IRMANTECH

SEPAHAN

Technical Engineering Company

> Website: Pinion.ir

Designing

Manufacturing

Trading

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If no one else can do it, "WE CAN"

INTRODUCTION:

We create the innovative technologies. While no one knows what's going to change our country next, we're probably already working on it.

IRMANTECH is a science-based company consists of some experienced experts in fields of designing, analysis and manufacturing industrial parts and equipment.

This company, with utilizing engineers graduated from the best universities in Iran, could pass a difficult way of growing and development for helping industries and engineers and also advancing science in the country.

In this regard, researchers, engineers and university faculties in IRMANTECH are trying that their resultant attempts leading to achieve their goals.

WHAT IRMANTECH DO:

According to the Irmantech expertise and experiences, there are two groups of manufacturing in following fields:

- 1- Automation (linear motions), control and electronics
- 2- Mechanics (Composite and Metals); designing, analysis and manufacturing

Irmantech with considering the new management ways and using managing software such as; MSP Server and SharePoint, is successful in controlling and executing large-scale projects.

In the following, details of Irmantech activities on that two fields are explained:

- 1- Automation (linear motions), control and electronics
 - Designing and manufacturing powder filling and weighing (precision) machine.
 - Modeling and Controlling 3 degrees of freedom RRP robot.
 - Simple and rotary Data loggers with a software for displaying online data (USB Loggers, Bluetooth (BLE) Loggers, Web-based logger, Wireless Sensors)
 - Manufacturing portable piezoelectric Vibrometer (vibration analyzer), with customized parameters for using in all industries and a software for analyzing displaying online data
 - Designing and Manufacturing 3 axis motion simulator
 - Designing and manufacturing Laboratory equipment (request of international "IranLabExpo Laboratory Equipment" Exhibition):
 - Spin Coater (Nano technology)

- Dip Coater (Nano technology)
- Nano Powder Production Equipment by Ultrasonic (Nano technology)
- Syringe Pump (An infusion pump for medication, Nano technology, and a sol-gel process)
- Peristaltic Pumps

2- Mechanics (Composite and Metals); designing, analysis and manufacturing

- Manufacturing of Linear and rotary actuators, high accuracy, controllable, high performance, high Reliability and for using in bad environmental conditions
- Overhauling, Starting up, redesign and manufacturing industrial composting machine (dimensions: 4*5*3 meter) for using in Recycling industry
- Designing and manufacturing high rotation (60,000 rpm) tester
- Reverse Engineering of Uniball bearing
- Designing and Manufacturing 2000°C Vacuum Furnace with Graphite heater.
- Composite Material;
 - Design, Analysis, and Producing Composite blade for commercial helicopters
 - ✓ Fatigue analysis of composite blade
 - Design and manufacturing of Composite Dome for Mosque and some special buildings

CERTIFICATES AND AWARDS

- Having certificate and Confirmation of conformity from Civil Aviation
- Presence in Isfahan science and technology town, and Science-based
 Companies
- Member of Iran Composite Committee
- Technical Engineering License of Ministry of industry, mine, and trade

IN THE FOLLOWING WE INTRODUCE SOME IRMANTECH COMMERCIAL PRODUCTS:

PORTABLE VIBRATION METER

The Iramntech Vibrometer is an all solid state, battery powered. Hand-held vibration meter featuring a large digital panel meter. It converts the vibr2ation signal from a piezoelectric sensor to the peak value of the vibration signals generated by these type sensors.

Units are powered by lithium polymer battery-900 mAh. This unit powers the IEPE accelerometer (10 or 100 mV/g sensitivity) with 2 to 10 mA of current at +18 to 30 VDC compliance. The signal from the accelerometer is fed to a low–current operational amplifier gain stage which selects the gains necessary to use a 10 or 100 mV/g accelerometer.



