视觉技术中心 Visual Technology Center

力生智能视觉技术中心具备较强的人工智能算法开发能力，自主开发多种 3D/2D 的视觉产品，提供客制化的技术解决方案，包括机器人视觉、识别、测量、追踪、检查等，助力工业实现自动化全过程，产品服务范围广，致力于协助客户降本增效，降低人工成本和差错率。

Lisen Automation visual technology center has strong ability of AI algorithm development, and has self-independently developed multiple types of 3D and 2D visual products. It provides customized technology solutions such as robot vison, robot recognition, robot measurement, robot tracking, robot inspection, etc., contributing to the whole process of industrial automation. With broad product service scope, it's committed to helping customer reduce cost and improve efficiency, reduce labor cost and error rate.

合作伙伴 Partners

富士康/立讯精密/比亚迪/杜邦集团/联塑集团/正崴集团/公牛电器/歌尔声学

Foxconn/ Luxshare Precision/ BYD/DuPont/Lesso/Foxlink/Bull Electric/Goertek

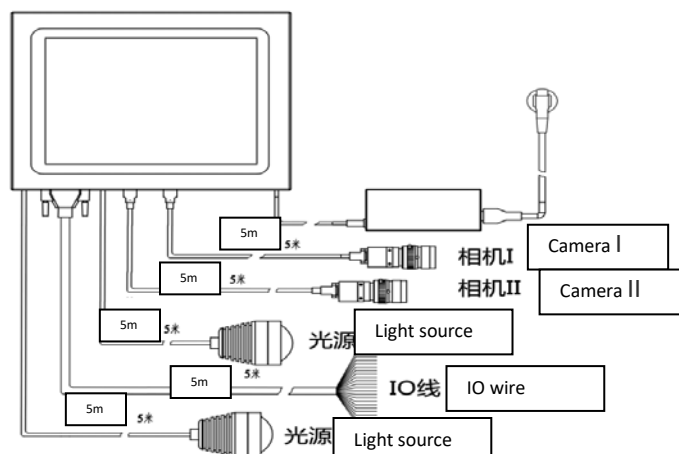## 模具监视器 Mould monitor

模具做为现代加工业的最重要设备，其质量的优劣、精密度和寿命，直接影响产品 的质量和生产成本。因此，延长模具使用周期具有非常重要的意义。在实际生产中，大多数模具都无人看守，如何保证发生顶针回位异常、产品残留等问题时模具不被损坏？

As mould is one of the most important devices in modern processing industry, its quality, precision and lifetime directly influence the quality and production cost of products. Therefore, it's very meaningful to prolong the life cycle of mold. In actual production, most of molds are un-supervised, how can be ensured that mold will not be damaged when there is product residue, or problem with ejector pin return or some other problem?

模具监视器（又称模具保护器器），是基于视觉的模具在线智能监视系统。系统运行时，将采集到的图像与事先建立的模板进行实时对比，当发现异常时，断开合模信号，阻止模具合模动作，从而起到保护模具的作用。可替代人工对应用模具的生产进程进行实时监视，避免停机修模，并保证生产的延续性。

