A Project on Conveyor belt according to packet sizesby using PLC



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Declaration

It is declared hereby that this thesis paper or any part of it has not been submitted to anywhere else for the award of any degree.

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Certification

This is to certify that this project entitled “A Project on Conveyor belt according to packet sizes by using PLC” is done by the following students under my direct supervision. This project work has been carried out by them in the laboratories of the Department of Electrical and Electronic Engineering under the Faculty of Engineering, Sonargaon University (SU) in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering.

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ACKNOWLEDGEMENT

The report titled as“A Project on Conveyor belt according to packet sizes by using PLC”

has been prepared to fulfill the requirement of our practicum program. In the process of doing and preparing our practicum report, we would like to pay our gratitude to some persons for their enormous help and vast co-operation.

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We are, indeed, grateful to all those from whom we got sincere cooperation and help for the preparation of this report

ABSTRACT

In many industrial applications there is need of sorting. Sorting can be done by using many ways like sorting of object according to their dimensions (height, length etc.), according to their colors, according to their weight, using machine vision (image processing), according to the material of an object etc. For example in Thermal Power Station electromagnetic sorting technique is used to sort ferromagnetic materials from coal. In this project, the development of a LCA (Low Cost Automation) system to sort objects according to their height has been designed. This LCA system is controlled by Programmable Logic Controller (PLC). This project consists of two parts, first consisting of software which contains ladder logic programming which is used to program PLC that controls the whole process of the project step by step according to input data sequence. Second is the hardware part which consists of conveyors used to transport the objects, sensors used to sense the height (i.e. laser sensors) of the objects, electronic system used to sort the objects and motors to drive the conveyors.

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CHAPTER I

INTRODUCTION

1.1 Introduction

A **conveyor belt** is the carrying medium of a **belt conveyor system** (often shortened to belt conveyor). A belt conveyor system is one of many types of conveyor system . A belt conveyor system consists of two or more pulleys (sometimes referred to as drums), with an endless loop of carrying medium. One or both of the pulleys are powered, moving the belt and the material on the belt forward. The powered pulleysis called the drive pulley while the unpowered pulley is called the idler pulley. There are two main industrial classes of belt conveyors; Those in general material handling such as those moving boxes along inside a factory and bulk material handling such as those used to transport large volumes of resources and agricultural materials, such as grain, salt, coal, ore, sand, overburden and more

.

1.2 History

Primitive conveyor belts were used since the 19th century. In 1892, Thomas Robins began a series of inventions which led to the development of a conveyor belt used for carrying coal, ores and other products. In 1901, Sandvik invented and started the production of steel conveyor belts. In 1905 Richard Sutcliffe invented the first conveyor belts for use in coal mines which revolutionized the mining industry. In 1913, Henry Ford introduced conveyor-belt assembly lines at Ford Motor Company's Highland Park, Michigan factory. In

1972, the French society REI created in New Caledonia the longest straight-belt conveyor in the world, at a length of 13.8 km. Hyacynthe Marcel Bocchetti was the concept designer.

In 1957, the B. F. Goodrich Company patented a Möbius strip conveyor belt, that it went on to produce as the "Turnover Conveyor Belt System". Incorporating a half-twist, it had the advantage over conventional belts of a longer life because it could expose all of its surface

area to wear and tear. Such Möbius strip belts are no longer manufactured because untwisted modern belts can be made more durable by constructing them from several layers of different

materials.In 1970, Intralox, a Louisiana-based company, registered the first patent for all plastic, modular belting.

1.3 Objectives

The main objective of this system is to introduce a automated conveyor belt system with PLC technology. The supplementary objectives of this project are as follows:

A conveyor belt system catagorise matarials by their size and distribute them into proper delevery system that maximises the generation and distribution of production and which makes large amount of packaging possible in short time.

1.4 Project Organization

In this report, Chapter one covers introduction, background, objectives. Chapter two represents theory, description of the PLC andother components. Chapter three describes and working principle of the project. In chapter four we have discussed result and discussion, cost estimation, future modification, conclusion.

CHAPTER II

THEORY OF THE PROJECT

2.1 Introduction

This chapter includes the total over view of the device. In this chapter we have followed-up the theory of PLC,relay,fuse, limit switch,photo sensor,DC motor,power supply other components. Here we can know that the total system overview of the projects. And we will also know that how the equipment are working with each other.

2.2 Theory

We've developed the system that can handle this critical switching situation perfectly. Our system has several photo sensors to measure any big/small size package. Based on those circumstances our system manages that power source switching. For exampleaconveyor belt system catagorise matarials by their size and distribute them into proper delevery system that maximises the generation and distribution of production and which makes large amount of packaging possible in short time.

2.3 Conveyor belt:

Conveyors are durable and reliable components used in automated distribution and warehousing, as well as manufacturing and production facilities. In combination with computer-controlled pallet handling equipment this allows for more efficient retail, wholesale, and manufacturing distribution. It is considered a labor saving system that allows large volumes to move rapidly through a process, allowing companies to ship or receive higher volumes with smaller storage space and with less labor expense.

Belt conveyors are the most commonly used powered conveyors because they are the most versatile and the least expensive. Products are conveyed directly on the belt so both regular and irregular shaped objects, large or small, light and heavy, can be transported successfully. Belt conveyors are also manufactured with curved sections which use tapered rollers and curved belting to convey products around a corner. These conveyor systems are commonly used in postal sorting offices and airport baggage handling systems.
Belt conveyors are generally fairly similar in construction consisting of a metal frame with rollers at either end of a flat metal bed. Rubber conveyor belts are commonly used to convey items with irregular bottom surfaces, small items that would fall in between rollers (e.g. a sushi conveyor bar), or bags of product that would sag between rollers. The belt is looped around each of the rollers and when one of the rollers is powered (by an electrical motor) the belting slides across the solid metal frame bed, moving the product. In heavy use applications the beds which the belting is pulled over are replaced with rollers. The rollers allow weight to be conveyed as they reduce the amount of friction generated from the heavier loading on the belting. The exception to the standard belt conveyor construction is the Sandwich Belt conveyor.The Sandwich Belt conveyor uses two conveyor belts, instead of one.

Thesetwoconventional conveyor belts are positioned face to face, to firmly contain the items being carried in a "sandwich-like" hold.

Belt conveyors can be used to transport product in a straight line or through changes in elevation or direction. For conveying Bulk Materials like Grains, Ore, Coal, Sand etc., over gentle slopes or gentle curvatures, a troughed belt conveyor is used. The trough of the belt ensures that the flowable material is contained within the edges of the belt. The trough is achieved by keeping the idler rollers in an angle to the horizontal at the sides of the idler frame. A Pipe Conveyor is used for material travel paths that require sharper bends and inclines up to 35 degrees.[2] A pipe conveyor features the edges of the belt being rolled together to form a circular section like a pipe. Like a Troughed Belt Conveyor, a Pipe Conveyor also uses idler rollers. However, in this case the idler frame completely surrounds the conveyor belt helping it to retain the pipe section, while pushing it forward. In the case of travel paths requiring high angles and snake-like curvatures, a Sandwich Belt is used. The sandwich belt design enables materials carried to travel along a path of high inclines up to 90 degree angles[3], enabling a vertical path as opposed to a horizontal one. This transport option is also powered by idlers.
Other important components of the Belt Conveying System apart from the Pulleys and Idler rollers include the Drive Arrangement of reducer Gear Boxes, Drive motors and associated



Belt conveyor systems at a Packing Depot | Baggage Handling Belt Conveyor systems | Belt conveyor from an open-pit lignite mine in Bavaria

couplings. Scrapers to clean the belt, Chutes for controlling the discharge direction, Skirts for containing the discharge on the receiving belt, Take Up assembly for "tensioning" the belt and Technological Structures like Stringer, Short Post, Drive Frames, Pulley Frames make up the balance items to complete the Belt Conveying system. In certain applications Belt Conveyors can also be used for static accumulation or cartons.

Working principle ?

A conveyor system systematically carries and transports materials, typically in an industrial or controlled environment. Conveyor belts are a tried-and-true energy saver designed to increase efficiency. Let’s take a look at how conveyor belts work and why they’ve stood the test of time.

A conveyor belt works by using two motorized pulleys that loop over a long stretch of thick, durable material. When motors in the pulleys operate at the same speed and spin in the same direction, the belt moves between the two.

If objects are particularly heavy or bulky — or if the conveyor belt is carrying them for a long distance or duration — rollers may be placed on the sides of the conveyor belt for support. Rollers keep objects in place and keep the belt from sagging.

Functions of the Conveyor Belt

How is a conveyor belt typically used? A conveyor belt's function is to move objects from Point A to Point B with minimal effort. The conveyor belt pace, direction, curvature and size varies based on the needs of the user. In some industries, a conveyor belt brings products through a manufacturing or packaging line and back out again.

Conveyor belting usually falls under two categories: lightweight and heavyweight.

Lightweight belting is designed to meet various material handling requirements in diverse industries. A lightweight belting system has a working tension of less than 160 pounds per inch of width.
The four main types of light-duty conveyor belts are:

Solid plastic
Non-woven
Thermoplastic covered
Lightweight rubber

Top industries that use lightweight belting include:

Food processing
Unit package handling
Pharmaceutical
Paper goods

For your toughest applications, use heavyweight conveyor belting with a tension of at least 160 pounds per inch of width. A heavy-duty belting system is used for applications that require continuous movement of bulky, heavy materials. The belt is often coated with PTFE to withstand high temperatures.

Top industries that use heavyweight belting include:

Mining
Manufacturing
Waste/recycling
High-temperature food processing
Conveyor Belt Uses and Applications

Lightweight and heavyweight belting have a range of uses and applications across different settings and industries. Whether you need light-duty or heavy-duty belting, conveyor belt systems are remarkable in their ability to impact efficiency, productivity and labor.

Conveyor Belt Uses

A conveyor system has a wide variety of uses, such as:

Quickly and reliably transport a large amount of material
Stack materials at the end of a transportation line
Streamline the process to get something from Point A to Point B
Move a product vertically or horizontally with a high degree of flexibility

The advantages of using a conveyor belt system include:

- Reduce labor while massively increasing productivity and time efficiency
- Protect workers from any injuries caused by carrying heavy loads
- Keep the product safe from damage during transportation
- Easily transfer a product onto a different route
- Enjoy relatively simple maintenance of this durable, long-lasting system

Conveyor Belt Applications

Conveyor systems are at work across many industries, including air travel, mining, manufacturing, pharmaceuticals, food processing and more.

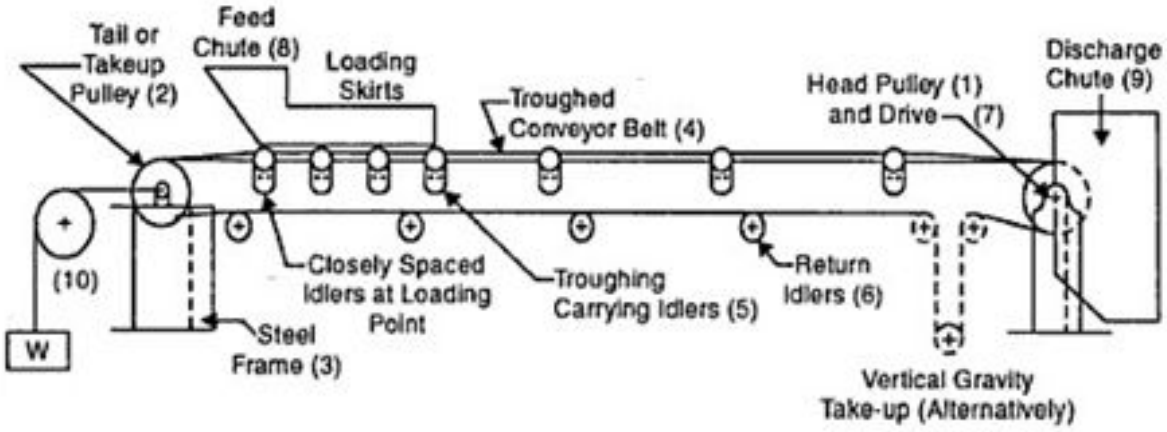
At an airport, a conveyor belt is the best way to process, sort, load and unload passenger luggage efficiently. For the pharmaceutical industry, conveyor belt systems transport cardboard boxes or palates full of medical supplies before and after packaging and distribution. In manufacturing and mining, enormous amounts of material are transported through tunnels, along roads and up steep slopes on conveyor belts.

For food processing, products go through their life cycle on a conveyor belt. Items can be spread, stamped, rolled, glazed, fried, sliced and powdered — all while rolling on the belt. Think of the hours of manpower that would otherwise be spent bringing each food item through every part of that process. With conveyor belts, goods move from start to finish in mass quantities while still retaining a uniform high quality.

