

HOME TECHNOLOGY



AVD Australia's

"THE ENERGY-EFFICIENT RESIDENCE"



Home Installation

AVD Australia's "The Energy-Efficient Residence"

Winner of the Australia AMX Best Projects Award 2009



The motorised glass roof that helps control the temperature within the house.

THE SCOPE

To ensure that all the electronic architecture and components are:

- Totally hidden within the five-storey structure
- Simple to operate
- To automatically control the climate of the residence by:
 - Opening and closing of the louvres and motorised roof
 - The control of air-conditioning systems and floor heating to maintain a constant ambient air temperature throughout the home
 - Pumping of hot air from the top of the building to the bottom
- Ensure maximum re-use of water
- Minimise power consumption

To be able to achieve the above in an automated or manual way (attended or unattended)

THE CHALLENGE

To achieve this, the client engaged the services of AVD Australia to undertake the entire home automation system. AVD brought to the project 20 year's experience in Advanced Home

Automation and immediately employed their tried and true philosophy of systems engineering to achieve the result within time and within budget.

THE RESPONSIBILITIES

To enable the design, integration and implementation of a fully functioning Home Automation System AVD undertook the following:

- Scope of Works Development
- Systems and Infrastructure Engineering & Design
- Documentation including Australia Plans and Schedules of
 - Electrical Systems
 - Electronic Systems
 - Lighting Schedules
 - Cabling Schedules
 - Switching Schedules
- Infrastructure Project Management
- Product Selection
- Installation & Project Management of Systems
- Control System Development, Programming and Testing
- Final Commissioning and Handover

THE SOLUTION

To bring together a five-storey stand alone converted warehouse with such an advanced level of electronic integration required a control system that was capable of communicating seamlessly and reliably with each of the stand alone systems. The AMX systems were selected to communicate with all the electrical and electronic systems within the residence, thus allowing AVD to control the environment. For example:

- With AVD's unique Daikin D-Bacs Gateway, AMX is able to communicate directly to the Daikin VRV system and its 30 conditioned zones thus allowing the client to manually or automatically vary the temperature to each of the areas or the entire home. As such when they see that the temperature in an area is too high they can open the motorised louvres or if it is very hot they can open the 4m x 4m motorised glass roof to evacuate the air from the entire five-storey home.
- On a cold day in the middle of winter they do the opposite by taking the hot air at the top of the building and venting it through 50mm pipes to the different areas of the house, depending on the temperature of that area.
- Temperature sensors located at the top of the roof gauge the temperature within the residence and can automatically open or close windows and turn down the air conditioning should it be on.

- Water catchment to the house is stored in total, in a 10,000 litre storm water detention tank and pumped to the different garden levels, including the roof garden. Water storage capacity is monitored via the touch screen systems, as is the watering of the gardens located in the central atrium, ensuite and roof terrace.
- A black water treatment plant has been allowed for, but at this stage has not been built.
- Lighting levels and therefore power consumption is monitored with light outputs varied according to the amount of ambient light available. This function can be overridden as required.

The AMX product allowed AVD to develop a custom Graphical User Interface (GUI) to meet the exacting design and functionality criteria. This was critical in order to achieve easy operation of the house.

At any one of the four 15" Modero Touch screens, the owner is able to control every aspect of this home, from the initial control of the base and global functions through to drilling down to the finest detail of each system.

To achieve complete functionality the AMX system consists of 139 custom designed GUI screens. However, only about 12 of these are needed to be used on a daily basis to achieve the majority of daily functions.



The Central Distribution Point.

THE AUDIO & VIDEO

AMX integrates with Philips Pronto remote control through AVD's unique Pronto module to operate all audio, video and local functions to each area. Axonics media server provided media to both the music areas and audio visual areas.

THE UNUSUAL

Unique to this residence is a cellar cut out of the natural sandstone bedrock located under the footpath of the street above. This natural grotto is perfect for storing wine as it requires no artificial ventilation or cooling to maintain temperatures as the rock face is always damp. Excess water is collected in a well and pumped out into the water collection tanks and used to water the gardens. Low temperature lighting has also been added so as not to increase the humidity in the room.

THE CONSTRUCTION PROCESS

What started as an old warehouse, ended up as a five-storey luxury residence with 900 square metres of living space. During the initial design phase it was realised that construction of this five storey unique environment would prove to be very difficult as the entire demolition of existing and construction of new works would need to occur within the confines of the structure itself as the residence was constrained by common walls to neighbours each side, a very narrow lane to the rear and a busy street with very restricted access to the front. It had also been given a Heritage title; therefore the facade and remaining three walls had to remain in tact.

This posed a logistical nightmare for the Architect, Builder, Engineers and trades people alike as working in this environment, let alone taking delivery of and installing anything from concrete and steel work to electrical services and finishes trades, proved to be very demanding.

AVD'S VERDICT

"We at AVD are constantly pushing the envelope and we approach each new project as if it is our very first – we look at it with fresh eyes so that we can devise integration solutions that best suit the client's needs as well as the residence's needs and aesthetics. For us no two homes are ever the same, the only consistency is the way we approach our projects using our highly successful seven-step methodology as outlined in our White Paper, The Architect's Guide to Home

Automation. By carefully following these strategies we are able to come in on time and on budget, every time." said Sandy Howard, Managing Director AVD.

He added, "We are very proud of our energy-efficient residence. It's the way of the future".

THE CLIENT'S VERDICT

"The way in which we are able to maintain a constant level of air temperature throughout the house with electronic and motorised devices, means we hardly ever have the need for our ducted air-conditioning system. Remarkably, due to the intricate way AVD has designed the advanced level of integration of all the products, this all happens with very little input from us. A truly energy-efficient home!" Client's name withheld).



The entrance to the sandstone cellar



Bathroom featuring AMX touchscreen and green wall.

THE SYSTEM COMPONENTS

Timing

- Documentation Period: 12 months
- Construction Period: 18 months
- Fit-Off: 3 months

Electrical

- 1 dedicated distribution room
- 250 Amp 3 Phase power supply
- 50 kVA 3 Phase Uninterrupted Power Supply
- Surge protection

Infrastructure

- Main & Sub mains cabling: 204 meters
- Lighting cable: 1813 meters
- Power cable: 1243 meters
- Security cable: 2456 meters
- Cat 5e cable: 2257 meters
- Cat 6 cable: 2021 meters
- RG-6 Co Axial cable: 2416 meters
- Conduit: 806 meters
- Cable tray: 398 meters
- Cable ties: 3,864
- Power points: 139

Security

- Tecom Challenger Version 9
- 11 areas
- 54 Plus Inputs
- Extensive CCTV System

Lighting

- Dynalite lighting system
- 469 light fittings
- 85 individual areas
- 2 networks
- 37 custom switch plates
- 106 dimmer channels
- 77 relay channels
- 9 base areas
- 264 programmed lighting scenes

Data Network

- 4 Netgear 24 port switches
- 29 cabled points
- Extensive WAN
- ADSL2+

Communications

- Panasonic TDA 200 Digital Hybrid Phone System
- 12 digital 6-line LCD handsets
- DECT Cordless Solution with 5 base stations
- 2 custom front door stations

Motorised Devices

- 4 blinds
- 2 sets of ventricle louvres
- 1 glass roof
- 3 doors
- 1 Gate
- 25 Zones Floor Heating

- 11 Exhaust Fans
- 1 Gate

HVAC

- Daikin VRV System
- 30 Zones
- AVD Daikin DBACS Gateway Interface to AMX Touch Screens
 - Current Room Temperature
 - Room Set Temperature
 - AC On/Off
 - Mode Heat/Cool - (Has to be operating in Master Mode)
 - Fan Status High/Low

MATV/CATV

- 9 Ikusi 7MHz Stereo Modulators
- 3 Foxtel Digital Inc IQ Boxes
- 6 Distributed DigitalView HDTV STU's
- 9 TV Points

Audio Visual

- 11 Zones of distributed audio
- 3 Axiom Pre-Power Amps
- 2 Home Theatre areas
- 1 x Axonics Media Server
- 8 Sonance 625T Speakers
- 14 Sonance Virtuoso Speakers
- 5 Sonance Cinema 2 Speakers
- 2 Sonance Cinema 2 Subwoofers
- 2 x Integra 8.8 Integrated Surround Amp Receiver
- 3 x 42 inch Pioneer Plasma Screens
- 1 x 50 inch Pioneer Plasma Screen
- 1 x Ultra Lift Plasma Vertical Lifter
- 4 Philips Pronto Remote Controls

Control Systems

- 4 AMX 15" Modero Touch Screens
- 3 AMX NI-700's
- 1 AMX NI-3000
- 2 Multinet 4 port RS-232 to TCP-IP
- 1 x 3GHz Server – Remote Access and Remote monitoring
- 2 AV AutoPatch Matrix Switchers
- 139 Custom Screens for the Graphical User Interface
- 724 Custom Buttons
- RS-232/485
- TCP-IP
- IR/RF to RS-232

AVD Australia
<http://www.avd.com.au>

Project Connection Australia
<http://www.project-connection.com.au>

AVD Solutions
<http://www.avd.com.au/solutions>

AVD Australia's White Paper, The Architect's Guide to Home Automation
<http://www.avd.com.au/registration.html>