



TVP1 PERFORMANCE TEST TAG MANUAL

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Patents:

Patents in the UK and other countries protect Cryptag and CypherTag systems.

Registered Designs

Various aspects of the Reader design are registered.

WARNING NOTICE

This product uses radio frequency signals to identify tags, 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.

CypherTag neither uses nor generates hazardous voltages. You should not connect any such voltage to the equipment.

The TVP1 Test Tag is used to monitor correct operation of a RV1 Loop Controller. It will only do so if it is properly installed in accordance with this manual. You should also consider the failure mode analysis of Appendix A.



See Appendix C

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1. Introduction

The CypherTag Performance Test Tag (TVP1) is used in those situations where the continued operation of an aerial on a RV1 Loop Controller is essential and has to be monitored at all times. Its purpose is to raise an alarm should the RV1, for whatever reason, fail to operate. Its secondary purpose is to monitor the reading range and raise an alarm should the reading range be reduced significantly.

The TVP1 monitors the Reader's operation, but it must be understood that this does not provide a complete guarantee that every tag will be read on every occasion. When doing a safety analysis, customers should be aware that:

- *Tags may fail, although the normal failure rate is believed to be less than 0.1% per annum.*
- *Tags have a specified battery life (which varies dependent upon the type of tag used and the way it's used). CypherTag tags have a battery low indicator, which should be used to ensure tags don't die unexpectedly.*

For more details see Appendix B.

The TVP1 is located within the radio field of the aerial, and communicates with the reader using radio frequency communications. An alternative product, the TVP2 is wired into the aerial leads of the RV1. The TVP2 monitors the voltage and current in the aerial leads, and it also injects its own output into the aerial leads. As TVP1 uses the same communication as tags it is a more direct monitor of performance, whereas the main advantage of the TVP2 is that installation is simpler, as the TVP2 can be placed anywhere in the aerial leads.

The RV1 periodically checks for the presence of the TVP1. Should the data exchange between RV1 and TVP1 fail, a relay on the TVP1 will operate. Some faults are detected by the RV1, which can operate its own relay, and show the state of TVP test tags on its display.

TVP1 can only be used with RV1 Loop Controllers and cannot be used with smaller readers such as REV1.

TVP1 can be used to monitor individual parts of a RV1-DS1 type reader, but positioning of the TVP1 must ensure it is within range of both the transmit, and receive aerials.

One TVP1 (or TVP2) is required for each aerial on the system.

