MODBUS on SMC75 and Quickstep motors.   2.3.2009

The SMC75 firmware used with the JVL QuickStep motors MISxxx, implement a subset of the MODBUS standard to read and write to the motor registers.
The default protocol for SMC75 based products is the MacTalk protocol, but the protocol can be changed either way by writing to a MODBUS Setup register (register 121).
After a "Save In Flash" operation, the SMC75 will start up with the protocol selected in this register.
Note that there are certain commands that can NOT be performed in MODBUS, but only in MacTalk. Also when updating firmware and uploading the PLC program to/from the motor, the MacTalk protocol must be used.

We currently support the following command numbers:
3 - Read holding registers.
6 - Write single register.
16 (decimal) - Write multiple registers.

We do not support single bit access (like Read/Write Coil, Discrete inputs etc.)

To enable MODBUS operation, write one of the following values into register 121:
31 hex (49 decimal): 8-bit data, no parity, 2 stop bits.
19 hex (25 decimal): 8-bit data, even parity, 1 stop bit.
15 hex (21 decimal): 8-bit data, odd parity, 1 stop bit.

These are the only ones supported by the MODBUS standard. However, we also support 8 data bits, No parity and 1 stop bit (register value 11 hex (17 decimal)).

The firmware will then switch from the MacTalk protocol to the MODBUS protocol after there has been no communication on the serial line for a time dependent on the baud rate. The baud rate used is the same as MacTalk, selectable in register 146. 0: 9600, 1: 19200, 2: 38400, 3: 57600, 4: 115200, 5: 230400, 6: 460800, 7: 921600.

Note that the MODBUS Node ID is the same as the MacTalk Motor Address - default 254.

How-to:
- Connect to the motor using the MacRegIO program.
- Write one of the values 21, 25 or 49 to register 121.
- Exit MacRegIO immediately after that (since the protocol is now changed to MODBUS).
- Configure your MODBUS enabled equipment for the same communications settings as used on the motor.
- Start communicating...!

As an alternative, Register 121 can be assigned from the user program in the motor. Perhaps when a digital input is turned on.

Note that while it is possible to switch from MacTalk to MODBUS, the reverse is currently not supported. The motor must be power-cycled to return to MacTalk.

Also note, that the maximum number of bytes per transfer is limited to 32. This means that the common practice of reading all register in a single operation will not work, but must be split up into smaller chunks.

We have successfully tested it with the PC program MODBUS Poll and a few of the Pro-Face industrial HMIs.