



Old Orchard Passivhaus: Intelligent control for a high-performance retrofit

Set within a quiet Oxfordshire village on the edge of the Cotswolds, Old Orchard is a carefully reimagined bungalow, transformed into a high-performance Passivhaus family home, delivered in line with EnerPHit retrofit standards.

Completed in 2025, the project brings together thoughtful architecture, intelligent building control and a collaborative network of professionals across the KNX ecosystem. AVINU were appointed to design and deliver the home's integrated technology strategy, ensuring that lighting, shading, ventilation and environmental systems work together to protect the building's exceptional energy performance, while enhancing everyday living.



Reimagining a Bungalow as a Passivhaus Home

In 2024, AVINU were appointed by the architect homeowners, Tom and Phoebe Gresford of Gresford Architects, themselves recognised specialists in Passivhaus and low-energy design. The brief was to conceive and deliver the complete intelligent building strategy for their own private residence.

From the outset, the ambition for Old Orchard was clear: demonstrate that high-performance sustainable design could be achieved through sensitive retrofit rather than demolition, while still delivering a comfortable and intuitive family home.

Rather than rebuilding entirely, the original bungalow was retained, upgraded and extended with a timber-framed first floor, making best use of the existing structure while significantly improving operational energy performance and long-term efficiency.

Large glazed openings maximise daylight and carefully controlled solar gain. Continuous insulation, airtight detailing and triple-glazed windows establish the fabric performance required for Passivhaus. Mechanical ventilation with heat recovery (MVHR) provides a constant supply of fresh air while retaining heat within the building.

Together, these elements create a stable internal environment where heating demand is dramatically reduced. However, a high-performance fabric alone does not guarantee comfort in daily life. A Passivhaus building depends on careful balance. Solar gain must be harnessed without allowing overheating. Ventilation must remain consistent. Lighting, shading and environmental systems must work together rather than independently.

Maintaining that balance in everyday living is where intelligent building control becomes essential.



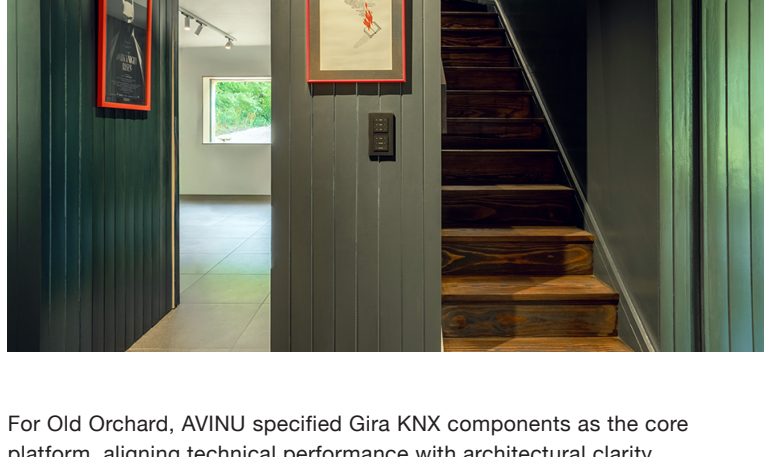
Designing the Intelligence Behind the Building

Working collaboratively from inception to completion, AVINU designed, engineered and commissioned a fully integrated technology ecosystem incorporating lighting control, solar gain management, audio-visual systems, structured data infrastructure, access control and security. Everything coordinated through a KNX building management platform.

KNX plays a unique role within high-performance buildings. While Passivhaus dramatically reduces energy demand at the fabric level, KNX ensures that energy performance is optimised in daily use.

Small behavioural inefficiencies, such as unmanaged blinds, unnecessary lighting or poorly coordinated ventilation, can destabilise even the best building envelope.

By connecting lighting, shading, ventilation, heating, audio-visual systems and security into a single coordinated control architecture, KNX allows each system to respond intelligently as part of one integrated strategy. Rather than operating as isolated technologies, the home functions as a unified environment.



