HawkEye Thai National ID Card
R&D NID Card DLL Plus SDK
Developer Manual
for Windows

R&D Computer System Co., Ltd.

RDNIDLib_Manual_Eng_R221102.odt

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R&D NID Card DLL Plus is a software library for Thai national ID card reading. It's an important part of software development kit (SDK) for TDK series product.

1. Features

1.1 Uses for smart card readers that support R&D NID Card DLL Plus such as TDK2700RB+.

1.2 Supports Visual Basic 6.0, Visual Basic .Net, Visual C++, C# and other computer languages that can use Microsoft DLL library.

1.3 Supports Windows 32-bit and 64-bit.

1.4 Supports Windows XP and higher versions.

2. Applications

2.1 Must place RDNIDLibD.dll (or RDNIDLibD64.dll) into the same folder of executable file (.EXE)

2.2 Must place the license file, RDNIDLib.DLD into the same folder of executable file (.EXE) or the folder that application program have read-write access rights.

2.3 For RDNIDLibD.dll, which is 32-bit library version, is suitable for general usage, both 32 and 64 bits Windows. It can be used with 32-bit only languages such as VB 6.0 and 32/64-bit languages.

- For VB.Net and C# in Visual Studio, developer have to configure the compiler to support 32-bit Platform or Target CPU as x86. Please don't configure to x64 nor AnyCPU type.

2.4 RDNIDLibD64.dll is a 64-bit library for Windows 64-bit only.

- Please configure Platform or Target CPU to x64, use RDNIDLibD64.dll for library file and rename library file in source code from RDNIDLibD.dll to RDNIDLibD64.dll

2.5 DLL calling steps are :

- Start DLL with `openNIDLibRD` function.
  - Call `getReaderListRD` for getting smart card readers list.
  - Select a reader with `selectReaderRD`. Normally we should select the first reader in the list that got from `getReaderListRD`.
    - Connect the Thai ID card via `connectCardRD` function.
      - Read data from card by these functions:
        - `getNIDNumberRD` : Read Thai national ID number (13-digit).
        - `getNIDTextRD` : Read the text data from Thai ID card.
          - Or use the `getATextDD` for reading all text data from Thai ID card.
        - `getNIDPhotoRD` : Read card holder photo from the card.
    - In case of reading other card, please use `disconnectCardRD` to abort card connection and re-connect with the new card with `connectCardRD` function.
  - You can switch to other reader by using `deselectReaderRD` then call `getReaderListRD` and `selectReaderRD` again.

- Use `closeNIDLibRD` when you want to stop DLL usage or want to reset it. This will release and return all memory to the system.
- For other functions such as `getSoftwareInfoRD` and `getLicenseInfoRD` are optional, you may use them if you want.

Note **Please refer to this file: RDNIDCardDLL_Plus_SourceCode_Usage. pdf for choosing 32 / 64 bit DLLs, adding DLL files into Visual Studio and VB 6.0, VB.Net and C# development**

3. Variable Passing

3.1 Pass by Reference/Pointer

For “Pass by Reference/Pointer” variables, please pass them by “Reference” or “Pointer” or “ByRef” .

For other variables, please pass “By Value” or “ByVal”.

3.2 Visual Basic

For string variables in Visual Basic, please use “ByVal”. Such as

```
ByVal strLicFilename As String
```

4. RDNIDLib API functions

Command	Description
openNIDLibRD	Start using the R&D NID Card DLL Plus library.
closeNIDLibRD	Stop using R&D NID Card DLL Plus library.
getReaderListRD	Get the list of connected smart card readers name from system.
selectReaderRD	Select a working reader.
deselectReaderRD	Deselect the reader.
connectCardRD	Connect with Thai ID card in the reader.
disconnectCardRD	Disconnect the connected card.
getNIDNumberRD	Read Thai national ID number (13-digit) from card.
getNIDTextRD	Read text data from Thai ID card.
getNIDPhotoRD	Read photo from Thai ID card.
getSoftwareInfoRD	Get R&D NID Card DLL Plus library information.
getLicenseInfoRD	Get license file information.
updateLicenseFileRD	Update new license file from internet.
getRidDD	Get Reader ID (RID).
getATextDD	Read all text data from Thai ID card.

