



BluePad-50 Plus MSR USER GUIDE



BluePad-50 Plus User Guide
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BluePad-50 Plus MSR User Guide

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1.1.0	03.09.2021	Updated section "Update Firmware and Application with using Firmware API"
1.2.0	28.06.2023	Updated section "REGULATORY"
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REGULATORY

FCC NOTICE

FCC ID: YRW-BP50PLUSM

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: —Reorient or relocate the receiving antenna. —Increase the separation between the equipment and receiver. —Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. —Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Specific Absorption Rate (SAR) information:

This BluePad-50 Plus MSR meets the government's requirements for exposure to radio waves. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons regardless of age or health. FCC RF Exposure Information and Statement the SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. Device types: BluePad-50 Plus MSR has also been tested against this SAR limit. This device was tested for typical body-worn operations with the back of the BluePad-50 Plus MSR kept 0mm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that maintain an 0mm separation distance between the user's body and the back of the BluePad-50 Plus MSR. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

PREFACE

This guide is the primary source of information for setting up and installing BluePad-50 Plus.

Audience

This guide provides simple descriptions of BluePad-50 Plus features, as well as basic information for anyone installing and configuring BluePad-50 Plus.

Organization

This guide is organized as follows:

[Chapter 1, Overview](#). Provides an overview of the BluePad-50 Plus.

[Chapter 2, Specifications](#). Discusses power requirements and dimensions of BluePad-50 Plus, etc.

[Chapter 3, Setup](#). Explains setup and installation of BluePad-50 Plus. This chapter tells how to establish connections with other devices.

[Chapter 4, Maintenance and Cleaning](#). Explains maintenance of BluePad-50 Plus.

[Chapter 5, Service and Support](#). Provides information on contacting your Datecs representative or service provider and information on how to order accessories or documentation from Datecs.

[Chapter 6, Troubleshooting Guidelines](#). Provides troubleshooting guidelines should you encounter a problem in terminal installation and configuration.

Related Documentation

To learn more BluePad-50 Plus, refer to the following set of documents:




- *BluePad-50 Plus Physical Security Features*
- *BluePad-50 Plus Firmware API Specifications*
- *BluePad-50 Plus Software Design Specifications*

CONVENTIONS

Various conventions are used to help you quickly identify special formatting.

[Table 1](#) describes these conventions and provides examples of their use.

Table 1 Document Conventions

Convention	Meaning	Example
Blue	Text in blue indicates terms that are cross references.	See Guide Conventions
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	You <i>must</i> not use this unit underwater.
	The Information icon is used to highlight important information.	BluePad-50 Plus is using USB communication
	The caution symbol indicates hardware or Software failure, or loss of data.	The unit is not waterproof or dustproof, and is intended for indoor use only.
	The warning symbol is used as a warning when bodily injury might occur.	Due to risk of shock do not use the terminal near water.

Overview

This chapter provides a brief description of Datecs's BluePad-50 Plus device.

BluePad-50 Plus

The BluePad-50 Plus unit is a handheld PIN pad with an integrated smart, magnetic stripe and contactless card reader an optional wireless connectivity designed to be used with a variety of PDA's, offering advanced security and smart card processing capabilities.

BluePad-50 Plus supports both symmetric encryption algorithms (DES, 3DES, and AES) and asymmetric encryption (RSA). This device internally manages simultaneous multiple keys through either Master Session- or DUKPT-based processes, and offers high performance smart card processing, as well as support for the new generation of 3-volt cards.

The BluePad-50 Plus sleek and stylish ergonomic.



Datecs ships variants of BluePad-50 Plus unit for different markets. Your unit may have a different configuration, such as a Bluetooth module, etc. However, the basic processes described in this guide remain the same, regardless of configuration.



Features At a Glance

- Delivers **power** and **usability** in a **small convenient** hand-held design.
- **Security** architecture meets specifications for PIN-entry devices (PED) and sophisticated **file authentication**.

