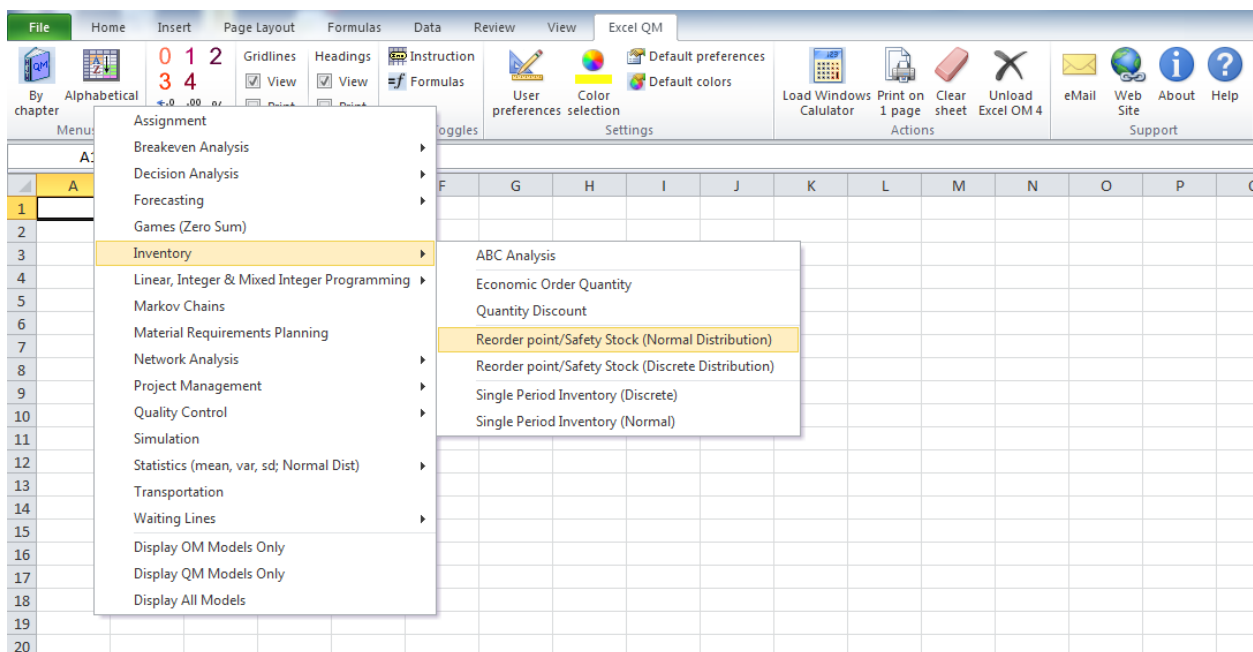


Safety Stock

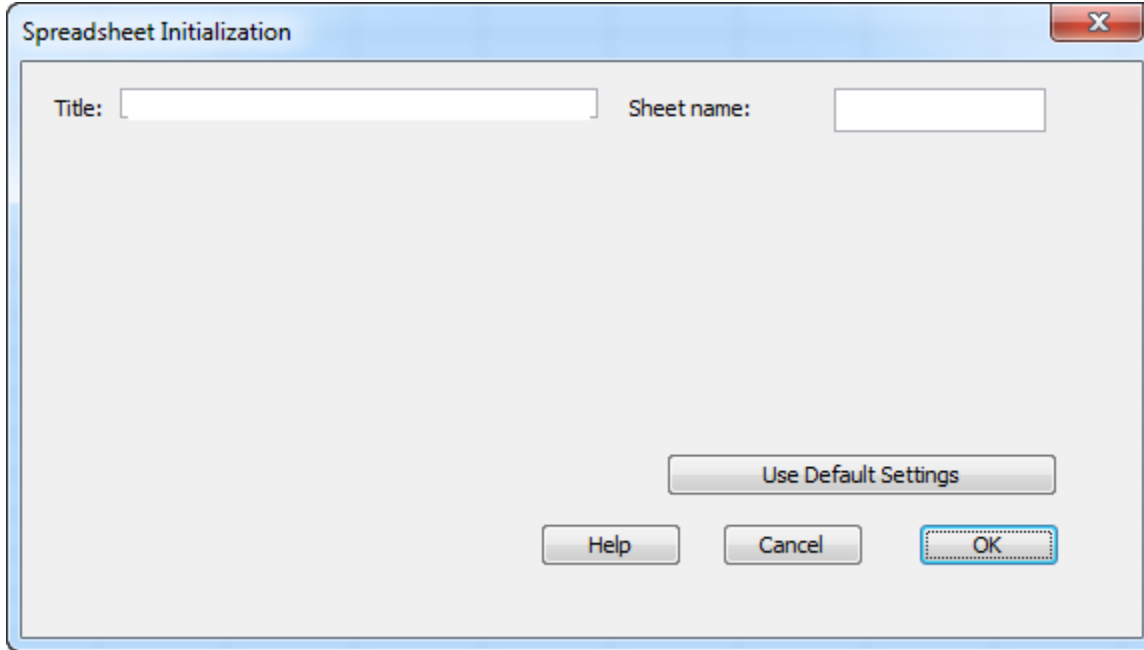
In this tutorial, we will examine how to calculate a safety stock problem.

