

# MagneFlex Browser

## Magensa Services Developer Tool Installation and Operation Manual

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# Magensa Services Developer Tool - MagneFlex Browser

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**Table 0.1 - Revisions**

| Rev Number | Date         | Notes  |
|------------|--------------|--|
| 10         | May 2, 2017  | Initial Release                                      |
| 20         | July 8, 2017 | Added screen showing favorites and pop-up management |
| 30         | Jan 22, 2018 | Added Android App                                    |
|            |              |  |

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### 1 Introduction

**MagneFlex Browser** is a full-function HTML browser application for Windows, iOS, and Android. It is integrated with driver applications that allow the control of a MagTek payment card reader from an HTML over HTTP(S) context. Integrators can build an HTML application, such as a web-based POS Application, that can interact with MagTek Readers through the MagneFlex Browser to collect data from magnetic stripe, contact chip, or contactless (NFC) cards for the purpose of processing a payment. MagneFlex Browser can be distributed by the integrator to its end users, along with MagTek Readers, to deploy a full-function POS system.

## 2 System Architecture

MagneFlex Browser employs an architecture that contemplates the following elements of a payment system:

- **Reader** – A supported MagTek payment card Reader. See Appendix A or a MagTek sales representative for the current list.
- **User Device** – The computer system that is connected to the Reader. The User Device is also where the MagneFlex Browser application is installed. Supported operating systems include Windows (version 7 or later), Apple iOS, and Android (not yet released). Not all Readers can be supported by all operating systems. Please see a MagTek sales representative for further details.
- **HTML Application** – The application, provided by the integrator of MagneFlex Browser that will communicate with the browser to control and obtain data from the MagTek Reader. This is often a POS Application for processing payment transactions, but is not limited to this use. MagTek Readers can be used for many other purposes, including multi-factor authentication, facilities access, closed-loop loyalty and payment applications, etc. Magensa, MagTek’s payment processing subsidiary, has a wide variety of services that can be used to process data from the Reader downstream to payment processors or other endpoints, while maintaining the point-to-point encryption (MagneSafe) provided by MagTek Readers. Please see a MagTek sales representative or [www.magensa.net](http://www.magensa.net) for more details.
- **MagneFlex Browser** – A full-function HTML browser application, for Windows, Apple iOS, and Android, that is integrated with driver applications that allow the control of a set of MagTek payment card Readers from an HTML over HTTP(S) context.

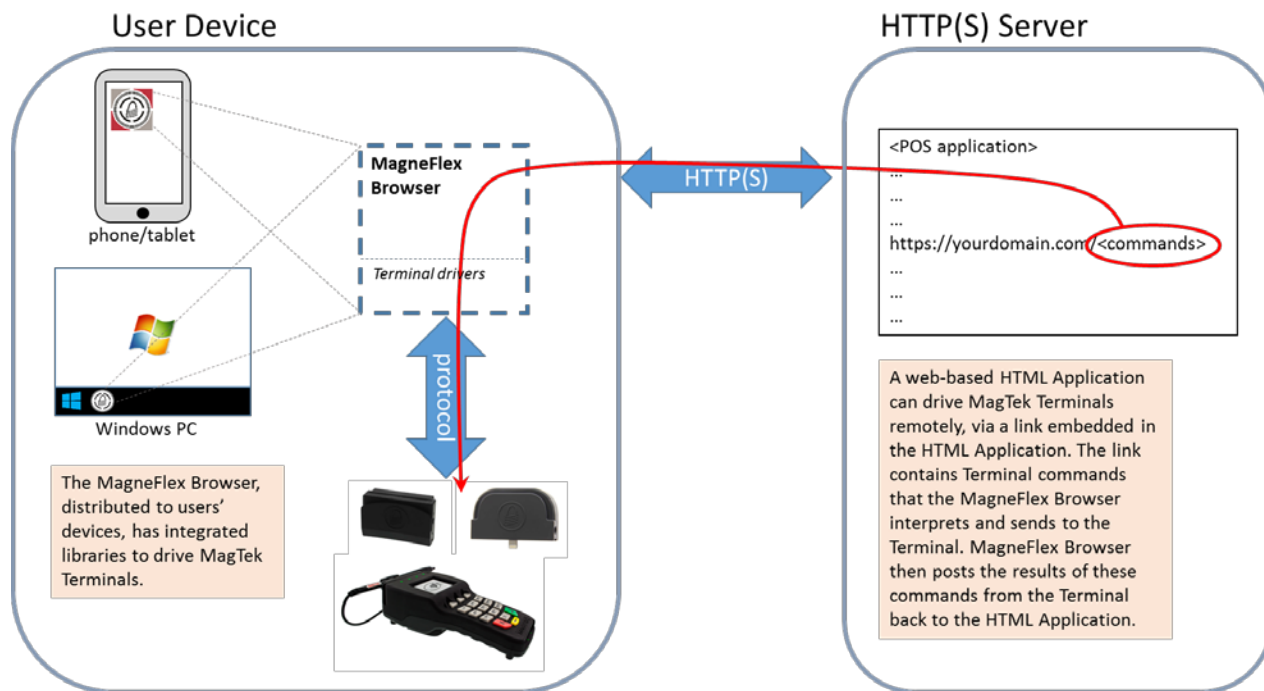


Figure 2.1 Diagram of MagneFlex Browser

## 3 Browser Functions

MagneFlex Browser includes all of the normal functions found in popular HTML browsers. Additional features have been added to assist in managing Readers connected to the User's Device. The following section outlines the major features of MagneFlex Browser by operating system.