4.1 `openNIDLibRD(byte *licFilename[])`

Description	Start using the R&D NID Card DLL Plus library. Always call this function first before other functions.
Input Parameter	**`licFilename[]` (Pass by Reference/Pointer) :** license filename (include path or folder) follow by Null. Should always use filename as RDNIDLib.DLD to protect confusion.
Function Type	Int32
Return Value	Return Code (see details in **Return Code Table**).

4.2 `closeNIDLibRD()`

Description	Stop using R&D NID Card DLL Plus library, release and return all memory to system.
Input Parameter	No
Function Type	Int32
Return Value	Return Code (see details in **Return Code Table**)

4.3 `getReaderListRD(byte *rList[],int32 rListSize)`

Description	Get the list of connected smart card readers name from system.
Input Parameter	**`rList[]` (Pass by Reference/Pointer) :** memory buffer for list, at least 1000 bytes. **`rListSize`** : size of **`rList[]`** in bytes.
Output Parameter	**`rList[]`** : list of readers, separate each reader by semi-colon (;) and follow by Null (ASCII 0 , \0). For the example: “SCM Reader01; SCM Reader02; SCM Reader03”Null.
Function Type	Int32
Return Value	Positive value for number of readers found. Negative value is Return Code (see details in **Return Code Table**).

4.4 `selectReaderRD(byte *reader[])`

Description	Select a working reader.
Input Parameter	**`reader[]` (Pass by Reference/Pointer)** : reader name, follow by Null.
Function Type	Int32
Return Value	Positive value is Instance of the selected reader (`readerInst`) . Negative value is Return Code (see details in **Return Code Table**).

4.5 `deselectReaderRD(DWORD readerInst)`

Description	Deselect the reader.
Input Parameter	**`readerInst`** : Instance of the selected reader got from `selectReaderRD` function.
Function Type	Int32

Return Value Return Code (see details in **Return Code Table**).

4.6 `connectCardRD(DWORD readerInst)`

Description Connect with Thai ID card in the reader.

Input Parameter **`readerInst`** : Instance of the selected reader got from `selectReaderRD` function.

Function Type Int32

Return Value Return Code (see details in **Return Code Table**).

4.7 `disconnectCardRD(DWORD readerInst)`

Description Disconnect the connected card.

Input Parameter **`readerInst`** : Instance of the selected reader got from `selectReaderRD` function.

Function Type Int32

Return Value Return Code (see details in **Return Code Table**).

4.8 `getNIDNumberRD(DWORD readerInst, byte *nidNumber[])`

Description Read Thai national ID number (13-digit) from card.

Input Parameter **`readerInst`** : Instance of the selected reader got from `selectReaderRD` function.

`nidNumber[]` (Pass by Reference/Pointer) : memory buffer 14 bytes.

Output Parameter **`nidNumber[]`** Thai national ID number, follow with Null.

Function Type Int32

Return Value Return Code (see details in **Return Code Table**).

4.9 `getNIDTextRD(DWORD readerInst, byte *nidText[],int32 nidTextSize)`

Description Read text data from Thai ID card.

Input Parameter **`readerInst`** : Instance of the selected reader got from `selectReaderRD` function.

`nidText[]` (Pass by Reference/Pointer) : memory buffer for text data, at least 1024 bytes.

`nidTextSize` : size of **`nidText[]`** in bytes.

Output Parameter **`nidText[]`** : Text data read from Thai national ID card, 23 items, follow with Null.

Function Type Int32

Return Value Return Code (see details in **Return Code Table**)

In case return 0 (`NID_SUCCESS`), **`nidText[]`** will contain all data field from the card.

