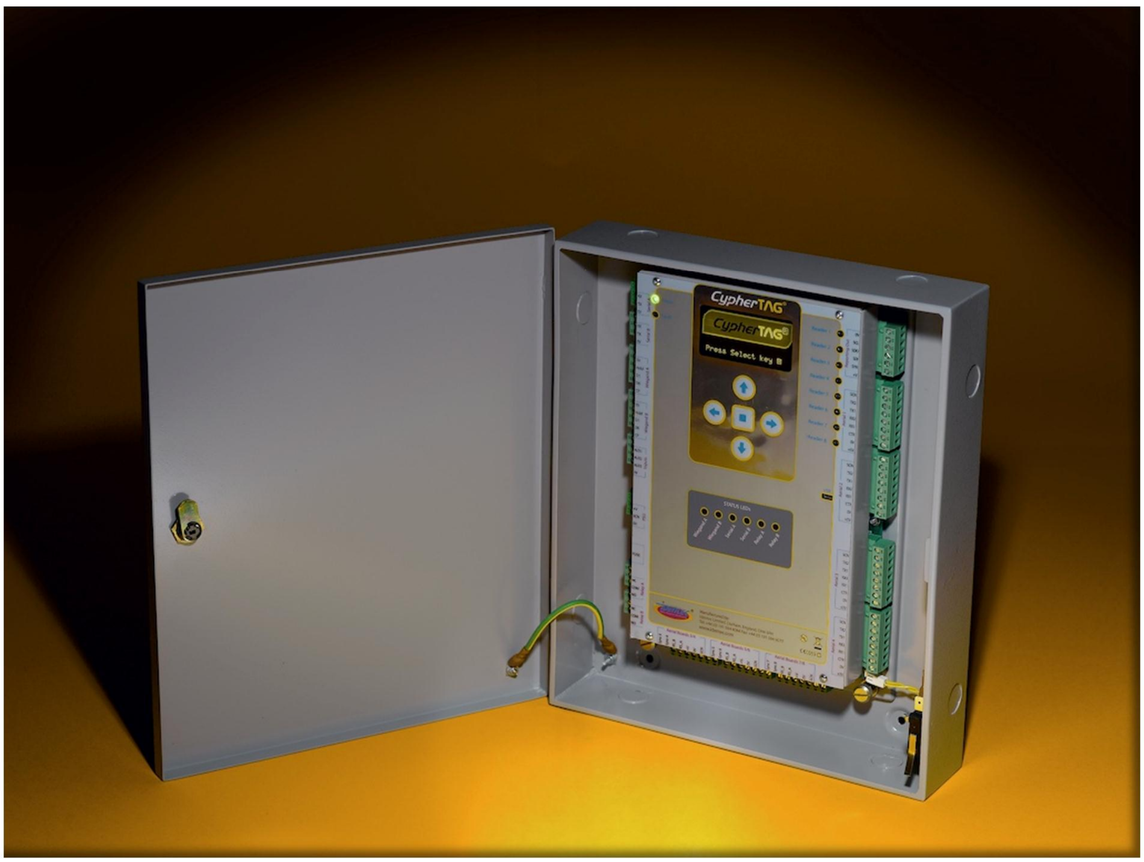
CypherTAG®

RV1 Loop Controller
(1 to 4 Loop Unit)



Identec Limited
Mercantile Road
Rainton Bridge Industrial Estate
Houghton-le-Spring
County Durham
England DH4 5PH

Tel: +44 (0)191 584 4084
Fax: +44 (0)191 584 9077
Web site: www.identec.com
e-mail: info@identec.com

Issue 1a October 2011

This manual is provided for information purposes only. All information included in this manual is subject to change without notice. Identec is not responsible for any damages, direct or indirect, arising from or related to the use of this manual or associated product.

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***® loop controller neither uses nor generates hazardous voltages. You should not connect any such voltage to it.

CE

See Appendix F

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.

CONTENTS

1. ***Cyphertag***® LOOP CONTROLLER RV1

1.1 Introduction

Cyphertag® is a high performance tag identification system, offering fast long range multiple reading with optional direction sensing from the RV1 Loop Controllers. The shorter range mullion reader REV1 complements the RV1.

This manual is intended for use on site during installation and commissioning. Further information is available from the Identec web site www.identec.com .

1.2. The RV1 Loop Controller

A ***Cyphertag***® loop controller, when combined with suitable aerials, 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 which is centred on 4MHz.

The RV1 loop controller is configurable; this is normally done in the factory. Configuration controls the operating mode, output format and timings and relay function and timings etc. Many configuration parameters can be adjusted on site using a menu based display (section 5.0).

The RV1 monitors one or two loop aerials (RV1-DS) and provides a single or double "reader" output as standard. The RV1-MSM version of the reader is set to monitor three loop aerials with the RV1-DS-MS monitoring four aerials. The enhanced product can offer solutions for up to a maximum of 16 loop aerials which are dealt with in separate documentation. This manual deals only with the RV1 driving a maximum of 4 aerials.

Aerials can be configurable in size since they consist of a single loop of 20 amp copper wire. An aerial interface unit (AV1 or AVR1) provides the interface between the RV1 and the loop aerial plus other features such as a tag read and tuning indicators. In most installations the loop aerial can be used as the transmit and receive aerial. However in some installations it is advantageous to separate the TX and RX functions. This can be done using AV2 or AV3 receivers in addition to the AV1/AVR1 units.

Aerials are also available in preformed and tuned configurations, for example a Stainless Steel Stanchion SSV-03 which includes the aerial interface unit AV1.

All aerials controlled by a single RV1 are synchronised, eliminating possible problems when aerials are placed near to each other. In ***Cyphertag***® the general principle is that a tag is read by the nearest aerial. This is useful when controlled doors are located near each other.

Cyphertag® uses sophisticated digital processing techniques to minimise the effect of external interference (noise). The RV1 utilises energy saving methods. All LEDs and displays are switched off when the cabinet lid is closed.

1.3 Unpacking

Check that the package contains

- Loop controller hardware
- Manual/CD
- Reader Specification Sheet
- Spare fuse
- Terminal blocks
- Data folder, attached to the inside of the lid
- Keys

Other packages should contain the necessary AV1 aerial interface units, AV2/AV3 receivers or stanchions.

