



RHV1 Hand Held Reader / Wand Manual



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Patents:

Patents in the UK and other countries protect **Cyphertag**[®] systems.

Registered Designs

Various design aspects of the RHV1 Hand Held Reader and associated equipment are registered.

WARNING NOTICE

This product uses radio frequency signals, and is therefore subject to possible interference. Any application should bear this in mind, and in particular it should not be possible for personal safety to be jeopardised by a failure to read.

This **Cyphertag**[®] Hand Held Reader neither uses nor generates hazardous voltages. You should not connect any such voltage to it.



See Appendix D

FCC Regulations

FCC Approval pending

Operation is subject to the following two conditions:

- (1) This device must not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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1. **Cyphertag[®] RHV1 Hand Held Reader**

1.1 Introduction

Cyphertag[®] is a high performance tag identification system, offering fast long range (hands free) multiple reading with optional direction sensing from the RV1 and RVR1 Loop Controllers. The shorter range mullion reader REV1 complements the hands free readers offering ranges up to 150mm with the standard Cyphertags. The RHV1 is a rechargeable “battery operated” hand held reader which provides tag detection range of up to 1.0m. The RHV1 is a multi-function unit and incorporates a survey meter which can benefit surveyors and installers when assessing where to fit loop aerials for the RV1 and RVR1 readers to enable optimum performance. The typical operational life of a fully charged RHV1 unit is around 10 hours. **Identec do not recommend the unit is retained on charge when not in use.**

The reader firmware is extremely flexible and the menus available can and will differ from one site to another depending on the main function being performed by the reader. Customisation of the unit will normally result in a slight variation to the operating menu items. Most functions are self-explanatory with the options for changing the values being clearly defined on the screen.

This manual is intended for use on site to assist with the installation, commissioning and for training end user staff on how to use the product. Further information is available from Identec's web site; www.identec.com.

1.2. The RHV1 Hand Held Reader

A **Cyphertag[®]** RHV1 hand held reader identifies tags (sometimes referred to as tokens or cards) using low frequency radio signals. It transmits to the tag at 125 kHz and detects the tag's response around 4MHz.

The RHV1 hand held reader is configurable using a simple to use menu displayed on the face of the reader controlled by the five function keypad.

1.3 Unpacking

Check that the package contains

- RHV1 Hand Held Reader
- Mains Charger Unit
- Reader Specification Sheet
- Manual
- C of C

2.0 Getting Started

The RHV1 is normally supplied with a fully charged battery and should therefore be ready for immediate use.

The unit is switched on by depressing the RED “power” button on the faceplate, for a second. The display will light showing the normal default setting “SHOW TAGS”. In this mode the identity of any Cyphertags detected in the field of the reader, bearing the same “site code” as the wand, will be identified in the display window. The display shows the PID followed by a six digit number. This is the Public Identity of the tag being read. If two tags are presented to the reader the identities of both tags will be displayed. If a tag is detected with a “battery low” flag raised the display will indicate this by adding “LOW” to the right of the number displayed.

2.1 The RHV1 Faceplate & Controls



The column of LEDs in the bottom right hand corner of the faceplate provide information to assist the user.

The “POWER” LED will light while the unit is active.

The “READ” LED will light while a Cyphertag with the same site code as the reader is in the detection field.

The “REPORT” LED will flash while data is being downloaded from the reader.

The “BATTERY LOW” LED will light when the unit is in need of a recharge.

The “CHARGE” LED will light when the charger unit is plugged in and the unit is charging. It is extinguished once the wands battery is fully recharged.

The reader function and settings can be changed using the centre “enter” key and the four “arrow” keys. A full list of the adjustable functions is detailed in section 2.

Note: The unit is supplied with a battery saving feature which automatically switches the reader “off” after 60 seconds if no new transaction (i.e. keypad entry or tag detection) has been detected. This time interval is adjustable using the menu and appropriate arrow keys.

The reading range is determined by the type of tag being detected, its position and orientation relative to the faceplate of the RHV1. For maximum range most tags should be presented to the centre of the faceplate so the tag’s coil is parallel to the faceplate. The only exception is the TV3 which should be presented edge on to the faceplate as this tag uses a ferrite rod.

3.0 Main Menu Items.

Press the centre “Enter” button once. The “UP” and “DOWN” arrows can now be used to scan the main menu items. The standard list comprises:-

Survey Meter

Show Tags

View Noise

Battery Voltages

Firmware

Settings

Additional items can be engineered to address specific client requirements. These would be covered in an appendix should they be present.

