<u>Allegato 12</u>: Specifiche tecniche per integrazione con sistema di lettura codici RFID Microtest Srl *(vedi Capitolato Tecnico, paragrafo 2.2)*

<u>A12.1. Denominazione e contenuto del file letture</u>

A bordo dei mezzi impiegati per la raccolta porta a porta dei rifiuti urbani e assimilati in quei Comuni nei quali è previsto un sistema di tariffazione puntuale (*pay as you throw*) basato sul metodo della pesatura indiretta tramite la stima della quantità di rifiuto prodotto dalle singole utenze sulla base della volumetria dei sacchi e contenitori forniti, ASCIT SpA ha provveduto ad installare dispositivi di lettura dei codici RFID, apposti per mezzo di chip a perdere sui sacchi e tag installati sui contenitori, prodotti dall'azienda Microtest Srl.

Ad oggi l'importazione delle letture è effettuata unicamente allo scopo della determinazione della tariffa corrispettiva di gestione dei rifiuti urbani e assimilati e si realizza con il salvataggio di tutte le letture effettuate in un file con estensione sql, che è inviato al server aziendale tramite rete wi-fi al momento del rientro dei mezzi in sede aziendale.

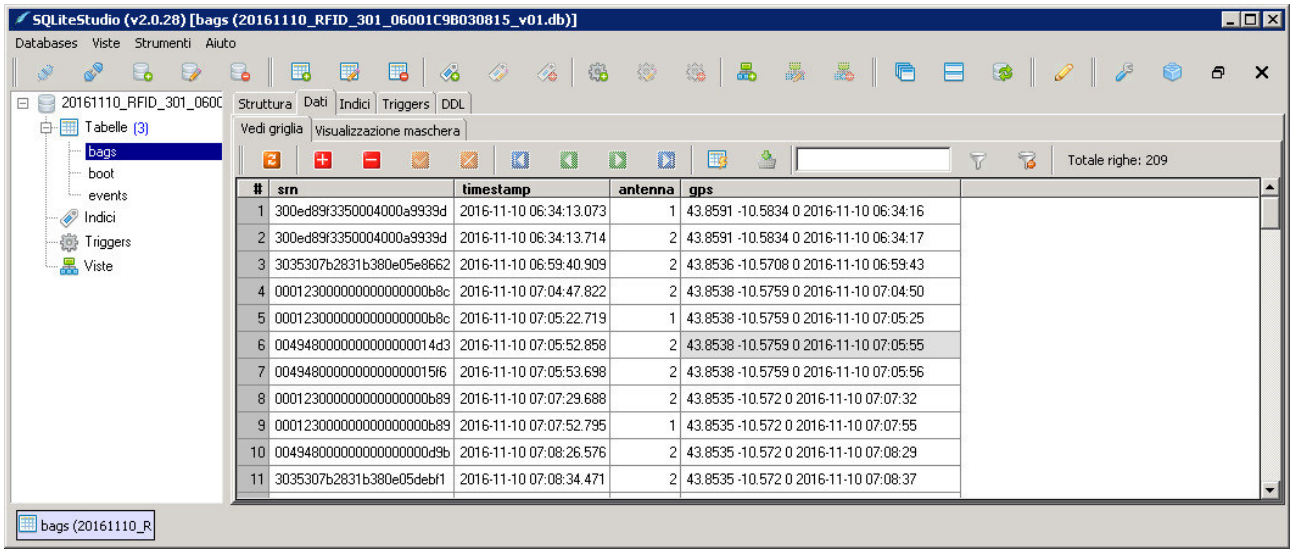
Per ogni lettura di tag/chip RFIF, il dispositivo genera pertanto una riga all'interno del file sql, che è successivamente convertito in formato txt al momento dell'esportazione sul server aziendale.

