PLC Project – Traffic Light

**Objective**

At the completion of this project you will have a working traffic light with multiple patterns for use at various times of day and days of the week.

**Problem**

Simulate a Traffic Light that follows the patterns and timings shown below.

*Patterns:*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **North – South** | | | **East – West** | | |
| **G** | **Y** | **R** | **G** | **Y** | **R** |
| **A** | 20 | 5 | 27 | 20 | 5 | 27 |
| **B** | 25 | 5 | 22 | 15 | 5 | 32 |
| **C** | 15 | 5 | 22 | 15 | 5 | 22 |
| **D** | 25 | 5 | 27 | 20 | 5 | 32 |
| **E** | 20 | 5 | 32 | 25 | 5 | 27 |

*Timings:*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** | **Saturday** |
| **0** | A | A | A | A | A | A | A |
| **1** | A | A | A | A | A | A | A |
| **2** | A | A | A | A | A | A | A |
| **3** | A | A | A | A | A | A | A |
| **4** | A | A | A | A | A | A | A |
| **5** | A | A | A | A | A | A | A |
| **6** | B | D | D | D | D | D | B |
| **7** | B | D | D | D | D | D | B |
| **8** | B | D | D | D | D | D | B |
| **9** | B | D | D | D | D | D | B |
| **10** | B | D | D | D | D | D | B |
| **11** | C | C | C | C | C | C | C |
| **12** | C | C | C | C | C | C | C |
| **13** | C | C | C | C | C | C | C |
| **14** | C | C | C | C | C | C | C |
| **15** | B | E | E | E | E | E | B |
| **16** | B | E | E | E | E | E | B |
| **17** | B | E | E | E | E | E | B |
| **18** | B | E | E | E | E | E | B |
| **19** | B | E | E | E | E | E | B |
| **20** | A | A | A | A | A | A | A |
| **21** | A | A | A | A | A | A | A |
| **22** | A | A | A | A | A | A | A |
| **23** | A | A | A | A | A | A | A |

There must be checks in place so that you do not change to a pattern that could cause an accident. When a timing change occurs, the pattern should not result in a sequence of lights other than the traditional Green Yellow Red. Also, the direction of traffic flow should be uninterrupted.

Example:

The current time is 5:59 AM on Monday and your sequence is operating normally and traffic is flowing in the North – South lanes. When the time switches to 6:00 AM, traffic should remain in this direction and not change to East – West without completing the current portion of the cycle.

**Correct**

*North – South East – West*

*5:59* Green Red

*6:00* Green/Yellow Red

**Incorrect**

*North – South East – West*

*5:59* Green Red

*6:00* Red Green

**Outputs and registers to be utilized:**

D2, D3, D6, D7, D10, and D11

Please use counters to keep track of Day and Hour and use ***CTD10*** for **Hour** and ***CTD11*** for **Day**.

Procedure:

1. Start CLICK Programming Software. Double mouse click on the CLICK Programming Software icon on the desktop to start the ladder logic editor.
2. Open the existing project named **Blank.ckp**. The file **Blank.**ckp has all necessary configurations, which means communication and I/O modules are already configured for you.
3. Select Save As… under file menu and save the project under name *'project.ckp'*
4. Once confident that your program runs as desired to meet the requirement of the given problem, run it and test how it works.

Inputs and Outputs



