BioPointe

User's Manual

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Preface

Thank you for choosing the BioPointe Fingerprint Identification System by Keri Systems Incorporated. This device is not only simple to use, but it also provides a variety of versatile, flexible and powerful features at the same time. In this manual, you will learn about the features of the BioPointe, how to administer the BioPointe and how to communicate with the BioPointe.

Using the Manual

If you are reading this manual for the first time, we suggest you read it from the start to end in order to achieve an overall understanding of the features provided by the BioPointe.

However, if you are looking for specific information, you may turn to the Table of Contents to help you look for the information you want quickly. The Table of Contents is on the next page.

In the chapters to follow, you will see the following chapters. The synopsis describes what you can expect to find in each of these chapters:

- ***Chapter 1 - Getting to Know the BioPointe***
  Gives an overview of the BioPointe. Read this chapter to gain an overview of the device.

- ***Chapter 2 - Getting Started***
  Gives a quick and concise introduction to what you need to do to get started when you first receive the device.

- ***Chapter 3 - Features***
  Gives a detailed description of the features provided by the BioPointe. The description is divided into sections according to each feature. Read all or the relevant sections you need.

- ***Chapter 4 - Administering the BioPointe***
  Shows you how you can access the functions within the BioPointe such as enrollment. Read this chapter to get started on enrolling the first fingerprint of the device.

- ***Chapter 5 – Performing Authentication on the BioPointe***
  Shows you how to use the device for fingerprint, card or card with PIN authentication.

- ***Chapter 6 – Configuring the BioPointe***
  Gives a description on how you can connect interfacing cables to the control board. Also covers DIP switch settings.

- ***Chapter 7 – Communicating with the BioPointe***
  Gives a description on how to communicate with the device with RS232, RS4422 and RS485.

- ***Chapter 8 – Interfacing to a Keri System Controller***
  Gives a description on how to interface to a Keri System Controller.

- ***Chapter 9 - Technical Specifications***
- ***Chapter 10 - Troubleshooting***

- ***Appendix A – Log Types in BioPointe***
- ***Appendix B – Configuring the ADAM 4520***
- ***Appendix C – Communicating in RS422 and RS485***
- ***Appendix D – Communication Using Modem***

Table Of Contents

Chapter 1

1 Getting to Know The BioPointe

Introduction

The BioPointe is a fingerprint identification device designed for use in access control. It relies on 3 LEDs to convey status information to the user. Depending on the color and speed of the blinking LEDs, different statuses are conveyed.

1.1 How The BioPointe Works

Types of Authentication Properties

The BioPointe is able to perform three types of ***authentications***. The three types are:

- Fingerprint
- Card Only
- Card with PIN

Each of these authentication properties is associated with an ID. For fingerprint enrollment, each ID can be enrolled with up to 3 different fingers, unless the ID is for a Master. You will come across terms like a Master and a User. The difference between a Master and a User is described later.

The other two authentication properties, Card Only and Card with PIN are necessary in order to cater for some people whose fingerprints cannot be enrolled at all.

Device Master and User

When you are enrolling using fingerprint, you can choose to enroll as a Master, or as a User. A Master is someone whose fingerprint is allowed to enter the administration or master mode of the device. When this administration mode is entered, he can enroll other Users. A User, on the other hand, does not have this privilege access.

Unlike a User, each Master can only be enrolled with one fingerprint. The BioPointe can enroll up to a maximum of 5 Masters fingerprints.

With up to 5 Masters, you can assign more than one person to administer the device.

Local Enrollment and Central Enrollment

The system is designed to cater for both local and central enrollment. By central, it means that the users of the device are enrolled centrally on a host PC. Their authentication properties are then downloaded by means of a communication link, to the BioPointe.

Central enrollment requires the use of the central enrollment software, known as BioPointe Central. For local enrollment, you can refer to *Chapter 4 - "Administering The BioPointe"*.

Communicating With The BioPointe

As mentioned, the authentication properties can be downloaded using a communication link. This link can be RS232, RS422 and RS485.

Transaction Logging

Every time a user successfully verifies his authentication property at the device, a transaction log is recorded. This log remains in the device in a round-robin flash storage. The role of the host software is to upload the log from the device to the host PC.

Event Logging

Besides the transaction logs, there is also another category of logs which is known as Event Logs. Event logs are recorded whenever any exceptional events happen. An example of such and event is when an alarm is triggered.

For a full listing of the different types of event logs, you can refer to the Appendix.

Wiegand Interface To Keri Systems Controllers

The BioPointe provides a Wiegand interface to a Keri System Controller. The Wiegand signals are sent out upon a successful verification of the authentication property.

Chapter 2

2 Getting Started

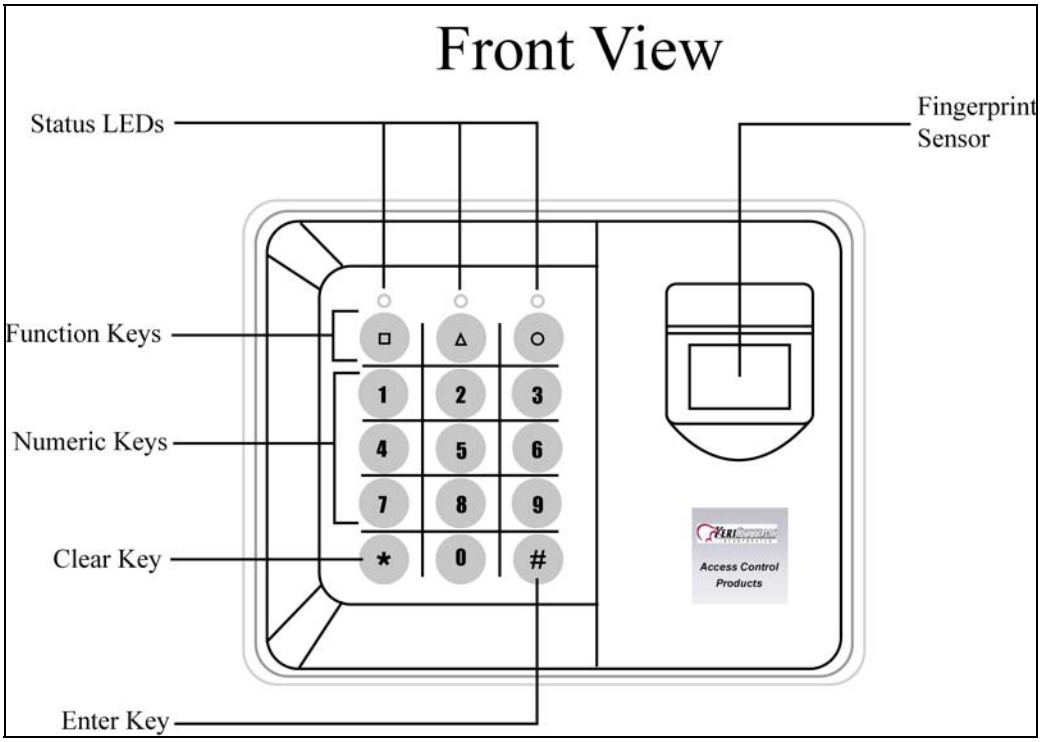
2.1 Unpacking And Initial Inspection

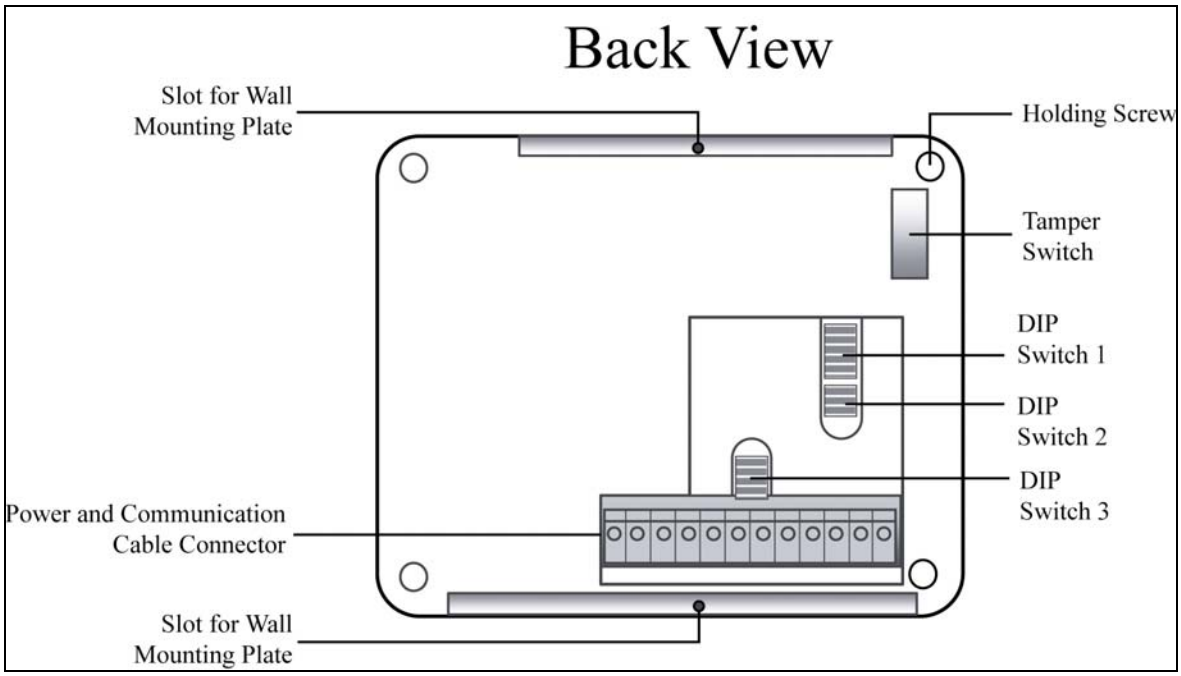
The following items are included in the packing box:

- Packing List
- BioPointe Unit
- CDROM (User's Manual)
- Warranty Statement

Verify the items against the packing list and inform us if there is any discrepancy immediately.

2.2 Identifying the Parts





2.3 Applying Power

Safety instructions

It is necessary to take special precautions to avoid the introduction of hazards while operating, installing, maintaining, transporting or storing the device.

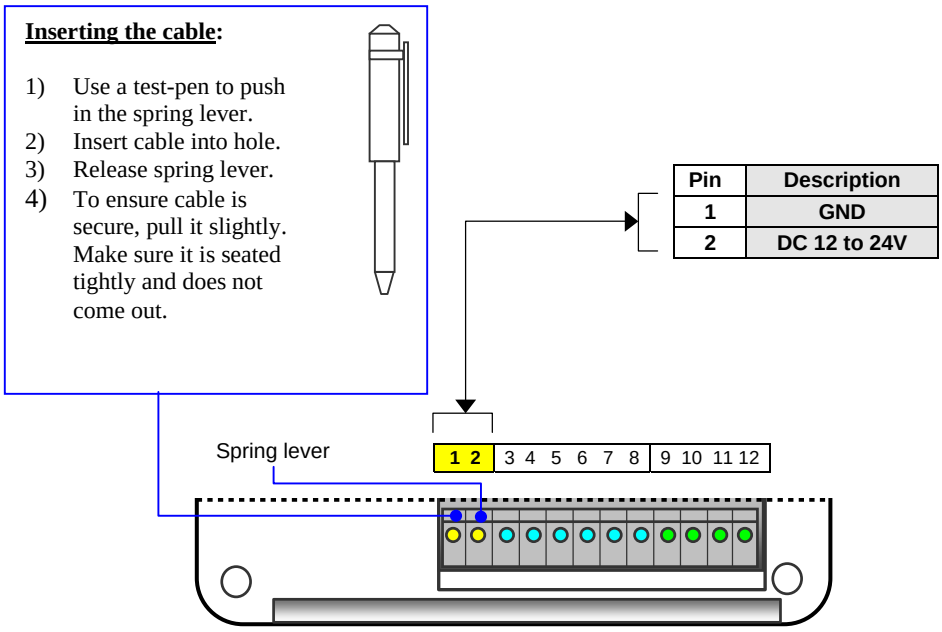
The power supply that is used should have an output voltage of between 12V to 24VDC rated at 1.0A (please refer to the *Technical Specifications* for more details).

[WARNING!]
Make sure the mains supply voltage rating of the power adapter is suitable for the supply voltage in your country before you power on. When in doubt, you should consult your local representative for advice.

Steps for Applying Power

Step 1: Ensure that the power adapter is powered off.

Step 2: Insert the two wires of the power adapter correctly into the connector.



Step 3: Switch on the power to the adapter.

When the device is powered on, all three LEDs will be blinking continuously in red color.

When the device is ready, the first LED will turn to steady amber color while the second and third will be turned off. However, if the first LED is blinking periodically in red color instead of being steady amber, it is likely that the tamper switch is opened.

If you want the first LED to stop blinking in red attach the C-bracket so that the tamper switch is set, or disable the alarm through the device settings (see *Chapter 4 – Administering the BioPointe*).

2.4 Typical Setup For Use in Door Access

The figure below shows a typical setup of the BioPointe device used for access control. It consists of a communication link from the BioPointe Central software to communicate with the device, as well as a Wiegand line to a controller. The following steps are in no particular order.

Step 1 – Enroll fingerprints (authentication properties):

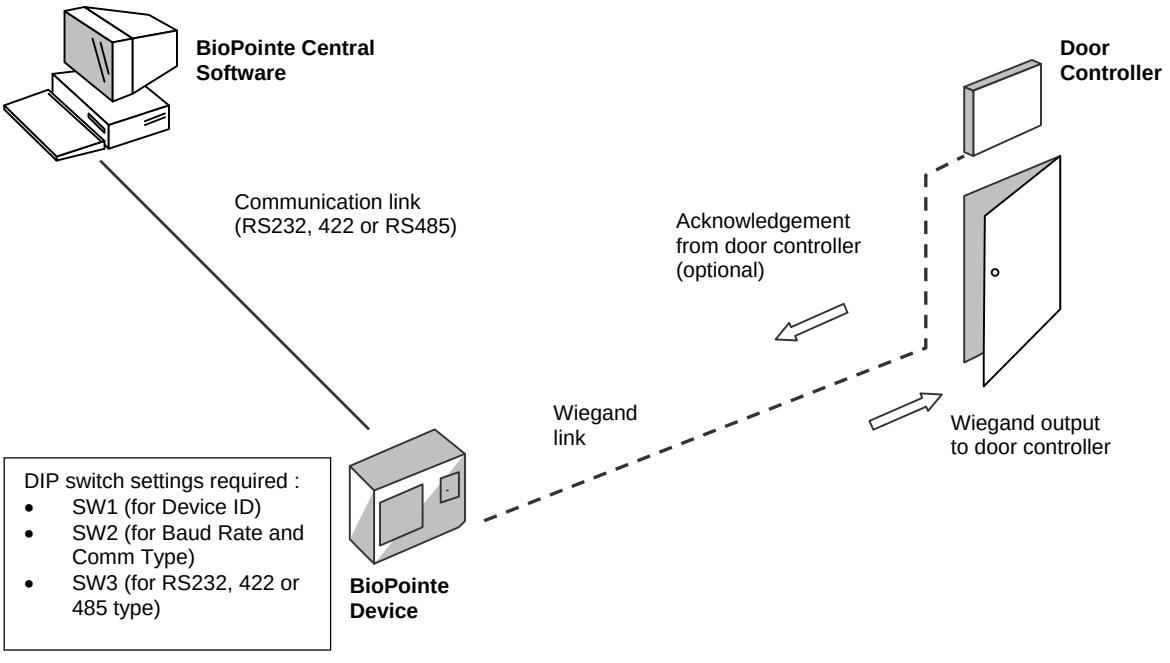
In order to start using the device, fingerprints or any other authentication properties (that is card or card with PIN) need to be enrolled. The fingerprints and other authentication properties can be enrolled locally on the device or remotely using the central enrollment feature in the BioPointe Central software. You can refer to Chapter 3-1 to 3-3 for a description on managing authentication properties, local administration as well as remote administration.

