

2019

Cavity Eye Catalogue

Cavity Eye
Intelligence
in molding





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CAVITY EYE
INTELLIGENCE IN MOLDING

Introduction

The purpose of Cavity Eye is to optimize the production-parameters with the help of measuring pressure inside the mould. It is important to see these internal processes because they define the quality of the product, thus the name: Cavity Eye. We can only understand these processes if we examine the conditions of the injection with adequate instruments. Later we can use the acquired information to properly set up the injection-moulding machine.

The Cavity Eye production-monitoring system uses built-in pressure- and temperature-sensors inside the mould to show us what really happens inside the cavities where the product is created. If this product is eligible the client pays for it, if not it is an expense for the manufacturer.

Even the latest injection-moulding machines and their most experienced operators have production losses if they don't have enough information of the production. The precision of one machine setup will be defined more by luck than by intention. If you think that your injection-moulding technology is unstable, has hidden errors, the product-quality is varying and causes customer complaints or production blocks, than we are your partners!

The Cavity Eye Team consists of experienced machine operators, mould designers and engineers who aimed to create a user-friendly, easy-to-use system. Spend your nights peacefully knowing that everything is going on the right way!

We give you a solution to reduce the production time, the proportion of bad parts and customer-complaints and most important of all, to improve your company's efficiency!



Technology

One of the most challenging issue of the injection moulding is to precisely learn the problems and inadequacies of the product, so the quality of the product is sufficient for the customer. The problem identifying becomes more effortless if you have multiple sources of information. Pressure measurement in injection moulds gives you a helping hand in such cases.

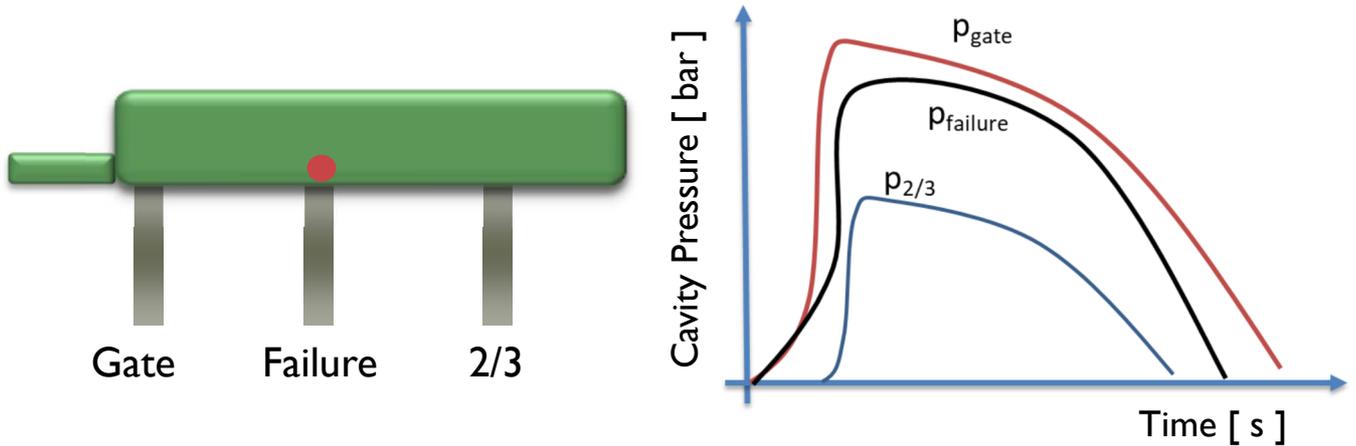
Our system assists you in the following areas of production:

- Following the injection cycle with the help of the pressure curves measured in the cavity
- Quicker production start- and restart process
- Injection moulding machine's (IMM) parameters optimization
- Switchover to holding by cavity pressure
- Locating filling imbalances, reaching filling balance
- New mould tests, new moulds reach mass production phase faster
- Automatic scrap product sorting
- Product quality improvement using cavity pressure results
- Stabilized production
- Production, cycle data saving, documentable production, statistical analysis

According to customer requirements and product parameters, we offer different measuring positions:

- Start of flow path (Post-Gate)
- The 2/3 of the flow path (End-of-Filling)
- Direct measuring at the failure

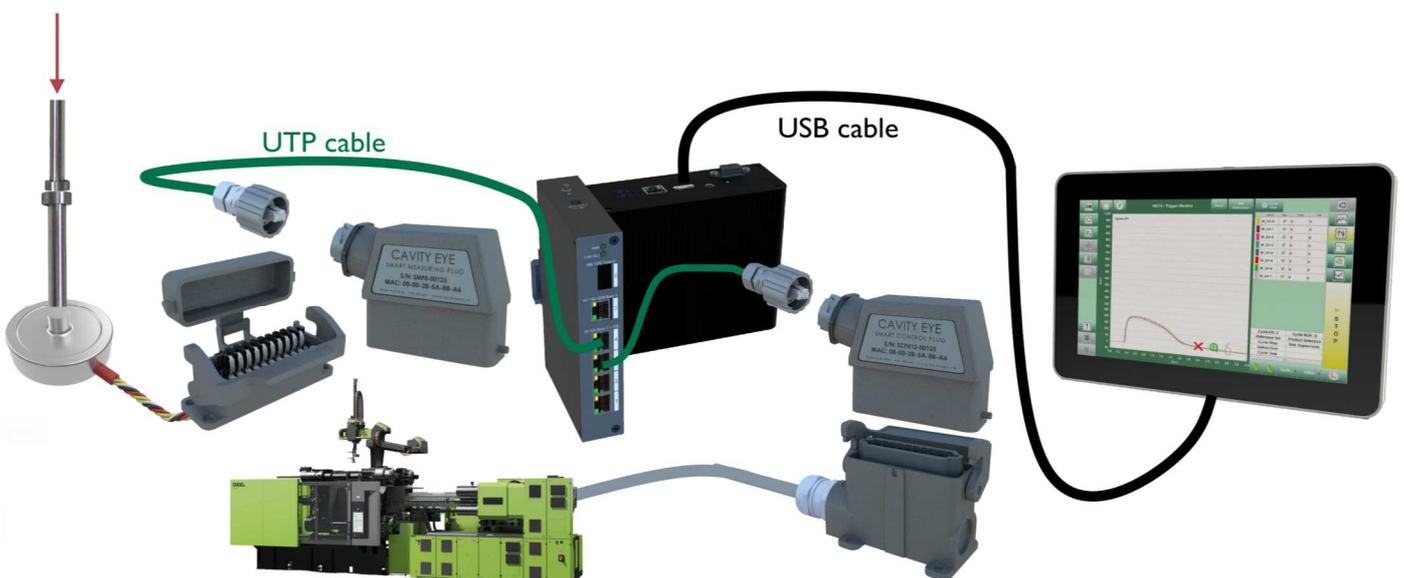
The different measuring positions leads to different pressure curve shapes, as you can see the figure below.