2. Installation

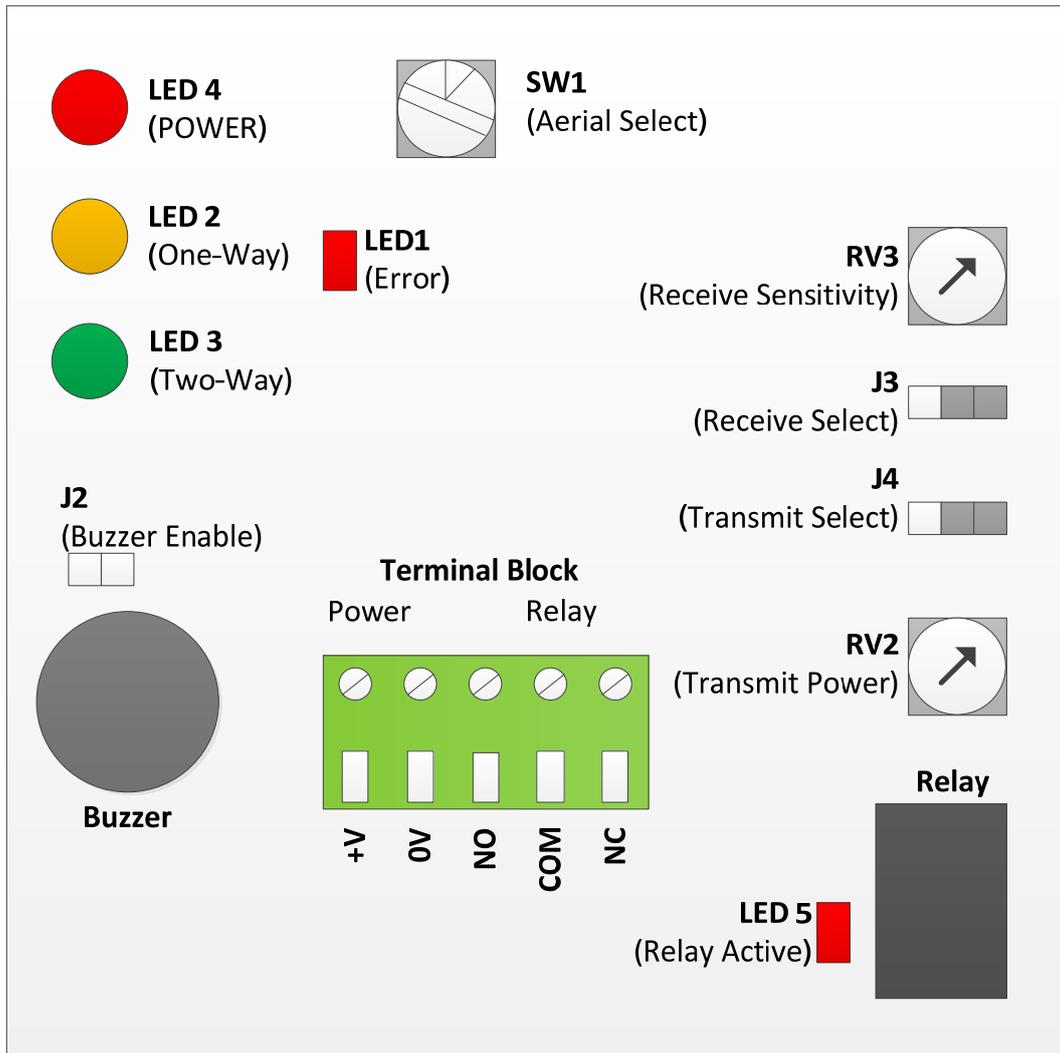


Figure 1 – The TVP1 PCB

The TVP1 should be mounted in a position where it can monitor the selected aerial. It must be within range of the aerial, and also it must not be close to another aerial. If it is within range of 2 aerials it will respond to the aerial with the stronger signal.

Attention must be paid to the orientation of the TVP1 in relation to the aerial it is to monitor. To assist in getting the best alignment, there are links which select between two different sets of aerials within the TVP1. The Receive Select determines the TVP1's sensitive axis for the reader's transmit signal, and the Transmit Select determines the TVP1's axis for signals sent to the reader's receiver.

Receive Select (J3)

Link Position
Left
Right

TVP Aerial used
Ferrite coil
Open coil

Sensitive Axis
Parallel to top edge of PCB
Perpendicular to PCB

Transmit Select (J4)

Link Position
Left
Right

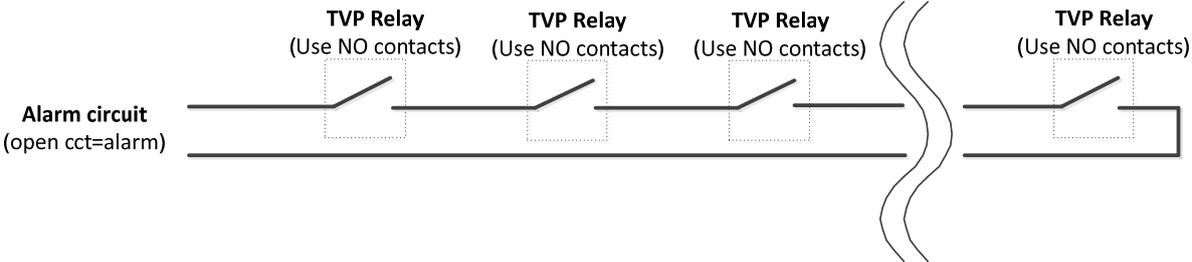
TVP Aerial used
Ferrite coil
Open coil

Sensitive Axis
Parallel to top edge of PCB
Perpendicular to PCB

The right hand link position for both (open coil) should be used when the plane of the TVP1 PCB is in the same plane as the aerial being monitored. However when used with a RV1-DS1 a different combination may be required.

