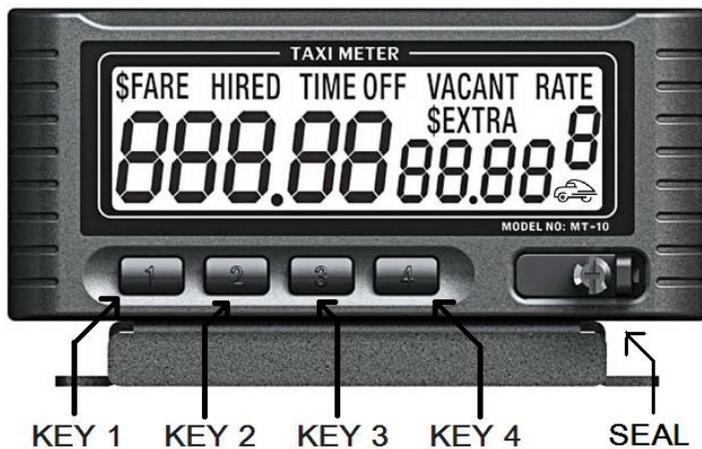# iElectron

MT-10 ELECTRONIC TAXIMETERS

INSTALLATION AND PROGRAMMING GUIDE

V1.06 2021/09/04

1. Introductions and operations

a) **Features:**

Large LCD screen with bright LED backlight.
Up to 4 independent rates
7 items statistics display.
Power down data protection.
Built-in pulse divider.
Relay driver output for rooflight.
Built-in battery voltage meter
Power down data protection

b) **Specifications**

Power input: 9-16V DC
Relay driver drain current: 200mA normal, 400mA maximum (overload protected)
Operating temperature: -30 ℃ to 70 ℃ (-22 ℉ to 158 ℉)
Storage temperature: -30 ℃ to 80 ℃ (-22 ℉ to 176 ℉)
VSS signal sensitivity: 0.5V peak value

c) **Turn to HIRED**

While the taximeter is "VACANT", press the KEY 1 to turn the taximeter to "Hired". The initial fare, "$FARE" and "HIRED" will display on the screen. The "VACANT" indicator will

turn off. The meter is running in Time-On mode

d) Turn to HIRED-TIME OFF

While the taximeter is in Hired-Time-On mode, press the KEY 2 to turn the meter to Time-Off mode. The "TIME OFF" indicator will come on and the taximeter will stop charging the time. To resume charging the time, press the KEY 2 again, the meter will go back to Time-On mode and "TIME OFF" indicator will come off.

e) Use the EXTRAS function

You can use this function only if the meter is programmed for EXTRAS. Ensure your meter is in Hired-Time-On mode, press the KEY 3 to put the pre-programmed extras amount on the screen, continue pressing the KEY 3 will add more extras to the current extras amount until the pre-programmed limit is reached.

To sum the EXTRAS to the FARE, ensure the meter is in the HIRED-TIME OFF mode, and press the KEY 3 once. The total of the FARE and EXTRAS will be shown on the screen for 5 seconds.

f) Turn to VACANT

Put the meter in the HIRED-TIME OFF mode first, then press the KEY 1.

g) Select a RATE

Press KEY 4 to select a new rate while the meter is vacant.

If the meter is programmed for "Rates selecting allowed while being hired", you can put the meter in the HIRED-TIME OFF mode first, and then press the KEY 4 to select a new rate.

h) Reviewing the STATISTICS

There are 7 statistics items stored in the taximeter, to view them, press the KEY 3 while the taximeter is "VACANT". Continue pressing the KEY 3 will scroll all the items. The item number is shown on the very right of the screen. Pressing any keys other than KEY 3 will turn the meter back to VACANT.

If you press and hold the KEY 3 for 2 second, the display will flash and the item 2 "Daily gross dollars, Cents" will be cleared. The other 6 items can only be cleared in programming mode.

If the taximeter is programmed so that all 7 items of statistics can be cleared (See page 6), press KEY 3 to scroll the statistics to item 7. Press and hold KEY 3 until display flashes, now all the 7 items of statistics are cleared.

Fare	Extras	Item
Last fare	Last extras	1
Daily gross dollars	Cents	2
Gross dollars	Cents	3
Total trips		4
Total units increments		5
Total extras increments		6
Paid miles		7

i) LED Backlight and dimmer

Your taximeter has a bright-white LED backlight to ensure the screen has a clear view at anytime. The backlight will automatically turn on whenever the meter is in HIRED or STATISTICS mode. In the VACANT mode, every key-pressing will turn it on for 10 seconds.

