



M020-GUIDE01-V1-8

M020/M021 Operational Guide

Date: 25th April 2023

Commercially confidential

Uncontrolled when printed

Document History

Doc/Version	Details of change(s)	Author(s)
1.0	Approved Version	R Stephens
1.1	Compliance comments. Draft	R Stephens
1.2	Formatting changes, storage statement	G Richards
1.3	Additional formatting changes	G Richards
1.4	Added test sections for touchscreen, green LED and keypad backlight. Renamed Apple co-processor test as MFi test. Updated charging cradle test and WiFi test. Added Battery level estimation without app section. Minor fixes.	D Herranz
1.5	Added detail around M-Link Sticker. Updated to include Miura's Raspberry Pi BT/WiFi responder/ In-vehicle implementation note, maximum storage period before charge changed to 12 months. Appendix C added.	D Shaw/S Marlow/G Richards
1.6	Section 3.4 added-Wi-Fi configuration. Added details for Bluetooth menu. Section 3.5 added-USB Mode. Section 3.9 added-Systems Menu.	J Barton
1.7	Update to section 9. Clarification to documentation for battery regulatory requirements. Minor mods made	S Marlow
1.8	Section 9: battery type amended to Li-Poly	M. Cosci

Contents

1	Introduction.....	4
2	M020/M021 Feature Guide.....	5
3	Operating the M020/M021 Payment Terminal	7
3.1	Introduction.....	7
3.2	Power and charging	7
	Implementation note: In-vehicle use.....	8
3.3	Bluetooth.....	9
3.4	Wi-Fi	11
3.5	USB Mode.....	14
3.6	Transaction Mode	15
3.7	Contactless	16
3.8	Terminal Maintenance.....	16
3.9	System Menu	17
3.10	Error states.....	18
4	Revive™.....	19
4.1	Power up as Normal	19
4.2	System Restore	19
4.3	Total Factory reset	19
4.4	Terminal Diagnostics.....	20
5	Functional Test	21
5.1	Beeper Test.....	21
5.2	LCD display Test	21
5.3	Touchscreen (TS) test (M021 only)	22
5.4	LED test (green LED)	22
5.5	Keypad backlight test (M021 only)	22
5.6	Keypad Test.....	22
5.7	Magnetic Stripe Reader Test (Mag swipe)	22
5.8	Chip card Test.....	22
5.9	Contactless card Test	22
5.10	Charger Test	22

5.11	Charging Cradle Test.....	23
5.12	Bluetooth Test	23
5.13	WiFi Test.....	24
5.14	MFi Test.....	24
5.15	Hardware Functionality Test Completion	24
6	End-user Troubleshooting	25
7	Filtering Process	26
8	Appendix A: Example Diagnostic Files	27
9	Appendix B: Regulatory Information	30
10	Appendix C: Precautions for use.....	33

1 Introduction

This document provides general information about the operation of the M020/M021 payment terminal and gives detailed instructions to be used as the basis for device filtering and fault diagnostics. The intention is to convey all necessary information about the operation of the terminal in one document. This document does not cover any operations which are controlled by third-party applications (either those running on the terminal or those running on the smart device).

It is envisaged that the information in this document will then be used by Miura partners, in conjunction with other information they have about the system as a whole, to produce other documents / webpages for end-users and teams within the partner's organisation.

Appendix B contains regulatory information about the device.

It is recommended that this information is added to all end-user documentation.

It is mandatory that the Declaration of Conformity (or a link to it) should be included in the end-user documentation, along with a statement that the equipment meets the essential requirements of Directive 2014/53/EU. For example:

“This product is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. The declaration of conformity may be consulted at www.miurasystems.com”

In addition, the name, registered trade name, or registered trademark, and the postal address of the **reseller or distributor** should also be included in the user documentation.

Storage requirements - battery charging:

Fully charge the terminal **every 12 months (even when not in use)** to prolong the lifetime of the battery.

Units received before **1st January 2021 must be fully charged after 6 months** and then they can go onto a 12-month full charge cycle.

2 M020/M021 Feature Guide



Feature Function References:

1 Charging Red/Green LED. Indicates unit is charging (Red) or fully charged (Green). A flashing red LED indicates a fault condition.

2 Charging contacts for standard or fast charge cradles.

From right to left: 5V fast charge, USB 5V VBUS, USB D-, USB D+, USB ID, GND (as seen from the back of the M020).

3 Revive™ button. Pin-hole reset button used to activate the Revive feature.

4 USB connector. USB Micro-B receptacle- used for charging / file transfer

5 Magnetic stripe reader. Card stripe downwards and facing away from user.

6 Power button. Used to power the terminal on and off and enter sleep mode

7 Contactless display icons to indicate different stages of a contactless card transaction

8 Function key for Bluetooth and WiFi communication

9 Colour TFT Display (with touch-screen on M021 variant).

10 Cancel key with tactile identifier. Cancels actions including PIN entry.

11 Enter key with tactile identifier. Confirms actions including PIN entry

12 Clear key with tactile identifier. Deletes last PIN digit entered

13 Chip card slot. Insert card with chip facing upwards.

14 Cut-outs used to lock the device into the retail cradle or fast charger

15 Protection Sticker covering the M-Link connector.

3 Operating the M020/M021 Payment Terminal

3.1 Introduction

This section covers the basic operation and use of the terminal. This covers power on and off, charging, basic Bluetooth connection, transaction PIN entry and terminal maintenance. The logos displayed in this document are configurable. This document assumes that the Miura (MPI) application is loaded and the default logos are still in use.

