M320 Series Universal Trigger

Technical Manual

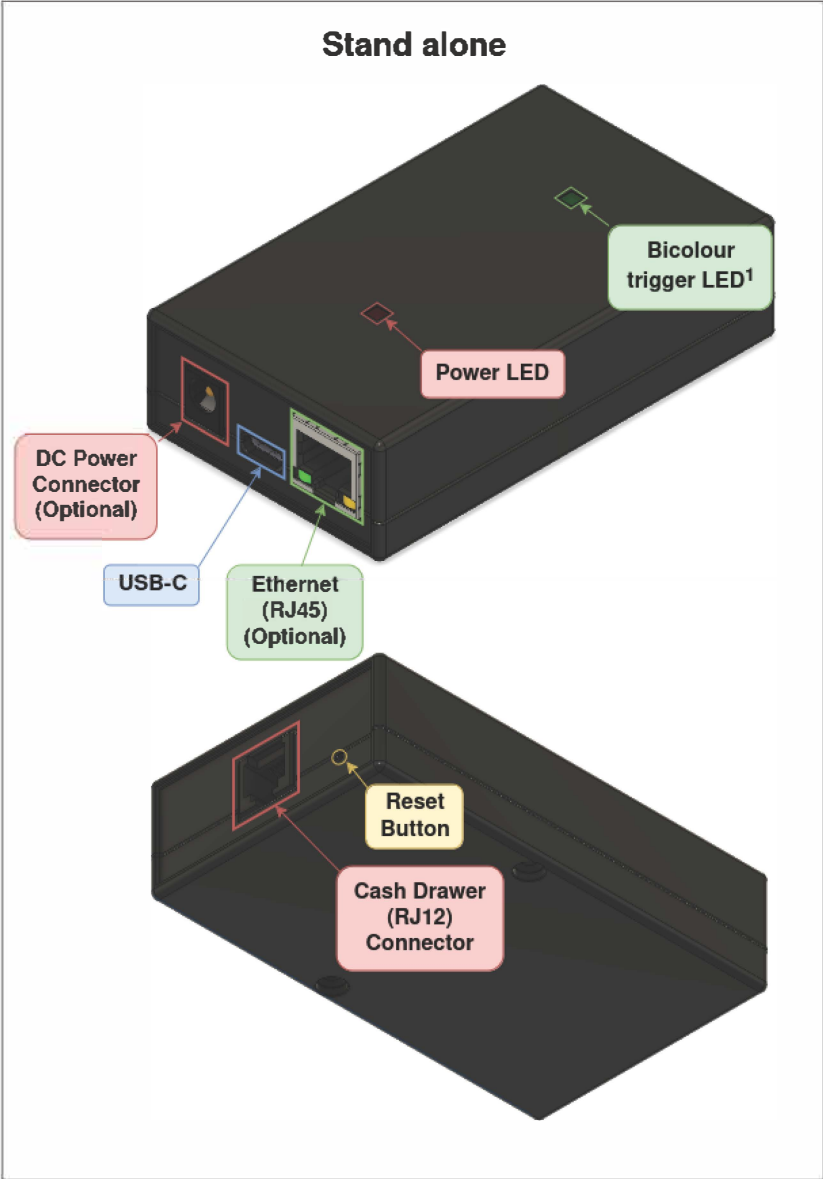# M320 Series Universal Trigger - Technical Manual