3.1 Main Menu Functions.

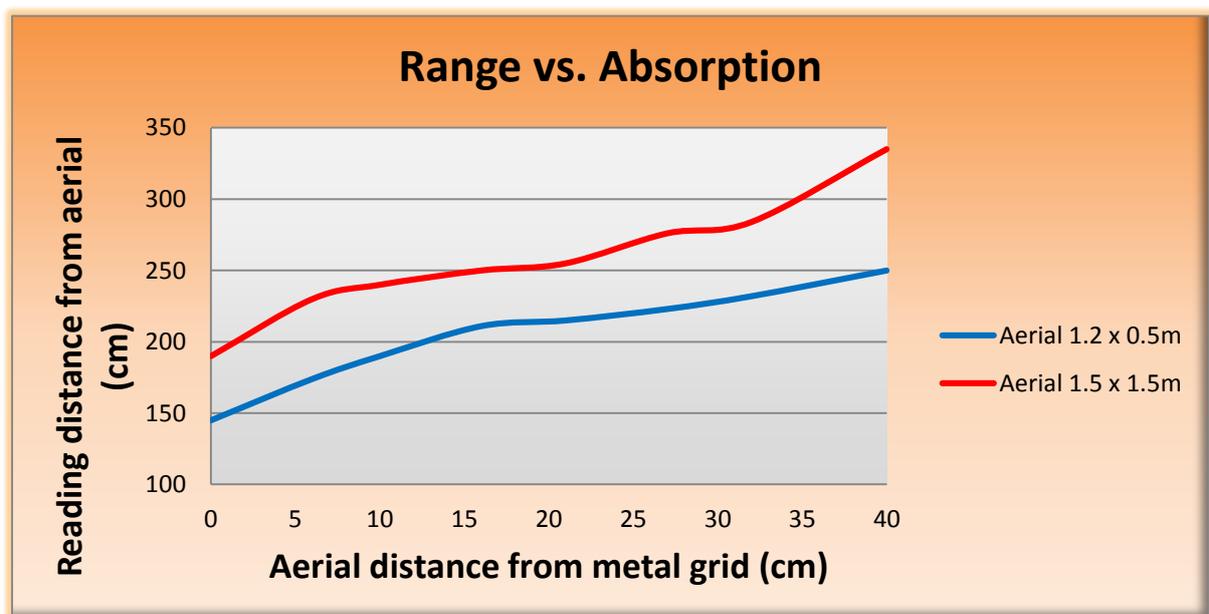
3.1.1 SURVEY METER. This function enables surveyors and installers preparing to specify, or install, a **Cyphertag**[®] system to know the level of performance they might expect for a loop aerial mounted in certain locations.

The unit provides three indicators. The top graph indicates the presence of metal.

The middle graph shows the level of electrical interference present.

And the bottom graph indicates the signal strength of the tag.

RV1 and RVR1 aerials should not be mounted directly on to a metal surface. Steel reinforced mesh often used in concrete floors can limit the range of a floor loop aerial. Not only will the reading range be severely affected, but the current consumption will rise. See graph below:



The survey meter function enables the operator to detect the presence of metal and determine the likely impact of the metal on any proposed loop aerial. The cursor is positioned in the centre of the graph and moves to the left the closer the wand is held to metal. The operation of the unit can be demonstrated by laying the back-plate of the reader against a filing cabinet or similar metal plate. As the RHV1 is moved away from the sheet of metal the cursor returns to its normal position. The further the movement of the cursor to the left the greater the impact of the metal being detected on a loop aerial used on an RV1 or RVR1 loop aerial reader.

Interference.

Cyphertag[®] has been designed to minimise the effects of external interference, but regrettably this doesn't mean it is totally immune. The location of the loop aerial is important; they should be kept away from electrical equipment, mains/data cables or electric motors as far as it is possible.

The Noise Indicator, highlights the presents of electrical interference. The RHV1 should be rotated in all directions to determine if any interference at the critical frequencies are present. If the graph indicates noise is present we recommend the "View Noise" option is selected from the main menu. This provides an expanded chart. Noise which is below the top graticule will not normally impair performance. Broadband noise (i.e. noise on every channel) at levels above the top graticule will have a significant impact and advice on how to overcome the impact should be sought from Identec.

3.1.2 SHOW TAGS. The display shows the identity of the tag as it enters the detection field. Whilst the tag remains in the detection field the "Read" LED will flash every 2 seconds. Once the tag exits the field the "Read" LED is extinguished. If the tag remains out of the field for 2 seconds the transaction is considered to be over and reintroduction of the tag to the reader will generate a new line on the display. Ten tag reads are displayed before the oldest is dropped from the display. New reports are added to the bottom of the display. The "ARROW" keys can be used to scroll "UP" and "DOWN" the list. The "RIGHT" key will clear the list, while the left key exits the menu and enters the "MAIN MENU".

