

Bilcare nonClonable™ Reader SX21

User Manual

Bilcare Technologies Singapore Pte Ltd

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NOTE: Although this Reader can be used with a personal computer, laptop or PDA device, this manual specifically refers to the use of a mobile phone, however Wi-Fi and other connection means may also be used.

Throughout this User Manual an identity card (the “Card”) is used to demonstrate the Reader however the Reader can be used on a wide variety of products.

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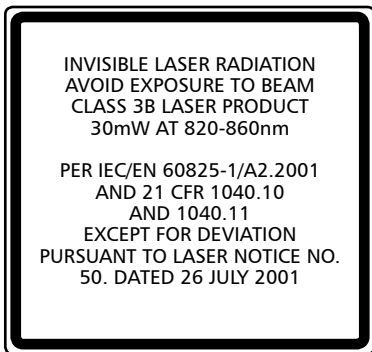
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This Reader may contain commodities, technology, or software subject to export laws and regulations from Singapore and other countries.

Reverse engineering of any software or hardware associated with the Bilcare nonClonable™ System is prohibited to the extent permitted by applicable law. The Bilcare nonClonable™ System is protected by granted and pending international patents including WO2007/133164 A1 and WO 2007/133163 A1.

SAFETY WARNINGS

CAUTION PRODUCT CONTAINS A LASER



This product contains a Class 3B laser and the casing should not be opened or tampered with to avoid possible exposure to the laser.

The Bilcare nonClonable Reader SX21 is a Bluetooth device and is safe to use in most areas, however if the device is paired with a GSM mobile phone please consult your mobile phone manual for details on where the product may be used. Please exercise caution and follow the instructions below:

SWITCH ON SAFELY

Do not switch the Reader on where wireless phone use is prohibited or when it may cause interference or danger.

SWITCH OFF IN HOSPITALS

Follow any restrictions. Switch the Reader off near medical equipment.

SWITCH OFF IN AIRCRAFT

Follow any restrictions. Wireless devices can cause interference in aircraft.

SWITCH OFF WHEN REFUELING

Do not use the Reader and phone at a refuelling point. Do not use near fuel or chemicals.

SWITCH OFF NEAR BLASTING

Follow any restrictions. Do not use the Reader and phone where blasting is in progress.

QUALIFIED SERVICE

Only qualified personnel may repair this product. For technical support, please refer to the information on the website: www.bilcaretech.com/technical_support/index.php.

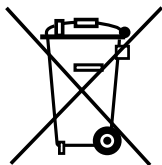
Do not attempt to open or repair the Reader yourself.

ENHANCEMENTS AND BATTERIES

Use only approved enhancements and batteries. Do not connect incompatible products.

PRODUCT DISPOSAL

This product and its peripheral items must be taken to a separate collection point at the product end-of-life. Do not dispose of these products as unsorted municipal waste.



WATER-RESISTANCE

Your Reader and accompanying peripheral equipment are not water-resistant; keep them dry.

TABLE OF CONTENTS

1	GENERAL INFORMATION	
	1.1 Product overview	8
	1.2 Terms and abbreviations applied in this User Manual	8
	1.3 Technical support	9
	1.4 Manufacturer details	9
2	PRODUCT SUMMARY	
	2.1 System components	10
	2.2 Overview of the System	11
	2.3 Overview of the Reader	12
	2.4 Overview of the Tag	14
3	GETTING STARTED	
	3.1 Setting up your mobile phone	15
	3.2 Downloading the software onto your mobile phone	15
	3.3 Connectivity: authorizing your mobile phone to use the software	16
	3.4 Charging the battery and switching the Reader on/off	18
	3.5 Starting the application	22
4	USING THE READER	
	4.1 How to swipe the Card	27
	4.2 Authenticating the Card	32
	4.3 System unable to authenticate the Card	34
	4.4 System messages appearing on your mobile phone	34
	4.5 Non-authenticated Card	40
	4.6 Maintenance of the Reader and battery	40

4.7	General care of your Bilcare nonClonable™ Reader SX21	42
4.8	Bluetooth aspects	43
5	RECHARGING THE BATTERY	44
6	USB DATA TRANSFER	44
7	TROUBLESHOOTING	
7.1	Mechanical troubleshooting	44
7.2	Electronic troubleshooting	46
7.3	Swiping troubleshooting	46
7.4	Connectivity and mobile phone troubleshooting	47
8	TECHNICAL SPECIFICATIONS	50
8.1	Repair work	51
9	WARRANTY	51
10	END USER LICENSE AGREEMENT	52

1 GENERAL INFORMATION

1.1 Product overview

Counterfeiting and fraud have become serious issues in many industries around the world and are prevalent in a diverse range of sectors, including pharmaceutical products, fashion items, software and entertainment media, consumer electronics, legal documentation and identity cards. The Bilcare nonClonable™ System provides an anti-counterfeiting solution that gives real-time authentication throughout the supply chain; from manufacturing to the point of sale. Combining proprietary tag-based technology with easy-to-use equipment, this unique groundbreaking solution provides brand manufacturers with a safe, secure and highly effective way of authenticating products. The technology can also be deployed to protect assets and people by enhancing the security of identification credentials such as ID documents, payment cards and access cards.

User perspective: brand authentication

The Bilcare nonClonable™ System and the Bilcare nonClonable™ Reader SX21, herein referred to as the Reader, have been designed to provide state-of-the-art anti-counterfeiting protection. It also provides secure identification and real-time authentication of personnel through tamper-evident nonClonable cards.