3.1.4 AV1 Aerial Interface Unit
(Normally used between the RV1 and the aerial loop wire)

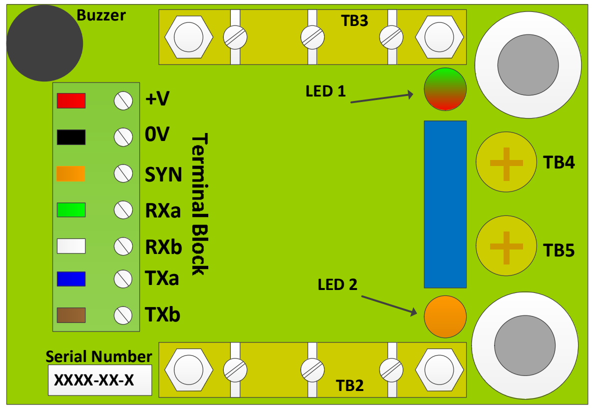


Fig 3-1 Aerial Interface Unit AV1

Tuning LED	ACTION
Off	In tune
Green	Add Capacitance.
Red	Remove Capacitance

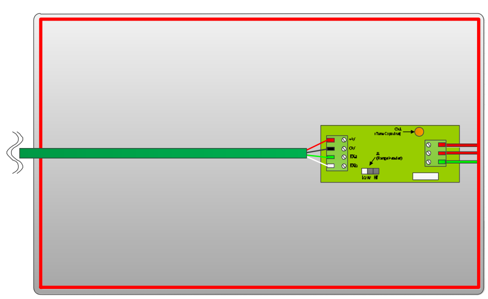
Tag Read LED	ACTION
OFF	No tag being read
ON	Tag being read

The AV1 should be fitted as close as possible to the configurable aerial loop, as any extra wire length will affect the reading range. The aerial loop wire should be heavy gauge copper cable with a minimum area of 1.5mm^2 (20A rating). Thicker cable will give better performance. The brass terminals on the AV1 are suitable for up to 2 mm^2 diameter wire.

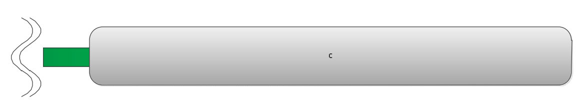
The connections to the RV1 loop controller and AV1 aerial board are described above. Note that there is no screen connection on the AV1, AV2 or AV3 but it should be terminated at the RV1 loop controller.

Make sure that the aerial loop connections are secure.

3.1.5 Separate Receiver
Where a separate receiver is used, the unit will be supplied with the cable already fitted.



AV2 receiver (Belden 9534)

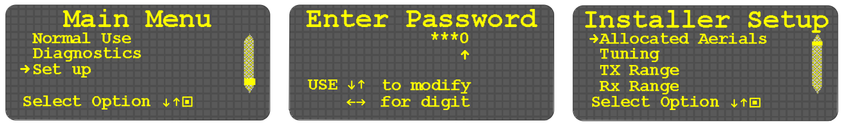


AV3 receiver (Belden 9534)

The loop controller is now ready for commissioning.

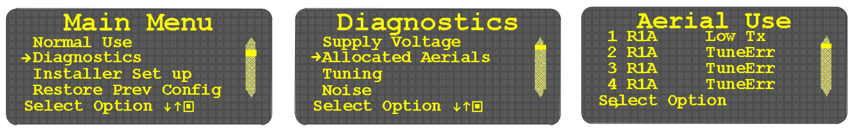
3.2. Commissioning

The RV1 has comprehensive diagnostic displays which can be used to guide you through the commissioning process. To start, enter the installer password to enable the editing features. The installer password is on the reader specification form mounted in the plastic wallet inside the lid.



3.2.1 Configuration Check

The RV1 should be configured to take account of the number of aerials connected and how these are to be used. You can check the current configuration using the menu as follows:



Check that all "physical aerials" are allocated, and that there are no other aerials allocated. If the configuration is incorrect the set-up must be changed. Contact Identec for further information.

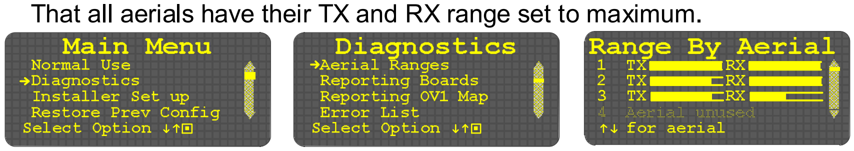
If you are unsure about the physical aerials, refer to Appendix B.
The use of the Diagnostics display is described in 5.3.

If an aerial has "TuneErr" against it, then it is likely that the loop is not fitted properly or that it is a long way out of tune. Check the wiring, then if necessary add or remove capacitance.

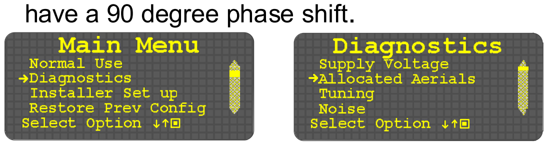
You should also check

a) That all aerials are allocated to readers for which there is a reporting module fitted.

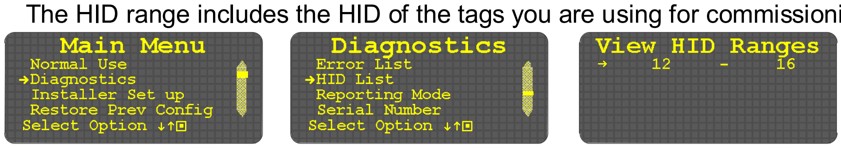
b) That all aerials have their TX and RX range set to maximum.



c) The aerial phases are correct. If more than one aerial is allocated to the same side (entry or exit) of a loop controller, then the transmit signals must have a 90 degree phase shift. One of the aerials must have a phase shift of 0 or 180 degrees and the other a phase shift of 90 or 270 degrees. If there are more than 2 aerials then adjacent aerials should have a 90 degree phase shift.



d) The HID range includes the HID of the tags you are using for commissioning.



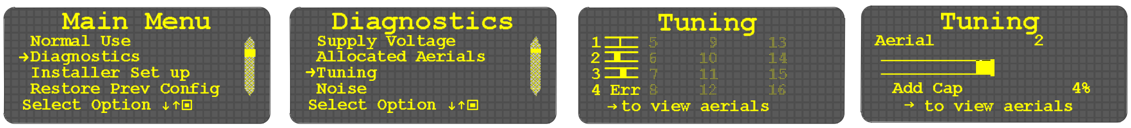
e) The Supply Voltage should be between 12V and 26V.

If there are any errors the fault LED will flash. This can be left for now.

3.2.2 Tuning

All aerials must be tuned, using capacitors in the AV1. The capacitance depends on the length of wire in the loop. The capacitors used should be metal film/foil polypropylene construction as supplied by Identec. They should be fixed in place across the two terminal bars TB2 and TB3 using the appropriate grub screws. **Never place the capacitors across TB4 and TB5 as this is for the coil only.**

The RV1 loop controller is also fitted with a tuning indicator, the status of each loop is shown on the display



(Use the right button to view an individual aerial)

The display also shows the approximate percentage error in the tuning capacitor. Generally 2% is good enough

Aerial size	Typical Capacitor to be added
2.0 x 2.0m	68nF
2.0 x 1.0m	122nF
1.5 x 1.0m	168nF

Note that aerial interface units are normally supplied with an initial capacitor, usually 68nF. This is consistent with the larger size loop that may be fitted. If larger loops are to be used these should be specified at the time of ordering and a smaller capacitor will be fitted.