Mould monitor, called mould protector as well, is an online smart monitoring system based on vision for mould. During system operation, the mould monitor compares captured image with pre-set template in real time, so that when it founds any problem, it disconnects mold clamping signal to stop the clamping operation, therefore it can protect the mould. The mould monitor can replace labor to monitor the production process of application mould in real time, to avoid shutdown for mould repair and ensure the continuity of production.
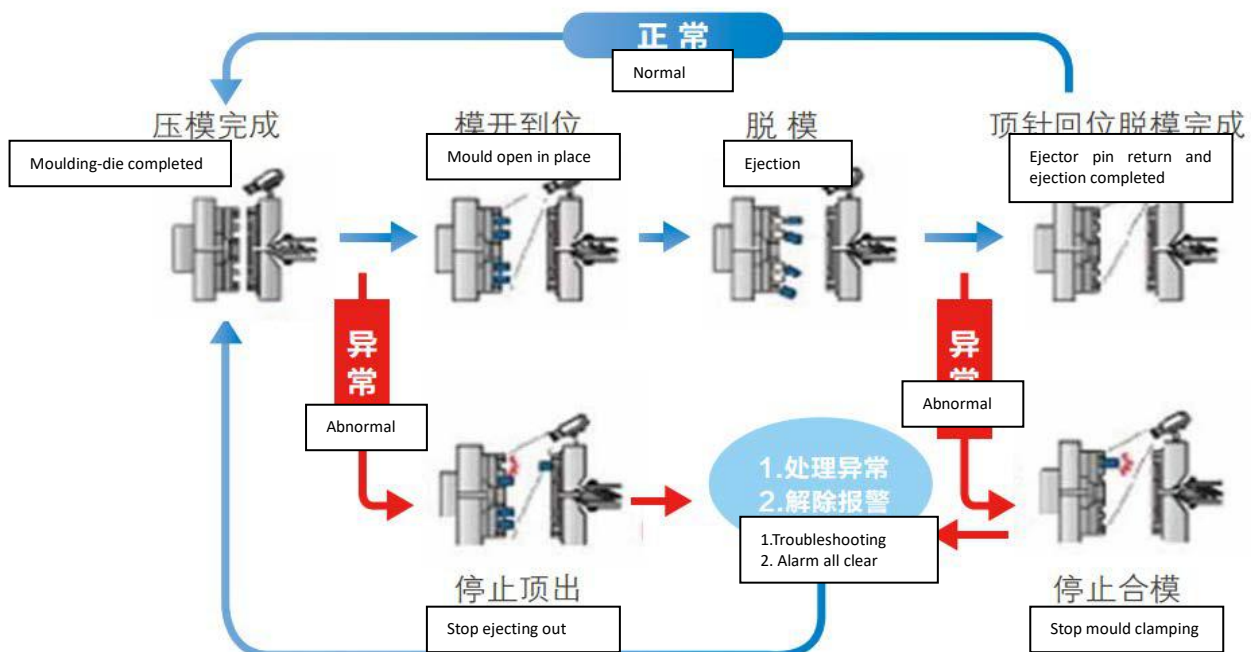

系统构成 System composition

人机界面 HMI

应用现场 Application site

正常 Normal

压模完成
Moulding-die completed

模开到位
Mould open in place

脱模
Ejection

顶针回位脱模完成
Ejector pin return and ejection completed

异常 Abnormal

异常 Abnormal

1.处理异常
2.解除报警
1.Troubleshooting
2. Alarm all clear

停止顶出
Stop ejecting out

停止合模
Stop mould clamping

工作流程 Workflow

Main controller	Camera	Light source	IO wire	Alarm light	Shortcircuit terminal
主控制器	相机	光源	IO线	报警灯	短路端子

系统组件 System components

Mobile stand	Gas spring rocker support	Magnetic desktop	Magnetic wall hanger
移动支架	气弹簧摇臂支架	磁吸桌面	磁吸壁挂

安装方式 Installation method

模具监视器的功能 Functions of mould monitor：

1、防止粘模、脱模不良：通过视觉系统监视模具表面，防止产品或水口没有正常脱落；

2、插件位置确认：通过视觉系统监视插件位置，保证插件到位；

3、确保滑块、顶针、抽芯回位：通过视觉系统监视相应位置，防止没有回位；

4、防止压模：通过视觉系统监视模具表面，及时发现异常，防止发生压模；

5、短射或不良品提醒：通过视觉系统监视产品，发现明显缺陷的产品；

6、缩短生产周期：通过视觉系统监视，在合模前就发现模具异常，缩短生产周期

1. Prevent die adhesion: monitor the surface of mould through visual system in case product or gate doesn't fall off as it should.

2. Plug-in location confirm: monitor plug-in location through visual system to ensure it in right place.

3. Ensure slide, ejector pin and core pulling back in place: monitor corresponding locations through visual system in case they are not back.

4. Prevent mold crush: monitor the surface of mould through visual system so that risks can be found promptly to prevent mold crush.

5. Shortshot or defective products warning: monitor products through visual system and find defective products.

6. Shorten production period: monitor through visual system so that mould problem can be inspected before clamping, therefore shortening production period.

