



## SmartStage™ XY Monolithic Stage

### High Stiffness Integrated XY Stage

Precision linear stage with *all* control electronics built-in.

The SmartStage XY Monolithic positioning stage, is a linear motor stage in a low-profile XY form factor, with physically integrated controller, designed for precision positioning. It is designed using stiff crossed roller bearings for superior performance.

- Stiffer structure, high bandwidth / performance than separate stacked systems
- More compact
- Single combined power and communications cable
- Machined-in orthogonality



US Patent 10,374,530  
US Patent 10,367,436

# SmartStage XYM Specifications

Travel (mm)	50	75
Position Feedback - Encoder Resolution*	5 nm	
Full Travel Accuracy ( $2\sigma$ , $\mu\text{m}$ ) <sup>1</sup>	10	12
ULTRA Resolution Option Accuracy per 100 $\mu\text{m}$	5 nm	5 nm
ULTRA Resolution Option Trigger On Position Accuracy at 50 mm/s velocity	5 nm	5 nm
Bi-directional repeatability. ( $2\sigma$ $\mu\text{m}$ )	0.8	0.8
Homing repeatability ( $\mu\text{m}$ )	1	1
Holding Stability ( $\pm$ nm)	30	30
Load Capacity (kg) <sup>2</sup>	10	10
Maximum Acceleration ( $\text{m/s}^2$ ) <sup>3</sup>	10	10
Maximum Velocity ( $\text{m/s}$ ) <sup>3</sup>	0.7	0.8
Flatness & Straightness ( $\mu\text{m}$ TIR) <sup>4</sup>	3	4
Total Mass (kg)	2.95	
Moving Mass - moved by lower axis (kg)	2.27	
Moving Mass - moved by upper axis (kg)	0.94	

\* Other resolutions available, for options contact an applications engineer

<sup>1</sup> Accuracy has 2 point slope correction applied

<sup>2</sup> Please contact our Applications Engineers for loads exceeding 10kg.

<sup>3</sup> The maximum acceleration and velocity is encoder and load dependent.

<sup>4</sup> Stage must be mounted to a plate with flatness according to dimension details for each travel listed below.

<sup>5</sup> Travel Life > 1,000,000 km

Motor Specifications			
Main Supply Voltage		V	48
Rated Performance	Symbol	Units	Value
Peak Force <sup>1</sup>	$F_p$	N	36 *
Continuous Force	$F_c$	N	12
Motor constant	$K_m$	N / W <sup>0.5</sup>	3.1
Electrical Specifications	Symbol	Units	Value
Motor Type			3 Phase
Peak Current	$I_p$	A	6 **
Continuous Current <sup>1</sup>	$I_c$	A	2
Electrical Resistance <sup>2</sup>	R	$\Omega$	5.4
Inductance <sup>2</sup>	L	mH	1.8
Back EMF (Sine RMS) <sup>2</sup>	$K_e$	V / m / s	6.9
Force Constant <sup>2</sup>	$K_f$	N / A <sub>Peak</sub>	6.0
Max Allowable coil temp	$T_{max}$	$^{\circ}\text{C}$	80
Max Voltage	$V_{max}$	V	48
Magnetic Pole Pitch	P	mm	25.4

\* Motor Peak Force assumes 48V main supply, for 24V main supply Peak Force is 24N

\*\* Motor Peak Current assumes 48V main supply, for 24V main supply continuous Current is 2A

<sup>1</sup> Motor winding temperature rise,  $\Delta T=75^{\circ}\text{C}$ , @  $25^{\circ}\text{C}$  ambient; Stage mounted to a 200x200x10 mm or larger aluminum plate

<sup>2</sup> Measured @  $25^{\circ}\text{C}$

Electrical Specifications	Units	Value
Input Voltage	VDC	24 - 48 $\pm$ 10%
Idle Power	W	< 2
Digital Input Voltage	VDC	5V
Digital Input Current Range	$\mu\text{A}$	5 - 20
Digital Output Voltage	VDC	5
Digital Output Max Current	mA	10
Maximum Input Current Rating	A	5
Maximum Input Power	W	250

## Environmental Requirements

- Operating Temperature Range  $0^{\circ}\text{C}$  -  $40^{\circ}\text{C}$
- Maximum Humidity 80% Non-Condensing