The TVP1 needs its own power source. This can be the same as that used by the readers, **but only** if the N.O. (normally open) contacts of the relay are used, so that a power supply failure will always give a fault.

Failures may be detected by either the TVP1 or by the RV1, each operating a relay contact. It is preferable that the Normally Open contacts are used. The contacts should therefore be wired in series.



Series connected, using normally open contacts that close in correct operation

It is possible to use the Normally Closed contacts wired in parallel, but only if the TVP1 has a totally independent power supply. This must be considered as part of a Failure Mode Analysis.

3. Commissioning

3.1 Initial Condition

On each TVP1 ensure that the RX and TX pots are fully clockwise.

The Aerial Select switch on the TVP1 should be set to the Number of the Aerial being monitored.

Aerial	Switch setting
1-9	as Aerial Number
10	A
11	B
12	C
13	D
14	E
15	F
16	0

3.2 RV1 Set-up

Make sure that all aerials are correctly assigned, they are tuned, and their transmit and receive ranges are set to the desired values.

Configure the RV1 Reader to check for the presence of TVP test tags. This is on the “TVP Test Tag” option in the Installer menu. Select “On” for each physical aerial that has a TVP tag.

During TVP set up, select either TVP Activity in the Normal Use menu, or TVP Status in the Diagnostic menu. When one of these is selected the RV1 checks the TVP more frequently which aids set up.

3.3 Initial Check

The green (Two-Way) LED should be flashing to show that the TVP1 is communicating with the reader. If not, refer to Fault Finding.

Turn both RX and TX pots to minimum (anti-clockwise). Neither green nor amber LEDs should be flashing. If the LEDs are still illuminated the TVP1 is probably too close to the aerial.

3.4 RX Potentiometer

Turn the RX pot clockwise until the amber (One-Way) LED is flashing. Then turn the RX pot about one eighth of a turn clockwise to get a reliable read.

3.5 TX Potentiometer

Turn the TX pot slowly clockwise until the green LED is flashing. Then turn another eighth of a turn clockwise.

The TVP1 may cut out occasionally but it should not cut out for more than a second once per minute (when the RV1 is on TVP Activity or TVP Status). This should give a low rate of false alarms.

If there are known sources of interference, make sure that the TVP1 does not cut out when they are operating, and also make sure that they don't reduce the performance to an unacceptable level.

3.6 TVP1 Relay

When the green LED is flashing, the Relay LED should also be lit, and the relay will operate. Remove the +5V connection from the reader to the associated head amp (AVx) and verify that the Relay LED goes out and the relay is no longer active.

3.7 **RV1 Relay**

The RV1 relays can be set to operate if the TVP1 is functioning. Relays on the RV1 operate by reader, so you must select a relay on that reader's output board. Select TVP as a relay event for that relay, and set the flag for that relay to "Mult Clicks Off".

3.8 **Buzzer Link**

Buzzer operation can be prevented by removing the buzzer jumper link.

3.9 **Checking operation**

Deliberately introduce faults to verify that the TVP1 detects them. These tests should be carried out on a regular basis to avoid the possibility of dormant faults. (Dormant Faults are those that are not detected, but would prevent the detection of faults that affect functionality.)

3.9.1 Disconnect one of the RX connections on the RV1 aerial being monitored. The green LED will cease flashing, and the amber LED will start to flash. The relay LED will go out, and the buzzer will sound (if J2 fitted). Restore the connections.

3.9.2 Disconnect one of the TX connections to the RV1 aerial being monitored. Neither the green or amber LEDs will be on, the relay LED will go out and the buzzer will sound (if J2 fitted). Restore the connection.

The system is now correctly set up and functioning

3.10 Refit the cover.

4. LED indications

Main LEDs (visible from outside)

Red (POWER) Power on
Should always be on

Amber (One-Way) Flashes when TVP1 is getting communications from the reader, but goes out once two way communication is established.

Stays on if the TVP1 is communicating with the RV1 but either the voltage or current has fallen too low. Check the Error LED indication within the TVP1.

If both green and amber LEDs are off (and power is on) the TVP1 is not getting transmission signals from the reader. Check the connections.

