



NEW ULTRASONIC SENSORS PELLET & WOOD DETECTION

6

NEW
CUBIC
MINIATURIZED
INDUCTIVE
SENSORS

NEW
90° RIGHT ANGLE
ULTRASONIC
SENSORS

sps ipc drives
ITALIA

Electric Automation
Systems and Components
Trade Fair and Congress
Parma, 12-14 May 2015



Micro Detectors
Italian Sensors Technology

► EDITORIAL: AND WE WILL NEVER STOP!

Happy 2015 M.D. Micro Detectors! May the Power, the Determination, the Initiative and Good Luck be always with you! I am used to tell these words to my partners, because they could also breathe them the way I do, as a propitiatory ceremony before a very important match.

2014 was a positive year for us, under many points of view. Good. Great satisfaction. But now it's part of our History. We will not look ourselves in the mirror of the good actions and positive results obtained, because we have no time and because we are M.D. People hungry for "doing well", aiming to reach any results and win any challenges. People who treasure the positive results just obtained and take them into account for their self-confidence, but their mind is already focused on future challenges and commitments. People who are always looking for new targets, conscious that experience is not enough to reach them, but rather willingness and enthusiasm are essential features. People who never give up. People aware that these are particularly difficult times, as Mr. Masi – our President - frequently says; it is just in these periods that "who is technically talented has the task to run very fast", using a football analogy.

2015 is going to be another year of primary importance for us. Working with a great energy and with sleeves rolled up. In Italy, in Spain and in China. Wherever we are.

This year we are attending four exhibitions: SIAF Ghuanzhou, Hispack Barcelona, SPS Parma and SPS Nuremberg. It has never happened during our more than 40 years of life. But we strongly believe in taking any opportunity for increased visibility offered by such events. We like to open up and show off, becau-

se we think we have a lot of material to show and so many skills to show, lots of positive elements and many ideas to share with our guests, who love to exchange views with us, taking benefits for their growth and resulting in new ideas and goals. Fairs are for us similar to open-air medieval markets: joining events, unique and essential, where ideas and knowledge can be exchanged, besides all usual business. There's not a moment to lose, from the first to last minute.

In 2015 we are going on to invest or rather increase our investments in machines, tools and new products. We are bringing new technologies both in our factory and in our product portfolio and we are making further changes to our manufacture layout; it is, indeed, our intention to extend it aiming to increase and improve our performances.

From the beginning our strategic approach has been based on our Company complete integration. We can define it as *Made in Modena* approach: we want to grow and develop being here, in our territory. Sometimes there are strategic approaches aiming to externalize most of the company activities. We think in a diametrically opposite way. We do not want to depend on external factors, on the contrary we want to "own" our future, be free to choose.

M.D. is a Company with integrated processes: from Research & Development to Shipment to the final customer everything is carried out by our staff and everything is made in our facilities. Only a particular working is made by an external supplier, who is totally comparable to a department of our Company in terms of quality and flexibility.

Thanks to "Integration Strategy" we reached following goals:

1. Increase in Production Capability and Productivity;
2. Increase in Flexibility and Responsiveness at all levels;
3. Total control of Production Processes;
4. Control of Technology.

Certainly this strategic approach requires a greater commitment and a high competence. It needs a strong and efficient organization. You must be able to plan and manage many more variables. But with the right organization and appropriate persons you can gain a great competitive advantage.

At the beginning of 2013 this strategic approach led us to decide about internalization of coil production for inductive sensors. And we are carrying out this job with excellent results at our Chinese subsidiary, M.D. Micro Detectors (Tianjin) Co. Ltd. In such a good way that, after satisfying M.D. Micro Detectors complete demand, this factory has started to manufacture coils for other companies, who right off trusted our openness, capacity and availability (from raw material procurement to final manufacture). Technology and Quality, always featured in M.D. sensors, have now become significant elements of this important component for inductive sensors. Now we can say that M.D. has become "Sensors and More". Even in this new business field we want to grow a lot.

We are growing in China the same as in Spain. The Iberian Peninsula is historically one of the most interesting markets for M.D. Micro Detectors and even there we are on the right path of growth again. Furthermore our Barcelona seat has been renovated and widened, in order to offer our Spanish customers a more efficient and complete service.

We are working to highlight all the unique features of our Company more and more: Technology, Quality, Flexibility, a short Decision Line, and a very short Communication Line.

Speed has indeed become one of the best featuring words for our Company Style, thanks to the strategic approach previously described. And it can't be different, since M.D. was born and is growing in Modena, a motor valley, land of speed. Ferrari, Maserati, Pagani Zonda were born in this territory and are still located here. Also De Tomaso and Bugatti had their activity in the same valley. These are countries where speed can be found in blood and neurons of the people. M.D. is no doubt really fast in manufacturing, fast in delivering, fast in giving answers, fast in developing new products, fast in communicating and taking decisions: the utmost Quality is rigorously present in all those activities. This is M.D. and this must be our main feature in the future.

Enthusiasm is another key word distinguishing our people. People who take any challenges and every day work with great passion and resolution. People who are willing to do and do it right. We want to act. Act with logic thought. Act in a professional manner. Act fast and flexible. Act with passion and inventive-

ness. Act always keeping a long term view. Act to create value and real wealth for us and for people working and cooperating with us.

We are MD. We are Finmasi Group. We have a precise identity. We believe in a certain way of doing business and we have a precise concept of the Future. A Future we want to contribute to build. We want to distinguish ourselves at a great extent. We strongly aim to actively do things in an Excellent way!

They say, in the right, that Italy is a country where nothing changes. Well, we can proudly say with great satisfaction that we have been able to change a lot with very positive results. And we are only at the beginning. Follow us and, for those who do not know us, come and discover us: we have a lot to show and to make available to all of you for a joint growth.

2015 is an important year also because a new technical word is violently entering our history, digging a groove with the past: *I/O Link*. The *Input/Output link* technology is going to feature our products in short, raising them at a higher level. In the next months we are getting up to all sorts of things! In the meantime, starting from January 2015 also M.D. Micro Detectors S.p.A. has become a member of Profibus and Profinet Italia Consortium and of I/O Link Community.

Happy 2015 M.D. May this be another year full of satisfactions for us, for our people and for all those who work and cooperate with us.

GIACOMO VILLANO
CHIEF EXECUTIVE
OFFICER



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QM more specialized,
without any limits...



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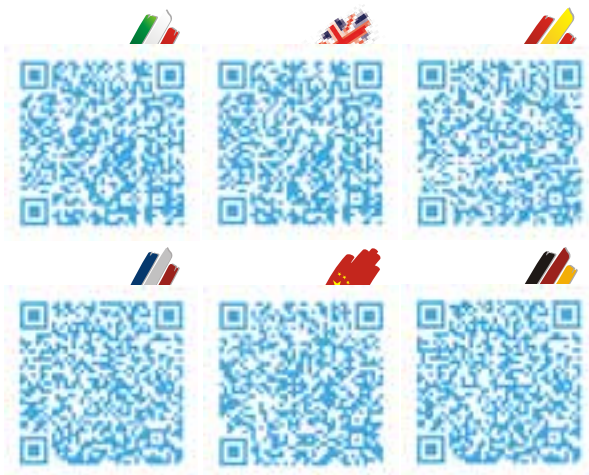
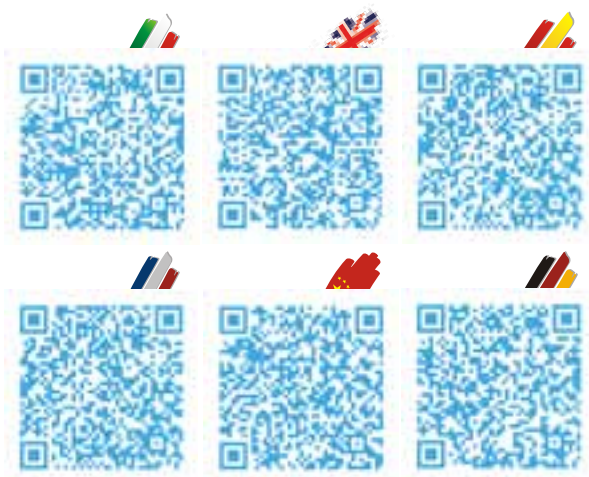
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SPS - Industrial Automation Fair Guangzhou
中国广州国际工业自动化技术及装备展览会

Hispack
2015



sps ipc drives
ITALIA

FOLLOW US!

For the first time in our company History, in 2015 we will take part to 4 Fairs:

- SIAF Guangzhou: from 9 to 11 March 2015
- Hispack Barcellona: from 21 to 24 April 2015
- SPS IPC DRIVES Parma: from 12 to 14 May 2015
- SPS IPC DRIVES Nurnberg: from 24 to 26 November 2015

We wait for you in our Booths!



Micro Detectors

Italian Sensors Technology

▶ PRODUCTS: CX NEW AREA SENSORS!

M.D. Micro Detectors, has specialized for many years in the design and manufacture of Area Sensors and now thanks to the introduction of new CX family it considers itself the Market leader for this style of product.

The new CX family is composed of three series: CX0 and CX1 series, with standard functionality and CX2 series with advanced functions; the 20 x 36 mm aluminum profile makes this new family of Area Sensors one of the smallest devices now available on the market.

CX0 SERIES

CX0 series models allow detection of objects as small as 2 mm, thanks to the cross beam function.

Models are also available with up to 320 mm controlled height and 3 m working distance (for 5 mm pitch versions) as well as 6 m working distance (for 10 mm pitch versions).

CX0 series is characterized by an intrinsic synchronization through connection wire between Receiver and Emitter unit, by a high switching frequency and an external wire enabling the Emitter/Receiver system to be adjusted remotely.

The CX0 series also features an AUTO-SET function to permit an automated adjustment at the power up.

CX1 SERIES

CX1 series models allow detection of objects as small as 1mm, thanks to the cross beam function. Models are also available with up to 480 mm controlled height and 3 m working distance (for 5 mm pitch versions) as well as 6m working distance (for 10 mm pitch versions).

CX1 series is supplied with optical synchronization, making the installation and connection phases easier; in fact it is not necessary to connect the two units Emitter

module via TRIMMER, which can be disconnected once the adjustment has been completed and used for other area sensors.

SERIE CX2

The full range of functions and outputs of CX2 series permits this family to rationalize the number of available models and makes this product suitable for any customers' needs.

Just two versions can satisfy all output logics, both digital and analogue: the double analogue output – 0-10 and 4-20 mA – model, which is invertible and the double digital PNP and NPN output, NO/NC selectable.

CX2 series products not only enable object detection (cross beams models) in a controlled areas measuring up to 980 mm in height with a working distance of 6 m but they can also give the targets dimension and position (parallel beams models). By means of auto-set function, the cross beams models can detect 1 mm objects.

A banking function is also available to adjust the area sensor so that it can ignore possible permanent obstructions between any beams due to mounting constraints. If this function is used, the analogue outputs will be rescaled according to the number of free optics and the analogue/digital outputs enable detection according to the sensor pitch: 5 mm, 10 mm and 20 mm.

Three LEDs positioned at both the top and bottom of the area sensor which are clearly visible through the front face, enable an easy diagnosis of the output state making installation even easier.

Ease of use and a great functional flexibility are the key factors of these new Area Sensor families.

MAIN FEATURES:

- Compact aluminum housing 20 x 36 mm
- Controlled Area height from 160 mm up to 960 mm
- LEDs optic interaxis: 5 mm, 10 mm, 20 mm
- Wire or optical synchronization
- Crossed and parallel beams versions
- Minimum detectable object ≤ 1 mm



- (crossed beams)
- Measuring resolution ≥ 5 mm (parallel beams)
- Blanking function
- Models with external sensitivity adjustment TRIMMER
- Models with self-adjustment set up or remote Teach-in
- Models with NPN+PNP double digital output, NO/NC selectable
- Models with 0-10 V and 4-20 mA double analogue output.

