

factory &  
process automation  
solutions

test & measurement  
solutions

*Partner to global industrial product companies for control & connectivity based engineering solutions.*

## Programmable Networkable BA Controller

---

### The Customer

The customer is a known provider of Building Automation (BA) solutions and specializes in providing browser based DDC Systems.

### Customer Need

The customer needed a solution, to reduce high cost of development of a wide range of next generation controllers (low end thermostat to high end controllers). The Customer's requirement was to design a programmable, scalable Building Automation controller for commercial buildings.

### SoftDEL Solution

SoftDEL developed a common reference platform for an end-to-end product range for Building Automation.

### Platform Development

The target platform chosen for the development was Linux Operating System (Kernel version 2.6.22.6). The various drivers and protocol stacks that were supported on the selected target OS were:

- USB Host driver (USB 2.0)
- Ethernet Driver (10/100 mbps)
- TCP/IP stack
- Telnet
- LCD Graphic Driver (480x272)
- Wi-Fi Stack (802.11n)
- SMTP server
- FTP

Driver development and BSP modification: BSP was modified for following device specific hardware

- 2k page flash driver
- LCD and touch screen driver
- I/O interface / I2C driver

## Application Development

The following components were developed as part of the Application Development:

### GUI Application

A rich User-friendly Graphic Interface was provided to the User for easy monitoring and control of the various parameters. The screens were configurable as per User requirements by using an XML based configuration file.

### Web Server Interface

Since a web server interface is provided, this controller can be controlled and configured remotely over a network. Web pages are designed in DHTML and CSS.

### Python Interface

This interface allows the User to write their own control algorithm/application using Python scripts. It provides great flexibility to change the control algorithm on the fly without recompiling entire source code.

### BACnet Stack

This controller communicates with other device on the network using BACnet protocol over IP. SoftDEL's B-ASC component stack was used for providing this protocol support.

This communication stack is ported on device and tested with standard BACnet protocol test tool. This tool has in-built feature for rigorous testing of BACnet compliancy of the device.

### Multi Language Support

This product is designed to be able to support multiple languages.

### Alarm Module

This controller has been designed to provide User configurable alarm modules. A system log is maintained of the various alarms generated. Also using a built in address book that stores email address and identities of various Users, email notification is given of the alarms using SMTP.

## Data Logger

This controller has a data logging facility, which is user configurable. User can add, edit, delete or download selected data log.

## Online Application Updating

The controller application can be remotely troubleshot and updated from a host computer.

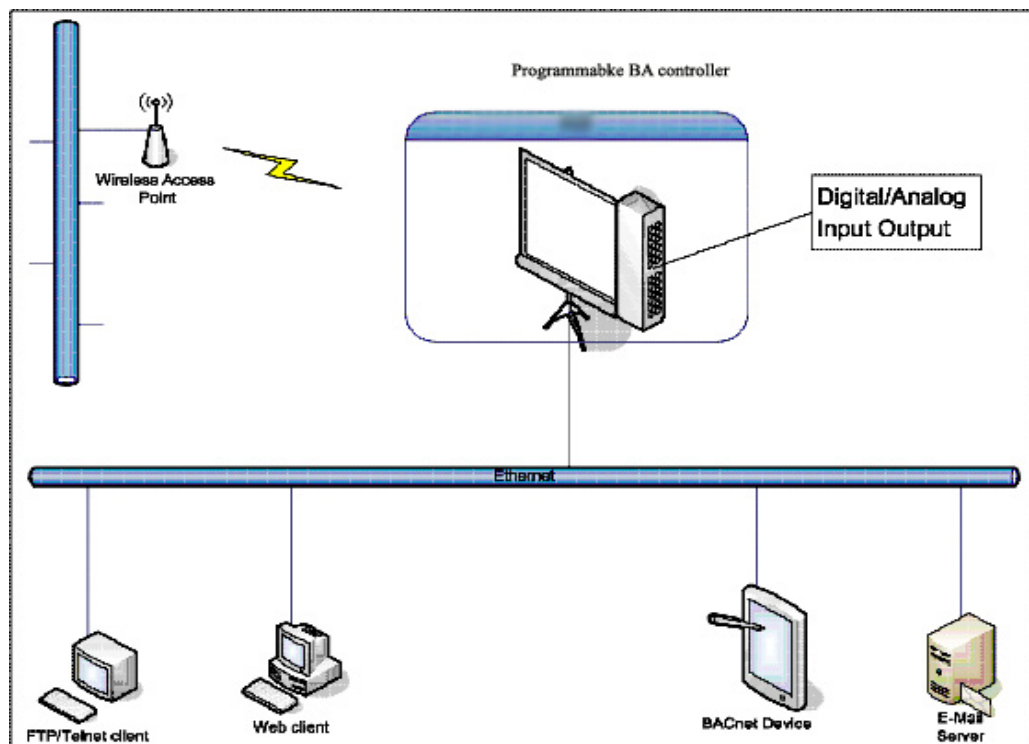
## Weather forecast

The controller can readily download weather details over the internet for a selected zip code.

## Scheduling

The controller can be scheduled to function in a pre-programmed fashion with an option for temporarily overriding schedule setting.

## System Overview



## Key Features

- **Rich GUI:** Touch screen based user interface.
- **Alarms:** Real time Alarms are flashed on screen and email notification for selected alarm is also available.
- **Data log:** Periodic data logging as per predefined time interval for statistical analysis.
- **User Levels:** This controller has been designed to cater to 3 user levels.
  - End User: Change set points, schedule, and monitor alarms, data logs
  - Installer: Configure, program, setup, firmware upgrade (plus all end user privileges)
  - Super User: Full control, will be used by the Customer's Tech support
- **Communication:** While these controllers communicate over the standard TCP/IP protocols it supports both static and dynamic addressing.
- Following interfaces are provided for communication
  - Web interface
  - BACnet interface
  - Remote debugging and data file transfer
  - Serial interface
  - I2C interface
- **Programming:** No separate software is needed for programming of this device. It is completely configurable to meet end User requirement through the various interfaces that it offers. User can write his control algorithm in simple script language.
- **Diagnostic:** In built diagnosis module is available for user and system administrator. This module generates log information of system errors and user errors.
- **Testing:** Following automated test tools used for application, BACnet interface and web interface testing.
  - Visual Test Shell
  - Test Complete

## Impact

- Shortened development time due to usage of COTS based hardware items and sub-systems
- Economical BOM and overall development cost
- Configurable platform for multiple applications
- User friendly touch screen menu driven operation

[WWW.SOFTDEL.COM](http://WWW.SOFTDEL.COM)

**USA**  
1050 Winter St. #1000  
Waltham, MA 02451  
+1 (832) 886 0006  
[info@softdel.com](mailto:info@softdel.com)

**India**  
3rd Floor, Pentagon P-4  
Magarpatta City, Hadapsar,  
Pune, 411028  
+91 (20) 6701 0001  
[india@softdel.com](mailto:india@softdel.com)

**Japan**  
Nitte Bldg, 1101,  
1-22-12 Shinkawa,  
Chuo-Ku, Tokyo 104-0033.  
Japan.  
[japan@softdel.com](mailto:japan@softdel.com)

