

**SYnergy/A**

SYNEL AMERICAS  
Product Manual & Guide

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# SYnergy/A

## Product Manual

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# 1. Introduction

The SYnergy/A terminal is a Linux-based fingerprint biometric device which combines a multi-media color graphic screen with technologically advanced features for all of your Time and Attendance and Access Control applications.

SYnergy/A utilizes a full version of Java 1.7 as its basic framework for building applications. The device supports Java graphics libraries SWT and SWING and TSL/SSL communication encryption.

SYnergy/A is compact in size and attractively designed and is also equipped with a built in camera and a speaker for generating various sound effects such as alert notifications, report confirmation/rejection and other actions or events.

SYnergy/A can be linked to a variety of networks in your organization to complement the systems already in place. SYnergy/A is capable to integrate Time and Attendance with Access Control.

In addition SYnergy/A has a unique photo-taking function for attendance checking using a 1.3M pixel color camera that snaps a photo of the user. A personal color photo, personal information and identification time can be displayed on the screen.

SYnergy/A supports TCP/IP networking protocol with optional Power over Ethernet (POE) capability. The clock includes both a protected USB port and an external USB port.

SYnergy/A is offered with a variety of reader options, including barcode, magnetic and proximity, and supports 3,000 fingerprint templates (standard configuration) or 10,000 templates (optional) in SmackBio reader, 9,050 in the Suprema reader for identification or verification purposes, with fast 1:1 and 1:N matching speed.

## 2. Technical Specifications

The following table displays the technical specifications for SYnergy/A

Operating system	Advanced Linux open source embedded OS
High speed processor	ARM 9 - 400 MHz
Identification Unit	Optical fingerprint (FP) sensor
FP template size	1404 Byte (SmackBio) 785 Bytes (Suprema)
Registered FP Capability	3,000 FP; 10,000 FP (optional); 9050 FP (optional). Maximum up to 10 FP per employee.
FP Register	3 times
False positive rate	< 0.001% / < 0.1%
Identification Speed	RF card identification < 0.2 sec. / FP Identification < 1 Sec
Identification Features	FP, PIN, FP + PIN, card + FP, camera + FP
Readers	HID iClass Proximity, HID Proximity, Synel Proximity, Mifare R/O, Magnetic Track I, II, Barcode - code 39/25/128
Memory	128MB DDR/Flash
Display	3.5" color TFT LCD; 320x240 pixels
Data Transmission Protocols	TCP/IP / HTTP/HTTPS, RS485/232, USB, WiFi (WPA2-Enterprise TKIP or AES)
Network Interface	10/100 Base-T Ethernet
External reader	Wiegand - 26, 34, 37 bit + optional formats
2 X USB 2.0	Host1 - Used to connect internal camera. Host2 - used to connect external device.
SD-card	Supports up to 32GB Micro SD Cards (unit ships with 4GB card).
Power	* External AC/DC adaptor : 100-240VAC~50/60Hz=> 10Watt-12VDC/2A Optional POE-802.3af Standard (Power Over Ethernet)
Environment	Temperature: 0 -50° C Humidity: 10%-90%
Physical Dimensions	210x145x48(mm); Wall mount
Camera	1.3M pixels color camera
Output	1 Relay
Input	1 Input
Sound	Voice, tones or alarm

Multi-media Function	Advertisement page broadcast, background music, Video files
Keyboard	6 programmable function keys, 10 alphanumeric keys, menu key
Back up battery RTC	3 years
Back up battery for operation	120 minutes
Coupon Printer	Supported
CE/TUV/FCC and ROHS Standards Approval	Yes

## 2.1 Additional Technical and Interface Specifications

- 3.5" TFT Color LCD with back light display
- Rechargeable backup battery (three years capacity) for Real Time Clock
- RS-232 and RS-485 communication
- One relay for bell, door control, etc.
- Variable baud rate for serial devices is 9600~115200 bps
- Printer support

### 2.1.1 Options

#### Fingerprint readers

SmackBio FPU SFM5020 (optical sensor)

