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ADDENDUM
DL-Windows V5 User's Guide
Mag Stripe Enrolling Instructions

WI2249LF 8/17

Note: This addendum is intended to be used with **DL-WINDOWS Software (V5.5.2 or later)** and the **DL-WINDOWS Version 5 User's Guide** (OI382).

Overview

Mag stripe cards are created by encoding user information and other credential data on a magnetic strip that can be read and validated by **Mag stripe**-enabled **ArchiTech locks**. **Mag stripe** cards are usually sold as blanks; the user then encodes their credential data onto any of the 3 available "Tracks" on the magnetic strip using a pre-determined card format (typically, this data is encoded onto Track two*). To help you get started, the DL-WINDOWS software provides a flexible interface to accommodate 3 popular pre-configured formats (two are *character-based* and one is *bit field-based*):

- **Continental** (character based; see next section)
- **Swipe Format 16 Character Type 1** (standard "bank card" format, character-based; see next section)
- **User Define 26-bit Swipe Version** (bit field-based; see page 2)

First select (or create) an appropriate card format to match the user's programmed cards, then enroll the cards into DL-Windows. This guide details the usage of the 3 "default" formats, and how to create your own optional "custom" format based on each of the default formats.

Card Enrolling (Character-Based)

Note: Refer to the section **Add Users with the Global Users Screen** in OI382 for more information (adding **Mag stripe** cards to users is very similar to adding proximity cards as described in that section).

1. To add **Mag stripe** cards to users, open the **Global Users Screen**, select a user from the **User List**, and click **Add Card**. The **Card Enrolling** dialog opens (see Fig. 1 and Fig. 4, below).
2. From the **Card Type** pull-down, select **Swipe Cards CB**.
   - The default **Card Format Name** shown in Fig. 1 is **Continental** format; for this default format, all that is required is the **5-digit Facility Code** and the **6-digit Card Code** on your card.

     --or--

   - From the **Card Format Name** pull-down, you may also choose **Swipe Format 16 Character Type 1** shown in Fig. 4. For this default format, all that is required is the **16 digits** printed on your card (standard "bank card" format).
3. Click **OK** to continue.

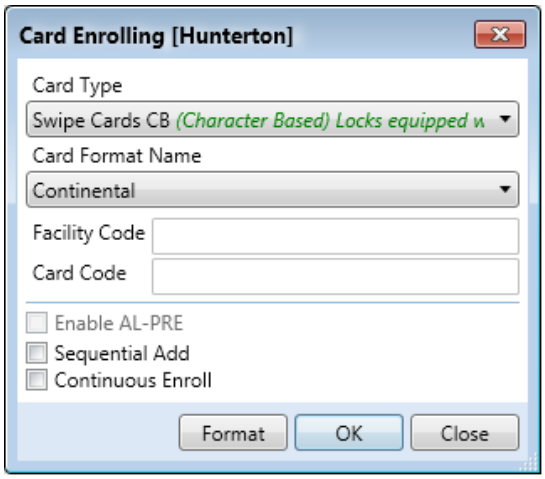

Fig. 1: Continental Format

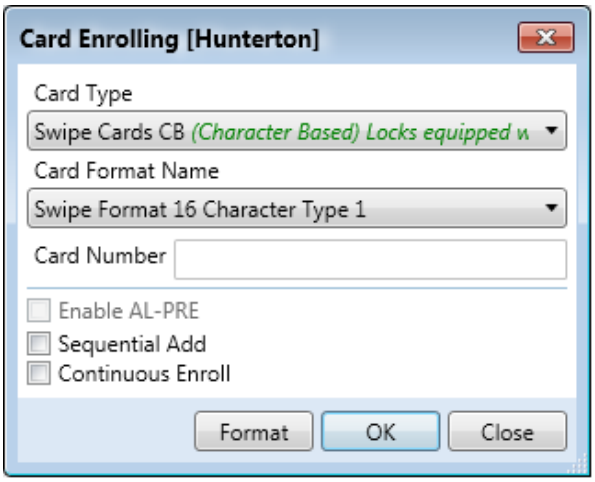

Fig. 4: Swipe Format 16 Character Type 1

* **Important!** Track two must **ALWAYS** contain data. If the user data is located on Track 1 or 3, Track 2 cannot be left blank. We recommend that Track 2 should, at the very minimum, have a start sentinel and at least 5 characters or 26 bits in total.

