Integr8tor v2016.04

Introduction

We are pleased to announce the release of Integr8tor version 2016.04

Integr8tor v2016.04 offers significant improvements and new functionality explained in these release notes.

It also offers improved quality and bug fixes.

We recommend to install v2016.04 as soon as possible.
## Integr8tor v2016.04

### Commitment to regular updates

<table>
<thead>
<tr>
<th>Version</th>
<th>Release date</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Jul-10</td>
<td>Multiple job submit via email.</td>
</tr>
<tr>
<td>5.2</td>
<td>Nov-10</td>
<td>Copper clearances by type.</td>
</tr>
<tr>
<td>6.1</td>
<td>Mar-11</td>
<td>Perspectives in Cockpit.</td>
</tr>
<tr>
<td>6.2</td>
<td>Nov-11</td>
<td>Multiple QED reports.</td>
</tr>
<tr>
<td>7.1</td>
<td>Jun-12</td>
<td>Localized interface.</td>
</tr>
<tr>
<td>7.1.3</td>
<td>Jul-12</td>
<td>Bug fix release for 'recovered job'.</td>
</tr>
<tr>
<td>8.1</td>
<td>May-13</td>
<td>Support for ODB++ v7.</td>
</tr>
<tr>
<td>8.2</td>
<td>Nov-13</td>
<td>Detection and flagging of duplicate archives.</td>
</tr>
<tr>
<td>8.3</td>
<td>Jun-14</td>
<td>New standard parameters.</td>
</tr>
<tr>
<td>9.1</td>
<td>Dec-14</td>
<td>Support for Gerber X2 datasets.</td>
</tr>
<tr>
<td>2015-06</td>
<td>Jun-15</td>
<td>New standard parameters.</td>
</tr>
<tr>
<td>2016-04</td>
<td>Apr-16</td>
<td>SMD/BGA pads differentiates copper- and solder mask defined</td>
</tr>
</tbody>
</table>

- **Integr8tor v5.1** Jun 2010
- **Integr8tor v5.2** Nov 2010
- **Integr8tor v6.1** Mar 2011
- **Integr8tor v6.2** Oct 2011
- **Integr8tor v7.1** Jun 2012
- **Integr8tor v7.1.3** May 2013
- **Integr8tor v8.1** Jun 2014
- **Integr8tor v8.2** Nov 2013
- **Integr8tor v8.2** Dec 2014
- **Integr8tor v9.1** Jun 2015
- **Integr8tor v2015.06** June 2015
- **Integr8tor v2016.04** April 2016

» We try harder «

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Integr8tor v2016.04

Enhancements and new functionality

- Report copper area when no outline is found
- Cut-outs now recognized and processed as outline
- SMD/BGA pad count and characteristics for jobs without solder mask
- Report the presence and the ring of solder mask defined SMD/BGA pads
- Copper to outline clearance now reports separate values for pad, track and region
- More accurate pad count for nets without plated drills and jobs with lots of contours
- ODB++ input: supports for version 8 and mixed imperial/metric jobs
- Better pad classification in the Rebuilt Job; classification can be used in UcamX. e.g. selecting specific pads
- Simplified way to change the order of copper layer order in Job Editor by drag & drop
- Much more capable DFM Checks (this was called Capabilities in the previous versions; same license)
- Now possible to script layer subclasses in a new layer rename functionality
- Other important improvements
When no outline is found, the Copper Area is now calculated based on the user defined envelope (rectangle manually defined in the Cockpit).

Benefit:
- copper areas available without going to CAM

Before:

<table>
<thead>
<tr>
<th>File</th>
<th>Pos.</th>
<th>Min. Line Width</th>
<th>Min. Ring</th>
<th>Min. Cr. to Copper</th>
<th>Min. Same Net spacing</th>
<th>Min. Cr. &amp; Plated Ht.</th>
<th>Copper Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>1</td>
<td>0.127</td>
<td>0.000</td>
<td>0.137</td>
<td>0.128</td>
<td>0.114</td>
<td>0.0000</td>
</tr>
<tr>
<td>LS</td>
<td>2</td>
<td>0.127</td>
<td>0.004</td>
<td>0.111</td>
<td>0.010</td>
<td>0.189</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

No Copper Area calculated because of non-existing outline

Now:

<table>
<thead>
<tr>
<th>File</th>
<th>Pos.</th>
<th>Min. Line Width</th>
<th>Min. Ring</th>
<th>Min. Cr. to Copper</th>
<th>Min. Same Net spacing</th>
<th>Min. Cr. &amp; Plated Ht.</th>
<th>Copper Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>1</td>
<td>0.127</td>
<td>0.000</td>
<td>0.137</td>
<td>0.128</td>
<td>0.114</td>
<td>0.00944</td>
</tr>
<tr>
<td>LS</td>
<td>2</td>
<td>0.127</td>
<td>0.004</td>
<td>0.111</td>
<td>0.010</td>
<td>0.189</td>
<td>0.0547</td>
</tr>
</tbody>
</table>

Copper Area calculated and reported based on the envelope

If available the correct PCB size could be used for the envelope.
Cut-outs are now recognized and processed as the PCB outline.

