M600 User Manual and Programmer SDK

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Note that at this time the PDF417, MRZ, and QR code decoders are documented but not yet functional.

Note that the M600 RFID interfaces to the PC using a standard CCID USB class and in not covered by this document.

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Patented Product

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection
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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

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This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
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2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

TABLE OF CONTENTS

1. INTRODUCTION

Thank you for choosing this device.

This User's Guide provides descriptions of the operating procedures and programming APIs for E-seek Model M600. Carefully read this User's Guide before using this device.

The actual screens that appear may be slightly different from the screen images used in this User's Guide. The Model M600 scanner Unit is hereafter referred to as "this device"

Manual Convention

- Caution: This warns of a possibility of damage to this device.
- Important: This indicates instructions that should be followed to ensure correct functionality and efficiency of this device.
- Note: This indicates an item of general importance.
- Reminder: This indicates an item of relative importance.
- Detail: This indicates an item of specific importance.

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- The information contained in this User's Guide is subject to change without notice.

1.1 PRODUCT FEATURE

This device is a ID3, ID1, and boarding pass reader.

2. Device Description

The E-Seek Model M600 ID Reader introduces a new performance standard for ID card reading. It can read ID3 and ID1 cards without a hood to streamline document reading. Boarding pass barcodes can also be read. Advanced image processing is performed to provide a high quality ID1 images without a hood.

The Model M600 SDK also includes MRZ, QR, and PDF417 decoders. It connects to a PC using a high-speed USB 2.0 connection.

2.1 Overview of Model M600

Figures, 1 and 2 illustrate the major modules and components of the M600.

Figure 1

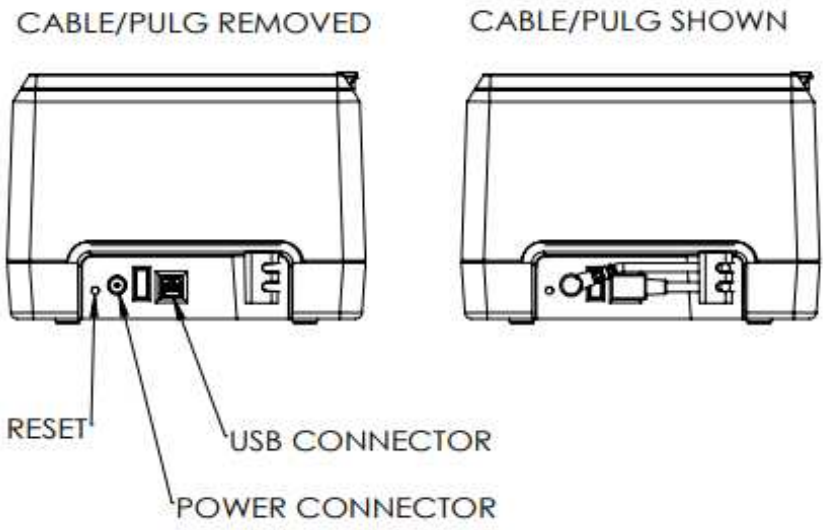


Figure 2

3. PRODUCT SPECIFICATION

Items	Description
Imaging	Sensor: 2D CMOS Resolution: RGB/IR 600dpi, UV 300dpi Color depth: RGB/UV: 24 bits / pixel, IR: 8 bits / pixel Light Sources: Visible (White), IR (870 nm), UV (365 nm) Image output format: BMP
Smart Card	Contactless: ISO 14443 A/B, NFC,
Alert	Audible: Beep Visual indicator: 2 RGB status LEDs
Connectivity	USB 2.0 High Speed.
Electrical	Input power: 5V input voltage. Power Consumption: TBD Power adaptor: AC110-240V, 50/60Hz 0.35A Max Output: 5V 2Amps
Physical	Dimensions: Length: 195mm Width: 160mm Height: 109mm/ 102mm (to glass) Weight: 900grams (2lbs) Image capture window: 130 x 95 mm (5.12 x 3.74”) Anti-reflective and scratch resistant Glass
Environmental	Temperature: Operating: –10°C to 50°C (14°F to 122°F) Storage: –20°C to 70°C (–4°F to 158°F) Humidity: Operating: 5-95 % (non-condensing) Dust: IP5x