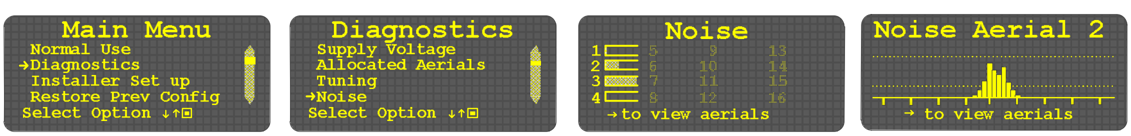
The tuning LED on the AV1 shows red or green to indicate if capacitance should be reduced or increased respectively. It will flash with the duty cycle reducing as it approaches tune.

If the tuning LED alternates red/green with no gaps then there is an error (open circuit or very badly out of tune). Alternate flashing with the tag read LED (Tag read LED 1 sec, red ½ sec, green ½ sec) means data is not getting to the AV1.

If the aerial is not properly tuned it will lead to increased current consumption and reduced range. Using a valid site tag check that the aerial is working properly; when a tag is read it will flash the amber read LED on the AV1.

3.2.3 Noise

It is advisable to check the noise levels on the aerials. When aerials are used in "Master/Slave" mode it's possible that noise could be affecting one of the aerials, but this is masked because tags are being read at the other aerial. This could mean that the detection rate will not be as good as expected.

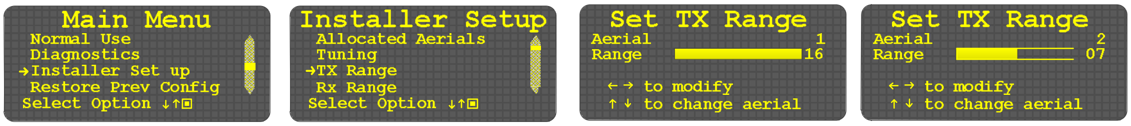


Overview *Expanded*

The third screen is an overview showing the effective noise level at each aerial. This is a logarithmic scale, so it's quite common to see some activity. Individual aerials can be expanded by using the "right" key. The ideal is no noise, but the noise illustrated in the fourth slide will not present a problem. Contact Identec if the noise is in excess of the top display graticule.

3.2.4 Ranges

The transmit and receive range for each aerial can be adjusted.
This may be necessary to prevent tags being read in unwanted areas.

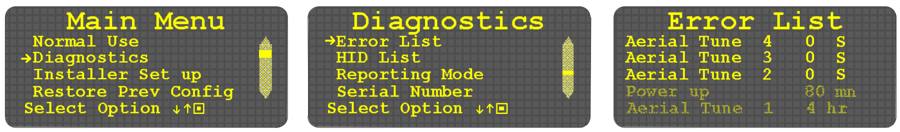


Note; the Rx range is set in the same way as above.

3.2.5 Fault LED and Error List

(The fault LED is located beneath the power LED on the RV1 front panel)

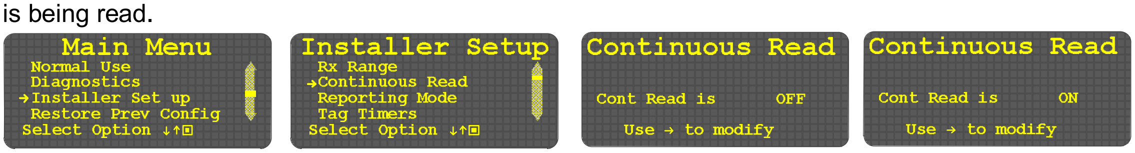
The fault LED should not be flashing. If it is, you should look at the error list to see what is causing it to flash.



The error list shows the last 5 errors detected by the RV1. Errors that have been cleared will be greyed out, and the most recent errors are at the top of the list. For each error it also shows the time since it occurred. The error text should be self-explanatory.

3.2.6 Tag Reading

For each aerial check that tags are being read. When a tag is read it will flash the amber read LED on the AV1. Note that tags are read every few seconds, so the LED may flash briefly and then go off for a while. It is easier to enable continuous read which will permanently illuminate the LED while the tag is being read.

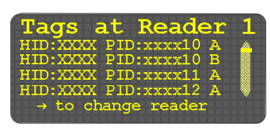


If tags are not being read as expected, see the Troubleshooting section 4 of this manual. You can see when tags are being read and reported from the display. Options are

And then one of the following

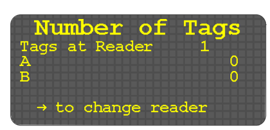
Show Tags

Each tag is listed as it is read. The list is cleared when you leave diagnostics mode.



Show Tag Count

For each loop controller you can see the number of tags in the (A) and (B) detection/reading fields.

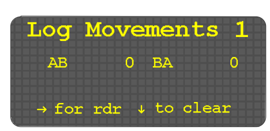


Tag Activity

This shows the field strength at each physical aerial. As tags are read intermittently the display will increase rapidly then decay. If "continuous read" is on, the display will be constant.

Log Movements

This records when the RV1 generates a report, so it will depend on the reading mode. Some reading modes only generate a report when the tag has moved from one side to

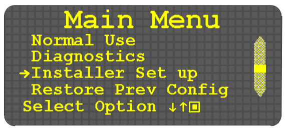


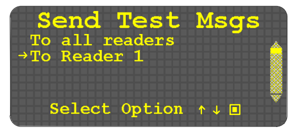
the other (i.e. Entry to Exit aerials).

Then check that tags are being reported correctly from the RV1. This checks the connections from the RV1 to the access control system.

3.2.7 Data Integrity

The RV1 outputs can produce a lot of tag data, and it is advisable to check that the equipment at the other end is capable of receiving this data without errors. This is particularly true for Wiegand interfaces. Identec advise that checks be made on typical units. The RV1 can send a burst of data at its maximum rate as follows:





3.2.8 Display

Check that the display, and all front panel LEDs are off when the micro switch is pressed on the RV1. Note, this will reset the menu and the installer password will be required if further changes are necessary.

3.2.9 Finally

Before you leave, make sure that the end users are given a copy of the instructions (Appendix D)

4. TROUBLESHOOTING

In most cases the RV1 will give you good diagnostic information. Section 5.3 lists the diagnostic information available.

4.1 Nothing comes on

Check micro switch	The RV1 turns the display and all LEDs off when the lid is closed. Make sure the switch is operating.
Check the fuse	1.6 Amp anti-surge.
Check the input voltage	Voltage between 0V and V+ should be between 12V and 26V D.C.
Check wire is terminated	It is possible to insert the wire under the terminal clamp. Make sure each conductor is correctly clamped.

If these don't fix the problem the RV1 should be returned to Identec.

4.2 Tag does not read

Try different aerials/tags	Try to work out whether it's the tag or the loop controller.

4.3 Tag won't read

Is it a ***Cyphertag***® Tag?	Other tag types won't be read.
Is the HID valid?	Present the tag to either aerial 1 or aerial 2. Refer to section 5.4.15 and enable all HIDS. You will then be able to see the amber light on both the AV1 and Reader 1 on the front panel.

