



WALKER SYSTEMS

building
intelligence

PRODUCT OVERVIEW

Feature/Function/Benefits

FORM # WSC00-FF102

REVISION 1

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CONTROL SYSTEM OVERVIEW

FEATURE	FUNCTION	BENEFIT
SIMPLE ARCHITECTURE	<ul style="list-style-type: none"> • Evolved over 12 years this reliable and expandable system architecture uses common building blocks in all controllers to maximize efficiency while reducing system complexity. 	<ul style="list-style-type: none"> • Ease of design. • Ease of application. • Ease of installation. • Ease of comprehension. • Ease of training. • Ease of operation. • Ease of diagnosis and repair.
INTUITIVE OPERATION	<ul style="list-style-type: none"> • Browser based operator front end allows complete operation and programming from a familiar and intuitive graphical interface. 	<ul style="list-style-type: none"> • Minimized system complexity. • Maximize ease of use. • Minimize learning curve. • Efficient use by inexperienced personnel. • Idiot proof.
INTERNET/INTRANET/EXTRANET CONNECTIVITY	<ul style="list-style-type: none"> • Front end designed using Internet technology, to guarantee building owners full compatibility to existing and emerging connectivity technologies. 	<ul style="list-style-type: none"> • Guaranteed migration of systems tied to the latest advances in technology on a long-term basis.

CONTROL SYSTEM OVERVIEW

FEATURE	FUNCTION	BENEFIT
COMMON DATABASE	<ul style="list-style-type: none"> All controllers use the same database and database creation program. Any database written for one type of controller can reside and operate in any other controller. This applies to all controllers manufactured by WSC for the last 12 years. 	<ul style="list-style-type: none"> Upsize any controller without modifying original database. Guaranteed backward and forward compatibility without reprogramming. Once technicians are trained to use the system they are trained for all installed systems and all panel types. Reduction in engineering costs.
FULLY PROGRAMMABLE	<ul style="list-style-type: none"> All panels are fully programmable via fixed function algorithms and English like programming language (GCL). Resulting code is self documenting. 	<ul style="list-style-type: none"> Easy to write. Easy to read. Easy to change. Easy to understand. Easy to modify at a later date. Description of operation is the program itself.
FIXED or UNITARY OPERATIONS	<ul style="list-style-type: none"> Panels can be pre-loaded at factory with fixed function applications for 'plug and play' operation. Programs can be varied at a later date on site if required. 	<ul style="list-style-type: none"> Reduced installation time for standard applications. Increased flexibility to handle minor modifications or additions to standard applications. Programmable unitary controllers allow the best of both worlds.

CONTROL SYSTEM OVERVIEW

FEATURE	FUNCTION	BENEFIT
ANY PANEL ANYWHERE IN SYSTEM	<ul style="list-style-type: none"> • Panels can be added or upgraded at any point in the system. • The same LAN technology is used in all controllers. • Any type of controller can be placed on any LAN segment. 	<ul style="list-style-type: none"> • Flexible architecture makes system easy to lay out, bid, install, modify or upgrade.
MULTIPLE OPERATORS	<ul style="list-style-type: none"> • Any panel on any LAN segment can support an operator terminal providing full system access. • There can be as many operators as there are SAC panels in the system. SmartLAN technology guarantees concurrent operation. <p>NOTE: CONNECT-500 must be used for MiniSAC and MicroSAC system access. CONNECT-2000 support for MiniSAC and MicroSAC to be available Jan 1999.</p>	<ul style="list-style-type: none"> • No limitation on operator accesses to system. • Operator can obtain full access to system from any RoomSTAT or controller.
SINGLE LEVEL LAN	<ul style="list-style-type: none"> • SmartLAN is a single level LAN technology, which works like a telephone network. Any panel can communicate with any other panel in the system. If a destination panel is not on the same LAN segment the trunk number (area code) is included in the address. 	<ul style="list-style-type: none"> • Makes system simple to understand and operate. • High throughput, flexible, open architecture. • Sharing data between panels or control strategies is simple, efficient, and flexible.

CONTROL SYSTEM OVERVIEW

FEATURE	FUNCTION	BENEFIT
TRUE PRIORITIZED PEER TO PEER COMMUNICATIONS	<ul style="list-style-type: none"> All panels on all LAN segments are equal peers in a data-sharing environment, which allows interruption of data flow for several different levels of priority traffic. Any panel's point data is available from any controller. Synchronized communications guarantee 100% throughput independent of network loading. 	<ul style="list-style-type: none"> Exceptional communication speed and reliability. Guaranteed instant access for high level operators and alarms.
FLEXIBLE ARCHITECTURE	<ul style="list-style-type: none"> Panels are located to fit the layout and constraints of the building not the architecture of the control system. The only restriction on LAN configuration is the logical organization of panels in the building. 	<ul style="list-style-type: none"> Low cost installation and future expansion.
CONSISTENT DESIGN with PROVEN TECHNOLOGY	<ul style="list-style-type: none"> Evolved over 12 years, the hardware, the architecture, the programming, and the user interface are consistent throughout the entire product line. 	<ul style="list-style-type: none"> Consistency for the customer. Minimizes owner's cost to maintain system. Enhances operator's ability to operate the system efficiently. Offers the owner a consistent product over time.
LONG TERM PRODUCT PHILOSOPHY	<ul style="list-style-type: none"> Corporate philosophy to always maintain support and compatibility with past and future installations. Product is evolved and perfected rather than reinvented and replaced. 	<ul style="list-style-type: none"> Once installed, system only needs to be expanded and upgraded as time goes on, never replaced.

CONTROL SYSTEM OVERVIEW

FEATURE	FUNCTION	BENEFIT
INTUITIVE OPERATION	<ul style="list-style-type: none"> Operator controls are intuitive and quickly become familiar. Drop-down and pop-up menus lead the operator logically through the control system. 	<ul style="list-style-type: none"> Training requirements are minimized and retention levels are high.
ERGONOMIC ROOM SENSORS	<ul style="list-style-type: none"> Attractive easy to use room sensors satisfies the most discriminating designer. This highly flexible, line of products can be adapted for any user-defined application. Custom applications can easily be programmed in the attached panel. Allows for non-standard applications such as lighting control, door access, emergency call buttons, annunciation, alarm acknowledge, or display of any system parameter on request etc. Custom labels are inexpensive. 	<p>Give owner any functionality desired.</p> <p>Example: display Temperature, Humidity, and Time at 10 second intervals on the Roomstat in the operating room during certain critical operations.</p>
GLOBAL ACCESS	<ul style="list-style-type: none"> Any Roomstat or panel provides the authorized operator, FULL GLOBAL ACCESS as if he were at the main operator workstation (OWS). Access is achieved using a laptop or other portable operator terminal (POT). 	<ul style="list-style-type: none"> Multiple concurrent accesses to the system. Operators can respond instantly to problems or requirements from the system. Ease of reference to the system for the operator when in remote locations. <p>Example: Observe boiler room status while checking the operation of the rooftop unit.</p>

CONTROL SYSTEM OVERVIEW

FEATURE	FUNCTION	BENEFIT
SEAMLESS INTEGRATION TO THIRD PARTY SOFTWARE	<ul style="list-style-type: none"> • CONNECT-2000 the PC based front- end software is designed to integrate easily with third party software packages for data analysis and calculations. 	<ul style="list-style-type: none"> • Operators can use familiar software products for program creation, graphics creation, system design, data analysis and reporting. • No need for retraining on proprietary software. High compatibility with other systems for data sharing
REAL TIME CONTROL	<ul style="list-style-type: none"> • Unique real time calculations use actual elapsed time rather than estimated or averaged scan rate for time based control calculations. • Controller parameters are calculated consistently and independent of variations in panel scan rate due to operator interactions, variations in highway traffic, or other normal system variations. 	<ul style="list-style-type: none"> • The most stable, accurate, control system in the industry • Higher tenant comfort. • Less cycling of equipment. • Ideal and proven for lab control, process control, light industrial etc.
FRIENDLY PROGRAMMING	<ul style="list-style-type: none"> • Databases are simple and logically laid out and allow complete definition of any desired control strategy. 	<ul style="list-style-type: none"> • Programming is easy to learn and maintain.
INFINITE CASCADING OF POINTS AND VALUES FOR UNLIMITED CONTROL STRATEGIES	<ul style="list-style-type: none"> • Any point, either physical or virtual, can be used (if logical) as an input parameter value for any other point. <p>Example: Set point, gain, reset or rate of a controller can be any other point in the system.</p>	
ENGLISH LANGUAGE PROGRAMMING	<ul style="list-style-type: none"> • Programming of control strategies is accomplished on the graphic using easy English like statements and descriptive labels. 	<ul style="list-style-type: none"> • Programs are quick and easy to create and totally self documenting.