Overview

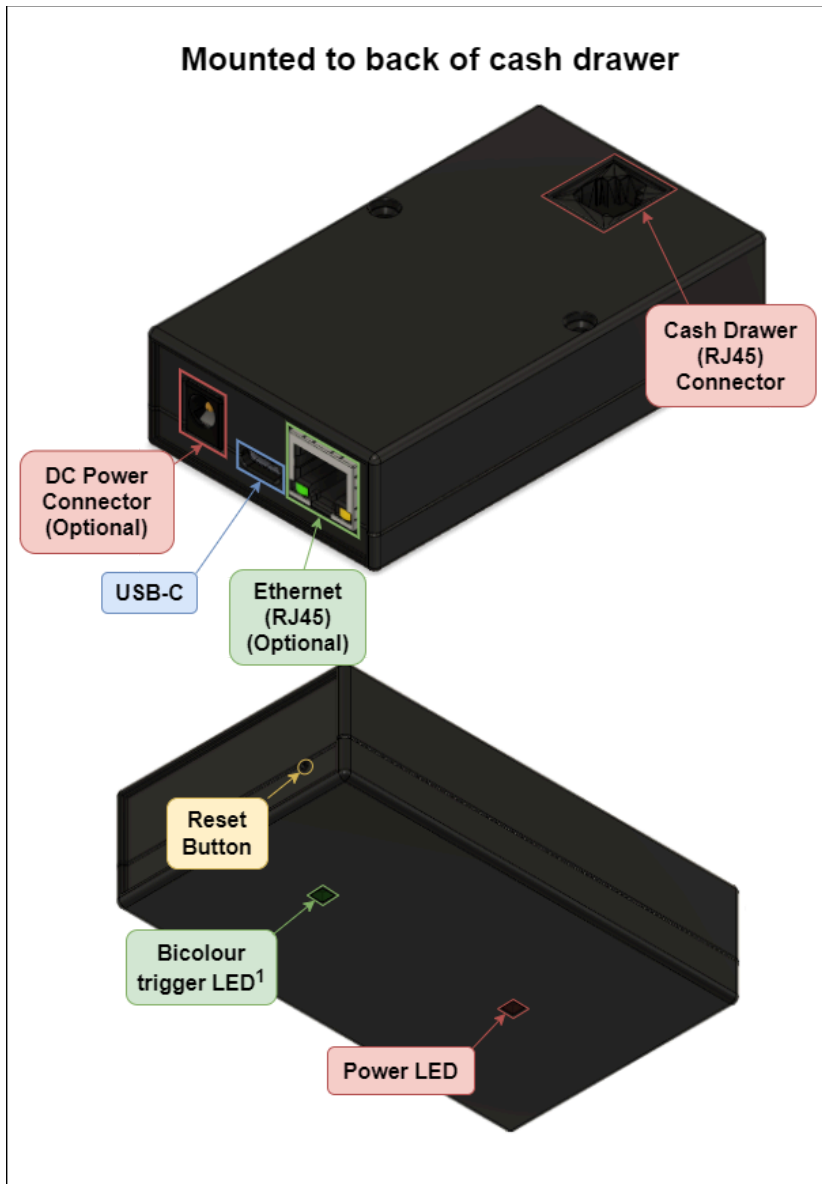This guide covers the Unique Micro Design *M320 Series Universal Trigger.*

The M320 Universal Trigger is an intelligent microcontroller based device. It interfaces to solenoid based locking mechanisms as found in cash drawers and locks.

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Stand alone

- Bicolour trigger LED[1]
- Power LED
- DC Power Connector (Optional)
- USB-C
- Ethernet (RJ45) (Optional)
- Reset Button
- Cash Drawer (RJ12) Connector

Mounted to back of cash drawer

Cash Drawer (RJ45) Connector

DC Power Connector (Optional)

USB-C

Ethernet (RJ45) (Optional)

Reset Button

Bicolour trigger LED[1]

Power LED

[1]Trigger 1 lights up **GREEN**, trigger 2 lights up **AMBER**

Host Communication Interfaces

Depending on the model, the M320 can be triggered by command from the host computer/device via:

- **USB**
  - Appears as a CDC serial device to the host computer
- **USB Host**
  - Acts as a host to a USB Human Interface Device (*HID*) such as a keyboard or a barcode reader
- **Ethernet and/or Wi-Fi Client**
  - Acts as a raw TCP socket server

Powering The Module

The M320 is powered by either:

USB-C (cable supplied) OR 8-28V Plug pack with a 2.1 mm DC socket (special order only)

When power is applied, the **RED LED** will be illuminated.

