# Hands free - How does it work?


The hands free system increases the effective read range of a standard Paxton P or KP series reader. Standard tokens use the readers radio field to power the token but hands free tokens have a battery and so only require a much weaker signal to be activated.

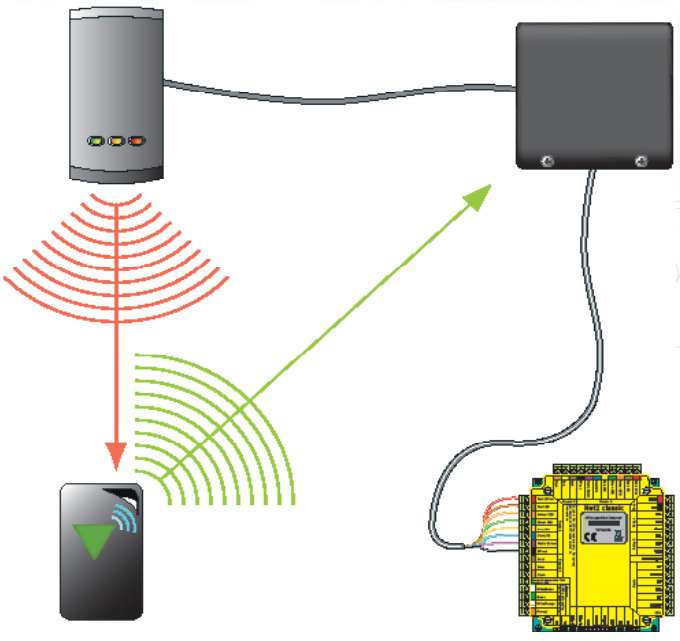
The system comprises of a compatible reader (see read range table), a hands free interface and hands free tokens (keycard or keyfob). The system operates by using the reader to wake up the battery powered token which then communicates with the interface and its long range receiver aerial.


Existing P and KP readers can be used without modification. The hands free interface takes its power from the control unit and therefore does not require a power supply.

Hands free tokens also include a standard PROXIMITY ID chip and can therefore be presented to any compatible proximity reader whether they are using the hands free interface or not.

## Overview

The P series reader is constantly transmitting the address of the interface it is connected to. When the hands free token comes in range, it wakes up and transmits its card number to the interface just identified. This ensures that it only communicates with the correct interface board, allowing several interface boards to be placed within range of each other.



The token then shuts down for two seconds to stop repeated transmissions and preserve battery life. After this two second period, the token checks to see if it is still in the same field. If so, it shuts down and checks again two seconds later. If it finds no field, it shuts down completely until woken again by a fresh transmission from a reader.

NOTE: After a good read, you must take the token away from the readers field before you can repeat a test at the same door.

## Reader position

The read range of the system depends on the type of reader chosen.

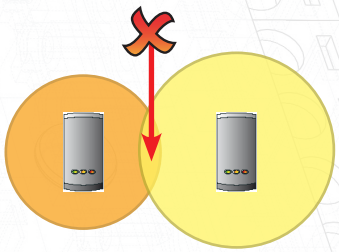
| Read Range | |
|---|---|
| P38 | 0.85 m |
| P50 | 1.1 m |
| P75 | 1.5 m |
| P200 | 2.5 m |
| P200 metal mount | 2.0 m |
| Long Range Reader | 5.0 m |

When a reader is connected to a hands free interface board for the first time the reader firmware will be modified to transmit the address of its interface every 100 ms.

The location of both reader and the interface directly affects the operation of the system.

As the reader is constantly transmitting interface information, it must be placed outside the transmission range of adjacent readers, loop aerials etc, or this data may be corrupted.

For example, the minimum distance between a P200 and a P50 reader with hand free should be greater than their combined read range of 3.6 m (P200 hands free range = 2.5 m + P50 hands free range = 1.1 m)



When using in and out readers, users may be picked up by both readers as they move through the door which will affect the reliability of any roll call or anti-passback application. Ensure that sufficient spacing is provided between these readers for optimum range and reliability.

## Interface position

The token communicates with the interface using a wireless device at 2.4GHz. This frequency is ideal for low power, short-range communication and enables the high speed transmission of secure, encrypted data packets.

The interface should be physically positioned within 15 metres of the reader regardless of the actual cable length between them. Wireless technology can be susceptible to environmental factors so if problems are experienced it may be necessary to reposition or move the interface closer to the reader.

The hands free interface contains the main radio aerial and so should not be housed in a metal enclosure, behind metal girders, reinforced concrete, etc or the read range will be greatly reduced.

## Keycard operation

The keycard will operate as a passive (standard token), hands free or long-range (button) token. It will hold multiple interface details within its memory.

A keycard has a range of typically 5 metres (maximum 50 metres). This is achieved by transmitting the data by pressing a button while still outside the wake up range of a reader.

Before the keycard buttons will operate, the card needs to used in normal hands free mode. Assign the token to a user and then bring it in range of the reader to open the door in hands free mode. The token will store the interface address and which button the interface responds to (interface switch SW2).

When you press a button on the keycard, it transmits its card number to all the interfaces that are set to use that button. If two interfaces are likely to be within range, (e.g. In and Out barriers) you should set each interface to use a different button.

NOTE: This range can only be achieved in free space with a good line of sight between user and interface. In many secure areas such as car parks, metal gates and fencing can disrupt the radio signal resulting in a reduction in read range. As usual, the positioning of the interface is important and the range may be greatly improved if the interface is located well above ground level giving a clear line of sight to the user.