Step 2 - Set up the communication link:

To successfully setup the communication link, the appropriate device ID, baud rate, type of communication and the serial interface type have to be configured. This can be done through the DIP switches located on the back of the BioPointe device. Refer to *Chapter 6 – Configuring the BioPointe* or *Chapter 7 – Communicating with the BioPointe* to find out how to set the DIP switches.

Step 3 - Set up the Wiegand link:

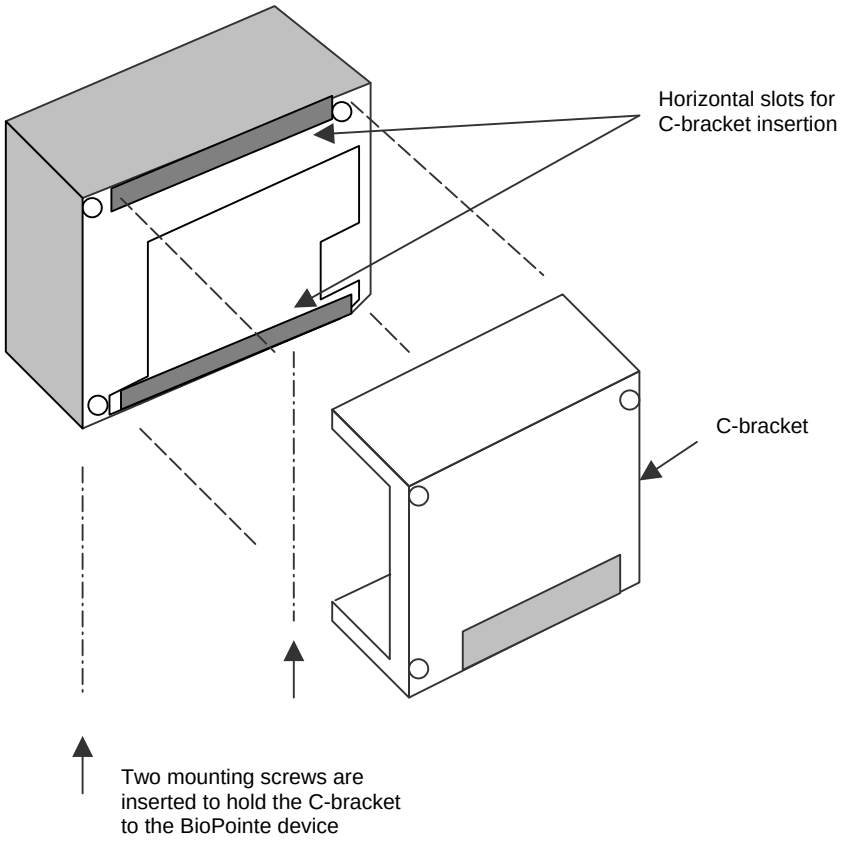
Having setup the communication link, you will also need to wire the Wiegand output from the BioPointe device to the controller. Refer to *Chapter 8 – Interfacing to a Keri System Controller*.



Typical Setup for Door Access

2.5 Mounting The BioPointe

The figure below shows how the BioPointe can be mounted using the C-bracket.



Mounting The BioPointe using the C-bracket

Chapter 3

3 Features

The BioPointe functions are designed as an access control device aimed to provide irrefutable personal identification using fingerprints. Its system architecture includes the fingerprint identification technology, the recording of event logs, the interfacing to security panels and so on. In this chapter, you will learn about the variety of features that make up the system.

List of Features

The following table lists the features of the BioPointe, and also provides a quick reference to what you can expect to find within the device. In the table, you will find next to each entry a reference to a specific sub-section. The sub-section describes the particular features.

	Feature Group	Section
1	***Authentication and Managing Authentication Properties*** • *Door Access Authentication* (using fingerprint, card only or card with PIN) • Multiple Fingerprints Verification • Quick Search • One-To-Many Search	3.1
2	***Local Administration from Device*** • *Master Authentication* • Enroll, delete user and basic local configurations	3.2
3	***Remote Administration from Host Program*** • Communication Authentication Mode	3.3
4	***Transactions and Trace Events Logging***	3.4
5	***Interfacing with Keri System Controllers through Wiegand***	3.5
6	***Usage of Other Auxiliary Devices*** • Legic, Mifare, Mag stripe, and Barcode readers.	3.6

3.1 Authentication and Managing Authentication Properties

The BioPointe is designed to refute unauthorized access using fingerprint authentication. However, the device also caters to the use of a non-fingerprint medium.

As you have seen briefly, the BioPointe also supports the use of card only and card with PIN authentication. The type that is being used is defined during the enrollment process.

As you read this section and the next few, you will come across the term 'authentication' quite frequently. The various types of authentication can be grouped as follows:

- ***Door Access Authentication***

Fingerprint, card only and card with PIN authentication are grouped under this, since they essentially involve authenticating you to gain access, regardless of whether you are enrolled with fingerprint, card only or card with PIN.

- ***Master Authentication***

A master authentication involves ascertaining whether you have the device administrator rights to administer the device.

- ***Door Access Authentication Time-Zone Control***

Door Access Authentication Time-Zone Control is similar to Door Access Authentication except that the first type checks a user against schedule that he or she is assigned to before granting access, while the second type does not.

In this section, you will learn more about *Door Access Authentication* only. The other two types of authentication will be described in the next few sections.

3.1.1 Fingerprint Authentication

For fingerprint authentication, each user will be assigned with a unique ID (not necessary a secret ID). The number of digits to use for the ID is 4 by default. However, the ID can be configured to be in other number sets, in the range of 3 to 10, using the BioPointe Central software.

The fingerprint authentication operation begins when the User provides the ID (either by entering keys or scanning a contactless card). The device will check whether the ID has already been registered in the device. If the entered ID is valid, it will activate the fingerprint sensor to capture the live fingerprint. The fingerprint authentication operation completes with the result being shown on the LEDs.

Up to Three Fingerprints can be enrolled for each ID

Each ID can be associated with a maximum of three fingerprint templates. During the authentication operation, the device will match the live fingerprint with the entire associated fingerprints automatically. Matching speed will be fastest if the first fingerprint (primary fingerprint) matches. Otherwise, any subsequent matching will take up a little more time. This is one of the most powerful features provided by the BioPointe.

Multiple Fingerprint Verification

In usual operation, the BioPointe only matches a single fingerprint to successfully pass a verification process. However, it can be configured to match two or even three fingerprints before a verification process can be considered as successful.

In such a mode, the user has to enroll this ID with the same number of fingerprints that it is matching with, or more. For example, if the BioPointe is configured to match two fingerprints, this ID must be enrolled with *at least* two fingerprint templates. If it is configured to match three fingerprints, three fingerprint templates must be enrolled.

During the matching process, the fingerprints that are provided need not be in the order that they were enrolled.

Note that the three fingerprint templates that were enrolled for a particular ID can come from the same person, or from up to three different persons. This powerful feature allows the BioPointe to be deployed in areas of higher security where more than one person is required to authenticate.

Note that for master authentication, only one fingerprint matching is required.

Quick Search

In a usual verification process, the user enters his or her full ID. The BioPointe provides a feature where you only need to enter a trailing part of your ID to activate a match.

Hence, if your ID is 1234, you only need to press "34" to begin matching, the BioPointe will search its fingerprint database (in the device) for all the IDs that ends with "34" to find the correct fingerprint template that matches the live finger. This feature is useful in applications when long digits are used for the ID.

One-To-Many Search

Another advanced feature to take note of is the one-to-many search capability provided by the BioPointe. This mode is also known as *identification* as opposed to *verification.*

An ID is not required during one-to-many fingerprint matching operation. It works by searching through the complete fingerprint database to look for the matching fingerprint template. This is an effective tool to replace the need for remembering IDs.

One-to-many search is operated on a higher level of stringency as compared to verification. Therefore, the rejection rates will be higher. In addition, searching time increases with the number of fingerprints registered in the device.

3.1.2 Card Authentication

Besides fingerprint authentication, you are also allowed to enroll the user to authenticate using a contactless card combined with a PIN or just the contactless card alone. Every contactless card carries a unique ID.

The security level provided by this mode of authentication also depends on the type of card being used. Some cards store more (or unique) information than the others. For example, if a Wiegand card is used, the device can extract the unique system code and site code (depending on the Wiegand format supported by the card) besides the card ID. During the enrollment, this information will be stored in the device and it will be used for verification later.

3.1.3 Card with PIN Authentication

For the card with PIN authentication, each card registered into the device is associated with a six digits PIN number (provided during the enrollment stage), which the User must key-in to complete the presentation. The device will then check the database for authenticity when the User enters his PIN.

3.2 Local Administration from Device

Local administration means tasks can be performed at the device without the need for a host program.

Master Authentication

Before any of these tasks can be performed, a master authentication is first carried out. The master authentication allows the device administrator to enter the device administration mode, which permits the device administrator to register new Master or User and access the device basic configurations.

Each device can register up to a maximum of five Master fingerprints. You are designated as the device administrator once your fingerprint is enrolled as a Master fingerprint.

During registration, each master has to provide a unique ID (Master ID). This Master ID will not be required during the authentication to get into the administration mode. However, the Master ID is still required when the administrator uses this particular ID during authentication for access control.

Tasks that can be Administrated Locally

The tasks that you can do at the device are listed out as follows. These tasks are described in greater detail in Chapter 4.

- Enroll, delete any of three different authentication properties
- Delete the entire database
- Configure basic settings

3.3 Remote Administration from Host Program

The BioPointe device provides two modes of communication channel so that the remote PC can connect to the device to perform administrative function and upload log records from the device.

The serial interface supports the RS232, RS485 and RS422 specification. In order to prevent unauthorized access to the device from remote PC, the authentication protocol is added to the communication protocol.

Communication Authentication Mode

If the *Communication Authentication Mode* is enabled, the device will only accept command from the remote PC only if the PC has successfully authenticated the device through the Start Authentication[1] sequence. If the start authentication sequence is successful, the device will be able to process all subsequent commands it received.

Take note that all subsequent commands must be send back-to-back within the next five seconds i.e. before the remote PC closes the communication channel. The End Authentication sequence command must be sent to the device (to terminate the sequence) so that other PC connected to the same network will not be able to access the device unless it has started another authentication sequence successfully.

Note that BioPointe Central will handle the above procedure. However, the administrator is required to register his or her fingerprint into the BioPointe Central database (from the User Setup option provided by the BioPointe Central application). The registered finger will then be sent to the BioPointe device for authentication before the device can accept any other commands.

[1] The Start Authentication Sequence and End Authentication Sequence commands are transparent from the user of the BioPointe Central.

3.4 Logging of Transactions and Trace Events

The BioPointe device handles three types of log records listed as follows:

- ***Transaction Log***
  A transaction log is recorded upon a successful Door Access Authentication or Door Access Authentication Time-Zone Control. Each log contains the ID of the user performing the authentication, as well as the date and time.

- ***Trace Event Log***
  A trace event log is recorded whenever any critical event has occurred during local administration or during operation (such as when the device was being tampered with).

- ***Fail Attempt Log***
  A fail attempt log is recorded when the authentication process fails.

The BioPointe allocates a storage space for ***22000*** log records before they are over-written by a first-in-first-overwritten basis. As a system administrator, you ought to upload the log record to the host database periodically. Logging of the Trace Event and Fail Attempt can be disabled if these logs are not required. You can refer to the Appendix for a full listing of the types of logs.

3.5 Interfacing to Keri System Controller

The BioPointe device supports the following Wiegand formats to interface to a Keri System Controller:

- ***26 Bits Standard***
- ***26 Bits Vendor 1***
- ***35 Bits Standard***
- ***36 Bits Standard***
- ***37 Bits Standard***
- ***40 Bits Standard***

When Wiegand output is enabled, the device will be able to generate and send the Wiegand data (ID with site code and system code) to the external controller upon a successful authentication. The type of external controllers used must be able to support the above Wiegand formats.

Chapter 4

4 Administering The BioPointe

Introduction

This chapter describes how you can perform a range of administration tasks from the device. For example, you can enroll authentication properties, or have them deleted from the device. In addition, you can also configure certain settings like the *Communication Authentication Mode* (see Chapter 3.3) or the *Fingerprint Identify Mode* (see Chapter 3.1.1).

4.1 Understanding the Administration Modes

All the tasks that you can administer at the BioPointe device are collectively known as the *Administration Modes*. This section describes the various types of Administration Modes and how you can get into them.

Only a Master can administer the Device

For security, only a Master can administer the device. As such, as you enter any of the administration modes, a Master fingerprint authentication will be carried out first.

Types of Administration Modes

The various administration modes can be categorized into 2 types, namely *Configuration* and *Enrollment*. Each Administration Mode is associated with an Administration Number. Please refer to the tree diagram for the complete list of the various modes.

The Administration Modes of the BioPointe

Administration Modes

Enrollment

Press the ○ key twice followed by the admin number.

Admin No.	Mode
1	Enroll Master Finger
2	Enroll User Finger(s)
3	Enroll Card Only
4	Enroll Card + PIN
5	Delete User
6	Delete All

Configuration

Press the △ key twice followed by the admin number.

Admin No.	Mode	After master authentication, press relevant mode followed by # key.
1	Config Comms Authentication	Modes: a) 1 – Normal b) 2 – Normal with authen
2	Config Identify Mode	Modes: a) 0 – Disable b) 1 – Enable
3	Config Security Level	Modes: a) 1 – Normal b) 2 - High
4	Enable or Disable Alarm	Modes: a) 0 – Disable b) 1 - Enable
5	Erase All Logs	-

Getting into an Administration Mode

To get into any Administration Mode, press the second or third function key twice followed by the relevant Administration Number using the numeric key.

If the device does not contain any master fingerprints, only entry into Administration Mode 1 will be allowed. In such a case, the first person to access Mode 1 would be asked to enroll himself as the first Master.

On the other hand, if the device already contains one or more master fingerprints, a master authentication will be carried out. Upon passing the authentication, you would then be allowed to perform the operation associated with the chosen Administration Mode.

4.2 Interpreting the LEDs

The three status LEDs on the BioPointe are used to convey different status interpretations.

- First LED is used to indicate the *Device Status.*
- Second LED is used to indicate an *Action* to be taken.
- Third LED is used to indicate a particular *Mode* (or *State*).

The different interpretations act as guidelines while you are in any of the Administration Modes.

Each LED can be displayed in 3 different colors or be switched off simply. The colors can be:

- Red
- Amber
- Green

At any time, each LED can be in one of the following state:

- Stationary
- Blinking fast
- Blinking slow

The combination of color and state together helps you to navigate through the Administration Modes. In addition to using the LEDs, the buzzer from the BioPointe is also used to indicate different status. A *short* buzzer sound usually indicates a pass status, while a *long* buzzer sound usually indicates a fail status.

4.2.1 Table of LED Status (For Administration Modes Only)

The following tables list all the different statuses that the BioPointe can be in. You can use these tables to help you interpret the status conveyed at any point while you are administrating the device. This table is only applicable to administration.

For ease of reference, there is a separate table in Chapter 5 – "*Performing Authentication in the BioPointe*". This table is applicable when the user is performing authentication on the device.

The following describes what each LED is used for:

- **LED 1** is usually used to indicate ***pass*** or ***fail*** status.
- **LED 2** is used to indicate the ***action*** waiting for you to carry out. For example, when it blinks slowly in red, it means that the device is waiting for you to enter the desired ID of the master or user that you are going to enroll.
- **LED 3** is used to indicate the type of ***mode*** you are in. For example, when you have just entered into administration mode 1 (to enroll master), you can know this by its amber color and its slow blinks.

