

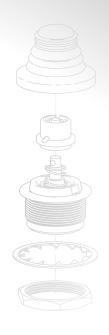
AGRICULTURAL MACHINERY

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APEM **IN AGRICULTURAL** MACHINERY

APEM is a leading manufacturer of high-reliability Human Machine Interface (HMI) products with more than 20 years' experience in the agricultural industry.

With vertically integrated manufacturing, APEM offers its agricultural customers uncompromised reliability through its custom product development, manufacturing excellence and outstanding service.

APEM offers a broad range of HMI components designed for the agricultural market, including toggles, rockers and pushbutton switches, LED indicators, paddle controllers as well as switch panels and joysticks.



STANDARD PRODUCTS

CUSTOMIZED PRODUCTS

APEM offers unique expertise in HMI product customization.

With robust development processes, based on the automotive APQP method, APEM supports custom design specifications for exclusive HMI requirements.















PERFORMANCE - APEM's fully integrated front panel solutions ensures the highest performance to mechanical, electrical, environmental and EMC/EMI standards.

EFFICIENT INTEGRATION - APEM can design electronics and connector systems to fit most applications.



COMMUNICATION PROTOCOLS CANbus (J1939, CANopen) RS422, RS485, USB..

INTEGRATED **BOOT LOADER** Diagnostic and software upgrade capability





ELECTRONICS AND SOFTWARE DESIGN

LOW POWER

BIT SOFTWARE eal time Built-In-Test

FILTERING & PROTECTION ESD, EMI, filter and protection

INTEGRATED DIMMING

OUR PRODUCTS

APEM OFFERS THE WIDEST RANGE OF HMI COMPONENTS & SOLUTIONS WITH OVER 125,000 STANDARD PART NUMBERS INCLUDING SWITCHES, JOYSTICKS, SWITCH PANELS, INDICATORS.

PANEL SWITCHES



5000 Series 6 HIGH PERFORMANCE MINIATURE TOGGLE





FP Series8 DESIGNED TO ATTRACT ATTENTION



FD Series9 DOUBLE ICON ILLUMINATED PUSHBUTTON



HIGHLY VERSATILE PUSHBUTTON



BACKLIT ALUMINUM PUSHBUTTONS



MSG & CSG series12 DESIGNED TO PROTECT

4	SEALING BOOTS PROTECTS AGAINST DUST, SAND AND WATER
	KL Series PROLONGED USE WITH CRITICAL FUNCTIONS

.. 13

.. 14





HIGH QUALITY AND COST EFFECTIVE E-STOP SOLUTION

PCB SWITCHES



ABSOLUTE RELIABILITY AND FUNCTIONALITY

JOYSTICKS PROPORTIONAL ERGONOMIC HANDHELD DEVICE HR Series 20 UNIQUE THUMB CONTROL MECHANISM PRECISION FINGERTIP CONTROL 1000 Series 22 COMPACT SWITCH JOYSTICK COMPACT, PRECISION HALL EFFECT JOYSTICK HG Series24 RUGGED HANDGRIP JOYSTICK

ERGONOMICALLY DESIGNED FOR PERFORMANCE



LARGE VARIETY OF LED SIZES AND COLORS





SWITCH PANELS



ENHANCED MEMBRANE KEYPADS..... 27 SEALED AND SHOCK RESISTANT KEYPAD



STANDARD SOLUTION FOR MULTIPLE BUTTON APPLICATIONS







ON DEMAND ELECTRONICS & SOFTWARE INTEGRATION



5000 SERIES

TOGGLE SWITCHES

600 & 600NH SERIES

POWER TOGGLE SWITCHES







HIGH PERFORMANCE MINIATURE TOGGLE

6

• High performance, sturdy construction

· Widest variety of actuators, contact materials, functions, poles, terminals, bushings, finishes & sealings

- Visual versatility: sealing boots in 6 different colors
- · Easily adaptable to final application
- Available with low level contact



MAXIMUN RATINGS 15A 250VA0 Ø12 (.472) 10A 24VDC 15A 250VA0 Ø12 (.472)

SUPERIOR QUALITY

TOGGLE SWITCH

TOP APP : NAVIGATION & CONTROL SYSTEMS FOR PRECISION FARMING APPLICATIONS REMOTE CONTROLS FOR HYDRAULIC ATTACHMENTS / TRACTORS, COMBINES & SPRAYERS