Di seguito un esempio di un nome di un file preso direttamente dal sever:

20161121_RFID_301_06001C9B030815_v01.txt

(<yyyymmdd>_RFID_<numero veicolo>_<mac address>_<revisione file>)

Di seguito un esempio di un estratto preso da uno dei veicoli:

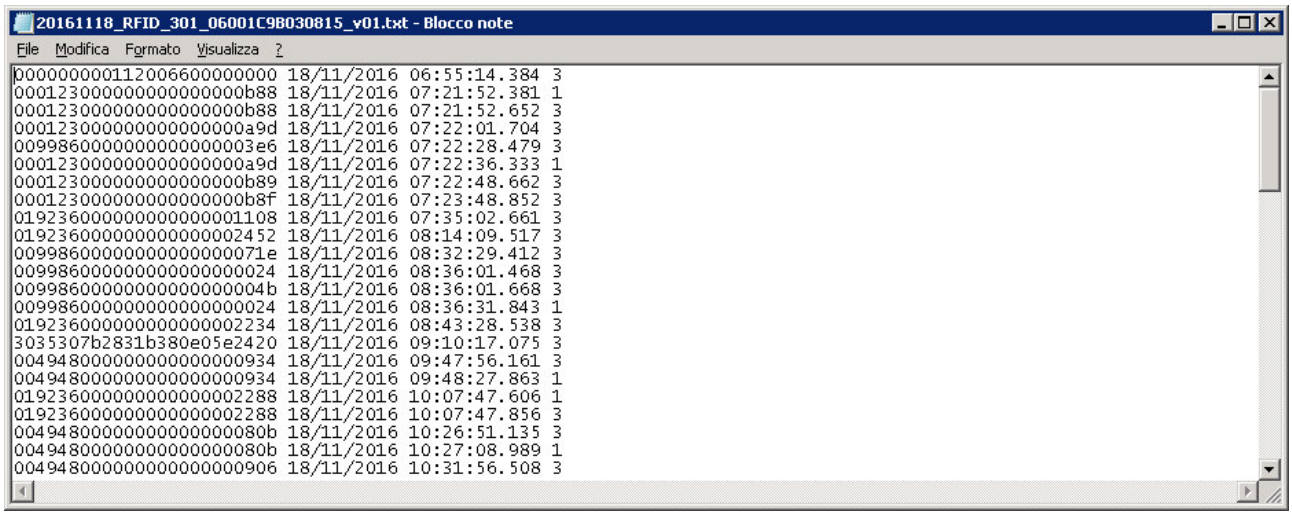


Si possono notare i vari campi con i dati necessari per un completo riconoscimento della lettura.

In ordine viene scaricato:

- Tag (codice del tag)
- Timestamp (tempo di avvenuta lettura)
- Antenna (informazione relativa all'antenna quale è l'antenna che effettua la lettura)
- Gps (coordinate,, latitudine, longitudine dl meriano Greenwicth)

Le stesse colonne vengono riportate sui file txt, un esempio è riportato nella figura successiva:



La colonna gps al momento è soltanto disponibile nei file db, (database), e non ancora in quelli txt.

Nell'integrazione con il *fleet management system*, l'importazione in tempo reale del dato di lettura avrà lo scopo di dare ulteriore conferma dell'esecuzione dei servizi di svuotamento, sarà pertanto richiesto di importare almeno i seguenti campi:

- Tag
- Timestamp

L'implementazione da parte di Microtest della possibilità di installare un modulo GSM sui dispositivi di lettura per procedere con l'upload runtime dei file di lettura in ambiente cloud è attualmente in fase di valutazione tecnica, mentre è già possibile realizzare la connessione con sistemi esterni tramite le seguenti porte di interfaccia:

- Ethernet
- RS232

A12.2. Scheda tecnica tag RFID instalati sui contenitori

(Vedi documento CONFIDEX)

A12.3. Scheda tecnica chip RFID instalati sui sacchi a perdere

(Vedi documento Alien Technology)

PRODUCT DATASHEET

Confidex Carrier Tough™

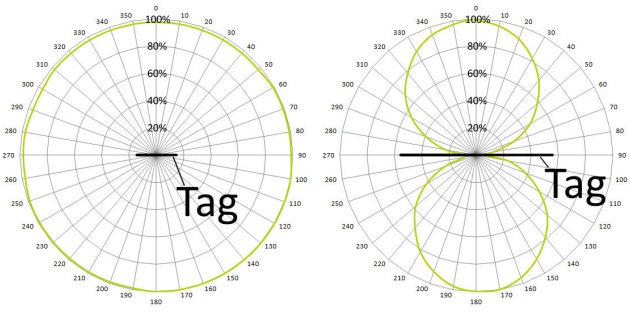
Thin tag solution for reliable plastic container and returnable transit item tracking.

