

**MICROTEC ENGINEERING**

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Manitowoc custom LCM software

The custom software contains both standard Light Control Module (LCM) functionality and the custom RT Light Control Module functionality. This new software release means that you can stock the one item but have the functionality of both software to suit the crane you are fitting external warning lights to.

The standard functionality is as per Microtec's standard LCM module with the exception that when the mode switches are both off then standard operation is selected and with both on RT mode is selected.

When RT mode is selected then the LCM takes the analog light bar signal from the rough terrain cranes into input 1 and uses this to trigger the external warning lights. The remaining inputs are used the same as in standard mode.

Output allocations for Ground and Power outputs:

- 1 - Green
- 2 - Orange
- 3 - Red
- 4 - Buzzer

Input allocations:

- Input 1 activates orange output when standard program selected.
- Input 1 is for the analog light bar input when the RT program is selected.
- Inputs 2, 3, 4, 5 and 6 activate red and buzzer outputs

Output priorities exist such that red takes priority over yellow which takes priority over green. Only one "colour" output is activated at a time. The Buzzer output is activated at the same time as the red output.

Outputs for yellow and red take 2 seconds after losing activating input signal before returning to green light. If an input occurs within the 2 second period then the light will stay on. This is useful for when pulsing signals of less than 2 seconds are being tapped for input signals to prevent outputs from flashing orange to green when we want signal to stay orange eg when buzzer tapped off in cranes that use an alternating buzzer for orange and a constant buzzer for red.

On board LED should flash on for 1 s and off for 1 s continuously during normal program execution.



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Entering programming mode:

1. To program input sensitivity turn on mode switch 1 and turn off mode switch 2.

Set Settings switches 1 to 6 corresponding to inputs 1 to 6. Whilst in this mode LED flashes every 100ms. Changes to Settings switches 1 to 6 are stored whilst mode switch 1 on and 2 is off.

Turning Settings switch on causes associated input to go to high sensitivity where the switching threshold is 1V. Otherwise the threshold is 3V.

Turn mode switch 1 off to exit this programming mode.

2. To program output flashing ensure mode switch 1 is off and mode switch 2 is on.

Set Settings switches 1 to 4 (corresponding to outputs 1 to 4) to on or off positions. On position will cause output to flash. Whilst in this state changes to Settings switches 1 to 4 will be stored.

Turn mode switch 2 off to exit programming mode.

3. Programming mode is exited when mode switch 1 and 2 are both on or both off.

Selecting LCM operation mode:

1. Turn power off.
2. To select standard LCM operation both mode switches need to be off.
3. To select RT light bar LCM operation both mode switches need to be on.

When RT light bar LCM operation selected the following occurs:

Analog input from the crane's light bar is used to activate the colours as follows:

LCM input 1 used for analog input

1. Green light activated when input < 3.1V
2. Yellow light activated when $3.1V \leq \text{input} < 3.4V$
3. Red light activated when input $\geq 3.4V$

Other inputs are operated same as in the standard LCM operation.