The post-gate sensors are used for moulding technology optimization, because this position provides information of the filling, holding and cooling phase as well. The sensor at the 2/3 of the flow path is near the end of filling, so it provides information about whether the shot is short or the product has flash, thus it is a valuable information to sort the products. The direct failure measuring is good for having the failure held under control.

The Cavity Eye sensors are measuring the mould cavity pressure indirectly. The pressure in the cavity acts on the ejector pins as a force load, and the force is transmitted by the ejector and the transfer pin. The transfer pin is an ejector pin upside-down, which transfers the measuring to the sensor, thus the information is forwarded from the cavity to you.

The adequate amount of free-moving is highly important for the transfer pins and the ejector pins. The pinching of the ejectors should be regularly checked, moreover, the fitting of the ejectors, transfer pins and sensors must be done according to the specifications. You can find further information in the *Cavity Eye Sensor Installation Guide* and our installation layout drawings located on our official website.





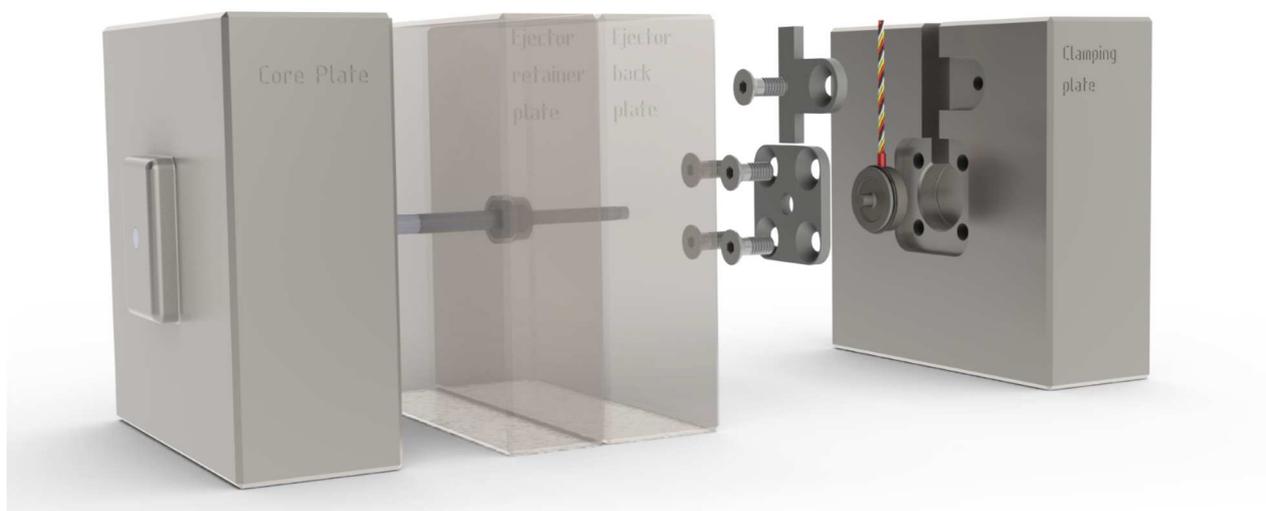
Sensor installation possibilities

The sensor installation is possible in different plates of the mould:

- Clamping plate — front installed (Force transmitted by ejector and transfer pin)
- Clamping plate — rear installed (Force transmitted by ejector and transfer pin)
- Cavity / core plate — (Force transmitted by static pin)
- Cavity core plate — mould opening deformation design
- Other inserts — unique design

Clamping plate - front installed

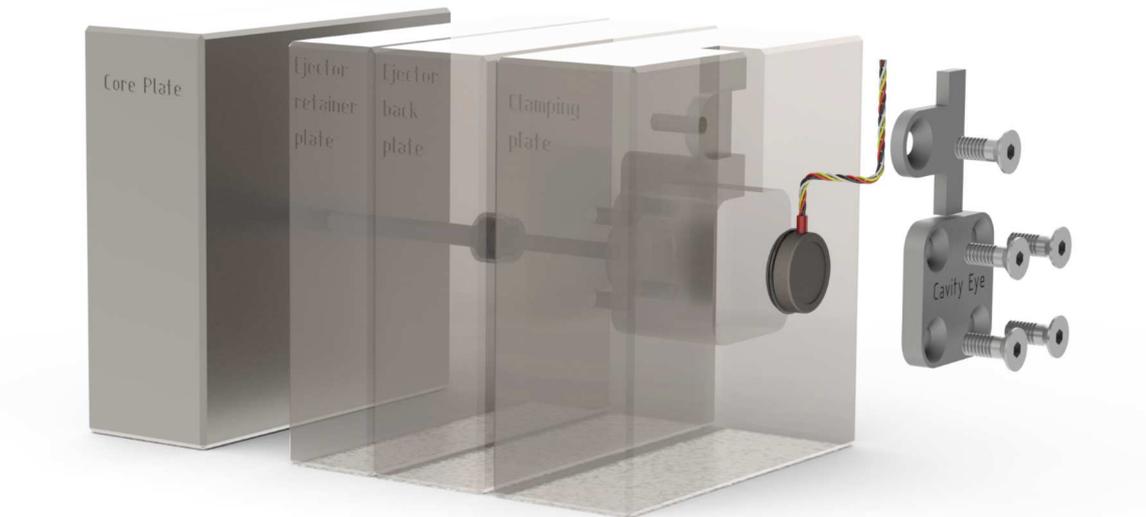
In case of installing the sensors in the clamping plate we use ejector and transfer pins to measure the pressure of the cavity. In this case, it is very important that the sensors are not preloaded, so the measuring pins are not under load after the assembling. This is the most frequently used design, because the clamping plate offers larger space for the sensor pockets and the cable channel.



Clamping plate — front installed

Clamping plate - rear installed

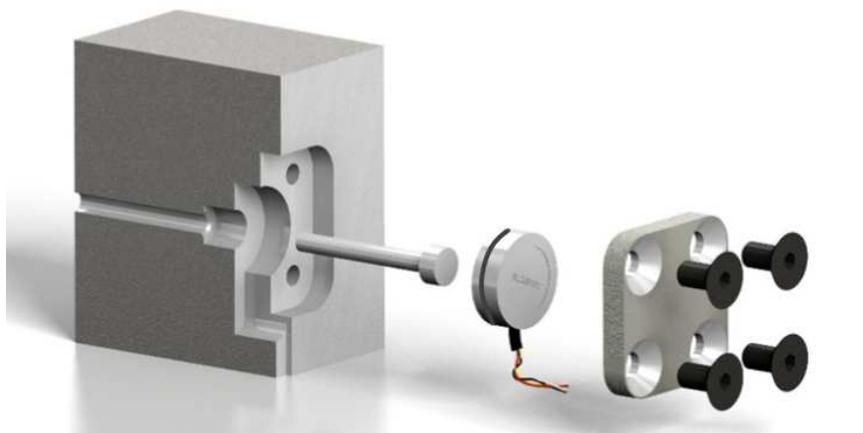
There are two types of clamping plate designs according to the sensor placement direction: front and rear installation — same as the case of the ejector plate. The rear-installed design is applied in case of thin clamping plates (< 30 mm) to avoid unnecessary milling and preload caused by other elements of the mould



Clamping plate — rear installed

Cavity / Core plate design

This design is only applied, when there is no place for the sensors in the clamping plate, or there are no ejectors in the mould, or one would like to place the sensors in the fixed side of the mould. The measurement is accomplished by static pins. Rarely used design, as it is expensive, complicated and the maintenance is dangerous to the cables and sensors, however it is the only working design occasionally.



