

SMART CLOCK

USER MANUAL



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Introduction

A **Smart Clock** is microcontroller based electronic system which is specially design for display accurate time. Device has 7segment displays for its visibility from long distance. Device display has four digits for display time. Four keys for basic settings.

Specification and features

1. Controller	Power of ARM 32 bit controller.
2. Display	2.3 Inch 7 segment display.
3. Accuracy	Time synchronised w.r.t UTC/ GPS as per model with accuracy of +/- 1 second.
4. AM / PM indication	AM / PM LED indication.
5. Communication	LAN / RS-485 / Wireless GPS master and slave. (As per model selection)
6. Time Format	24 Hrs Modes and 12 Hrs Modes. (Settable through Slide switch.
7. Time Synchronization Mode	GPS Master Clock / Ethernet through Master PC/RS-485 Through Master PC
8. Environmental Ratings	0 - 50° C
9. Mechanical	<p>Smart Clock : Wall mounts enclosure, Flush mount. e.g. 1>Wall mount 2.3 inch 7 segmented display Dimension: 310mm (W) X 115mm (H) X 45mm (D) 2>Flush mount 2.3 inch 7 segmented display Dimension: 350mm (W) X 160mm (H) X 45mm (D).)</p>

10. Enclosure material	Wall mount Material: SS304 (Stainless steel), Matt Finish Flush mount Front plate Material: SS304 (Stainless Steel), Matt Finish. Back enclosure material: MS with black powder coated.
11. Operating Voltage	220VAC, 50 Hz, 15Watt

Feature

1. Accurate RTC clock with +/- 1 second.
2. Time synchronized through GPS Master Clock / Ethernet through Master PC/RS-485 through Master PC.
3. 12/24 Hrs Time Format and can be set with short key slide switch.
4. Synchronizes from internal RTC in case of network failure and battery backup in case of power failure.
5. Keypad contains MENU Key, Increment Key, and SET Key for Menu operation and Slide switch for selecting 24 hrs/12 hrs time formats.
6. RED Large 7 segmented display for long distance visibility.
7. Wall mount and flush mount model available.
8. 2.3 inch and 4 inch 7 segmented display.
9. Wireless Master Slave communication / Ethernet based / RS485 base clock system.
10. Factory Settable different Model as follow:
 - a. HH:MM
 - b. HH:MM:SS

Front View of device:

1. MASTER Clock:




2. SLAVE Clock :



Keypad Functions:

There are four operation keys used and there description as follows:

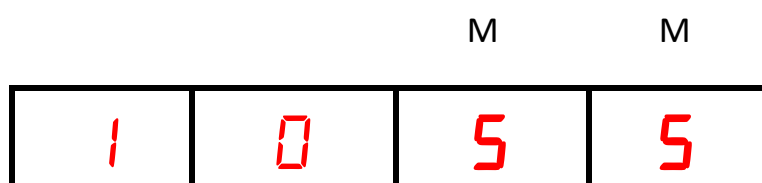
KEY	Description
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MENU</div>	<ul style="list-style-type: none"> • Press this key once to set the Hour in current format. • Press this key again to set the Minutes in current format. • This key used for exit without set time.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">INC</div>	<ul style="list-style-type: none"> • Increments numerical data for setting. • To Continues increment press key it will increment automatically by one.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">SET</div>	<ul style="list-style-type: none"> • To set selected values.
<p>Slide Switch</p> <div style="text-align: center;"> <p>12Hr</p>  <p>24Hr</p> </div>	<ul style="list-style-type: none"> • For time format setting. • If Key is UP side 12 hour format is set. • If Key is DOWN side 24 hour format is set.

To set Time by using Keypad:

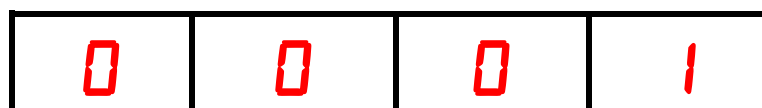
1>Press Menu key current HH is blinking after that by using increment key change the HH number from 00 to 23.



2>Again press menu key once it shifted to MM, its blinking and by using increment key change the MM number from 00 to 59.



3>Press menu key twice **Device ID** will be show in format of 0001.



4>To change Device ID only press menu key last two digit will be blink and by using increment key change the Device ID.

NOTE: DEVICE ID MUST BE UNIQUE FOR CLOCK NETWORK.

