

# Optical Fiber Data Collection and Transmission System Dedicated to Environmental Test of Electric and Electronic Device and Equipment

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Electric and electronic devices and equipment are usually tested to assure the reliability against vibration, temperature, electromagnetic field, and electrostatic voltage. These tests are carried out in each testing room to keep the safety of operators from the environmental test parameters.

The thesis describes the data collection and transmission system using optical fiber for the environmental tests. This data collection and transmission system consists of a robot, a sensor switch, a camera, and new types of optical fiber data transmission systems.

A non-contact sensor which is attached to the robot arm is scanned in accordance with the motion of the robot arm. Measured data which is obtained from the non-contact sensor is transmitted through the plastic optical fiber data transmission system having the reference capability in the testing room. One sensor is selected from many contact sensors by the sensor switch. One measured data which is obtained from the sensor switch and the sensor switch control data are bidirectionally transmitted through the plastic optical fiber full duplex data transmission system using a pair of optical couplers in the testing room. Through a GI optical fiber full duplex transmission system using a pair of laser diodes, while the robot and sensor switch control data are transmitted from the monitoring room to the testing room, the measured data and the video signal are transmitted from the testing room to the monitoring room.

Under the strong electromagnetic field, the environmental test data were satisfactorily measured using the proposed data collection and transmission system. The test equipment and the measurement equipment installed in the testing room are easily able to be connected to the computer network through both the data collection and transmission system and the interface computer installed in the monitoring room.