



LABVIEW Implementation of Central Controller for Active Power Load Balancing

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Presentations
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Background - Active Power Load Balancing

- Increased use of distributed renewable energy generators
- Renewable (PV) use may result in output power fluctuations which result in grid frequency fluctuations
- Central Controller updates Power Data so frequency can be regulated
- The purpose of Active Power Load Balancing is to regulate output frequency in islanded mode by ensuring that:

$$|P_{PV} - P_{load}| \leq P_{batt}$$

Central Controller

- Goal: Implement Central Controller in LABVIEW due to hardware
- Central Controller consists of two main parts: Planning and Monitoring Block
- Planning Block – triggered as soon as islanded and every minute thereafter
- Monitoring Block – begins 4 seconds after planning block and every 2 seconds after thereafter

Planning Block

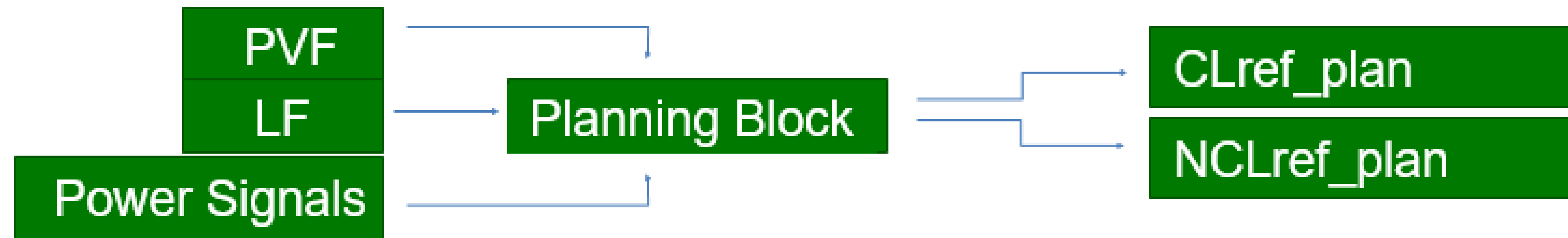


Figure 1. Planning Block I/O Diagram.