Each industry has its own specifications and requirements for the type of conveyor belt they use. From shipyards and power plants to bakeries and ice cream plants, the conveyor belt is the go-to utility because of its simplicity and reliability.

Working principle:

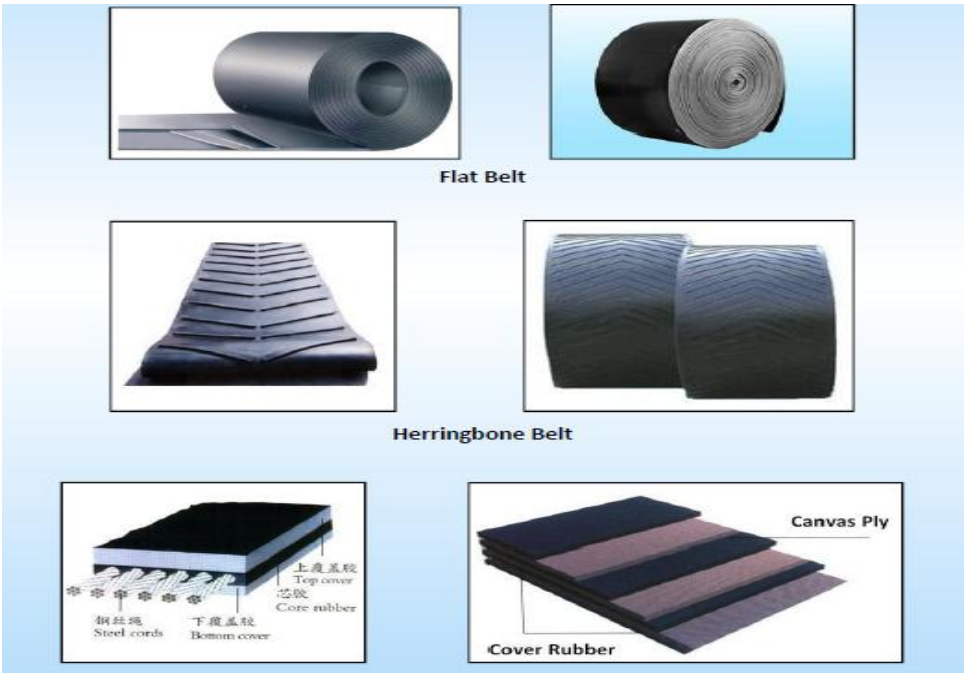
Belt conveyor is composed by two pulleys and a closed conveyor belt. The pulley that drives conveyor belt is called drive pulley ; the other one–only used to change conveyor belt movement direction–is called bend pulley. Drive pulley is driven by the motor ,. The drive pulleys are generally installed at the discharge end. Material is fed on the feed-side and landed on the rotating conveyor belt.



Schematic Diagram of Belt Conveyor

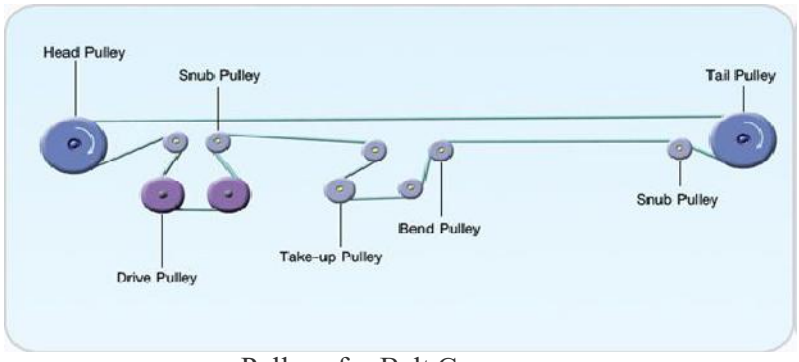
1) Belt

Belt is used for moving and supporting surface on which the conveyed material rides. It is the traction element. Which type of belt will be used depend on the nature of materials to be transported.

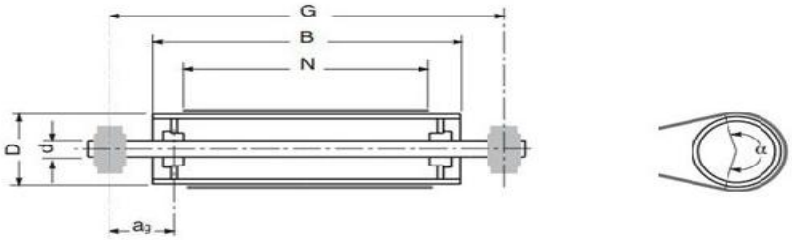


2) Pulley

A conveyor belt system uses different types of pulleys like end pulley, snub pulley, bend pulley etc.



Pulleys for Belt Conveyor



Measurement Needed for Pulley Design

3) Idlers or Rollers

Idlers/Rollers are the supports for the carrying and return stands of the belt.



Flat Rollers

4) Driving Unit

Driving unit imparts power to one or more pulleys to move the belt and its loads. Belt drive is provided normally at the discharge ends, however, it may be provided through the head end or through intermediate pulley by coupling the pulley shaft to the reducing gear's output

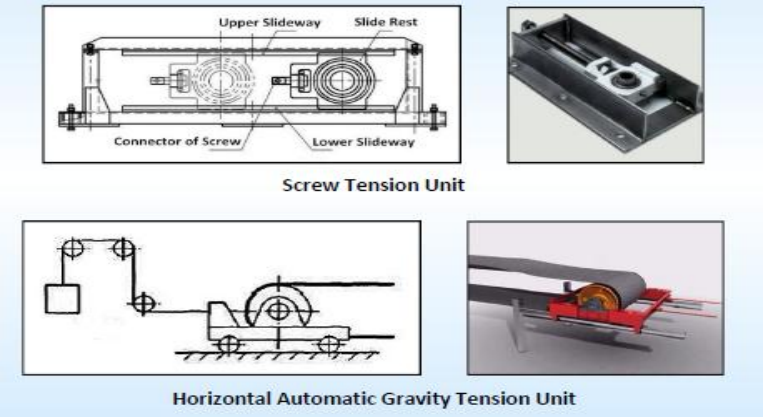
shaft. The coupling is selected based on the load characteristics and applications. Flexible coupling or fluid couplings are often used.



Motorized Pulley

5) Tension Unit

Tension unit is used to maintain the proper tension of the belt for effective power transmission.
The purposes of take-up are:
a. To allow for stretch and shrinkage of the belt.
b. To ensure that the minimum tension in the belt is sufficient to prevent undue sag between idlers.
c. To ensure that the tension in the belt in the rear of the drive pulley is sufficient to permit such pulley to transmit the load.



ADVANTAGES OF BELT CONVEYORS

- Easy maintenance
- No product degradation
- Stable performance and reliable operation
- Large length of conveying path.
- Lower power consumption.
- Long life.

LIMITATIONS OF BELT CONVEYORS

(a) Accumulation difficult
(b) The loss of light weight bulk material carried away as dust
(c) Continuous or periodic monitoring of belt is necessary (d) Heat affects the material of belt.

2.4 Equipments:

* Belt (denim)
* Pulley
* Rollers
* Hard board
* Bearing
* Screw
* Channel
* Dower channel
* Gear motor
* Relay & base
* Switch
* Glass type fuse & holder
* Power supply (12volt), (24volt)
* PLC
* Cable
* Photo sensor

2.5 PLC

A programmable logic controller (**PLC**) or programmable controller is an industrial digital computer which has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, or robotic devices, or any activity that requires high reliability control and ease of programming and process fault diagnosis.

PLCs were first developed in the automobile manufacturing industry to provide flexible, ruggedized and easily programmable controllers to replace hard-wired relays, timers and sequencers. Since then, they have been widely adopted as high-reliability automation controllers suitable for harsh environments. A PLC is an example of a "hard" real-time system since output results must be produced in response to input conditions within a limited time, otherwise unintended operation will result.

In this conveyor belt system we are using UniMaT PLC of model UNI120.

UNI 120 SerieS UniMaTPLC

CPU 124 Profile

UN 120 series Economical PLCs are highly cost-efficient micro PLC which are independently developed, and self-produced by UniMAT, for the field of automated machinery equipment.UN 120 series PLC are the optimal choice for machinery equipment automatic production. Based on its strict cost control,and reliable quality.

UN 120 series PLC general technical specification	
Protection Grade	IP20, Match IEC 60529
Environment Temperature Horizontal installation Vertical installation	0℃~60℃ 0℃~40℃
Relative humidity	5% ~ 95%, non condensing (RH Grade2, Match IEC61131-2)
Atmosphere	795~1080hPa
Isolation 24V DC circiut 230V AC circuit	Test voltage 500V DC Test voltage 1460V AC
Electromagnetic compatibility	Accord with EMC regulation's requirements Noise suppression, accord with IEC 61000-6-2 Testing accord with: IEC 61000-4-2, 61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC 61000-4-6
Mechanical grade vibration, testing condition is accord with	IEC 60068, Part2-6/10 μp58Hz; Constant amplitude 0.075mm; 58~150Hz; constant accelerated speed 1g; Vibration period: in every direction of three mutually orthogonal axis, every axis is 10 vibration period.

CPU 124 of UN 120 series has compact structure and powerful instruction set, and outstanding performance, can control various industrial equipment, it is mainly used in small automation control system and satisfies various control needs.

UN120 Series CPU Module

CPU 124-1Q	CPU 124-2Q	CPU 124-1R
		
· Local Digital 14DI/10DO, Transistor output · Communication ports: one RS485 supports PPI Protocol, communication · Expansion Modules Max. allowed: 3 I/O Modules · Supports 128 digital and 32 analog · Apply FLASH's long-time data-holding on power-off, no need of power supply, can save data for 10 years · Unique AES iterative encryption algorithm, which protects clients' intellectual property.	· Local digital 14DI/10DO, transistor output · Communication ports: two RS485, support both PPI Protocol and free port communication · Expansion modules max. allowed: 3 I/O Modules · Supports 128 digital and 32 analog · Apply FLASH's long-time data-holding on power-off, no need of power supply, can save data for 10 years · Unique AES iterative encryption algorithm, which protects clients' intellectual property.	· Local Digital 14DI/10DO, relay output · Communication ports: one RS485, supports PPI Protocol and free port communication · Expansion modules max. allowed: 3 I/O Modules · Supports 128 digital and 32 analog · Apply FLASH's longtime data-holding on power-off, no need of power supply, can save data for 10 years · Unique AES iterative encryption algorithm, which protects clients' intellectual property.

CPU 124-2R	CPU 124XP-2Q	CPU 124XP-2R
		
· Local digital 14DI/10DO, relay output · Communication ports: two RS485, support both PPI Protocol and free port communication · Expansion modules max. allowed: 3 I/O Modules · Supports 128 digital and 32 analog · Apply FLASH's longtime data-holding on power-off, no need of power supply, can save data for 10 years · Unique AES iterative encryption algorithm, which protects clients' intellectual property.	· Local digital 12DI/8DO, transistor output · Local analog4AI/2AO, non-Isolated output · Communication ports: two RS485, support both PPI Protocol and free port communication · Expansion modules max. allowed: 4 I/O modules · Supports 128 digital and 32 analog · Apply FLASH's longtime data-holding on power-off, no need of power supply, can save data for 10 years · Unique AES iterative encryption algorithm, which protects clients' intellectual property.	· Local digital 12DI/8DO, transistor output · Local analog 4AI/2AO, non-isolated output · Communication ports: two RS485, support both PPI Protocol, and free port communication · Expansion modules max. allowed: 4 I/O modules · Supports 128 digital and 32 analog · Apply FLASH's longtime data-holding on power-off, no need of power supply, can save data for 10 years · Unique AES iterative encryption algorithm, which protects clients' intellectual property.

