

## IP68 SEALED SCROLL WHEEL MODULE

Panel mount, Hall effect technology



The SWM scroll wheel module is a high specification human interface device that provides the same scroll, pan, and middle switch functionality found in scroll wheels installed in commercial desktop mice.

Utilizing reliable non-contacting Hall effect technology, the SWM scroll wheel provides environmental protection up to IP68 (IEC 60529) ensuring continued operation even when exposed to the most extreme environments.

The scroll wheel module provides various configuration options including: optional wheel colours, optional backlight LED lighting for use in low level environments, optional detent-scrolling mechanism, and a choice of rear or front panel mounting.

The module is available with a variety of electrical outputs and has been designed for integration into OEM Keyboards and consoles.

### FEATURES

- Hall effect encoding technology
- Sealing up to IP68 (IEC 60529)
- Integrated switch function (middle button function)
- Optional detent scrolling mechanism
- USB & PS2 (auto-select) or TTL quadrature output
- Smooth operation in rugged environments
- Various wheel colours available
- Backlight LED illumination feature available
- Custom mounting bracket options available

### GENERAL TECHNICAL SPECIFICATIONS

Mechanical	
Weight	: 22 grams
Wheel diameter	: 25mm
Wheel shaft diameter/material	: 3.0mm, Ni-Cu-Ni plated Magnetic Neodymium Iron Boron
Magnet strength	: N42
Wheel material/colour	: PC/ABS ; V various colours available
Housing material/colour	: PC/ABS, Black
Encoding technology	: Hall effect technology
Detent scrolling force	: 30 grams nominal (optional)
Electrical	
Protocol	: USB & PS2 (auto-select) or TTL Quadrature
Supply voltage	: 4.4V to 5.25V D.C.
Supply current - non illuminated	: 25mA typical, 30mA maximum
Supply current - LED illuminated	: 50mA typical, 65mA maximum
Resolution	: 24 counts per wheel revolution
Output connector	: 6 Way JST, vertical header, part no B6B-PH-SM4-TB
Mating output connector	: 6 Way JST connector, part no: PH, CR or KR types (e.g. PHR-6)
Integrated switches	: 1 x low profile tactile switch providing middle button functionality
Switch actuation force	: 150 circa 50grams force
Environmental	
Operating temperature	: 0°C to +55°C (IEC 60068-2-1, IEC60068-2-2)
Storage temperature	: -40°C to + 85°C (IEC 60068-2-1, IEC60068-2-2)
Operating humidity	: 93% RH @ 40°C, non-condensing (IEC 60068-2-78)
Storage humidity	: 10%-95% non-condensing (IEC 60068-2-78)
Vibration	: 2g, 10-500Hz, 1 octave/min, 10 sweep cycles (IEC 60068-2-6)
Operating Shock	: 15g/11ms, . sine, 3 shocks in +ve and -ve direction, all 3 axes (IEC 60068-2-27)
Mechanical lifetime	: 1 million wheel revolutions
MTBF	: in excess of 80,000 hours (MIL-STD-217F)
ESD	: 15kV air-discharge and 8kV contact discharge (IEC 61000-4-2)
EMC	: Radiated immunity - limits according to level 3 of IEC 61000-4-3 Radiated emissions to EN55022 class B
Sealing capability	: IP68 (BS EN 60529)

VER. 1.1

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### SCROLL WHEEL CONFIGURATIONS

#### INSTALLATION OPTIONS

The scroll wheel module can be installed into the front face of a panel or from the rear of the panel. Please refer to page 8 for the part ordering code section for configuration options.

#### REAR PANEL INSTALLATION

The scroll wheel module, when configured to be installed to the rear of a panel, utilises a standard mounting bracket with integrated sealing gasket.

A typical installation arrangement should include;

- 1 x 3mm thick metal panel (recommended).
- 4 x M3 threaded studs (M3 x 20mm) spot welded/pressed to the underside of the metal panel.
- 4 x M3 nuts and lock washers (not supplied).

