Dobot Magician Demo Description (MATLAB)

Issue: V1.0

Date: 2018-06-30

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Preface

Change History

Date	Change Description
2018/06/30	The first release.

Symbol Conventions

The symbols that may be founded in this document are defined as follows.

Symbol	Description
⚠DANGER	Indicates a hazard with a high level of risk which, if not avoided, could result in death or serious injury
⚠WARNING	Indicates a hazard with a medium level or low level of risk which, if not avoided, could result in minor or moderate injury, robotic arm damage
⚠NOTICE	Indicates a potentially hazardous situation which, if not avoided, can result in robotic arm damage, data loss, or unanticipated result
🕮NOTE	Provides additional information to emphasize or supplement important points in the main text

Contents

1. MATLAB Demo

This topic is aimed at helping user to understand common API of Dobot Magician and build development environment quickly.

1.1 Environment Building

This demo is developed with **MATLAB** and compiled with **TDM- GCC**. You need to install MATLAB and TDM-GCC with 64-bits. The download path of TDM-GCC is http://tdm-gcc.tdragon.net/download.

This topic takes **Windows 10** OS as an example to describe how to install and configure MATALB. Please replace it based on site requirements.

Procedure

Step 1 Take **MATLAB 2016Ra** as an example, install **MATLAB**. The details how to install is no descripted in this topic.

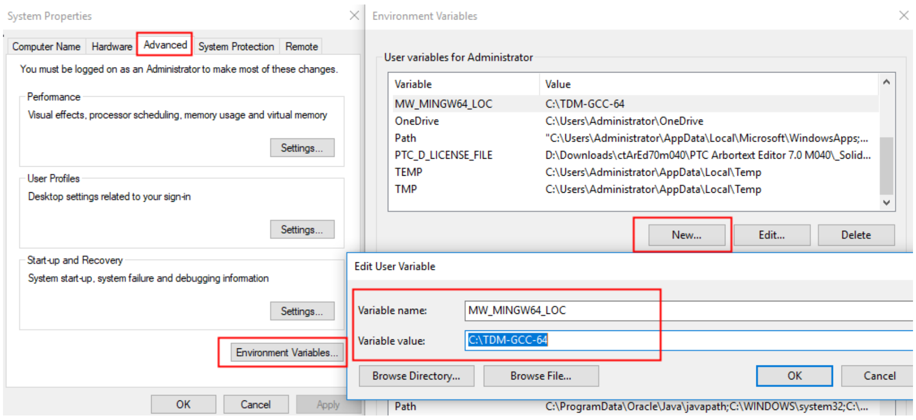
Step 2 Install **TDM-GCC**. The details how to install is not descripted in this topic.

⚠NOTICE

The installation paths of **MATALB** and **TDM-GCC** cannot contain Chinese character and space.

Step 3 Create system variable **MW_MINGW64_LOC** and set to the installation path of **TDM-GCC**, as shown in Figure 1.1.

If the installation path of TDM-GCC is ***C:\TDM-GCC-64***. Please replace it based on site requirements.



You must be logged on as an Administrator to make most of these changes.

Visual effects, processor scheduling, memory usage and virtual memory

Desktop settings related to your sign-in

System start-up, system failure and debugging information

User variables for Administrator

Variable	Value
MW_MINGW64_LOC	C:\TDM-GCC-64
OneDrive	C:\Users\Administrator\OneDrive
Path	"C:\Users\Administrator\AppData\Local\Microsoft\WindowsApps;...
PTC_D_LICENSE_FILE	D:\Downloads\ctArEd70m040\PTC Arbortext Editor 7.0 M040_Solid...
TEMP	C:\Users\Administrator\AppData\Local\Temp
TMP	C:\Users\Administrator\AppData\Local\Temp

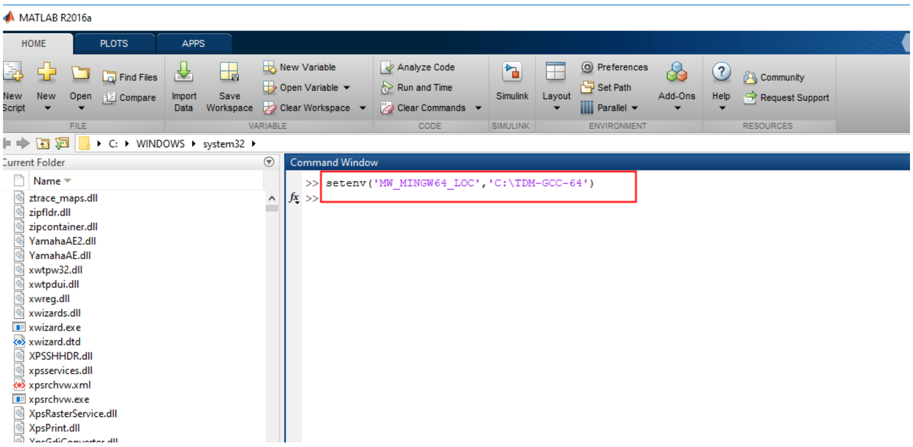
Variable name: MW_MINGW64_LOC

Variable value: C:\TDM-GCC-64

Path C:\ProgramData\Oracle\Java\javapath;C:\WINDOWS\system32;C:\...

