MD news

M.D. Micro Detectors Magazine n° 7- 24/11/2015 - English edition

SAFETY SINGLE BEAM SENSORS

PHOTOELECTRIC LASER SENSORS

IO-LINK ULTRASONIC SENSORS

sps ipc drives

Electric Automation
Systems and Components
International Exhibition

Micro Detectors

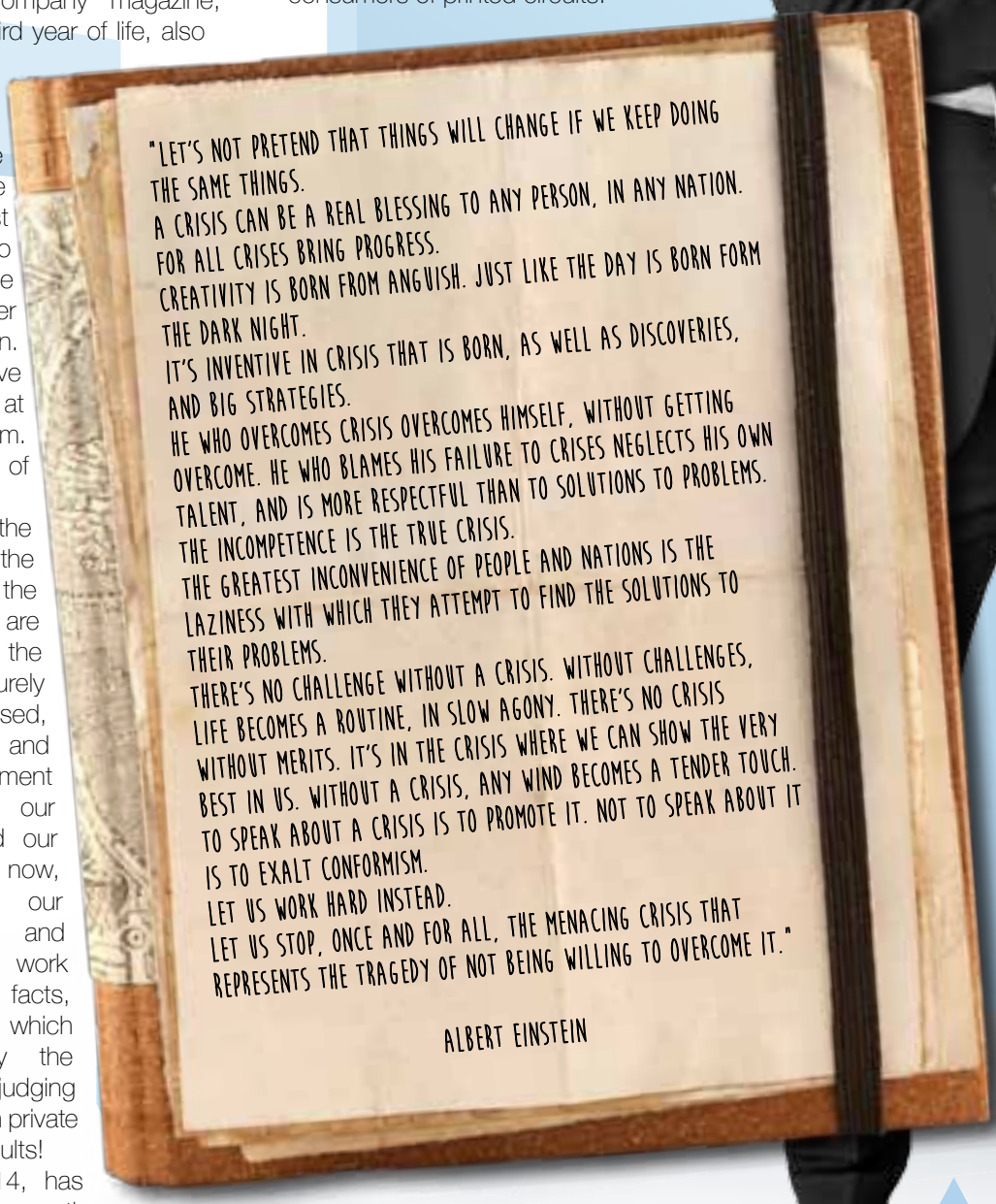
Italian Sensors Technology

EDITORIAL

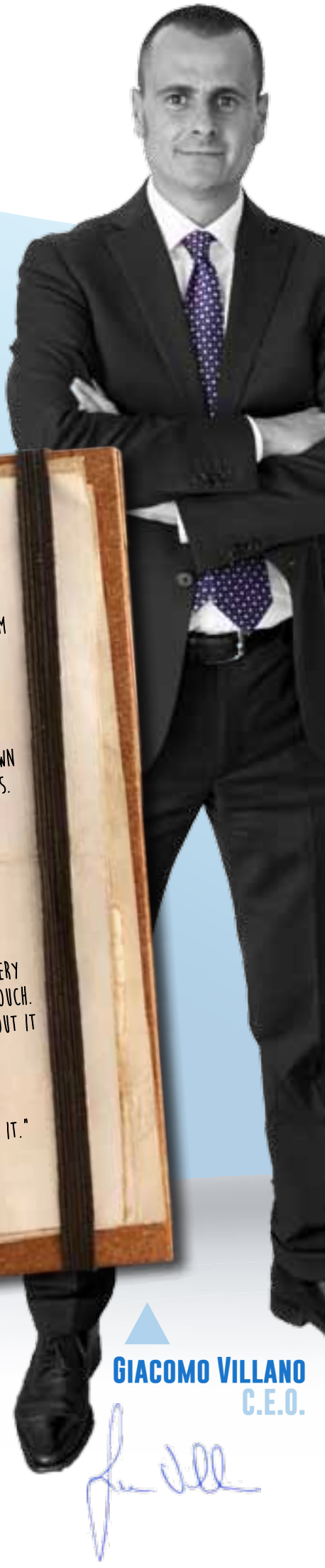
PEOPLE, PRODUCTS AND SERVICES: OUR STRENGTH

We have now reached the seventh edition of our company magazine, that is to say its third year of life, also corresponding to the fourth year of our Revolution. Yes indeed, because four years have already "flown" past since we decided to take the challenge and started all over changing our skin. Four really intensive years, driving at "three hundred km. per hour" and full of satisfaction.
Now, as then, the enthusiasm and the wish of climbing the highest pinnacle are unchanged. On the contrary, they surely have increased, fostered by growth and constant improvement resulting from our strategic plan and our daily actions. And now, more than then, our enterprising spirit and our passion for work are producing facts, the positivity of which is confirmed by the supreme arbiter judging any action validity in private companies: the results!
2015, as for 2014, has proven to be a growth and improvement year under all points of view for M.D. Micro Detectors: turnover, new products and performance. In 2015 we have also pursued our significant investment plan, aiming to raise our technological level and make our reality more efficient and effective. New plants and machines have increased our "fire power" and, in addition, we have converted a wide area to manufacturing activities, previously assigned to our warehouse.
The articles composing current edition of MD News, another icon representing our improvement path, will show you lot of news regarding M.D. Micro Detectors and Finmasi Group, too. Following topics, in short, are developed in the next pages:

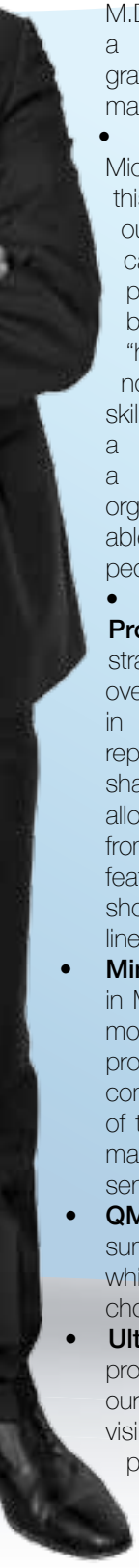
- Journey in **Finmasi Group**: in this edition we are talking about Cistelaier S.p.A.. Printed circuit high technology, a complete range of products and excellent service. All of this at the disposal of European consumers of printed circuits.



- **IO-Link**: a technology violently entering the M.D. world as of January this year, together with other connectivity protocols, which led us to show our first ultrasonic sensor with IO-link on board at SPS in Nurnberg, in addition to other news



GIACOMO VILLANO
C.E.O.



concerning communication field. In the next months this technology will be added to the other Micro Detectors product families.

- Our **safety sensor range**: also in this case this is a typical product returning us a great visibility.
- M.D. Micro Detectors S.p.A. **coils**: they represent the new worldwide M.D. business border as well as a new 2015 product receiving gratifying responses from the market.
- A new piece about M.D. Micro Detectors ***Lean Academy***: this time we are telling you about our experience on Takt Time calculation and how to size a production cell. Matters studied by some of us (maybe) on some "holy texts" up to 2011, they are now a consolidated professional skill of our people. This is M.D., a company who have faced a momentous change in their organization and way of working, able to realize it with the same people as before.
- The importance of **Custom Products** in Micro Detectors strategy: you will find therein a brief overview of M.D. competences in this matter. Custom products represent a more and more important share of our business, which allows us to distinguish ourselves from competitors, highlighting our features: Technology, Quality, a very short and simple communication line, a short decision making line.
- **Miniaturized Proximity Sensors:** in May 2014 we launched the first models completely developed and produced by us. In 2015 we have completed the range. We are one of the few companies in the world manufacturing these types of sensor.
- **QM and FAL lines**: we are summarizing in these two articles which advantages you will gain in choosing M.D..
- **Ultrasonic Sensors:** this range of products is strongly accompanying our growth and giving us great visibility on the market. We wish to let people know the reasons driving the choice of M.D. ultrasonic sensor. Very briefly: a complete and high performing range, fast deliveries and availability of custom products solving any customer application need.
- The previous paragraph is so realistic that our **first sensor with IO-link on board** is indeed an M18 standard cylindrical ultrasonic sensor.
- **Micro Detectors Ibérica**: a company with a great growth, a flagship in our Group, an example of M.D. Style. A General Manager, **Daniel Jornet**, one of those people who is worth knowing. Spain is a relevant market for us and more and more it will be.
- **CX series area sensors**: we are giving you some suggestions for better understanding which are the main applications of such a new product, which is distinguishing our company from our competitors.

We are ending our magazine with:

- The first images of M.D. Micro Detectors **new general product catalogue**: yet more evidence of the relentless and continuous improvement in our processes..
- The **new time of flight application sensor**: M.D. are widening their range of action, but above all they never stop.

And so, using the sentence of a famous TV announcer for motor races: "Engine at full speed and unleash Hell". Go M.D., we are ending 2015 in style and laying the foundations for a 2016 full of satisfactions for us, for our customers, for our suppliers, for our people and all those cooperating with us.

May Power and Good Luck be with us always!

DEPARTURES

Time	Destination	Flight
03·15	SIAF	GUANGZHOU
04·15	HISPACK	BARCELONA
05·15	SPS IPC DR.	PARMA
11·15	SPS IPC DR.	NURNBERG
03·16	SIAF	GUANGZHOU
05·16	SPS IPC DR.	PARMA
11·16	SPS IPC DR.	NURNBERG
03·17	SIAF	GUANGZHOU
05·17	SPS IPC DR.	PARMA

During 2015 M.D. Micro Detectors has participated in 4 fairs: SPS DRIVES IPC in Nuremberg and Parma, the SIAF in Guangzhou and the most important Spanish fair for packaging, Hispack in Barcelona.

In 2016 M.D. will take part to the following fairs:

- SIAF in Guangzhou: from 8th to 10th of March
- SPS IPC DRIVES in Parma: from 24th to 26th of May
- SPS IPC DRIVES in Nuremberg: from 22nd to 24th of November

We wait for you in our booth!

Micro Detectors
Italian Sensors Technology

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info@microdetectors.com.

YouTube

During the SPS IPC DRIVES fair in Parma we showed a preview of our new Company video. If you cannot feel our Company reality you can see the atmosphere, enthusiasm and professionalism we live by in M.D. Micro Detectors.

MD news

Enjoy our newsletter service:

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CISTELAIER TECHNOLOGY, QUALITY AND SERVICE

In 2014 Finmasi Group registered a funded turnover of 154 billion Euro, with 490 employees located in Italy, France, Spain and China.

Starting from the mid 90's, Finmasi Group developed a strong vocation for the PCB's market sector. Basic component for each electronic device, the PCB has a continuing and growing demand especially for technologically complex products.

Finmasi Group PCB Division, composed by the Italian Cistelaier S.p.A. and the French Techci Rhone-Alpes SA, approaches the PCB market with the offer pack "3M":

1. Multi-Product: from double side to more complicated multilayer and rigid-flex
2. Multi-Services: from prototype to mass production
3. Multi-Technologies: from the consolidated to those of maximum complexity.

The Group is able to offer a complete range on the market: from simple circuits to those of maximum complexity, from small batches to large quantities, from QTA prototype (three-five working days delivery) to planned batches of every quantity.

Cistelaier S.p.A. is a company with 130 employees, the result of merging Cistel in Genova and Laier in Modena, founded in 1976 and 1986.

Cistelaier S.p.A. is a company characterized by tradition, reputation and high technological level, built up over the years. It has a company organization based on Lean Thinking principles, reliable and controlled industrial processes and a really significant asset of machineries. It is a society with immaterial assets that with difficulty can be replied: its people's know-how, a result of decades spent developing and producing each kind of PCB. This is the real strength of Cistelaier: a professional team with high technical and professional levels create an organization able to supply its Customers with high level products and services.

The product portfolio is very wide: from double-side PCBs to multilayer; from rigid to rigid-flex PCBs; from standard material PCBs to special material PCBs with high technology for special application.

In the last two years the Company has been characterized by a deep revision process, with the objective being to improve in quality and quantity to help it compete in an ever more competitive market.