### 3.1 Windows

Navigation controls are common with standard browsers. Settings are also common, with the exception of the type of Reader connected. If connecting a MagTek SCRA or eDynamo, choose MSR (USB). If a DynaPro family Reader, select PinPad (USB) or PinPad (Ethernet – an IP address will be required). MagneFlex Browser may be customized by the HTML Application developer, including buttons and trim colors. Please see a MagTek sales representative for further details.



Figure 3.1 Manage Pop-ups

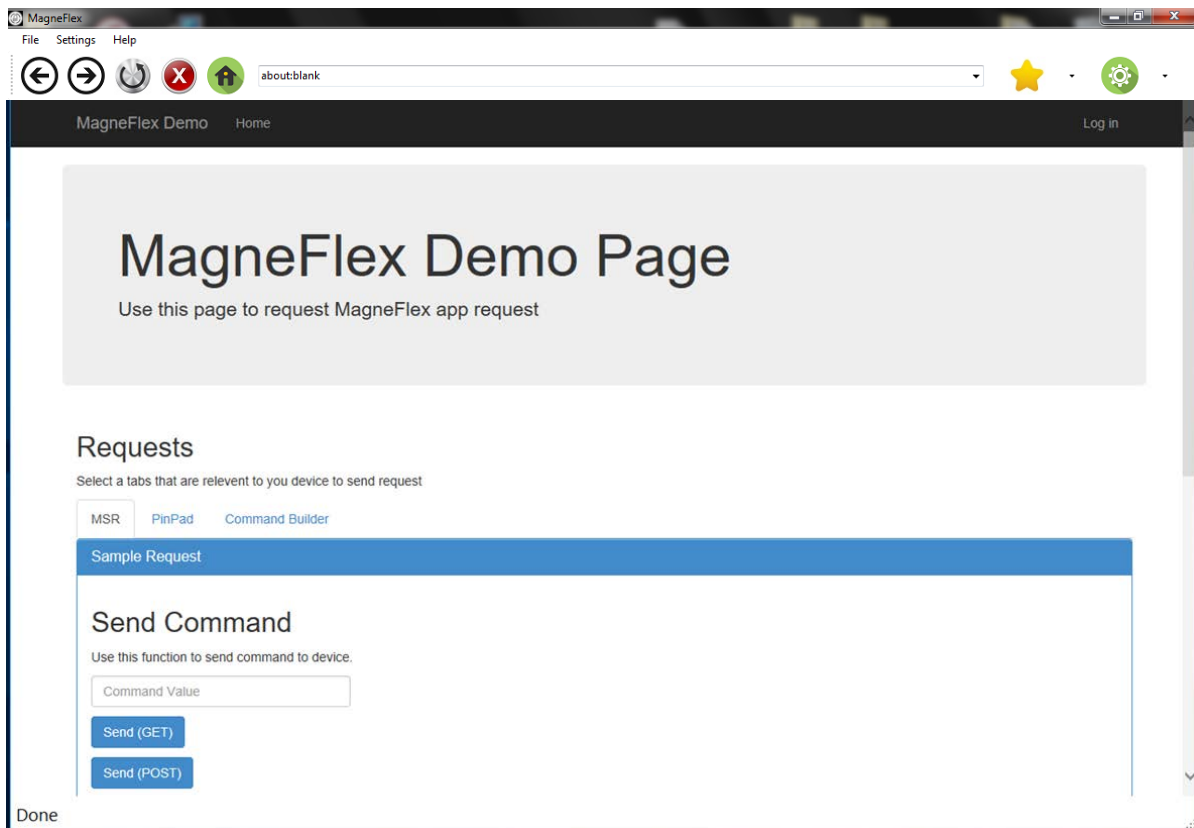


Figure 3.1 Screen shot showing MagneFlex Browser demo home page for Windows.

## 3.2 Apple iOS

MagneFlex Browser is available in the Apple App Store. Search “MagneFlex”. This application is also available for customization, and can be deployed to the Apple App Store under the HTML Application developer’s own Apple product plan. Please see a MagTek sales representative for further details.

### 3.2.1 Web Applications

- **Quick Launch:** Perform the action stored in **Launch Settings**.
- **Launch Settings:** Determines the behavior of the application upon launch:
- **Favorites:** A list of website URLs stored in in the application. Allows the user to enter and store multiple URLs, as well as select websites to open.

### 3.2.2 Admin

- **Set Readers(s):** Configure the application to communicate with various MagTek readers.
- **Passcode Admin:** Set a passcode lock for the application
- **Test Readers:** Test a configured reader for proper operation.

### 3.2.3 Help

- **FAQs:** Browse MagTek support website.