APPLICATIONS

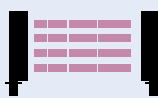
- Package Industry
- Automated Warehouses
- Logistics/conveyors
- Automatic Machines



detection of full load on wraparound packers

CX series AREA sensor is used on conveyors of packaging machines in Food & Beverage and Cosmetics industries to monitor if the full load has been achieved. Thanks to "parallel beam" function and to the analogue output – both current and voltage ones – the Area sensor can measure and verify if the load has been completed before it is pushed into the box. In addition, CX series is easy and fast to install even in reduced spaces, thanks to its compact housing and to the absence of dead zones. At last, the "Blanking" function allows to ignore permanent obstructions between any beams due to mounting constraints and guarantees a proper functioning of Area sensor.



		CX0E*R*/**-***	CX1E*R*/**-***	CX2E*R*/**-***
				
nominal sensing distance Sn	beam pitch 5 mm	0,3...3 m (controlled area 160 mm)	0.3...3 m	0.1...3 m
	beam pitch 10 mm	0.5...6 m (controlled area 160 mm)	0.3...6 m	0.1...6 m
		1...6 m (controlled area 320 mm)		
LED IR emission		850 nm ((beam pitch 5 mm) 880 nm ((beam pitch ≥ 10 mm)		
power supply voltage		16,8...30 Vcc		
ripple		< 1.2 Vpp		
power consumption (receiver)		1...1.5 W		1...2.5 W
power consumption (emitter)				1...3 W
output		1 x PNP, 1 x NPN (only model CX0RB)	1 x PNP, 1 x NPN	1 x PNP ; 1 x NPN; 1 V _{ANA} + 1 I _{ANA}
output current (with load)		< 100 mA		
minimum resistance load		280 Ω		
leakage current		10 μA		
capacitive load		< 0.7 μF		
delay ON		0.05 μs		
delay OFF		> 10 μs		
POWER ON Delay		200 ms		< 3 ms
Teach-In procedure duration		< 15 s		
operating temperature		-10°C...55°C		
storage temperature		-25°C...55°C		
artificial light rejection		IEC 61496-1		
ambient light rejection		IEC 61496-1		
standard protection models		IP67		
humidity		95% max.		
vibrations		IEC 61496-1		
shocks		IEC 61496-1		
max. cable length		< 20 m		
cables		1 x M12, 4 poles, male (CX0E), 1 x M12, 5 poles, male (CX0R)		
housing material		painted aluminium RAL5002		
front glass material		PMMA		

► BX04, BX10, BX80: IP 69K PROTECTION DEGREE AREA SENSOR

BX products are the first area sensors designed for machines which must be cleaned with high-pressure water jets, for example in the food and beverage industry, thus assuring the best protection of these devices without the traditional accessories used today, such as PMMA tubes.

Thanks to the introduction of BX04 and BX10 models in addition to existing BX80 version, the family is nowadays the most complete on the Market of Area Sensors for harsh environments applications.

The BX04 is the lowest cost option for use in applications where high resolution is less important.

- 4 beams
- Crossed beams
- Maximum Resolution Ø 15 mm
- Maximum working distance 6 m

The BX10 offers the best price/performance ratio on the market thanks to following technical specifications:

- 10 beams

- Crossed beams
- Maximum Resolution Ø 5 mm
- Maximum working distance 6 m.

Enduring water jets at 100-bar pressure and 80°C-temperature, these sensors are extremely sturdy and suitable for applications in harsh environments.

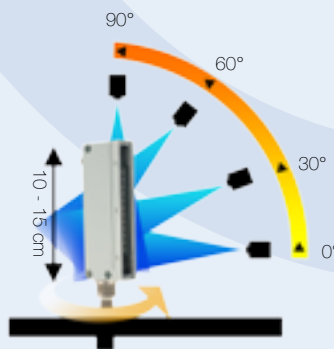
Complete water-tightness is guaranteed by a totally resin-filled body and ultrasonic welding between front lens and sensor housing, while laser marking



technical specifications

the watertight system is granted from the ultrasonic soldering between the PBT Housing and the polycarbonate optical front side.

The LASER marking grants a perfect housing sanitization.



- 30 seconds cycle
- 14-16 liters per minute
- Water at 80 °C
- 80-100 bar pressure

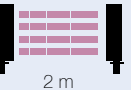
The sensor must be in touch with all materials used for cleaning and sanitizing the Food Industry. The sensor resists to all water jets with pressure of 100 bar and temperature of 80°, and all this makes the product ideal for all application in harsh environment.

assures a perfectly clean housing. Models in an aluminum housing and with air-cooling systems are also available and ideal for use in ovens and furnaces as well as in the metal processing industry.

Cat. 2 and cat. 3 ATEX-certified models for use in explosive areas can also be provided upon request.



nominal sensing distance sn	
response time	
controlled area height	
beams quantity	
beam's pitch	
minimum detect. object	
emission	
histeresys	
operating voltage	
repeat accuracy	
tolerance	
ripple	
output Current (no load)	
load current	
leakage current	
output voltage	
output	
connections	
excess gain	
aperture angle	
response time (light/dark)	
response time (dark/light)	
POWER ON Delay	
power supply protection	
output protection	
sensibility adjustment	
operating temperature	
storage temperature	
temperature drift	
ambient light	
protection degree	
emitter LEDs	
receiver LEDs	
housing material	
lens material	
tightening torque	
weight (approx)	

BX04SR/0A-HB9K	BX10SR/0A-HB9K	BX80A/1P-0H9K	BX80S/10-0H9K
			
300 mm		0 mm	-
90 mm		70 mm	
4	10	12	
30 mm	10 mm	6 mm	
ø 35 mm ⁽¹⁾ ø 25 mm ⁽²⁾ ø 15 mm ⁽³⁾	ø 15 mm ⁽¹⁾ ø 7,5 mm ⁽²⁾ ø 5 mm ⁽³⁾	ø 6 mm	-
infrared			
≤ 10%		≤ 15%	
10...26 Vcc		12...24 Vcc	
-		5 %	
-		0...20% of the nominal sensing distance Sn	
≤ 10%			
50 mA (emitter); 25 mA (receiver)		100 mA (emitter); 50 mA (receiver)	
≤ 100 mA			
≤ 10 µA			
≤ 2 V @ I _L = 100 mA		≤ 1,2 V @ I _L = 100 mA	
NPN + PNP NO or NC		NPN o PNP - NO/NC (selectable)	
M12 connector, 4 pins			
-		2° (at nominal sensing distance Sn)	
-		3° (emitter) - 6° (receiver) at Sn distance	
500 µs		-	
5 ms		-	
≤ 85 ms		500 ms	
reversal polarity and transient		reversal polarity and voltage transient	
short cuircuit (auto reset)			
trimmer		-	trimmer
0...+50°C (no freeze)		-25...+50°C (no freeze)	
-40...+80°C			
≤ 10%			
1.000 lux max. (incandescent lamp), 1.500 lux max. (sunlight)		1.500 lux max. (incandescent lamp), 4.500 lux max. (sunlight)	
IP67 / IP69K			
green		green (supply), red (synchronization alarm), yellow (area state)	
red / yellow		green (supply), red (alignment), yellow (output state)	
PC			
PC			
25 Nm			
0,26...0,30 Kg			

⁽¹⁾ Granted resolution everywhere in the detection area.

⁽²⁾ Granted resolution in the central part of the detection area with exclusion of the dark zones

⁽³⁾ Granted resolution in the central part of the detection area with exclusion of the dark zones, but with sensitivty adjustment

⁽⁴⁾ NC output models available on request Dark zones are parts of the detection area close to the emitter and the receiver, their amplitude X is proportional to the distance D between the emitter and the receiver. (BX04: X = 0,17 D; BX10 = 0,06 D)



NAMUR: NEW FAMILY OF INDUCTIVE SENSORS!

M.D. Micro Detectors is glad to announce its new Family of NAMUR Inductive Sensors.

NAMUR are 2 wire non-amplified and direct current output sensors designed to detect metallic objects and to drive electronic integrated circuit with amplifiers.

You can refer to below chart for NAMUR sensors output:

- The sensor is not activated when it operates at current output between 0.05 mA and 0.35 mA
- The sensor is activated when the current output is between 1.2 mA e 2.1 mA
- Useful to test the cable integrity thanks to output current never goes to zero mA unless standard digital sensors.
- Easiness to identify a short circuit in case of current output up to 6 mA.

Low voltage and current value as well as low impedance (unaffected by overvoltage and over current typical of inductive and capacitive field) make this sensor particular suitable for both intrinsic safety and non-intrinsic applications.

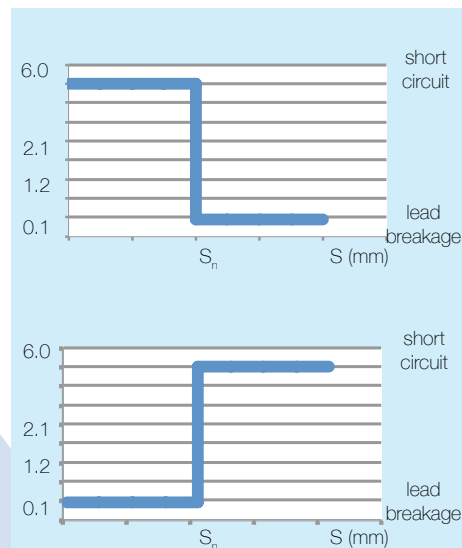
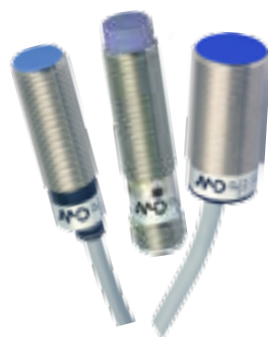
These devices are typically used in potentially explosive areas with presence of either air and gas and/or air and dust, in compliance with classification of group II, category 1G and 1D, zone 0 (gas) EPL Ga, zone 20 (dust) EPL Da. These sensors conform to standards EN60079-0, EN60079-11, EN60079-26, IEC60079-0, IEC60079-11 and IEC60079-26.

Amplifiers are designed for connection with NAMUR sensor according to DIN EN 60947-5-6, powering the supply voltage to intrinsic safety current circuit.

MAIN FEATURES

NAMUR Inductive sensors main technical details:

- M8 (series NE), M12 (series NM), M18 (series NK) e M30 (series NT)
- Pre-wired and M8 plug connector exit (for M8 size models) and plug M12 connector (for M12, M18 and M30 models)
- Standard and long distance sensing range
- Shielded and unshielded types available
- NO or NC output state
- IP67 protection degree
- Nominal supply voltage: 8.2 Vdc
- Operating voltage range: 5 ÷ 30 Vdc.



Namur Inductive Sensors	
M8: 1.5 mm - 2.5 mm (shielded); 2.5 mm - 4 mm (unshielded) M12: 2 mm - 4 mm (shielded); 4 mm - 8 mm (unshielded) M18: 5 mm - 8 mm (shielded); 8 mm - 12 mm (unshielded) M30: 10 mm - 15 mm (shielded); 15 mm - 20 mm (unshielded)	
sensing distance	
hysteresis	5...15%
repeat accuracy	5%
operating voltage	5-30 Vdc ±10%
consumption	10 mA max, load excluded
polarity reversal protection	•
inductive load protection	•
short circuit protection	• (autoreset)
main output	NAMUR; NO or NC
output current	≥ 3 mA (sensor ON state); ≤ 1 mA (sensor OFF state)
voltage drop at signal output	< 1V max. @ I max.
switching frequency (min.)	The same of standard sensor (as minimum)
time delay before availability	≤ 50 ms
output signal indicator	Yellow LED (ON: output energized)
protection	Reference standard EN 60947-5-2
mechanical protection	IP67
operating temperature range	-25 °C...+70 °C
thermal drift	≤ 10%
storage temperature range	-40 °C...+85 °C
connection	M8, 3 pins - M12, 4 pins, cable 2 m

size	standard sensing range (mm)		long distance sensing (mm)		series
	Shielded	Unshielded	Shielded	Unshielded	
M8	1.5	2.5	2	4	NE1
M12	2	4	4	8	NM1
M18	5	8	8	12	NK1
M30	10	15	15	20	NT1



FEEL THE NEW ULTRASONIC WAVE

MULTIPLEXING AND SYNCHRONIZATION NOW AVAILABLE!



