M.D. micro news 12

M.D. Micro Detectors Magazine n°12 - 08/05/2018

English edition

PHOTOFLIGHT

THE FIRST TIME-OF-FLIGHT SENSOR IN A

M18

BODY

INDUSTRY 4.0

NEW QF SERIES

METAL CUBIC

PHOTOELECTRIC SENSORS!

NEW ITS SERIES

THE FIRST THERMAL IMAGER

SENSOR BY M.D. MICRO DETECTORS!

Micro Detectors

Italian Sensors Technology

Hispack 2018

GRAN VIA - HALL 3

LEVEL 0 - B STREET

STAND 280

sps ipc drives ITALIA

HALL 6 - STAND H006

30 BIEMH

HALL 6 - STAND A35

EDITORIAL

ENGINES AT FULL POWER. THE ADVENTURE CONTINUES

By **Giacomo Villano** - C.E.O.

We closed 2017 with positive and growing results in M.D. Micro Detectors and in all Finmasi Group companies.
Satisfaction and pride are at the highest level by our shareholders, by those who hold positions of responsibility, and by the great majority of our workers. Strengthened by the results obtained and the countless concrete facts so far produced, we face the future on a daily basis full of uncertainties and difficulties, animated by clear ideas, unlimited courage and a great desire to do and fight.
So far 2018 is giving us even greater satisfactions, but the year is still a long time. "Head down and ride" we continue to repeat ourselves as a mantra, aware that the results obtained by M.D. Micro Detectors and by Finmasi Group are not coming by chance or fortune. Certainly our companies, like many others, are benefiting from a positive economic situation, but the results obtained are the outcome of a very precise strategy and the consequence of the operational actions, both great and small, implemented to put this strategy into practice.

We believe that the process of great change already well underway and widely reported in the various editions of M.D. News, has only just begun to produce positive results. There is still a lot to do and a lot to have fun. The example provided by two new products described in the following pages is emblematic of what we are doing and of the effort we are producing at all levels:

1. The **Photoflight:** this is a photoelectric sensor in a M18 cylindrical body, based on Time of Flight technology. The application idea was to achieve a flight time with excellent performance in a small body, operating in a range of work that went beyond the standards already achieved with photoelectric technology.
2. The **Thermal imager sensor:** it is a hybrid thermal sensor, also in this case in a M18 cylindrical body, through which it is possible to perform non-complex thermographic analyzes on objects made by automatic machines. This happens in a completely autonomous way from the PC and / or from the PLC.

Products that represent absolute market news and that M.D. Micro Detectors has designed, developed, industrialized and produced in its Modena plant. Deepen the knowledge of these new products in the articles dedicated to them and above all contact us for more information and test them.

I will never tire of reiterating that we continue to grow, develop, compete with the major players in the industry and gain visibility and reputation, resting on the fundamental elements that have accompanied us in this path of **great change** started in mid-2011:

- **a Property, with Marcello and Paolo Masi in the first place, who believes in it and is consequent in fact;**
- **a Strategic and a Product Plan which are clear and well defined;**
- **the Human Factor and the involvement of people;**
- **the Vertical integration of assembly processes;**
- **Lean Manufacturing;**
- **all investments made on new products, machinery, equipments, new staff and in our building.**

The combination of these strategic and operational pillars, has so far enabled us to **reconcile company development with the development and the exaltation of the professional characteristics of our people.**

The **Trainee Program** continues to boast. Collaborating with local technical institutes and some universities is a source of great personal and concrete commitment for us, but it is also a source of great satisfaction. Seeing these young people growing, by giving them the professional foundations, seeing them part of our work teams, collaborating with the professors to share with them a responsibility as big as that of **training future professional generations**, are very important goals. We are not interested in political or philosophical concepts and fashion discourse. We are interested in students getting in touch with the world of work and professional environments. We are interested in understanding the importance of values such as **commitment, professionalism, fatigue, respect, the desire to be realized as professionals and as men.** We make sure that take responsibility and acquire initiative. We are interested in their understanding the value of work, of doing and operating in an organized way.
The concepts of Team and Organization are at the base of what we have achieved in M.D. Micro Detectors so far. Maria Cristina Origlia has recently published an article in Sole 24 Ore newspaper that perfectly summarizes the organizational model, we started to apply in M.D. at the end of 2011. Origlia writes: "*Companies that run on the edge of innovation are more and more adopting horizontal organizational models, where hierarchies leave room for widespread leadership that makes decision-making much faster and where people work for multidisciplinary teams that are flexible and functional to the project and the objective to be pursued. This transformation is accompanied by an empowerment, autonomy and even self-entrepreneurship of people, which translates into work patterns marked by greater freedom of movement in space and time* [...]".

Good reading to all and may Force and Good Luck be always on our side. Our organization is ready to introduce you to our new products and their applications in details.

"flashnews

NEWS IN BRIEF FROM M.D. WORLD."

NEW GENERAL CATALOGUE IN SPANISH

M.D. General catalogue in Spanish is available in electronic format and on paper.

NEW MINIATURIZED INDUCTIVE SENSORS AC6/AD6

M.D. Micro Detectors is launching the new miniaturized inductive sensors with short body and cable exit:

- AC6 series (Ø4)
- AD6 series (M5)

The new miniaturized inductive sensors are aveilable in shielded version, cable exit and stand alongside current models - AC1 and AD1 series.

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WE ARE WAITING FOR YOU AT THE EXHIBITION!

SIAF
GUANGZHOU
4 - 6 MARCH

HISPACK
BARCELONA
8 - 11 MAY

SPS IPC DRIVES
PARMA
22-24 MAY

BIEMH
BILBAO
28 MAY - 1 JUNE

IAS
SHANGHAI
19-23 SEPTEMBER

SPS IPC DRIVES
NUREMBERG
27-29 NOVEMBER

PHOTOFLIGHT

THE FIRST TIME-OF-FLIGHT SENSOR IN A M18 BODY

By **Jessica Galantucci** - Sales Manager Brand Label and Subsidiaries and **Marco Messori** - Responsible for Ultrasonic and Photoelectric Sensor Development

WE DID IT AGAIN...

One of the key factors for M.D. Micro Detectors' success was the brilliant intuition to realize in 1977 the first M18 cylindrical body photoelectric sensor, which was initially conceived for the ceramic sector.

NEW !!

It was a success! This mechanical configuration spread widely around the world and became a standard for both photoelectric sensors and other types of sensors for the industrial automation market.

Today, almost fifty years after the event that gave rise to a successful business history, history is repeating itself: M.D. Micro Detectors had the intuition to exploit the Time-of-Flight (ToF) technology, inserting it into an M18 cylindrical body, thus resolving all the technical / technological problems that such a choice entails and thus making a product with high technological content available to the market. That technology is born in the tradition of cylindrical sensors characterizing our company, and at the same time this product differs by its very high technological content.

Like most of the latest products developed by M.D. Micro Detectors, also the new M18 ToF is made with IO-Link technology so as to make it perfectly compatible with standards required by Industry 4.0.

Moreover, taking advantage of the experience that our company has built in recent years in the field of ultrasonic sensors, in order to offer the customer many features in a single product, the new ToF M18 has been implemented in four different operating modes:

- Standard:

1. Single Point
2. Window Mode
3. Two Point Mode

- Background Suppression (BGS)

INNOVATION IN THE WAKE OF TRADITION

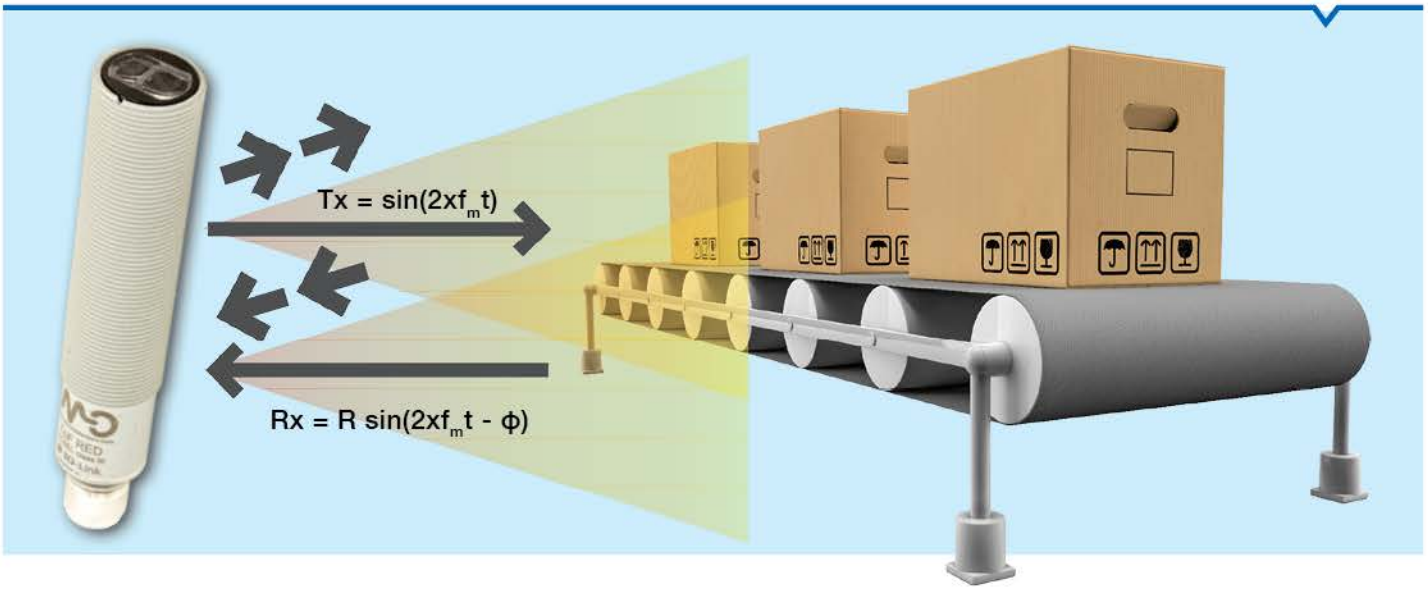
M.D. Micro Detectors is also this. A constant and continuous tension towards product, process and organization innovation, without forgetting what has been done in the past to always set new foundations for solid and lasting growth; all that allows and encourages new investments in human and technological resources, to always highlight the distinctive features of our products more and more: durability, ease of use and quality, all strictly 100% Made in Italy!

