

A yellow excavator is shown in a construction setting at sunset. The excavator's arm is raised, and its bucket is open. A worker is visible in the cab. The background features a sunset sky with orange and blue hues. A blue geometric globe graphic is on the right side of the image.

# CONSTRUCTION MACHINERY





APEM offers high-reliability Human Machine Interface (HMI) products for special vehicles.

With vertically integrated manufacturing, APEM guarantees an uncompromised reliability through its custom product development, manufacturing excellence and outstanding service. APEM offers a very broad range of HMI components designed for off-highway vehicles, including joysticks, switches and keypads.

# APEM IN CONSTRUCTION MACHINERY

FIELD PROVEN RELIABILITY

UNPARALLELED RANGE





# YOU HAVE SPECIFIC NEEDS, WE HAVE DEDICATED SOLUTIONS



**SAFETY**  
is essential on  
construction sites

## KL SERIES

The KL rocker is the perfect solution for construction vehicles thanks to its **reliable** interlocking mechanism preventing accidents due to unintended operation.



**ERGONOMICS**  
is critical for  
construction workers

## TS SERIES

The TS thumbstick is a proportional two axis joystick similar in size and operation to "gamepad" controls, but in a **rugged** industrial package.



**PRODUCTIVITY**  
is key for  
construction  
companies

## XD RT HANDLE

Build the optimal joystick **ergonomics** for the operator by using our large range of HMI components.



**EFFICIENCY**  
driven by innovation

## NV SERIES

Instead of an expensive display controller, use our **intuitive** NV to navigate the touch panel while keeping your hand on the joystick.





# THE WIDEST RANGE OF HMI COMPONENTS FOR JOYSTICKS

INTEGRATE OUR HMI COMPONENTS IN YOUR DESIGN  
OR SELECT OUR CUSTOM JOYSTICK & HANDLE SOLUTIONS



**IA SERIES**  
Field proven  
reliability



**HR SERIES**  
Versatile range



**CW SERIES**  
Compact thumbwheel



**IX SERIES**  
Compact  
and illuminated



**TS SERIES**  
Miniature hall  
effect joysticks



**IM SERIES**  
Exceptional tactile feedback



**NV SERIES**  
“push to validate”  
switch based joystick



**FNR SERIES**  
Robust and reliable

## XD SERIES

Shallow mounting  
depth < 60 mm  
Extremely robust,  
resists high axial load  
(1780 N - 400 lbf)



# WE CUSTOMIZE OUR FIELD-PROVEN QUALIFIED COMPONENTS TO BUILD YOUR UNIQUE HMI

## TAILOR-MADE FNR CONTROL



### FNR SERIES & CUSTOM ACTUATORS

A rugged rocker available with custom actuator options designed to fit all hand sizes, reduce index fatigue and avoid inadvertent actuation



### HR SERIES

Best-in-class thumbwheel



### ROCKERMEC

The PCB-mounted compact solution



### TOGGLE\*

Compact toggle ideal as a joystick-mounted FNR

\*see our toggle range on [apem.com](http://apem.com)



### MT SERIES

Highly sealed rocker switch

## CUSTOM START / STOP SOLUTIONS



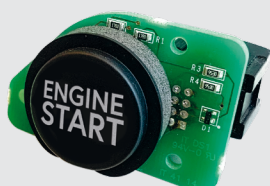
### AV30 SERIES

Large illuminated metal switch



### FD24 SERIES

Double legend depending on the red/ green illumination



### MULTIMEC™ 5G

Illuminated PCB switch sealed up to IP67

CONTACT US TO BUILD YOUR UNIQUE HMI



# OUR PRODUCTS

WHETHER IT'S A STANDARD  
PRODUCT OFFERING  
OR A CUSTOMIZED  
SOLUTION, LET APEM'S  
DECADES OF EXPERIENCE  
WORK FOR YOU

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# XD SERIES

## HALL EFFECT ROBUST JOYSTICK

**TOP APPLICATIONS:**  
LOADER, EXCAVATOR, TELEHANDLER, MINING



## DESIGNED FOR CONSTRUCTION

- 10 million lifecycles
- Extreme robustness
- Available with CAN bus J1939-71
- Shallow mounting depth
- IP67 above panel sealing
- Up to 1780 N - 400 lbf horizontal load (depending on handle)
- SIL2 / Pld capable

