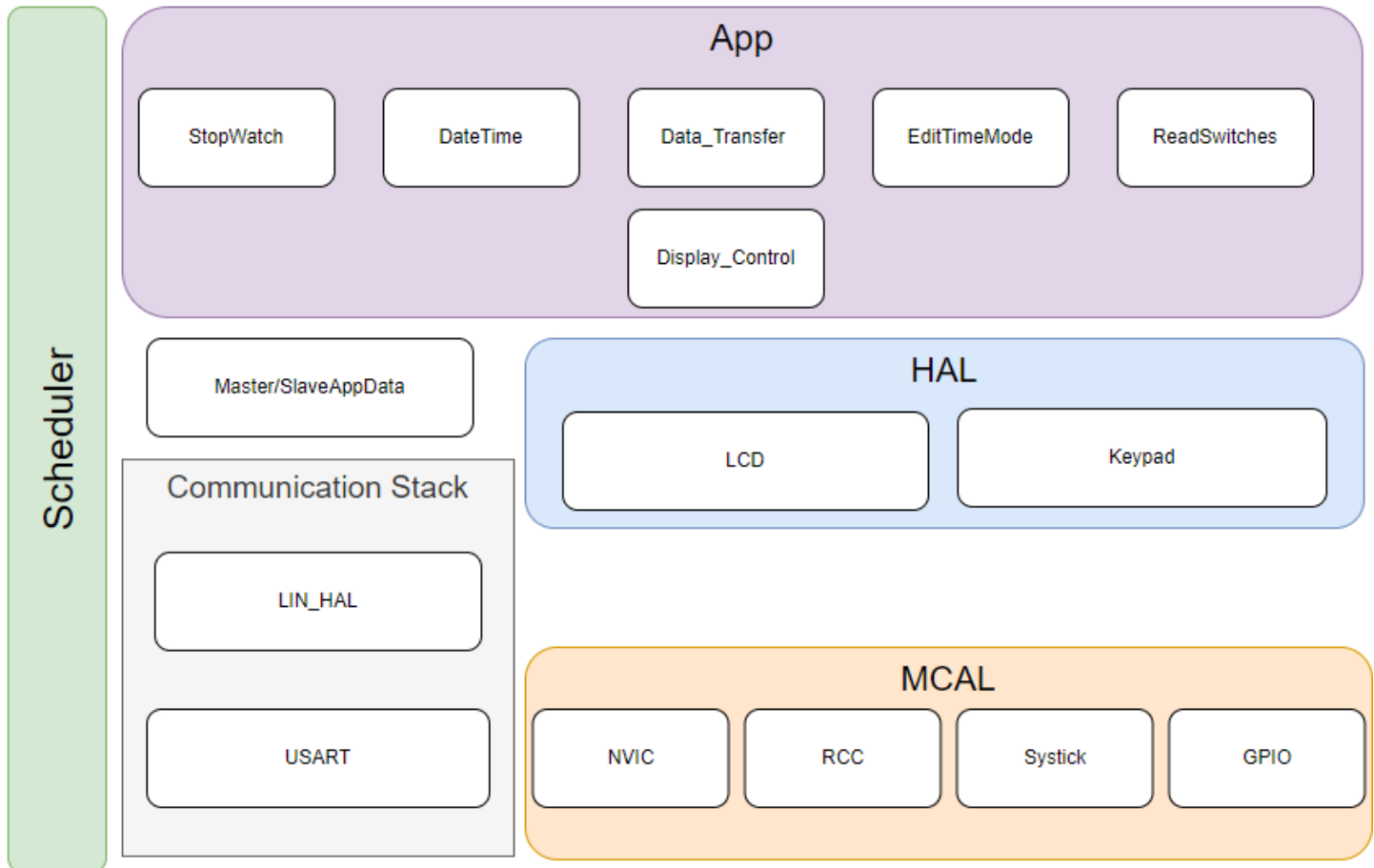


# Demo1

## Static Design

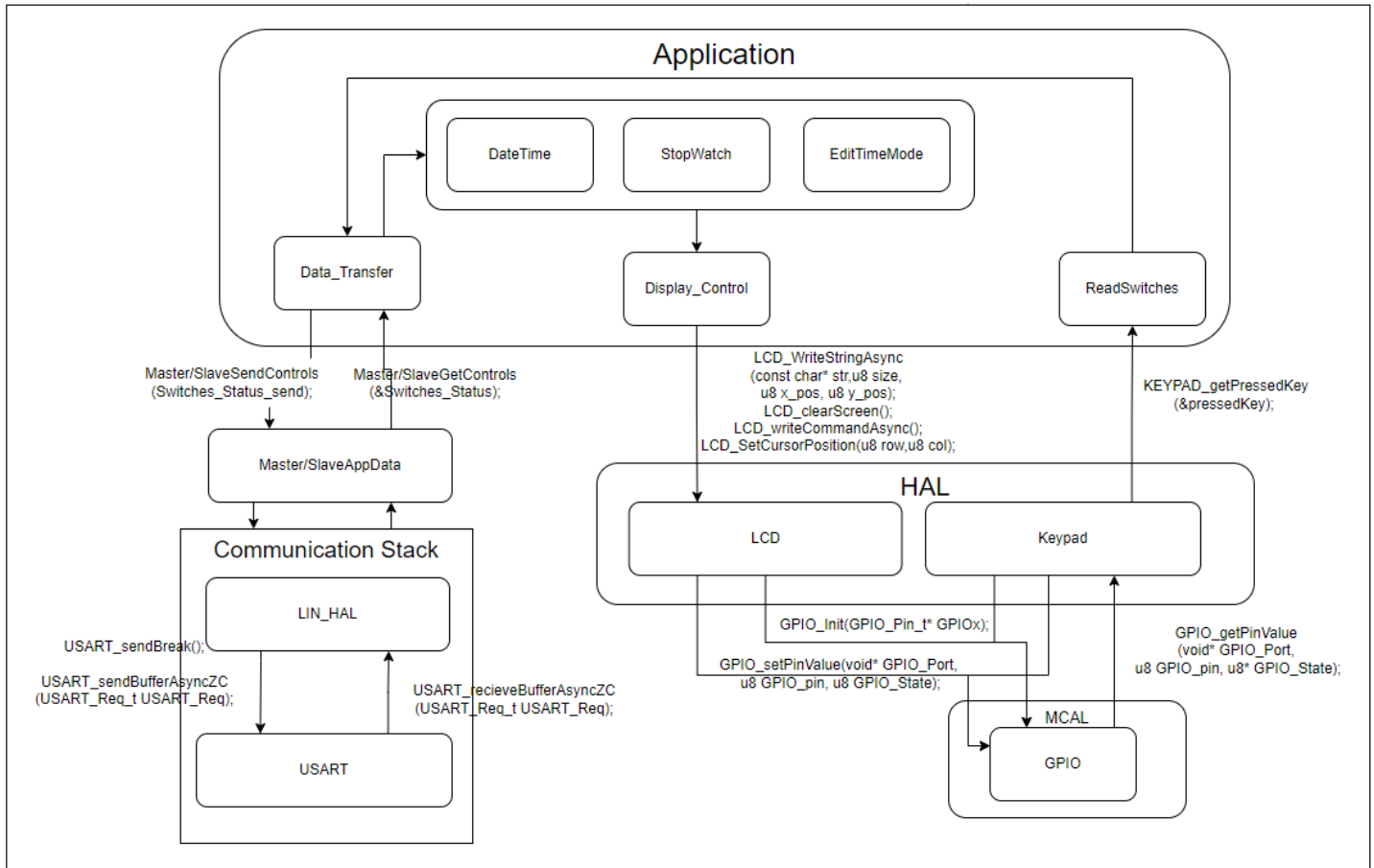
### 1-Components Diagram



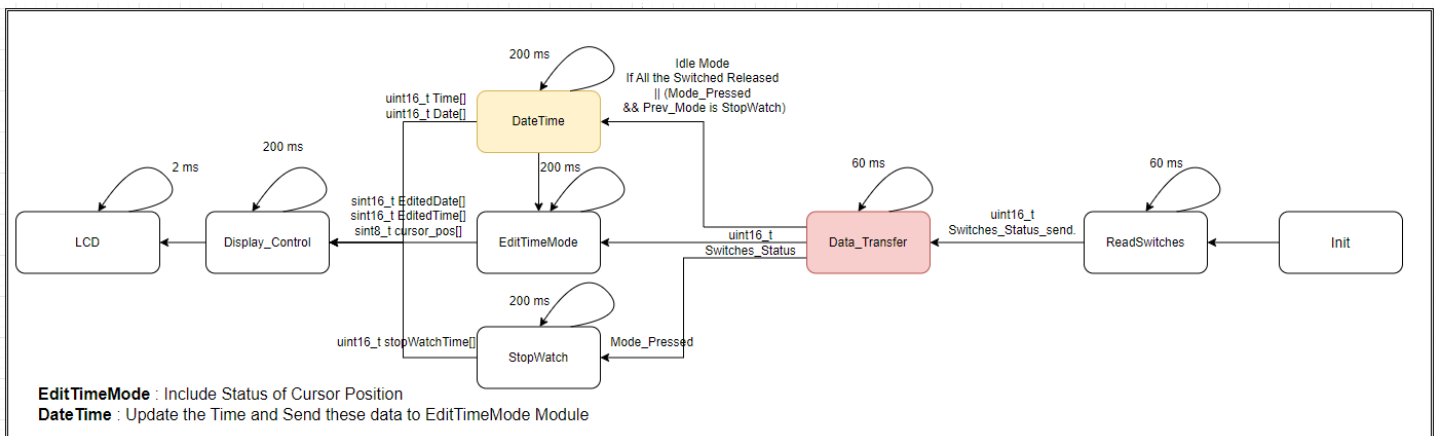
Our application comprises seven modules:

- Stopwatch: Controls the stopwatch mode.
- DateTime: Manages the date (02/04/2024) and current time (09:30:25) display.
- EditTimeMode: Controls the Edit Mode.
- ReadSwitches: Retrieves switch values.
- Data Transfer: Sends and Receive data over LIN protocol.
- Display Control: Selects the appropriate mode for LCD display.