Cistelaier has the following certifications:

- ISO 9001:2008
- EN9100:2009 (aerospace and defence)
- UNI EN ISO 13485:2012 (medical devices)
- ISO/TS16949:2009 (automotive)
- UL 94 e UL 796 DSR
- IPC and MIL compliances.

Cistelaier strong points are:

1. excellent technical competence, result of years of high level activity
2. reliability and complete stability of the industrial processes
3. service level, in particular the QTA prototyping service
4. a complete product offer

5. organization and Team
6. people Know-How
7. equipment and machinery, that allow the production of more complex PCBs
8. access to the service of some of the highest qualified Chinese producers, removing the need for interested Customers from developing and producing tested PCBs.

We need to add to these characteristics

that are indelible parts of this Company's DNA, **the synergies created with the French sister Techci Rhone-Alpes SA, synergies that allow to our Group to face the European market in a coordinated way, proposing a wide and highly qualified product offer.**

The PCB sector represents a clear example of the globalization effects: starting from 2001 to today, the big producers of middle-low technology circuits have left Europe and the USA to manufacture in the Far East. Nowadays only producers with high qualified technology and service levels able to produce efficiently and rapidly the most complex circuits, can resist and get a space in Europe.

Finmasi Group believes so much in the PCB sector and in the Companies of the Group – Cistelaier and Techi- that work in this industry. Finmasi Group is strongly convinced that there is still so much space for European manufacturers, that are able to supply a wide and complete range of products, technological support to its Customers and high level service. The Group is investing substantially at all levels to maintain and develope its European industrial plant, and it is doing the same in Italy. Cistelaier is the example of how much the Group believes, with fact and words, that Europe should have an industrial future.

Marcello Masi, Finmasi Group's President and Cistelaier S.p.A. Sole Administrator, and also dominus and soul of the whole Group, is involved personally in the PCB sector, in the strong belief that the offer of Finmasi Group PCB Division is more than ever actual and able to satisfy the always more particular need of the PCBs consumers, that nowadays live in Europe.

Cisterlaier's references are the following:

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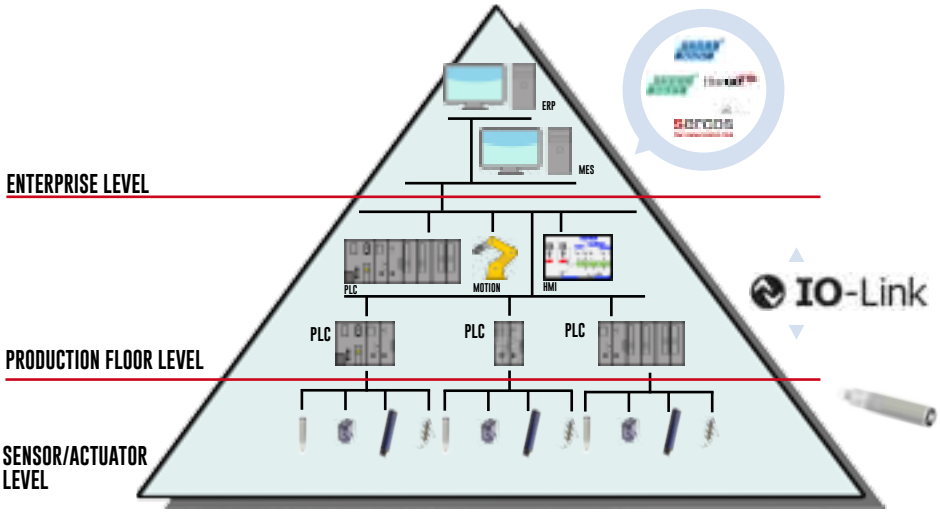
Download the brochure

MARCELLO MASI
PRESIDENT OF THE FINMASI GROUP

IO-LINK THE NEW M.D. CHALLENGE



Together with all changes our Company is bringing on day by day, both on the technical side, as well as production and service, we could not ignore considering a new open window into the communication world.

The new product types on which in the last years M.D. have concentrated all their efforts and investments, almost forced us to bring our portfolio to a higher level by adding the new IO-link interface.
Defining in few words on IO-link connection, we can talk about a system of bi-directional point to point communication between an IO-link master and all signals of (binary) interface (a sensor/actuator) belonging to any technology type) which gives as added value the chance to transmit I/O data via serial protocol, avoiding any issue between the fieldbus (of any type: Ethercat, Ethernet, Sercos, Profibus, Profinet, Asi) and sensors, since all their interfaces are now able to communicate.

With this new way of designing and of completing our ranges of products we thought to provide a further advantage in customer service. The goal of such an important choice has been not just to follow a market trend, but to make our sensors much more useful and functional. We have studied, tested and evaluated, we have been sharing within all departments and digested the reason of such a choice and we realized that M.D. must be involved! We must be there!

It was necessary to start such a path. And here we are into the first challenge: IO-link interface in our ultrasonic UK1 family, the product more conforming to this technology.

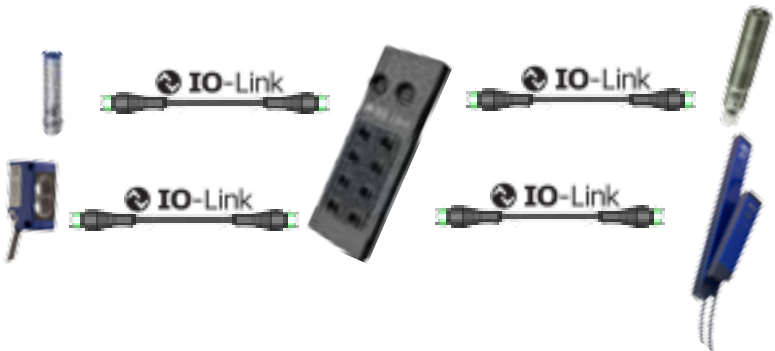
The principles defining an IO-link system and for which we have been attracted, and from which we started appreciating and "digesting" such a system are as follows:

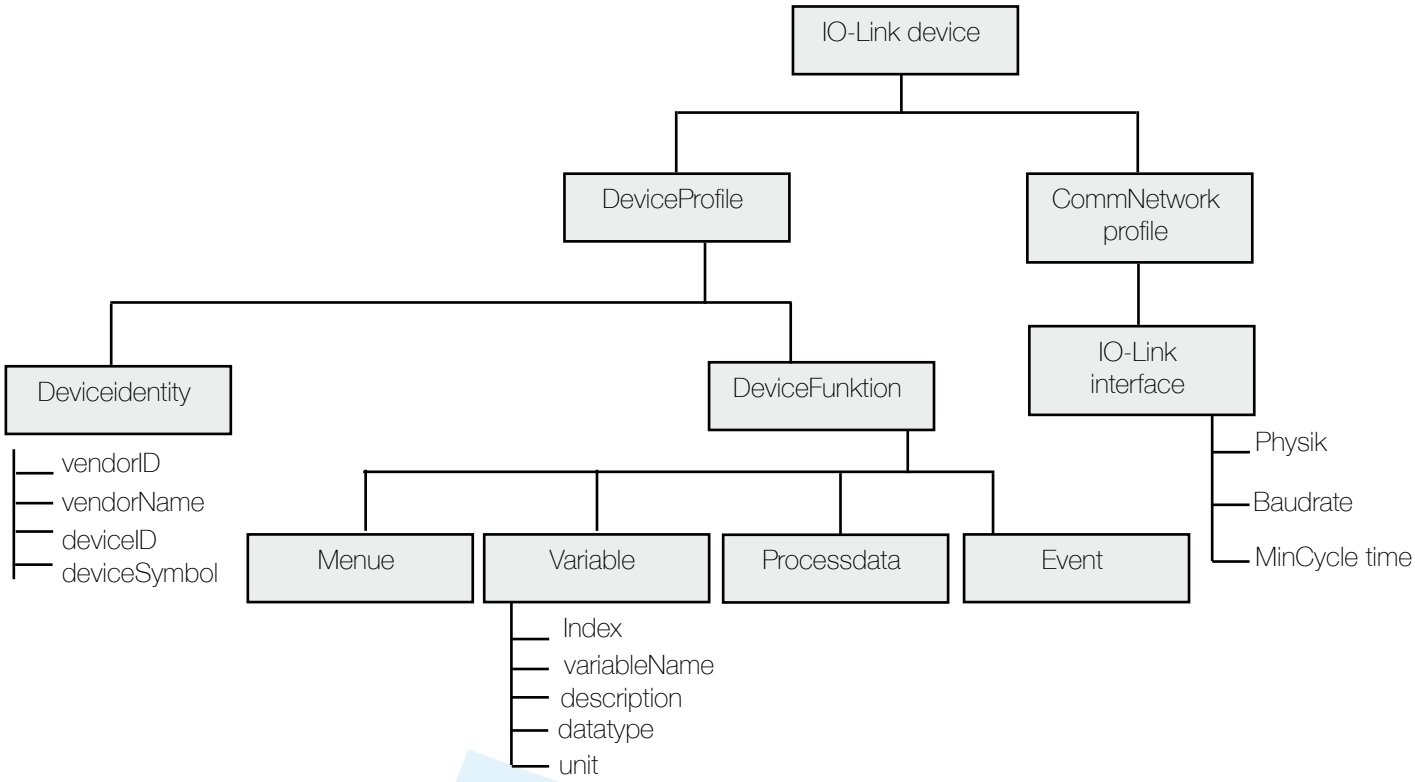
- easy installation
- automatic parametrization
- extended maintenance based on real factory needs.

We have always promoted the robustness of our sensors and their endurance over the years. Finding a system which makes these features more obvious in the application, removed any doubt in the realization and final choice of such a project from the M.D. side. The only effort required by the operators, once they choose the required sensor is its initial installation.
In this case we do not talk only about simply installation but we consider the real application needs.

Thanks to such a system, in fact, the sensors are mounted in the best way since their availability is not always required. There is no need to modify every time the set up of the sensor. Now through a common interface (IODD), the operator can adapt the technical specifications of the product to the real needs of the machine, automatically parametrizing the necessary features to make the system function.

Soon after, any intervention will come from a real factory needs. After-sales, maintenance, and all improvements will be made only in case of emergency and they will be managed with faster and shorter interventions. There will be no need of any extraordinary maintentance intervention or machine hold for unforeseen replacement, with all relevant consequences. The machine hold times will be deeply reduced, because in case of any issue on the sensors, its parameters will be automaticaly forwarded from the IO-link master to the new one. The start, shape variations, or changes in the sensors preparation can be performed and managed through a centralized level. Once the sensor is connected to an IO-link system can transmit any wrong functioning or intervention need. Moreover, in such a system, all data from/to the sensor are stored to avoid any consequence in case of current overload. Once these data have been





stored, it is possible the replacement of any device without need of re-programming it but simply re-installing.

Moreover, an IO-Link system is absolutely not complicated for any operator, since it is composed of only 3 important elements already available to work together:

- Sensor
- 3 pin cable
- Master.

The connection between Master and sensor, and by consequence Master and Fieldbus make absolutely profitable and efficient any machine intervention. If there is a problem relating to the cable, the sensors automatically, through this universal system enables you to arrive at the cause immediately with minimal effort.

This is reason why we, M.D. Micro Detectors, decided to move ahead aware of all the advantages that such a system could grant to our customers. Our ambition and will to grant confidence and efficiency to our customers brought us to become a specialist in this technology, so we can propose to our customers a complete M.D. IO-link offer, made not only of a cable and sensor, but also of a personalized expert. Our challenge is to make our IO-link expertise 100% complete to take advantage of any opportunities requiring this technology.

Our aim is to start from the "easiness" of a whole package and being available to work in a fieldbus system to avoid any trouble and thought to one willing to use it and to get profit since the beginning of its advantages.

Of course all M.D. personnel will be glad to show to all their customers what has been described above, starting from the ultrasonic family, and more than that to show the easiness to adapt such a system to all of our products to find all applications by any industrial reality.

We invite you to download our detailed brochure on our website and experience it!

SOMETHING UNIQUE
M.D. SAFETY PHOTOCELLS

Industrial Safety is an extremely important subject which requires a deep knowledge not only for standards, directives and regulations but also for the technological and innovation aspects behind safety products.

M.D. Micro Detectors has these characteristics in its SAFETY product offer, confirming itself as a company committed to excellence in all fields of technology and commodity in the world of industrial automation.

Customers today require industrial safety compliant to the main standards/ regulations but also requires a supplier able to provide an offer as complete and detailed as possible. In this perspective the M.D. Micro Detectors safety product portfolio outlined is complete and extensive.

Let's talk about the type 2 and type 4 safety light curtains LS2, LS4 and LP4 series all of which are available with 14, 20, 30, 40, 50, 90 mm resolution as well as 2,3 or 4-beams for the finger, hand, presence control and body protection respectively with Control heights range from 150mm up to 1800mm. Basic models for fast and easy mounting and cabling and advanced models with integrated functions, such as the selectable automatic or manual reset and EDM.

In order to meet the requirements of harsh environments and applications, M.D. Micro Detectors also offers models with waterproof Plexiglas tube housings that guarantee IP68 and IP69K mechanical protection, ideal for applications on food machinery, or simply where there is persistent presence of moisture deposited on the surface of the barrier. In addition, for applications where barriers are installed inside cold storage, M.D. Micro Detectors can provide versions with an integrated resistance heater.

A full range of Category 2 Safety control units SBCR03 Series are available with the advanced model benefitting from dual channel muting. This highly effective solution is widely used in applications in the ceramics industry, especially on palletizing, stacking and sorting lines, to perform safety access control and even confirm the presence of an operator within a hazardous area. The muting function in this case is used to discriminate between the operator, who can not be inside the machine during the working phases and an automatic guided vehicle (AGV) that brings in an empty pallet and returns to remove it after it's loaded with tiles.

