



SMART KINDERGARTEN, A PLACE FOR CHILDREN TO DEVELOPE

Full automated classrooms to yield maximum education and comfort potential

Olum Pezeshki kindergarten is based in Shiraz, Iran and has been a second-home for all children whom parents care for future and well-being. This 2000 square meter well-planned structure provides a diverse range of entertainment and educational events via the aid of purpose-built classrooms, cinema, and playground, which all seamlessly link together via a common internal walkway. The Olum Pezeshki kindergarten is tailored to meet the needs of children, parents, and specifically teachers who are responsible for providing the most effective way to nurture talent.

As the routine procedure of classes and events is closely defined during the day, our priority was to control as many functions as possible through scheduled programs. Therefore, pretty all scenarios will be fulfilled without the need of any operator, which leads to comfort and accuracy, the sole responsibility of this complex. In addition to precise and flexible schedules, there are about 50 presence detectors, that are like supervisors in every place to determine whether the HVAC system and lighting should stay in comfort mode or switch to economy mode smoothly in the event of a longer absence. By the aid of touch panels installed in every classroom, which are equipped with temperature and CO2 sensors, the system can provide a perfect atmosphere by not only controlling lighting, HVAC, and shades, but also, thanks to versatile KNX gateways, the amount of fresh air that AHU is supplying.

Visual and audio effects are essential to bring a dynamic learning course, not to be outdone, a decentralized audio system is implemented in every place to let teachers play their own audio or video clips. Besides this capability, automation provides an exceptional broadcasting system, which is available by pushing just a button to speak to the whole building and reset each class's audio configuration to its latest state after broadcasting. The cinema, which is located in the basement for soundproofing reasons, children are able to watch their favorite cartoon with an intoxicating combination of 3D projector, Dolby Atmos audio and rainbow lighting.

The solution

KNX technology was chosen for its versatility, its ability to adapt to the future, and its ubiquitous integration. This fully-integrated and modernized technology enhances the control of system by providing perfect visualization and different accessibility for individuals who are deemed to have access. The fact that it is possible to select the best technologies from multiple vendors and combine them seamlessly into one native system was seen by business as a major benefit.

Products and technologies

Since KNX protocol is absolutely robust, we decided to use it as the backbone of the system. This huge facility consists of nine baby-proofed distribution panels, which each of them is equipped with suitable actuators and controllers and all connected through well-designed KNX topology. Lighting and curtain control is done by MDT actuators, as well as this MDT 0-10 volts actuator has been used to control VFD of AHU together with Zennio HVAC controllers to bring well-adjusted temperature and fresh air based on demand. The ease of use and friendliness of Zennio touch panels have made us benefit from this prevalent brand in all classrooms in which the operator needs local control such as lighting, HVAC, sound, and sockets. Except for the cinema, which is equipped with Yamaha Dolby Atmosphere speakers and amplifiers, all the facility is filled with 32 EGi speakers. The EGi DOMOS 2 sound system was a rational choice to have a discrete and concentrated broadcasting system at the same time. The whole facility would be controlled by ABB Busch-ComfortTouch with different levels of accessibility and restricted control for manager, security team, teachers, and staff.

The benefits of using KNX

Thanks to the vast number of manufacturers supporting the KNX standard, we opt for this protocol as it offers the flexibility to continuously evolve. In addition, being able to run thousands of meters of control cable alongside power cable, gave KNX a huge advantage and made the wiring job a lot simpler than it would otherwise have been. Reliability of transferred data was also a major concern from the beginning so, by the aid of line couplers and KNX Secure devices, operators were reassured that every event and scenario will be happen without a doubt. Energy management is becoming increasingly important in today's world, as we strive to reduce our carbon footprint and become more sustainable. One way to achieve this is through the use of KNX protocol. When all the primary functions of this kindergarten are under control and connected to a united system, energy management would be much easier in comparison with conventional control. We hope that we have been able to take a step forward toward informing people about the benefits of automation and smart home systems.