



ept connector selected for use in the new specification by the PICMG®

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The demand for modular industrial PCs is high and will continue to grow – a fact that market analyses confirm. For this reason, a working group of the PICMG® has agreed on a new manufacturer-independent standard under the name ModBlox7 in order to connect modules that are primarily used in bus and railroad technology.

### **Goals of ModBlox7**

The ModBlox7 specification outlines the architecture for a modular box PC, consisting of various block types, such as a CPU, power supply unit, and I/O units. This new manufacturer-independent standard enables users to implement a wide range of device combinations in modular design thanks to interoperable functional units. The aim of the PICMG® was also to reduce costs and promote sustainability.



### **Scope of the new specification**

The new specification of the PICMG® includes both the mechanics, the modular functional units, and the electrical connection via connectors in the predefined pinout. According to the specification, a box PC consists of a housing, one or two power supply units, and one or two CPUs, each with up to four PCI Express and up to eight USB-based I/Os. In turn, each module can comprise up to three stacked PCBs, depending on the complexity of the unit. The dimensions of the box PC are predefined in terms of height and depth. However, the front width varies depending on the number of units. In turn, these can each consist of one or more slots with a width of 1.4 inches, with the possibility of lining up a maximum of twelve slots for a maximum width of 16.8 inches.

### **Requirements for the connector**

When developing a standard for modular device configuration, special attention is normally paid to the electrical and mechanical connection of the individual modules by means of connectors. The operating conditions of the box PCs required that it be a high speed connector in SMT. This connector is characterized not only by enormous robustness during installation, but also by high tolerances in operation and highest resistance to adverse environmental conditions. In some applications it is necessary to provide reliability through redundancy by means of a further connector, which means it must also be possible to use several connectors simultaneously on a single printed circuit board. This requires a high degree of compensation offset during mating as well as tolerances during operation.

## Zero8 as the connector of choice



The working group for the ModBlox7 specification determined the Zero8 from ept to be a connector suitable for the diverse requirements. The SMT connector with an 0.8 mm pitch comes from a large product family with different types, heights, and pin numbers as well as with optional EMC shielding. The ModBlox7 specification uses the angled, 80-pin version, which enables adjacent units to use a horizontal PCB connection. The simultaneous use of two Zero8 connectors is also permitted in accordance with the specification to provide redundancy and ensure reliability. This is made possible by an offset compensation of 0.4 mm during installation and tolerances during operation of 0.7 mm. If it were not the case, the modules could be damaged when being connected.

Another advantage of the Zero8 is the possibility of simultaneous transmission of high currents and high speed signals. Initially this does not sound like it is compatible; however, it is made possible due to the connector design in combination with an appropriate pin assignment, thus saving space and costs.

Thanks to its gender-neutral ScaleX connection technology with interlocked male and female connectors, the Zero8 also has enormous contact reliability and thus guarantees reliable signal transmission even in the event of vibration and shock.

### Zero8 also for PCB connection within individual units

The Zero8 portfolio also offers an apt solution for the mezzanine connections of up to three PCBs of a CPU under the same installation conditions. The use of several connectors of a scalable product family offers another decisive advantage: This means that the connectors do not have to be designed in and approved over and over again, which results in further cost savings for the user. Interoperability while reducing costs and offering sustainability. The new specification promises great advances for box PCs. The individual modules can be successfully and safely connected thanks to the Zero8. The specification is expected to be adopted by the end of the first quarter.