FEATURE	FUNCTION	BENEFIT
UNLIMITED BOOLEAN EXPRESSION USING ALL DATABASE POINTS	<ul style="list-style-type: none"> Any database point can be included in the input or output side of a Boolean expression in GCL. 	<ul style="list-style-type: none"> Complete flexibility. Any control strategy can quickly be implemented. Speeds code generation and comprehension of pre-written code.
PROGRAMMING THE SAME FOR ANY PANEL	<ul style="list-style-type: none"> All SAC programmable panels have identical databases and programming tools. Compatibility extends back to panels installed over 12 years ago. 	<ul style="list-style-type: none"> Panels can be easily upgraded or downgraded at any time with reprogramming. Identical programming environments reduces training requirements.
PROGRAMMABLE "HYPERPOINTS"	<ul style="list-style-type: none"> Critical point information can be treated and passed like alarms. 	<ul style="list-style-type: none"> Remote points such as stairwell pressurization, fume hood switches, override buttons, etc., can be wired to the closest panel rather than 'home run' to the panel controlling equipment. Cost savings can be achieved by reduction of wiring. Control strategy can be optimized because of guaranteed system throughput. Supervisory control strategies can be optimized for maximum cost savings.
UNIVERSAL DATABASE	<ul style="list-style-type: none"> Controller database compatibility. Backwards, forward, and across the line database compatibility. 	<ul style="list-style-type: none"> Upsize any controller with no database change. Backward and forward compatibility with no reprogramming.

FEATURE	FUNCTION	BENEFIT
GCL PROGRAMMING	<ul style="list-style-type: none"> • English 'like' programming Language. • Allows simple readable expression of any control strategy in English. 	<ul style="list-style-type: none"> • Easy to write. • Easy to read. • Easy to change. • Easy to understand.
GCL RESIDES IN DATABASE	<ul style="list-style-type: none"> • Defines sequential control procedures. • All panels are completely stand-alone. 	<ul style="list-style-type: none"> • Stand alone capability, whether intended or emergency.
MULTIPLE DATABASE POINTS	<ul style="list-style-type: none"> • Each controller shares: <ul style="list-style-type: none"> • 4 Variable types. • VA 16 bit 1Decimal Place integers. • VB, 8 bit integers. • VC, VA with alarm status bytes. • VF Floating point variables. • Alarm monitors any point's conditions. • PID controllers use true elapsed time • Totalizer for any point. • I/O defines external connection to system and sensors. • DISPLAY can display up to 80 system points. • ASCII defines external database mapping. • SCHEDULE of Weekly and Annual schedules. • COMMAND can handle activity reports or dial-out. 	<ul style="list-style-type: none"> • System flexibility.

HARDWARE FEATURES

FEATURE	FUNCTION	BENEFIT
TYPE 2 RATING	<ul style="list-style-type: none"> All devices are low energy type 2 rating. 	<ul style="list-style-type: none"> Low cost wiring. Very little code scrutiny from regulatory bodies or inspectors.
SUPERCAP BACKUP (WS1600, WS1616, MINISAC60)	<ul style="list-style-type: none"> Supercap used instead of battery to provide program backup in the event of a power failure. 	<ul style="list-style-type: none"> Eliminates the cost of battery replacement.
SWITCHING POWER SUPPLIES	<ul style="list-style-type: none"> More energy efficient – less heat. Oscillator based voltage converter. Efficiency is typically 98% or better. Operates over larger voltage range (18 to 24 VAC) to allow ganging. 	<ul style="list-style-type: none"> Lower mean time between failures (MTBF). High noise immunity. High brownout immunity. Lower installed cost.
12 BIT A/D CONVERSION (WS1616 and MiniSAC)	<ul style="list-style-type: none"> Higher resolution, better accuracy. Multiple average sampling is equivalent to Industrial Controller technology. Multiple averaged sampling gives resolution up to 14 bits. 	<ul style="list-style-type: none"> High resolution (one part in 4000 or better) is maintained when reading in temperatures, fluctuating analog voltages or currents.
FLASH MEMORY (O/S download only for MiniSAC and MicroSAC for system security reasons)	<ul style="list-style-type: none"> Flash Memory contains each controller’s Operating System and database (program). Database and Operating System download over the SmartLAN communication network. Flash memory is “non volatile” and will retain its contents indefinitely when DC power to it is removed. 	<ul style="list-style-type: none"> Automatic power failure protection. Eliminates the need for battery backup protection in the event of power failure. Eliminates battery replacement costs. Eliminates the expense of chip changes in ceiling space the cost and complication of O/S upgrades is substantially reduced.

HARDWARE FEATURES

FEATURE	FUNCTION	BENEFIT
O/S UPGRADE OVER SMARTLAN	<ul style="list-style-type: none"> • As above 	
ANALOG OUTPUT SHORT CIRCUIT PROTECTION ON EACH CHANNEL	<ul style="list-style-type: none"> • On board solid state current limited outputs with thermal shutdown. Continuous short circuit will not damage or overheat device. 	<ul style="list-style-type: none"> • DDC equipment protected in the event of short circuit during installation or control device failure.
1 AMP OUTPUT CURRENT (WS1616 and MiniSAC)	<ul style="list-style-type: none"> • High current output capability provides a maximum of 1 amp combined current from all channels. • Individual outputs also rated at one amp. • Outputs may also provide drive for I/O bus on some controllers. 	<ul style="list-style-type: none"> • Most loads can be driven without additional buffers. • Increases output point capacity by providing free I/O Bus drive source.
WATCHDOG TIMER	<ul style="list-style-type: none"> • Hardware watchdog timer resets panel if OS program hangs or crashes in the unlikely event of a software bug or noise induced failure. 	<ul style="list-style-type: none"> • Panel will automatically reset if software locks up.
SNAP ON CONNECTORS	<ul style="list-style-type: none"> • Snap on or push-on connectors allow easy pre-wiring and instant board replacement. 	<ul style="list-style-type: none"> • Low cost and problem free panel replacement. • Reduced commissioning costs.

FEATURE	FUNCTION	BENEFIT
PREDICTABLE PERFORMANCE	<ul style="list-style-type: none"> • Operator Access - 2 Seconds. • Alarm Reporting - 6 per Second. • Trends - 200 Samples/Second/Segment. • Panel to Panel - 2 to 3 Seconds. 	<ul style="list-style-type: none"> • Even large systems will not 'bog' down under extreme loads.
HIGH DENSITY LAN	<ul style="list-style-type: none"> • 2500 plus controllers on up to 51 segments. 	<ul style="list-style-type: none"> • Configure LAN as large and as logically as you wish.
DATA SYNCHRONIZATION	<ul style="list-style-type: none"> • Token passing network rules allow only one panel to talk at a time. • Permission to transmit data is passed from panel to panel in an orderly fashion that takes into account the priority of the information to be passed. • No "competition" for right to talk is required. 	<ul style="list-style-type: none"> • Installation savings. • Guarantees no loss of data. • Maximum Network Throughput. • No Collisions. • No complicated and costly collision detection and avoidance mechanisms required.
GUARANTEED THROUGHPUT	<ul style="list-style-type: none"> • Complete data synchronization and prioritization of SmartLAN communication technology guarantees all traffic gets through under any loading conditions. • No packet loss or communication or failure is possible due to overloading. • Technique ensures 100% data throughput. 	<ul style="list-style-type: none"> • Industrial control system reliability. • Guaranteed performance gives consistent results to operator. • No concerns about impact on LAN throughput, system operation, or system performance when additional panels or control strategies are added. • No network failure under critical or life safety situations such as fire or other high load events.

