

Confidex Pino™ NXP G2XM
3000067

Technical Product Specification
Version 1.0
September 2008

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1. Product description

Confidex Pino™ is designed to enable cost-efficient and reliable tracking of wooden pallets. The tag is suitable for identifying all kinds of similar wooden items from timber to finished structures. Confidex Pino is supplied with the NXP G2XM chip, which has together with the EPC-memory also additional memory for user specific information. Typically returnable transit items like wooden pallets require additional data storage to be included with the EPC number.

Confidex Pino has been specifically made for wooden objects. In wooden pallet tracking the typical requirement is to read from one to many pallets when pushed through a RFID portal. Confidex Pino has been successfully tested in stacked pallet tracking where the tags have been in the corner blocks enabling visibility to the readers even when handled with forklift trucks.

1.1 Specification data

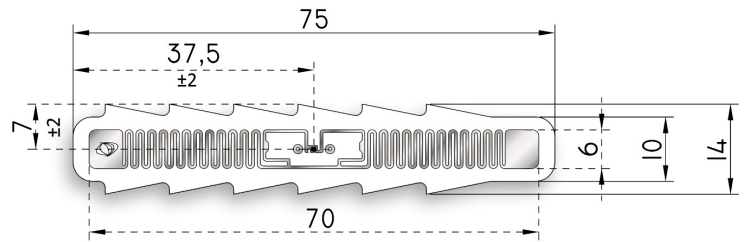
Device type	Class 1 Generation 2 passive UHF RFID transponder
Air interface protocol	EPCGlobal Class1 Gen2 ISO 18000-6C
Operational frequency	860-960 MHz
IC	NXP UCODE G2XM
EPC memory	240 bit
Extended memory	512 bit
Read range^{*)}	up to 3-4m / 10-13ft, reader power 2W ERP
Material	PET
Weight	0,6 g
Delivery format	Singulated
Tag amount in a box	500pcs (default)
Reel core inner diameter	76mm / 3"
Protection class	IP67
Environmental compatibility	Product is RoHS compliant

*) Moisture in the wood will typically decrease the performance by 20-30% ? CHECK

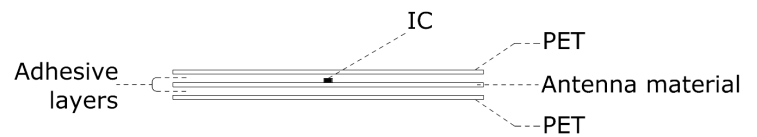
1.2 Dimensions

**General dimensions
and IC location**

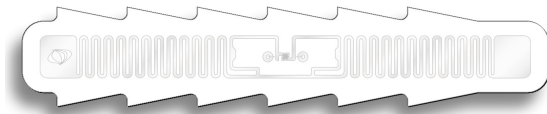
75 mm x 14 mm x 0.3 mm / 2.95" x 0.55" x 0.012"



Cross section



**Delivery in singulated
format**

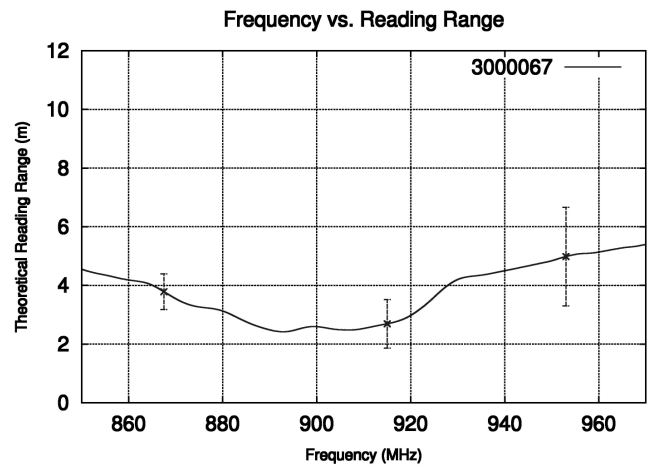


1.3 Performance data

Electrical performance

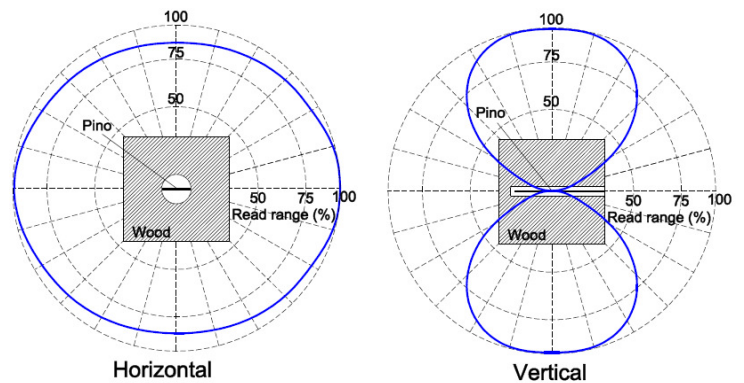
Theoretical reading range when Pino assembled in the wood

Presented reading ranges are calculated values in non-reflective environment, in where antennas with optimum directivity are used with maximum allowed operating power: EU 865-868 MHz (2W ERP), US 902-928 MHz (4W EIRP), and JPN 952-954MHz (4W EIRP).