Model	OPTICAL V 3.0	
Module format	Shared Library	
File name	fp.so	
Image dimension	256 pixel(W)x256 pixel(H) 403 dpi	
FP data size pre 1FP	1404 Bytes	
Internal database capacity	Up to 10,000 templates	
Speed	Exact time	<0.250ms
	10,000fp search time	<0.500ms
	Total time	<0.75s
Accuracy	FRR	<0.1%
	FAR	<0.0001%

Suprema FPU SFM5020 (optical sensor)

Model	SFM5020	
Module format	Shared Library	
File name	fp.so	
Image dimension	272 pixel(W)x320 pixel(H) 500 dpi	
FP data size pre 1FP	768 Bytes	
Internal database capacity	Up to 9,050 templates	
Speed	Exact time	<0.7 sec
Accuracy	FRR	<0.1%
	FAR	<0.0001%

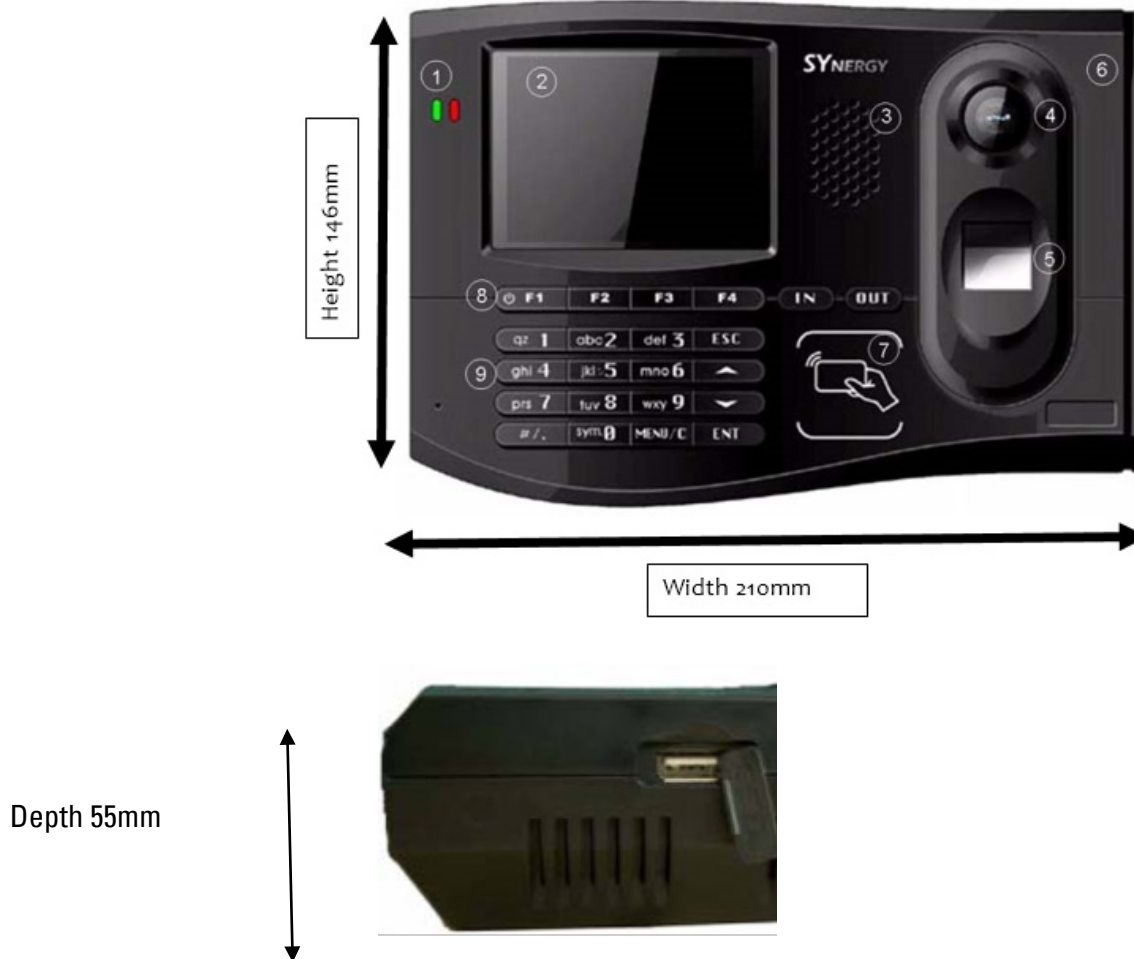
**Reader types**

- Proximity (125 KHz)
- Mifare R/O (13.56MHZ)
- Barcode
- Magnetic
- HID iClass Proximity
- HID Proximity (125 kHz)

**Net connection**

- Ethernet (10BASE-T/100BASE-T OR AUI)
- Optional POE-802.3af standard (Power Over Ethernet)

## 2.1.2 Physical characteristics Front view



## 2.1.3 Power Requirements

- External AC/DC switching adapter, DC 100-240/Volt -> 10Watt-12V/2A Back-up battery-rechargeable included

POE-802.3af (Power Over Ethernet)

## 2.1.4 Environment

Temperature: 0 -50° C

Humidity: 10% -90%

## 2.1.5 Communication and configurations

### 2.1.5.1 Communication parameters

Communication between the host and terminals is performed under an asynchronous mode. The baud rate is programmable, enabling rates from 9600 to 115000 bps.

### 2.1.5.2 Multiple terminal configuration

RS-485 communication enables you to connect up to 32 terminals to a single COM port and/or to extend the cabling distance to up to 1,000 meters (3,280 feet) using 9600 baud via an RS-485 multi-drop line. RS-485 communication uses two wires as opposed to RS-422 communication, which uses four wires.

### 2.1.5.3 Point to point configuration

A single terminal, equipped with RS-232 communications, can be connected directly to an asynchronous RS-232 port. If RS-232 communication is used, only one terminal may be connected to each COM port and cabling distances should not exceed 50 meters (160ft).