3.1.3 VIEW NOISE. This is a diagnostic aid. It displays the electrical interference being picked up by the reader. The series of histograms represent each channel used by a Cyphertag to transmit its identity. If the display indicates most of the channels are being affected by electrical noise the performance of a **Cyphertag**[®] reader may be reduced. In most locations a few bars may be detected. This will not seriously affect the **Cyphertag**[®] system.

3.1.4 BATTERY VOLTAGE. This display indicates the level of charge held by the internal battery. A fully charged battery is indicated by a voltage of 8.4V. Once the level drops below 5.6V the unit will beep three times and then switch off. The unit should be immediately put on charge. If the reader is switched on with a low battery, the unit will beep three times and switch off.

3.1.5 FIRMWARE. This display should be used to communicate to Identec the firmware version level of the hand held reader. The serial number will identify the features programmed into the reader and any site code restrictions.

3.1.6 SETTINGS. This item provides the end user with a number of variable options. The Standard unit includes the following options.

4.0 Sub Menu Items

Auto Shutdown Time.

Buzzer

Initial Form

TX/RX Range

4.1 Auto Shutdown Time. This function allows the end user to set the time the reader will remain “on” without any activity. The display shows a “STEP” function and a “VALUE”. The left and right “ARROWS” should be used to set the “STEP” (i.e. 1 minute, 10 minutes or 100 minutes). The “VALUE” is then increased or decreased using the up and down “ARROWS”. The “VALUE” is the multiplier that is applied to the “STEP” number. (i.e. STEP=1, VALUE =11 the reader will shut down after 11 minutes if a transaction has not occurred).

4.2 Buzzer. The function provides four operational options for the internal buzzer.

Buzzer off, no sound is emitted when a site tag is detected.

Buzz only normal tags, the buzzer will sound for site tags which do not have the battery low flag raised.

Buzz only on Battery Low, the buzzer will sound for site tags with the battery low flag raised.

Buzz any valid tag, the buzzer will sound for all site tags irrespective of the battery state.

The buzzer will sound once as the tag enters the detection field. It will not buzz again for the same tag unless it has been out of the detection field for more than 2 seconds.

A battery low tag is identified by the buzzer sounding for twice as long as a normal tag.

4.3 Initial Form. This function enables the end user to set the function and therefore the display that is shown first when the unit is first switched on. Three options are provided, they are:-

MAIN MENU

SHOW TAGS

SURVEY FORM

The item is selected by using the right “ARROW” key and the “ENTER” key to exit this section.

4.4 Tx/Rx Range. This function enables the reading range of the unit to be changed. The display provides two bar charts indicating the settings selected. The unit is normally supplied from the factory with both Tx (transmitter range) and Rx (receiver sensitivity) set to maximum.

The up and down “ARROW” is used to select the Tx or Rx function. The left and right “ARROWS” are used to decrease or increase the range.

Note the Tx function has 16 increments while the Rx only provides 12 increments.

5.0 LED FUNCTIONS

There are five function LED's clustered in the bottom right hand corner of the reader unit.

They are:-

Power

Read

Report

Low Bat.

Charge.

5.1 Power, this indicates when the unit is switched "on" and working.

5.2 Read, this indicates when a Cyphertag is being interrogated. The LED will flash every 2 seconds (or remain "on" if continuous read is enabled) when the tag is being interrogated continuously in a strong transmission and receive area of the detection field. The LED will flash as the signal weakens towards the edge of the detection field.

5.3 Report, the reader can be supplied with a Serial, Wiegand or Clock and Data output. The "report" LED indicates when data is being transferred from the reader to a host unit.

5.4 Low Bat, this indicates when the readers internal battery has discharged to a level where the reader will shortly cease working. When this LED is lit the reader should be switched off and placed on charge. The typical charging time for a fully flat battery is several hours, this is ultimately dependent upon the age of the battery.

5.5 Charge, when the unit has been connected to the charger unit and power is applied the charge LED will be lit. The LED will be extinguished when the battery is fully charged.