The TOP CLASS inside M.D. Micro Detectors safety portfolio is the full range of safety photocells. We speak about Class 4 M18 tubular photocells SH4-IA series compliant to IEC 61496-2: 2013, PL e and SIL 3 in accordance with EN ISO 13849-1. Models with axial or radial optics are available, with operating distances reaching 10 and 5 meters respectively. All SH4-IA models are available with plastic or metal housings and with axial or radial M12 connector.

When a safety photocell with extreme performance is needed, M.D. Micro Detectors, the only company on the market able to offer such a solution, can provide its customers with a range of M30 Tubular TH6-IA series safety photocells which are Class 4 certified according to IEC 61496-2: 2013 as well as SIL 3 and PL e according to EN ISO 13849-1.

The main characteristics of TH6-IA series are the following:

- **Operating distance up to 60 m**: only M.D. Micro Detectors can provide this range in such a housing style
- **Metal housing**: it gives higher strength to the product making it ideal for all applications on large machines, subject to mechanical stresses
- **Glass Optic**: it gives higher strength to the product making it ideal for all applications where the working temperature is greater than 50 °C
- **IP67 Protection**: thanks to having complete resin filling the product can be temporary immersed into water and has a higher resistance against shock and vibrations
- **Working temperature from -20 to +60 °C**: thanks to resin filling, TH6-IA photocells working temperature is extended to -20 to +60°C compared to the usual 0°C to 55°C. That makes TH6-IA the ideal product for extreme applications
- **TÜV and cULus SAFETY certification**: the products are fully certified and compliant with updated editions of 2006/42/CE Machinery Directive and IEC 61496-2:2013 e EN ISO 13849-1 safety standards
- **Service Level**: M.D. provides extremely fast and efficient delivery thanks to its lean, modern and qualified production process. Not only but all our customers are totally supported under technical and commercial point of view by our professionals.

All TH6-IA models are equipped with M12 4-pole radial connectors that makes installation and cabling quick and simple.

Safety photocells TH6-IA series can be used in combination with M.D. Micro Detectors safety control unit SBCR03 series to perform a Category 2 safety control installation according to EN ISO 13849-1, or even with a Category 2 or Category 4 safety PLC to perform respectively Category 2 or Category 4 safety system.

The most common applications/sectors for TH6-IA safety photocells are:

- Logistic and automatic warehouse
- Packaging and packing machinery
- Robot cells
- Automatic assembly lines
- Woodworking machinery
- Glass and ceramic machinery.

Contrary to what is perceived by some operators in the safety market, that the mono-beam photocells with external control unit represent non actual and impractical solution compared to the fully integrated light curtains, we are seeing, especially in the last three years, a constant increase in the sales of these product lines. This is why, Micro Detectors invests significantly in keeping the sensors performing from both a technological and commercial point of view. Customers are recognizing our efforts so, despite having the possibility to choose from our offer "barrier" solution, they continue to believe in and prefer this reliable, unique and distinctive solution, able to solve all the problems of their applications.

By combining expertise in the various technologies (proximity, photoelectric, ultrasonic, area and safety sensors) M.D. Micro Detectors is recognized as sole supplier for the sensors to be used on your machines. This is not only due to the high quality and technology expressed in our products but also due to aspects like flexibility, speed, quality and above all excellent levels of service, features that cannot be ignored in the complex and demanding market of industrial automation.

	SH assiale	SH radiale	TH
			
nominal operating distance Excess Gain = 2	0...16 m	0...7 m	0...84 m
nominal operating distance Excess Gain = 4	0...11 m	0...5 m	0...60 m
model	M18		M30
spot diameter	12		26
minimum detectable object	ø 15 mm		ø 24 mm
emission	red		
Effective Aperture Angle (EAA)	typical 1.8°; ± 2,5°		
power supply	10...30 Vcc		
current comsumption	≤ 25 mA (emitter); ≤ 25 mA (receiver); 22 mA (typical, light mode)		
output current	50 mA; 70 mA max		
emission wavelength	660 nm		
standard modulation frequency	123 KHz		
supply voltage UB	19.2 V...28 V		
residual ripple	≤ 5 V		
HIGH level output	U_B - 3.2 V... U_B - 2.5 V (typical)		
LOW level output	5 V		
reaction time receiver output per transaction LIGHT / DARK	200 µs, from front to LOW DARK models for IC, to HIGH for models IA		
reaction time receiver output per transaction DARK /LIGHT	400 µs, from front to LIGHT UP models for IC, LOW models for IA		
response time of safety	it would depend on the security utility		
LOW input Test projector	< 5 V IC output inactive; model IA active issue		
HIGH input Projector test	vin test >> 15 V IC output active; model IA issue inactive		
test input LOW level (Emitter)	IC models, LOW = DARK; HIGH = LIGHT IA models, HIGH = DARK; LOW = LIGHT		
electrical protection class	III		
mechanical protection	IP67 (EN60529)		
working temperature	-40 °C... + 55 °C (typical + 20 °C)		
storage temperature	-40°C... + 75°C		
humidity (no condensation)	15%...95%		
weight	30 g (plastic); 67 g (metallic)		212 g
shocks	10 g; 16 ms; (IEC60068-2-6)		
vibration	10 Hz... 55 Hz, 1 oct./min, 0.35 mm (IEC 60068-2-6)		
material	Lens: Glass with PBT ring; Housing: Brass nickel-plated or PBT; M12 plug:PC		Lens: Glass, aluminium; Housing: Brass nickel plated; End cap: PC; M12 plug: PBT

RAFFAELE TOMELLI
EXPORT SALES MANAGER

AMBITION AND EXPERIENCE

THE RIGHT MIX TO DEVELOP THE M.D. COILS

Micro Detectors' strategic vision considers the Company vertical integration as one of their milestones: this concept is represented by "Made in M.D.". From Research and Development of new products to shipment to the customer, everything is carried out by our staff under our roof. Having a total control on the whole company activities has given us concrete benefits in terms of increase in Production Capacity, Productivity, Efficiency, Speed, Flexibility, Control of Processes and Technology.

We consider M.D. Micro Detectors as a single entity having its activities in Italy, Spain and China. The three facilities have to move in coordination and in synergy. The three companies bring their contribution for elaborating and implementing the whole strategy. Also the managing staff, even if located in different locations, work as one as a team.

A practical example of the above concept is represented by M.D. Micro Detectors (TIANJIN) CO., LTD., who have manufactured coils for our inductive sensors since the middle of 2013, a product provided by a foreign supplier till then.

At the dawn of its first three years of activities, our Chinese subsidiary has totally borrowed M.D. Style and thanks to our Operations Manager Gary Li's essential work we have created a solid structure for production of coils, able to give steady and excellent performances both under the qualitative point of view and the quantitative one. In addition our Chinese production facility is organized to fully comply with Lean Manufacturing principles.

The type of product, the experience reached and the strict cooperation between M.D. Micro Detectors S.p.A.'s Research & Development and the Chinese subsidiary ensures this business covers not only the M.D. inductive sensor range, but also other companies dealing in the industrial automation field and beyond.

The efficiency level reached during the last years both in standard production and in the different customizations made on this component, naturally lead to the promotion of a service, useful for all companies that may be interested in it.

M.D. Tianjin, in fact, is not simply producing, but also creating a great number of specific versions on the basis of a drawing or a project, aiming to supply our customers not only with the best product in terms of performances, but also the most competitive one.

During the different phases of our continuous improvement process we actually have been able to set up a great number of connections among suppliers of material used to manufacture the coils, thus granting the possibility of creating a lot of versions suitable for any needs.

We currently offer our customers three main options:

- The customer standard product as it stands
- The customer standard product, optimized in terms of material used
- The customer standard product, improved in terms of

GARY LI
OPERATIONS MANAGER M.D. TIANJIN

performances or technical features.

The offer we are presenting our customer is never a single option, but composed of different distinctive elements and factors. The only effort we ask our customer for, at the very first phase of the project, is to verify which one meets their needs the best. Moreover, thanks to the strong relationship among our Purchasing Dept. and our suppliers both local and Chinese ones, the selection and procurement of raw materials is always carried out in short times; therefore any supplies is featured by "made in M.D." concept, that i s efficiency, speed and total product reliability.

All coils are subject to different tests during the manufacturing phase and are 100% tested, no random tests are carried out. Obviously our customers are not charged with any cost increase for this.

M.D. Micro Detectors are able to offer their customers a 360° service as a matter of fact: from design to shipment. This is the reason why we have gone in this new business direction. We are confident we can offer our customers a way, the easiest one, of improving their product and not just a mere alternative.

Our structure is presenting its whole more than 40 years experience, granting high levels performance. This is the main reason we decided to invest in our factory in Tianjin.

Therefore you are invited to experiment with us, at your free choice, so that you can test the benefits from this new component!

Download the coils brochure

LEAN ACADEMY

TAKT TIME CALCULATION & PRODUCTION CELL DIMENSIONING

Starting from MD News No.4, we have included a series of articles concerning the Lean Thinking method, introduced in our company since the end of 2011. Through these tutorials we wish to share our experiences and make them available for other companies to benefit from. M.D. Micro Detectors believes that the application of these principles gives the European companies a competitive edge that is essential in order to compete and to grow even against those manufacturers working in countries where they have advantages in terms of costs (referred to the relevant Country-System cost, meaning in particular labor costs, taxes and costs of bureaucracy).

In this edition we are going to show you the method we adopted for calculating the Takt Time in order to correctly size a Production Cell.

TAKT TIME

Let's start from its definition: what is the Takt Time? Is it the time strictly necessary to manufacture a product? Is it the time spent between the manufacture of a product and the following one? None of this.
The Lean Manufacturing techniques expect a Production System perfectly consistent with the demand expressed by the Customers for all the products corresponding to each different manufacturing process: the fulfillment of the Customer request must be completely granted by each cell for all its production line.

It is the Customer that "pulls": for this reason the logic behind the Lean Manufacturing is of Pull type.

The Takt Time related to a Production Cell is the maximum time that must pass between the completion of one piece and the next one, to ensure that in every productive day we can manufacture the demand expressed in average by the totality of Customers concerning products carried out in that cell, nothing less and nothing more.
Why nothing less? If truth is the system it must satisfy the Customer's demand, then it must guarantee fulfillment of the total demand on time.

Why nothing more? A Lean Manufacturing principle provides for a "tailor made" production system, it should not be oversized to avoid bad use of resources with any relevant waste. If capacity of a production line was higher than requested, a negative result of creating inventory stock would be the consequence together with the "Total Costs of Ownership" (TCO) including financial costs, obsolescence costs and all those costs linked with bad use of production area; in few words the system would not work following the "Just in Time" principle anymore.

"Just in Time" means to start production only with the strictly necessary time in advance to ensure a shipment on the very date required by Customer.
The production system must be able to quickly react to any changes in demand: it must not be oversized, but always ready and able to "change gear" at the right time or, better, at any time. Hereof another fundamental concept, which has been emphasized in M.D. Micro Detectors thanks to the introduction of Lean Manufacturing: Flexibility.

The following explanations are completing and illustrating in a better way all concepts expressed as far, however it is necessary to understand straight away that a Lean Production System is built on customer's needs.

FROM THE TAKT TIME CALCULATION TO THE PRODUCTION CELL SIZING

Once defined the Sales Volumes for single production process and therefore for single cell, it is possible to determine the production rate that should keep the same cell: that is, you can calculate the so-called Takt Time.

In details it is necessary to find out the real Time Available in One Year for Production.
We can obtain this result through two steps below:

- Calculation of Actual Working Days per year
- Calculation of Actual Working Hours per single working day.

For instance, if for a particular Cell resulted:

1. Annual Sales Volumes in total: 100 k units
2. Actual Working Days per year: 225
3. Actual Working Hours per working day: 5 (except for breaks, set up, physiological decrease of operator's performances and any other inefficiencies

the relevant Takt Time in minutes would correspond to
Takt Time = (225*5*60) / 100K = 0,675 minutes = 40.5 seconds

This means that to satisfy the Annual Total Customers' demand it is necessary to manufacture 1 piece every 40.5 seconds during the actual working hours.
The Production Cell should be conceived to return therefore a daily output not inferior to – and slightly superior to – 445 pieces per each working production day.

Daily Output = = (5*60) / 0.675 = 445 units.

We suppose that the Content of Manual Work to produce a single piece is 125 seconds. In this case to guarantee a pieces could be manufactured every 40.5 seconds it is necessary to consider a staff made of 3 persons:
Needed staff for Cell = Content of Manual Work each piece/Takt Time = 125/40.5 = 3

The three persons in reference should have a similar workload. In order to grant this result it is necessary to divide the whole work content necessary to manufacture a single piece in elementary and feasible work portions, then share them among the three persons composing the Cell Team. This phase is called "Balancing" and allows to assign a substantially equivalent content of work to the single Cell operators.

The Production Cell size should be periodically re-calculated on the basis of any variations in demand.
You can find some realistic examples as follows.

Should a sudden peak in demand arise, it is easy and fast to ask the so sized staff to do some overtime. This guarantees, in fact, to reach the goal without changing anything regarding

the cell structure, in particular without any need to modify the Standard Work already assigned to each person in this cell.

Should the demand show a structural growth, even if moderate, the most suitable recovery action would be to add a new person to the staff. In this case the Takt Time, the Balancing as well as the Standard Work assigned to each operator should be modified.

Should the demand show an important structural growth, for instance the double with respect to original one, the most suitable action would be to add a new working shift for that specific cell. In this case it would not be necessary to modify the Takt Time and the Balancing. Therefore, the Standard Work assigned to each operator would remain the same.

This means that the Production Cell should be conceived in a reasonably flexible way from the beginning, so that a fast reaction to possible variations in demand can be achieved.

That flexibility will also depend on the Company's capacity to create a multitasking Staff: it is possible to add a person to the cell only provided that he is able to carry out the new activity required.

