

Exceptionally Smart and Reliable

Robustness, Connectivity, Precision



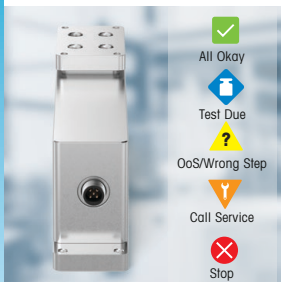
Reliable Operation

The SWP331D-RTU weighing sensor combines a durable design with high vertical overload protection to safeguard the sensor during shipment, installation, and operation.



High-Precision Weighing

SWP331D-RTU weighing sensors are available with OIML C6 and C3 classes. TwinCal™ calibration technology supports loading and unloading applications. Onboard filtering and adjustment for temperature changes enable precise weighing results.



Smart Integrated Connectivity

Compact PCB integration in the weighing sensors provides direct PLC connectivity and condition monitoring, saving space and reducing complexity. Smart5™ alarms ensure the system is performing as expected and allow quick reaction in case of issues.



Compact Design

SWP331D-RTU weighing sensors, at 38 mm wide, enable efficient space utilization and are ideally suited for installation in multi-channel production lines.



SWP331D-RTU Weighing Sensor

High-Quality Aluminum Alloy with Modbus RTU Connectivity

Key Features:

- Extremely robust design with 100 kg vertical overload protection to ensure mechanical safety from shipment to operation.
- High accuracy with repeatability up to $\pm 0.05\text{g}$.
- Compact design and integrated connectivity save space, reduce system complexity, and allow quick and straightforward installation.
- Smart5™ intelligent condition monitoring and alarms for easy maintenance and high machine uptime.
- Low contamination risk thanks to the high-quality aluminum alloy housing, containing less than 1% zinc and copper.
- Rapid machine integration and reduced development time due to direct connection to PLCs, DCSs, and other host controllers.

METTLER TOLEDO

SWP331D-RTU Technical Specifications – Weighing Sensor

Parameter		Unit of Measure	Specification		
Model No.		-	SWP331D-RTU		
Rated Capacity (R.C.)		kg (lb) nominal	5 (11)	10 (22)	20 (44)
Warm-up Time from Cold Start		minutes	5		
Communications	Type	-	RS485		
	Protocol	-	Modbus RTU		
	Baud rate	-	1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200		
	Default Node ID	-	15		
	Condition monitoring	-	Smart5™		
Effective System Update Rate, for one cell, 115200 baud rate		Hz	up to 200		
Span Stability, typical (peak to peak in 1 min)		ppm	< 5		
Material		-	Aluminum		
Vertical Overload Protection		kg (lb)	100		
Load Limit	Safe	kg	100		
	Ultimate	kg	150		
Fatigue Life		cycles @R.C.	> 10,000,000		
Direction of Loading		-	Compression		
Deflection @ R.C., nominal		mm (in)	<0.35 (0.014)		
Max. platter size		mm (in)	400 x 400 (15.75 x 15.75)		
Off-center load error, R76-1		%A.L. / cm (%A.L. / in)	0.0016 (0.0040)		
Weight, nominal		kg (lb)	1.0 (2.2)		
Cable		-	M12 industrial, 5-pin, shielded recommended		
Connector		-	M12 industrial, 5-pin, male (Class A)		
Mounting Screw	Material, Grade	-	Stainless Steel, A4-70 / A4-80		
	Weighing pan, size/thread	mm (in)	M4		
	Base Plate, size/thread	mm (in)	4.5		
	Torque, nominal	Nm (ft-lb)	1.5 (1.1)		