Table 1: For the Enrollment Administration Modes

LED 1 (Device Status)		
Steady Light	*Amber* *Green* *Red*	Device Ready (in Normal Mode) OK Not OK
LED 2 (Action)		
Steady Light	*Amber* *Green* *Red*	Enroll first finger Enroll second finger Enroll third finger (The above are 1 sec steady light followed by "Place finger on sensor" LED.)
Slow Blinking	*Amber* *Green* *Red*	Enter PIN - Enter ID
Fast Blinking	*Amber* *Green* *Red*	Waiting for Hex # key (3 times) Waiting for Hex # key (1 time) Place finger on sensor
LED 3 (Mode)		
Steady Light	*Amber* *Green* *Red*	Enroll User Enroll Card Enroll PIN
Slow Blinking	*Amber* *Green* *Red*	Enroll Master Delete Record Deleting all in progress
Fast Blinking	*Amber* *Green* *Red*	- - -

Table 2: For the Configuration Administration Modes

LED 1 (Device Status)		
Steady Light	*Amber* *Green* *Red*	Device Ready (in Normal Mode) OK Not OK
LED 2 (Action)		
Steady Light	*Amber* *Green* *Red*	- - -
Slow Blinking	*Amber* *Green* *Red*	- Enter Comm Authentication Mode number *or* Enter Fingerprint Identify Mode number *or* Enter Security Level *or* Disable or enable alarm (enter the mode number) -
Fast Blinking	*Amber* *Green* *Red*	Waiting for Hex # key (3 times) Waiting for Hex # key (1 time) Place finger on sensor
LED 3 (Mode)		
Steady Light	*Amber* *Green* *Red*	Set Comm Authentication Mode Set Fingerprint Identify Mode Set Security Level Mode
Slow Blinking	*Amber* *Green* *Red*	Enable or disable alarm mode Erase log records mode Erase all log records in progress
Fast Blinking	*Amber* *Green* *Red*	- - -

Notations Used for LED Status and Buzzer Sound

In the rest of this chapter, detailed steps are provided to help you to navigate through the various Administration Modes. You may take note of the following notations for the LED and buzzer sound that would be used in the description.

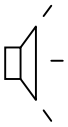
***Color** :*

Amber	 AMBER
Green	 GREEN
Red	 RED

***State** :*

Stationary	 GREEN
Slow Blinking	 GREEN
Fast Blinking	 GREEN
Off	 *Has no color indication

***Buzzer**:*

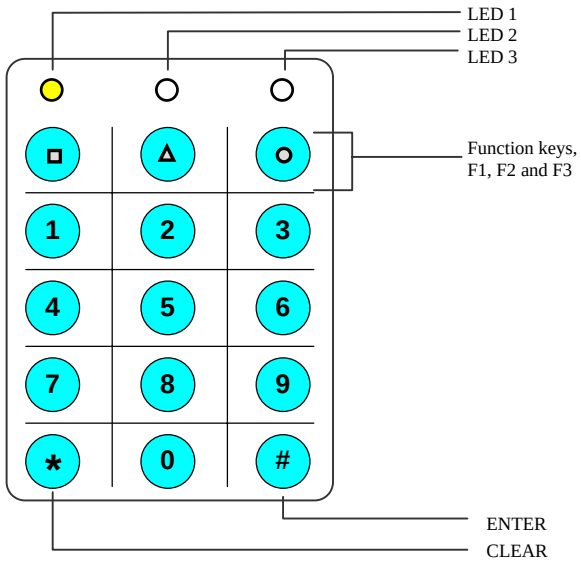
Short	
Long	

4.3 Using the Keypad

The following diagram shows the BioPointe keypad. There are three function keys. The first function key,  is used for performing Quick Search and One-To-Many matching. For more detailed information in using this key, please refer to Chapter 5 on "*Using the BioPointe*".

While the configuration of the device and the enrollment of authentication properties can be totally performed from the interfacing software, the BioPointe does also cater to some minimal level of standalone capabilities. This is provided through the use of two other function keys that serve to configure basic parameters and to enroll authentication properties locally.

The second,  and the third  function keys are used respectively for such configuration and enrollment.



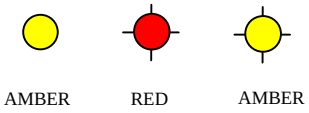
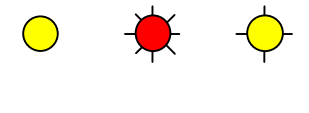
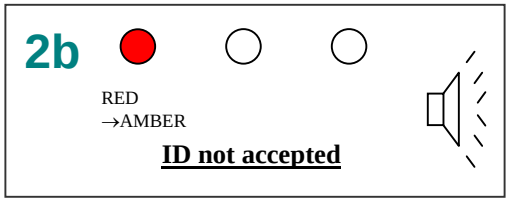
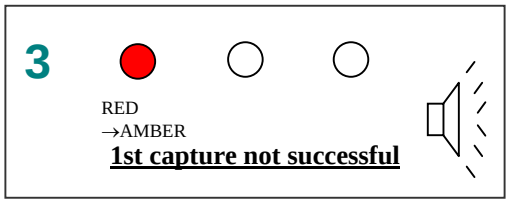
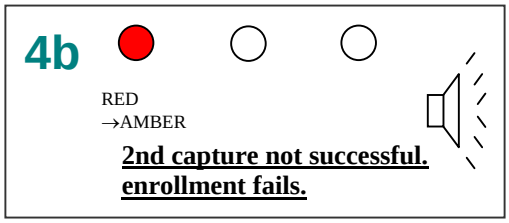
KEY	Purpose
□	➢ Quick Search & One-To-Many matching
△	➢ Configuration
○	➢ Enrollment and Deletion
*	➢ Clearing keys previously pressed
#	➢ For "confirming" to a key value while in the administration mode

Parts of the keypad

4.4 Using the Administration Modes (Enrollment)

4.4.1 Enrolling the First Master of the Device

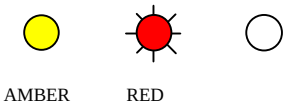
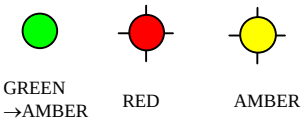
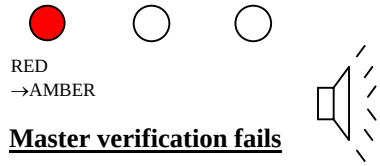
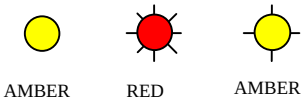
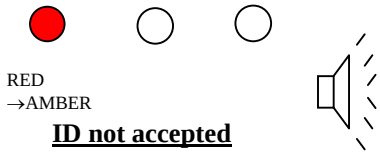
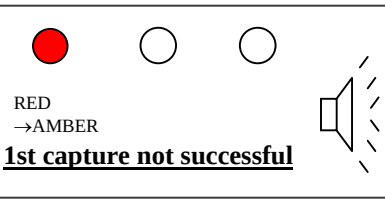
When you first receive the device, there are neither any master nor any other fingerprints within it. The steps below show you how to enroll the first Master.

Steps	LED and Buzzer Status
1 **Press**  ,  ,  . The LEDs will light up as shown in *1*.	**1**  AMBER RED AMBER
2 **When the 2nd LED starts to blink slowly in red, Enter a 4-digit[2] ID.** a) If the 4-digit ID is accepted, the 2nd LED will blink fast in red as shown in *2(a)*, and the sensor will light up. Proceed to step 3. b) If the ID is not accepted, the 1st LED will blink red briefly as shown in *2(b)*. Operation will cease and return to normal mode.	**2a**  AMBER RED AMBER  **2b** RED →AMBER **ID not accepted**
3 **Place your finger on the sensor for the enrollment when the sensor lights up.** Each successful enrollment requires 2 image captures. a) The sensor will go off after the first image has been successfully captured, and a series of beep sound will be heard. Proceed to step 4. b) If the first capture is not successful, the 1st LED will blink red briefly as shown in *3*. Operation will cease and return to normal mode.	 **3** RED →AMBER **1st capture not successful**
4 **Lift up your finger when you hear the series of beep sound and place it back on the sensor when it lights up again.** This is for the second capture. a) If the 2nd capture is successful, the 1st LED will blink green briefly as shown in *4(a)*. The enrollment is successful. Operation will return to normal mode. b) If the 2nd capture is not successful, the 1st LED will blink red briefly as shown in *4(b)*. Operation will cease and return to normal mode.	**4a**  GREEN →AMBER  **4b** RED →AMBER **2nd capture not successful. enrollment fails.**

[2] The number of digits, by default is 4. But it can be changed by BioPointe Central. The range can be from 3 to 10 digits.

4.4.2 Enrolling a Next Master

When there are already one or more masters in the device, enrolling subsequent masters will first require a master fingerprint verification. The following steps describe how to enroll subsequent masters.

Steps	LED and Buzzer Status
1 **Press**  ,  ,  . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be placed and verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2a**  **2b** 
3 **When the 2nd LED starts to blink slowly in red, Enter a 4-digit ID.** a) If the 4-digit ID is accepted, the 2nd LED will blink fast in red as shown in *3(a)*, and the sensor will light up. Proceed to step 4. b) If the ID is not accepted, the 1st LED will blink red briefly as shown in *3(b)*. Operation will cease and return to normal mode.	**3a**  **3b** 
4 **Place your finger on the sensor for the enrollment when the sensor lights up.** Each successful enrollment requires 2 image captures. a) The sensor will go off after the first image has been successfully captured, and a series of beep sound will be heard. Proceed to step 5. b) If the first capture is not successful, the 1st LED will blink red briefly as shown in *4*. Operation will cease and return to normal mode.	**4** 

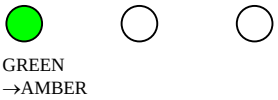
5 **Lift up your finger when you hear the series of beep sound and place it back on the sensor when it lights up again.**

This is for the second capture.

a) If the 2nd capture is successful, the 1st LED will blink green briefly as shown in 5*(a)*. The enrollment is successful. Operation will return to normal mode.

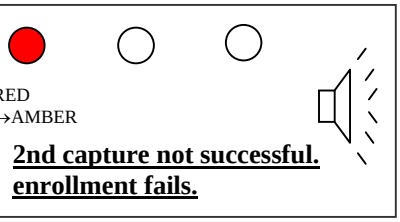
b) If the 2nd capture is not successful, the 1st LED will blink red briefly as shown in 5*(b)*. Operation will return to normal mode.

5a



GREEN
→AMBER

5b

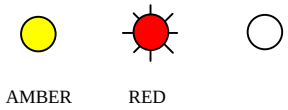
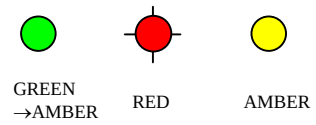
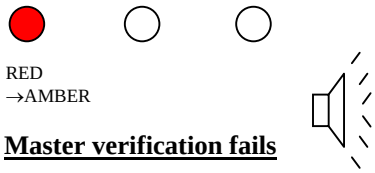
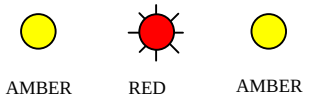
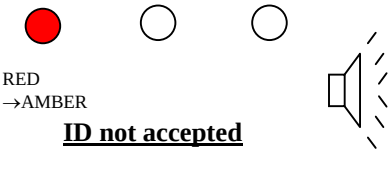
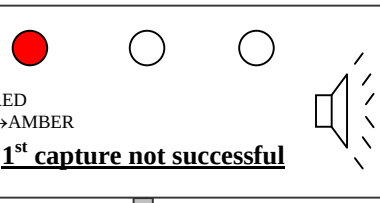
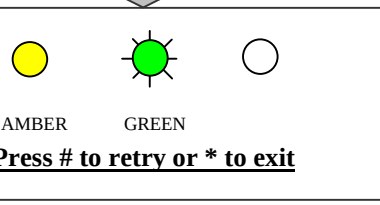


RED
→AMBER

2nd capture not successful. enrollment fails.

4.4.3 Enrolling a User with 1 to 3 Fingerprints

The following steps describe how you can enroll a user with fingerprint. Each user can be enrolled up to **3** fingerprints. You can choose to enroll just **1** or **2** in any case by quitting the enrollment process after you have enrolled the desired number.

Steps	LED and Buzzer Status
1 **Press** 0 , 0 , 2 . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2a**  **2b** 
3 **When the 2nd LED starts to blink slowly in red, Enter a 4-digit ID.** a) If the 4-digit ID is accepted, the 2nd LED will blink fast in red as shown in *3(a)*, and the sensor will light up. Proceed to step 4. b) If the ID is not accepted, the 1st LED will blink red briefly as shown in *3(b)*. Operation will cease and return to normal mode.	**3a**  **3b** 
4 **Place your finger on the sensor for the enrollment when it lights up.** Each successful enrollment requires 2 image captures. a) The sensor will go off after the first image has been successfully captured, and a series of beep sound will be heard. Proceed to step 5. b) If the first capture is not successful, the 1st LED will blink red briefly as shown in *4*. The 2nd LED will next blink fast in green. While this LED is blinking fast in green, press # to retry or * to exit. If the # key is pressed, repeat step 4. If the * key is pressed, operation will cease and return to normal mode.	**4**  

5 **Lift up your finger when you hear the series of beep sound and place it back on the sensor when it lights up again.**

This is for the second capture.

a) If the 2nd capture is successful, the 1st LED will blink green briefly as shown in 5*(a)*. The enrollment is successful. The 2nd LED will blink fast in green next. Proceed to step 6.

b) If the 2nd capture is not successful, the 1st LED will blink red briefly as shown in 5*(b)*. The 2nd LED will blink fast in green next. Proceed to step 6.

6 **Press # to enroll the 2nd finger, or to re-enroll the current 1st finger that was not successfully done so earlier.**

Or,

Press * to exit.

If the # key was pressed, the 2nd LED flashes briefly in the color associated with the finger that it will enroll next. The color is *amber* for the *first* finger, *green* for the *second* finger, and *red* for the *third* finger. Proceed to step 7.

If the * key was pressed, however, operation will cease and return to normal mode.

7 **Place your finger on the sensor for the 2nd finger enrollment when it lights up.**

As before, each successful enrollment requires 2 image captures. The sensor will go off after the first image has been successfully captured, and a series of beep sound will be heard. Proceed to step 8.

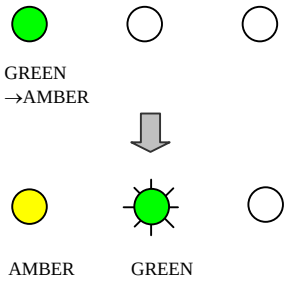
8 **Lift up your finger when you hear the series of beep sound and place it back on the sensor when it lights up again.**

Steps 7 and 8 are similar to steps 4, 5 and 6.

9 **Repeat steps 6, 7 and 8 to enroll the 3rd finger, or to re-enroll the current 2nd finger if it was not successfully done so earlier.**

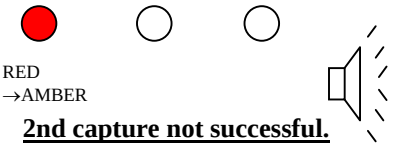
If the 3rd finger was successfully enrolled, operation will cease and return to normal mode.

5a

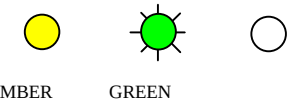


Press # to enroll 2nd finger, or * to exit

5b



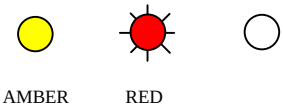
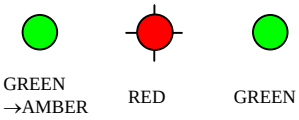
2nd capture not successful. enrollment fails.



