Appendix A -Glossary

$\boxed{A}$

ABORT A signal used to terminate the current process.

ACTIVE LIGHT An LED Indicator on most I/O modules, which indicates the module is communicating properly with the controller. Use as a maintenance aid.

ADDRESS A numeric value used to identify a specific channel, module, I/O point or communication port.

ADDRESS INDEX PIN A mechanical device which screws into one of eight detents and establishes an address for a specific 200 Series I/O housing slot.

ADDRESS SELECTOR A switch on a 500 series I/O housing used to establish the housing address.

ANALOG INPUT MODULE Analog input modules accept signals from the users' field device (e.g. a 4-20 mA signal from a level transmitter), perform an analog to digital conversion, and transmit the digital result to the programmable controller.

ANALOG OUTPUT MODULE Analog output modules accept digital information from the PLC, perform a digital to analog conversion, and provide the result to the users' field device (e.g. a 4-20 mA signal to a valve actuator).

ANALOG SIGNAL A continuously varying signal such as voltage or frequency.

AND FUNCTION This function logically "AND" each bit in a source matrix with a corresponding bit in a second (destination) matrix.

ASCII A 7-bit digital coding of standard alphanumeric characters as established by the American National Standards Institute. ASCII stands for the American Standard for Information Interchange.

ASYNCHRONOUS Having a variable time interval between successive bits, characters, or events. In asynchronous data transmission, each word is individually synchronized using start and stop bits.

B

BAUD The rate of speed digital data is transmitted or received. Derived from the name BAUDOT and equivalent to bits per second.

BCD (BINARY CODED DECIMAL) A numerical system wherein values are represented by only two digits; 0 and 1. This system is commonly used in digital equipment because circuits can be economically designed using semiconductor technology. A transistor switch can be biased off to represent a logical "0", or on to represent a logical "1".

BINARY A numerical system wherein values are represented by only two digits; 0 and 1. This system is commonly used in digital equipment because circuits can be economically designed using semiconductor logic. A transistor switch can be biased off to represent a logical "0", or on to represent a logical "1".

BIT An acronym for binary digit. This is the smallest unit of information in the binary numbering system. Bits are represented by the digits 1 and 0.

BIT MODIFY FUNCTION Its function alters a specific bit within a matrix. Bits may be set to a "1" or cleared to a "0".

BIT SENSE FUNCTION This function determines the state, "1" or "0", of a specific bit within a matrix.

BLOCK MOVE This function copies, during one scan, the entire contents of any table to a table of outputs or holding registers.

BUS An electrical conduit used to send or receive data.

BYTE A sequence of binary digits usually operated upon as a unit. Typically = 8 bits.

C

CALCULATE FUNCTION These functions are used to add, subtract, multiply, divide or compare two numerical values.

CASCADE FUNCTION Connecting two or more functions together to control one output. For example, timers and counters can be cascaded to produce results that cannot be achieved by one counter or timer.

CATV Rigid, well shielded coax cable with dB loss of 0.8 dB/1000 feet.

CD (CARRIER DETECT) A signal indicating the carrier is being received. (Pin 89 of an RS-232C connector)

CHANNEL A group of I/O modules that are separately connected to the controller. A channel of I/O can contain up to 128 inputs and 128 outputs.

CHARACTER One set of elementary symbols, such as a letter of the alphabet or a decimal number. Characters may be expressed in many binary codes. For example, an ASCII character is a group of 7 bits.

CHARACTER One of a set of elementary symbols, such as a letter of the alphabet or a decimal numeral. Characters may be expressed in many binary codes. For example, an ASCII character is a group of 7 bits.

CHECKSUM An error detection code that sums all the one bits in a group of registers or data storage locations. The known result is stored: any variance from this result indicates data has been changed.

CIRCUIT CARD A printed circuit board containing electronic components.

CLEAR To return a memory to a non-programmed state (all zeroes).

CLOCK Pulse generator that synchronizes the timing of various logic circuits and memory in the processor.

CLOCK RATE The speed (frequency) at which the processor operates as deter mined by the rate at which words or bits are transferred through internal logic ' quences.

CMOS Complementary metal oxide semiconductor. An integrated circuit family with low power consumption and high noise immunity.