OPERATING PRINCIPLE

The time-of-flight sensors calculate the distance between the source and the surface to be measured, by calculating the time that the light source takes to reach the surface and return to the sensor. They are based on the methodology used in radar sensors, but they use light. The travel time multiplied by the speed of light, gives the distance from the measured surface.

The sensor made by M.D. Micro Detectors operates in the frequency domain and uses analog signal processing techniques to obtain measures of distance from the phase shift. Through the emission chip a particular wave is emitted which is then received with a certain phase shift and a certain attenuation depending on the distance and the reflectivity of the target.

TRANSMISSION AND RECEPTION OF A SIGNAL IN A SYSTEM



The phase difference between the emitted signal and the received one is determined in the frequency domain and is converted into a distance measurement; this displacement, as previously mentioned, depends on the distance from target and is relatively independent of the reflectivity of the object to be detected. This is one of the main advantages of the Photo Flight sensor by M.D. Micro Detectors.
A second strength of the new M.D. sensor is the rejection to ambient light: to minimize the effect of ambient light on distance measurements, the sensor contains a series of correction algorithms, that are used to correct in real time the delays (ie measurement errors) introduced by the environment surrounding, making the sensor very robust even in situations where lighting conditions change over time.

M.D. AND TIME-OF-FLIGHT TECHNOLOGY

As it always happens when a development project of a new product is born and in a way fully compliant with what is defined within M.D. Micro Detectors' strategic plan, also the Photo-Flight has been designed with the aim of offering the market a durable, easy to use, high performance product, compact in size and with M.D.'s high quality standards.

The basic idea that led us to develop a photoelectric sensor based on ToF technology was to create a product capable of detecting targets of different colors within a range of work that went beyond the standards already achieved with the photoelectric technology. This operating mode is defined as background suppression (BGS), meaning the ability to detect the target in the most independent way possible from the background color. This type of sensor is probably the most complex to obtain, because the optical signal is strongly influenced by the color of the target itself. The technologies that can be used in the industrial field are actually reduced to optical triangulation or to the use of specific detectors (PSD, CMOS ...). However, both of the aforementioned technologies have different criticalities: first of all, in order to obtain distances greater than 500 mm, high interaxis between the photo-elements is required; secondly, the detection circuit is expensive and, finally, the mechanical complications are considerable. All this is necessary to achieve limited performance with maximum sensitivity around 50 cm.

The use of ToF technology allows to obtain an optical sensor able to measure with a sufficient accuracy even dark targets, maintaining a compact mechanical structure to be used anywhere in the production chain. Photo-Flight has the additional characteristic of being part of a very large family due to its potential and flexibility. In fact, there are many light sources that can be managed through the electronic configuration devised by M.D. Micro Detectors and in particular:

- emission with infrared LED
- emission with infrared laser VCSEL
- emission with red laser VCSEL
- emission with standard red laser

This range flexibility, in terms of the wavelength used for the emission section, guarantees the customer the possibility of using the most appropriate product for his specific application.

In the case of long-distance detection of large-sized targets, it is possible to use the Infrared LED emission models (850nm) that guarantee great precision, immunity to ambient lighting and maximum operating temperature range. If the detection of small or medium-sized objects is required and if it is not necessary to have a visible emission, Class 1N or 3B Infrared Laser light models are available which have

high sensitivity combined with small-sized optical spots.

Finally, in the case of detection of very small objects, it is possible to use the models with Visible Red Laser emission (650 nm) and millimeter spot to guarantee the repeatability of detection.

Each of the products belonging to the new Photo-Flight range can be used with IO-Link output, thus making the products configurable remotely (also in terms of operating mode), easy to install and perfectly inserted inside of the company industrial network with all the consequent benefits linked both to the collection and monitoring of production data in real time, and to the possibility of implementing predictive maintenance policies, etc.

The new ToF sensors can be used in any detection situation and, using an intrinsic measurement principle, allow the operating modes typical of ultrasonic sensors. Moreover, where it is necessary to measure, it is possible to use the digital data via IO-Link or through the traditional analogue output in current or voltage.

The main technical specifications of this new range of products are shown below. Our Organization is available to introduce you fully into this absolute market news!

	IR LED	Red VCSEL (Classe 1M)	IR VCSEL (Classe 1M)	Red Laser
Detection Distance (Sn)	0…2,000 mm	0..2,000 mm (Wh 90%) 0..1,000 mm (Bk 6%)		100..2,000 mm (Wh 90%) 100..1,000 mm (Bk 6%)
Measurnig Distance	100..2,000 mm	100..2,000 mm (Wh 90%) - 100..1,000 mm (Bk 6%)		
Adjustable Range (Sd)	100…2,000 mm			
Sensitivity Adjustment	Teach-in button			
Hysteresis	<10%			
Operating Voltage	10…30 Vdc			
Ripple	5%			
No-load current	50 mA			
Output current digital output	100 mA			
Light Source	IR LED 850 nm	RED VCSEL 670 nm	IR VCSEL 850 nm	RED Laser 655 nm
Output voltage drop digital output	2.2 V max (II=100mA)			
Output Type	Pin 4: IO-Link/Push-Pull - Pin 2: PNP/NPN			
Switching Frequency (filter: MEDIUM)	4 Hz	2 Hz	4 Hz	4 Hz
Supply Electrical protections	Polarity reversal, transient			
Digital output electrical protections	Short circuit (autoreset), over voltage pulses			
Temperature Range	-20°C…+70°C	0°C…+40°C	0°C…+50°C	0°C…+50°C
Interference to external light	20,000 lux (incandescent lamp)			
Interference to fluorescent (modulated) lamp	>5,000 lux			
Spot Dimension	200 x 200 mm @ 2,000 mm	Ø: 5 mm @ 2,000 mm	Ø: 10 mm @ 2,000 mm	Ø: 5 mm @ 2,000 mm

Tof Model	FILTER NONE (Hz)	FILTER LOW (Hz)	FILTER MEDIUM (Hz)	FILTER HIGH (Hz)
IR LED	12	8	4	2
IR VCSEL	12	8	4	2
RED VCSEL	10	5	2	1
RED LASER	12	8	4	2

A WORLD OF SOLUTIONS
A WORLD OF APPLICATIONS

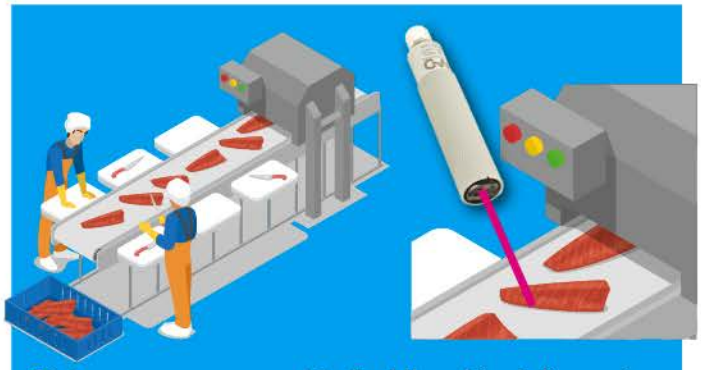
Two different application types are available, based on direct/indirect time of flight:

1. Applications based on measurement of distance
2. Applications detecting presence

Unlike the ultrasonic sensors used for same measurement types, the optical distance sensors allow to obtain an optimal spot dimension for any applications, they are not influenced by air turbolences and they can work under varying pressure conditions.

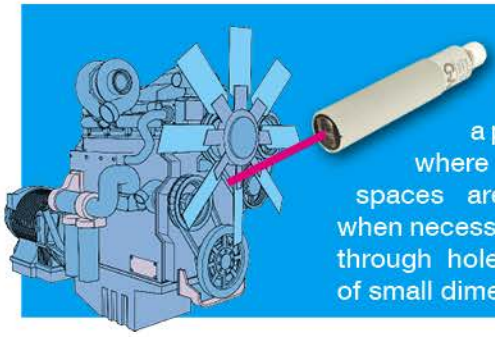
APPLICATIONS BASED ON DISTANCE MEASUREMENT

Distance measurement if necessary to know the targe correct position in any industrial applications where handling processes are present.



Distance measurement to find the object dimensions such as height, diameter of thickness.

Profile measurements using different sensors.



Distance measurement in those applications where operating spaces are reduced or when necessary to measure through holes or windows of small dimensions.

APPLICATIONS OF PRESENCE DETECTION

Detection of object at long operating distances with high detection angles with respect to the sensor.

Detection of glossy surfaces or dark color objects. They work at background suppression mode.

Detection of small objects even at long distances.

M.D. sensor offers different features making it useful in any industrial application:

- Standard M18 body
- Analog output, current or voltage
- Increate functionality and easier installation thanks to IO-LINK communication
- Easy alignement sensor / object in red emission models
- Models with red laser light in CLASS 1, 1M, 3B with collimated 4 mm spot for a precise detection of small objects even at long distances.

THERMAL IMAGER SENSOR

TERMOGRAPHY, THE NEW APPLICATIVE "VISION"

By **Roberto Bosani** - R&D Manager and **Rocco Trivigno** – Responsible for Applicative Sensor Development

With the introduction of regulations aimed at protecting energy savings (mainly in the construction sector), thermal imager sensor is more and more being used as one of the best tools to characterize thermal efficiency. The usages of thermal imager sensor, however, are much wider and, thanks to recent technologies, it is possible to produce higher-performance and miniaturized detectors with a considerable advantage for the end user.

