10-PORT ETHERNET SWITCH & MOBILE ROUTER FOR BMS SYSTEM

HIGHLIGHTS

- Skopos is a Serbian automation solutions provider and system integrator, providing ingenuity in building automation, energy savings, and sustainable solutions.
- For its BMS system encompassing a 17,000 sqm multifunctional facility, Skopos deployed a fleet of Teltonika's RUT200 4G routers and TSW210 10-port Ethernet switches. These connect to a host of end equipment to establish a single, interconnected network communicating via the Modbus RTU, Modbus TCP, BACnet, and OPC UA protocols, while RSTP is used for redundancy.
- Using the Connect and VPN suites of Teltonika's RMS remote management tool, remote device access to the BMS system is enabled and routine operations such as firmware updates and alarm monitoring can be done fully remotely, thereby cutting operational costs.

THE CHALLENGE – EFFICIENT, INTERCONNECTED BMS SYSTEM

Currently being built in the city of Belgrade, Serbia is the Early Childhood Development and Inclusion Centre (CRRDI)—a 17,000 sqm multifunctional facility for children with mental development challenges and special needs. In addition to spaces for diagnostics and therapy, this centre also contains training centres, physiotherapy rooms, a swimming pool, mini zoo, and riding area. These offer comprehensive support and resources for the progress of children.

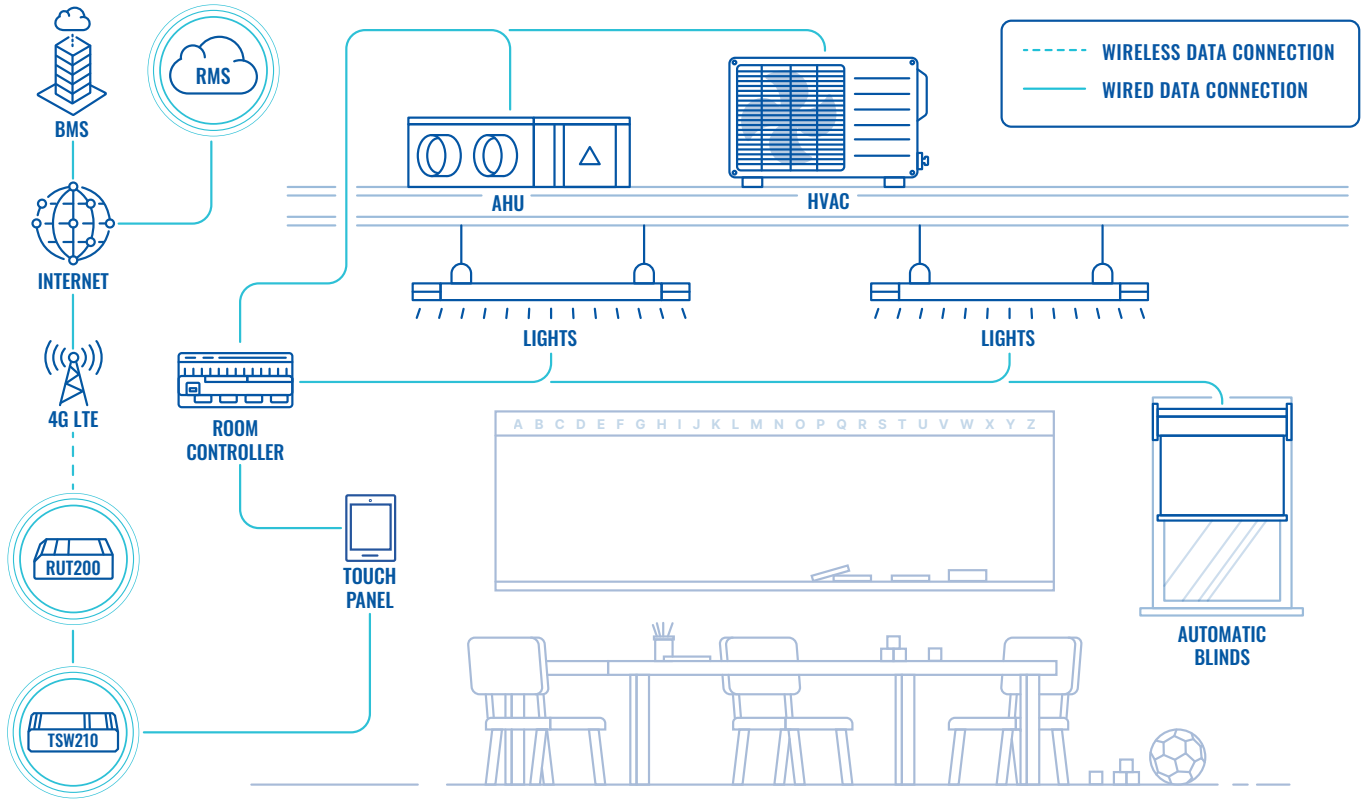
The scale of this hospital necessitates an equally robust building management system (BMS). These are control systems used for remote monitoring and management of mechanical and electrical systems and services within a facility. Said systems include HVAC, lighting, window blinds, energy consumption, among many others.