4.4 No Tags are read

Is the transmit aerial tuned?	If there is a tuning error it may be that the aerial loop is not connected.
Is the receiver connected?	Check the connections to the receiver. Also look at the noise level, as no noise at all probably indicates bad connections.
Is TX or RX range turned down?	If this is the case tags should still read close to the aerials.
Is there excessive noise?	Check the noise level. Once again tags should still read close to the aerials.
Separate aerials?	If the transmit and receive aerials are separated, make sure that tags are within range of both. (Maybe made worse by range being turned down or excessive noise)

4.5 Range too low

Is it transmit or receive?	A TVD1 LED tag is very useful to establish transmit range. First work out whether it's because the tag is not picking up the loop controller's transmit signals, or because the loop controller cannot pick up the tag's response. To do so, turn the TX range up or down. If the reading range tracks the TX range then look at the transmit range. Otherwise investigate receive range. (Adjusting the RX range in this way is less reliable.)

4.6 Transmit Range Low

Check TX range	See section 3.2.4
Check that aerial is in tune	See section 3.2.2
Is the loop wire thick enough?	Low conductivity wire will give greatly reduced performance. Make sure it's copper wire of at least 1.5mm^2 area (20A rating).
Is the wire tightly screwed in?	Poor connections on the aerial interface unit will affect range.
Is the loop large enough?	The range will depend on the loop size and shape. For a TV1 tag the range will vary from about 2.1 metres for a loop 0.5 metres by 1 metre to 3 metres for a loop 2 metres square, to 3.8 metres for a loop 4 metres square. (These are minimum figures, and a typical installation should give 10-20% more) It's the length of the shorter side that has the greater effect on range.
Is the cable to the aerial interface unit too long?	Refer to section 3.1.1 for maximum cable lengths.
Is the tag orientation correct?	TV3 tags are different from TV1, TV2, TV4 and TV6.
What tag type are you using?	Smaller tags will have less range

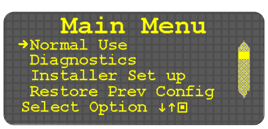
4.7 Receive Range Low

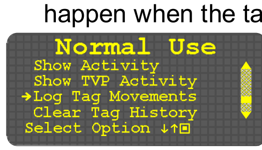
Is the RX range turned down?	The RX range control can reduce the range by about 50%.
Is there excessive noise?	If the noise level is too high, the RV1 may not be able to cope with it. Consult Identec. As the RV1 uses digital signal processing techniques to reduce the effect of noise, it may be possible to tailor the system to the type of noise seen.

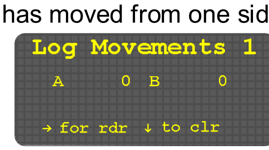
4.8 Tag is being read but is not reported

Is a report being sent?

Look at the Log Movements screen. This will increment when a report is generated. For some reading modes this will only happen when the tag has moved from one side to the other.



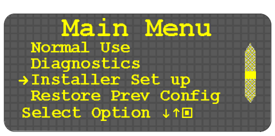


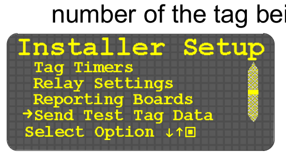


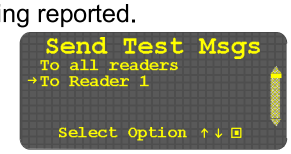
There will be some LED activity on the status LEDs when a tag is reported

Do test messages get through?

See whether test messages get through. If so check the number of the tag being reported.







4.9 Tag Number reported incorrectly (Wiegand)

The most likely cause is that the Wiegand data lines are reversed.

4.10 Tag Number reported incorrectly (RS232)

Check that the RS232 cable is not too long for the data rate being used.
It is also possible that the wrong baud rate has been set in the menu.

4.11 External Reporting Board does not appear to be connected

Is the wiring correct on "Reporting Out" terminal block?

Is the cable too long? Maximum of 3 metres.

4.12 Aerial Interface Unit does not appear to be connected

Is the wiring correct? See section 3.1.3 for connections.

Is the cable too long? Maximum of 100 metres, 10m recommended.

4.13 Repair

The loop controller is designed to be "Installer-Friendly", and is rarely damaged, so please check the installation thoroughly and seek advice from Identec before returning the unit. In the unlikely event that you find that the loop controller is faulty you should replace the entire ***Cyphertag***® loop controller. Identec encourages its customers to return all faulty equipment, as investigation of faults will help us improve the product.

12 month "no-quibble" guarantee, providing that the security seal remains intact.

All Identec readers, interface hardware and tags are guaranteed for 12 months from the date of despatch from the factory.

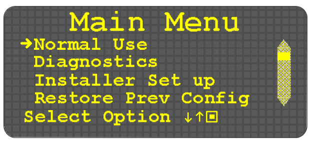
5. PROGRAMMING.

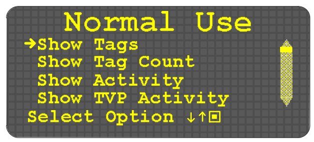
5.1 Introduction.

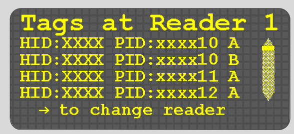
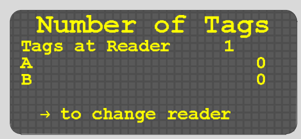
On power up the screen will show a welcome message. Below the screen are the 5 programming buttons which enable a large range of features of the RV1 to be accessed. These features are menu driven and many of them are only available by password.

To leave the welcome screen and go to the Main Menu, press the Select button. The Select button is used to choose an individual menu item. The Left button normally goes back to the previous level, except in areas of Set-up where a value is being entered. The Up/Down buttons are used to select menu items but have different uses in areas of Set-up where a value is being entered. Where the button use is not clear it is shown on the bottom line of the display.

5.2 Normal Use Menu

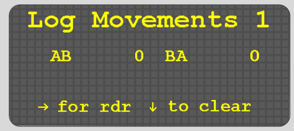




5.2.1 Show Tags The display shows tags as they arrive at each aerial. For security reasons the full tag number is not displayed, just the last 2 digits. The display is cleared when you leave this menu. This means that you can Log Tag Movements (see below), and then if the number of tags seen is not as expected you can investigate using Show Tags. This shows all tags seen by all aerials.	
5.2.2 Show Tag Count This provides a count of all tags which are currently in the field of a particular reader. It is split into two zones and tags will normally be counted as being in one or the other. (When a tag moves from one side to the other it's just possible it will be counted in both for a short time.) To change the reader, use the Right button. This will cycle through all readers that are configured.	
5.2.3 Show Activity This shows when tags are actually being read at individual <u>physical aerials</u>. It is useful to check which physical aerials are reading tags and also the signal strength. The indication varies with time because each tag is not normally read continuously (unless continuous read is enabled).	
5.2.4 Show TVP Activity This shows when TVP performance test tags are actually being read at individual <u>physical aerials</u>. It is useful to use the display during commissioning and initial set-up.	

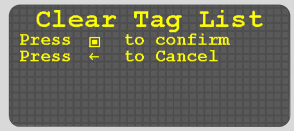
05.2.5 Log Tag Movements

This shows tag reports for a single reader by direction. Note that two reports for the same tag will give two counts. For instance if it was taken round outside the field and then back through the aerial. The number of reports depends on the reading mode, so for DS (direction sensing) readers it may be necessary for the tag to be seen by both sides before it is reported.

