SCI1000 Operational Description

The SCI1000 OEM reader is an inexpensive, compact radio frequency communications electronic interface unit. Bi-directional RF communication to contactless smart cards, serial communication to application controller and rich set of macro commands make it the keystone in contactless smart card systems..

The SCI1000 can be integrated into existing systems. Using TTL level NRZ communication between reader and Host, the SCI1000 allows **bi-directional,** communication between the Host and passive, contactless smart card.

The SCI1000 OEM Reader Board serves as a smart interface unit between the application controller and:

- ISO 14443 Type B Contactless smart cards.
- ISO 14443 Type A Contactless smart cards.
- Mifare Contactless smart cards

At the Host's command, the SCI1000 generates and modulates a 13.56 MHz carrier signal for the transmission of power, commands and data to an in-range smart card. The SCI1000 detects the, signal encoded by the card automatically choosing the modulation technique required by the card.

Read and write operations have equal data rates and range.

Transceiver circuitry:

The transceiver is based on a single Philips RC531 chip. Inductive coupling to contactless cards requires constant transmission of 13.56MHz carrier via a loop antenna (unlike conventional radios which mute their transmitter during receiving time).

Data transfer to the card is achieved using amplitude modulation as defined in ISO14443 standard with two possible scenarios: Type A and Type B.

In order to transfer data from the card to the reader the card modulate its impedance using double modulation technique where an 847KHz subcarrier is further modulated with the data as also described ISO14443 standard. The load modulation also modulates the antenna impedance as seen from the reader, affecting amplitude and phase shift modulations in the transmitted signal. These fluctuations are sensed by the chip receiver which also performs the incoming digital data retrieval.

Inductive Loop Antenna:

The close range inductive coupling is supported by a loop antenna, with an attempt to generate maximum magnetic field while maintaining the Electrical field at minimum, especially at far field.

The loop antenna is matched to 50ohm in order to fit the 50ohm feeding coax cable.

Single chip Microprocessor:

A single chip microprocessor performs all the control and communication tasks, both to/from the host and the transceiver chip.

Digital IO

The SCI1000 supports 3 buffered outputs which drives 3 indicating LEDs, used for status indication..

Operating Voltage

The SCI1000 operates on regulated 5VDC/350mAmax.