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS						MOUNTING OPTIONS	ABOVE PANEL SEALING
				Single	Dual	Analog	PWM	USB	CAN bus		
XD	10 million	1 to 2 axis	Hall effect	X	X				X	Drop-in	IP67



# HJ SERIES

HALL EFFECT ROBUST JOYSTICK

**TOP APPLICATIONS:**  
LOADER, DUMP TRUCK



## HEAVY DUTY AND FIELD PROVEN

- 5M cycles
- Standard or custom handle
- CAN options available

- Up to IP69K
- Up to 180 Nm horizontal load (depending on handle)
- SIL2 / Pld capable

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS						MOUNTING OPTIONS	ABOVE PANEL SEALING
				Single	Dual	Analog	PWM	USB	CAN bus		
HJ	5 million	1, 2, 3	Hall effect	X	X	X		X	X	Drop-in or rear mounting	IP69K



# XF SERIES

## SMALL HALL EFFECT JOYSTICK

**TOP APPLICATIONS:**  
COMPACT VEHICLES, ROAD CONSTRUCTION, MINING



## AVAILABLE WITH CAN BUS

- 5M cycles
- Many outputs available, including CAN bus J1939
- Available with 1, 2 or 3 axis
- Very compact
- SIL2 / Pld capable
- Up to IP67 above panel sealing

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS						MOUNTING OPTIONS	ABOVE PANEL SEALING
				Single	Dual	Analog	PWM	USB	CAN bus		
XF	5 million	1, 2, 3	Hall effect	X	X	X		X	X	Drop-in or rear mounting	IP67



# 3000 SERIES

PREMIUM HALL EFFECT JOYSTICK

**TOP APPLICATIONS:**  
LOADER, ROAD CONSTRUCTION



## COMPACT, PRECISION HALL EFFECT JOYSTICK

- Precision contactless Hall effect technology
- Compact for low profile applications
- Robust with over 10 million mechanical lifecycles

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS						MOUNTING OPTIONS	SEALING
				Single	Dual	Analog	PWM	USB	CAN bus		
3000	10 million	1, 2, 3	Hall effect	X	X	X	X			Drop-in or rear mounting	IP67



# HR SERIES

## PROPORTIONAL THUMBWHEEL

**TOP APPLICATIONS:**  
EXCAVATOR, TELEHANDLER, SKID STEER



## ROLLER AVAILABLE WITH MANY OPTIONS

- Up to 5M cycles
- Electronics sealed up to IP68
- Available with detents, friction, latching and 360° infinite wheel
- 7 colors and 4 shapes in standard
- Illumination of the body in option
- SIL2 / Pld capable

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS				MOUNTING OPTIONS	SEALING
				Single	Dual	Analog	PWM		
HR	5 million	1	Hall effect	X	X	X		Rear mounting	IP68



# CW SERIES

## MINIATURE PROPORTIONAL THUMBWHEEL

**TOP APPLICATIONS:**  
EXCAVATOR, TELEHANDLER, LOADER



## MINIATURE THUMBWHEEL

- Up to 3M cycles
- Snap-in mounting
- Custom actuator on request
- Spring to center

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS				MOUNTING OPTIONS	SEALING
				Single	Dual	Analog	PWM		
CW	3 million	Single	Hall effect	X	X	X	X	Snap-in	-



# TS SERIES

PROPORTIONAL HALL EFFECT THUMBSTICK

**TOP APPLICATIONS:**  
TELEHANDLER, EXCAVATOR, LOADER



## PRECISION FINGERTIP CONTROL

- Illuminated version available
- Ergonomically designed for repetitive operation over extended periods
- Highly reliable: up to IP67 and IP69K sealing
- Easy integration with rear or drop-in mounting & compact size
- Available with multiple handle options and material