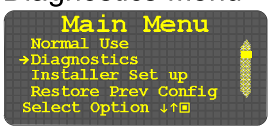


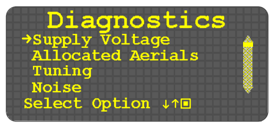
5.2.6 Clear Tag History

Clear the list of tags stored in “Show Tags”



5.3 Diagnostics Menu

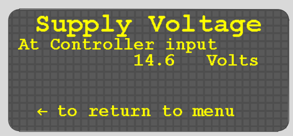




Note that some Diagnostics menu items are only available after the Installer password has been entered.

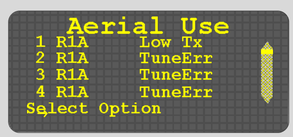
5.3.1 Supply Voltage

This shows the supply voltage inside the RV1 Main Processor board. This may be significantly less than the supply voltage if there is too much voltage drop on the cabling. If the voltage drops too low the Fault LED will flash.



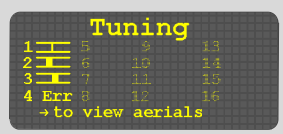
5.3.2 Allocated Aerials

This shows which physical aerials are allocated to readers, and also indicates whether the aerial modules are communicating to the main processor.

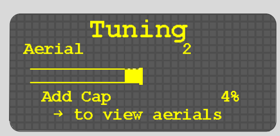


5.3.3 Tuning

This provides an indication of whether individual physical aerials are in tune. Note that an aerial will show an error if the aerial loop is not connected, or if there is no tuning capacitance, or the tuning capacitance is too low (below about 50% of the required value).



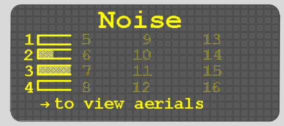
Individual aerials can be selected using the Right button where the estimated capacitance error is shown. This is shown as a percentage of the current value (not the desired value) which makes the calculation easier.

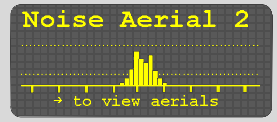


5.3.4 Noise

This provides an indication of the background noise level at each physical aerial. The scale is logarithmic, with each step corresponding to about twice as much noise power as the previous one. Even relatively low noise levels will register some activity. The main use of this is to check to see whether one aerial is affected by a lot more noise than the others.

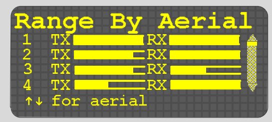
Each channel can be expanded using the Right button. The expanded scale shows the individual 25 channels and the noise levels in each.





5.3.5 Aerial Ranges

This provides a quick view of the current aerial ranges, so you can check to see whether a particular aerial is turned down.



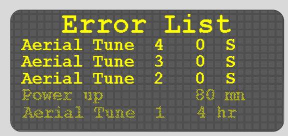
5.3.6 Reporting Boards

This shows the state of all Reporting Boards (where each defined reader needs its own reporting board).

If a reader is not defined (and the reporting board not needed) that reader will be greyed out.

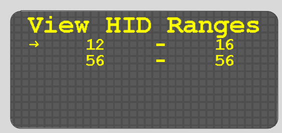
5.3.7 Error List

This shows the last 5 errors and the time since they last occurred. Current errors and those which occurred in the last few seconds are shown normally, but older errors which have now been cleared are greyed out.



5.3.8 HID List

This shows the HID list which is valid on this reader. This cannot be changed on site.



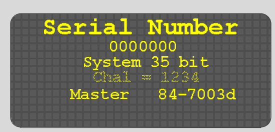
5.3.9 Reporting Mode

The Reporting Mode determines how tags are reported and whether it is a DS (Direction Sensing) mode.

The secondary mode can be configured onto an Auxiliary Input, for instance while a door is held open.

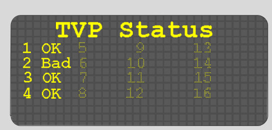
5.3.10 Serial Number

This gives the serial number of the main unit and the firmware versions of ALL processors on the system. Use the Down key to scroll through firmware versions.



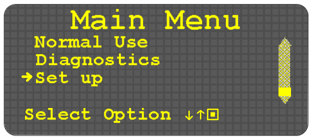
5.3.11 TVP Status

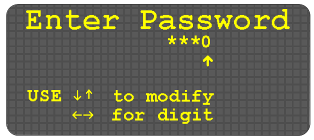
This screen shows the current status of the TVP on the system. Greyed out items means there is no TVP allocated to that aerial. Once this screen is selected the TVP will be scanned every 0.5 seconds.

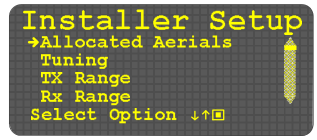


5.4 Installer options

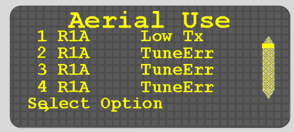
To begin, enter the installer password to enable the Installer Set Up (see section 3.2 for instructions). When entering the password (and other numbers) the Left and Right buttons move a digit cursor. The Up and Down buttons alter the value of the selected digit.



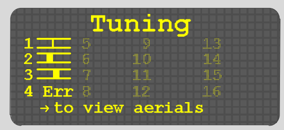




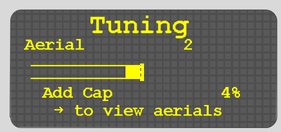
5.4.1 Allocated Aerials
This shows which physical aerials are allocated to readers and also indicates whether the aerial modules are communicating to the main processor.



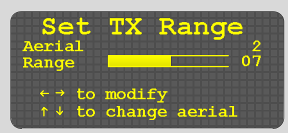
5.4.2 Tuning
This provides an indication of whether individual physical aerials are in tune. Note that an aerial will show an error if the aerial loop is not connected, or if there is no tuning capacitance, or the tuning capacitance is too low (below about 50% of the required value).



Individual aerials can be selected using the Right button when the estimated capacitance error is shown. This is shown as a percentage of the current value (not the desired value) which makes the calculation easier.



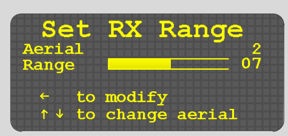
5.4.3 Transmit Range
This adjusts the range from reader aerial to tag.
Individual aerials can be selected using the up/down buttons, while the left/right buttons alter the range.



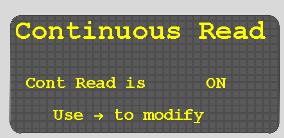
5.4.4 Receive Range
This adjusts the range from tag to reader aerial in the same way.

If a DS1 type of reader is selected the maximum range is 15 otherwise 16.

Note that reducing the RX range also reduces the sensitivity of the signal strength indication.



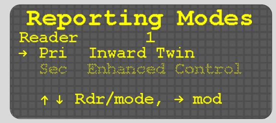
5.4.5 Continuous Read
This causes tags to respond to the reader at much faster intervals and is useful for checking reading range. In Continuous Read mode the reader will not read a number of tags reliably, so this mode is automatically switched off when the lid is shut.