1.2 Terms and abbreviations applied in this User Manual

Barcode: 12 or 16 digits Code 128C barcode incorporated into the Tag

BATS:	Bilcare Authentication and Tracking System <i>please note that the definition of this acronym and this system could also be hosted at Bilcare premises or at the customer's and in which case called by a different name.</i>
Card:	Bilcare nonClonable™ Card SXGP16C
EULA:	End User License Agreement
Fingerprint:	Unique micro/nano material fingerprint contained in each Tag
GPRS:	General Packet Radio Service
GSM:	Global System for Mobile communications
IP:	Internet Protocol
LED:	Light-Emitting Diode
Optical Sensor:	Laser-based sensor that reads the Barcode
Reader:	Bilcare nonClonable™ Reader SX21
Remote server:	Bilcare's Authentication and Tracking System Server
Server:	Secure server hosting Fingerprints from all genuine/authorized Tags
SIM:	Subscriber Identity Module
Tag:	Bilcare nonClonable™ Tag SXM12T
URL:	Uniform Resource Locator
WLAN:	Wireless Local Area Network

1.3 Technical support

For technical support and other product enquiries please refer to the Bilcare Technologies website www.bilcaretech.com/technical_support/index.php.

1.4 Manufacturer details

Bilcare Technologies Singapore Pte Ltd
52, Changi South Street 1
Singapore 486161

2 PRODUCT SUMMARY

2.1 System components

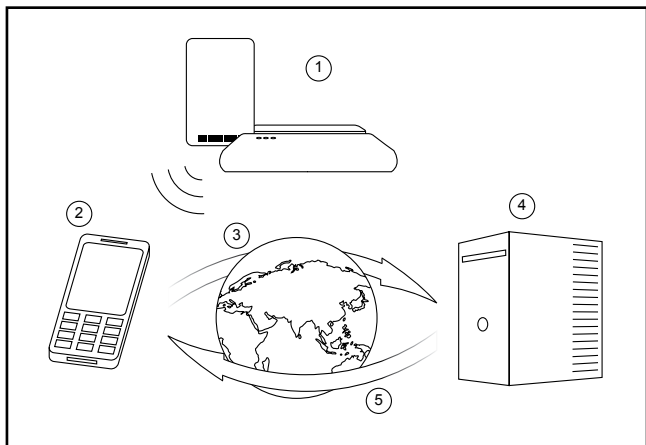
Please take the time to first familiarize yourself with the components of the Bilcare nonClonable™ System SX21 Reader product box.



1. Reader
2. CD
3. USB charger
4. Battery
5. USB charger cable (USB to micro USB)
6. User Manual (CD or booklet)
7. Quick Start Guide
8. Warranty Certificate

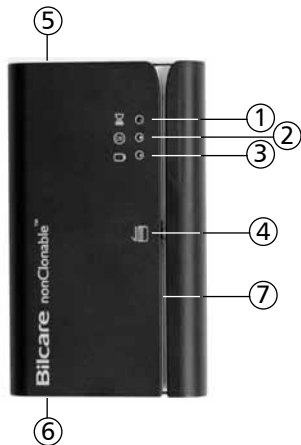
2.2 Overview of the System

The Bilcare nonClonable™ System consists of several integrated components. It is worth acquainting yourself with the system process so that you understand what the system is doing when you use it. The following diagram gives an overview of how the system works.



1. The Card is swiped through the Reader
2. Your mobile phone (not included in this package) receives the Fingerprint information
3. The Fingerprint information is sent via the Internet to Bilcare's remote secure server (referred to here as the BATS Server)
4. The Fingerprint information is checked against the original on the BATS Server database
5. A signal is sent back to your mobile phone indicating whether a match has been made.

2.3 Overview of the Reader



1. Red LED
2. Green LED
3. Orange LED
4. Barcode Symbol indicating positioning of Optical Sensor
5. On/Off button
6. USB charger cable connection
7. Slot for swiping

LED indications

LED Colour	LED Mode	Description
Orange	Solid light	Charging battery
	Rapid blink	Battery fully charged
	Slow blink	Low battery indication
Red	Solid light/ off	Starting the system, to be replaced by the green LED blinking slowly (indicating undergoing system authentication)
Green	Off/slow blink	
Red	Off	System (both Reader and mobile application) is authenticated, Reader is ready for swiping
Green	Solid on	
Red	Off	As you swipe the Tag (busy)
Green	Rapid blink	
Red	Rapid blink	Failure in reading Tag (cannot decode barcode, too slow, too fast, etc)
Green	Rapid blink	
Red	Off	Indicates successful authentication of swiped Tag
Green	Blink twice	
Red	Blink twice	Indicates failed authentication of swiped Tag
Green	Solid on	
Red	Two alternate flashes	Indicates receipt of time out message from mobile application
Green		

2.4 Overview of the Tag

The Reader is designed to authenticate the Bilcare nonClonable™ Tag SXM12T attached to the Bilcare nonClonable™ Card SXG16C – an example is shown here. The Tag contains a special micro/nano Fingerprint, which is read, together with the Barcode, by the Reader when the Tag is swiped.



1. Card
2. Barcode
3. Tag containing the Fingerprint



3. GETTING STARTED

3.1 Setting up your mobile phone

Mobile phone prerequisites:

- a) You will need a Symbian phone preferably of the Nokia E Series. The application has been tested on Nokia E63, E71 and E72. The recommended screen resolution is 320*240 pixels. For a comprehensive, up-to-date list of the mobile phone brands that are compatible with this mobile phone application, please go to www.bilcaretech.com/technical_support/index.php.
- b) GPRS connectivity: Your mobile phone SIM card should have GPRS connectivity enabled for sending information to the Server. If you wish to check whether you have GPRS correctly configured, try opening a web browser on your mobile phone and accessing (for example) www.google.com. If you do not have GPRS connectivity you will need to consult with your mobile phone service provider.
- c) Bluetooth: You should be able to pair your mobile phone with the Reader as described in Section 3.5, provided your mobile phone is also equipped with Bluetooth capabilities.