模具监视器的特点 Features of mould monitor：

1、 快速：最快检测速度 0.02 秒；

2、 稳定：基于 Linux 系统开发，稳定可靠；

3、 精确：检测效果好、精度高；

4、 易用：部署快速，操作简单；

5、 数据：实时记录报警画面，方便回看；支持以太网接入生产管理系统，可按约定呈现生产数据；

6、 智能：自适应外部光线变化；自适应开模位置不准情况。

1. Fast: 0.02s inspection speed

2. Stable: developed based on Linux system, stable and reliable

3. Accurate: good inspection effect, high precision

4. Easy to use: quick deployment, simple operation

5. Data: record alarm image in real time, convenient for reviewing, and support connecting Ethernet to production management system, to display production data according to arrangement.

6. Smart: automatically adapt to external light changing, and automatically adapt to situation of inaccurate die-open position.

产品规格 Product specification：

机型		TT-MP-10	TT-MP-12
主控制器 Main Controller	工作温度 Working Temperature	0~60C	0~60C
	工作电源 Power Voltage	220VAC/12VDC	220VAC/12VDC
	外形尺寸 Size	258x148x60 (W*D*H)	325x260x70 (W*D*H)
	最快处理时间 Min Processing Time	20ms	20ms
	功率 Power	65W max	65W / 100W max
	屏幕大小 Screen Size	10.1" LCD	12.1" LCD
	分辨率 Resolution	1280*800	1024*768
	重量 Mass	<2.2kg	<4kg
相机 Camera	数量 Quantity	1～2	1～6
	分辨率 Resolution	130 万或 500 万 1.3M or 5M Pixels	130 万或 500 万 1.3M or 5M Pixels
	接口 Interface	USB	USB
镜头 Lens	数量 Quantity	1~2	1~6
	焦距 Focus Length	标配: 12-36mm 可选: 6-50mm	标配: 12-36mm 可选: 6-50mm
光源 IR Light	数量 Quantity	1~2	1~6
	类型 Type	红外线 850nm IR	红外线 850nm IR
相机、光源 安装磁力架 Magnetic stand	数量 Quantity	2~4	2~12
	吸力(标配) Magnetic Force	80kg	80kg
信号接口 I/O Interface	数量 Quantity	1	1
	规格 Specification	3 输入/4 输出 3DI / 4DO	3 输入/4 输出 3DI / 4DO
	信号电压 Working Voltage	12~24VDC	12~24VDC

适用场景 Application scenes：

1）精密模具注塑成型（防止模具弯曲折损，比如 TYPE-C 连接器）；

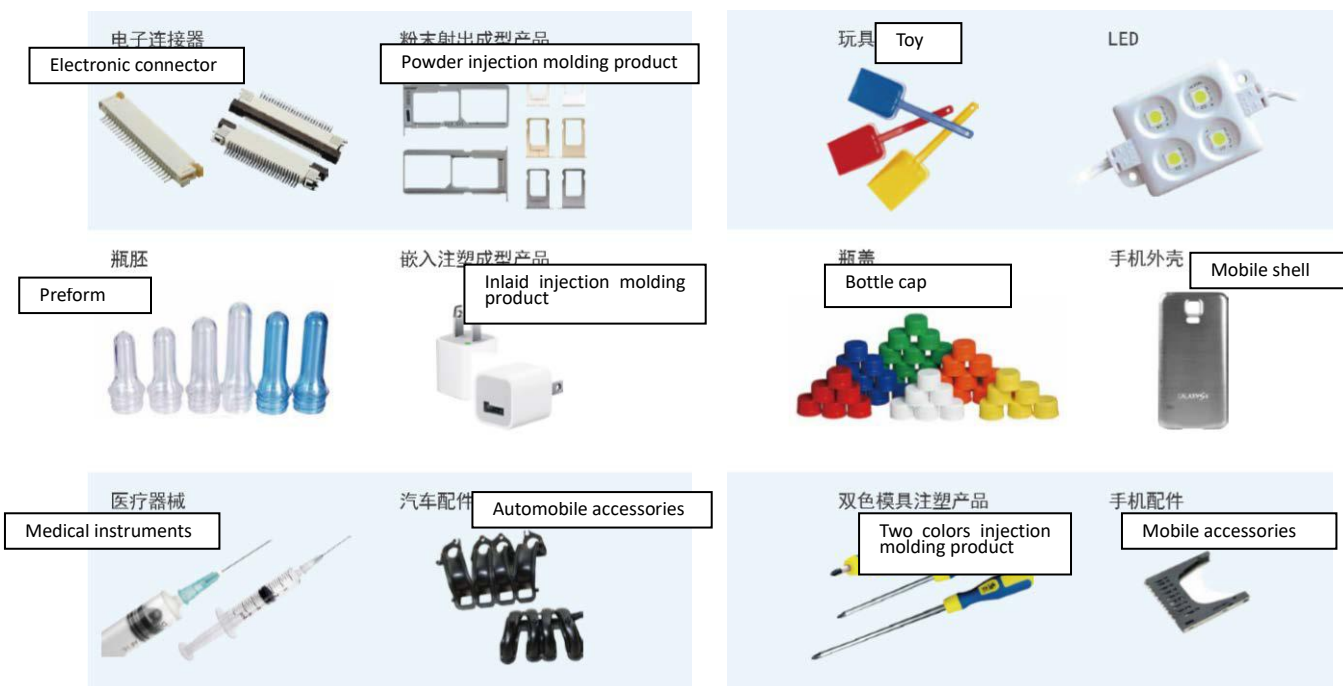Injection molding for precision mould (prevent mould such as TYPE-C connector from being bended and