3.1 TECHNICAL DETAILS

- RGB 24 bit @ 600 dpi
- IR 8 bit @ 600 dpi
- UV 24 bit @ 300 dpi
- ID3, ID1, and boarding pass
- Decodes MRZ
- Decodes QR
- Decodes 2D (PDF417) & 1D
- USB 2.0 High speed
- Hoodless operation
- RFID
- Patented

3.2 Unpacking Device

The M600 package includes:

- M600 Device
- USB Cable
- Calibration Card (???)

3.2.1 USB Cable

The M600 is provided with a USB interface cable. This cable allows the M600 to interface with standard USB 2.0 high speed port on your computer.

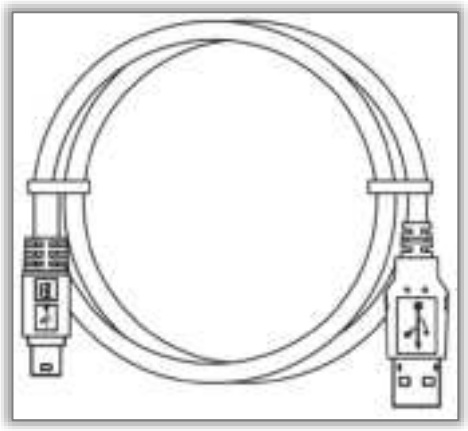


Figure 3

3.2.2 WHITE BALANCE CALIBRATION CARD

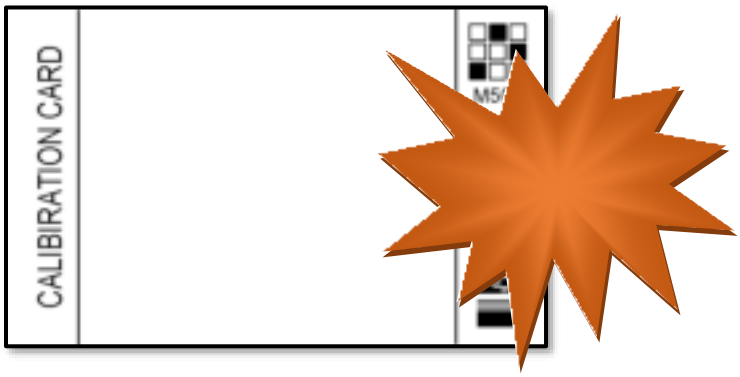


Figure 4

The calibration card is used to calibrate the white balance. Calibration could be required after shipping or prolonged use. To perform the white balance calibration simply insert the card with the arrow side first.

After prolonged use or if the card becomes scratched it should be discarded.

4. GETTING STARTED

1. The M600 scanner uses WinUSB drivers and no installation is required for Windows8, Windows10, or Windows11.

Connect the M600 Power cable and power up the scanner.
The M600 should appears under Universal Serial Bus devices in Device Manager.

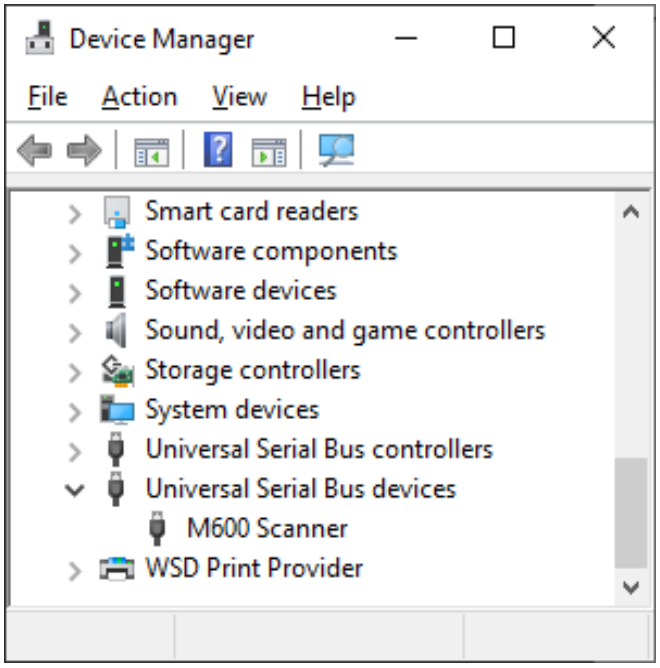


Figure 5

At this point check the M600 top LED status, and make sure the Green light is solid ON.