ELECTRICAL SPECIFICATION

Device type
Class 1 Generation 2 passive UHF RFID transponder
Air interface protocol
EPCGlobal Class1 Gen2 ISO 18000-6C
Operational frequency
Global 860-960MHz
IC type
Impinj Monza 4QT™
Impinj Monza 4E™ (upon special request)
Memory configuration
With Monza 4QT: EPC 128 bit; User 512 bit; TID 96 bit
With Monza 4E: EPC 496 bit; User 128 bit; TID 96 bit
EPC memory content
Unique number encoded as a default
Read range (2W ERP)*
EU on plastic up to 11,5 m / 37 ft
EU on dry wood up to 8,5 m / 28 ft
US on plastic up to 12,5 m / 41 ft
US on dry wood up to 10 m / 33 ft
Applicable surface materials*
Non-metallic surfaces.

* Read ranges are theoretical values that are calculated for non-reflective environment, in where antennas with optimum directivity are used with maximum allowed operating power according to ETSI EN 302 208 (2W ERP). EU = 865 - 868 MHz, US = 902 - 928 MHz. Different surface materials may have an effect on performance.

RADIATION PATTERNS



MECHANICAL SPECIFICATION

Tag materials
Printable white PET, scratch resistant engineering plastics
Background adhesive
High performance acrylic adhesive specifically for low surface energy plastics
Weight
0,1 g
Delivery format
Single
Amount in box
500 pcs
Tag dimensions
120 x 30 x 2 mm / 4.72 x 1.18 x 0.08 in

ENVIRONMENTAL RESISTANCE

Operating temperature
-20°C to +70°C / -4°F to +158°F
Ambient temperature
-20°C to +70°C / -4°F to +158°F
Water resistance
IP68
Washing resistance
Excellent, tested 1000 cycles with water at 175bar / 80°C
Chemical resistance
No physical or performance changes in:
- 168h Salt water (salinity 10%) exposure
- 168h NaOH (10%, pH 13) exposure
- 70h Motor oil exposure
- 70h Sulfuric acid (10%, pH 2) exposure
- 4h Acetone exposure
Storage condition
1 year in +20°C / 50% RH (shelf life for adhesive)
Expected lifetime
Years in normal operating conditions

Values in the table are the best recommendations; resistance against environmental conditions depends on the combination of all influencing factors, exposure duration and chemical concentrations. Thus, product's final suitability for certain environmental conditions is recommended to be tested. Contact Confidex for more specific information.

01-2013
contact@confidex.com www.confidex.com

PERSONALIZATION OPTIONS

Pre-encoding

- Customer specific encoding of EPC or user memory. Locking permanently or with password.

Customized printing

- Customer specific layout including logo, text, numbers, barcodes etc.

INSTALLATION INSTRUCTIONS

Confidex Carrier Tough™ polarization is along the longest dimension of the tag like shown below.

When selecting the location ensure the following

- Select a smooth surface without uneven areas below tag
- Avoid touching the background adhesive

When mounting the tag with its adhesive background, clean and dry the surface for obtaining the maximum bond strength. Remove the liner and place the tag on the correct location. Ideal application temperature is from +21°C to +38°C (+70°F to +100°F), bond strength can be improved with firm application pressure and moderate heating from +38°C to +54°C (+100°F to +130°F). Application at temperatures below 10°C (50°F) is not recommended

Confidex Carrier Tough™ can also be attached mechanically through the holes in the tag's structure with:

- Screws (size M3)
- Pop rivets (size 3mm)

When using mechanical attachment please add also washer with more than 9mm outer diameter like shown below. Also avoid using unnecessary force during the attachment.

ORDER INFORMATION

Product number: 3000447
Product name: Confidex Carrier Tough™ M4QT

For other versions, additional information and technical support contact Confidex Ltd.

PRODUCT DATASHEET

01-2013
contact@confidex.com www.confidex.com

ALN-9740

Squiggle Inlay (Higgs™ 4)

The Alien Technology® ALN-9740 Squiggle® is a high-performance, general-purpose RFID inlay for use in a wide variety of applications. Brings all the Higgs™ 4 advantages to highly-regarded "Squiggle" Inlay.