CPU 124E Techical Specifications

Model	CPU 124 -2QE	CPU124-2RE
Power consume	5W	
Program areas	16K	
Data areas	10K	
Local digital	14DI/10DO	
I/O Image area		
Digital	256 (128DI/128DO)	
Analog	64 (32AI/32AO)	
Expansion module	4	
Data-holding on power off	support	
Real-time clock	Built-in	
Removeable terminal	removable	
Timers	Total 256pcs: 4pcs 1ms, 16pcs 10ms, 236pcs 100ms	
Counters	256	

Model	CPU 124 -2QE(transistor)	CPU124-2RE(relay)
Timed interrupts	Two with 1ms resolution	
Edge interrupts	4 up /4 down	
Real time clock	50 hrs/representative value（at 8 hrs at 40°C）	
Lock option	Battery card	
Power characteristics		
Rated voltage	DC 24V	AC 220V
Input voltage	DC 20.4-28.8V	AC 110-240V
Senor voltage and current	voltage:L+ minus 5V;current:300mA	
Ethernet communication capabilities		
Port	1 RJ485 ethernet port	
Communication rate	10/100 Mb/s	
Duplex mode	Full duplex support cross/straight line heat plug	
Communication distance	UTP 100m	
Max.simultaneous connection	8	
Max communication bytes one time	240 bytes	
PC communication	STEP7 Micro/Win and kingview support	
Modbus-TCP host	Max 4 connection at the same time	
Modbus-TCP salve	Max 4 connection at the same time	
Series port communication function		
Port	2 RS-485port（DB9 port）	
PPI baud rate	9600,19200,187500 bps	
Max stations	32 stations every section, 126 stations/network	
PPI host mode	support	

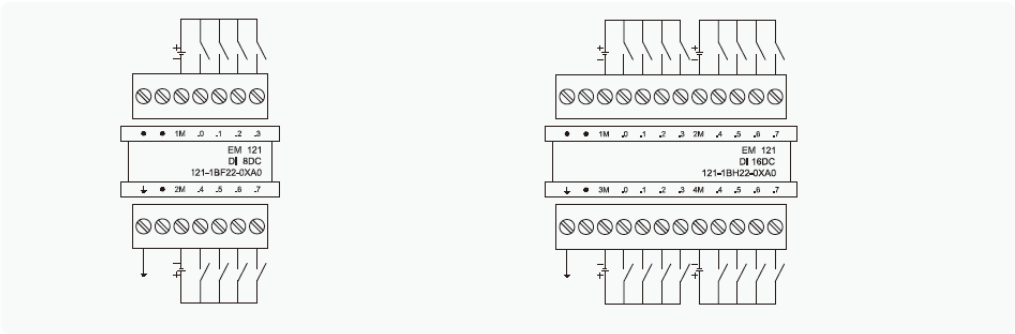
Digital input/output characteristic(s)		
Digital input integrated	14	
Input type	PNP/NPN	
Rated voltage	24V DC,4mA	
Max leakage current	1mA	
Isolation	yes	
Digital output integrated	10 outputs	
Output Type	Solid state -MOSFET	Dry contact
Rated Voltage	24V DC	24VDC or 250VAC
Voltage range	20.4-28.8V DC	5-30VDC 5-250VAC
Max Rated Current very point	0.5A	2A
Mechanic Life span	-	10000000(No load)
Contacts lifetime	-	100000(Rated load)
Parallel connections	yes,when in the same group	No
Environment parameters		
Working temperature	0°C～+60°C	
Transportation temperature	-20°C ~ 80°C	
Environmental relative humility	5~90%	
IP grade	IP20	
Order number	UN 124-2AE23-0XB0	UN 124-2BE23-0XB0

UN 120 Digital Input Module

Technical Specification

Product		EM 121 8 input	EM 121 16 input
Product picture			
Product Introduction		· 8 digital input, 24V DC; · optocoupler isolation with high stability and anti-interference.	· 16 digital input, 24V DC; · optocoupler isolation with high stability and anti-interference.
Bus current consumption		40 mA	85mA
Total power consumption		2 W	3W
Inputs		8	16
Input type		PNP/NPN	
Rated voltage		24V DC 4mA	
Max. continuous permissible voltage		30V DC	
Surge voltage		35V DC, 0.5s	
Logic "0"		0~5V DC	
Logic "1"		15~30V DC	
Max. input delay		4.5 ms	
Optical isolation (field to logic)		500 V AC for 1 minute	
Permissible max.leakage current (Bero)		1 mA	
Cable length	Shielded	500m	
	Unshielded	300m	
Dimension (W*H*D)		46×80×62 mm	71.2x80x62 mm
Order number		UN 121-1BF22-0XA0	UN121-1BH22-0XA0

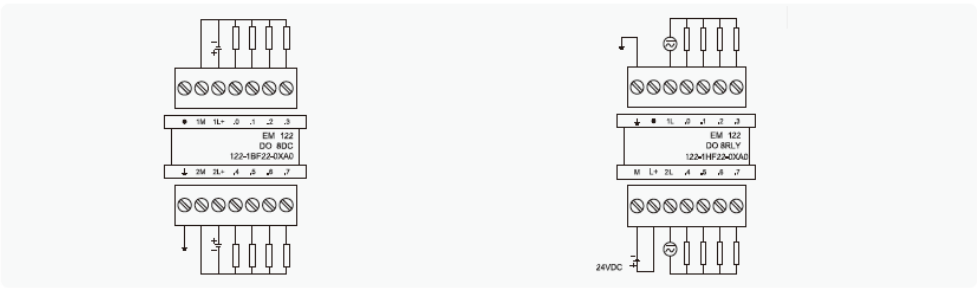
Wiring Diagram



UN 121-1BF22-0XA0 UN121-1BH22-0XA0

Model		EM 122 8 output, transistor	EM 122 8 output, relay
Product picture			
Product Introduction		· 8 digital output, 24V DC; · strong anti-interference performance and high with a stability; · Transistor output, optical isolation.	· 8 digital output, 24V DC/250V AC · It has a strong anti-interference performance and high stability; · Relay output.
Bus current consumption		65 mA	60 mA
Total power consumption		2 W	3W
Digital output data units		8	8
Output type		transistor	relay
Isolation		optocoupler	relay
Rated voltage		24 V DC	24V DC/ 250V AC
Voltage range		20.4~28.8V DC	5~30V DC/ 20~250V AC
Rated current		0.75A	2.0A
Lamp load		5 W	30W DC/200W AC
Cable length	shielded	500m	
	unshielded	150m	
Switching frequency		/	1 Hz
Contacts machine lifetime		/	10,000,000
Contacts machine lifetime (rated load voltage)		/	100,000
Dimension (W*H*D)		46×80×62 mm	46×80×62 mm
Order number		UN 122-1BF22-0XA0	UN 122-1HF22-0XA0

Wiring Diagram



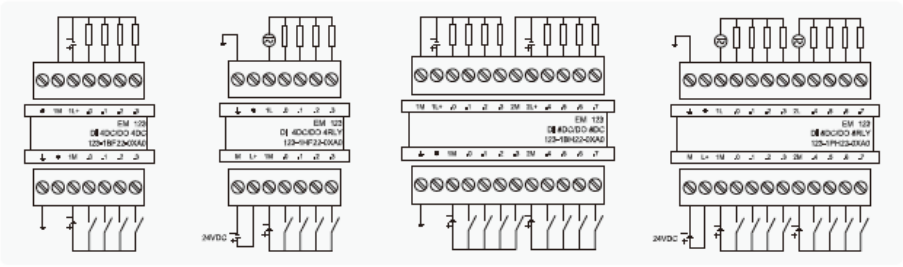
UN 122-1BF22-0XA0 UN 122-1HF22-0XA0

Technical Specification

Model	Em123 4 input/4 output	Em123 4 input/4 output	Em123 8 input/8output	Em123 8 input/8output
Product Picture				
Product Introduction	· 4 digital input/ 4 output, 24V DC; · Transistor output, optocoupler isolation;	· 4 digital input/4 output, 24V DC/250V AC · Relay output, electro-magnetism isolation;	· 8 digital input /8 output, 24V DC; · Transistor output,opto-coupler isolation;	· 8 digital input/ 8 output, 24V DC/250V AC; · Relay output, electrom-agnetism isolation;
	· Strong anti-interferencr performance and high stability.			
Bus current consumption	40mA		80mA	
Total power consumption	2W		3W	
Input characteristics				
Number of digital input	4		8	
Rated voltage	24V DC,4mA			
Logic "0" voltage range	0~5V DC			
Logic "1" voltage range	15~30V DC			
Input delay (max.)	4.5ms			
Signal input type	PNP/NPN			
Optical isolation (field to logic)	500V AC for 1 minute			
Cable length	500m(shielded); 300m(unshielded)			

Output characteristics				
Number of digital output	4	4	8	8
Output type	transistor	relay	transistor	relay
Isolation	optocoupler	relay	optocoupler	relay
Rated voltage	24V DC	24V DC/250V AC	24V DC	24V DC/250V AC
Voltage range	20.4~28.8V DC	5~30V DC/20~250V AC	20.4~28.8V DC	5~30V DC/20~250V AC
Rated current	0.75A	2.0A	0.75A	2.0A
Lamp load	5W	30W DC/200W AC	5W	30W DC/200W AC
Lifetime mechanical cycles(no load)	/	10,000,000	/	10,000,000
Lifetime contacts (rated load)	/	100,000	/	100,000
Cable length	500m (shielded); 150m (unshielded)			
Demension (W*H*D)	46×80×62 mm	46×80×62 mm	71.2×80×62 mm	71.2×80×62 mm
Order number	UN 123-1BF22-0XA0	UN 123-1HF22-0XA0	UN 123-1BH22-0XA0	UN 123-1PH22-0XA0

Wiring Diagram



UN 123-1BF22-0XA0 UN 123-1HF22-0XA0 UN 123-1BH22-0XA0 UN 123-1PH22-0XA0

Technical Specification

Model	EM 131 4 inputs× 12bits	EM 131 8 inputs× 14bits
Product Picture		
Product Introduction	•4 AI, resolution 12bits, 24V DC; •Circuit design support no gain calibration, easy to use; •strong anti-interference performance with a stable state.	•8 AI, resolution 14bits,24V DC; •Circuit design supports no gain calibration,easy to use; •All channels support voltage range and current rang, high flexibility.
From bus current consumption	20 mA	20 mA
From L+current consumption	60 mA	60 mA
Total power consumption	2W	2W
AI port	4	8
Input type	Differencial input	
Voltage input range: unipolarity	0~5V, 0~10V	
Voltage input range: bipolar	±2.5V,±5V	±5V,±10V
Input range: current	0~20mA	0~20mA,±20mA
Resolution	12bits	14bits
Bipolar range	−32,000~+32,000	
Unipolarity range	0~+32,000	
Cable length (unshielded)	300m	
Input Impedance	≥10M Ω voltage input 250 Ω current input	
Isolation (field to logic)	>2000V	no
Aualog to digital conversion time	<250μs	
Common-mode rejection	40dB, DC to 60Hz	
Common-mode voltage	Signal voltage + common-mode voltage≤12V	
Max. input voltage	30V DC	
Max. input current	32mA	
Address range	AIW	
Dimension (W*H*D)	71.2×80×62 mm	
Order number	UN 131-0HC22-0XA0	UN 131-0HF22-0XA0

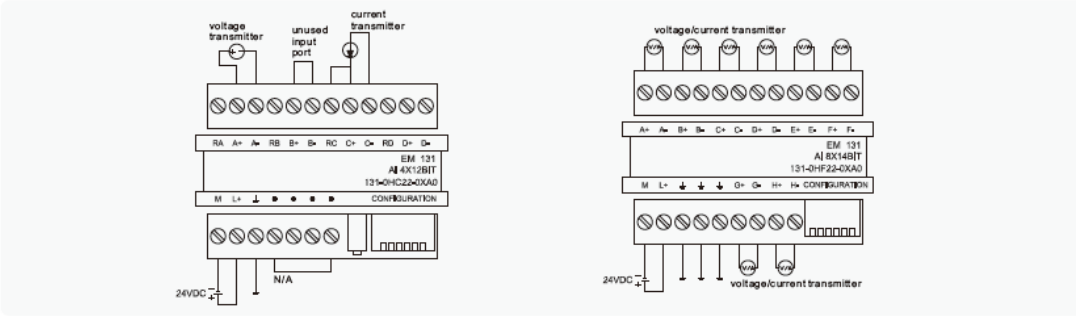
DIP Switch configuration table

Model No. \ Switch	SW 1	SW 2	SW 3	SW 4	SW5	SW 6	Full inputs
UN 131-0HC22-0XA0	ON	OFF	ON			OFF	0 ~ 10V
	ON	ON	OFF			OFF	0 ~ 5V
	ON	ON	OFF			OFF	0 ~ 20mA
	OFF	OFF	ON			OFF	±5V
	OFF	ON	OFF			OFF	±2.5V

Model No. \ Switch	SW 1	SW 2	SW 3	SW 4	SW5	SW 6	Full inputs
UN 131-0HF22-0XA0	OFF	OFF	ON	OFF	OFF	OFF	0 ~ 10V
	OFF	OFF	ON	ON	OFF	OFF	0 ~ 5 V
	ON	ON	ON	ON	ON	OFF	0 ~ 20mA
	OFF	OFF	OFF	OFF	OFF	OFF	±10V
	OFF	OFF	OFF	ON	OFF	OFF	±5V
	ON	ON	OFF	ON	ON	OFF	±20mA

★ Remark: To guarantee the configuration of DIP switch effective, PLC should be repowered.