damaged.).

2）需要镶嵌配件的模具注塑成型（防止因为没有配件而注塑的情况）。Injection molding for mould that needs to be inlayed with accessories (avoid injection without required accessories).
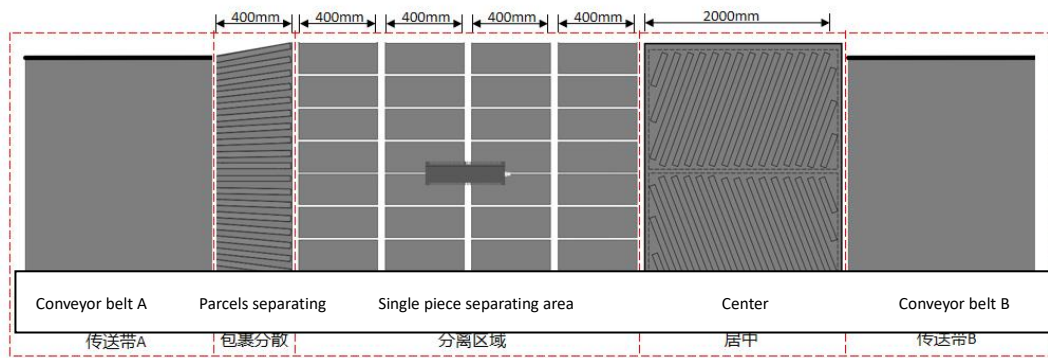
应用行业 Application industries：

1、电子：消费电子（手机、玩具等）配件、连接器（SIM 卡、USB 接头等）；

2、医疗：精密医疗器械、药品等；

3、汽车：汽车配件（汽车连接器、汽车电子、汽车精密塑胶件）；

4、家电：家电精密塑胶件；

5、光电：LED 芯片、料片、光学配件；

6、五金：与压铸相关的领域。

1.Electronics: consumer electronics (mobile phone, toys, etc.) accessories, connector (SIM card, USB connector, etc.)

2.Medical treatment: precision medical instruments, medicine, etc.

3.Automobile: automobile accessories (automobile connectors, automobile electronics, automobile precision plastic parts.)

4.Home appliance: precision plastic parts for home appliance.

5.Photoelectron: LED chip, material piece, optical elements.

6.Hardware: fields related to die casting.

