Home Automation

BY CHRIS HAYES

Brief History

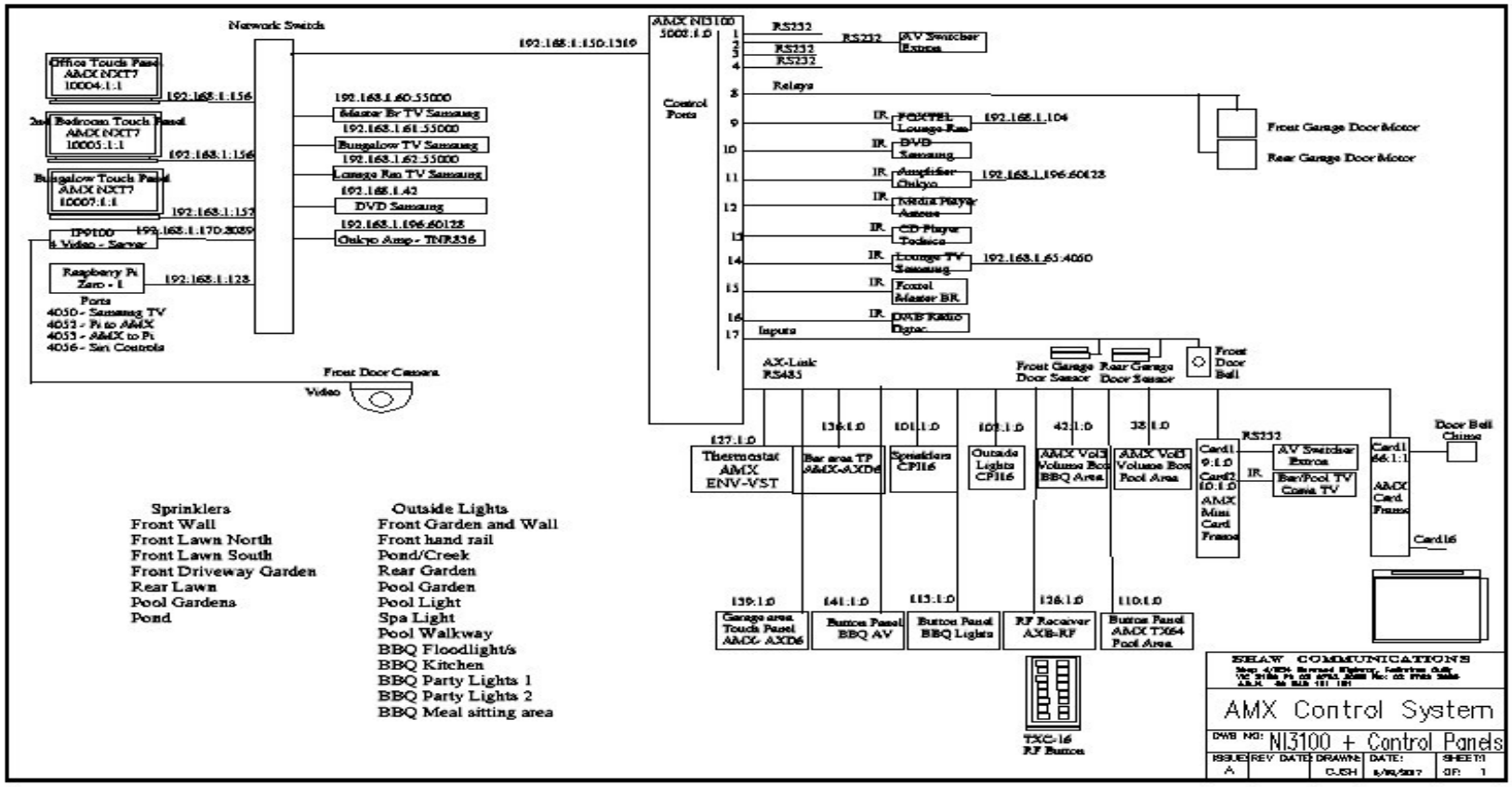
- Former RAAF: 1977 -1986 - Radio
- ATN Channel Seven: 1986 – 1990 Live outside broadcast, Racecam, RF Communications including Satellite systems, China, Europe*2, Russia
- Sharp Corporation – 1990 -1995 - Video engineer – Japan factories teaching electronics across Australia.
- Electronic companies – Engineer design large systems – Casino's, International Stadiums ie China, also RSL's, Panthers Leagues Club, Woolworths Head Office Sydney.
- Won a Design award for MOOT Court at Canberra Uni.

Why automate?

- forget to turn things on or off
- garden expensive – needs watering
- to many remote controls in lounge room
- house large – cannot hear door bell (eg. whilst in Bungalow or pool)
- add value to your home

Lounge Room Remotes

System Design



Master Controller

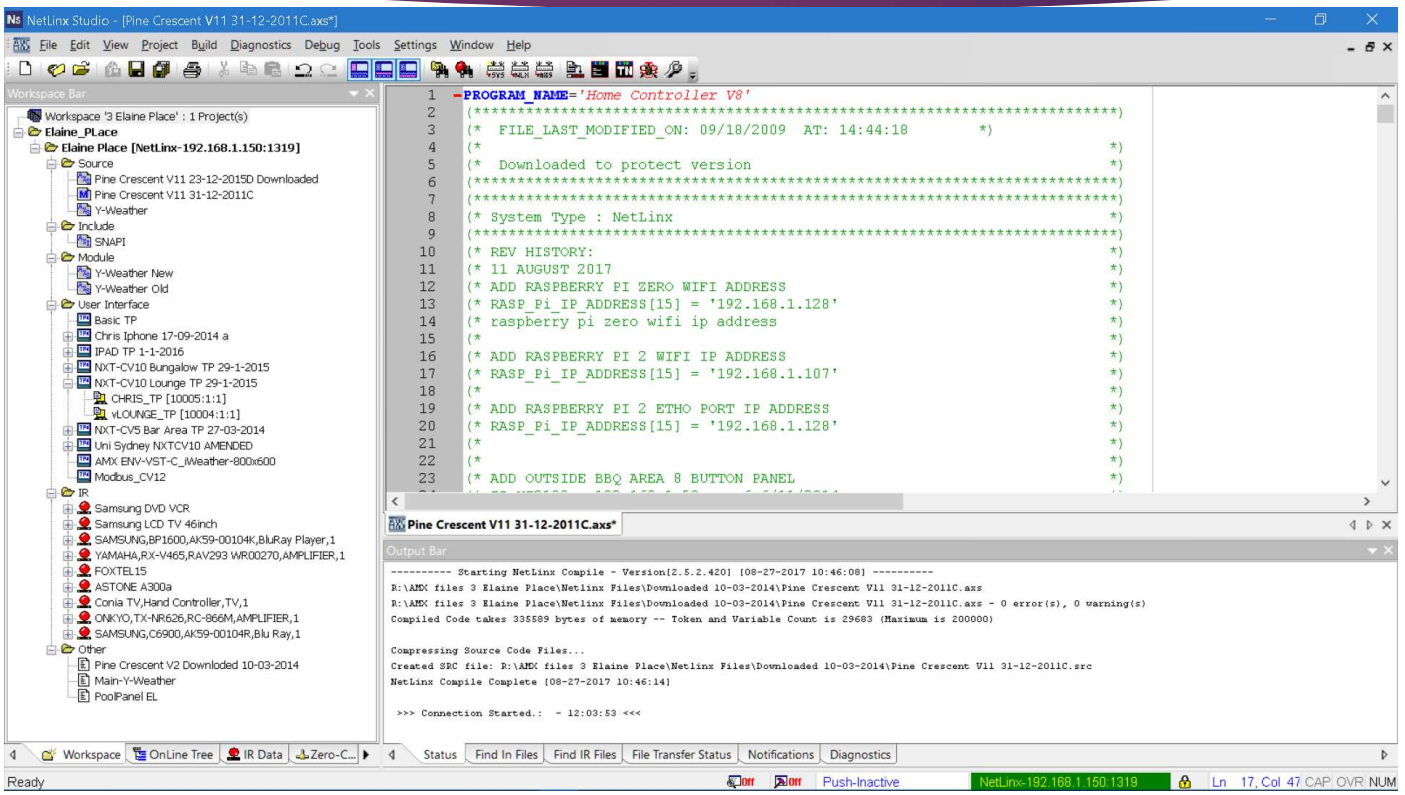
- AMX (from the US – 30 years) – NI3100

  Purchase from ebay around $100

  Requires Netlink Software from AMX

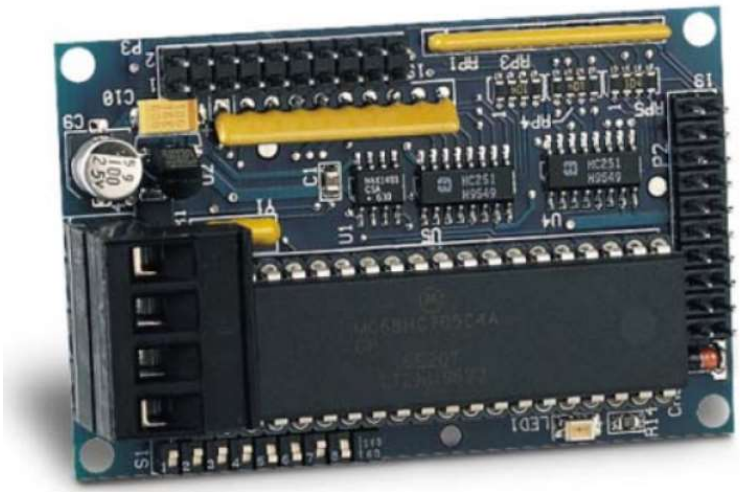
Rhythm Active
THE NOISE DIVISION

Netlink Software



Sub Systems

- Sprinklers – CPI-16(AMX device via Axlink RS485) switches 12vdc relays which switch Water flow solenoids (Bunnings) on or off to allow flow of water.



Connecting the Two 20-pin Headers

The following chart notes the pinouts of the two 20-pin headers for P2 and P3.

AXP-CPI16 P2/P3 Pinouts							
P2				**P3**			
Pin	**Function**	**Pin**	**Function**	**Pin**	**Function**	**Pin**	**Function**
1	Output 1	11	GND	1	Output 9	11	GND
2	Output 2	12	GND	2	Output 10	12	GND
3	Output 3	13	Input 1	3	Output 11	13	Input 9
4	Output 4	14	Input 2	4	Output 12	14	Input 10
5	Output 5	15	Input 3	5	Output 13	15	Input 11
6	Output 6	16	Input 4	6	Output 14	16	Input 12
7	Output 7	17	Input 5	7	Output 15	17	Input 13
8	Output 8	18	Input 6	8	Output 16	18	Input 14
9	GND	19	Input 7	9	GND	19	Input 15
10	PWR	20	Input 8	10	PWR	20	Input 16

Pin 10 provides +12 VDC power from AXlink bus. Add 1K series resistors when using AXP-CPI16 with LED indicators receiving 12 VDC power from Pin 10.

AMX Touch Panels

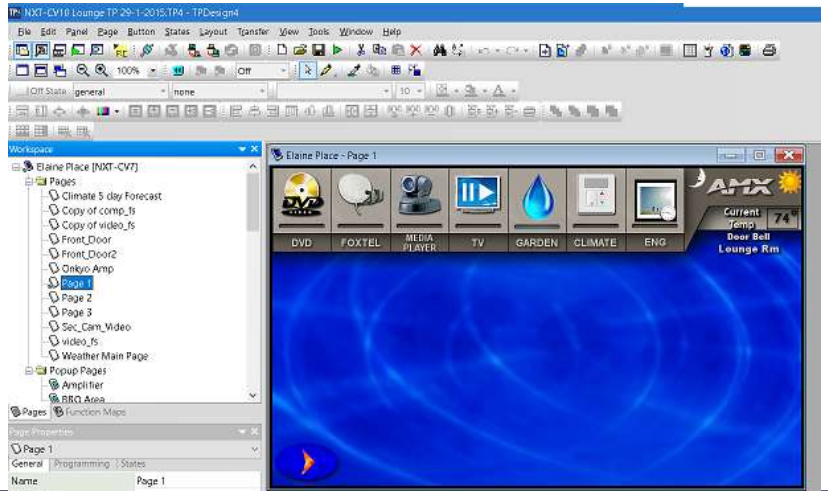
- AMX Touch Panels –
  - Play mp3 files (advise remote location)

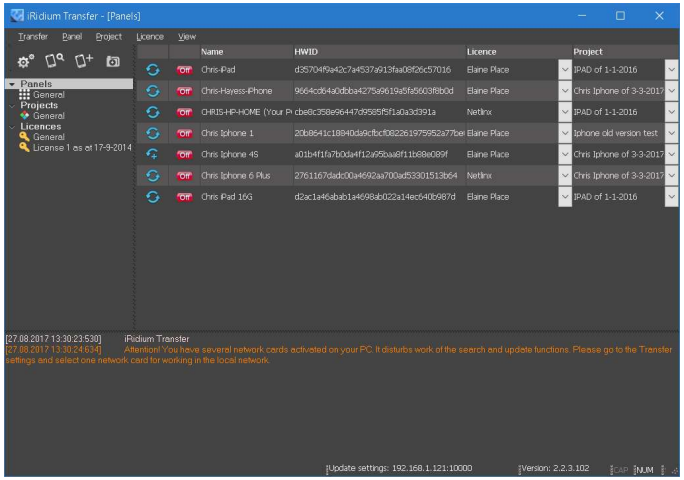
AXD-CV6 (6")

NXT-CV10

Other Touch Panels

- iPhones
- iPads
- All pages deigned in Touch Panel Design4 and uploaded via Iridium service onto apple or android devices.





Button Panels

- AMX Button Panels,
  - AXD-TX64(64 button panel)
  - TXC16 (16 button RF device)
  - Jaycar – RF 4 button remotes (Poolside)

AV Switcher

- Extron MAV1616 – analogue
  16 inputs to 16 outputs
  RS232 via AMX serial

Outside Controls

- Outside Control Board
- Switches relays
  Lights, Spa, Pool functions
- Receives inputs
  Light Sensor
  Rain Sensor
  RF Button inputs

Garage Doors

- Control Garage doors (front and back)
- Open and shut doors plus auto shut doors if still open after midnight
- Door sensors $12 off ebay
- Relays close contact on low voltage connection inside garage door motor

Lights

- After 4pm auto lights control become available
- When light sensor determines now night time (dusk) switches a sequence of lights (timed for load sharing)
- At 10:30pm lights turn off. Except from path hand rail
- At midnight redoes all lights off (just incase forgot to switch off from late parties)

Water Irrigation – Sprinklers

- Preprogrammed sequence – also has manual mode
- Detects season and adjusts the time the sprinkler/s are on for
- Turns on in sequence over a week period water solenoids
- Will not switch on if rain sensor triggered
- Note all controlled via AMX – but I want to move to Raspberry Pi for better software functionality.
- Also wish to use weather web sites to determine long range forecasts

HVAC – Air Con

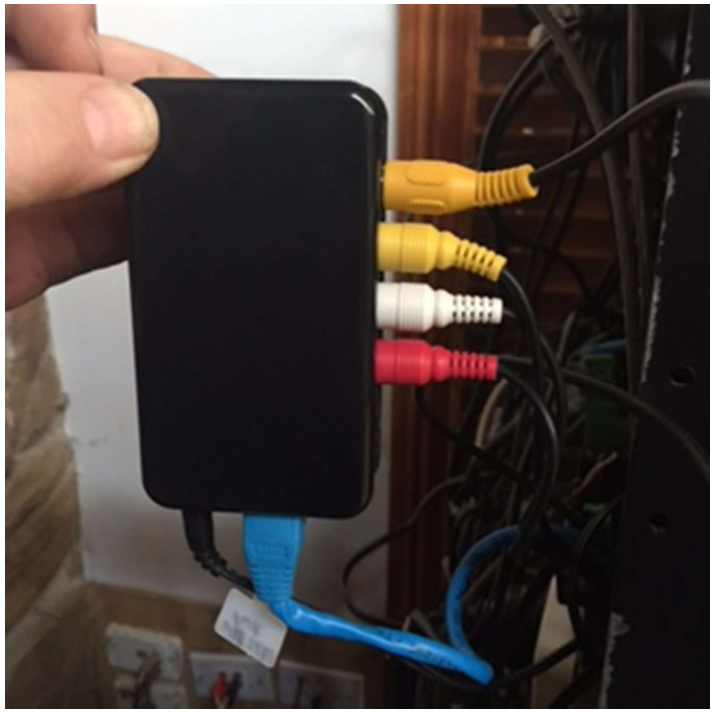
- AMX Thermostat controls – Axlink device
- Has Yahoo weather web sight hack
  (not working just now as Yahoo has changed instruction set/s)
- Full control of Heating and Cooling functions
- Pre programmed to switch on and off per day
- 2 zones functional

AMX
Thermostat

Temp Sensor
8 Channels

Security

- IP9100 Video Server 4 inputs
  Jaycar ($89 maybe out of stock)
- Analogue Cameras
  routed via the Extron switcher
- Forms part of the front door camera feature re takes snapshot of front door camera when door bell pressed



Raspberry Pi Functions

- Communicate between AMX and Raspberry Pi via web sockets
- Control IP address devices
  - Samsung TV's
  - Onkyo Amplifier
  - IP9100 Camera server
  - Automate timing features
- Extra features
  - Voice Command control (Siri or Twitter)
  - Take front door camera shots when front door bell pressed
  - Control remote devices

Pics of various lights

Outside lights

Front Garden Lights

Poolside Lights