Applications

- Volume Retail/Apparel
- Enterprise Wide Asset Management
- Warehouse Management
- Tracking Challenging Materials and Objects

FEATURE	DESCRIPTION	BENEFIT
One of the most widely-used general-purpose tags, now with an optimized memory footprint.	Well-proven design for a broad range of worldwide applications. Optimized 448 bit memory footprint for volume and enterprise applications.	Robust, proven, and reliable. Designed to drive down the cost-of-ownership while increasing efficiencies of RFID solutions in large enterprises.
One of the best performing general-purpose tags on the market, now with next generation Higgs™ 4 performance.	Optimized for high performance in all world regions. Higgs™ 4 further enhances read and write sensitivity.	Trusted performance now even further enhanced, enabling robust encoding and reading, even in challenging conditions.
Designed to work well in challenging dielectric environments.	A very robust general purpose tag.	Reliable in challenging environments.

Features:

- Designed to meet EPCglobal Gen2 (V 1.2.0) and ISO/IEC 18000-6C
- Worldwide operation in the RFID UHF bands (840-960 MHz)
- 448-Bits of NVRAM Memory
  - 128-EPC Bits
  - 128 User Bits
  - 64 Bit Unique TID
  - 32 Bit Access and 32 bit Kill Passwords
- Pre-Programmed with a unique, unalterable 64-bit serial number
- User Memory can be Block Perma-Locked as well as read password protected in 32 Bit Blocks
- Low power operation for both read and program
- Dynamic Authentication™ - anti-cloning/anti-counterfeit technology
- Exceptional operating range, up to 11m with appropriate antenna.
- Available in high-yield, high capacity dry/wet inlay rolls

Product Overview:

Powered by Alien®'s volume focused **Higgs™4 UHF RFID IC** and innovative **Squiggle** antenna design, the ALN-9740 delivers industry leading EPC Gen 2 performance and reliability at a competitive price.

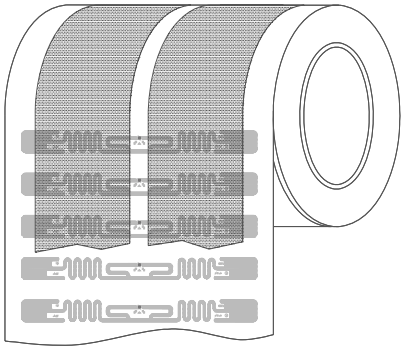
ALN-9740 inlays are *World Tag* compliant, enabling consistent operation across the diverse frequencies of the Americas, Europe, Middle East, Asia, and Africa.

With its Higgs-4 core, the Squiggle delivers next generation performance and a rich feature set, yet is completely **optimized for the highest volume enterprise, retail, and apparel applications**.

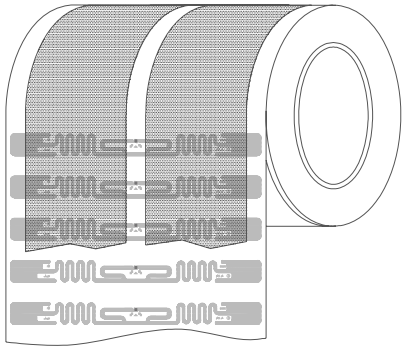
An optimized memory footprint includes a 32-bit TID, a **64-bit Unique TID for authentication** and **next generation serialization** applications, a **128-bit EPC memory** bank, 128-bits of user memory for distributed data applications, and **password protected read and write** support capabilities to prevent unauthorized viewing and modification of the tag's data.

Typical applications for the Squiggle include, but are not limited to, corrugate cases, pallet placards, apparel hang tags, baggage tags, shipping labels, asset management, and file folder labels.

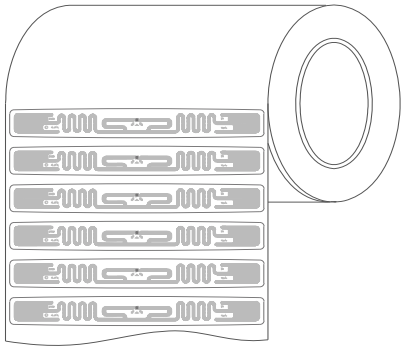
ALN-9740 Inlay Orientation



ALN-9740-R
(Dry Unslit Roll)