Figure 1.1 Add system variable

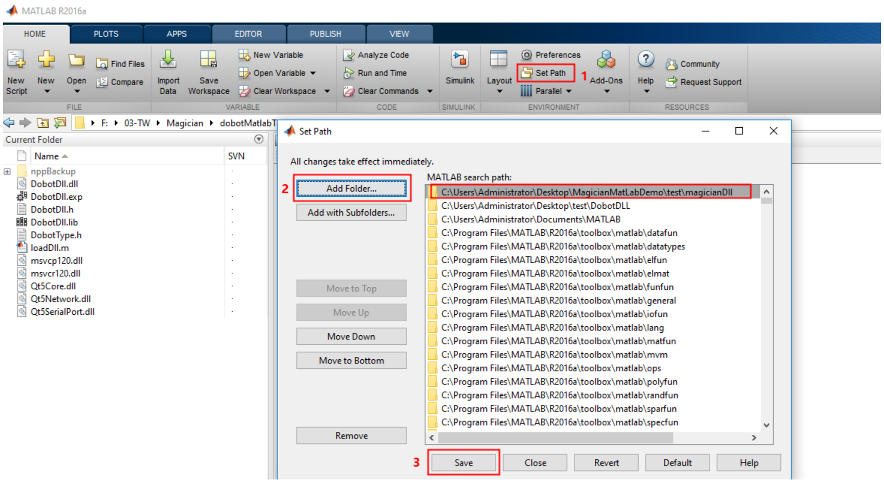
Step 4 Run **setenv('MW_MINGW64_LOC','C:\TDM-GCC-64')** command in the command window of MATLAB, as shown in Figure 1.2



```
>> setenv('MW_MINGW64_LOC','C:\TDM-GCC-64')
>>
```

Figure 1.2　Set system variable

Step 5　Add the directory of Dobot DLL where is in the **MATLAB** demo to the search path of MATLAB, as shown in Figure 1.3.



All changes take effect immediately.

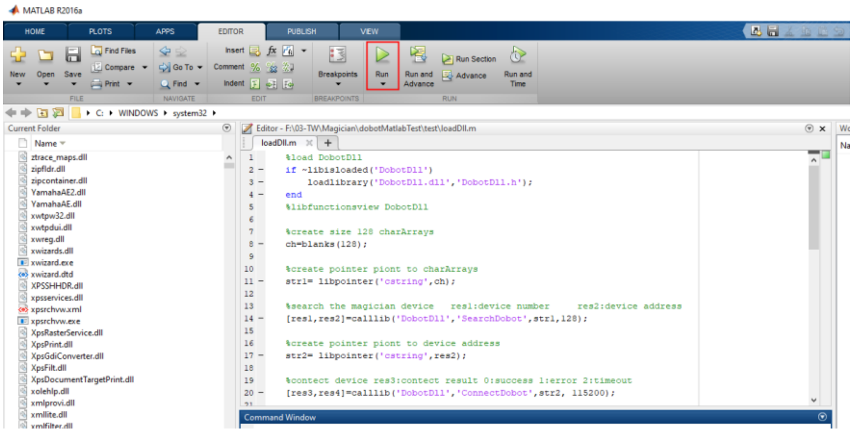
MATLAB search path:

```
C:\Users\Administrator\Desktop\MagicianMatLabDemo\test\magicianDll
C:\Users\Administrator\Desktop\test\DobotDLL
C:\Users\Administrator\Documents\MATLAB
C:\Program Files\MATLAB\R2016a\toolbox\matlab\datafun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\datatypes
C:\Program Files\MATLAB\R2016a\toolbox\matlab\elfun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\elmat
C:\Program Files\MATLAB\R2016a\toolbox\matlab\funfun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\general
C:\Program Files\MATLAB\R2016a\toolbox\matlab\iofun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\lang
C:\Program Files\MATLAB\R2016a\toolbox\matlab\matfun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\mvm
C:\Program Files\MATLAB\R2016a\toolbox\matlab\ops
C:\Program Files\MATLAB\R2016a\toolbox\matlab\polyfun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\randfun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\sparfun
C:\Program Files\MATLAB\R2016a\toolbox\matlab\specfun
```

Figure 1.3　Add Dobot DLL directory

Step 6　Restart MATLAB and open MATALB demo.