After the 10 seconds, the backlight will still be on but dimmed. If the engine is off, the backlight will turn off after about 3 minutes. You can choose not to wait until the engine is off, just turn off the backlit after 3 minutes into vacant mode. Make this selection in the control group 1, digit 4.

j) **Power down data protection**

In case of unexpected power lost, the meter will save the all the reading to protect the driver's earning. If the power comes back in 3 seconds, the meter will continue run without any interrupt. If the power comes back after 3 seconds, the previously display will return to the screen and meter stop running, the previously display will return to the screen and the meter stop running. Press any button or wait for 1 minute, the meter will turn into the VACANT.

k) **Program data review function**

Pressing the KEY 2 while in the VACANT mode can get into the programming data reviewing mode. This is a function for the installation technician to check the program data. All the screen showing will be exactly same of the programming mode; the only difference is those items cannot be changed in this mode. Press KEY3 and KEY4 to select the programming items and Press the KEY 1 to exit the program data reviewing function. If the vehicle moves while reviewing the Calibration number, the current value of the calibration will be reset to 0 and the incoming pulse will be counted, this number will not be stored in this mode.

l) **Self-Diagnoses Mode**

This mode allows the manufactures and installation technicians to check if the meter is normally functional. Disconnect the power first, wait 5 second, reconnect the power while pressing and holding KEY4. The LCD will show all the segments for 2 seconds with LED backlight blinking 2 times and then go into Self-Diagnoses mode. The 5 bigger digits on the left show the speed of the vehicle (the meter has to be properly calibrated in previous). If you want to test it on your table, you can simply enter a calibration number of 3600 and connect the meter to a signal generator, the meter will show the frequency of the input. The middle 4 smaller digits (normally the **EXTRAS** display) show the power voltage, the very right 1 digit shows the key number of pressed, if you place the programming key in the position of PROGRAMMING MODE, this digit will show 5. If you press and hold any button, the relay driver output will be pulled down to ground potential and energize the rooflight relay.

m) **Advanced Programming Key Socket**

Open the seal by unscrewing the bottom-right screw with a Slotted or Philips screwdriver. You can see the advanced programming key socket. The top two holes are for programming mode, with the taximeter in the VACANT, place the programming key in the position of PROGRAMMING MODE, the taximeter will go into the programming mode, you can review and change all the programming data, clear all the statistics or read the serial # and power voltage. Please refer the "Do the programming and calibration" portion for the programming procedure. Place the programming key in the position of RESET, the taximeter will reset the inside software (not clear the statistics and programming data), this is just like if you pressed the RESET button of a computer.

The programming key is actually a 2.54mm jumper, and you can make one by yourself. With a 2 pins 2.54mm male connector, connect one side with solder.

```
▣ ▣ ← PROGRAMMING MODE
▣ ▣ ← NO USE
▣ ▣ ← RESET
```

2. Do Wiring and Installation
   !WARNING: There is a USB female connector on your Taximeter and a USB male connector on the mounting bracket. They are NOT regular USB port and contain higher voltage. Do not apply any other USB devices to those USB connectors, fire or damages may occur.