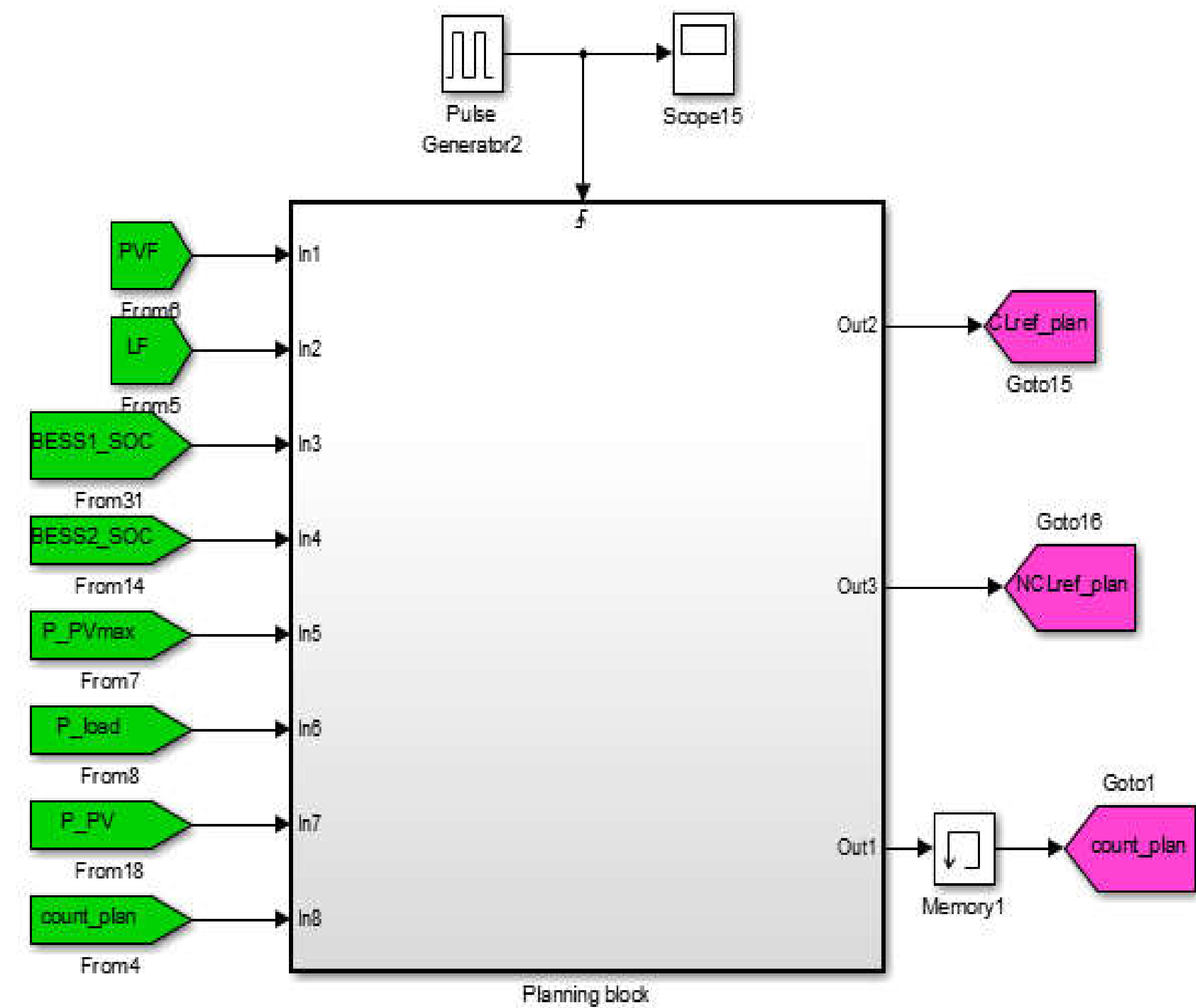


Figure 2. Planning Block in Simulink.

