

MICROCONTROLLER BASED DELTA MODULATED  
PWM FOR 3-PHASE INVERTER

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This thesis is submitted as partial fulfilment of the requirement for the award  
of the Bachelor Electrical Engineering (Power System)

Faculty of Electrical & Electronic Engineering  
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“I declare that this thesis entitled “*Microcontroller Based Delta Modulated PWM for 3-phase Inverter*” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.”

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### List of Symbols

|            |   |  |
|------------|---|--|
| $d_V$      | = | Window width in delta modulator in volts.          |
| $f_m$      | = | Modulation frequency.                              |
| $S$        | = | Slope of the triangular estimated wave.            |
| $S_F$      | = | Falling slope of carrier/estimated wave.           |
| $S_R$      | = | Rising slope of carrier/estimated wave.            |
| $t_i$      | = | Terminating position of i-th pulse.                |
| $t_{i-1}$  | = | Starting position of i-th pulse.                   |
| $V_F$      | = | Estimated wave (Carrier wave).                     |
| $V_I$      | = | Modulated signal.                                  |
| $V_L$      | = | Lower boundary of estimated wave of DM.            |
| $V_m$      | = | Magnitude of sine wave.                            |
| $V_R$      | = | Reference sine wave (Modulating sinewave).         |
| $V_S$      | = | Magnitude of DC supply to electronic circuit.      |
| $V_U$      | = | Upper boundary of estimated wave of DM.            |
| $\omega$   | = | Fundamental frequency in rad/sec.                  |
| $\omega_R$ | = | frequency of input sine reference wave in rad/sec. |
| $\Delta V$ | = | Window width in delta modulation.                  |

**List of Abbreviation**

|      |                                    |
|------|------------------------------------|
| CPU  | Central Processing Unit.           |
| dc   | Direct Current.                    |
| DM   | Delta Modulation.                  |
| I/O  | Input Output.                      |
| PWM  | Pulse Width Modulation.            |
| RAM  | Random Access Memory.              |
| ROM  | Read Only Memory.                  |
| RWDM | Rectangular Wave Delta Modulation. |
| SPWM | Sinusoidal Pulse Width Modulation. |