MULTIPLEXING:

- The sensors are driven independently one from the other.
- You can mount different sensors one close to the other (no minimum distance is required).
- You can have different distances between the sensors and the targets.
- The PLC activates one sensor per time completely avoiding the cross talk.

SYNCHRONIZATION:

- All the sensors are driven at the same time through a sync pulse.
- You have to respect a minimum distance in mounting the sensors.
- You have to position the target at the same distance for all the sensors.
- The PLC activates all the sensors at the same time.
- You reduce the cross talk eliminating the echoes of the other sensors.



UK1 SERIES

- M18 Diameter.
- Plastic and Metallic.
- In resin full filled to resist to all vibrations.
- Retro Reflective Function available.



UT1 AND UT2F SERIES

- M30 Diameter and M30 Large front shape.
- Plastic and metallic.
- In resin full filled.
- Retro Reflective Function available.



Micro Detectors

Italian Sensors Technology

DO YOU WANT YOUR DREAMS COME TRUE?



TAKE PART OF OUR TEAM

Get in touch with us: we are looking for people to be added in our Team.

SEND US YOUR CURRICULUM VITAE TO [INFO@MICRODETECTORS.COM](mailto:info@microdetectors.com).

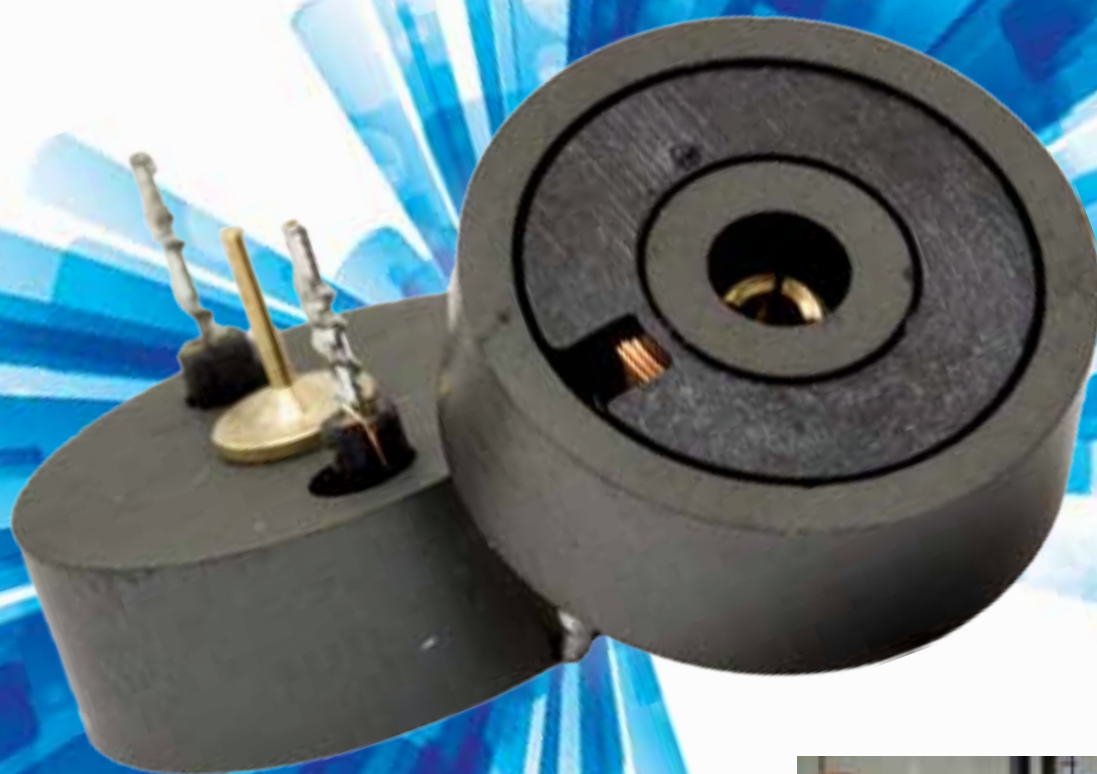
This message is not addressed to the ones believing that life is made only by rights, the ones wishing quietness and ordinariness, the ones scaring easily, the solo ones, the ones who like sleeping, the ones having no passion, no fantasy, no resourcefulness and working culture, the ones not willing to change.



Micro Detectors

Italian Sensors Technology

YOUR SENSORS, OUR COILS!



COILS FOR ALL INDUCTIVE SENSORS TYPES.


Micro Detectors

Italian Sensors Technology

SENSORS AND MORE!

SINCE 1971 44 YEARS EXPERIENCE!

1,300,000 SENSORS PRODUCED ON YEARLY BASIS



M.D. Micro Detectors, a leading company in the design and manufacturing of inductive, ultrasonic and photoelectric sensors for industrial automation, is now more than a very competent sensors' developer and an outstanding manufacturer. Since mid 2012, M.D. Micro Detectors S.p.A. has established the new Chinese facility for the production of coils for inductive sensors.

The Company M.D. Micro Detectors (Tianjin) Co. Ltd, has a Shareholders' Capital amounting to RMB 14,000,000 and is entirely owned by M.D. Micro Detectors S.p.A. This means that the concepts of Total Quality, High Technology and Lean Manufacturing are fully applied in the Chinese Manufacturing Plant as they are applied in the Italian Manufacturing Plant.

The coil is a fundamental component to guarantee high performances of the inductive sensors. This is why M.D. decided to rule this technology setting a manufacturing unit in Tianjin where they produce 100% of the coils needed by M.D. Italy.

Yes it is!! Since 2013, with the full sup-

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

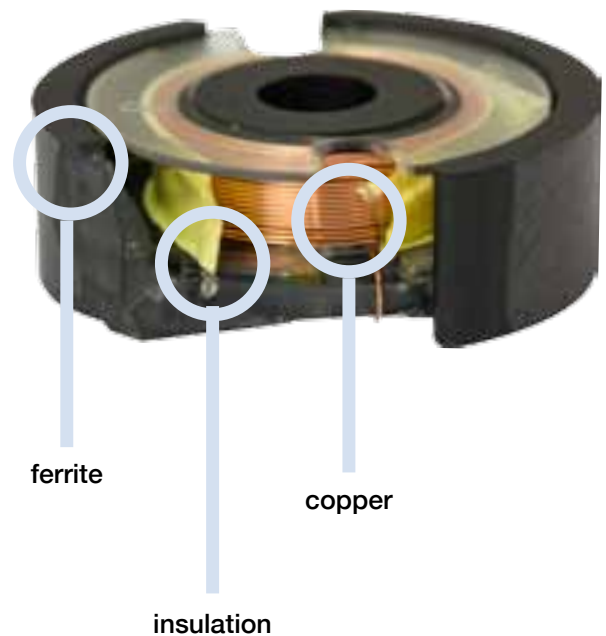
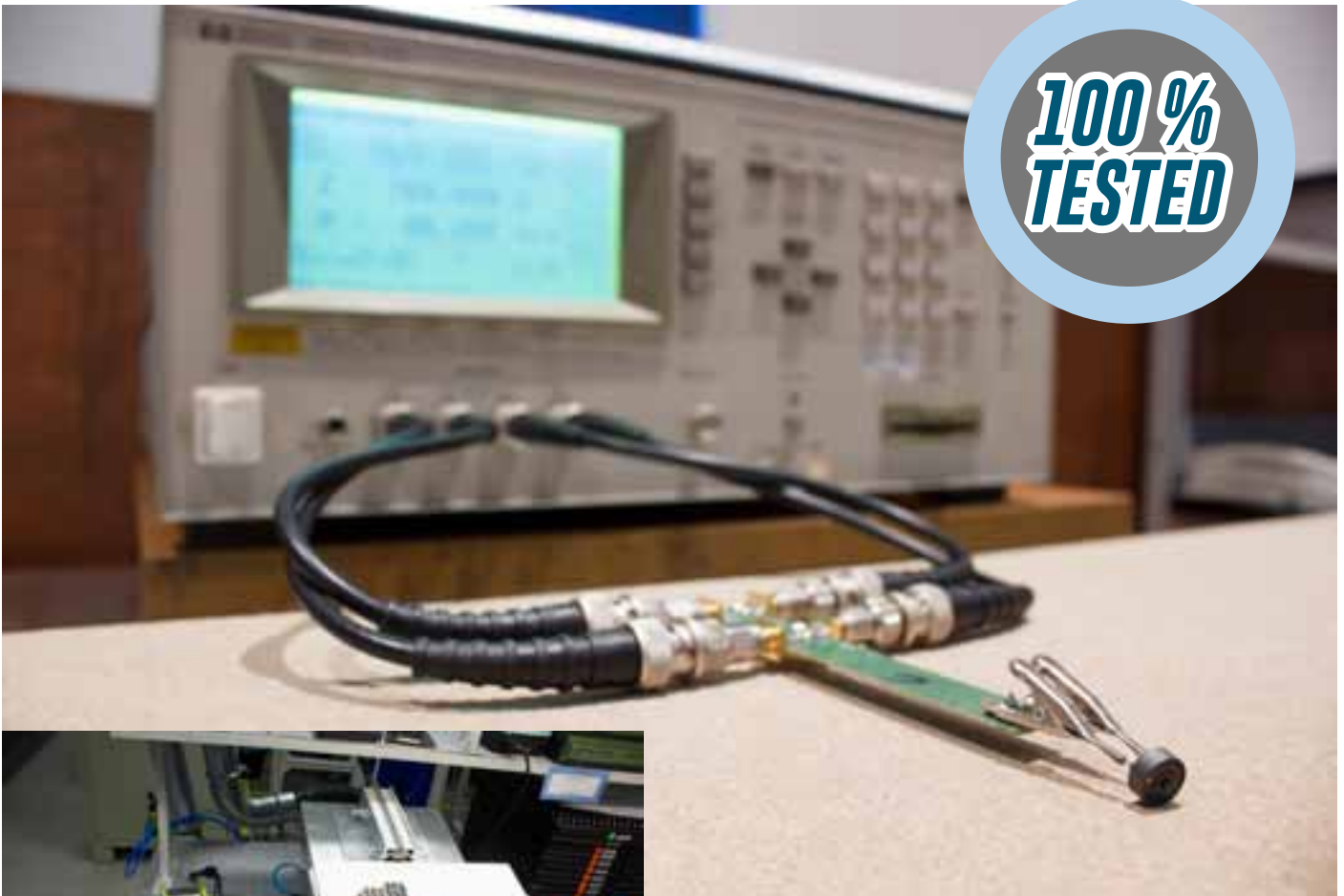
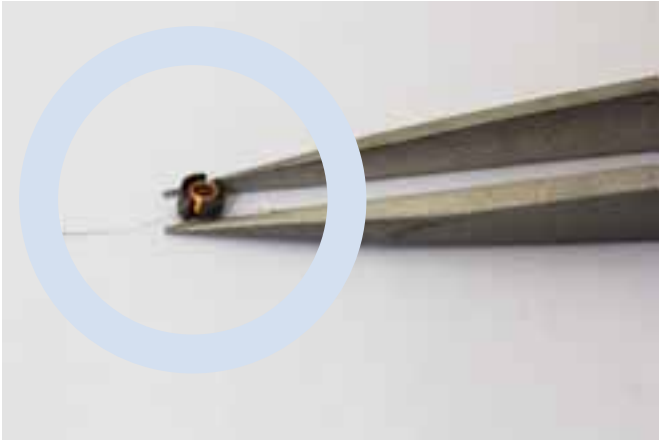
- a stable manufacturing process, compliant to lean manufacturing principles and M.D. control protocols. Totally controlled by our people;
- quality of raw materials used;
- competence of our operators in China;
- reliability: all the products manufactured are subject to quality and functional tests;
- technology and know-how: more



than 40 years of experiences in the design and production of coils for inductive sensors;

- services: fast production and fast delivery worldwide;
- customization: production of coils with diameter and number of windings according to customer's request;
- competitive prices.