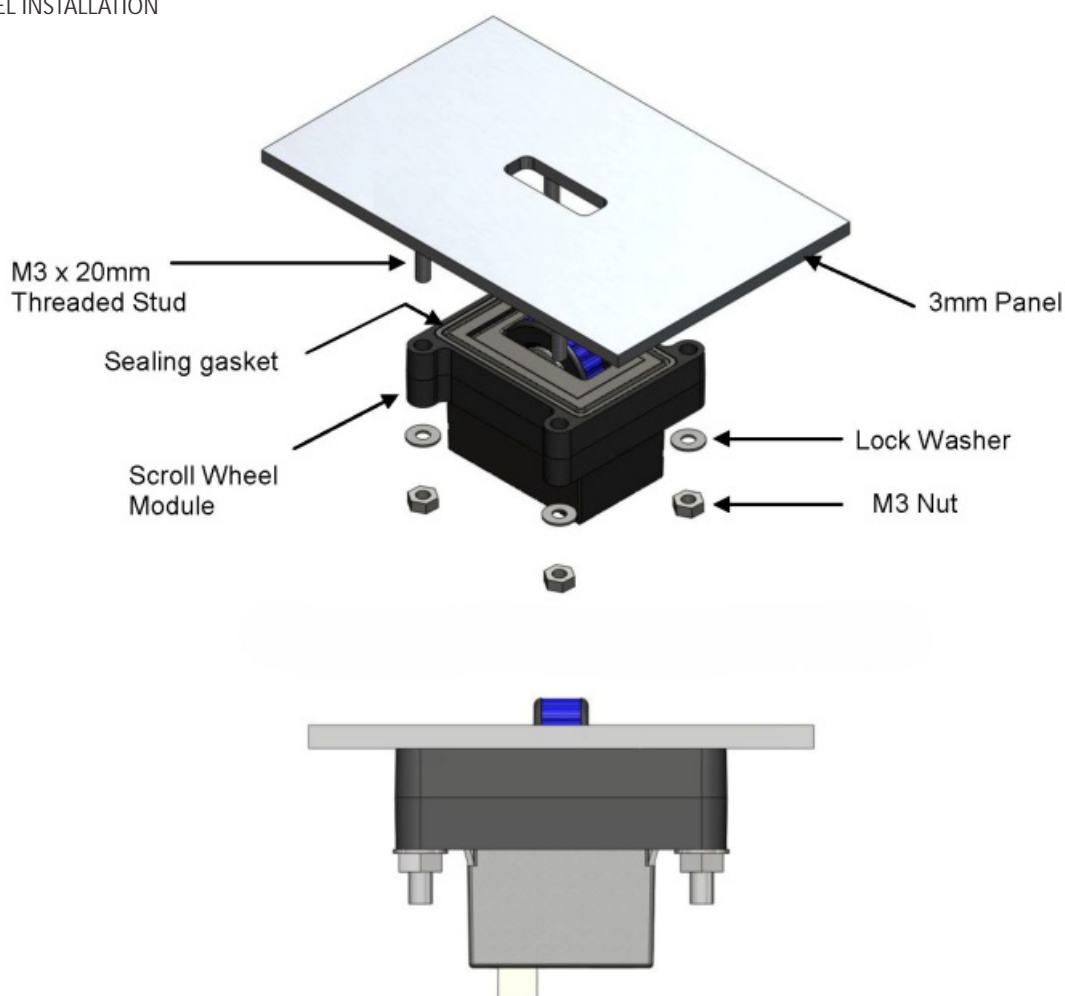
#### NOTES:

Please note that fixings and fasteners are not included with the scroll wheel module.

Please refer to the dimensional drawings for recommended panel cut-out dimensions and M3 threaded stud locations.

Custom installation brackets are available on request - please contact your local sales office for more information.