电子连接器
Electronic connector

粉末射出成型产品
Powder injection molding product

玩具 Toy

LED

瓶胚
Preform

嵌入注塑成型产品
Inlaid injection molding product

瓶盖
Bottle cap

手机外壳
Mobile shell

医疗器械
Medical instruments

汽车配件
Automobile accessories

双色模具注塑产品
Two colors injection molding product

手机配件
Mobile accessories

3p

单件分离设备 Singulator

| 400mm	400mm	400mm	400mm	400mm	2000mm	
Conveyor belt A	Parcels separating	Single piece separating area			Center	Conveyor belt B
传送带A	包裹分散	分离区域			居中	传送带B

- 上游：包裹在场内传输装置上，进入系统之前；Upstream: parcels are on the conveying device in the field before entering into the system.
- 传输带A：从上游进入系统，增加一段传输带过渡；Conveyor belt A: add a section of conveyor belt for transiting into system from upstream.
- 包裹分散：主要将黏连通过的包裹拉开少许间距，用于优化单件分离的分离效果，且防止包裹拥堵时卡包；Parcel separating: mainly widen some gap between the passing parcels that are closed to each other, for strengthening the separating effect, and it can help avoid parcel block during traffic jam.
- 单件分离：将并排包裹进行分离，实现包裹前后通过；Single piece separating: separate the parcels side by side to make parcel pass sequentially.
- 居中装置：将靠边包裹进行居中处理,确保包裹通过时在传送带正中间,同时也可起到拉包效果;Center device: center the parcels aside and ensure that the parcel is located in the middle of the conveyor belt during its passing through, and it also can enlarge the distance from the parcel to subsequent parcels.
- 传输带B：从系统进入下游，增加一段传输带过渡，此传输带可做拉包功能使用，也可以不增加该段，系统能与下游对接上即可；Conveyor belt B: add a section of conveyor belt for transiting into downstream from the system, and it can enlarge the distance from the parcel to subsequent parcels. The section can be removed as long as the system can connect with downstream.
- 下游：包裹离开单件分离系统，进入下游，如识别、分拣等。Downstream: parcel leaves singulator system and enters into downstream such as identification, sorting, etc.

分离机构 Separating mechanism
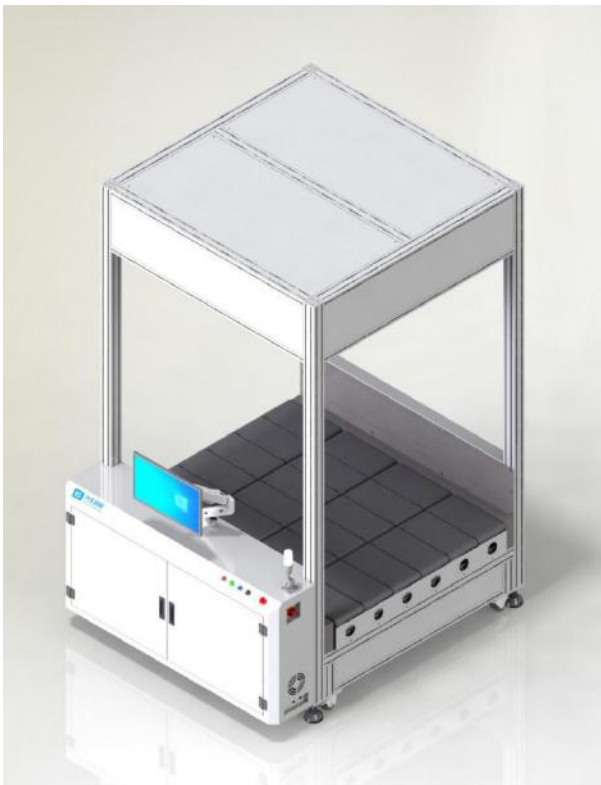
项目 Item	参数 Parameters
分离区范围（长*宽）（mm） Separating area(L*W)（mm）	1600*1400
传送带速度（m/s） Conveyor belt speed（m/s）	1.5
包裹大小（mm）（单相机） Parcel size（mm）(single camera)	100*100*50-1000*1000*500
包裹大小（mm）（双相机） Parcel size（mm）(double camera)	100*100*50-1000*1000*700
效率（件/小时） Efficiency(pcs per hour)	>5000
设备尺寸（长*宽*高）（mm） Equipment size(L*W*H)（mm）	1600*1800*2900

应用行业 Application industries：

邮政、快递、小件电商、配送中心、商超、快消品、化妆品、电子产品等行业。

Post, Expressage, Small packet e-commerce, Distribution center, Supermarket, Fast consumer goods, Cosmetics, Electronic products, etc.