SLP331D-RTU Technical Specifications – Load Cell

Parameter		Unit of Measure	Specification		
Model No.			SWP331D-RTU		
Rated Capacity (R.C.)		kg (lb)	5 (11)	10 (22)	20 (44)
Noise-free Resolution ⁽¹⁾		-	C3: 100 000 / C6: 200 000		
Zero load Output		%R.C.	< 1		
Combined Error ⁽²⁾⁽³⁾		%R.C.	C3/IIIM n:5: ≤ 0.018 / C6/IIIM n:10: ≤ 0.012		
Repeatability Error (typical values)		%A.L. ⁽⁴⁾	C3/IIIM n:5: ≤ 0.01 / C6/IIIM n:10: ≤ 0.005		
		(g) ⁽⁵⁾	C3: ± 0.25 / C6: ± 0.05	C3: ± 0.5 / C6: ± 0.1	C3: ± 1.0 / C6: ± 0.2
Creep, 30 minutes		%A.L.	C3/IIIM n:5: ≤ 0.02 / C6/IIIM n:10: ≤ 0.01		
Min. Dead Load Output Return (DR), 30 min.		%A.L.	C3/IIIM n:5: ≤ 0.0167 / C6/IIIM n:10: ≤ 0.0083		
Temperature Effect on	Min. Dead load Output	%R.C./°C (./°F)	C3/IIIM n:5: ≤ 0.00107 (0.0006) / C6/IIIM n:10: ≤ 0.00064 (0.0004)		
	Sensitivity ⁽³⁾	%A.L./°C (./°F)	C3/IIIM n:5: ≤ 0.0013 (0.0006) / C6/IIIM n:10: ≤ 0.00067 (0.0003)		
Temperature Range	Compensated	°C (°F)	-10 ~ +40 (+14 ~ +104)		
	Operating		-30 ~ +65 (-22 ~ +150)		
	Safe Storage		-40 ~ +80 (-40 ~ +176)		
OIML / European Approval ⁽⁶⁾	Number, OIML / Europe	-	R60/2017-A-NL1-23.23 / NMI TC12619		
	Class	-	C3 / C6		
	nmax	-	3000 / 6000		
	Y	-	15000 / 25000		
	PLC	-	0.8		
	Humidity Symbol	-	None		
	Min. dead load	kg	0		
	Z	-	3000 / 6000		
	Barometric Pressure Effect	-	None		
NTEP Approval ⁽⁶⁾	Number	-	12-060A2		
	Accuracy Class	-	III		
	nmax	-	5000 / 9000		
	Vmin	g	0.2	0.4	0.8
	Min. dead load	g	0		
ATEX Approval ⁽⁶⁾	Number, cat. 2	-	Coming soon		
IECEX Approval ⁽⁶⁾	Rating	-	Coming soon		
Factory Mutual Approval ⁽⁶⁾	Number, USA / Canada	-	Coming soon		
Supply Voltage Non-regulated	Range (nominal)	V DC	10 ~ 30		
	Typical	-	12 / 24		
Supply Current	Max.	mA	60 ⁽⁷⁾		
	Typical	-	40 / 20		
ESD rating		kV	8 ⁽⁶⁾		
Immunity OIML R60		V/m	10		
Load Cell Material Spring Element		-	Aluminum		
Protection	Type		Silicon potting		
	IP Rating		IP67		
	NEMA Rating		NEMA 6/6P		

(1) The range of R.C. can be divided into 100,000 (200,000) digital increments which are higher or equal to the noise floor.

(2) Error due to the combined effect of non-linearity and hysteresis.

(3) Typical values only. The sum of errors due to Combined Error and Temperature Effect on Sensitivity comply with the requirements of OIML R60 and NIST HB44.

(4) A.L. = Applied Load.

(5) Repeatability error of SLP33xD integrated in the SWP331D Weighing Sensor. Values comply with the requirements of OIML R60 and NIST HB44. Typical values are 2x better.

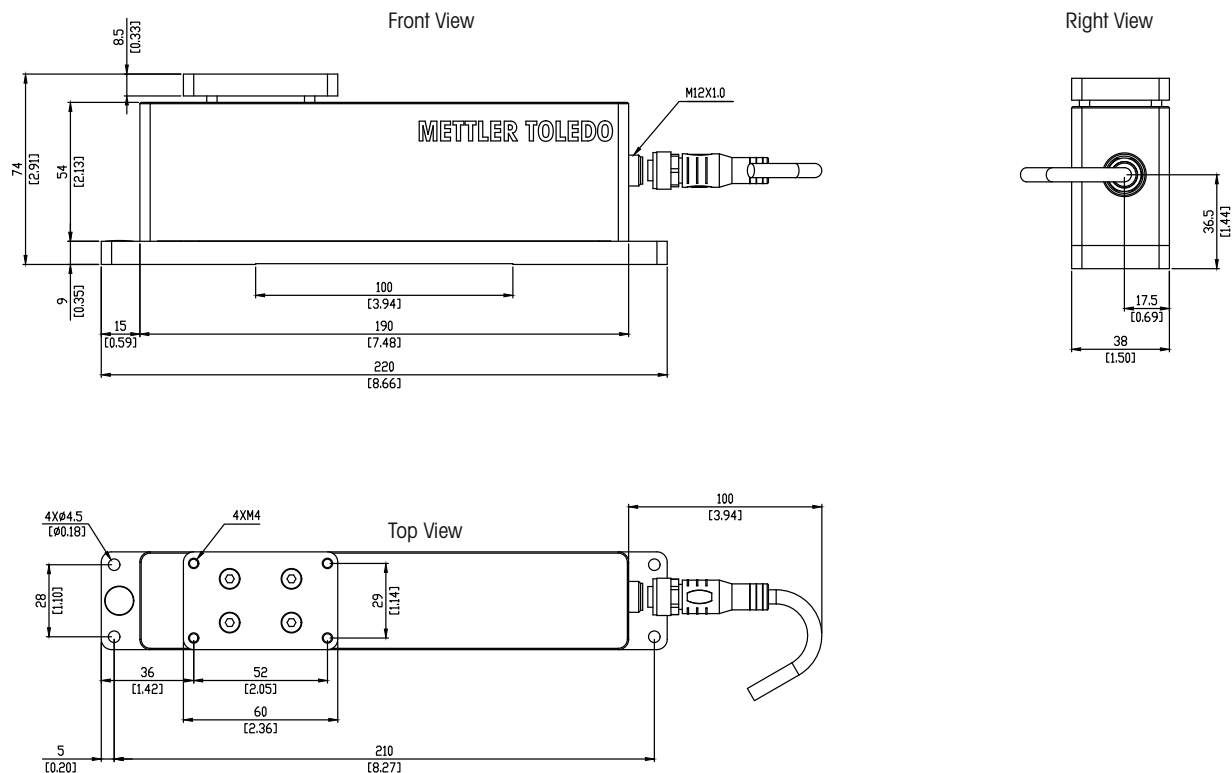
(6) See certificate for complete information.