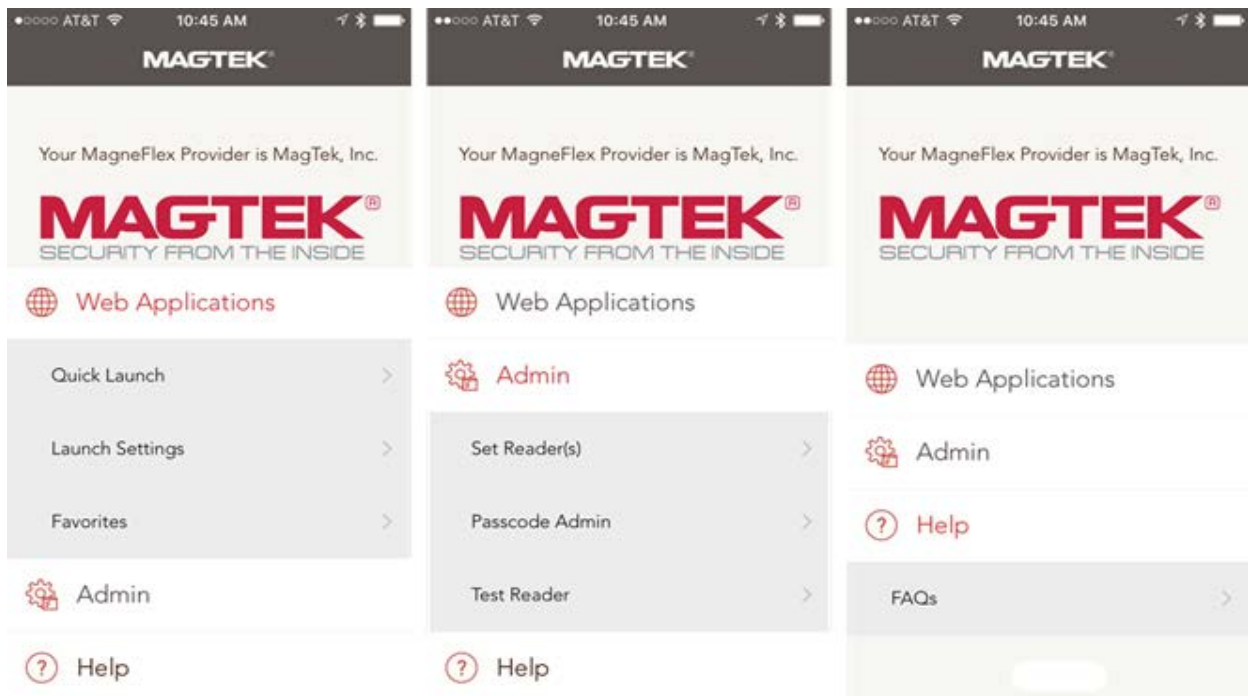


Figure 3.2 Screen shots showing menu options.

### 3.2.4 Launch Settings (figure 3.3)

- **Default Web App:** Immediately surf the website stored in **Favorites** that has been marked as “Default”
- **List of Web Apps:** Open the list of websites stored in **Favorites**.
- **Blank Page:** Opens a blank page.
- **None:** Begins at the top menu.

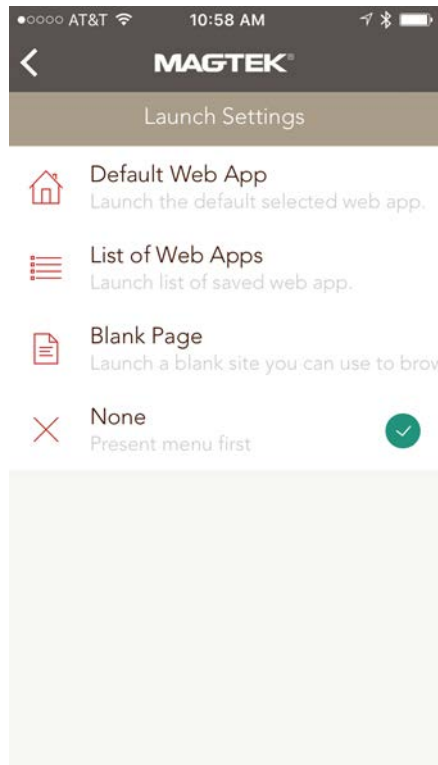



Figure 3.3 Screen shot showing launch settings.



### 3.2.5 Favorites

The **Favorites** screen lists all websites that have been setup in the application. The user may launch websites from this screen, or they may add new favorites by selecting  **Add New Site**.