Solenoid Interface

The module provides a standard modular **RJ12** - 6 pin cash drawer connector to trigger up to two **12V** or **24V** solenoids (as configured by the *M320 Manager*).

Pin	Usage	Notes
1	Not connected	
2	Trigger 1	This pin is typically left floating. When triggered, the M320 shorts this line to ground. This powers the primary cash drawer with Vtrig as the supply voltage, and illuminates the Trigger LED **Green**.
3	Status 1	Provides primary cash drawer open/closed status from microswitch. Pulled up to 3.3V

4	Vtrig	Typically 24V. Supplied by a capacitor bank charged by a firmware-controlled boost converter.
		
		 When either of the trigger pins is activated (i.e., shorted to ground by the M320), the capacitor briefly discharges, powering the selected solenoid.
		
		     You can **not** fire both solenoids at the same time.
		
		        The capacitor takes ~8 seconds to charge up.

5	Trigger 2	This pin is typically left floating. When triggered, the M320 shorts this line to ground. This powers the secondary cash drawer with Vtrig as the supply voltage, and illuminates the Trigger LED **AMBER**.
6	Ground	

M320 Manager

The M320 can be configured via a web browser available on all modern mobile devices.

The *M320 Manager* page enables you to:

- Add, modify, and remove arbitrary trigger codes
- Configure the voltage being use to trigger the solenoid, i.e. 12 or 24V[1]
- Configure the pulse duration for the trigger[1]
- Toggle drawer open/close responses
- Modify communication interface settings (Ethernet, Wi-Fi, and USB)

> ℹ️   [1]The same settings are used for both trigger 1 and 2.

To configure the M320, you must first connect your computer (or mobile device when using the M320 Wi-Fi Access Point) to one of the M320's communications interfaces as described below:

- USB-C (all models)
- M320's Wi-Fi Access Point (model specific)
- Ethernet (model specific)

Connect and configure via USB-C

1. Connect the module to your PC with the supplied USB-C cable
2. Open *Google Chrome*, or *Microsoft Edge* (*Firefox* and most other browsers will not work)

3. Browse to the public website https://www.umd.com.au/m320

   a. You should see the *M320 Manager* page.

4. Press the `Connect` button

   a. You should be presented with a pop-up listing the available M320 serial ports, e.g., `M320AU (COM18)`

   b. Select the appropriate serial port

   c. Click the `Connect` button on the pop-up

5. Once connected, you will be presented with **Status** details

6. Continue with the ***M320 Manager*** section below to configure

Connect and configure via M320's Wi-Fi Access Point

By default, the M320 with Wi-Fi model will host it's own *Wi-Fi* network (Access Point mode) for **10 minutes** on being powered up[1]. This allows easy configuration of the module without requiring physical access to the module.

> ℹ️ [1]This can be disabled in the *M320 Manager*

Typically, you would use a mobile device to connect to the M320's Wi-Fi Access Point within this 10 minute window. To do so:

1. Power the module on

2. Connect the mobile to the module's Wi-Fi Access Point using these default credentials (unless changed in the *M320 Manager)*:

   a. SSID: `M320AX-<serial_number>`

      i. e.g., `M320AX-A1B2C3D4E5F6`

   b. Password: `14121982`

3. Once the Wi-Fi is connected, browse to `http://192.168.4.1`

4. You will be presented with the login page

5. Login to the *M320 Manager* website using the following default credentials (unless changed in the *M320 Manager)*:

   a. Username: `M320`

   b. Password: `14121982`

6. Continue with the ***M320 Manager*** section below.

Connect and configure via Ethernet or Wi-Fi Client

1. Connect the module to your LAN with an Ethernet cable, or to your local Wi-Fi Access Point

2. Power the module on

3. Connect to the module's web UI using a web browser:

   a. If you know the module's IP, browse to `http://<device_ip>`

      i. e.g., `http://192.168.1.132`

   b. If you know the module's Serial Number, browse to `http://M320-<serial_number>.local`

      i. e.g., `http://M320-A1B2C3D4E5F6.local`

      ii. Note: Older software revisions pre v1.1.1 instead use `http://M320-<last_6_serial_number_characters>.local`