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS						MOUNTING OPTIONS	PANEL SEALING
				Single	Dual	Analog	PWM	USB	CAN bus		
TS	1 million	1, 2	Hall effect	X	X	X		X		Drop-in or rear mounting	IP67, IP69K



# NV SERIES

## NAVIGATOR SWITCH

**TOP APPLICATIONS:**  
ROAD CONSTRUCTION, TELEHANDLER



## IDEAL AS DISPLAY CONTROLLER

- Compact momentary micro switching thumbstick
- Available with "push to validate" option, ideal for navigation in display menu
- Enhanced tactile feedback
- Easy integration in joystick handle
- Sealed up to IP69K

SERIES	MECHANICAL LIFECYCLES	AXIS	BUSHING DIMENSIONS	TECHNOLOGY	TERMINAL OPTIONS	MOUNTING OPTIONS	SEALING
NV	1 million	1,2	Ø16 mm (.629 in)	Switching	Wire leads or connector	Panel	IP69K



# BHN/BL SERIES

## PROPORTIONAL PADDLE

**TOP APPLICATIONS:**  
DUMP TRUCK, ROAD CONSTRUCTION



## STYLISH AND ROBUST

- Available in 2 heights
- Soft touch sculpted grip
- 5 color options
- Sealed up to IP67
- Custom actuator on request
- SIL2 / PLd capable

SERIES	MECHANICAL LIFECYCLES	AXIS	TECHNOLOGY	OUTPUT OPTIONS				MOUNTING OPTIONS	SEALING
				Single	Dual	Analog	PWM		
BHN/BL	10 million	Single	Hall effect	X	X	X	X	Drop-in	IP67

# FNR SERIES

## FNR ROCKER SWITCH

**TOP APPLICATIONS:**  
EXCAVATOR, LOADER, TELEHANDLER



## FOR EFFORTLESS FORWARD/REVERSE CONTROL

- 2 or 3 positions, momentary or maintained

- Sealed up to IP67
- 1 NO/NC in each direction

- Illumination with marking
- SIL2 / PLd capable

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS	MOUNTING OPTIONS	SEALING
FNR	2 NO+NC	1A /24V	Ø20 mm (787 in)	Flying leads, solder lugs	Panel	IP69K & IP67



# IA SERIES

## DUSTPROOF PUSHBUTTON SWITCH

**TOP APPLICATIONS:**  
EXCAVATOR, LOADER, TELEHANDLER



## THE REFERENCE IN THE CONSTRUCTION INDUSTRY

- Dustproof: Membrane on top with no gap between actuator and panel
- Frost, sand and hydrocarbon resistant
- Sealed up to IP67
- Flush on panel
- SIL2/PId capable

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS	MOUNTING OPTIONS	SEALING
IA	1 NO+NC	2A 24VDC	Ø16 mm (.629 in)	Flying leads	Panel	IP65 IP67

# IX SERIES

## COMPACT PUSHBUTTON SWITCH

**TOP APPLICATIONS:**  
EXCAVATOR, LOADER, TELEHANDLER



## THE NEXT STANDARD

- Compact
- Available with backlit marking
- Dustproof: Membrane on top with no gap between actuator and panel
- Frost, sand and hydrocarbon resistant
- Flush on panel
- Sealed up to IP67/IP69K
- SIL2/PId capable

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS	MOUNTING OPTIONS	SEALING
IX	1 NO/NC	2A 28VDC	Ø12 mm (.472 in)	Solder lugs / Wire leads	Panel	IP67 IP69K



# IM / IP / IS SERIES

## COMPREHENSIVE PUSHBUTTON RANGE

**TOP APPLICATIONS:**  
SKID STEER LOADER, GRADER, TELEHANDLER



## EXTENSIVE COMPACT RANGE

- Compact
- Available with illumination
- Available with snap action and audible tactile feedback (IM)
- Marking in option
- Sealed up to IP67
- Momentary or latching
- Up to SIL2/PID capable