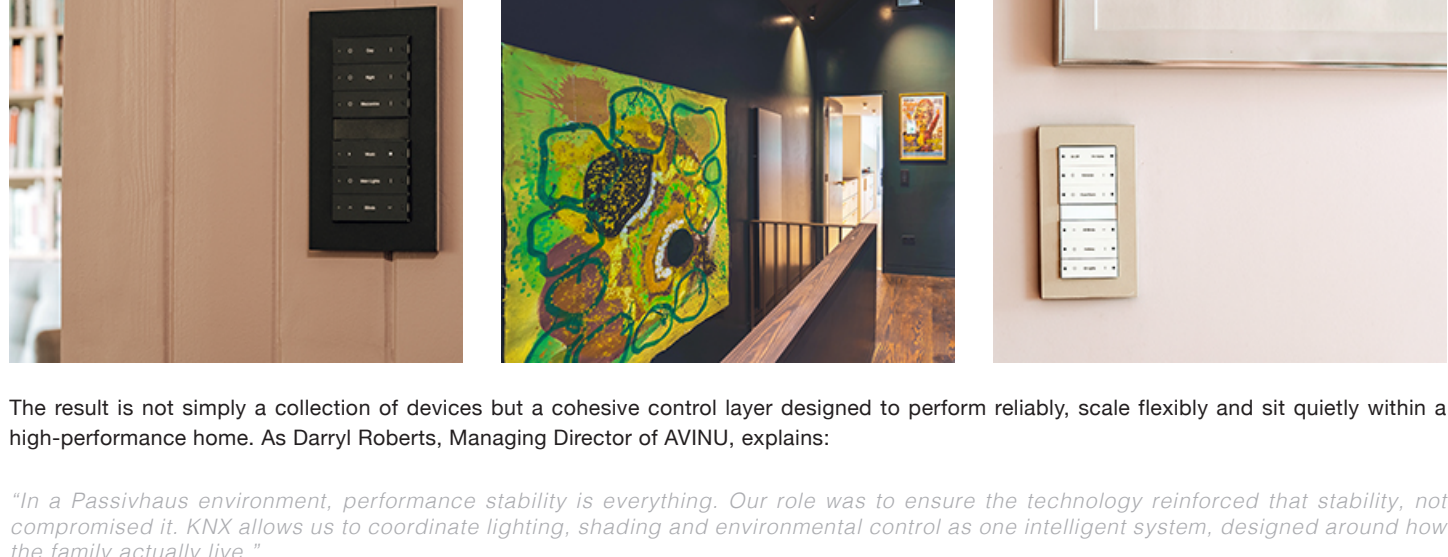
For Old Orchard, AVINU specified Gira KNX components as the core platform, aligning technical performance with architectural clarity.

Early engagement with the Gira UK team ensured that product selection, finishes and functionality supported both the performance ambitions of the home and the refined interior aesthetic.

The system centres around the Gira X1 controller, providing intuitive visualisation, automation logic and scene management through a simple easy to use app interface.

A KNX Gira S1 module enables secure remote access, and ongoing support, ensuring the system can be maintained and adapted long into the future.

At field level, Gira DALI lighting actuators deliver precise dimming across the home, while occupancy sensors automate lighting and environmental responses. Wall-mounted Gira Pushbutton Sensor 3 interfaces consolidate lighting, shading and scene control within a single elegant control point. All available in finishes that complement the home's interior architecture.



The result is not simply a collection of devices but a cohesive control layer designed to perform reliably, scale flexibly and sit quietly within a high-performance home. As Darryl Roberts, Managing Director of AVINU, explains:

"In a Passivhaus environment, performance stability is everything. Our role was to ensure the technology reinforced that stability, not compromised it. KNX allows us to coordinate lighting, shading and environmental control as one intelligent system, designed around how the family actually live."

Environmental Coordination in Daily Life

Solar gain is one of the most important aspects of Passivhaus performance. During colder months it contributes to heating the home naturally, but during summer it must be carefully controlled to prevent overheating.

At Old Orchard, Velux roof windows and automated blinds are integrated directly into the KNX backbone. Internal and external shading responds intelligently to sunlight conditions and occupancy patterns, protecting comfort while maintaining the building's energy balance.

Ventilation strategies remain aligned with the MVHR system, ensuring the airtight and highly insulated envelope continues to perform as intended throughout the seasons.

The technology operates largely in the background. For the homeowners, interaction with the system remains simple and intuitive.

Lighting throughout the home was programmed by AVINU using DALI control, with motion detection incorporated in selected areas to prevent unnecessary energy use. Custom scenes - Morning, Evening, All Off, All Lights and All Blinds - were developed around the family's routines. Throughout the design, the homeowners were clear that should never feel technical but support the way they live.