DEVICE ID RANGE BETWEEN 1 TO 128.

5>Then press SET key to save settings.

6>Using slide switch change the time format as 24 hour or 12 hour.

For **UP** side of switch it will set as **12** hour with AM/PM LED indication.

For **DOWN** side of switch it will set as **24** hour.

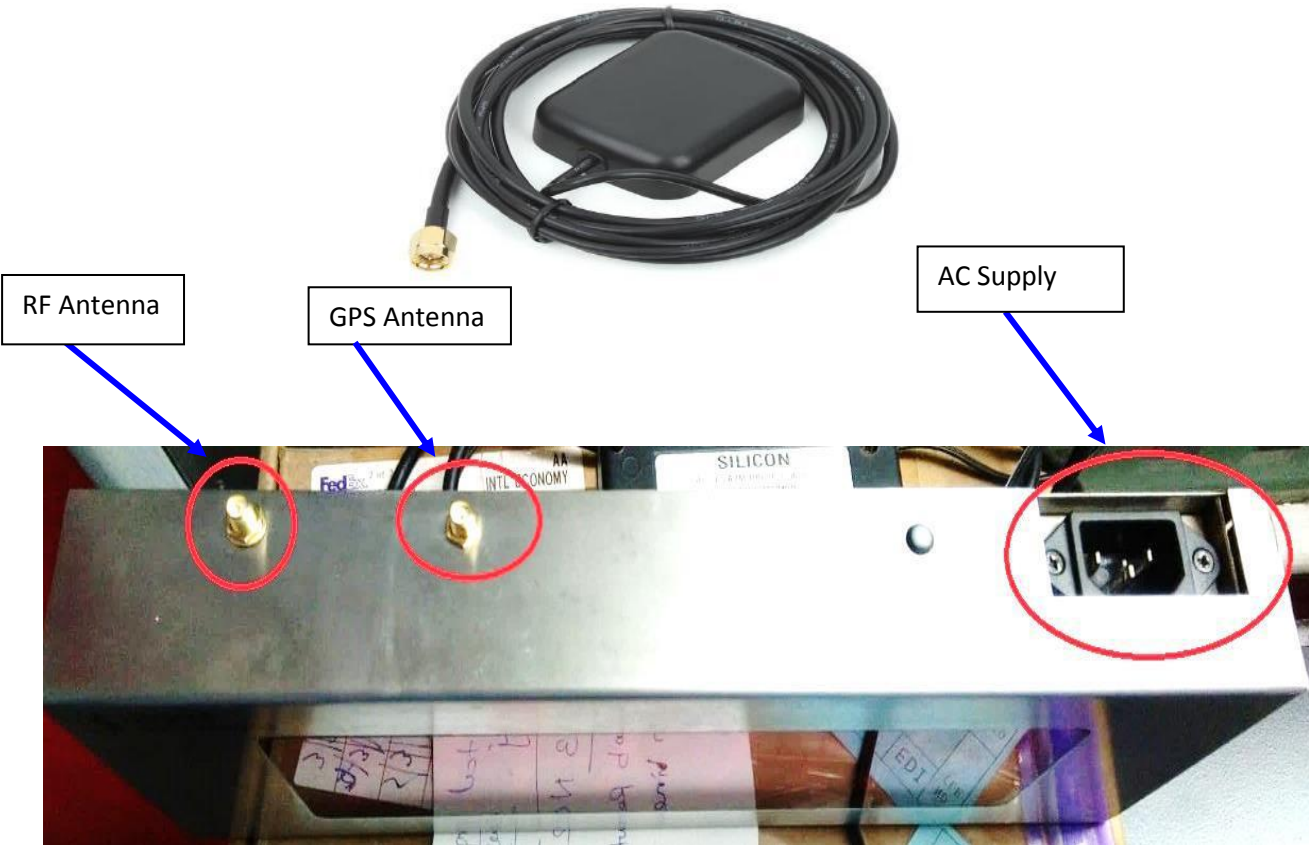
NOTE: Setting time in 24 hour format and check the slide switch direction as DOWN.

