3-in-1 Control Solution for Medical, Industrial & Commerical Applications

The **series 293 joystick encoder** is a new, multi-function solution from CTS Corporation that combines a 4-directional joystick with an optical encoder and a pushbutton switch for a robust and cost-effective control unit. This three-in-one device can be employed throughout numerous medical, industrial and commercial applications, offering full, single-hand control of e.g., medical scanning equipment, factory handling control units and drone remote controllers.

Series 293 Joystick Encoder

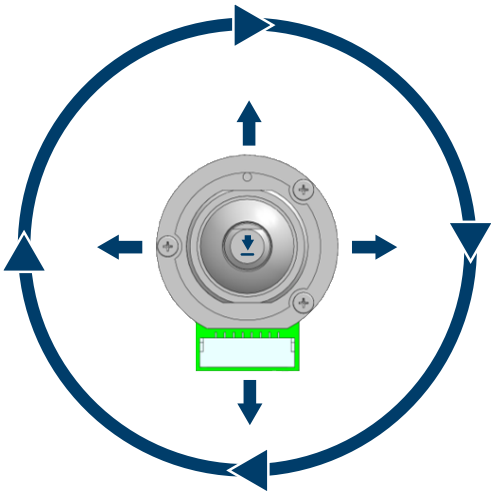
The ability to reliably control and steer electronic equipment and tools is an ever-present necessity throughout multiple markets and industries. Both manual and semi-automatic applications of all kinds require a dependable means of control, allowing operators to easily input commands in order to steer the movement of the systems in question.

The series 293 joystick encoder from CTS Corporation provides equipment operators with an ideal solution for simple and reliable system control at a competitive price point. Combining a four directional joystick with an optical encoder and an integrated pushbutton switch, the series 293 joystick encoder grants all the control functionality needed to efficiently operate a large number of electronic systems and tools such as medical scanners, robotic arms and various remote-controlled vehicles and devices. And as an integrated, three-in-one solution, the series 293 only requires one hand for control inputs, offering easy of operation and broad applicability.

The series 293 Joystick Encoder from CTS Corporation

The Series 293 Joystick Encoder - How Does It Work?

The series 293 consists of a joystick, an optical encoder and a pushbutton switch.



Control directions of the series 293 joystick encoder

The joystick features **four momentary tactile switches** that enable system movement in four directions across the X and Y axes. For many applications, four directions are more than enough for proper operation. Adding more directions will often lead to over-specification, resulting in redundant functionality, more complicated operation and a higher rate of failure. With an operational lifespan of upwards of 500k activations, long-lasting performances are guaranteed.

Bird's-eye view illustration of possible input activations for the series 293 joystick encoder.

Built into the series 293 is an **optical encoder** that can be turned to a total of 20 positions with five pulses per revolution. The encoder allows for additional position adjustment or other functionalities such as zooming in and out. The operational lifespan of the encoder exceeds 1M cycles thanks to its optical design with no mechanical contact.

The series 293 joystick also features a **momentary pushbutton switch** which can be activated by pressing down on the joystick shaft. This functionality is ideal for initiating various system commands, e.g., executing scans or imaging. The robust mechanical design of the pushbutton switch ensures its longevity with 1M activations.

Series 293 Three-in-One Joystick Encoder				
Size	**Termination**	**Operating Temperature Range**	**Storage Temperature Range**	**Output Signal (Neutral)**
25.4mm (Ø)	Connector / 50 mm wire w. Connector	-40°C to 85°C	-50°C to 95°C	2.5 V_{DC}

Series 293 Joystick					
Directions	**Angle of Throw**	**Operation Force**	**Operational Life**	**Input Current**	**Output Signal (Neutral)**
4	8° (±2)	150 gf (±75)	500k Activations	5 mA	2.5 V_{DC}

The Series 293 Joystick Encoder - How Does It Work?

