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 smartphones.

Accordingly, there is a need for improved devices and methods for transmitting payment card data, or other information, from a smartphone, 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 smartphone, or other electronic device, remotely into a Point of Sale transaction terminal by pressing a payment button on the smartphone or on the magnetic stripe data transmitter.

According to a first aspect of the present invention, there is provided an apparatus comprising: a driver configured to receive a stream of pulses associated with magnetic stripe data of a payment card and to cause a series of timed current pulses; and an inductor having one or more windings configured to emit magnetic pulses based on the series of timed current pulses, wherein the inductor is configured to cause the series of timed current pulses for having a rising time, the one or more windings of the inductor to generate magnetic pulses contactlessly recognizable by a magnetic read head.

According to a second aspect of the present invention, there is provided an apparatus comprising: a memory for storing a wallet application and information regarding a plurality of payment cards, a controller configured to execute the wallet application to select one of the plurality of payment cards based on a user input and to transmit a stream of pulses associated with magnetic stripe data of the selected payment card, a driver configured to receive the stream of pulses

associated with magnetic stripe data of the selected payment card and to generate a series of timed current pulses; and an inductor having windings formed on a substrate layer configured to emit magnetic pulses based on the series of timed current pulses, wherein a series of timed current pulses are used to drive the inductor to generate magnetic pulses contactlessly recognizable by a magnetic read head.

According to a third aspect of the present invention, there is provided an apparatus comprising: a driver configured to receive a stream of pulses associated with magnetic stripe data of a payment card; and an inductor having an inductance value coupled to the driver, which when driven by the driver causes a series of timed current pulses to flow through the inductor, resulting in emission of magnetic pulses having a rising time that emulates fluctuating magnetic field created by a moving magnetic stripe, wherein the magnetic pulses are to be contactlessly picked up and recognizable via an existing infrastructure of a magnetic stripe reader head located in a point of sale (POS) card payment terminal.

In general, one ~~aspect~~ embodiment the invention provides a system for a baseband near field magnetic stripe data transmitter including a mobile phone, a magnetic stripe transmission (MST) device and a payment button. The mobile phone includes a payment wallet application and is configured to transmit a stream of pulses comprising magnetic stripe data of a payment card. The magnetic stripe transmission (MST) device includes a driver and an inductor, and the MST device is configured to receive the stream of pulses from the mobile phone, to amplify and shape the received stream of pulses and to generate and emit high energy magnetic pulses comprising the magnetic stripe data of the payment card. The inductor is driven by a series of timed current pulses that result in a series of high energy magnetic pulses that resemble the fluctuating magnetic field created by a moving magnetic stripe. The payment button is programmed to be associated with a preselected payment card and activating of the payment button initiates the emission of high energy magnetic pulses comprising the magnetic stripe data of the pre-selected payment card.

Implementations of this ~~aspect~~ embodiment of the invention include the following. The payment button is located in the MST device, or in the mobile phone. The mobile phone is configured to receive a notification signal when the payment button is activated. The payment button is configured to be activated remotely via a wireless connection. The transmitted card data may be retrieved from either a memory of the mobile phone or a memory contained in the MST device. The emitted high energy magnetic pulses are configured to be picked up remotely by a magnetic read head. The MST device shapes the received stream of pulses to compensate for shielding, eddy current losses and limited inductance value of the magnetic read head. The magnetic read head includes a magnetic read head inductor and the inductor of the MST is configured to form a loosely coupled transformer with the magnetic read head inductor from a distance longer than 0.5 inches. The inductor of the MST includes an iron or ferrite core and the core is designed not to saturate under a high current flowing through the inductor.

In general, in another ~~aspect~~ embodiment, the invention provides a system for a baseband near field magnetic stripe data transmitter including a mobile phone, a magnetic stripe transmission (MST) device and a payment button. 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 driver and an inductor, and the MST device is configured to receive the stream of pulses from the mobile phone, to amplify and shape the received stream of pulses and to generate and emit high energy magnetic pulses comprising the magnetic stripe data of the payment card. The emitted high energy magnetic pulses are configured to be picked up remotely by a magnetic read head. The inductor includes one or more windings, and the one or more windings are configured to generate magnetic flux lines that are spread over a large enough area dimensioned to include a sensing aperture of the magnetic read head and to generate an inductance value that is configured to cause properly timed current pulses to reach their maximum value and thereby to cause maximum induced voltage in the magnetic read head. The payment button is programmed to be associated with a pre-selected payment card and activating of the payment button initiates the emission of high energy magnetic pulses comprising the magnetic stripe data of the pre-selected payment card.

In general, in another ~~aspect~~ embodiment, the invention provides a magnetic stripe transmission (MST) device including a driver, an inductor and a payment button. The MST device is configured to receive a stream of pulses comprising magnetic stripe data

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