APPENDIX A Example Reader Specification Sheet

Example



Reader Specification sheet

Customer : Identec Limited
Site : Identec Test Tags and Readers
Works Order : 12345
Purchase Order : new order
Serial Number : 12345
HID(s) : 57
Site Code : 57
Programmed By : Gary On the 13/04/2010 08:55:49

IDENTEC Limited
Mercantile Road
Rainton Bridge Ind. Est.
Houghton-le-Spring
Email: info@identec.com
Web: www.identec.com

Format and Timings

Wiegand : 26 bits
Interburst Delay : 100 ms
Tag Timeout : 2000 ms
Tag Lockout : 5000 ms
Serial : HID:<5 digit HID> PID:<6 digit pid> <Entry><Exit>
BaudRate : 115200 baud (Entry)

Reader Type : RHV1

Serial No	Hardware	Issue	Processor	Firmware
1	RHV1 Controller	93-2183-1c	Main CPU	84-7252c

Initial Display

Show Tags

Statement of Conformity

~~~~~  
The items in this consignment have been fully tested and subject to Quality Control approval routines within an ISO 9001:2008 Quality Management Systems Environment.

They conform in every respect to the requirements of your order.  
Identec Ltd is a B.S.I. Registered Company Certificate No FM36029  
The Items are RoHS Compliant.

### Quality

Tested By : \_\_\_\_\_

Date : \_\_\_\_\_

QC Stamp : \_\_\_\_\_

## Appendix B User Instructions

### D.1. Hand Held Reader (Wand).

The response of the reader will depend upon the set-up of the unit. In most installations the unit is being used to determine if a tagged set of keys is present. This is done by switching the unit "on" by depressing the red button for 1 second. The unit is immediately ready for use. The RVH1 should be positioned to ensure any tag is within a maximum of 900-1000mm from the face of the unit. If a tag is detected the unique number of the tags is displayed and the internal buzzer may be operated. This depends if the function has been enabled. The unit automatically switches off to preserve battery operating time. This is also an adjustable feature.

### D.2 Tag Disposal.

All Identec tags contain a Lithium battery.

When a tag reaches the end of its life it should be disposed of properly.

If you are uncertain about how to dispose of tags they may be returned to Identec for disposal.

### D.3 End User Instructions

*This section can be used to generate simple instructions for end users.*

You have been provided with a **Cyphertag**<sup>®</sup>. To get the best out of your tag, please spare a few moments to read this.

The tag operates best when it is in the same plane as the Loop Aerials, which are usually mounted vertically. You will get best performance if the tag is worn vertically around the neck on a lanyard. If the tag is held horizontally by being placed flat in the bottom of a bag the reading range will be reduced.

The performance of the tag will be affected if it is surrounded by metal objects such as coins or keys or flat against a mobile phone. (The larger the metal objects, the more effect they can have.)

This tag has been designed and built to work under conditions met in normal daily use and for reliable operation the following precautions should be observed:-

1. Do not bend the tag excessively. It should not be kept in the back pocket of trousers, or other places where it may be subject to bending.
2. Do not immerse in water, or allow it to come in contact with solvents.
3. Do not leave the tag in a hot place (e.g. on a radiator).
4. Each **Cyphertag**<sup>®</sup> contains a small battery, which under normal circumstances will last for 3-5 years dependent upon the tag type. Battery life will be reduced if the tag is left for long periods within range of a **Cyphertag**<sup>®</sup> Aerial.

## Appendix C Technical Data

For more information on **Cyphertag**<sup>®</sup> in general, refer to the Product Briefs and Reference Manual.

### Hand Held Reader mechanical details

|                   |                                                  |
|-------------------|--------------------------------------------------|
| Dimensions (mm)   | 347 x 162 x 24                                   |
| Weight (gm)       | 500                                              |
| Temperature Range | -20°C - +60°C                                    |
| Colour/Material   | Light Grey ABS                                   |
| LEDs              | Power<br>Read<br>Report<br>Battery Low<br>Charge |
| Display           | OLED 128 by 64 pixels                            |

### Electrical connections

Power input (Charger)  
12V d.c. Typically 1.5A

Wiegand output  
Configurable to include, for example Power up messages

Clock/Data output  
This uses the same circuitry as the Wiegand output.  
Configurable to include, for example Power up messages

RS232  
Configurable to include, for example Power up messages

### Configuration

RHV1 Hand held readers are initially configured by Identec. Some parts of the configuration can be altered on site as described in section 5.0.

### Operating Environment

-20°C to +60°C non-condensing.

## Appendix D APPROVALS

The RHV1 and associated tags require some form of approval in all countries, as both are intentional emitters of radio frequency. This section describes the status of the product in various countries at the time of writing. For more up to date information contact Identec.

### European Union and other ETSI countries

**APPROVED**

### United States of America

**PENDING**

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*In all countries this product is approved on the basis that it shouldn't cause interference to other equipment, and that it won't be affected by interference. If you make an unauthorised modification you may invalidate this approval and you might be committing a criminal offence.*

### Low Voltage Directive

**Cyphertag**<sup>®</sup> Hands held reader has been designed and manufactured in accordance with EN60950, following the provisions of the Low Voltage Directive.

### ISO 9001:2008

Identec's Quality System conforms to ISO 9001:2008. (Certificate Number - FM36029)