#### REAR PANEL INSTALLATION



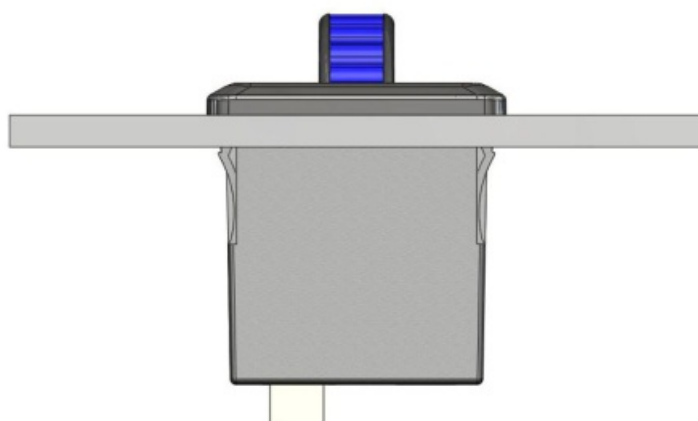
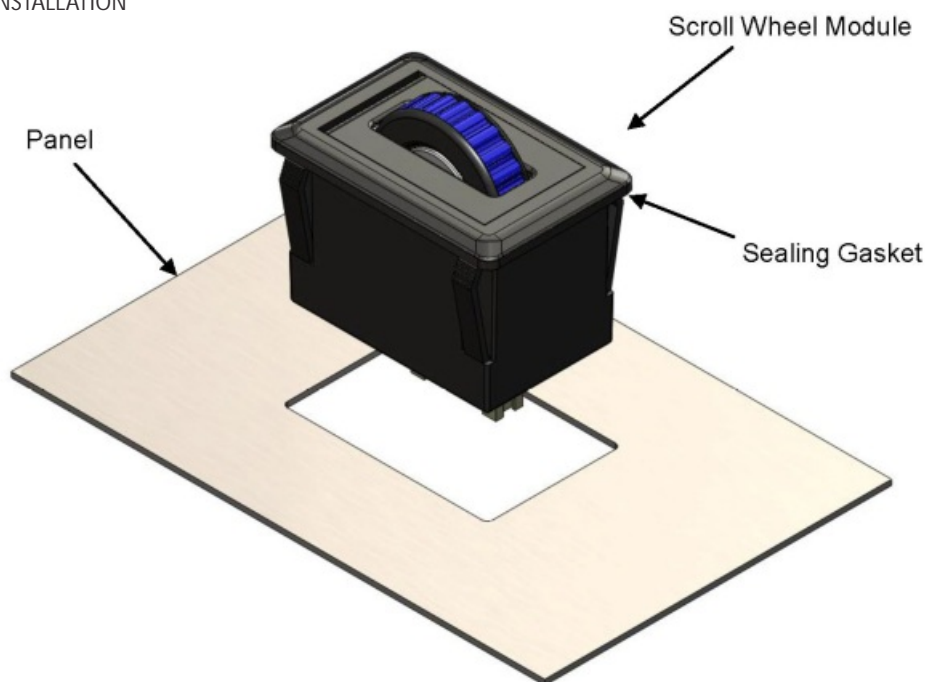
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### FRONT PANEL INSTALLATION

The scroll wheel module, when configured to be installed into the front face of a panel, utilises 4 x snap features integrated into the plastic housing. A sealing gasket is incorporated into the module to provide protection from ingress of water and dust. The module has been designed to be mounted into panels with a thickness of between 1mm and 3mm.

### FRONT PANEL INSTALLATION



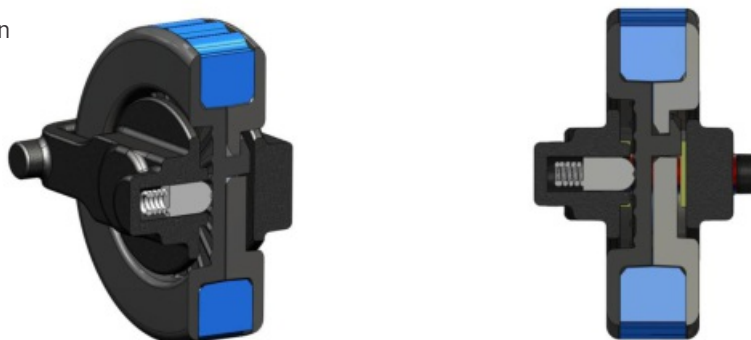
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### DETENT SCROLLING MECHANISM

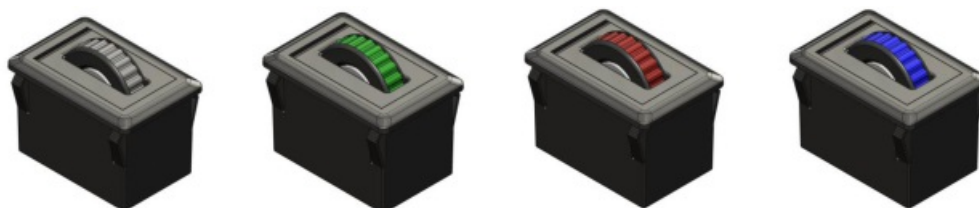
The scroll wheel module can be configured to include a detent scrolling mechanism that provides an audible click and tactile feedback for each output on the screen/system.