FEATURE	FUNCTION	BENEFIT
NO DATA LOSS	<ul style="list-style-type: none"> Loss of critical emergency broadcasts or global command packets does not occur under heavy loading conditions. 	<ul style="list-style-type: none"> Customer can be guaranteed that stairwell pressurization command gets through when the building is burning down.
PRIORITIZED DATA TRANSFER	<ul style="list-style-type: none"> SmartLAN data is always prioritized. Panels with alarms, critical information, or Operator activity can "grab" the token so that they can send information immediately. At lower priorities, the highest priority data is always passed first. Operator can assign priority levels to network data. 	<ul style="list-style-type: none"> Makes any sequence of operations fully programmable. High priority data gets through first. System designers and operators have guaranteed throughput rates for various types of commands. Critical control loops can be shared between different panels where more convenient. Input events in one panel can be passed to another panel with a guaranteed throughput.
INTERRUPTIBLE TOKEN PASSING	<ul style="list-style-type: none"> Instant response to PRIORITY operator requests and CRITICAL alarms. With the right priority, panels can grab the token to make a transaction then return it for resumption of background operations. 	<ul style="list-style-type: none"> Panel with critical information or need does not wait for less important information to be circulated.
<u>TRUE</u> PEER TO PEER COMMUNICATION	<ul style="list-style-type: none"> Token passing architecture normally passes the token from panel to panel each panel sequentially becoming the buss master in its turn. All data transfers are synchronized to this token passing. 	<ul style="list-style-type: none"> <i>All</i> controllers have same level of authority. <i>Any</i> panel can talk directly with <i>any other</i>. No LAN hierarchy.
AUTOMATIC NETWORK RECONFIGURATION	<ul style="list-style-type: none"> When a panel is added or removed or the communication trunk is broken or reconnected, the network automatically reconfigures enunciating the new or lost panels. 	<ul style="list-style-type: none"> Automatic network configuration or reconfiguration. Added panels automatically begin communicating and sharing data.

FEATURE	FUNCTION	BENEFIT
INTERRUPTIBLE TOKEN	<ul style="list-style-type: none"> • With 7 levels of priority, SmartLAN allows the token to be interrupted from its normal sequential path so that a higher priority message can be passed. After the interrupt is "serviced", the token is replaced so that normal operation is resumed. 	<ul style="list-style-type: none"> • Instant response for operator or high priority events independent of network loading.
REAL TIME	<ul style="list-style-type: none"> • The interruptible token allows events occurring in one panel to cause a desired result in a destination panel within a guaranteed time frame. This transaction occurs independent of network loading. 	<ul style="list-style-type: none"> • Instant response. • Accurate and timely control.
MULTIPLE NETWORKS	<ul style="list-style-type: none"> • Up to 25 WS1600 NODE controllers can be added to the system each with two local highways of 50 panels. This gives a base system with up to 2500 panels on the LAN. • SmartLAN architecture makes ALL panels equal peers on a LAN on which they all reside. • Node controllers act as data routers between different LAN segments analogous to different area codes. 	<ul style="list-style-type: none"> • Logical LAN configuration matches building layout not control system constraints. Any panel can easily be added to any LAN segment at any time. • Completely flexible architecture. • Every system can be expanded indefinitely without starting over from scratch.
HIGH THROUGHPUT	<ul style="list-style-type: none"> • Sustained independent of network loading or size. • 38k Baud LAN delivers same performance as 5 Meg Ethernet LAN. This is a result of the prioritized token passing architecture. 	<ul style="list-style-type: none"> • Coaxial system avoided resulting in cost savings.
PLUG AND PLAY	<ul style="list-style-type: none"> • Two or more panels automatically form LAN. • Add <i>any</i> panel <i>anywhere</i> in the system. 	<ul style="list-style-type: none"> • Cost savings for future. • Cost effective programming. • Minimal wiring costs.