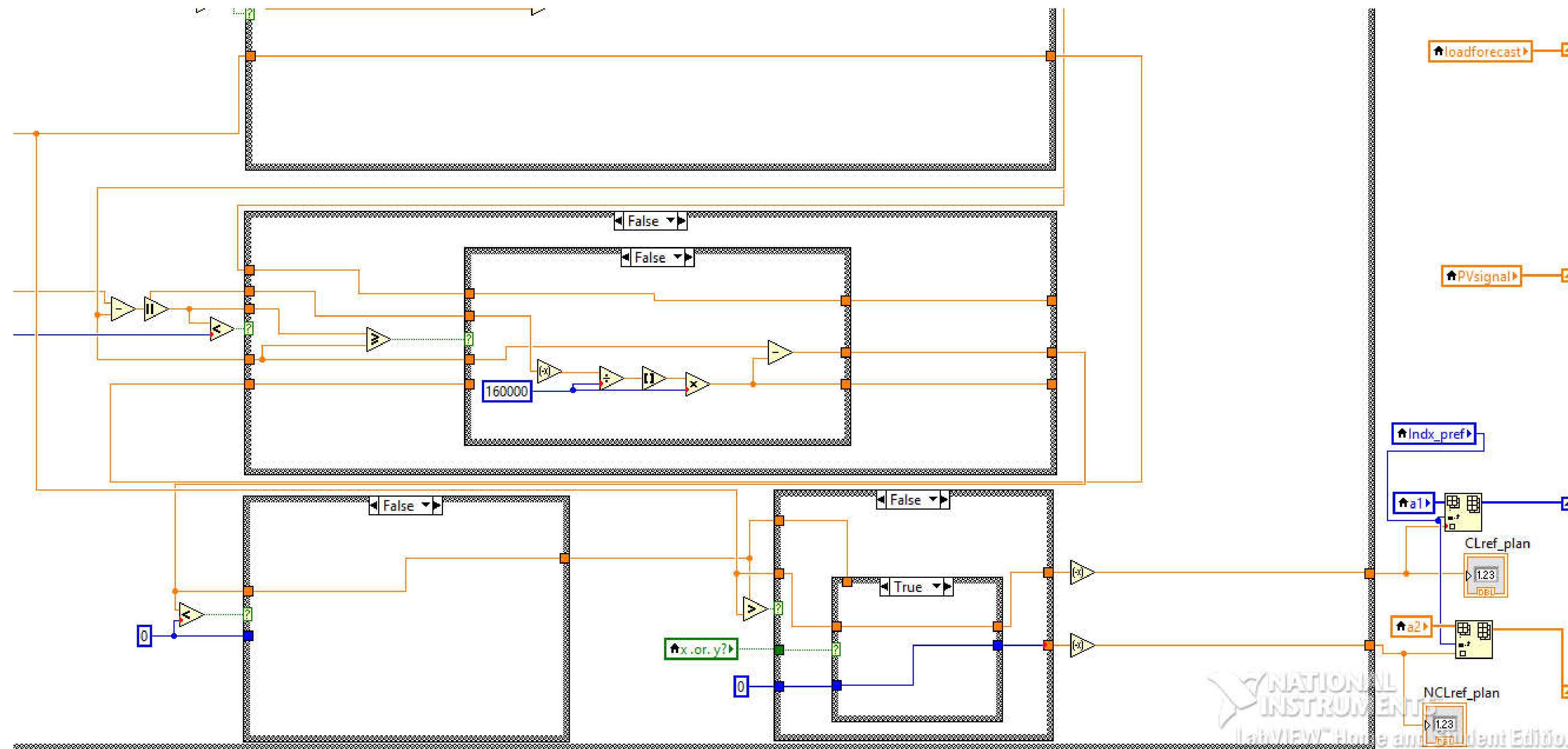


Figure 3. Planning Block in LABVIEW.

Monitoring Block

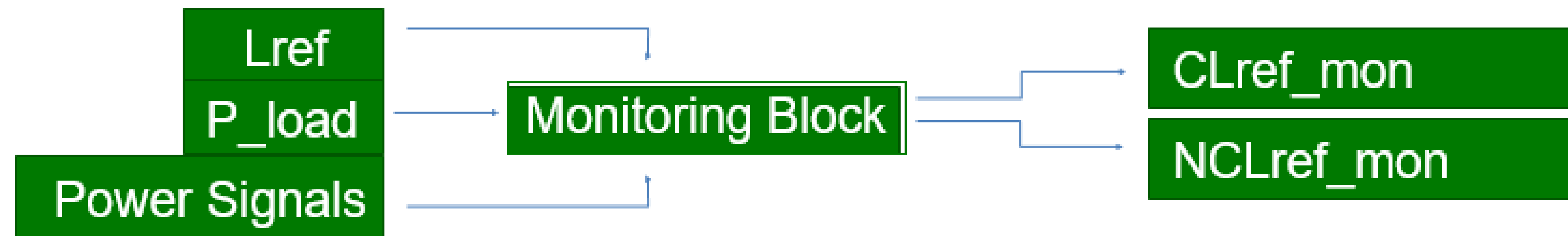


Figure 4. Monitoring Block I/O Diagram.