In this context, the new M.D. Micro Detectors' proposal is born: our first infrared thermal imager sensor.

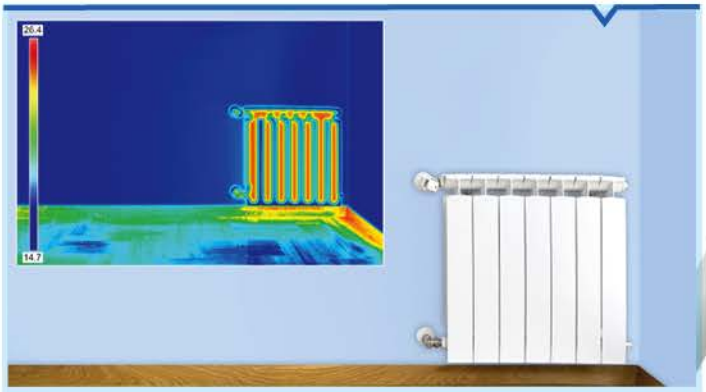
OPERATING PRINCIPLE

Thermography (infrared) is a method of investigation for diagnosis, maintenance and control of the condition of the elements and is a non-destructive technique. The thermographic survey makes it possible to carry out targeted diagnoses very quickly, remotely and without contact. This is possible through the measurement of infrared radiation emitted by a body, which allows to determine its relative surface temperature.

The physical principle on which the thermography is based was discovered by William Herschel in 1800 when, by performing experiments on the spectrum of light using prisms, he discovered infrared radiation (invisible to the human eye) with the help of a thermometer. From that moment on, the foundations were laid which, after more than a century, would have allowed the realization of the sophisticated thermographic devices that are currently used in the military, industrial and medical applications. All objects on our planet have a temperature above absolute zero and therefore emit thermal energy, in the form of electromagnetic waves. Thermo-chambers are therefore able to process and represent the thermal radiation emitted by objects, creating "maps", called thermograms, which associate a corresponding color with a measured temperature.

M.D. MICRO DETECTORS' PROPOSAL

In most cases, the thermo-chambers currently on the market are designed to be used by an operator. They are more or less portable devices and the thermograms have very high resolutions. In general, technological progress greatly improves the performance of these devices (for example, increasing the resolution of the thermograms and on-board displays), but makes them more and more constrained to the interpretation of operator.



The thermogram is generated according to the intensity of radiation in the long infrared wave (about 10 μm) or in the "thermal zone" of the electromagnetic spectrum generated by the object.

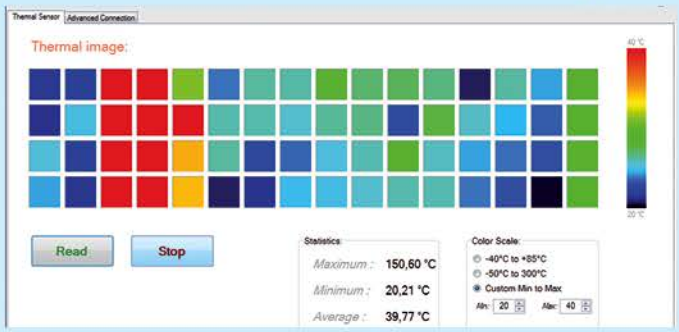
If you want to do thermographic analyzes automatically and directly on the PC / PLC of the machinery, you should almost certainly use image processing techniques (with considerable demand for computational resources) and somehow adapt the modern thermal-rooms to provide the thermographic images to the post-processing device (not to mention the form factor of the product which would be anything

but miniaturized!).
The new ITS sensor addresses and solves precisely this problem by using the classical architecture of an industrial vision sensor, applying it to a thermographic acquisition system. The goal is to exploit the ease of use of sensors to solve a complex subject such as thermography: it is in this track that a smart sensor is born in full style IoT (Internet of Things) and therefore perfectly compatible with the requirements of Industry 4.0.
Also the form factor is typical of industrial sensors: thanks to the miniaturization of the components it was possible to insert everything in a cylindrical M18 housing!

Precisely for this reason, it will be possible to easily install the device inside the machines and above all reach unattainable positions for the classic thermo-chambers.

By means of this hybrid thermal imager sensor, it is therefore possible to perform simple thermographic analysis on the objects made by automatic machines in a completely autonomous way by the PC and / or the PLC. All this is also made possible by the fact that the thermogram is pre-processed by the sensor that works with a much lower resolution than that of a classic thermal camera.
The ITS sensor has a resolution of 64 pixels (16x4) with a field of view of 60°x16°:

These features allow the sensor to be very flexible in terms of operating distance and, above all, the video frame is easily processed by any PLC or PC.
The sensor itself is however able to calculate autonomously (for each individual thermogram) the characteristic statistical parameters such as: average, minimum and maximum value. The latters can also be associated with thresholds and / or reported externally by integrating the digital and analog outputs.
Obviously the sensor is equipped with a communication BUS (RS-485) through which it is possible to acquire the video stream and configure all the embedded thresholds.



The ITS sensor has a resolution of 64 pixels (16x4) with a field of view of 60°x16°.

The advantages compared to a point temperature sensor are numerous among which, in addition to having the entire “thermal map” of the object framed, you can be independent of the geometry and the position of the object itself!

Imagine, for example, what it would be like to measure the temperature of a series of objects (all different from one another) transported on a conveyor in a not known position. With a classic sensor you should reposition everything when the format changes, while with ITS you can frame the entire transport plan and always have the guarantee to read!

Exactly for these reasons, the applications are almost infinite because now it is possible to use this sensor for all those applications that cannot be solved by a classical thermo-chamber or by a point thermal sensor.

Connect the sensor and you will also find yourself in this new “VISION”.

	ITS
supply voltage	24 Vdc ± 20%
consumption	<1 w
operating range	-20°C...+350°C
resolution	0.0017°C @ +350°C
size of thermic image	16 x 4 pixel
frequency of image	4 Hz
technology	array 16 x 4 thermopile
Field of View (FOV)	60° axis X, 16° axis Y
digital output	RS-485 (addressable) 57600 Baud rate -1 bit stop - no parity
digital resolution	18 bit (thermopile) 12 bit @ analog output
voltage analog outputs	0..5 V / 0..10 V (programmable)
load resistance (voltage)	1 k .. 1 M Ohm
load resistance (current)	100 .. 500 Ohm
humidity	<80% non condensing
temperature range	-25°C...+70°C
storage temperature range	-30°...+90°C without freeze
electrical protections	Polarity reversal - over voltage pulses
machanical protection degree	IP65 (EN60529)
housing material	GRILAMID + INOX AISI316-L
connections	5 pin cable - 5 pin pig-tail M12
dimensions	M18

NEW C12P SERIES

NEW PLASTIC M12 CAPACITIVE SENSORS IN DC

By **Giovanni Di Lorenzo** - Product Marketing & Application Engineer

M.D. Micro Detectors has been designing and building sensors for automation for over 45 years and has a wide product portfolio of solutions for industrial automation including inductive sensors, photoelectric sensors, ultrasonic sensors, area sensors, safety sensors, application sensors and encoders. Our 8.000 active code references generate an annual production of more than 1.5 million pieces. Our Organization and our Management operate following high Quality and Efficiency parameters, paying great attention to the control of Processes and Technology.

The continuous improvement activity, always present in the M.D. genes, has led us to introduce the new versions of plastic capacitive sensors in DC with M12 body.
Using the adjustment button it is possible to set the sensor in non-shielded mode, for surface mounting with a working range up to 8 mm, or in shielded mode, for flush mounting with a range of up to 4 mm.
Thanks to the M12 body with a length of less than 80 mm, these sensors can be installed in all those applications where a particularly reduced space is available.

The strength points of these models are:

- EMC high immunity

  1. ESD discharges up to 30 KV
  2. radiated electromagnetic fields up to 15 V/m
  3. electric transients / burst up to 3KV
  4. overload up to 2 KV
  5. conducts up to 10 Vrms (surface mounting) or 3 Vrms (flush mounting)

- high mechanical and electronic features

  1. vibrations (10÷150 Hz, 1mm)
  2. shock (30 g, 11 ms)
  3. IP68 protection degree (24h continuous immersion @1m)
  4. adjustment by button
  5. high stability at temperature variations of working environment

M.D. Micro Detectors' capacitive sensors can be used in the most different sectors. Below you can find some examples of applications:

- animal feed: detection of the level of feed inside the feeders;
- plastic industry: detection of the level of plastic granules inside the hoppers feeding the extrusion machines;
- agricultural, earth moving and lifting machines: they are installed inside the control joysticks and detect the presence of the operator's hand allowing to activate then the commands only with operator present;
- control of the level of liquid in tanks;
- wood industry: detection of panels.

M.D. Micro Detectors, always strongly oriented to the satisfaction of application needs, therefore offers a new solution to its customers to have more efficient machines, always at the forefront, able to deal with the international competition on all the reference markets.

Supply	Installation	Distance	Connections	NPN/PNP NO/NC
10...40 Vdc	shielded or unshielded	0.5...4 mm (shielded) 0.5...8 mm (unshielded)	Cable 2 m	C12P/00-3A
			Plug M12	C12P/00-3E

TESTED TO WITHSTAND EXTREME CONDITIONS

NEW !!!