Note: The **Format** button (located at the bottom of the **Card Enrolling** dialog) opens the **Card Formats** screen that displays all the parameters of the selected card format (see "**Card Formats Screen** " sections, below).

Card Enrolling (Bit Field-Based)

Adding **Mag stripe** cards to users is very similar to adding proximity cards, therefore refer to the section **Add Users with the Global Users Screen** in OI382 for further information. To add **Mag stripe** cards to users:

1. Open the **Global Users Screen**, select a user from the **User List**, and click **Add Card**. The **Card Enrolling** dialog opens (see Fig. 5).
2. From the **Card Type** pull-down, select **Swipe Cards BF**.
3. Click **OK** to continue

Notice how this option defaults to **Decimal** representation. This **bit field-based** format is meant to be a swipe card implementation of the industry standard 26-bit proximity format using a card code and Facility Code.

Note: The **Format** button at the bottom of the **Card Enrolling** dialog opens the **Card Formats** screen that displays all the parameters of the selected card format (see the **Card Formats Screen** section, below).

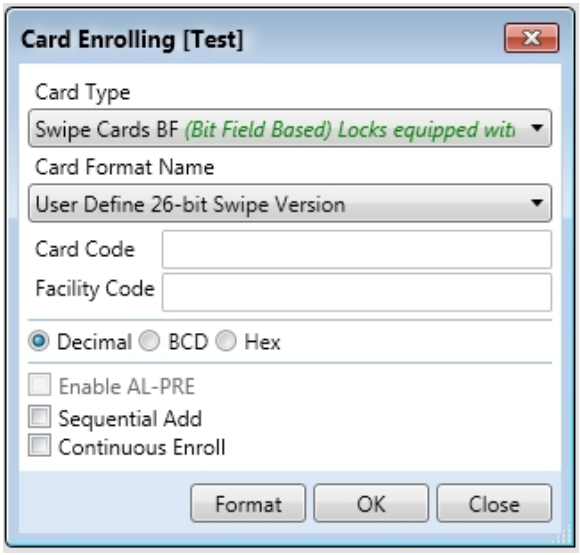

Fig 5: Card Enrolling Dialog (Bit Field-Based)

Card Formats Screen (Character-Based)

To open the **Card Formats** screen, click the **Format** button (described above). The **Card Formats** screen displays all the parameters used to create the selected card format. The default card formats are non-editable. From the **Card Type** pull down menu, there are two card options that open different **Card Formats** screens. The first type shown below is the **Swipe Cards CB** (Character Based) **Card Formats** screen. The second is the **Swipe Cards BF** (Bit Field-Based) shown on page 4.

The following is a breakdown of the **Card Formats (Character Based)** screen's parameter descriptions. An example will be provided at the end for clarity.

- **Format Number** -- Generated automatically; used internally by DL-Windows.
- **Format Length (characters)** -- The total number of characters on the Track you wish to use. **Format Length** = the number of characters in each field + the start sentinel character + the end sentinel character + any field separator characters.
- **Format Length (bits)** -- Calculated by taking the number of bits in a character and multiplying it by the **Format Length** (total number of characters).
- **Physical Track** -- One of three Tracks available on a **mag stripe** card. When used with ArchiTech locks, data MUST always be present on Track two.
- **Character Length** -- The number of bits used to make a character, including the **Parity Bit.**
- **Parity Bit** -- This number designates the position of the Parity Bit within the group of bits used to make a character. This is typically the **5th** position. The Parity Bit is an extra bit used to detect errors in the data.
- **LSB First (Least Significant Bit)** -- When checked: After the Parity Bit is removed, the remaining bits that define the character are read from right to left.
- **Start Sentinel** -- The very first character on a given Track; this character is the first character before any fields.
- **Field Separator** -- The character used to separate fields (select up to three fields to validate at the lock).
- **End Sentinel** -- The very last character on a given Track, i.e. the last character after all the field(s).
- **Field 1/2/3** -- The fields that will be validated at the lock (up to three different fields are allowed). Here you can name the fields and select the length of each (the field length must be specified because you can choose not to use a field separator character). For example, you can take a string of 11 characters and call the first 5 characters field 1 and the next 6 characters field 2.
- **Match Field 1/2/3** -- Select the fields to be validated at the lock.
  Important! *When using **mag stripe** cards with ArchiTech locks, there must always be some data encoded on Track **two**. Even if you do not use Track two, at least some data must be present for the ArchiTech locks to function correctly*.