The BluePad-50 Plus provides the right combination of features and functions in a small stylish device that fits in the palm of your hand. This includes a magnetic stripe card reader, contactless card reader, smart card reader, an integrated PIN pad, and an optional wireless connectivity.

Features and Benefits

Exceptional Ease of Use

- Bold, ergonomic design is sleek, stylish, and lightweight for conveniently handing the unit to the consumer for PIN entry.
- Intuitive interface and large, colored control keys simplify training and reduce support requests.
- Highly readable display handles multiple languages.

Critical Security Protection

- Incorporates tamper-detection circuitry to resist unauthorized intrusion and supports a broad spectrum of hardware and software-based security features.
- Integrated security modules simultaneously support sophisticated encryption (AES, DES, 3DES, RSA) and key management schemes, including single and 3DES Master Session, single, and 3DES Derived.

Strong Feature Set

- Primary smart card reader support for synchronous and asynchronous smart cards.
- Support for international character sets and Unicode standard.
- BluePad-50 Plus has received EMV Level 1 approval for smart card solutions.
- BluePad-50 Plus has received EMV Level 2 approval for smart card solutions.
- BluePad-50 Plus has received PCI PTS 6.0 SRED Security Certification.

Device Specifications

Processor	ARM Cortex® M4 Security Microcontroller
Memory	32KB I&D-Cache 1MB Internal RAM 8KB OTP
Application Memory	8MB Serial Flash
Display	<ul style="list-style-type: none"> • Type – LCD, 262K colors • Size - 2 inches • Resolution – 240 x 320 pixels
Keypad	<ul style="list-style-type: none"> • ON / OFF key • 10 numeric keys • 2 functional keys
Magnetic Card Reader	<ul style="list-style-type: none"> • 3-track bi-directional reading • ISO 7810, 7811 and 7813
Smart Card Reader	ISO7816, EMV L1 certified
Contactless Card Reader for payment applications (option)	<ul style="list-style-type: none"> • AMEX ExpressPay • Discover D-PAS • MasterCard Contactless • VISA PayWave • China Union Pay • JCB
Contactless Card Reader	<ul style="list-style-type: none"> • NFC-A/ISO 14443 Type-A • NFC-B/ISO 14443 Type-B • NFC-F/Felica • NFC-V/ISO 15693
Battery	Rechargeable lithium-ion polymer battery 3.7V, 620mAh
Connectivity	<ul style="list-style-type: none"> • USB <ul style="list-style-type: none"> - Device • BLE 5.1 • Wireless <ul style="list-style-type: none"> - WiFi module 802.11 b/g/n • UART pass through rear pads
Audio indication	Electro-Magnetic Buzzer
OS compatibility	iOS, Android, Windows
Reliability	<ul style="list-style-type: none"> • 500 000 chip card cycles • 1 000 000 magnetic card swipes
Certifications	CE, FCC, EMV Level 1, EMV Level 2, EMV Level 1 Contactless, PCI PTS 6.0
Dimensions (LxWxH), mm	120.8 x 69 x 15.7
Weight, g	133
Environmental	Operating: -10°C to +45°C / 5 to 90% RH Storage: -20°C to +70°C / 5 to 90% RH
Drop Test	
Power Supply	<ul style="list-style-type: none"> • 5V through USB C • 5V through Docking station
Accessories	<ul style="list-style-type: none"> • Docking station