The more the Cell Managers are able of turning the staff in different cells – thus different processes – as well as to facilitate the staff work assigned for each process, the higher this capacity will be.

This has become a daily activity in M.D. Micro Detectors. In this way any possible absence for illness or vacation is not binding at all. That practically corresponds to the Company's capacitive of constantly keeping high levels of service.

This means also that flexibility does not always have a cost, on the contrary it can be and must be obtained through the simplification of working activities.

This calculation and re-calculation technique for the cell sizing makes people realize how simple the definition of necessary staff variation can be. Therefore it becomes easier to ask the "Boss" for the authorization to hire a person in addition to those already available.
With the department system previously adopted by M.D. Micro Detectors (please see M.D. News n.6) it was difficult to calculate the additional staff to hire in case of structural growth and even more complicated – sometime frustrating – to submit this request to the Company Management, because it was really problematic to support same request by means of actual data.

To banish all doubts about the need of never stopping the constant improvement journey, it is necessary to emphasize that on equal demand and therefore same Takt Time it is also possible to reduce the cell staff. One of the main targets for the Cell Manager, supported by the Cell Leader, the Cell Staff and the Factory Support Services is, indeed, to make the process easier for a production time decrease with consequent cell staff reduction.

The constant relationship with Research and Development people should also take to simplifications with consequent benefits in terms of Productivity.

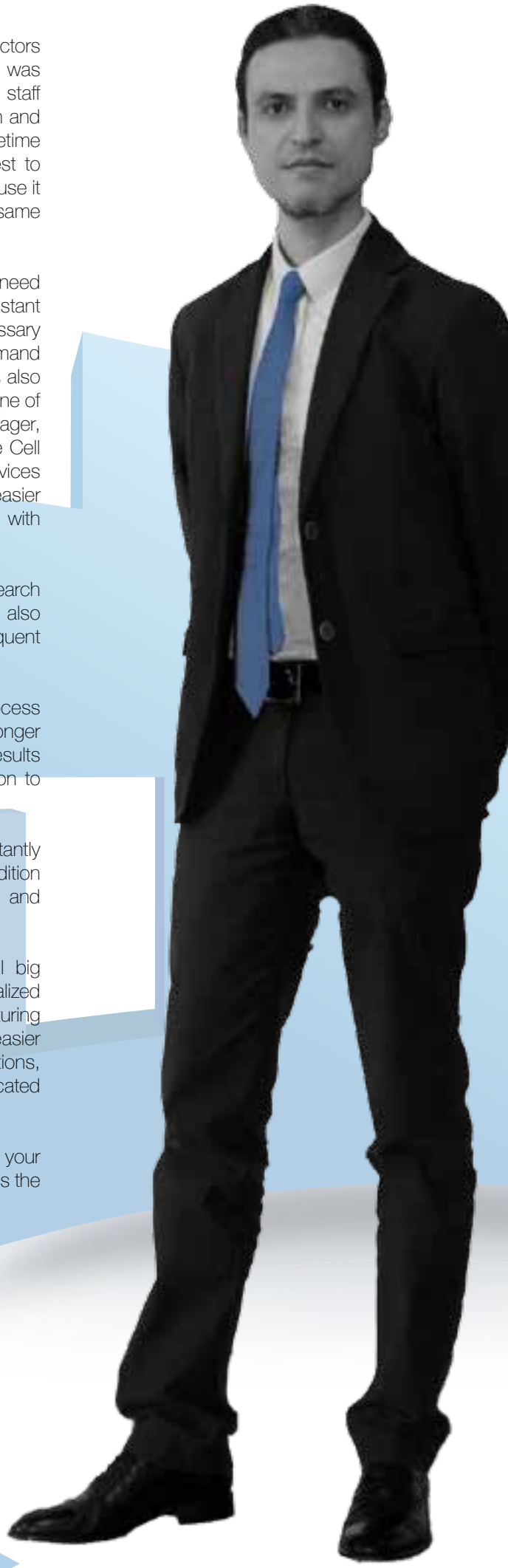
A collateral effect of a process simplification is to make it stronger and able to return the best results also in terms of Quality, in addition to Productivity aspects.

This approach allows to constantly remain competitive, necessary condition for the Company Development and Growth.

According to our experience, all big simplification processes realized by means of Lean Manufacturing implementation allow an easier identification of necessary solutions, the less physiologically complicated and most efficient.

The Lean approach "lets your imagination run wild" and enhances the people potential efficiency.

Have a Good Job!



CLAUDIO GUERZONI
OPERATIONS MANAGER

CUSTOMIZED: THE GREAT IMPORTANCE OF THE CUSTOM PRODUCTS

Current economic conditions are forcing companies to become substantially faster in meeting the market demands, with the aim to satisfy their customers' requirements also by means of personalized products (the so called "custom products"); these devices are realized with high quality standards, in reasonably short times and they can even solve niche applications as well as be used in very critical working conditions.

M.D. Micro Detectors S.p.A. strategy is strongly focused both on Customer and on the maximization of their Service Level, aiming for excellence. Another main target for M.D. is represented by the Made in Italy concept. The application of these three strategic guidelines is what probably motivated our Company most to become a specialist in development of custom products. M.D. Micro Detectors want to grow and develop in Italy, in Modena, taking more and more root in their territory. At the same time they want to spread their presence on the International markets in a wider and extensive way: M.D. is a real example of global development by means of local strengthening. Customization should then be seen as a tool used by our company to improve the service level we offer our Customer.

M.D. Micro Detectors' dimension and structure benefit the development of this particular product category, because upon its receipt the customer request is immediately taken into consideration and analyzed, therefore a feedback is given to the customer rapidly. The decision-making line is very short in our Company, since the sales department directly interfaces with people in Research and Development, who in their turn involve the Management only in case the request for a custom product needs either longer times than some working weeks or important investments to realize mechanical parts or printed circuit board customizations.
The concept of a custom product is very broad for M.D.: different cable length, personalized label and LASER marking, cabling on customer's demand, different packaging than standard are only few examples of what is considered as a custom product easy to be realized in M.D.. But for M.D. the realization of a custom product often means to design, manufacture and sell a sensor starting from scratch on the basis of specific Customer's application needs.
For a better understanding of the custom product meaning, we are showing below the latest two cases regarding products we have developed following the specifications defined in cooperation with our customer.

The first case represents an optoelectronic sensor with 12 optics with programmable and independent analogue outputs, with parallel elaboration. This sensor is able to reconstruct the profile of a matt object passing through the single optical beam. The object shadow mitigates the signal received and that variation is processed and turned to the corresponding analogue output. By leveraging this principle in a differential way, it is then possible to size a small object and its relevant counting.

The second case instead is constituted by a single beam Photoelectric Sensor with digital output for person detection, approaching a fitness equipment, aiming to start the equipment console when a person is detected and switch it off when the absence of same person is detected.
These two short descriptions will help you understand how we are handling two very different products, with different technology complexity levels (the former based on FPGA and 32 bit microprocessor, the latter on a more simple 8 bit microcontroller) but with one single essential common element: in both cases the electronic and mechanical design has been realized on the basis of specifications defined by Customers and starting with a blank sheet of paper.

This high flexibility has allowed the customer companies to perfectly solve their needs, both electronically and mechanically, making the installation easier. On the other hand M.D. Micro Detectors had the opportunity to enter two market fields, which were only a strategic target not yet achieved a few months ago. These are a clear evidence of "win-win" strategy, meaning a great value has been produced both for the Customer as well as for the supplier.

In the following table we are showing the quantity of custom products realized by M.D. Micro Detectors during the last 3 years:

As you can see from this data, the number of customized products is very high; it demonstrates how our company believes in this tool as a means of promoting loyalty among its customers, winning new ones and attacking those markets, which do not yet belong to M.D. Micro Detectors standards:

CUSTOMIZZAZIONI	
2013	133
2014	142
2015	104 (*)

(*) Data updated at 31/10/2015

all this aims to keep on strengthening our growth process under way, both in Italy and abroad, as well as increasing our technology level.

As a further demonstration of our companies willingness to increase its business through custom products, a new marketing tool has been realized ad hoc, M.D. Special, containing all possible customizations available on M.D. products as well as the main examples of custom products.

Flexibility, Speed, Technology, Quality, Level of Service: this is M.D. Micro Detectors.

Just test us!

Multi-beam optoelectronic with 12 optic beams

Multi-beams optoelectronic sensor with independent and programmable analog outputs with parallel data processing. The sensor is able to profile any opaque object that interrupts the single optic beams.

Single beam optoelectronic sensor

- Easy mounting
- Molex Picoblade connector
- Digital output: PNP

Single beam sensor with digital output to detect the presence of a person on a "treadmill" for home wellness.
The sensor is used to switch ON the console when a person gets on the "treadmill" and to switch OFF the console when the person gets off in order to drastically reduce the equipment's energy consumption.

ROBERTO BOSANI
R&D MANAGER

On-Line available **MD SPECIAL:** the catalogue of all M.D. customizations

Now available online the english and italian version of the catalogue of all customizations, which M.D. Micro Detectors realized for all their customers during last year. For more information, visit our website or ask for it to your contact person.

M.D. MINIATURIZED PROXY WHERE THE BEST DARE

M.D. Micro Detectors is one of the few companies in the world that develops and manufactures its own line of miniaturized proximity sensors, both in cylindrical and cubic housings. For more than 40 years M.D. has been manufacturing proximity sensors: with the new miniaturized products, launched on the market in May 2014, we renewed and completed a range of sensors that, thanks to its great tradition with technology, quality, durability and level of service, has always positioned as a market leader.

As a further guarantee of professionalism and reliability of design, the coils used in all of our inductive sensors is made at our manufacturing site, M.D. MICRO DETECTORS (TIANJIN) CO., LTD., which produces using the principles of lean manufacturing and conforming to the technology parameters and quality of Micro Detectors Worldwide. The integration strategy we have undertaken for several years, allows us to have the complete control of the production of a key component for an inductive sensor, the coil and to have full control of the production process and of the product technology.

The range of miniaturized inductive sensors from M.D. Micro Detectors is fully complete and consists of the following product types:

- Cylindrical miniaturized proximity sensors, launched in mid-2014 (see Annex 1)
- Cubic miniaturized proximity sensors, launched in middle of this year (see Annex 2).

The key strengths of the miniature inductive sensors produced by M.D. Micro Detectors are:

- ASIC-based sensors, who's key benefits are:
  1. high stability with changing operative temperature
  2. complete control of the characteristics of the sensor (sensing distance, hysteresis, temperature drift,...)
  3. accurate detection in all working conditions
  4. prolonged lifetime
- housing with reduced dimensions
- easy installation sensor
- completely resin encapsulated circuit that ensures:
  1. high protection against vibration
  2. low maintenance costs.
- High working distances
- For all models, cylindrical and cubic models IL5-IL8-IL9, the housing is in robust AISI303 stainless steel
- LASER etched labels, for cylindrical models with connector output and cubic steel housing
- Visible status LED on all models
- High switching frequency: many models up to 7 kHz.

Other key strengths of the range produced by M.D. are as follows:

- sensors completely developed and produced by M.D.. This allows us to provide our customers the highest level of flexibility and effectiveness as well as the guarantee of total control of the production chain and thus the quality and technological performances
- since it's made by us using our technology, also with these lines of sensors we are able to achieve customizations to meet specific application needs of our clients.

With these new sensors, M.D. Micro Detectors offers the market with a full range of inductive sensors, all designed and produced in-house:

- miniature inductive sensors, from Ø 3 to M8
- standard inductive sensors, from Ø 6.5 to M30
- inductive sensors with cubic housing: 5x5, 8x8 and 10x16
- inductive sensors for food and beverage applications, with AISI 316L stainless steel housing and IP68-IP69K protection degree
- inductive analogue sensors
- inductive sensors with special features (IP68, DECOUT, extended temperature, etc.).

Moreover, M.D., as noted above, can offer customized products dedicated to the customer or to the individual application. These customizations ranging from basic modifications such as:

- cable lengths or dedicated connectors
- housing of non-standard size
- custom labels with the logo and the part number of the customer.

Where needed we can develop a totally new product based around a customer's specific requirements by combining our expertise in the various areas (proximity, photoelectric, ultrasonic, area and safety sensors) M.D. can be your unique sensor partner.

1: NEW MINIATURIZED SENSORS IN CYLINDRICAL HOUSING

AA1	AB1	AC1	AD1	AHS	AES
Ø3	M4	Ø4	M5	Ø6.5 mini housing	M8 mini housing
Sn= 0.6 mm (standard)		Sn= 0.8 mm (standard)		Sn= 1.5 mm (standard)	
Sn= 1 mm (long distance)		Sn= 1.5 mm (long distance)		Sn= 2mm (long distance)	
Shielded					

2: NEW MINIATURIZED SENSORS IN CUBIC HOUSING

IL5	IL8	IL9	IL1
	Top detection	Centre detection	
5 x 5 x 25 mm (cable)	8 x 8 x 40 mm (cable)		10 x 16 x 28 mm (cable)
	8 x 8 x 59 mm (M8 plug)		10 x 16 x 37 mm (M8 plug)
Sn = 0.8 mm (standard)	Sn = 1.5 mm (standard)		Sn= 3 mm (shielded)
Sn = 1.5 mm (long distance)	Sn = 2 mm (long distance)		Sn= 6 mm (unshielded)
	Sn = 2,5 mm (extended distance)		
Shielded			
AISI303 stainless housing			Plastic housing (PA)

GIOVANNI DI LORENZO
PRODUCT MARKETING
PROXIMITY SWITCHES
AND ULTRASONIC
SENSORS

Download the miniaturized inductive sensor brochure

IF THE SKY IS YOUR LIMIT, JOIN US!