TOP APP: TRACTOR ATTACHMENTS & IMPLEMENTS, SPRAYERS & HARVESTING EQUIPMENT LIVESTOCK HOUSING, GREENHOUSES, CONTROL UNITS





- Superior reliability and longer life
- Great sealing
- Visual versatility
- Sealing boots in a wide range of colors and lever choices including paddle levers for at-aglance directional control

E	ERMINA	L OPTI	ONS			MOUNTING		ILLUMI-
	Screw	PCB	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION
	х					Panel	Optional	
	х					Panel	No	

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FD SERIES

DOUBLE ICON ILLUMINATED PUSHBUTTON SWITCHES

FP SERIES

FULLY ILLUMINATED PUSHBUTTON SWITCHES











- 24/26/30mm diameters
- Threaded or snap-in versions

DOUBLE ICON ILLUMINATED PUSHBUTTON

	APPROVALS P		MAXIMUM	BUSHING		TERMINAL OPTIONS				MOUNTING		ILLUMI-		
SERIES	APPROVALS	POLES	RATINGS	DIMEN- SIONS	Solder lugs	Quick-connect	Screw	РСВ	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION
			4A 12VDC	Ø24 (.944)								Panel, snap-in		
FP		1,2	200mA	Ø26 (1,024)	Х				Х		Х	or threaded bushing	Up to 69k	Х
			12VDC	Ø30 (1.18)										

			MAXIMUM	BUSHING TERMINAL OPTIONS							MOUNTING	0511110	ILLUMI-	
SERIES	APPROVALS	POLES	RATINGS	DIMEN- SIONS	Solder lugs	Quick-connect	Screw	PCB	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION
FD		1,2	4A 12VDC 200mA	Ø24 (.944) Ø26 (1,024)	х							Panel, Snap-in or threaded bushing	IP69K (threaded bushing)	х
			12VDC	020 (1,024)								Ū	0,	

TOP APP : IN-CAB CONTROL PANELS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS





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



A1 SERIES



COMPACT PUSHBUTTON SWITCHES



HIGHLY VERSATILE PUSHBUTTON

- High performance pushbuttons
- · Largest selection of color, shapes, terminals, markings, backlighting
- Unified look, differentiated functions, simplified purchasing

BACKLIT ALUMINUM PUSHBUTTON

			MAXIMUM	BUSHING		т	ERMINA		ONS			MOUNTING		ILLUMI-
SERIES	APPROVALS	POLES	RATINGS	DIMEN- SIONS	Solder lugs Quick-connect Screw Pl	PCB	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION		
IP	UL	1	5A 28VDC	Ø12 (.472)	х	X		x	х			Panel	IP67	х
	4A 12VDC	()												

6A 250VAC Ø22 UL/CSA-VDE 1,2,3,4 A1 (0.866) 6A 12VDC

TOP APP : SPRAYERS, TRACTORS, COMBINES, SPECIALTY HARVESTERS





ENGRAVED ALUMINUM PUSHBUTTONS

- Chemical etched custom legends
- One to four pole changeover contact arrangement
- Contact rating from 10mA 5VAC to 6A 250VAC/12VDC
- Super bright LEDs visible even in strong daylight
- Flush mounting bezel option for a sleek appearance

E	RMINA	OPTIC	NS			MOUNTING		ILLUMI-		
	Screw	PCB	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION		
	Option					Panel, flush mounting	Up to IP65, optional back panel sealing	х		

TOP APP : IN-CAB CONTROL PANELS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS



MSG & CSG SERIES

SWITCH GUARDS





(12)

- · High robustess with no risk of jamming
- Variety of locking options (MSG)
- Hydrocarbon/acid/chemical resistant (MSG)
- Easy marking on top (MSG)
- Complements APEM's toggle range
- Anti-tamper wire seal hole as standard

PROTECTS AGAINST DUST, SAND

AND WATER

SERIES	BOOT MATERIAL	NUT MATERIAL		EMPERATURE	TEMPERAT	URE RANGE	Elasticity	Mechanical
SERIES	BOOT MATERIAL	NOT MATERIAL	OPERATING	EWIPERATORE	Low	High	Elasticity	resistance
	Neoprene	Brass, nickel	Silicone	-40°C to +85°C	Best	Best	Best	Good
SEALING BOOTS	or silicone	plated, matte black	Neoprene	-20°C to +50°C	Good	Better	Good	Best