Green (Two-Way) Flashes when two way communications are established

Internal LEDs and sounders

Red error

Red (RELAY) on when relay is on (TVP1 operating normally).

Buzzer Comes on when the relay is off. This may not occur at exactly the same time as the green LED stops flashing. The buzzer can be disabled to avoid a nuisance.

NB: Due to the way the TVP1 flashes the LEDs and controls the relays, it may sometimes be observed that the relay goes off while the green LED continues to flash, or the green LED is replaced by the amber LED but the relay does not turn off. This is most likely to be observed during set up, and is normal. Both the green LED going off (usually with amber LED on) and relay going off indicate that a message from the TVP to the reader has failed.

5. Fault Finding

Symptom	Cause	Action/Investigate
Power LED off	No Power	Apply a 5-26V supply to the TVP1
Neither Amber/Green	No valid input	Is TVP enabled in Reader for this aerial? Is TVP1 close enough to aerial? Is TVP1 in correct orientation? Is RX link in right place? Is correct aerial selected on switch? Is RX pot too low? Does RV1 read normal tags? Is RV1 TX Range too low?
Amber but not Green	Reply failing	Is TX pot too low? Is TX link in right place? Is TVP too far from Receive Aerial? Is TVP in correct orientation? Is RV1 Reader RX range too low?
Green or Amber on at pot min	Too close to aerial	Move TVP1 further away (or accept that TVP1 is less sensitive)
TVP1 cuts out (amber off)	Detuning of aerial	Identify why detuning occurs Turn up RX pot
TVP1 cuts out (amber flashing)	Intermittent noise	Turn up TX pot Identify noise source Increase TVP timeout (see below)

The normal settings on the RV1 Reader are for the TVP to be polled every 2 seconds, and the TVP timeout to be 6 seconds, which means it needs 4 (occasionally 3) failed reads of the TVP to give an error. Nuisance faults can be reduced by increasing the timeout. However this might hide problems such as a loss of range when a certain piece of equipment operates.

Appendix A Failure modes and detection

TVP1 will pick up most faults that will affect reading, since it relies on the same communications as a tag. However there are some faults which might not be detected. These also apply to TVP2, but there are some additional specific faults that TVP1 will not detect.

The TVP1 will not detect a faulty tag.

TVP1 will not detect noise that will cause a small loss of range.

TVP1 will not necessarily react to intermittent noise as it only communicates occasionally with the reader. The first symptom of such noise would be occasional alarms on the TVP1.

As mentioned previously, the TVP1 should itself be tested occasionally to ensure that it is operating properly. It is theoretically possible for a TVP1 to fail with the relay permanently on, which is a dormant fault that will mean that it would not detect a failure of the RV1.

Appendix B Quick setup procedure

1. Connect TVP1 to 12 Volts DC (range 5 to 26 volts). The buzzer will come on. (The buzzer can be disabled by removing the buzzer jumper link.)
2. Install TVP1 within range of the aerial being monitored.
3. Set TX and RX fully anti-clockwise.
4. Make sure TVP is enabled for aerial being monitored and select TVP Activity screen on RV1 Reader.
5. Turn the RX pot clockwise until the TVP1 starts reading (Amber light flashing) and then another 1/8 turn clockwise.
6. Turn the TX pot (RV1) slowly clockwise until the Amber light goes out and the Green LED flashes.
7. Continue turning TX Adjust pot a further 1/8 turn (threshold)
8. Green LED should be blinking. The RELAY LED should be on. The buzzer should have stopped sounding.
9. Connect relays as stated in Installation section.

Appendix C Regulatory

European Union and other ETSI countries



This product is in conformity with the requirements of 2004/108/EC covering EMC.

Low Voltage Directive

CypherTag Loop Controllers and accessories have been designed and manufactured in accordance with EN60950, following the provisions of the Low Voltage Directive.

Waste from Electrical and Electronic Equipment (WEEE) Directive

We encourage the recycling of Identec products at the end of their life. Equipment can be returned to Identec Ltd for safe disposal. However we recommend any metal cases be recycled locally. For further information contact Identec Ltd.

United States of America

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.

ISO 9001

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