(7) Values are not finalized, subject to change.

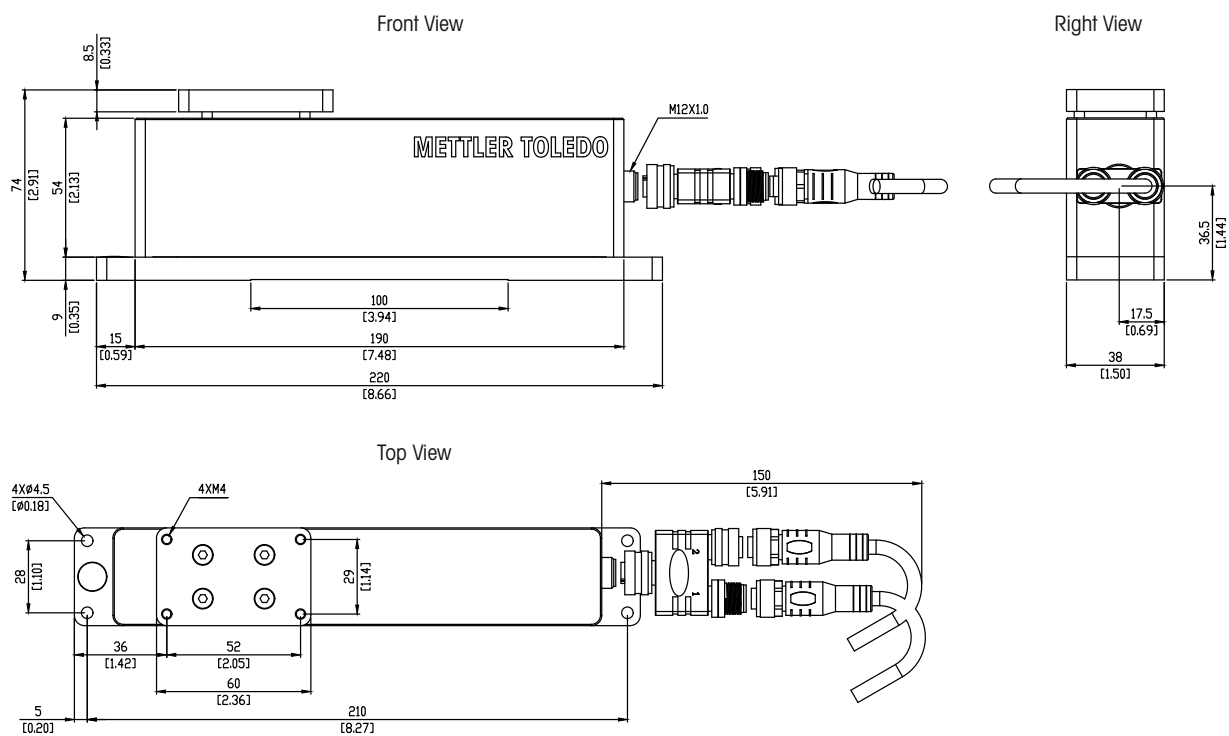


Weighing Sensor Dimensions, mm [in]