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



► YOUR SENSOR? WE TAILOR IT TO YOUR NEEDS!

M.D. Micro Detectors is present in virtually all of the main industrial market sectors with a complete portfolio of products, able to satisfy many different applications and provide customer specific solutions. One of the activities which makes M.D. Micro Detectors different from other industrial sensor manufacturers is the ability to offer customized products according to customers' specific requirements.

Fast response times of quality products makes us one of the most qualified

companies in the industrial market. Special models have been developed to solve applications where standard products can not completely solve a customer's problem in many different industries found in the Industrial World.

In logistics, M.D. Micro Detectors has developed a dedicated product for transport lines (such as conveyor belts or roller tables).

To speed up and simplify the installation steps, M.D. supplies the photoelectric sensor M18 FQ series with a flush mounted head. In this way, to install the sensor it is necessary only to use a lock nut on the back side of the sensor.

In the FOOD sector, M.D. Micro Detectors is able to provide a unique solution on the market for packaging lines in harsh

environments. The BX Series sensors are provided with mechanical protection IP69K. These Area sensors are able to "survive" the different chemicals used for



cleaning and sanitation in the Food Industry.

The sensor is resistant to water jets with pressures up to 100 bar and temperatures of 80 ° C, and this makes it the ideal solution for this specific application sector.

The robustness of the system is guaranteed through the ultrasonic welding of the PBT body to the polycarbonate optical front section. Moreover the use of LASER marking rather than a label is ideal for areas subject to washdown.

In a specific Application the sensors are placed just outside a cold store and they must detect trays containing food. The criticality of the application is in the



positioning of the Area Sensor which is very close to 'the cold store material exit', where there are sudden temperature changes as well as condensation caused by high-pressure washdowns.

Also in logistics, M.D. Micro Detectors has developed a dedicated solution for Forklifts.

The solution is a kit consisting of two different inductive sensors connected to the forklift via specific length cables and fitted with a customer specific connector.

This solution simplifies and speeds up the installation phases of the sensors by the manufacturer.

Another interesting application solution that M.D. Micro Detectors can provide, is in the cash counters field.



We have developed an extremely compact barrier sensor, ideal for use in confined spaces typically found in cash counters. The through beam sensor set is delivered without container and with 3 mt length cable.

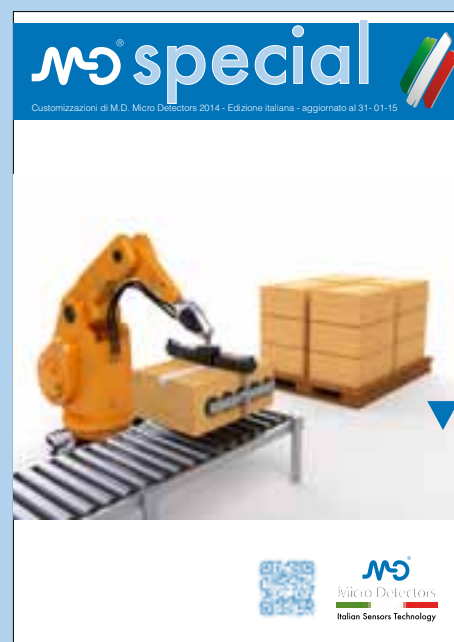
The ability to develop dedicated solutions highlights the great attention and capability of M.D. Micro Detectors to attend to all their

customers needs, and this makes it the ideal partner for your automation system.



Online available M.D. 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.



available customizations

customizable sensors	customizations
photoelectric cylindric	PUR cable
photoelectric cubic	free cable from 100 mm to 10 m
proximity	M12 pig-tail, 4 pins
ultrasonic	M8 pig-tail, 3 pins
	M8 pig-tail, 4 pins
	superseal AMP connector
	deutsch connector
	MTA/MTE connector
	JST connector
	Molex connector
	RJ11 connector
	UP connector
	wieland connector
	customized connectors
	customized labels and packaging

▶ OUR HISTORY: CARLA BAZZI, LADY PURCHASE

Among the strong features differentiating M.D. Micro Detectors there is the cohesion and the strong Team Spirit, felt and practiced by the people taking part in it. The M.D. Team consists of a "charming" mix of young and not so young people with considerable experience. The significant change this company made starting from the end of 2011, was carried out with great determination both by the "older" ones, and the "younger" ones. In M.D. it is tradition and daily practice that experienced people, not only design the strategy and lead the way, but they are every day on the front line, on the field, ahead and close to their employees. In M.D. the most experienced people run as much as the young. There are no pure conductors in MD: even the ones with the highest level of responsibility must not use only their baton, but they must also play the instruments.

Carla Bazzi, in M.D. since 1980 (when the company was differently named) and Head of Purchasing Dept. since 1990, is a shining example of this way of working. Carla Bazzi is a living example of the working culture of Emilia, a genetic code passed down from father to son, leading us to consider the work as a mission to live every day with great passion.

How do you feel to be part of the first in line for so many years?

Well, or better I would say: Very well. It is very tiring, but on the same time rewarding. Sometimes too heavy, but always extremely stimulating. Boredom is something unknown to me for many years.

Carla Bazzi: please introduce yourself in 120 seconds?

I was born in Modena in 1958, the only daughter of parents involved in a

grocery store management. Simple, real and great valued people, who, among different things, handed down to me their passion for the job and for the initiative. After obtaining the Technical Sales degree, I matriculated to Economics and Business University, which I interrupted almost immediately because a local bank was offering to me a job

opportunity. What an opportunity! Once it was

considered a guarantee for the future, therefore I left the studies and the idea of following my parent's activities.

Soon after in 1980, after a period of 18 months in the sales office of Iris Ceramics, I had another work chance in Di-ell - TFT (acronym for Thick Film Technology). Starting from then began my long history in what some years later became M.D. Micro Detectors.

How did you start working for M.D. Micro Detectors?



The story of what later was proved to be a true love with this company, started 35 years ago when Mrs. Laura Melotti (company founder), together with my father convinced me to be part of a team where the “creatives” Mauro Del Monte and Attilio Bugamelli were already realizing some amazing things.

In those years I was involved in almost all activities, being in office: from accounting, personnel, purchasing. We were a small family: at that time there was the habit to drink a coffee all together once we listened to the grunt and we smell the coffee coming from the old “famous” Moka machine.

What kind of activities have involved you in the past, and which are your current tasks?

Since the beginning I always preferred all activities related to the electronic components supply. In the past there were many difficulties connected to this job since our company from certain points of view acted as a true pioneer in the market, and for me it was the big challenge to find some chips which in that time were really hard to find.

Since 1990, when TFT merged into the current Micro Detectors, I started to work almost exclusively in buyer activities. My professional dream was realized; my professional life took a definite direction.

How did your passion for electronics?

For sure it was not coming from my studies or from my first work experiences, since both of them had nothing to do with electronics. The passion was born by the time, living in this company and close to all the ones working here and able to transfer their “sacred fire” for electronics.

What are the activities you have undertaken in this long period of which you should be most proud of?

Without looking arrogant, there are so many that it would take too much space to list them all. If I could mention

just some of them, I like to remember the warehouse optimization achieved in these last few years and the ability to create a motivated and close-knit working group. Surely the most impactful and shocking but at the same time rewarding, was the introduction of the Lean Manufacturing principles in the Supply Chain. This has been the biggest challenge of these 35 years. At first I was quite sceptical: now I am a great advocate. My professional life has improved so much from all points of view, as well as all performances of the Purchasing Area.

In the last 20 years in which way and how much has the job changed for people dealing with purchases?

The change has been momentous: the current market does not allow you to operate with the past flexibility both for economic reasons, and for raw material availability. We live in a time where the buyer must daily put themselves in discussion and be ready for even new challenges. Troubleshooting should be fast, there is no time delay. Thanks also to the new communication media everything seems to be more immediate and easily executable. Thinking of the '90s, or even before to the '80s, the communication systems for a buyer were the fixed telephone and telex and all the orders were hand written from the Agent of the supplier who was used to work “door to door”. Nowadays we process some orders in the evening for material and components directly through the supplier's websites, and for the very next day we have already the chance to check the tracking number to easily localize the delivery of the goods.

Which are the main professional and even personal characteristics needed, from your point of view, for people trying to approach the buyer profession today?

For sure the knowledge inside and outside of your own company. Then it is important to be on the field every day, talk and share with people. Using the existing and extremely powerful information provider, is a necessity. Knowledge is power, knowledge is really necessary to operate and plan effectively. This is deeply true now that we are part of an information based society. Moreover I



consider very important to act daily with intellectual honesty, initiative in relationships and professionalism. It is in my opinion important working to build strong relationships with suppliers having a long-term vision and the idea of creating more partnership than trade relations. The “hit and run” approach does not pay.

How would you describe in a few words the strategic approach of MD to their own supply chain?

M.D. Take great care of the Supply Chain relationship. In M.D., starting from our direction, we put the same attention and the same energy in both the development of our customer relationships, and in the ones with suppliers. With both of them we aim to create some solid and long-term partnership. In M.D. we have many long-lasting relationships which are a great valued heritage, built by the years of hard work and based on the seriousness of collaboration, regard, fairness in payments and in people relationships.

What in your view generates more value for both parties, in the relationship between customer and supplier?

The seriousness, fairness and respect of the roles. It is important to find the right balance where the counterparties can get a mutual satisfaction. I think that forcing their strengths to strongly “win” in the long period does not pay. It is not my habit to force a strong position to reach unfair advantage. My experience taught me that acting in this way you can get ongoing support from your suppliers, also in case of need. This way of operating is fair.

CARLA BAZZI
SUPPLY CHAIN
MANAGER

What do you like more, professionally and personally, of your job?

From the professional point of view definitely the continuing challenges through which every day my team and myself are always facing. These challenges come both our ambitious growth plans, and from the increasing competitiveness of our market.

From the personal point of view I am always supported from the confidence continuously provided by the management to myself and to the department I have responsibility for. This trust that has never been missing even when, in 1995, there was a change of ownership. Indeed, since the beginning with Marcello Masi was born immediately a mutual respect that even today, after twenty years, is unchanged.

Please, kindly, tell us about some past events you remember with pleasure?

I would say that every day I find great pleasure in what I am doing, all negotiations give me great satisfaction.

But there are moments fixed in my minds with some funny stories I like to remember. Back to some years ago, in 1983, I remember, for example, how difficult it was to explain to a customs officer at the State Railways, worried of a package coming from a German manufacturer, that white aluminium oxide was not a drug but a component for thick film mounting. I remember that I convinced him by the evidence and a short lesson on electronics technology. On the other hand it was the first time that in Modena that this type of material was cleared by customs.

What do you like more of M.D.? Today?

I really like the air you breathe and the way we work always playing "attack". I really like the continuous development of new products. I really like the way we mean and use the Marketing Communication today: in the past it was seen a no return costs, but now, thanks to the people working there, it is an extraordinary communication means.

I feel a great satisfaction when I see what we can and we are at length to create, to share the results and the pleasure of achieving them each month and not only: it's nice to reach the daily goals. I am personally satisfied when I go back home knowing that I was able to solve the issues of the day.



I have great satisfaction and feel really proud of our "supply chain": to have built in the years lasting relationships with companies representing the excellence in electronics and mechanics. The historical relationships with small and large companies based on honesty, reliability and professionalism.

