User Manual

Last Updated: 4/24/2020

Revision 1.4

Table of Contents

1 Package Content

- JPL100 unit (Item#: 12975)
- GPS Antenna
- Sync Cable Assembly (Item #: 12845)
- Dual 100 Amp Power Cable (Item #: SUB557)

2 Electrical Specifications

Parameter	Rating
Max Input Voltage (DC)	±170 VDC
Max Input Current (DC)	100 Amperes
Max Input Voltage (AC)	120 VAC
Max Input Current (AC)	100 Amperes
Ambient Operating Temperature	-40°C to +80°C

3 Introduction

This chapter covers the items that you will need to know before using the JPL100, including the names of the physical parts and their functions.

3.1 Overview

Thank you for your purchase of the MC Miller JPL100 Interrupter. To get the most of the JPL100's functionality please read through this manual and make sure to store this manual somewhere where others who use the JPL100 can read it.

3.2 Getting to know the JPL100

1 GPS Antenna Connector (SMA)
2 Power Button
3 Power Status LED
4 Sync Jack
5 PE Jack
6 Latch Button
7 Relay Status LED

The JPL100 has a simple front panel interface for quick and easy operation. Elements of the front panel and its functionality are listed below:

1. GPS Antenna Connector – SMA connector for attaching a GPS antenna.
2. Power Button – Power On/Off the JPL100.
3. Power LED – Power LED has multiple purposes. During normal operation it can be in two different modes.
    a. When the power LED is pulsing every second, it states that the GPS module within the JPL100 is on and is gathering GPS data. If the LED is flashing every 5 seconds the GPS within the JPL100 is turned off and indicates that GPS data has previously been acquired.
    b. When the power LED is flashing very rapidly, the JPL100 is detecting an overheat event. Please stop using the interrupter immediately and contact MC Miller support team if an overheat event were to happen.
4. Sync Jack – The Sync Jack is used for connecting to other MC Miller Interrupters for synchronizing of interrupting cycles.
5. PE – Protective Earth (only connect to Rectifier case).
6. Latch Button – Activates the latch function.
7. Relay State LED – Relay state LED shows if the interrupter is cycling and will do so by flashing the LED at the start of the On cycle. When the output is latched, The LED will stay solid for 4 minutes and then blink synchronized to the power LED.

4 Application

This chapter explains the procedures of getting the Android application as well as explaining the function of each parameter and how it works with the JPL100.