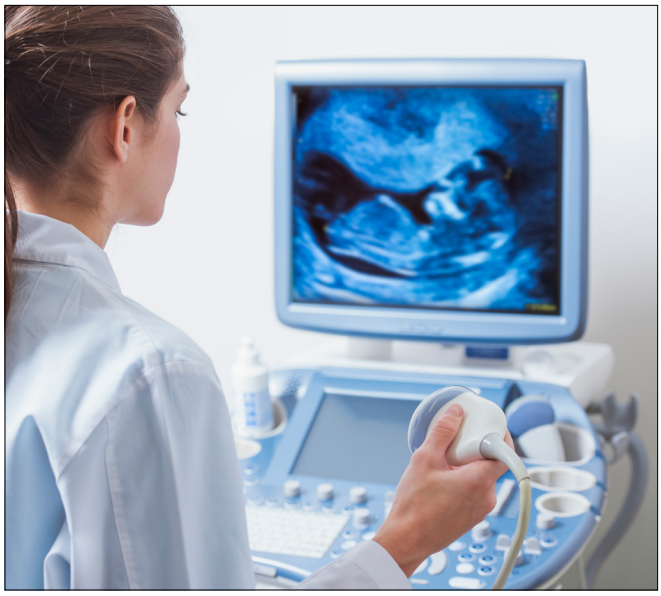
Series 293 Optical Encoder						
Positions	Pulses per Revolution	Rotational Torque	Rotational Life	Input Voltage	Input Current	Power Consumption
20	5	100 gf • cm (±50)	1M Cycles	5 V_{DC} (±0.25)	≤ 20 mA (at 5 V_{DC})	≤ 100 mW

Series 293 Pushbutton Switch						
Operation Force	Shaft Travel	Operational Life	Power Rating	Contact Resistance	Contact Bouncing	Power Consumption
350 gf (±150)	0.5 mm (±0.2)	1M Activations	10 mA (at 5 V_{DC})	10 Ω	4 ms (make) 10 ms (break)	≤ 100 mW

Ideal Applications for the Series 293 Joystick Encoder

Medical Equipment

The functionality offered by the series 293 joystick encoder makes it an ideal choice for various medical applications.



Medical imaging systems such as **CT**, **MRI** and **ultrasound scanners** will make good use of the series 293 as the four-directional joystick can be used to navigate the imaging interface while the integrated optical encoder can be turned to adjust and fine-tune slice selection or image rotation. Activation of the pushbutton can initiate e.g., image recording or snapshots.

Similarly, **surgical robotics** and **minimally invasive surgery systems** can employ the series 293 as well. Here, the joystick can move instruments in four directions, and the optical encoder will allow for adjustment of the tool and camera orientation, zoom or depth.

Ideal Applications for the Series 293 Joystick Encoder

Industrial Controls

The series 293 joystick encoder is also sure to find a home in factory halls around the globe, providing accurate and intuitive control for various applications.

In **Computer Numerical Control (CNC) machines** and manually operated **robotic arms**, the joystick enables movement along two axes, while the encoder can be used to finely adjust positioning, speed or tool orientation.

Operators of **conveyor systems** and **material handling equipment** can navigate items using the joystick and control orientation and alignment with the encoder.

Additionally, in **heavy equipment** and **crane controls**, the joystick provides straightforward directional control while the encoder fine-tunes lifting angles and rotation.

Commercial and Industrial Remote Controllers

Finally, the series 293 joystick encoder can be employed in various remote-control applications.

In **drone** and **Unmanned Aerial Vehicle (AUV) piloting**, the joystick grants control of the basic flight directions (forward, backward, left and right), and the rotational encoder can adjust drone yaw (rotation) or control a gimbal-mounted camera, allowing for smooth panning and scenic shots.

Similarly, other **remote-controlled vehicles** such as **cars**, **trucks**, **rovers** and **underwater drones**, can be steered using the series 293. Also, the joystick encoder can enable the control of **security camera** movement, orientation and zoom.

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