SmartID™ HARDWARE, APPLICATIONS AND CONFIGURATIONS

Introduction

SmartID™, SmartTRANS™ and SmartTOUCH™ access control readers are made up of three components: hardware, application and format configuration.

The hardware defines the maximum capacity of the readers. SmartTRANS, the only reader in the SmartID family that includes the supporting hardware to read 125 kHz HID Prox cards, is also capable of reading multi-technology 13.56 MHz and 125 kHz credentials. Additionally, SmartID, SmartTRANS and SmartTOUCH non-keypad readers are unable to perform keypad operations because the keypad membrane does not exist within the hardware.

The application defines the general procedures a reader will follow in order to read data from an access card. There is one set of procedures to read an HID MIFARE® card, another set of procedures to read a custom MIFARE card and yet another set of procedures to read a custom DESFire® card. The procedures to read HID MIFARE cards do not match the procedures to read custom MIFARE cards because even though the underlying MIFARE technology is the same, the keys and data on the card and the procedure to read the data are different. With differences in technology and reading procedures, the application to read custom MIFARE cards is not the same as what is used to read custom DESFire cards. Not to mention, the underlying card technology differences between MIFARE and DESFire require different sets of procedures in the reader so that data from the relevant card technology can be read and processed by the reader.

The format configuration defines the unique settings applied to an application, including reading, process and outputting a unique custom access control application. These settings include keys to access data, location of data, length of data, the output order and type of data. It is the configuration that explains to the general procedures within the application how to actually read and process data per unique site requirements.

All three components are defined within an order for a reader. For customized readers, both a reader part and format number are supplied on a purchase order. The reader part number (e.g. 8030DSCM) defines both the hardware (8030DS = SmartID Mullion) and application (CM = MIFARE). The format number defines the format configuration of the SmartID Mullion MIFARE reader. Format configurations can be generic (open for use by any customer) or custom (defined specifically per unique customer requirements).

This setup of hardware, application and configuration produces a powerful and dynamic reader solution. After base hardware, with initial applications and configurations installed on site, the readers can be upgraded with enhancements to the existing reader application or complete application migration to different card technologies. Without taking the reader off the wall, configurations that add a card application (e.g. from MIFARE to DUAL MIFARE) after a new card population is introduced to a multi-facility company or applications/configurations that upgrade sites to a higher security technology can be achieved with little cost and effort. This also allows for tailored applications to be written and downloaded to the reader when future card populations shift in unexpected directions. As long as the hardware can handle the communication with the card, the application and associated configurations can be downloaded at any point in time.

In more detail, the following section explains existing SmartID hardware, applications and common configuration settings used during custom definition of reader and card solutions.

Hardware

The applications available within the SmartID product line are:

◗ SmartID™
  • 13.56 MHz Mullion: Used to communicate with ISO 14443 cards
  • 13.56 MHz Mullion Keypad: Used to communicate with ISO 14443 cards, and offer an additional factor of authentication via keypad.
◗ SmartTRANS™
  • 13.56 MHz and 125 kHz (HID) Mullion: Used to communicate with ISO 14443 and 125 kHz HID Prox and AWID cards.
  • 13.56 MHz and 125 kHz (HID) Mullion Keypad: Used to communicate with ISO 14443 and 125 kHz HID Prox and AWID cards, and offer an additional factor of authentication via keypad.
  • 13.56 MHz and 125 kHz (Indala) Mullion: Used to communicate with ISO 14443 and 125 kHz Indala Proximity cards.
  • 13.56 MHz and 125 kHz (Indala) Mullion Keypad: Used to communicate with ISO 14443 and 125 kHz Indala Proximity cards, and offer an additional factor of authentication via keypad.
◗ SmartTOUCH™
  • 13.56 MHz Mullion: Used to communicate with ISO 14443 cards, and offer an additional biometric finger authentication.
  • 13.56 MHz Mullion Keypad: Used to communicate with ISO 14443 cards, and offer a combined biometric finger and keypad authentication.

