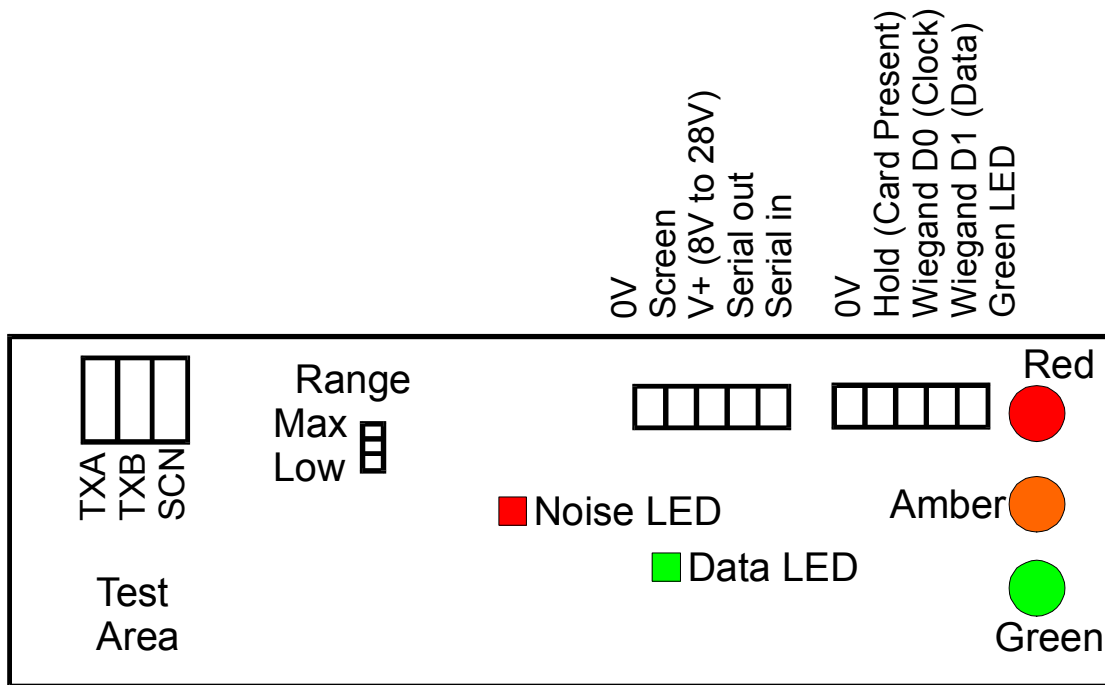## 1.2.   The CR2A reader

A Cryptag Census reader identifies tags (sometimes referred to as tokens or cards) using low frequency radio signals. CR2A transmits to the tag at 153 kHz and detects the tag's response which is at 115kHz. CR2A uses frequencies which are permitted in USA.

The CR2A reader is a cost effective reader for longer range applications that do not require the full capabilities of CR1A readers. The CR2A can only be used with a single antenna loop (internal or external). With the external antenna loop fitted, the reading range depends on the size and shape of the loop as well as on the type of tag.

The CR2A reader is configurable, and this is normally done in the factory. Configuration controls the output format, timings etc.

The printed circuit board of the CR2 reader

The CR2 reader can be used as a self-contained reader, using the internal antenna loop, or it can be used with an external antenna loop.

Installation

The reading range of the CR2 reader is approximately 1.5 metres with the internal loop, and 3 metres with an external loop 2 metres square. With such ranges it is essential to carry out a Site Survey using an MS3A Site Survey Meter to ensure that the site is free from interference. (Since the range is similar to the CR1 reader, you are advised to read the CR1 manual – much of it also applies to this reader.)

The reader is mounted using the 3 holes in the base. If the reader is to be used in an exposed position the cable entry hole should be protected. (If a lot of condensation is expected, drill a drainage hole at the bottom of the reader.)

All connections to the reader should use screened cables. See below for how to connect the screens.

, with the screen connected to the Screen terminal. The screens should be earthed at the controller end. (If this causes problems, connect a 1nF capacitor between the screen and earth at the controller end.)

Connections

0V	Reference for supplies and data connections
Screen	All cables must be screened. See below for other details on connections.
V+	Positive power supply (8 to 28V at typically 80mA)
	(Range drops below 13V, falling to 80% at 8V)
Serial Out	Pseudo-RS232 data output (9600 baud, 8 data, 1 stop bit, no parity)
Serial In	Only used when configuring readers
0V	Extra 0V connection for data cables
Hold	Normally unconnected. Connect to 0V to pause Wiegand reporting.

Wiegand D0	Wiegand format output D0 line. (5V with low going pulses)
Wiegand D1	Wiegand format output D1 line.
Green LED	Connect to 0V to turn the green LED on.

For Clock/Data output readers, the Hold and Wiegand lines are used as shown in the figure.
Maximum cable lengths

Wiegand	100 metres
Serial out	10 metres (to RS232 input)

Coil connections (for use with external antenna loops)

Screen	The cable to the coil must be screened, with the screen connected here.
TXA/TXB	Coil connections. Connect to the coil and tuning capacitor

If an external loop is used, disconnect the internal coil. The external loop should be tuned with the correct type of capacitor, as close as possible to the loop. The capacitance required can be measured using MS3A Site Survey Meter (or adjust for minimum current consumption into the reader).

Screen Connections
Screened cables should be used both for the antenna cable and the power/data cable(s). In addition the screen of the power cable must be connected at one end. It is preferred that the screen is connected to the 0V line at the reader and left unconnected at the other end. If the other end of the screen must be connected, then connect a 1nF capacitor between screen connection and 0V.

Screened cable, and correct connection of the cable screen, is necessary for good performance.

Operation
The reading range can be reduced (to 50-60%) by putting the Range link to the bottom. For full range put the link to the top. (Omitting the link is not recommended. It gives an intermediate range, but tags will cease to read very close to the reader.)
When a tag is being read the amber LED flashes.
The Noise LED flashes if a tag is present, or if there is interference that may affect reading range.
The Data LED flashes momentarily when a tag is reported. All tags are reported on both the Wiegand and RS232 outputs. (Unless the tag does not belong to the same site as the reader.)
If an external coil is fitted, tags will read within a few centimetres of the Test Area near the coil connections.

Identec Ltd
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