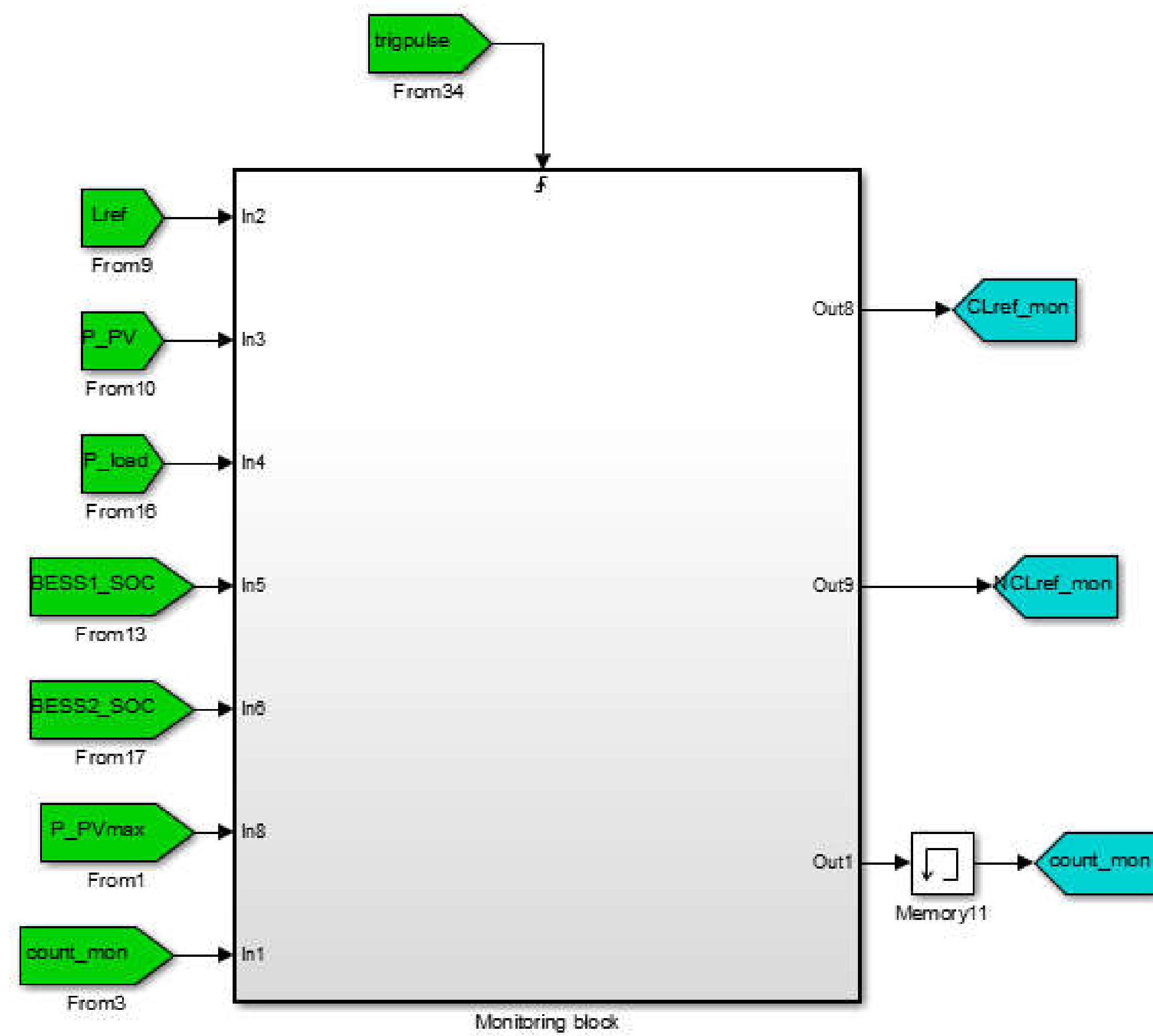


Figure 5. Monitoring Block in Simulink.