### 2.1.5.4 Network connections

The terminal can be connected to one of the following communication networks:

**Ethernet** - For this type of communication, an IP address is defined for each terminal, enabling communication with each terminal in TCP/IP protocol.

**GPRS** - For this type of communication, one SIM card with available GPRS service must be inserted into the terminal.

### 2.1.5.5 Function configuration

Enter the corresponding menus and set functions you desire.

# 3. Terminal

This terminal is enclosed in a rugged plastic molded casing and is secured to the wall using four screws and a removable panel.



## 3.1 Front panel

1. On the left side of unit, there are two programmable LED indicator lights with different colors. The functions can be defined by the user.
2. A 3.5" TFT LCD screen
3. The speaker is located to the right of the display. A terminal with an audio decoder chip can play files in MP3 format with adjustable volume. Additionally, custom sounds can be programmed to play according to preferences.
4. A camera with a wide visible lens to monitor or photograph users.
5. A Biometric fingerprint reader located below camera, supports 3,000, 9,050 or 10,000 templates.
6. Magnetic/bar code card reader (located on the right side of terminal).
7. Internal proximity reader indication.
8. Function keys are located on the left, below the display. F1~F4 keys are programmable. F1 is also used as the power button of the terminal. IN and OUT keys are two special function keys.
9. A numerical keyboard of sixteen keys, including Enter, Escape, and arrow keys, is located below function keys. They are mainly used for menu operation, input etc.

## 3.2 Side USB socket

The side of the terminal contains a connection socket for connecting a USB cable or device. Turn the socket cover to reveal the USB socket.



## 3.3 Bottom connection sockets

The bottom of the terminal contains connection sockets for external connections.

1-GPI/O - PIN no. 1 is on the most right side and PIN no. 6 on the most left side. For more information see "I/O- RJ- 11 (6 Pin)" on page 52 2-Wiegand input 3.

