Circuit Description for ExcelSyus products

LOGIC BOARD
Sheet 1 of 3
This sheet shows the microprocessor and memory. The SRAM is 32K x 8 and the EPROM is also 32K x 8. Also shown on this sheet is 128K x 8 FLASH memory. The board is set up to use either the EPROM or the FLASH.

Sheet 2 of 3
This sheet shows the RS485 circuit driver and the RS232 UART circuit driver.

Sheet 3 of 3
This is the power supply and SPI expansion interface drawing. The power supply is designed for 12VDC input or 24VAC input. This section also has battery backup circuitry. The SPI expansion port will allow for future expansion and interfaces directly to the RF Modem board. These two boards are included in the same enclosure and together they make up the product. The trade name for this product is called "ExcelSyus Listener".

RF MODEM BOARD
Sheet 1 of 2
This sheet shows the microcontroller circuitry that interfaces to the RF Transceiver circuit and the SPI expansion port. This section includes a receive LED and a transmit LED that is useful for troubleshooting and system diagnostics.

A 4-pole dipswitch is included that, when set, will cause 3 data packets to be transmitted on every transmission. The default is to transmit a single data packet on every transmission. Another pole on the dipswitch is used to configure the unit as a repeater. If set, the RF modem will continue to receive data packets as before, but will repeat the signal if the repeat setting in the data packet has not been set. It will not repeat a repeated data packet. If it is not set as a repeater, the received data packet is pass on to the logic board through the SPI expansion port. The other two poles of the dipswitch are available for future use.

Sheet 2 of 2
This sheet shows the RFM transceiver and antenna interface.

PULSE TOTALIZER BOARD
Sheet 1 of 1
This sheet shows the battery input (11.0VDC to 3.6VDC) and a low-dropout regulator that will also detect a low battery condition. On the drawing is the pulse input. The expected pulse input is a relay contact closure. Every pulse transmission will wake-up the microcontroller and will be counted. U2 is the RF transmitter and a trace on the board provides the antenna.

A low-power one-minute WDT (watchdog timer) is also included to wake up the microcontroller. This will allow the Pulse Totalizer to use very little power since it will be in low-power mode most of the time. The Totalizer will transmit at a selectable 3 or 5 minute interval.

A transmit enable circuit is on the board to only allow transmissions when in service. The unit is designed to be factory sealed to prevent moisture and weather related problems. The unit is shipped with the transmitter disabled. Connecting the two transmit enable wires will enable the transmitter.

TEMPERATURE SENSOR BOARD
Sheet 1 of 1
This sheet shows the battery input (11.0VDC to 3.6VDC) and a low-dropout regulator that will also detect a low battery condition. The circuit includes a push button switch that is used for testing and for putting the zone in override. A connector is provided on the board to allow connection to a precision thermistor. U2 is the RF transmitter and a trace on the board provides the antenna.

A low-power one-minute WDT (watchdog timer) is also included to wake up the microcontroller. This will allow the Temperature Sensor to use very little power since it will be in low-power mode most of the time. The Temperature Sensor will transmit once every 5 minutes or once every minute if the temperature change is greater than one degree F.

The Led is used to indicate when a transmission has occurred.

EXCELSYUS 'M' BOARD
Sheet 1 of 11
This sheet shows the microprocessor and memory. It also includes a RTC (Real Time Clock).

Sheet 2 of 11
This is the power supply section. It detects power outages and will automatically convert to battery power. A battery charging circuit is also included.

Sheet 3 of 11
This is the A/D converter section. It converts the temperature sensors current input to a digital value. The A/D section has a Gain and Span pot that is factory calibrated.

Sheet 4 of 11
This sheet contains the Keyboard and Display interface.

Sheet 5 of 11
This sheet contains the scanning LED's and 4-pole dipswitch. The dipswitch is used to select Telephone modem settings.

Sheet 6 of 11
This sheet contains the RS232 port, the RS484 port and a power-out indicator latch.

Sheet 7 of 11
This sheet contains the I/O ports for turning on/off the external Triacs.

Sheet 8 of 11
This sheet contains the Pulse meter input section and the external Thermocouple interface section.

Sheet 9 of 11
This sheet is left intentionally blank.

Sheet 10 of 11
This is the Analog input filter section.

Sheet 11 of 11
This sheet is left intentionally blank.

KEYPAD & DISPLAY BOARD
Sheet 1 of 1
This sheet contains the external keypad and a 7-digit display.

THERMOCOUPLE BOARD
Sheet 1 of 2
This sheet contains the 12-bit A/D Converter and interface to the ExcelSyus. The board will allow up to 14 external J-Type thermocouples.

Sheet 2 of 2
This sheet contains the power supply section. The main function of this circuit is to convert positive 5V to negative 5V. It uses a voltage doubler, an inverter, and a negative voltage regulator to achieve this task.