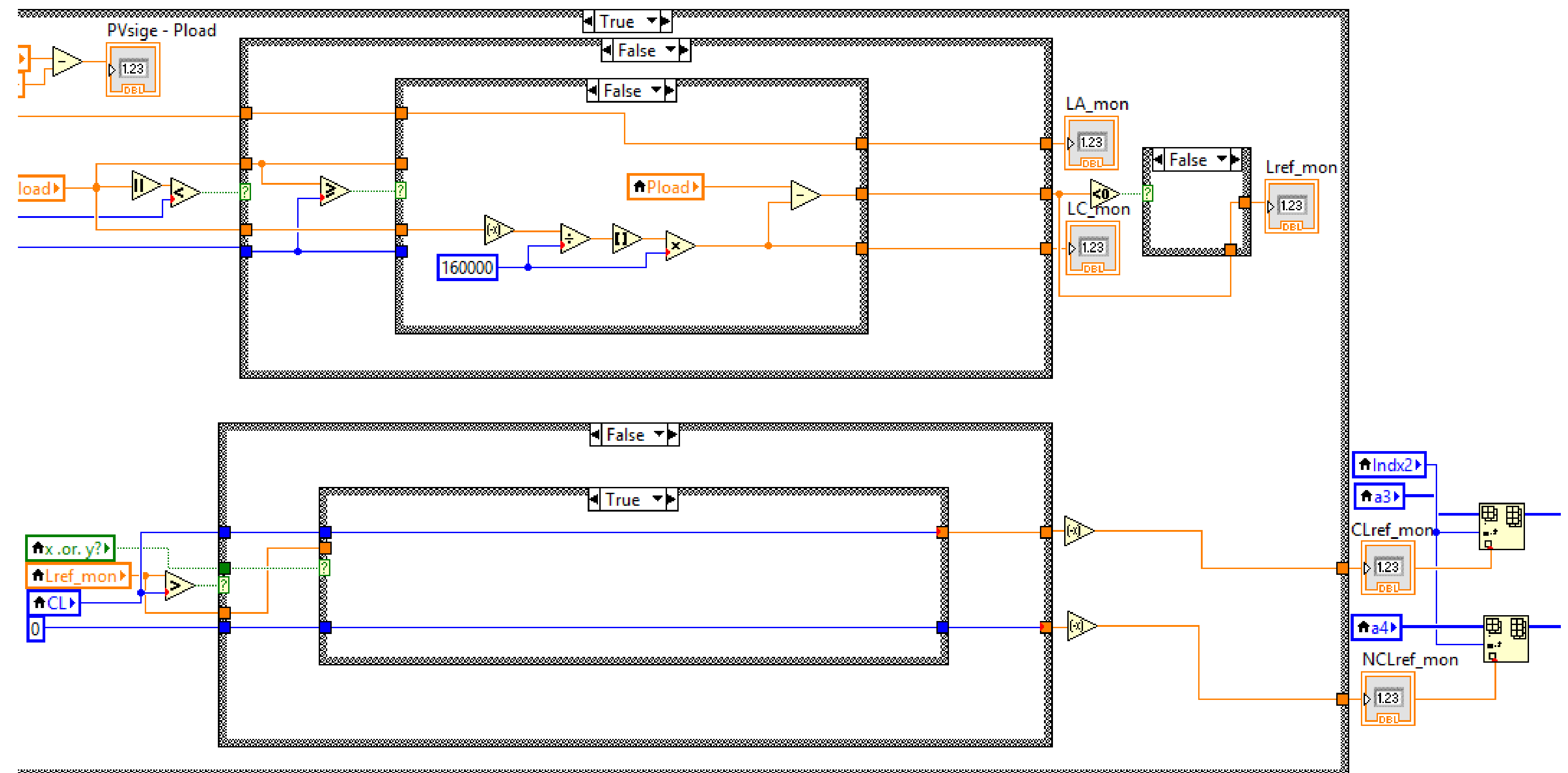


Figure 6. Monitoring Block in LABVIEW.

Switches



Figure 7. Switches which choose between monitoring and planning block critical and noncritical loads.

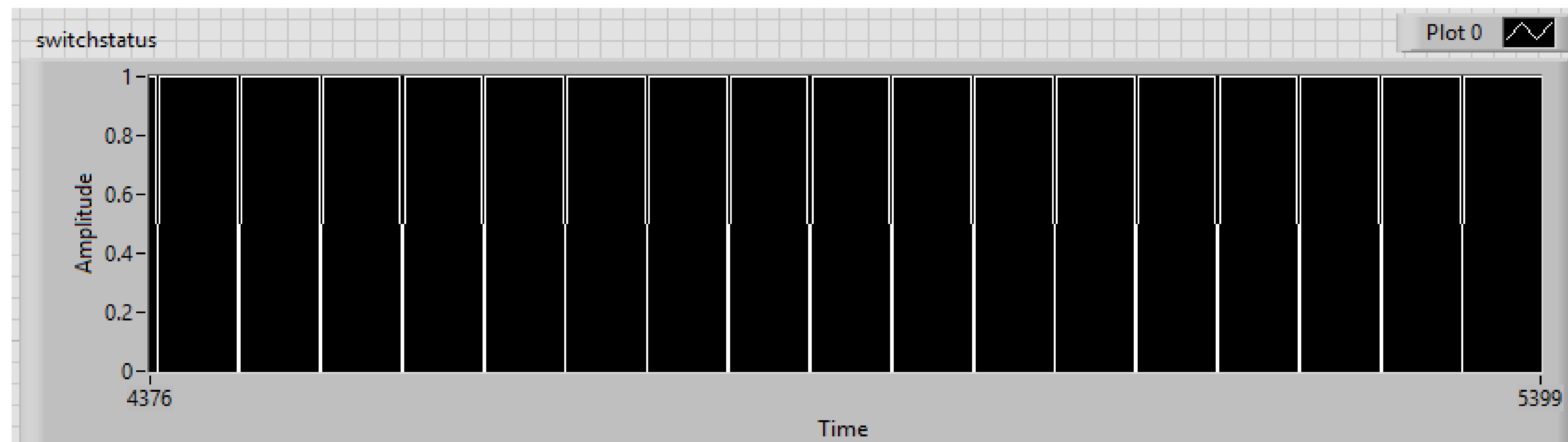


Figure 8. Switches signal to choose between monitoring and planning block.

Acknowledgements



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Questions and Answers