Benefits:
- more accurate area detection and outline length measurement
- cut-outs taken into account for minimum clearances
Correct SMD/BGA pad count and characteristics now for jobs without solder mask

Benefits:

- provides important information to correctly quote mask less boards
- provides vital information to CAM
New: Solder mask defined pads

Report the presence and the ring of solder mask defined SMD/BGA pads.

Benefits:
• better information to choose the best manufacturing process
• supports a more accurate cost calculation

<table>
<thead>
<tr>
<th>Side</th>
<th>SMD Pads (Total)</th>
<th>Min. SMD Pad</th>
<th>Pitch of Min. SMD Pad</th>
<th>Solder Mask Defined Pads</th>
<th>SMD Pads (Excl. BGA)</th>
<th>BGA Pads</th>
<th>BGA Min. Pitch</th>
<th>All Tracks in BGA Centered</th>
<th>BGA Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>662</td>
<td>0.279</td>
<td>0.787</td>
<td>25</td>
<td>328</td>
<td>334</td>
<td>0.800</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Bottom</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>662</td>
<td>0.000</td>
<td>0.000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.800</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solder Mask</th>
<th>Min. Ring on Copper Defined Pads</th>
<th>Min. Ring on SM Defined Pads</th>
<th>Min. Clr. Mask to Copper</th>
<th>Min. Web</th>
<th>Min. Clr. Mask to Copper</th>
<th>Fully Covered Via Holes</th>
<th>Partly Covered Via Holes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0.076</td>
<td>0.125</td>
<td>&gt;0.250</td>
<td>&gt;0.250</td>
<td>0.076</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Bottom</td>
<td>0.102</td>
<td>0.125</td>
<td>&gt;0.250</td>
<td>&gt;0.250</td>
<td>0.076</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
We now report outline clearances separately for pads, tracks and regions.

Benefit:

More detailed and clearly arranged information for a better cost analysis.

## Copper Layers Details

### Old QED report

### New QED report

**Moved to the new section Copper Layers Details**

**New information**
Integr8tor v2016.04
Improved: copper area and SMD/BGA count

Better reporting of the copper area and SMD/BGA count
- for nets without plated drill holes
- for jobs with lots of contours

Benefits:
- improved reporting of copper surface
- more accurate SMD/BGA count in QED report
Now supports input of ODB++ v8 data sets
Full support of ODB++ data sets with mixed metric and imperial units

Benefit:

- Designers begin sending more and more ODB++ v8 data sets to fabricators. This release keeps you up-to-date with the latest practices
Integr8tor v2016.04
Improved: pad classification

Rebuilt Job Export has improved pad classification

BGAs and edge connectors more effectively classified

Benefits:
- better pad classification in UcamX after import of Rebuilt Job
- less manual CAM work
Now possible to change the order of copper layer order in Job Editor by drag & drop

Benefit:
Fast and easy way to rearrange the order of copper layers by drag and drop
The “Capabilities” option is amplified to DFM Classes

- DFM Classes can now access all QED fields and not just a limited subset. This includes custom parameters
- DFM classes no longer require contiguous intervals
- Indicates when checks are not applicable for the job
- Possibility to pick any number of design characteristic values, perform calculations using them and insert the result in the table or use it for classification

Benefits:
- The table in the QED report can now match each customer’s layout and rules
Example 1 – Combine min. ring and Product IPC Class

I have a design characteristic min ring and I have a custom parameter Product IPC Class.

Depending on the value of Product IPC Class, I can instruct DFM Classes to subtract a certain amount off the value of annular ring, giving me not just the min annular ring in the design, but the real tolerance for drill hole (mis)placement during production.

Example 2 – Custom parameter “Impedance Controlled”

If I had a custom parameter “Impedance Controlled”, DFM Classes can be instructed to:

a) Take into account this controlled impedance parameter as a criterion in my DFM Classes.

b) Make sure the classes Standard and Extra1 (cf. screen shot) always turn orange if impedance controlled is set to “yes” for a given job.
DFM Review, a software application in Integr8tor with which the static table of DFM Classes can be interrogated. Locations worthy of review can be visited and visualized.

Benefits:
- great support in evaluating the PCB
- fast way to evaluate results
- easy to locate possible threats
New layer renaming functionality - now possible to script layer subclasses

Benefit:

Subclasses can be scripted according to existing in-house requirements or customer conventions.

Example: different inner layer subclasses based on their copper area

- inner layers with copper area < 50% should be subclass “signal”
- inner layers with copper area 50% - 70% should be subclass “mixed”
- inner layers with copper area > 70% should be subclass “solid”
- drill layer starting on outer layer but not going through all layers should be subclass “blind”
- drill layer starting on inner layer and ending on inner layer should be subclass “buried”
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Other improvements

- More stable server – less “No license” problems
- New v2016 Cockpit introduces hotkeys:
  - Ctrl s save preferences
  - Ctrl q close (quit) preferences / licenses
  - Ctrl e exit cockpit
- Improved recognition of solder mask polarity
- Faster processing after action in the Cockpit, like duplicate layers in the Job Editor
- Support for openings in outlines
- More reliable Eagle import by improved handling of font text
- Support for Windows 10
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General information

- The installer can be downloaded at ftp://ftp.ucamco.com/Integr8tor
- We recommend to install this update as soon as possible.
- Users on v9.1 and earlier need a new license key.
- For all questions please contact our local business partner or Ucamco support (see contact page on the website)
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