Wiring Diagram



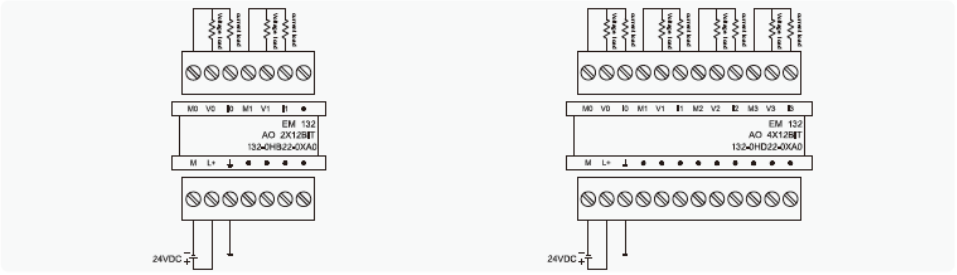
UN 131-0HC22-0XA0 UN 131-0HF22-0XA0

Technical Specification

Model	EM 132 2 output×12bits	EM 132 4 output×12bits
Product Picture		
Product Introduction	•2 AO; •12 bits voltage output, 11 bits resolution current output; •All channels to support voltage outputs and current outputs, which has a high flexibility.	•4 AO; •12 bits voltage output, 11 bits resolution current output; •All channels to support voltage outputs and current outputs, which has a high flexibility

Bus current consumption		20 mA	22 mA
From L+ current consumption		70mA	92mA
Total power consumption		2W	2.5W
Output Feature			
Number of analog output		2	4
Voltage output range		10 ~ +10V	
Current output range		0 ~ 20mA	
Load resistance	For voltage output	Min. 5KΩ	
	For current output	Max. 0.5KΩ	

Model		EM 132 2 output×12bits	EM 132 4 output×12bits
Resolution		12 bits voltage output; 11 bits current output	
Data word format	Voltage output	32,000 ~ + 32,000	
	Current output	0 ~ 32,000	
Basic error		± 0.5% FS	
Dimension (W*H*D)		46×80×62 mm	71.2×80×62 mm
Order Number		UN 132-0HB22-0XA0	UN 132-0HD22-0XA0



UN 132-0HB22-0XA0 UN 132-0HD22-0XA0

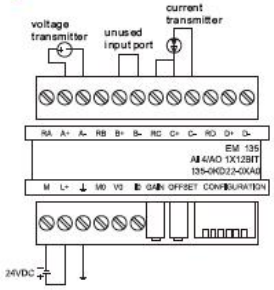
Technical Specification

Model	EM 135 4input/1 output × 12bits
Product Picture	
Product Introduction	• 4 AI; • 1 AO; • Resolution 12 bits voltage output, 11 bits current output.

Input Feature		
Bus current consumption		30mA
From L+ current consumption		60mA
Total power consumption		2W
Number of analog input		4
AI type		Differencial input
Max. Input voltage		30V
Max. Input current		32mA
Voltage input range	Unipolar	0 ~ 50mV, 0 ~ 100mV, 0 ~ 500mV, 0 ~ 1V, 0 ~ 5V, 0 ~ 10V
	Bipolar	±1V, ±2.5V, ±5V, ±10V, ±25mV, ±50mV, ±100mV, ±250mV, ±500mV
Current input range		0 ~ 20mA
Resolution		12 bits
Unipolar, full-scale range		0 ~ 32,000
Bipolar, full-scale range		– 32,000 ~ + 32,000
Analog to digital conversion time		< 250 μs

Output Feature		
Number of analog output		1
Voltage output range		–10 ~ +10V
Current output range		0 ~ 20mA
Maximum drive	Voltage output	Min. 5KΩ
	Current output	Max. 0.5KΩ
Resolution		12 bits voltage output; 11 bits current output
Data word format	Voltage output	32,000 ~ + 32,000
	Current output	0 ~ 32,000
Basic error		± 0.5% of full range
Size (L*W*H)		71.2×80×62 mm
Order number		UN 135-0KD22-0XA0

Wiring Diagram



UN 135-0KD22-0XA0

DIP switches configuring table

Model No. \ Switch	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	Full scale input
UN 135-0KD22-0XA0	ON	OFF	OFF	ON	OFF	ON	0 ~ 50mV
	OFF	ON	OFF	ON	OFF	ON	0~100mV
	ON	OFF	OFF	OFF	ON	ON	0~500mV
	OFF	ON	OFF	OFF	ON	ON	0 ~ 1V
	ON	OFF	OFF	OFF	OFF	ON	0 ~ 5V
	ON	OFF	OFF	OFF	OFF	ON	0 ~ 20mA
	OFF	ON	OFF	OFF	OFF	ON	0 ~ 10V
	ON	OFF	OFF	ON	OFF	OFF	± 25mV
	OFF	ON	OFF	ON	OFF	OFF	± 50mV
	OFF	OFF	ON	ON	OFF	OFF	± 100mV
	ON	OFF	OFF	OFF	ON	OFF	± 250mV
	OFF	ON	OFF	OFF	ON	OFF	± 500mV
	OFF	OFF	ON	OFF	ON	OFF	± 1V
	ON	OFF	OFF	OFF	OFF	OFF	± 2.5V
	OFF	ON	OFF	OFF	OFF	OFF	± 5 V
	OFF	OFF	ON	OFF	OFF	OFF	± 10V

★ Remark:After DIP switches are set up, it will be effective only when the PLC is repowered.

Product Instructions

How to input and calibrate UN 135-0KD22-0XA0: Use a voltage source or a current source to add “0” signal to one input terminal. RegulateOFFSET Potentiometer till its reading is “0”.

Then add a signal of full-scale value to another input terminals, regulating GAIN Potentiometer
till its reading is “32000”.

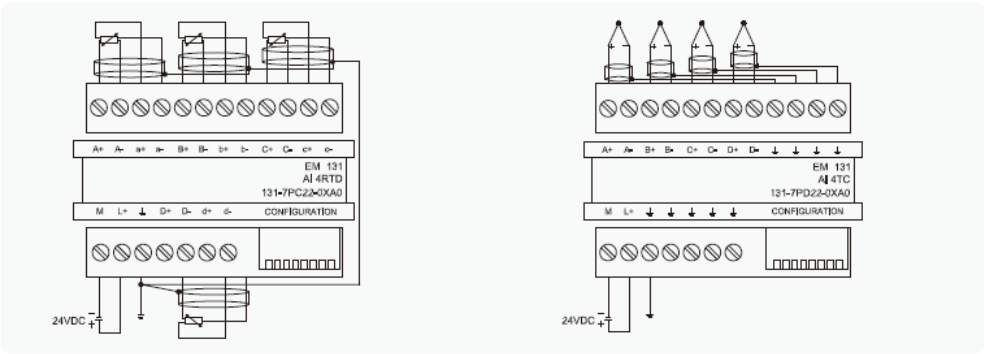
UN 120 TC Modules

Technical Specification

Model	EM 131 4 input, RTD	EM 131 4 input, TC
Product Picture		
Product Introduction	•4 input thermal resistance temperature measurement modules; •Resolution: 16 bits •Optical isolation, stable performance	•4 input thermal couple temperature measurement modules; •Resolution: 16 bits; •Optical isolation, stable performance
Bus current consumption	45mA	87mA
From L+ current consumption	20mA	60mA
Dissipation	1W	1.8W
Number of analog input	4	4
Input type	Module ground referenced RTD	Floating TC
Common mode rejection	> 120dB @ 120VAC	
Wire loop resistance (Max.)	20Ω (Cu10 is 2.7Ω)	100Ω
Module update time	800 ms	290 ms

Model	EM 131 4 input, RTD	EM 131 4 input, TC
Data word format	Resistance: 0 ~ +27648	Resistance: –27648 ~ +27648
Input ranges	Thermal resistance: Pt100, Pt200, Pt500, Pt1000, Pt10000, Ni100, Ni120, Ni1000, Cu10 (9.035) Resistance: 150Ω, 300Ω, 600Ω	Type: E, J, K, N, R, S, T Voltage range: ±80mV
Measurement principle	Sigma→delta	
Resolution	15 bits plus 1 sign	
Address interval	AIW	
Basic error	0.1% FS	
Isolation (field to logic)	> 500V	> 2000V
24VDC supply voltage range	20.4 ~ 28.8V DC	
Dimension (W•H•D)	71.2×80×62 mm	
Order Number	UN 131-7PC22-0XA0	UN 131-7PD22-0XA0

Wiring Diagram



UN 131-7PC22-0XA0 UN 131-7PD22-0XA0

UN 120 RTD temperature measurement modules DIP switches configuring table

Model / Location	UN 131-7PC22-0XA0		
	Options	Setting	
SW1 ~ SW5	Thermal resistance: Pt100, Pt200, Pt500, Pt1000, Pt10000, Ni100, Ni120, Ni1000, Cu10 (9.035) Resistance: 150Ω, 300Ω, 600Ω		
SW 6	Offline detection direction	0: positive (+3276.7)	1: negative (-3276.8)
SW 7	Measurement units options	0: degree centigrade	1: fahrenheit degree
SW 8	Connections method selection	0: line3	1: line2 or line4

UN 120 TC temperature measurement modules DIP switches configuring table

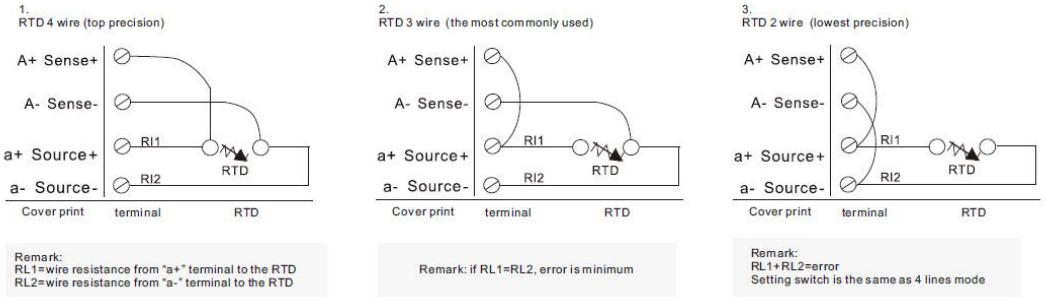
Model / Location	UN 131-7PD22-0XA0		
	Options	Setting	
Sw1 ~ SW3	TC type: J, K, T, E, R, S, N, ±80mV		
SW 4	Hold unused	Hold unused	
SW 5	Open wire detection direction	0: positive (+3276.7)	1: negative (-3276.8)
SW 6	Open wire detect enable	0: enable	1: prohibit
SW 7	Measurement units option	0: degree centigrade	1: fahrenheit degree
SW 8	Cold junction compensation	0: yes	1: no

UN 120 RTD temperature measurement modules model selection and DIP switch configuring table

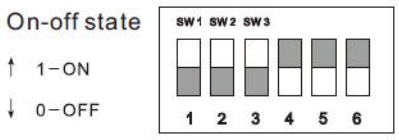
RTD type	SW 1	SW 2	SW 3	SW 4	SW 5	RTD type	SW 1	SW 2	SW 3	SW 4	SW 5
100Ω Pt0.003850 (default)	0	0	0	0	0	100Ω Pt0.003902	1	0	0	0	0
200Ω Pt0.003850	0	0	0	0	1	200Ω Pt0.003902	1	0	0	0	1
500Ω Pt0.003850	0	0	0	1	0	500Ω Pt0.003902	1	0	0	1	0
1000Ω Pt0.003850	0	0	0	1	1	1000Ω Pt0.003902	1	0	0	1	1
100Ω Pt0.003920	0	0	1	0	0	Nc	1	0	1	0	0
200Ω Pt0.003920	0	0	1	0	1	100Ω Ni0.00672	1	0	1	0	1
500Ω Pt0.003920	0	0	1	1	0	120Ω Ni0.00672	1	0	1	1	1
1000Ω Pt0.003920	0	0	1	1	1	1000Ω Ni0.00672	1	0	1	1	1
100 Ω Pt.0.00385055	0	1	0	0	0	100 Ω Ni0.006178	1	1	0	0	0
200Ω Pt0.00385055	0	1	0	0	1	120 Ω Ni0.006178	1	1	0	0	1
500Ω Pt.0.00385055	0	1	0	1	0	1000Ω Ni0.006178	1	1	0	1	0
1000Ω Pt0.00385055	0	1	0	1	1	10000Ω Pt0.003850	1	1	0	1	1
100Ω Pt0.003916	0	1	1	0	0	10Ω Cu0.004270	1	1	1	0	0
200Ω Pt0.003916	0	1	1	0	1	150Ω FS resistance	1	1	1	0	1
500Ω Pt0.003916	0	1	1	1	0	300Ω FS resistance	1	1	1	1	0
1000Ω Pt0.003916	0	1	1	1	1	600Ω FS resistance	1	1	1	1	1

★Remark: When RTD resistance value is corresponding to table, indicating that measuring temperature is 0℃; Cu10 indicates its measuring resistance value when the temperature is 25℃; the resistance value is 9.035Ω when the temperature is 0 ℃.