Press # to re-enroll 1st finger, or * to exit

4.4.4 Enrolling a User with Card Only

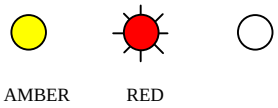
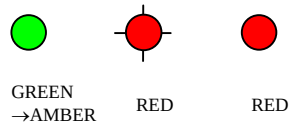
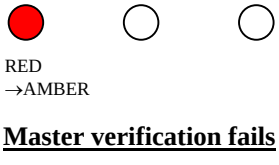
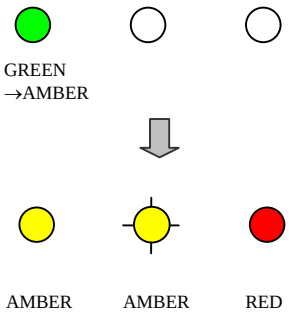
The following steps describe how to enroll a user with card only access.

Steps	LED and Buzzer Status
1 **Press**  ,  ,  . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1**  AMBER RED
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2a**  GREEN →AMBER RED GREEN **2b**  RED →AMBER **Master verification fails**
3 **When the 2nd LED starts to blink slowly in red, Flash your card above the fingerprint sensor.** a) If the card ID is accepted, the 1st LED will blink green briefly as shown in *3(a)*. Operation is completed and will return to normal mode. b) If the card ID is not accepted, the 1st LED will blink green briefly as shown in *3(b)*. Operation will cease and return to normal mode.	**3a**  GREEN →AMBER **3b**  RED →AMBER **Card ID not accepted**

4.4.5 Enrolling a User with Card *with* PIN

The following steps describe how to enroll a user with Card *with* PIN.

Note: The presence of the Card is not necessary when the "PIN-Only" feature is turned on. If Card presence is not necessary, the ID input can be through the keypad. For more details on this feature, refer to the section on "PIN-Only" in Chapter 3 – Features.

Steps	LED and Buzzer Status
1 **Press**  ,  ,  . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2a**  **2b**  **Master verification fails**
3 **When the 2nd LED starts to blink slowly in red, Flash your card above the fingerprint sensor.** a) If the card ID is accepted, the 1st LED will blink green briefly as shown in *3(a)*. The 2nd LED will blink slowly in amber next. Proceed to step 4. b) If the card ID is not accepted, the 1st LED will blink green briefly as shown in *3(b)*. Operation will cease and return to normal mode.	**3a**  **Waiting for PIN to be entered** **3b**  **Card ID not accepted**

4 **When the 2nd LED blinks slow in amber,**

Enter a 6-digit PIN.

When the 6-digits has been accepted, the 1st LED will blink green briefly to indicate that it has been accepted as shown in *4*.

The 2nd LED will blink slowly in amber next.

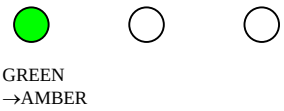
5 **When the 2nd LED blinks slowly in amber again,**

Re-enter the same 6-digit PIN for confirmation.

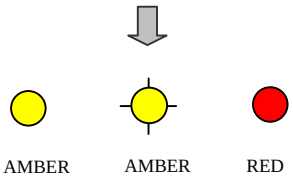
a) If the 2 PINs match, the enrollment is successful. The 1st LED will blink green briefly as shown in *5(a)*. Operation is completed and will return to normal mode.

b) If the 2 PINs do not match, the enrollment is not successful. The 1st LED will blink red briefly as shown in *5(b)*. Operation ceases and will return to normal mode.

4



GREEN
→AMBER



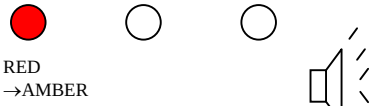
AMBER AMBER RED

Waiting for re-entering of PIN for confirmation

5a

GREEN
→AMBER

5b

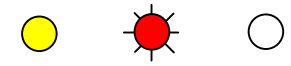
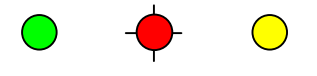
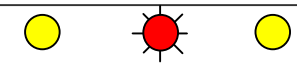
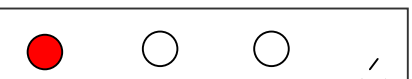
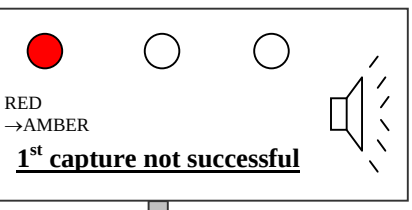
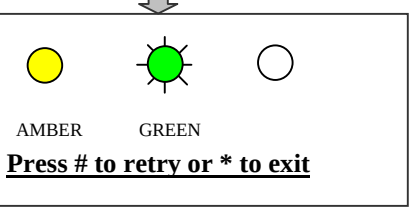


RED
→AMBER

PIN enrollment fails

4.4.6 Enrolling a User with Card *with* Fingerprint

The following steps describe how to enroll a user with Card *with* fingerprint.

Steps	LED and Buzzer Status
1 **Press** [0], [0], [2].	**1**  AMBER RED
The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	
2 **Place the master finger on the sensor to verify.**	**2a**  GREEN →AMBER RED AMBER
a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. Proceed to step 3.	
b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2b**  RED →AMBER **Master verification fails**
3 **When the 2nd LED starts to blink slowly in red, present a card in front of the keypad.**	**3a**  AMBER RED AMBER
a) If the card ID is accepted, the 2nd LED will blink fast in red as shown in *3(a)*, and the sensor will light up. Proceed to step 4.	
b) If the card ID is not accepted, the 1st LED will blink red briefly as shown in *3(b)*. Operation will cease and return to normal mode.	**3b**  RED →AMBER **Card ID not accepted**
4 **Place your finger on the sensor for the enrollment when it lights up.**	**4**  RED →AMBER **1st capture not successful**
Each successful enrollment requires 2 image captures.	
a) The sensor will go off after the first image has been successfully captured, and a series of beep sound will be heard. Proceed to step 5.	
b) If the first capture is not successful, the 1st LED will blink red briefly as shown in *4*. The 2nd LED will next blink fast in green. While this LED is blinking fast in green, press [#] to retry or [*] to exit. If the # key is pressed, repeat step 4. If the * key is pressed, operation will cease and return to normal mode.	 AMBER GREEN **Press # to retry or * to exit**

5 **Lift up your finger when you hear the series of beep sound and place it back on the sensor when it lights up again.**

This is for the second capture.

a) If the 2nd capture is successful, the 1st LED will blink green briefly as shown in 5*(a)*. The enrollment is successful. The 2nd LED will blink fast in green next. Proceed to step 6.

b) If the 2nd capture is not successful, the 1st LED will blink red briefly as shown in 5*(b)*. The 2nd LED will blink fast in green next. Proceed to step 6.

6 **Press # to enroll the 2nd finger, or to re-enroll the current 1st finger that was not successfully done so earlier.**

Or,

Press * to exit.

If the # key was pressed, the 2nd LED flashes briefly in the color associated with the finger that it will enroll next. The color is *amber* for the *first* finger, *green* for the *second* finger, and *red* for the *third* finger. Proceed to step 7.

If the * key was pressed, however, operation will cease and return to normal mode.

7 **Place your finger on the sensor for the 2nd finger enrollment when it lights up.**

As before, each successful enrollment requires 2 image captures. The sensor will go off after the first image has been successfully captured, and a series of beep sound will be heard. Proceed to step 8.

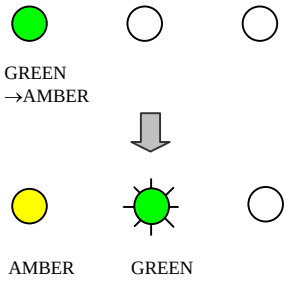
8 **Lift up your finger when you hear the series of beep sound and place it back on the sensor when it lights up again.**

Steps 7 and 8 are similar to steps 4, 5 and 6.

9 **Repeat steps 6, 7 and 8 to enroll the 3rd finger, or to re-enroll the current 2nd finger if it was not successfully done so earlier.**

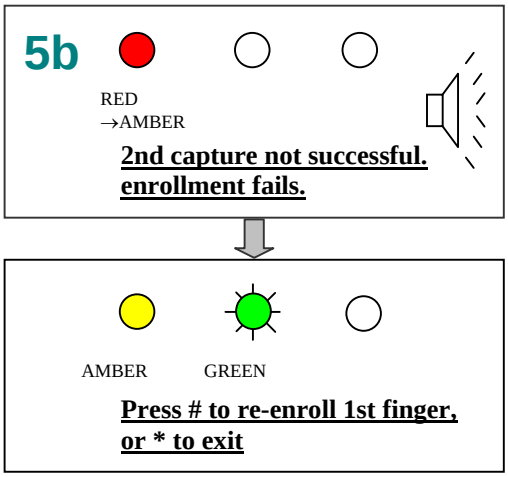
If the 3rd finger was successfully enrolled, operation will cease and return to normal mode.

5a



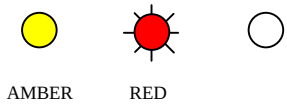
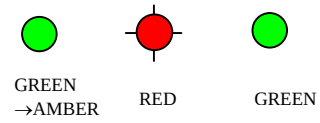
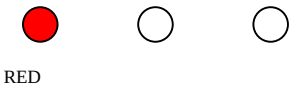
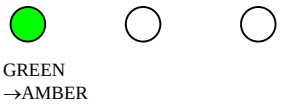
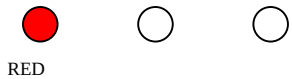
Press # to enroll 2nd finger, or * to exit

5b



4.4.7 Deleting a Single Record

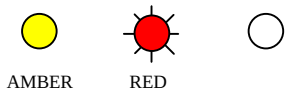
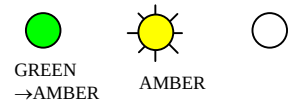
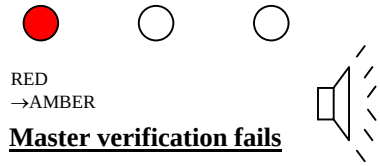
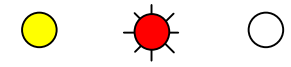
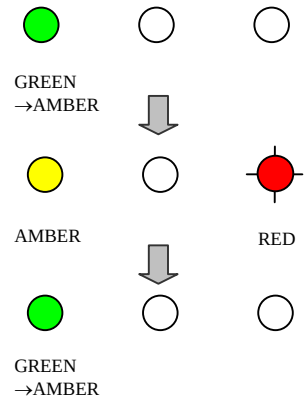
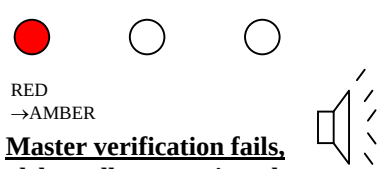
The following steps describe how a record can be deleted. The record can belong to any of the three authentication properties. It can also be a master or a user.

Steps	LED and Buzzer Status
1 **Press**  . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2a**  **2b**  **Master verification fails**
3 **When the 2nd LED starts to blink slowly in red,** **Enter the 4-digit ID of the record to be deleted[3].** a) If the ID exists, the record will be successfully deleted. The 1st LED will blink green briefly as shown in *3(a)*. Operation is completed and will return to normal mode. b) If the ID does not exist, the deletion cannot be carried out. The 1st LED will blink red briefly as shown in *3(b)*. Operation ceases and will return to normal mode.	**3a**  **3b**  **Fail to delete (ID does not exist)**

[3] You can also flash a card, if the card ID is the one you are going to delete.

4.4.8 Deleting All Records

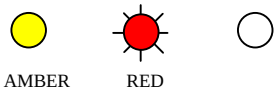
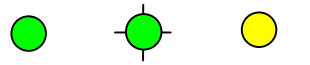
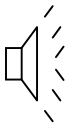
The following steps describe how **all** user records in the BioPointe can be deleted. To prevent accidental deletion, two instances of master verifications are put in place.

Steps	LED and Buzzer Status
1 **Press** [o], [o], [6]. The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. The 2nd LED will blink fast in amber next. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly. Operation will cease and return to normal mode.	**2a**  **2b** 
3 **Press** [#] **3 times to proceed with the operation.** **Or,** **Press** [*] **once to abort.** When the # key is pressed 3 times, The 2nd LED will blink fast in red as shown in *3*. The sensor will also light up to ask for the master fingerprint verification again. Proceed to step 4. If the * key is pressed, operation will cease and return to normal mode.	**3**  **4a** 
4 **Place the master finger on the sensor to verify**. a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *4(a)*. The 3rd LED will blink slowly in red next, indicating that the operation is in progress. At the end of the operation, the 1st LED will blink green briefly to indicate that the delete all operation has been completed successfully. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *4(b)*. Operation ceases and will return to normal mode.	**4b** 

4.5 Using the Administration Modes (Configuration)

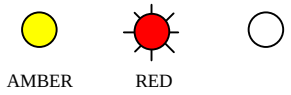
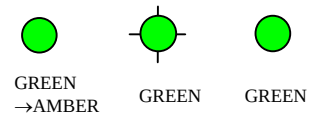
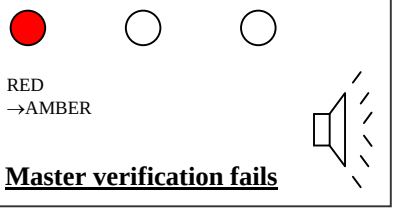
4.5.1 Enabling or Disabling Communication Authentication

The following steps describe how the Communication Authentication Mode in the BioPointe can be set. To find out more about this feature, you can refer to the section on *"Remote Administration From Host "* in Chapter 3.1.

Steps	LED and Buzzer Status
1 **Press** Δ , Δ , 1 . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be placed and verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. The 2nd LED will blink slowly in green next, while the 3rd LED is steady amber. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *2(b)*. Operation will cease and return to normal mode.	**2a**  **2b**   RED →AMBER **Master verification fails**
3 **Press** 1 **or** 2 **, the number that corresponds to the appropriate mode, followed by** # **to confirm.** **Or,** **Press** * **to exit.** 1 corresponds to the *Normal* mode, while 2 corresponds to the *Normal with Authentication* mode. When the mode has been successfully set, the 1st LED will blink green briefly as shown in *3*.	**3** 

4.5.2 Enabling or Disabling the Fingerprint Identify Mode

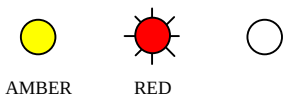
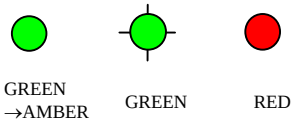
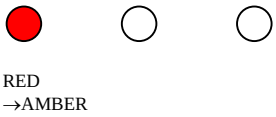
The following steps describe how the Fingerprint Identify Mode in the BioPointe can be set. To find out more on this feature, you can refer to the section on "*Fingerprint Authentication*" in Chapter 3.1.1.

Steps	LED and Buzzer Status
1 **Press** [Δ] , [Δ] , [2] . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1** 
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. The 2nd LED will blink slowly in green next while the 3rd LED is steady green. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *2(b)*. Operation will cease and return to normal mode.	**2a**  **2b** 
3 **Press** [0] **or** [1] **, the number that corresponds to the appropriate mode, followed by** [#] **to confirm.** **Or,** **Press** [*] **to exit.** 0 corresponds to *Disable*, while 1 corresponds to the *Enable* level. When the mode has been successfully set, the 1st LED will blink green briefly as shown in *3*.	**3** 

4.5.3 Changing the Security Level

The following steps describe how the Security Level in the BioPointe can be set. The allowed levels are *Normal* and *High*. By default, the security level of the device is at the *Normal* level.

Note that this security level pertains to using one-to-one matching (verification) as opposed to using one-to-many matching (identification). Configuring of the security level used in one-to-many matching is not allowed. It is defaulted to a high level.

