habitat. ■

Argos-3: what this brings to Argos customers

In the last issue of Argo-Trans, we featured the launch of NOAA-K which is the first satellite to carry the Argos-2 payload. Argos-2 is another step in the improvement process of the Argos system. The next major step will be the following generation of Argos payloads, Argos-3.

Argos-3 is the new generation of Argos payloads that is programmed to fly onboard the European METOP satellite starting in 2003 and on the US NOAA satellites in 2004. Argos-3 will bring several major improvements to all the Argos community.

First, Argos-3 will introduce **two-way communications** that will enable a variety of new services. For example it will be possible to start and stop a transmitter remotely to be able to get information only when required. Acknowledgement is also a future service: a transmitter will know when it has been received so that it needs to transmit less frequently, further reducing power consumption. Of course it will be possible to send any kind of mes-



The launch of NOAA-K

sage to a transmitter, enabling new services like starting a refrigeration engine or resetting the temperature of a reefer.

It must be noted that this two-way capability will be tested on the Argos-Next payload that will be launched in 2000 on a Japanese ADEOS satellite.

Furthermore, the receiver on the **Argos-3 payload will be more sensitive** allowing to use transmitters radiating less power (1W instead of 2W for instance): this again directly impacts power consumption.

And finally Argos-3 uses a

larger bandwidth allowing to process data from many more transmitters. This means, of course, being able to track many more transmitters, but also that existing transmitters, spread on the band, will not interfere with each other. Thank to this increased bandwidth, new services, like the ability to transmit larger messages will be available. Currently, Argos allows to transmit 256 bits of data which is enough to transmit technical information like temperature, pressure, etc. In some cases, Argos users want to transmit more information. **With Argos-3, users will be able to send messages of several kilobits**, meeting the requirements of those who have large volumes of data to transmit. This can be useful when monitoring refrigeration equipment to remotely access diagnostic information.

Argos-3 is yet another step in the improvements of the Argos system and shows CLS's commitment to improve the quality of its services and to make Argos available deep into the 21st century. ■

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