UN 120 RTD temperature measurement modules wiring diagram



UN 120 4TC type and DIP switch SW1-SW3 corresponding table



TC type	SW1	SW2	SW3
J (default)	0	0	0
K	0	0	1
T	0	1	0
E	0	1	1
R	1	0	0
S	1	0	1
N	1	1	0
+/-80mv	1	1	1

UniMAT General Accessories



PROFIBUS connector

Name	Order Number
90° without programming port	UN 972-0BA12-0XA0
90° with programming port	UN 972-0BB12-0XA0
35° without programming port	UN 972-0BA41-0XA0
35° with programming port	UN 972-0BB41-0XA0

BUS Cables

Name	Order Number
Profibus Cable	UN 830-0EH10

2.6 Motor

We are using a Gear Motors to rotate conveyor belt as main motor. And 3 more Gear Motorsas arms.

Gear motor of 12v DC, 9.2 rpm. 1-3/8" D x 3 -1/4"L gear box. 0.183” square shaft.0.848"D x 0.875"mounting centers and 10lb in torque.

2.7 Photoelectric Sensors

Threaded Cylindrical Photoelectric Sensors with Built-in Amplifier for Use as an Optical Proximity Switch.

• M18 DIN-sized cylindrical housing
• Housing materials: plastic, nickel plated brass and stainless steel
• Axial and radial types (with integrated 90°-optics)
• Enclosure rating IP67
• DC switching types with connectors for easy maintenance
• Full metal plug-in type
• Sensing distance separate types: 7 m, 10 m
• Retroreflective polarizing types: 2 m, 4 m • Background suppression type: 10 cm
• Long detection distance (0.3 m, 1 m) with sensitivity adjuster for diffuse type
• Wide-beam characteristics (10 cm) for diffuse type
• Wide operating voltage range (10 to 30 VDC or 24 to 240 VAC)
• Short-circuit and reverse connection protection (DC switching type)
• UL and CSA approved (AC switching types) • UL listed (DC switching types)



Ordering Information

■ DC-Switching Models

Housing Material: Plastic

Sensing method			Appearance	Connection method	Sensing distance	Model	
						PNP output	NPN output
Through-beam	Multi purpose		axial	pre-wired	7 m	E3F2-7B4	E3F2-7C4
				M12 connector		E3F2-7B4-P1	E3F2-7C4-P1
	- precision detection (*1) - test input			pre-wired	10 m	E3F2-10B4	E3F2-10C4
				M12 connector		E3F2-10B4-P1	E3F2-10C4-P1
Retro-reflective (incl. reflector E39-R1 or E39-R1S)	Non-polarizing (without MSR function)		axial	pre-wired	0.1 - 2 m (*2)	E3F2-R2B4	E3F2-R2C4
				M12 connector		E3F2-R2B4-P1	E3F2-R2C4-P1
	Polarizing (with MSR function)	Fixed sensitivity		pre-wired	0.1 - 4 m (*3)	E3F2-R4B4F	E3F2-R4C4F
				M12 connector		E3F2-R4B4F-P1	E3F2-R4C4F-P1
		Adjustable sensitivity		pre-wired		E3F2-R4B4	E3F2-R4C4
				M12 connector		E3F2-R4B4-P1	E3F2-R4C4-P1
	Polarizing (with MSR function)		radial	pre-wired	0.1 - 2 m (*2)	E3F2-R2RB41	E3F2-R2RC41
				M12 connector		E3F2-R2RB41-P1	E3F2-R2RC41-P1
Diffuse reflective	Fixed sensitivity Wide-beam characteristics		axial	pre-wired	0.1 m	E3F2-DS10B4-N	E3F2-DS10C4-N
				M12 connector		E3F2-DS10B4-P1	E3F2-DS10C4-P1
	Adjustable sensitivity			pre-wired	0.3 m	E3F2-DS30B4	E3F2-DS30C4
				M12 connector		E3F2-DS30B4-P1	E3F2-DS30C4-P1
				pre-wired	1 m	E3F2-D1B4	E3F2-D1C4
				M12 connector		E3F2-D1B4-P1	E3F2-D1C4-P1
	Adjustable sensitivity		radial	pre-wired	0.3 m	E3F2-DS30B41	E3F2-DS30C41
				M12 connector		E3F2-DS30B41-P1	E3F2-DS30C41-P1
Background suppression	Fixed sensing distance		axial	pre-wired	10 cm	E3F2-LS10B4	E3F2-LS10C4
				M12 connector		E3F2-LS10B4-P1	E3F2-LS10C4-P1

■ Housing material: Metal (Nickel plated brass)

Note: Shaded models are normally stocked.

Sensing method			Appearance	Connection method	Sensing distance	Model	
						PNP output	NPN output
Through-beam	Multi purpose		 axial	pre-wired	7 m	E3F2-7B4-M	E3F2-7C4-M
				M12 connector		E3F2-7B4-M1-M	E3F2-7C4-M1-M
	- precision detection - test input			pre-wired	10 m	E3F2-10B4-M	E3F2-10C4-M
				M12 connector		E3F2-10B4-M1-M	E3F2-10C4-M1-M
Retro-reflective (incl. reflector E39-R1)	Polarizing (with MSR function)	Fixed sensitivity	 axial	pre-wired	0.1 - 2 m(*1)	E3F2-R2RB4-M	E3F2-R2RC4-M
				M12 connector		E3F2-R2RB4-M1-M	E3F2-R2RC4-M1-M
				pre-wired	0.1 - 4 m(*2)	E3F2-R4B4F-M	E3F2-R4C4F-M
				M12 connector		E3F2-R4B4F-M1-M	E3F2-R4C4F-M1-M
		Adjustable sensitivity		pre-wired		E3F2-R4B4-M	E3F2-R4C4-M
				M12 connector		E3F2-R4B4-M1-M	E3F2-R4C4-M1-M
	Polarizing (with MSR function)		 radial	pre-wired	0.1 - 2 m(*1)	E3F2-R2RB41-M	E3F2-R2RC41-M
Diffuse reflective	Fixed sensing distance Wide-beam characteristics		 axial	pre-wired	0.1 m	E3F2-DS10B4-M	E3F2-DS10C4-M
				M12 connector		E3F2-DS10B4-M1-M	E3F2-DS10C4-M1-M
	Adjustable sensing distance			pre-wired	0.3 m	E3F2-DS30B4-M	E3F2-DS30C4-M
				M12 connector		E3F2-DS30B4-M1-M	E3F2-DS30C4-M1-M
				pre-wired	1 m	E3F2-D1B4-M	E3F2-D1C4-M
				M12 connector		E3F2-D1B4-M1-M	E3F2-D1C4-M1-M
	Adjustable sensing distance		 radial	pre-wired	0.3 m	E3F2-DS30B41-M	E3F2-DS30C41-M
				M12 connector		E3F2-DS30B41-M1-M	E3F2-DS30C41-M1-M
Background suppression	Fixed sensing distance		 axial	pre-wired	10 cm	E3F2-LS10B4-M	E3F2-LS10C4-M
				M12 connector		E3F2-LS10B4-M1-M	E3F2-LS10C4-M1-M

■ Housing material: Metal (Stainless steel)

Note: Shaded models are normally stocked.

Sensing method		Appearance	Connection method	Sensing distance	Model	
					PNP output	NPN output
Through-beam		 axial	pre-wired	7 m	E3F2-7B4-S	E3F2-7C4-S
			M12 connector		E3F2-7B4-M1-S	E3F2-7C4-M1-S
Retro-reflective (incl. reflector E39-R1)	Polarizing (with MSR function)	 axial	pre-wired	0.1 - 2 m (with reflector E39-R1)	E3F2-R2RB4-S	E3F2-R2RC4-S
			M12 connector		E3F2-R2RB4-M1-S	E3F2-R2RC4-M1-S
Diffuse reflective	Fixed sensitivity Wide-beam characteristics	 axial	pre-wired	0.1 m	E3F2-DS10B4-S	E3F2-DS10C4-S
			M12 connector		E3F2-DS10B4-M1-S	E3F2-DS10C4-M1-S
	Adjustable sensitivity		pre-wired	0.3 m	E3F2-DS30B4-S	E3F2-DS30C4-S
			M12 connector		E3F2-DS30B4-M1-S	E3F2-DS30C4-M1-S

■ AC-Switching Models

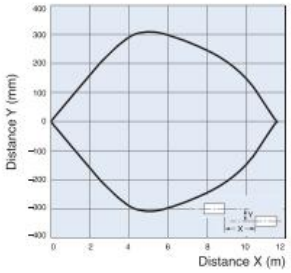
Housing material: Plastic

Note: Shaded models are normally stocked.

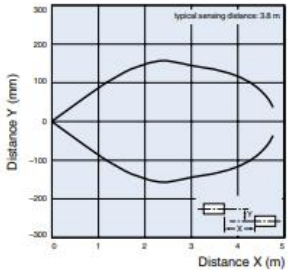
Sensing method		Appearance	Connection method	Sensing distance	Model	
					Light-ON	Dark-ON
Through-beam		 axial	pre-wired	3 m	**E3F2-3Z1**	**E3F2-3Z2**
Retro-reflective (incl. reflector E39-R1)	Non-polarizing (without MSR function)	 axial	pre-wired	0.1 - 2 m (with reflector E39-R1)	**E3F2-R2Z1**	**E3F2-R2Z2**
Diffuse reflective	Fixed sensing distance Wide-beam characteristics	 axial	pre-wired	0.1 m	**E3F2-DS10Z1-N**	**E3F2-DS10Z2-N**

■ Operating Range (typical)

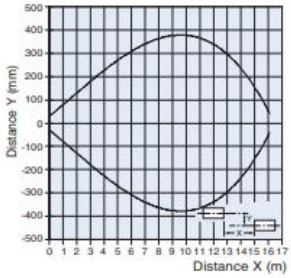
Through-beam Models (axial)
E3F2-7□4-□



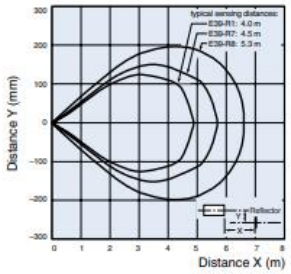
Through-beam Models (axial)
E3F2-3Z□



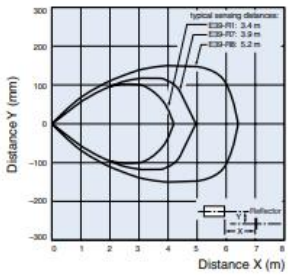
Through-beam Models (axial)
E3F2-10□



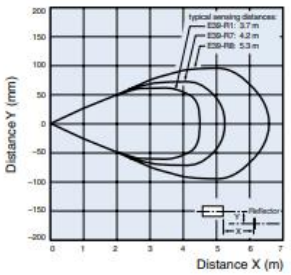
Retroreflective Models (axial)
E3F2-R2□4-□ (non polarizing)
and reflectors



Retroreflective Models (axial)
E3F2-R2Z□ (non polarizing)
and reflectors



Retroreflective Models (axial)
E3F2-R2R□4-□ (polarizing)
and reflectors

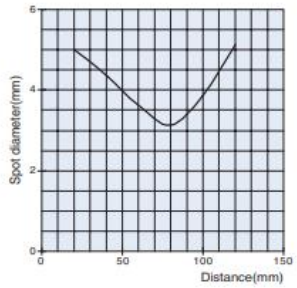


Retro-reflective Models (axial)
E3F2-R4□4□-□ (polarizing)

Retroreflective Models (radial)
E3F2-R2R□41-□ (polarizing)
and reflectors

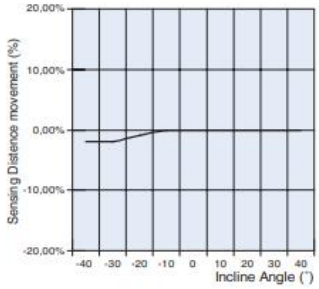
■ Light spot vs. sensing distance

Background suppression Models
E3F2-LS□



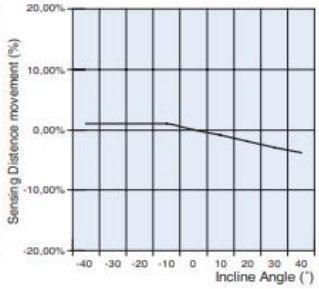
■ Incline (left and right)

Background suppression Models
E3F2-LS□



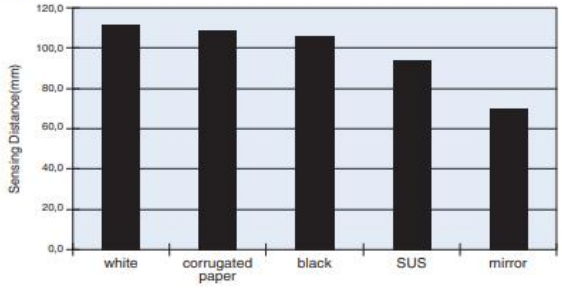
■ Incline (up and down)

Background suppression Models
E3F2-LS□



■ Object material vs. sensing distance

Background suppression Models
E3F2-LS□



2.8 Relay

1. MAIN FEATURES

* Switching capacity available by 10A in spite of small size design for highdensity P.C. board mounting technique.