What in your opinion does MD excel in?

Innovation, Reliability, Speed, Technology and Quality. Our enthusiasm in creating things. The new organizational model, the "inverted pyramid" in which everyone, starting from the highest levels, we are on the field to "do" and "build".

In your opinion, how is the technology evolving in this sector? Where are we heading?

I wonder it constantly, especially once I am back from the Electronica Fair in Munich. This exhibition is the chance for me to understand what could be the evolution in electronics, the miniaturization of electronic components and particularly the Asian market offer. I would say that in the field of miniaturization we cannot go further... But it is better to wait for Electronica 2016, which will surely hold many new surprises.

Which are in your opinion the trends of the electronics market?

For sure this is a growing market but with really high risks. It could change in a ruthless market without expecting it. We are in Europe, a difficult reality if we consider the volumes currently moved in the Asian countries and which are changing the balance of this market type. In this case they are the playing a big role increasing the location risks

coming from sudden consumption increases.

What does Carla Bazzi suggest to young people approaching the world of work for the first time?

To join the company in the morning with the same enthusiasm you feel when you go home. Paying great attention to all the things you make, from the most mundane one to the most important one, in order to avoid any obstacle to colleagues but rather trying to help them and facilitate also their work. Being in the company does not mean to sacrifice your own life, but sharing the pleasure of building the success of the team.

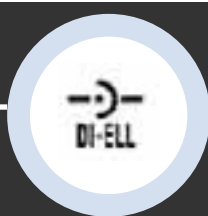
What does Carla Bazzi suggest to a youth approaching the sensors world?

It is a fascinating world where there is still much to discover. Technology grows every day. The sensor is an important interface between the machine and environment which will not stop for many years. It is a growing field offering great spaces for young people who are willing to do. In M.D. particularly those spaces for young people having such characteristics, are even more amplified. Visit us and discover us!



1971

Diell Establishment of
Melotti Laura and first
DI-ELL Logo

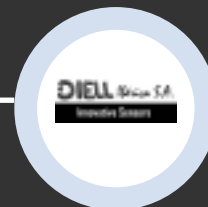


1988

Diell S.r.l. and T.F.T.
S.p.A. merging into
M.D. S.r.l.

1991

Diell
Establishment. Ibérica



1980

T.F.T.
Establishment. Sr.l.



1995

Conversion into M.D.
Micro Detectors S.r.l.
and Finmasi Group
Acquisition.

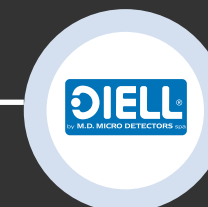
1984

M.D. Micro Detectors
S.r.l. Establishment
and new logo.



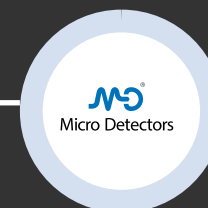
2000

New Logo.



2001

New Logo.



1986

New Logo.



2012

New Logo and M.D.
Tianjin Establishment



COMPANIES OF FINMASI GROUP: SIDERMED S.P.A.

mm width metal working were installed. The choice to move into this new plant located in Mordano di Imola (in Bologna District) just 6 km from the motorway and 40 km from one of the main ports for the Iron and Steel industry located in Ravenna, demonstrates a logistical winning strategy, as well as a central position in the heart of one of most important manufacturing centres within the Emilia Romagna-Lombardia-Veneto areas.

The capability of the two founders and their staff gave a boost to the business enabling it to expand to today's manufacturing facility: a 14,000 square

Sidermed's key product among its portfolio is zinc-coated steel, a highly diversified range of products, varying from steels for cold stamping, high strength steel, constructional steel and coated steel used in both automotive and household appliance manufacturing.

In 2013 with the aim of widening its range of products the company committed to develop zinc-coated and aluminum pre-painted steel products offering customized products for the most demanding customer applications.

In June 2008 Finmasi group acquired Sidermed shares held by Mr. Angelo Spiga.

Mr. Nicola Vagheti, formerly Sales Manager since 1987, took over the management as CEO of Sidermed company.

This is a beginning of a new synergic phase between Sidermed and Metalsider (other Service Centre for Steel Metal working of Finmasi Group specialized in the production of medium and high thickness carbon steel sheets from black, pickled coils) involving all companies activities related to Procurement and Sales, passing through Financial strategy and company policy plans to adopt. Since then Sidermed has been fully merged into the Finmasi Group with its business identity, becoming a benchmark for the group's principles: Search for Excellence, Quality, Service, Initiative, Professional approach, Commitment and Challenging attitude.

In the past three years Sidermed enhanced its Sales Team recruiting a new Sales Manager and Sales personnel to have a widespread coverage of whole domestic market.

Among customers of the company are the main national leaders in the manufacturing fields of air conditioning, shelving systems, cold stamping, profiling, metal furnishing, light carpentry, automotive industry and household appliances.

In order to further strengthen its growth, in 2015 Sidermed has decided to install a new levelling plant, one of the most up-to-date of its kind in Europe, allowing better cutting and perfect flatness performances as well as meeting very strict tolerance parameters. This



Siderurgica Medicinese S.p.A., better known as Sidermed, was established in 1984 thanks to the idea and commitment of Mr. Marcello Masi, formerly the founder of Metalsider S.p.A., and Mr. Angelo

Spiga the former Sales Manager. The initial aim of its founders was to set up a company involved in the manufacturing and sales of second choice and surplus products, in particular coated steel products. Sidermed's activity started in a rented plant of 500 square meters located in Bubano close to Bologna

From its beginning the company registered a continuous growth increasing numbers of new customers and consequently achieving more and more important market share.

In the early '90's Sidermed moved to a new owned plant of 4000 square meters where a Slitting line for thicknesses up to 3 mm and Leveling line for up to 6

meter factory sited on a plot of over 30,000 square meters.

Primary strategic target of this Service Centre is customer satisfaction that focuses on:

- Search of worldwide suppliers partners able to satisfy the most demanding customer requirements.
- Providing an excellent service, based on quality and speedy manufacturing, delivery and customer care support.
- Research of new products and solution to offer a continuous improvement to its customers.

Nowadays the manufacturing area is equipped with the most modern machinery for steel coil processing like Slitting, levelling and blanks cutting lines, assuring the highest quality standards in addition to that of the Quality Assurance laboratory that certifies technical specifications and chemical analysis of every individual stocked coil.

NICOLA VAGHETTI
CHIEF EXECUTIVE
OFFICER

investment demonstrates once again the undoubted confidence of the company in future developments and Finmasi Group's commitment in the development of its industrial business in Italy.

Quality, on time service, reliability and competitiveness make this service center a point of reference for customers looking for a Partner able to support them in terms of high quality products at the best market conditions.

Sidermed headed by its President Mr. Marcello Masi, is composed of a highly skilled team among whom are:

- Nicola Vagheti (CEO)
- Arianna Campomori (Controlling/ Administration and Finance)
- Alessandro Pistoni (Sales Manager)
- Marco Zerbini (Plant's Quality Assurance Manager and Human Resources Manager)
- Daniele Gardi (Manufacturing and Maintenance Service Manager)
- Gaetano Toschi (Sales Dept. Supervisor).

Nicola Vagheti, is the C.E.O. as well as the

guiding and strategic person of the company.

Nicola likes to represent the company he manages as follows: *"Throughout these years the company took important steps which lead to extraordinary growth but what makes me feel the most proud is the passion, commitment and enthusiasm of the whole team to find day after day the necessary bravery and great tenacity needed to move forward and build towards the future together with its customers."*

According to Mr. Vagheti thoughts of what is the actual market situation and the most appropriate business attitude to keep Sidermed on its positive growing trend, he says:

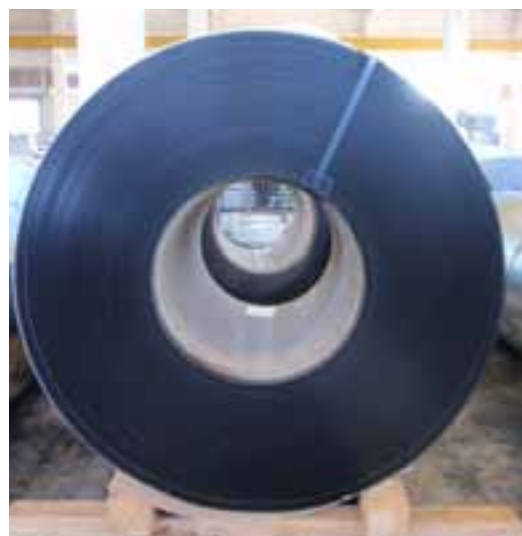
"Control, efficiency, proactive and strategic view are key factors that must guide any decision within the company involving every department. These guidelines represent my daily commitment as well as that of all Sidermed's team in their everyday tasks."



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Fax. +39 054 252525

www.sidermed.it
info@sidermed.it



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STEEL



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**MILAN - FROM 20
TO 22 MAY**

▶ LEAN ACADEMY: THE IMPLEMENTATION OF A PRODUCTION CELL

In the previous editions of MD News, we have included a series of tutorials concerning the Lean Thinking method, introduced in our company since the end of 2011. Through these tutorials we wish to tell our experience and make it available for other companies which can benefit from it. 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. This tutorial highlights the methodology we have adopted to build a production line.

BEFORE THE LEAN CONCEPT – THE PRODUCTION BY DEPARTMENTS

Before the transition to the Lean Manufacturing the Production was organized in one only factory divided by Departments: each department included more machines analogous or similar to each other, taken to achieve a specific process step. Each department had the task of transforming a semi-finished material in the upper level of semi-finished product.

The BOM of the products was composed by multiple levels of semi-finished material to which the Final Product Level was added.

There was inventory stock for each level of semi-finished material, even for the Final product level.

The production was supported by complex IT systems and in particular:

- a production Planning System;
- a production Progress System.

These tools were necessary due to the numerous levels of the BOM and to

fragmentation of the stock on each level of semi-finished and finished product.

THE LEAN IMPLEMENTATION – THE PRODUCTION BY PROCESS.

The transition we have performed from the Production by Departments to the Production by Process (involving the shift from one only factory to many production lines), will be more comprehensible after having clarified the path followed to re-organize, re-plan and implement the New Sales Order Processing.

The followed path has included the following steps:

- definition of the Targets in terms of Quality, Service and Cost;
- checking of the Present Method of Sales Order Processing, from Order Receipt to Shipment to the Customer;
- definition of the Ideal Process of Sales Order Processing with substantial reduction of No-Value Added Activity, to achieve the objectives defined upstream;
- Definition of the Future Process that is to say the Best

Process of Sales Order Processing which can be realized in 12 months, keeping as final target the achievement of the Ideal Process.

- Definition of a New Lay Out of Production and of the stock for Raw Material and Semi-finished material in compliance with the Future Process;
- Definition of an Organization able to support and to put into practice the Future Process.

The Factory was divided into “Pre-Production” and “Production”. The “Pre-Production” is an upstream phase creating the De-coupling stock (that is to say, meant to build all those basic Semi-finished that should never “run out”); Production is, instead, the downstream phase where Finished Products are manufactured using



said stock of semi-finished available and some other added components.

All intermediate levels of semi-finished material has been eliminated from the BOM except for the basic semi-finished material.

Moving on to a higher level of detail, the below considerations will focus on the realization of a Cell dedicated to the manufacture of the Finished Product, however similar considerations are valid even if the object of the discussion would be the semi-finished material.

A PRODUCTION PROCESS = A PRODUCTION CELL

In a Production Cell we can manufacture all those products related to the same production process or too few similar production processes. The semi-finished material and the Finished Products developed and manufactured by M.D. Micro Detectors S.p.A have been split into product families sharing the same Manufacturing Process as to determine the required number of production environments, Pre-Production Cells and Production Cells, and of needed productive resources (Machines, Equipment and Staff) to ensure the fulfillment of customer requirements.