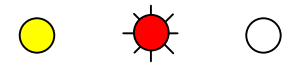
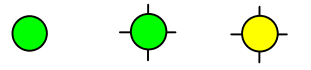
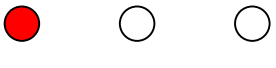
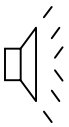
Steps	LED and Buzzer Status
1 **Press** Δ , Δ , 3 . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1**  AMBER RED
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. The 2nd LED will blink slowly in green next while the 3rd LED is steady red. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *2(b)*. Operation will cease and return to normal mode.	**2a**  GREEN →AMBER GREEN RED **2b**  RED →AMBER **Master verification fails**
3 **Press** 1 **or** 2 **, the number that corresponds to the appropriate mode, followed by** # **to confirm.** **Or,** **Press** * **to exit.** 1 corresponds to the *Normal* level, while 2 corresponds to the *High* level. When the mode has been successfully set, the 1st LED will blink green briefly as shown in *3*.	**3**  GREEN →AMBER

4.5.4 Enabling or Disabling the Alarm

There are two events that can trigger an alarm indication from the BioPointe:

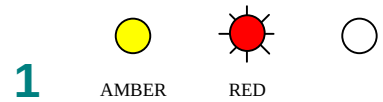
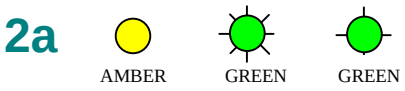
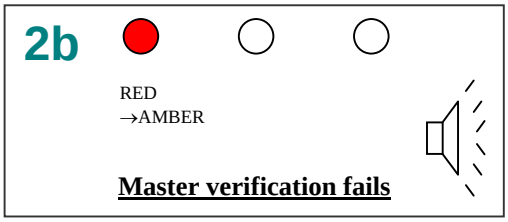
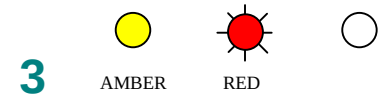
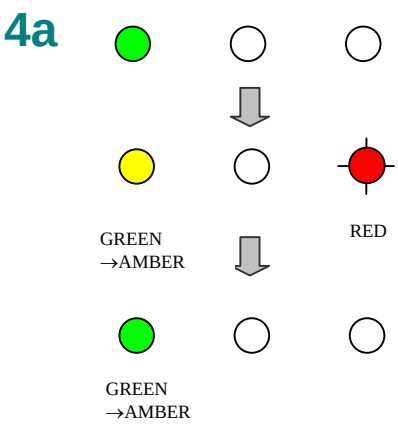
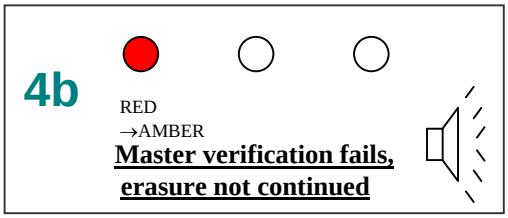
- The tamper switch of the BioPointe was triggered, and

The following steps describe how the alarm indication in the BioPointe can be enabled or disabled. The user would find this operation used oftentimes especially during installation or maintenance when preventing false alarm triggers is necessary.

Steps	LED and Buzzer Status
1 **Press** Δ , Δ , 4 . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	**1**  AMBER RED
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. The 2nd LED will blink slow in green and while the 3rd LED will blink slow in amber next. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *2(b)*. Operation will cease and return to normal mode.	**2a**  GREEN →AMBER GREEN AMBER **2b**  RED →AMBER  **Master verification fails**
3 **Press** 0 **or** 1 **, the number that corresponds to the appropriate mode, followed by** # **to confirm.** **Or,** **Press** * **to exit.** 0 corresponds to the *Disable* , while 1 corresponds to the *Enable* . When the mode has been successfully set, the 1st LED will blink green briefly as shown in *3*.	**3**  GREEN →AMBER

4.5.5 Erasing the Logs

The log records that are stored in the device can be erased totally through this authentication mode. This process will involve an additional master fingerprint authentication to prevent accidental erasure.

Steps	LED and Buzzer Status
1 **Press** Δ , Δ , 5 . The LEDs will light up as shown in *1*. The sensor will also light up, waiting for a master fingerprint to be verified.	
2 **Place the master finger on the sensor to verify.** a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *2(a)*. The 2nd LED will blink fast in green while the 3rd LED will blink slowly in green next. Proceed to step 3. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *2(b)*. Operation will cease and return to normal mode.	 
3 **Press** # **3 times to proceed with the operation.** **Or,** **Press** * **once to abort.** When the # key is pressed 3 times, The 2nd LED will blink fast in red as shown in *3*. The sensor will also light up to ask for the master fingerprint verification again. Proceed to step 4. If the * key is pressed, operation will cease and return to normal mode.	
4 **Place the master finger on the sensor to verify**. a) If the finger is successfully verified as a master, the 1st LED will blink green briefly as shown in *4(a)*. The 3rd LED will blink slowly in red next, indicating that the operation is in progress. At the end of the operation, the 1st LED will blink green briefly to indicate that the delete all operation has been completed successfully. b) If the finger is not successfully verified as a master, the 1st LED will blink red briefly as shown in *4(b)*. Operation ceases and will return to normal mode.	 

Chapter 5

5 Performing Authentication With The BioPointe

This chapter assumes that you have already learned how to enroll the authentication properties. If you have not learned how to do so, you may like to look at Chapter 4 – *Administering the BioPointe* again. This chapter describes how your fingerprints and other authentication properties can be enrolled locally on the device. Alternatively, if you are enrolling the authentication properties remotely, you can refer to the section on *Remote Administration*, and to the BioPointe Central manual that comes separately.

Handling Exceptions with Card Only and Card with PIN Authentication

As mentioned, there are three main types of authentication properties – namely, *fingerprint*, *card only* and *card with PIN*. While *fingerprint authentication* will be the main usage, the other two types of authentication are provided to handle exceptions, such as in the case of persons having severely callous fingerprints. By handling such exceptions, you would then be able to use the device for the entire spectrum of people in your organization.

We will now take a look at how the various authentication modes can be performed.

5.1 Performing Fingerprint Authentication

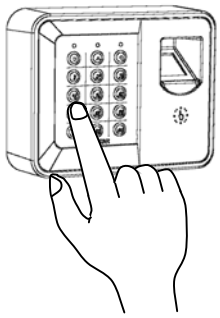
There are 4 ways to perform fingerprint matching.

The first is to use the keypad to enter your full ID. The second is to present your full ID to the BioPointe through the hidden card reader by flashing the card across the device. These 2 methods are also known as one-to-one-matching (verification). The third method is to use Quick Search. This method also uses the keypad, but eliminates the need of having to enter your full ID. Only 2 or more digits of your ID are sufficient to tell the device to search for a match.

The last method is to use one-to-many matching (or identification), where no ID is required to be entered. However, the user should note that this method is carried out at a higher level of security, and hence may be more difficult to match successfully for reasons such as the finger was not well enrolled initially, or when it was not placed well on the sensor.

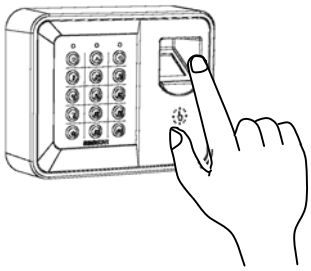
One-to-One Matching using the Keypad

1 **Using the numeric keys, enter your ID.**



2 **If the ID exists, the sensor will light up and the 2nd LED will blink fast in red.**

Place your finger on the sensor, removing it only when the sensor light goes off.

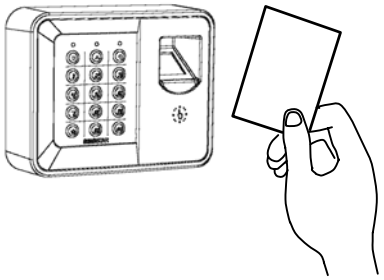


3 **If the 1st LED lights up in green, the authentication is successful.**

If the 1st LED lights up in red, you will be allowed another try. Place your finger on the sensor again when it lights up.

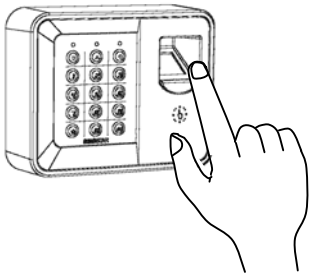
One-to-One Matching using the Card Reader

1 **Flash your card across the device.**
(Your card ID must be the same as the UserID enrolled previously.)



2 **If the ID exists, the sensor will light up and the 2nd LED will blink fast in red.**

Place your finger on the sensor, removing it only when the sensor light goes off.



3 **If the 1st LED lights up in green, the authentication is successful.**

If the 1st LED lights up in red, you will be allowed another try. Place your finger on the sensor again when it lights up.

Quick Search

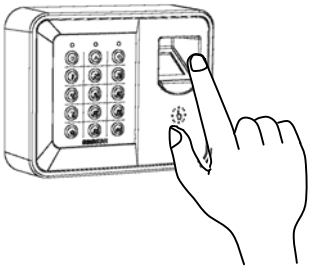
Quick search eliminates the need for you to enter your full ID. This is useful if the number of digits you organization used for the ID is long, making it hard for the staff to remember the full ID.

With quick search, what you need to do is to enter just 2 or more digits of your ID **from the back** and then hit the first function key to initiate the matching process.

1 **As an example, if your ID is 12345, enter '4', '5' followed by the**  **key.**
(The BioPointe device will perform a search for IDs ending with '45'.)

2 **If any ID ending with '45' is found, the sensor will light up and the 2nd LED will blink fast in red.**
Place your finger on the sensor, removing it only when the sensor light goes off.

If no IDs ending with '45' is found, the 1st LED lights up in red immediately.



3 **If the 1st LED lights up in green, the authentication is successful.**

If the 1st LED lights up in red, you will be allowed another try. Place your finger on the sensor again when it lights up.

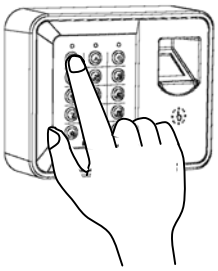
One-to-Many Matching (or Identification)

With one-to-many matching, you need not remember your ID. However, the user must note that this matching process is carried out at a higher security level.

Before one-to-many matching can be used, the mode must first be enabled. To enable this mode, you can refer to Chapter 4 – *Administering the BioPointe*.

Note that one-to-many matching mode will be automatically disabled if the *Multiple Fingerprint Matching* feature is configured at 2 or 3. For more information on this feature, you can refer to Chapter 3 – *Features*.

1 **With the one-to-many matching mode enabled, press the**  **key 2 times.**



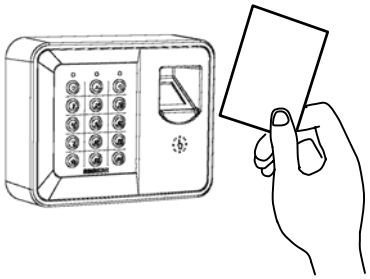
2 **Place your finger on the sensor, removing it only when the sensor light goes off.**

3 **If the 1st LED lights up in green, the authentication is successful.**

If the 1st LED lights up in red, the authentication fails.
(There is no automatic retry for one-to-many matching.)

5.2 Performing Card Only Authentication

1 **Flash your card across the device.**
(Your card ID must be the same as the UserID enrolled previously. In addition, this card ID must be enrolled as the Card Only authentication property.)

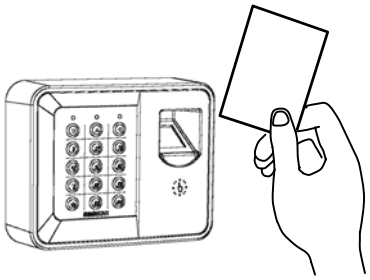


2 **If the 1st LED lights up in green, the authentication is successful.**

If the 1st LED lights up in red, the authentication fails.
(This could be because the ID was not found within the device.)

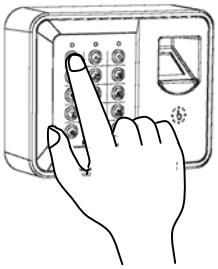
5.3 Performing Card with PIN Authentication

1 **Flash your card across the device.**
(Your card ID must be the same as the UserID enrolled previously. In addition, this card ID must be enrolled as the Card with PIN authentication property.)



2 **If the ID exists, the 2nd LED will blink slowly in amber.**
Enter your 6 digits PIN.

If the ID does not exist, the 1st LED will light up in red.



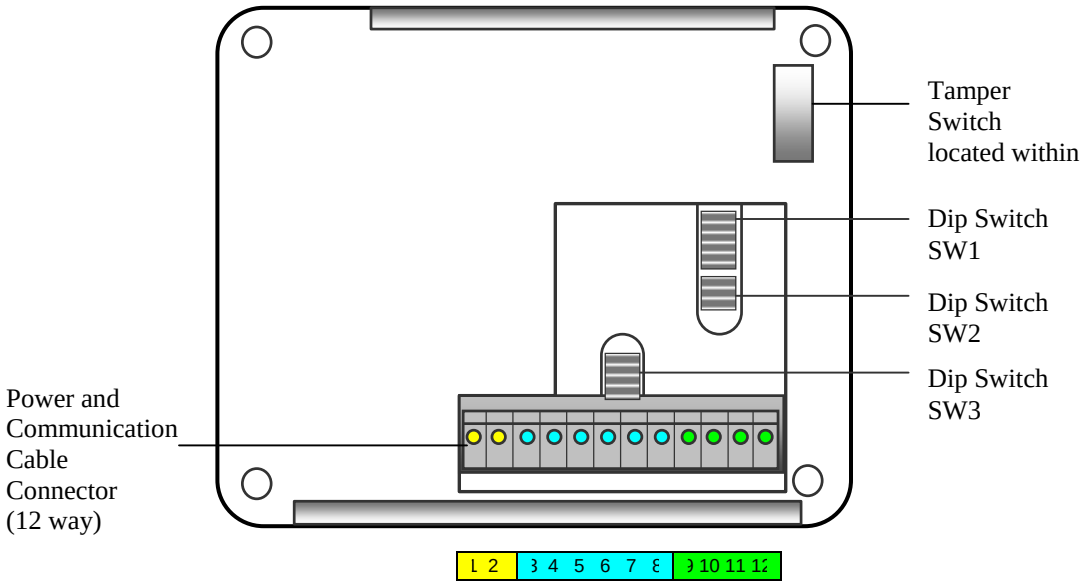
3 **If the PIN is correct, the 1st LED will light up in green.**
If the PIN is incorrect, the 1st LED will light up in red.

Chapter 6

6 Configuring The BioPointe

This chapter describes how DIP switch settings can be made and how the serial and Wiegand cables can be wired to the BioPointe control board.

6.1 Location of DIP Switches and Connectors



PIN No.	Description
1	GND
2	+12V
3	Rx+
4	Rx-
5	GND
6	D+ (Rx)
7	D- (Tx)
8	RST
9	W0
10	COM
11	W1
12	ACK

Backview and Pin Layout of the BioPointe

6.2 DIP Switches

There are three DIP switches on the control board. The usage of each switch is as tabulated:

SW1	8-way	To set the Device ID
SW2	4-way	To set the baud rate and communication type
SW3	8-way	To set the type of serial communication (i.e. whether RS232, 422 or 485)

The following tables show the settings for each of the three DIP switches.
Note that a "-"indicates an "OFF" position.

Table 1: SW1 (Device ID)

SW1 is used to set the Device ID of the device. It has a row of 8 DIP switches. The range of Device IDs that can be set is 0 to 255. However, the **acceptable range for field operation is 1 to 254**. The Device ID is set according to the binary format of an 8-bit byte. An "ON" position is interpreted as binary bit 0. To help you to find the dip switching settings for a particular Device ID, use the index value associated with each bit.

