

## Assembly Solution for Modular Buildings: Development of a Plug-In Self-Locking Device Designed for Light-Framed Structures

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**Abstract :** The prefabricated construction industry has been operating in North America for several years now and differs from traditional construction by its much shorter project timelines, lower costs, and increased build quality. Faced with the global housing crisis, prefabrication should be the first choice for erecting buildings quickly and at a low cost. However, the reality is quite different; manufacturers focus their operations mainly on single-home construction. This is explained by the lack of a suitable and efficient assembly solution for erecting large-scale buildings. Indeed, it is difficult to maintain the coveted advantages of prefabrication with a laborious on-site assembly and a colossal load of additional operations such as the installation of fasteners and the internal finishing. In the desire to maximize the benefits of prefabrication and make it a smart choice even for large buildings, an automated connection solution is developed. The plug-in self-locking device was developed accordingly to the product design phases: on-site observations, the definition of the problem and product requirements, solution generation, prototyping, fabricating and testing.

**Keywords :** assembly solution, automation, construction productivity, modular connection, modular buildings, plug-in device, self-lock mechanism

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