FM** series

M5, M8, M12, M18, M30 Inductive sensors with full metal housing

characteristics

- Shock resistance degree: IK05, IK06, IK08, IK10
- Protection degree: IP68/IP69K
- M8, M12 plug exit
- Output logic PNP or NPN
- Output state NO or NO + NC

Micro Detectors

Italian Sensors Technology

CE cULus IP69K


PCB Division supports his customers for any technological and service needs, always granting them excellent quality levels
CISTELAIER
PCB leading technology
Techci
Rhône Alpes
BridgEarth
GLOBAL PCB DISTRIBUTION

YOUR BUSINESS
OUR KNOW - HOW

In order to realize its Vision of being a truly capable player able to offer a "global" service, Finmasi Group' PCB Division, composed of two manufacturing companies - Cistelaier in Italy and Techci in France – and its exclusive sales agency for German market BridgEarth in Munich:

- has a Quality Assurance System qualified in following fields: Industrial (ISO 9001:2015), Aerospace & Defense (EN 9100:2016), Civil Avionics (NADCAP), Medical (ISO 13485:2016), Automotive (IATF 16949:2016) and Rail (IRIS)
- is present in all applicative markets of: Aerospace & Defense, Civil Avionics, Medical, Automotive and Rail; in Industrial Sensors, in Telecommunications, Home Automation Systems, in Energy Management sector, Infotainment and in many others
- is able to produce any types of circuit boards, rigid and flexible-rigid, up to 900 mm length and 5.5 mm thickness, with any type of finishing: ENIG, ENEPIG, chemical tin, HAL with and without lead recast with Tin-Lead alloy, chemical silver, and OSP
- is able to maching 100 different basic materials to guarantee its service to all applicative markets
- has a structure able to give support alla long the product life cycle: from Design for Manufacturing, to Co-Design and to prototype service with fast delivery, up to series volumes manufactured internally or, upon request, at the highest qualified Asian PCB manufacturer sites.

Our capacities are at your service. Test us.

NEW M30 ULTRASONIC WITH IO-LINK

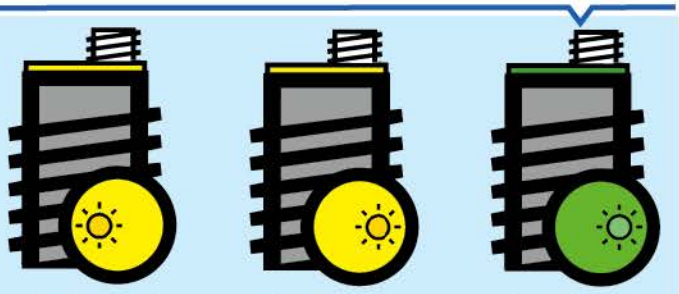
M30 ULTRASONIC WITH IO-LINK

By **Jessica Galantucci** - Brand Label Manager and Subsidiaries Sales Manager

Among the various targets, that we have set ourselves in the last few years there is without a doubt the achievement of excellence. Excellence in manufacturing, excellence in design, excellence in services and excellence in giving our customers the most effective and versatile solutions.
For this reason we have focused on the development and improvement of various sensor families, in particular the inductive, applicative and ultrasonic sensors. The latter, thanks to the various applications that are able to solve and, above all, given the high expectations of many customers, have been subject to a rapid and intense development making them even more performing from a technical point of view, versatile and easily adaptable to the most varied applications.
As already widely described in the previous M.D. News issues, this process has immediately affected the UK1 and UK6 series, the most complete sensor families for functionality, performance and detection distances. It is no coincidence that the ultrasonic sensors in M18 format were the first M.D. sensors to be equipped with the I-O Link system to make them functional and compliant with Industry 4.0 requirements.

For the completion and refinement of the ultrasonic range, we have decided to introduce these improvements also to the M30 family both in the 3.5 m working range (UT1B) and in the 6 m range (UT2F). Furthermore we have added a new series with a working range up to 8 meters (UT5L).

SIGNALING LED



Also in the M30 series it is now possible to select three different functions in one sensor, simply by pressing the teach button. The combination of the signaling LEDs (Green Led for the received echo and two Yellow LEDs for the two outputs activated), ensures that the choice is made correctly, but above all indicates the selected functionality in a simple and intuitive way, thanks to a new simplified programming menu.
The standard versions we offer for new ultrasonic sensors UT1, UT2 and UT5 ranges are shown as follows:

1. single digital output (NPN or PNP – NO/NC) with

- **VERSION WITH PARYLENE**
- **LASER MARKING ON PLASTIC AND METAL MODELS**

In addition to laser marking that combines an aesthetic improvement with a functional one, the IO / Link versions are now available on the entire range of sensors (plastic and metal), in the “Smart Sensor Profile” configuration; an even simpler and more complete platform for the user, in which it will also be possible to select two different ways of adjusting the ultrasonic beam: “standard” or “narrow”. This will result in greater accuracy of use.

synchronism, to avoid interferences in those applications where more than one ultrasonic sensor is used;
2. single analog output (voltage or current – positive/ negative ramp) with synchronism;
3. mixed output (1 digital + 1 analog) with synchronism;
4. double digital output (NPN or PNP – standard window/coded window/hysteresis) with synchronism;
5. double digital output (NPN or PNP – standard window/coded window/hysteresis) + 1 analog output (corrent or voltage) without synchronization function.

As for the UK1 and UK6 series, the new UT range also guarantees greater reliability on more complex applications and greater accuracy for analog versions, while also increasing the solvable applications by extending the power range to 10-30 Vdc and thus including in fact all those applications where batteries are used.
On request, the parylene version is now available for greater cleaning and even higher strength.
Our organization is at your disposal to present you the new features introduced in this new range of products and to offer you an overview of the whole IO-Link world. With the M.D. sensors Your company will also enter the era of Industry 4.0!

	UT1B	UT2F	UT5L
Operating mode	Diffuse / Retroreflective		
Sensing range	250…3,500 mm	300…6,000 mm	600…8,000 mm
Blind zone	0…250 mm	0…350 mm	0…600 mm
Opening angle of sound cone	15°± 2°	18°± 2°	15°± 2°
Operating voltage	10…30V		
Ripple	5%		
Current consumption	≤ 30 mA		
Operating frequency	112 kHz	75 kHz	40 kHz
Polarity reversal protection	●		
Outputs	Push-Pull (IO-Link); PNP / NPN ;4…20 mA; 0…10 V		
Output signal voltage	0…10 V		
Output signal current	4…20 mA		
Switching output	Push-Pull/PNP/NPN - NO/NC selectable		
Continuous current	100 mA		
Switching frequency	1 Hz		
Linearity error	1%		
Repeating accuracy	0.1%		
Resolution	0.1%		
Temperature compensation	●		
Thermal drift	±5%		
Overload protection	●		
Short-circuit protection	●		
Synchronization	●		
Controls	Teach-in button / IO-Link		
Indicators	Switching status: 2 LEDs orange, Echo: 1 LED green		
Operating temperature	-20°C...+70°C		
EMC	EN 60947-5-2		
CE label	●		
UL approval	cULus listed		
Housing material	AISI316L or PBT	PBT	AISI316L + PBT
Connector type	M12 5-pin		
Protection class	IP 67 (EN60529)		

NEW MINIATURIZED INDUCTIVE SENSORS

general catalogue ed. 01/2017

AA series
Ø 3 mm cylindrical miniaturized inductive sensors

- Complete range of cylindrical ultraminiaturized inductive sensors ø 3
- PUR cable
- IP67 protection degree

AB series
M4 cylindrical miniaturized inductive sensors

- Complete range of cylindrical ultraminiaturized inductive sensors M4
- PUR cable
- IP67 protection degree

AC series
Ø 4 mm cylindrical miniaturized inductive sensors

- Smooth stainless steel housing
- Ø4 mm diameter
- Yellow output LED 360° visible
- Availabe 2 m PVC cable models or M8 connector models
- IP67 protection degree

AD series
M5 cylindrical miniaturized inductive sensors

- Extremely reduced models
- Operating voltage: 10...30 Vdc
- Output current: 100 mA
- LED output indicator
- Totally protected against electrical damages
- Cable and M8 plug output
- Stainless steel housing

AHS series
Ø 6.5 mm cylindrical miniaturized inductive sensors

- Extremely reduced models: Ø 6,5 x 20 mm (cable) / 30 mm (plug)
- Operating voltage: 10...30 Vdc
- Output current: 100 mA
- LED output indicator
- Totally protected against electrical damages
- Cable and M8 plug output
- Stainless steel housing

A WORLD OF SOLUTIONS
A WORLD OF APPLICATIONS

AES series

M8 cylindrical
miniaturized inductive sensors

- Extremely reduced models: M8 x 20 mm (cable) / 30 mm (plug)
- Operating voltage: 10...30 Vdc
- Output current: 100 mA
- LED output indicator
- Totally protected against electrical damages
- Cable and M8 plug output
- Stainless steel housing

IL5 series

5 x 5 mm cubic
miniaturized inductive sensors

- Complete range of cubic inductive sensors IL5 series: 5 x 5 x 25 mm
- IP67 protection degree

IL8 / IL9 series

8 x 8 mm cubic
miniaturized inductive sensors

- Complete range of cubic inductive sensors:
  1. IL8 series: 8 x 8 mm with sensing head at the top
  2. IL9 series: 8 x 8 mm with sensing head at the centre
- IP67 protection degree

MOULDING

Detection of metal position guides to determine the correct position of mould parts.

ROBOTS

In order to determine the presence of an object between the pliers of a robot, the metal targets are directly detected. Thanks to the small dimensions it is possible to place the sensors inside the pliers directly.

MACHINES FOR SOCKS

It is possible to determine the position of needles, of wire cutters and of spool speed. The miniaturized inductive sensors can detect position of targets as well as the rotation speed of cogwheels .

PACKAGING MACHINES

Due to reduced spaces and high speed of processes, highly performing sensors are required. The miniaturized sensors can be easlily installed and their high working frequency can guarantee a correct detection.

WRAPPING MACHINES FOR FOODSTUFFS

To detect position and speed of metal targets, stainless steel miniaturized sensors are nrecessary. Their long working distance allows detection of targets in steel.

STEEL INDUSTRY

FILIPPO VAGHETTI, C.E.O. OF METALSIDER, SPEAKING

Interview with **Filippo Vaghetti** - C.E.O. of Metalsider S.p.A.

