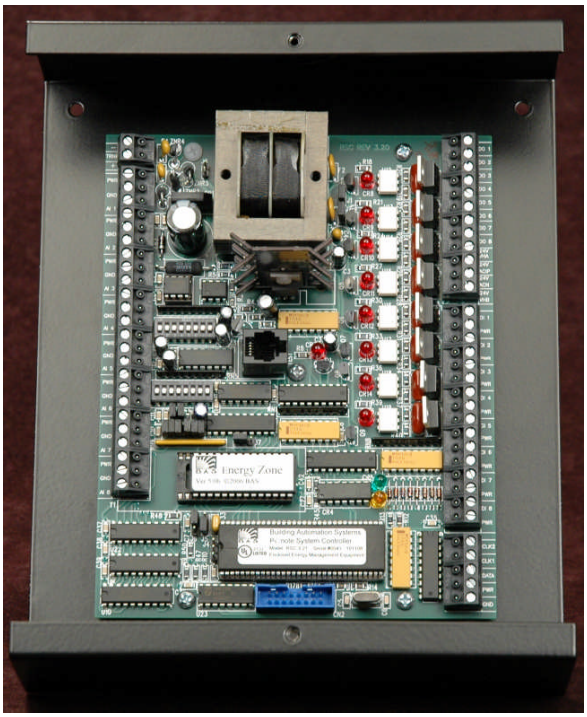
Remote System Controller

Energy Zone



The microprocessor based Remote System Controller (RSC) can be programmed with control sequences for 128 different types of HVAC equipment, serving the needs of virtually all equipment found in use today. The RSC, when connected with a 2 conductor trunk line to a PC running Windows, provides the basis for an extremely powerful and versatile Building Automation and Energy Management System.

Features:

- 8 Analog Inputs
- 4 Analog Outputs
- 8 Digital Inputs
- 8 Digital Outputs
- Up to 4 HVAC Zones connected to a single RSC
- Communicates with a PC and other RSCs using reliable RS-485 communication network
- Auto-configure feature provides Plug-and-Play capabilities when connected to a PC
- Full backward compatibility
- Dip switch selectable default mode allows operation without PC interface
- Advanced microprocessor control algorithms provide highly accurate temperature control
- Test plug allows connection of portable handheld terminal

Specifications

General Description - The RSC is a microprocessor based controller. The design of the RSC circuit board is based on the NEC 78C10 microcomputer. Each RSC has a total capacity of thirty I/O points including eight Digital Outputs, eight Digital Inputs, eight Analog Inputs, four Analog Outputs, and two remote LCD display modules. The Analog Outputs (AO) are controlled by the RSC using a separate AO board.

Backward Compatibility – Any RSC sold by BAS (past, present or future) can communicate with any other RSC. If an upgrade becomes necessary, it can be done through a simple EPROM exchange.

Memory Configurations - The RSC contains 256 bytes of on-board RAM. The operating instructions and default Equipment Schedules are provided in one of four possible configurations; 1) 32K EPROM (the most common configuration), 2) 128K EPROM, 3) 32K battery backed SRAM, and 4) 128K battery backed SRAM. Jumpers are used to configure the RSCs for the different memory configurations. These are set at the factory and will not need to be modified in the field.

Default Mode - Equipment Schedules are the control sequences for a given type of HVAC equipment. Equipment Schedules are stored on an EPROM that resides on the RSC. The default mode for all supported Equipment Schedules is programmed into the EPROM (or SRAM) shipped with every RSC. Positioning a dip switch on the RSC will determine which Equipment Schedule is used for RSC default control. The dip switch selectable default mode provides for sophisticated control algorithms without connection to a PC, allowing for rapid and trouble free initial building startup. This also ensures continuation of excellent temperature control even after loss of the PC or a communication trunk failure.

Multiple Zone Control - One RSC can control up to 4 HVAC control zones. Each Equipment Schedule is divided into 1, 2, or 4 control Zones depending on the output requirements of the equipment being controlled.

RSC Address - Each RSC on a given trunk line must be assigned a unique address between 1-32. The address does not have to correspond to the physical location or position on the trunk line. One of the two dip switch banks on the RSC is used to set the address.

Communication -Two communication interfaces are available at each RSC. Communication between each RSC and the PC follows the RS-485 specification. Up to 128 RSCs can be placed on each of eight trunk lines. Communication is on a standard 2-conductor, 18 AWG, twisted shielded pair (tsp), with all RSCs on a trunk line wired in parallel. Maximum length of the trunk line is 5000'. The trunk line is protected from voltage spikes at each RSC by surge suppressers. Automatic resetting solid state fuses prevent damage to the surge suppressers by sustained faults.

An RS-232 interface is also available at each RSC and is the communication standard used to communicate with the Handheld Tester (HTD). The HTD can be plugged directly into the RSC or into an external RJ-11 jack up to 250’ from the RSC. The presence of the HTD is sensed by the RSC, which will then automatically enter HTD troubleshooting mode. Any standard RS-232 terminal, or a PC operating in terminal mode, can be substituted for the HTD.

Status LEDs - Several status LEDs are provided on the RSC. Simply checking the status of these LEDs can isolate most common problems. A Heartbeat LED monitor is located on the RSC and will indicate one of five possible operational modes. Two LEDs indicate the status of communication, one for incoming and one for outgoing transmissions. Eight additional LEDs are provided, one at each Digital Output, to indicate the commanded state of the output.

Power Supply - All devices supplied by BAS are rated as NEC Class 2 limited energy electrical devices. The RSC requires 10 VA from a 24 Vac transformer. In order to ensure proper operation of the Digital Outputs, the power supply must be able to maintain a minimum of 20 Vac under all load conditions.

