TagMaster

DATA SHEET

MarkTag Classic

General purpose ID-tag

Part No. ***125500***

Pat. Pend.

MarkTag Classic

is a battery-assisted passive (BAP) 2.45 GHz RFID tag. The versatile credit card ID-tag can be used for many different applications in access and logistics. The front and back-sides are available for custom prints.

The ID-tag is Read-Only and permanently programmed with an 8 digit decimal “Mark”. Every TagMaster "Mark" is unique and can only appear on one single tag.

The programmed code includes a 32 bit checksum for automatic “Mark” validation. The patented pre-programmed tag checksum eliminates any “Mark” reading errors even if the tag is far away or if several tags are present in the same reading zone.

The ID-tag can be mounted on any material including metal without affecting any read-range properties. The MarkTag Classic can be read in any rotational angle as long as the front side is turned towards the reader.

A lithium energy cell gives the ID-tag a long predictable life independent from the number of times the tag is read. If the energy is about to run out after several years of operating life, a status bit is set to give the user a warning via the Reader. When the status bit is set, the tag will continue to function for about six months.

The design is vibration resistant, watertight, corrosion free, UV stable and withstands most chemicals. The front panel is made from a polymer that can be printed according to user requirements. The back panel is equipped with the Part number and a Serial number (s/n).

The MarkTag Classic can be fitted by using a standard credit card holder. For windshield attachment the “WinFix” card-holder is recommended and for permanent attachment the “CardTape” accessory can be used.

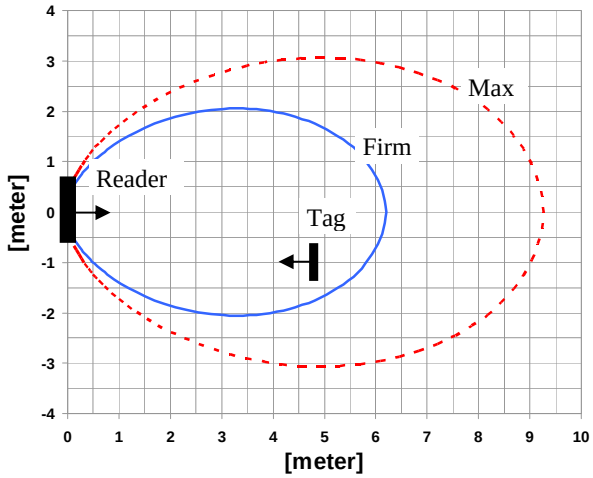
The WinFix Classic card holder

Read- range

MarkTag Classic receives/reflects it’s signals through the front panel. The tag can not be read towards the back-side.

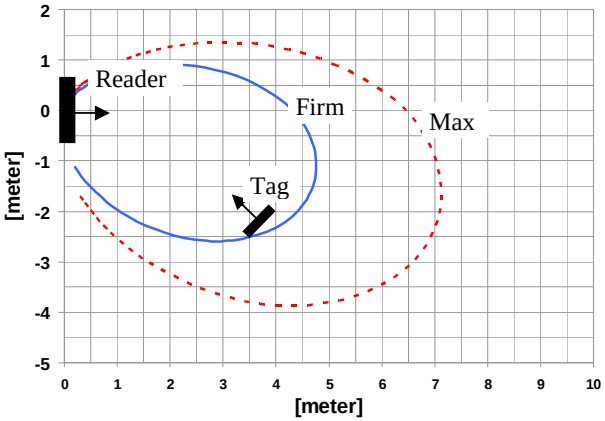
The read-range is defined by a number of factors such as the positioning of the reader and the tag. The read-range also depends on the reader model and settings as well as the environment.

The ID-tag will be read at any distance from the reader up to the maximum read-distance. The firm read-range shown in the identification-lobe diagrams below indicates the typical read-range for near 100% reading-probability in an ideal environment using the LR-6 reader at 10mW (EIRP). The max read-range below represents the average 0%



Typical read-range lobes for LR-6 at 0° Tag-tilt

Read-range cont...
If the tag is tilted 45° vs. the reader the read-range will be transformed according to the diagram below.



Typical read-range lobes for LR-6 at 45° Tag-tilt

The lobe is unaffected if MarkTag Classic is mounted on a metal surface, and non metallic materials in front of the tag usually have little effect on the read-range lobe.

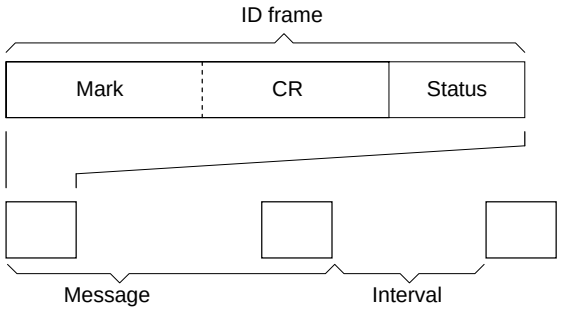
The diagrams above show typical MarkTag Classic read-range properties for an average of all available frequency cannels in an ideal environment. Other readers in the LR-3/LR-6 family provide different average firm read-ranges from 3.5 up to 10 meters.

Any excess read-range can easily be reduced by setting the LR-reader's *Readlevel*. If the *Readlevel* function is used, very accurate identification-lobes can be defined as well as minimizing the difference between the firm and the maximum read-range.

Communication

The ID-tag will supply the tag information to any interrogating TagMaster Reader set to any frequency (channel) within the frequency band. If different Readers are set for different channels and simultaneously illuminate the tag, the tag will be safely read by all of these without interference.