Data format is:

"NID number#Thai title#Thai first name#Thai middle name#Thai last name#English title# English first name#English middle name#English last name#Number#Moo#Trok#Soi# Thanon#Tambon/Khwaeng#Amphoe/Khet#Changwat#Gender#Birth date#Issue place#Issue date#Expiry date#Issue number"Null

Text Data Table

	Field	Text size	Note
1	NID number	13 characters	“1234567890123”
2	Thai title	103 characters maximum	
3	Thai first name		
4	Thai middle name		
5	Thai last name		
6	English title	103 characters maximum	
7	English first name		
8	English middle name		
9	English last name		
10	Number	167 characters maximum	
11	Moo		
12	Trok		
13	Soi		
14	Thanon		
15	Tambon/Khwaeng		
16	Amphoe/Khet		
17	Changwat		
18	Gender	1 character	“1”=Male, “2”=Female
19	Birth date	8 characters	YYYYMMDD YYYY : Buddhist Era Year MM = “00” if month is unknown. DD = “00” if day is unknown.
20	Issue place	100 characters maximum	
21	Issue date	8 characters	YYYYMMDD (Buddhist Era)
22	Expiry date	8 characters	YYYYMMDD (Buddhist Era) “99999999” for life long card.
23	Issue number	14 characters	May be not available in some card versions.

Example

“3650800011234#นาย#สมชาย##สามรักสกุล#Mr.#Somchai##Samruksakul#123/45#หมู่ที่ 12####ตำบลบึงพระ#อำเภอเมืองพิษณุโลก#จังหวัดพิษณุโลก#1#25240119#เทศบาลนครพิษณุโลก#25521026#25590118#12345678901234” Null

4.10 `getNIDPhotoRD(DWORD readerInst, byte *nidPhoto[], int32 *nidPhotoSize)`

Description	Read photo from Thai ID card.
Input Parameter	**`readerInst`** : Instance of the selected reader got from `selectReaderRD` function. **`nidPhoto[]` (Pass by Reference/Pointer)** : memory buffer for photo, at least 10,240 bytes. **`nidPhotoSize` (Pass by Reference/Pointer)** : size of **`nidPhoto[]`** in bytes.
Output Parameter	**`nidPhoto[]`** : Photo of card holder in jpeg format, resolution is 297x355 or 148x178. **`nidPhotoSize`** : actual photo size in bytes.
Function Type	Int32
Return Value	Return Code (see details in **Return Code Table**).

4.11 `getSoftwareInfoRD(byte *libInfo[])`

Description	Get R&D NID Card DLL Plus library information.
Input Parameter	**`libInfo[]` (Pass by Reference/Pointer)** memory buffer, at least 512 bytes.
Output Parameter	**`libInfo[]`** : Text of library information, follow with Null.
Function Type	Int32
Return Value	Return Code (see details in **Return Code Table**).

4.12 `getLicenseInfoRD(byte *licenseInfo[])`

Description	Get license file information.
Input Parameter	**`licenseInfo[]` (Pass by Reference/Pointer)** memory buffer, at least 512 bytes.
Output Parameter	**`licenseInfo[]`** : License file information, follow with Null.
Function Type	Int32
Return Value	Return Code (see details in **Return Code Table**).

4.13 `updateLicenseFileRD(byte *licenseFilename[])`

Description	Update new license file from internet.
Input Parameter	**`licenseFilename[]` (Pass by Reference/Pointer)** license filename (include path or folder) follow by Null, same as used in `openNIDLibRD`.
Function Type	Int32
Return Value	Value 0 and upper: the new license file has been successfully updated. Negative value is a Return Code, see details in **Return Code Table**.
Note	End user must has rights to access, read and write this file. Should not place license file in system folders such as Program Files or Windows unless end user has Administrator Rights.

4.14 getRidDD(DWORD readerInst, byte *ridData[])

Description Get Reader ID (RID).

Input Parameter **readerInst** : Instance of the selected reader got from selectReaderRD function.

ridData[] (Pass by Reference/Pointer) : memory buffer, at least 256 bytes.

Output Parameter **ridData[]** : Binary data of Reader ID

Function Type Int32

Return Value Positive value is size of **ridData[]** in bytes.

Negative value is Return Code (see details in **Return Code Table**).

4.15 getATextDD(DWORD readerInst, byte *aText[], int32 aTextSize)

Description Read all text data from Thai ID card.