FEATURE	FUNCTION	BENEFIT
PROGRAMMABLE HIGHWAY POINTS	<ul style="list-style-type: none"> Operator dictates priority and frequency of all information transferred on highway. 	<ul style="list-style-type: none"> <i>Any</i> point's value can be routed through the system with the priority of an alarm.
SINGLE PROTOCOL	<ul style="list-style-type: none"> All controllers use same program and language. No layering or data encapsulation due to varied technology or subsystems. 	<ul style="list-style-type: none"> Information shared directly from panel to panel quickly. No protocol layering. No data translations.
NOISE IMMUNITY	<ul style="list-style-type: none"> 38k Baud LAN has much more immunity to noise than Ethernet or other high speed LANs due to lesser noise at lower frequencies. 	<ul style="list-style-type: none"> Guaranteed speed and delivery.
IEEE / RS 485 / LAN	<ul style="list-style-type: none"> Inexpensive two conductor shielded cable. 	<ul style="list-style-type: none"> No expensive Coax required.
ANY PANEL ANYWHERE	<ul style="list-style-type: none"> Flexible system layout with simple connectivity. 	<ul style="list-style-type: none"> Need to add a panel later? Place it where it is logical. New construction? Lay points out in terms of density then group logically into segments.
AUTOMATIC RECONFIGURATION	<ul style="list-style-type: none"> LAN automatically reconfigures as panels are added or removed. 	<ul style="list-style-type: none"> Integrity of LAN maintained if cut or disconnected. Add or remove panel with ease.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
Y2K	<ul style="list-style-type: none"> Complies with calendar year 2000 (and beyond). 	<ul style="list-style-type: none"> DONE DEAL: Software has been tested and verified by the Canadian Government to operate properly after the year 1999.
OPERATING SYSTEM INDEPENDENCE	<ul style="list-style-type: none"> Operates on any O/S. 	<ul style="list-style-type: none"> Customer may choose: <ul style="list-style-type: none"> Windows 3.1 Windows 95 Windows 98 Windows NT OS/2 UNIX Mac O/S.
MACHINE INDEPENDENT	<ul style="list-style-type: none"> Runs on any computer including Palm tops or set top boxes. 	<ul style="list-style-type: none"> Customer may use existing or preferred equipment, be it IBM, Macintosh, or any workstation.
BROWSER BASED FRONT END	<ul style="list-style-type: none"> Microsoft Internet Explorer and Netscape Navigator are the two most popular web browser front-end packages available. Each are produced by third parties and are non proprietary and available off the shelf. 	<ul style="list-style-type: none"> With the popularity of the Internet, the Web Browser has become the standard user interface throughout the world. With a browser front end, the building operator can 'surf' his building site as he would the net. Easy to use, it maintains a consistent look, regardless of the platform it is running on.
TCP/IP CONNECTIVITY Transfer Control Protocol, Internet Protocol	<ul style="list-style-type: none"> Connection between front end and panel uses TCP/IP protocol. Controllers act like Internet Service Provider (ISP) using the PPP wrapper. 	<ul style="list-style-type: none"> Both controllers and front end use the Internet protocol for connection. Unlike BACNET this protocol is a defacto world standard that is actively in use.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
ACCESS VIA THE INTERNET	<ul style="list-style-type: none"> • Connect to your building or buildings via the NET. • Use E-mail to report alarms and building status. • Use chat channels to talk to your operators. 	<ul style="list-style-type: none"> • Saves on telephone charges. • Customize connection mechanism to your needs. • Route messages to multiple people instantly. • Have meetings between operators while they are on line with their own buildings. • Conduct interactive training sessions.
BUILDING LAN COMPATIBILITY	<ul style="list-style-type: none"> • Tie into existing proprietary building LAN, Intranet or Extranet. 	<ul style="list-style-type: none"> • Internet (TCP/IP) functionality means anybody connected to the building intranet or extranet can (with appropriate authority) access any of the connected control systems.
INTERNET FUNCTIONALITY INTERNET COMPATIBILITY	<ul style="list-style-type: none"> • Any functionality available in a WEB browser can be integrated into the control system. • As technology evolves operator can keep his system abreast of new breaking technology. 	<ul style="list-style-type: none"> • Voice, video clips, animation, off-line programs, downloaded images, downloaded programs, chat sessions, e-mail, URL links, • User favorites can be easily added and integrated into the operating environment strategy.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
<p>WIDE SUPPORT OF THIRD PARTY SOFTWARE</p>	<ul style="list-style-type: none"> Because of the Browser based front end and Internet compatible software, any software package can be used in conjunction with Connect-2000 for data input, data analysis, charting, report generation, real time import or export etc. <p>Examples: Microsoft Word, Microsoft Excel, AutoCAD, Paint Shop Pro, Corel, Micrographics designer.</p>	<ul style="list-style-type: none"> Operators can use familiar software products for program creation, graphics creation, system design, data analysis and reporting. No need for retraining on proprietary software. High compatibility with other systems for data sharing.
<p>DIGITAL IMAGERY</p>	<ul style="list-style-type: none"> State of the art ANIMATION. Status at a glance COLOUR CODING. DIGITAL CAMERA IMAGES. Scanned in images. Real time display superimposed over graphic images. Uses gif or jpg images of any type including animated gif. 	<ul style="list-style-type: none"> Group processing of status and alarms makes animation more efficient to program and view than other methods. Seamless integration with other software packages allows operator option of customizing graphics with digital camera photographs, CAD drawings, and scanned images. Digital imagery based graphics substantially reduces engineering time – no need for mechanical drawings. Operator’s imagination is only limitation.
<p>MULTI-TASKING</p>	<ul style="list-style-type: none"> System processes multiple events concurrently. 	<ul style="list-style-type: none"> Alarms and critical information are not delayed while routine sequences are accomplished. Operator can be watching the system in real time while writing a report, reading the manual, having a meeting, or surfing the net.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
MULTI-USER	<ul style="list-style-type: none"> Any number of operators can be connected simultaneously to system via a combination of direct or Internet connectivity. 	<ul style="list-style-type: none"> Operators with different interests can access network transparent to each other.
MULTIPLE WINDOWS	<ul style="list-style-type: none"> A single operator can run multiple copies of the front end concurrently (maximum 8). Instances can all be connected to the same system for concurrent views or be connected to several different locations via the Internet. 	<ul style="list-style-type: none"> A single operator can have multiple concurrent views into one or several systems. He can make program changes while watching their effect dynamically. Alternatively, other monitoring and control packages can be operated concurrently in real time. This would include other Internet compliant vendors' products totally independently.
PROGRAMMED IN JAVA	<ul style="list-style-type: none"> Java Virtual Machine (JVM) is the Operating System that executes the Java code of Connect-2000 and makes it run in any browser. Java is the defacto language standard for the Internet. 	<ul style="list-style-type: none"> Fast learning curve. Java is the most widely used language today and is used for all browser and Internet type applications. Connect-2000 is highly compatible to any off the shelf Java products (or APPLETS) which can be quickly integrated.
INTERNET UPGRADES	<ul style="list-style-type: none"> Software upgrades automatically installed via the Internet. 	<ul style="list-style-type: none"> Most recent revisions of software are easily obtained and loaded.
INTERNET SUPPORT	<ul style="list-style-type: none"> Technical Support and Documentation available twenty-four hours over Internet. 	<ul style="list-style-type: none"> Assistance for operations immediately available around the clock.
INDEPENDENT OPERATION	<ul style="list-style-type: none"> Operation of control system is not dependent on the existence of Connect-2000 or a connected PC. 	<ul style="list-style-type: none"> Control operations remain in remote SAC panels and operate independently of the PC. Panels are not dependent on a third party OS for integrity.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
GLOBAL ACCESS	<ul style="list-style-type: none"> Operator connects to <i>any</i> ROOMSTAT MICROSTAT, or CONTROLLER with a Palmtop, laptop, or any PC capable of running a browser. Any point in the system can be accessed and controlled as if from the main operator workstation (OWS). Terminal access via a dumb terminal or OCD can also be accomplished. 	<ul style="list-style-type: none"> Building operator need not be at the main OWS, or even in the same building to view, over-ride or command any point.
USER CUSTOMIZATION	<ul style="list-style-type: none"> EASY TO SET UP Straightforward process for defining graphics and links. Digital photographs and other images can be quickly integrated into interactive graphics that give full control of the process from the graphic. Additional links to other graphics can be quickly added at any time. 	<ul style="list-style-type: none"> Operator can quickly learn to efficiently use graphic and menu creation techniques to customize the system for his best use. Connect-2000 utility encourages the operator to configure and take ownership of the control system.
DRAG AND DROP GRAPHICAL MODIFICATIONS	<ul style="list-style-type: none"> Addition of Links to other points, programs, or graphics is as simple as selecting the object from a drop down list and dragging it to where you want it located. The resulting hotspot can then be optionally sized be a small area or a whole floor. If the Link is to other graphic, the thumbnail for this graphic can optionally be displayed. 	<ul style="list-style-type: none"> Operator utility.
MULTI LEVEL GRAPHICAL MENU PENETRATION	<ul style="list-style-type: none"> Quick building system access via penetration through operator defined graphic links. 	