Example using the Continental Format

Continental format is based on **5-bit ABA** character set found in ISO7812. This means that the characters are **5-bits** long, the **5th bit is parity** and the bits are in **LSB** first order. This information is used to arrange user data for use by the lock.

As shown in the **Card Formats** screen shown in Fig. 2, **the Continental** format is **19** characters in length. The total of **19** characters is derived from the following string of characters:

Start sentinel (1) + Facility code (5) + Field separator (1) + Card code (6) + Field separator (1) + Expiration date (4) + End sentinel (1) = **19 characters in length**

The following parameters are used in this example:

- For the start sentinel, the character '**;**'
- For the Facility Code, the characters '50011'
- For the filed separators, the character '**=**'
- For the card code, the characters '112556'
- For the expiration date, the characters '0520'
- For the end sentinel, the character '?'

Therefore, the following character string is stored on the card (to be burned on the card by an end user or a service providing pre-programmed cards):

;50011=112556=0520?

The **format length in bits** = **5 bits per character** x **19 characters** = **95 bits**

Note: In Fig. 2, the **expiration date** is not required for validation because the **Match Field3** box is not checked. In this case, although the expiration date data exists on the card, because it is unchecked it is not used in the validation process. If you wish to use the expiration date in the validation process, or not use the Facility Code in the validation process, then simply modify the format and create a **custom format** that fits your requirements.

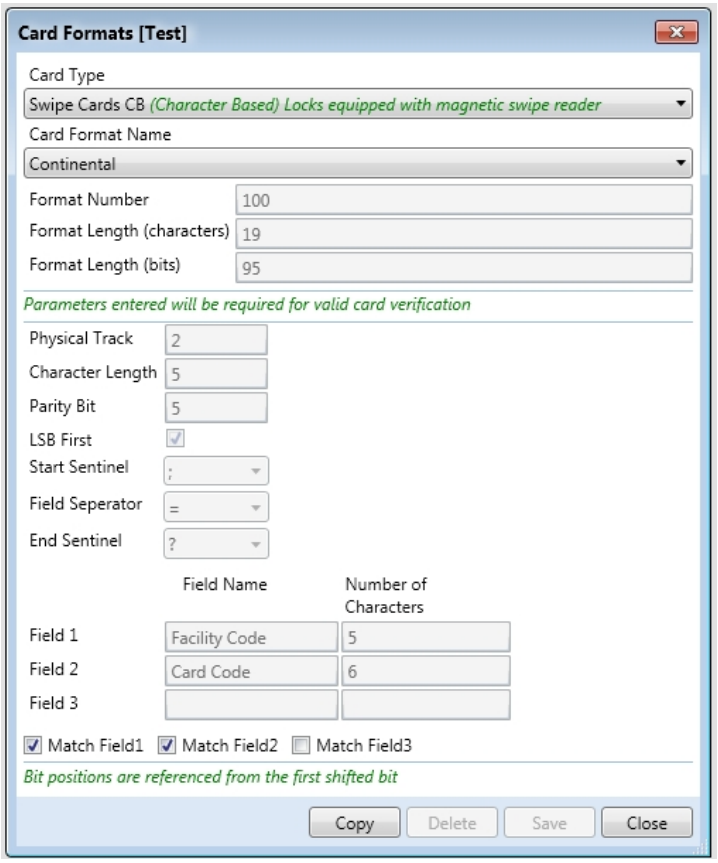

Fig. 2: Card Formats screen, Continental Format

Custom Format Example

To create a **custom format**, click the **Copy** button at the bottom of the **Card Formats** screen and the fields become editable. Fig. 3 will build a **custom format** for a card with the following 3 Fields:

- **10-digit Card Number**
- **6-digit Facility Number**
- **4-digit Expiration Date**

If we use **ABA**-style characters as in the Fig. 2 example, your screen will look similar to the one shown in Fig. 3. You can now use the check boxes at the bottom to select the fields the lock will use to validate the credential.