         1. e.g., `http://M320-D4E5F6.local`

      iii. Note: If you see `This site can't be reached`, your network likely does not allow *mDNS broadcasting*. To get around this, you will have to instead use USB, see **Connect and configure via USB-C**.

4. You will be presented with the login page

5. Login to the website using the following default credentials:

   a. Username: `M320`

   b. Password: `14121982`

6. Continue with the ***M320 Manager*** section below.

Configuring the Module

Upon connecting to the site, you will be presented with the *M320 Manager* page, enabling you to configure the device:

M320 Manager

Device

Settings
  Security
  Trigger
  Networking
  Ethernet
  Wi-Fi Access Point
  Wi-Fi Client
  USB
  Codes

Update Firmware

Device

Control

| Restart | Trigger #1 | Trigger #2 |

Status

Module

Connection status	Connected
Model number	M320AX000-F00
Serial number	57CA04A8F3A4
Hardware version	v1.0.0
Firmware version	v0.2.9
Up time	1 minute, 1 second

Ethernet

MAC address	DC:54:75:C4:41:E7
Status	Connected
IP	192.168.0.60
Netmask	255.255.254.0
Gateway	192.168.1.253

Wi-Fi Access Point

MAC address	DC:54:75:C4:41:E5
Status	Enabled
SSID	M320A
IP	192.168.4.1
Netmask	255.255.255.0
Gateway	192.168.4.1

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To make changes to the M320:

1. Use the sidebar to navigate to the correct section

2. Make the relevant change

3. Press `Save and apply all changes`

The M320 will then restart with the new changes.

Basic Configuration Tasks

Before operating the device, we suggest that the following are configured in order:

1. In *M320 Manager → Settings → Security*
    a. Change **M320 Manager Login** *→ Password*
    b. If using Wi-Fi Client or Ethernet interfaces we *strongly* recommend
        i. Check **Trigger Security** *→ Require trigger password*
            1. If checked, the POS Software must prepend the password to issued command codes

ii. Change **Trigger Security** → *Trigger Password*

1. The default is `pass`

2. For example, if the Trigger *Password* is `pass` and the code to open the drawer is `<BEL>` (i.e., CTRL+G / 0x07), the following must be sent: `pass<BEL>`

2. In *M320 Manager → Settings →* **Trigger**

a. Configure **Relay trigger voltage** to match your solenoid

3. Press *Save and apply all changes*

Command Codes

Command Codes are unique sequences of characters that when received, will trigger the associated function as set by configuration from the *M320 Manager* page.

All standard *ESC/POS* and *OPOS* printer drawer open commands are used to trigger the device by default. This allows cash drawers previously attached to POS printers and cash registers to be connected with a variety of computer interfaces without modification to the POS software.

ESC/POS printer status commands are also available to return the open or closed status of the drawer.

The three functions are:

- **Trigger 1**

  - Opens drawer 1

- **Trigger 2**

  - Opens drawer 2

  - If drawer 2 is not connected, Trigger 2 will have no effect

- **Echo**

  - The module will send a response in the following form:

```
1  UMD - Universal Trigger Module - v1.1.1
2  SN: 576210A8F924
3  (C) 2024 UMD IP - Jun  8 2024
```

By default, the following *Command Codes* are defined:

Command Code Printable ASCII & <control characters>	Command Code Hexadecimal	Associated Function
<BEL>	07	Trigger 1
<ESC>p0	1B 70 30	Trigger 1
<ESC>p1	1B 70 31	Trigger 2
<DLE>00<SI>	10 30 30 0F	Echo
DG 2<CR>	44 47 20 32 0D	Echo
<GS>a<0xFF>	1D 61 FF	Echo

