

Unity™ Custom Digital Placer

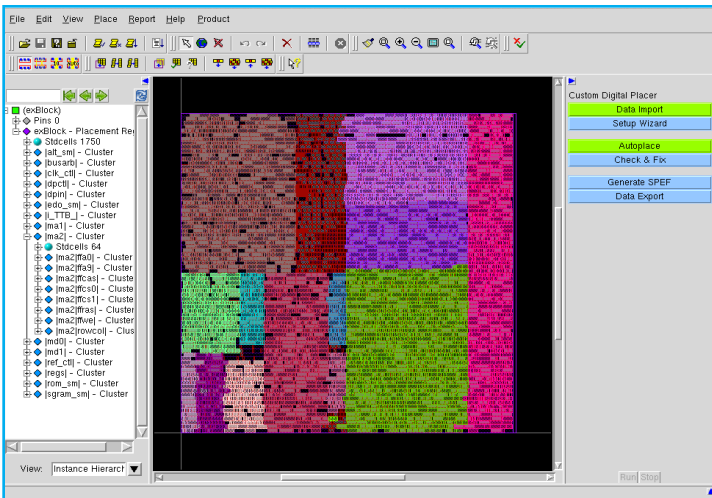
PRECISION PLACEMENT FOR CUSTOM DIGITAL DESIGNS

With the explosion in size and complexity of custom digital designs, designers can no longer rely on manual layout to place their leading-edge custom designs. However, they cannot afford to compromise on quality, either. Traditional digital placers fall short in providing the quality of result that leading-edge custom design teams require. Pulsic Unity Custom Digital Placer offers a broad range of advanced placement technologies that enable a precise result to be achieved with a speed only possible through automation.

CUSTOM PLACEMENT REQUIRES PRECISION

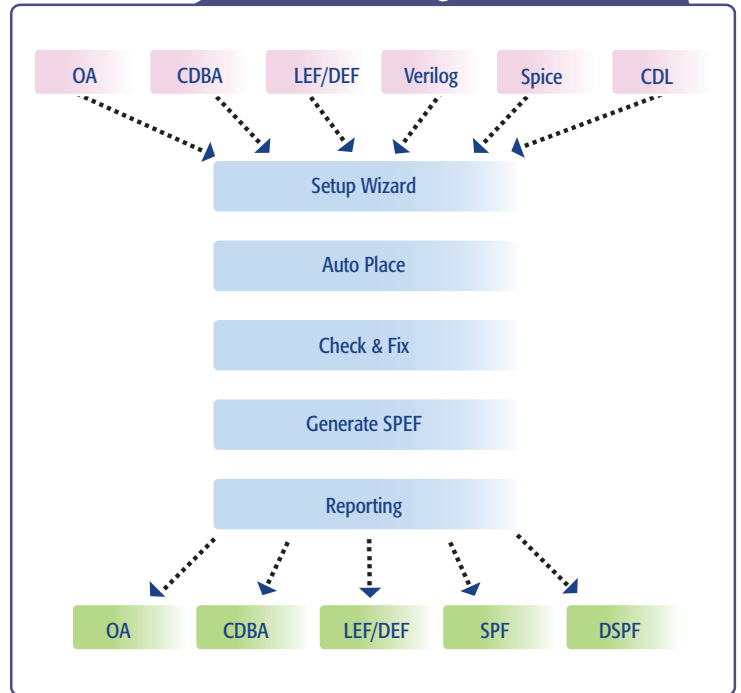
Leading-edge custom digital design teams have very specific requirements for placing their designs. While their design style is row-based, their libraries do not conform to the standard cell model. Instead, their library cells vary in height and require special alignments, and have non-uniform power rails. Some standard cells may be added to the mix, complicating the task even further.

Today's advanced custom digital designs require special placement topologies. Most custom digital design teams employ a simulation-driven flow, and need a flattened circuit hierarchy to be placed pseudo-hierarchically, while the extreme aspect ratio of many leading-edge custom processes additionally requires specific placement patterns to achieve an optimal routable result.



Unity Custom Digital Placer showing hierarchically clustered placement, each cluster is shown in a different color

Custom Digital Placer Flow



Because of the exacting requirements of custom placement, design teams have traditionally placed their designs using manual layout editors. But, the time and effort required to hand-place today's custom digital designs, with their vastly increased size and complexity, have made manual placement of custom cells impractical. Until now, however, automated placement tools have yielded results so poor that any productivity gained by using an automated approach has been lost due to the need to hand-correct the automated results.