Detent mechanism cross-section



### SCROLL WHEEL COLOURS

The wheel can be configured to provide various colours as standard – please refer to page 8 for part ordering code for configuration options. Customisation of the wheel shape and form is also possible – please contact your local sales representative for further information.



### LED ILLUMINATION FEATURE

The scroll wheel module can be configured to provide LED illumination of the outer edges of the wheel. The illuminated edges provide an excellent means of locating the scroll wheel in low level light environments and also serve as an aesthetic feature to compliment other illuminated components that may be incorporated within a user interface panel (e.g. illuminated switches). The wheel can be configured to provide various colours as standard – please refer to page 8 for the part ordering code for configuration options.



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CONNECTION DETAILS

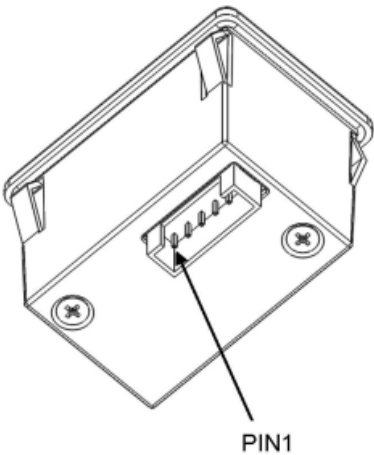
Connection is made to the scroll wheel module by means of a 6 way JST connector. Table 1 highlights the connection details.

Output Connector: P1  
Description: 6 way, 2.0mm pitch, vertical connector  
Manufacturer: JST (or equivalent)  
Part No: B6B-PH-SM4-TB

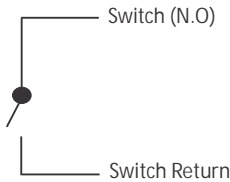
Output connections

Pin Number	USB & PS/2	TTL Quadrature
1	Earth	Switch Return
2	Do Not Connect*1	Switch (N.O.)*2
3	+5V	+5V
4	D-,PS/2 Data	Z1
5	D+PS/2 Clock	Z2
6	0V	0V

NOTE 1: Pin to be left floating (unconnected)  
NOTE 2: Switch operation is normally open.



Internal Switch Schematic (TTL Quadrature Only)

