With the increased popularity and capability of smart-phones, there is a growing desire to use them as mobile wallets and to use them to make payments at the point of sale. The key impediment to adoption has been the lack of data transfer channel between mobile phones and the point of sale terminal. A number of alternatives have been proposed. These include the manual keying of data displayed on the phone's screen into POS terminal, 2D barcodes displayed on the phone's screen and read by a 2D barcode reader, RF ID tags attached to phones and built-in Near Field Communications (NFC) hardware driven by an application in the phone. Of these methods, 2D barcodes and NFC are the most promising. Their wide scale adoption, however, is prevented by a lack of suitable reading devices at the point of sale, and in the case of NFC, also the lack of standardized NFC capability in many smart-phones.

Accordingly, there is a need for improved devices and methods for transmitting payment card data, or other information, from a smart-phone, or other electronic device, remotely into a Point of Sale transaction terminal.

Summary of the Invention

The present invention describes a system and a method for a baseband near-field magnetic stripe data transmitter that transmits payment card data, or other information, from a smart-phone, or other electronic device, remotely into a Point of Sale transaction terminal via the terminal's magnetic stripe reader.

In general, ~~one~~ a first aspect of the invention provides a system for a baseband near field magnetic stripe data transmitter including a mobile phone and a magnetic stripe transmission (MST) device. The mobile phone is configured to transmit a stream of pulses comprising magnetic stripe data of a payment card. The magnetic stripe transmission (MST) device includes a wave shaper, a driver and an induction device. The MST device is configured to receive the stream of pulses from the mobile phone, to shape and amplify the received stream of pulses and to generate and emit high energy magnetic pulses comprising the magnetic stripe data. The emitted high energy magnetic pulses are configured to be picked up remotely by a magnetic read head. The MST device shapes

millimeters and 1700 square millimeters. The induction device includes an iron or ferrite core and the core is designed not to saturate under a high current flowing through the induction device. A portion of the magnetic stripe data of the payment card is replaced by a cryptographically generated dynamic element that prevents replay or copy attacks. The cryptographically generated dynamic clement is generated either in the MST or the mobile phone. The cryptographically generated dynamic element comprises a secure hash generated using the magnetic stripe data of the payment card, an MST identification number, and a sequence number that is incremented for each data transmission and encrypted by an encryption key.

According to a second aspect of the invention, there is provided a magnetic stripe transmission (MST) device comprising: a wave shaper; a driver; and an induction device; wherein the MST device is configured to receive the stream of pulses from a mobile phone, to shape and amplify the received stream of pulses and to generate and emit high energy magnetic pulses comprising the magnetic stripe data; wherein the emitted high energy magnetic pulses are configured to be picked up remotely by a magnetic read head; and wherein the wave shaper shapes the received stream of pulses to compensate for shielding, eddy current losses and limited inductance value of the magnetic read head.

Brief Description of the Drawings

Referring to the figures, wherein like numerals represent like parts throughout the several views:

FIG. 1 is an overview diagram of the baseband near-field magnetic stripe data transmitter system, according to this invention;

FIG. 2 is a schematic diagram of a typical inductor used to generate the required magnetic field, according to this invention;

FIG. 3 is an overview diagram of another embodiment of the baseband near-field magnetic

stripe data transmitter system, according to this invention;

FIG. 4 is an. overview diagram of another embodiment of the baseband near-field magnetic stripe data transmitter system, according to this invention;

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FIG. 5 is a graphical representation of the inductor current versus time and the magnetic reader head output voltage versus time, for the embodiment of FIG. 4;

FIG. 6 depicts an array of two inductors; and