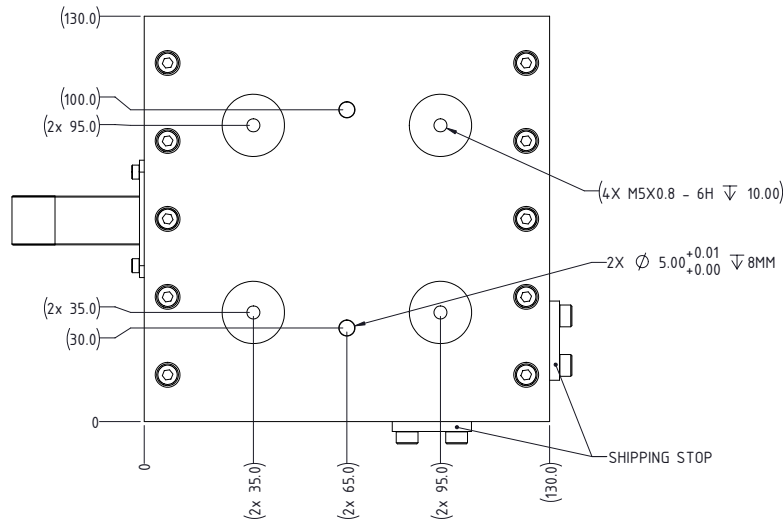


Dover Motion has implemented a Quality Management System in accordance with ISO 9001:2008 for the Design and Manufacture of Precision Positioning Products and Motion Systems

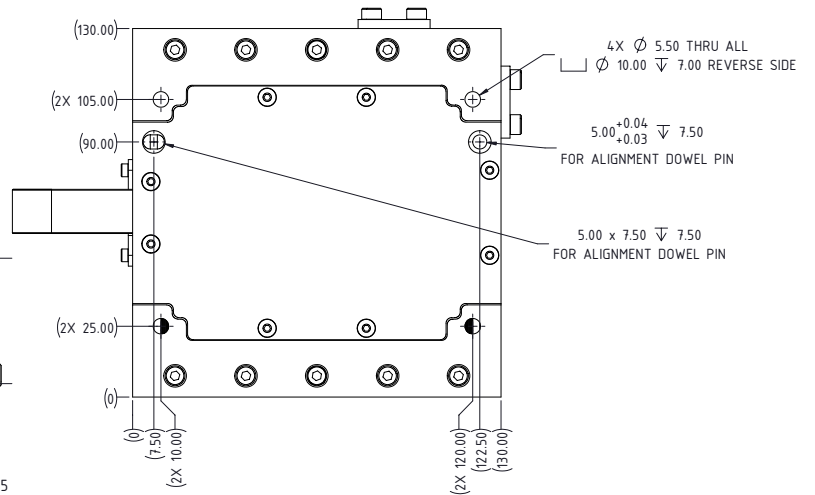
# SmartStage XYM Dimensional Drawings

Shown for both 50 and 75 mm Travel Options

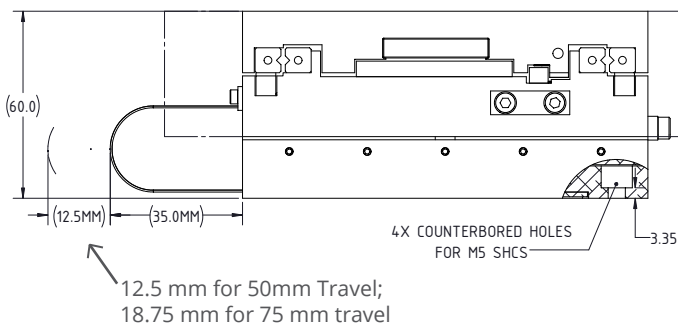
## Top View



## Bottom View



## Front View



Specifications based on mounting base of stage to a surface with flatness of 0.005 mm

All dimensions are in millimeters [inches]

# Pinout

## J1 - Main Connector

Pin	RS-232	RS-485	CAN	14 Pin Male
1		Secondary Axis I/O 3		
2		Secondary Axis I/O 1		
3		Primary Axis I/O 3		
4		Primary Axis I/O 1		
5		Digital I/O Return		
6	Primary Axis TX	Y		
7		Secondary Axis I/O 2		
8		Digital I/O Return		
9		Primary Axis I/O 2		
10	Secondary Axis RX	B	CANH	
11	Primary Axis RX	A	CANL	
12	Secondary Axis TX	Z		
B	Main Logic and Bus Supply			
A	Main Supply Return			