3.2 Power and charging

3.2.1 Turning the terminal ON

To power up, push the power button or plug the terminal into a USB power source. The power-up sequence starts with the boot logo display. Once the terminal is ready to use, the Bluetooth icon will start to flash or stay solid at the top left corner of the display, depending on whether the terminal has been paired with a smart device. The battery status indicator appears in the top right corner of the display when the terminal is ready to use.

3.2.2 Turning the terminal OFF

To switch off, press and hold the power button until the display shows “Shutting Down” and the display turns off. Once off, the terminal will not react to any key presses, except Power button and the Revive™ switch.

3.2.3 Sleep

The terminal can be put into sleep mode. In this mode the terminal's power consumption is very low (WiFi and Bluetooth is switched off), but when it is woken it will be ready to use within a few seconds. The terminal will enter sleep mode if the power button is briefly pressed, or after a period of inactivity.

The terminal will wake on any of the following activities:

- Any key press
- USB charge cable inserted
- Smart-Card inserted
- Magnetic Stripe Card swiped

3.2.4 Charging the Battery

The terminal has a rechargeable battery which cannot be removed or replaced. The battery should be charged for at least 3 hours before using the terminal for the first time or if the terminal has not been used for a long time.

The battery is charged by plugging the terminal into either a computer or external USB adapter using the USB lead provided. Charging via a USB wall adaptor is faster, but the adaptor must be capable of supplying at least 1A. The battery may also be charged by placing the terminal into a Retail Cradle (connected either to a computer or external USB power adapter), or into a Fast Charge Cradle which will allow the fastest charging time. Please note that if using the device in conjunction with the Retail Cradle or Fast Charge Cradle then you should remove the protection sticker as shown in item 15 in the [M020 Features](#) section.

When the unit is charging and running normally the charging icon will be displayed in the top right hand corner of the display. The battery status icon will also indicate the battery charge level.

Implementation note: In-vehicle use

The 12V power supply in vehicles (for example via the cigarette lighter socket) is subject to large voltage transients generated by the vehicle. Any 12V to USB power adapter used must protect the terminal from voltage transients and other disturbances. Only good quality power adaptors meeting ISO 7637-2 must be used.

3.2.5 Low Battery

If the battery power goes below the configured Low Battery Threshold, the low battery warning screen will be displayed. If the battery power goes below a critical level the terminal will sleep until the charge has increased above this level.

3.2.5 Battery level estimation without app (MPI)

For devices without an app (MPI) installed, only the OS, and which are at the “Ready To install” screen, an approximate estimation of the battery level can be obtained following the next steps:

- Plug the device into a USB charger
- Make sure the red charging LED comes on
- Wait for at least 1 minute
- On the “Ready To Install” screen press the 8 key
- Check the bottom line of text. It will be one of the following, which approximately corresponds to these battery levels:
 - “Prequal mode”: very low battery
 - “Const current.”: less than 60-70 %
 - “Const voltage.”: between 60-70% and 90%
 - “Top off”: above 90 %
 - “Charge complete”: full

Please note that, when pressing the 8 key, a percentage is also shown on the screen. However, that percentage is not very precise, and it is better to follow the percentage indications above.

If this method is used to check the battery status when charging devices in storage to prolong shelf-life, the “Charge complete” status must be reached.

3.2.6 Battery usage guidelines

- Keep the battery well-charged and do not let it discharge completely.
- Charge at normal room temperature (charging is disabled below 0C).
- Keep the terminal away from heat sources (such as heaters or direct sun-light)
- Fully charge the terminal every 12 months (even when not in use) to prolong the lifetime of the battery. (applicable to units manufactured after 1st January 2021) [See Section 1: Introduction- Storage Requirements for mor detail.](#)

Error conditions

- Flashing red LED (regular on/off about twice a second)
 - Remove power for 1 hour and ensure the terminal is in a room temperature environment (18-25C). Re-power with a known good cable and power supply (5V 1A). If the error re-occurs or persists, **return the unit for repair**
- Flickering red LED (irregular or on with short off periods)
 - Remove power and check with a known good cable and power supply (5V 1A). If the error re-occurs or persists, **return the unit for repair**
- Red LED does not light even when correctly plugged into a power supply
 - Remove power and check with a known good cable and power supply (5V 1A)
 - If the red LED still does not light, there is fault – disconnect the USB power & **return the unit for repair**

3.3 Bluetooth

3.3.1 Start up

Once the terminal is ready to use, the Bluetooth icon and the battery status indicator will be displayed at left and right top corners of the display respectively and the terminal enters one of the following modes:

- Ready To Pair
- Ready to Connect

3.3.2 Ready To Pair:

If the terminal has never been paired with any Bluetooth device previously, the terminal starts in **Ready To Pair** mode. The Bluetooth icon will be flashing once per second. In this mode the terminal will be discoverable by other Bluetooth devices. The remote Bluetooth device can now pair with the terminal. The terminal will remain in this state until the remote Bluetooth device successfully completes the pairing process, at which point it will change to **Ready To Connect** mode.