Cavity / Core plate



Sensors and accessories

The pressure sensors operate on an electro-resistive principle, which is one of the oldest and most stable measuring methods. The final form of the sensors was achieved with years of hard work and development, so you get the most reliable source of information about your mould.

The sensors are grouped by dimension and maximum load. The colour code of plastic pipe on the sensor cable refers to the type of the sensor:

15 mm diameter (RC15):

- 1 kN load (red pipe)
- 5 kN load (gray pipe)

26 mm diameter (RC26):

- 20 kN load (red pipe)
- 40 kN load (gray pipe)

Every sensor type has an item number, for example: RC15-1 - where RC refers to Ring Cell, 15 refers to the diameter of the sensor in mm and the last number refers to the maximum load: 1 kN. The two characters at the end of the code refers to the operating temperature of the sensor.



For every different maximum load, there are a higher temperature range sensor. The normal temperature range sensor (without the last two characters) is capable of measuring up to 150°C, while the high temperature range sensor (last two characters: HT) is capable of measuring up to 200°C.

Sensors



Technical data	RC15-1	RC15-1-HT
Diameter with rubber ring (mm)	16	
Height (mm)	8	
Weight (g)	21	
Maximum load (kN)	1	
Hardness (HRC)	45	
Protection rating	IP 67	
Operating temperature range (°C)	-40 - 150°C	-40 - 200°C
Excitation voltage (V)	5...12	
Deformation at max. load (mm)	< 0,05	



Technical data	RC15-5	RC15-5-HT
Diameter with rubber ring(mm)	16	
Height (mm)	8	
Weight (g)	21	
Maximum load (kN)	5	
Hardness (HRC)	45	
Protection rating	IP 67	
Operating temperature range (°C)	-40 - 150°C	-40 - 200°C
Excitation voltage (V)	5...12	
Deformation at max. load (mm)	< 0,05	



Technical data	RC26-20	RC26-20-HT
Diameter with rubber ring (mm)	27.5	
Height (mm)	12	
Weight (g)	35	
Maximum load (kN)	20	
Hardness (HRC)	45	
Protection rating	IP 67	
Operating temperature range (°C)	-40 - 150°C	-40 - 200°C
Excitation voltage (V)	5...12	
Deformation at max. load (mm)	< 0,05	



Technical data	RC26-40	RC26-40-HT
Diameter with rubber ring (mm)	27.5	
Height (mm)	12	
Weight (g)	35	
Maximum load (kN)	40	
Hardness (HRC)	45	
Protection rating	IP 67	
Operating temperature range (°C)	-40 - 150°C	-40 - 200°C
Excitation voltage (V)	5...12	
Deformation at max. load (mm)	< 0,05	

Choosing the right sensor for your mould is depending on the maximum load the sensor must bear during injection. The load is a function of the cavity pressure and the measuring area of the ejector pin. Given the same conditions, the larger the measuring area is, the higher the force acts on the sensor. The following table helps you in choosing the right sensor for your ejector diameter.

Diameter [mm]	Area [mm ²]	Force[N] P=1000 bar	Force[N] P=2000 bar	Recommended Sensor
0,5	0,20	20	39	1 kN
1	0,79	79	157	1 kN
2	3,14	314	628	1 kN
3	7,07	707	1413	1 kN
4	12,56	1256	2512	5 kN
5	19,63	1963	3925	5 kN
6	28,26	2826	5652	5 kN
7	38,47	3847	7693	20 kN
8	50,24	5024	10048	20 kN
9	63,59	6359	12717	20 kN
10	78,50	7850	15700	20 kN
11	94,99	9499	18997	20 kN
12	113,04	11304	22608	20 kN
13	132,67	13266	26533	20 kN
14	153,87	15386	30772	40 kN
15	176,63	17662	35325	40 kN
20	314	31400	62800	40 kN

Front and back plates

We use front and back plates to cover our sensors. Front plate is used in case of front installed, clamping plate design. The front plate is a 2,5 mm thick steel sheet. Back plate is used in case of rear installed, clamping plate design. The back plate is a 4 mm thick steel sheet. In case of rear installation, the back plate is not just covering the sensor, but it is also a load-bearing part, thus the fixing of this plate is quite critical.

Item number	Installation direction	Thickness (mm)	Fixing screws
PC15-FP	Front	2,5	M4x10
PC15-BP	Rear	4	M4x10
PC26-FP	Front	2,5	M6x16
PC26-BP	Rear	4	M6x16



PC15-FP



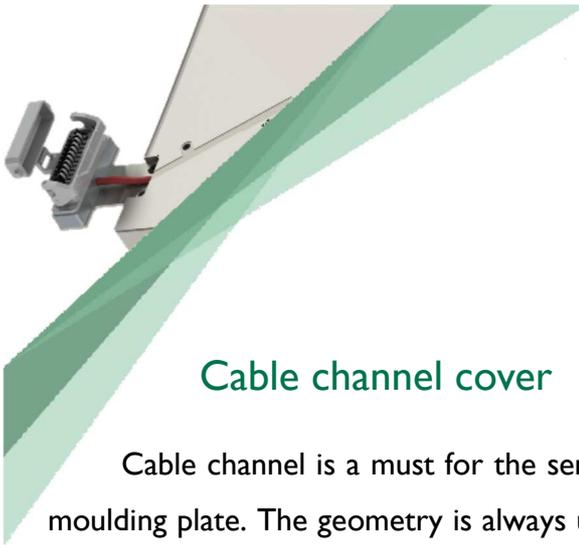
PC26-FP



PC15-BP



PC26-BP



Cable channel cover

Cable channel is a must for the sensor wires to reach our mould socket on the surface of the moulding plate. The geometry is always unique, but some dimensions should be chosen according to our general guidelines. You can find further information in *Cavity Eye Sensor Installation Guide* and our installation layout drawings located on our official website. We recommend using a cover sheet for the cable channel to protect the sensor cables. The cover sheet is 2,5 mm thick, and it is recommended to be fixed with M4 screws.

Dummy sensors

The dummy sensors are static parts of the measuring system as they are physically replacing the pressure sensors in the sensor pockets. They are typically applied in case of selecting multiple possible sensor positions. The sensor pockets are milled in every position and the unused ones are filled up with dummy sensors after finding the optimal measuring positions. It has the same geometry like the pressure sensors, so it is available in RC-15 and RC-26 design.