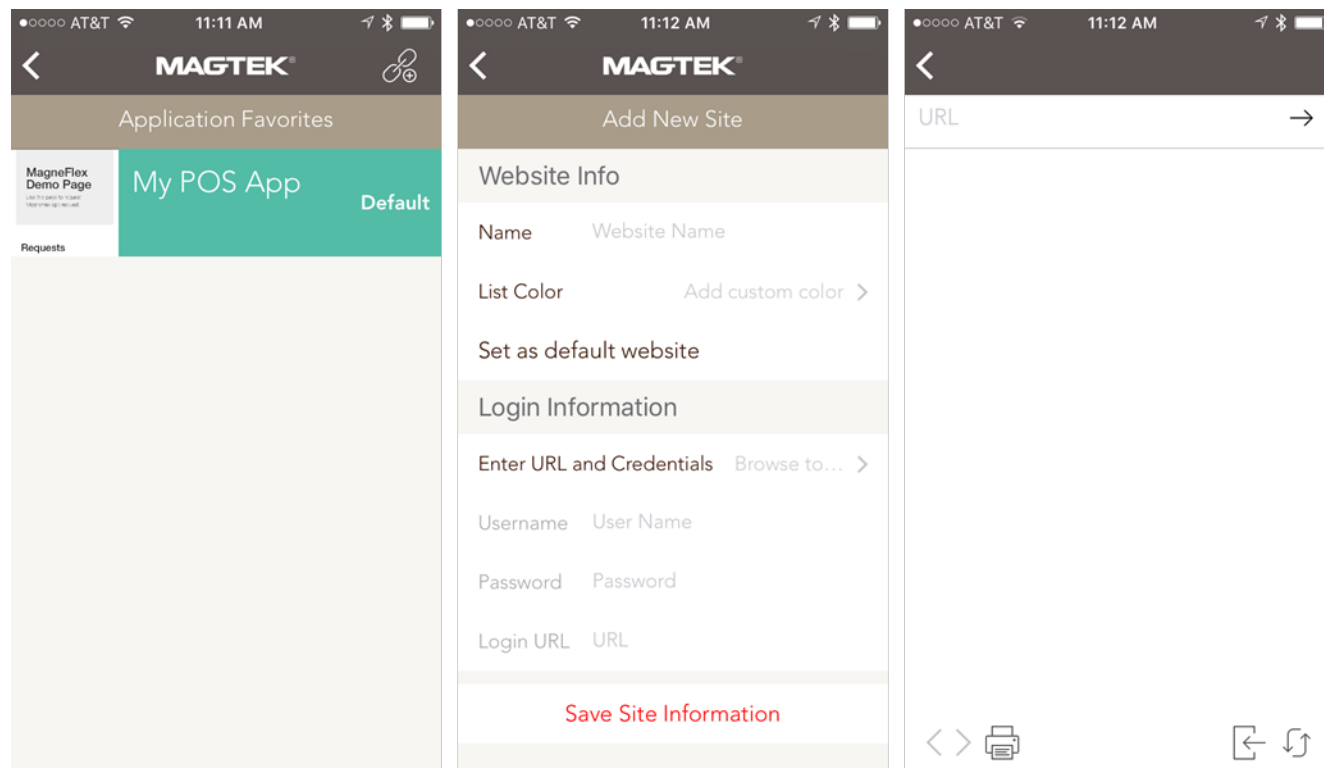



Figure 3.4 Screen shots to add new Web App.

**Add New Site:** Add a new website favorite. Select **Save Site Information** once complete.

- **Name:** A “friendly” name for the website. Will be displayed on the **Favorites** list (example: “My POS App”).
- **List Color:** The background color of the website listing in **Favorites**.
- **Set as default website:** A toggle that sets this website as the default for **Launch Settings**.
- **Enter URL and Credentials:** Selecting this item will cause the browser to launch and display a blank page. Enter a URL and surf to the desired start point for the favorite. After completion select , and you will return to **Add New Site**. The start URL will show in **Login URL**. If the start page of the desired favorite requires *username* and *password* entry, the application will automatically detect the entry of these credentials and ask if you wish to store them. Selecting “yes” will cause the application to automatically log in the user every time this favorite is launched.

### 3.2.6 Set Readers(s)

The **Device Configuration** screen allows the user to select and configure the MagTek Readers to be used with **MagneFlex Browser**.

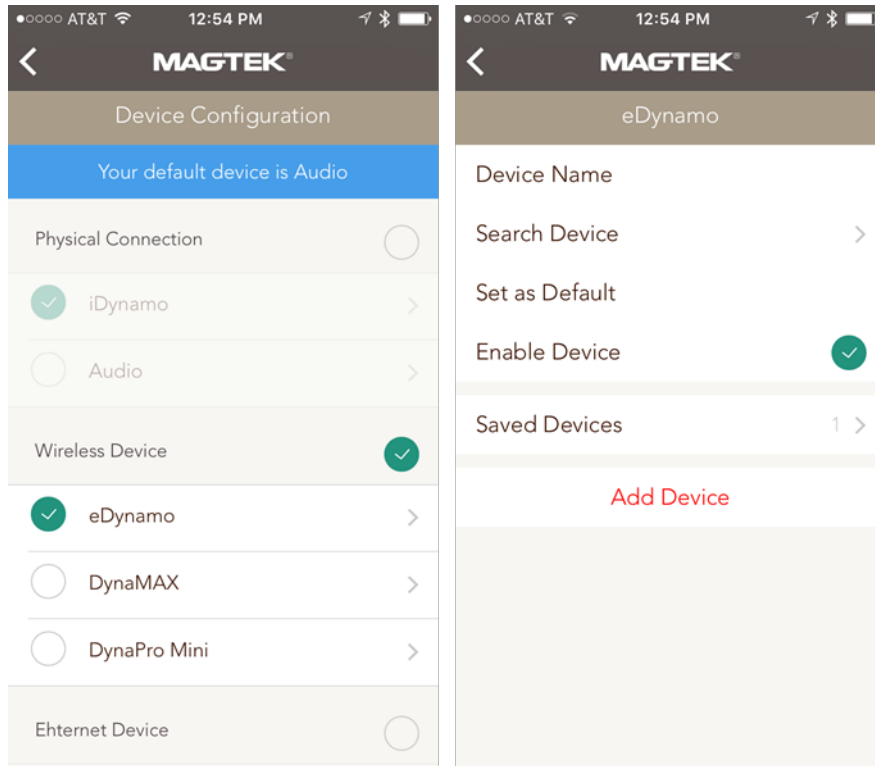


Figure 3.5 Screen shots showing device configuration.

First select an interface type, and then select the Reader model. On the following screen, attributes for the Reader may be selected and entered.

- **Device Name:** Enter a name for the Reader (DynaPro/Go Ethernet/Wi-Fi only).
- **Device Address:** Enter the IP address of the Reader. (DynaPro/Go Ethernet/Wi-Fi only).
- **Search Device:** If the Reader is discoverable over Bluetooth, this option will be available. Select it to find Bluetooth Readers in range.
- **Set as Default:** Select if you wish to make this Reader the default Reader for the application.
- **Enable Device:** This selection shows whether the Reader is enabled for use.
- **Saved Devices:** Readers that have already been configured will be displayed in this list.
- **Add Device:** This selection saves the Reader configuration and makes it available to the application for use.