3.2 Downloading the software onto your mobile phone

Before you can start using the Reader, you will need to transfer the program software onto your mobile phone. Insert the enclosed CD into your computer disk drive and transfer the program files (named .jad and

.jar) to your mobile phone using either Bluetooth or a USB. Locate the file on your mobile phone using the file manager. Open the file (named .jad) and it will automatically install onto your mobile phone. If you are unsure how to transfer the file, please consult the user manual for your mobile phone.

3.3 Connectivity: authorizing your mobile phone to use the software

The first time you use the application, we advise you to authorize your phone to use the software following steps 1-6 below, thereby reducing the time it takes to get the application going subsequently.

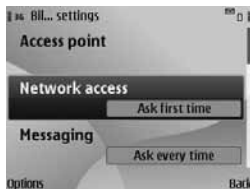
Step 1: Open App. manager (which you can find by selecting Menu>Installation>App. manager) and select the BilcareSecurityApp.



Step 2: On the same screen select "Open".



Step 3: Using the up and down button, select Network access, then "Options", then "Change".



Step 4: Using the up and down button, select "Always allowed", then "OK", after which you will see the setting for network access confirmed as "Always allowed".



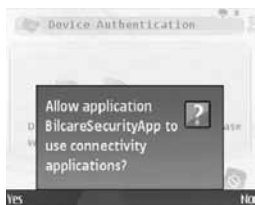
Step 5: Using the up and down button, select "Connectivity", then "Options", then "Change".



Step 6: Using the up and down button, select "Always allowed", then "OK", after which you will see the setting for connectivity confirmed as "Always allowed".



If you do not follow the above steps, each time you use the Reader you will need to confirm that you allow the application on your mobile to connect with the Reader and that you allow the application on your mobile phone to use the network to send and receive data, as shown in the two screen shots below.



3.4 Charging the battery and switching the Reader on/off

Step 1: Insert the battery provided into the Reader. Only use the battery provided. For replacement batteries please contact Bilcare Technologies. Use of unauthorized batteries may damage the Reader and will result in the product warranty being void. Please refer to Figures 1-6 below:

Fig. 1: Gently slide the backing along in the direction of the arrow, until it clicks - you do not need to push the backing any further - and gently lift up from that position. This process is similar to removing the backing of a mobile phone.

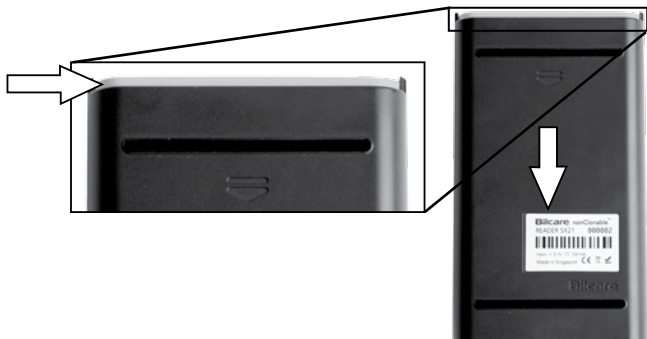


Fig. 2: *Insert the battery by pushing slightly towards the connector and down.*



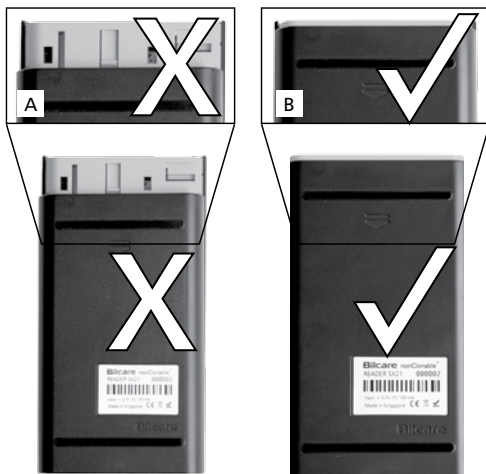
Fig. 3: *Should you need to remove the battery at some stage, push slightly back towards the connector and up.*



Fig. 4: Reader with battery correctly in place.



Fig. 5: Ensuring the sides of both the backing and the main part of the Reader are aligned and that the two parts are oriented correctly, replace the backing and gently slide it along until it "clicks" back into place. In Fig. A the backing has been replaced too far down the Reader and will not close properly. Fig B shows correct replacement. Push backing upwards from this position.



Please refer to Troubleshooting in Section 7 of this User Manual if you are experiencing problems removing or replacing the backing.

Fig. 6:



1. Slot for swiping
2. USB charger cable in place

Step 2: Insert the USB cable into the USB charger if charging from a wall socket; otherwise insert the cable directly into the USB outlet of a laptop or PC. Charge the battery for 5 hours for first-time use. Please note that if you are charging via a laptop or PC, charging times may vary according to your USB port current. Once you have plugged in the charger and attached it to the Reader, the orange LED will light up, indicating that the battery is charging. Once the orange LED starts to blink rapidly, the battery is fully charged and the Reader is ready for use. The orange LED will light up as soon as the charger is plugged in, even if the

Reader is not switched on. The Reader must be switched on for you to check for a low battery (slow blinking orange LED) or fully charged battery (rapid blinking orange LED) For more information on maintenance of the Reader and battery, see Section 4.6 of this User Manual.

Step 3: Push the On/Off power button to switch on the Reader. Once the Reader is on, the red LED will glow briefly while the Reader self-calibrates. Do not attempt to swipe a Tag, or interfere with the Reader's slot during this period as it can affect the calibration. Once the Reader has successfully self-calibrated the red LED will stop and the green LED will start to flash. The green LED will continue to flash until the Reader has successfully paired with your mobile phone (see 3.5 below).

NOTE: To switch off the Reader, push the On/Off power button again. All LEDs will go off (unless the Reader is powered via the USB socket, in which case the orange LED will continue to glow), indicating that the Reader has been shut down properly.

3.5 Starting the application

You are now ready to start the application. For this, find and select the Bilcare nonClonable™ mobile application on your mobile phone, which is usually found under "Installations". There will be a brief pause as the application starts.