Mould Plug with Memory (MPM)

The Cavity Eye Mould Plug with Memory (MPM) socket was developed for the Injection Moulds equipped with Cavity Eye pressure sensors. This socket is equipped with a special, integrated memory, and responsible for storing the data of the moulds and the Cavity Eye sensors. The wiring of the sensors takes place in this device, and it is also the counterpart of the Cavity Eye Smart Measuring Plug (SMP). It is an indispensable accessory of the Cavity Eye pressure sensors. The memory works with 5 V power supply, and the data stored in the memory will not be lost in case of disconnecting the MPM from the power source. The device is fixed to the mould, thus after disconnecting from the SMP counterpart, it is moving with the mould.



MPM8-B



MPM32-A

There are two types of Mould Plugs you can choose from, depending on how much sensor signal is required to handle. MPM8-B type can be used up to 8 sensors. Over 8 sensors and up to 16 sensors 2 MPM8-B device can be applied. In case of higher sensor number, the MPM32-A device can be used. It can handle 32 sensors at the same time. In case of using more, than 32 sensors but maximum 64 sensors, 2 MPM32-A device is the right choice.

Data	Unit	MPM8-B	MPM32-A
Weight	g	152	548
Main dimensions	mm	96x93x45	127x140x57
Operating temperature range	°C	0 - +80	
Power supply	V	5	
Protection rating	IEC 60529:1989	IP64	
Number of channels	pcs	8	32
Number of pins	pcs	20	76

The pin allocation is important for the MPM devices. You can find further information about the sensor wirings in the *Cavity Eye Sensor Installation Guide*.

Mould Plug Spacers

The MPM sockets are always fixed on the mould with a spacer. Depending on how thick is the plate where the sensors are installed, we use different type of spacer parts. The standard spacer can be applied at thick clamping plates or ejector plates. Offset spacer is used, when the clamping plate is not thick enough for the MPM to fit with the covering cap opened on the mould. The angle spacer is used for the same reason: to make more space for the MPM cap in opened state.



Standard Spacer
(MPH-SS)

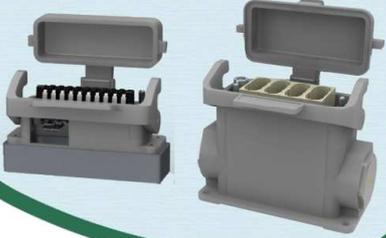


Offset Spacer
(MPH-OS)



Angle Spacer
(MPH-AS)

MPM8-B MPM32-A



SMP8

SMP32



SCP412



SCS16

PC-NUC



SWITCH-4





RC26-X-YY



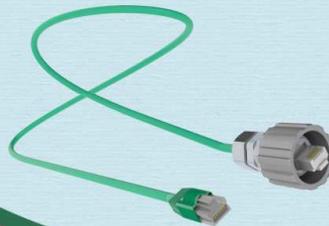
RC15-X-YY



SCR-M-H



UTP-B-XX



Mould-side products

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Smart Moulding Control

The Smart Moulding Control (SMC) is an online, real-time quality and production monitoring system, which measures the cavity pressure in injection moulds and controls the production.

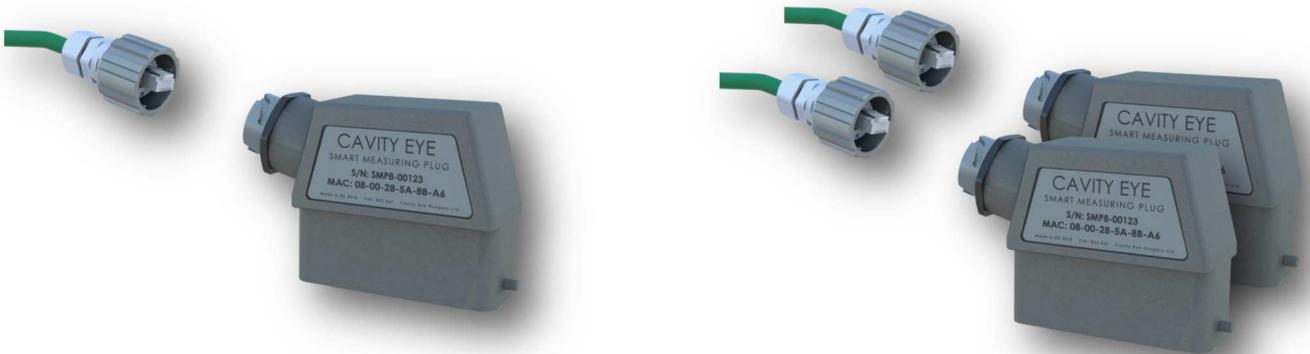
The SMC system consists of the following:

Name	Description
Smart Measuring Plug (SMP)	Smart Measuring Plug, 8 or 32 channels
Smart Control Plug (SCP412)	Smart Controlling Plug with 4 inputs and 12 outputs
Display (SCR-M-H)	Touchscreen display
PC and Switch (PC-NUC; SWITCH-4)	Data processing and storing devices
UTP cable with bayonet lock (UTP-B)	Cable between the Plugs and the Switch
UTP cable 300 mm	Cable between the PC and the Switch
Display USB cable (USB-M)	USB mini-B and USB-A cable, 2 or 5 m
Display HDMI cable (HDMI-M)	HDMI cable for display, 2 or 5 m
PC power supply (PSU-PC)	19 V PSU for PC
Switch power supply (PSU-SWITCH)	48V PSU for Switch
Fixing accessories	Display holder, screws, DIN rail, magnets

Further devices, which are necessary for the measurement system to operate, but the **SMC system does not contain:**

Name	Description
Smart Control Socket (SCSI 6)	Injection Moulding Machine socket with memory
Mould Plug with Memory (MPM)	Mould socket with memory, 8 or 32 channels
Pressure sensors (PC)	Cavity Eye pressure sensors, in 1-40 kN range

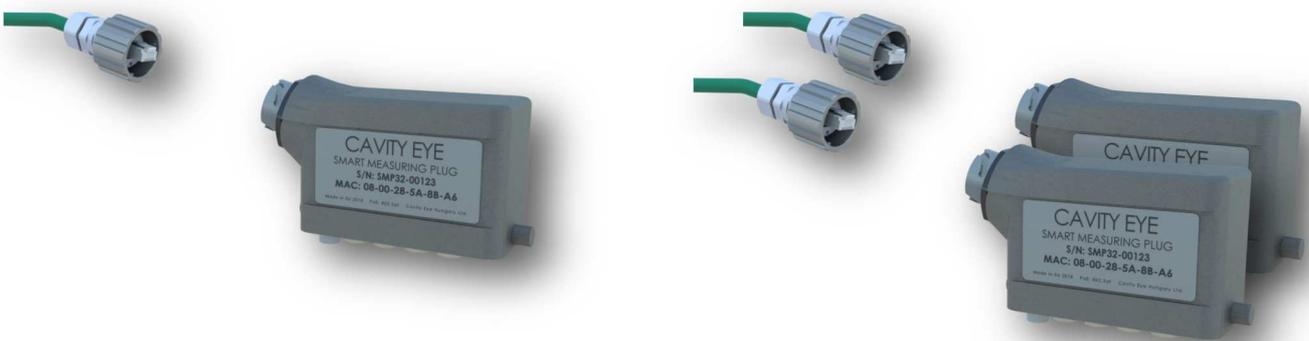
The Smart Moulding Control system is available in different types according to the number of sensors used. Up to 8 sensors the SMC8 system, over 8 but maximum 16 sensors the SMC16 system is the right choice. SMC8 contains one and the SMC16 contains two SMP8, as you can see in the figure below.