CAP MATERIA OPERATING TEMPERATUR SWITCHES Ø11.9mm, Ø12mm threaded bushing 17.5mm outside -20°C to + 55°C CSG Thermoplastic hermoplastic bushing Ø11.9mm, Ø12mm 17.5mm outside Matte black MSG -40°C to +85°C 20,000 cycles Thermoset threaded bushing stainless steel bushing

TOP APP : IN-CAB CONTROLS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS

TOP APP : IN CAB & FENDER IN AGRICULTURAL EQUIPMENT, REMOTE CONTROLS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS



SEALING BOOT SERIES

SEALING BOOTS



• Wide variety of shapes & colors • Fast customization to accomodate any actuator length

13

• Available in silicone and neophrene

KL SERIES

LOCKING POWER ROCKER SWITCHES

POWER ROCKER SWITCHES





• Field proven reliability Solid construction Intuitive ergonomics • Easy-operation one hand activation



CEDIEC			MAXIMUM	PANEL		TERMINAL OPTIONS MOUNTING				AL OPTIONS		ILLUMI-		
SERIES	APPROVALS	POLES	RATINGS	CUT-OUT	Solder lugs	Quick-connect	Screw	РСВ	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION
KL		1,2	10A 24VDC	36,8 X 21,08	х	х	х					Panel	IP68	х



TOP APP : PTO ENGAGEMENT & OTHER CRITICAL FUNCTIONALITIES IN TRACTORS, COMBINES, SPECIALTY HARVESTERS & SELF-PROPELLED SPRAYERS



KR SERIES



- Large variety of colors & laser etched symbols • Infinite number of options available for cost effective customization solutions
- Connectors and mounting panel accessories available
- Illuminated and non-illuminated

ſ	ERMINA	L OPTI	ONS			MOUNTING		ILLUMI-	
	Screw	PCB	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION	
	Х					Panel	IP68	Х	

TOP APP : IN-CAB CONTROLS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS



A01ES-D SERIES

EMERGENCY STOP SWITCHES

MULTIMEC 5 SERIES

HIGH PERFORMANCE PCB SWITCHES









HIGH QUALITY AND COST EFFECTIVE **E-STOP SOLUTION**

• Red mushroom-head: twist to reset • Extremely reliable single & double pole positive break switch

Custom actuator printing availableApproved to EN60947-5-5

ABSOLUTE **RELIABILITY AND** FUNCTIONALITY

			MAXIMUM	BUSHING	MOUT				AL OPTIONS	MOUNTING		ILLUMI-		
SERIES	APPROVALS	POLES	RATINGS	DIMEN- SIONS	Solder lugs	Quick-connect	Screw	PCB	Flying leads	Wire wrap	Cable	OPTIONS	SEALING	NATION
		1,2 (po-	6A 250VAC	Ø16mm										
A01ES-D	EN60947-5-5	sitive break)	6A 12VDC	(.629)	Х	ХХХ					Panel	IP65		

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

TOP APP : TRACTORS, COMBINES, SPECIALTY HARVESTERS, REMOTE CONTROLS, MILKING EQUIPMENT





- 10 million trouble-free actuations
- Impervious to top layer damage
- Superior sealing
- Superior illumination with integrated chip-LEDs • Available in NC/NO

TOP APP : TRACTORS, COMBINES, SPECIALTY HARVESTERS



PC SERIES

Q SERIES



LARGE VARIETY OF SIZES AND COLORS

18

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

PROPORTIONAL ERGONOMIC HANDHELD DEVICE

	PANEL	MAXIMUM	BEZEL	BEZEL		TERMINAL	OPTIONS		LED	
SERIES	CUT-OUTS	RATINGS			TYPE OF ILLUMINATION	COLORS				
Q	Ø6, 8, 12, 14, 16, 19, 22	2VDC -220VAC	Prominent, recessed & flushed		х	х	х	х	Fixed light, flashing bi-color, tri-color, night vision	5 standard colors, 5 super- bright colors



TOP APP : ALL AGRICULTURAL MACHINERY



HANDHELD PENDANT CONTROLLER



- USB and analog output
- Lightweight, one hand design
- Excellent proportional control
- Easily configured with APEM components
- Mechanical lifecycles and technology
- dependent on custom configuration