FILIPPO VAGHETTI, INTRODUCE YOURSELF.

I was born in Pisa on 17th December 1964. Following the career path of my father Giovanni, manager of the ILVA-Italsider Group, I had the opportunity to live the first 18 years of my life with "the suitcase in hand", often changing cities in Italy. This was a fundamental experience as I consider it formed my practical approach to things as well as to the spirit of adaptation. When you have to start over friendships, environments, habits and school paths, you have to rely mainly on yourself, know how to listen and look around to understand before doing. Experience that I then found very useful in the leadership of even complex organizations. I spent the period of studies in Bologna, Milan, Naples to finish again in Bologna, where I graduated in Electronics and Telecommunications at the "Aldini Valeriani" Technical Institute. The choice of my scholastic path was very natural for me, since I always had interests in the field of electronics and particularly of telecommunications. That's where my passion for M.D. Micro Detectors comes from!

DESCRIBE YOUR PROFESSIONAL PATH TO READERS.

In 1986 I entered the SIP Company (now TIM) at first as a Specialized Technician in Voice and Data Transmission Systems, then as Coordinator of Technical Assistance Services and subsequently transferred to Bologna in the Center North Regional Direction as Operations Manager. In 1997, I was appointed Head of Business Area until the end of 1999, when, while transferring for a new position in General Management in Rome, I left Telecom Italia to join Metalsider, the Finmasi Group's Steel Services Center, as Director. It was our President Marcello Masi, who proposed me to join Metalsider, running the risk of hiring a young man with good hopes but without a shred of experience in the steel industry. With great enthusiasm and a bit of sound unconsciousness, I accepted his proposal. At the time Giovanni Vaghetti, my father, was the CEO; a man with great skills and with charisma and moral integrity, who has contributed so much to the growth of the Finmasi Group operating since 1984 alongside the President, Marcello Masi, in a professional and personal relationship, which we all still miss after his premature death in 2004. Since the end of 2004, I was entrusted with the role, which I still hold, of the Managing Director of Metalsider S.p.A. - Services center for flat steel products - and Sanvitale Trasporti S.r.l. - transport company.

WHAT'S YOUR CURRENT ROLE IN FINMASI GROUP?

In addition to the offices mentioned above, I am a member of the Board of Directors of several companies of the Finmasi Group, as well as a member of the Group Committee composed of the Chairman Marcello Masi, the Vice President Paolo Masi, Giacomo Villano and the CEO of Sidermed, Nicola Vaghetti. Within this discussion committee we define the strategy of Finmasi Group and analyze the performance of companies.

WHAT ARE THE POSITIONS YOU ARE HOLDING OUTSIDE THE GROUP?

I consider associative life as a commitment that deserves to be spent, to help improve issues common to companies and people who work there: from competitiveness, to internationalization, to the themes of work. For this reason, since 2001 I have held the position of Vice President of the Metalworking Section in Confindustria Ravenna and today I am a member of the Board of Directors of Confindustria Romagna (born from the merger between Ravenna and Rimini). In addition, I hold the role of Director in the Technical Committee of Assofermet, the association of all the operators in the Italian steel distribution sector.

WHAT DO YOU LIKE MOST OF CURRENT MD? WHAT ARE THE STRENGTHS OF THIS COMPANY IN YOUR OPINION?

The great reactivity in responding to the stimuli received from the Customers; the ability to know how to listen to the needs and requirements of the market and the wisdom of translating them into products, through a very careful Research and Development team. And the ability to customize them for each customer in a very short time. Then, let me tell you, a young and extremely motivated team with extraordinary harmony, guided with wisdom and clarity of objectives by the tireless CEO Giacomo Villano. It is no coincidence that I often use the term "Dream Team" to indicate the propulsive and proactive force of this group, a contagious force that can be felt in the company in every corner. I can't but mention another point of great strength of M.D.: to observe the new organization of the Modena production site, visiting it from within, completely reorganized and redesigned in 2012 according to the principles of

Lean Manufacturing. This, as we often love to say, is the best business card of this company.

What are the strengths of M.D. products in your opinion?

As already mentioned, MD Lean organization MD has allowed a great improvement in production performance, to the full advantage of the reduction of production times, raising the level of customer service. The experience gained in over 35 years of research and development, characterizes M.D products: a high level of quality, constant performance and great reliability recognized by our customers. Furthermore it can boast an extremely rich and constantly evolving product catalogue. Exactly the speed of change is one of the main strengths of the company also in the introduction of new products: today, around 30% of turnover comes from news released in the last five years. The ability of commercial network to support customers constantly and to act as a partner for every solution linked to the world of sensors, is also found in the very high number of customizations: today the customized products represent more than 30% of turnover.

Can you describe the companies in Finmasi Group Steel Division in brief?

The steel division of the group consists of two companies, both founded by Marcello Masi. Today, with a turnover of over 150 million euros and a volume of tapes and plates derived from carbon steel coils sold in 2017 of over 250,000 tons, they represent one of the leading independent steel service centers in Italy. **Metalsider** was founded in 1961 in Ubersetto di Fiorano and was then moved to Ravenna, within what would become the main steel port of Italy, thanks to the happy intuition of Marcello Masi who had the first sheet ship landed in the new Port of Ravenna. Today Metalsider is one of the main Service Centers for Steel Flat products in Italy; it employs over 90 people (including internal and external resources) for a turnover of over 85 million Euros and a production capacity of over 300,000 tons of black and pickled carbon steel strips and sheets. It is able to supply "just in time" customers belonging to the most diverse sectors of Italian and European metalworking. From automotive, to mechanical engineering, to industrial carpentry, to pipe production and to the "construction" and "earth moving" sectors. **Sidermed** was founded in 1984 in Mordano di Imola and specializes in the production of cold rolled, galvanized and coated carbon steel strips and sheets. With a staff of almost 50 people, a turnover of 65 million and a production capacity of 150,000 tons ensures supplies in very short time and according to the lean logic in the sectors of light carpentry, automotive, household appliances, shelving and metal furniture, in conditioning and industrial ventilation just to mention some sectors. The managerial, commercial and production synergy between the companies is almost total and allows us to offer our customers a range of the most complete products in Italy. Both companies are ISO 9001 certified and qualified in-house laboratories to guarantee customers strict and continuous quality standards over time.

Strengths of these companies? Why rely on them?

Over 90 years of experience between the two companies translate today in product quality, speed of delivery, breadth of range and professionalism at the service of our customers. Being a Service Center means being constantly at the side of its Customers to be involved in their projects, identifying the best products for specific uses. Thanks to the professionalism of our sales network, together with the vast range of products in the catalog of our steel division from the most important steel mills in the world, we can guarantee reliability, consistency and continuity of supply to our customers. In addition, thanks to an important investment policy, the two companies can count on the highest quality systems realized by the best manufacturers, which guarantee cutting performance in strips and sheet metal spreading on thicknesses from 0.3 to 25 mm representing, as said, one of the widest ranges on the market.

Which is the Finmasi Group strategy for mid-long term period?

Growing by keeping the heart of production activities in Italy. Our "mission" is to concentrate all our energies on interpreting the needs of our customers, possibly anticipating them. Each goal achieved is always a new starting point for all the companies in the group, aiming to guarantee a space in the future by combining efficiency, innovation in processes and products without ever taking our eyes off what the Customer asks us. We must never forget that customers ask us to be the best, the most competitive and the most reliable. And we work with them to look for long-lasting relationships,

aware that the value of a relationship is recognized and exalted in the long term. We work to grow our reputation in the market because the Finmasi style means Ethics in deeds and not just in words. Always put your face on it, get your hands dirty and set an example.

How do you judge today situation of Industrial Automation sector and its future?

Industry is in the middle of the fourth industrial revolution, an epochal change that is seeing the emergence of business models, new industrial and commercial strategies that are summarized in the Plans launched by governments under the heading "Industry 4.0". The common factor is the 360 degree innovation in every company process. And this, very often, coincides with the application of more and more reliable and performing automation and interconnection systems. Precisely because of the need to detect situations, data and samples, the sensor market (seen as a sensitive termination of increasingly sophisticated networks) has a very strong future ahead of it. Sensors that must be not only detectors but acquire ever greater "intelligence", delocalizing the processing of information from the center to the periphery of a system, being they a machine or a network. In this context the new frontier of "Internet of Things" is developed, where each device is interconnected, exchanging information with others through increasingly powerful networks. This is the starting point where M.D. Micro Detectors is focusing its great attention, aiming to find a very close relationship with the Schools and Universities as well as its great attention to training, which plays and will play a more and more important role in preparing the women and men, who will lead the challenges and opportunities offered by the new scenarios 4.0 .

How do you judge, instead, the situation of steel sector and its future?

Steel is a substantially everlasting product; its characteristic of complete recyclability makes it to be considered as the most durable material, less impacting on the environment and with a great versatility of uses. Steel is also one of the main indicators of a country's economic performance. Indeed, the variation in the gross domestic product of an economy is closely linked to the trend in steel consumption. In the last two years we are living a period of new growth in consumption precisely in line with the increase in world GDP. This positive situation does not hide major issues and uncertainties on the future scenarios of the national and international steel industry. In our country we are witnessing a wicked management of the problem ILVA, the main national steelworks: the inability of our political system has allowed the expropriation of the Riva family, the commissioner resulted in bankruptcy and finally an extraordinary management entrusted to government commissioners to which the mandate was given to find a buyer. Today, now six years after the seizure, with a production cut by 40% and a huge financial deficit, the situation is still in the balance, with the assignment to the Arcelor Mittal group pending between appeals and authorizations, on the background of a environmental situation that has not yet seen the implementation of those substantial remedies that had to be put into practice immediately after the seizure. The recent issues on regionalization and the obstacles to international trade in steel products are also added to this situation. We are witnessing a real tariff war: Europe imposing tariffs on un-fair steel imports from China, then from Russia, Ukraine, Brazil and Iran; Trump applies the duty against imports from all over the world with the aim of further closing an already protected market. As if to say: the situation is at the same time complicated and quite sparkling.