The very first time you use this application, you will



be presented with this screen, prompting you to enter the Domain name (you can obtain this from your IT administrator, the entry shown here is for demonstration purposes only) and the phone number of the mobile phone you are using. You will only be asked for this information once and will not be able to change the entries you make unless you reinstall the program.

Before you can proceed, the License Agreement screen will be displayed on your mobile phone.

1. License agreement screen



This is the License Agreement screen. By selecting "Accept" you agree to the terms and conditions given in the End User License Agreement (EULA) provided at the end of this User Manual – see Section 10.

If you select "Decline" the program will exit and you will not be able to use the application or Reader.



2. Welcome screen 1

Selecting "Accept" will lead to you being prompted to enable the Bluetooth device on your mobile phone, if you have not

already done so. Selecting "Exit" will allow you to exit the application.

3. Welcome screen 2



Once the License Agreement has been accepted and the Bluetooth device enabled, you will be presented with the options as displayed here. Selecting "Options" will allow you to either execute a search for a Bilcare SX21 Reader or to

exit the program. Alternatively you can select "Search" using the right-hand key and execute a direct search for a Bilcare SX21 Reader.

4. Welcome screen 3



If you have chosen to pair with a previously configured SX21 Reader, there will be a brief pause as the display on the mobile shows that the application is trying to pair with the last configured Reader.

5. Welcome screen 4



If the application has detected the previously paired SX21 Reader, the serial number for this Reader will be displayed. Selecting "Options" and then "Search" will allow you to select a different Reader and pair with

that one instead. Selecting “Pair” will pair you with the previously paired Reader.

6. Device search screen 1



If you have selected “Search” to pair with another Reader, this screen will be displayed while the application searches for the Reader. Selecting “Cancel” cancels the Reader search and the message “No Bilcare nonClonable™ tag reader

found” will be displayed. This message will also be displayed if the application is unable to detect any SX21 Reader (see Error Messages).

7. Device search screen 2



Once a new Reader has been found, the details for that Reader will be displayed and you can use the mobile phone’s up and down buttons to select the new Reader, then once the device search process is complete you can select “Pair” to pair with that Reader.

8. Device authentication screen 1



Once the required Reader has been found, you can pair with that Reader. If the Reader and mobile are being paired for the first time, you will be prompted to enter the Bluetooth passcode, which is the default passcode

“0000”, and then “OK” to proceed or “Cancel” to cancel and exit the application or to go back and pair with a different Reader. If you give the wrong passcode, you will be asked if you wish to retry. Please refer to the Troubleshooting section for problems with Bluetooth passcode entering and failed pairing issues.

9. If you are using the device for the first time, see Section 3.3 Connectivity: authorizing your mobile phone to use the software.

10. Device authentication screen 2



While device authentication is in progress, options for choosing a valid access point will now be given as shown. Selecting WLAN and then “Yes” allows the user to create a WLAN connection in offline mode for communication with the BATS Server. If you

select WLAN and then “No”, you will be prompted to search for another Bilcare SX21 Reader. If the BATS Server does not respond after you have selected your valid access point, you will be asked if you wish to send again. If you then select “Yes”, the application will try again to connect with the Server and, if successful, will send the request for device authentication.

11. Device authentication screen 3



Your mobile will display this screen while the application is communicating with the BATS Server and device authentication is in process. You will be informed if the mobile phone ID and the SX21 Reader cannot

be matched in the BATS Server database. Please refer to Error Messages if you receive a network communication error at this point.

12. Authentication process screen 1



Once the mobile phone ID has been authenticated by the BATS Server, you will be prompted to swipe the Card as shown here. Selecting "Options" and then "Search" will allow you to disconnect from the current SX21 Reader and search for

another SX21 Reader. You can also exit the application via the "Options" key. Selecting "Back" will also allow you to disconnect with the SX21 Reader and search for another Reader.



Ready to use display

4. USING THE READER

4.1 How to swipe the Card

Now you can take the Card, and swipe it through the slot in the Reader (as shown in the figure below).

Important note: When swiping the Card, take a firm, central hold of the Card (as shown below) to ensure you maintain smooth and constant contact throughout the swiping process. Any jerking or changes in swiping speed will result in one of the warning messages listed in Section 4.4. The red LED will also start to blink rapidly if you have not swiped correctly. Once the red blinking stops and is replaced by a solid green light, you may try to swipe again.

Any communication error between the Reader and your mobile phone will cause the red LED to blink rapidly. If you are experiencing problems with swiping, refer to Troubleshooting in Section 7 of this User Manual, or to Section 4.4, which gives all system messages that appear on your mobile phone.

The figures below show the correct swiping procedure.

Fig. 1: Place the Reader on an even, stable surface such as a table. Grip the Card as shown below. Making sure that the Barcode is oriented towards the Barcode Symbol on the Reader, insert the Card into the leading edge of the Reader as shown below, holding the Reader steady with your other hand if necessary as you proceed to swipe. You may swipe in either direction (either top to bottom or bottom to top), but the Card must be swiped right through the Reader slot.



Fig. 2a shows the start position: Make sure you insert the outer edge of the Card into the leading edge of the slot, that no part of the Card overlaps with the sensor area in the middle of the slot when you start swiping and that the Barcode is oriented towards the Barcode Symbol on the Reader.



Fig. 2b shows the Card being swiped at an even, moderate speed, passing through the optical sensor indicated by the Barcode Symbol on the Reader.