### 3.2.7 Test Readers

The user may attach or associate any Reader type shown on this list to their mobile device and test its function by selecting the appropriate item.

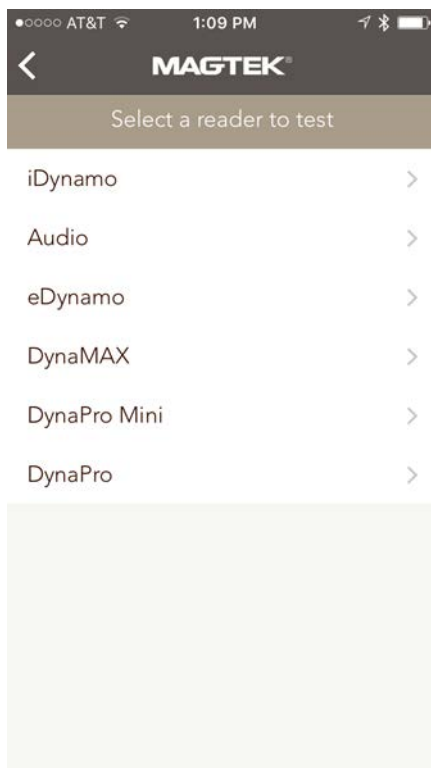


Figure 3.6 Screen shot showing set readers.

The application will attempt to communicate with the Reader, and if successful, ask the user to swipe a card. The raw data from the swipe will be displayed on the screen. The Reader DOES NOT need to be configured on the **Device Configuration** screen first.

### 3.3 Android

MagneFlex Browser is available in Google Play. Search “MagneFlex”. This application is also available for customization, and can be deployed to Google Play under the HTML Application developer’s own Google product plan. Please see a MagTek sales representative for further details.

#### 3.3.1 Web Applications

- **Quick Launch:** Perform the action stored in **Launch Settings**.
- **Launch Settings:** Determines the behavior of the application upon launch:
- **Favorites:** A list of website URLs stored in in the application. Allows the user to enter and store multiple URLs, as well as select websites to open.

#### 3.3.2 Admin

- **Set Readers(s):** Configure the application to communicate with various MagTek readers.
- **Passcode Admin:** Set a passcode lock for the application
- **Test Readers:** Test a configured reader for proper operation.

## 3.3.3 Help

- FAQs: Browse MagTek support website.

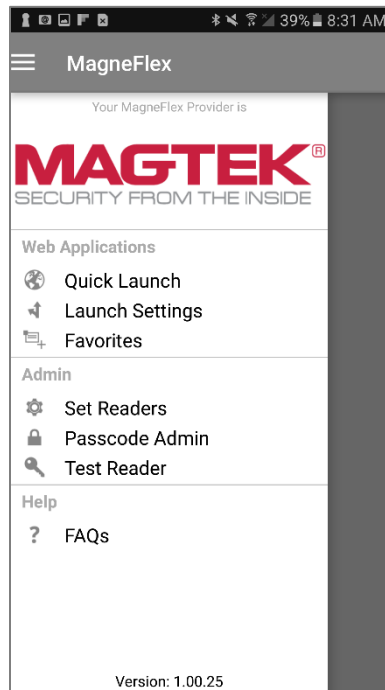


Figure 3.7 Screen shot showing main menu options.

### 3.3.4 Launch Settings (figure 3.3)

- **Default Web App:** Immediately surf the website stored in **Favorites** that has been marked as “Default”
- **List of Web Apps:** Open the list of websites stored in **Favorites**.
- **Blank Page:** Opens a blank page.
- **None:** Begins at the top menu.

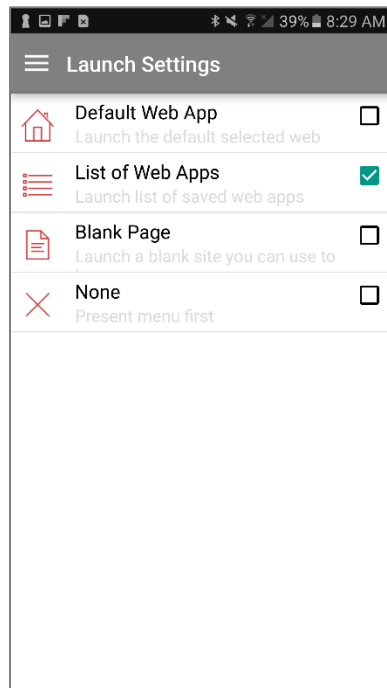



Figure 3.8 Screen shot showing launch settings.

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The **Favorites** screen lists all websites that have been setup in the application. The user may launch websites from this screen, or they may add new favorites by selecting  **Add New Site**.

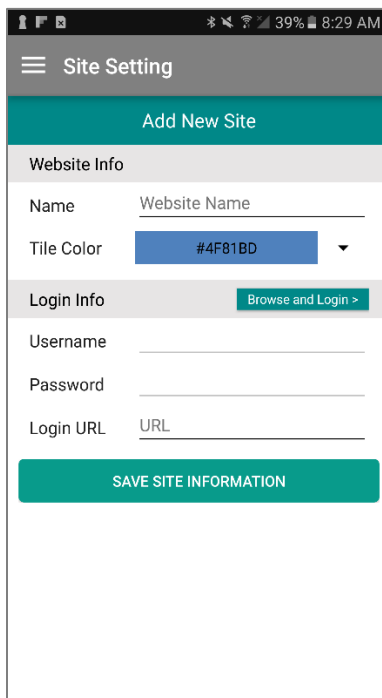



Figure 3.9 Screen shots to add new Web App.

