

Reorder point (ROP) control

This method of inventory control is widely used and forms the basis for understanding other methods. It can be adapted for system-controlled processes as well as manual and visual environments. When control parameters are kept constant, ROP control is a **Pull** system. **Kanban** is a form of ROP control.

In the following notes, a **period** is a consistent unit of time used for planning. Depending on the supply chain, it may be an hour, day, week or month. The important point is to maintain **consistency** throughout the calculations.

For each SKU, ROP requires us to define:

Forecast demand per period (D) – how much we expect to use/sell

Supplier lead time (LTs) – time expressed in periods between submitting an order and receiving delivery

Planned order size (Q) – normal quantity of product we plan to order each time

Safety stock (SS) – target stock on hand just before we receive an order

Review time (R) – time interval expressed in periods between reviews of stock levels to determine whether to place an order

Process lead time (LTp) – time expressed in periods from receipt of goods to their being available to the customer

We then derive:

Effective lead time (ELT) = LTs + LTp + $\frac{1}{2}$ R

Lead time demand (LTD) = ELT x D

Reorder point (ROP) = SS + LTD

Order-up-to level = ROP + Q

Each time we review the stock, we count:

Stock on hand – real stock on the shelf

Stock on order – the total outstanding orders from the supplier

Back-orders – any stock ordered by a customer

We derive:

Effective stock = stock on hand + stock on order – backorders

We place an order if:

Effective stock \leq ROP

The amount we order is:

ROP + Q – Effective stock