### Notes:

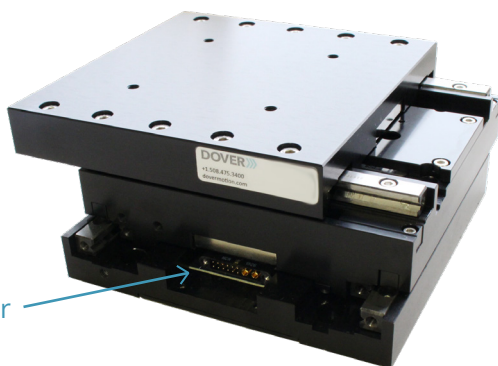
For Half Duplex (2 wire) RS-485 slave use signals: Y for Data+ and Z for Data-

Half Duplex RS-485 has the master and slave(s) Data + connected together and Data- connected together

For Full Duplex (4 wire) RS-485 slave use signals: A for RxD(B)+, B for RxD(A)-, Y for TxD(B)+, Z for TxD(A)-

Full Duplex RS-485 has the master Tx connected to slave(s) Rx and master Rx connected to slave(s) Tx

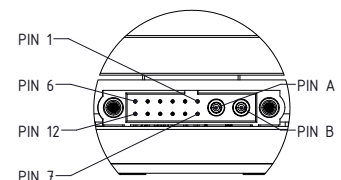
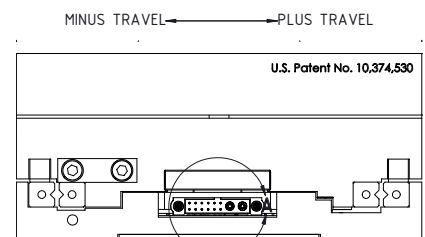
## Main Connector Location