What does Filippo Vaghetti recommend to young people who are approaching the world of work today?

To put passion, curiosity, commitment and humility in every action. To take into account that working also means sacrificing oneself, making physical or mental effort, but never withdrawing. To share the knowledge acquired with sacrifice on books with the value of the experience of those already in the world of work. That there are no barriers for those who use their talents, that there is no limit to the ambition of a young person, no matter if high school or university graduated, if this ambition translates into the desire to do well. To be hungry to know, to seek, to always be proactive, to have initiative, to anticipate problems and to dose logic and imagination in their solution. Then, if possible, to do some experience abroad: a direct experience is highly educational, opens the mind and helps to confront a world that inevitably becomes more and more multicultural.

Why in your opinion a young high school or university graduated should approach M.D. Micro Detectors?

Because M.D. Micro Detectors is the place where enthusiasm, initiative, growth, research and merit are combined. Because inside M.D. there are skills and excellence, nourished by the concrete spirit of "doing". All in an environment characterized by a high motivation and a strong team spirit, essential ingredients to better interpret the challenges imposed by the market.

Metalsider
steel service center

Founded by Marcello Masi, current President, in 1961 Metalsider has started its activity in in Ubersetto di Fiorano (MO) and was then moved to the new industrial port of Ravenna, where it currently has its production site on a 50,000 m² area with over 30,000 m² of production plants and wharehouses of raw materials and finished products.

SIDERMED
steel service center

Sidermed is a service centre of steel products founded in 1984. This company is placed in an important production area of 14.000 m² in a region of over 23,000 m². The choice of establishing in Mordano di Imola (Provice of Bologna), only 6 km away from A14 high way and 40 km far from Ravenna siderurgical port, turned out as a winning one under a logistics point of view; it stands in fact in the focal industrial point of Emilia Romagna, Lombardia, Veneto, Marche, a very high density industrial area.

the **steel** for your **projects**

NEW QF SERIES

MINIATURIZED CUBIC PHOTOSENSORS

By **Fabrizio Marchi** - Product Marketing & Application Engineer

The offer of M.D. Micro Detectors' miniaturized cubic body photoelectric sensors expands with the introduction of new models with AISI316L stainless steel body and IP69K mechanical protection degree. The new QF series increases the range of sensors for applications in Harsh Environment and in particular those used in the Food & Beverage sector, that is:

- M12 cylindrical inductive sensors (PFM series);
- M18 cylindrical inductive sensors (PFK series);
- M18 cylindrical photoelectric sensors (FF series).

The new QF family combines excellent detection capabilities with a compact and optimized housing design. The small dimensions (10.8 x 20 x 30 mm) comply with industry standards and the 2 x M3 mounting holes guarantee a quick and easy installation. In addition, the new QF family is able to solve countless applications thanks to the different operating principles adopted:

- Background suppression (both with red and infrared emission);
- Direct diffuse (with infrared emission, short and long distance);
- Polarized retro-reflective (with red emission);
- Retro-reflective (with infrared emission);
- Through-beam (with infrared emission).

The new QF family has been specially designed to be used in hostile environments and where the hygienic factor proves to be decisive for the resolution of the application.

Built with materials having excellent mechanical properties, it has a miniaturized body able to withstand high pressure and high temperature washes as well as aggressive cleaning agents and disinfectants.

Among the other certifications obtained (CE and CULus), the QF family complies with the tests conducted by ECOLAB, details of which are shown below. Compliance was achieved by maintaining a stable and accurate detection of objects even in hostile working conditions.

You can find the technical specifications of new cubic miniaturized family and available models as follows.

Substance	Description	Concentration	Test duration	Result
Topax 56	Acid foam detergent for the food industry	5%	240 h at 50°C	Test passed
P3 Hypochloran	Disinfectant containing chlorine for food industry	1%	240 h at 24°C	Test passed
TOPAZ CL1	Alkaline foam detergent, containing chlorine for the food industry	5%	240 h at 50°C	Test passed
TOPAZ AC1	Acid foam detergent for the food industry	4%	240 h at 50°C	Test passed
TOPAZ MD3	Alkaline foam detergent for the food industry	5%	240 h at 50°C	Test passed
P3-topactive OKTO	Acid foam disinfectant for the food industry	1%	240 h at 24°C	Test passed

	Background suppression		Retro-Reflective		Direct Diffuse		Through-beam	
	Red Light	Infrared Light	Standard	With Polarized Filter	Standard	With Wide Angle	Receiver	Emitter
Nominal Working Distance	200 mm		6 m		1 m	200 mm	15 m	
Hysteresis	≤ 10%	5% to 20%						-
Supply Voltage	da 10 a 30 Vdc							
Absorption	≤ 40 mA @ U_B max. ≤ 20 mA @ U_B min.	≤ 25 mA @ U_B max.						≤ 20 mA @ U_B max.
Output function	Open collector, NPN o PNP							-
Output commutation function	N.O. and N.C.							-
Output current	≤ 100 mA (max. load capacity 100 nF)							-
Minimum supply current	≤ 0.5 mA							-
Leakage current	≤ 100 µA							-
Tension drop	≤ 2 Vdc @ (I_e) max.							-
Electric protections	Short-circuit (A), inversion of polarity (B) and transient (C)							B + C
Response time	≤ 1.0 ms		≤ 0.5 ms				≤ 1.0 ms	-
Power on delay	≤ 200 ms		≤ 30 ms				≤ 200 ms	≤ 30 ms
Led indicators	Target detected (yellow LED), Stability of signal and Power ON (green LED)							Power ON
Sensitivity adjustment	Trimmer							
Protection degree	IP68 @ 2 m and 20 h (IEC 60539; EN60947-1), IP69K (DIN40050-9)							
Operating temperature	-25°C… +60°C		Cable version: -25°C… +60°C Plug version: -40°C… +60°C					
Ambient Light immunity	≤ 45,000 Lux	≤ 65,000 Lux			≤10,000 Lux		≤ 65,000 Lux	
CE certification	According to EN 60947-5-2							
Homologations	cULus (UL508, CSA C22.2), ECOLAB							
Vibrations	10 at 150 Hz (1.0 mm / 15 g; (EN 60068-2-6) along directions X,Y and Z							
Shock	30 g / 11 ms. 6 positive and 6 negative along directions X,Y and Z							
Emission	Red 617 nm	Infrared 850 nm	Red 625 nm		Red 617 nm		-	Infrared 850 nm
Materials	Housing: stainless steel, AISI316L; Frontal glass: PPSU or PMMA; Trimmer: (PEEK)							
Cable	PVC, black, 2 m, 4 x 0.14 mm², Ø = 3.3 mm							
Plug	4-pin M8, male							
Dimensions	11 x 31.5 x 21 mm							

applications

MEAT, FISH, POULTRY PRODUCTION

The food industry needs high standards of resistance, hygiene and cleaning. QF photoelectric sensors can perfectly work even in "harsh environments" thanks to their stainless steel body, above all.

PRODUCTION OF JUICES AND DAIRY PRODUCTS

Colored graphic of some packagings can be hardly detected. QF series with background suppression is able to solve this issue being this product designed to work in particularly difficult conditions, as it can also withstand high pressure water jets.


A COMPLETE
RANGE OF
AREA
SENSORS
CR0 series
Retroreflective Polarized
Area sensors
INDUSTRY 4.0
Area height controlled 69 mm
Maximum operative distance up to 4,5 m
Minimum object detection diam. 6mm
Two teach-in types: fine and standard
Optical pitch 10mm
Protection degree IP67
Blanking function
100% TESTED
WARRANTY 3 YEARS
MADE IN ITALY
IO-Link
CE
cULus

	CR0
nominal sensing distance (Sn)	0.2...4.5 m (RL106G - ExG 2)
emission	red (617 nm)
operating voltage	16...30 Vdc
no load supply current	≤ 10%
no load supply current	100 mA
load current	100 mA
leakage current	≤ 100 µA (Vdc max)
output voltage drop	3 V max (100 mA)
adjustment	Teach-in: fine < 3 sec; > 6 sec
output type	PNP; NPN ; Push-pull ; (NO+NC) compl. output (NO+NC)
switching frequency	600 Hz
time delay before available	300 ms
minimum object detection	3...6 mm @ 2 m RL106G (1) 3...10 mm @ 4.5 m RL106G (1)
power supply protections	polarity reversal, transient
output protection	short circuit (autoreset)
interference external light	5,000 lux (fluorescent lamp); 50,000 lux (sunlight)
operative temperature range	-10°C....+55°C (without freeze)
temperature drift	10% Sr
LED indicators	green: power supply red: dark/light status
protection degree	IP67 (EN60529)
housing material	aluminium
optical material	PMMA

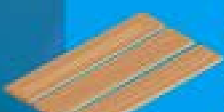
(1) 106G reflector 20 x 80 mm (corrosed insert)

PACKAGING

Flow-pack machines work in loop by wrapping and sealing the product with coil film: BX10 area sensor can detect any type of object inside the film.

METAL INDUSTRY

CX0 area sensor can detect objects of small and thin dimensions which are ejected at high speed out of the chopping machines, thanks to its crossed beams.



WOOD

On conveyors it is possible to detect wooden panels of any finishing and color by means of CR0 area sensors together with reflector placed at the opposite side.