Unit specification:

1	Dimensions	204*200*40 mm
2	Monitor feature	LCD 2/8 inch, 16 million color
3	Temperature range	5°C to 50°C
4	Weight	350 gr with battery
5	Battery type	lithium polymer battery-900 mAh
6	Connection type	BNC Plug

Technical Features:

1	Number of Input channels	3 channels or less
2	Number of probes	3 or less
3	Data logger Sampling Rate	500 sample/sec
4	Online Sampling Rate	2k sample/sec
5	Memory Card	SD memory card; 1G to 16GB size
6	Data Hold	Freeze the displayed reading
7	device measuring parameters	Acceleration, Velocity, Displacement
8	Frequency range	1 to 2,000 HZ
9	(FFT)window type	Hanning-flat top-uniform
10	(FFT)FFT resolution	Line 512
11	Data processing	Time wave analysis, FFT analysis, Vibrometer
		analysis
12	Sampling Time	2 second
13	Measurement range	Acceleration: 0.025 to 20 g Peak
		Velocity: 0.01 to 39.01 mm/s Peak
		Displacement: 0.001 to 12420µm
14	Power	12VDC-300mA

3 AXIS MOTION SIMULATOR

3-axis motion simulator is a unit that can be configured for testing and calibrating gyroscope or rotor wing (helicopter) or fixed wing or a combination of both.

This unit can simulated rotary motions around coordinate axis.

The base unit consists of the frame unit with 3 actuators to control pitch, roll, and yaw. It includes a master computer to control the motions.



Unit specification

			Roll (Inner Axis)	Pitch (Middle Axis)	Yaw (outer Axis)
1	1 Angular freedom		Continuous	Continuous	Continuous
2	Accuracy	mechanical Backlash	4 arc min	4 arc min	9 arc min
	Accuracy	Encoder resolation	4096 cpr (absolute)	4096 cpr (absolute)	-
3	Range (simu	ltaneous)	±100 deg/sec	±100 deg/sec	±360 deg/sec
4	Acceleration		2000 deg/sec2	500 deg/sec2	250 deg/sec2
5	Actuator		Servomotor & Gearbox	Servomotor & Gearbox	Servomotor & Gearbox

LINEAR ELECTROMECHANICAL ACTUATOR

A linear actuator is a device that moves between two points in a linear motion. Linear actuators are available based on a variety of technologies including: Mechanical, Electro-Mechanical, Direct Electric, and Hydraulic & Pneumatic.

Electro-Mechanical Linear actuators are also known as Electric Linear Actuators due to the primary drive being an electric motor.

Electric Linear Actuators convert the rotary motion of the electric motor to linear motion by means of two main components a gearbox (rotary motion) and a lead screw or ball screw (linear motion).



The electric motors rotation drives the pinion of the gearbox, which through single or multiple gear stages turns the gearboxes output shaft. This rotates in unison with the lead screw. When the lead screw rotates the lead nut that mates with the lead screw translates along the screw and so converts rotary motion to linear motion.

The Electric Linear Actuators are suitable for low to high duty applications in most industry sectors and offer a better solution than hydraulic and pneumatic actuators in most cases.

1	Input Voltage	12 or 24 or 24 volt DC
2	Power	Customize
3	Max stroke length	50 mm to 1000 mm
4	Max Dynamic Load	1 to 800 kg
5		
6	Max Operating Speed in Max Load	1 to 50 mm/s
7		
8	Screw / Nut type	Ball screw or lead screw
9	Operating Temperature	-40°C to +85°C
10	backlash	0.15 mm or less

Unit Specification:

SYRINGE PUMP

A syringe pump is a small, positive-displacement pump used to gradually transfer precise volumes of fluid. Irmantech syringe pumps are all driven via a stepper motor. A lead screw, threaded through a pusher block, precisely turns the pump's stepper motor. This causes the pusher block to move.

The fluid ejects at an accurate and precise rate during infusion mode, when the pusher block pushes against the plunger of a secured syringe.



There are two types of syringe pumps:

- Medical Infusion Pump: are devices used to deliver controlled quantities of fluids such as nutrients, drugs, and blood to patients. They can be used for in vivo diagnosis, treatment, and research. Medical pumps should be sufficiently safe to prevent injury or even death from air bubbles and other hazards. Only highly competent medical staff should operate or supervise their use.
- **Research Syringe Pump:** are devices used in research laboratories for applications that require very small fluid deliveries. Research pumps typically handle smaller volumes and offer additional features that benefit research yet are impractical for in vivo use.