For most smart devices the numeric comparison pairing method is used. This involves both devices displaying the same random number. The user should check that these numbers match and if so, confirm on both devices. For the Miura terminal the green tick key is used for this. For older Bluetooth

devices, PIN pairing may be used. If the user is prompted for a Bluetooth PIN during the pairing process, it will be the last 6 digits of the terminal's serial number.

3.3.3 Ready To Connect

If the terminal has previously been paired with a Bluetooth device, and the pairing information is still available in the terminal, it will start in **Ready To Connect** mode. In this mode the terminal will allow connections with the paired Bluetooth device and will not be discoverable by other Bluetooth devices. In this state the Bluetooth icon will stay solid.

To activate the **Ready To Pair** mode press and hold the **ENTER**(✓) key until the Bluetooth Icon starts to flash. Once pairing is complete, the old pair will be removed (this is the only way to remove old pairs). To exit **Ready To Pair** mode without making a new pair, press the **CANCEL**(X) key. The terminal will also exit **Ready To Pair** after a configurable time-out.

3.3.4 Bluetooth Menu

The user can also activate **Ready To Pair** mode by way of the Bluetooth menu which can be seen by pressing the yellow back arrow (←) to show the menu, then selecting 1.

Note: This Main System Menu is configurable and may be disabled via configuration =. If pressing the yellow back key does not bring up a menu please check the configuration loaded.



This will then display 3 options.



Option 1 **Bluetooth Info** will display the Name of the terminal and the Mac address.
 Option 2 **Manage Pairs** here you will see smart devices already paired to your terminal.
 Option 3 **Start Pairing** this will put your terminal into the **Ready To Pair** mode where the Bluetooth icon starts to flash.

3.3.5 Connected

The terminal enters **Connected** mode once a Bluetooth connection is established with an application on the smart device.

3.4 Wi-Fi

3.4.1 Start up

If the device has been Wi-Fi enabled (this is done via a configuration file), there will be a Wi-Fi icon on the display. This will be in an **unconfigured** mode by default. The **unconfigured** mode is indicated by the icon flashing once per second.



To configure the Wi-Fi on the device there needs to be an active Wi-Fi Access Point (AP) nearby. Press the YELLOW back arrow (←) to show the menu. Once the menu appears, select (2) to configure/Set up

Wi-Fi.



Select (3) to add a new Wi-Fi Network.



M020 Scanning for Network(s).



After a short period, a list of Wi-Fi Access Points that are found will be available for you to select. Choose the desired AP from the list by either selecting the number associated with the named AP

using the keypad or manually scrolling down using '8/0 scroll'.

Note: Use this option to input the SSID of an Access Point which is hidden (does not broadcast its SSID). Note that prior to MPI V1-62 this option would add the SSID but only connect when the Access Point broadcasted its SSID.



The following should then be displayed after selecting AP:



The Miura device keypad uses a basic scrolling function to allow the user to select the appropriate password character.

- 2 = Up
- 8 = Down
- 4 = Left
- 6 = Right
- 5 = Select

Connecting to Network.



Once Connected to Network



Finished Screen showing connected Wi-Fi



3.5 USB Mode

By press the yellow back arrow (←) to show the menu. Once the menu appears, select (3) to use the

USB menu. Once selected the display will change, like below.



3.5.1 Use Mass Storage

Selecting option (1) *USB Mass Storage* will enable the user to use the mass storage on the terminal.



3.5.2 Use USB Serial

Selecting option (2) *USB Serial mode* will enable the user to communicate over USB serial connection.



3.6 Transaction Mode

3.6.1 PIN Entry

If the terminal is expecting PIN entry from the user, the instructions will be displayed. Once PIN entry is complete, the user should press **ENTER**(✓) key to continue.

During PIN entry the user can press **CLEAR**(←) to delete the previous digit or **CANCEL**(X) to delete all the digits and re-start PIN entry. Pressing **CANCEL**(X) when no digits are entered will cancel the PIN entry.

3.6.2 PIN OK

If the PIN is correct, the terminal will display “PIN OK”.

3.6.3 PIN Incorrect

If the PIN is incorrect the terminal will display “INCORRECT PIN” for 2 seconds and request for Pin entry again.

3.6.4 Last Try

If the user is attempting last try for Pin entry, the terminal will indicate “ENTER PIN: (Last Try)”.

Note: The Pin Entry instruction are language dependent and will change depending on the language configured. The Language can be configured from the application on the smart device.

3.7 Contactless

When the M020 is ready to take a contactless payment, the screen below will be displayed (with the relevant transaction amount shown). The contactless card should be presented with the card centralised on the contactless logo on the screen.



3.8 Terminal Maintenance

3.8.1 Security Check