TRAINEE PROGRAM

INTERNSHIP OPPORTUNITY FOR STUDENTS

JOIN OUR TEAM

We don't look for dreamers, we look for people who believe it's possible to realize their dreams in the only way we know: with the passion, professionalism, a forehead of sweat and the team working.
If the electronics and the Industrial Automation worlds are your professional ambition then come and join M.D. Micro Detectors. We are waiting for you!

Micro Detectors
Italian Sensors Technology

SEND YOUR CURRICULUM VITAE AT INFO@MICRODETECTORS.COM.

M.D. PEOPLE


















"Proudly we say this is the M.D. style: people believe the work is firstly a pleasure and then a necessity and a duty. It's a continued challenge, a tool to accomplish ourselves and create something useful for all: inside and outside our company. People don't suffer challenges and problems but face them increasing adrenaline levels in the body. This is the M.D. style: team working, professionalism, quality, resourcefulness, elbow grease and a lot quantity. Always. Without limits. Everyone must be a living example of this way of doing business, every day and every minute. Everyone must always be in the frontline, in front of everyone and next to the others who do it every day. This is the secret to achieve everything we want to put into practice".

QM LINE
TECHNOLOGY, QUALITY AND SERVICE

M.D. Micro Detectors S.p.A. were the first company to launch the M18 cylindrical housing on the market. As a consequence we have been and we still are today to a large extent, identified as a company specialized in production of cylindrical sensors but M.D., who have developed and manufactured photoelectric sensors for 44 years, produce an extensive range of sensors in a variety of housings. The production line of cubic miniaturized photoelectric sensors, QM series, is giving M.D. a high visibility, beyond the limit of cylindrical shape.

QM series is composed of a really wide range of sensors, to fit all typical application needs for industrial automation. All that equipped with a service level based on speed and efficiency, making a highly performing company of M.D. Micro Detectors relating to speed of manufacture and fast delivery to customers.

QM line is composed of:

- direct diffuse models with sensing distance of 100mm, 400mm, 1000mm and 1500mm, either red emission or infrared
- background suppression models with optics triangulation and mechanical adjustment of sensing range from 30…200mm with red emission and from 30…400mm with infrared
- reflex models with sensing distance up to 7m and polarized up to 5m
- models for detection of transparent objects with sensing range of 1m and 4m
- through beam models with sensing range of 20m (red emission) and 30m (infrared emission).

QM family strength points are:

- high commutation frequency up to 2kHz
- except for mechanical background suppression, products are completely filled with resin as to guarantee high performances in the presence of vibrations
- high working distances
- easy to adjust by trimmer and possibility of selecting Lo/Do output status
- different types of exits: cable, M8 plug, M8 and M12 pig tail
- wide range of mounting brackets, including two armored models
- easy to align for through beam model, thanks to the led signaling the output state inside the optics
- background suppression allowing detection of different color objects at the same distance, thanks to optics triangulation technology
- special models available with high immunity to ambient light (special version code 28)
- cULus homologation.

These products are available with PNP or/and PNP output. Working range varies from -25°C to +70°C.

M.D. Micro Detectors photoelectric sensor range includes:

- Cylindrical sensors from M8 to M30
- MINI and MAXI cubic sensors
- Fork sensors for label or object detection.

In addition to the different models for various working functions (diffuse, background suppression, polarized, reflex, for transparent objects and through beam), other models for special applications are available including:

- AISI316L stainless steel housing and IP69K protection degree for food & beverage and pharmaceutical applications
- DECOUT (NPN/PNP,NO/NC) output to fit any connection needs and for series or parallel connections
- LASER emission (Class 1), necessary to detect very small objects or to reach high distances
- Alternate operating voltage supply 24-230Vac or multi voltage 24…230Vac/dc
- Sensors with separate amplifier with high sensing range.

M.D. Micro Detectors are also able to realize custom products on the basis of customers' specific application needs, such as:

- cable versions with different length than standard
- models with personalized labels
- cable versions with personalized/ dedicated plugs
- models with different performances than those shown in the catalogue (sensing range, working frequency, …).

Technology, Quality, Service, possibility of receiving Custom Products in shorter times compared to our competitors: these are genetic codes marked in the DNA of M.D. products. We are ready to be tested by those who don't know us yet!

	QM
dimensions	21 x 12,8 x 31.2 mm
background suppression	30...200 mm 30...400 mm
short distance diffuse	100 mm
long distance diffuce	400 mm / 1,000 mm / 1,500 mm
retroreflective	7 m
polarised	5 m
retroreflective for transparent objects	0.4...4 m 0.05...1.5 m
through beam	20 m / 30 m
switching frequency	1 kHz / 2 kHz
LED emission	red / IR
90° emission	●
operating voltage	10...30 Vcc
output type NPN - NO/NC	●
output type PNP - NO/NC	●
operative temperature range	- 25°C...+ 70°C
protection degree	IP67
housing material	plastic
optic material	PMMA
cable exit	●
M8 plug exit	M8 and M8 pig-tail
M12 plug exit	M12 pig-tail
certifications	CE, cULus

FAL SERIES
A COMPLETE RANGE WITH HIGH PERFORMANCES

The M18 photoelectric sensors range, red, infrared and LASER emission as proposed by M.D. Micro Detectors S.p.A. (FAL series) is particularly rich, surely one of the most complete and performing on the market. M18 cylindrical photoelectric line, FAL series, with LASER emission (equipped with class I LASER) is composed of:

- direct diffuse models with sensing distance up to 300mm
- polarized models with sensing distance up to 30m
- Through-beam models up to 50m
- background suppression models with adjustment range from 30 to 150mm, available with class I or class II LASER.

All codes are available either with axial optics or with radial optic particularly suitable for those applications where installation space is reduced.

The main strengths of FAL family are:

- teach-in adjustment for the direct diffuse and polarized models, with the possibility either of a fine or rough adjustment
- trimmer adjustment for background suppression and through beam models
- models in Cat.3 ATEX available
- housing material: either nickel-plated brass or plastic

The Background suppression version, introduced last year, has the following characteristics:

- FALS models, LASER Class I, setting range from 30 to 100mm
- FALW models, LASER Class II, setting range from 30 to 150mm.

Both types have the following operating modes:

- axial or radial optics
- sensitivity adjustment by trimmer
- 1500Hz switching frequency, the highest one on the market
- immunity to ambient light up to 15,000 Lux
- housing with LASER marking.

In addition all models belonging to FAL series (LASER emission) have the following features:

- cULus approval
- complementary outputs (NO + NC)
- NPN or PNP
- IP67 Mechanical protection
- Operating range from -10 ° to + 50 ° C.

Last but not least, all the products that make up this line are completely filled with resin in order to increase the resistance to mechanical stress and durability.
The short description provided above highlights the real completeness and technical validity of M.D. Micro Detectors' offer. More details may be obtained by consulting our catalogue and our website (www.microdetectors.com).

The Technology, Quality and Durability distinguishing M.D. Micro Detectors products are accompanied by an excellent level of service based on short delivery times.

FABRIZIO MARCHI
PHOTOELECTRIC SENSORS AND AREA SENSORS

	FAL axial	FAL right angle
dimensions	M18	
background suppression	30...100 mm (cl.1) 30...150 mm (cl.2)	30...80 mm (cl.1) 30...120 mm (cl.2)
short distance diffuse	400 mm	300 mm
polarised	30 m (RL201)	
through beam	50 m	
switching frequency	800 Hz - 1 kHz/ 1.5 kHz (BGS)	
LED emission	LASER (cl. 1/2)	
operating voltage	Vcc	
output type NPN - NO/NC	●	-
output type PNP - NO/NC	●	-
output type NPN - NO + NC	●	
output type PNP - NO + NC	●	
operative temperature range	- 15°C...+ 55°C	
protection degree	IP67	
housing material	plastic/metallic	
optic material	vetro/PMMA	
cable exit	●	
plug exit	●	
ATEX	II3GD	
other certifications	CE, cULus	

ULTRASONIC SENSORS

WHY CHOOSING M.D.

In the sensor Industry the ultrasonic technology has spread at a high speed in the last years.

In general the ultrasonic technology is used in the sensor field, because ultrasonic sensors can precisely detect different materials no matter their shape, color or the outline of any surface.

There are several applications they can cover. Just by way of explanation, even if not exhausting, we are listing following ones:

- measurement of level, both of solid materials and of liquid, as well as grainy and dusty ones
- material handling
- moving vehicles
- doors and gates
- agricultural machine field, both building and earth moving ones
- wood industry
- food and beverage field.

There are really few sensor manufacturers able to develop and produce ultrasonic sensors directly. M.D. Micro Detectors fully belongs to this small group, thanks to a strategic longsighted decision taken some years ago, which has given great satisfaction under any points of view since 2012.

Then why choosing M.D. Micro Detectors as a partner for ultrasonic sensors?

M.D. Micro Detectors s.p.a. first of all has completed their ultrasonic sensor portfolio by adding radial version with retro-reflective function to direct diffuse models.

In the direct diffuse models the sensor detects an object when passing in front of same sensor. The sensor can thus either activate the digital output or give an analogue value proportional to the distance between sensor and object. In some applications very short body sensors (UK6 series) or 90° emission sensors (available on some UK1 series models) are necessary for an easier installation and to reduce the relevant costs. Even if much used being suitable to solve most applications, the direct diffuse sensors can answer incorrectly in the presence of a very insulating target or with highly angle shaped surfaces with respect to the ultrasonic beam.

In the retro-reflective models the sensor acquires the presence of a background (any surface, whether it is flat, fix or perpendicular to the ultrasonic beam). Any object between the sensor and the background, thus changing the acquired signal, is detected no matter whether insulating or not, angled or perpendicular to the ultrasonic beam.

The main strength points of new retro-reflective sensors are:

- electron is based on µC, therefore allowing:
  1. high stability when the working temperature changes (all sensors are thermally compensated) with working range enhanced up to +70°C
  2. total control of the sensor features
  3. precise detection under any working condition
  4. long life time
  5. operating voltage available 10 … 30V
- easy to install, intuitive adjustment by button or teach-in cable
- circuit totally protected by resin that guarantees
  1. high protection against vibrations
  2. lower costs for maintenance
- high working distances
- all metal models are manufactured with AISI316L stainless steel housing
- LASER marking for models in stainless steel housing
- visible LED of status on all models
- synchronization and multiplexing to avoid any issues due to mutual interferences between sensors installed one close to the other.

With these new sensors M.D. offers a complete range of ultrasonic sensors, both in plastic housing and in metal one, including following product types:

- direct diffuse models M18 (both standard and short body), M30 and M30 with large front (Annex 1)
- models with 90° emission in M18 housing (Annex 2)
- retro-reflective models in M18 housing (both standard and short ones), M30 and M30 with large front (Annex 3)
- through beam models in plastic housing with sensing distance up to 1100mm (Annex 4).

In addition, M.D. can offer their customers customized versions to fit specific applications:

- special cable lengths or connector plugs
- out of standard body dimensions
- customized labels with customer logo and item code
- special software aimed to solve specific applications (such as detection of woodchips/pellet inside a biomass burner storage).

Then, once more: why choosing ultrasonic sensors made by M.D.?:

- because M.D. offers a complete range covering all typical functionalities for ultrasonic sensors with few models
- because M.D. ultrasonic sensors are easy to use
- because M.D. ultrasonic sensors have a certified quality and IP67 protection degree
- for the fast production process and fast delivery performances characterizing M.D. Micro Detectors
- for the excellent service level M.D. can provide their customers with
- because M.D. is able to realize in a short time any custom product solving specific customers' applications needs.

A NEW TECHNOLOGY...

In the second half of 2015 M.D. Micro Detectors have further upgraded the performance level of their ultrasonic sensors, by adding IO-Link technology to UK1 series of products for the first time. IO-link benefits are as follows:

- easy installation: no particular connectors are required, but a simple 3 pin plug
- automatic parameterizing of sensor: no more difficult installation procedures. All critical information (working distance, function mode, …) are automatically stored inside the sensor memory of IO-Link master. In this way all machine maintenance downtimes are reduced as well as possible mistakes of inexpert staff
- sensor diagnosis: IO-Link enables the sensor functionality diagnosis, therefore it is much easier to create scheduled maintenance programs.

The introduction of IO-Link technology will therefore enable to offer M.D. customers new functions and services, resulting in technological and competitive benefits for their machines.

Download the ultrasonic sensor brochure

1

UK6	UK1	UT1	UT2F
sensing distance up to 900 mm	sensing distance up to 2,200 mm	sensing distance up to 3,500 mm	sensing distance up to 6,000 mm
plastic or AISI 316L housing			plastic housing
cable or connector exit			
available models with digital, analogue and mixed ouputs			

2

UK1A	UK1D	UK1F
sensing distance up to 400 mm	sensing distance up to 1,600 mm	sensing distance up to 2,200 mm
plastic housing		
cable exit		
available models with digital output		

3

UKR6	UKR1	UTR1	UTR2
sensing distance up to 900 mm	sensing distance up to 2,200 mm	sensing distance up to 3,500 mm	sensing distance up to 6,000 mm
plastic housing			
cable or connector exit			
available models with digital output			

4

UHS	UHZ
sensing distance up to 300 mm	sensing distance up to 1.100 mm
plastic housing	
cable exit	
available models with digital output	

THE INDUSTRIAL COMMUNICATION: IO-LINK AND MORE...

As already introduced by the "IO-Link: the new M.D. challenge" article, the Industrial Communication is becoming a strategic key factor in the Industrial Automation Market to connect actuators, devices, computers through an Industrial network, giving to the Users the possibility to introduce and/or to improve a Supervisory Control and Data Acquisition (SCADA) systems in their factories.
M.D. Micro Detectors always focused on the technological innovation and Market trends, after the introduction of the IO/link on its products, is continuously looking for embedded solutions in order to be able to provide a complete offer of field-bus and real time Ethernet networks.
Following is a brief overview about the most important characteristics of the three communications protocols currently under evaluation by M.D. Micro Detectors.