SMP8 x1
Up to 8 sensors
UTP-B x1

SMP8 x2
Up to 16 sensors
UTP-B x2

Over 16 but maximum 32 sensors the SMC32, and over 32 but maximum 64 sensors the SMC64 is the right choice. SMC32 contains one and the SMC64 contains two SMP32, as you can see in the figure below.



SMP32 x1
Up to 32 sensors
UTP-B x1

SMP32 x2
Up to 64 sensors
UTP-B x2

Be advised, that the sensors, the MPM8-B / MPM32-A and the SCS16 are not part of the SMC system.

Smart Moulding Control

Smart Measuring Plug (SMP)

The Cavity Eye Smart Measuring Plug (SMP) is a special data processing unit, with the role of ensuring the communication with the injection moulds equipped with Cavity Eye's pressure cells. It receives and processes the pressure cell's signals, then transmits the data to the central unit (PC and Switch).



The device is capable of measuring the cavity pressure in moulds if it is equipped with the Cavity Eye's pressure sensors. It is a necessary accessory of the Cavity Eye mould pressure system. Fulfills the requirements of the industry by having a heavy-duty design. The main parameters and the pin allocation of the 8 channel type plug can be seen in the tables below.

Data	Unit	SMP8	SMP32	Pin	Function	Pin	Function
Weight	g	327	532	1	Memory GND	11	4. Sensor +
Main dimensions	mm	110x70x36	126x70x43	2	Memory Data	12	4. Sensor -
Operating temp. range	°C	-40 - +85		3	Excitation GND	13	5. Sensor +
Power supply	IEEE 802.3af	max. 56V		4	Excitation 5V	14	5. Sensor -
Protection rating	IEC 60529:1989	IP64		5	1. Sensor +	15	6. Sensor +
Number of channels	pcs	8	32	6	1. Sensor -	16	6. Sensor -
A/D resolution	bit	32		7	2. Sensor +	17	7. Sensor +
Sampling frequency	SPS	100		8	2. Sensor -	18	7. Sensor -
Connection		RJ-45		9	3. Sensor +	19	8. Sensor +
				10	3. Sensor -	20	8. Sensor -

Smart Control Plug (SCP)

The Cavity Eye Smart Control Plug (SCP) device is a special data processing and communication unit, with the role of ensuring the communication between the Cavity Eye pressure measuring system and the injection moulding machine. The device can control bad part sorting, detect the cycle start and can stop the injection machine in case of an error.



The device is capable of measuring the cavity pressure in moulds if it is equipped with the Cavity Eye's pressure sensors. It is a part of the Cavity Eye mould pressure measurement system, and can be used for communication with the injection moulding machine, mould valve control, part sorting on 8 different channels, and stopping the injection moulding machine. Fulfills the requirements of the industry by having a heavy-duty design. The main parameters and the pin allocation can be seen in the tables below.

Data	Unit	Value	Pin	Function	Pin	Function
Weight	g	311	1	Memory GND	11	CE Cycle Stop
Main dimensions	mm	110x70x36	2	Memory Data	12	CE Prompt Cycle Stop
Operating temp. range	°C	-40 - +85	3	IMM GND	13	CE ON feedback
Power supply	IEEE 802.3af	max. 56V	4	IMM 24V	14	Out 6 (empty)
Protection rating	IEC 60529:1989	IP64	5	IMM Trigger	15	Out 7 (empty)
Number of inputs	pcs	4	6	IMM Auto cycle	16	Out 8 (empty)
Number of outputs	pcs	8	7	IMM OK/NOK	17	Out 9 (empty)
Connection		RJ-45	8	In 4 (empty)	18	Out 10 (empty)
			9	CE OK/NOK	19	Out 11 (empty)
			10	CE V-P Switch over	20	Out 12 (empty)

Computer (PC) and Switch

The Computer and Switch as a unit is the data processing and storing device. The Cavity Eye system instruments are connected to the Switch via UTP cables. Communicating with each other and with the PC via TCP/IP protocol. The Switch is a Power over Ethernet (PoE) device, so the UTP cables are not just data forwarding accessory, but it is also serving as the power supply transmitter for the instruments.

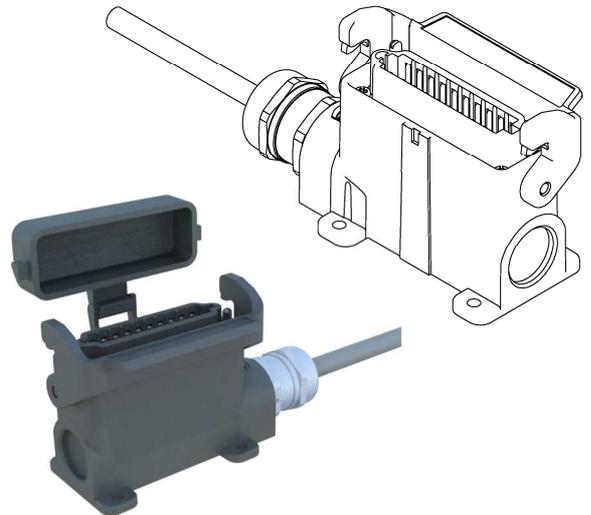


Smart Moulding Control

Smart Control Socket (SCS16)

The Cavity Eye Smart Control Socket (SCS) is equipped with a special memory, and responsible for the communication between the Cavity Eye pressure measurement system and the IMM. The analog inputs from the IMM and the analog outputs to the IMM are running through this device; furthermore, it is a necessary counterpart for the Cavity Eye Smart Control Plug (SCP).

Not part of the SMC system, but necessary device for the appropriate operating of the pressure measurement.



Data	Unit	Value
Weight	g	290
Main dimensions	mm	130x75x57
Operating temp. range	°C	0 - +80
Power supply	V	24
Protection rating	IEC	IP64
In- and outputs	Pcs	16
Number of pins	Pcs	20

The socket is used for cavity pressure measurement in injection moulds as a part of the Cavity Eye system. Indispensable accessory of the Smart Moulding Control (SMC) pressure measurement system. Fulfills the requirements of the industry by having a heavy-duty design. Easy to install on every IMM, it is pronouncedly made for industrial applications. The adequate pin wirings can be found in the *SCS16 I-O signals Quick Installation Guide*.