1	Syringe Size	10 , 20 , 30 , 50 ml
2	The number of syringe	Optional
3	Injection rate	Min : 0.01 ml/ min (0.6 ml/h)
		Max : 50 ml/ min (300ml/h)
4	Speed flow rate	50 ml/min (300 ml/h)
5	Accuracy	± 2%
6	Injection mode	Time mode and Speed mode
7	(Device Dimensions (L x W x H	270 × 130 × 100 (mm)
8	Display monitor Dimensions	LCD , 1.8"
9	Computer connectivity – USB Ports	Optional
10	Drive Motor	Stepper Motor
11	Power Supply	DC 12V , 2A
12	Maximum Power Consumption	10 watt
13	Syringe Holder	Aluminum
14	Weight	Approx. 3 kg

Technical Specifications

SPIN COATER

Applying uniform thin films to flat substrates can be achieved by spin coating procedure. An excess amount of a solution is applied to a substrate (manually: using a syringe). The substrate is then rotated at high speed (e.g. up to 12.000 rpm) in order to spread the fluid by centrifugal force. A machine used for spin coating is called a spin coater.

Spin coating is widely used in the semiconductor industry, as one of the applications of thin films, creating thin films with thicknesses below 10 nm of even high quality thickness. It is used intensively in photolithography, to deposit layers of photoresist about 1 micrometer thick. Photoresist is typically spun at 1000 to 4000 revolutions per minute for 30 to 60 seconds.



The Irmantech Spin Coater doesn't have vacuum pump for keeping substrates on rotation part. By means of removing vacuum pump the cost of unit and maintenance significantly reduced.

1	Rotation speed of the disk	500-12000rpm
2	Rotation direction	CW
3	Disc dimensions	Circle with 13 cm diameter
4	Substrate size	2×2 ,4×4, 6×6 ,8×8 cm2
5	Number Of Program In Memory	20
6	Number Of Ramp In a program	5
7	Possibility to Connecting With Infusion	Ves
	Pump	yes
8	Possibility to Inject Inert Gas	yes
9	Acceleration Rate	Optional
10	Vacuum Pressure	Depended to speed (max : 43 kpas)
11	Coating time	to 999 second
12	Speed control accuracy	±2%
13	lcd display size	2.8"
14	Unit Dimensions (L x W x H)	41 ×30 ×47 cm
15	Weight	30 Kg
16	Power supply	220V, 50 Hz
17	Maximum Power Consumption	100 Watt

Technical Specifications:

INDUSTRIAL COMPOSTING MACHINE (COMPOST TURNER- HYDRAULIC CRAWLER TYPE)

The Irmantech Compost turner is a self-propelled turning machine for composting waste. The design is particularly obvious in the attention to user needs.

For example, its ergonomic cabin offers 360 degrees of visibility and is easily accessible without climbing any ladders: you enter directly from the ground through the front windshield, which also serves as a frameless door. For transport, the machine folds into a compact form that easily fits on a flatbed trailer and does not require a special permit.

The Irmantech Compost turner achieves a significantly higher compost quality than the traditional flat rick composting method.



Features:

- High performance diesel engine
- Simple handling and optimum ergonomics
- Compact transport dimensions
- Low ground pressure for gentle turning

General specification:

- Controlling machine by a Joystick and HMI Monitoring
- Possibility to equip machine with remote control
- Customized language monitoring
- Warning system
- Equip with air conditioning system
- Temperature control of Hydraulic, Gearbox and engine water systems
- Hydraulic System Pressure control
- Equip with wheels drive control
- After sale service guarantee and minuteness

Technical Specifications

Power supply system	Full Hydraulic	
Approximately weight	17000 (Kg)	
Machine speed	0-65 (rpm)	
Power Transmission system	Hydraulic gearbox	
Drum Dimonsions	Length: 4400 mm	
Drum Dimensions	Diameter: 1200 mm	
Turner Dimension during performance		
Height of input tupped	2200	
neight of hiput turner	2200 mm	
Width of input tunnel	4440 mm	
Width of input tunnel Length	4440 mm 4000 mm	
Width of input tunnel Length Unit height	4440 mm 4000 mm 4500 mm	

DIP COATER

The dip coating technique is a simple method for creating various coatings in fields such as biomaterials, electronics or sensors. Some of the benefits include:

- Dipping process can be fully automated.
- Use of substrates of various sizes, shapes and materials.
- Use of several different liquids in a single coating sequence.
- Coating quality and thickness can be adjusted with measurement parameters.