## 2- Interfaces Between Modules



## 3-Data Flow Diagram



- DateTime, EditTimeMode and StopWatch will run in parallel.
- DateTime and StopWatch Modules Running in background all the time.
- Data\_Publish will collect the signals in one message to be sent to LIN (Master Slave Task).
- ReadSwitches will send the readings of the switches from Master MC and send the data to Data\_Publish

## 4-Bus Matrix

### 4.1 Scheduler Table

<b>Msg Name</b>	<b>Time Slot</b>	<b>Msg ID</b>	<b>Master</b>	<b>N0</b>
<b>Mstr_Ctrl</b>	30 ms	0x05	W	R
<b>Node_Ctrl</b>	30 ms	0x07	R	W

### 4.2 Signals

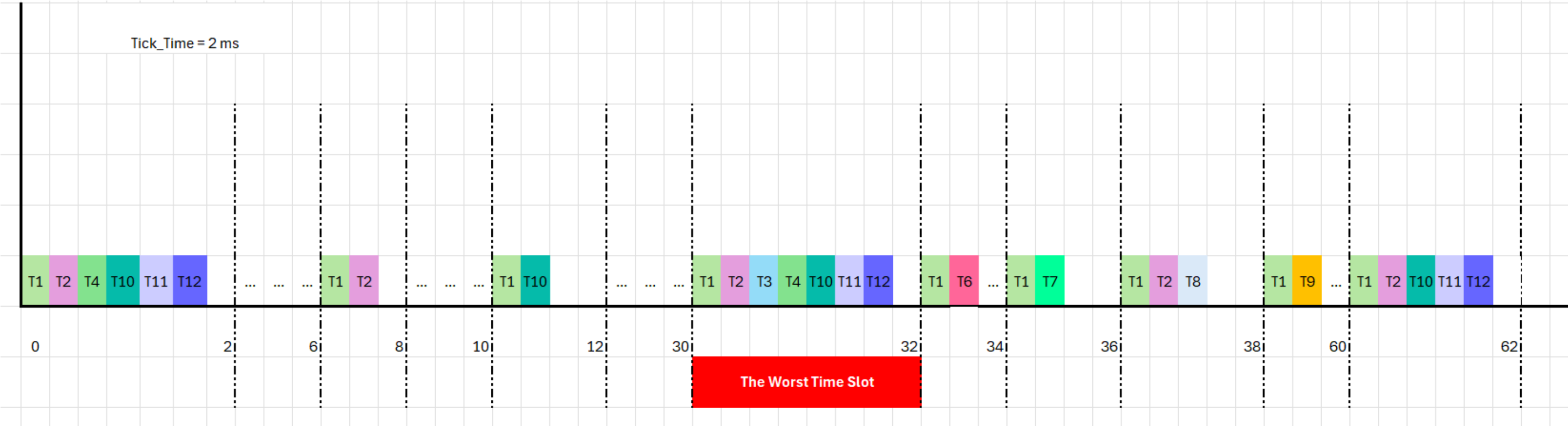
#### 4.2.1 Signals in Mstr\_Ctrl

	<b>Directions</b>	<b>Control</b>
<b>Start</b>	0	8
<b>Len</b>	4	5
<b>Msg</b>	0x05	0x05

#### 4.2.2 Signals in Node\_Ctrl

	<b>Directions</b>	<b>Control</b>
<b>Start</b>	0	8
<b>Len</b>	4	5
<b>Msg</b>	0x07	0x07

5. Dynamic Design



Task No.	Task Name	Periodicity	Delay	Priority
T1	LCD_Task	2 ms	0	0
T2	Keypad_Task	6 ms	0	1
T3	Read Switches	60 ms	30 ms	2
T4	Data_Transfer	60 ms	30 ms	3
T6	DateTime	200 ms	32 ms	6
T7	StopWatch	200 ms	34 ms	8
T8	EditTime Mode	200 ms	36 ms	7
T9	Display_Control	200 ms	38 ms	9
T10	LIN_Master_Task	10 ms	0	4
T11	LIN_Msg0	30 ms	-	-
T12	LIN_Msg1	30 ms	-	-

## 6. Tasks Distribution

Team1 : Moamen Hamed – Momen ElSayed

Team2: Ahmed Osman – Mohammed Ebrahim

<b>Momen Elsayed</b>	<b>Moamen Hamed</b>	<b>Ahmed Osman</b>	<b>Mohammed Ebrahim</b>
Scheduler	NVIC	RCC	Scheduler
RCC	GPIO	GPIO	NVIC
DateTime	DataTransfer	DataTransfer	DateTime
Systick	LCD	LCD	Systick
Keypad	USART	USART	Keypad
EditTimeMode	LIN_Slave	LIN_Slave	EditTimeMode
StopWatch	LIN_Master	LIN_Master	StopWatch
ReadSwitches	MasterAppData	MasterAppData	ReadSwitches
DisplyControl	SlaveAppData	SlaveAppData	DisplayControl