Radiation patterns

Estimated radiation pattern when tag orientation towards reader antenna is optimized.



Resistance against environmental conditions*

Operating temperature	-35°C to +60°C (-31°F to +140°F)
Ambient temperature	-35°C to +60°C (-31°F to +140°F)
Storage condition	+20°C / 50% RH
Water resistance	Good, tested for 5 hours in 1 meter deep water
Chemical resistance	No physical or performance changes in: <ul style="list-style-type: none"> - Salt water (salinity 10%), tested in 196h exposure - NaOH (10%, pH 13), tested in 24h exposure - Sulfuric acid (10%, pH 2), tested in 168h exposure - Acetone, tested in 30min exposure - Motor oil, tested in 168h exposure

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.

1.3 Supported components

There are no additional components available for this product.

1.4 Supported services

Standard customer personalization

EPC coding	Customer specific EPC code can be programmed to IC.
EPC printing	Customer specific EPC code can be printed onto the label.*)
UID printing	IC UID code can be printed onto the label.*)
Minimum order quantity	10 000 pcs for standard customer specific personalization. Consult with Confidex Sales for lower quantity.

*) Tag's physical dimensions are limiting the printability

1.5 Information of used materials

White PET	Surface is printable with inkjet printing.
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1.6 Possible applications

Wood	Tracking of all kinds of wooden products: e.g. pallets, logs, Living trees tagging
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2 Installation instructions

Protection of tag during usage

Minimum bending diameter of the Confidex Pino is defined to be 50mm. Do not bend the tag above the limit.

Never touch on the location of the IC. IC chip is sensitive electrical component and can be damaged if unexpected pressure is applied on the chip.

Try to avoid mechanical impacts to the Confidex Pino. IC and antenna may be damaged due to mechanical shocks.

Tag's antenna parts should not be in contact or close to metal to enable best possible performance of the label.

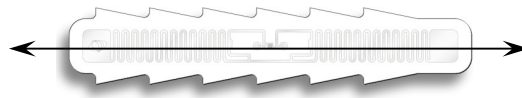
Tag application

Following guidelines are valid when installing and using the Pino tag. There are several options how to install the tag on the pallet depending on the reader antenna location and tag inserting technique. Usually, pallet is equipped either with one or two Pino tags.

Tag should be installed into the corner blocks according to instructions on next page. The centre block is not recommended since truck's metal forks will block the signal from the tag.

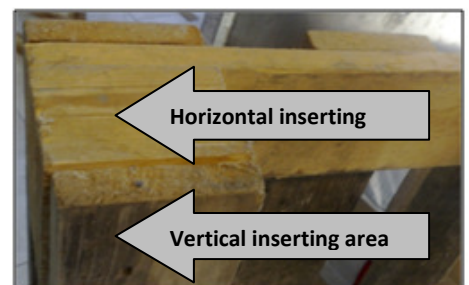
Tag orientation

Label polarization is along the tag's longest dimension



Orientation options for application

- **VERTICALLY** in the corner block: Vertical positioning offers best orientation towards RFID antennas in various configurations.
- **HORIZONTALLY** in the corner block: If fixed reader antenna is placed above the pallet, horizontal placement of the tag will give the best orientation and performance for the tag.



Tag Fixing Methods

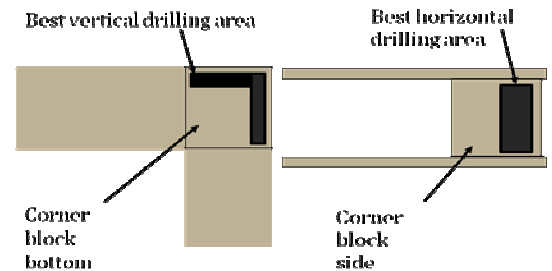
Both new and old pallets can be tagged with Pino by inserting the tag inside corner block. Nails should be avoided during the installation. Attachment inside the pallet will give outstanding resistance against mechanical impacts and different weather conditions.

Tools needed to assemble into the corner block:

- Drill bit, size 13mm
- Special Pino installation tool

Procedure:

- 1) After choosing the best tag orientation, drill a hole of 13mm diameter and 100mm depth. Drill the hole close to block edge avoiding nails. Best drilling areas are in the pictures, depending on if the tag is placed vertically (from block bottom) or horizontally (from block side)
- 2) A special Pino installation tool can be used for tag insertion.
- 3) Push the tag into the block so that it is totally inside the block
- 4) Hole can be covered with sealant if use environment includes high moisture.



Recommended operation conditions

Confidex PinoTM is tested to be resistant in certain environmental conditions. If Pino cannot be placed according to instructions above, it is recommend to install the tag into the place, which is protecting it against contaminations and mechanical shocks. Reliability of the Confidex Pino is defined to be its maximum if tag is positioned in such safe place.

3 Order information

Product number	Product name
3000067	Pino NXP G2XM

For additional information and technical support contact Confidex Ltd.

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