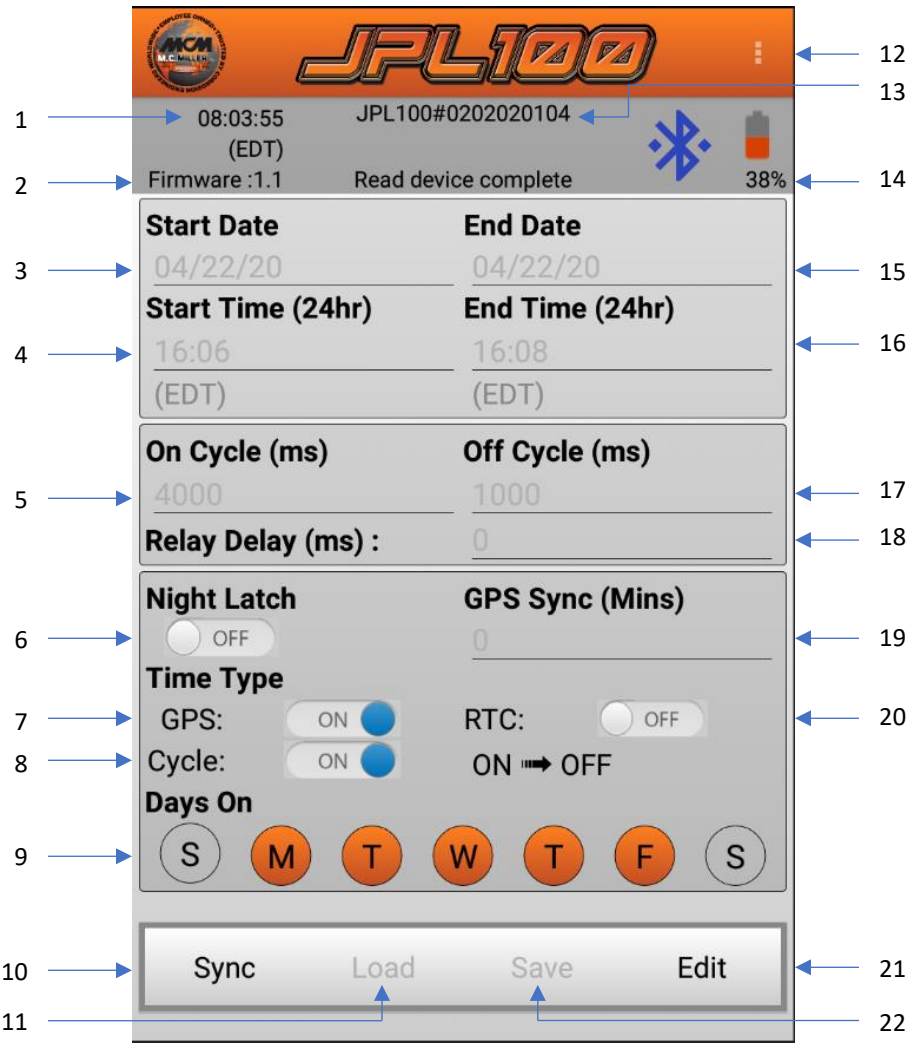
4.1 Getting the Interrupter Application

At the time of writing this manual, the application is at version 2.6. Please make sure your application is up to date by downloading the latest version at our MC Miller webstore. Install the APK onto your Android devices and your devices will be ready to connect to the JPL100. This application can be also used with MC Miller's manual synchronize interrupter, the TH100A.

*The Android application only supports Android version 5.1.1 and above. Please make sure that your device meets this requirement.

4.2 Getting to know the JPL100 Application

1 Device List



1	UTC in Real Time Clock	**12**	Additional Option Button
2	Firmware Version	**13**	Serial Number
3	Start Date	**14**	Battery Percentage
4	Start Time	**15**	End Date
5	On Cycle	**16**	End Time
6	Night Latch	**17**	Off Cycle
7	GPS Mode Selector	**18**	Relay Delay
8	Relay Position Switch	**19**	GPS Sync Period
9	Weekday Selector	**20**	RTC Mode Selector
10	Sync Button	**21**	Edit Setting Button
11	Load Previously Saved Parameters	**22**	Save Current Parameters

5 Basic Operation

5.1 Turning on the JPL100

To turn on the JPL100, push the power button on the front panel. After the power button is pressed the power LED will stay solid for 5 seconds then flashes to indicate that the JPL100 is running properly.

5.2 Connecting to JPL100

*** Do not attempt to connect to the interrupters with multiple Android devices at the same time.**

In order to connect to the JPL100 with an Android device, open the application on your device. The device will turn on Bluetooth service and automatically scan for nearby MC Miller Interrupters. At the time of writing this manual, the application supports TH100A and JPL100 interrupters.

***During initial startup, a prompt will pop up asking for Bluetooth and Location service. Please authorize these permissions so the application can work properly.**

The application will populate the list with nearby MC Miller Interrupters while it is scanning for nearby devices. Each selection shows the Interrupters name and Interrupters Serial Number. To connect to the chosen interrupter, simply tap the selected device on the application and the application will attempt to connect to the device.

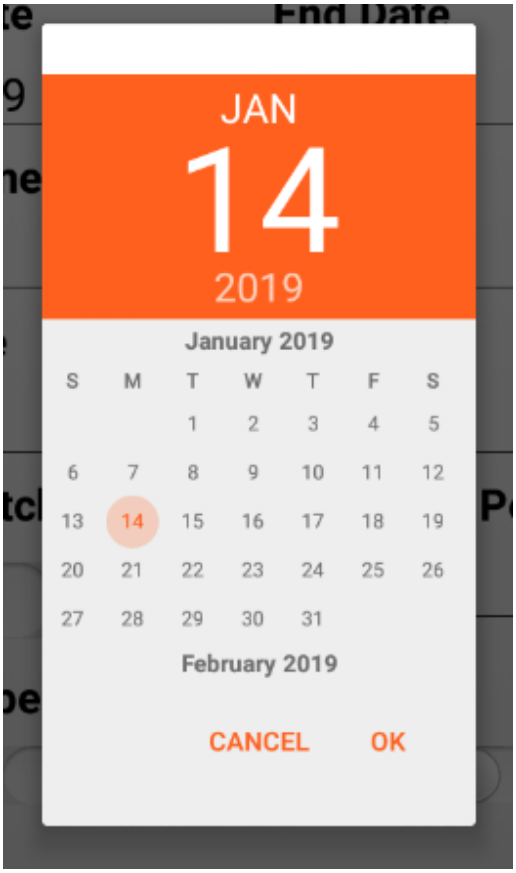
5.3 Setting the Parameters

All JPL100s come with a set of default settings shown below. All settings can be adjusted to meet the user's requirement.