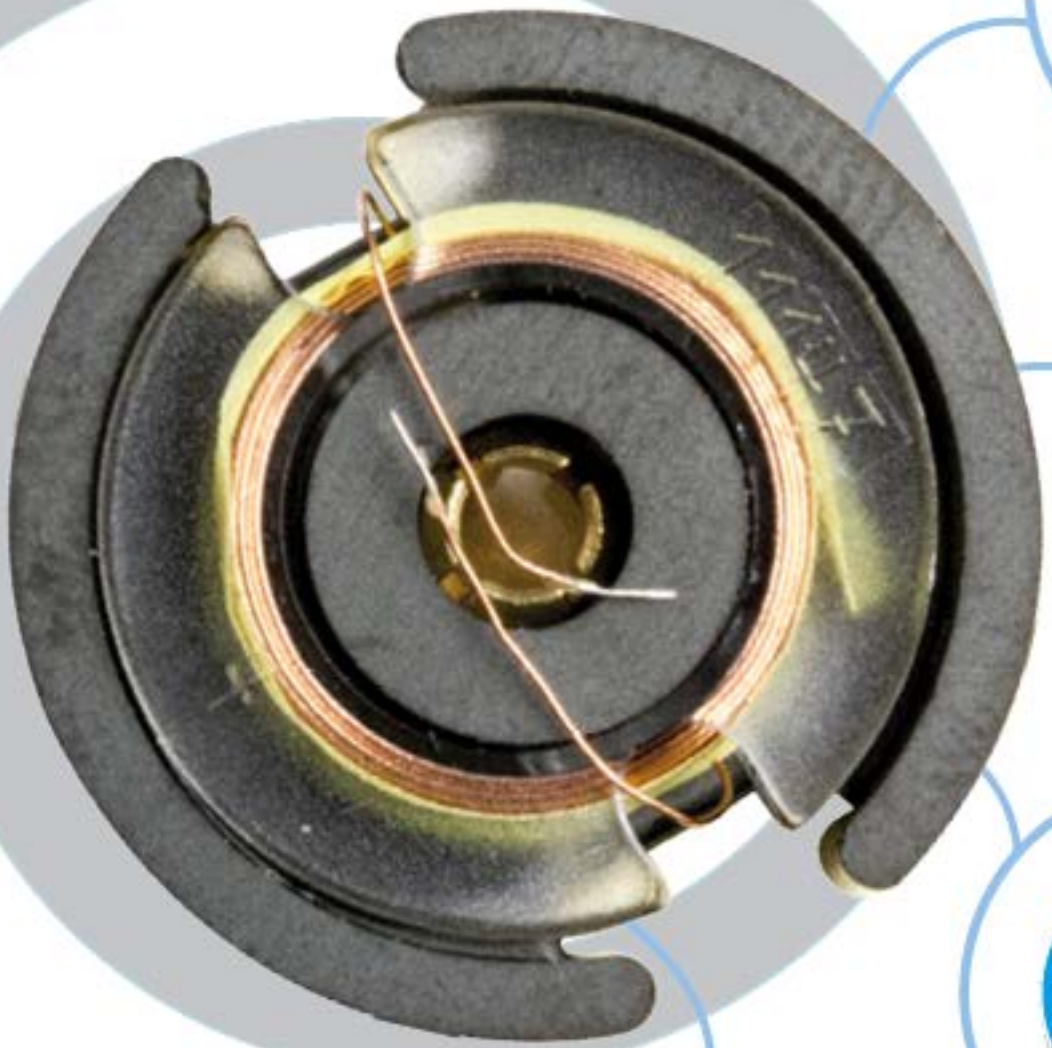
PACKAGING

CX0 area sensor can detect very thin magazines or newspapers , thanks to its total crossed beams, even if wrapped inside plastic films.

VENDING MACHINE

M.D. Micro Detectors, which has always been a point of reference for the production and development of multi-beam detection barriers, offers NX series area sensors, specific for the sector of Automatic Distribution. The NX series products, installed at the edges of the vending machine drawer, are able to detect irregular shaped objects, such as snacks, cigarette packs, DVDs, bottles and generally objects with a minimum diameter of 5 mm over a working range up to 2 m. The absence of casing and the radial optics allow the installation of barriers in the typically reduced spaces of the machine. The models with tropicalization treatment, that is equipped with a protective layer deposited on the body of the product, are the ideal solution for those distributors equipped with a refrigerator, as they protect the area sensor from condensation that may form on them due to the opening of the nozzle.

YOUR SENSOR, OUR COIL



PLANNING STAGE

CONSULTATION AND TECHNICAL SUPPORT

RAW MATERIAL SEARCH

PRODUCTION

100% TESTED

Micro Detectors

Italian Sensors Technology

MORE THAN SENSORS

COILS FOR INDUCTIVE SENSOR

By Gary Li - Site Manager M.D. Tianjin Co. Ltd. and Jessica Galantucci - Brand Label Manager and Subsidiaries Sales Manager

M.D. Micro Detectors, a company leader in design and production of inductive, ultrasonic, photoelectric, area, safety and applicative sensors for industrial automation is now much more. At the middle of 2012 M.D. Micro Detectors S.p.A fonde a new Chinese subsidiary producing coils for inductive sensors. M.D. Micro Detectors (TianJin) Co. Ltd is 100% of M.D. Micro Detectors property with a share capital of RMB 14.000.000. It means that all Total Quality, High Technology and Lean Manufacturing concepts are completely applied in this Chinese production plant.
The coil is a fundamental component to guarantee high performances of the inductive sensors. This is why M.D. decided to rule this technology setting a manufacturing

unit in Tianjin where they produce 100% of the coils needed by M.D. Italy.
Yes it is!! Since 2013, with the full sup port of more than 40 years of experience and know-how in inductive sensors, M.D. Tianjin is the sole supplier for coils for M.D. Micro Detectors, providing the utmost level of satisfaction in term of Technology and of Quality. M.D. Italy is relying on M.D. Tianjin 100% tested products and a short supply chain working with the philosophy of LEAN manufacturing concepts, M.D. Micro Detectors is now offering to his partners and valued customers the opportunity to access to the services of M.D. Tianjin for the manufacturing of coils. The main features offered by M.D. Tianjin are:

- a stable manufacturing process, compliant to lean manufacturing principles and M.D. control protocols. Totally controlled by our people;
- quality of raw materials used;
- competence of our operators in China;
- reliability: all the products manufactured are subject to quality and functional tests;
- technology and know-how: more than 40 years of experiences in the design and production of coils for inductive sensors;
- services: fast production and fast delivery worldwide;
- customization: production of coils with diameter and number of windings according to customer's request;
- competitive prices.

We assure to our Customers the utmost level of confidentiality and secrecy. M.D. is well known on the market for his long history of reliability and reputation.
With the development of Coils production, M.D. Micro Detectors is now "SENSORS AND MORE".


INDUSTRY 4.0
FEEL THE NEW
ULTRASONIC
WAVE
100% TESTED
3 YEARS
MADE IN ITALY
general catalogue ed. 01/2017
505

A WORLD OF SOLUTIONS
A WORLD OF APPLICATIONS

UK1 and UKR1 series

M18 cylindrical direct diffuse & retro-reflective Ultrasonic Sensor UK1 with Teach-In button

- Models with digital programmable output
- Models with current or voltage analogue outputs
- Adjustable Hysteresis function: model with programmable double digital outputs, specific for levels
- Working area adjusting (window teach or single point teach) by Teach-in button suitable for all models for a fast coming into work
- Multifunction LED indicator: output type, adjustment procedure, NO/NC selection and reverse analog output slope

UK6 and UKR6 series

M18 cylindrical short body direct diffuse & retro-reflective Ultrasonic Sensor UK6

- M18 diffuse sensors with short housing
- Digital output
- Analogue output

UT and UTR series

M30 cylindrical direct diffuse & retro-reflective Ultrasonic Sensor with Teach-In button

- M30 ultrasonic sensor with standard housing and with large front with high performances and high sensing distances
- Adjustable hysteresis function: models with double digital programmable output specific for level detection
- Models with voltage or current output: programmable slope to optimize resolution
- Adjustable working area (window mode or object mode) by Teach-in button on all models for a quick and easy installation
- • Two multifunction LEDs: orange LED for adjustment procedure and output type and green LED for target alignment
- Plastic and AISI 316L stainless steel housing, plug M12 or cable exit 4 pin

SHINY AND COLOURED OBJECTS

Since ultrasonic detection is not an optical detection, differences in the color or shine of the material do not constitute a problem for our ultrasonic sensors.

BOTTLES DETECTION

Our ultrasonic sensors make it possible to detect the presence of bottles, regardless of their degree of transparency, colour and shape (cylindrical or rectangular).

LEVEL DETECTION

Our ultrasonic sensors make it possible to detect the level of liquids or solids inside tanks. Both analog output and digital output (single or dual) sensors can be used.

NEW!!!

EXTENDED TEMPERATURE RANGE

PIZZA DETECTION

The new ultrasonic sensors, thanks to an extended operating temperature now ranging from -20°C to +70°C, are able to guarantee more reliability on more complex installations and ensure more precision even in the analogue versions, due to a supply voltage of 10-30 Vdc.

IO-Link CE cULus Ex

VIBRATION SENSOR

VBR series

Vibration sensor

characteristics

- working frequency: 0...400 Hz or 0...1,200 Hz
- bus RS485
- selectable analogue output
- selectable full range: ± 2g, ± 4 g, ± 8 g, ± 16 g
- AISI316L stainless steel
- 3-axes MEMS

Micro Detectors

Italian Sensors Technology

general catalogue ed. 01/2017

689

CE

TRAINEE PROGRAM

EYES ALWAYS FOCUSED ON FUTURE

By Giacomo Villano - C.E.O., Jessica Galantucci - Brand Label Manager and Subsidiaries Sales Manager and Roberto Bosani - R&D manager

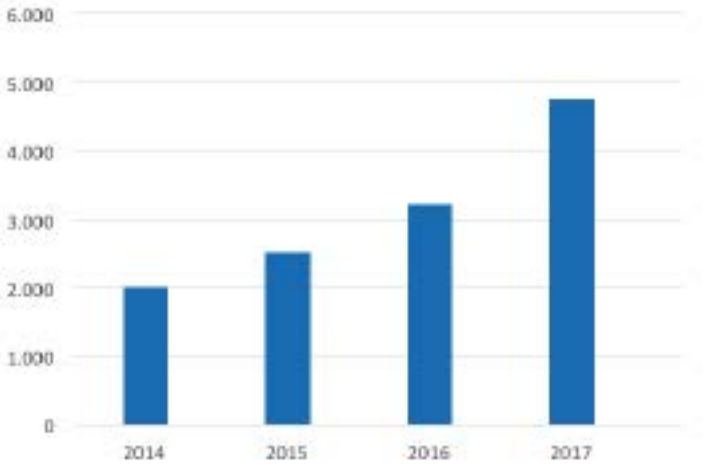
World of Work and World of Education can and must work in close connection. Companies and schools can benefit greatly from these collaborations and, more than any other, future generations can benefit from them. Our experience, which has intensified in the last few years, is that these collaborations require a huge use of human and material resources, but in the end they bring many benefits also to companies.