Only all those resources which are useful to manufacture the product must be present inside the cell: it is evident that if one wants to manufacture products with very different production processes in the same cell then the cell should have many different equipment and consequently the cell should have a larger size and the work would become more dispersed and less focused.

One of the key principles of Lean Manufacturing is the compliance with the 5S Techniques: to simplify we can say that the order must reign in the Cell. In M.D. Micro Detectors we have identified all the different production processes and then we have verified pertinent sales volumes. 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.

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. 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.

The Production Cell should be conceived to return therefore a daily output not inferior to the average daily customer demand.

We suppose that the Content of Manual Work to produce a single piece, compared with the Takt Time leads to the conclusion that it is necessary to provide a staff of three people to a specific production cell, Picture 2.

The three persons in question must have a similar workload. To ensure this result, it is necessary to divide the total labor content required to manufacture a single piece in elementary and feasible fractions of work and share

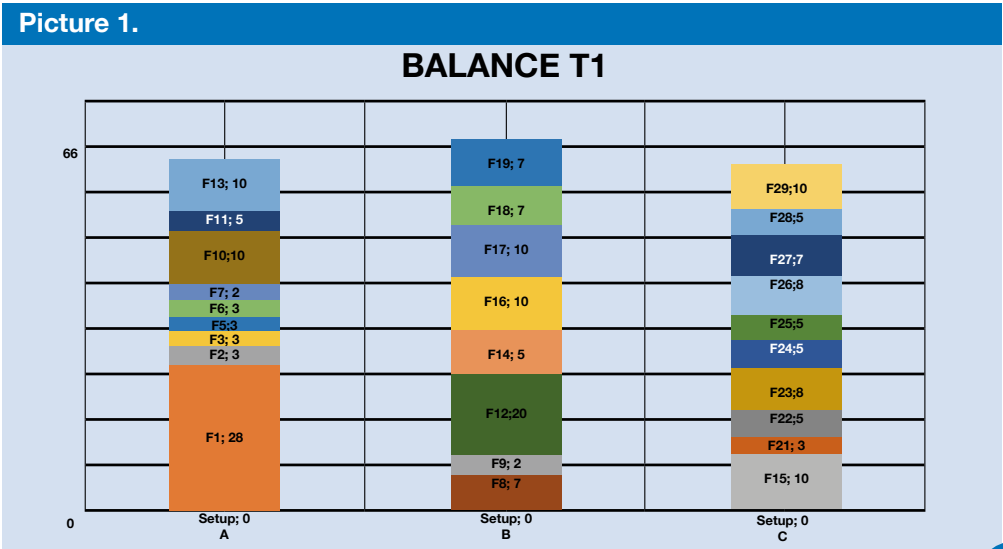
them between the three people who represent the Cell Team. This phase is called Balancing and assigns to individual Cell operators an equivalent content of work.

Picture 1, following the example in question, represents the result of the balancing activity of the Cell: the three operators representing the Cell Team were assigned workloads well balanced and in line with the Takt Time. The Balancing is not a simple task, it is not always evident to guarantee balanced fractions of work between the different cell operators. In order to simplify this activity the Cell is not conceived in a straight line but it is realized with shape of a “horseshoe” (v. Picture 2). This allows the operators to be closer and to help each other. The distribution of work between the different operators in the Cell Team is simplified.

A good balance of workloads ensures equity and work flow according to the principle of One Piece Flow.

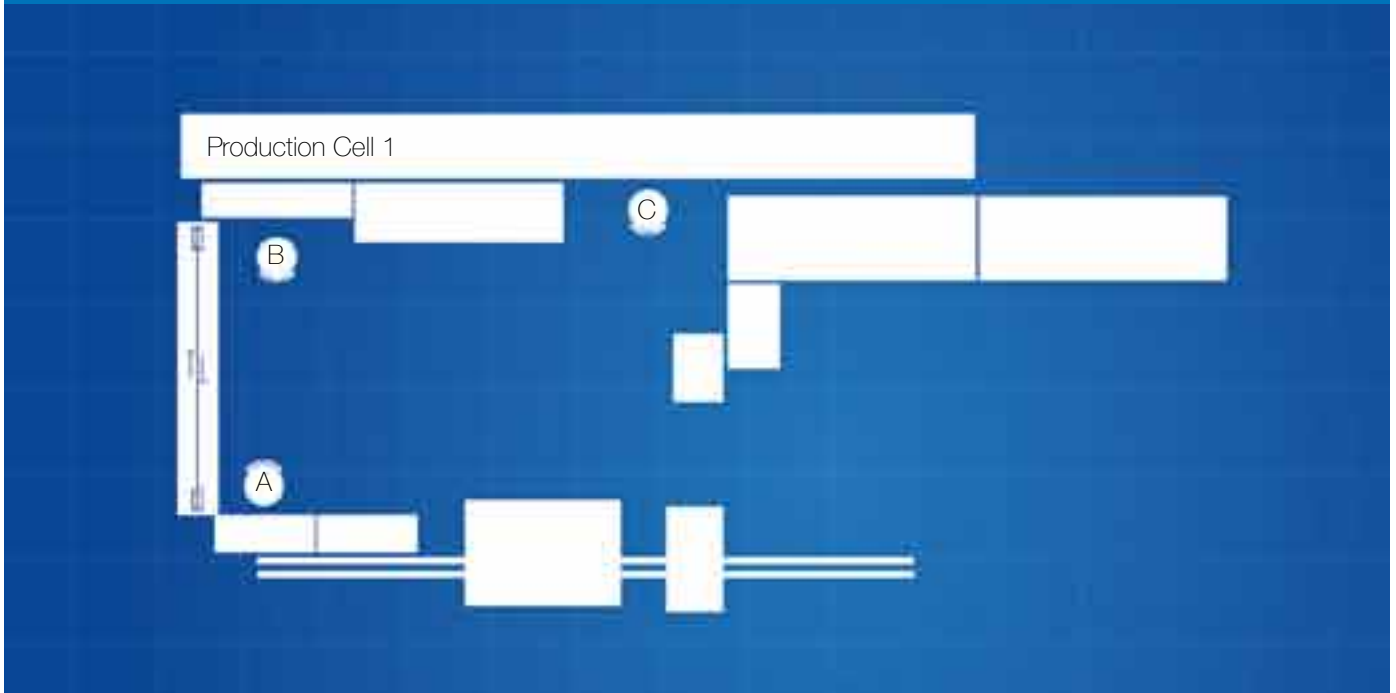
This procedure grants that the provider of the job fraction is very close to its customer: if the internal “customer” of the production cell finds a non-conformity on the job just performed by its cell “provider” there is an immediate feedback to solve the problem in the fastest way.

Possible problems must be definitively solved as soon as they occur, if we accept that these problems may arise again they will generate serious productivity losses: the Cell Process engages at the same time many people and for this reason if one problem occurs stopping the entire cell process, it must be solved immediately using all



CLAUDIO GUERZONI
OPERATIONS MANAGER

Picture 2.



available resources; on the opposite if the job is organized in Departments the operator follows the method of stand alone in front of the machine and it is its own responsibility only.

It is the concept of burning platform: if the problem is not solved immediately and effectively the platform sinks condemning at the worst result the staff working there.

The Lean Manufacturing and the Cell work contain therefore in itself the prerogative of raising the Quality level: the operator at Station B receiving the piece from the operator at Station A helps its neighbor to perform at the best level just to avoid possible re-work and additional efforts in case of not compliant results.

From the balancing activity follows directly the concept of Standard Work. Each operator has to deal with a certain number of tasks using only those tools and method specified and mentioned by the processing instructions as to grant the repeatability of the final result. Production must be carried out in standard way as to ensure standard results.

The Cell operators, as mentioned, are one Team. One of them, in general the most skilled person who is able to support in case of need during each working phase, is called Cell Leader: this is the referent for the Cell Manager. This latter is in charge of one or more cells, he deals with the staff of the cell, Sales and Logistic department from

one side and Shipment department from the other side for all the products related to those cells under his responsibility. The Cell Manager is also in charge of the correct development and management of the Kan Ban for the warehouse (please see the article on previous MD News release) he gives the Kan ban tags for the semi-finished material to the Pre-Production Cells and he also gives the tags related to Kan ban for Raw Material to Purchasing Department.

In fact the Cell Manager corresponds to the Owner of a Small Company specialized in the manufacture of all those products belonging to the same production process. The Cell Leader is, in this perspective, the Product Manager.

The Configuration of each Production Cell, from the drawing of the lay out to the decision of takt time and of balancing, requires the involvement of the Cell Team. This approach will allow everyone to feel really responsible for what they have mutually agreed on.

The Cell Staff is skilled to perform every activity carried out in each station of the Cell. In the past this was not possible as the staff was specialized in one activity related to one department. The growth of multidisciplinary staff, linked to the Cell Organization, has ensured a considerable increase of responsiveness and flexibility.

The Staff Training is planned and managed through the Qualification Matrix, one of the tool shown in Visual Board (v. Picture 3).

Picture 3.



The Visual Board is the instrument of dialogue between the Cell and all the external areas: Logistic and Sales Department, Shipment Departments, Purchasing Department, the Pre-Production Cells and the Warehouse. On the Visual Board following documents are listed:

1. Output Cell Timetable
2. Daily Production
3. Productivity of Cell during last 12 weeks
4. On Time Delivery towards Shipments, on time delivery of the Cells to Shipment Department
5. On Time Delivery towards Customers, on time delivery of Shipment Department towards Customers
6. Situation of production scraps of the Cell
7. Qualification Matrix of Cell
8. Vacation Plan of the Cell Staff
9. Planning Board (v. Picture 4), the tool used by the Cell Manager to plan the daily production activity and the following days on a shared time frame.

In M.D. Micro Detectors S.p.A. the Planning Board, based on Excel file, has replaced the complex and expensive Production Planning programs and Production Progress Verification programs.

The Production Planning program was fed by Sales Orders already placed and by Sales Forecasts. The result was that part of production capacity was used to manufacture products not for immediate sales at the expense of Sales Orders required with shorter Lead Time. The reactivity of the factory was limited by the production in Big Lots typical of Department Production: according to that logic, the goal was to maximize the productivity of the individual department, and not the process as a whole, minimizing the number of set-up.

The Cell Organization has completely changed the logic of Department Production with significant increasing of the set-up number. We have therefore worked with SMED techniques as to reduce in a drastic and systematic way the needed time for each set up: each Production Order corresponds in fact to a single Row of Sales Order.

The Cell Organization has allowed to activate a Just in Time Production exclusively based on Sales Orders Acquired.

M.D. Micro Detectors S.p.A. is able to respond with great reactivity for a Just in Time delivery without resorting to the stock. The Average Lead Time for Deliveries has been significantly reduced.

The focus that this model forces to keep on the process itself is the "seed of improvement": in short, the Lean Manufacturing and the Cell Production "forced" us to improve the process as a whole and in its individual parts.

Have a Good Job!



Picture 4.



▶ PRODUCTS: M18 ULTRASONIC SENSORS FOR WOOD AND PEL- LET DETECTION

The pellet and wood chip burners use virgin wood in small pieces (just a few centimeters in size), which are loaded automatically by some special mechanical devices. The burning material is of different types, such as pruning, sawmill waste or biomass, all coming from forestry activities (coppice cuttings, thinnings, conversion cuttings, etc.). The wood chip systems are fully automated and have no size limits, since they can reach several MW power.

A wood chip heating system consists of the following components:

- Burner;
- wood chips storage tank;
- burning material handling system;
- adjustment control unit;
- Possible buffer tank and boiler for domestic hot water;

In more advanced systems the wood chip flow and combustion are adjusted continuously by a microprocessor which works according to the energy needed from the user and to the temperature and oxygen concentration of the flue gas (lambda control).