Display (SCR-M-H)

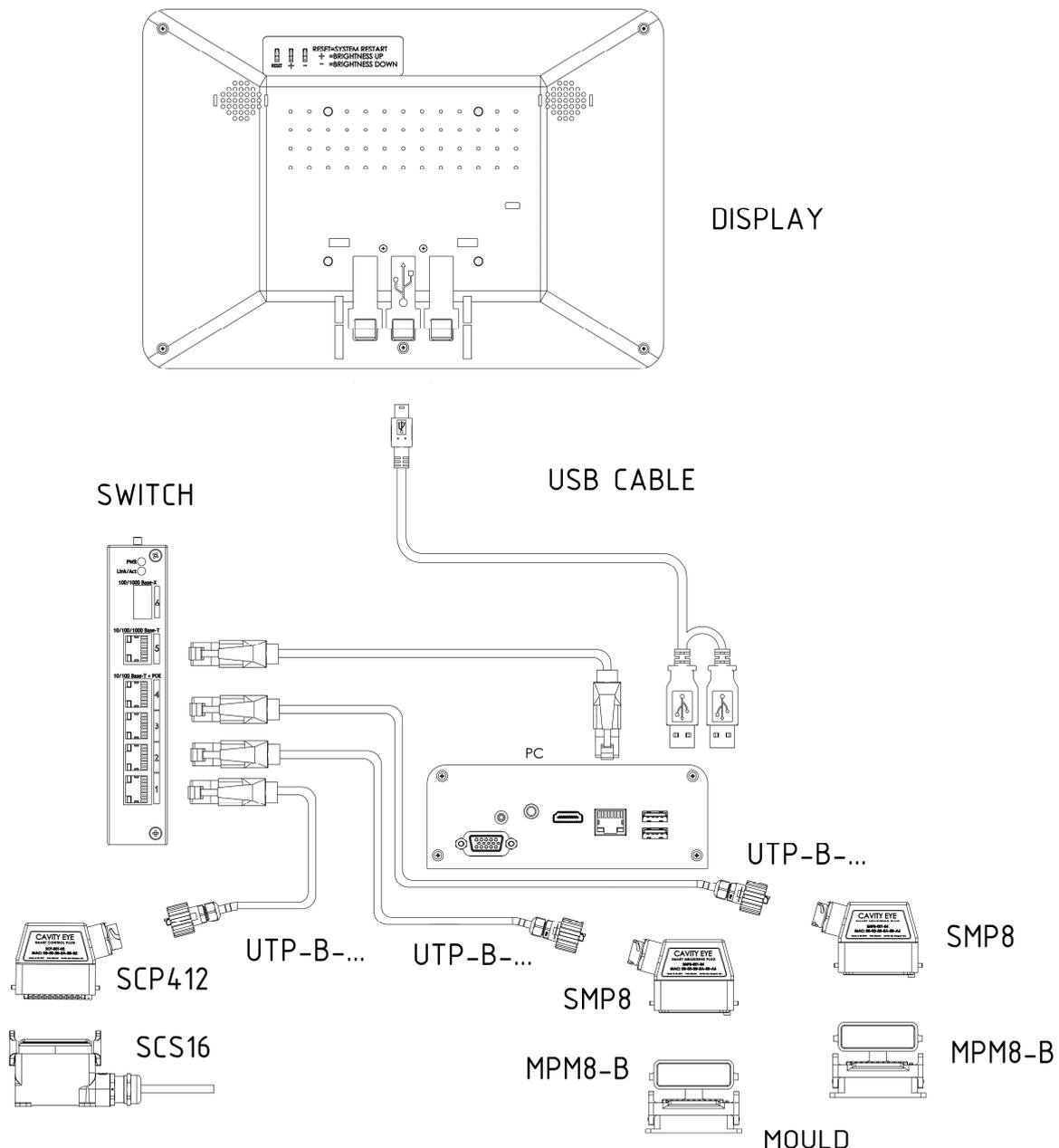
The Cavity Eye SMC system contains a 10" touchscreen display. It can be connected to the PC by USB or HDMI cable. The power supply is always an USB cable from the PC. The display can be mounted on the IMM with a display holder.

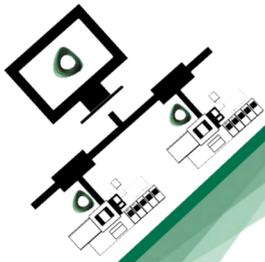


Smart Moulding Control system connection guide

You can see the SMC16 system connecting in the figure below. In case of SMC 8 only 1 SMP8 and MPM8-B is applied. In case of SMC32 one SMP32 and MPM32-A, and in case of SMC64 two of these plugs must be applied. For the appropriate operation of the measurement system, you must connect the devices as in the followingly described steps.

1. Fix the PC and the Switch in the low voltage cabinet with the DIN rail and magnets. Connect the PC to the Switch via 300 mm UTP cable in the 5th ethernet port.
2. Fix the Display on the IMM with magnets or with the display holder. Make sure it is easy to access. Connect the USB/HDMI cables to the PC.
3. Connect the SMP8 to the mould socket (MPM8-B), then connect the SMP8 to the PC via UTP cable with bayonet lock. Repeat the step for the other SMP8.
4. Fix the SCS16 on the IMM with magnets or screws. Connect the required signals to the IMM.
5. Connect the SCP412 to the SCS16, then connect the SCP412 to the Switch via UTP cable with bayonet lock.