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
GRAPHICAL MENU SYSTEM	<ul style="list-style-type: none"> • All system operations from monitoring to programming control strategies are available to the operator from the corresponding graphic. • Mouse or touch-screen operation eliminates the need for a keyboard. • Where required, text based operation is available. • A whole system complete with panel databases can be built by starting with a blank graphic. 	<ul style="list-style-type: none"> • Efficient engineering and system design. • Single, familiar interface is used from the Casual operator to the system programmer. • The system operator can then use the same graphics used for system setup, programming and commissioning (with appropriately adjusted access control).
MOUSE ONLY or TOUCH SCREEN OPERATION	<ul style="list-style-type: none"> • All operations relating to the control and modification of the system can be accomplished via the mouse. 	<ul style="list-style-type: none"> • Point and click or touch screen operator interface.
GRAPHICAL ACCESS TO POINTS, PROGRAMS, SETPOINTS AND SCHEDULES	<ul style="list-style-type: none"> • All database items can be commanded or revised directly from the graphic with easy to use drop down menus. • Includes input and output points, programs, controllers, schedules, trends, alarms, totalizers, etc. 	<ul style="list-style-type: none"> • Instant access and control of the system with no prior knowledge of systems or point names.
SLIDE BAR SCHEDULE MODIFICATION	<ul style="list-style-type: none"> • Weekly and Annual schedules can be quickly and simply viewed and modified using slide bar controls. 	<ul style="list-style-type: none"> • Efficient visual indication. • Ease of use and understanding even for unskilled operators.
ON LINE HELP LOCALLY OR VIA THE INTERNET	<ul style="list-style-type: none"> • Manuals and documentation can be viewed concurrently. • Latest updates and online help is available just a URL away. 	<ul style="list-style-type: none"> • All information always available. • Information updates are available instantly at any time of day.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
DATABASE GENERATION FROM THE FRONT-END BUILT IN CORRESPONDING GRAPHIC	<ul style="list-style-type: none"> Database building is accomplished graphically by placing corresponding points directly on the appropriate graphic then defining them using the database revise features. 	<ul style="list-style-type: none"> All database and points defined directly on associated graphic right from the beginning. Labels text file can be modified concurrently as database is built.
ASCII FORMAT FOR ALL DATABASE, LABELS AND LINK FILES	<ul style="list-style-type: none"> For power users, all database and graphic link files are saved in ASCII files as an intermediate format. Power users can create and revise these files using the editor of his choice. 	<ul style="list-style-type: none"> Programmer can quickly create a database for a new panel by quickly modifying an existing ASCII file.
TRENDING FOR ANY POINT RIGHT ON THE GRAPHIC INSTANT TREND GRAPHING FOR POINTS OR GROUPS	<ul style="list-style-type: none"> Any Database point can be set up for trending right on the graphic. Trends can then be scheduled to scroll to disk automatically. Both timed sample and COV trending can be implemented. Graphing and data analysis using Microsoft Excel or any standard program. 	<ul style="list-style-type: none"> Instant analysis of system operation. Instant access to all trend data in an easy to use format. Real time trending for tuning of control loops.
LABELS FLEXIBILITY	<ul style="list-style-type: none"> Point labels are contained in an ASCII file on the PC and can be easily and quickly modified with a text editor. Point labels file contains all point labels used on the graphics. Size is only limited to hard drive capacity. Labels can be turned on or off quickly to view generic point name or see physical address of point. 	<ul style="list-style-type: none"> Points are self documenting and descriptive. Labels are easy to set up and modify. Easy point location right from the graphic.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
ALARM POINTS AND ALARM GRAPHICS	<ul style="list-style-type: none"> • Points in alarm automatically give a link to the corresponding graphic containing the appropriate system. • A list of all active alarms is available. • Alarms can be quickly viewed and acknowledged by an operator with the correct access level. 	
FRIENDLY PROGRAMMING	<ul style="list-style-type: none"> • Databases are simple and logically laid out and allow complete definition of any desired control strategy. 	<ul style="list-style-type: none"> • Programming is easy to learn and maintain.
INFINITE CASCADING OF POINTS AND VALUES FOR UNLIMITED CONTROL STRATEGIES	<ul style="list-style-type: none"> • Any point either physical or virtual can be used (if logical) as an input parameter value as data for any other point. <p>Example: Set point gain, reset or rate of a controller can be any other point in the system.</p>	
ENGLISH LANGUAGE PROGRAMMING	<ul style="list-style-type: none"> • Programming of control strategies is accomplished on the graphic using easy English like statements and descriptive labels. 	<ul style="list-style-type: none"> • Programs are quick and easy to create and totally self documenting.
UNLIMITED BOOLEAN EXPRESSION USING ALL DATABASE POINTS	<ul style="list-style-type: none"> • Any database point can be included in the input or output side of a Boolean expression in GCL. 	
PROGRAMMING THE SAME FOR ANY PANEL	<ul style="list-style-type: none"> • All SAC programmable panels have identical databases. 	
HISTORY WINDOW	<ul style="list-style-type: none"> • All operator activity recorded. 	<ul style="list-style-type: none"> • Connect-2000 automatically records every operator sign on times and activity.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
PASSWORD SECURITY	<ul style="list-style-type: none"> • Each operator can have a domain of graphics assigned to him. Within this assigned domain, each point can be enabled for view only or access for modification. • There are 6 levels of password access available for each point including always enabled and always disabled. 	<ul style="list-style-type: none"> • Tight programmable control of operator accesses.
PRICING STRATEGY	<ul style="list-style-type: none"> • Software is priced on a per panel base for full functionality product. 	<ul style="list-style-type: none"> • Low price system startup. • Full functionality for every operator. • Lower support cost. • Lower operational cost – only one product to learn on.
GROUP POINTS	<ul style="list-style-type: none"> • Group processing of alarms and status makes alarm monitoring and annunciation more efficient to program with than conventional methods. • Tied into group points animation allows whole groups of points to indicate their value in color. 	<ul style="list-style-type: none"> • Easy to program and modify system. • More visible and readable system status.

CONNECT-2000 BROWSER BASED FRONT END

FEATURE	FUNCTION	BENEFIT
COLOR ANIMATION	<ul style="list-style-type: none"> We can see color to indicate status faster than we can see numeric data. Use colour bar animation to show level of tank or graduations of temperature. Use colour spot animation in groups of similar things to show status at a glance. <p>Example: floor zone temperatures.</p>	<ul style="list-style-type: none"> Operator is able to quickly view conditions at a glance. Less room for errors from busy operators.
ANIMATION	<ul style="list-style-type: none"> Values can be colour coded to allow operators instant visual recognition of normal or non-normal states. Animation can also be used for indication of bar graphs etc. 	<ul style="list-style-type: none"> Animation adds a high level of visibility and utility to the system.
OFF-LINE OPERATION	<ul style="list-style-type: none"> Database and Graphics can be created and tested off-line for easy engineering. 	<ul style="list-style-type: none"> Work at home or on the ferry.

FEATURE	FUNCTION	BENEFIT
MODULAR DDC CONTROLLER	<ul style="list-style-type: none"> High speed “workhorse” controller designed for the control of major mechanical and electrical equipment. 	<ul style="list-style-type: none"> Provides standard or customized solution for applications involving boiler and chiller plant equipment and large air handling units.
COMPLETELY PROGRAMMABLE WITH FULL DATABASE CREATION CAPABILITY	<ul style="list-style-type: none"> Can be used as a fully functional single panel system or integrated into a large system as a supervisory controller with complete programming and diagnostic capabilities. 	<ul style="list-style-type: none"> Has ability to build and revise a database for any connected panel anywhere in the system.
32 UNIVERSAL I/O	<ul style="list-style-type: none"> 16 Universal Inputs. 16 Universal Outputs 	<ul style="list-style-type: none"> Complete flexibility for input and output point configuration.
EXPANDABLE CAPACITY	<ul style="list-style-type: none"> Easily expanded to 72 inputs / outputs. 	<ul style="list-style-type: none"> Expander modules provide capacity for high point density areas or single panel systems.
12 BIT A/D RESOLUTION	<ul style="list-style-type: none"> Industrial rating of Analog to Digital conversion. 	<ul style="list-style-type: none"> Provides highly precise, accurate sampling of temperatures or fluctuating analog voltages or currents.
GLOBAL SYSTEM ACCESS	<ul style="list-style-type: none"> Any panel can be placed anyplace. Any point’s value can be shared with any other panel. Any point can be trended and any points can be combined in the same trend. Any point’s data can be prioritized and be treated with the urgency of an alarm. 	<ul style="list-style-type: none"> Panels can be placed where they logically belong. Information relative to one piece of equipment does not necessarily have to be connected to the same panel as the other points.

FEATURE	FUNCTION	BENEFIT
INDUSTRY STANDARD I/O	Inputs: 0-1 VDC 0-5 VDC 0-10VDC 1-5 VDC 2-10VDC 0-20mA 0-50mA 4-20mA 1 mA to Ground 10 mA to Ground Outputs: 0-5 VDC 0-10VDC 2-10VDC 4-20mA 24 VDC Triac 24VAC @300mA	<ul style="list-style-type: none"> • Accepts industry standard sensors and actuators. Perfect for retrofit as well as new construction projects.
ALARMS	<ul style="list-style-type: none"> • 6 Alarms per Second. 	
TRENDS	<ul style="list-style-type: none"> • 255 Trend log points per controller. 	<ul style="list-style-type: none"> • Trending done at controller level. • Can be transmitted to or combined with other panels, and/or exported to third party software.
HOA SWITCHES ON BOARD	<ul style="list-style-type: none"> • 16 three position HOA provide override capability for each universal output. 	<ul style="list-style-type: none"> • Provides control to drive output devices to override position from DDC panel.
LED OUTPUT STATUS INDICATION	<ul style="list-style-type: none"> • 16 LEDs indicating status of either digital output (on/off) or analog output (varied, pulsating, light intensity). 	<ul style="list-style-type: none"> • Technician identifies at a glance the status of each output, digital or analog.
RECEIVE & TRANSMIT DIAGNOSTIC LEDs	<ul style="list-style-type: none"> • Color coded LEDs indicate communication status of information being transmitted or received over highway to controller. 	<ul style="list-style-type: none"> • Technician easily determines communication status of a controller at a glance.