Therefore we continue to work alongside the main technical institutes operating in the local area and with some of the most renowned Italian universities. Thanks to these collaborations the results obtained in recent years make it clearer and clearer in us that a company can't disregard these activities to continue in its development process and also to have access to resources that grow and are formed, according to the different opportunities that our company can offer, thanks to direct activities carried out within MD as well.

Below we report the data related to the activities carried out from 2014 to 2017.

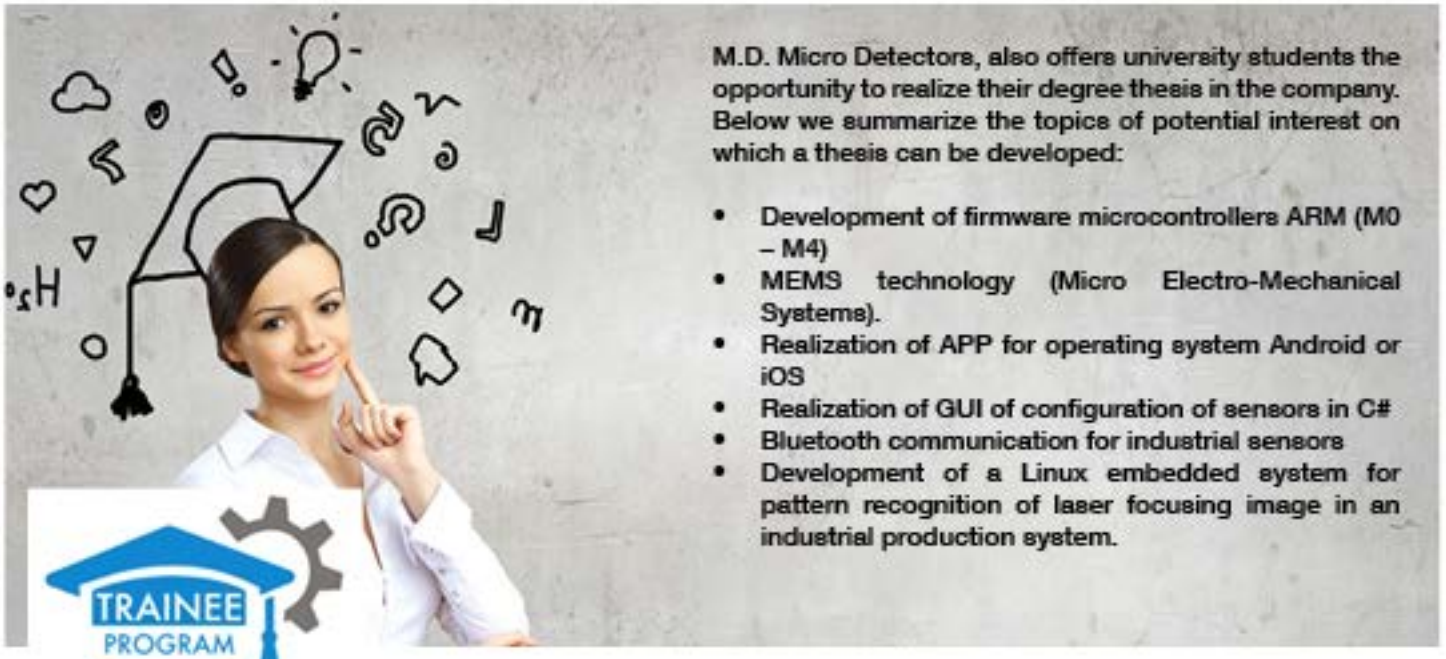
Classroom and support activities for school projects also continue. This summer we will replicate and intensify the guided summer work projects.

	2014	2015	2016	2017
Numero stagisti	15	21	25	39
ore di stage	2.000	2.520	3.756	4.765



We also remind that M.D. Micro Detectors:

- is part of the Technical Scientific Committee of the ITIS Fermi and the Guidance Committee for the Degree Course in Electronic Engineering of the University of Modena and Reggio Emilia;
- has an agreement with the University of Modena and Reggio Emilia and with the University of Bologna to host trainees / undergraduates;
- supports the school / work alternation project of the ITIS Da Vinci's III Classes;
- has an agreement with the Polytechnic Institute in Milan, with which it has carried out two strategic projects.



M.D. Micro Detectors, also offers university students the opportunity to realize their degree thesis in the company. Below we summarize the topics of potential interest on which a thesis can be developed:

- Development of firmware microcontrollers ARM (M0 – M4)
- MEMS technology (Micro Electro-Mechanical Systems).
- Realization of APP for operating system Android or iOS
- Realization of GUI of configuration of sensors in C#
- Bluetooth communication for industrial sensors
- Development of a Linux embedded system for pattern recognition of laser focusing image in an industrial production system.

NEW FL SERIES

FIT FOR CARWASHING

NEW !!!

FL series

"T-style" housing photoelectric sensors with M18 optical head for car washes

characteristics

- Sensors for car washes
- IP protection degree: head IP69K (sensor IP67)
- Wide angular range for an easy allignment
- Totally fullfilled resin
- Two versions: high and standard distance
- Syncronization through cable
- Coded emission: anti mutual-interference

WARRANTY 3 YEARS

MADE IN ITALY

CE

Micro Detectors

Italian Sensors Technology

MORE ENERGY FOR OUR SENSORS

NEW !!!

- RECHARGEABLE BATTERIES
- POSSIBILITY TO CHOOSE BETWEEN 5 V AND 24 V POWER SUPPLY
- CAN SERVE AS EMERGENCY BATTERY CHARGER FOR MOBILE PHONES
- CAN BE USED WITH 2-WIRE OR 3-WIRE DIGITAL SENSORS
- SILENCE MODE
- SLEEP MODE

ST 300D series

Sensor tester

characteristics

- 4 LED-lights
- can be used with photoelectric, inductive, capacitive, ultrasonic and applicative sensors
- both NPN and PNP sensors testable
- dimension: 125.5 x 62 x 22.5 mm
- weight: 145 g

2 YEARS

CE

Micro Detectors

Italian Sensors Technology

ALTERNATING CURRENT

(DIRECT QUALITY)

NEW !!

PROTECTED AGAINST SHORT CIRCUIT BOTH WITH DIRECT AND ALTERNATING CURRENT

V3** series

M8, M12, M18, M30 inductive
with AC/DC supply voltage

SHIELDED AND UNSHIELDED MODELS!

characteristics

- Operating voltage: 20...250 Vac / Vdc
- NO/NC output selectable, if DC supplied
- Cable or M12 plug exit
- IP67 protection degree

CE cULus

WARRANTY 3 YEARS

MADE IN ITALY

Micro Detectors

Italian Sensors Technology

EXÉ 1985

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M.D. Micro Detectors is an industrial group which has designed and produced a wide range of industrial sensors since 1971. M.D. has a great tradition but also a very visionary approach, thanks to their great entrepreneurship and innovating spirit.
The Group is composed of the head office, M.D. Micro Detectors S.p.A. (Modena), along with subsidiaries Micro Detectors Iberica SA (Barcelona) and M.D. Micro Detectors (Tianjin) Co. Ltd.
Our catalogue is composed of following product ranges:

- Photoelectric Sensors
- Proximity Sensors
- Ultrasonic Sensors
- Area Sensors
- Safety Devices

Technology, Quality, Service, Efficiency and Speed are the key words distinguishing our products and our companies. In addition to the catalogue products, an important share of our activity is dedicated to special versions and custom products, with the aim to satisfy our customer's specific application needs. Made in M.D. is another key point: from development of new products (or special version of catalogue products) up to final shipment, all activities are carried out internally by our staff. The integrating strategy enables us to be present on the market with great Flexibility, Speed and Efficiency. This way we have a total control on our processes and technology, too. The companies of our Group are organized and operate following the Lean Thinking principles, allowing us to offer our customers, our suppliers and all our partners an excellent service level. More than 1.3 million pieces per year are completely realized in our plant in Modena. The Made in Italy featuring our production means Quality, Accuracy and Reliability. All products manufactured by our factory are subject to precise control standards during the production process, before the final test. Working culture, focus on customer and on constant improvement, passion and excellence aptitude, continuous research: all of that is part of our staff professional background. All of that belongs to M.D. Style. M.D. Micro Detectors Quality is also guaranteed by all the certificates our Company has achieved over time: our quality management system is ISO 9001:2015 certified and many products are CE, ATEX, UL, cULus,Diversey, TÜV and ECOLAB certified.

+ THAN 26 MILLION, OUR CONSOLIDATED TURNOVER

+ THAN 1.5 MILLION ITEMS MANUFACTURED EVERY YEAR

+ THAN 200 EMPLOYEES

+ THAN 70% OF OUR TURNOVER PRODUCED OUTSIDE ITALY

+ THAN 30% OF OUR TURNOVER MADE UP OF CUSTOM PRODUCTS

+ THAN 70, THE COUNTRIES WHERE WE ARE PRESENT

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