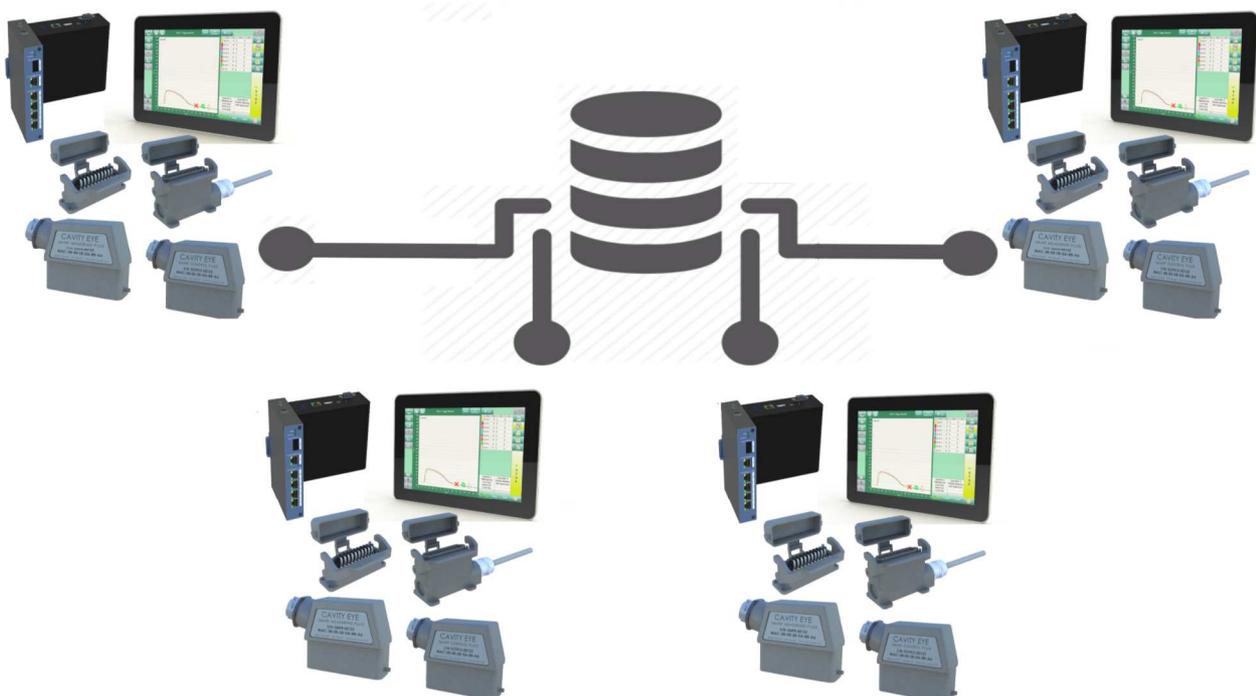


Networking possibilities

The Cavity Eye network

For the easy access of the stored data and settings, the Cavity Eye system's PC has the ability to connect to the local network of your factory. The system connects to the network via USB-Ethernet adapter (not accessory) in the system's PC. After that, the production data and settings can be saved directly on a central server, so other PCs on the network can reach these data directly on the server.

By connecting the SMC system to the local network, it is possible to share the screen and remote control each SMC systems with another PC via VNC (Virtual Network Computing) connection, so the possibility for the central production supervising is created. In this case, you can follow the production easily and quickly from anywhere with a PC using the network, and not only follow, but you can control, and/or interfere when necessary.



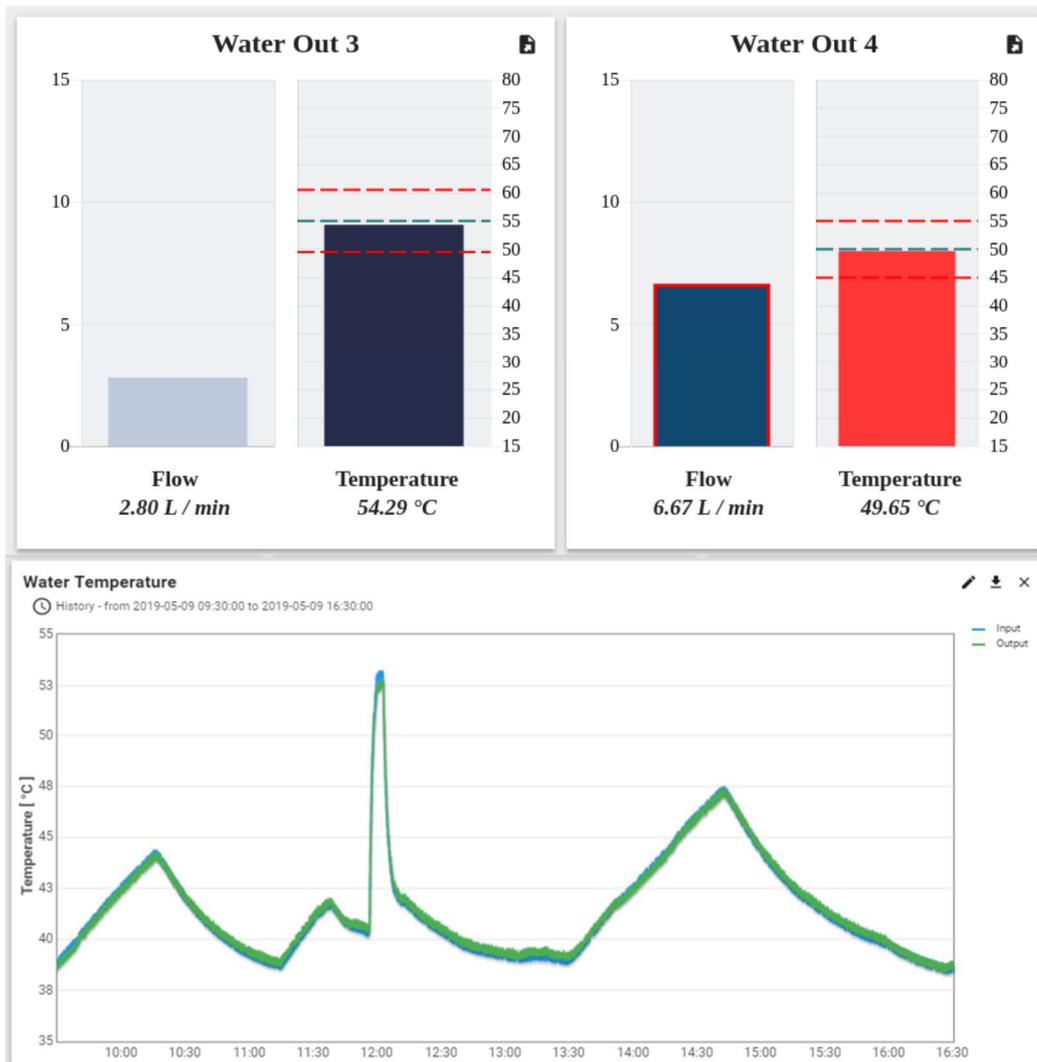
Thingsboard — The IoT Platform

The ThingsBoard IoT system creates the possibility to collect great amount of data and to manage devices as well. The ThingsBoard IoT platform helps in visualizing and correlating data sets from different sources of information.

Creating a network for the Cavity Eye SMC systems and using our IoT solution grants you not only the cavity pressure measurement data of your mould, but even more information about your production. You have the possibility to collect and process data from any common industrial 0-10 V or 4-20 mA analogue sensors, like flowrate, temperature or position sensors with our Smart Universal Plug.

Using Euromap63 communication protocol Cavity Eye is able to collect every injection parameter production data and event from the Injection Moulding Machine (IMM) as well. Any IMM with Euromap63 can be connected to our network and you will have every information to keep your production under control.

Using our solution gives you instant answers for the important questions about your latest or actual productions. Moreover, you can intervene in the production real-time from the information we collected for you. Our IoT system sends you emails for the alarms during the production, for example moulding 10 scrap parts successively or any of your requests. It is also suitable for generating statistical reports of the production, so you see every piece of information in one place.



