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## PL420

# Programmable Logic Controller with RS232/RS485 Communications

The PL420 PLC has been developed as a compact controller with a versatile combination of Analog and Digital I/O. The fact that the controller is programmable enables the user to program their own unique logic requirements and not be restricted by a pre-programmed unit or hardwired relays and timers.

The PL420 PLC is programmed in ladder logic. Procon's ProSoft windows-based PC software is used to generate the ladder diagram, compile the program, and then download the program to the PL420 via the programming port on the front of the unit.

The PL420 module is a multipurpose combination of inputs and outputs. The module can accommodate either 2 or 3 wire RTD sensors, current (0-20mA) and voltage (0-10V) inputs, current (0-20mA) or voltage (0-10V) output, and digital inputs and outputs.



### RTD INPUTS:

There are 2 RTD inputs on the module. The RTD resistance is read by the module circuitry, linearised and converted to degrees Centigrade. No ranging is required as the module covers the full range of the RTD as indicated in the RTD table. The value that is read from the Modbus register is the actual temperature in degrees centigrade to 0.1°C resolution. ie: a value of 3451 corresponds to a temperature of 345.1°C.

The RTD type is setup by writing a value to the RTD Type register. The value is obtained from the table below. For example to select a PT100 RTD, the value "1" must be written to the RTD Type register.

A value of -32767 is used to indicate downscale burnout.

Note: As there is no inter-channel isolation, isolated RTD's must be used in order to prevent

ground loops and reading errors.

### **ANALOG INPUTS:**

The Analog Inputs (2) can be configured by internal jumpers as either a current input (0-20mA) or a voltage input (0-10V).

An input of 0 - 20mA input current or 0 - 10V input voltage represents an output value of 0 - 4095 (12 bits) in the corresponding Modbus register.

### **ANALOG OUTPUT:**

There is a single analog output which can be configured with internal jumpers for a current output (0-20mA) or voltage output (0-10V).

The resolution is 12 bits, so writing a value to the Modbus register for each output of 0 - 4095 would give an output current of 0 - 20mA. A value of  $819 \pm 1\text{LSB}$  will give a current output of 4mA.

### **DIGITAL INPUTS:**

There are 4 digital inputs on the module. The inputs have internal pull-up resistors and are switched to negative.

The format of the registers allows the status of the inputs to be read as either single bits or all at once as a single register on the Modbus network.

### **DIGITAL OUTPUTS:**

The module has 5 open collector (NPN) digital outputs. The outputs may be used to drive lamps or external relays when more drive capability is required.

The outputs are written to by the Modbus master device such as a PC or PLC. Each output can be individually switched on or off, or all outputs can be set up at the same time by writing a single number to the output register which represents the status of all outputs.

An output watchdog timer can be configured to switch off all the outputs if there has been no communications with the module for up to 255 seconds. A value of 0 seconds will disable this timer and the outputs will remain in the last programmed state.

All wiring is done with screw terminals on removable connectors.

The programming port requires the use of a special adaptor to connect it to an RS232 communications port of a PC. This port supports the Modbus RTU protocol and all of the internal registers and I/O status can be accessed through this port.

The features in the PL420 include a Real Time Clock and 4 PID loops. The PID loops can be tuned manually or automatically using the open loop or closed loop techniques.

The RS485 communications port can be configured as a Modbus master or Modbus slave.

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