Main Connector

Shown: 50mm x 50mm SmartStage XYM;  
only one connector for both axes

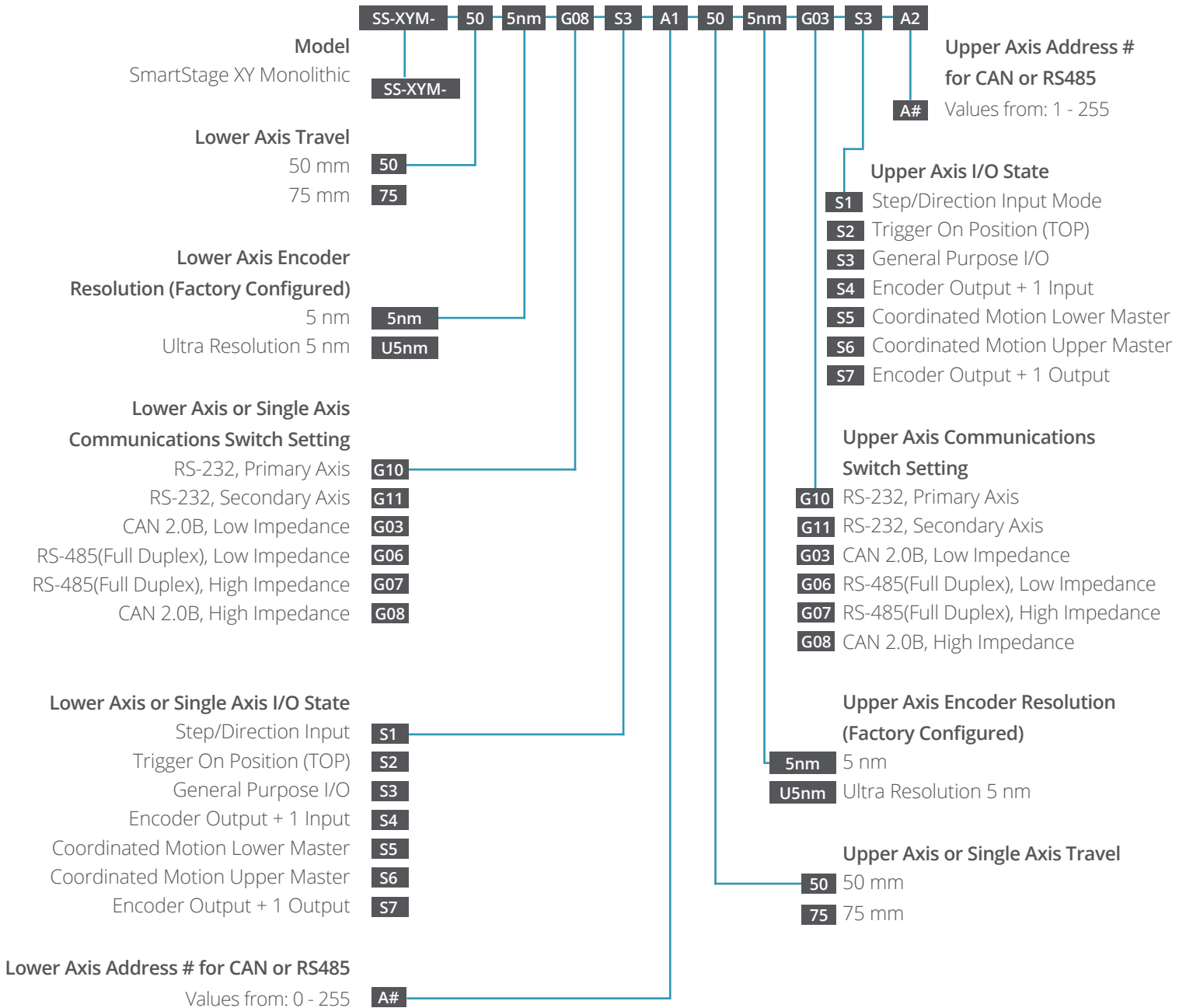
## Side View



DETAIL A  
SCALE 2 : 1

# Configurator

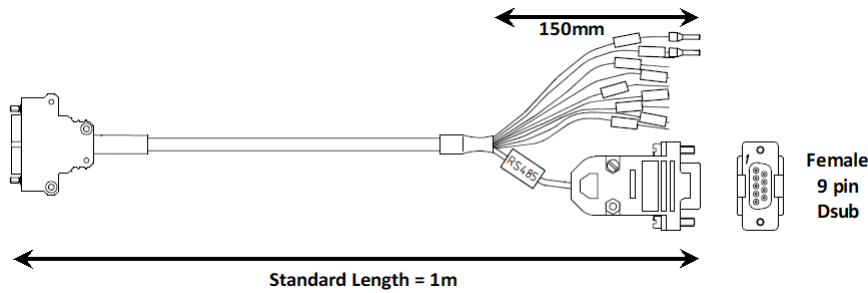
**Recommended Configuration: SS-XYM-##-5nm-G08-S3-A1-##-5nm-G03-S3-A2**



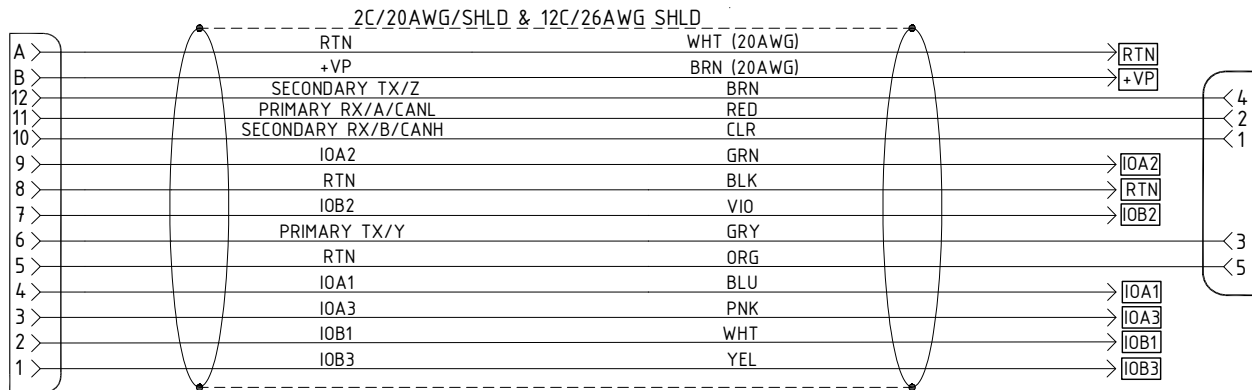
# Accessories

## Main Cable

Optional Accessory: Main Cable Details  
Orderable Part Number: 36308-040



Shown with Main Cable



## Cable Kits

Standard cable kits are available for communications, power, and I/O connections.

### RS-485 & RS-232 Cable Kit (P/N: 31-1045)

- 1m, Main Cable (see above 36308-040)
- RS-485 / RS-232 to USB Converter
- RS-485 to RS-232 Converter

### CAN Cable Kit (P/N: 31-3032)

- 1m, Main Cable (see above 36308-040)
- CAN to USB Converter



### 3 Node Communications Cable (P/N: 36185-00)

- Ribbon Cable with Dsub connectors to connect up to 3 nodes to the same communications host

### 5 Node Communications Cable (P/N: 36186-00)

- Ribbon Cable with Dsub connectors to connect up to 5 nodes to the same communications host

For customization, contact Dover Motion Applications Support at:  
sales@dovermotion.com for more information.