*UL,CUL,TUV recognized.

*Selection of plastic material for high temperature and better chemical solution performance. *Sealed types available.

*Simple relay magnetic circuit to meet low cost of mass production.



2. APPLICATIONS

Domestic appliance, office machine, audio, equipment, automobile, etc. (Remote control TV receiver, monitor display, audio equipment high rushing current use application.)

COIL DATA CHART (AT20 C)

Coil Sensitivity	Coil Voltage Code	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance (Ω) ☐ 10%	Power Consumption (W)	Pull-In Voltage (VDC)	Drop-Out Voltage (VDC)	Max-Allowable Voltage (VDC)
SRD (High Sensitivity)	03	03	120	25	abt. 0.36W	75%Max.	10% Min.	120%
	05	05	71.4	70				
	06	06	60	100				
	09	09	40	225				
	12	12	30	400				
	24	24	15	1600				
	48	48	7.5	6400				
SRD (Standard)	03	03	150	20	abt. 0.45W	75% Max.	10% Min.	110%
	05	05	89.3	55				
	06	06	75	80				
	09	09	50	180				
	12	12	37.5	320				
	24	24	18.7	1280				
	48	48	10	4500	abt. 0.51W			

2.9 Fuse

RT18-32

Low voltage AC fuse

RT18-32

Low voltage AC fuse

Application

This series fuse is mainly used for protecting the electrical circuit against overload and short-circuits(gG/gL). Because of different melting tablets, it also may derive for protecting the semiconductor device and others complete set installment from short-circuit (aR/gR/gs/gtr) as well as the electric motor from short-circuit (aM).



Structural Characteristics

- ☐ According to IEC60269-6
- ☐ Rated current: 1-32A
- ☐ Rated voltage: AC 380V/500V
- ☐ Cylindrical fuse



Specification

Pole	1P,2P,3P
Rated Voltage Ue (V AC)	380V/500V
Rated Current In (A)	1, 2, 3, 4, 5, 6, 8, 10, 12,16, 20, 25, 32
Biggest Block Ability(KA)	100



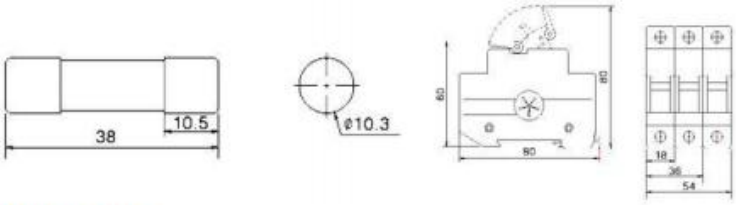
Connection and Installation

Working Temperature(℃)	-5~+40
Resistance And Damp Hot	Class 2
Altitude(m)	≤ 2000
Relative Humidity	≤ 95%
Protection Class/Degree	IP20
Pollution	3
Installation Environment	No obvious shock and vibration
Installation Class/Type	Class III/DIN rail

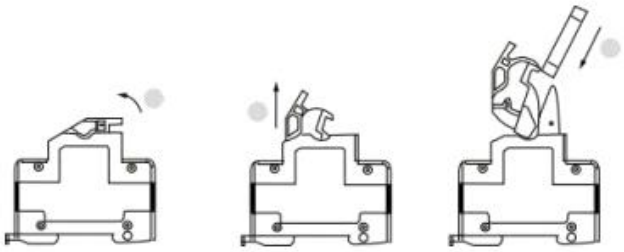
Size(mm)

W*H*L	18x60x80
Fuse Size	10x38

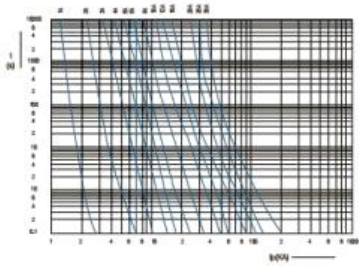
Dimensions(mm)



Installation



Characteristic Curve



2.10 Limit Switch

Miniature Micro switch With Lever

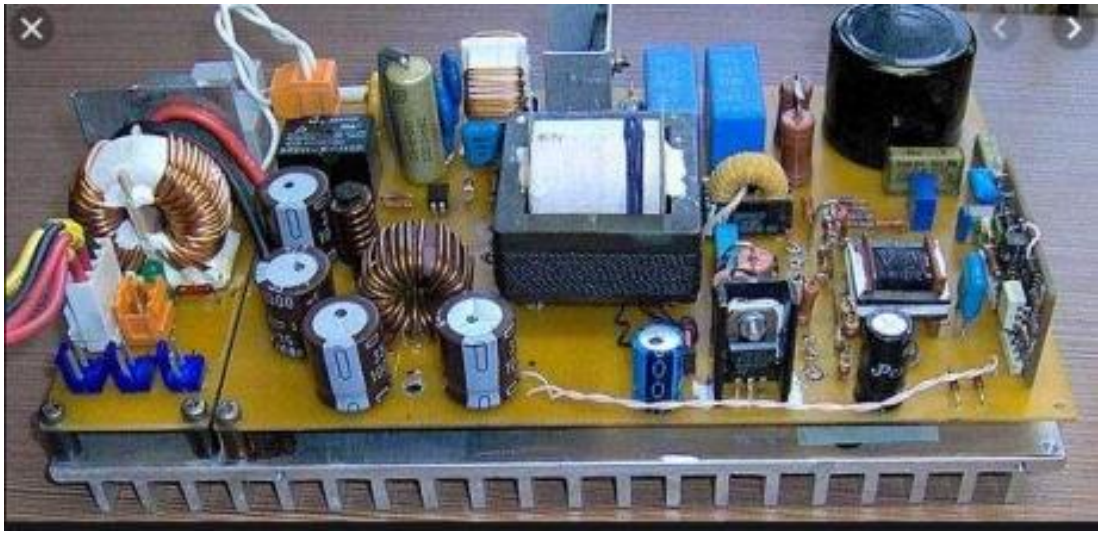
This micro switch lever has a little bending angle, more reliable to press
the button to actuate the switch. Many kinds micro switch levers, the choice is
up to you. UL, CE, VDE etc. certifications are ready. For mechanical function, our switch is very reliable and durable with quality raw materials and mature process.

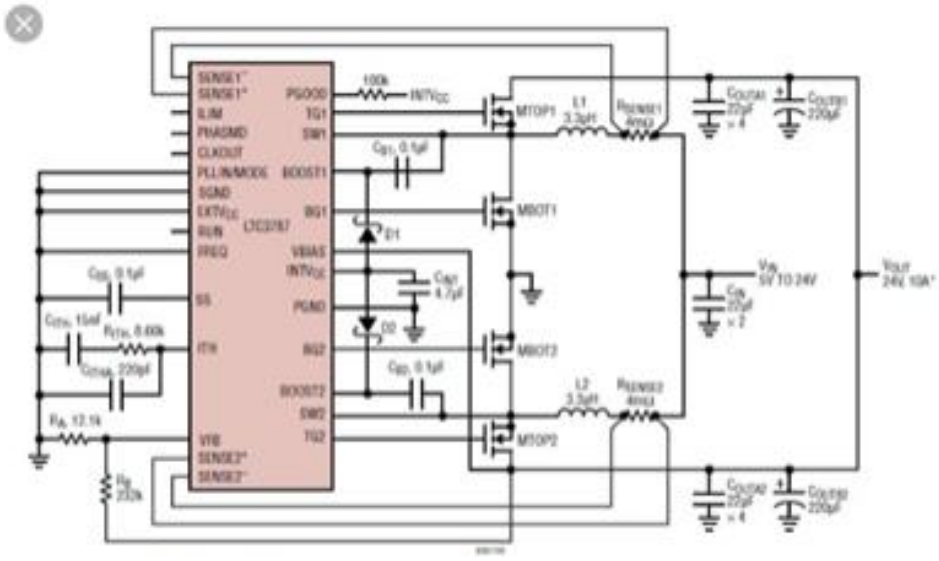
2.11 Power supply

We have used a 24V 10 A power supply for ontrolling.

And a 12V 20A power supply for 3 motors for arms**.**

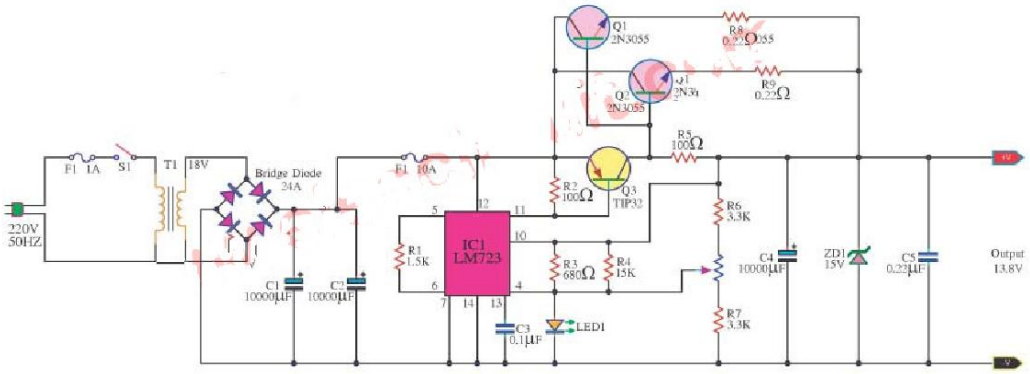
24v 10A power supply





12v 20A power supply

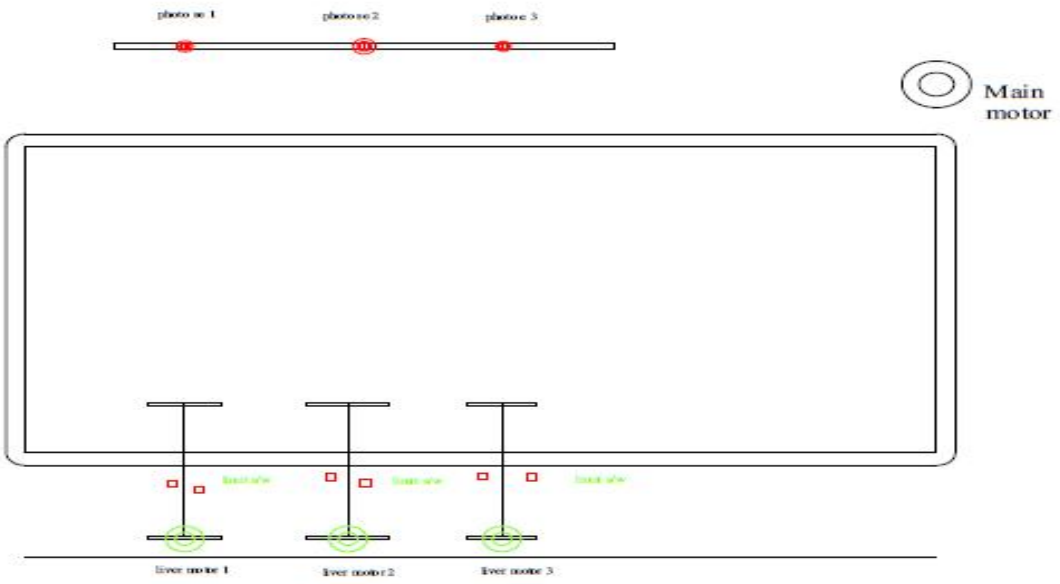



Q1
2N3055
R8
0.22Ω/5W
Q2
2N3055
R9
0.22Ω
R5
100Ω
F1 1A
S1
T1
18V
Bridge Diode
2A
F2 10A
220V
50HZ
R2
100Ω
Q3
TIP32
R6
3.3K
IC1
LM723
R1
1.5K
R3
680Ω
R4
15K
C4
10000µF
ZD1
15V
C5
0.22µF
Output
13.8V
C1
10000µF
C2
10000µF
C3
0.1µF
LED1
R7
3.3K