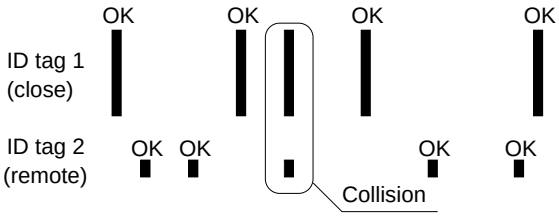
An ID-frame comprises the factory coded "mark" from the R/O memory, a 32 bit CRC checksum and a "status" field. The ID-frame is reflected from the tag at random intervals.



An interval plus leading and trailing ID-frames is called a "Message time". The "Message time" ,i.e. the longest time required for a complete ID-frame to be read, is always less than 150 ms. The average time is however only 80 ms which means that the a tag is read 12 times every second.

Multiple tag operation

Since the MarkTag Classic generates its ID-frames at random intervals, it is possible to read several tags at the same time as shown on the picture below:



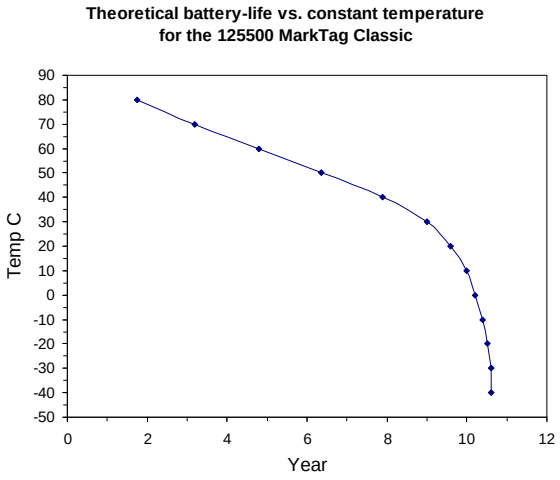
When a collision occur the checksum algorithm in the Reader will cancel any erroneous "ID- mark" readings. In the example above however, the "ID tag1" will be correctly identified, since the tag is more close to the reader.

In a worst case situation, e.g. if different tags are present, the tag is located close to the read-range limit or the environment provide strong interference, the likelihood for a reading error (wrong interpretation) is less than one in 5·E+9 (5 000 000 000) readings, thanks to the 32 bit CRC checksum.

This means that in all practical cases the TagMaster reader will always provide the correct "ID-mark".

Tag life

TagMaster has an excellent tag endurance experience for their semi-passive tags since 1995. The lithium cell is specified for high and low temperature operation, such as when the tag is installed in a car window. The operating temperature is the key to predict the operating life of the tag. The diagram does not represent the tag life in terms of average temperature.



Note that batteries are not specified beyond 10 years of operation.

Security

For security reasons, the serial number (s/n) which is printed on the tag has no relation to the 8 digit decimal electronic “Mark“ stored in the memory of the tag. Both are running numbers that are never repeated. The “Mark” is unique and is set at the semiconductor manufacturing level and can not be changed. The s/n and “Mark” information is only supplied to the specific customer.

Communication range data

Reader	Firm Read-range [meter]
LR-3	Up to 3.5
LR-6	Up to 6
LR-6 XL	Up to 10

Mechanical data

Weight	16 grams
Front color	Grey
Back color	Dark grey
Encapsulation	Polymer
Assembly method	Adhesive

Environmental data

Operating temperature	-20° … +70°
Storage temperature	-40° … +85°
Ingress protection	IP 54
Immunity	According to CE
Emission	According to CE

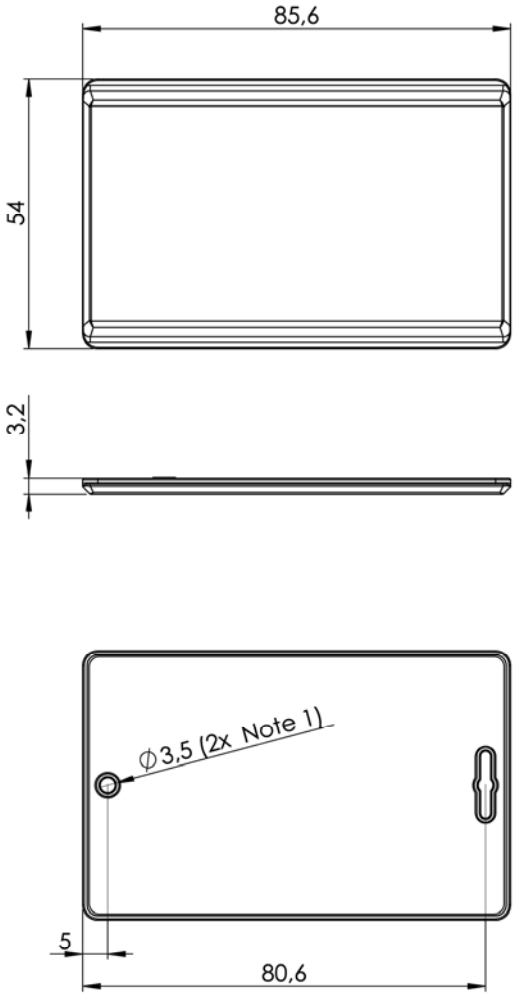
Certifications

The MarkTag Classic tag is CE approved

Order information

Item	Part No
MarkTag Classic	125500
WinFix card holder	195100
CardTape	195400

Outline drawing



[mm]

Note 1: Diameter for punching a through-hole