If the RED light blinks it indicates that the scanner encountered a fatal error. Check the error type by opening the "M600dll.log" file.

5. Running Demo Application

Download The M600 Demo Application from http://e-seek.com/products/m-600/

6. Scope

The PC software consists of an application exe, a C# API assembly, and a C/C++ DLL that communicates with the M600 over USB. This document covers the M600 C# sample application and the C# API that gives a C# developer a simple interface to the M600 DLL. The M600 contains an RFID module that uses a standard Microsoft CCID interface which is not covered by this document. Operation

When a card is inserted the M600 firmware will:

- Automatically scan a document if enabled
- Decode the MRZ if present
- Decode the PDF417 if present
- Scan using the White LEDs
- Scan using the IR LEDs
- Scan using the UV LEDs

6.1 Indicator LEDs

M600 LED status table is as follow:

	Solid	Scanner Ready
	Blink	Scanning
	Solid	Door Open
	Blink	Fatal Error

6.2

6.3 GUI

Figure 6 (ID3)

Figure 10 (ID1)

Figure 9 shows and ID3 document and Figure 10 shows and ID1 document. The ID1 images were cropped.

The GUI has three small preview images on the left and a large main image.

6.3.1 SMALL IMAGES PREVIEW PANE

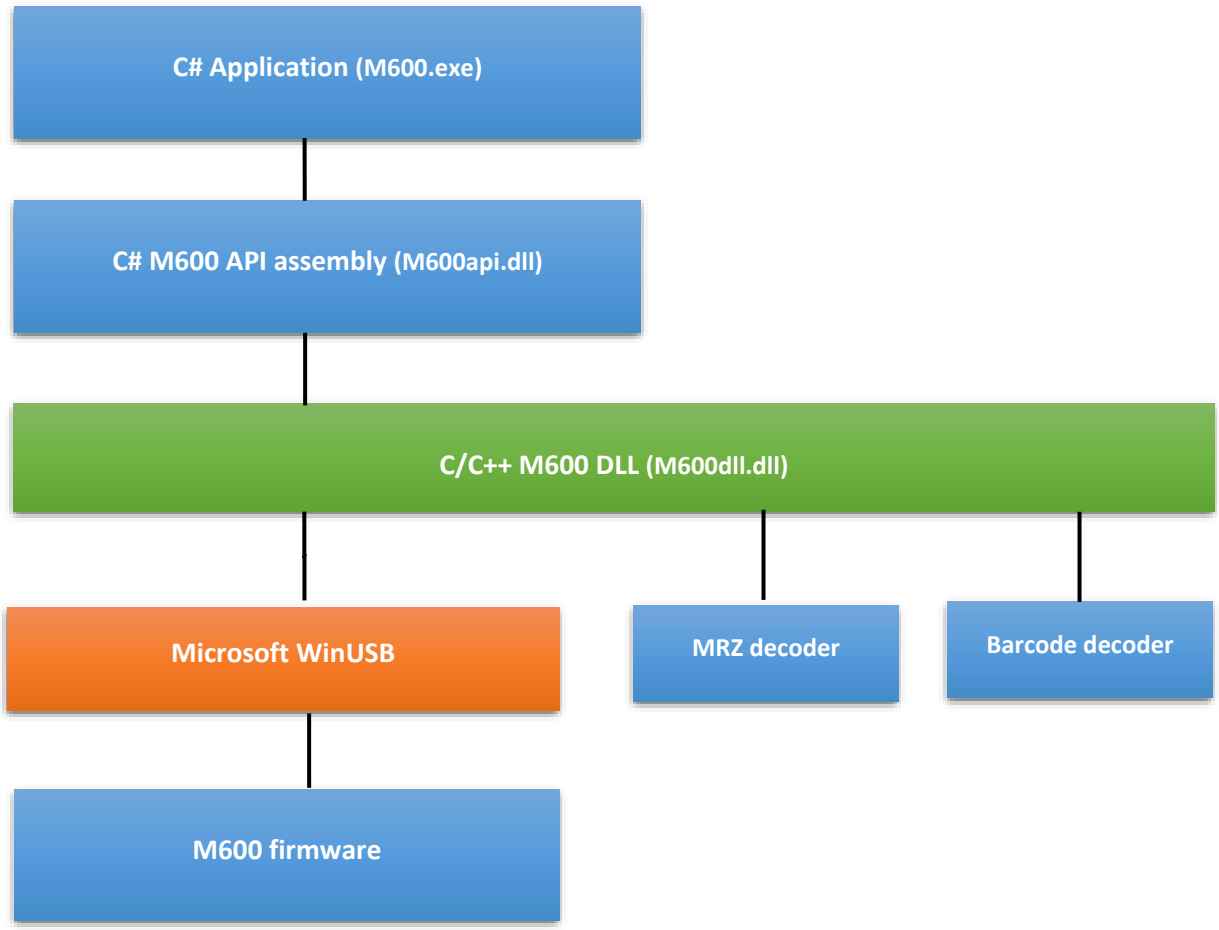
Figure 11

There are three small panes which display the scanned card using different lighting.

- The first image was captured using white light.
- The second image was captured using IR light.
- The last image was captured using UV light.

7. ARCHITECTURE

The main purpose of the C# demo application is to provide an example of how to write an application that interfaces with the M600 using a C# API.



The application (M600.exe or user application), M600api.dll and M600dll.dllnd must be in the same directory. The DLL will create a log file (M600dll.log) in the directory in which it is running by default but it can be disabled if desired.

As mentioned in scope the M600 has an RFID module that interfaces to a pc as a CCID USB class and is not covered by this document.

8. M600 DEMO APP

The C# M600APP project contains the Main app and GUI. It creates the "M600.exe" executable.
The modules in this project are:

- FormM600demo.cs
- FormUpdate.cs

8.1 FORMM600DEMO.CS

This is the main form and contains the code that interfaces with the M600 C# API. It calls the Init() function which initializes the M600DLL to communicate with the M600 and automatically transfer images. The user application should override WndProc() and call the M600's WndProcMessage() function if it wants to receive USB connect and disconnect events.

8.2 FORMUPDATE.CS

This module contains subroutines that update the GUI.

9. C# API

The C# API provides a simple interface to the M600. The C# developer should be able to use this interface to quickly interface with the M600 without needing to interface with the M600 DLL unmanaged code directly.

The application should register for call back events at initialization. The DLL will then call back the application when an event occurs. The application should then synchronize the call back to its thread using the Invoke method in FormM600demo.cs.

The API assembly is instantiated in the application as:

```
public static CM600api m_M600 = new CM600api();
```

9.1 API FUNCTIONS

`void` **`SetLogDir`**`(LOG_DIR)  [Optional]`
Call this function before Init() to override the default log directory. By default if this function is not called the M600DLL will create the M600DLL.LOG file in the same directory it is running in. Pass this function the string of the desired log directory. To disable logging pass the string “null”.

`void` **`Init`**`()`
Call this function at initialization such as during form load.

`void` **`RegCB`**`(OnNewEvent)`
Register event call back.

`void` **`Close`**`()`
Call this function before closing the application such as during form closed.

`bool` **`LogIn`**`(bool bLogin)`
When true the unit will scan when a card is inserted (normal operation).
When false the unit will not scan when a card is inserted.

`void` **`UserBeep`**`(E_BEEP eBeep)`
Creates a beep sound. The E_BEEP enumeration has three values:

```
BEEP_1,
```

`void GetVer(out M600_VER ver)`

Gets the E-Seek serial number (`EsSerNum`), Silicon serial number (`DsSerNum`), DLL version, Barcode decoder version, firmware version, and hardware version as defined by the `M600_VER` structure.