The Hardware Warehouse is evaluating the safety stock policy for all of its items. For SKU M4389, the company always orders 80 units each time an order is placed. The daily demand is constant at 5 units per day; the lead time is normally distributed, with a mean of 3 days and a standard deviation of two days. Holding costs are \$3 per unit per year and the company desires to maintain a 95% service level.

To calculate our safety stock, you will open Excel QM, click on the **Excel QM** tab → **Alphabetical** → **Inventory** → **Reorder point/Safety Stock (Normal Distribution)**.



The Spreadsheet Information window will appear.



Click **OK**. A spreadsheet will appear with tables for three models.

	A	B	C	D	G	H	I
1	Inventory				Safety stock - Normal distribution		
2	Select a model and then enter the data in the shaded area. The model on the bottom left						
3							
4	Model: Demand during leadtime and its standard deviation given				Model: Daily demand and its standard deviation are given		
5							
6	Data				Data		
7	Average demand during lead time, μ				Average daily demand		
8	Standard deviation of σ_{dLT}				Standard deviation of daily demand, σ_d		
9	Service level (% of demand met)				Lead time days		
10					Service level (% of demand met)		
11							
12	Results				Results		
13	Z-value	#NUM!			Z-value	#NUM!	
14	Safety stock	#NUM!			Average demand during lead time	0	
15					Standard deviation of demand during lead time, σ_{dLT}	0.00	
16					Safety stock	#NUM!	
17					Reorder Point	#NUM!	
18							
19							
20	Models: Either daily demand, lead time or both are variable						
21							
22	Data						
23	Average daily demand						
24	Standard deviation of daily demand				Enter 0 if demand is constant		
25	Average lead time (in days)						
26	Standard deviation of lead time, σ_{LT}				Enter 0 if lead time is constant		
27	Service level (% of demand met)						
28							
29	Results						
30	Z-value	#NUM!					
31	Average demand during lead time	0					
32	Standard deviation of demand during lead time, σ_{dLT}	0.00					
33	Safety stock	#NUM!					
34	Reorder point	#NUM!					
35							

In this example, our demand is constant, but our lead time varies, with a standard deviation of 2. Be sure you enter the data where the model notes that **either daily demand, lead time, or both are variable**.

Our average daily demand is 5, our standard deviation of daily demand is 0, our average lead time is 3 days, our standard deviation of lead time is 2 days and our service level is 95%. When you enter this information into the data table, the results are automatically calculated.

19				
20	Models: Either daily demand, lead time or both are variable			
21				
22	Data			
23	Average daily demand	5		
24	Standard deviation of daily demand	0	Enter 0 if demand is constant	
25	Average lead time (in days)	3		
26	Standard deviation of lead time, σ_{LT}	2	Enter 0 if lead time is constant	
27	Service level (% of demand met)	95.00%		
28				
29	Results			
30	Z-value	1.64		
31	Average demand during lead time	15		
32	Standard deviation of demand during lead time, σ_{dLT}	10.00		
33	Safety stock	16.45		
34	Reorder point	31.45		
35				

We can see from the results that we need to maintain a safety stock of 16.45 units (rounded up to 17) and our reorder point is 31.45 units (rounded up to 32). [Click here](#) to download the completed sample spreadsheet so you can compare it to yours.

This concludes the tutorial on calculating a safety stock problem using Excel QM.