

SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3, Bandar Tasek Mutiara. 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

# Programming NFC Sticker / Tags



#### Introduction:

Near Field Communication tag (NFC tag), is a sticker or wristband with small microchips that can be read by in range mobile devices. Information is stored in these microchips. The amount of information stored on a NFC tag depends on the tag type, as tag memory capacity varies by tag.

NFC tag has the ability to send data to other mobile phones with NFC capabilities. NFC tags also perform a variety of actions, such as changing handset settings or launching a website. Modern example of a commonly used NFC tag function is mobile payment processing, where users swipe or flick a mobile phone on a NFC reader

#### **Objective:**

In this guide, we will cover on how to Read, Program & Format the NFC Chips. Apps that been used in this guide are available for both Android and IOS platform.

*Side note:* The used Apps are slightly different in UI design between OS, but it provide same functionality.

#### NFC Specification:

Model	NTAG 213	NTAG 215	NTAG 216	Anti-Metal OEM	NTAG 213 OEM	
IC	NT2H1311G0DUx	NT2H1511G0DUx	NT2H1611G0DUx	F8213*	F8213*	
Manufacturer	NXP	NXP	NXP	FEIJU	FEIJU	
EEPROM	180 bytes	540 bytes	924 bytes	180 bytes	180 bytes	
Storage	144 bytes	504 bytes	888 bytes	144 bytes	144 bytes	
Pages	45	135	231	45	45	
	ISO/IEC14443-2	ISO/IEC14443-2	ISO/IEC14443-2	ISO/IEC14442 2	150/15014442 2	
Protocol	ISO/IEC14443-3	ISO/IEC14443-3	ISO/IEC14443-3	130/1EC14443-2	130/1EC14443-2	
	Туре А					

Currently we already tested & verified all listed NFC Sticker / Tags below:



SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3, Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

#### <u>Requirement</u>

Android - Devices that support NFC, run Android 4.1 and Up. (Turn On NFC in settings)

IOS – All latest iPhone from 2014 (iPhone 6 series and Up) and with minimum IOS 13.0.

# Apps / Program / Software:

There are lot of apps on Store that support programming and read the NFC data for both OS platform.

Here some recommended apps that work the best:

NFC TagInfo by <u>NXP</u>					
This apps are used to check the chip manufacturer & version of tags (storage) if it's from NXP					
This App does not have ability to write the Tags.					
NP	Android <u>https://play.google.com/store/apps/details?id=com.nxp.taginf</u>				
IOS <u>https://apps.apple.com/us/app/nf</u>		https://apps.apple.com/us/app/nfc-taginfo-by-nxp/id1246143596			
		NFC TagWriter by <u>NXP</u>			
With this apps user can write / program NFC tag					
	Android	https://play.google.com/store/apps/details?id=com.nxp.nfc.tagwrit			
	IOS	https://apps.apple.com/us/app/nfc-tagwriter-by-nxp/id1246143221			
		NFC Tools by <u>wakdev</u>			
T	his apps provi	de more advanced features such as Tasker & Device Automation			
( N )	Android	https://play.google.com/store/apps/details?id=com.wakdev.wdnfc			
	IOS	https://apps.apple.com/us/app/nfc-tools/id1252962749			
		BLK CARDS by <u>EmerTech Limited</u>			
This apps are more to Professional Business Card & Social Media Account					
Currently tested only support NXP Chip					
Encoding size quite large not suitable for small storage NFC Tag					
	Android	https://play.google.com/store/apps/details?id=hk.emertech.blk			
	IOS	https://apps.apple.com/us/app/blk-cards/id6443552250			



SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3, Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

### A. Checking your NFC Tag Manufacturer & Storage Size

Recommended to check NFC Tags Storage before start programming.





SYNACORP TECHNOLOGIES SDN. 8HD. (1310487-K) No.25 Lorong I/SS3, Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

Storage Size located at the 'EXTRA' page	NXP TagWriter			
	User can tap on 'Read' to read storage info			
$\equiv$ TagInfo < $\Box$ :	K 🔍 Empty			
IC INFO NDEF EXTRA FULL SCAN	Tag type and NFC storage size			
Memory size	NFC Forum Type 2 Tag			
504 bytes user memory ▶ 126 pages, with 4 bytes per page	492 bytes			
IC information	Content			
Full product name: NT2H1511G0DUx	() Empty			
Version information	Empty			
Vendor ID: NXP (0x04) Type: NTAG (0x04) Subtype: 50 pF (0x02) Major version: 1 (0x01) Minor version: V0 (0x00)	Tap next tag to read content and view results			
Storage size: 504 bytes (0x11) Protocol: ISO/IEC 14443-3 (0x03)	RT1			
Configuration information	121			
ASCII mirror disabled NFC counter: disabled (no tearing: 0xBD) No limit on wrong password attempts Strong load modulation enabled				
Originality Check (asymmetric)				
Signature verified with NXP public keyECDSA signature: r: 0x8F0C64C73A13C4B4F520858107DF1CC4 s: 0xD363834BD41A495D63C169ACDFA72377				
TagInfo Version				
Version :4.25.5				
Device Info				
Device Model :Google ( Pixel 6a ) Android OS Version :13				
	EDIT DATASET DONE			



SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3. Bandar Tasek Mutiara. 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

# **B. Programming NFC Tag**

NFC Tag Storage / User data normally already formatted to NDEF format from factory. NDEF is a standardized data format specification by the NFC Forum which is used to describe how a set of actions are to be encoded onto a NFC tag or to be exchanged between two active NFC devices. The vast majority of NFC enabled devices (readers, phones, tablets...) support reading NDEF messages from NFC tags.

#### There a numerous Data type that user can program into NFC Tag for example:

- 1. Contact or Business Card (VCF / vCards / .vcf format).
- 2. Link / URL / URI (Website, Spotify playlist, YouTube).
- 3. Telephone Number, Email & SMS.
- 4. Smart Home Automation Tags.
- 5. Wi-Fi connection (Share Wi-Fi without showing your password).
- 6. Bluetooth connection (Quick pair between BT devices).
- 7. Location (Add any location / address on Tag).
- 8. Plain Text Message.

NXP TagWriter					
Simpler interface & ability to save user data (My datasets)					
		-			
TagWriter		< 🖹 New dataset	:		
		Business card	$\rightarrow$		
Q		ි Link	$\rightarrow$		
Deedters	Write tags	ন্ন WiFi	$\rightarrow$		
Read tags			$\rightarrow$		
		@ Email	$\rightarrow$		
		C Telephone number	$\rightarrow$		
-		Geo location	$\rightarrow$		
Erase tags	Protect tags	Launch Application	$\rightarrow$		
My datasets		Plain text	$\rightarrow$		
		□ SMS	$\rightarrow$		
		JL	]		



SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3, Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia, T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

1010	ore data type pro	viue	eu jor use	
Add a record	S	SMS	SMS Add SMS	
<b>Text</b> Add a text record	>	9	Location Add a location	
URL / URI Add a URL record	> _	<u>Q</u>	Custom location Open a custom location	
Custom URL / URI Add a URI record	> <		Address Add a address	
Search Add a link to a search	>	<u> </u>	<b>Destination address</b> Start the navigation to a location on Google Maps	
Social networks Add a social network link	> [	M	<b>Proximity search</b> Search for points of interest near a location	
Video Add a video link	>	0	Street View Open the street view at coordinates	
File Add a link to a file	> (	Ð	Emergency Information in case of emergency	
Application Add application record	>	₿	<b>Bitcoin</b> Add a Bitcoin address	
Mail Add mail record	>	*	<b>Bluetooth</b> Add a bluetooth connection	
Contact Add contact	> 4	<b>?</b>	<b>Wi-Fi network</b> Configure a Wi-Fi network	
Phone number Add phone number	>		<b>Data</b> Add a custom record	



# **B-1. Programming Business Card**

Depend on apps, some can input more information into vCards format, some app can only input basic info such as name and telephone number.

# B-1a) Programming Business Card using TagWriter app.

- NXP TagWriter will share contact from your Phone Contact apps (User saved contact).
- Make sure to add all detail first.
- Close the app after complete the process.
- Next time user scan the NFC Tag it will automatically Contact info.







SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong 1/SS3. Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

# B-1b) Programming Business Card using NFC Tools app.

- NFC Tools require user to manually input contact detail from app itself.
- Close the app after complete the process.
- Next time user scan the NFC Tag it will automatically Contact info.







SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong 1/SS3. Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

# **B-2.** Programming Link / URL

Some Link / URL will trigger the installed apps on the phone. For example sharing YouTube Link thru NFC Tag will trigger YouTube apps instead of Web browser app.

#### B-2a) Using NXP TagWriter app

- Close the app after complete the process.
- Next time user scan the NFC Tag it will automatically launch Web browser.







SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3, Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

# B-2a) Using NFC Tools app

- Close the app after complete the process.
- Next time user scan the NFC Tag it will automatically launch Web browser.







SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3. Bandar Tasek Mutiara, 14120 Simpang Ampat, Penang, Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

# C. Formatting / Erase NFC Tag

As mentioned before data that encoded / programmed into NFC are in NDEF format. Since NFC are rewriteable, sometimes user will need to erase old data from tag to clear spaces for new data.

#### C-1. Using NXP TagWriter.

• User need manually enter NDEF storage size. Check storage size before format.







SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K) No.25 Lorong I/SS3. Bandar Tasek Mutiara. 14120 Simpang Ampat. Penang. Malaysia. T: +604.586.0026 F: +604.586.0026 WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

#### C-2. Using NFC Tools

• This app will automatically define the storage size and auto format.