FEATURE	FUNCTION	BENEFIT
AUTODIAL / AUTO ANSWER	<ul style="list-style-type: none"> Each panel has capability of receiving or transmitting information over hardwired LAN, WAN, or telephone system through a modem to other parts of the network or other systems all together. 	<ul style="list-style-type: none"> Remote sites and equipment can function completely in- dependent from the rest of the network.
FIXED FUNCTION OR CUSTOMIZED PROGRAMMING	<ul style="list-style-type: none"> Up to 16 independent side loops can be custom programmed or "fixed function" (canned) programs can be installed. Fixed function programs can be installed, then customized. 	<ul style="list-style-type: none"> Complete flexibility of control sequencing can be achieved.
STAND ALONE CONTROLLER	<ul style="list-style-type: none"> REAL TIME IC CLOCK on board. 	<ul style="list-style-type: none"> Controller easily programmed for independent or unique schedules.
ON/OFF TOGGLE SWITCH	<ul style="list-style-type: none"> Each panel is factory wired with ON/OFF switch. 	<ul style="list-style-type: none"> Power controlled at the panel for easy maintenance and troubleshooting.
PROTECTIVE FUSES	<ul style="list-style-type: none"> Panel is fuse protected. 	<ul style="list-style-type: none"> Electrical safety.
SUPERCAP BATTERY BACKUP	<ul style="list-style-type: none"> Electronically charged "SuperCap" replaces conventional battery. 	<ul style="list-style-type: none"> Eliminates battery replacement cost and trouble.
SYSTEM WIDE DIAGNOSTICS	<ul style="list-style-type: none"> Built in, menu driven, diagnostic tools. 	<ul style="list-style-type: none"> Speeds system troubleshooting.
RAM MEMORY	<ul style="list-style-type: none"> Memory stored in 512 K RAM. 	<ul style="list-style-type: none"> Intelligence required for all levels of energy management from loss during power outage
MENU DRIVEN OPERATOR INTERFACE	<ul style="list-style-type: none"> Interface from Windows Internet Browser, Operator Work Station, over LAN, WAN, modem (or direct connection), intelligent space temperature sensor, or OCD. English like programming language resident in each panel (GCL). 	<ul style="list-style-type: none"> Un-intimidating easy to use, programming is in conversational English and the same in every panel.



FEATURE	FUNCTION	BENEFIT
MULTI-LEVEL PASSWORD SECURITY	<ul style="list-style-type: none">• 4 levels of access.	<ul style="list-style-type: none">• Each operator can have his own password.• Four levels of security are available.• Access can be restricted to panels or authority.

FEATURE	FUNCTION	BENEFIT
NETWORK HUB	<ul style="list-style-type: none"> • Provides connections and functionality required for multi-segmented SmartLAN networks. • Adds 2 local SmartLAN segments to existing SmartLAN main segment. • Each local SmartLAN segment supports up to 50 Stand Alone Controllers (SACs). 	<ul style="list-style-type: none"> • LAN can be configured logically and cost effectively. • Special alarm and communications handling provide a very powerful supervisory controller for large systems. • Provides a means for effective zone management for physical zones or common equipment. • Allows for all programming, diagnostic and supervisory functions of a zone to be available at one location.
SMARTLAN BUFFER	<ul style="list-style-type: none"> • Buffers traffic between attached LAN segments, or traffic such as alarms, even destined to itself. 64K RAM available. 	<ul style="list-style-type: none"> • Accelerated alarm handling and optimal network traffic management on larger systems.
FULL DATABASE CREATION CAPABILITY	<ul style="list-style-type: none"> • Database program creation for any controller on network 	<ul style="list-style-type: none"> • System does not require front end presence with proprietary software to create database for other controllers on system. • Windows non-proprietary 'Hyperterminal' software can be used to load data into any WS1600 or WS1616 panel.

FEATURE	FUNCTION	BENEFIT
256K RAM EXPANDABLE	<ul style="list-style-type: none"> • Additional CPU power for systems requiring large calculations or extra trending. 	<ul style="list-style-type: none"> • Any point's data can be trended in combination with any other point in the system. • Trending can be done in any controller and/or the Network Hub. • Trend data storage space = 512K.
I/O BUS COMPATIBILITY	<ul style="list-style-type: none"> • ASCII protocol for I/O BUS systems integration. 	<ul style="list-style-type: none"> • Cost effect addition of future points of control for expansion or retrofit needs. • Addition of panels with small quantity of inputs / outputs with or without intelligent sensors is possible.
ISOLATED SWITCHING POWER	<ul style="list-style-type: none"> • More energy efficient – less heat. • Oscillator based voltage converter. • Efficiency is typically 98% or better. • Operates over larger voltage range (18 to 24 VAC) to allow ganging. 	<ul style="list-style-type: none"> • Lower Maximum time between Failures (MTBF). • High noise immunity. • Lower installed cost.

FEATURE	FUNCTION	BENEFIT
COMMUNICATION / POWER SUPPLY STATUS INDICATION	<ul style="list-style-type: none"> • Visual representation of correct LAN and power supply operation. 	<ul style="list-style-type: none"> • Colour-coded LED's indicate presence of power and communication to and from panel. • Technician identifies status at a glance.
FLASH MEMORY	<ul style="list-style-type: none"> • Database (program) and Operating System storage. 	<ul style="list-style-type: none"> • Operating system upgrades accomplished with minimal labor costs.
SUPERCAP BATTERY BACKUP	<ul style="list-style-type: none"> • Electronically charged "SuperCap" replaces conventional battery. 	<ul style="list-style-type: none"> • Eliminates battery replacement costs.
REAL-TIME CLOCK ONBOARD	<ul style="list-style-type: none"> • Each panel has complete standalone capability, with or without network to other panels on system. 	<ul style="list-style-type: none"> • Each controller easily programmed independent or with unique schedules. • Automatic stand alone capability.
MENU DRIVEN OPERATOR INTERFACE	<ul style="list-style-type: none"> • English like programming language (GCL) resident in panel. 	<ul style="list-style-type: none"> • Runs without proprietary front-end • All program editing functions available from intuitive menu driven interface
MULTILEVEL PASSWORD SECURITY	<ul style="list-style-type: none"> • 4 Access Levels. 	<ul style="list-style-type: none"> • Each operator can have his own distinct sign-on password, restricting each operator from any specific controller.
ENGLISH LANGUAGE GENERAL (GCL) CONTROL LANGUAGE	<ul style="list-style-type: none"> • Resident and used in every controller. 	<ul style="list-style-type: none"> • English like programming language - easy to read, write and understand.
GLOBAL SYSTEM ACCESS	<ul style="list-style-type: none"> • Can be placed anyplace on LAN. 	<ul style="list-style-type: none"> • System wide programming and diagnostics available.



WS1600 NODE CONTROLLER

FEATURE	FUNCTION	BENEFIT
AUTO-DIAL AUTO-ANSWER	<ul style="list-style-type: none">• Each panel has capability of receiving or transmitting information over hardwired LAN, WAN, or modem, with or without connection to the DDC system.	<ul style="list-style-type: none">• Remote sites and equipment can function completely independent from the rest of network.
32-122 DEGREE F OPERATING RANGE	<ul style="list-style-type: none">• Tolerant to all normal building temperature conditions.	<ul style="list-style-type: none">• Suitable for placement in mechanical rooms or at remote equipment.