In order to change any of the settings for the connected interrupter the user must first activate edit mode on the tablet by pressing the "Edit" button on the application. This will activate the edit mode where all parameters can be changed.

5.3.1 Changing Start/End Date

In order to change the start or end date, edit mode must be activated. To change the start date and/or end date tap on the date on the application. A calendar like the one shown below will pop up for the user to select the start/end date of your interrupting cycles. The user can also change months by swiping the calendar.



5.3.2 Start/End Time

The time that is shown on the parameters are adjusted to the Android device's local time. For instance, MC Miller is in Eastern Standard Time (UTC-5) therefore the application will show "EST" at the end of the text field.

To set a new time, activate edit mode and enter the time you want to start/end the interruption cycle according to the local time zone the Android device is set for.

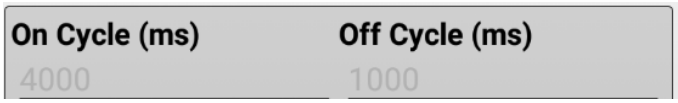
***If Start Date/Time and End Date/Time are set the same, the interrupter will run continuously.**

5.3.3 On/Off Cycle

The On/Off cycle setting determines On and Off cycles of the interrupter. The setting can be changed by the user through the application and will have to enter the cycle in milliseconds. For example, if an on cycle of 2 second and off cycle of 3 second are required, the user will have to change the on cycle setting to **2000** and off cycle setting to **3000**. The range of the On/Off cycle ranges from 50 milliseconds to 65,535 milliseconds.

*** Do not set On/Off Cycle under 50 milliseconds.**

1 second = 1000 millisecond

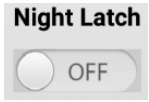


5.3.4 Relay Delay

The relay delay field enables the user to control the delay of the switch. This is only use if the JPL100 is syncing to another interrupter that has a slower switch. The unit of measure for the delay is in milliseconds. To accurately get the relay delay of the system, do an initial waveform and calculate the difference between the rising edge of the waveform.

5.3.5 Night Latch

The Night Latch can be selected through the Android application. Enter edit mode by pressing the “Edit” button on the application and tapping on the night latch switch within the application. The function of the Night Latch is to latch the output to ON when the interrupter is not within its preset cycling period.



5.3.6 GPS Sync Period

The GPS Sync Period field enables the user to control when the JPL100 will resync its internal RTC time with the accurate UTC time coming from the GPS. The unit of measurement of this period is in minutes.

***** Longer period between GPS sync will lower power consumption but will cost accuracy.
***** Shorter period between GPS sync will increase power consumption but will be most accurate.
Setting of "0" is not recommended as it will leave GPS on indefinitely.

* **Recommended setting: 60 minutes**

5.3.7 Time Type

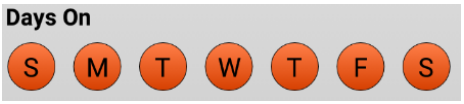
This setting lets the user decide if GPS sync is required and which relay start position the JPL100 needs to be in. The characteristic of each selection is as follows:

- GPS on / RTC off: GPS synchronization is on and GPS Sync Period parameter determines the interval of which the JPL100 will resync to GPS. Please view "Setting the Parameters – Setting GPS Sync Period" for more detail on setting GPS sync periods.
- GPS off /RTC on: The JPL100 may take up to 12.5 minutes to get accurate time from the GPS. In the case of an accidental power down please use this setting to jump start the cycle of the JPL100. With the RTC mode turned on the JPL100 will immediately start cycling with the time that is stored within its RTC.
  * You may switch GPS time after the JPL100 is cycling to capture GPS time for later use. JPL100 will automatically re-adjust as soon as the new accurate time is available.
- Cycle on – This setting tells the JPL100 to switch from "ON to OFF" on the first cycle according to the start date/time that is set previously.
- Cycle off – This setting tells the JPL100 to switch from "OFF to ON" on the first cycle according to the start date/time that is set previously.

5.3.8 Days On

If interrupting is only required at certain days of the week, this setting can be used. Each button on the application represents a day of the week, starting from Sunday and ending in Saturday.

* If days of the week is not required, please have them all activated.



5.4 Latch

The latch button on the front panel is to latch the output to be always closed and will override all interrupting cycle settings. The latch button is located on the front panel. When the latch button is pushed, the latch LED will stay solid for 4 minutes and then flash with in synchronization with the power LED.