5.4.6 Reporting Mode

The Reporting Mode determines how tags are reported.

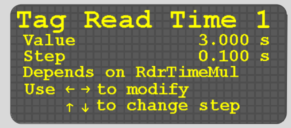
The secondary mode can be set up to happen on an Auxiliary Input, for instance while a door is held open or for periods outside normal office hours.



5.4.7 Tag Timers

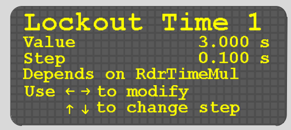
Tag Timeout

This is the time after a tag is last read when it is treated as having left the reading field. The time is a multiple of 0.1 sec



Tag Lockout Time

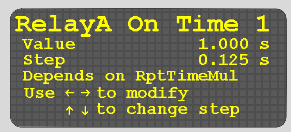
This is only used in some DS reading modes (e.g. Control). When the tag is moving between the two sides there may be a region where the tag isn't read, and the Lockout time is the maximum time it can take before it is locked out and assumed to have left without going right through entry or exit sequence.



5.4.8 Relay Settings

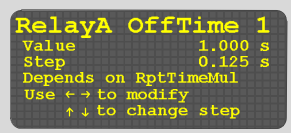
Relay A(B) ON time

This is the minimum time that the relay will be on even for the shortest of events.



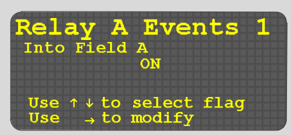
Relay A(B) OFF time

This is the minimum time that the relay will be off before it turns on again.



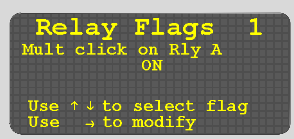
Relay A(B) Events

Select which events will cause the relay to operate. It is possible to select more than one event, for instance to combine alarms.



Relay A(B) Flags

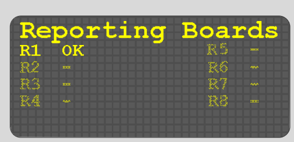
Select multiple clicks when you want the relay to fire a number of times, for instance once for every tag read.



5.4.9 Reporting Boards

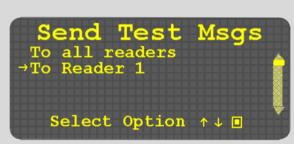
This shows the state of all Reporting Boards (where each defined reader needs its own reporting board).

If a reader is not defined (and the reporting board not needed) that reader will be greyed out.



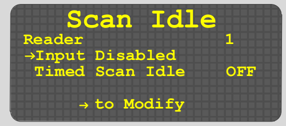
5.4.10 Send Test Messages

Test Messages are sent to check that tag data from the readers is correctly received and is not being sent too fast. If more than one reader's output goes to the same unit it is best to send data for each reader and then on all readers simultaneously.



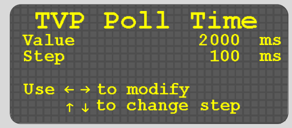
5.4.11 Scan Idle Options

This selects an external (Auxiliary) input which will be used to stop tag reading, for instance to force the use of a shorter range reader instead.
Selection of the timed Scan Idle enables a proximity reader to coexist with the loop aerial system

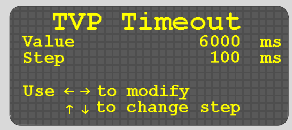


5.4.12 TVP (Performance Test Tag)

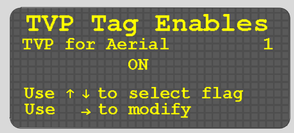
<u>TVP Poll Time</u>
This sets the time that the reader checks for a TVP test tag. This is normally left at 2 seconds.



<u>TVP Timeout Value</u>
This is the time before a TVP alarm is raised. The normal value of 6 seconds allows 3 tries before an alarm. It may need to be increased if occasional bursts of noise are giving nuisance alarms.



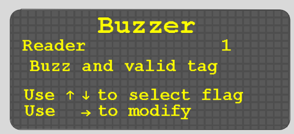
<u>Enabling TVP test tags</u>
This turns on the TVP test tag for each physical aerial. There must be a TVP tag for each aerial where turned on.



5.4.13 Buzzer Settings

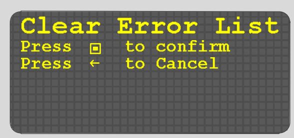
This selects when the buzzer will operate. Options are:

- Buzz for any valid tag
- Buzz only normal tag (not Battery Low)
- Buzz only for a Battery Low tag
- Buzzer off



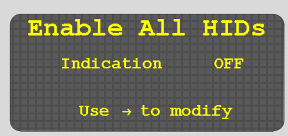
5.4.14 Clear Error List

The error list records all errors such as aerials out of tune. The error list should be cleared once the RV1 has been commissioned and all faults cleared.



5.4.15 Allow All HID

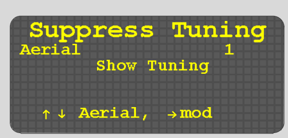
Normally tags not meant for this site will not give any indication as they have the wrong HID. You can turn on indications to allow testing with a tag that won't give any reports.