Accessories

SET-2 BOX

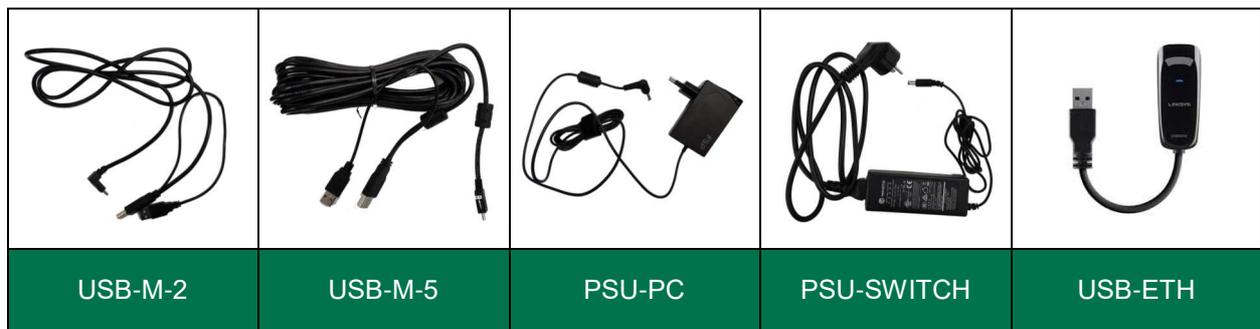
The SET-2 BOX contains all the important equipment and tools for the sensor installation. Further information about how to use them can be found in the *Cavity Eye Sensor Installation Guide*.

				
Diagonal cutter	D-sub crimp tool	Wire ferrule crimper	Stripping tool	
				
Combination pliers	Needle nose pliers	Caliper	Depth gauge	
				
Wire ferrule	D-sub crimp	Heat shrink tube	Countersunk head screw	Socket head screw
				
Crosshead screwdriver	Flathead screwdriver	Allen keys		

Cables and power supplies

As Cavity Eye system accessories the following cables are available:

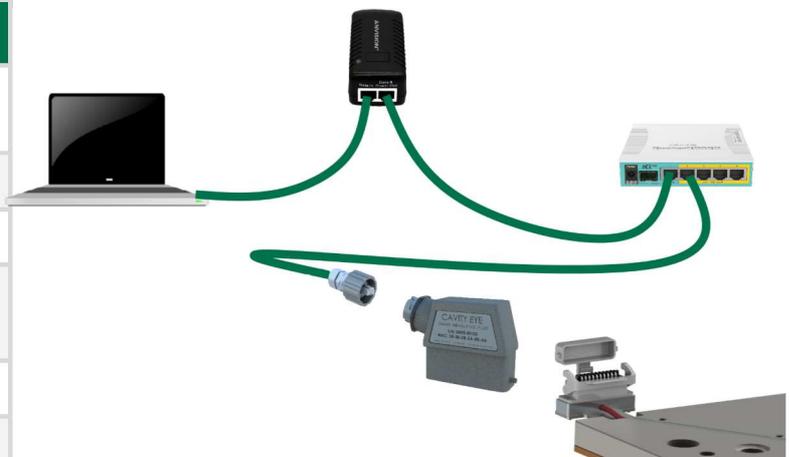
- UTP cables for the Plugs and the PC to connect to the Switch
- Display USB cables 2 and 5 metres
- Power supplies 19 and 48 V
- USB-Ethernet adapter



Cavity Eye Portable Measuring System

A mobile, test measuring system is also available. This system is mostly used in the tool shop to test the measurement system before mounting the mould to the IMM. The system consists of:

Name	Pieces
SMP8 or SMP32	According to the mould
hEX PoE Router	1
PoE injector 48 V	1
UTP cable with bayonet lock	Same as SMP
UTP cable	2
Switch power supply (24V)	1 (optional)



A PC (or laptop) is also required for the test system with Windows operating system and with the adequate software version of Cavity Eye. Further informations can be found in *Cavity Eye Portable Measuring System quick guide*.



Services

First project – let's start together! Remote control support

Cavity Eye provides services to guarantee the success. We believe that the cavity pressure application is easy, but the new customers have to understand and study the basic rules of this technology. The best way is to make the first projects together, from design to DOE. If you need more training, we train injection moulding from beginners to experts.

One week service in plant. The preparation of the project is online. We consult about the goal of the project, former production failures and statistics, instrumentation, sensor positions, design, modification and manufacturing.

After the online preparation, we visit the production plant of the customers and install the sensors together, then test the mould in toolshop. After the mould clamp, we optimize the process by cavity pressure.

A Cavity Eye engineer gives a training of “curve reading” and DOE analysis based on cavity pressure. The software and other applications also the part of the training. After the training, one-two days production will be analyzed. Stability, and production restart also based on cavity pressure. During the first project, the Customer gets enough experience to handle the second one on his own.

If the customer has any kind of difficulties of the application of Cavity Eye, after invitation we can connect to the Cavity Eye instrument and give online support (mould analysis, production analysis, statistical analysis, software update etc). Thanks to this online service, you do not have to wait for a service engineer and the problem can be solved in a day.

Consultation

A Cavity Eye service engineer visits the production plant of the customer to help personally in the following tasks:

- Sensor installation, and dry test in the tool shop (mould preparation)
- Instrument installation
- Production and failure analysis by DOE

Design and design review

The designers of the Cavity Eye can modify and make review of the 3D designs after signing the NDA. The review is free of charge and takes 1...3 days, the design has service charge.

Trainings

Basic training of injection moulding (10-15 days)

This training is recommended to beginners who has no or has minimal experiences in injection moulding. The length of the training can be 10 or 15 days, depending on the knowledge of the participants. The goal of the training is to study and practice the steps of mould changing. After the training they will be able to clamp the mould and prepare the machine for production, but they will not be able to start the production alone.

After the training they need a mentor for a month to get more experience and study the local rules.

The training is organized at the customer's plant by two trainers.

Intermediate training for machine setters and technologies (5 days)

This five-day-training focuses for the theoretical background of injection moulding, but all the theory can be verified during the training in practice too (60% is theory and 40% practice). The program focus on:

- Material properties and material preparation
- Material tests and measurement (MFI, moisture, mechanical properties...)
- Parameter set (material temp. mould temp, speed, pressure...)
- Mould trial (how to prepare a mould for the first test, first shot)
- Process analysis, DOE (to determine the optimal machine parameters and define the mould failures, necessary modifications)
- Cavity pressure analysis
- Production failure analysis (understand, reproduce, modify, eliminate)

The training can be organized at the customer's plant or in the research centre.

Cavity Eye training (3 days)

This training is for customers who need complex program for study the application of the Cavity Eye system.

- Mould design and sensor installation
- Measuring instrument installation
- Software application
- Machine set up and fine tune by cavity pressure

Injection training for engineers

Unique training for the customers requests.

Cavity Eye training

Educational training specially for the Customer to get familiar with the Cavity Eye measurement system.



Contact

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CAVITY EYE
INTELLIGENCE IN MOLDING