**Add New Site:** Add a new website favorite. Select **Save Site Information** once complete.

- **Name:** A “friendly” name for the website. Will be displayed on the **Favorites** list (example: “My POS App”).
- **List Color:** The background color of the website listing in **Favorites**.
- **Set as default website:** A toggle that sets this website as the default for **Launch Settings**.
- **Enter URL and Credentials:** Selecting this item will cause the browser to launch and display a blank page. Enter a URL and surf to the desired start point for the favorite. After completion

select , and you will return to **Add New Site**. The start URL will show in **Login URL**. If the start page of the desired favorite requires *username* and *password* entry, the application will automatically detect the entry of these credentials and ask if you wish to store them. Selecting “yes” will cause the application to automatically log in the user every time this favorite is launched.

## 3.3.6 Set Readers(s)

The **Device Configuration** screen allows the user to select and configure the MagTek Readers to be used with **MagneFlex Browser**.

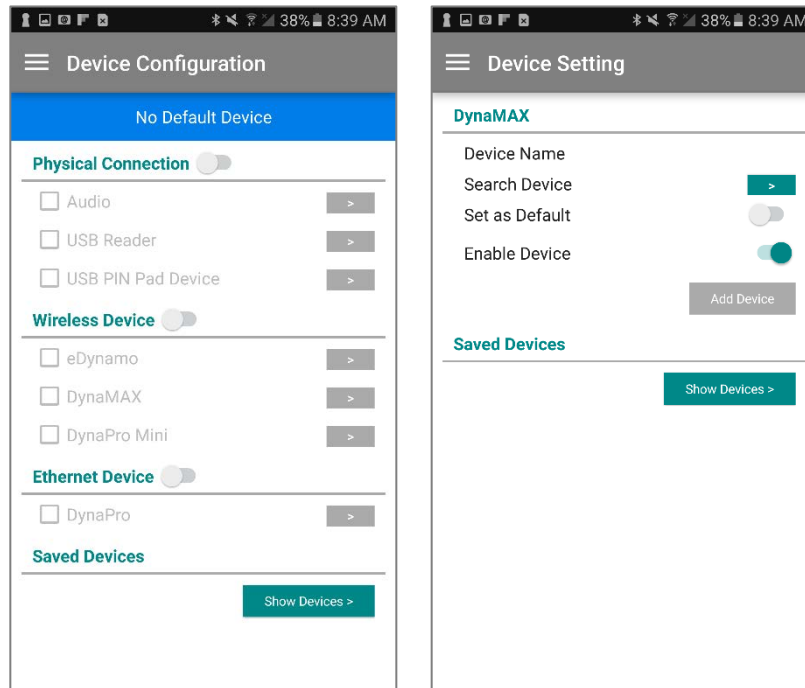


Figure 3.10 Screen shots showing device configuration.

First select an interface type, and then select the Reader model. On the following screen, attributes for the Reader may be selected and entered.

- **Device Name:** Enter a name for the Reader (DynaPro/Go Ethernet/Wi-Fi only).
- **Device Address:** Enter the IP address of the Reader. (DynaPro/Go Ethernet/Wi-Fi only).
- **Search Device:** If the Reader is discoverable over Bluetooth, this option will be available. Select it to find Bluetooth Readers in range.
- **Set as Default:** Select if you wish to make this Reader the default Reader for the application.
- **Enable Device:** This selection shows whether the Reader is enabled for use.
- **Saved Devices:** Readers that have already been configured will be displayed in this list.
- **Add Device:** This selection saves the Reader configuration and makes it available to the application for use.

### 3.3.7 Test Readers

The user may attach or associate any Reader type shown on this list to their mobile device and test its function by selecting the appropriate item.

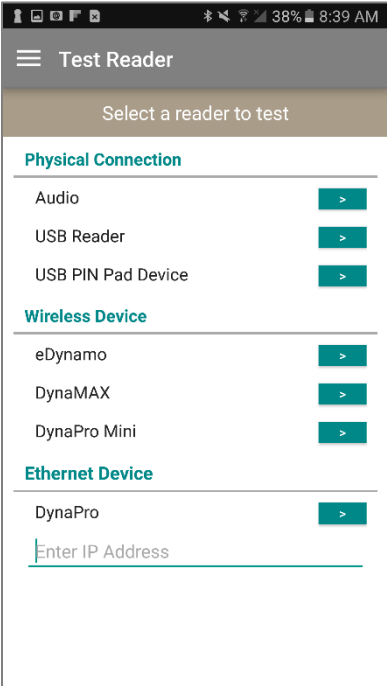


Figure 3.11 Screen shot showing set readers.

The application will attempt to communicate with the Reader, and if successful, ask the user to swipe a card. The raw data from the swipe will be displayed on the screen. The Reader DOES NOT need to be configured on the **Device Configuration** screen first.



### 4 HTML Application Integration

To control the Reader from an HTML Application, an HTML link (hyperlink) must be embedded into the HTML Application that contains commands destined for the Reader. The HTML link can be activated by a user or an event, depending on how it is expressed in the HTML Application. MagneFlex Browser will intercept the processing of the HTML link, performing operations embedded in the HTML link structure. These operations are different types of interactions MagneFlex Browser can have with the Reader. At the completion of the operation, MagneFlex Browser will return any data provided by the Reader back to the HTML Application using either an HTTP GET or POST action.