GPI/O<sup>1</sup> | RS232/485 | Wiegand<sup>2</sup> | Printer | Ethernet | USB port | Power



# 4. Unpacking



*Check the box and contents for signs of damage that may have occurred during shipment. Do not throw away the box or any of the packing materials.*

The terminal package contains:

Terminal	Phillips flat head 4x50 mm screws & anchors (3 x brick/cement 3 x plaster walls)
Power Supply cable 110V~240V AC INPUT DC12V OUTPUT CE standard or UL standard	Connecting/splitter box (included only when network communication is not available)
Mounting panel	3 Ft Cat5 Ethernet Patch cable.
User guide on CD	

# 5. Installation

## 5.1 Selecting the Terminal Location

### General Considerations

- The terminal should be placed near an easily accessible power outlet.
- Make sure there is enough space around the terminal for the communication cabling.
- Do not place the communication cable near a source of electromagnetic radiation or radio interference such as power lines, large machinery, etc.
- If the communication cable is to be wired through the wall, make sure that it is safe to drill a hole at the desired location.
- For best usability the terminal should be mounted at employee eye level. The recommended height is 140 cm (4' 7").

### GPRS Considerations

When selecting a place to install a terminal with wireless network communication (GPRS) you need to consider environmental factors that affect the connection. To find the optimal location:

- Do not install the machine in a strong electromagnetic environment where the RF signal can be effected.
- Avoid locations where the transmission may be blocked by metal obstacles.
- It is best to place the terminal where no high or large buildings are located nearby.
- Do not install the terminal in a location where people gather and linger since they can block the connection and also as to not expose them to radiation.

## 5.2 Terminal Wall Mounting



***Make sure the unit is not plugged into a power source. If you have already connected your terminal to a PC, disconnect it. You can reconnect it after you have completed mounting the unit.***

***The terminal contains computer components. It should not be mounted where it will be exposed to extreme heat or cold, water, steam, violent vibrations, high electromagnetic radiation including high voltage power lines and electrical equipment.***

- 1) Select a location for the terminal following guidelines specified above.
- 2) Remove the back mounting panel, if it is connected to the terminal.

**A** - Screw holes - for screwing the mounting panel in place. **B** - Entrance for cables wired from the wall.  
**C** - Entrance for cable entering terminal from below.

- 3) Prepare the wall for mounting by placing the panel on the wall as a template and mark the place for drilling the holes (A).
- 4) Drill holes using a 6 mm. (1/4") drill bit.



***Live wires in the vicinity may contain 115V or 220V. Make sure not to drill into any live electric wires. Overlooking this warning may result in harmful contact with an electrical current.***

- 5) Position the panel so that all of the wires are in place and screw the panel to the wall.
- 6) Wire all of the cables through the mounting panel and position the electric socket in its place in the mounting panel.
- 7) Connect the communication cables to the terminal. Plug one end of the communication cable into the communication socket of the terminal.
- 8) Slide the terminal into place.

## 5.3 Communication Connections

- 1) Select a location for the connection box. The box must be positioned where both the communication line and the terminal can be connected to it. The terminal should be placed near the connection box, and must be within the reach of the short RJ45 cable.
- 2) Plug the communication cable from the terminal into the connection box.
- 3) Wire an additional connection for Ethernet.

# 6. Maintenance

This section gives instructions for maintaining the terminal in good working order.

The issues described are:

- Terminal Maintenance
- Calibrating the Real Time Clock (RTC)
- Formatting microSD card
- Clear terminal Flash
- Fingerprint sensor cleaning and care

## 6.1 Do's and Don'ts

- Install the unit indoor where the temperature can be controlled.
- Keep the unit free of dust and water to avoid a short circuit.
- Keep the unit away from magnetic objects and an intense magnetic field.
- If you need to repair the device, please contact the device supplier.
- Use original power adapter, supplied with the unit. The original power adapter has voltage-stabilizing and wave filtering functions, which reduce the influence of power to device.
- Do not open or repair the unit circuit if you are not certified to do so. You may lose your data and seriously damage the unit.
- If the device utilizes the camera, do not install the unit facing the door or window. This may cause the photos to be over exposed. It is better to take photographs where the light is dimmer.
- Do not scratch, hit or press the device with sharp or heavy objects as to not damage the LCD screen, FP Reader and surface.
- Do not shake the device as this can cause damage to inside parts.
- Do not format the storage disk without consulting the supplier.