Click **Save** to save your new format. The **Card Enrolling** dialog will display the fields for your custom format (see Fig. 6).

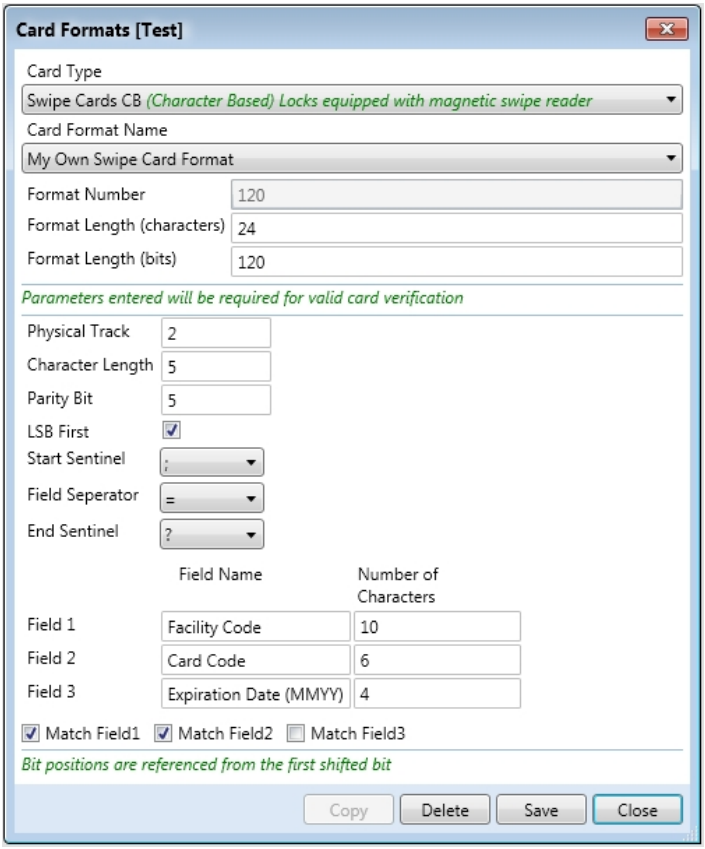

Fig. 3: Example of a "Custom" Format

Card Formats Screen (Bit Field-Based)

In the **Card Enrolling** screen, click the **Card Type** pull down menu and select **Swipe Cards BF**.

The following is a breakdown of the **Card Formats (Bit Field-Based)** screen's parameter descriptions:

- **Format Number** -- Generated automatically and is used internally by DL-WINDOWS.
- **Format Length (without sentinel values)** -- The total number of bits on the Track you wish to use. **Format Length** = The number of bits in each Field + Parity Bits.
- **Card Number Offset** -- The character location within the card number, usually starting from 0. Given from the vendor if there is an offset to the card number.
- **Physical Track** -- One of three Tracks available on a **mag stripe** card.
- **Start Sentinel** -- The very first character on a given Track (the first character before any Fields). This character is a group of bits that is represented by its decimal and hex values.
- **End Sentinel** -- The very last character on a given Track. This end sentinel character is the last character after all the Field(s). This character is a group of bits that is represented by its decimal and hex values.
- **Card Code** -- The position of the card code is given by the position of its first bit, the position of its last bit, and the length of the card code in bits.
- **Facility Code** -- The position of the Facility Code is given by the position of its first bit, the position of its last bit, and the length of the Facility Code in bits.
- **Issue** - (Optional) The position of the issue is given by the position of its first bit, the position of its last bit, and the length of the Facility Code in bits.
- **1st Parity Bit** -- The position of the 1st Parity Bit in the bit string and if the parity is even or odd. The Parity Bit is an extra bit used to detect errors in the data.
- **2nd Parity Bit** -- The position of the 2nd Parity Bit in the bit string and if the parity is even or odd. The Parity Bit is an extra bit used to detect errors in the data.
- **Set Parity Mask 1** -- Selects the bits that the 1st Parity Bit checks for, even or odd.
- **Set Parity Mask 2** -- Selects the bits that the 2nd Parity Bit checks for, even or odd.
- **Match Boxes** -- Selects the Fields the lock will use to validate the credential.