CPU (CENTRAL PROCESSING UNIT) The e "brain" of the controller system, wherein the customer's logic and executive are stored; all logic solving and decision making is performed by the CPU. Also called the processor.

COIL 1. A discrete element which can be on or off based on the result of power flow within the users' ladder logic program. A coil is used to activate logic within the users' program, or to control an output. 2. The electromagnet in a relay.

COMMUNICATION NETWORK A serial data link which provides communication among multiple stations which may be separate PLC's, computers, or data terminals.

COMPARE FUNCTION This function compares the bit pattern of one matrix against the bit pattern of a second matrix for discrepancies.

COMPLEMENT FUNCTION This function copies the complement of an inverted bit pattern (all "1's" are replaced with "0's", all "0's" are replaced with "1's") of one matrix into a second matrix.

COMPUTER A device incorporating a CPU, memory, I/O facilities, power supply, and cabinet that accepts information, processes it in a prescribed manner, and supplies the results of these processes.

COMPUTER INTERFACE A device designed for data communication between a computer and another unit such as a printer.

CONFIGURATION The procedure which defines the 984's database. Includes setting system size, communication parameters, memory allocation, and addressing.

COUNTER An electromechanical device which can count the transitions of an input. Typically has relay contacts which change state when a preset number of counts is reached.

COUNTER FUNCTIONS The 984 has both up counter (UCTR) and down counter (DCTR) functions. These count the transitions of a control input from on to off. The up counter counts up from zero to a preset number, and the down counter counts down from the preset to zero.

CRT An acronym for cathode ray tube; the video display device used in programming panels (e.g. the P190), televisions, oscilloscopes, etc.

CTS (CLEAR TO SEND) A signal that tells the transmitting device that it may now place data on the transmit data line (pin 5 of an RS-232C connector).

CURSOR A visual movable pointer used on a CRT to locate where instructions will be added or edited.

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DATA TRANSFER FUNCTION The technique of moving and manipulating data within the controller.

DELIMITER A special ASCII character that terminates or ends an ASCII communication; normally a carriage return.

DIAGNOSTIC PROGRAM A test program to help isolate hardware malfunctions in programmable controllers.

DENSE I/O modules and connectors that allow more I/O points than the standard configuration.

DIGITAL Having discrete states. Typically two states: ON and OFF.

DISABLE The capability of removing a logic coil or discrete input from program control. A disable coil or input may then be "forced" ON or OFF manually.

DISCRETE REFERENCE A reference that can be either ON or OFF. A discrete reference can be an input, output, or internal logic element.

DISTRIBUTED SYSTEM Any combination of PLC's, computers, and data terminals communicating via a network.

DOUBLE PRECISION FUNCTION The technique of storing a single numerical value in two consecutive registers. Since each register can store up to four digits (maximum value 9,999), double precision allows a value of up to 99,999,999 to be stored.

DROP Two channels of I/O, 256 input points and 256 output points.

DSR (DATA SET READY) A signal indication the modem is connected, powered up, and ready (pin 6 of an RS-232C connector).

DTR (DATA TERMINAL READY) A signal indicating the transmitting device is connected, powered up, and ready (pin 20 on an RS-232C connector).

DUMP Recording the entire or partial contents of user memory onto a storage medium (e.g. magnetic tape,floppy disk, etc.).

DUPLEX

A means of two way communication (see full duplex and half duplex).

DX The abbreviation for data transfer.

E

EDIT To deliberately modify the user program.

EIA Electronic Industries Association. This organization establishes data communication standards.

ELEMENT The basic building block of the PLC ladder logic. An element can be a relay contact, horizontal short, vertical short, coil, or function block. Sometimes referred to as a logic element.

ENABLE To reactivate a logic coil or discrete input after it has been disabled.

EXCLUSIVE OR FUNCTION (XOR) This function logically "XORS" each bit in a source matrix with its corresponding bit in a destination matrix. If either bit is a "1", the bit in the destination matrix will be set to a "1". If both bits are a "1" or a "0", the bit in the destination matrix will be cleared to a "0".

EXECUTIVE An operating system that processes the user logic program.

EXTENDED MEMORY Additional memory, up to 96K max, available in the 984B only. BCD, 16 bit binary, hex, and ASCII data may be stored using the extended memory write function (XMWT), or retrieved using the extended memory read function (XMRD)

F

FIRST IN (FIN) / FIRST OUT (FOUT) FUNCTIONS These two functions are normally used together to create a FIFO (First In / First Out) stack. A FIFO stack is a table that maintains the order data was entered.