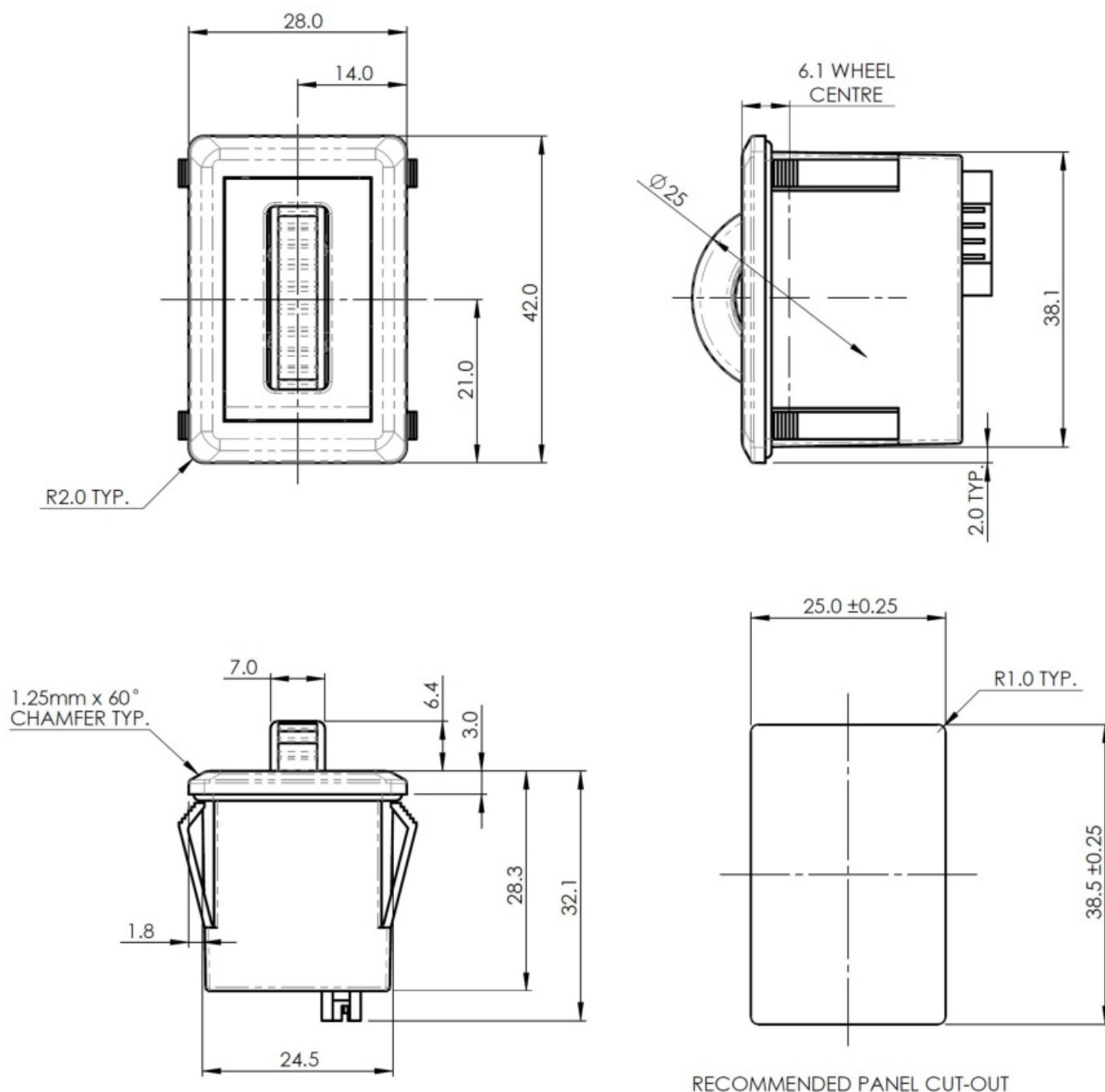


Internal Switch Specification  
Mechanical lifetime : 300,000 operations  
Travel (mm) : 0.25 + 0.2mm/- 0.1mm  
Operating Force : 150 ± 50 grams force

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### DIMENSIONAL DRAWING - FRONT OF PANEL INSTALLATION



Dimensional drawing specifies factory default orientation.

All dimensions are in mm unless otherwise stated.

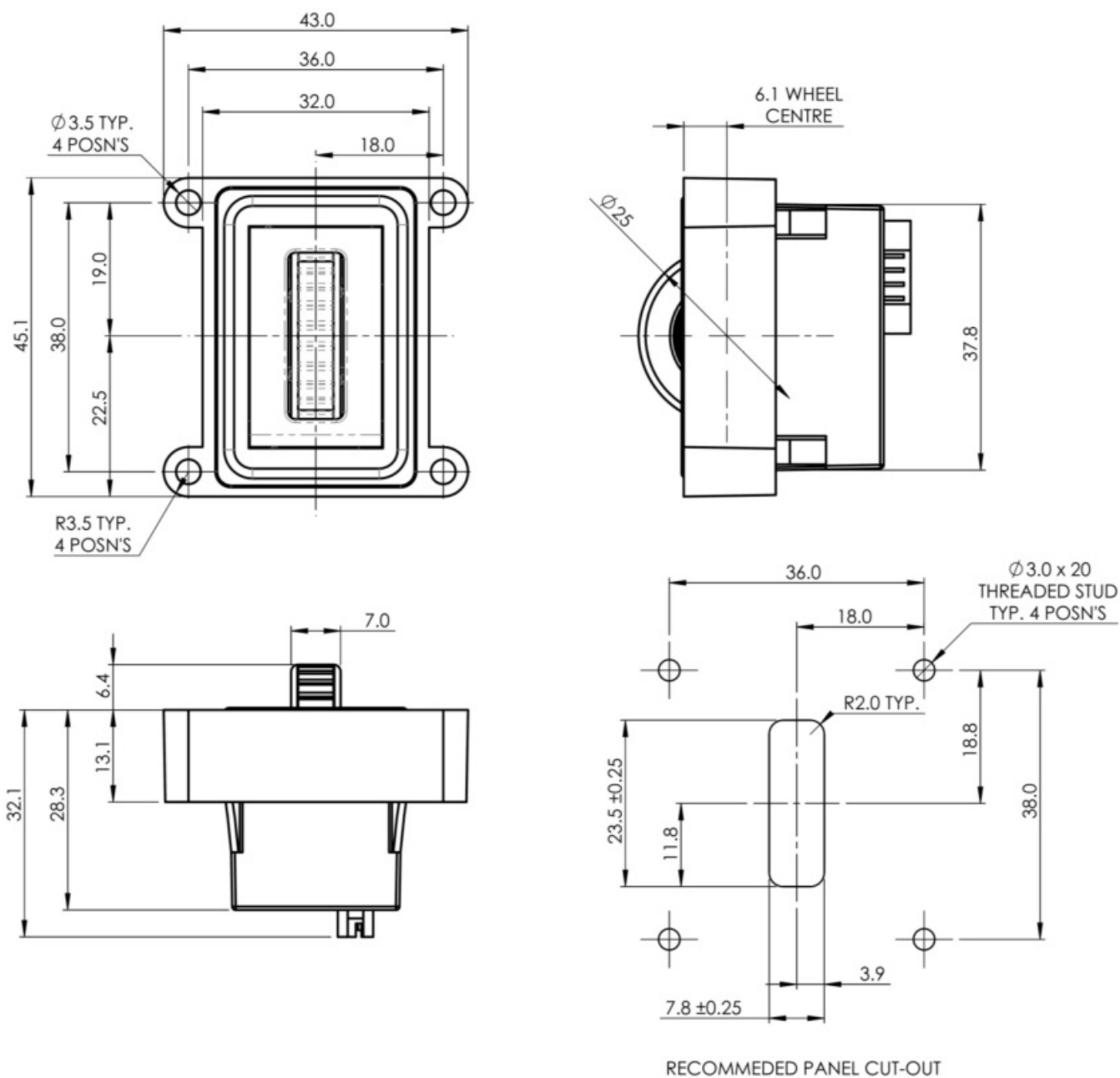
Tolerances  $\pm 0.2$  mm unless otherwise stated