IO-LINK

IO-Link is a powerful standard, an increasingly deployed point-to-point serial communication protocol used to communicate with sensors and/or actuators. Extending the globally recognized PLC standard IEC 61131, it allows three types of data to be exchanged:

1. process data
2. service data
3. events

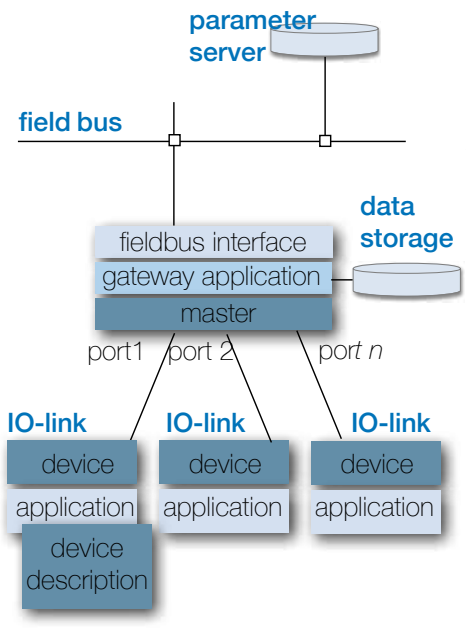
Consequently, it's possible to send the parameters to the sensor, to verify the status of the plant and to exchange data avoiding any loss of data.

IO-LINK offers several advantages:

1. It doesn't require a special cable it keeps the standard connection based on the M12 plug connector, 3 or 5 wires not shielded.
2. Through the SIO functioning the sensor/actuator works like a standard 3 wires device with NO/NC output.
3. According to the V1.1 IO-Link specification it's possible to reach a centralize management of the sensor's data, whilst it's operating. Consequently we have the automatic parameter reassignment for device replacement during operation.
4. Consistent diagnostic information down to the sensor/actuator level.
5. Data transfer up to 20m avoiding any loss of data.

However IO-link is not a field-bus, the mapping between sensor with IO-link interface and the field-bus is performed through the use of the IO-link master that is composed by three levels:

- Master manages the communication with the IO-link device (sensor/actuator), all the operations (process data, service data or events) are only performed and verified by the IO-link master.
- Gateway manages the data packages to send to the network.
- Field Bus Interface connects the I/O master to the Industrial field-bus selected.

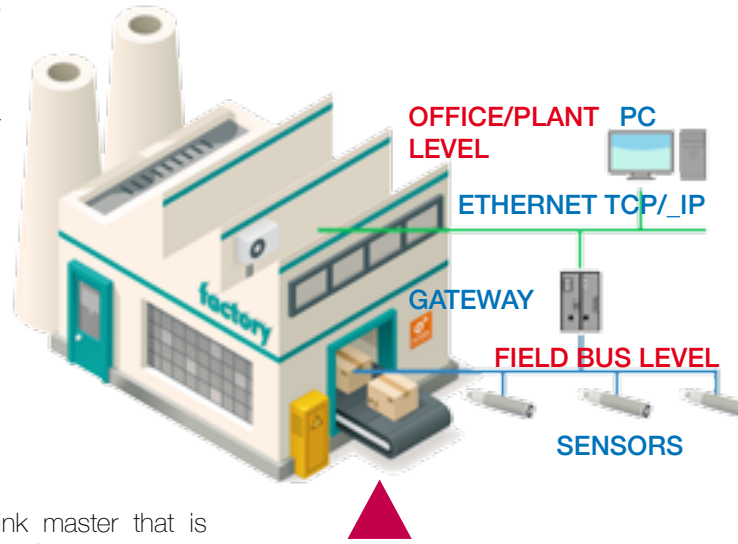


MODBUS

Modbus RTU is a serial communications protocol originally published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs).
It has since become a standard communication protocol, and it is now a commonly available means of connecting industrial electronic devices.

Modbus is a complete field-bus based on two different version:

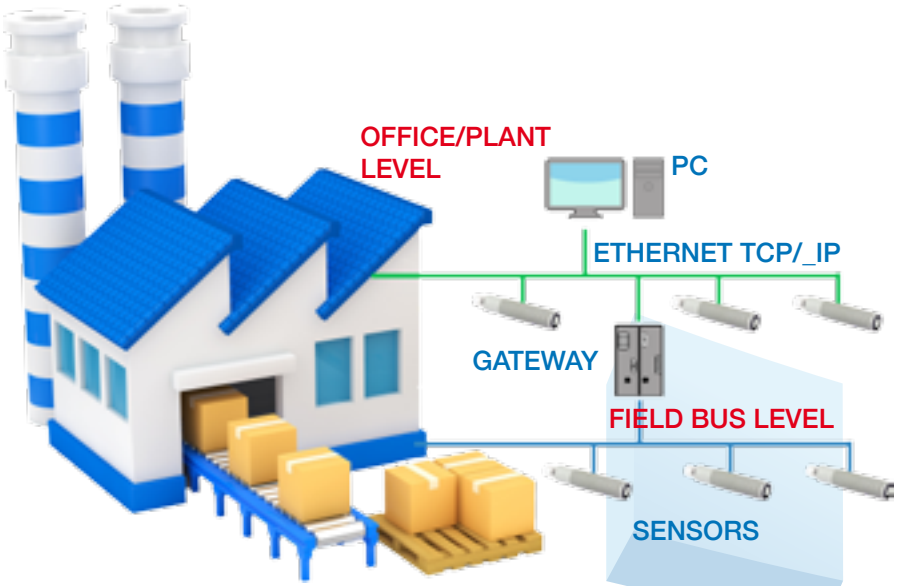
1. Modbus RTU and ASCII
2. Modbus TCP/IP



In this picture you can see how the sensor equipped with Modbus RTU interface is directly connected to the field-bus without any interface adapter. Only one gateway is used to connect a supervisory computer (EtherNet TCP/IP network) with a remote terminal unit (RTU) in Supervisory Control and Data Acquisition (SCADA) systems.

Modbus RTU offers several advantages:

1. Modbus RTU messages are a simple 16-bit CRC (Cyclic-Redundant Checksum).
2. Easy connection (4 wires, M12 connector), shielded cable is not required.
3. The physical layer is based on very common serial protocols RS232 or RS485 derived from Master/Slave architecture.
4. Enables the upload and download of the parameters by the using of commercial SW.



5. Enables high data exchange providing no restrictions for the User.

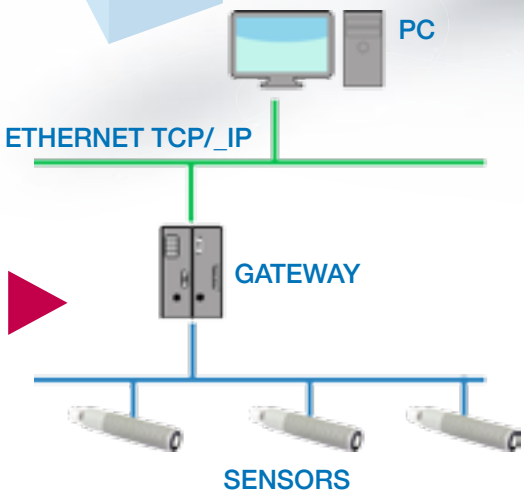
MODBUS TCP/IP

Modbus TCP/IP is simply the Modbus RTU protocol with a TCP interface that allow its implementation on a Industrial real time EtherNet TCP/IP network
Modbus TCP/IP offers the following advantages:

1. Modbus TCP/IP combines a physical network (Ethernet), with a networking standard (TCP/IP), and a standard method of representing data (Modbus).
2. It enables to increase the data transfer speed from the typical 19.2Kbps to the 10Mbps, ensuring fast response time (few milliseconds) making it suitable for any Industrial application.
3. It allows you to manage a network with more masters able to simultaneously exchange data with several slaves.
4. EtherNet TCP/IP network can become physically unlimited.
5. It allows you to extend the connection up to thousand ModBus TCP/IP devices, removing the typical limits of the 247 RTUs of the Modbus RTU protocol and practically giving the possibility to connect an unlimited I/O devices.
6. It's extremely simple to connect RTUs directly on EtherNet TCP/IP network by the using of simple signal converters.
7. Modbus TCP/IP is based on the TCP/IP protocol family and shares the same lower four layers of the OSI model common to all Ethernet devices.

In this picture is highlighted how the Modbus TCP actuators are directly connected to the EtherNet TCP/IP network.

If the EtherNet network should have a different protocol (e.g. EtherNet IP) a gateway would be necessary to connect the actuators to the network.
This brief analysis highlights the specific interest of M.D. Micro Detectors about the Industrial Communication that will become more and more a key success factor in the Industrial Automation Market for the next years.
The critical points to introduce industrial communication capability into industrial sensors are mainly the dimension of the sensor and the space required by the physical layer of the field-bus you want to implement.
Besides we face that on the Market there doesn't exist a standard and the field-bus available today are not completely compatible with each other (about this point, only the IO-link offers the advantage to be used independently from the field-bus used by the User Factory).
M.D. Micro Detectors will continue to monitor the Market trends and the technological innovation in order to be able to offer to its Customers innovative products, which are easy to use and equipped with advanced functionalities also concerning the industrial communication.
Our Sales Network will constantly keep updated about our future development concerning Industrial communication and connectivity.



MARCO MESSORI
ULTRASONIC AND PHOTOELECTRIC SENSORS DEVELOPMENT MANAGER

VAMOS M.D.!

DANIEL JORNET SPEAKS, THE GENERAL MANAGER OF MICRO DETECTORS IBÉRICA

Micro Detectors Ibérica was established in 1991. At that time the name of the company was Diell Ibérica. Since the beginning our Spanish subsidiary was one of the milestones in the development strategy of M.D. Micro Detectors.

Today M.D. Worldwide is composed by three companies very strictly connected: Micro Detectors Italy, Micro Detectors Spain and Micro Detectors China. One Company, one Strategy, one way of approaching the market, one target: continuous development in a solid and healthy way, following the continuous improvement approach.

A turning point in the history of the Company happened at the beginning of 2011 when a new General Manager, Daniel Jornet, joined the Company. During this period and with the strong support of the new CEO of M.D. Micro Detectors S.p.A., Giacomo Villano, and of the entire M.D. Italy Team, Daniel introduced several modifications and improvements to the Organization, in the way of working, approach to the Spanish market and working tools, in Company's premises. The result is that the Company is developing strongly.

M.D. Micro Detectors will continue to invest significantly also in Spain, to gain market shares, to improve its visibility and its reputation.

Daniel is a living example of M.D. Style. Read this interview to better understand who he is and to have a clearer picture of Micro Detectors Ibérica.

DANIEL, PRESENT YOURSELF!

My name is Daniel Jornet, I'm married, with a daughter and live in Barcelona. I was born here in 1970, in a large family of 4 children. To be the youngest among four brothers shows you a lot in life, among others, to share things. It is wonderful to be able to play nearly any imaginable game with your brothers.

My father was a hard working bank teller, who had honesty and trustworthiness in his DNA. My mother, apart from keeping a household with five men, worked in a food shop.

When I was sixteen years old, I signed up in a Taekwondo gym where two of my other brothers were already training. The reason might seem a little bit contradictory: on the one hand, I had to learn to defend myself as the youngest, but on the other … I learned new values such as to control my mind and my strength, learn to detect my competitor's defects to overcome him, learn not to repeat the same errors, channelling my strength on a determined target. All this got deeply inside me and later determined my way of doing things in my professional career. The atmosphere in this gym was something absolutely exhilarating. We won many important championships and had a wonderful time together.

PLEASE SUMMARIZE TO OUR READERS YOUR PROFESSIONAL HISTORY!

My first job in the world of sensors was with the distributor of Keyence in Spain. During my 5 years with them we introduced a brand in Spain which nobody knew. My next step was Sick, for 6 years, where I learnt a lot about safety products. Afterwards I put into practice my life-long dream and founded my own company: the subsidiary of Datasensor in Spain, where I was shareholder and General Manager. The turnover increased significantly during this five years period. Later, when Datalogic merged with Datasensor, I decided to drop out, sell my part and take a sabbatical year. During this year, again, I realized another life-long dream which due to life circumstances I had not been able to do until then: I took a Master's Degree Course at the famous ESADE Business School in Barcelona. Afterwards I travelled to Germany, basically with the intention to check the possibilities to found another own company and there I came to know M.D.

WHEN AND WHY DID YOU JOIN M.D. MICRO DETECTORS?

After my contact in Germany, I had a first meeting in Spain with Marcello Masi. I will never forget his words: "I do not

offer you any shares because I hold all of them. But I offer you a company and the opportunity to be part of our M.D. family." Open and directly to the point. I was overwhelmed by his frankness and knew him immediately: I had found the place I had been looking for, above all considering my experience in other companies, including my own.

A short summary after this five years period in M.D.?

I'm very happy working in this M.D. surrounding. I'm lucky to have an excellent and close relationship with my direct superior, Giacomo Villano (CEO). Every day I share with him each of the values of the M.D. work ethics, beginning with the team work, producing highest quality and high technology in Italy, focusing all our attention on the customers to offer them exactly the products they need up to cooperation with some of our competitors.

Coming from other important companies in our industry, which are the main positive features M.D. Micro Detectors has with respect to them?

The high quality of its products is incredible, to know that all our inductive sensors are checked 100% gives us an enormous confidence and security towards our customers and the total certainty to deliver a product that will never fail. In my opinion, another strong point is the fact that we have a deep and solid European manufacturing background (products Made in Italy) with a strong presence in Europe, but at the same time we have a powerful international projection, also reaching China and other far-away markets.