Connector Connection Details

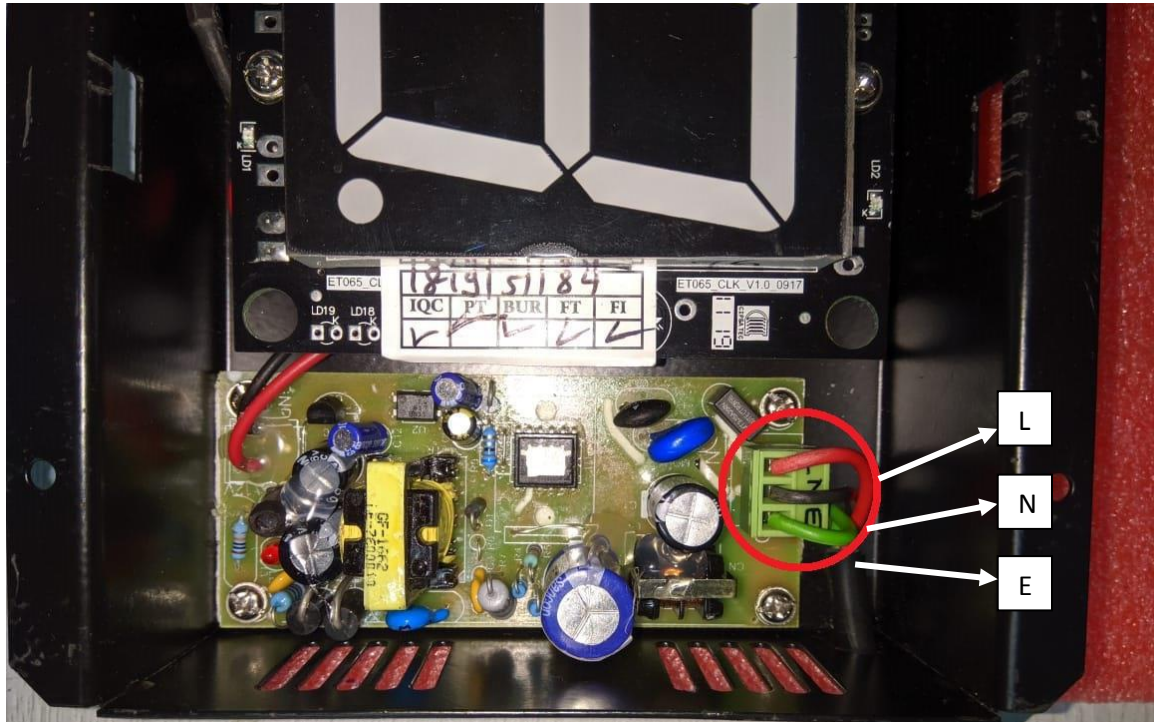
1> RF Antenna Connection:



2> GPS Antenna Connection for MASTER:

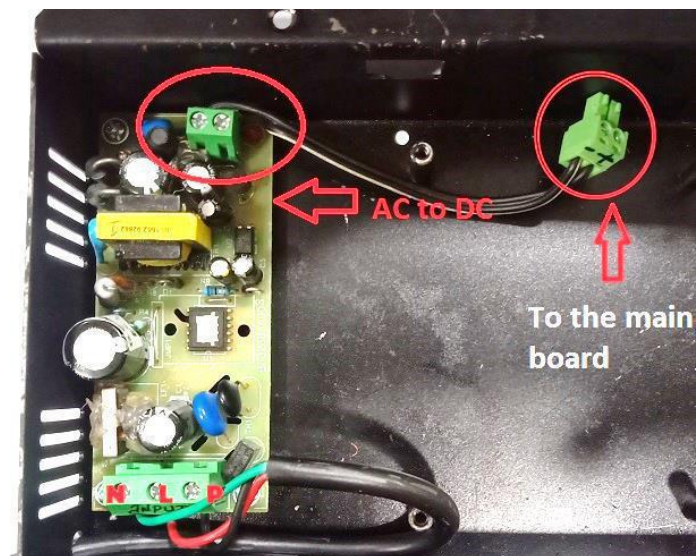


- **AC power supply connection details L,N,E**
L for Line, N for Neutral, E for Earth