FORCE Manually controlling a disable input or output via a programming panel.

FULL DUPLEX (FDX) A mode of communication in which data is transmitted in two direction at the same time.

H

HALF DUPLEX (HDX) A mode of data transmission capable of communication in two directions, but only one direction at a time.

HARD COPY Any form of printed document such as a ladder diagram program listing.

HARDWARE Physical equipment (e.g. mechanical, electrical, and electronic devices).

HEXADECIMAL The numbering system that represents all possible ON/OFF combinations of four bits with sixteen unique digits (0-9 then A-F).

HOST COMPUTER A computer that monitors and controls other computers and peripheral devices.

HOUSING Device which I/O modules plug into. Also called the rack.

I

IMAGE TABLE A table in the PLC memory that contains the status of all inputs, coils, and registers. Also called the "State RAM".

INPUT A signal that provides information to the programmable controller. Can be a discrete (e.g. push-button, relay contact etc.), BCD (e.g. thumbwheel switches), or binary (analog transmitter).

INPUT DEVICE Devices such as limit switches, push-buttons, pressure switches, etc., that supply the programmable controller with data.

INPUT MODULE Accept input device signals from the users' machine or process.

INSTRUCTION A command or order that will cause a programmable controller to perform one certain operation. See also ELEMENT.

INTERFACING Interconnecting a controller with its application devices, and data terminals through various modules and cables.

I/O Input/Output, the programmable controller connection to the "real world".

I/O MODULE The modular component which mounts in a housing and provides the electrical connections between the controller and the field.

I/O RACK A housing which contains I/O modules. Also called a housing.

$$\boxed{L}$$

LADDER DIAGRAM Industry standard symbology used to document relay logic control systems. Logic lines are drawn horizontally, similar to the rungs of a ladder.

LADDER LISTING A hard copy listing or printout of a logic program.

LATCHED COIL A type of coil or output that will power-up in the state (either ON or OFF) it was in when power was lost.

LCD Acronym for liquid crystal display. Segments are displayed only by re-flected light.

LED Acronym for light emitting diode.

LINE In communications, describes cables, telephone lines, etc., over which data is transmitted to and received from the terminal.

LINE PRINTER a high speed printing device that prints an entire line at one time.

LOCAL Connected directly to the controller housing, with no intervening devices.

LOCATION A storage position in memory.

LOGIC Problem solution via an orderly thought or computational process.

LOGIC DIAGRAM A graphic description of logic functions and conditions.

LOGIC ELEMENT Any of the elements that can be used in a ladder logic diagram. This includes relay contacts, coils, shorts, timers, counters, arithmetic and function blocks.

LOGIC LINE A line of user logic used to construct unique logic for an application.

M

MATRIX FUNCTION Data transfer function which operates on a sequence of data bits formed by consecutive 16 bit words derived from tables. Functions include; complement, and, or, exclusive or, compare, bit modify, bit sense, and bit rotate.

MEMORY Storage area for binary data.

MEMORY ADDRESS A specific location in memory.

MEMORY PROTECT LOCK A key-switch used to prevent the unauthorized alteration of a user program.

MICROPROCESSOR The control and processing portion of a small computer with large scale integration (LSI) circuitry, usually on a single chip. Also called the CPU (Central Processing Unit).

MICROSECOND One millionth of a second (0.000001).

MILLISECOND One thousandth of a second (0.001).

MINI-COMPUTER A complete computing system, including CPU, memory, I/O interfaces, and power supply.

MODBUS A communication system that links MODICON controllers with intelligent terminals and computers over common carrier or dedicated lines.

MODEM Acronym for modulator/demodulator. It modulates digital signals to analog signals for transmission over telephone lines, coaxial cable, or other transmission media. It demodulates incoming analog signals and converts them to digital signals.

MODULE Hardware sub-assembly that can be easily replaced for maintenance purposes.

MOVE FUNCTION Data transfer functions which copy data (16 bit words) from one memory are to another.

MULTIPLEXING The time-shared scanning of a number of data lines into a single channel. Only one data line is enabled at any instant.

NETWORK A group of logic elements that are connected together to perform a specific function.