FEATURE	FUNCTION	BENEFIT
MODULAR DDC CONTROLLER	<ul style="list-style-type: none"> • Low cost programmable controller for low point density or unitary applications. 	<ul style="list-style-type: none"> • Perfect for terminal equipment control.
INDUSTRY STANDARD I/O	<p>INPUT:</p> <ul style="list-style-type: none"> 0-1 VDC 0-5 VDC 0-10 VDC 1-5 VDC 2-10 VDC 0-20 mA 4-20 mA 0-50 mA 3K Thermister (-10°C to 140°C) 1K Thermister (-40°C to 40°C) 1 mA to GRND/10 mA to GRND <p>OUTPUTS:</p> <ul style="list-style-type: none"> 0-5 VDC 0-10 VDC 2-10 VDC 24 VAC@300mA (S.S. Relay) 4-20 mA 	<ul style="list-style-type: none"> • Accepts industry standard sensors and actuators. • Perfect for retrofit as well as new construction projects.
OUTPUT EXPANDER BOARDS	<ul style="list-style-type: none"> 4 DO 24 VAC Triac 8 DO 24 VAC Triac 2 AO 1-10 VAC / 4 - 20 mA 	
MICROBRIDGE (OPTIONAL)	<ul style="list-style-type: none"> • VAV monitoring and control. 	<ul style="list-style-type: none"> • Configured for VAV box application.
BELIMO MOTOR & ENCLOSURE	<ul style="list-style-type: none"> • VAV applications. 	<ul style="list-style-type: none"> • Lower Cost solution to VAV applications. • Smaller, lightweight VAV motor and case. • Easy to install. • High torque, DC motor drive.
EEPROM	<ul style="list-style-type: none"> • Program stored in non-volatile memory. 	<ul style="list-style-type: none"> • No database loss during power outage.

MicroSAC CONTROLLERS

FEATURE	FUNCTION	BENEFIT
I/O BUS COMPATABLE	<ul style="list-style-type: none"> Allows for SAC I/O point expansion. 	<ul style="list-style-type: none"> Cost effect addition of future points of control for expansion or retrofit needs. Addition to panels with small quantity of inputs / outputs with or without intelligent sensors is possible.
FLASH MEMORY	<ul style="list-style-type: none"> Stores database and program data. O/S Upgrade downloadable over SmartLAN network. 	<ul style="list-style-type: none"> Automatic power failure protection. Eliminates majority of field installation time when O/S upgrade is required.
FULLY PROGRAMMABLE	<ul style="list-style-type: none"> All panels are fully programmable via fixed function algorithms and English like programming language (GCL). Resulting code is self documenting 	<ul style="list-style-type: none"> Easy to write. Easy to read. Easy to change. Easy to understand. Easy to modify at a later date. Description of operation is the program itself.
EXPANDABLE REAL TIME CLOCK	<ul style="list-style-type: none"> Real time clock available with addition of clock module. Battery backup retains time during power failure. 	<ul style="list-style-type: none"> Provides battery backed up real time clock for unitary controller applications. Maintains time/date related functions.
COMMUNICATIONS STATUS LEDS	<ul style="list-style-type: none"> Color coded LEDs indicate communication status. 	<ul style="list-style-type: none"> Technician identifies at a glance the status of the SmartLAN network.
8 BIT A/D RESOLUTION	<ul style="list-style-type: none"> High resolution, better accuracy. Multiple average sampling is equivalent to Industrial Controller technology. 	<ul style="list-style-type: none"> High resolution is maintained when reading in temperatures, fluctuating analog voltages or currents.

FEATURE	FUNCTION	BENEFIT
MULTI-LEVEL PASSWORD PROTECTION	<ul style="list-style-type: none"> • 4 Levels of access. 	<ul style="list-style-type: none"> • Each operator may have his own password.
GCL	<ul style="list-style-type: none"> • Resembles conversational English 	<ul style="list-style-type: none"> • Easy to write. • Easy to read. • Easy to change. • Easy to understand. • Self documenting.
GLOBAL SYSTEM ACCESS	<ul style="list-style-type: none"> • Can be placed anywhere on LAN. 	<ul style="list-style-type: none"> • System wide access to point data. • System wide Program modification and creation through Connect-500. • System wide program modification and creation using Connect-2000 available Jan. 1999.
FIXED FUNCTION VAV ROUTINES AVAILABLE	<ul style="list-style-type: none"> • Panels can be pre-loaded at factory with fixed function applications for 'plug and play' operation. • Programs can be easily varied at a later date if required. 	<ul style="list-style-type: none"> • Reduced installation time for standard Applications. • Increased flexibility to handle minor modifications or additions to standard applications. • Programmable unitary controllers allow the best of both worlds.
AVAILABLE IN ENCLOSURES FOR VAV OR UNITARY APPLICATIONS	<ul style="list-style-type: none"> • Protective metal enclosure for installation in extreme environments and/or house damper motors and VAV ports. 	<ul style="list-style-type: none"> • Rugged protection for controller with or without damper motor and VAV ports.

MiniSAC 60 CONTROLLER

FEATURE	FUNCTION	BENEFIT
MODULAR DDC CONTROLLER	<ul style="list-style-type: none"> • Full function, mid sized process controller ideal for the control of boilers, chillers and packaged air conditioning units. 	<ul style="list-style-type: none"> • Low cost programmable controller for low point count or unitary applications. • For the applications that are too big for the smaller MicroSACs and don't need the high point count and supervisory capability of the WS1616.
MEDIUM POINT COUNT DENSITY	<ul style="list-style-type: none"> • 8 Universal Inputs. • 8 Digital Outputs (Triac). • 4 Universal Outputs. 	<ul style="list-style-type: none"> • Medium point count. • High flexibility.
FLASH MEMORY	<ul style="list-style-type: none"> • Contains each controllers operating system and database. • Non-volatile memory. • Allows database or operating system download over the SmartLAN network. 	<ul style="list-style-type: none"> • Automatic power failure protection. • Eliminates majority of field installation time when O/S upgrade is required.
I/O BUS COMPATABLE	<ul style="list-style-type: none"> • Allows for SAC I/O point expansion. 	<ul style="list-style-type: none"> • Cost effect addition of future points of control for expansion or retrofit needs. • Addition to panels with small quantity of inputs / outputs with or without intelligent sensors is possible.
WATCHDOG TIMER	<ul style="list-style-type: none"> • Hardware watchdog timer resets panel if OS program hangs or crashes in the unlikely event of a software bug or noise induced failure. 	<ul style="list-style-type: none"> • Panel will automatically reset if software locks up.

FEATURE	FUNCTION	BENEFIT
ON BOARD REAL TIME CLOCK	<ul style="list-style-type: none"> • Maintains system time and date. • Battery backup retains time during power failure. 	<ul style="list-style-type: none"> • No need to reset time and date after power outage. • All time/date related functions continue to operate properly.
OS UPGRADABLE OVER LAN	<ul style="list-style-type: none"> • Allows database or operating system download over SmartLAN highway 	<ul style="list-style-type: none"> • Cost savings in reduced field time during O/S upgrade.
12 OR 24 VAC INPUT SWITCHING POWER SUPPLY	<ul style="list-style-type: none"> • More energy efficient – less heat. • Oscillator based voltage converter. • Efficiency is typically 98% or better. • Operates at either 12 to 24 VAC. 	<ul style="list-style-type: none"> • Lower mean time between failures (MTBF). • High noise immunity. • High brownout immunity. • Lower installed cost.
INDUSTRY STANDARD I/O	<p>INPUT:</p> <ul style="list-style-type: none"> 0-1 VDC 0-5 VDC 0-10 VDC 1-5 VDC 2-10 VDC 0-20 mA 4-20 mA 0-50 mA 3K Thermister (-10°C to 140°C) 1K Thermister (-40°C to 40°C) 1 mA to GRND/10 mA to GRND <p>OUTPUTS:</p> <ul style="list-style-type: none"> 0-5 VDC 24 VAC@300mA 0-10 VDC 2-10 VDC 4-20 mA 	<ul style="list-style-type: none"> • Accepts industry standard sensors and actuators. • Perfect for retrofit as well as new construction projects.