Naturally, this BMS system is high in complexity and, consequently, number of end devices. In total, it comprises 22,800 separate tags, all of which must be interconnected within a single network where data can flow seamlessly and efficiently. In addition, remote access to this system is vital, as manual operations at this scale are simply not feasible.

Tasked with creating this BMS system is our partner, Skopos. As the interconnectivity of equipment is the foundation upon which its BMS system is built upon, the choice of mobile router and Ethernet switch that enable this connectivity was crucial.

As such, it chose Teltonika.

TOPOLOGY



THE SOLUTION – MOBILE ROUTER & 10-PORT ETHERNET SWITCH

Skopos chose to deploy a fleet of Teltonika's RUT200 mobile routers and TSW210 Ethernet switches for its CRRDI BMS system. The 4G router is the source of LTE Cat 4 cellular connectivity, while the unmanaged switch ensures optimal distribution of connectivity to the myriad end devices.

The RUT200 is connected to the TSW210 via its LAN port. The TSW210 is a 10-port switch, having eight Gigabit RJ45 Gigabit Ethernet ports and two SFP ports. The switch is connected to the RUT200 via one of the router's RJ45 connectors. Meanwhile, the switch's remaining nine ports are used to connect to up to 20 end devices, such as PLCs, touch panels, and other Ethernet-capable equipment, using a daisy chain wiring scheme.

In total, 10 daisy chain loops are installed throughout the facility. Using this setup, Skopos both maintains remote monitoring and management of the equipment and is able to utilise the Rapid Spanning Tree Protocol (RSTP) for BMS system redundancy.

This IoT solution comprises a total of 68 controllers connected to the TSW210 network switches: 46 for room control, such as the aforementioned HVAC, lights, and blinds, and 22 for lighting in open areas and data integration. The controllers and panels communicate via the BACnet and OPC UA protocols, while power and energy consumption operations communicate via the Modbus TCP and Modbus RTU protocols.

In addition, the solution uses a total of 117 connected touch panels. 115 of them are used as operator panels for the room control, while the remaining two are used for AHU units and thermal substation.

The TSW210 is a plug-and-play 10-port network switch with an integrated DIN rail bracket and supported wall and flat mounting options. With a compact size of 132 x 44.2 x 95.1 mm, this Ethernet switch is quick and easy to deploy to scale.

Meanwhile, the RUT200 mobile router features WAN failover, which automatically switches to an available backup connection in case of any network interruption. This helps maintain seamless interconnectivity and remote monitoring and management capabilities at all times.

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This IoT solution also relies on Teltonika's Remote Management System (RMS) and its Connect suite for remote access of devices. Using this remote management tool, Skopos is able to use the 4G router and Ethernet switch to remotely access the BMS system.

Moreover, the VPN suite of this remote device management system allows our partner to perform routine tasks such as firmware updating and alarm monitoring—fully remotely. As a result, RMS pulls significant weight in cutting operational costs and enhancing the efficiency of this IoT solution.

Thanks to the RUT200 4G router and TSW210 10-port Ethernet switch, Skopos have created a well-interconnected BMS system capable of remote access of end devices.