   a) Mounting and Wiring:
      The taximeter should be mounted on the dashboard or on the front panel with at least 2 screws, in such a way with no vibrations, no potential hazard and away from vent and airbag. Open the panel and run the wire to under the kick panel. The wire must not be cut, squeezed or drawn with force, and must be away from any sharp edges and moving parts.
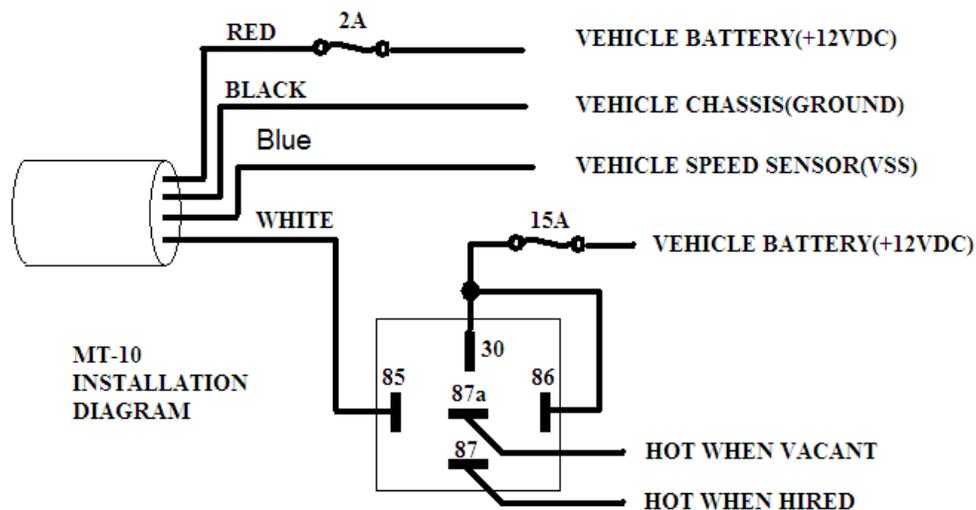   b) Connecting:
      All the connections must be soldered and properly sealed with electric tape or heat-shrink tube.
      The Red wire connected to the vehicle battery via a 2 amp fuse. Provides primary power to the taximeter.
      The Black wire connected to the vehicle chassis ground at or close to the vehicle battery ground connection
      The Blue wire (Green wire on early version) connected to the Vehicle Speed Sensor (VSS) wire.
      The White wire connected to one of the rooflight relay coil connectors. The other connector of the relay coil should be connected to the vehicle battery. The common connector of the relay should be connected to the vehicle battery via a 15 amp fuse. The normally open (NO) connector of the relay will be hot (+12VDC) when HIRED and the normally close (NC) connector of the relay will be hot (+12VDC) when VACANT.

```
                    RED      2A
                    ─o─o─        VEHICLE BATTERY(+12VDC)
                    BLACK
                    ─────        VEHICLE CHASSIS(GROUND)
                    Blue
                    ─────        VEHICLE SPEED SENSOR(VSS)
                    WHITE           15A
                                   ─o─o─   VEHICLE BATTERY(+12VDC)
                                    30
    MT-10
    INSTALLATION      85          86
    DIAGRAM                87a
                          87         HOT WHEN VACANT
                                     HOT WHEN HIRED
```

3. Do the programming and calibration
   a) Open the seal and place the programming key.
   b) The $FARE, HIRED, TIME OFF, VACANT, RATE AND $EXTRAS indicators will disappear on the screen. Now the screen has 3 parts, the very right 1 digit (normally the RATE window) shows the major item number of a programming step, press the KEY4 to select this number. The 4 smaller digits on the middle (normally the $EXTRA window) show the sub item number of a programming step, press the KEY3 to select this number. The left bigger 5 digits (normally the $FARE windows) show the contents of every programming step, press KEY1 to start flashing the number you want to change and press KEY1 again to shift the flashing position (from right to left), press KEY2 to scroll the flashing number. When the desired setting is reached, press KEY3 or KEY4, the number will stop flashing and the new setting is stored. Any time if you want to discard a new setting, you have to remove the programming key without KEY3 or KEY4 being pressed.

   c) **Programming items table**

Major Item	Sub Item	Contents
0	1	Pre-scale number (Pulse divider), range: 1-20.
	2	Calibration number, range: 500-60000
	3	Control options group 1
	4	Control options group 2
	5	Statistics clear
	6	Battery voltage, (not able to be changed)
RATE 1-4	1	Initial Drop (cents), range: 0-60000
	2	Fare Increment (cents), range: 0-60000
	3	Drop Distance (meters or milli-miles), range: 0-60000
	4	Distance Rate (cents per mile or km), range: 0-60000
	5	Time Rate (cents per hour), range: 0-60000
	6	Extra Increment (cents), range: 0-9999
	7	Maximum Acceptable Extra Increments, range: 0-199
All numbers together show the Software Version. (not able to be changed)		

   d) **Pre-scale number** (Pulse divider) (item 0, sub-item 01)
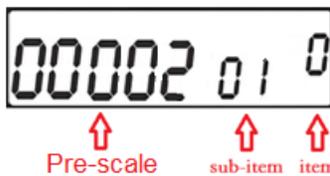
   The VSS input signal will be pre-scaled by this number; and the Calibration number will be the real value of pulses per mile or km divides the pre-scale number. For example, if a vehicle VSS outputs 40,000 pulses per mile or km and this pre-scale number was set to 10, the Calibration number would be 4,000 instead of 40,000. For the best calculation accuracy, it is recommended to adjust this number and let the Calibration number be in a range of 1,000 to 10,000.

