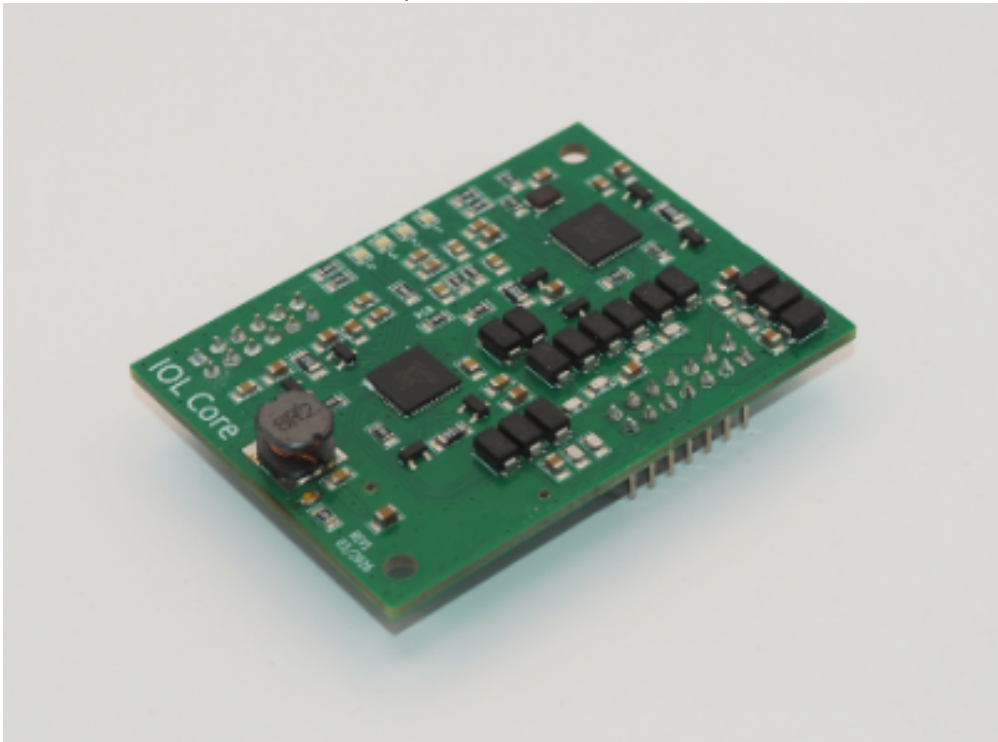


# 10. OEE Calculation Reference

Hardware manual

[www.pinetek-networks.com](http://www.pinetek-networks.com)





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# 10. OEE Calculation Reference

This chapter documents exactly how **Pinetek Insight** computes its figures, so every displayed value can be audited. All analysis views, reports and the AI Assistant use the same calculation functions; figures are consistent everywhere.

## 10.1 Data captured per production run

| Quantity                          | Source                                                                                           |
|-----------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Actual quantity</b> (units in) | Input-stage counter × units-per-count <a href="#">[PBX]</a>                                      |
| <b>Good quantity</b> (units out)  | Output-stage counter × units-per-count <a href="#">[PBX]</a>                                     |
| <b>Defect quantity</b>            | Defect/Reject-stage counter; can be corrected by the operator at run end <a href="#">(5.2.4)</a> |
| <b>Target quantity</b>            | Entered at changeover                                                                            |
| <b>Running time</b>               | Total time in states <i>Running</i> and <i>Running Slow</i> (from state events)                  |
| <b>Unplanned downtime</b>         | Total time in state <i>Down</i>                                                                  |
| <b>Planned production time</b>    | Wall-clock run duration (start → end)                                                            |
| <b>Ideal cycle time</b>           | From the product (or program default) configuration                                              |

## 10.2 Availability

$$\text{Availability} = \text{Running time} / (\text{Running time} + \text{Unplanned downtime})$$

Availability relates run time to operating time. Time in *Planned Stop*, *Changeover* and *Draining* is not an availability loss, only unplanned *Down* time reduces Availability. This follows the standard OEE definition in which planned stops are excluded from the loss calculation.

## 10.3 Performance

$$\text{Performance} = (\text{Ideal cycle time} \times \text{Actual quantity}) / \text{Running time}$$

Performance compares the time the production *should* have taken at ideal speed with the time it actually ran. Slow cycles and minor stops (shorter than the stage timeout) reduce Performance. The value is capped at 100%.



Performance is only as accurate as the configured **ideal cycle time** ([chapter 7.2](#)).

## 10.4 Quality

$$\text{Quality} = \text{Good quantity} / \text{Actual quantity}$$

Good quantity is the output-stage count; actual quantity is the input-stage count. Operator corrections of the defect quantity at run end are reflected here.

## 10.5 OEE

$$\text{OEE} = \text{Availability} \times \text{Performance} \times \text{Quality}$$

## 10.6 Aggregation across runs

When several runs are combined (period views, grouping by product/program, reports), the factors are weighted, not simply averaged:

| Factor       | Aggregation                                                                                                                                               |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quality      | Volume-weighted: $\Sigma \text{ good} / \Sigma \text{ actual}$ over all runs                                                                              |
| Availability | Time-weighted: $\Sigma \text{ running} / \Sigma (\text{running} + \text{unplanned downtime})$                                                             |
| Performance  | Running-time-weighted mean of the per-run values, mathematically equal to $\Sigma (\text{ideal cycle} \times \text{count}) / \Sigma \text{ running time}$ |
| OEE          | Recomputed from the three aggregated factors: $A \times P \times Q$                                                                                       |

This means a long run influences the aggregate more than a short one; a simple arithmetic mean of run OEEs would distort the result.

## 10.7 OEE colour scale

OEE values are colour-coded throughout the application. The default bands:

| Band      | Default threshold | Colour      |
|-----------|-------------------|-------------|
| Excellent | $\geq 85 \%$      | dark green  |
| Good      | $\geq 75 \%$      | light green |
| Fair      | $\geq 60 \%$      | yellow      |
| Poor      | $\geq 40 \%$      | orange      |
| Critical  | $< 40 \%$         | red         |

The thresholds are configurable under *System* → *System* → *OEE Thresholds* ([chapter 9.1](#)).