## 6.2 Terminal Maintenance

### 6.2.1 Once a month

#### Badge Readers

- **Magnetic badge readers:** Use a special cleaning badge made of plastic with a polishing paper (made of Al<sub>2</sub>O<sub>3</sub>, with a grain size of approximately 16 microns) attached to the part of the badge where it contacts the magnetic head. Swipe the badge once or twice. Excessive cleaning will result in wearing out of the magnetic reader head.

## 6.2.2 Every six months

### General

- Verify that all cables to the terminal ports are well connected.

### Keypad and screen

- **Keypad and screen:** Turn off the device, and clean the keypad and screen with a rag or neutral detergent, then wipe dry.

### Battery

- **Backup battery:** Visually check the battery for leakage. Clean all of the electrical contacts inside the terminal with a contact cleaner.

- 1) Collect and clear all the data stored in the terminal.
- 2) Turn off the terminal.
- 3) Open the terminal.
- 4) Remove jumper J4. Check the voltage of the memory back-up battery and make sure it is between 2.8V and 4.2V.

### Camera lens

- **Cleaning the camera lens:** If the lens is dusty the dust can be gently blown off. Clean the display window with a pressure-sensitive adhesive cloth. Do not use water or detergent to clean the lens as it may be damaged. Dry the lens with a soft cloth.

### Fingerprint sensor

- The fingerprint sensor is designed to provide years of trouble-free service. Observance of a few basic maintenance steps will help to ensure a high level of performance over the sensors life span. Several types of sensors exist, such as optical and silicon based like capacitance or of RF technology. Each type of sensor requires a different cleaning method. Make sure to use the proper cleaning method for the sensor type in use.

- **Cleaning the fingerprint sensor**

After repeated use oily deposits from your finger accumulate on the surface of the fingerprint sensor and these can inhibit the functionality of the sensor. It is recommended that you clean the sensor at least once a week, and also whenever an oily residue is visible on its surface.

Use a clean cotton cloth or tissue paper dampened by water or window cleaning solution to remove oily deposits.

- **Caring for the Fingerprint Sensor**

Do not place the fingerprint sensor close to a heat source, such as a radiator or hot plate.

Do not subject the fingerprint sensor to heavy shocks/ vibrations

Do not allow the sensor to come in contact with metallic objects.

- **Condition**

The sensor can be stored in temperatures ranging from  $-65^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ , and can operate in temperatures ranging from  $0^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .

Sensors should not be exposed to rain or excessive humidity. A sensor can operate within a range of 5% to 95% humidity (non-condensed).

Other than for cleaning, as instructed above in **Cleaning for Fingerprint Sensors**, do not bring the sensor in contact with liquids.

# 7. Connectors and Jumpers

## PC communication - RJ-45 (8 pin) with LED indicator Serial Communication with PC

Yellow led is an indication for TXD of terminal Green led is an indication for RXD of terminal

### Printer - RJ- 11 (6 Pin)

Pin	Signal	Value	Remarks
1	NC		
2	RS-485 (-TRX)	0-5 Volt	
3	RS-485 (+TRX)	0-5 Volt	
4	GND		
5	RS - 232 (TXD)	-/+15Vdc	Standard RS-232 levels
6	RS - 232 (RXD)	-/+15Vdc	Standard RS-232 levels
7/8			

Secondary serial communication channel for printer.

Pin	Signal	Value	Remarks
1	NC		
2	GND		
3	CTS	-/+15Vdc Standard RS-232 levels	Printer busy
4	RS - 232 TXD	-/+15Vdc Standard RS-232 levels	Printer
5	RS - 232 RXD	-/+15Vdc Standard RS-232 levels	Printer
6	VCC	5 volt	

### I/O- RJ- 11 (6 Pin)

Pin	Signal	Value	Remarks
1	Input		
2	GND		
3	GND		
4	Relay	COM	
5	Relay	NC	
6	Relay	NO	

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