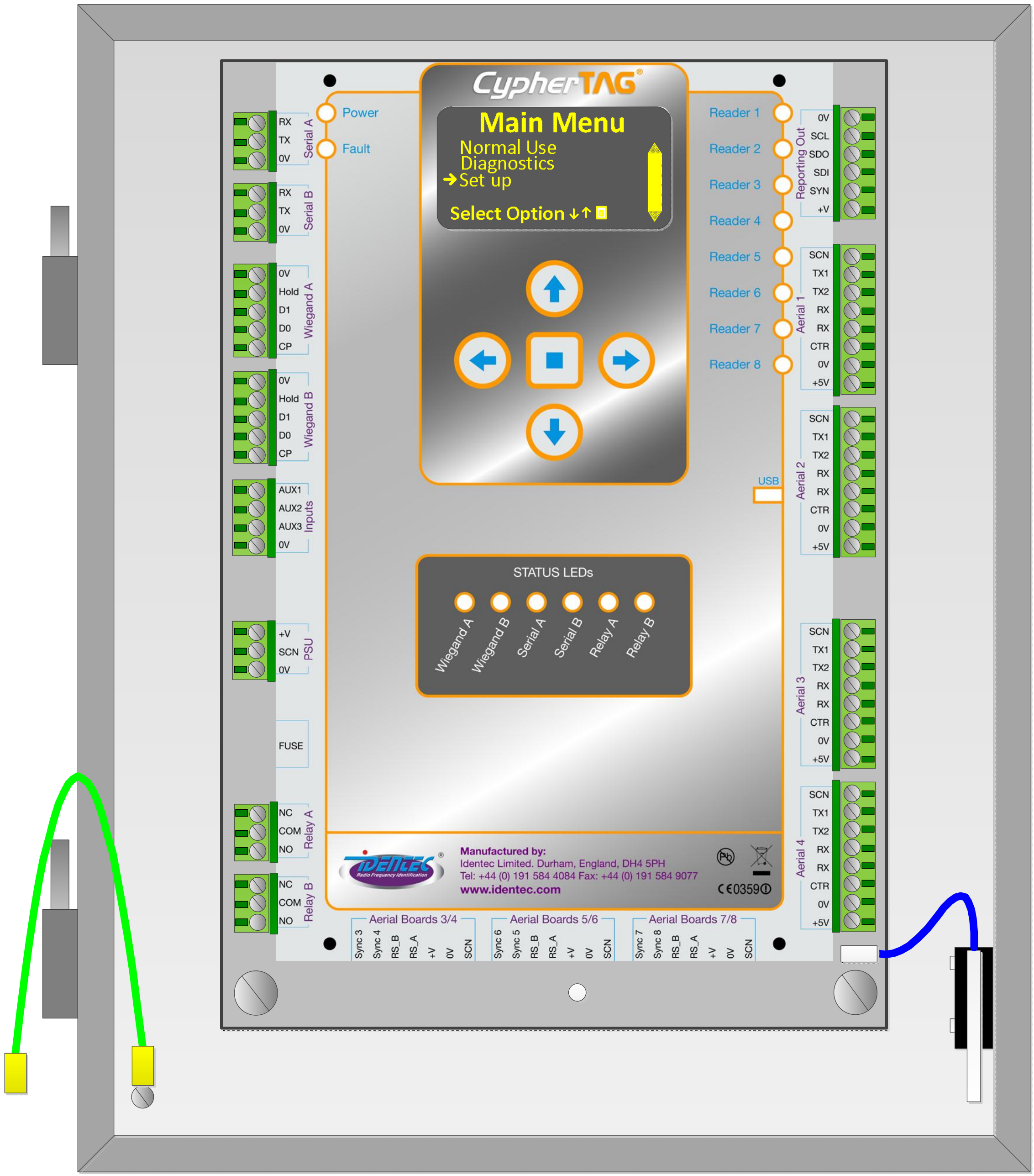
5.4.16 Suppress Tuning Error

Since tuning errors cause the fault LED to come on and appear on the error list, you may want to suppress them if they are likely to occur. For instance the aerial may go out of tune when a metal door is shut or a vehicle is over an aerial loop in the ground. Options are:

- Show Tuning - Show an error if the tuning is off
- Errors Only - Show an error only if the tuning shows a fault
- No Indication - Never show a tuning error



Appendix A - *Cyphertag*® RV1 Assembly



Appendix B - *Cyphertag*® Aerial Arrangements

An RV1 can handle up to 16 aerials. It is therefore important to understand how aerials are allocated to loop controllers. There are many ways in which the RV1 aerials can be configured. With a two loop unit the two aerials can be treated as separate detection areas giving independent reader outputs, or the two loops can operate as a single detection zone using a Master/Slave configuration. However most often they are set up to sense the direction tags are moving through a single portal. When further aerials are specified these can be configured in any combination within two reporting zones unless further OV1 reporting modules are added.

B.1 Physical Aerials

We use the term "physical aerial" to describe one transmit and one receive aerial, although the same wire loop is used for both. Physical aerials are numbered from 1 to 2 or (4)

2 Aerial	**Aerial**	**Description**	**Entry/Exit**	**Phase**
	Aerial 1	Channel A Master	Entry	0 deg
	Aerial 2	Channel B Master	Exit	0 deg

4 Aerial	**Aerial**	**Description**	**Entry/Exit**	**Phase**
	Aerial 1	Channel A Master	Entry	0 deg
	Aerial 2	Channel A Slave	Entry	90 deg
	Aerial 3	Channel B Master	Exit	0 deg
	Aerial 4	Channel B Slave	Exit	90 deg

B.2 Logical Aerials

Each loop controller can have aerials on both its entry side and its exit side and these are sometimes referred to as A and B respectively. We use the term "logical aerial" to describe the aerials on the same side of the same loop controller. For instance all aerials on the entry side of loop controller 1 constitute the same logical aerial, such as in a Master/Slave arrangement. One of the most important parts of configuring the RV1 is the assigning of physical aerials to logical aerials.

B.3 Aerial Phase

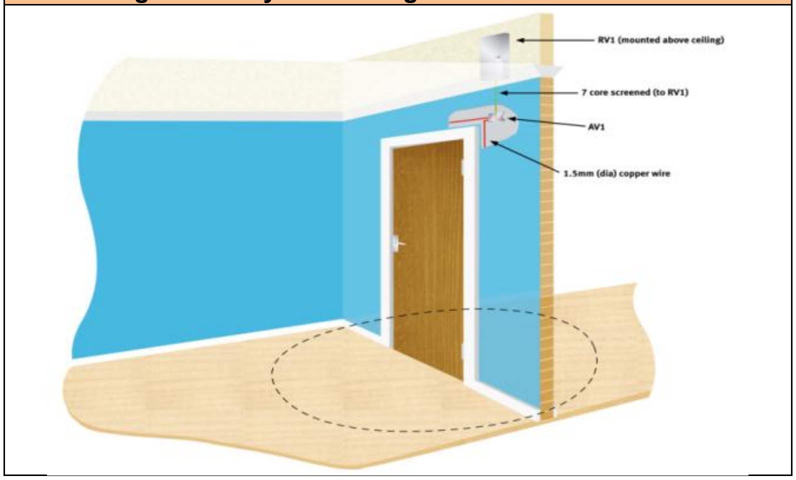
Each transmit coil can have its phase varied. The important thing about this is that if there is a 90 degree phase shift between two aerials, they will never cancel each other out. This is the principle of "Master/Slave" aerials, where one aerial of the pair has 0 or 180 deg phase shift, and the other should have a 90 or 270 deg phase shift.

A 180 degree phase shift is the same as reversing the two wires going to the loop. It is good practice (but not essential) that aerials should be arranged so that the phases cancel out. For instance if there is a row of 4 floor loops their phases should go 0, 90, 180, 270 degrees along the row. In this instance care should be taken to ensure the loops are wired in the same way.

B.4 Some typical arrangements

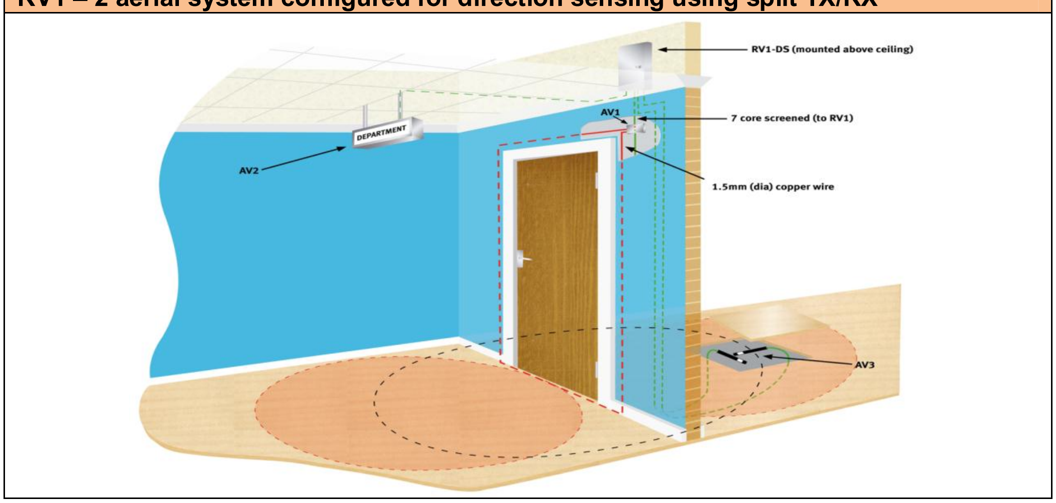
B4.1 - 1 Aerial System

RV1 – Single aerial system configured for “Hands Free” access.



