LOST TIME INJURY CLOCK
Product Technical Specification
(RTI-EM-DOC1014-PTS-RV00)

Revision History

Rev	Date	Change Description	Prepared By	Approved By
00	03-09-19	Initial Draft	RA	AX

# LTI CLOCK- PRODUCT TECHNICAL SPECIFICATION

1   INTRODUCTION

A lost time injury (LTI) is an injury sustained by an employee that will ultimately lead to the loss of productive work time in the form of worker delays or absenteeism. An injury is considered a lost time injury only when the worker is unable to perform the regular duties of the job, takes time off for recovery, or is assigned modified work duties for the recovery period. This product marks the LTI duration in Man days and Man hours. The product is featured with 7 segment LED displays and also featured with remote control for reset and to set the values of the days and hours.

2   SYSTEM DIAGRAM

3   BLOCK DIAGRAM
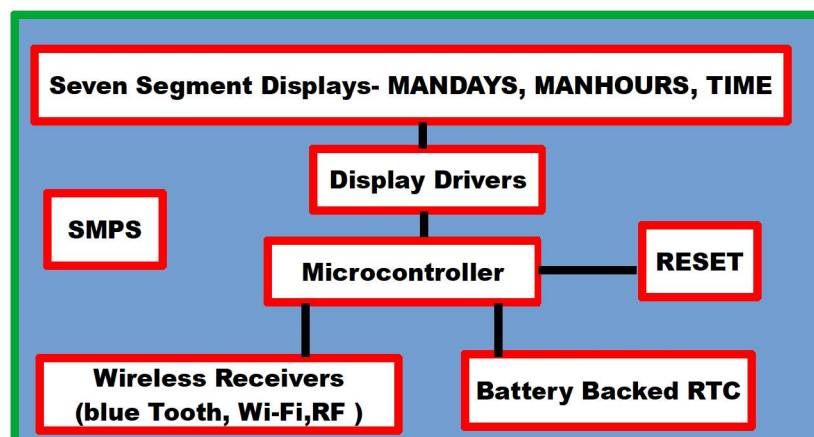
4 HARDWARE SPECIFICATION

S. NO	SPECIFICATION PARAMETERS	DESCRIPTIONS	REMARKS
1	CONTROLLER	8-bit Microcontroller	
2	RTC	Real time Clock and calender IC to have date and time. To be operated with a battery pin, and IC to provide charging voltage to the battery.	Optional internal RAM required
3	MEMORY	EEPROM to store less than 500 bytes	
4	INPUTS	One - Reset switch	
5	OUTPUTS	Not Available	
6	PCB SPECIFICATION		
6.1	Three PCBs	2 LAYER (FR4,HAL) PCBs for Main card, 8 Digit Display Card 1 LAYER (FR4,HAL) PCBs for Main card, 1 digit Display Card	Size to accomodate 1.5Inc and 1 Inch Seven segment LEDs
7	COMMUNICATION		
7.1	RF	Wireless RF 433KHz Receiver On board to accept the encoded data for device config and reset	Optional (Not to populate)
7.2	Bluetooth	Connect to processor through UART , and to pair to Mobile	First preference is this communication
7.3	WI-FI	Wi-Fi to communicate to mobile through Hotspot. ESP8266 Wifi device to plugg in, communicate to controller through UART.	First option to have Bluetooth, and Wi-Fi and Wireless RF are optional
8	DISPLAY		
8.1	Manday Display	1.5 Inch LED (RED) Seven segment display with 8 characters to display mandays	Client's requirement is 7 characters. One character can be left free/NP
8.2	Manhour Display	1.5 Inch LED (RED) Seven segment display with 8 characters to display man hours	Client's requirement is 7 characters. One character can be left free/NP
8.3	Date Display	1Inch LED (RED) Seven segment display with 8 characters to display Date	
8.4	LTI Flag Display	1 Inch LED (RED) Seven segment single digit display	
6.0	POWER SUPPLY		
6.1	INPUT POWER SUPPLY	12V, 3A SMPS	
7	LED INDICATIONS		
7.1	Power On	Red	

5 FIRMWARE SPECIFICATION

S. NO	PARAMETER	FEATURES INVOLVED
1	Prime Functions	Read the Time from RTC and Run the 7 digit **Man hours count** and 7 digit **Man Days count** displays.
2		Read the Date from the RTC and display in the 7 segment **Date display**.
3		In the Day of accident, On press of LTI clock RESET, LTI flag to Set as 1, other days, it shall be 0. This point is to be reconfirmed with client once again.
4	LTI Reset	LTI clock Reset to be prompted by the user by two means. One is using local switch in the hardware, and another is using a Remote Mobile App/ RF switch.
5		On pressing the RESET button, all the counters to go to 0000000, and start counting from that.
6		When operated from the Mobile App, it shall be after reconfirmation of the request.
7	Authentication	Since Mobile App is used for LTI clock reset and configurations, the user shall be an authenticated one. For that, every unit will have a 4 digit device password, and the mobile app shall be connected with that password for further access.
8		If the device password is forgotten, the unit shall be bought to default password 1234 by a hardware button press on the board.
9	Configuration	The RTCC can be adjusted to run on the present time by the setting the present time from the mobile Application.
10		On Press of the Time sync button on the mobile App, the device shall be bought to have the correct time of mobile.
11		And by any means, if the devices running counts to be set with a known predefined value, the value shall be accepted from the mobile application to the device.
12	General Exceptions	Firmware should have enough exception handling procedure to avoid junk displays, RTCC wrong time values, EEPROM data erase/worng data etc to give uniterrupted clock to the clients.

6 MOBILE APPLICATION SPECIFICATION

S. NO	PARAMETER	FEATURES INVOLVED
1	**Prime Functions**	Communication – Blue tooth pairing and connecting the device.
2		RESET the LTI clock
3		Configure the LTI Clock Parameters
4		Change password of the device
5		RTCC clock time synchronization
6	**Blue Tooth**	Blue tooth communications shall be established and maintained for reconnection to the users with minimal effort by user.
7		Get all running parameters from the device before reset, or change to show the App and the device are in sync.
8		After the changes made on the device, read and reconfirm that, the chnage by the device got effected.
9	**Authentication**	Since Mobile App is used for LTI clock reset and configurations, the user shall be an authenticated one. For that, every unit will have a 4 digit device password, and the mobile app shall be connected with that password for further access.
10		If the device password is forgotten, the unit shall be bought to default password 1234 by a hardware button press on the board.
11	**Configuration**	The RTCC can be adjusted to run on the present time by the setting the present time from the mobile Application.
12		On Press of the Time sync button on the mobile App, the device shall be bought to have the correct time of mobile.
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