NODE A point on a ladder diagram that receives power from the left and can provide power to the right.

NOISE Extraneous signals; any disturbance which causes interference with the desired signal.

NON-VOLATILE MEMORY A memory which does not lose its information when its power supply is turned off.

OFF-LINE OPERATION Describes equipment or devices that are not connected to the communications line. Typically software devices which may be programmed "off-line".

ON-LINE OPERATION Operations where the programmable controller is directly controlling the machine or process.

ONE SHOT A discrete reference, typically a logic coil, that is energized for one scan of the controllers logic.

OPTICAL COUPLER A device which uses light to couple two electrical points, isolating power and ground.

OR FUNCTION This function logically "OR's" each bit in a source matrix with its corresponding bit in a second (destination) matrix. If either or both bits are a "1", the bit in the destination matrix will be set to a "1". If both bits are a "0" the corresponding bit in the destination matrix will be cleared to a "0".

OUTPUT A signal provided from the programmable controller to the "real world". Can be either discrete (solenoid valve, relay, motor starter, indicator lamp, etc.) or numeric (display of values within the controller).

OUTPUT DEVICES Devices such as solenoids, relays, motor starters, indicator lamps, etc., that are controlled by the PLC.

OUTPUT MODULE Converts digital signals from the programmable controller to signal levels compatible with the users' machine or process output devices.

P

PARALLEL OUTPUT Simultaneous availability of two or more bits, channels or digits.

PARITY A method of verifying the accuracy of transmitted data.

PARITY BIT An additional bit added to a memory word to make the sum of the number of "1s" in a word always even (even parity) or always odd (odd parity).

PARITY CHECK A check that tests whether the number of "1s" in an array of binary digits is even or odd.

PLC Abbreviation for Programmable Logic Controller

PERIPHERAL EQUIPMENT Units that may communicate with the programmable controller, but not part of the programmable controller (e.g. teletype, cassette recorder, CRT terminal, tape reader, programming panel, etc.).

PG (PROTECTIVE GROUND) The safety or power line ground for equipment (pin 1 of an RS-232C connector).

PID (PROPORTIONAL-INTEGRAL-DERIVATIVE) FUNCTION This function provides the ability to control analog loops such as flow, pressure, or temperature.

PORT An I/O connection on a processor or peripheral device.

PRESET The upper limit specified for a timer or counter function. Expressed as a numeric value.

PRINTED CIRCUIT BOARD A board on which a predetermined pattern of printed connections have been formed.

PROCESSOR The "brain" of the programmable controller. The area where logic is solved. Sometimes called the CPU (Central Processing Unit).

PROGRAM A sequence of instructions to be executed by the CPU to control a machine or process.

PROGRAMMABLE CONTROLLER An electronic digital device designed to receive instructions for monitoring and controlling industrial processes.

PROGRAMMING PANEL Device used to insert, monitor and edit a programmable controllers' program.

PROGRAM SCAN The time required for the controller processor to execute all instructions in the program once. The program scan repeats continuously. See SCAN and SCAN TIME.

PROM (PROGRAMMABLE READ ONLY MEMORY) A retentive memory used to store date. This memory can only be erased using ultraviolet light, and is reprogrammed with special electronics; thus, it is not readily alterable in the field, but programmed in the factory.

PROTOCOL A means of establishing criteria for receiving and transmitting data through communications channels.

R

RAM (RANDOM ACCESS MEMORY) A memory where information may be written and/or read as many times as desired. This type of memory is volatile. (Memory is lost when power is turned off, unless battery backup is used.)

RD (RECEIVED DATA) The data line which data is received (pin 3 of an RS-232C connector).

READ To sense the presence of information in some type of storage, such as RAM or ROM.

REAL TIME The actual time during which physical events take place.

REDUNDANCY The use of two 984's, one on-line and the other a hot stand-by, to control a single remote I/O system.

REFERENCE NUMBERS Five digit numbers used to address specific items. See also ADDRESS.

REGISTERS A memory location where 16 bits of data can be stored.

REGISTER MODULE A device used to select, convert, and condition binary coded decimal (BCD) signals that pass between a user device being controlled at the PLC.

REGISTER TO TABLE FUNCTION Copies the bit pattern of any register or 16 discretes to a specific register located within a table.