Note: Do not use latch button until the GPS time has been acquired in GPS mode. Latch can be used anytime when JPL100 is in RTC mode.

5.5 Synchronizing TH100A to JPL100

-Warning-

If the JPL100 is connected to the rectifier, make sure the rectifier output is OFF before attempting to sync to avoid injuries to the operator and damage to the equipment.

The JPL100 can sync other interrupter units such as the TH100A which does not have GPS synchronization. In order to sync them together please follow the steps below.

1. Connect into each device via Android Application and ensure that all devices have the same parameters. If they are not the same, please change them to the desired setting. To make changing the parameters easier, use save and load function of the application.
2. Make sure all units are powered on and are cycling through its preset configurations.
3. Connect the devices together via a sync cable.
4. Connect to the JPL100 through the Android application.
5. Press the Sync button on the bottom of the application and it will prompt you to change the connection. Press “OK” when ready.

To make sure that the interrupters are synchronized properly, watch the latch status LED closely to make sure they blink at the same time. If the interrupters are successfully synchronized the latch LEDs on the interrupters should be synchronized as well. If they are not synchronized, please repeat the above steps.

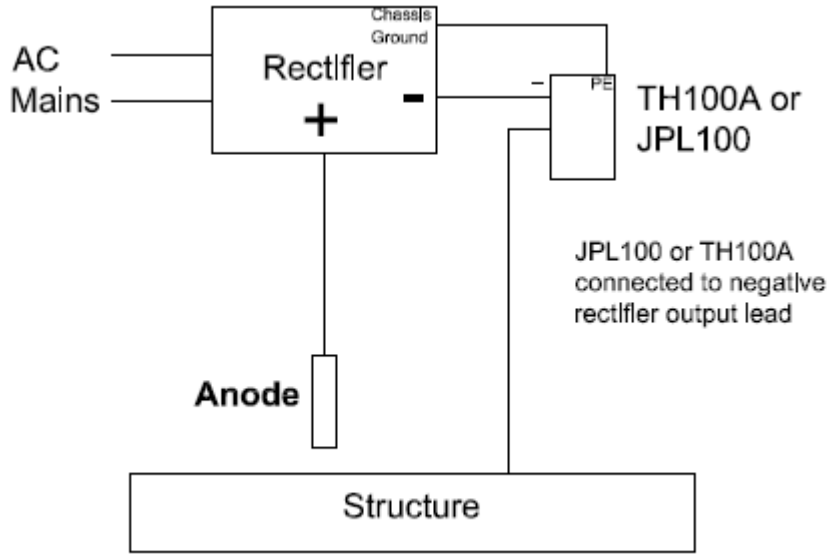
5.6 Synchronizing JR-1/ JR-2 to JPL100

The sync capability is also backwards compatible with older generation MCM interrupters such as the JR-1 and JR-2. In order to sync the JPL100 with the JR-1 and JR-2 please follow the steps below.

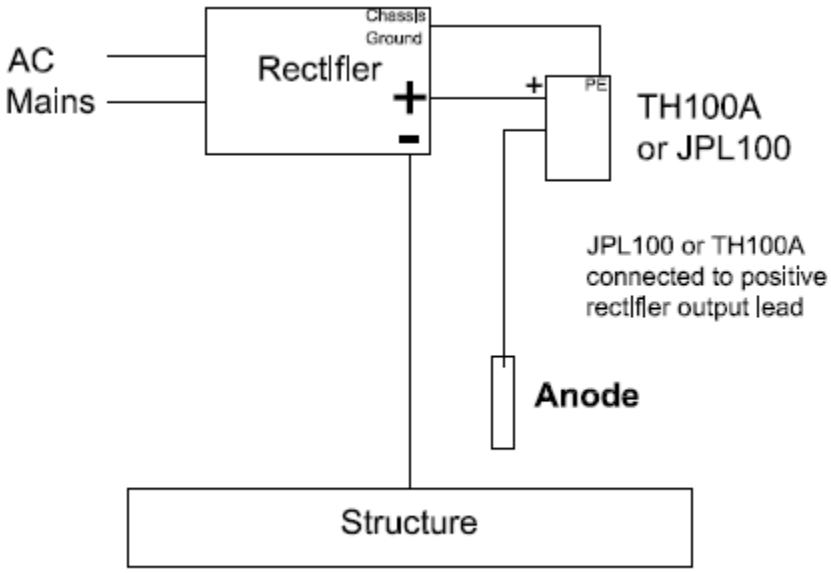
1. After the JPL100 has acquired GPS lock, configure the JPL100 to the desired settings using the MCM Interrupter application.
2. Make sure that the JPL100 is cycling through its preset configurations.
3. Turn on the JR-1 or JR-2 and let it initialize for usage.
4. On the JR-1/ JR-2 set "**START SET**", "**STOP SET**", "**ON CYCLE CLOSED**", and "**OFF CYCLE OPEN**" parameters to the same value as the JPL100. The JR-1 start relay condition must be set to ON.
5. Press "CLOCK SET" on the JR-1 and DO NOT PRESS ENTER!
6. Connect the sync cable from the JPL100 to JR-1/ JR-2. Use the sync cable that came with the JPL100.
7. On the Android interrupter application, press Sync.
8. Make sure that the JR-1/ JR-2 display changes from "**LOCh06**" to "**LOCh01**" and will start cycling in sync with the JPL100.
9. Remove the sync cable.
10. If for any reason, the JR-1/ JR-2 is powered off, please perform the above steps again.