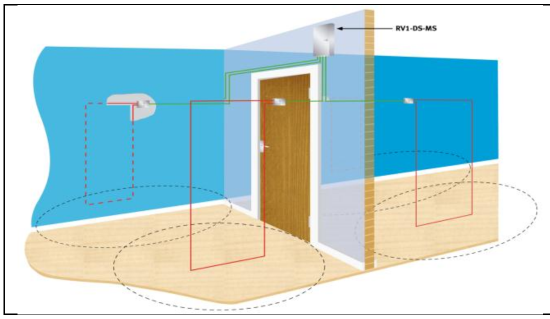
RV1 – 2 aerial system configured for direction sensing(left) Master/Slave (Right)

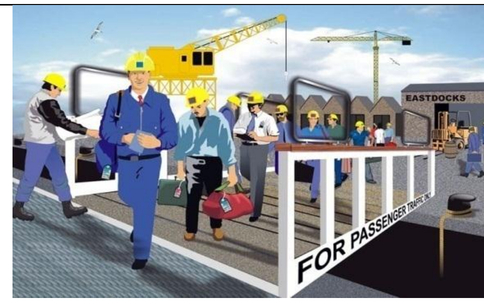
RV1 – 2 aerial system configured for direction sensing using split TX/RX



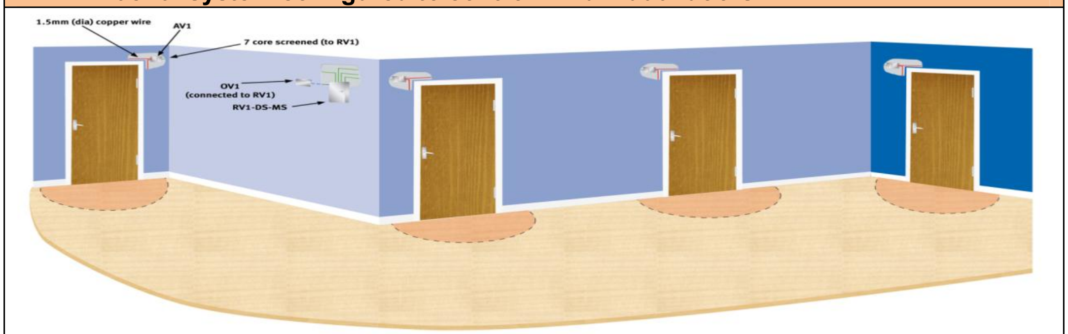
B4.2 - 4 Aerial Systems

RV1 – 4 aerial system configured for direction sensing using Master/Slave





RV1 – 4 aerial system configured to control 4 individual doors



Appendix C - *Cyphertag*® Sample Reader Specification sheets

Reader Specification sheet

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

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
Installer Passcode : 0001
Programmed By : Gary On the 13/04/2010 08:55:49

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)
: 115200 baud (Exit)

Reader Type : RV1-DS-MS

Serial No	Hardware	Issue	Processor	Firmware
1	RVx Master board	93-2183-1c	Master CPU	84-7003c
			Aerial board CPU	84-7004d
			Reporting CPU	84-7005c
2	RVx Aerial Board	93-2175-1b	Aerial Board CPU	84-7004d
3	RVx Master Terminal	93-2186-1b		Undefined

Aerial configuration

Aerial No	Reader	Entry/Exit	Aerial Phase
1	1	Entry	0 deg
2	1	Entry	90 deg
3	1	Exit	0 deg
4	1	Exit	90 deg

Reading Modes
Reader 1 : Primary = Enhanced Control : Secondary = Undefined

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 D User Instructions

D.1 After installing *Cyphertag*® it is a good idea to make sure that the customer understands how the system works, and how to get the best out of it. What they are told depends on the type of application. This section provides information that will be useful to the manager responsible for the system, as well as the basis for information to give to all tag holders (if applicable).

Optimum reading range is obtained when a tag is presented parallel to the loop aerial in the centre of the aerial. Different angles will reduce the reading range. The ideal is to have all personnel wear their tags in the same place as this will result in consistent reading across the tag population.

If personnel are carrying tags, show them how to present a tag to an aerial or an REV1 reader. Explain that tags are much less likely to be read if they are on their side/edge on to the aerial (for instance lying in the bottom of a bag).

Tags performance can be reduced when carried inside bags with metal frames, or when surrounded by keys or coins. Similar performance reduction is observed when stored in the same pocket as a mobile phone. The identity of the tag will not be incorrectly reported, but the range may be affected.

Once a tag has been reported, most software versions will not report that tag again until it has been taken right out of the reading zone for several seconds, then brought back. If you need the door to unlock again you must walk well away from the aerial before returning to it.

Tags must not be left within the range of aerials as the tag battery will be discharged quickly. If the tag is left within 3.0-4.0 metre of an aerial for several days the battery would become totally flat, it is for this reason we would recommend the avoidance of loitering within the range of an aerial.

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***®. 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 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***® 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***® Aerial.

Appendix E Technical Data

For more information on ***Cyphertag***® in general, refer to the product briefs and reference manual on the Identec website www.identec.com .

Loop Controller mechanical details

Dimensions (mm)	305 x 285 x 62
Weight (gm.)	1800
Colour/Material	light grey/aluminium
LEDs	Green (Power) Red (Fault) Reader (one for each loop controller to show when tags are being read) Status LEDs
Display	OLED 128 by 64 pixels

NB All LED's and the Display are disabled when the lid is closed.

Electrical connections

Screened cables are required to meet EMC requirements.

Power input

12 - 26V d.c. typically 450mA for 2 aerial system and 700mA for 4 aerials.
The RV1 power connection is reverse voltage protected.

Wiegand output

Configurable to include, for example, heartbeat or power up messages

Clock/Data output

This uses the same circuitry as the Wiegand output.
Configurable to include, for example, heartbeat or power up messages

RS232

Configurable to include, for example, heartbeat or power up messages

Relays

2 relays. Operation is configurable.

Auxiliary Inputs

3 inputs which can alter the configuration.

Configuration

RV1 loop controllers 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 F APPROVALS

The RV1 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

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® loop controllers have been designed and manufactured in accordance with EN60950, following the provisions of the Low Voltage Directive.

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