Please present Micro Detectors Ibérica and the entire M.D. Spanish Team

One of the most gratifying aspects is our M.D. team in Spain. In our local headquarters in Barcelona, we have Joan Vives who is responsible for the Purchasing Department, his colleague Cristina Balaguer is in charge of the Customer Service and the order entry, Luis Porta is responsible for the Accounting Department and Raúl Domenech takes care of the Logistics. In the Sales Area, we have two technical

salesmen in Catalonia, Deiber Perdomo and Daniel Palomera, in the east coast region we have José Codoñer, in the North we have Jesús Bernardo and in the central region we have Miguel Ángel Peñas as regional sales manager.
I'm very proud of all of them. They are outstanding professionals and great people and colleagues who achieve excellent results. Not everybody is able to work in M.D., this is a life and working style where people are motivated and cooperate because together we make the company grow, making a sacrifice to achieve something worth fighting for.
One important point of strength for Micro Detectors Iberica is that we have our own warehouse in Spain, to support in a more and efficient way our customers. We do not provide products to our customers using and hub somewhere in Europe. We directly manage our stock to better support our customers.

Which are the main targets Daniel Jornet has for Micro Detectors Ibérica for the next three years?

Our target is very clear: put M.D. in its proper place as one of the leading reference companies in the sensor market in Spain. Our turnover must continue increasing until it surpasses its historic high of the past. Actually we are preparing the ISO 9001 certification so that we can guarantee the best system to our customers. We are also linking our web page to the SAP system to offer an easy access for our customers to enter directly their orders. Furthermore, our team is highly motivated and enthusiastic about the project of the 25th anniversary of our company: Next year, we are going to organize a celebration in the headquarters in Modena together with our team and our customers!

Why choosing M.D. Products?

M.D. products are of a superior quality and have an exceptionally large portfolio for all kind of applications. Furthermore, we offer our customers a special service with our customized products, which means we are able to deliver exactly the product our customers need and fit it to their requirements. In my five years with M.D., I have noticed that this is a very strong attraction point.

In the last 15 years, which are in your opinion the main changes in the professional approach of a sales person?

The fast changes in technology mean that our sales personnel must have a broad technical basis to be able to adapt themselves to the new situations. This means that we need sales personnel with a solid technical foundation and background and a good professional education to be able to be successful in this highly competitive atmosphere. Furthermore, in the past you had big price differences between the products. This difference has been levelling itself out during the last years, so that the most important difference are made by the sales people and the service they offer the customer.

WHICH ARE THE MAIN CHARACTERISTICS OF A SALESPERSON TO EFFECTIVELY COMPETE IN THIS MARKET CONTEXT?

A salesperson must be able to offer the customer the required service, attend them at any moment and detect their needs and surroundings, even if they did not explicitly express it. The customer must have the certainty that the salesperson is trustworthy and honest and always looking for the best solution and optimum price/performance ratio, being prepared to adapt it to the customer's requirements. If there is a solution with simple equipment, the salesperson should not try to offer more expensive solutions. Needless to say: the communicative capacity is a key element in this relationship. The customer must know that their phone call or e-mail will be answered at any moment and that the M.D. sales contact is the best partner to discuss any technological question. This means that our sales personnel are always informed and ahead of the latest technological developments and able to anticipate any possible doubts on the basis of their technological know-how.

WHICH ARE THE 5 MAIN CHARACTERISTICS OF A GENERAL MANAGER TODAY?

In my opinion, the first job of a manager is to fix targets and achieve them. To succeed in achieving the company targets implies many characteristics, one of them the capacity to build up and develop a cohesive team. First you have to pick the right people, then you must be able to communicate, share your thoughts or explain your decisions and expectations, so that your message and the company goals get through to them. This encourages those who work for you and the company, creating a

DANIEL JORNET
GENERAL DIRECTOR
MICRO DETECTORS IBÉRICA

strong team spirit and high motivation to work together.

Very important, especially considering the hard economic situation we are facing is to keep the right working approach. Nowadays it's necessary that the general manager spends a lot of time on the field together with the members of his team, staying with them on the front line. He must provide to everybody the living example of the right working approach, meet customers and suppliers and must be a flexible fast problem solver. He must have a long term view accompanied by a positive, practical and effective day-to-day approach.

Obviously, your professional qualification must be according to the position. Without the necessary technical background and experience it is impossible to carry out such a job. Another characteristic is the organizational capacity. As we have seen in the Lean Manufacturing, a perfect work flow without waste and high added value is the way to leadership. A manager has the obligation to introduce these ways of working and ensure their deployment in his company. This means that you must have a multifunctional capacity, to understand the accountant's problems as well as those of the sales person who is far away or those of the personnel in the warehouse, and find solutions that join all of them together under the same roof: M.D. Micro Detectors.

Then there is the flexibility. Not everything goes as planned. Our competitors might change tactics, there might be new regulations from the governments which force us to change, etc. In this context a manager must have the skill to adapt the course: firstly to be able to make sure that the business will continue as planned and then to find new ways to achieve their goals.

How do you describe in a few words the customer approach of M.D.?

In M.D. the customer is the most important aspect of our work, all our efforts are focused on them. On the one hand, there is the empathy, which is the ability to identify with customers, to feel what they are feeling and need. On the other, there is our technical focus on the customer, which produces best results when balanced with empathy. This refers to our technical capacity and flexibility: we offer high quality products and leading technology which can be customized to exactly the customer's requirements so that we are the perfect partner for any customer in the industrial or private sector.

In your opinion, what generates the highest value between both parts, in the relationship between customer and supplier?

In the customer – supplier relationship the customer must feel absolutely certain that the goods or service they are receiving is of excellent quality. M.D. Micro Detectors is not an old-fashioned supplier but a real technological partner who is able to offer the best solutions. This leads to a perfect mutual understanding and above all, to a long lasting commercial relationship for the future.

What do you like best in your job?

I love the relationship I achieve with my customers and I love it when I succeed winning their confidence. All my life, I have been passionate about the world of sensors and this translates itself into the relationship with my customers. I'm also very happy, as I mentioned before, with the excellent team I succeeded in building up in Spain, as well as with the close and good cooperation with our headquarters in Italy.

What do you like best in M.D. Micro Detectors?

Nowadays, customers are highly demanding with very short lead times, and the service that M.D. is able to offer thanks to the Lean Manufacturing with a very fast production and quick delivery of the products to Spain means an incredible working basis which guarantees us the necessary immediacy to exceed our customer's expectations.

Which are the main points of strength of M.D.?

As mentioned before, the fast production and lean delivery chain is one of the biggest advantages to working with M.D. Another one is the flexibility to adapt the products to the customer's needs. Our products are European, "Made in Italy", and offer the highest quality available on the market at very competitive prices. Nevertheless, this does not limit the worldwide projection of our products and our company which is gaining more and more importance on a global level.

Which is your opinion about the possible future developments of sensors technology?

Sensors are becoming smaller and smaller every day, miniature is the key word of the new materials and components. The eventual future possibility of being able to program a sensor via Wi-Fi, to develop sensors which are more and more complex and sophisticated and able to carry out intelligent working steps and the perspective of the development of artificial vision applications are absolutely overwhelming.

What is your opinion about the possible future developments in electronic industry?

Technology is changing at a dizzying rate and nobody is able to know how things will be in the long run but for me the discovery of materials like graphene with its extraordinary properties, makes the future seem an exciting adventure. The 3D printers are a revolution on the market, there are already whole factories producing using this technology for the car industry. It is a privilege to live this unique moment in technological history, with absolutely ground breaking possibilities for the future.

What do you suggest to a young person approaching work for the first time?

I feel I'm very lucky to work in a field for which I have a total passion. I recommend all young people to work in something which they really like. If you have to work, look for something which you really like: That every day you wake up and put your feet on the ground you feel that you enjoy going to work and that the things you do there make you happy.

What do you suggest a young person approaching for the first time the sensors' industry?

In this sector, there are no intermediate terms: either you love the sensors' world or you don't like them. If you like this sector, you will be able to work for many years. I do not know any salesperson in this sector who is good at their job and is unemployed, so … there must be a good reason!!!

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- M8, M12 e M18 cylindrical sensors with RED and IR emission
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- Diffused up to 1m
- Retroreflex up to 4 m
- Polarized up to 3 m
- Retroreflex for clear detection up to 1 m
- Through beam up to 20 m
- DECOUT® models (NPN/ PNPNO/ NC)
- Models for Food & Beverage Industry, with AISI 316L stainless steel smooth housing and mechanical protection IP68/IP69K
- AC power supply models
- Radial or axial optics
- Plastic or metal housing
- Sensitivity adjustment by trimmer
- IP67 mechanical protection
- Available ATEX zone 2/22 models

INDUCTIVE SENSORS

- Standard inductive sensors from ø 6.5 mm to M30
- Flush and not flush models with standard or long switching distance
- Models for Food & Beverage Industry, with AISI 316L stainless steel housing and mechanical protection IP68/IP69K
- Models with extended operating temperature up to 110°C
- Models with IP68 mechanical protection
- AC power supply models
- Models with analog output
- DECOUT® models (NPN/PNP NO/ NC)
- High switching frequency
- Cable or M8/M12 connector output
- Available ATEX zone 2/22 models

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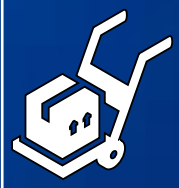
FAST IN MANUFACTURING



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COILS FOR ALL TYPES OF INDUCTIVE SENSOR

M.D. Micro Detectors offers to its Partners and selected Customers the opportunity to take advantage of M.D. Tianjin services for the coils production. The main services are:

- a stable production process, compliant to the Lean Manufacturing principles and to the M.D. checks protocol, under the direct control of our people
- high quality of the raw material used
- expertise of our employees
- reliability: all the pieces are produced under strictly quality and functional checks
- technology and know-how: more than 40 years of experience in coils development and production for inductive sensors
- services, fast production and Worldwide speedy shipment
- customization: production of coils under Customer specifications for the diameter and the number of wires
- very competitive prices.

We guarantee to our Customer the highest level of confidentiality and secrecy.
With the introduction of the coils development and production M.D. Micro Detectors is now a "SENSORS AND MORE" Company.

CX AREA SENSOR: A WORLD OF APPLICATIONS

The Area Sensors are optoelectronic multi-beam light curtains designed to detect objects or to measure their dimension and position. The main characteristic of these devices is the capability to detect any kind of object inside a defined detection area.

These devices are typically based on one emitter unit combined with one receiver unit and they can provide two different optical beams:

- Crossed beams
- Parallel beams

The crossed beams models are suitable to detect small objects up to 1mm of diameter or objects such as paper sheets, magazines, wood or glass panels, metal sheets, etc……

The parallel beams models are normally used to measure the dimension of objects, profile an object or to verify its position.

Thanks to the introduction of the new CX Area Sensor family, M.D. Micro Detector, a leader in design and production for these kind of devices.

The new CX family is based on three different product lines:

- the CX0 series characterized by basic functions and remote teach-in setting mode
- the CX1 series characterized by basic functions and provided with external trimmer unit used for the setting procedure
- the CX2 series equipped with a complete set of advanced functions.

This product is widely used in the Automation Industry, mainly in sectors such as Packaging and Logistics as well as Automatic Machines for Wood, Glass and Paper production.

In the Packaging industry Area Sensors are typically used on the Horizontal Flow Pack machines and also on Automatic Case packers.

HORIZONTAL FLOW PACK PACKAGING MACHINES

The “horizontal flow pack machines” are suitable for any need of flexible packaging for food and non-food Applications; these machines operate with flexible plastic wrap reels based on various wrapping materials (Polyethylene, Polypropylene...).

The “horizontal flow pack machines” operate on continuous cycle, taking the plastic wrap from a reel and sealing it around the product; these kind of packaging machines are suitable for every kind of Industry, for small, medium and high productions.

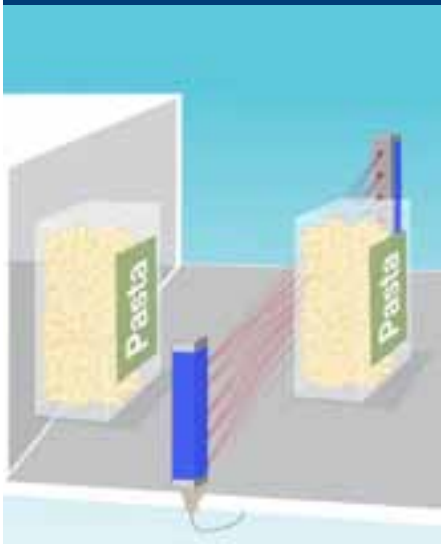
The Area Sensor is used to detect different objects inside the plastic wrap, thanks to it’s high detection accuracy (crossed beams) combined to the “equalizer” function adjustable by the remote “teach-in” setting procedure.

AUTOMATIC CASE PACKERS

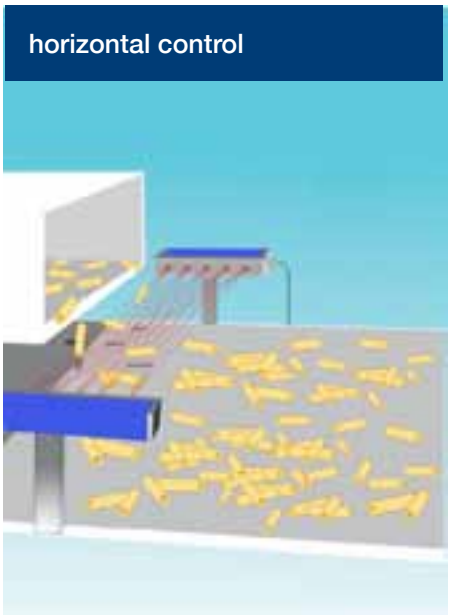
The Automatic Case packers are used to solve the works of forming, loading (side or top loading) and sealing of cases using a packing tape or hot-melt system.