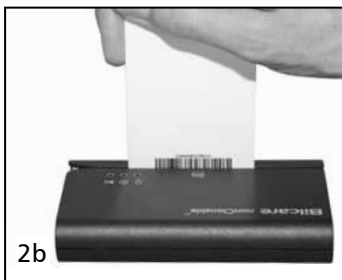
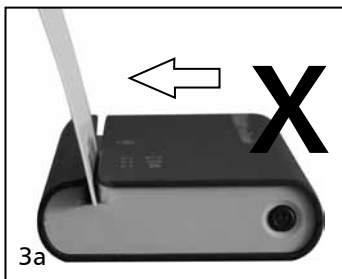


Fig. 2c shows the final part of the swipe – make sure that you continue to swipe the Card all the way through the Reader slot.



Fig. 3a: Make sure that you do not bend the Card while swiping. (In all figures the user's hands have been removed for clarity.) Here the Card is bending



to the left due to lateral pressure being exerted by the user during the swipe. This is incorrect and the Reader may not be able to read the Barcode or the Tag's micro/nano Fingerprint – which could result in a failed authentication.

Fig. 3b shows the correct position for swiping. No lateral pressure is being exerted on the Card during the swipe.

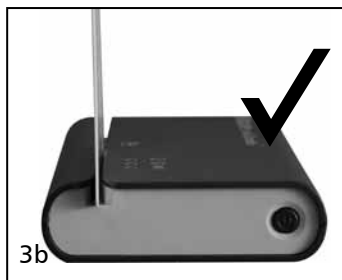


Fig. 3c shows a Card bending to the right due to lateral pressure being exerted by the user during the swipe. This is incorrect and the Reader may not be able to read the Barcode or the Tag's

*micro/nano
Fingerprint –
which could
result in a failed
authentication.*

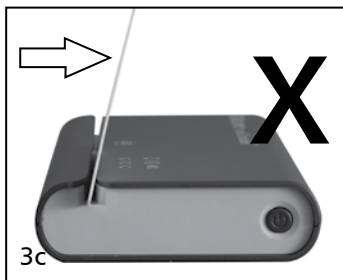
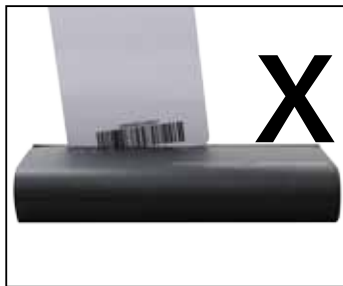


Fig 4: *Keep the
bottom edge
of the Card in
constant, firm
contact with
the base of the
Reader slot at all
times during the
swipe. Figure*



*4 shows a highly exaggerated tilting of the
Card during swiping. The Bilcare nonClonable™
Reader SX21 is a precision instrument and
any tilting or loss of contact during the swipe
may cause the Reader to incorrectly read the
Barcode or the Tag's micro/nano Fingerprint –
which could result in a failed authentication.*

If you are experiencing problems with swiping, please refer to Troubleshooting in Section 7 of this User Manual, or to System Messages in Section 4.4.

Once the Reader has successfully read the Tag on the Card it will send information to the mobile phone it is paired with and you can move on to verifying the Card using the following steps.

4.2 Authenticating the Card

Reading data

Once you have successfully swiped the Card (see System Messages below and the Troubleshooting section for problems with swiping), the application will first inform you that data has been received from the Reader and, if the Tag on the Card is valid, your mobile will show this display, indicating that the application is now ready to connect with the BATS Server database.

Authentication process



This screen will be displayed on your mobile while the application contacts the BATS Server to confirm the authenticity of the Card you have swiped. Selecting "Cancel" allows you to go back, exit the application or swipe a different Card

Please refer to Troubleshooting and/or System Messages if you have problems with contacting the remote database.

Authentication details screen 1

This screen will be displayed if you have correctly swiped an authentic Card. The authentication details



(tailor-made to suit individual customer's requirements) of the swiped Card and current transaction are given, as exemplified here. Selecting "Reports" allows you to view more details regarding the

swiped Card. "Back" allows you to return to swipe another Card.

Authentication details screen 2



If you have selected "Reports", further details will be displayed for the authenticated Card, with the individual details that the customer has required to have access to via this application. This screen is for sample purposes only. If you select "Back" you will

go back to the first Authentication details screen, from where you can either select "Reports" to return to this screen again, or "Cancel" to return to swipe another Card.

Exiting the application



If you have selected "Exit", the application will ask you to confirm that you wish to exit and by selecting "Yes" you will exit the application. Selecting "No" allows you to return to the screen for swiping another Card.

4.3 System unable to authenticate the Card

If you have swiped a non-authentic Card, the application will notify you that the authentication has failed and details for the current transaction will be given. Selecting "Back" will allow you to return to swipe another Card.

If you receive this message it is advisable to re-swipe the Card (please refer to Section 4.4 and the Troubleshooting section for possible problems with swiping). If the Card still cannot be authenticated, refer to your company policy regarding non-authenticated cards.

4.4 System messages appearing on your mobile phone WARNING MESSAGES

Security: connectivity not allowed



This screen will be displayed if you have either selected "No" when asked if you allow the application to use connectivity applications, or if you have selected "No" when asked if you allow the application to use the

network to send or receive data.

Authentication failed: application and reader do not match

This screen will be displayed if your mobile device ID and the SX21 Reader have not matched in the BATS Server database. The SX21 Reader you are currently



using will switch off. Selecting "OK" will close this prompt and allow you to search for another Reader.

Please swipe slower!



Your swiping speed is too fast. Please swipe again more slowly.

Please swipe faster!



Your swiping speed is too slow. Please swipe again faster.

Unrecognized barcode received. Please swipe again



The system has not been able to recognize the Barcode. Your swiping speed may be incorrect (see above) or the Barcode may be dirty.

- Check Barcode is clean and swipe again.

- Check your swiping action is correct. Refer to Section 4.1 for correct swiping technique.
- Check that the Card is oriented towards the Barcode Symbol on the Reader and that it is passing right through the optical sensor.
- If the problem persists please make sure that the card you are swiping is indeed a Bilcare nonClonable™ Card. All Bilcare nonClonable™ SXGP16C Cards use 16 digit Code 128C barcodes. Please check that the Barcode has 16 numeric digits printed on it.