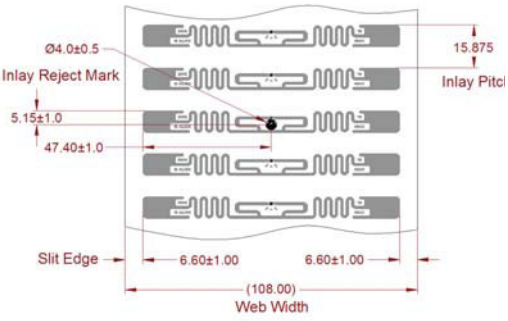
ALN-9740-SR
(Dry Slit Roll)



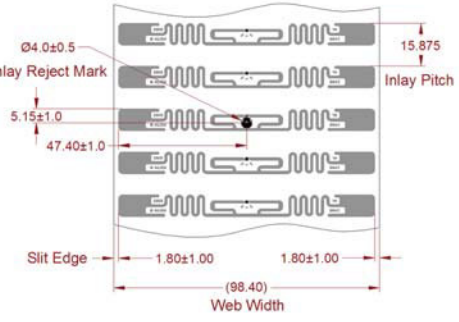
ALN-9740-WRC / -WRW
(Clear / White Wet Inlay)

Standard Alien Inlay rolls unwind with metal antenna side facing outward, with respect to the core.

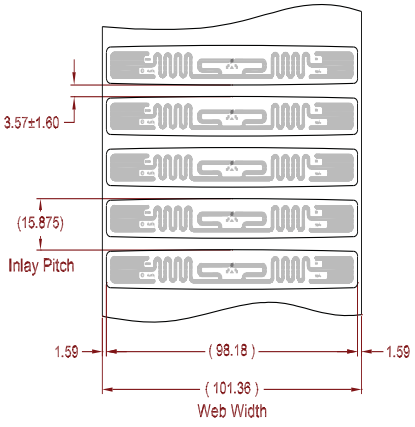
ALN-9740 Inlay Specification



ALN-9740-R
(Dry Unslit Roll)

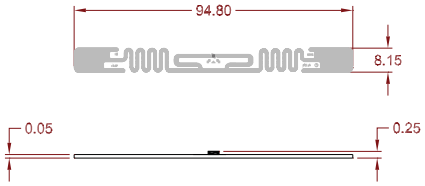


ALN-9740-SR
(Dry Slit Roll)

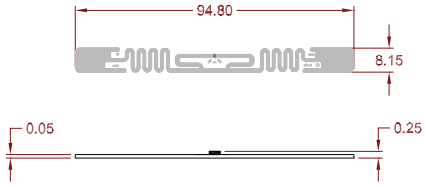


ALN-9740-WRC / -WRW
(Clear / White Wet Inlay)

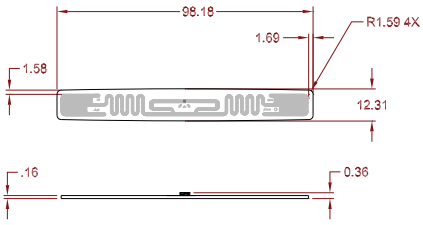
ALN-9740 Inlay General Dimensions



ALN-9740-R
(Dry Unslit Inlay)



ALN-9740-SR
(Dry Slit Inlay)



ALN-9740-WRC / -WRW
(Clear / White Wet Inlay)

ALN-9740 Inlay Stackup

DRY INLAY THICKNESS, ±10%	
OVER ANTENNA	0.05 mm
OVER CHIP	0.25 mm

ALN-9740-R / -SR
(Dry Unslit / Slit Inlay)

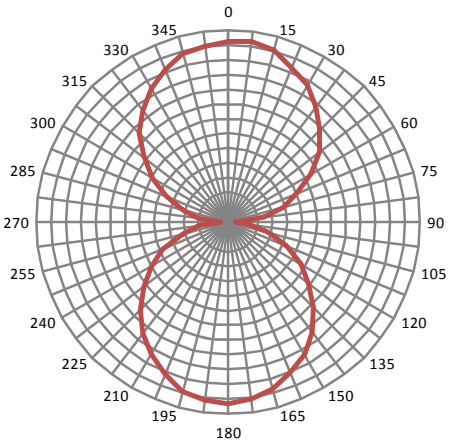
CLEAR WET INLAY THICKNESS, ±10%	
OVER ANTENNA	0.08 mm
OVER CHIP	0.28 mm

