

TECHKO® ModularDC - modular construction of data center facilities



In 2020, around 10% of all data was created and processed outside of large data centres or so-called public cloud solutions. Forecasts made by Gartner company indicate a rapid increase in this number. The company predicts that this rate will rise to 75% in 2025.

As a result of these developments, the market for so-called edge data centres, which process data 'close' to the customer (edge computing), is expected to achieve a compound annual growth rate (CAGR) of 21.4 per cent, increasing from a value of US\$7.2 billion in 2021 to US\$19.1 billion by 2026. This represents an increase of 165% in only six years' time.

To meet the changes taking place in the structure of data centre facilities and the technical requirements posed by the implementation of new ICT technologies such as:

- cloud computing solutions,
- 5G-based telecommunications networks,

- artificial intelligence (AI),
- Internet of Things (IoT). ,
- machine learning (ML).

which are driving the changes associated with such a rapid development of edge computing, **TECHKO®** is introducing the **TECHKO® ModularDC** solution to the Polish market in 2023.

TECHKO® ModularDC complements the offer in the segment of data centre facilities. This type of facility has so far been constructed on the Polish market mainly using traditional building technology or, less frequently, container technology (often mistakenly referred to in the media as modular technology). This situation involved a difficult choice between the quality and functionality offered by traditional solutions and the short lead times characterising container solutions.

TECHKO® ModularDC is a proposal for companies wishing to build a new data centre facility, satisfying their IT needs in this area, or wanting to provide commercial services related to:

- co-location of systems,
- data storage,
- services (e.g. saas, paas, iaas, etc.) provided in the so-called 'cloud',
- edge processing,

and need a facility built within a short timeframe, on a reasonable budget and 'close' to the client.

TECHKO® ModularDC is also a proposal for companies that need to modify their existing solutions:

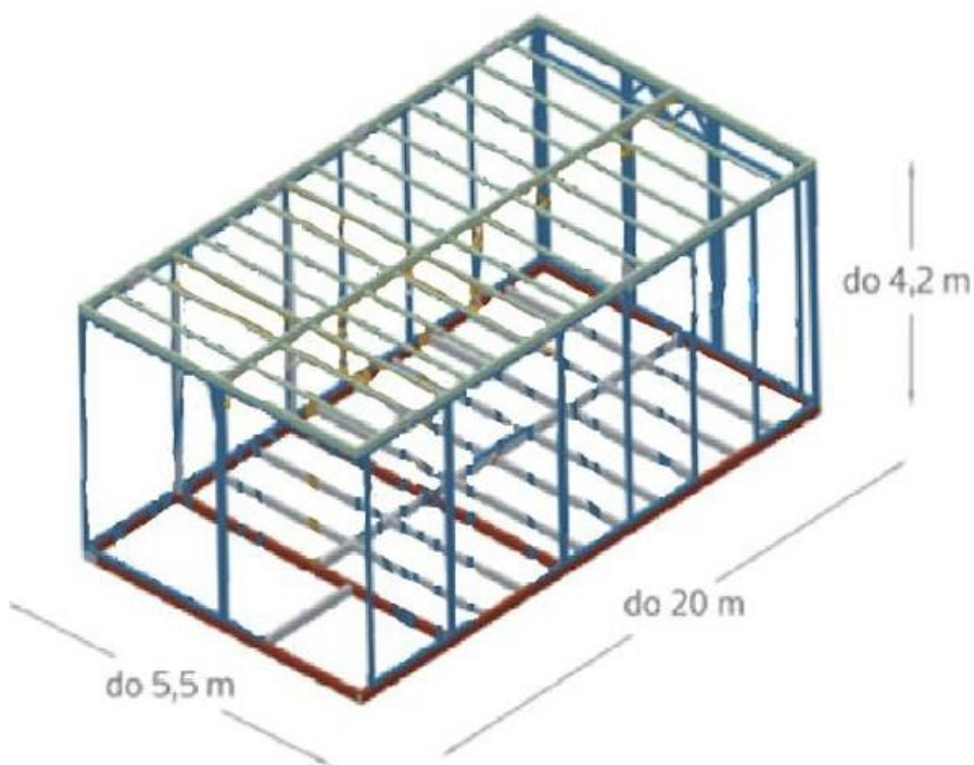
- IT - for example, for economic, strategic reasons, they do not want to migrate their applications to the public cloud and want to create their own cloud environment,
- telecoms - for example, they need to increase their ability to process data 'close' to the customer or expand their capacity to cache data used by internet customers,

or need solutions that are scalable, easy to expand in the future and that meet high technical and functional requirements.

TECHKO® ModularDC is a comprehensive solution related to the design and construction of data centre facilities, using modular building technology for this purpose. Our solution

represents a kind of innovation, combining the high quality and durability of traditional construction with the speed of implementation and mobility of container systems.