Entertaining and play an important role in family life at Old Orchard, and the intelligent infrastructure was designed to enhance those moments without adding complexity.

At Tom's request, AVINU created a dedicated Breakfast scene for the kitchen and dining area. At the press of a single button, or via the home control app, the lighting adjusts to the family's preferred morning levels while his chosen radio station begins playing automatically. The space transitions instantly into its daytime setting; considered light, curated sound and a calm start to the day.

Additional room scenes for hosting allow lighting, shading and multi-room audio to respond cohesively during gatherings, creating atmosphere while maintaining the home's underlying comfort and energy performance.



For Gira UK, projects like Old Orchard demonstrate how intelligent systems can reinforce sustainable design:

"It's been fantastic to see Gira technology play such a central role in The Old Orchard. Projects like this really highlight how smart building systems can do more than provide convenience — they actively support sustainable, Passivhaus design. Watching lighting, blinds, ventilation, and energy management work seamlessly together to enhance comfort and efficiency shows exactly how technology can complement high-performance architecture."

A Collaborative Ecosystem

Delivering a robust KNX installation requires more than technology alone. It depends on strong collaboration between integrators, manufacturers and specialist suppliers.

Behind the scenes, AVINU worked closely with MyKNX to coordinate equipment specification, logistics and technical support throughout the build. Within the UK KNX community, this type of collaboration plays a crucial role in successful project delivery.

For Paul Kinghorn, General Manager of MyKNX, the project highlights the value of close collaboration between technology partners:

"Old Orchard is a strong example of how collaboration between integrator and supplier strengthens project delivery. By working closely with AVINU from specification through to supply and commissioning support, we were able to ensure the KNX system was technically robust, correctly configured and aligned to the client's long-term requirements."

Careful product selection and coordinated logistics meant the project progressed smoothly, with confidence at every stage. The result is a future-proof installation built on solid foundations from the outset.

This collaborative approach reflects the broader ethos of the KNX community itself. As Tracy Palazzo-Barnes, President of KNX UK, observes:

"As the UK representative body for the KNX open standard, my role at KNX UK is to support and promote a strong, collaborative community of manufacturers, distributors and integrators who share a commitment to quality and technical excellence."

KNX is built on interoperability and long-term reliability, and it's always encouraging to see members working together to deliver projects that truly reflect those values."

Old Orchard stands as an example of how that ecosystem can function when each partner contributes their expertise.

A Home That Demonstrates What's Possible

Old Orchard reached completion in late 2025, marking the culmination of a carefully considered architectural and technological collaboration. The result is a high-performance Passivhaus family home that balances sustainability, comfort and intuitive control. For the homeowners, the intelligent infrastructure works quietly in the background, enhancing everyday living while protecting the building's exceptional energy performance.

For the homeowners, Tom and Phoebe Gresford, the project represents both a family home and a practical demonstration of the principles they champion in their profession. Reflecting on their experience working with AVINU, Tom Gresford notes:

"We have been working with Darryl and Mike at AVINU on a number of projects over the past couple of years, including my own home. Their expertise is exceptional, and their solutions are sustainable and user friendly, whilst the implementation is well considered and their site teams are also knowledgeable and professional. I have no hesitation in recommending AVINU for any Building Management, lighting control or Audio Visual installation."



As architects specialising in low-energy design, Tom and Phoebe Gresford now reference Old Orchard as a living example of what thoughtful integration can achieve.

The architecture reduces demand.

The intelligent infrastructure protects that performance.

Together they create a home that is not only sustainable, but calm, comfortable and deeply enjoyable to live in.

About AVINU

AVINU is an award-winning smart home design and integration consultancy based in Berkshire, serving London, Oxford and the South East. With over 16 years of experience, AVINU specialises in KNX building management systems, intelligent lighting design, HVAC coordination, energy management and whole-home integration for high-performance residential projects.

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About MyKNX

MyKNX is a specialist UK distributor of KNX building automation products, supporting system integrators with product specification, technical guidance and reliable supply logistics. Working closely with manufacturers and accredited integrators, MyKNX helps ensure that KNX systems are correctly specified, robustly delivered and supported throughout their lifecycle.

Through technical collaboration and responsive support, MyKNX plays an important role within the UK KNX community, enabling high-performance projects such as Old Orchard to be delivered with confidence and continuity.

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