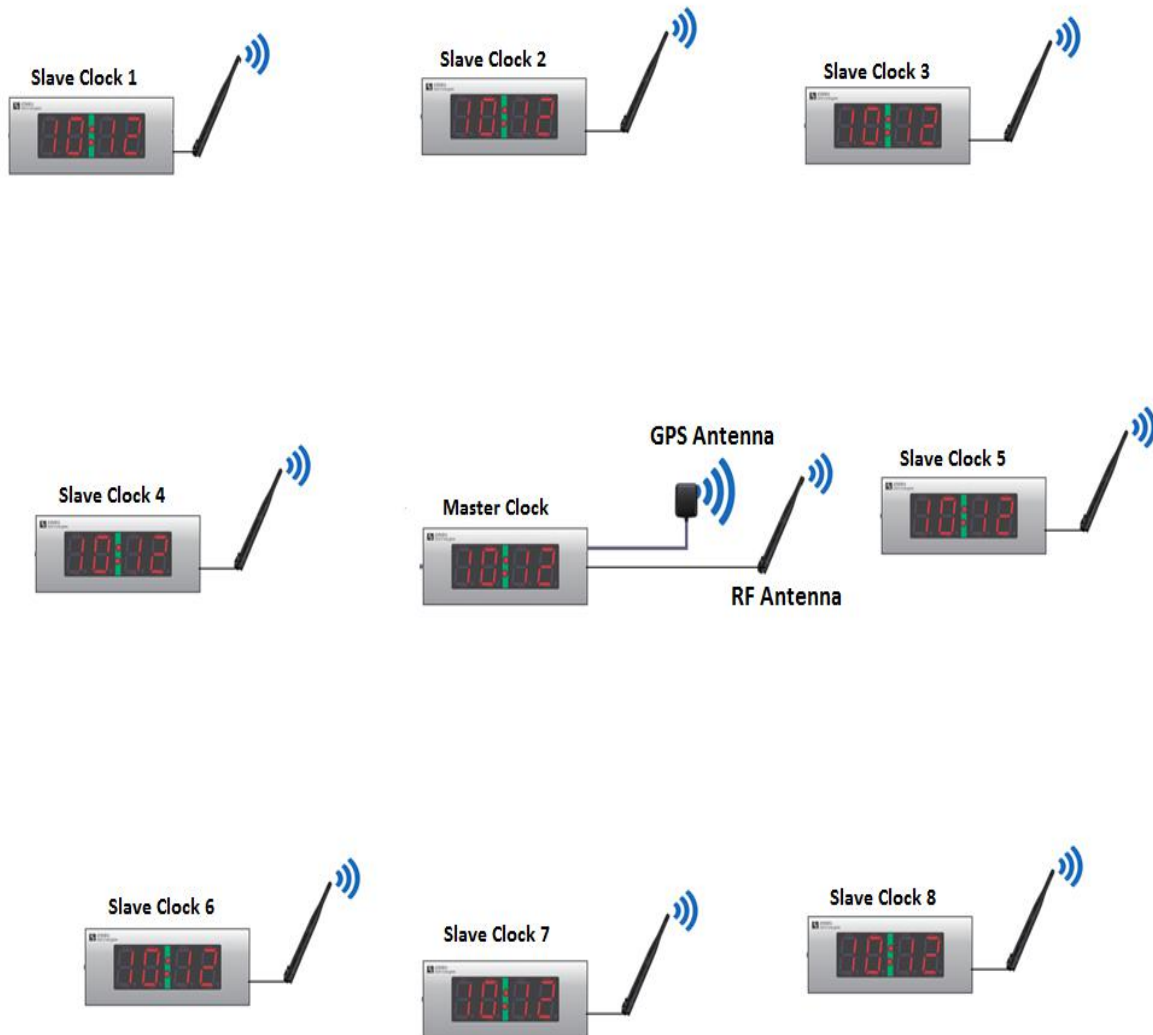
- **AC to DC supply connection to main board.**

12V	RED
GND	BLACK



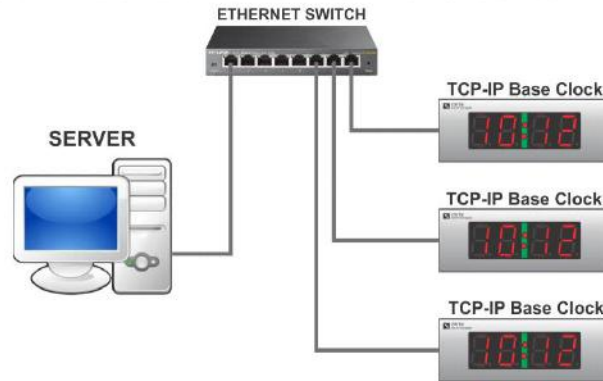
Architecture of different Model Configuration:

1> WIRELESS GPS MASTER Clock with SLAVE Clock:



2> MASTER SERVER WITH ETHERNET SLAVE CLOCK OR POE CLOCK CONFIGURATION.