Input Parameter **readerInst** : Instance of the selected reader got from selectReaderRD function.

aText[] (Pass by Reference/Pointer) : memory buffer for text data, at least 1024 bytes.

aTextSize : size of **aText[]** in bytes.

Output Parameter **aText[]** : Text data read from Thai national ID card, 28 items, follow with Null. The total items may be changed in the future.

Function Type Int32

Return Value Return Code (see details in **Return Code Table**)

In case return 0 (NID_SUCCESS), **aText[]** will contain all data field from the card. Data format is:

"NID number#Thai title#Thai first name#Thai middle name#Thai last name#English title# English first name#English middle name#English last name#Number#Moo#Trok#Soi# Thanon#Tambon/Khwaeng#Amphoe/Khet#Changwat#Gender#Birth date#Issue place#Issue date#Expiry date#Issue number#BP1/Request number#Issuer code#Structure version#Card type#Title flag"Null

AText Data Table

	Field	Text size	Note
1-23	Text data of Thai ID card		First 23 data items are same as 23 text data from getNIDTextRD function, see details in getNIDTextRD function.
24	BP1/Request Number	20 characters	"12345678901/12345678" The first 11 characters are the BP1 Number. The last 8 characters are Request Number. The slash (/) as a separator.
25	Issuer Code	13 characters	"1234567890123"

	Field	Text size	Note
26	Structure Version	4 characters	The card data structure version, such as “0003” or “0004”.
27	Card Type	2 characters	“01” 01 is Thai ID card.
28	Title Flag	1 character	Space = No title flag “0” = Normal title “1” = Royal Thai navy ranks (ร.น.) “2” = Priest’s ranks

Example

“3650800011234#นาย#สมชาย##สามรักสกุล#Mr.#Somchai##Samruksakul#123/45#หมู่ที่ 12####ตำบลบึงพระ#อำเภอเมืองพิษณุโลก#จังหวัดพิษณุโลก#1#25240119#เทศบาลนครพิษณุโลก#25521026#25590118#12345678901234#12345678901/12345678#1234567890123#0004#01#0” Null

Note May replace the `getNIDTextRD` function with this function.

The total items may be changed in the future.

Data Type

Type	Description
`DWORD`	Integer 32 bits
`Int32`	Signed Integer 32 bits (int, int32)
`Byte`	character 8 bits
`Byte []`	Array of bytes

Return Code Table

Return Code	Name	Description
0	NID_SUCCESS	All done, no error.
-1	NID_INTERNAL_ERROR	Found internal error.
-2	NID_INVALID_LICENSE	Invalid license.
-3	NID_READER_NOT_FOUND	Smart card reader not found.
-4	NID_CONNECTION_ERROR	Connection error.
-5	NID_GET_PHOTO_ERROR	Can’t get photo from card.

Return Code	Name	Description
-6	NID_GET_TEXT_ERROR	Can't get text data from card.
-7	NID_INVALID_CARD	Invalid card or not Thai ID card.
-8	NID_UNKNOWN_CARD_VERSION	Unknown Thai ID card version.
-9	NID_DISCONNECTION_ERROR	Can't disconnect.
-10	NID_INIT_ERROR	Initialize error or library didn't open yet.
-11	NID_READER_NOT_SUPPORT	Doesn't support this reader.
-12	NID_LICENSE_FILE_ERROR	License file error.
-13	NID_PARAMETERS_ERROR	Parameters error.
-15	NID_INTERNET_ERROR	Internet connection error.
-16	NID_CARD_NOT_FOUND	Card not found.
-18	NID_LICENSE_UPDATE_ERROR	Can't update license file.

5. License file management (.DLD)

License File is the most important for using TDK's R&D NID Card DLL Plus. This file is a collection of registered and licensed readers.

- R&D NID Card DLL Plus license filename is RDNIDLib.DLD.
- Can get license folder name, license filename and license date via `getLicenseInfoRD` function.
- All registered readers S/N will be saved inside this license file.
- Only registered readers can be use with R&D NID Card DLL Plus.
- Users should update new license file from internet when they want to install a new reader.
- How to get the new license file :
  - Download from internet via `updateLicenseFileRD` function.
  - Manual download TDK software development kit from our company website. Then copy new RDNIDLib.DLD file inside SDK to license file folder.
- The new license file will bigger than the old one.
- For the first run of developed application, we should download the new license file from internet with `updateLicenseFileRD` function.