FEATURE	FUNCTION	BENEFIT
LED OUTPUT INDICATION	<ul style="list-style-type: none"> • Color coded LEDs indicate communication and power supply status. • 12 LEDs indicate status of either digital output (on/off) or analog output (varied, pulsating, light intensity). 	<ul style="list-style-type: none"> • Technician identifies at a glance the status of the SmartLAN network and each output, digital or analog.
12 BIT A/D RESOLUTION	<ul style="list-style-type: none"> • Higher resolution, better accuracy. • Multiple average sampling is equivalent to Industrial Controller technology. • Multiple averaged sampling gives resolution up to 14 bits. 	<ul style="list-style-type: none"> • High resolution (one part in 4000 or better) is maintained when reading in temperatures, fluctuating analog voltages or currents.
SUPERCAP BACKUP	<ul style="list-style-type: none"> • Supercap used instead of battery to provide backup in the event of a power failure. • Retains time and date during power failure. 	<ul style="list-style-type: none"> • Eliminates the cost of battery replacement.
MENU DRIVEN OPERATOR INTERFACE	<ul style="list-style-type: none"> • Provides easy to use menu driven interface to panel. • Access to system wide database programming (GCL) provided with Connect-500. • Connect-2000 support for system wide database programming through MiniSAC available Jan. 1999. 	<ul style="list-style-type: none"> • Un-intimidating easy to use, programming is in conversational English and the same in every panel.
MULTI-LEVEL PASSWORD PROTECTION	<ul style="list-style-type: none"> • 4 Levels of access. 	<ul style="list-style-type: none"> • Each operator may have his own password.

FEATURE	FUNCTION	BENEFIT
GCL	<ul style="list-style-type: none"> • Resembles conversational English 	<ul style="list-style-type: none"> • Easy to write. • Easy to read. • Easy to change. • Easy to understand. • Self documenting.
GLOBAL SYSTEM ACCESS	<ul style="list-style-type: none"> • Can be placed anywhere on LAN 	<ul style="list-style-type: none"> • System wide access to point data. • System wide Program modification and creation through Connect-500. • System wide program modification and creation using Connect-2000 available Jan. 1999.
FIXED FUNCTION OPTIONS	<ul style="list-style-type: none"> • Night Cycle and Purge. • Peak Demand Limiting. • Scheduled and Optimum Start/Stop. • Enthalpy control. 	
32K RAM 32K ROM	<ul style="list-style-type: none"> • Database Storage. 	

I/O EXPANSION BUS

FEATURE	FUNCTION	BENEFIT
PLUG & PLAY/AUTO MAPPING	<ul style="list-style-type: none"> External points or devices have points automatically mapped into the host panel database. Virtual or physical points mapped to host database. 	<ul style="list-style-type: none"> Points can be 'seen' globally in the system.
EASY RETROFIT	<ul style="list-style-type: none"> Can be added to any installed SAC. 	<ul style="list-style-type: none"> Can add to 10 year old installations.
LONG DISTANCE I/O	<ul style="list-style-type: none"> Can be located up to 2000 feet from host panel. 	<ul style="list-style-type: none"> Pick up single point a long way away.
LOW POWER TYPE 2 WIRING	<ul style="list-style-type: none"> All devices are low energy type 2 rating. 	<ul style="list-style-type: none"> Low cost wiring. Very little code scrutiny from regulatory bodies or inspectors.
TWO WIRE CIRCUIT	<ul style="list-style-type: none"> Power and communications on same buss. 	<ul style="list-style-type: none"> Lower cost installation.
ALL DEVICES POWER OFF BUSS	<ul style="list-style-type: none"> Powered off the bus or can use external power if extra load is needed. 	<ul style="list-style-type: none"> No need for extra power wiring or transformers. Saves installation costs
LOW IMPEDANCE WIRE LOW NOISE COMMUNICATION	<ul style="list-style-type: none"> Zero impedance communication technique absolutely prevents noise induced communications problems. 	<ul style="list-style-type: none"> Highest integrity operation. Highest possible noise immunity and brown out protection.
LINE LOSS COMPENSATION	<ul style="list-style-type: none"> Differential receiver/transmitter stages on all devices ensures high noise immunity operation and proper operation even under marginal conditions. 	<ul style="list-style-type: none"> Trouble free communications.
SHORT CIRCUIT PROTECTION	<ul style="list-style-type: none"> I/O Bus is completely short circuit protected. In fact, communication is achieved by repeatedly shorting the wire to pass ASCII Codes. 	<ul style="list-style-type: none"> Completely fault tolerant system.

I/O EXPANSION BUS

FEATURE	FUNCTION	BENEFIT
T-TAP CAPABILITY	<ul style="list-style-type: none"> • Devices can be 'T tapped' off main run at any location convenient. 	<ul style="list-style-type: none"> • Low cost installation. • Inexpensive upgrade or later addition. • Dramatic reduction in wiring cost. • No home-run wiring.
SMART DEVICES	<ul style="list-style-type: none"> • All modules are microprocessor based so they can do data conversion, communication and other smarts. • Off loads processing from host panel. 	<ul style="list-style-type: none"> • Low cost distribution of control system. • Smart end devices add features, functionality and flexibility at low cost.
UNITARY OPERATIONS	<ul style="list-style-type: none"> • Ample processing power for unitary applications. 	<ul style="list-style-type: none"> • Low cost, high powered units. • High connectivity and flexibility simply connected to powerful facilities management system.
COMMUNICATION IN ASCII	<ul style="list-style-type: none"> • ASCII protocol allows easy inter-device communications and high level diagnostics. • Standard devices can interface easily to third party products. 	<ul style="list-style-type: none"> • High degree of interoperability.
LIVE INSTALLATION INSTALL AND COMMISSION IN SINGLE STEP	<ul style="list-style-type: none"> • Install devices with I/O bus live to instantly verify proper installation. • This is the recommended installation procedure. 	<ul style="list-style-type: none"> • Greatly reduces installation time.
SELF DIAGNOSTIC	<ul style="list-style-type: none"> • LED service tool instantly indicates integrity of communications and indicates quickly where short has occurred. • Software indicates which devices are communicating. 	<ul style="list-style-type: none"> • Low cost installation. • Low service cost.

FEATURE	FUNCTION	BENEFIT
PLUG AND PLAY	<ul style="list-style-type: none"> • Devices automatically appear in the host controller's database once they are connected. 	<ul style="list-style-type: none"> • Reduced engineering time. • Makes customer additions a synch.
CUSTOM MODULES	<ul style="list-style-type: none"> • Technology lends itself to rapid development of custom modules. • Supervisory configuration and integration of these modules has already been done. No additional work is required at the system level to map points from new devices or modules. • New modules can be developed and added to an existing system without changing the firmware of the host controller. 	<ul style="list-style-type: none"> • Existing installations can have newly developed modules added. • Walker can custom build modules for single job if volume is higher. • Algorithms can be created and implemented by the vendor in the host panel to verify operation or modify unitary operation for special applications.
SEAMLESS INFORMATION	<ul style="list-style-type: none"> • Because points are mapped to host database, they are automatically available to the total control system as system points. 	<ul style="list-style-type: none"> • No special software or hardware consideration.
OFFLOAD PROCESSING	<ul style="list-style-type: none"> • By doing processing in the I/O BUS modules, host panel is offloaded allowing higher point density. 	<ul style="list-style-type: none"> • Lower cost systems. • Larger point expansion capacity.