Switch / Device ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Index Value	*1*	*2*	*4*	*8*	*16*	*32*	*64*	*128*
0 (Not used)	ON	ON	ON	ON	ON	ON	ON	ON
1	-	ON	ON	ON	ON	ON	ON	ON
2	ON	-	ON	ON	ON	ON	ON	ON
3	-	-	ON	ON	ON	ON	ON	ON
4	ON	ON	-	ON	ON	ON	ON	ON
5	-	ON	-	ON	ON	ON	ON	ON
6	ON	-	-	ON	ON	ON	ON	ON
7	-	-	-	ON	ON	ON	ON	ON
8	ON	ON	ON	-	ON	ON	ON	ON
9	-	ON	ON	-	ON	ON	ON	ON
10	ON	-	ON	-	ON	ON	ON	ON
: : :				: : :	: : :			
253	-	ON	-	-	-	-	-	-
254	ON	-	-	-	-	-	-	-
255 (Not used)	-	-	-	-	-	-	-	-

Examples:

Switch/ Device ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Index Value	*1*	*2*	*4*	*8*	*16*	*32*	*64*	*128*
Device ID 5 =	**1** +		**4**					
Position	-	ON	-	ON	ON	ON	ON	ON
Device ID 6 =		**2** +	**4**					
Position	ON	-	-	ON	ON	ON	ON	ON
Device ID 10 =		**2** +		**8**				
Position	ON	-	ON	-	ON	ON	ON	ON
Device ID 30 =		**2** +	**4** +	**8** +	**16**			
Position	ON	-	-	-	-	ON	ON	ON

Table 2(a): SW2 (Baud Rate)

SW2 has a row of 4 DIP switches. Two is used to determine the baud rate while another two is used to indicate the communication type.

Switch / Baud Rate (Bps)	**1**	**2**
38400*	ON	ON
19200	-	ON
9600	-	-
2400	ON	-

*- Default setting

Table 2(b): SW2 (Communication Type)

The communication type is a setting that lets the BioPointe know how to respond to incoming data from the host. For example, if the Modem type is chosen, the BioPointe has to be able to respond to 'AT' commands coming from the modem.

Switch / Comm Type	**3**	**4**
RS232*	ON	ON
Modem	ON	-
TCP/IP	-	ON
RS422 / 485	-	-

*- Default setting

Table 3: SW3 (Serial Communication Type)

In Table 3, you will see the serial communication type. This is different from the communication type. The serial communication type lets the BioPointe know what type of signals is to be expected. For example, RS232 is single-ended, while both RS422 and RS485 are differential.

Switch No./ Serial Interface Type	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
RS232*	-	-	-	ON	-	ON	-	ON
RS422	-	ON	ON	-	ON	-	ON	-
RS485	ON	-	ON	-	ON	-	ON	-

* - Default setting

Chapter 7

7 Communicating with The BioPointe

The BioPointe supports 4 types of serial communication i.e. RS232, RS485, RS422 and Modem.

When you have decided which type of serial communication interface to use, make sure that each cable is inserted correctly at the location that corresponds with the signal type. In addition, you also need to configure the BioPointe to the correct type of serial interface and the correct type of baud rate through DIP switches. Another point to take note is that if you are using RS485 or RS422 for several devices connected in a multi-drop manner, each device has to be assigned a unique device ID.

This chapter describes how you can communicate with the BioPointe with RS232, RS485, RS422 and the modem.

7.1 Setting up the Communication

In brief form, a communication link can be setup based on the sequential layout steps listed below. The details are described in the sections to follow:

Step 1: Power off device

Ensure that the power is switched off so that any wrong connection would not damage the device. Also ensure that the positive and ground line is connected correctly.

Step 2: Connect cables :

Insert the wires correctly at the location that corresponds to the signal type.

Step 3: Configure type of serial interface with SW3

This is a hardware setting.
The type of serial interface chosen with SW3 allows the BioPointe to communicate with the correct signal type.

Step 4: Configure type of communication and baud rate with SW2

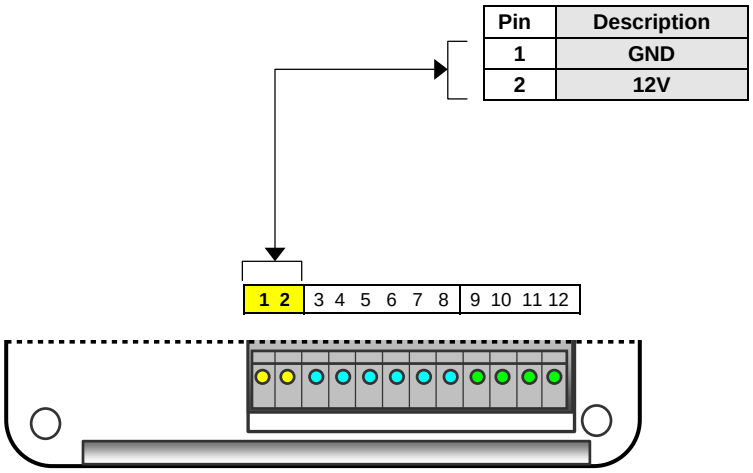
Both are software settings.
The type of communication chosen with SW2 tells the BioPointe how to respond to the command received. For example, if the selected type is 'RS422 or RS485', the BioPointe would not respond to commands not addressed to it, but was received in a multi-drop network.

The baud rate chosen also with SW2 should correspond with the baud rate that the host software uses to communicate with the devices.

Step 5: Set the Device ID with SW1

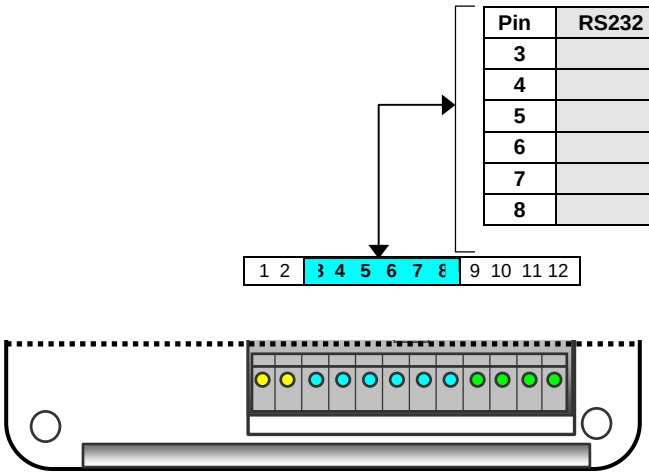
Step 1: Power off device

Connect the pair of power supply wires as shown in the figure below. Ensure that the location of each wire is correct. Keep the device powered off so that any wrong connection later will not damage the device.



Pin	Description
1	GND
2	12V

Step 2: Connect Cables



Pin	RS232 (See Note 1)	RS422	RS485
3	-	Rx+	-
4	-	Rx-	-
5	GND	-	-
6	Rx	Tx+	D+
7	Tx	Tx-	D-
8	-	-	

Pins 3 to Pin 7 are designated for different signal depending on the type of serial communication selected. (Pin 8 is currently not used for serial communication.) If you are communicating via a modem, you can connect using RS232, RS422 or RS485 mode, depending on the number of BioPointe devices you need to communicate with. Please refer to the appendix for a description of the modem connection setup.

Note 1: Pin-out for RS232 cable for connecting between PC and the BioPointe Device :

BioPointe Device	DB-9 Connector (Female)
5	5
6	3
7	2

[NOTE]

In RS422/485 mode, it is necessary to install termination resistors at both ends of the communication lines. The value of each resistor should equal the characteristic impedance of the signal wires (approximately 120 Ohms). No resistors are installed at the factory.

Step 3: Configure type of serial interface with SW3

The BioPointe supports three different signal types – RS232, RS422 and RS485. Depending of which signal type you are using, the device has to be configured correspondingly. The configuration is done through the 8-way DIP switch, SW3. The table below shows the different settings.

Switch No./ Serial Interface Type	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
RS232*	-	-	-	ON	-	ON	-	ON
RS422	-	ON	ON	-	ON	-	ON	-
RS485	ON	-	ON	-	ON	-	ON	-

* - Default setting

Step 4: Configure the type of communication and the baud rate with SW2

The baud rate is configured through switches 1 and 2 of SW2 as shown in the table below:

Switch / Baud Rate (Bps)	**1**	**2**
38400*	ON	ON
19200	-	ON
9600	-	-
2400	ON	-

*- Default setting

For multi-drop networks (RS422 and RS485), devices do not respond to commands that are not addressed to it. In order for the BioPointe to respond correctly, you need to set the type of communication using switches 3 and 4 of DIP SW2 as shown in the table below:

Switch / Comm Type	**3**	**4**
RS232*	ON	ON
Modem	ON	-
TCP/IP	-	ON
RS422 / 485	-	-

*- Default setting

Step 5: Setting the Device ID

SW1 is used to set the Device ID of the device. It has a row of 8 DIP switches. The range of Device IDs that can be set is 0 to 255. However, the **acceptable range for field operation is 1 to 254**.

The Device ID is set according to the binary format of an 8-bit byte. An "ON" position is interpreted as binary bit 0. To help you to find the dip switching settings for a particular Device ID, use the index value associated with each bit.

Switch / Device ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Index Value	*1*	*2*	*4*	*8*	*16*	*32*	*64*	*128*
0 (Not used)	ON	ON	ON	ON	ON	ON	ON	ON
1	-	ON	ON	ON	ON	ON	ON	ON
2	ON	-	ON	ON	ON	ON	ON	ON
3	-	-	ON	ON	ON	ON	ON	ON
4	ON	ON	-	ON	ON	ON	ON	ON
5	-	ON	-	ON	ON	ON	ON	ON
6	ON	-	-	ON	ON	ON	ON	ON
7	-	-	-	ON	ON	ON	ON	ON
8	ON	ON	ON	-	ON	ON	ON	ON
9	-	ON	ON	-	ON	ON	ON	ON
10	ON	-	ON	-	ON	ON	ON	ON
: : :				: : :	: : :			
253	-	ON	-	-	-	-	-	-
254	ON	-	-	-	-	-	-	-
255 (Not used)	-	-	-	-	-	-	-	-

Examples:

Switch/ Device ID *Index Value*	**1** *1*	**2** *2*	**3** *4*	**4** *8*	**5** *16*	**6** *32*	**7** *64*	**8** *128*
Device ID 5 =	**1** +		**4**					
Position	-	ON	-	ON	ON	ON	ON	ON
Device ID 6 =		**2** +	**4**					
Position	ON	-	-	ON	ON	ON	ON	ON
Device ID 10 =		**2** +		**8**				
Position	ON	-	ON	-	ON	ON	ON	ON
Device ID 30 =		**2** +	**4** +	**8** +	**16**			
Position	ON	-	-	-	-	ON	ON	ON

After all the steps above have been performed, power up the device and check the communication using the host software.

7.2 Tips for Ensuring Good Communication

Communication faults are problems that are commonly faced during field setups of RS485 and RS422 networks. To alleviate the occurrence of problems, do take note of the following points:

- Obtain good communication cables. The Beldon 8102 (4-core) is the recommended cable to use.
- Ensure that wire tips are soldered-tinned and seated securely in the connector of the device.

7.3 Troubleshooting Communication Problems

The table below describes some of the problems that are commonly faced and what you can check to resolve them:

	Error reported at TDM software program	**Description of Error**	**Items to check**
1	Error code 203 (CB hex) – Zero byte received	Device does not respond	1. Check that the serial 9-pin DB connector is connected to the serial port of the PC. Ensure that the correct com port setting is set on BioPointe Central. 2. Check that the RS232 to RS422/485 converter has been switched on. 3. Check that the device has been powered up. 4. Check that the baud rate at BioPointe Central and that at the device are the same 5. Check that the cables are correctly wired, e.g. Rx+ from the converter will go into Tx+ of the device 6. Check the continuity of the cables by isolating them from other parts of the network.
2	Error code 199 (C7 hex) – Receive header wrong Error code 198 (C6 hex) – Receive footer wrong Error code 202 (CA hex) – CRC mismatch at host	Some garbage was received	1. Check that the baud rate at BioPointe Central and the device are the same 2. Check that each individual wire is not shorted to any other wires 3. If the distance of the cable used (as in RS422/485 communication) is reasonably long, try to run at a lower baud rate).
3	Error code 201 (C9 hex) - Device ID mismatch	Device ID does not match	1. One of the devices in multi-drop is configured as "*RS232*" for the type of communication.

7.4 Communication using Modem

Communication using the modem is supported in the BioPointe for one device as well as with multiple devices. If the modem is connected to only one device, the signal type is RS232 in nature. The SW2 setting for communication type has to be "*Modem*" for this device.

If the modem is connected to multiple devices in a multi-drop network, the signal type will be either RS485 or RS422 depending on which is chosen.

Only one device can handshake with the modem. As such, one and only one device has to be configured as "Modem" to be the communication type, while the remaining will be either RS485 or RS422.

The connection setup for communication using the modem is described in more details in the Appendix.

Chapter 8

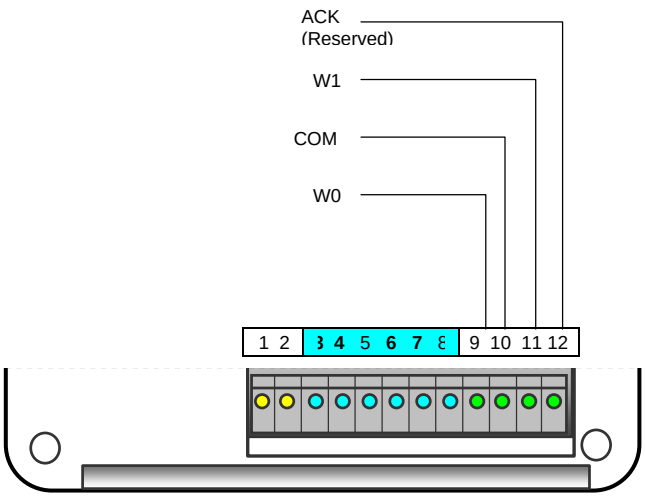
8 Interfacing with Keri System Controllers

This chapter describes how you can interface the BioPointe with Keri System controllers through Wiegand signaling.

The BioPointe currently supports the following Wiegand formats:

- 26 bits standard and other versions
- 34 bits standard
- 35 bits standard
- 36 bits standard
- 37 bits standard
- 40 bits

If you are unsure whether your controller supports any of the above formats, please consult with Keri Systems.



Wiegand output from the BioPointe to an external controller is interfaced by W0 and W1 outputs.

Configuring the BioPointe to work with Keri System Controllers

The BioPointe has to be configured with the necessary settings to assure operation with Keri System controllers. In the BioPointe Central software, follow the steps below:

Step 1: Go to *Device Management System*.

Step 2: Under the *Wiegand* selection box, select the appropriate format to work with the door controller. E.g. 26 Bits Vendor 1.

Step 3: Under the *Wiegand Out* selection, select "*Enable*"

Table 1: Summary of necessary settings in the BioPointe

Property in TDM	Setting
Wiegand Format	*E.g. 26 Bits Standard, 26 Bits Vendor 1, etc*
Wiegand Out	*Enable*

Chapter 9

9 Technical Specifications

9.1 Technical Specifications

Controller

Supply Voltage	12 to 24 VDC
Power Consumption	< 5 W
Operating Environment	Ambient temperature 0°C ~ 60°C
(*for indoor use only*)	Humidity 10 ~ 90 %RH
	(*non-condensing*)
Dimension	137.8 x 110.8 x 44.0 mm
Weight	<1 kg
Fingerprint Storage	720 fingerprint templates (*basic option*)
	(*expandable to 4400 fingerprint templates*)
Event Log	At least 20,000 records
	(*store in non-volatile memory*)
Comm Interface	RS232 / RS485 / RS422 / Wiegand (multi-format)
CPU	98Mhz-32Bit RISC/DSP
Memory	Flash 4Mbyte
LED	3 (3 colours each)
Clock / Calendar	Battery backup
Keypad	15 keys (*with 3 Function keys*)
Material	- Keypad (*membrane*)
	- Enclosure (*high impact PC-ABS*)
Built-in with	- Contactless card reader (*HID compatible available*)
Optional	- Modem (*external*)
	- Barcode reader (*external*)
	- Magnetic stripe reader (*external*)

Sensor

Type	Optical type
Light Source	LED (red)
Verification Speed	< 1 second
Resolution	500 dpi
Sensing Area	12.6 (W) x 16.2 (L) mm
Minutiae Size	400 bytes (encrypted)

9.2 Maintenance Instructions

The BioPointe is a very rugged device that can operate trouble-free for many years. Although no stringent maintenance and handling requirement is required, some basic caring, and precaution is still needed to ensure good and reliable performance.