SERIES	POLES	MAXIMUM RATINGS	ILLUMINATED	BUSHING DIMENSIONS	MOUNTING OPTIONS	TERMINAL OPTIONS				SEALING
						PCB	Solder lugs	Quick-connect	Flying leads	
IM	1 NO/NC	(1A 250VAC)* 3A •28VDC		Ø 12 mm (.472 in)	Panel	x		x		IP67
IP momentary	1	(2A 250VAC)* 5A 28VDC	x	Ø 12 mm (.472 in)	Panel	x	x	x	x	IP67
IP latching	1	(2A 250VAC)* 4A 12VDC	x	Ø 12 mm (.472 in)	Panel	x	x	x	x	IP67
IS	1	(2A 250VAC)* 100mA 48VDC		Ø 12 mm (.472 in)	Panel	x	x	x		IP67

# IHS / IHL SERIES

## HALL EFFECT PUSHBUTTON RANGE

**TOP APPLICATIONS:**  
BACKHOE LOADER, EXCAVATOR



## HALL EFFECT TECHNOLOGY

- Long life: 5M cycles
- Hall effect technology
- Momentary (IHS) or proportional (IHL)
- Sealed up to IP67

SERIES	MAXIMUM RATINGS	BUSHING DIMENSIONS	MOUNTING OPTIONS	TERMINAL OPTIONS	SEALING
IHS	5mA 24VDC	Ø 12 mm (.472 in)	Panel	Flying leads	IP67
IHL	1,25mA 4,5VDC	Ø 12 mm (.472 in)	Panel	Flying leads	IP67



# FD SERIES

## DOUBLE ICON ILLUMINATED PUSHBUTTON SWITCH

**TOP APPLICATIONS:**  
CONSTRUCTION MACHINERY DASHBOARD (ENGINE START)



## DOUBLE ICON ILLUMINATED PUSHBUTTON

- 3 standard legends (0/1, START/STOP, ON/OFF)
- Threaded or snap-in versions
- Sealed up to IP69K

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS					MOUNTING OPTIONS	SEALING	ILLUMINATION
				Solder lugs	Quick connect	PCB	Flying leads	Cable			
FD	1,2	4A 12VDC 200mA 12VDC	Ø24 (.944) Ø26 (1.024)	X					Panel, Snap-in or threaded bushing	IP69K (threaded bushing)	X

# AV30 START STOP

## METAL PUSHBUTTON

**TOP APPLICATIONS:**  
CONSTRUCTION MACHINERY DASHBOARD (ENGINE START)



## RUGGED METALLIC PUSHBUTTON

- Robust pushbutton
- Stainless steel actuator and bushing
- Appealing aesthetics
- Easily customizable: marking, illumination

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS					MOUNTING OPTIONS	SEALING	ILLUMINATION
				Solder lugs	Quick connect	PCB	Flying leads	Cable			
AV	NO/NC	1 A 30 VDC	Ø30 (1.18)	X	X	X	X	X	Panel	IP67	X



# KR / KH / KL SERIES

## ROCKER SWITCH

**TOP APPLICATIONS:**  
DUMP TRUCK, LOADER



## SEALED, CUSTOMIZABLE ROCKER

- Protected against accidental actuation (KH)
- Customized laser etched legends
- Up to IP68/IP69K
- Patented locking system for safety application (KL)
- Illuminated versions

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	MOUNTING OPTIONS	TERMINAL OPTIONS			SEALING	ILLUMINATION
					Solder lugs	Quick-connect	Screw		
KR	1, 2	20 A 12 VDC	36.8 x 21.08 mm	Panel	X	X	X	IP68 or IP69K	X
KH	1, 2	10 A 24 VDC	36.8 x 21.08 mm	Panel	X	X	X	IP69K	X
KL	1, 2	10 A 24 VDC	36.8 x 21.08 mm	Panel	X	X	X	IP68 or IP69K	X

# MT SERIES

## SEALED ROCKER SWITCH

TOP APPLICATIONS:  
CONCRETE CUTTER



## SELECTOR SWITCH FOR ERGONOMIC INTERFACE

- Environmentally sealed (IP68)
- Multiple functions available
- Various contact materials that allow usage from dry circuit applications up to 4 A

SERIES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS		MOUNTING OPTIONS	SEALING
			Solder lugs	PCB		
MT	4 A 30 VDC	Ø17,46	X	X	Panel, Vertical-Through hole	IP68