Device Operation

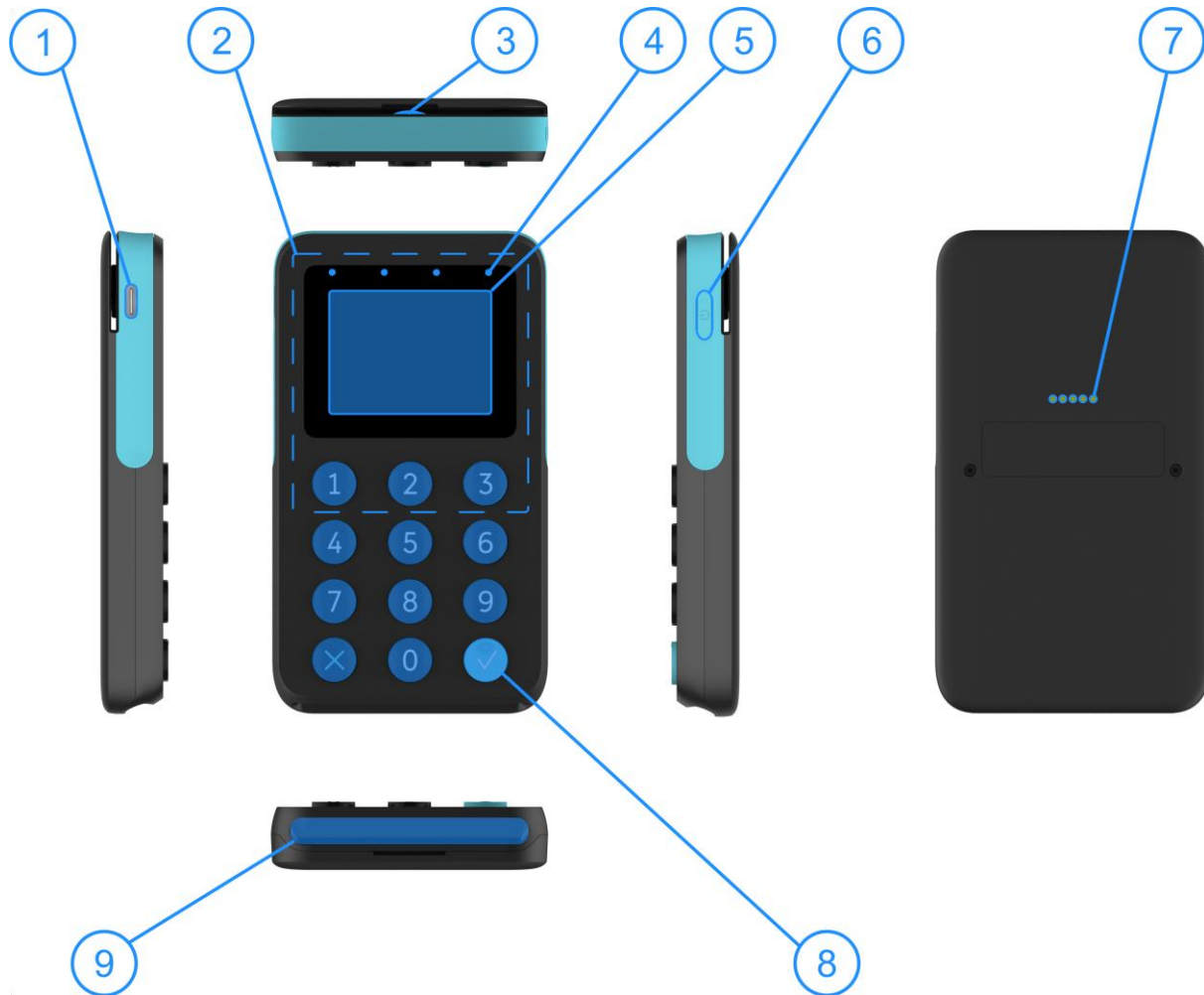


Figure 1

1. **Communication port (USB)**
2. **Contactless reader**
3. **Magnetic stripe reader**
4. **Contactless transaction status LEDs indication**
5. **LCD Display**
6. **On/Off button**
7. **Charging and communication (UART) pads**
8. **Keypad**
9. **Chip card reader**

GETTING STARTED

BluePad-50 Plus has rechargeable lithium-ion polymer battery. The battery can be charged from USB power adapter connected to USB port or when is attached to Docking station.