The bundle control is preformed prior to putting the bundle into the box, typically this verification is carried out using Area Sensor with parallel beams and analog output.

vertical control



horizontal control



In the Logistics Market the Area Sensors are mainly used on the transportation lines to detect critical objects by dimension and shape, where the classic single beam sensor is not able to work in stable and reliable condition.

CORRUGATED PAPERBOARD INDUSTRY

On the End Line of corrugated paperboard production plant, we find the corrugated paperboard stacker phase where is typically used a mobile platform system to create the corrugated paperboard stack.

The Area Sensor is used to dynamically measure the paperboard stack height providing the signal to lower the mobile platform in order to build the corrugated paperboard pallet which is then moved on rollers and stored.

PAPER INDUSTRY

On transportation lines for the Paper industry, the Area Sensor is used to detect magazines, books, envelopes, etc…

The thin object thickness and its corrugated shape means that a standard single beam sensor isn't suitable, whereas the Area Sensor with crossed beams is able to guarantee a very accurate and stable object detection.

WOODWORKING MACHINERY

The automatic saws use the Area Sensors in order to guarantee an accurate and stable detection of the wood to cut.

The wood has a frequent corrugated profile that makes it impossible to use standard single beam sensors, the Area Sensor with crossed beams is able to solve the application providing a reliable detection.

AUTOMATIC SYSTEMS AND MACHINES FOR METAL SHEET PROCESSING

Industrial machinery such as Punching, Fiber LASER cutting and Press-Brakes use the Area Sensor to detect the metal sheet during the production processes.

The metal sheet has frequently a corrugated shape and can be extremely thin which makes it impossible the use of standard single beam sensor, the Area Sensors with crossed beam is able to guarantee a stable and reliable object detection.

PRESS/FORMER MACHINERY

These Machines need the use of Area Sensors to detect the formed object during its ejection from the press head.

The detection is difficult because very often the formed object is very small and during its ejection from the press head the object trajectory is not predictable making it impossible to use a standard single beam sensor.

The crossed beams models give a wide detection with no blind region which guarantees a stable and reliable object detection even where the objects are very small.

As you could read above, CX area sensors offer a great application versatility, in addition to their high quality and undisputed technological consistency, making them suitable for any complex applications. M.D. Micro Detectors wish to show this product features to whom may be interested in and to study the best solution together with their customers, so that they also can fully understand this product potential to create added value.

MAURO DEL MONTE
AREA SENSORS DEVELOPMENT MANAGER

THE NEW M.D. CATALOGUE IS COMING!

2016 will start with great news: the brand new general catalogue will be available. Unique, practical and easy-to-use.

The new catalogue is another weighty work made by M.D. Micro Detectors and the Marketing Communication area in particular, that cooperated with Sales and R&D departments with the strategic target to improve, in quality and quantity, the technical documentation to support our Customers and our sales team (see the Marketing Communication Area introduction and related strategic approach, in the MD News N.3).

Before starting exposing some anticipation about the main changes applied, let us make a small jump back into the past.

Someone could ask why M.D. has renewed their general catalogue only now. The answer could be summarized in one word: "progression".

Starting from a difficult situation, at the end of 2011 we rolled up our sleeves and began to work hard thus we started creating a huge quantity of facts and actions. These facts and actions have produced a constant growth but had to be separated on the basis of a precise order of priority. The Marketing Communication department is realizing a real progression, that is giving us back visibility on the market and a chorus of appreciations from the external stakeholders.

The new general catalogue is another milestone in the changing process that is running in M.D. that, from Marketing Communication point of view, will close its first step with a radical renewal of our website expected within 2017.

The brand new M.D. Micro Detectors general product catalogue is based on very precise founding criteria: clearness, usability, Customer orientation. The main target is to be easy to consult for the end users, not necessarily being technicians or super technicians.

It will be a unique volume, compact, easy to handle more than clear and aesthetically appealing; texts will be equipped with pictures, response curves, technical drawings and clear, pleasant and professional electrical diagrams

MARKETING COMMUNICATION DEPARTMENT

of the connections.

Any information will be easy to find, not only through graphic symbols but also and moreover thanks to an internal organization and a more “user friendly” approach. It will be lean and intuitive, and built around the Customer (for this reason it will be monolingual).

It will be unique thus not divided into families or market segments and in our mind, it will allow the reader to easily find the ideal solution for their needs.

It will have a more captivating graphic layout, aligned with the sales and technical documentations, in a way to have a more and more coordinated marketing.

The general catalogue will be available both in Italian and in English languages. After that, the Spanish and the Chinese versions will be realized.

It is both in paper and as digital format.

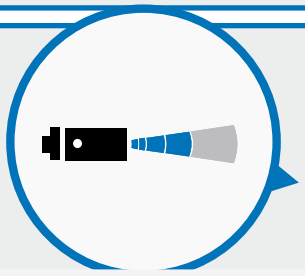
All the catalogue contents will be digitalized and made available on both current and future website. For this reason, aiming to create a search engine inside the new website, the R&D department has worked to unify the technical terms. In the old catalogues, in fact, different terms were used to identify the same parameter (Ex.: termal drift, temperature range, temperature drift of Sn).

The countdown to present this product has started. A product that is the result of an intense teamwork. We are really looking forward to it!

code description

series	PFK	M18 inductive sensor for FOOD application
housing	1	Standard housing
output status	A	N.O. output
	C	N.C. output
	B	Complementary NO+NC outputs
logic status	P	PNP digital ouput
	N	NPN digital output

A catalogue innovation: to the product’s code understanding easier, a square bracket has been added on the left grouping the items and explaining their meaning.



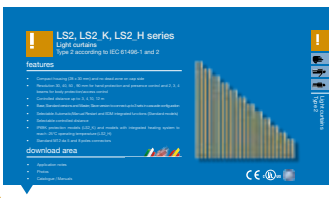
	UT1B/E*-**UL
maximum operating distance	3,500 mm (1)
minimum operating distance	250 mm / 350 mm metal housing
adjustment range	250...3,500 mm
optic beam aperture	± 7°
switching frequency (digital output)	2 Hz / 1 Hz metal housing

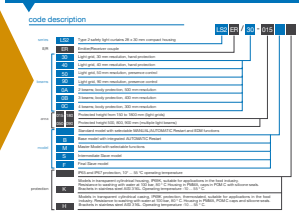
Already introduced in the previous catalogue for the nominal operating distance of the ultrasonic sensors we have created specific symbols for each market segment in order to simplify and speed up your product research.

We have created specific symbols for each tehnology in order to simplify and speed up your product research: Photoelectric Sensors, Ultrasonic Sensors, Proximity Sensors, Safety devices, Acessories, Area Sensor, Applicative Sensors.

The new catalogue will have texts with photographs, reading diagrams, technical and very clear electrical drawings, pleasant and professional.

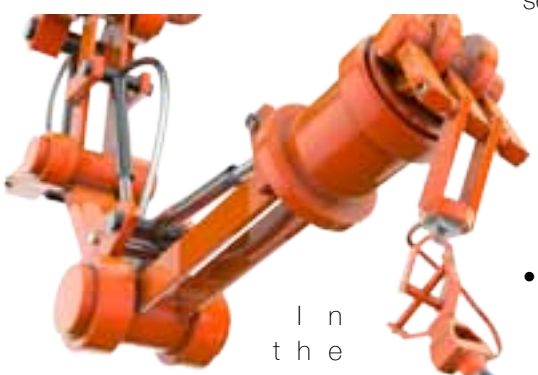
The safety general catalogue is already available On-line





TIME OF FLIGHT
THE NEW M.D. FRONTIER

The modern industrial applications are calling for advanced technology sensors as well as high performing hardware and software; at the same time different technologies get more specialized and better known, depending on their field of application. M.D. Micro Detectors, aiming to a constant technological development, have launched their first sensor based on ToF (Time of Flight) technology on the market; this technology is able to offer the higher flexibility covering most of applications in the field of distance measurement and 3D images reconstruction. A human being can easily sense any distance or any object shape, while for a machine it is much more difficult to understand the working environment, thus sensors are indeed used to facilitate this activity.

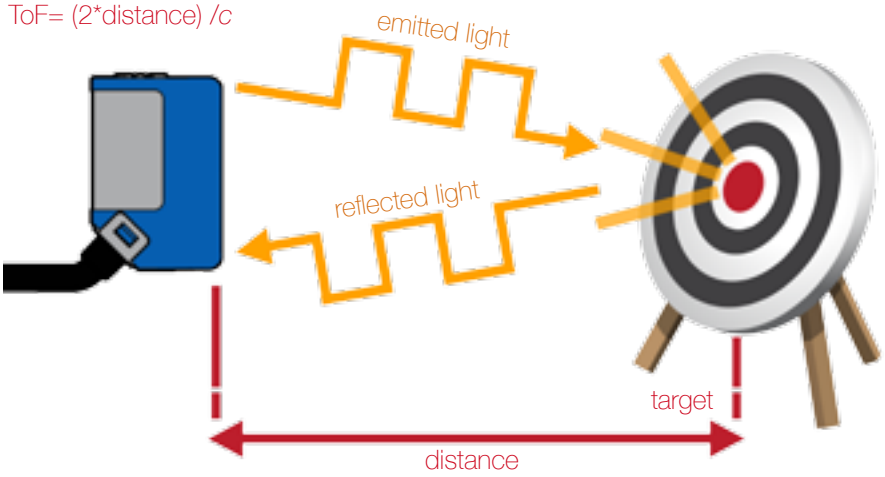


In the field of measurement, the sensor is an optical one using the light (often in infrared ~850nm) to be able to obtain information regarding the distance of an object from the viewed scene. This means that the sensor produces a number of light impulses and detects those reflected by the target. These impulses are then converted in electrical signals, therefore elaborated to find out the time value difference between emitted and reflected light. By means of this parameter the target distance can be deduced. Practically the time the light takes to go from sensor to target twice is hereby calculated. "Time of flight" comes from this.

OPERATION PRINCIPLE:

1. The sensor sends a light impulse to a target.
2. The light is partially reflected by the target.
3. The sensor establishes "when" the light comes back to the sensor.

ToF= (2*distance) /c



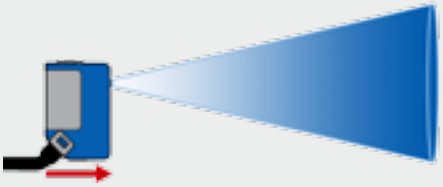
The time spent by the light signal, multiplied by the speed of light results in the distance traveled.M.D. Micro Detectors are offering on the market a sensor based on ToF technology in a miniaturized cubic shape, the main function of which will be to establish where the target is, instead of its mere detection.

- Working Range: 0..250 mm & 0..500 mm (white 90%)
- Resolution: 1mm @ range 0..250mm 2mm @ range 0..500mm
- Accuracy: +/- 10mm
- Commutation frequency: < 10 Hz
- Outputs: 2 programmable outputs PNP/NPN/PushPull -- NO/NC
- Emission: LASER infrared 850 nm

Its compact shape and its capacity of measuring the targets up to the optical front allow the sensor to be used for several applications, in particular those with space constraints. This sensor spot is not a sharp one. This feature can solve all those applications with targets of uneven surface.

The spot dimension is usually 40% of the distance value of the targeted scene. Since the light impulse follows an angle of 25°, it comes that the optical path has a strongly marked conical shape.

Even if the sensor is an optical one, the core ToF high sensitivity also allows the measurements of transparent and/or reflective surfaces.



Ex. At a distance of 100mm the spot dimension will be about 40 mm.

Another important function of this sensor is the possibility of programming both outputs separately; in fact the distance from a target (or from a possible background) can be "divided" in different areas. Using two separate signals allows the precise identification of the 3 areas (low outputs, one high and one low, high outputs) without any need to acquire an analogue signal. The result for end customer is an economic saving and an easy to use product.

The engine ToF is optimised also to minimize the measurement variations due to color differences.

Despite the energy reflected by colored targets is far different, the sensor can compensate possible differences thus minimising any consequent mistake. All that is obtained thanks to an algorithm able to guarantee the result of measurement to converge, as it comes into precise parameters of "result reliability". It follows that the sensor response time is minimised in function of the target colour and in function of the distance. That is to say, the sensor can adjust its speed in function of the application, thus always resulting in the best possible performances.

The constant technology development has allowed the realization of more and more advanced and performing sensors, even keeping the easy to use feature unchanged: this sensor has been designed basing on this very concept and contains all necessary features to solve a lot of applications.

Try it!

NEW MARKET FIELD: APPLICATIVE SENSORS

The sensor ToF comes under a new market field for M.D.: The Applicative Sensors.
Very soon the vibration sensor VBR will be placed side by side with the "First-born" of this category of products.
As for any M.D. market field, also the applicative sensors are identified by a precise symbol and colour.

ROCCO TRIVIGNO
APPLICATIVE SENSORS
DEVELOPMENT MANAGER

WHY TO USE IT:

- Compact dimensions
- No blind zone
- Detection of translucent materials
- Detection of distances also for uneven and/or compact targets
- Compensation of colour and temperature variations.

	ToF
dimensions	21 x 12.8 x 31.2 mm
power supply voltage	24 Vcc ± 20%
sensing range	0..250 mm (bianco 90%) 0..500 mm (bianco 90%)
resolution	1 mm @range 0..250 mm 1 mm @range 0..500 mm
accuracy	± 10 mm
switching frequency	< 10 Hz
output type	2 x programmable digital outputs PNP/NPN/PushPull -- NO/NC
emission	LASER infrared, Class 1
wave lenght	850 nm
temperature range	-10°C..+60°C
protection degree	IP67
housing material	plastic
front-end material	PMMA
connection	4-pins cable M8 4-pins Pig Tail
other certifications	CE

Micro Detectors

Italian Sensors Technology

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
- Accessories
- Coils for inductive sensors

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 9001:2008 certified and many products are CE, ATEX, UL, cULus, Diversey, TÜV and ECOLAB certified.

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