SWP331D-RTU Point-to-Point Communication

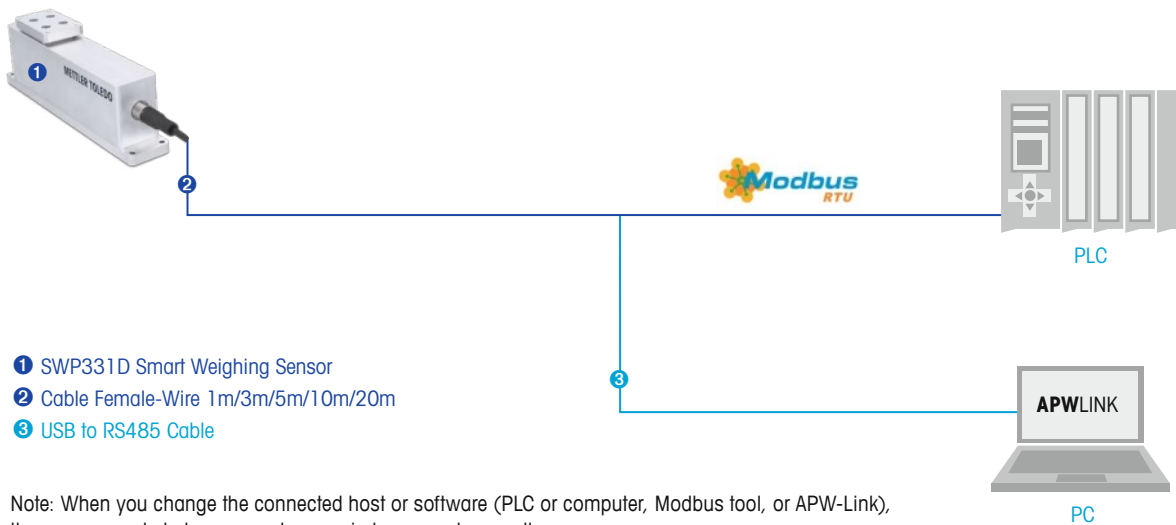


SWP331D-RTU Network Communication



SWP331D-RTU Typical System Configuration

Point to Point Communication



Example with 3 Weighing Sensors



Connector Pin Definition

M12 Male	Pinning	Signal	Cable Color
	1	VDC (Voltage)	Brown
	2	RS485 A	White
	3	GND (Ground)	Blue
	4	RS485 B	Black
	5	Not used	-
	Shielding	-	Braided Tape

Note: To protect the weighing module, the power supply GND is connected to the metal body of the weighing module. Once the cable is connected to the weighing module, the GND and the shield are connected.

Order information SWP331D-RTU

Rated Capacity	Item number, SWP331D-RTU	
	C3	C6
5 kg / 11 lb	30981255	30966640
10 kg / 22 lb	30981256	30966641
20 kg / 44 lb	30981257	30966642

Accessories

Item	Description	
30810382	Cable M12 5P A-code Female-Wires 1m	
30810383	Cable M12 5P A-code Female-Wires 3m	
30810384	Cable M12 5P A-code Female-Wires 5m	
30810385	Cable M12 5P A-code Female-Wires 10m	
30810386	Cable M12 5P A-code Female-Wires 20m	
30810267	Connector M12 5P Y Branch	
		
30810378	Terminal M12 5P 120 Ohm Resistor	
30914331	Cable M12 5P A-code Female-Male 0.5m	
30916471	Cable M12 5P A-code Female-Male 3m	
30810379	Cable M12 5P A-code Female-Male 5m	
30810380	Cable M12 5P A-code Female-Male 10m	
30810381	Cable M12 5P A-code Female-Male 20m	



For more information:

► www.mt.com/SWP331D

METTLER TOLEDO Service

Our extensive service network is among the best in the world and ensures maximum uptime and optimized performance of your weighing solution.

www.mt.com/IND-Service



Documentation and Qualification

Provide your customers with valuable weighing component information to increase visibility into the system you designed and address maintenance and audit requirements. StarterPac professional documentation simplifies long-term maintenance by providing all equipment component information to easily reference.



Calibration

Through METTLER TOLEDO, you can offer both Factory Acceptance Tests and initial calibration to prove a weighing system is performing as intended and to verify for the end-user that it is ready for use. Highly accurate calibration using traceable and certified test weights for weighing systems between 0.5 mg and 5000 kg ensures precision to meet any customer tolerances, regardless of application.

www.mt.com/SWP331D

For more information

METTLER TOLEDO Group

Industrial Division

Local contact: www.mt.com/contacts

Subject to technical changes

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