Test Drawer

Once the Basic Configuration Tasks are complete, it is time to test the cash drawer:

1. Plug the cash drawer's cable into the RJ12 cash drawer connector
2. Press *M320 Manager* → **Device** → *Control* → *Trigger #1*
    a. The green LED should blink and the connected drawer should open

Updating Firmware

Follow the instructions below to update the module's firmware:

1. Download the new firmware from an official UMD source
    a. M320AW (Wi-Fi) https://www.umd.com.au/m320/firmware_M320AW.bin
    b. M320AU (USB) https://www.umd.com.au/m320/firmware_M320AU.bin
    c. M320AE (Ethernet) https://www.umd.com.au/m320/firmware_M320AE.bin
2. Connect to the M320 using the *M320 Manager*
3. Select **Update Firmware**
4. Click `Choose file`, and select the downloaded firmware
5. Click `Upload file`
6. Wait for the firmware to finish uploading to the module

Hardware Ordering Options

M320A	Universal Trigger Module
	Host Interface
W	Wi-Fi Interface with USB
U	USB interface
E	Ethernet Interface, with Wi-Fi and USB (Wi-Fi not available for POE mounting)
X	Reserved
Y	Custom
	Housing/Mounting
0	Stand Alone Box
D	Mounted to Outside rear of Drawer
P	Mounted to Inside rear of Drawer for POE use
	Housing/Colour
0	Standard Black
1	UMD Blue
	Hardware Option
00	Standard
	Firmware Option
-F00	Standard as per Interface (U or E)

Standard Modules

Oder Code	Model	Details
M320AU0000-F00	M320-U	UMD Universal Trigger Module - with USB Interface
M320AW0000-F00	M320-U	UMD Universal Trigger Module - with Wi-Fi Interface
M320AE0000-F00	M320-U	UMD Universal Trigger Module - with Ethernet Interface

Appendix A - POS Developer Notes

The following provides instructions on how to manually trigger a cash drawer via command for the purposes of developing POS software.

USB

In this mode, the M320 appears as a USB *Communication Device Client* (*CDC*) **serial device**. This allows existing POS Software that normally communicates using the computer's serial port to use the USB virtual serial port.

USB Instructions

To manually trigger the module on a Windows PC:

1. Connect the M320 to your PC with the supplied USB cable.
2. Open Microsoft Windows *Device Manager*.
3. In `Ports (COM & LPT)` look for `USB Serial Device (COMXX)` and remember the number in brackets.
4. Open a Windows command prompt.
5. Type in `echo`, press CTRL+G, then type in `> \\.\COMXX` where COMXX is the value from before and press enter.
   a. The final command should look like the following (noting the spaces) if the com port was COM81:
      i. `echo ^G > \\.\COM81`

Network

With **Wi-Fi** (both *Access Point* and *Client* modes) or **Ethernet** interfaces enabled, the module hosts a ***TCP Server*** which listens on **TCP port 10001** (the port is configurable in the *M320 manager*). Trigger commands are sent to this port using TCP or Telnet software clients. This allows communications with PCs, tablets, or embedded devices. Up to six devices can be connected at a time.

> 🗄 Devices connected to the module's web UI count towards the six connections limit.

Wi-Fi Client or Ethernet instructions

To manually trigger the module on a Windows PC, you will need to prepend the configured trigger password to the trigger code:

1. Power the M320 either via the supplied USB cable or Plug Pack.
2. Connect the Ethernet cable if using this.
3. Open the command prompt.
4. Type `telnet <IP> 10001` and press enter
   a. `<IP>` is the previously noted IP for the selected interface.
   b. e.g., `telnet 172.16.9.69 10001`
5. Type `pass`, then press CTRL+G.

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