Please note that an IGES model is available on request. Please contact your local sales office for more information.

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### DIMENSIONAL DRAWING - REAR PANEL INSTALLATION



Dimensional drawing specifies factory default orientation.

All dimensions are in mm unless otherwise stated.

Tolerances  $\pm 0.2$ mm unless otherwise stated

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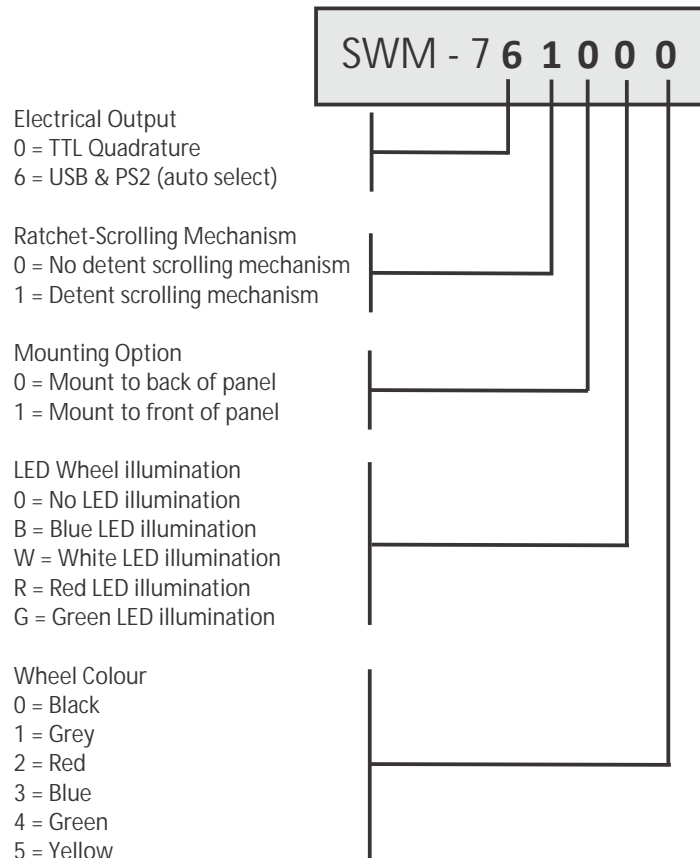
Custom mounting bracket options are available on request. Please contact your local sales office for more information.

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### ORDERING INFO

Please construct your standard product ordering code by selecting the numbers and letters to suit your specification:



Example SWM-761000 (standard available, others on request for projects)

Scroll Wheel module, IP68, USB & PS2, detent scrolling mechanism, mount to back of panel, no LED illumination, black wheel.