ERROR MESSAGES

Pairing failed. Restart reader to try again



If the application detects that the Reader has switched off during the pairing process (for example if the battery is not sufficiently charged), you will be informed that pairing has failed. Selecting "OK" closes this

prompt and you will then need to restart the Reader (charging the battery if necessary) and proceed to search for the Reader as described above.

No Bilcare nonClonable™ tag reader found



You will be informed if the application cannot detect a Reader. This display will allow you to search again by selecting "Options" then "Search", exit the application by selecting "Options" then "Exit", or search directly for a Reader by selecting

"Search". If you are still experiencing problems, check

that the Reader is switched on and that the battery is charged.

Network communication error!



Your mobile phone is unable to establish a connection with the Internet. This may be because you are in an area of poor reception (network coverage). Another possibility is that the SIM card in your mobile phone does not have GPRS connectivity.

Contact your service provider to upgrade to activate GPRS on your SIM card, or to obtain a SIM card that is GPRS-enabled. You will also receive this message if the application fails to connect with the BATS Server. If you select "OK" you will be asked if you wish to send again.



This screen will be displayed if the application fails to connect with the BATS Server during the Card authentication process. Selecting "OK" closes this prompt and allows you to go back to swipe the Card again.

Entered passcode did not match. Pairing failed



You will be informed if pairing has failed due to an incorrect passcode and selecting "OK" will give you the option of retrying. Make sure that you have the correct Bluetooth passcode (default 0000) and enter it carefully.

Time Out: unable to communicate with BATS Server



This message will be displayed during the device/Tag authentication process if there has been a delay of more than 100/20 seconds since your request for communication with the BATS Server has been sent.

Selecting "OK" closes this prompt and the application will then ask if you wish to send again.



Invalid response from BATS Server

This message will be displayed if an invalid response is received from the BATS Server during the device authentication process.

Selecting "OK" closes this prompt and the application will then ask if you wish to send again.



The two messages on the left may also be displayed during the Card authentication process.



For both of these screens, selecting "OK" allows you to return to swiping a Card.

Domain name input error, please enter again!



If you incorrectly enter the domain name the very first time you use the application, you will be presented with this screen. Selecting "OK" will allow you to return to the previous screen where you can re-enter the

domain name. Check with your IT administrator if you are unsure of the domain name.

Reader service is not reachable. Restart reader to try again



If the pairing could not be completed because the SX21 Reader services could not be reached, the application will prompt you to restart your Reader and you will need to switch the Reader off then on

again to do this. Selecting "OK" closes this display and allows you to search for SX21 Readers.

Communication with reader lost!



A Bluetooth communication error has occurred during the Card authentication process. Try reconnecting to the Reader following the steps in Section 3.5.

4.5 Non-authenticated Card

To report a suspect Card, please refer to your company policy regarding non-authenticated Cards.

4.6 Maintenance of the Reader and battery

The Reader is powered by a rechargeable battery. Please charge the battery for at least 5 hours for first-time use. The full performance of a new battery is achieved only after two or three complete charge and discharge cycles.

Unplug the charger from the USB plug and the Reader when not in use. Do not leave a fully charged battery connected to a charger, since overcharging may shorten its lifetime. If left unused, a fully charged battery will lose its charge over time.

DO's and DONT's

- Only use the battery for its intended purpose. Never use any charger or battery that is damaged.
- Do not short-circuit the battery. Accidental short-circuiting can occur when a metallic object such as a coin, clip, or pen causes direct connection of the positive (+) and negative (-) terminals of the battery (these look like metal strips on the battery). This might happen, for example, when you carry a spare battery in your pocket or purse. Short-circuiting the terminals may damage the battery or the connecting object.
- Leaving the battery in hot or cold places, such as in a closed car in summer or winter conditions,

will reduce the capacity and lifetime of the battery. Always try to keep the battery between 15°C and 25°C (59°F and 77°F). A Reader with a hot or cold battery may not work temporarily, even when the battery is fully charged. Battery performance is limited in temperatures well below freezing – do not use your Reader at temperatures below freezing.

- Do not dispose of batteries in a fire as they may explode. Batteries may also explode if damaged. Dispose of batteries according to local regulations. Please recycle when possible. Do not dispose of as unsorted municipal waste.
- No water or moisture should enter into the Reader. The Reader has been designed to operate under normal room temperature and pressure and should not be used under extreme temperatures or humidity conditions – the Readers are designed to be used between 5°C and 50°C without any moisture condensation.
- Due to the sensitive nature of the identity information received via your SX21 Reader and mobile phone, no data or history is retained on the mobile phone following a Card swipe. You are advised not to record this information yourself, either in soft or hard format, as it could lead to potential security issues.

4.7 General care of your Bilcare nonClonable™ Reader SX21

The Bilcare nonClonable™ Reader SX21 is a precision instrument and should be treated with care. The suggestions below will help you protect your warranty coverage.

- Keep the Reader dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your Reader does get wet, remove the battery, and allow the Reader to dry completely before replacing it.
- Do not use or store the Reader in dusty or dirty areas. Its external parts and internal electronic components can be damaged. In particular always keep the slot and sensor area of the Reader clean.
- Do not store the Reader in hot areas, i.e. in direct sunlight. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics. Refer to Storage Conditions under Section 8.
- Do not store the Reader in high humidity. When the Reader returns to its normal temperature, moisture can form inside the Reader and damage electronic circuit boards. Refer to Storage Conditions under Section 8.
- Do not attempt to open the Reader under any circumstances.

- Do not drop, knock, or shake the Reader. Rough handling can break internal circuit boards and fine mechanics.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the Reader.
- Do not paint the Reader. Paint can clog the inner parts and prevent proper operation.
- Use a soft, clean, dry cloth to clean the Reader, ensuring that cloth strands are not left on the Reader, particularly not in the slot area of the Reader, after cleaning.