The structure of the HTML link is as follows:

```
http(s)://yourdomain.com/<additional path>/default.aspx?operation=<>&httpMethod=<>&readerArgument=<>&destinationURL=<>&passInData=<>
```

| Parameter      | Description   |
|----------------|---|
| operation      | Operation to be performed by MagneFlex Browser. See Operation Definitions.  |
| httpMethod     | The HTTP method MagneFlex Browser uses to send the Reader data back to the HTML Application.<br>Available methods: GET, POST<br>Note: When using MagneFlex Browser with EMV transactions, POST is recommended due to query string length limitations for GET. |
| readerArgument | Additional command arguments to be sent to the Reader. Comma delimited list.  |
| destinationURL | The URL of the destination resource MagneFlex Browser will send the Reader data, using httpMethod.  |
| passInData     | Optional data that will be sent by MagneFlex Browser, along with the Reader data, to the destination. Commonly used by the HTML Application to maintain context.  |

#### 4.1 Operation Definitions and Inputs

MagneFlex Browser recognizes and performs the following operations:

##### 4.1.1 requestCardSwipe

Commands the Reader to perform a magnetic stripe card swipe. There is no <readerArgument> with this operation. This operation is intended for our SCRA family of magnetic stripe reading Readers.

##### 4.1.2 requestSendCommand

Commands the Reader to perform the operations defined in <readerArgument>. See the Programmer's Reference Manual for the Reader for a list of available commands and the byte sequence required.

### 4.1.3 requestSendExtendedCommand

Commands the Reader to perform the operations defined in <readerArgument>. See the Programmer's Reference Manual for the Reader for a list of extended commands and the byte sequence required.

### 4.1.4 requestStartEMVTransaction

Commands the Reader to perform an EMV transaction (if capable). This operation must be accompanied by <readerArgument>. See the Reader's Programmer's Reference Manual, "Start EMV Transaction".

### 4.1.5 sendARPC

Commands the Reader to accept an ARPC returned by the card issuer at the completion of an EMV transaction (if required). This operation must be accompanied by <readerArgument> containing the ARPC data. See the Reader's Programmer's Reference Manual, "Acquirer Response ARPC".

### 4.1.6 requestPIN

Commands the Reader, if it has a PIN PAD, to prompt the user for the entry of a PIN. This operation must be accompanied by <readerArgument>. See the Reader's Programmer's Reference Manual, "Request PIN Entry".

### 4.1.7 requestManualCard

Commands the Reader, if it has a PIN PAD, to prompt the user for the entry of a card number. This operation must be accompanied by <readerArgument>. See the Reader's Programmer's Reference Manual, "Request Manual Card Entry".

### 4.1.8 requestSignature

Commands the Reader, if it has a signature capture screen, to prompt the user to sign the screen. This operation must be accompanied by <readerArgument>. See the Reader's Programmer's Reference Manual, "Request Cardholder Signature".

## 4.2 Operation Outputs

MagneFlex Browser will return to the HTML Application data returned by the Reader using either GET or POST as indicated in the original HTML link. For POST, the variables are POSTed to destinationURL.

For GET, the data is sent to the operation indicated:

[http\(s\)://<destinationURL>?<variable>=<value>...](http(s)://<destinationURL>?<variable>=<value>...)

| Variable | Description   |
|----------|---|
| opType   | Indicates the operation performed:<br>requestCardSwipe: CARD_SWIPE_RESULT<br>requestSendCommand: SEND_COMMAND_RESULT<br>requestSendExtendedCommand: SEND_EXTENDED_COMMAND_RESULT<br>requestStartEMVTransaction: EMV_ARQC_RESULT<br>sendARPC: EMV_TRANS_RESULT<br>requestPIN: PIN_RESULT<br>requestManualCard: CARD_MANUAL_SWIPE<br>requestSignature: SIGNATURE_RESULT |

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| <b>Variable</b> | <b>Description</b>  |
|-----------------|---|
| cardDataIn      | requestCardSwipe and requestManualCard only. The result of these operations in TLV format. See appendix B for common TLV tag definitions. |
| commandID       | requestSendCommand and requestSendExtendedCommand only. An echo of the command that was sent in the operation.                            |
| commandResult   | requestSendCommand and requestSendExtendedCommand only. Data returned from the Reader as a result of the command.                         |
| arqcData        | requestStartEMVTransaction only. The ARQC data from an EMV transaction.   |
| batchData       | sendARPC only. The batch data from an EMV transaction.  |
| operationStatus | requestPIN only. The status of the PIN operation from the Reader.   |
| pinEPB          | requestPIN only. The encrypted PIN block from the PIN operation.  |
| pinKSN          | requestPIN only. The KSN of the encrypted PIN block from the PIN operation.   |
| signatureDataIn | requestSignature only. Signature data from the Reader.  |
| signatureResult | requestSignature only. Result of the signature operation.   |
| passInData      | Echo of the passInData variable in the HTML link.   |

## 5 Test page

As part of our developer tools we also include a test demo page that developers can access:

<https://nrf.magensa.net/MagneFlexSampleCode/>

It includes MSR, Pinpad, and command builder:

The screenshot shows the 'MagneFlex Demo Page' with a navigation bar containing 'MagneFlex Demo', 'Home', and 'Log In'. The main heading is 'MagneFlex Demo Page' with the subtext 'Use this page to request MagneFlex app request'. Below this is a 'Requests' section with tabs for 'MSR', 'PinPad', and 'Command Builder'. The 'Command Builder' tab is active, showing a form with the following fields:

| Field             | Value                         |
|-------------------|-------------------------------|
| PostBackType      | GET                           |
| Type              | MSR Card Swipe                |
| Amount            | 1.99                          |
| Cash Back         | 0.00                          |
| Timeout           | 30                            |
| Card Type         | Magnetic Stripe - 01          |
| Transaction Type  | Purchase - 00                 |
| Options           | Normal - 00                   |
| Currency Code     | Use Value From Contactless Da |
| Tone              | No Sound - 00                 |
| Pass Through Data | Test Pass Through             |

A 'Send Request' button is located at the bottom of the form. The footer of the page reads '© 2017 - MagneFlex Demo'.