The load-bearing element of the building structure, made according to the technical and functional principles of **TECHKO® ModularDC**, is a steel module welded from structural profiles with cross-sections resulting from the static calculations carried out for each project (Fig.1). The steel structure is protected against corrosion and fire protection.

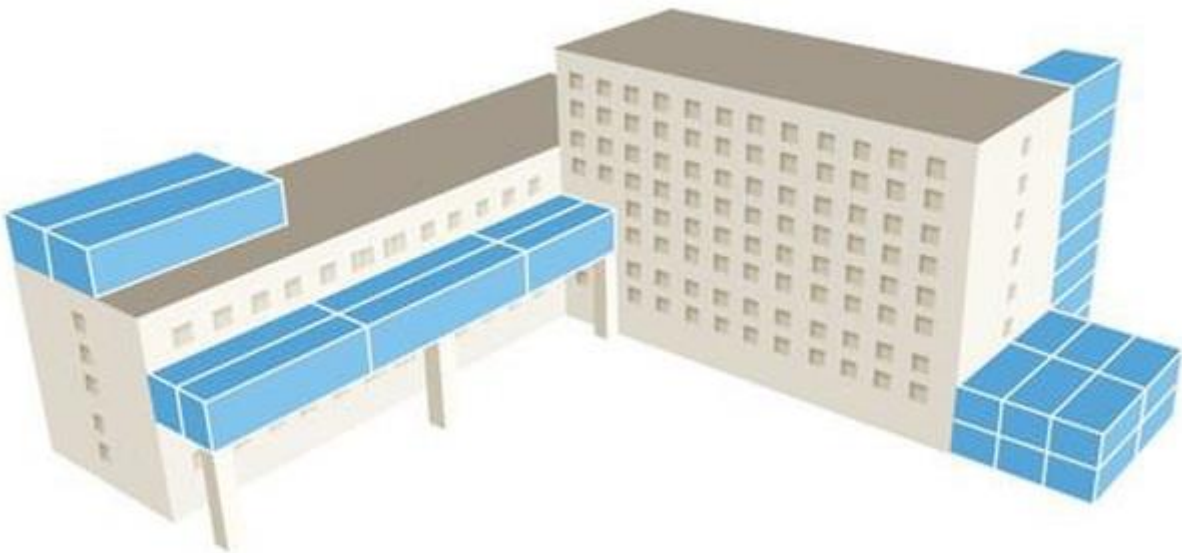


*Fig.1 Maximum dimensions of the module used in the solution **TECHKO® ModularDC***

The **TECHKO® ModularDC** building technology uses standardised and repeatable elements (modules), by means of which it is possible to create a larger whole with the parameters of the resulting homogeneous building instance matched to the defined project assumptions, expectations and requirements of the client. A single module of the building structure can be up to **110m²** in size, with a maximum gross height of **4.2 metres**.

The **TECHKO® ModularDC** solution, thanks to the use of a steel structure as a load-bearing element, is characterised by half the weight of the same section of the building built using

traditional technology. This feature of our solution significantly increases the range of possible solutions for superstructures or additions to an existing building (Fig.2).



*Fig.2 Examples of superstructure, extension to the main building of the solution **TECHKO® ModularDC***

TECHKO® ModularDC also offers the possibility of founding a new data centre facility space, for example in the inner courtyards of buildings or in the vicinity of a company's main building, with which communication will be provided through a functional link. Such an expansion usually takes place without disrupting the day-to-day operations of the operating facility (main building) and can be a good solution for companies that want to expand, replace or adapt their IT infrastructure to new needs and challenges.

The structure of the **TECHKO® ModularDC** building does not create any design and execution limitations for the technical infrastructure systems used in this type of facilities, such as: power supply systems, ventilation and cooling systems, including more and more widely used solutions of the so-called liquid cooling both in immersion solutions. Immersion Cooling) as well as DLC. Direct Liquid Cooling), as well as fire, security, surveillance and automation systems. This infrastructure is designed and built according to defined customer expectations,

requirements described in **EN50600**, **TIA-942** or recommendations developed by the **Uptime Institute**. Both the design and the subsequent realisation of the project might, upon the Customer's request, be certified.

The **TECHKO® ModularDC** solution is compliant with the provisions of the **PN-EN 1090-2** standard for the **EXC3** construction class. Compliance with the standard is mandatory for all steelwork contractors wishing to place their products on the EU market. Among other things, the standard describes the principles of construction, starting with the selection and purchase of materials, through the execution processes to the quality control of workmanship. Its provisions also refer to the professional qualifications to be fulfilled by persons: carrying out work on the construction, supervision and quality control of the work carried out.

The constructions of all module partitions are certified to fire resistance class **REI120**, which is a prerequisite for the construction of data centre facilities.