UNITY CUSTOM DIGITAL PLACER: A PRECISE APPROACH TO AUTOMATED PLACEMENT

Unity Custom Digital Placer offers design teams a unique combination of placement technologies that enable precise, handcrafted quality to be achieved automatically. Based on the familiar row-based placement concept, Unity Custom Digital Placer includes a comprehensive and easy-to-use cell-alignment capability that enables placement of non-standard cells while conforming to design rules and constraints. The unique hierarchical clustering technology in Unity Custom Digital Placer ensures strict pseudo-hierarchical placement topologies. Pseudo-hierarchical placement enables the

optimization of routing resource, and ensures that the routing estimates used in simulation-driven flows remain accurate throughout layout. Pre-route-aware placement optimizes the placement for pre-routed critical signals and top-down methodologies. A comprehensive array of user-controlled placement constraints enables designers to obtain the precise results they require with automated speed.

MADE-FOR-CUSTOM PRECISION, AUTOMATED SPEED

Today's advanced custom digital designs require specialized and precise placements. The demands of multi-height cell libraries, constrained design area, restricted routing layers, extreme aspect ratios, and high-performance signals all increase this need for precision. With more than a decade of continuous custom design automation development, Pulsic is well qualified to address these custom design challenges. Unity Custom Digital Placer integrates a comprehensive set of precision-placement technologies to work in unison, within an easy-to-use flow, to produce handcrafted-quality results in a fraction of the time.

The precision placement technologies embodied in Unity Custom Digital Placer include high-quality, row-based placement; non-standard and multi-height cell alignment; hierarchical clustering; and cluster control and pre-route-aware placement.

Non-standard cell alignment enables the automated placement of real-life custom libraries. Sub-height, over-height, and multi-height cells can all be used.

The unique hierarchical clustering technology in Unity Custom Digital Placer maintains the circuit hierarchy in the placement topology. Cells in the same sub-circuit are kept closely together in the placement. Subsequently, these sub-circuit groups are clustered together in the same way. Clustering ensures a good separation of circuits at any level in the hierarchy, and keeps cells from different sub-circuits from being mixed together. Hierarchical clustering also optimizes design area by maximizing routing efficiency within each cluster. Hierarchical clustering supports simulation-driven flows that assume each sub-circuit can be modeled in isolation by ensuring that sub-circuits are physically separate from each other.

Unity Custom Digital Placer is the only complete solution for precision placement of advanced custom digital designs. Standard automated placement solutions lack the breadth and depth of technology required to address today's complex custom-placement challenges.

GUIDED FLOW FOR IMPROVED DESIGNER PRODUCTIVITY

The Unity Custom Digital Placer includes a step-by-step guided placement flow with a graphical user interface (GUI) showing each step and progress through the flow. The guided flow informs designers of their progress through the flow and the pre-requisites for each step. If the designer wants to leave the tool and return at a later time, the guided flow keeps track of the steps already completed.

BENEFITS

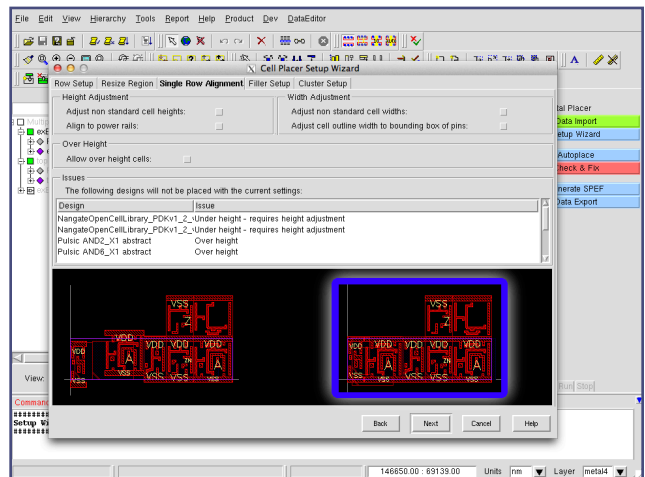
- Precise, handcrafted-quality placement results
- Custom digital layout with automated placement speed
- Optimized placement enables efficient routing with minimum design area
- Enables use of multi-height custom and standard-cell libraries
- Supports simulation-based design flows through hierarchical clustering
- Increased productivity through automation of advanced custom placement functions
- Fast adoption and realization of benefits through a guided flow and thematic GUI

FEATURES

- Row-based placement technologies
- Multi-height cell alignment
 - Custom-cell placement of over-height, under-height and multi-height cells
 - Standard cell placement in custom designs
- Hierarchical clustering
 - Strict physical grouping defined by the circuit hierarchy
 - Clustering of cells within sub-circuit, and of sub-circuit cell groupings
- Proximity control: cells and clusters of cells can be placed in close proximity based upon net constraints.
- Pre-route-aware placement: pre-planned critical signals drive the placement of cells
- Easy-to-use, intuitive guided flow and thematic GUI

SPECIFICATIONS/SYSTEM REQUIREMENTS

- Linux: x86 and x86_64
- Solaris: Sparc 64 and x86_64



The Unity Custom Digital Placer with guided flow makes placement of non-standard cells easy and intuitive

for more information, please go to our website at www.pulsic.com or email us at sales@pulsic.com