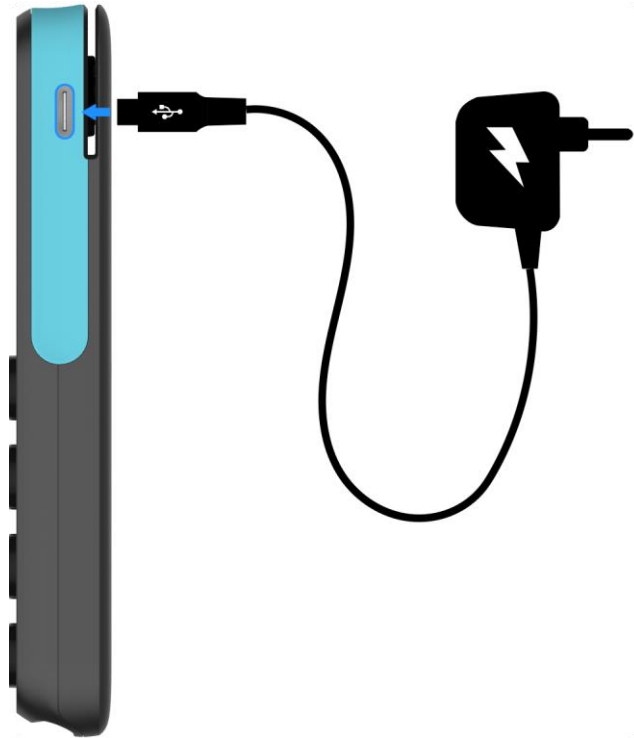



Figure 2

	Battery of BluePad-50 Plus is non removable, for replacing please see “Main battery replacement”.
---	---

Setup

When a BluePad-50 Plus is switched on and the Power button is kept pressed, on the display will be shown the name and the version of the Secure Boot Loader and the firmware.

Service personnel can access two different system modes: “**System Mode**” and “**Application Download Mode**”.

SYSTEM MODE

To enter System mode on the BluePad-50 Plus, the button **2** has to be maintained pressed while switching on the PINPAD. A characteristic sound is played and on the display appears the “SYSTEM MODE” menu.

The following keyboard buttons can be used in service mode:

- 1**: move through the list one position upwards
- 2**: move through the list one position downwards
- ✓**: selection of the active option
- ✗**: return to previous level or exit the service mode

The following menu options can be selected in service mode:

INFO VERSION
INFO HARDWARE
INFO KEYS
TEST DISPLAY
TEST KEYBOARD
TEST SCR
COMMUNICATION MODE

INFO VERSION

Shows the serial numbers and the versions of the detached program modules:

DEV SN - BluePad-50 Plus serial number
USIP SN - USIP serial number
USIP VER - USIP version
ISBL VER - USIP Boot loader version
HAL VER - USIP Hardware Abstraction Layer (HAL) version
LOAD VER - Secure Boot Loader (SBL) version and name
FW VER - Firmware version and name
PROM VER - Prompts version
APPL VER - Application version and name
PKFA VER - Version of the public key used for firmware authentication
PKAA VER - Version of the public key used for application authentication
PKKA VER - Version of the public key used for manufacturing keys authentication

INFO HARDWARE

Gives information about the status of the following hardware properties:

BATT: indicates the voltage of the battery

VBUS: indicates if external power supply is plugged in

CHARGE: indicates if the battery is charging

INFO KEYS

Shows the version of the following keys:

AIK keys version

TEST DISPLAY

Performs a display test. Initially a blank screen is displayed. When OK button is pressed once, completely black screen is displayed. When OK button is pressed twice, checkmate background is displayed, its contrast can be changed with the UP and DOWN buttons.

To exit the test at any time the button C has to be pressed.

TEST KEYBOARD

Performs a keyboard test. At first the symbols of all the keys appear on the display. Pressing a key makes its corresponding symbol to disappear. The test ends when all the buttons have been pressed.