The high degree of prefabrication (preparation of the **TECHKO® ModularDC** building and installation of its technical infrastructure in the conditions of the production facility), scalability and independence of the investment implementation from weather conditions are features that significantly reduce investment time. In the case of 'design and build' projects, the prefabrication of the building and its fit-out starts already during the process of obtaining the building permit, which allows the investment process to be significantly shortened, up to 50% (Fig.3).

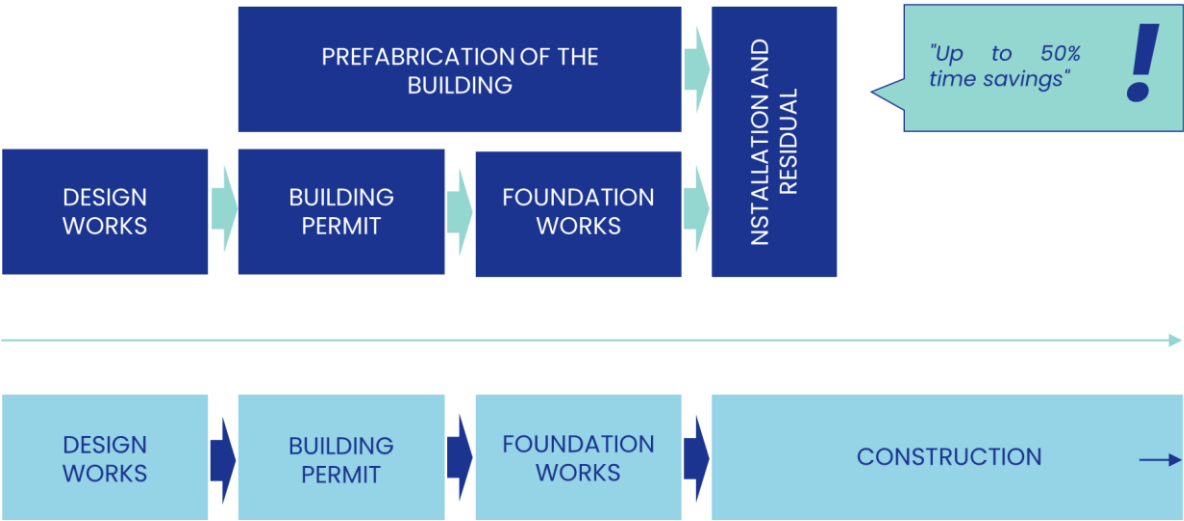


Fig.3 Comparison of investment scenarios for a modular and a traditional solution

This innovative approach to investment implementation allows the client to gain a number of benefits that will have an impact on the efficient and effective implementation of the investment and its subsequent proper operation in accordance with the client's expectations.

To illustrate the possibilities of building modular data centres according to the **TECHKO® ModularDC** principles, we present below a solution made from a single module for 10 800x1200 racks. The module is made entirely in the factory including its external facade. Installation of batteries for the UPS and DC power plant, connection of external power cables, external genset and fibre optic cables are being carried out on site. The solution can be easily extended by a further 10 cabinets by adding a second module (Fig.4). The extension will be made so that, from the outside, the building will appear as a single, coherent whole.