4.8 Bluetooth aspects

There may be restrictions on using Bluetooth technology in some locations. Check with your local authorities or service provider.

Using Bluetooth technology increases the demand on battery power. You are advised to switch your Reader off when it is not in use and to turn off the Bluetooth on your mobile phone when you are not intending to use your Reader for extended periods.

All of the above suggestions apply equally to your Reader, battery, charger, or any enhancement. If any part of this equipment is not working properly, contact Bilcare via our website: www.bilcaretech.com/technical_support/index.php for advice on servicing.



5. RECHARGING THE BATTERY

The swiping process takes up some power from the battery and you have to recharge the battery periodically. For this, use the cable provided along with the Reader. Insert the thin end of the cable into the Reader and connect the other end with the charger to a wall socket. See Section 3.4 for more details on charging the battery. The Reader also supports USB Charging; you may charge from a laptop or a Personal Computer by gently detaching the cable from the charger and plugging this end into the USB slot of the laptop/PC. You may use the Reader even as charging is in progress. If you do charge via your PC or laptop, be aware that charging times may vary according to your USB port current.



6. USB DATA TRANSFER

Although your Reader has a micro-USB connector it is not configured to transmit data via USB.



7. TROUBLESHOOTING

7.1 Mechanical Troubleshooting

Problem: I cannot remove/replace the Reader backing.

Solution: Carefully follow the instructions in Section 3.4 showing how to remove and replace the Reader

backing. In the image below, the backing has been replaced too far down the Reader and will not click back up into place. When removing the backing, gently slide the backing along in the direction of the arrow, until it “clicks” - you do not need to push the backing any further – and gently lift up from that position. Forcing or tugging will potentially damage the Reader.

Ensuring the sides of both the backing and the main part of the Reader are aligned, replace the backing, as shown above, and gently slide it along until it “clicks” back into place. There should be no gaps between the backing and the main part of the Reader.



7.2 Electronic troubleshooting

Problem: My Reader is not powering on.

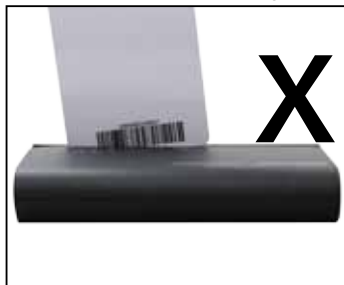
Solution: Your battery may have been discharged. Recharge the battery using the charger cable provided with the Bilcare nonClonable™ System. Refer to Section 3.4 in this User Manual for further information on charging your Reader battery.

Problem: When the Reader is switched on, the red LED stays on and is not replaced by a blinking green light.

Solution: The Reader is unable to self-calibrate. Switch the Reader off, make sure that nothing is in the Reader slot and switch the Reader back on again. If the problem persists, please refer to Section 1.3 of this User Manual for technical support information.

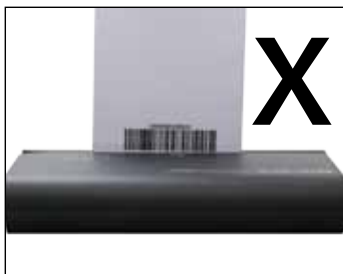
7.3 Swiping troubleshooting

Problem: I cannot complete a correct swipe.



Solution: Ensure you are applying the correct swiping method by referring to the information and images given both here and in the main swiping Section 4 of this User Manual.

In the image below, the card is positioned too far out of the Reader slot, so that the Tag on the Card does not make smooth, constant contact with the base of the



slot. This can happen if the Card is held too far to the back. Taking a firm, central grip on the Card, as shown in Section 4.1, facilitates a smooth swiping action.

If the Card is removed too early from the Reader, it cannot read the Tag properly and you will receive an error message. To remove the Card at the point depicted above would be too early. The Card must pass through the optical sensor indicated by the Barcode Symbol on the Reader and pass right through the Reader slot.

Please also remember that the Tag must be correctly oriented. The Barcode Symbol on the Reader indicates the placement of the optical sensor, which reads the Tag. The Barcode on the Card must face towards the Barcode Symbol and pass through the optical sensor for a successful swipe.

7.4 Connectivity and mobile phone troubleshooting

Problem: Every time I use the application, I always have to confirm that I both allow the application on my mobile to connect with the Reader and that I allow the application on my mobile to use the network to send and receive data.

Solution: You need to follow the 6 steps described in Section 3.3, which will permanently set your mobile to authorize the software. Once you have done this you will no longer be asked the above questions.

Problem: The Reader is not detected by the mobile phone for Bluetooth pairing.

Solution: Please make sure of the following: a) that the Reader is switched on and the green LED is blinking, b) that your mobile phone's Bluetooth is switched on (ensure that the Reader is within a 5 meter radius of the mobile phone).

Once both the Reader and mobile phone are switched on, pair them via Bluetooth using the steps outlined in Section 3.5. You can also refer to the information provided in Section 4.8. If you are still experiencing problems, try following the steps below:

Step 1: Go to the Bluetooth options in your mobile phone and make sure that your phone's Bluetooth is turned on. (Refer to your mobile phone user manual to activate Bluetooth connectivity).

Step 2: Now search for the Bluetooth devices in the vicinity. The Bilcare nonClonable™ Reader will come up as one of the devices detected. If the Reader does not appear, make sure a) that the Reader is on with the green LED flashing, b) that the mobile phone's Bluetooth is turned on and c) that the Reader and mobile phone are in close proximity.



Step 3: Choose the option to pair the Reader with your mobile phone. The Bluetooth application will ask you to enter the passcode. The default passcode is four zeros, i.e.: 0000. Key in the passcode, select “OK” and the Reader will be paired with the mobile phone through Bluetooth. (See the Screen display below). If you do not enter the correct passcode, you will be asked if you want to retry.