The members of the M600_VER structure that may be of intrest to the deverloper are:

```
ulong  EsSerNum;        // E-Seek serial number
//
byte   DllMajor;        // DLL version number
byte   DllMinor;
byte   DllBuild;
byte   FwMajor;         // Firmware version number
byte   FwMinor;
byte   FwBuild;         // Always zero
```

`bool WrUserData (byte[] aryData)`

Writes a user data byte array to flash (128 byte limit).
Flash should not be used store frequetly changing data as it is limited to 10,000 reliable writes.

`bool RdUserData(byte[] aryData)`

Reads a user data byte array from flash (128 byte limit).

Note that in order to recive USB connect and disconnect the user application has to override WndProc() and call the M600 api''s WndProcMessage.

```
protected override void WndProc(ref Message m)
{
    m_M600.WndProcMessage(ref m); // checks for usb connect and disconnect

    base.WndProc(ref m);
}
```

9.2 API OBJECTS

The C# API `M600_IMG` class has a bitmap for each of the three light sources:

```
Bitmap bmBmRgb;
Bitmap bmBmIr;
Bitmap bmBmUv;
```

The first image is RGB.
The second image is IR.
The third image is UV.

The bitmaps will be cropped if an ID1 document is detected.

The C# API `M600_BC` structure contains a 2D data structure.

```
byte[] aryMRZ;       // Byte array for MRZ*
byte[] aryQR;        // Byte array for QR*
byte[] aryP417;      // Byte array for PDF417*
int     iBcOrient;
```

If the PDF417 barcode is found the `iBcOrient` element has four enumerated values of the card orinetation and zero for unknown.

0 = Unknown orientation
1 = Normal orientation (Front of card is on the right).
2 = Front on the right but upside down.
3 = Front is on the left.
4 = Front is on the left and upside down.

Note that for this release the MRZ, QR, and PDF417 decoding is not yet implamented.

9.3 EVENTS:

The user application should pass a delegate on initialization to the M600dll so that the DLL can call the delegate with the integer value of the event.

The M600 DLL sends event call backs to the application on a thread the M600 DLL creates.

EVENT_DISCOVERY	
EVENT_SCANING	Firmware is scanning a document
EVENT_IR	IR image ready
EVENT_RGB	RGB image ready
EVENT_UV	UV image ready
EVENT_REMOVE	Document can be removed
*EVENT_BARCODE**	
*EVENT_MRZ**	
EVENT_DONE	Scan complete
EVENT_USB_CON	USB connected
EVENT_USB_DIS	USB disconnected

Not: MRZ and bardode functions are not currently implamented

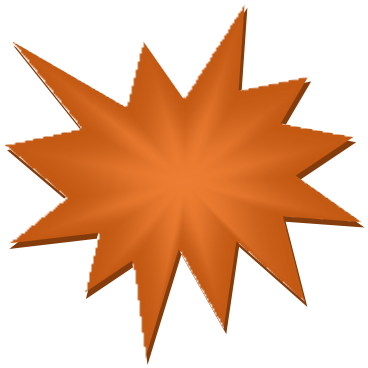
9.4 PSEUDO CODE EXAMPLE

```
CM600api m_M600 = new CM600api(); // C# API object

m_M600.Init(M600_Callback); // callback for events

// Event callback
//
public void M600_Callback(int iEvent)
{
   switch (iEvent)
      {
      case EVENT_IR:       // IR image ready
           break;
      case EVENT_RGB:      // RGB image ready
           break;
      case EVENT_UV:       // UV image ready
           break;
      case EVENT_DONE:     // Scan complete
           break;
       …
      }
}


…

m_M600.Close()
```

9.5 MAINTENANCE

There are three parts to maintain the M600:
Cleaning (Step 3-5)
Calibration (Step 6-7)

Step 1: Insert the Calibration Card.



9.6 Mechanical Drawings