Figure 5.1 Screen shot showing demo page Command Builder

## 6 Examples

### 6.1.1 requestCardSwipe

HTML link:

[http\(s\)://yourdomain.com/myapplication/default.aspx?operation=requestCardSwipe&httpMethod=GET&readerArgument=&destinationURL=http\(s\)://yourdomain.com/yourpath/yourresource?passInData=mycontextinformation](http(s)://yourdomain.com/myapplication/default.aspx?operation=requestCardSwipe&httpMethod=GET&readerArgument=&destinationURL=http(s)://yourdomain.com/yourpath/yourresource?passInData=mycontextinformation)

Data returned using GET:

[http\(s\)://yourdomain.com/yourpath/yourresource?opType=CARD\\_SWIPE\\_RESULT&cardDataIn=<reader data in TLV format, see appendix B>&passInData=mycontextinformation](http(s)://yourdomain.com/yourpath/yourresource?opType=CARD_SWIPE_RESULT&cardDataIn=<reader data in TLV format, see appendix B>&passInData=mycontextinformation)

### 6.1.2 requestStartEMVTransaction

HTML link:

[http\(s\)://yourdomain.com/myapplication/default.aspx?operation=requestStartEMVTransaction&httpMethod=GET&readerArgument=timeLimit:3c,cardType:02,option:00,amount:9.99,transactionType:00,cashBack:0.0,currencyCode:0840&destinationURL=http\(s\)://yourdomain.com/yourpath/yourresource?passInData=mycontextinformation](http(s)://yourdomain.com/myapplication/default.aspx?operation=requestStartEMVTransaction&httpMethod=GET&readerArgument=timeLimit:3c,cardType:02,option:00,amount:9.99,transactionType:00,cashBack:0.0,currencyCode:0840&destinationURL=http(s)://yourdomain.com/yourpath/yourresource?passInData=mycontextinformation)

Data returned using GET:

[http\(s\)://yourdomain.com/yourpath/yourresource?opType=EMV\\_ARQC\\_RESULT&arqcData=<ARQC data to send to processor>&passInData=mycontextinformation](http(s)://yourdomain.com/yourpath/yourresource?opType=EMV_ARQC_RESULT&arqcData=<ARQC data to send to processor>&passInData=mycontextinformation)

### 6.1.3 requestSendCommand

(Example: DynaPro command: 0x07, “Display Message”, displays a pre-programmed message on the DynaPro screen)

HTML link:

[http\(s\)://yourdomain.com/myapplication/default.aspx?operation=requestSendCommand&httpMethod=GET&readerArgument=071E04&destinationURL=http\(s\)://yourdomain.com/yourpath/yourresource?passInData=mycontextinformation](http(s)://yourdomain.com/myapplication/default.aspx?operation=requestSendCommand&httpMethod=GET&readerArgument=071E04&destinationURL=http(s)://yourdomain.com/yourpath/yourresource?passInData=mycontextinformation)

Data returned using GET:

[http\(s\)://yourdomain.com/yourpath/yourresource?opType=SEND\\_COMMAND\\_RESULT&commandID=07&commandResult=00&passInData=mycontextinformation](http(s)://yourdomain.com/yourpath/yourresource?opType=SEND_COMMAND_RESULT&commandID=07&commandResult=00&passInData=mycontextinformation)

## 7 Appendix A – Supported Readers

Windows: MagTek SCRA readers (USB), DynaPro (USB, Ethernet), DynaPro Mini (USB), DynaPro Go (USB, Wi-Fi), eDynamo (USB)

Apple iOS: iDynamo, uDynamo (audio jack), eDynamo (Bluetooth), DynaMAX (Bluetooth), DynaPro (Ethernet), DynaPro Go (Wi-Fi), DynaPro Mini (Bluetooth)

Android: (not yet released)

## 8 Appendix B – Common MagTek Magnetic Stripe Reader TLV Tags

|        |                      |
|--------|----------------------|
| DFDF25 | Device Serial Number |
| DFDF30 | Masked T1 Status     |
| DFDF31 | Masked T1            |
| DFDF32 | Masked T2 Status     |
| DFDF33 | Masked T2            |
| DFDF34 | Masked T3 Status     |
| DFDF35 | Masked T3            |
| DFDF36 | Encrypted T1 Status  |

## Magensa Services Developer Tool - MagneFlex Browser

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|        |                        |
|--------|------------------------|
| DFDF25 | Device Serial Number   |
| DFDF37 | Encrypted T1           |
| DFDF38 | Encrypted T2 Status    |
| DFDF39 | Encrypted T2           |
| DFDF3A | Encrypted T3 Status    |
| DFDF3B | Encrypted T3           |
| DFDF3C | Encrypted MagnePrint   |
| DFDF3D | MS2.0 Status           |
| DFDF43 | MagnePrint Status Data |
| DFDF50 | Key Serial Number      |