- In case of application software found unregistered reader, please try to update the new license file from internet with `updateLicenseFileRD` function or ask user to replace a new registered reader.
- For more convenient users experience, we should have a smart license updating.
  - First, we should place SDK's license file in the target folder for default.
  - After installation, we should update the new license file from internet immediately.
  - When found a -2 or -12 return code , we should update the new license file automatically.
  - Always put a "Update License" command button on some application screen. Then users can solve the problem by updating license file manually by themselves.
- Updating license file requires internet connection. Please ask user to make internet connection when found -15 or -18 return code.
- Normally we can place license file in the same folder of executable file (.EXE). But if that folder is under Windows's Program Files folder, user will can't update it.
  - Solution 1 : User have to run the application by "Run as administrator" option (right click for running). Input Admin's password and then update the license file.
  - Solution 2 : Place license file into a free writable data folder such as C:\Users\Public\xxxx. We have to specify this path for `openNIDLibRD` function.

6. Difference of R&D NID DLL Plus (TDK) compared with the standard version of TRK

The library of TDK is a special edition (Plus version) of TRK library (standard version). The Plus version can be used and replace standard version of TRK almost immediately.

The R&D NID Card Plus (TDK) features compared to the standard version (TRK) are as follows:

- Plus version supports all TRK functions, these functions name are ending with "RD".
- Plus version has more special functions, these functions name are ending with "DD". Such as `getRidDD` and `getATextDD` function.
- The DLL file of Plus version has "D" suffix, so in the source code developer must be set to use the correct name.
  - The 32-bit of the standard DLL is RDNIDLib.dll.
  - The 64-bit of the standard DLL is RDNIDLib64.dll.
  - The 32-bit of the Plus DLL is RDNIDLibD.dll.
  - The 64-bit of the Plus DLL is RDNIDLibD64.dll.
- The license file will have a different extension. For TRK the extension will be DLX, while TDK will be DLD.
  - The license file name of the standard version is RDNIDLib.dlx.
  - The license file name of the Plus version is RDNIDLib.dld.

A program that has been developed for TRK products when bring to use for TDK, the following points must be modified in the source code.

- Rename the DLL file to RDNIDLibD.dll (32-bit) or RDNIDLibD64.dll (64-bit).
- Rename the license file to RDNIDLib.dld.

7. `getRidDD` Function Usage

Every TDK reader has a special ID number inside, it called Reader ID or RID. Developer can get it by using `getRidDD` function.

- Normally RID is 16-byte long, hex number 00 to FF.
- `getRidDD` must be called after `selectReaderRD` function, steps like this :

```
openNIDLibRD
      getReaderListRD
      selectReaderRD
            getRidDD
```

- After useing `getRidDD` developer should `deselectReaderRD` and then `closeNIDLibRD` immediately.
- Developer may use RID for software protection by these steps:
  - Read RID and save in database file before selling to customers.
  - Check RID of connected reader every time application start. If RID didn't match with RID saved inside database file then abort the application.
  - RID can be check multiple times while software is running.
  - Database file may be store in user's computer or in internet server or may be check via web service.
  - Database file should be encrypted.

R&D NID Card DLL Plus New Features

R221102 (DLL 2.32)

1. Fixed Windows 11 compatible issue in DLL files.
2. Improved user interface and operation of the sample programs (V 1.2.31.1).

R221027 (DLL 2.31)

1. Improved the License File Auto Switch Downloading.
2. Fixed an issue where DLL files were identified as a malware by some Anti-Virus software.

R221007 (DLL 2.30)

1. Support automatically downloading license files from multiple sources (License File Auto Switch Downloading).
2. Fixed various library and sample program bugs.
3. Added `getATextDD` function to read 5 more Thai ID card text data.

R220429 (DLL 2.21.7a)

1. Support reading Thai ID card structure version 0004, such as JC3 card.

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