   e) **Calibration number** (item 0, sub-item 02)

   Enter a value of pulses per mile or km. If the vehicle moves while in this step, the current value of the calibration will be reset to 0 and the incoming pulse will be counted, the KEY1

02520 02 0

↑ Calibration # ↑ sub-item ↑ item

and KEY2 will no longer function. This is auto-calibration mode. Move the vehicle to the start point of a measured mile or km and stop, select the programming item to Calibration number, the previous stored Calibration number will show on the screen, move the vehicle and stop when a measured mile or km is reached, press KEY3 to save the new number into taximeter.

f) **Control options group 1**(item 0, sub-item 03)

Control Options
00102 03 0

↑ ↑ ↑ ↑ ↑ ↑
5 4 3 2 1 sub-item item

The Control options group 1 has 5 digits, every digit represent a control option.

Digit 1: Number of rates to be used, range 1-4, enter 1 for a single rate.

Digit 2: Rates selecting allowed while being hired, range 0-1. Enter 0 to forbid selecting a new rate while being hired.

Digit 3: Enable Statistics clearing. 0: Only Daily gross dollars can be cleared. 1: All the 7 items of Statistics can be cleared.

Digit 4: Backlight turn off selection: 0: Backlight turn off if vacant and engine off 3 minutes. 1: Backlight off if vacant 3 minutes.

Digit 5: Reserved. No use

g) **Control options group 2**(item 0, sub-item 04)

All 5 digits of Control options group 2 are reserved. No use.

h) **Statistics clear**(item 0, sub-item 05)

Every time get into this step, the content is 0, put any number other than 0 and press KEY3 or KEY4 to clear the Statistics.

i) **Battery voltage**(item 0, sub-item 06)

When the programming get into this step, a built-in voltmeter will turn on to measure the voltage of power input and display the voltage on the screen. This function is also available in the programming data reviewing mode. This function is designed for installation technician to check whether the taximeter is working at a proper power input.

Program the Rate

item number presents the Rate to program, sub-item present the which rate item to program.

00250 01 1

↑ ↑ ↑
item value sub-item item

j) **Initial Drop**(sub-item 01): Enter a value in cents, range: 0-60000

k) **Fare Increment**(sub-item 02): Enter a value in cents, range: 0-60000

l) **Drop Distance**(sub-item 03)**:** Enter a value in meters or milli-miles, range: 0-60000

m) **Distance Rate**(sub-item 04): Enter a value in cents corresponding to the amount of charge per mile or km, range: 0-60000

n) **Time Rate**(sub-item 05): Enter a value in cents corresponding to the amount of charge per hour, range: 0-60000

o) **Extra Increment**(sub-item 06): Enter a value in cents, range: 0-9999

If this item is set to 0, the Extras function will be disabled.

p) **Maximum Acceptable Extra Increments**(sub-item 07): range: 0-199
The $EXTRAS amount will stop increasing when the times of Extra increments reach this setting. If this item is set to 0, the Extras function will be disabled.

Appendix:

Changes of version 1.02 versus version 1.01:

Page 2, Added

If the taximeter is programmed so that all 7 items of statistics can be cleared (See page 6), press KEY 3 to scroll the statistics to item 7. Press and hold KEY 3 until display flashes, now all the 7 items of statistics are cleared.

Page 6, Added

Digit 3: Enable Statistics clearing. 0: Only Daily gross dollars can be cleared. 1: All the 7 items of Statistics can be cleared.

Changes of version 1.03 versus version 1.02:

Page 6, "press KEY3 or KEY4 to store the new number into taximeter."

Changed to "press KEY3 to save the new number into taximeter."

Changes of version 1.04 versus version 1.03:

Page 5, "All numbers together show the serial no. (not able to be changed)"

Changed to "All numbers together show the Software Version. (not able to be changed)"

Changes of version 1.05 versus version 1.04:

Page 4, "The Green wire connected to..."

Changed to "The Blue wire (Green wire on early version) connected to…"

Changes of version 1.06 versus version 1.05:

Page 2, Add "After the 10 seconds, the backlight will still be on but dimmed. If the engine is off, the backlight will turn off after about 3 minutes. You can choose not to wait until the engine is off, just turn off the backlit after 3 minutes into vacant mode. Make this selection in the control group 1, digit 4."