TEST MSR

Performs magnetic card reading test. The test waits for a card to be inserted. On a successful card reading, the tracks data are displayed.

TEST SCR

Performs smart card reading tests. On the display appears a menu with the supported options. To perform a test, insert a card in the card slot and select the corresponding menu option:

1: RESET : performs card reset and returns the ATR

2: GET CHALLENGE : calls the command GET CHALLENGE and returns a random number

KEYS DOWNLOAD

To download the Acquirer Initial Keys (AIK) the PINPAD has to be set in Keys Download Mode, in which it exchanges information in a secure way through the USB interface using proprietary communication protocol. To exit the mode the "C" button has to be pressed.

CLEAR DEA KEYS

Deletes the customer's DEA key hierarchy.

EXIT

Exit the service menu forwarding the control to the application.

APPLICATION DOWNLOAD MODE (Firmware/Application update via USB interface)

To enter application download mode on the BluePad-50 Plus, the button **1** has to be maintained pressed while switching on the PINPAD. A characteristic sound is played and on the display appears the name and version of the Secure Boot Loader.

When application download is initiated, on the display is shown the progress in percentages of the downloading process.

To exit the mode, press **X** or Power buttons.

The Application download process shall not be interrupted to prevent memory corruption. If the buttons **X** or Power are pressed during the downloading process, the application integrity checking will fail on booting up and process will have to be repeated.

COMMUNICATION PARAMETERS

The default USB VC serial port communication parameters are the following:

115200bps

8bit

1 stop bit

no parity

SETTINGS IN APPLICATION(DEPENDS OF THE APPLICATION)

RS SPEED	115200*
USB MODE	DISABLE*/DEVICE/HOST
BLUETOOTH	Settings
	Mode: ENABLE/DISABLE
	ADDR: MAC ADDRESS of the Bluetooth
	NAME: Bluetooth name
	PASS: Bluetooth password
	PAIR: DISCOVERABLE/HIDDEN
	AUTO: ENABLE/DISABLE
	VER: Bluetooth firmware version
	MASTER RESET: return to default settings
	FW UPDATE
AUTO OFF	60min*/120min/180min/240min/DISABLE/1min//5min/10min/ 15min/30min/45min

***Default settings**

OPERATING MODE

To start Operating mode on the BluePad-50 Plus, quick press the power button. A characteristic sound is played and on the display appears the clock and battery status. For entering in "SYSTEM MODE", need to be pressed button ③.

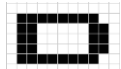
The following keyboard buttons can be used in System mode:

- ①: move through the list one position upwards
- ②: move through the list one position downwards
- ✓: selection of the active option
- ✗: return to previous level or exit the service mode

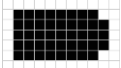
Display

The device is equipped with 2" inch color display.

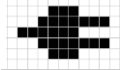
Display Indications



Battery indication for discharged battery



Battery indication for fully charged battery



Outside power from USB cable – "Plug"



Battery is charging from UBS cable or Power station – "Flash"



"USB" - connection with USB

Bluetooth Pairing

Turn on BluePad-50 Plus and Commercial off-the-shelf/smart device with Bluetooth capabilities. In smart device enter to Bluetooth menu and locate BluePad-50 Plus (used Bluetooth name in Air is BluePad-50 Plus serial number). Press on pair and confirm if passkey is same on both devices.

Bluetooth Pairing with Apple device by using “Scan to Pairing”

1. Turn on BluePad-50 Plus (hold On/Off button, around ~2sec).
2. Run the iOS application, go to the settings “Scan barcode”:



Figure 3

Then the camera of the phone will be activated.

3. Scan the serial number on the label of BluePad-55 with back camera.
4. Then of the screens on both devices will be showed the “Pairing Request”.