# **CW SERIES**

MODULAR AND STYLISH PUSHBUTTON

**TOP APPLICATIONS:**  
ROLLER, GRADER, PAVER



## NEW INDUSTRIAL STYLE

- Stylish design
- Sealed up to IP67 with rubber boot option
- Illumination in option
- Selector switch available

SERIES	APPROVALS	POLES	SEALING	PANEL CUT OUT	TERMINAL	CONTACT TYPE	RATINGS
CW	UL, CE, CCC	Up to 6	IP65, up to IP67	Ø 22 mm (.866 in)	Screw	IP67	Heavy duty (up to 10 Amps)

# MW SERIES

FOR DEMANDING ENVIRONMENTS

TOP APPLICATIONS:  
ROLLER, GRADER, PAVER



## DUSTPROOF

- Dustproof: no gap between actuator and panel
- Sealed up to IP66
- Selector switch available

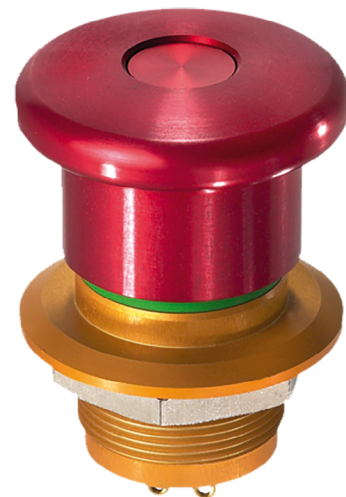
SERIES	APPROVALS	POLES	SEALING	PANEL CUT OUT	TERMINAL	CONTACT TYPE	RATINGS
MW	CE, CCC	Up to 2	IP65 IP66	Ø 22 mm (.866 in)	Solder/tab or screw	Monobloc	Heavy duty (up to 10 Amps)



# ES SERIES

## HEAVY DUTY METAL SAFETY SWITCH

**TOP APPLICATIONS:  
ROAD CONSTRUCTION**



## METAL SAFETY SWITCH

- Sealed up to IP65, IP67 & IP69K
- Compact body
- Complies with EN60947-5-1
- Impact resistant to IK10

SERIES	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	TERMINAL OPTIONS		MOUNTING OPTIONS	SEALING
				Solder lugs	PCB		
ES	2,3	1A 24VDC	Ø22.28 mm (.877 in)	X	X	Panel	IP65 IP67 IP69K



# XA / XW SERIES

ROBUST EMERGENCY STOP

TOP APPLICATIONS:  
ROAD CONSTRUCTION



## "SAFE BREAK ACTION" TECHNOLOGY

- Exclusive safety technology ensuring that the machinery is stopped if actuator is broken
- Sealed up to IP67
- Compact behind panel
- Available with illumination
- Twist or pull to release

SERIES	SAFE BREAK TECHNOLOGY	PANEL CUT OUT	OPERATOR SIZES	NUMBER OF CONTACTS	TERMINAL CONNECTION	OPERATION	ILLUMINATION
XA	X	16 mm	Ø 29 mm (1.141 in) Ø 40 mm (1.574 in)	Up to 4 NC : 1,2,3,4 / NO : 0,1	Solder, PCB	Push to lock, pull or turn to reset	Option
XW	X	22 mm	Ø 38 mm (1.496 in) Ø 40 mm (1.574 in) Ø 60 mm (2.362 in)	Up to 4 NC : 1,2,3,4 / NO : 0,1	Screw, solder, PCB	Push to lock, pull or turn to reset	Option



# 3500 / CT SERIES

HIGH PERFORMANCE TOGGLE SWITCH

TOP APPLICATIONS:  
PAVER, LOADER, MINING



## MARKET LEADER

- High current rating
- Very broad range: 5 finishes, 6 levers styles, 3 types of locking, 3 types of terminals...
- Sealed up to IP67/IP69K
- Available accessories: guard and boot