Applications

The applications available on SmartID readers are:

◗ HID MIFARE®: Benefit from optimized application and card performance by purchasing HID MIFARE application and HID MIFARE cards. Choose from a variety of card formats, including end user Corporate 1000 format. The reader will scan for HID MIFARE cards and output the data programmed on the card, whether it be 26-bits, 35-bit or any other legal length of data (SmartID™). SmartTRANS™ HID MIFARE readers will also read Proximity cards (Proximity technology is hardware dependent), while SmartTOUCH™ HID MIFARE readers combine HID MIFARE card readers with biometric authentication.
◗ MIFARE: Combined with a generic or custom configuration, the custom MIFARE application reads any two MIFARE applications (SmartID) or any one MIFARE application and Proximity cards (SmartTRANS, Proximity technology is hardware dependent). SmartTOUCH custom MIFARE readers combine custom MIFARE card read with biometric authentication.
◗ DUAL MIFARE: Combined with a generic or custom configuration, the dual MIFARE applications will read two MIFARE applications (SmartID). Each of the MIFARE applications can either be a custom sector, HID MIFARE or CSN configuration. This application is not available on SmartTRANS or SmartTOUCH because both SmartTRANS and SmartTOUCH already have an additional applications running (prox for SmartTRANS and biometrics for SmartTOUCH).
◗ DESFire®: Combined with a generic or custom configuration, the DESFire application read any one DESFire application and Proximity cards (SmartTRANS and Proximity technology is hardware dependent). SmartTOUCH custom MIFARE readers combine custom MIFARE card readers with biometric authentication.
◗ PIVII: Combined with generic configuration, the PIVII application will read the United States Government's FIPS 201 cards (SmartID) or PIVII applications and Proximity cards (SmartTRANS and Proximity technology is hardware dependent). PIVII applications are not available on SmartTOUCH readers.
◗ T=CL: Combined with generic configuration, the T=CL application allows host driven applications to read and write to MIFARE and ISO 14443-4 (DESFire) cards. This application is not available on SmartTRANS or SmartTOUCH readers.
◗ 3964: Combined with generic configuration, the 3964 application allows host driven applications to read and write to MIFARE cards.   While this application is not available on SmartTRANS or SmartTOUCH readers, it does support legacy installation. New installations should use T=CL protocol.

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Format Configuration

The format configuration defines a number of settings, including:

◗ Key: To access MIFARE® or DESFire® secure card data, the secret keys protecting access card data must be imported into the reader.
◗ MAD: MIFARE specific, MAD is the MIFARE Application Directory that can be utilized to find the card data.
◗ Data Location: Once inside a secure data area, the reader must know where to find the data. Data within MIFARE cards exists within sectors of data, while data within DESFire cards exists within applications and files.
◗ Data Length: The amount of data to output. HID MIFARE configurations allow for variable data output. Thus any HID MIFARE reader will read data of any length from an HID MIFARE card (26-bit, Corporate 1000, etc.) Custom MIFARE configurations are typically fixed data output. For example, 36-bit data formats are always 36-bits, and custom configured MIFARE readers expect this consistently.
◗ Data Output Hardware: Data can be output over several hardware medians, including Wiegand, Clock-and-Data, RS232, RS485 or RS422. Only one output type is possible per configuration.
◗ Data Output Form: Data can be output over the median in a variety of ways, including raw data, binary/hexadecimal, BCD, ASCII or ABA track 2. Only one output type is possible per configuration.

Additionally other reader configurations make up the format configuration, including:

◗ Keypad Output: A variety of keypad outputs is supported, including 4- and 8-bit bursts and 26-bit buffered.
◗ LED/Beeper: Behavior of the LED and beeper, including what the host controls, is configurable.
◗ RF Behavior: RF timeouts, power and baud rates.

Conclusion

SmartID™, SmartTRANS™ and SmartTOUCH™ access control readers are made up of three components: hardware, application and format configuration. Starting with hardware, the reader is configured to read site specific cards through applications and configurations. It is the applications and configurations that offers dynamic adaptation of the reader hardware to the installation site.

As an example, a MIFARE application could be initially installed at the site to work within an existing population of cards. Then after time, when funds become available, higher security DESFire applications may become desirable. A reader application migration would allow for field upgrading of the readers without taking a single reader off the wall.

Configurations are either generic for open public use or custom defined for site specific cards with custom data processing. Thus, complete the reader setup example above by presenting an HID or custom configuration for DESFire and the new technology and application data will now be read by the reader using the versatility of SmartID hardware, applications and configurations

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