When power reaches the RSC it is first passed through a pair of automatic resetting solid state fuses and an isolation transformer. This combination provides the RSC with almost complete immunity to fluctuations and noise in the 24 VAC power supply. It also protects vital components against faults that could affect RSC operation and reliability.

Internally Generated Power Supplies - All DC voltages necessary for system operation are generated by two onboard regulated power supplies, 18 VDC for external components and 5 VDC for onboard digital logic circuits.

LCD Display Modules - Terminals are provided for connection of up to two externally mounted LCD display modules. They will display the scaled value of a standard range temperature sensor. Additional uses are planned for a future EPROM release.

Analog Inputs - The RSC has the capacity for 8 Analog Inputs. All Analog Inputs are jumper selectable as 1-5 VDC, 0-5 VDC, or 4-20 mA. All 8 AI locations are provided with a separate 18 VDC power supply terminal and a DC common terminal.

Analog Outputs - All modulating Analog Outputs are provided by an AO card. AO cards receive digital control data from the RSC and use the data to generate 4 individual modulating outputs. Each output is jumper selectable as either 4-20 mA or 0-10 VDC. The AO card connects to the RSC by means of a factory provided 16 pin ribbon cable and connector.

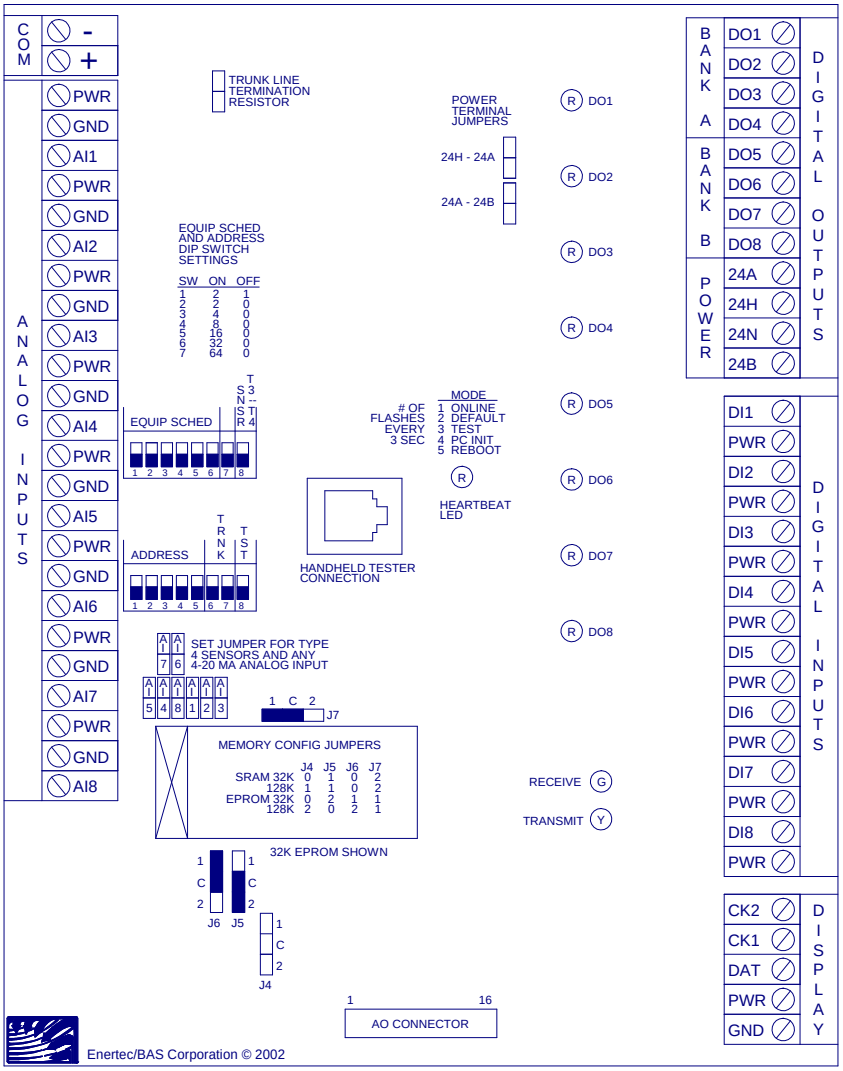
Digital Inputs - The RSC has the capacity for 8 Digital Inputs. Digital Inputs are activated by routing 18 Vdc from the RSC power supply to the appropriate RSC input terminal through a field device. This field device could be anything with a set of dry contacts.

Digital Outputs - The RSC has the capacity for 8 Digital Outputs. Control of loads connected to Digital Outputs is provided by triacs mounted on the RSC. Each output can directly switch loads up to 1 A @ 24 Vac. Loads that exceed these ratings should be provided with a pilot duty relay for interface to the RSC. An LED that indicates the state of the output accompanies each DO.

Digital Output Bank Isolation - The 8 DOs are divided into two banks of 4 DOs each, Bank A (DO1-4) and Bank B (DO5-8). The power supply common to each bank can be shared with the RSC or each bank can use an individual common, isolated from the rest of the RSC. This allows for control of up to two different pieces of HVAC equipment having a factory transformer from one RSC without the use of field installed isolation relays.

Installation - RSCs are sometimes grouped in a central location, but are usually distributed throughout the facility and mounted near the equipment they serve. The RSC is 5 1/2”w x 7”h and is mounted in a 7 1/2”w x 9”h NEMA 1 metal enclosure. Electrical conduit knockouts are provided in both 1/2” and 3/4” sizes. The RSC must be either mounted in a dry location or installed inside a field supplied enclosure. RSCs are available from BAS without an enclosure and can be mounted directly to any flat surface using plastic standoffs. All field wiring connects to the RSC with de-pluggable compression type screw terminal strips.

RSC Board Layout



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