Cleaning and caring

Never use a sharp object to scrape deposits from the fingerprint sensor. Permanent damage will result.

Normally do not require routine cleaning of fingerprint sensor if no noticeable degradation of fingerprint verification performance. However, for general cleaning, wipe the fingerprint sensor with a piece of dry and soft tissue paper.

Only use 99% pure Isopropyl Alcohol and lightly damp a piece of soft foam, soft cotton cloth or soft tissue paper to remove oily deposits or dirt from the fingerprint sensor or the enclosure surface.

Do not use wet (soiled or excessive moisture) cloth to clean the sensor or it's surrounding because the liquid can diffuse into the enclosure or the fingerprint sensor.

Normally not require to switch off the power supply when cleaning the fingerprint sensor or the enclosure surface.

After cleaning the fingerprint sensor, always allow two minutes for the liquid to dry up (before resume using it).

Preventive maintenance

Fingerprint sensor and other electronics devices inside the BioPointe device do not require routine calibration or preventive maintenance.

The optical based fingerprint sensor can withstand harsh environment and ESD; nevertheless, adequate precaution has to be taken to prevent degradation. Do not expose the device to intense sunlight, operate or storage environment exceeding the rated specification. Fingerprint sensor should not be exposed to excessive moisture or condensation.

Ensure wiring is secured to the screw terminal blocks and the screw terminal blocks are fully inserted.

Inspection maintenance frequency

Conduct weekly inspection to check for damages on the LCD display, key buttons or enclosure. Normally do not require routine cleaning of fingerprint sensor if no noticeable degradation of fingerprint verification performance.

Chapter 10

10 Troubleshooting

If you have difficulty in operating the BioPointe, the troubleshooting suggestions in this section should, in most cases, solve the problem. If you still have difficulty after trying these suggestions, contact your authorized reseller for technical assistance.

Interpreting LED Indication for Critical Events

The following list the LED indication when a critical event happens.

	Number of Blinks for 1st LED	Description	Duration of blink
1	Steady red light	Power up fail	Permanent. If the trace log is turned on, a log entry will be recorded. This log will record *Startup Error*. Subsequent logs will not be recorded.
2	3 (Red color)	Alarm within the BioPointe	Continuous until alarm event is removed
3	5 (Red color)	Error reading the internal clock	One time only (after verification pass)
4	7 (Red color)	Error recording log	One time only (after verification pass)

Troubleshooting Communication Problems

Refer to troubleshooting guide in *Chapter 7 – Communicating with the BioPointe*.

Contacting Customer Support

If your device is not operating properly and you cannot solve your problem with the troubleshooting information in this manual, contact customer support services for assistance.

We will be able to help you much quickly if you are able to give the exact information indicated below:

Serial number
(The serial number label is on the back of the device)

Keri Systems Customer Support

Contact us below:

Keri Systems, Inc.
1530 Old Oakland Road, Suite 100
San Jose, CA 95112 USA

Tel: 1-800-260-5265 or 1-408-451-2520
or mail to: techsupport@kerisys.com

Appendix A

11 Appendix A – Log Types in The BioPointe

The BioPointe device handles three types of log records listed as follows:

- ***Transaction Log***
  A transaction log is recorded upon a successful Authentication. The log contains the ID of the user performing the authentication, as well as the date and time.

- ***Fail Attempt Log***
  A fail attempt log is recorded when the authentication process fails.

- ***Trace Event Log***
  A trace event log is recorded whenever any critical event has occurred during local administration or during operation (such as when the device was being tampered with).

Using the BioPointe Central software, you can disable the Trace Event and Fail Attempt logs if they are not required.

Each log record carries with it a type value to indicate what log it is. The following tables show the various types of logs and the circumstances under which they would be recorded.

Table 1: Transaction Log

	Type value	Event	Additional Description
1	1	Pass authentication	Logged when Door Access Authentication is successful

Table 2: Fail Attempt Logs

	Type value	Event	Description
Events related to Door Access Authentication			
1	231 (E7 hex)	Fail fingerprint matching	-
2	232 (E8 hex)	Fail card matching	-
3	233 (E9 hex)	Fail card with PIN matching	-
4	234 (EA hex)	ID was not found	-
5	235 (EB hex)	Fingerprint match was not found using Quick Search	-
6	236 (EC hex)	Matching was aborted	-

Table 3: Trace Logs

	Type value	Event	Additional Description
Event related to the alarm indication			
1	28 (1C hex)	Tamper switch opened	See note 1
2	29 (1D hex)	Tamper switch closed	See note 1
3	129 (81 hex)	Activated alarm was acknowledged and disabled	The tamper switch being opened will cause the alarm indication via the 1st LED to be shown. If BioPointe Central subsequently sends a command to the BioPointe to disable the alarm indication, this log will be recorded.
Events related to the device powering up			
4	144 (90 hex)	Device powered up	Recorded when the BioPointe powers up.
5	145 (91 hex)	Start-up error	Recorded when there are errors during power up.
Events related to the administration modes			
6	160 (A0 hex)	Administration mode was entered	-
7	161 (A1 hex)	Administration mode was exited	-
8	178 (B2 hex)	A user was added	Recorded when a user is added, be it using fingerprint, card only or card with PIN. If the user uses fingerprint, and enrolls three fingerprints for the same User ID, there will be three such consecutive logs.
9	179 (B3 hex)	A user was deleted	-
10	180 (B4 hex)	A master was added	-
11	181 (B5 hex)	A master was deleted	-

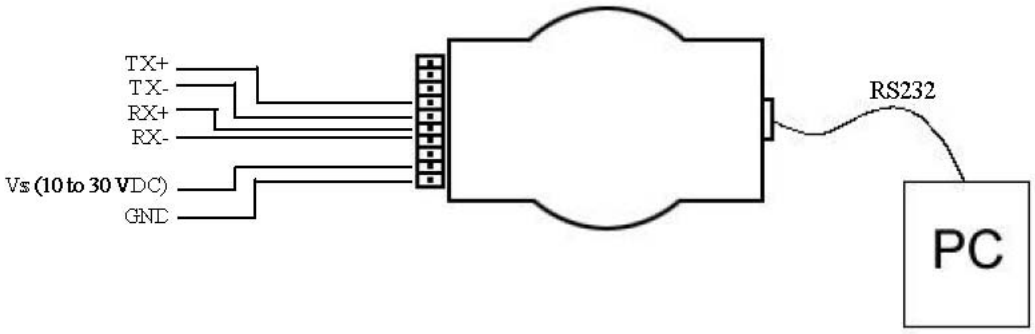
Note 1: The *Alarm* setting must be enabled for this log to be recorded.

Appendix B

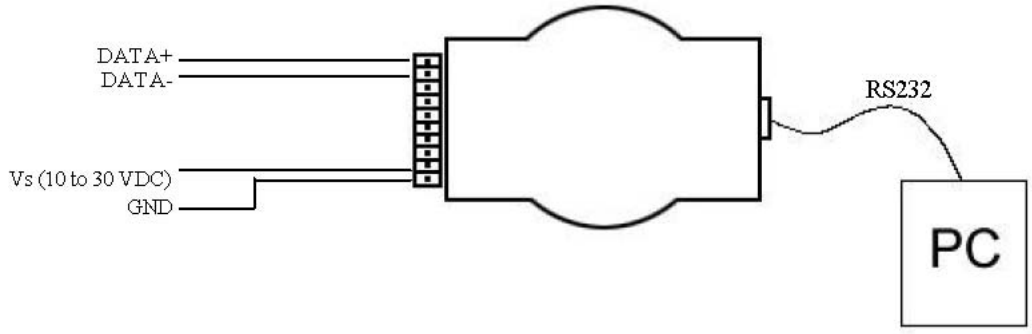
13 Appendix B – Configuring the ADAM 4520

In this illustration, we are showing the communication wiring diagrams on ADAM-4520 Isolated RS232 to RS422/485 Converter.

You can power this converter with any unregulated power source between +10 and +30 VDC (Keri Systems KPS-7).



RS422 to RS232 Converter Connection Diagram



RS485 to RS232 Converter Connection Diagram

RS232 Cable Connection

The table below shows the pin to pin connection between the RS232 port of the ADAM Converter module and the PC's Com port.

	ADAM 4520 (D-SUB 9-pin male connector)	**PC (Com Port 1) (D-SUB 9-pin female connector)**
Tx	2	2
Rx	3	3
GND	5	5

Switches and Jumper Settings

The following tables illustrate the possible switch settings for the ADAM Converter when you open up the module.

You will find that in the Converter board, there are 2 switch settings. One of it is labeled as SW1 while the other is labeled as SW2. SW1 controls the data format settings.

BioPointe uses the 10 bits data format (8 data bits, no parity, 1 stop bit and 1 start bit). Hence, you will need to set SW1 to the 10 bits data format (Table 1).

Table 1:

ADAM 4520 Data Format Settings (SW1)		
Data Format	**1**	**2**
9 bits	-	-
10 bits	ON	-
11 bits	-	ON
12 bits	ON	ON

SW2 controls the baud rate settings and the communication mode used (whether RS422 and RS485). If you are using RS422, you need only to on the **RS-422** switch (**Sw 10**), leaving the rest of the switches at the **OFF** position. If you are using RS485 however, turn off the **RS-422** switch (**Sw 10**), and turn on the switch for the desired baud rate. Take note the baud rate you set on the module must be the same as that configured at the device and that used at the host program (Table 2).

Table 2:

ADAM 4520 Baud Rate Settings (SW2)											
Baud Rate	**Sw**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
RTS control	1	ON	-	-	-	-	-	-	-	-	-
1200 bps	2	-	ON	-	-	-	-	-	-	-	-
2400 bps	3	-	-	ON	-	-	-	-	-	-	-
4800 bps	4	-	-	-	ON	-	-	-	-	-	-
9600 bps	5	-	-	-	-	ON	-	-	-	-	-
19.2 Kbps	6	-	-	-	-	-	ON	-	-	-	-
38.4 Kbps	7	-	-	-	-	-	-	ON	-	-	-
57.6 Kbps	8	-	-	-	-	-	-	-	ON	-	-
115.2 Kbps	9	-	-	-	-	-	-	-	-	ON	-
RS-422	10	-	-	-	-	-	-	-	-	-	ON

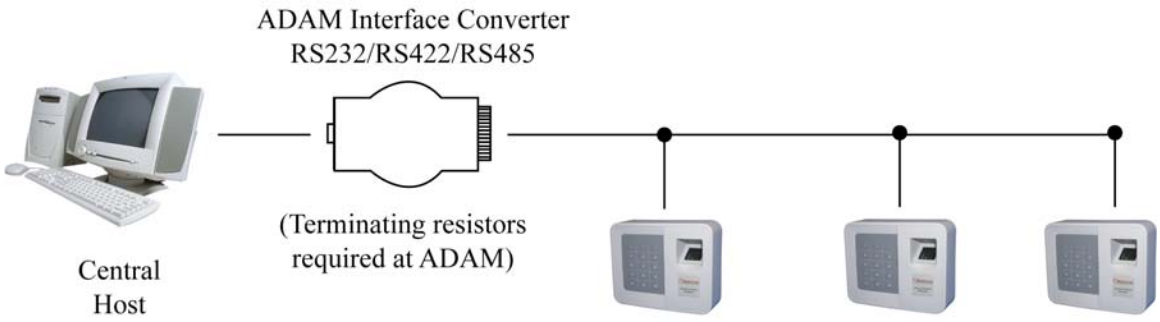
Legend -= OFF 13–2

Appendix C

14 Appendix C – Communicating in RS422 and RS485

The following examples show how three BioPointe are connected in daisy chain using RS422 first and RS485 next.

The following diagram shows a schematic layout of the connection. Appendix C can be referred to for a pinout description for the RS422 or RS485 signals at the ADAM. ADAM configurations are also described in the Appendix C. Note that terminating resistors are required at the ADAM. The contents that follow in this Appendix will describe how the terminating resistors are connected as well as how to connect the various pin -outs.



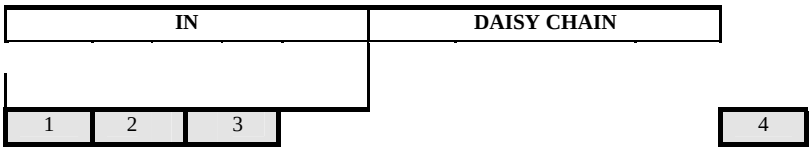
Schematic Diagram of a netwok of BioPointe in RS422 / RS485

The following diagram shows a schematic layout of the T-Junction box. There are three main sections for the pin-outs, namely 'IN', 'OUT' and 'DAISY CHAIN'. Each pin number of a section is internally shorted to the similar pin number of the other two sections. If this is the first T-Junction box from the ADAM, the RS422 or RS485 signals go into the 'IN' section. The signals from the 'OUT' section go into the BioPointe unit. And the signals from the 'DAISY CHAIN' section go into the next T-Junction box. Take note that the 'DAISY CHAIN' section of the last junction box has to be terminated with terminating resistors. The recommended colors of the wires to use are also shown.

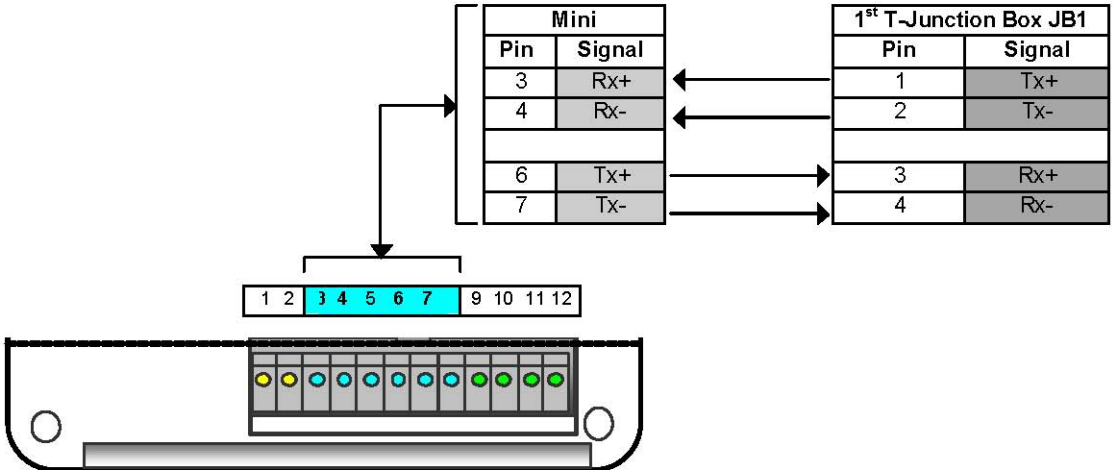
CN2

CN1

1	2	3	4	1	2	3	4



RS422 Connection



RS422 Signals between BioPointe Control Board and T-Junction Box

1) Connection between ADAM and JB1

ADAM	*Color of Wire**	*JB1 (Pin No. at 'IN')*	*Remarks*
Tx+	Blue	1	120 Ohms terminating resistor across Tx+ and Tx- at ADAM's end.
Tx-	Blue/White	2	
Rx+	Orange	3	120 Ohms terminating resistor across Rx+ and Rx- at ADAM's end.
Rx-	Orange/White	4	

*Any wires in the RS422 cable can be used. The color scheme used is shown only as a guide.