ALN-9740-WRC
(Clear Wet Inlay)

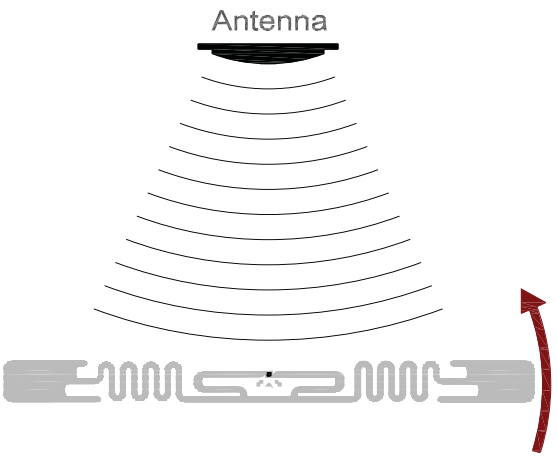
WHITE WET INLAY THICKNESS, ±10%	
OVER ANTENNA	0.16 mm
OVER CHIP	0.36 mm

ALN-9740-WRW
(White Wet Inlay)

ALN-9740 Inlay Angular Sensitivity



Angular Sensitivity
(Relative Read Range vs. Orientation)



Angular Sensitivity
Inlay is rotated in the x, y, plane about the z axis
(tag shown at 0° with respect to face of antenna)

ALN 9740 Squiggle Inlay

ALN-9740 Specifications

Dry Inlay	
Antenna Width	3.732" [94.8mm]
Antenna Length	0.319" [8.1mm]
Web Width (-R)	4.252" [108.0mm]
Web Width (-SR)	3.874" [98.4mm]
Web Pitch	0.625" [15.875mm]
Core Width (-R)	4.252" [108.0mm]
Core Width (-SR)	3.874" [98.4mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Interleaf Material	Paper
Interleaf Width	1.5" [38.1mm]
Inlays per Roll	20,000 Nominal
Maximum Roll OD	< 12" [304.8mm]
Roll Labeling Data	Roll #, Quantity

Wet Inlay	
Inlay Width	3.866" [98.2mm]
Inlay Length	0.484" [12.3mm]
Web Width	3.992" [101.4mm]
Web Pitch	0.625" [15.875mm]
Core Width	4.752" [120.7mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll	20,000 Nominal
Maximum Roll OD	< 16" [406.4mm]
Roll Labeling Data	Roll #, Quantity
White (-WRW)	TT Printable White Film Overlay
Overlay Adhesive (-WRW)	General Purpose Permanent
Inlay Adhesive	General Purpose Permanent
Adhesive Application Temperature	> +25°F [-4°C]
Adhesive Service Temperature	-40°F to +200°F [-40°C to +93.3°C]
Release Liner	40# SCK

Environmental	
Shelf Life	2 years at +77°F [+25°C] @ 40% RH
Recommended Storage	+77°F [+25°C] @ 40% RH
Storage Limits	-13°F to 122°F [-25°C to +50°C] 20% to 90% RH Non-condensing
Operating Limits	-40°F to +158°F [-40°C to +70°C] 20% to 90% RH Non-condensing
Bend Diameter	> 1.97" [50mm]
Pressure	< 5N/mm^2
Drop Resistance	Per ASTM D5276
Write Cycles	100,000 @ 25°C
RoHs	2002/95/EC, 2005/618/EC, 2011/65/EU Compliant
REACH	1907/2006/EC Compliant (SVHC and ECHA)
ESD Limit– HBM / CDM	5.0kV / 1.5kV

RFID	
Protocols Supported	ISO/IEC 18000-6C EPCglobal Class 1 Gen 2
Integrated Circuit	Alien Higgs-4
EPCglobal Certificate	950110126000001084
Operating Frequency	840–960 MHz
EPC Size	128 Bits
User Memory	128 Bits
TID	32 Bits
Unique TID	64 Bits
Access Password	32 Bits
Kill Password	32 Bits

* Shipped with 6" to 3" plastic core adapter

Alien Technology
18220 Butterfield Blvd.
Morgan Hill, CA 95037
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www.alientechnology.com

07 Feb 2014