The vertical moving system of the Irmantech Dip Coater allows the fabrication of diverse types of homogeneous films. The immersion and dipping-out speed rates range from a minimum of 50 microns per minute to a maximum speed of 150 millimeters per minute. This broad

range of

programmable dipping rates combined with such high precision enables the fabrication of very thin films by wet deposition, sol-gel processing or self-assembled monolayers.

Usually Dip Coating process is used in university researches. Chemical and Nono engineers are applied on research projects for checking ways of fabrication thin films.

Irmantech Dip Coater has made in two types: Simple and Multi. The Multi type in addition to simple dip coater features, has possibility to drying, increasing dip coating levels to 5 and equip with rotational place.

1	Setting the depth of immersion	1 to 150 mm	
2	Speed ranges	0.1 to 100 mm/min	
3	Number of beaker	5	
4	Beaker Volume	50 , 100 ml	
5	Number of Coating In One Stage	1 to 5	
6	Heater	Infrared Element	
7	Temperature Range	0 – 120 C	
8	Setting the time of immersion	0 to 9999 Second	
9	Maximum weight Sample	500 gr	
10	programming process	Manually	
11	Speed resolution of device	± 2 %	
12	Holder Material	Aluminum	
13	Memory Capacity	Save last settings	
14	Number of Substrate	1	
15	Device Dimensions (L x W x H)	30×64×50 cm	
16	Weight	Approx. 13 kg	
17	Maximum power consumption	12W	
18	Power supply	220V ,50HZ	

Technical Specifications

DATA LOGGER

A data logger is a compact, battery-powered device equipped with an internal microprocessor, data storage, and one or more sensors, or sensor ports. Data loggers can be deployed in a variety of environments to record measurements at set intervals for up to years at a time, unattended.

A data logger comes with specific software for its graphing and analysis purposes.



Depending on the application, the logger must be connected and configured according to which sensors are to be sampled and how the logger will be operated.

Types of Data Loggers

- Strain Data Loggers
- Vibration Data Loggers
- Temperature data loggers
- Wireless data loggers
- Humidity data loggers
- Pressure data loggers
- Rotary Data loggers

Rotary data loggers:

A type of data loggers designed in Iramantech Company is Rotary data loggers. This data logger is completely balanced and it's suitable for rotational speed till 3500 rpm. Compatibility of connecting all types of sensors, high-speed collecting data, and resistance under pressure and stress.

Some Important features of Irmantech Data loggers:

- Input strain gauge sensor >120Ω
- 4GB memory card
- Setting up half bridge and full bridge strain gauge sensor
- Classifying data in different folders
- Connecting with wireless to 20 meters
- Auto Zero modifying
- Executing all setting in its software
- Gain factor between 350 to 2250
- Adjusting time and Sampling rate speed
- Resolution -60mV to +60mV
- Sampling accuracy 12 to 48 bit
- Online checking all parts of circuit
- Battery operation about 3 hours

Technical Specifications:

1	Device Dimensions (L x φ)	81 mm, φ170 mm
2	Weight	1.2 Kg
3	Memory Capacity	4 GB (16 Ch→400 min sampling)
4	Sampling Rate	2K sample/sec
		Capability to increase to 60K sample/sec
5	Sampling resolution	16 bit (4096 section)
		Capability to increase to 24 bit
6	Moisture & dust protection	IP53
7	Number of Input channels	16 Channels
		Capability to increase to 32 Channels
8	Inputs- Voltage & current	0-3.3V, 4-20 mA, ±30 mV, ±300 mV, 0-5 V, 0-10 V
9	Inputs- Sensor	Strain gauge >120Ω, PT1000, PT100, (JK-K-C)
		Thermocouple, Pressure, PH, Accelerometer
10	Input Gain	350 to 2250
11	hardware Offset	-60mV to +60mV
12	Startup voltage	4V
13	Battery operating time	3 hours operation
14	Balance certificate ACC	ISO1940