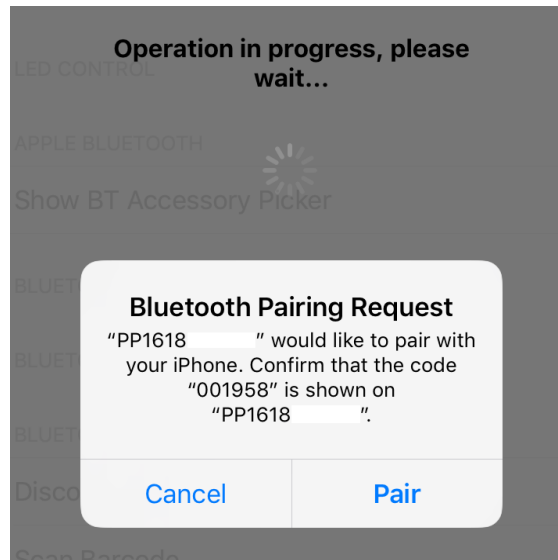


Figure 4

5. Please confirm if the passkey is same on both devices.

Update Firmware and Application with using Firmware API

Loaded Firmware and Application on BluePad-50 Plus can be updated via Application which is using Firmware API. Pair BluePad-50 Plus to another device via External Interfaces (Please refer to device specification section “Connectivity”). Run the Application* on COTS (smart device) and press “Update device firmware”.

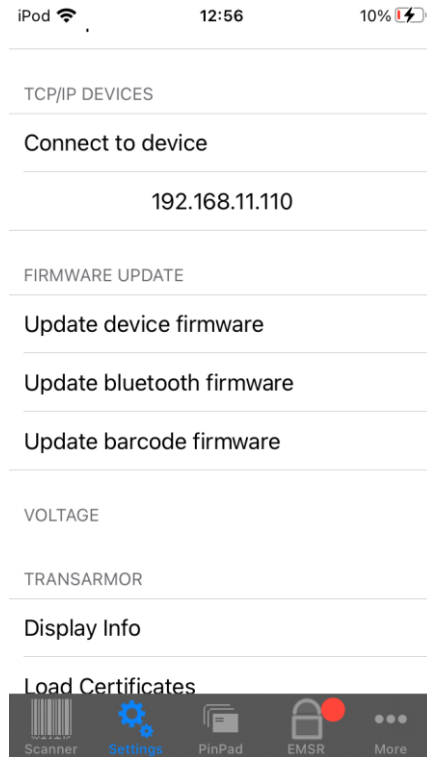


Figure 5

* In order to use the BluePad-50 Plus functions with COTS(smart device), special software must be used. Please contact your distributor in order to get the latest demo application and SDK.

Magnetic Card Reader Use

The magnetic card transaction procedure can vary depending on the application loaded on the BluePad-50 Plus. Verify the proper procedure with your application provider before performing a magnetic card transaction.

To Conduct a Magnetic Credit/Debit Card Transaction

- 1 Position a magnetic card as shown in Figure 6.
- 2 Insert it into the MS card reader slot and then quickly swipe it.
- 3 Hand BluePad-50 Plus to the customer for signature or PIN entry



Figure 6

Smart Card Reader Use

The smart card transaction procedure can vary depending on the application loaded on the BluePad-50 Plus. Verify the proper procedure with your application provider before performing a smart card transaction.

To Conduct a Smart Card Transaction

- 1 Position a smart card with the gold contacts facing upward.
- 2 Insert it into the ICC card reader slot in a smooth, continuous motion until it seats firmly.
- 3 Hand BluePad-50 Plus to customer for PIN entry
- 4 Remove the card when the display indicates the transaction is completed.



Figure 7



Leave the smart card in the card reader until the transaction is completed. Premature removal can void the transaction.

Contactless Card Reading

The contactless card transaction procedure can vary depending on the application loaded on the BluePad-50 Plus. Verify the proper procedure with your application provider before performing a contactless card transaction.

In order to use the Contactless card reading function, special software must be used. Please contact your distributor in order to get the latest demo application and SDK.

To Conduct a Contactless Credit/Debit Card Transaction

1. Place a contactless card to shown on the BluePad-50 Plus display contactless logo.
2. Remove the card when the display indicates the transaction is completed.




Figure 8

Troubleshooting Guidelines

This chapter lists typical examples of malfunction you may encounter while operating your BluePad-50 Plus unit and steps you can take to resolve them.

The troubleshooting guidelines provided in the following section are included to assist successful installation and configuration of BluePad-50 Plus units. If you are having problems operating your BluePad-50 Plus unit, please read through these troubleshooting examples. If the problem persists even after performing the outlined guidelines or if the problem is not described, contact your local Datecs representative for assistance.

	<p>The BluePad-50 Plus unit contains no user-serviceable parts. Do not, under any circumstance, attempt to disassemble the unit. Perform only those adjustments or repairs specified in this guide. For all other services, contact your local Datecs service provider. Service conducted by parties other than authorized Datecs representatives may void any warranty.</p>
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Blank Display

When the BluePad-50 Plus unit display does not show correct or clearly readable information:

- Check battery power.
- If the problem persists, contact your local Datecs service provider.

Keypad Does Not Respond

If the keypad does not respond properly:

- Check the display. If it displays is not blank, follow the steps outlined in [Transactions Fail To Process](#).
- If the problem persists, contact your local Datecs representative.

Transactions Fail To Process


There are several possible reasons why the unit may not be processing transactions. Use the following steps to troubleshoot failures.

Check Magnetic Card Reader

- Perform a test transaction using one or more different magnetic stripe cards to ensure the problem is not a defective card.
- Ensure that you are swiping cards properly (see [Magnetic Card Reader Use](#)).
- If the problem persists, contact your local Datecs representative.

Check Smart Card Reader

- Perform a test transaction using several different smart cards to ensure the problem is not a defective card.
- Ensure that the card is inserted correctly (see [Smart Card Reader Use](#)).
- If the problem persists, contact your local Datecs representative.


	Due to risk of shock or damage, do not use the BluePad-50 Plus unit near water, including a bathtub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.
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Maintenance and Cleaning

BluePad-50 Plus units have no user-serviceable parts.

To clean the unit, use a clean cloth slightly dampened with water and a drop or two of mild soap. For stubborn stains, use alcohol or an alcohol-based cleaner.

Do not attempt to clean the card readers. Doing so can void any warranty. For card reader service, contact your Datecs distributor or service provider.

	Never use thinner, trichloroethylene, or ketone-based solvents – they can deteriorate plastic or rubber parts. Do not spray cleaners or other solutions directly onto the keypad or display.
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Main battery replacement

To replace the main battery of BluePad-50 Plus please contact with your your local Datecs representative or service provider.

Safety

- To prevent damage to your device's parts or internal circuits, do not use it in dusty, smoky, damp, or dirty environments or near magnetic fields.
- Using an unapproved or incompatible power adapter, charger, or battery may damage your device, shorten its lifespan, or cause a fire, explosion, or other hazards.
- Keep the device and battery away from excessive heat and direct sunlight. Do not place them on or in heating devices, such as microwave ovens, stoves, or radiators.
- Dispose the battery, and accessories according to local regulations. They should not be disposed of in normal household waste. Improper battery use may lead to fire, explosion, or other hazards.
- Do not use, store or transport the device where flammables or explosives are stored (in a gas station, oil depot, or chemical plant, for example). Using your device in these environments increases

the risk of explosion or fire.

Service and Support

For BluePad-50 Plus problems, product service, and repair information, contact your local Datecs representative or service provider.

- International – Contact your local Datecs distributor

Service Returns

All customers, please contact your local Datecs Ltd representative or distributor for assistance with your service, return, or replacement.