

**HIGHER TECHNICAL INSTITUTE**

**ELECTRICAL ENGINEERING  
DEPARTMENT**

**DIPLOMA PROJECT**

**TRAFFIC SIGNALS SCHEME USING  
CROUZET SMART CONTROLLER**

**E/1405**

**GEORGIU STELIOS**

**JUNE 2006**

**HIGHER TECHNICAL INSTITUTE**

**ELECTRICAL ENGINEERING  
DEPARTMENT**

**DIPLOMA PROJECT**

**TRAFFIC SIGNALS SCHEME USING CROUZET  
SMART CONTROLLER**

**E/1405**

**GEORGIU STELIOS**

**JUNE 2006**

HIGHER TECHNICAL INSTITUTE	PROJECT NO 3657
----------------------------------	--------------------

# **HIGHER TECHNICAL INSTITUTE**

## **ELECTRICAL ENGINEERING DEPARTMENT**

### **DIPLOMA PROJECT**

**E/1405**

**GEORGIU STELIOS**

**This report submitted to the department of Electrical  
Engineering of Higher Technical Institute  
Nicosia, Cyprus**

**Project Supervisor**

**Mr.I.Demetriou**

**Lecturer in Electrical Engineering ,Higher Technical  
Institute**

HIGHER TECHNICAL INSTITUTE	PROJECT NO 3657
----------------------------------	--------------------

# Acknowledgement

I would like to express my thanks to Mr. DEMETRIOU, my supervisor during the training period, for his help through the project, for his precious advises.

I also like to express my thanks to the municipality`s office advisor who gave me the information about the traffic lights regulation system

I would like also to dedicate this project to my parents for their encouragement and patience during my collage years.

# Contents

<u>Acknowledgement.</u>	4
<u>Contents.</u>	5
<u>Introduction.</u>	7
<u>CHAPTER 1: Training environment.</u>	8
<u>1.1 Hiher Technical Institute.</u>	8
<u>1.1.1 Course subject.</u>	9
<u>1.1.2 Administration structure.</u>	9
<u>Chapter 2: General information and work specification.</u>	10
<u>2.1 General information.</u>	10
<u>2.1.1 Phase.</u>	10
<u>2.1.2. Stage.</u>	11
<u>2.1.3 Cycle.</u>	12
<u>2.1.4 Controller Start-up sequence.</u>	12
<u>2.2 Work specification.</u>	13
<u>2.3 Features overview.</u>	14
<u>2.3.1 Safety Monitoring.</u>	14
<u>2.3.2 Demand Facilities.</u>	14
<u>2.3.3 Methods Of Control.</u>	14
<u>2.4 Chapters Conclusion.</u>	15
<u>Chapter 3: Familiarization and Basic Program Realization.</u>	16
<u>3.1 Indtriduction.</u>	16
<u>3.1.1 Smart Controller SA-20.</u>	16
<u>3.1.2 Software.</u>	17
<u>3.2 Preliminaries tasks.</u>	20
<u>3.2.1 Phase's Definition.</u>	20
<u>3.2.2 Phase's sequence Definition.</u>	22
<u>3.2.3 Conflicting Phase's Definition.</u>	24
<u>3.2.4 Input/Output Assignment.</u>	25
<u>3.2.5 Cycle Definition.</u>	25
<u>3.3 Coding.</u>	27
<u>3.3.1 Start-up Sequence.</u>	27
<u>3.3.2 Stages and Interstages.</u>	27
<u>3.4 Chapter's Conclusion.</u>	29
<u>Chapter 4: Methods Of Control and Main Circuits.</u>	30
<u>4.1 Logic Gates.</u>	30
<u>4.2 Main Programming.</u>	32
<u>4.2.1 Function of first Phase Traffic Signal Control.</u>	34
<u>4.2.2 Pedestrian Demand Phase.</u>	37
<u>4.2.3 Phase For Green Light Arrow.</u>	41
<u>4.3 Chapter's Conclusion.</u>	43
<u>Main Program Scheme.</u>	44

<u>Summary</u> .....	45
<u>Illustration Tables</u> .....	47
<u>Appendices</u> .....	48

## Introduction

The purpose of this project was the development of a sequence control scheme of traffic lights using Crouzet Smart Controller.

The objectives of the project were:

- To investigate the characteristic and capabilities of programmable controllers
- To develop an application program for the control of traffic lights and test it on a simulation unit which must be constructed.

As there are a wide range of rules and functions that can be considered in the traffic regulation, no specified limitations are imposed, except hardware limitations.

The project is subjugated to several essential rules of safety. Thus, the work specifications were prepared after consultation with an Engineer responsible for the traffic lights of Nicosia area and in accordance to their specification for micro controller based in traffic signals controller.

The project is divided into several chapters. The first chapter deals with the training environment. The second chapter is referred to general information and work specifications. The third chapter presents the familiarization and the basic program. Finally, the fourth chapter deals with the methods used in the programming for controlling the traffic lights junction.