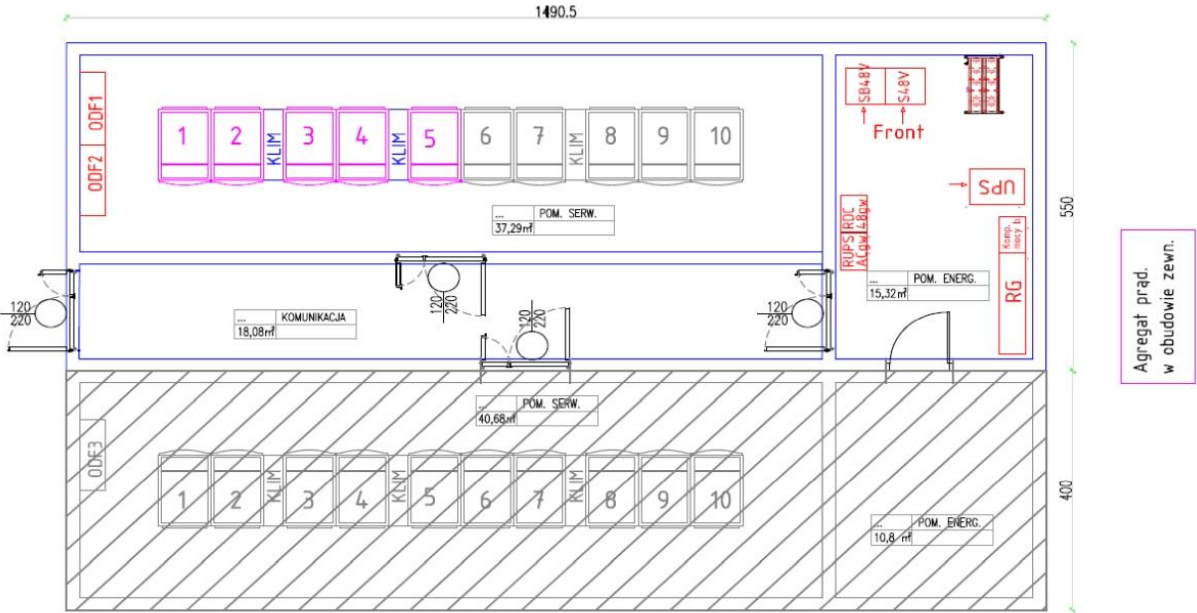


Fig.4 Two-module site version, 10+10 racks, solutions **TECHKO® ModularDC**

The second example (Fig.5) is a ten-module data centre facility (10 modules measuring 4.1 x 16.1 m), consisting of three separate functional zones:

- Administration and office area (1 module) with two workstations, IT storage, external fibre optic cable supply room, sanitary facilities, packaging storage and unpacking area for equipment installed in IT chambers.
- IT room area (7 modules, 4 kiosks for 100 racks 800x1200mm), also containing an airlock, storage area and gas extinguishing system cylinder room.

- Area for power supply equipment (2 modules) with separate entrance and separate rooms for batteries, switchgear, DC power plant and UPS.

The total area of the building is approximately 685 m².

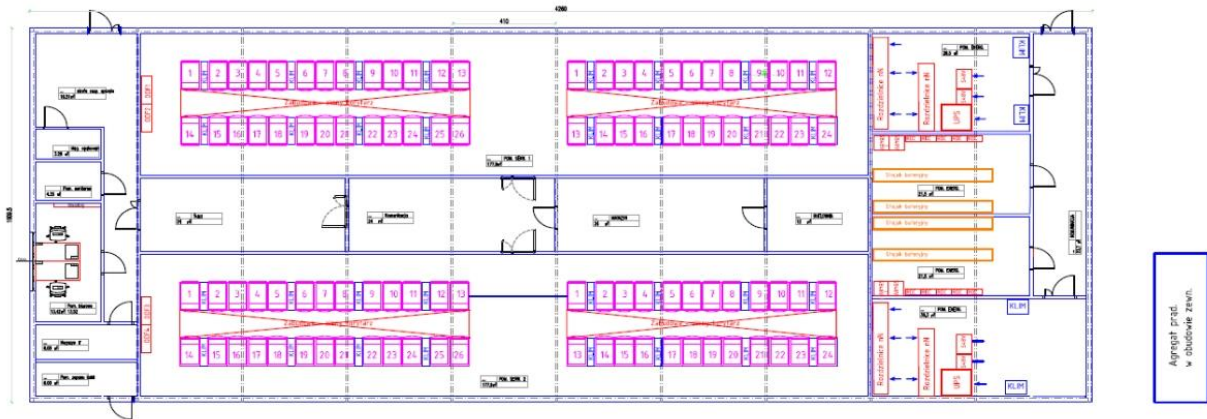


Fig. 5 Ten-module facility for 100 rack solutions **TECHKO® ModularDC**

The attractive appearance of buildings designed in accordance with **TECHKO® ModularDC** principles is also an important element. An outsider, who was not involved in the project and only saw it after its completion, is unable to find features indicative of the building's modular design. The building itself is a single unit and looks like it was built using the traditional method, as best demonstrated in the figure below (Fig.6).



Fig.6 Example of the external appearance of a multi-module object of one of the projects **TECHKO® ModularDC**

To summarise the content presented above, the **TECHKO® ModularDC** solution is characterised by the following features:

- up to 50% shorter investment time compared with traditional technology,
- up to 90% of the scope of work carried out at the production site,
- mobility and scalability of the solution,
- completeness of the solution, optimisation of the work carried out (scope, time, quality),
- price guarantee, no additional costs associated with additional works and design errors,
- guaranteed product quality achieved under controlled factory conditions,
- the extent of traditional construction work limited to the minimum necessary,
- significantly lower investor supervision costs,
- minimal impact of the development on its immediate surroundings (particularly important in highly urbanised locations),
- low energy consumption in the investment process,
- low operating costs of the facility,
- the use of green solutions.

The **TECHKO® ModularDC** solution also fits in with the European Green Deal by:

- reducing the carbon footprint,
- high proportion of recycled materials,
- reducing dust emissions and water consumption,
- closed-loop material management,
- high energy and process efficiency.

Anyone interested in the **TECHKO® ModularDC** solution and willing to learn more about it is welcome to contact us by e-mail (modulardc@techko.eu) or telephone ([+48 22 868 17 35](tel:+48228681735)) to contact **TECHKO®** representatives.