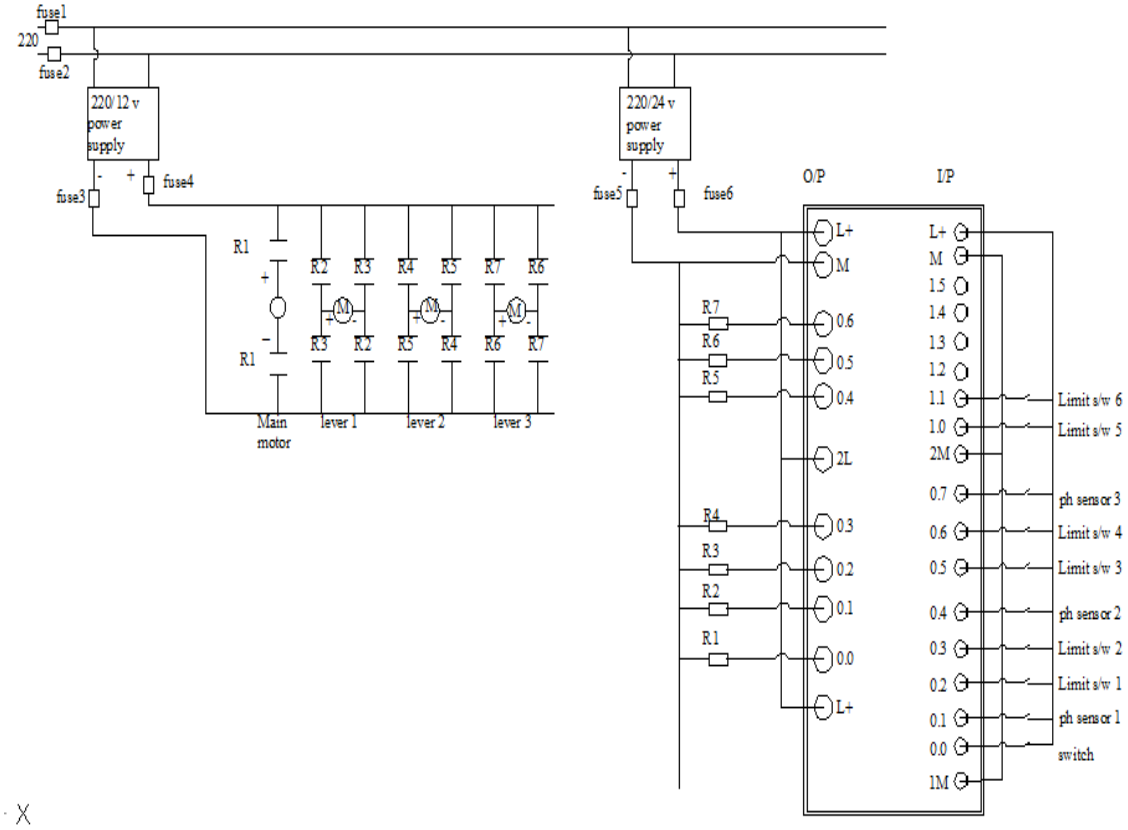
CHAPTER III

DESIGN AND FABRICATION

3.1 Block Diagram of the Project



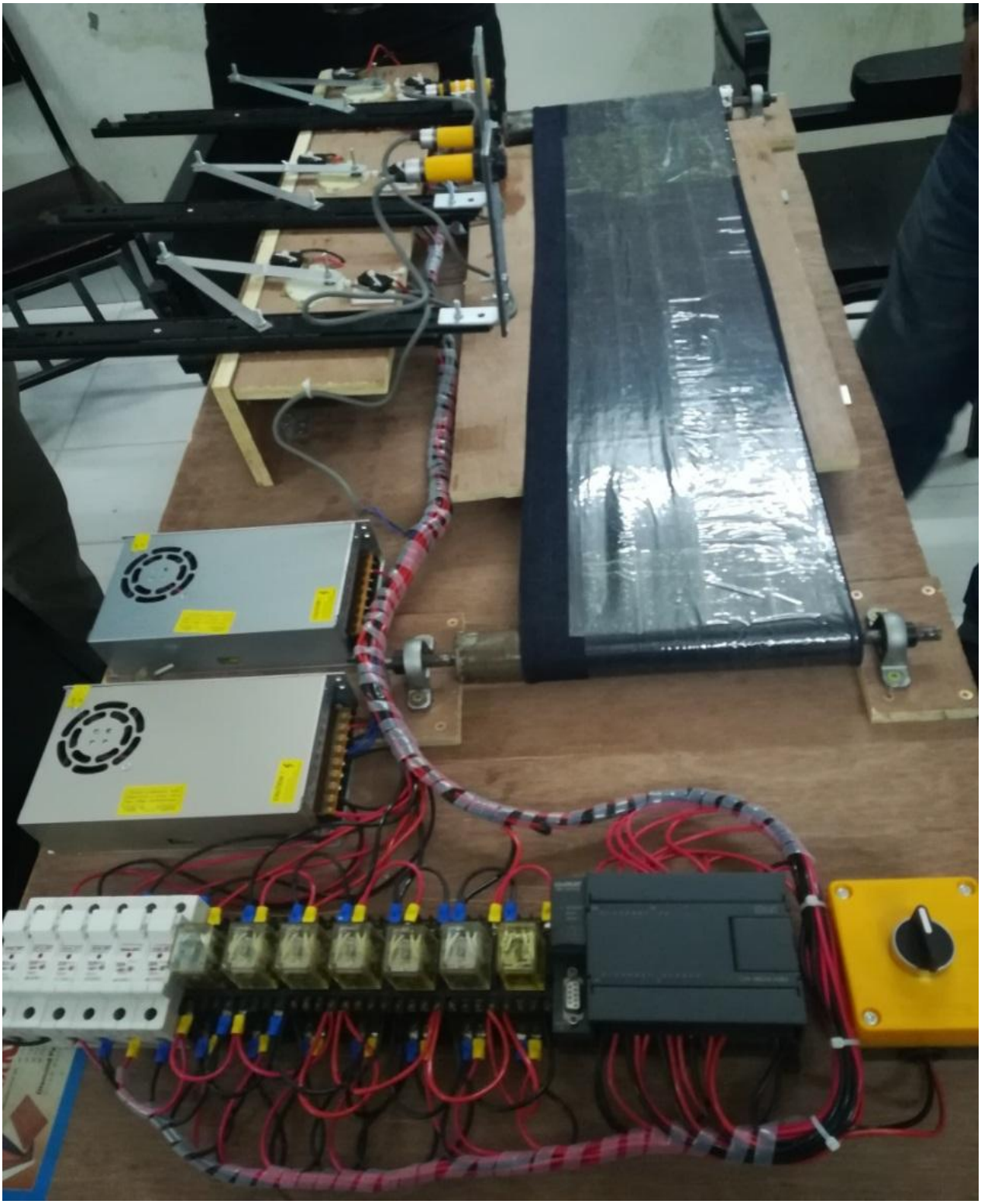
3.2 circuit Diagram



3.3 Working Principle:

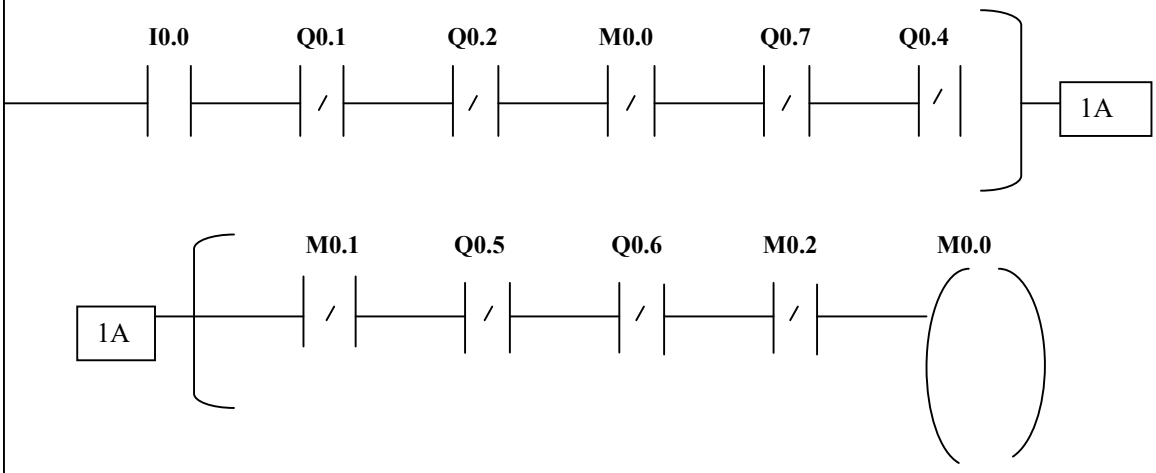
It can be easily separated by product . The sensor is set up at three levels here for separated product . The sensor will send signals to the PLC, depending on the size of the product . Based on the sensor signal, the PLC will instruct the motor to operate . The motor will be set to operate at a distance between the sensor and the delivery handle . Alternatively, the sensor can be used with the delivery handle . When the product comes in front of the handle from the size sensor, the handler sensor separates the product.