RELAY An electronic device operated by a variation in conditions of an electric circuit. When so operated, it in turn operates other devices such as switches.

RELAY ELEMENT A logic symbol used to simulate the effect of relays. Contacts can be normally open, normally closed, or transitional.

REMOTE I/O The portion of the controllers I/O that is installed at a location away from the controller, Communication between the remote I/O and the controller is typically via co-axial cable.

REMOTE PRESET The capability for placing the preset for a timer or counter line into the register and referring that register in the upper element of the logic. The preset is no longer fixed since the contents of a register (and thus the preset) can be altered at any time.

ROM (READ ONLY MEMORY) A ROM is a digital storage device specified for a single function. Data is loaded permanently into the ROM when it is manufactured. Data is available whenever the address lines are scanned.

RS-232C Electronic Institute of America (EIA) standard for data communications, type RS-232C. Data is provided at various rates, eight data bits per character.

RTS (REQUEST TO SEND) Signal indicating that data is ready to be transmitted (pin 4 on an RS-232C connector).

RTU (REMOTE TERMINAL UNIT) An eight bit communication code used by the 984 and P190.

S

SCAN The technique of examining or solving logic networks one at a time in numerical r.

SCAN TIME The amount of time it takes the 984 to solve all of its' logic and service all of the connected I/O.

SCRATCH PAD MEMORY A high speed memory used to temporarily store a small amount of data so that the data can be retrieved quickly when needed. Interim calculations usually are stored in a scratch pad memory.

SEARCH FUNCTION This function searches a table of resisters for a specific bit pattern.

SEGMENT A section of logic program that contains one or more networks.

SELF DIAGNOSTIC The hardware and firmware within a controller which allows it to continuously monitor its own status and indicate any fault that occur within it.

SG (SIGNAL GROUND) The common ground reference for all signal lines (pin 7 on an RS-232C connector).

SKIP FUNCTION This function allows networks of logic to be bypassed and not solved. It can be used to reduce scan time by not solving seldom used program sequences (e.g. fault monitors) or to create sub-routines.

SOFTWARE Application and internal programs used to support the performance of the controller.

SOLID-STATE Circuitry designed using only integrated circuits, transistors, diodes, etc.; no electro-mechanical or vacuum tubes are used. High reliability is obtained with solid state logic, which would be degraded by depending on electromechanical devices.

SWEEP FUNCTIONS these functions allow the user program to be scanned at a fixed interval.

STAT BLOCK This function loads a table of holding registers with up to 75 words of system status information.

STATE RAM See IMAGE TABLE

SYNCHRONOUS Data is transmitted continuously against a time base that is shared by transmitting and receiving terminals. If no legitimate data is available to be sent at a given time, "synch" or "idle" characters are sent to keep the transmitter and receiver in synchronization.

SYSTEM A collection of units combined to work as a larger integrated unit having the capabilities of all the separate units.

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T

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TABLE A group of consecutive 16 bit words.

TABLE TO REGISTER FUNCTION This function copies the bit pattern of any register or 16 discretes located within a table to a specific holding register.

TABLE TO TABLE FUNCTION This function copies the bit pattern of any register or 16 discretes from a position within a table to the same position within another table.

TD (TRANSMITTED DATA) The data line over which data is transmitted (pin 2 of an RS-232C connector).

TRANSDUCER A device to convert physical parameters such as temperature, pressure, flow, etc. into an electrical signal.

TRAFFIC COP A portion of the programmable controller executive that determines how input and output data is interpreted. Also directs the data to the appropriate Input or Output Module.

TRANSITIONAL CONTACT Logic contacts that pass power for one scan only.

TTL (TRANSISTOR TO TRANSISTOR LOGIC) A family of integrated circuit logic. Usually with 5 volts representing a high or "1" state, and 0 volts representing a low or "0" state.

V

VOLATILE MEMORY A memory that loses its contents when power is removed.

W

WATCHDOG TIMER (WDT) A circuit on the CPU board with an R/C network set up to time a fixed value. The CPU, when correctly operating, continuously resets the timer via a combination hardware/software command. In the event the CPU fails to reset the timer within the set limit, the timer "times out" and the system will shut down.

WORD A group of bits in sequence that is operated on as a unit and is stored in one memory location. One 984 word = 16 bits.

WRITE The process of loading or entering information into memory.