SERIES	APPROVALS	POLES	MAXIMUM RATINGS	BUSHING DIMENSIONS	MOUNTING OPTIONS	TERMINAL OPTIONS				SEALING
						Solder lugs	Quick-connect	Screw	Connector	
3500	CECC	1,2	15A 28VDC	Ø12.2 mm (.49 in)	Panel	X	X	X		IP67 IP69K
CT	UL	1,2	10A 125/250 VAC	Ø12.2 mm (.48 in)	Panel	X	X	X	X	IP67

# MULTIMEC 5 SERIES

## TACTILE PCB SWITCH

TOP APPLICATIONS:  
LOADER, TELEHANDLER



## LARGE SELECTION OF STANDARD ACCESSORIES

- 10 million activations
- Front panel sealing to IP67 depending on cap solutions
- Different haptic options
- Wide range of cap options

SERIES	POLES	MAXIMUM RATING	MOUNTING OPTIONS	SEALING	MECHANICAL LIFE
Multimec 5 series - 5E & 5G	Single pole / momentary	50mA - 24VDC	Trough hole or SMT mounting	IP67	10,000,000 operations



# Q SERIES

## LED INDICATOR

**TOP APPLICATIONS:**  
ROAD CONSTRUCTION, LOADER



## LARGE VARIETY OF SIZES AND COLORS

- Reverse diode protection available
- Wide variety of LED colors
- Wire customization available
- Optional sealing up to IP67
- Many different panel cut-out sizes
- Available with custom and secret until lit legends

SERIES	PANEL CUT-OUT	MAXIMUM RATINGS	BEZEL STYLES	BEZEL FINISHES	TERMINAL OPTIONS			TYPE OF ILLUMINATION	LED COLORS
					Fastons	Pins	Wire		
Q	Ø6, 8, 10, 12, 14, 16, 19, 22, 25, 30	2VDC -220VAC	Prominent, recessed & flushed	Bright, satin & black	X	X	X	Fixed light, bi-color, RGB, night vision	Suitable for in cab use and outside use which are daylight viewable

# KP6 CAN BUS KEYBOARD

## RUBBER KEYPADS

**TOP APPLICATIONS:**  
LOADER, GRADER, EXCAVATOR



## STANDARD SOLUTION FOR MULTIPLE BUTTON APPLICATIONS

- CAN bus or direct wiring output options
- CAN solution e-marking qualified (EMI, EMC)
- Backlit and quick front assembly
- Bargraph & indicators available
- Braille usage and glove usage compatible

SERIES	SEALING	OPERATING VOLTAGE	COMMUNICATION PROTOCOL	MOUNTING	EXTRA FEATURES
KP6	up to IP67	12 to 24 VDC	Can J1939 or discrete	Snap-in front mounting	Special illumination / phantom marking / special key colors



# REMOTE CONTROL

## PANEL SOLUTIONS

**TOP APPLICATIONS:**  
ALL CONSTRUCTION EQUIPMENTS AND VEHICLES



- Plug and play product
- Backlighting
- IP67/IP69K sealing
- Up to SIL2/PLd capable

### CUSTOMIZATION OPTIONS

Based on 9 mastered technologies (membrane, elastomeric...) and high performance APEM components

Design for outdoor and dusty environment

APEM Available Communication Protocols as a standard : CAN bus, RS485/422, USB

Consideration of ergonomic constraints in the design for user-friendly operation

Developed to withstand falls

# COMPLETE DASHBOARD

## PANEL SOLUTIONS

**TOP APPLICATIONS:**  
ALL CONSTRUCTION EQUIPMENTS AND VEHICLES



- Rear or front panel mounting
- Backlighting

- IP67/IP69K sealing
- Up to SIL2/PLd capable

### CUSTOMIZATION OPTIONS

Based on 9 mastered technologies (membrane, elastomeric...) and high performance APEM components

Design for outdoor and dusty environment

APEM Available Communication Protocols as a standard : CAN bus, RS485/422, USB

UV, shock & vibration resistance





# APEM

an IDEC company

## AT A GLANCE



**70** YEARS OF TRUST BUILT ON QUALITY



**1,400** EMPLOYEES WORLDWIDE



**50,000 +** PART NUMBERS

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