The application involves the use of an ultrasonic sensor positioned in the tank, measuring the level of

wood chips and providing the information to the control unit which keeps the tank constantly full. The choice of ultrasonic technology came from the work conditions, which are extremely complicated even for this type of sensor and absolutely not suitable for photoelectric sensors. First of all, wood is a soundproofing material, with a behavior changing also according to material types as wood chips, pellets or sawdust. The chips, due to their irregular and uneven shape, generates also some destructive interferences which makes its detection even more complicated.

Moreover, there are some further limiting aspects represented by the burner structure:

- the sensor must detect the different material types (wood chips, pellets, sawdust), in small and large spaces but in a case with a particular angular shape with reduced dimensions;
- the sensor mounted on the top is completely surrounded by the metal walls of the tank;
- inside the tank there are two movements types, an auger handling and a dispatcher consisting of two tubes. The sensor beam must go through these obstacles which should not interfere in the detection;
- during the filling, the material accumulation tries to deflect the sound emitted from the sensor creating

some false detections;

- there may be some fumes in the tank which go back to the burner chamber;
- the burning material, during winter season, is moist and wet, complicating even more the detection.

In this context, the Ultrasonic sensor must read the material level in a stable and reliable way and must create an analog output following the level in an accurate and stable way, without fluctuations, not to activate the filling of the tank when it seems not to be

necessary, since this will lock the machine.

M.D. Micro Detectors has cleverly solved this application thanks to one of its flagship products, the M18 ultrasonic sensor, UK1 Series. Particularly, using the ultrasound technology knowledge and some applications together with the great flexibility and the



attitude for the products development "tailored" to the customer's specifications, MD Micro Detectors has produced a special version able to overcome all the technological limitations and applications described before.

This is a special version of UK1F model, with the following features:

- **Operating range 100 ... 700 mm:** following to a precise request of the customer, the sensor has a reduced working range to match perfectly with the mechanical dimensions/size of the burning material tank and to avoid any detections either of the walls or any further materials different from the material itself. Not only, the blind zone of the sensor must be minimized in order to achieve the maximum tank filling.
- **The dead zone reduced to 100 mm:** High power emission of the acoustic wave: since the sensor must detect the wood in the most "complicated" type such as wood chips, pellets the sensor has been enhanced in order to have enough energy to compensate for the absorption of the material and ensure an accurate and repeatable detection. We can not forget also the possible presence of fumes and moisture which accentuate further the problem;
- **Wider acoustic emission angle:** this feature is necessary to avoid that, in the filling phase, the beam deviation, normally generated by the agglomerations of burning material, does not bring to any false detections;
- **No adjustable working distance:** the customer expressly requires a no-adjustable sensor considering the complexity of the application to prevent any setting changes from the operators, compromising the right way of


working of machine;

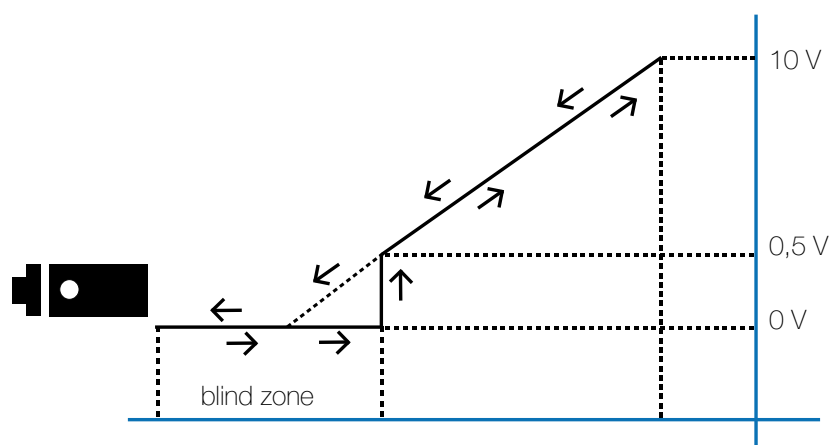
- **High Software Integration with a resulting "1 second" response time:** Since the material inside the tank is moved by an agitator, it is necessary that the creating "undulations" do not change the correct sensor detection, which in this way, must keep its stable and coherent analog output even with the motion of material filling;
- **Dynamic hysteresis close to the dead zone of the sensor:** to obtain a stable and wider reading area we proposed to the customer a system based on a double level of threshold with hysteresis function. The methodology we applied, uses the effect of multiple ECO to keep in this way the output stable and locked. Using a hysteresis trigger system, it is possible to realize some dedicated models which turn on/off only when passage of the target for two selected points.

As you can easily understand, this solution is deeply customized, since it is based on the customer's needs; on the same time, however, due to its great flexibility, the "UK1F platform" is suitable for various customizations, thus opening an application chance for which M.D. Micro Detectors today is able to provide a unique and effective solution. Starting from this product various versions can be derived only by adjusting some of the features described above which remain fundamental and differentiated by the application.

Flexibility, technology, application and market knowledge, customer's focus are striking features in a product and in an application like this one, and which make M.D. Micro Detectors company of excellence in the world of industrial automation.



UK1F/E7-0E**	
	
maximum sensing distance	700 mm
minimum sensing distance	100 mm
beam angle	$\pm 7^\circ$
response time (digital output)	1 s
hysteresis	1% of full scale value
repeatability	1% of full scale value
linearity error	2% of full scale value
operating voltage	15 - 30 Vcc
ripple	$\leq 5\%$
supply current (no load)	≤ 50 mA
output voltage (analog output)	0...10 V
minimum load resistance	3 k Ω
leakage current	10 μ A
time delay before availability	≤ 900 ms
operating temperature	-20 $^\circ$ C... + 60 $^\circ$ C
temperature drift (sn)	$\leq 7\%$
temperature compensation	●
short-circuit protection	auto reset
induction protection	●
voltage reversal protection	●
shocks and vibrations	IEC EN 60947-5-2 / 7.4
leds	yellow (output state)
protection degree	IP67 (EN60529) - NEMA 4X
emc	Conforming to IEC EN 60947-5-2
housing material	PBT
sensing surface	Epoxy-Glass resin
connection	M12 plug



▶ PRODUCTS: NEW MINIATURIZED INDUCTIVE SENSORS

M.D. Micro Detectors has completed its Inductive Miniaturized Sensors portfolio with the introduction of the following new models, in both cylindrical and cubic housings:

- AA1 series = Ø3 mm
- AB1 series = M4
- IL5 series = 5 x 5 x 25 mm
- IL8 series (with sensing surface at the edge) = 8 x 8 x 40 mm
- IL9 series (with sensing surface in the centre) = 8 x 8 x 40 mm.

Through the introduction of these models completing the range, today the M.D. Micro Detectors Proximity products portfolio is established as one of the most competitive and complete in the Industrial Automation Market.

M.D. Micro Detectors is one of the few companies able to develop directly a complete range of Miniaturized Inductive Sensors.

The new miniaturized inductive sensors are now

available shielded

versions, with both standard and long distance sensing range. Their working distances are as follows:

- 0,6mm and 1mm for Ø3 models (AA1 series) and M4 (AB1 series);
- 0,8mm and 1,5mm for 5x5mm models (IL5 series);
- 1,5mm and 2mm for 8x8mm models (IL8 and IL9 series).

All of the models are supplied with stainless steel housings. The small dimension and high switching frequency (up to 7kHz) makes these models particularly precise and repeatable during the detection phase.

Available with NPN or PNP outputs, NO or NC logic and either 2 m PVC or PUR cable as well as M8 plug. All models are available with CE and UL certification.

These products are completely "Made in Italy", as they have been developed and manufactured in our Modena facilities.

The complete range of Miniaturized Inductive Sensors by M.D. Micro Detectors is thus

composed of following models:

- Ø3 (AA1 series)
- M4 (AB1 series)
- Ø4 (AC1 series)
- M5 (AD1 series)
- Ø6,5 mm (AHS series)
- M8 (AES series)
- 5 x 5 mm (IL5 series)
- 8 x 8 mm (IL8 and IL9 series)

Main features

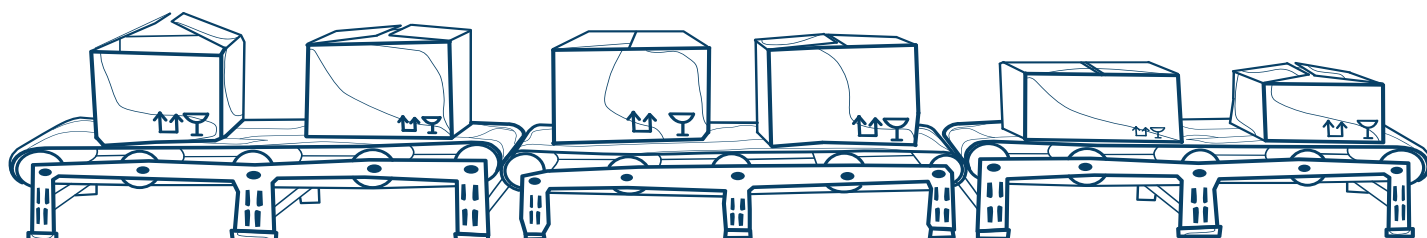
- INOX AISI303 stainless steel

housing, high tightening torque for a safe installation

- Switching frequency up to 7kHz, precise and highly repeatable detection of small and fast objects
- IP67 protection degree, no way for dust and liquid to penetrate inside the sensor
- Output state LED clearly visible
- Extremely reduced dimensions, easy to install in applications where space is a premium
- Cable or M8 plug versions, suitable for all connection needs
- Single or double sensing distance, shielded versions
- CE and UL product certifications available.

Typical applications

- Industrial Robots
- Metal working machines
- Textile Industry
- Packaging Industry
- Logistics.





**MARIA MIGLIACCIO &
ORAZIO DEL PRETE**
CELL MANAGER
OPERATIONS M.D.
MICRO DETECTORS\



The new miniaturized Proxy Sensors complete the MD Micro Detectors range. Thanks to the small dimensions and long detecting distances, they can be used in all the application where the space available is "critical". The High Working Frequency allow to detect small objects moving faster.

AA1 SERIES

- Ø3
- 0.6 mm 1 mm Detection Ranges
- Stainless Steel Housing
- cable Exit

AB1 SERIES

- M4
- 0.6 mm 1 mm Detection Ranges
- Stainless Steel Housing
- cable Exit

IL5 SERIES

- 5 x 5 mm
- 0.8 mm and 1.5 mm Detection Ranges
- Stainless Steel Housing
- cable Exit

IL8 SERIES

- 8 x 8 mm
- with sensing surface at the edge
- detection ranges 1.5 mm and 2 mm
- Stainless Steel Housing
- M8 connector and cable exit

IL9 SERIES

- 8 x 8 mm
- with sensing surface in the centre
- detection ranges 1.5 mm and 2 mm
- Stainless Steel Housing
- M8 connector and cable exit



Micro Detectors

Italian Sensors Technology

▶ PRODUCTS: 90° RIGHT ANGLE ULTRASONIC SENSORS



detection of the level of asphalt in the machine and the height level on road surface



Market Field: ASPHALT MACHINES

Solution: In the asphalt machines, the UK1 series is used both to detect the level of asphalt in the machine and to detect the height level deposited on the road surface.

detection of the level of the waste collected and the presence of the container



Market Field: REFUSE COLLECTION VEHICLES

Solution: in the refuse collection vehicles, the ultrasonic sensors have different applications. The M18 sensors, UK1 series are used both to detect the level of the waste collected in the tank, and the presence of the container in vehicles with side collection. These sensors are also used to detect the presence of persons in the work area before lowering the empty dumpster.