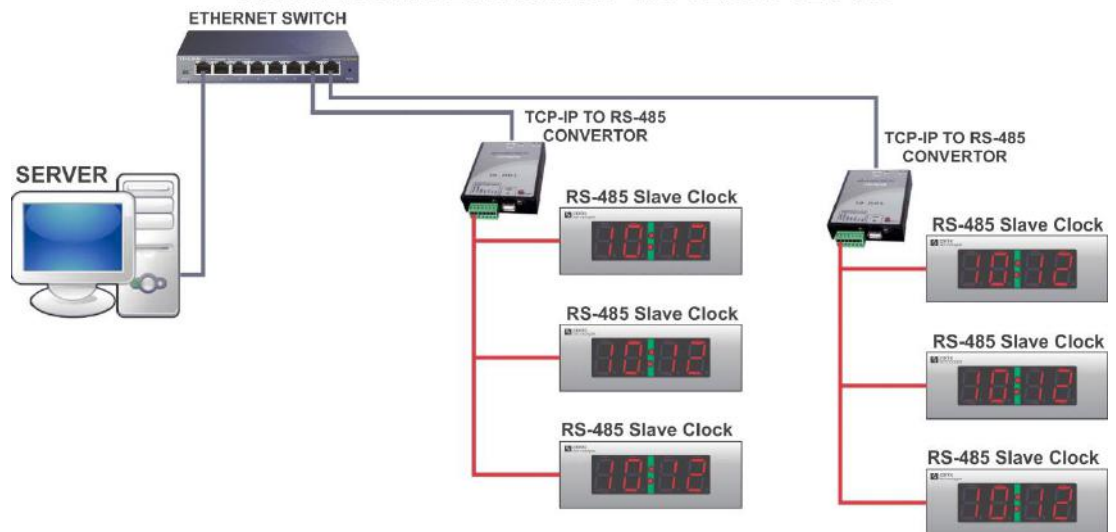
MASTER SERVER WITH ETHERNET SLAVE CLOCK OR POE CLOCK



NOTE:- If clock device are not POE base then power supply need to connet

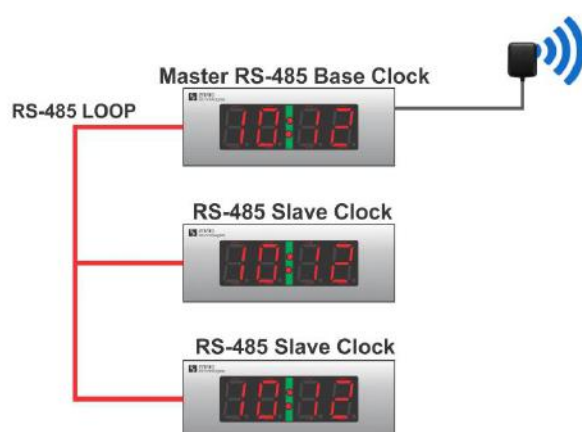
3> MASTER SERVER WITH RS 485 BASED SLAVE CLOCK CONFIGURATION.

MASTER SERVER WITH RS-485 SLAVE CLOCK



4> MASTER GPS RS-485 CLOCK WITH RS-485 SLAVE CLOCK SYSTEM

MASTER GPS RS-485 CLOCK WITH RS-485 SLAVE CLOCK



Troubleshooting Chart

Following are few troubles shooting point which will guide for rectifying problem while dealing with SMART CLOCK.

No	Problem	Probable solutions
1.	Display Doesn't show time	<ol style="list-style-type: none"> 1. Check power supply connection. 2. DC power supply connection of main board.
2.	Time is changed after reset.	<ol style="list-style-type: none"> 3. Set the time from Menu. 4. Check internal battery (change if required).
3.	If Time is disturbed/Lead/Lagging	<ol style="list-style-type: none"> 5. Check RF antenna direction of all slave devices or connect router in between them if required. 6. Master unit power on. 7. GPS antenna should be in range for synchronisation (for MASTER). 8. Check for slave device id which must be unique for network.

Note: GPS master clock should be synchronized once in a week from GPS module to maintain the mentioned accuracy of device.