

**DETECTION OF FAULTY PILOT CABLE USING ALTERA
CYCLONE II BOARD WITH TIME-DOMAIN REFLECTION (TDR)
TECHNIQUE**

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**MOHAMAD ZARIFI BIN MOHD RODZI
2006135079
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA (UiTM)
40450 SHAH ALAM
SELANGOR DARUL EHSAN
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ABSTRACT

This project implements digital technique to control the inspection wires in pilot cable by using ALTERA Cyclone II board. It is the advancement of time-domain reflection (TDR) technique for faulty cable detection. The TDR module generates pulse signal and it will be injected into the inspection wire. The edge and reflection signal from the inspection pilot cable are recorded by the digital sampling oscilloscope (DSO). By analyzing the shape of reflected pulse signal (in step waveform) and other data using oscilloscope, the type and location of fault cable can be determined. This entire module is coded using Very High Speed Integrated Circuit Hardware Description Language (VHDL).

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

The pilot cable is normally used for control signaling, telecommunication, protection and data transmission purposed associated with power distributed and transmission system. Pilot cable is complying with the customer requirement of Tenaga National Berhad (Malaysia Utility Company). Pilot channel provide channel between electricity supply substation for communication and for protective relaying of high voltage overhead and undergoes lines [3]. These cables must function under condition where there are subjected to long trains of high voltage, induced by electromagnetic induction from zero sequence fault current in the overhead phase conductors.

In the pilot cable there are bundle of wire enclosed in wire amour or single core round hard drawn aluminum wire applied helically (spiral-shaped) over them and covered by dual insulation with an inner core of cellular polyethylene and outer skin of solid polyethylene. An over voltage in pilot cable cores may compromise alarm system, resulting the severe damage to the power system and prevent equipment. However, the problems will occurs when the pilot cable along with transmission line enters swampy areas as water might seep into in and cause damage to it. Also there are others problems such as broken conductor, water damage, crimps and variety of other fault condition [2].

There are several types of testing the pilot cable such as wavelet based noise cancellation technique, a capacitive-inductive coupler, TDR cable fault locators and many more. For this project the implementation of TDR technique been used to monitor the pilot cable. TDR have been around for many years and remain the fastest and the most accurate way to pinpoint cabling problems.