The M18 UK1 series of sensors detect the presence of people on the platform, before putting the

vehicle in motion, regardless of the colour of the uniform and the weather conditions.

detection of height of the brushes and distance from the pavement



Market Field: Road sweepers

Solution: Ultrasonic sensors M18 series UK1 are used to define the height of the brushes to the ground and the distance from the pavement.

detection of powders, granular materials and fluids inside the vaults / tanks



Market Field: Storage facilities / tanks

Solution: Ultrasonic sensors M18 UK1 series with analogue output can be used to detect the level of powders, granular materials and fluids inside the vaults / tanks.



	UK1A/E*-**UL	UK1D/E*-**UL	UK1F/E*-**UL
maximum working distance	400 mm ⁽¹⁾	1,600 mm ⁽¹⁾	2,200 mm ⁽²⁾
minimum working distance (blind zone)	50 mm	150 mm ⁽¹⁾	200 mm
sensing range	50...400 mm	150...1,600 mm	200...2,200 mm
beam angle	± 8°	± 8°	± 7°
switching frequency (digital output)	10 Hz	2 Hz	1 Hz
response time (digital output)	500 ms	250 ms	500 ms
hysteresys	1%		
repeat accuracy	0.5%		
resolution	1 mm	3 mm	3 mm
linearity error	1%		
temperature range	- 20°C...+ 60°C		
temperature compensation	●		
operating voltage	15 - 30 Vdc		
thermal drift	5%		
ripple	≤ 7%		
leakage current	10 µA @ 30 Vdc		
output voltage drop	2.2 V max. (IL = 100 mA)		
no-load current	≤ 50 mA		
output/output current (digital output)	100 mA		
minimum load resistance (analog voltage output)	3 k Ω		
adjustment set point	Teach-In button		
time delay before availability (digital output)	≤ 500 ms		
time delay before availability (analog output)	≤ 900 ms		
electrical protections	overvoltage pulses, transient		
output electrical protections	short circuit (auto reset), overvoltage pulses		
digital output electrical protections	overvoltage pulses		
EMC	conforming to the EC Directive 2004/108/EC requirements according to EN 60947-5-2		
protection degree	IP67 (EN60529)		
housing material	PBT		
front end material	(plastic) /120 g (metallic)		
tightening torque	1 Nm		
weight	26 g (plug exit); 88 g (cable exit)		
storage temperature	100 g (plastic) /120 g (metallic)		

⁽¹⁾ Metallic target 100 x 100 mm ⁽²⁾ Metallic target 200 x 200 mm



executive hotel



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Hotel Executive is located in Fiorano Modenese, in the heart of the most important ceramic industrial district, just twenty minutes far from Modena city centre, close to the prestigious sports car manufacturer Ferrari and Fiorano circuit.

The hotel is owner run; opened in 1985, it was the first 4-star-hotel in the region. Modern and elegant, it meets the highest needs of any Customer. The hotel has a large hall with bar service and a refined, comfortable area where You can enjoy Your continental buffet-breakfast included in room price.

Meeting rooms with 10 to 150 seats are also available. The large parking areas, both outdoor and indoor, are free-of-charge and available for all Guests.

TYPICAL CUISINE FROM OUR REGION

The hotel has a Restaurant open to everybody , where all lovers of traditional food can delight their palate in an Elegant and Inviting place.



ATTRACTIONS

Maranello and Fiorano are the towns where the famous sports car manufacturer as well as its museum and racetrack are located. The best-known red racers of the world are tested there.

In Fiorano You can visit the Sanctuary dedicated to the Holy Virgin of the Castle (built in 1634), the wonderful Spezzano Castle (dated 12th Century) and in Sassuolo, a nearby town, You can visit the monumental Ducal Palace (1458).

An amazing natural phenomenon: Salse di Nirano. The natural reserve named "Salse di Nirano" is well-known for the geological phenomenon of mud erupting volcanoes.

MEETING ROOMS

Hotel Executive offers all that is needed to host meetings.

The hotel has elegant and large rooms, equipped with all needed technological tools. The qualified personnel offers all needed support for recreational, dining and pause activities.



CUBIC MINIATURIZED PHOTOELECTRIC SENSORS:

QM MORE SPECIALIZED, WITHOUT ANY LIMITS...

Since being launched the QM cubic miniaturized rectangular sensor has passed many strength and performance tests by our customers and it stands out when compared to different competitors' products. This a new style of product line for our family of photoelectric sensors, recognizable by its slightly wider width compared to similar products the QM series gives beyond expectation performance as you would expect coming from a company with years of experience in designing different optical

solutions for their extensive range of cylindrical sensors to solve almost any application.

Its miniature cubic housing has demanded a deep and accurate research as to enable us to reach the highest technical level for a perfect product to fit those applications, where technical excellence is required to solve any type of application.

When we developed the new QM series we challenged ourselves to create a more powerful and complete series than our competitors, able to exceed any optical limit but we are also happy to customize our

sensors to suit our customer's specific needs. We at M.D. are happy to create additional codes for our customers, thus widening the range further and making it as complete as possible. An example of our customization can be seen by the new codes below.

Available versions as follows, with relevant enhanced details:

- QMR7/**-** 28
- QMR8/**-** 28
- QMRS/**-** 28

Same performances as standard models, but immunity to incandescent lamp > 10,000 lux.



	QMR7/**-28	QMR8/**-***28	QMRS/**-0*28	QMIS/**-0*28
nominal sensing distance Sn	400 mm	1 m	200 mm	400 mm
minimum working distance	5 mm			
sensibility adjustment	●			
emission	red (630 nm)	red (850 nm)	red (630 nm)	infrared (850 nm)
differential travel	≤ 10 %			
repeat accuracy	5 %			
light-dark selection	●			
operating voltage	10...30 Vdc			
ripple	≤ 10 %			
no-load supply current	≤ 30 mA			≤ 45 mA
load current	≤ 100 mA			
leakage current	≤ 10 µA			
output voltage drop	2 V max. @ 100 mA			
maximum load current	≤ 100 mA			
output type	PNP or NPN NO or NC			
switching frequency f	2 kHz	1 kHz		
response time	≤ 100 ms			
supply electrical protections	polarity reversal, overvoltage pulses			
output electrical protection	short circuit (auto reset)			
operative temperature range	- 25°C...+ 70°C (without freeze)			
thermal drift	- 30°C...+ 80°C			
IP protection degree	IP67 (EN60529)			
EMC	conforming to the EC Directive 2004/108/EC requirements according to EN 60947-5-2			
interference external light	10,000 lux (incandescent lamp), 50,000 lux (sunlight)			
LED indicators	yellow (output state LO/DO; green (excess gain)			yellow (output state LO/DO
housing material	PA66			
optic material	PMMA			
tightening torque	1 Nm			
weight (approx)	52 g cable, 10 g M8 plug			

IN M.D. WE TRUST!



TOP PERFORMANCES, FAST DELIVERIES!



FAL SERIES

- Cylindrical M18 with Red LASER emission
- Direct sensing up to 200 mm (radial optic) and 300 mm (axial optic)
- Polarized up to 30 m
- Emitter/Receiver up to 50 m
- Axial and Radial Optic
- Plastic and Metal Housing
- Adjustment by button
- ATEX, cat. 3 Models Available
- IP67 Protection Degree



QM SERIES

- Housing Dimensions 21 x 12,8 x 31,2 mm
- LEDs emission both RED High Efficiency or INFRARED
- PMMA Optical Material
- 2 kHz Switching Frequency
- Cable, M8 Connector or M8 and M12 "pig-tail" exit
- IP67 Protection Degree



**FAST IN
ANSWERING**



**FAST IN
MANUFACTURING**



**FAST IN
DELIVERING**



Micro Detectors

Italian Sensors Technology

A person wearing a dark suit, white shirt, and blue tie is holding a large, glowing white sphere with both hands. The sphere is the central focus of the image.

WHAT'S NEXT?

READY TO CONNECT



IO-Link

***THE INPUT/OUTPUT LINK TECHNOLOGY ARRIVES
IN M.D.! FOLLOW US BECAUSE IN NEXT FEW
MONTHS WE ARE GOING TO PROPOSE YOU SOME
GREAT NEWS!***



Micro Detectors
Italian Sensors Technology

FINMASI GROUP: PCB DIVISION

Tradition, Technology, Service and Quality: these are the main characteristics of Cistelaier S.p.A. and Techci Rhône-Alpes S.A., the two companies belonging to Finmasi Group PCB Division that develop and manufacture printed circuit boards.

Finmasi Group PCB Division's approach to the market is based on the so-called "3M-offer":

- Multi-Product: from double layer to the most complex multilayer PCBs;
- Multi-Service: from Quick Turn Around prototypes to big series' production;
- Multi-Technology: from the standard to the most advanced ones.

Techci and Cistelaier's strengths are:

- Excellent technical competences as a result of decades of high-level activity;
- High-quality products and service;
- Its team and organization;
- Completely reliable and stable manufacturing processes.

Cistelaier and Techci can manufacture any kind of printed circuit board, whether it's a Quick Turn Around prototype or a full series' production:

- Double layer
- Multilayer
- Flexible and Rigid-flex
- HDI
- Micro-vias
- Press-fit holes
- Special boards.

Cistelaier and Techci have obtained following certifications:

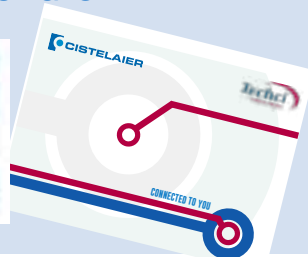
- ISO 9001 Company certification (VISION);
- Medical devices: ISO 13485:2003;
- Automotive sector: ISO/TS16949:2009;
- Railway sector: IRIS-International Railway Industry Standard;
- Aerospace sector: UNI EN 9100:2009;
- NadCap (National Aerospace and Defence Contractors Accreditation Programme);
- UL94V0.

Sourcing

FINMASI Group PCB Division, thanks to the know-how gained from its European PCB manufacturing companies (Cistelaier and Techci), has the capability to carefully select and constantly qualify the best Asian manufacturers in terms of quality, service, competitiveness, certifications and technical capabilities acquired, compliant to the European standards.

In this way, Finmasi Group PCB Division represents the ONE AND ONLY partner for customers all through their projects, starting from the design phase, manufacturing of prototypes and pre-series - produced in Cistelaier and Techci plants in Europe, up to big series' production by our Asian partners.

Download our brochure!



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Techci
Rhône-Alpes

**COME AND VISIT
US IN PARIS
19-21 JUNE**





Micro Detectors

Italian Sensors Technology



M.D. Micro Detectors S.p.A. has been designing and manufacturing a wide range of industrial sensors since 1971. Our company's strong commitment to future developments and innovations is based on over 40 years of knowledge. Our product portfolio is the following:

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

Variation and customization of catalogue products are also an important part of our activity, as well as products specifically developed to satisfy our customers' needs. Moreover, we develop innovative solutions for industrial applications using our technology. Our organization and competences allow us to manufacture our products quickly and with guaranteed

for our customers. Fast deliveries is one of our biggest strengths.

Over 1.3 million pieces are entirely manufactured in our Modena plant. Our Made in Italy production is synonymous for quality, accuracy, experience and reliability.

Since the beginning, our products have been renowned on the market for their quality, robustness, ease of use and for outstanding performance. This is the result of a manufacturing process carried out at the highest level of capacity, quality, efficiency and flexibility.

All processes, from research and development of new products to manufacturing and final shipment, are carried out by our personnel at our site. This allows us to keep all of our processes completely under control and to be flexible and reactive to customers' needs.

We are organized according to the principles of Lean Thinking. All products manufactured in our plant undergo constant controls and they are always double-checked.

The human and material assets of our Company guarantee the best results and a constant support at all times. Work ethic, customer orientation and continuous improvement, passion and commitment to excellence, search for professional challenges: the professional background of our people is made of this and more.

The quality of M.D. Micro Detectors S.p.A. has also been certified throughout the years: our Quality Management System has been certified ISO 9001:2008 and several products have obtained the CE, ATEX, UL, cULus, Diversey, TÜV and ECOLAB certification.

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