6 Connection Diagrams

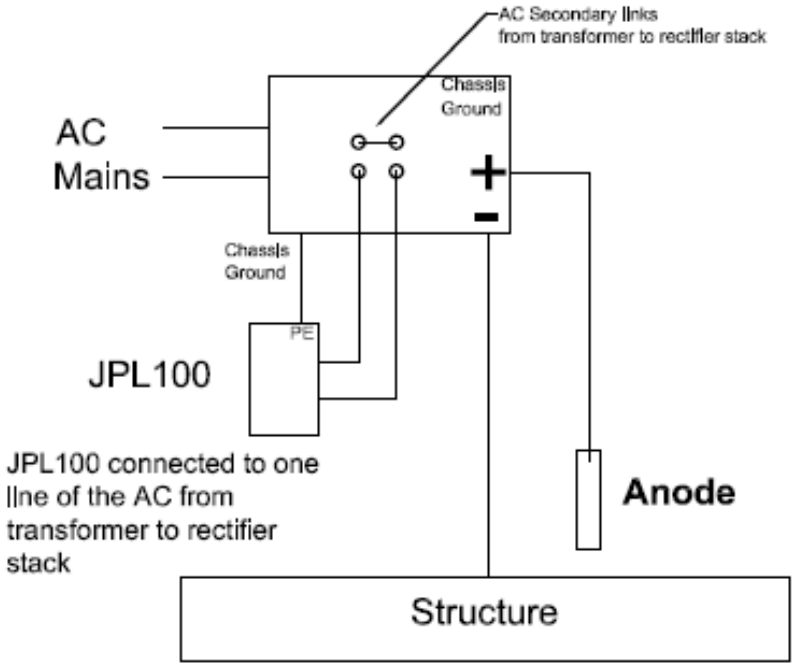
- Switching on the negative side of rectifier



- Switching on the positive side of rectifier



- Switching between Transformer and Rectifier



7 Troubleshooting

7.1 JPL100 Unit

Problem	Solution
- Unit does not power up	- Change battery. - Push the power button to turn off the unit and wait 5 seconds before powering up.
- Not cycling on power up	- JPL100 will only cycle according to the preset parameters when it has acquired accurate time from GPS. Please wait or use RTC time mode.
- Latch is not working	- Make sure Latch button on the front panel is pressed.
- Power LED is blinking rapidly	- Unit is overheating, power down the unit immediately and call MC Miller support number.
- GPS is taking longer than 12.5 minutes to acquire accurate time	- Connect antenna to front panel. - Go to a location where the JPL100 has a clear view of the sky. - Make sure antenna is not touching anything that may interfere with GPS signal

- UTC time within RTC is showing all 0	- Restart JPL100 and wait for GPS
- The unit stopped cycling when settings are changed	- The JPL100 stops cycling whenever a parameter is changed in order to always keep cycles as accurate as possible. The unit will continue to cycle after all re-adjustment has been confirmed internally

7.2 Android Application

Problem	Solution
- Application is not finding my JPL100	- Make sure the JPL100 is powered on - Place the JPL100 closer to the Android Device
- Not able change the setting on the application	- Make sure to activate edit mode
- Application froze up	- Restart your Android device and reopen the Interrupter application
- Application would not install on the device	- Make sure the device is at or above Android version 5.1.1.

8 Regulatory Information

Federal Communication Commission (FCC) Compliance Statement

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 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.

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.

Industry Canada (IC) Compliance Statement

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

NOTES: