

AutomateIt!

AutomateIt
For
Comprehensive Site Automation!

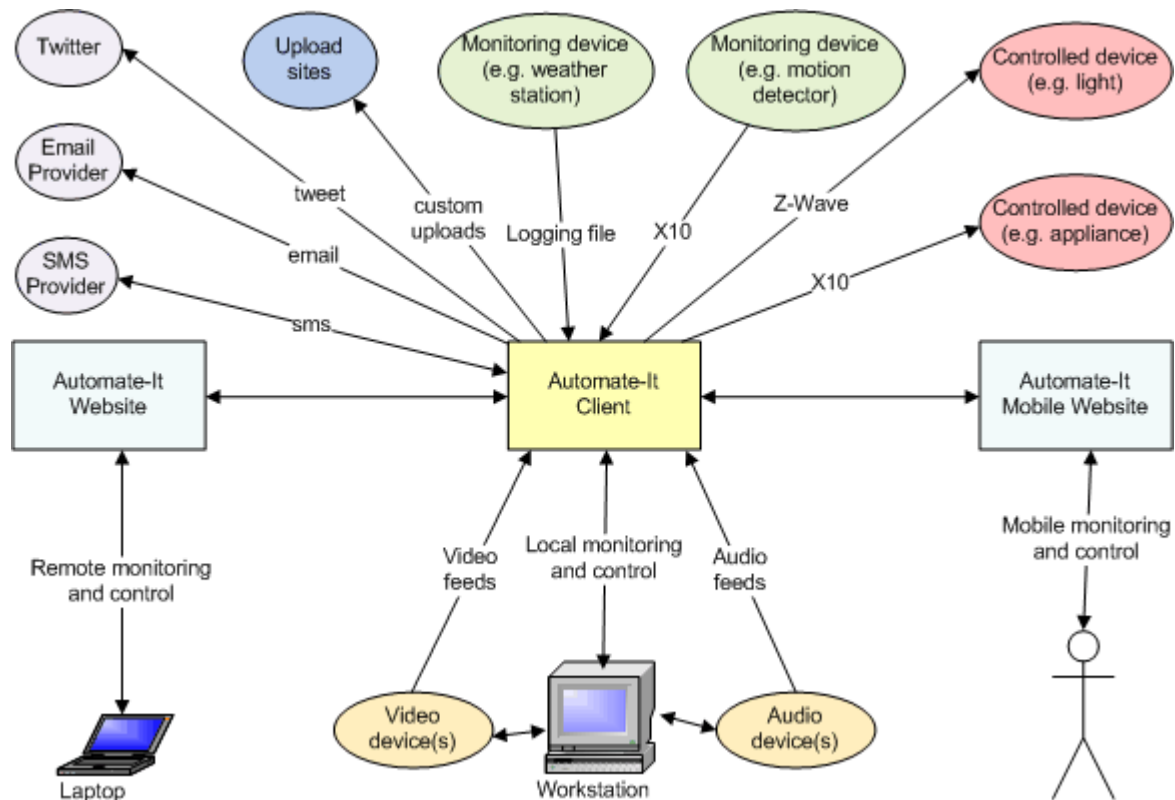
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Overview

AutomateIt is both a desktop application and a website for the local and remote monitoring and controlling of devices around the home. Monitoring and control of devices is done using both wired (X10) and wireless (Z-Wave) technologies. The types of devices that are monitored are typically things like weather stations, motion detectors, security cameras, etc. The types of devices that are controlled are typically things like lights, appliances, irrigation, etc. The desktop application includes functionality for comprehensive device configuration and programmability (schedules, rules and macros). Full upload functionality to the AutomateIt web site and custom uploads to other sites is also included, as well as SMS and email messaging and ability to tweet. The website offers remote viewing of the current status of the devices being monitored and controlled as well as the ability to remotely control selected devices.



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Software Components

1. AutomateIt desktop application (aka client software)
 - i. Written in C# and uses version 4 of Microsoft's .Net framework.
 - ii. Not necessary for any database software (e.g. Access, SQL Server, etc.) to be pre-installed, since the software uses XML files for its data store.
 - iii. Refer to the Appendix for example screenshots.
2. AutomateIt web site <http://www.automate-it.co.za>
 - i. Written in C# and uses ASP.Net 4.0
 - ii. Uses SQL Server 2008 for its data store.
3. AutomateIt mobile web site – currently under construction.



Desktop Application Functionality

1. Configuration

i. Controlled Devices

- a. The type of the device (e.g. X10 controller, Z-Wave adapter) can be configured and any relevant configuration parameters (e.g. communications port and house and device codes for an X10 device) can be specified.
- b. Controlled devices can be overridden manually and the override removed at any time. When overridden, any schedules for the device will not be actioned; instead the user can switch the device off and on via menu options.
- c. Controlled devices can be made inactive and re-activated at any time.
- d. Short mnemonics can be assigned to controlled devices to make them easily identifiable when sending commands in message format to the application.

ii. Monitoring Devices

- a. The type of the device (e.g. X10 receiver, weather station via the relevant software) can be configured and any relevant configuration parameters (e.g. house and device codes for an X10 device) can be specified.
- b. Monitoring devices can be made inactive and re-activated at any time.
- c. Short mnemonics can be assigned to monitoring devices to make them easily identifiable when sending commands in message format to the application.

iii. Video/Audio Devices

- a. Expression Encoder from Microsoft is used for identification of and recording from all video and audio devices known to the Windows operating system on the machine.
- b. Video and audio devices can be made inactive and re-activated at any time.
- c. Short mnemonics can be assigned to video and audio devices to make them easily identifiable when sending commands in message format to the application.

iv. Messaging Providers

- a. The details of providers of SMS and email messaging capabilities can be captured here. Additionally the technical details for tweeting to Twitter accounts can also be captured here.
- b. The time interval for checking for any messages from the provider may optionally also be specified.
- c. Messaging providers can be made inactive and re-activated at any time.
- d. FAMEX (Free Application Message Exchange) is a messaging web service that is part of the AutomateIt web site. It is used to refresh the data on the website and also to transmit control commands selected by a user of the website to the desktop application for processing there.

v. Uploads

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- a. The types of uploads that can be configured include data refreshes for the AutomateIt web site, ad-hoc uploads of recorded video and audio files and custom uploads (e.g. periodic upload of weather data to weather sites). The relevant parameters for the type of upload may also be specified (e.g. URL, login credentials, etc).
- b. Protocols supported for the uploads include FTP and HTTP (post, web method call or file upload). An upload can also be done in the form of a message sent using a selected messaging provider (i.e. sms, email, tweet, etc).
- c. The time interval between successive uploads may also be specified.
- d. Uploads can be made inactive and re-activated at any time.

2. Programmability

i. Schedules

- a. These can be defined for controlled devices either by specifying an “on” time for a selected duration in minutes or by specifying that the “on” and “off” times are determined by evaluating an expression (e.g. Sunset-0030 which equates to 30 minutes before sunset).
- b. Schedules can be configured to run every day of the week or on a selected day of the week only.
- c. Schedules can be made inactive and re-activated at any time.

ii. Rules

- a. Rules specify the action(s) that should happen if a specified condition occurs on a monitoring device (e.g. sound alarm if motion detector outside front door sends “on” signal). The expression that is evaluated to determine whether the condition has been satisfied can be quite complex (e.g. (DailyRainDayBeforeYesterday+DailyRainYesterday+DailyRainToday<5) AND RainLast24H=0). The action(s) that should happen if the condition is/is not met are defined using the Actions Editor (see below).
- b. The time interval between successive rule evaluations may also be specified.
- c. Rules can be made inactive and re-activated at any time.

iii. Macros

- a. Macros comprise one or more actions that are executed in sequence. The action(s) are defined using the Actions Editor (see below).
- b. Macros can be made inactive and re-activated at any time.
- c. Short mnemonics can be assigned to macros to make them easily identifiable when sending commands in message format to the application.

iv. Actions Editor

- a. New actions can inserted into or appended to the sequence and existing actions can be edited and removed.
- b. The following types of actions are currently supported:-
 1. Switching on and off of a selected controlled device.

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2. Recording of video/audio from a selected source for a specified duration and optional upload of this recording to the AutomateIt website.
 3. Playback of an existing audio file.
 4. Running a selected macro.
 5. Sending a message to a specified recipient using the selected messaging provider (i.e. sms, email or tweet).
3. Logging
- i. Comprehensive logging of all activity.
 - ii. Daily archiving of activity logs.
4. General
- i. Admin password required to save configuration and programmability changes.
 - ii. Timer can be disabled and re-enabled at any time by the administrator.
 - iii. There is a built-in browser for browsing from within the desktop application.
 - iv. The System Configuration option can be used to change, inter alia, the password for administrator access, the timer interval and the location details for the site (i.e. altitude, latitude, longitude and narrative).

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Website Functionality

Take the tour to find out more!

Supported Devices/Technologies

1. Wired Technologies
 - i. X10 – for control and monitoring of devices.
2. Wireless Technologies
 - i. Z-Wave – for control of devices only (at this stage – monitoring functionality is under construction).
3. Weather Station Software
 - i. Oregon Scientific Weather Stations
 - a. VWS
 - b. Free WX-Wi
 - ii. La Crosse Weather Stations
 - a. Heavy Weather Pro

System Requirements

1. Processor: ideally 2GHz or faster
2. Memory: ideally 2GB or more
3. Operating System: Windows XP or later
4. .Net Framework 4.0

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Hardware suppliers (South Africa)

1. X10
 - i. X10 Home Automation - <http://www.x10-sa.co.za>
2. Z-Wave
 - i. ZA Smart Homes - <http://www.zasmarthomes.com>
3. Weather Stations
 - i. La Crosse:
Yebo Electronics - <http://www.fort777.co.za>
 - ii. Oregon Scientific:
Oregon Scientific SA - <http://www.oregonscientific.co.za>

Costs

1. Small once-off fee for desktop application.
2. Small yearly subscription for unlimited use of the websites and all desktop application updates.

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Appendix

1. Desktop Application Screenshots

a. Site

The screenshot shows the AutomateIt! desktop application window. The title bar reads "AutomateIt!". The menu bar includes: Site, Environment, Communications, Activity Log, Programmability, Configuration, Disable Timer, Do Backup, Admin Logoff, and Help. The left sidebar shows a tree view with the following items: Site (expanded), Controlled Devices, Monitoring Devices, Video Devices, Audio Devices, Environment, Communications (expanded), Connections, Messaging Providers, Uploads, Browser, Activity Log, Programmability (expanded), Schedules, Rules, Macros, and System Configuration. The main content area displays a table with columns: Device, Status/Reading, and Value. The table is organized into sections: Controlled Devices, Monitored Devices, Video Devices, and Audio Devices.

Device	Status/Reading	Value
Controlled Devices		
Outside Light	Status	OFF
Lounge Light	Status	OFF
Panel Heater (kitchen)	Status	OFF
Irrigation	Status	OFF
Bedroom Lamp	Status	OFF
Dining Room Lamp	Status	OFF
Mosquito Defence - Bedroom	Status	OFF
Panel Heater (lounge)	Status	OFF
Monitored Devices		
Motion Detector	Status	OFF
Video Devices		
WebCam	Status	Available
VideoMate U2800F Capture	Status	Available (default)
Screen Capture Source	Status	Available
Audio Devices		
Realtek HD Audio Input	Status	Available (default)

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b. Environment

The screenshot shows the AutomateIt! application window. The menu bar includes: Site, Environment, Communications, Activity Log, Programmability, Configuration, Disable Timer, Do Backup, Admin Logoff, Help. The left sidebar shows a tree view with the following items: Site, Controlled Devices, Monitoring Devices, Video Devices, Audio Devices, Environment (highlighted), Communications, Connections, Messaging Providers, Uploads, Browser, Activity Log, Programmability, Schedules, Rules, Macros, System Configuration. The main area displays a table with the following data:

Device	Status/Reading	Value
Weather Stations		
La Crosse WS2801-HT	DateAndTime	2012/01/18 13:50:41
La Crosse WS2801-HT	WindDirection	270.0
La Crosse WS2801-HT	WindSpeed	2.9
La Crosse WS2801-HT	WindGust	
La Crosse WS2801-HT	IndoorHumidity	63.0
La Crosse WS2801-HT	OutdoorHumidity	50.0
La Crosse WS2801-HT	DewPoint	20.7
La Crosse WS2801-HT	IndoorTemperatureNow	28.2
La Crosse WS2801-HT	OutdoorTemperatureNow	32.4
La Crosse WS2801-HT	OutdoorTemperatureMaxToday	38.1
La Crosse WS2801-HT	OutdoorTemperatureMinToday	21.4
La Crosse WS2801-HT	OutdoorTemperatureMaxYesterday	34.5
La Crosse WS2801-HT	OutdoorTemperatureMinYesterday	20.2
La Crosse WS2801-HT	BarometricPressureActual	1003.6
La Crosse WS2801-HT	BarometricPressureSeaLevel	1005.1
La Crosse WS2801-HT	HourlyRain	0.0
La Crosse WS2801-HT	RainLast24H	0.0
La Crosse WS2801-HT	DailyRainToday	0.0
La Crosse WS2801-HT	DailyRainYesterday	0.0
La Crosse WS2801-HT	DailyRainDayBeforeYesterday	0.0
La Crosse WS2801-HT	MonthlyRain	1.5
La Crosse WS2801-HT	TotalRain	1.5
La Crosse WS2801-HT	WindChill	32.4
La Crosse WS2801-HT	IndoorHeatIndex	
La Crosse WS2801-HT	OutdoorHeatIndex	
La Crosse WS2801-HT	BarometerTrend	Falling
La Crosse WS2801-HT	Forecast	Rain

Ready

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c. Communications

The screenshot shows the AutomateIt! application window. The menu bar includes: Site, Environment, Communications, Activity Log, Programmability, Configuration, Disable Timer, Do Backup, Admin Logoff, Help. The left sidebar shows a tree view with the following structure:

- Site
 - Controlled Devices
 - Monitoring Devices
 - Video Devices
 - Audio Devices
- Environment
 - Communications**
 - Connections
 - Messaging Providers
 - Uploads
 - Browser
- Activity Log
- Programmability
 - Schedules
 - Rules
 - Macros
- System Configuration

The main content area displays a table with the following data:

Connection/Provider/Upload	Status/Reading	Value
Messaging Providers		
Bulk SMS	Last Check Done for Messages	2012/01/18 13:49:47
Bulk SMS	Last Message Received	
Bulk SMS	Last Message Sent	
FAMEX	Last Check Done for Messages	2012/01/18 13:48:46
FAMEX	Last Message Received	2012/01/16 17:03:39
FAMEX	Last Message Sent	2012/01/16 17:03:39
Clickatell	Last Check Done for Messages	2012/01/18 13:48:47
Clickatell	Last Message Received	
Clickatell	Last Message Sent	
MNSsoftware Email	Last Check Done for Messages	
MNSsoftware Email	Last Message Received	
MNSsoftware Email	Last Message Sent	
Twitter @MilnertonWeathr	Last Check Done for Messages	
Twitter @MilnertonWeathr	Last Message Received	
Twitter @MilnertonWeathr	Last Message Sent	
Uploads		
Upload to Weather Underground	Last Upload Completed	2012/01/18 13:52:48
Upload to MNSoftware.co.za	Last Upload Completed	2012/01/18 13:48:49
Tweet Latest Weather	Last Upload Completed	2012/01/18 13:31:01
Network Connections		
Network Connection	Status	Connected
Internet Connection	Status	Connected using LAN

The status bar at the bottom left shows "Ready".

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d. Activity Log

Date/Time	Source	Identification	Activity Type	Further Description
2012/01/18 06:44:02	Upload	Upload to Weath...	Upload executed	Failed
2012/01/18 06:23:46	Device	Mosquito Defenc...	Switched off	
2012/01/18 05:56:46	Device	Outside Light	Switched off	
2012/01/18 05:55:49	Device	Outside Light	Status unknown	
2012/01/18 05:55:49	Device	Outside Light	Command sent	The operation has timed out.
2012/01/18 05:54:49	Device	Outside Light	Status unknown	
2012/01/18 05:54:49	Device	Outside Light	Command sent	The operation has timed out.
2012/01/18 05:53:49	Device	Outside Light	Status unknown	
2012/01/18 05:53:49	Device	Outside Light	Command sent	The operation has timed out.
2012/01/18 05:45:03	Upload	Upload to Weath...	Upload executed	Failed
2012/01/18 04:49:01	Upload	Upload to Weath...	Upload executed	Failed
2012/01/18 03:38:01	Upload	Upload to Weath...	Upload executed	Failed
2012/01/18 02:35:32	Listener	Active Home Libr...	Message received	RECVRF M1 SOCIALITE_FF
2012/01/18 02:31:02	Upload	Upload to Weath...	Upload executed	Failed
2012/01/18 01:00:46	Device	Bedroom Lamp	Switched off	
2012/01/17 23:00:47	Device	Dining Room Lamp	Switched off	
2012/01/17 22:30:47	Device	Lounge Light	Switched off	
2012/01/17 21:59:45	Listener	Active Home Libr...	Message received	RECVRF M5 ON 0 2012/01
2012/01/17 20:29:47	Device	Mosquito Defenc...	Switched on	

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e. Programmability

Macro/Rule/Schedule	Status/Reading	Value
Macros		
Sound Alarm	Last Run	2012/01/04 16:18:56
Rules		
Switch on Kitchen Panel Heater if Cold	Last Checked	2012/01/18 13:49:45
Switch on Lounge Panel Heater if Cold	Last Checked	2012/01/18 13:51:45
Irrigate if No Rain	Last Checked	2012/01/18 13:55:45
Sound Alarm if Motion at Front Door	Last Checked	2012/01/18 13:55:45

f. System Configuration

Element Name	Element Value
Administrator Password	
Audio Compressor Default	
Audio Device Default	Realtek HD Audio Input
Location Altitude	13.8
Location Latitude	-33
Location Longitude	18.
Location Narrative	Royal Ascot, Milnerton
Main Timer Interval (milliseconds)	60000
Video Compressor Default	
Video Device Default	VideoMate U2800F Capture