Problem: The message “Contacting remote database...” is displayed on the mobile phone for a long duration and the Card details do not come up.

Solution: This is most probably due to poor GPRS connectivity and may be the case when any of the sending messages appear for a long time. First try selecting “Cancel” and retry. If the problem persists, contact your service provider for GPRS settings.

Problem: The application on the mobile phone does not start.

Solution: This could be due to multiple applications running on the mobile phone. Consult your mobile phone user manual to terminate unwanted applications. The application may be corrupted. Please refer to Section 1.3 of this User Manual for technical support information.

Problem: The message “Please swipe Card” does not appear on the mobile phone.

Solution: This happens if the Reader is switched off or if it has exited the 5 metre radius of the mobile phone. Exit the application and verify that the Reader is accessible to the mobile by following the steps in Sections 3.5 and 4.8.



8. TECHNICAL SPECIFICATIONS

Bilcare Technologies strives to constantly improve its products and services, therefore the specifications of components within the Bilcare nonClonable™ System may differ from those provided in this User Manual. Details of new specifications and component numbers are available on the Bilcare website: www.bilcaretech.com/technical_support/index.php. Reader model SX21

Dimensions: 100 mm x 66 mm x 19 mm

Operating: Voltage 3.7V

Battery capacity: 1500 mAh

Battery type: Reader is powered by a custom Lithium-Ion battery

Communication: Bluetooth

Charger cable: Micro USB cable to charge the Reader

Operating Conditions

- Temperature: Min: 5 °C, Max: 50 °C
- Relative Humidity: No-condensation

Storage Conditions

Please discharge the battery fully prior to storage.

- Less than 1 month duration
Temperature: Min: -20° C, Max: 60° C
Relative Humidity: 20% to 90% relative humidity, no-condensation
- Less than 3 months' duration
Temperature: Min: -20° C, Max: 45° C
Relative Humidity: 20% to 90% relative humidity, no-condensation
- Less than 12 months' duration
Temperature: Min: -20° C, Max: 25° C
Relative Humidity: 20% to 90% relative humidity, no-condensation

8.1 Repair work

Only personnel authorized by Bilcare should repair the Reader. For technical support and other product enquiries please refer to the Bilcare Technologies website www.bilcaretech.com/technical_support/index.php.



9. WARRANTY

The warranty period for the Bilcare nonClonable™ Reader SX21 is 1 year from the date of purchase. The warranty period for all peripheral items accompanying the Reader, including the battery, is 6 months from

the date of purchase. Both are subject to the Terms and Conditions as laid out in the enclosed Warranty Certificate. Please fill in the purchase details as required on both parts of the Warranty Certificate and mail to Bilcare Technologies at:

Bilcare nonClonable™ Reader SX21 Warranty
Bilcare Technologies Singapore Pte Ltd
52, Changi South Street 1
Singapore 486161



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- 10.12 The Supplier shall not be liable in contract or in tort (including negligence or strict liability) or otherwise for loss of profits or revenue, costs associated with business interruption, loss of use of equipment or plant, cost of capital, cost of purchased or replacement equipment, loss of data, breach of security protocols or data encryption methods, claims of customers of the Purchaser, or for any special, indirect, incidental or consequential damages

including, but not limited to, injury or loss of life. The remedies of the Purchaser set forth in this EULA are exclusive and exhaustive and the total liability of the Supplier in connection with, arising out of, and/or in relation to the Software Product shall not exceed the price of the Software Product on which such liability is based.

- 10.13 Data services, hardware information, software information, network information, authentication information, verification information, transaction IDs, and verification of Tags/labels/objects ("Authentication Information") that the Software Product may process, present, display, report, infer or store are provided on an "as is" basis and only as an indication and no assurance or guarantee of validity or correctness is made or implied by the Supplier.
- 10.14 The User and The Purchaser agree to "Authentication Information" being transmitted to the Supplier by the network service selected either by default or by choice, and for the information to be processed by The Supplier and The Purchaser. The User and The Purchaser understand and agree that the "Authentication Information" may include the unique identity of hardware, the phone number of the mobile phone number/SIM card in use, the IP address of the hardware, the name of the service provider, the location of the hardware and details of the Tag/label being read, and that it is necessary to do so to provide the brand security service offered through the use of the Software Product. The User and The Purchaser understand and agree that the data associated with the use and transactions of the Software Product may be stored in an electronic database by the Supplier and/or the Purchaser for future analysis and reporting purposes. The User permits that the Supplier may use the "Authentication Information" to contact the User or the Purchaser in relation to the provision, enhancement or quality control of the Software Product of the services that are being supplied to the Purchaser.
- 10.15 In no event, whether as a result of breach of contract, tort

(including negligence) or otherwise, shall the Supplier have any liability whatsoever to any third party for any damages whether direct, indirect, special, incidental, consequential or otherwise.

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- 10.17 The Purchaser agrees and acknowledges that it is reasonable and fair that the business interests of the Supplier are protected by way of the various provisions herein and throughout this EULA which limit the quantum, scope and/or extent of the liability or potential liability to the Purchaser and/or third parties.
- 10.18 The terms and conditions set out in this EULA shall be subject to, governed by, and interpreted in accordance with the laws of the Republic of Singapore. The United Nations Convention On Contracts for the International Sale of Goods (Vienna, 1980) shall not apply to the Contract and is hereby expressly excluded.
- 10.19 All disputes, claims or proceedings between the Supplier and the Purchaser relating to the validity, construction or performance of the EULA shall be resolved, at the election of the Supplier, either by court proceedings, or by reference to arbitration in Singapore in accordance with the Arbitration Rules in Singapore International Arbitration Centre ("SIAC Rules"). Judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction over the parties or application may be made to any such court for a judicial acceptance of the award and an order for enforcement, as the case may be.

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