Step 7　After Dobot Magician is connected to PC and powered on, you can click ▷ on the MATLAB page.



```
%load DobotDll
if ~libisloaded('DobotDll')
    loadlibrary('DobotDll.dll','DobotDll.h');
end
%libfunctionsview DobotDll

%create size 128 charArrays
ch=blanks(128);

%create pointer piont to charArrays
str1= libpointer('cstring',ch);

%search the magician device   res1:device number     res2:device address
[res1,res2]=calllib('DobotDll','SearchDobot',str1,128);

%create pointer piont to device address
str2= libpointer('cstring',res2);

%contect device res3:contect result 0:success 1:error 2:timeout
[res3,res4]=calllib('DobotDll','ConnectDobot',str2, 115200);
```

Figure 1.4 Compile and run this Demo

1.2 MATLAB Demo Description

1.2.1 Project Description

The **loadDLL.m** file is the Run file of MATLAB demo, which shows how to load Dobot DLL and call the Dobot Magician APIs.

After loading Dobot DLL, you can run **libfunctions DobotDll -full** command in the command window of MATLAB to view all Dobot Magician API declarations. For details about API description, please see *Dobot Magician API Description*.

1.2.2 Code Description

In this demo, we use command queue mode. Figure 1.5 shows the realization process of the MATLAB demo.

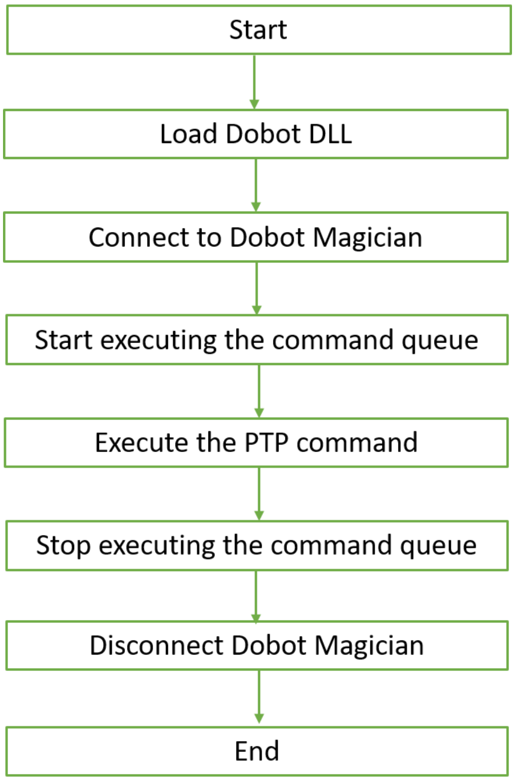

Start
Load Dobot DLL
Connect to Dobot Magician
Start executing the command queue
Execute the PTP command
Stop executing the command queue
Disconnect Dobot Magician
End

Figure 1.5 Realization process

（1） Load Dobot DLL.

Program 1.1 Load Dobot DLL

```
loadlibrary('DobotDll.dll','DobotDll.h');
```

（2） Connect to Dobot Magician.

Program 1.2 Connect to Dobot Magician

```
%create pointer piont to charArrays
str1= libpointer('cstring',ch);
%search the magician device    res1:device number      res2:device address
[res1,res2]=calllib('DobotDll','SearchDobot',str1,128);

%create pointer piont to device address
str2= libpointer('cstring',res2);

%contect device res3:contect result 0:success 1:error 2:timeout
[res3,res4]=calllib('DobotDll','ConnectDobot',str2, 115200);
```

（3） Start executing command queue.

Program 1.3 Start executing command queue

```
%cmd start exec queue
calllib('DobotDll','SetQueuedCmdStartExec')
```

（4） Run **PTP** command.

Program 1.4 Run **PTP** command

```
%create c type struct
ptpstruct=libstruct('tagPTPCmd',ptp);

%create ptp pointer
ptpstructptr=libpointer('tagPTPCmdPtr',ptpstruct);
queue_index_ptr=libpointer('uint64Ptr',queue_index);

%send ptp cmd
calllib('DobotDll','SetPTPCmd',ptpstructptr,true,queue_index_ptr);
```

（5） Stop executing command queue.

Program 1.5 Stop executing command queue

```
%cmd stop exec queue
calllib('DobotDll','SetQueuedCmdStopExec');
```

（6） Disconnect Dobot Magician.

Program 1.6 Disconnect Dobot Magician

```
%cmd disconnect device
calllib('DobotDll','DisconnectDobot');
```