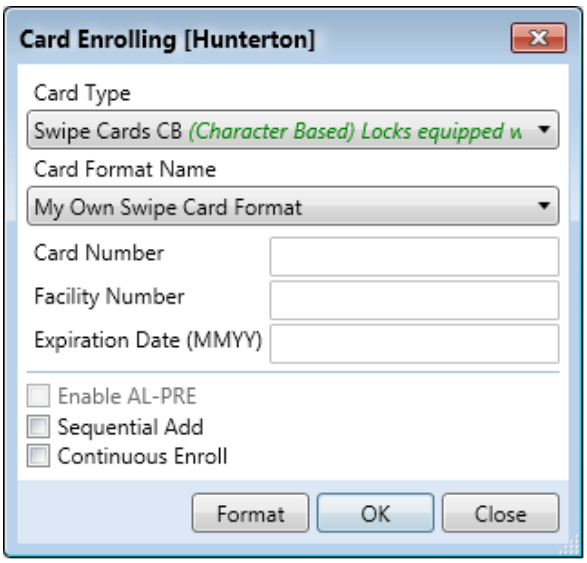

Fig. 6: (Custom) "My Own Swipe Card Format"

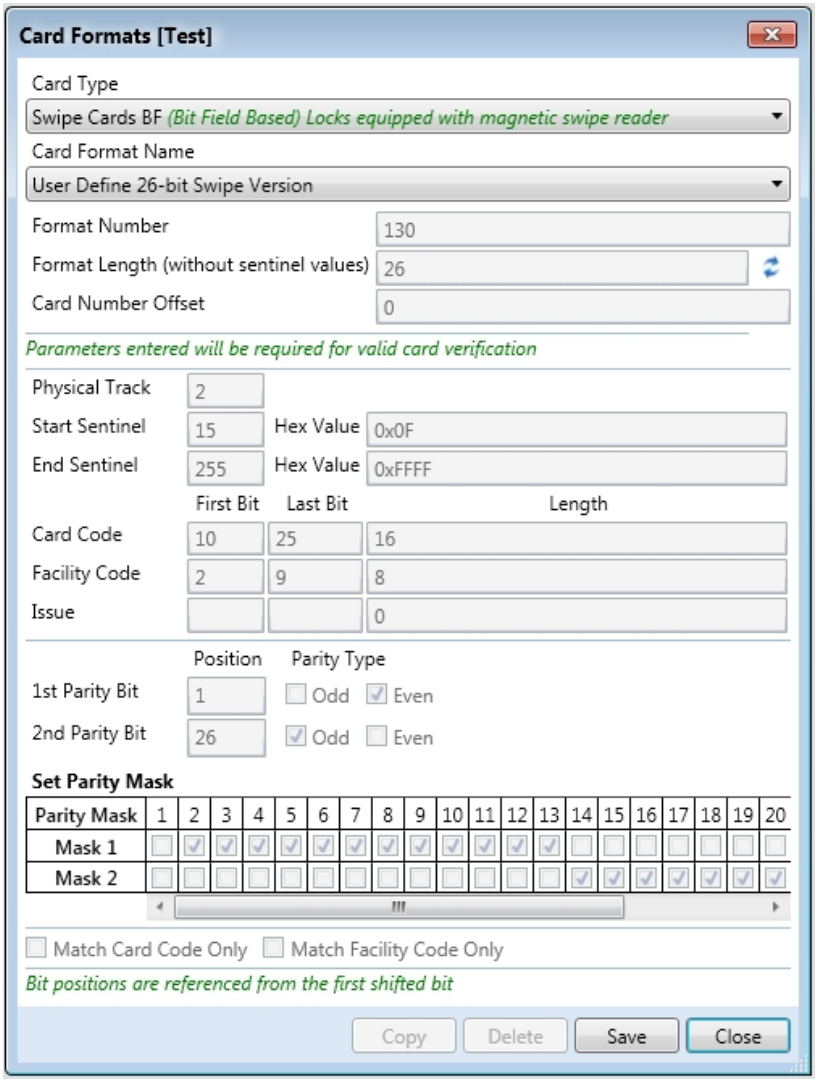

Fig. 7: User Define 26-bit Swipe Version Format