

MPPT

USING P AND O ALGORITHM

MR. V. BADRI RAMA KRISHNAN

Assistant Professor

Department of Electrical & Electronics Engg.
G.Narayanamma Institute of Technology and Science for
Women, Hyderabad, IN

MPPT USING P AND O ALGORITHM

Copyright© : Mr. V. Badri Rama Krishnan
Publishing Rights© : VSRD Academic Publishing
A Division of Visual Soft India Pvt. Ltd.

ISBN-13: 978-93-91462-80-2
FIRST EDITION, JULY 2023, INDIA

Printed & Published by:
VSRD Academic Publishing
(A Division of Visual Soft India Pvt. Ltd.)

Disclaimer: The author(s) / Editor(s) are solely responsible for the contents compiled in this book. The publishers or its staff do not take any responsibility for the same in any manner. Errors, if any, are purely unintentional and readers are requested to communicate such errors to the Author(s) or Editor(s) or Publishers to avoid discrepancies in future.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the Publishers & Author.

Printed & Bound in India

VSRD ACADEMIC PUBLISHING
A Division of Visual Soft India Pvt. Ltd.

REGISTERED OFFICE

154, Tezab mill Campus, Anwarganj, KANPUR–208003 (UP) (IN)
Mb:9899936803, Web: www.vsrdpublishing.com, Email: vsrdpublishing@gmail.com

MARKETING OFFICE

340, FF, Adarsh Nagar, Oshiwara, Andheri(W), MUMBAI–400053 (MH) (IN)
Mb:9956127040, Web: www.vsrdpublishing.com, Email: vsrdpublishing@gmail.com

ABSTRACT

Solar energy is most popular amongst the renewable energy sources. The reason being, the solar panels are modular in nature, has long life with non-moving parts and the time for commissioning is less compared to other sources. Like other renewable energy sources it is intermittent in nature and the output power induced in the photovoltaic modules is influenced by the intensity of solar radiation and temperature of solar cells. It is necessary to track the maximum power point of the input source. In this paper, a maximum power point tracker (MPPT) using perturb and observe algorithm is proposed to improve energy conversion efficiency with boost converter. The system is consisting of solar module, boost converter and resistive load simulated using MATLAB software.

CONTENTS

CHAPTER 1: INTRODUCTION	1
1.1. INTRODUCTION.....	1
1.2. BLOCK DIAGRAM.....	3
CHAPTER 2: RENEWABLE ENERGY SOURCES	4
2.1. THE NEED FOR RENEWABLE ENERGY.....	4
2.2. DIFFERENT SOURCES OF RENEWABLE ENERGY	6
2.3. RENEWABLE ENERGY TRENDS ACROSS THE GLOBE	19
CHAPTER 3: DESIGN OF PHOTOVOLTAIC SYSTEMS	24
3.1. DEFINITION	24
3.2. PHOTOVOLTAIC ARRANGEMENTS	26
3.3. MATERIALS USED IN PV CELLS	33
3.4. MODELLING OF SOLAR CELL	51
CHAPTER 4: DC-DC CONVERTER	54
4.1. INTRODUCTION.....	54
4.2. ISOLATED TYPE DC-DC CONVERTERS	55
4.3. NON-ISOLATED TYPE DC-DC CONVERTERS.....	59
CHAPTER 5: MAXIMUM POWER POINT TRACKING .	66
5.1. MAXIMUM POWER POINT	66
5.2. MAXIMUM POWER POINT TRACKING	67
5.3. TYPES OF MPPT TECHNIQUES.....	67
CHAPTER 6: MAXIMUM POWER POINT TRACKING WITH PV ARRAY USING MATLAB/SIMULINK	75
6.1. BOOST CONVERTER.....	75
CHAPTER 7: WORKING	88

CHAPTER 8: ADVANTAGES AND DISADVANTAGES..	89
CHAPTER 9: CONCLUSION.....	90
CHAPTER 10: REFERENCES	91