2) Connection between JB1 and JB2

JB1 (Pin No. at 'DAISY CHAIN')	*JB2 (Pin No. at 'IN')*	*Remarks*
1	1	-
2	2	-
3	3	-
4	4	-

3) Connection between JB and Bio2Touch

JB (Pin No. at 'OUT')	*Bio2Touch*		
	Pin No.	*Representation*	*Color of Wire Connected at Pin***
1	3	Rx+	Blue
2	4	Rx-	Blue / White
3	6	Tx+	Orange
4	7	Tx-	Orange / White

2)

3)

** This color scheme used is consistent with that shown in (1).

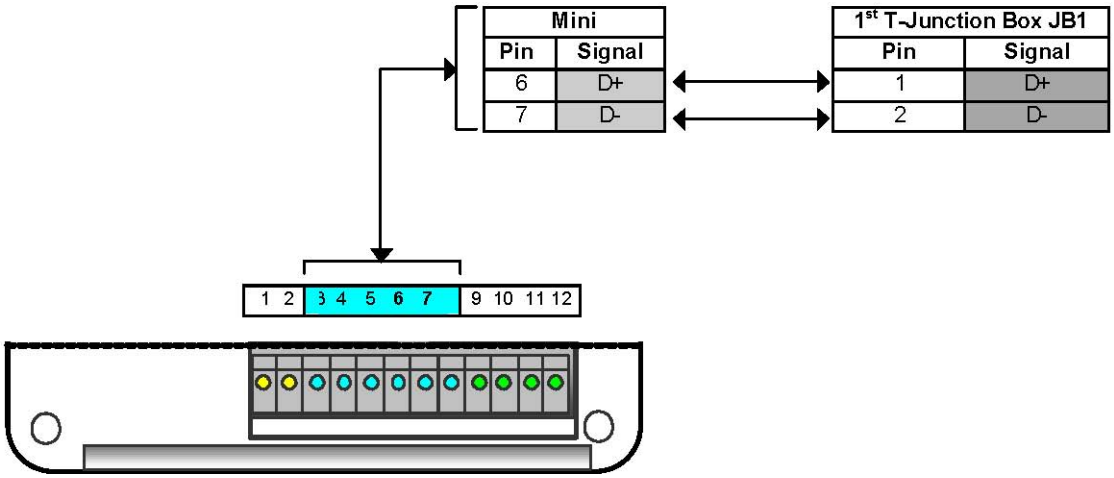
4) Connection at JB3 (last junction box or end of line)

JB3 (Pin No. at 'OUT')	*Remarks*
1	120 Ohms terminating resistor across Pin nos. 1 and 2.
2	
3	120 Ohms terminating resistor across Pin nos. 3 and 4.
4	

5) SW3 DIP Settings in BioPointe

Switch No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
RS422	-	ON	ON	-	ON	-	ON	-

[Note]
At each T-Junction box, the drain wires of the interconnecting branches must be shorted together.



RS485 Signals between BioPointe Control Board and T-Junction Box

1) Connection between ADAM and JB1

ADAM	*Color of Wire**	*JB1 (Pin No. at 'IN')*	*Remarks*
D+	Blue	1	120 Ohms terminating resistor across D+ and D- at ADAM's end.
D-	Orange	2	

*Any wires in the RS485 cable can be used. The color scheme used is shown only as a guide.

2) Connection between JB1 and JB2

JB1 (Pin No. at 'DAISY CHAIN')	*JB2 (Pin No. at 'IN')*	*Remarks*
1	1	-
2	2	-

3) Connection between JB and BioPointe

JB (Pin No. at 'OUT')	*Bio2Touch*		
	Pin No.	*Representation*	*Color of Wire Connected at Pin***
1	6	D+	Blue
2	7	D-	Orange

** This color scheme used is consistent with that shown in (1).

4) Connection at JB3 (last junction box or end of line)

JB3 (Pin No. at 'OUT')	*Remarks*
1	120 Ohms terminating resistor across Pin nos. 1 and 2.
2	

5) SW3 DIP Settings in BioPointe

Switch No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
RS485	ON	-	ON	-	ON	-	ON	-

[Note]
At each T-Junction box, the drain wires of the interconnecting branches must be shorted together.

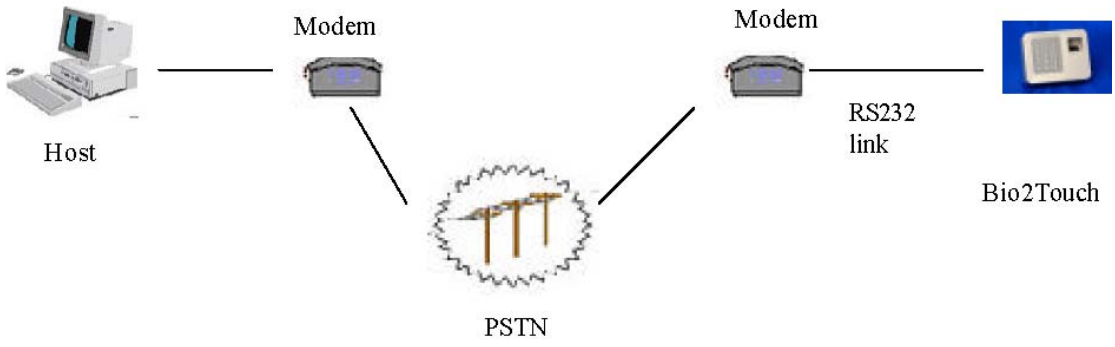
Appendix D

15 Appendix D – Communication Using Modem

BioPointe supports communication using the modem. This Appendix describes the setup you can use to effect the connection. If you have only one device unit that is situated at a remote site, and you wish to communicate with it, you can follow the setup described in (*A)*. On the other hand, if you wish to communicate remotely with a network of devices, you can follow the setup described in *(B)*. The setup in *(B)* is basically similar to the network configuration described in Appendix D (*Communicating in RS422 and RS485*), except for some differences in the unit settings.

A. Single BioPointe

If there is only a single device located remotely from the Host, the following setup can be used. RS232 link is used between the device and the modem. Hence, take note that the DIP switch settings in the BioPointe device have to follow the RS232 mode.



Schematic diagram of single BioPointe unit accessed via Modem

1) SW2 - Type of Communication Setting

Switch No	3	4
Position	ON	-

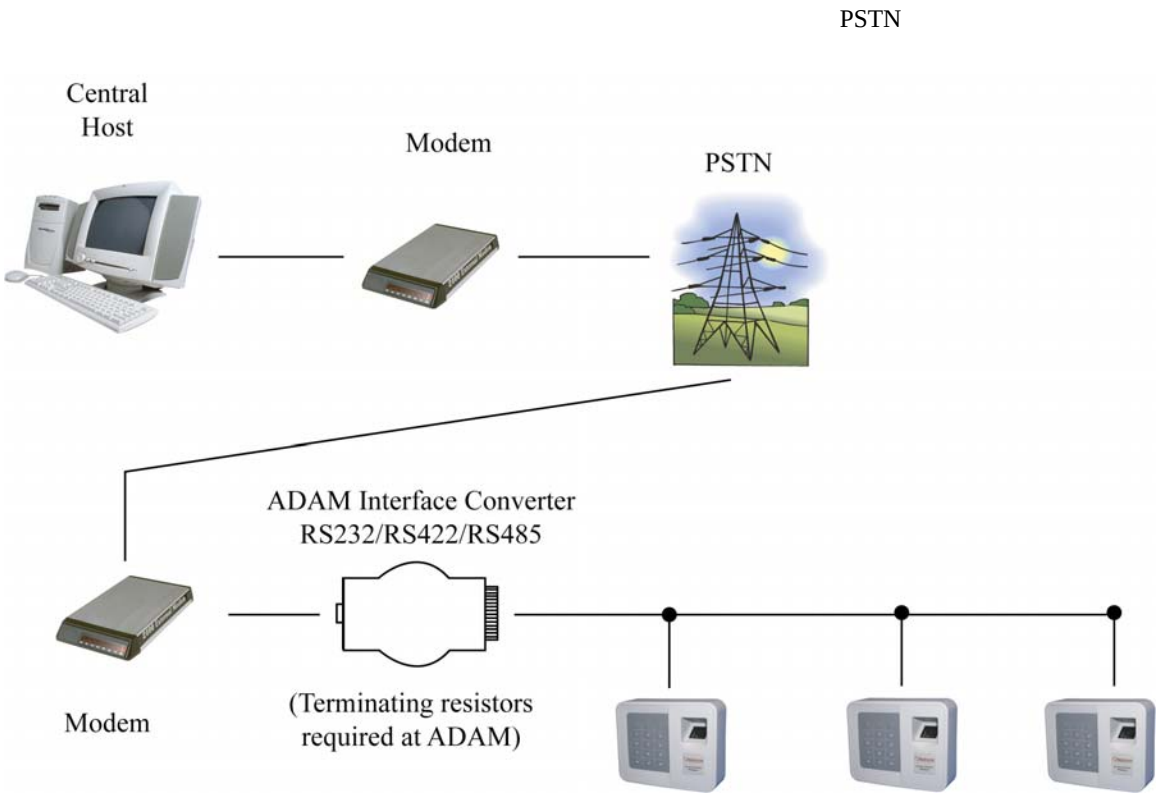
2) SW3 - Serial Interface Type Setting (follows RS232 mode)

Switch No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Position	-	-	-	ON	-	ON	-	ON

This setup can also be extended to individual devices located at different sites. In this case, the configuration in each device would be the same as the device setup as above. However, if the devices are located at the same site, the setup described next can be used.

B. Network of BioPointe Devices

The following schematic shows how a network of devices can be accessed remotely from a central host that is located geographically apart from the devices that it has to access.



Schematic diagram of network of BioPointe devices accessed via a modem

The network of BioPointe devices can be connected in RS422 or RS485 configuration as described in Appendix C. The connection between ADAM and T-Junction box, between T-Junction box and T-Junction box and at the last T-Junction box are described in the Appendix C.

A point to take special note is the DIP switch settings in the BioPointe devices. As only one unit can perform handshaking with the modem, only that unit is set to be at the 'MODEM' for the Comm Type. The rest of the units have to set at RS422 or RS485 for the Comm Type, depending on which is being used. The settings are tabulated in the tables as follows:

1) SW2 - Type of Communication Setting

Switch No / Switch Position for Device	3	4	Remarks
Device ID: 1	ON	-	Only one device can be set to "Modem" for the type of communication setting for handshaking with the modem. (In this case, it is Device ID 1)
Device ID: 2	-	-	
Device ID: 3	-	-	

2) SW3 - Serial Interface Type Setting if setup follows RS422:

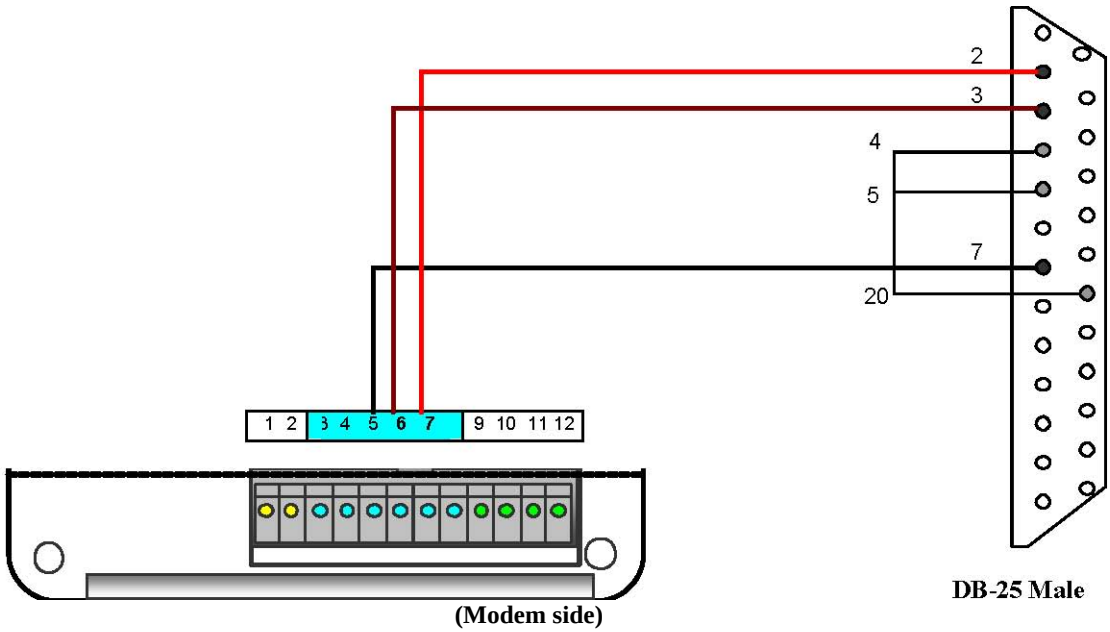
Switch No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Position	-	ON	ON	-	ON	-	ON	-

If setup follows RS485:

Switch No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Position	ON	-	ON	-	ON	-	ON	-

Modem to BioPointe Interface Cable

The following diagram shows the cable connection from the BioPointe device to the modem DB-25 connector.

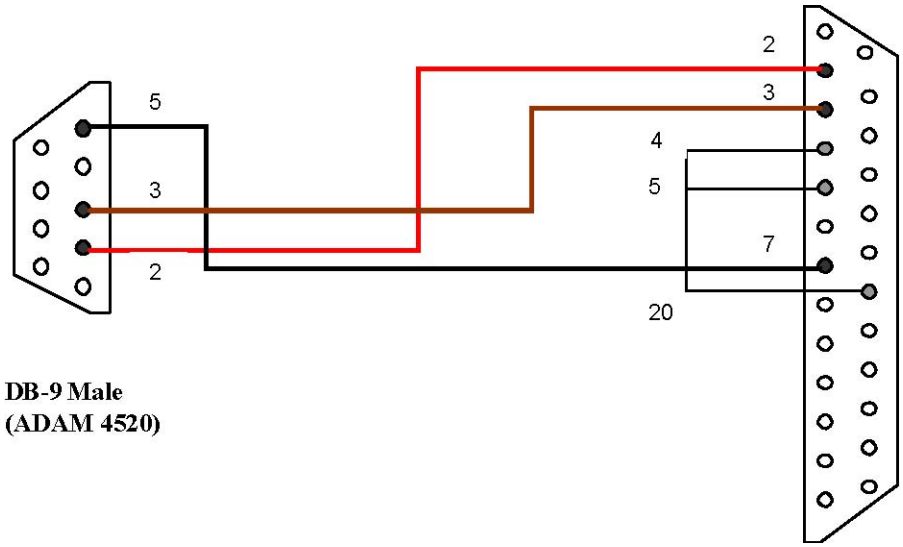


Pin at Bio2Touch Side	Pin at Modem Side
5 (Gnd)	7
6 (Rx)	3
7 (Tx)	2

Pin 4, 5 and 20 are shorted together at the modem side.

Modem to ADAM Converter (4520) Interface Cable

If the type of setup for modem communication is RS422 or RS485, the modem has to be connected to the ADAM unit. The following diagram shows the wiring setup.



DB-9 Male
(ADAM 4520)

DB-25 Male (Modem side)

Pin at ADAM Side	Pin at Modem Side
2	2
3	3
5	7

Pin 4, 5 and 20 are shorted together at the modem side.

Modem Specifications

As listed under the section, *Technical Specifications*, the type of modem used at the Host and at the BioPointe unit need to comply with the following specifications:

Type:	SMART Modem
External / Internal:	External