3.4 Project Image



3.5 Program:

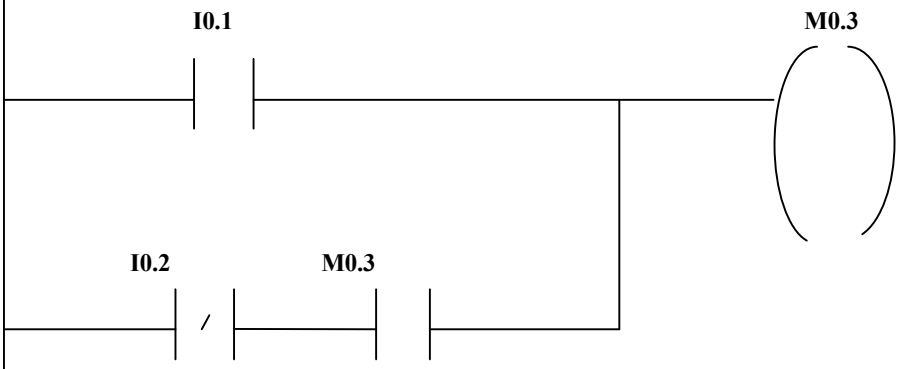
Network 1



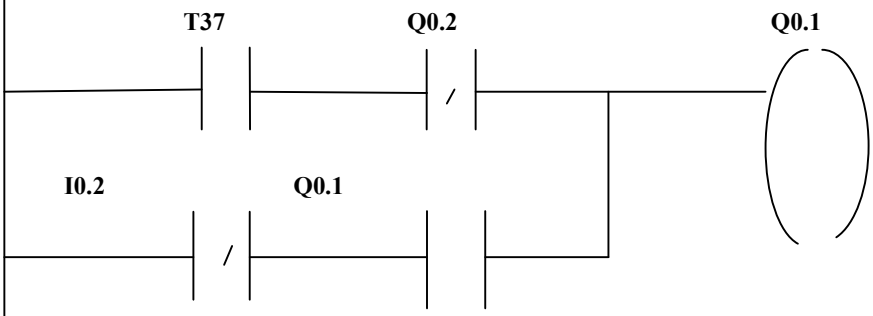
Network 2



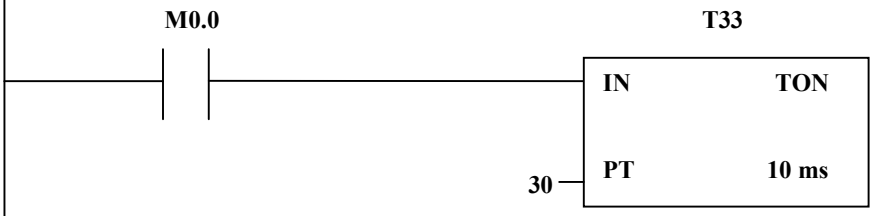
Network 3



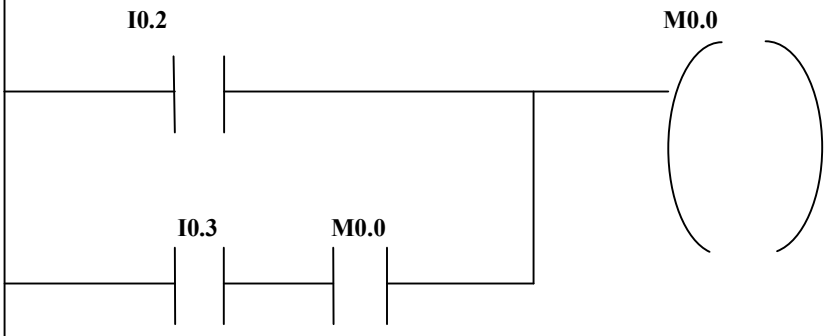
Network 4



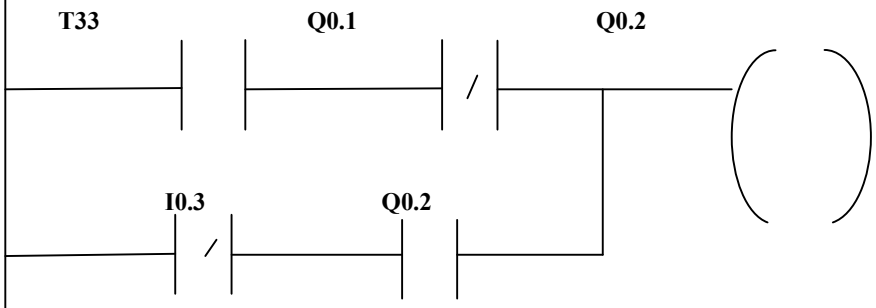
Network 5



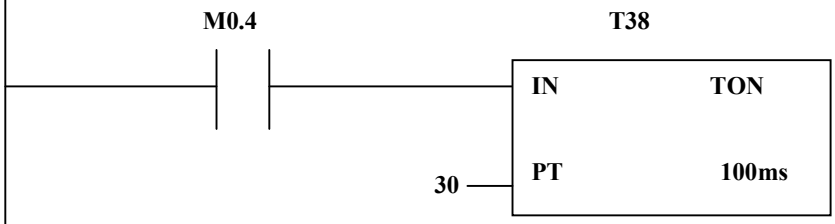
Network 6



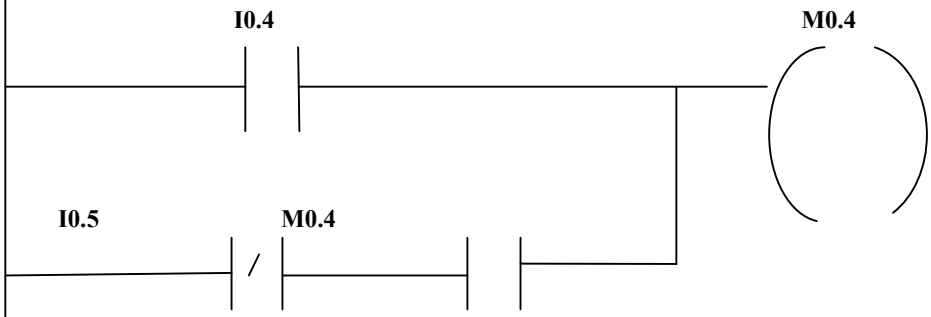
Network 7



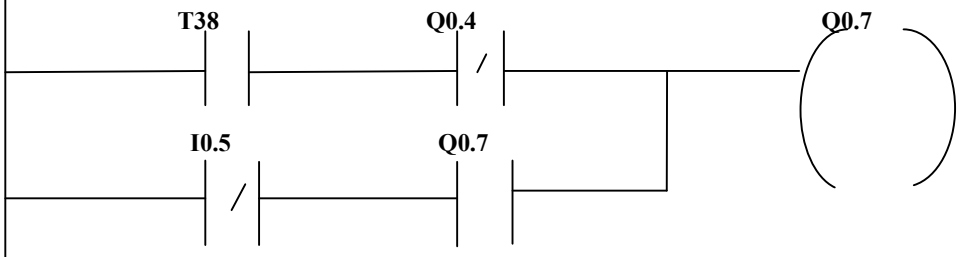
Network 8



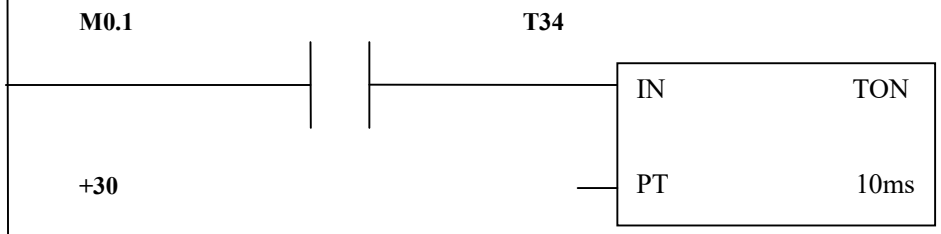
Network 9



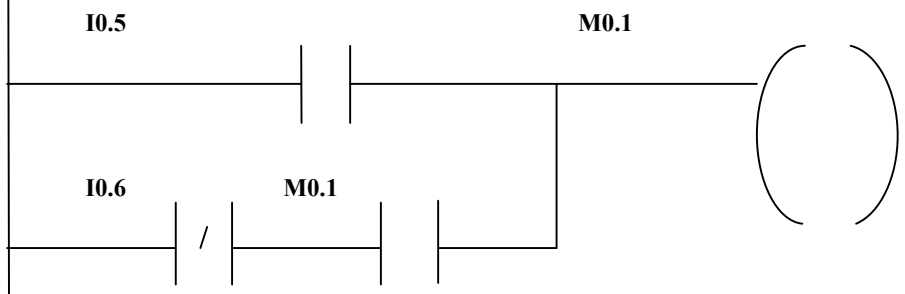
Network 10



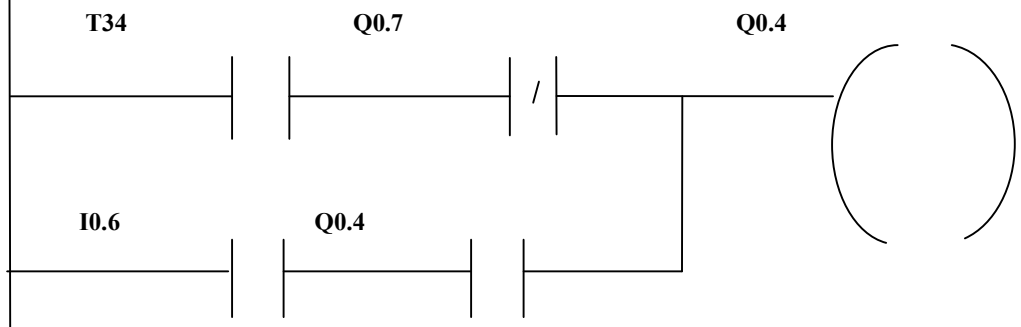
Network 11



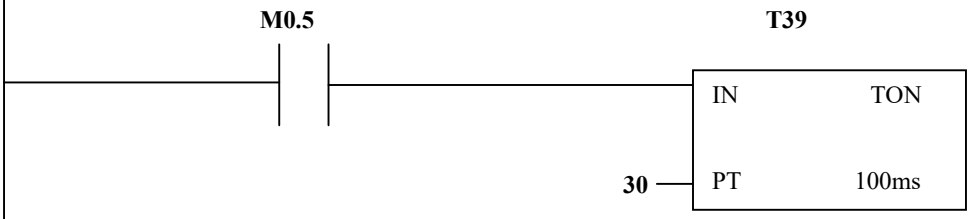
Network 12



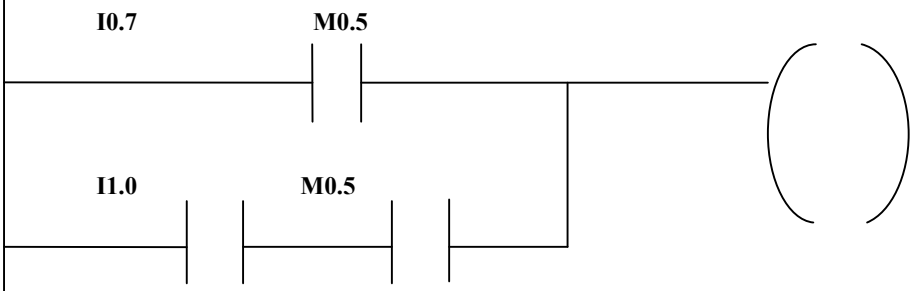
Network 13



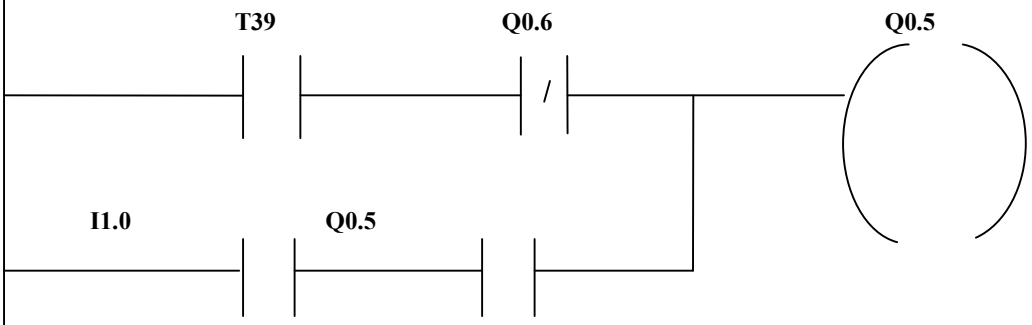
Network 14



Network 15



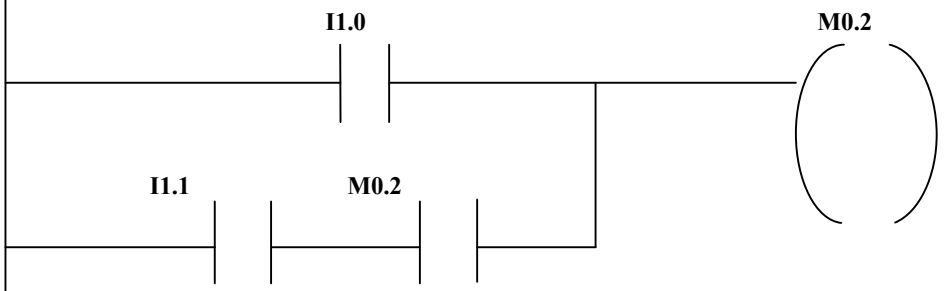
Network 16



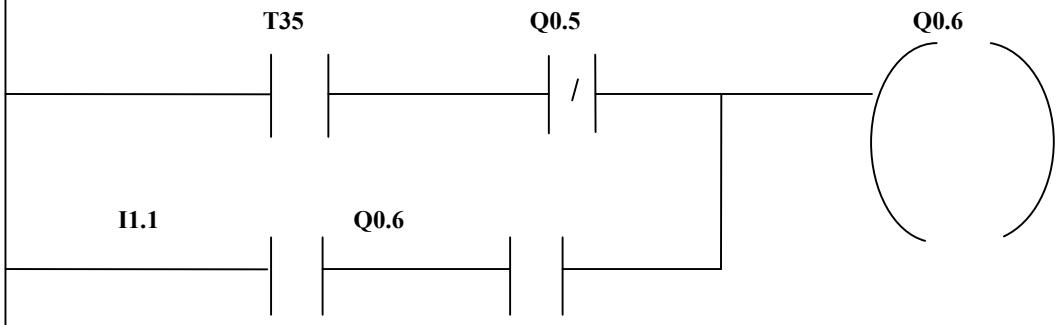
Network 17



Network 18



Network 19



CHAPTER IV

RESULT & DISCUSSION

4.1 Result:

- Due to increase in population, demand of every product has been increased and its availability becomes more crucial than ever before. In developing countries, our suggested solution might be suitable one.
- So, use of conveyor belt in packaging production, is essential to save time and energy and increase production in industry.

4.2 Discussion

By implementing above systems there are various benefits.

- By continuously monitoring the status of load, we can control the selection of power sources.
- Conservation of labor: Since the systems are automatic, they do not require continuous monitoring by labor.
- The design is low cost, small size, robust and highly versatile.
- This system use microcontroller which make it more convenient than conventional system.
- The main advantage is that the system's action can be changed according to the situation (high/Low power consumption of load).

CHAPTER V

CONCLUSION

Conclusion

The main objective of this project was to give a correct idea about automated PLC based conveyor system and possibility of a time saving device. To successfully build it and finally become able to create a sensor based PLC automated conveyor belt which can sense package size and deliver them according to size in their separate booth. This system is organized , well maintained and time saving .Which helps increase the packaging quantity and production in manufacturing industry .

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