OUTPUT	OPTION		MOUNTING	SEALING
			OPTIONS	SEALING
х		Х		VARIES, DEPENDING ON CONFIGURATION

TOP APP : TRACTORS, COMBINES, SPECIALTY HARVESTERS

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TS SERIES

HR SERIES

PROPORTIONAL THUMBWHEELS



UNIQUE THUMB CONTROL MECHANISM

- Backlighting & detent options available (up to 11)
- Self centering spring return mechanism
- Non-contacting Hall effect technology
- Choice of 4 actuator styles

PRECISION **FINGERTIP** CONTROL

050150	MECHANICAL LIFECYCLES	A.V.I.C	TEOLINIOLOOV			OUTPUT	OPTION			MOUNTING	0541010		MECHANICAL	4740	TECHNOLOOX	OUTPUT OPTION Single Dual Analog PWM USB CANbus						MOUNTING	SEALING
SERIES	LIFECYCLES	AXIS	TECHNOLOGY	Single	Dual	Analog	PWM	USB	CANbus	OPTIONS	SEALING	SERIES	LIFECYCLES	AXIS	TECHNOLOGY	Single	Dual	Analog	PWM	USB	CANbus	OPTIONS	SEALING
HR	5 million	1	Hall effect	Х	Х	Х				Rear mounting	IP68	TS	1 million	1,2	Hall effect			Х		Х		Drop-in or rear mounting	IP68 , IP69⊧

TOP APP : TRACTORS, COMBINES, SPECIALTY HARVESTERS, REMOTE CONTROLS, ARMRESTS & DASHBOARDS





PROPORTIONAL HALL EFFECT THUMBSTICKS



• Ergonomically designed for repetitive operation over extended periods

• Highly reliable: up to IP68 and IP69K sealing • Easy integration with rear or drop-in mounting & compact size

• Available with multiple handle options and material

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1000 SERIES

COMPACT SWITCH JOYSTICKS

3000 SERIES





COMPACT SWITCH JOYSTICK

- Configurable with single or double pole switching
- Versatile, compact and cost-effective
- Large selection of robust, ergonomic handles

COMPACT, PRECISION HALL EFFECT JOYSTICK

SERIES	MECHANICAL	AXIS	TECHNOLOOV		OUTPUT	OPTION		MOUNTING	SEALING
SERIES	LIFECYCLES	AXIS	TECHNOLOGY	Dual				OPTIONS	SEALING
1000	5 million	1,2	Switching (1,2 poles)					22mm bushing, 4 point screw	Up to IP67

050150	MECHANICAL	A)/(C	TECHNOLOOY			OUTPUT	MOUNTING	05411010			
SERIES	LIFECYCLES	AXIS	TECHNOLOGY	Single	Dual	Analog	PWM	USB	CANbus	OPTIONS	SEALING
3000	10 million	1,2,3	Hall effect	Х	Х	Х	Х			Drop-in or rear mounting	IP67

TOP APP : REMOTE CONTROLS FOR AGRICULTURAL EQUIPMENT, SELF PROPELLED SPECIALTY TRACTORS MOWERS, SPRAYERS, HYDRAULIC VALVE CONTROLS, MENU SELECTION FOR SCREEN NAVIGATION

TOP APP : REMOTE CONTROLS, REACH ARM MOWERS, VEGETATION CONTROL MACHINERY



PREMIUM HALL EFFECT JOYSTICKS

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

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HG SERIES

HAND GRIP HALL EFFECT JOYSTICKS

AG SERIES

AGRICULTURAL GRIPS



RUGGED HANDGRIP JOYSTICK

- Highly reliable controller designed for aggressive applications
- Several multi-function handles to choose from
- Long-life performance with Hall effect
- contactless technology & redundant outputs

ERGONOMICALLY **DESIGNED FOR** PERFORMANCE

	MECHANICAL LIFECYCLES	AVIC	TECHNOLOCY			OUTPUT	T OPTION			MOUNTING	UNTING SEALING	
SERIES	LIFECYCLES	AXIS	TECHNOLOGY	Single	Dual	Analog	PWM	USB	CANbus	OPTIONS	SEALING	
HG	10 million	1,2,3	Hall effect	Х	х	х		х	х	Drop-in or rear mounting	IP68	

TOP APP : TRACTORS, COMBINES, SPECIALTY HARVESTERS







- Designed specifically for operator comfort and accessibility
- CANbus J1939, CANopen & analog output options
- Custom, configurable faceplate options including pushbuttons, LED indicators and miniature joysticks

