

# Enable Sustainable Enterprises of the Future

## with Ethernet Connected Building Controllers

Making buildings more sustainable is fundamental to reducing global energy consumption and associated carbon emissions. Many new buildings are being outfitted with technologies to remotely control HVAC systems, sense room occupancy, autonomously control lighting, and monitor environmental conditions, making these buildings more sustainable while also making them safer and more comfortable for their inhabitants. Analog Devices' industry leading measurement, connectivity, and processing technologies are helping make intelligent buildings a reality. ADI's technology is purpose-built to make both new and existing buildings more sustainable and healthier, allowing retrofitting of buildings to re-use the twisted pair cable infrastructure and connect modern systems over single-pair Ethernet.









BUILDING CONTROLLER



## Architecting Building Automation Networks for Sustainable Enterprises

#### Seamless Ethernet Connectivity

A typical building has several controllers and many disparate nodes making up the building automation system. To enable connectivity to all of these devices, Ethernet can be used in different configurations over distances of up to 1 km. Analog Devices offers a portfolio of products to bring Ethernet connectivity to all levels of a building automation network. PHYs (**ADIN1100**), MAC-PHYs (**ADIN1110**), and low-complexity switches (**ADIN2111**) compatible with the IEEE 802.3cg 10BASE-T1L standard are available to bring Ethernet to room controllers and edge nodes in point-to-point, ring, and line network configurations. The **ADIN2111** two port low complexity switch reduces the burden on the room controller's microcontroller, making upgrades from legacy systems easier.

ADIN1100 10BASE-T1L Ethernet PHY ADIN1110 10BASE-T1L Ethernet MAC-PHY ADIN2111 10BASE-T1L 2 Port Ethernet Switch ADIN1200 10/100 Mbps Ethernet PHY ADIN1300 10/100/1000 Mbps Ethernet PHY

MAXQ1065

ROOM

CONTROLLER

TC4296-



### Flexibity at the Edge

Despite the limitations of RS-485, analog I/O, and other legacy communication systems, they have their benefits and will remain in new and existing buildings for many years to come. ADI products enable a staged upgrade path for legacy systems. Continued investments in RS-485, such as the **ADM2587E** provide isolated data and power on a single IC. Software I/O (SWIO) products such as **AD74412R** bring a new level of flexibility and space savings to either legacy or Ethernet based systems. Any port of the **AD74412R** can be programmed as an analog input or output or digital input.

When retrofitting a building to upgrade the communications system from RS-485 to Ethernet, the 10BASE-T1L products highlighted in Figure 1 can be used with the building's existing twisted pair cabling infrastructure, reducing waste and installation time. When bringing Ethernet to the edge, the **ADIN2111** and **ADIN1100** can be used together to connect nodes over single twisted pair cable. ADI's security products like **MAXQ1065** deliver root-of-trust solutions addressing today's cyber security threats with end-to-end turnkey security.



Figure 1: Staged transition from legacy systems to fully digital edge nodes

## Powering Intelligent Buildings

Intelligent buildings rely on a foundation of power. Efficiently managing the available power at the edge and reducing reliance on battery operated devices is key. ADI's **LTC4296-1** Single-pair Power over Ethernet (SPoE) Power Sourcing Equipment (PSE) and **LTC9111** Power Device (PD) solutions help drive greater levels of intelligence into smart buildings. While ideally suited for new installations where power lines don't exist, SPoE allows transmission of up to 52 W of power plus data over single twisted pair Ethernet cables, providing efficient, reliable, and easily installed power. Check out ADI's SPoE evaluation kit (**EVAL-SPoE-KIT-AZ**) to rapidly prototype your SPoE design today.



- 5 independent PSE ports
- ► Transmits up to 52 W over single-pair cabling



10BASE-T1L Media Converter Plug & Play Available on Arrow.com: 10BASE-T1L-MC