TOP APP : SPRAYERS, TRACTORS, COMBINES, SPECIALTY HARVESTER





ENHANCED MEMBRANE KEYPADS

CJ SERIES

ERGONOMIC MULTIFUNCTION JOYSTICKS



DESIGNED FOR OPERATOR COMFORT

- Ergonomical curved design minimizes operator fatigue • Configurable upper & lower faceplates • Optional deadman paddle switch, reducing the risk of inadvertent actuation
- Easy mounting with standard cut-out and hole pattern



SERI	50	MECHANICAL	AXIS	TECHNOLOGY			OUTPUT	MOUNTING	SEALING			
SERI	ES	LIFECYCLES	AAIS	TECHNOLOGY	Single	Dual	Analog	PWM	USB	CANbus	OPTIONS	SEALING
CJ]	10 million	1,2	Hall effect	Х	Х	Х		Х	Х		Up to IP68

ENHANCED MEMBRANE KEYPADS	
Panel mounted or remote control formats available	
Standard 2 or 3 buttons available	

Backlit button option available

TOP APP : TRACTORS, COMBINES, SPECIALTY HARVESTERS





MEMBRANE KEYPADS

• Sealed up to IP69K • Impact resistant IK10 • Fertilizer and hydrocarbon resistant • UV resistant

TOP APP : IN-CAB CONTROLS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS



6 BUTTON KEYPADS

RUBBER KEYPADS

STAINLESS STEEL KEYPADS



SOLUTION FOR

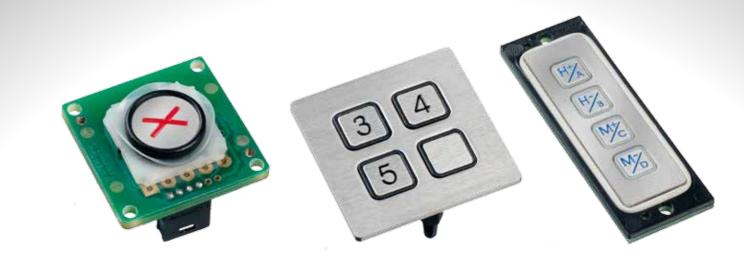
APPLICATIONS

MULTIPLE BUTTON



· CANbus or direct wiring output options

- CAN solution e-marking qualified (EMI, EMC)
- · Backlit and guick front assembly
- Bargraph & indicators available
- Blind usage and glove usage compatible



RUGGED, CUSTOMIZABLE **BACKLIT KEYPAD**

6 BUTTON KEYPADS
Sealed up to IP67
CAN Open or Can J1939
6V to 40V operating voltage
Easy front mounting

Sealed up to IP67 & impact resistant upt IK09

Diameter 17 mm and 20 mm pushbuttons available

Backlighting and LED indicators windows available

High resistance to agricultural chemicals (Fertilizer, gasoline, oil, ...)

Button legends resistant to heavy extended use

Thin design to 7,1mm below panel

TOP APP : IN-CAB CONTROLS, TRACTORS, COMBINES, SPECIALTY HARVESTERS, SELF-PROPELLED SPRAYERS

TOP APP : SCREEN NAVIGATION IN SELF PROPELLED VEHICLES AND FOR ATTACHMENTS, REMOTE CONTROLS



STAINLESS STEEL KEYPADS

- Outdoor use proof (greenhouse environment resistant)
- Customizable selection of key legends and symbols
- Single or multi color options available
- Fully customizable keyboard size and button position/configuration
- Current switching up to 150mA



CAPACITIVE SWITCH PANELS

CAPACITIVE SWITCH PANELS

CUSTOMIZABLE INTEGRATION





- Uniform backlighting
- · Large selection of button sizes and slider available
- Very low profile
- High resistance to mud, fertilizer and other agricultural chemicals
- Easy cleaning



ON DEMAND ELECTRONICS & SOFTWARE **INTEGRATION**

Communication protocols: CANbus (J1939, CANopen), RS485, RS422, USB.

Low power management

BIT Software: real time Built In Test

Integrated Dimming

Integrated Boot Loader: Diagnostic and software upgrade capability

TOP APP : SCREEN NAVIGATION, REMOTE CONTROLS





ELECTRONICS & SOFTWARE



• APQP development process · Communication protocols: CANbus, RS485/422, USB...

• Integration possible with all APEM products and solutions

TOP APP : ALL AGRICULTURAL MACHINERY



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