MIDAM
CONTROL SYSTEM

MIDAM BCI401

4 digital inputs/counters module

Microprocessor controlled digital counter module featuring 4 digital inputs. The serial line communication is based on Modbus RTU (RS485) protocol. Native modbus map grants seamless integration into variety of PLC/SCADA systems. Acquired values can be stored in the device temporarily as an extra protection against a short term power failure.

IO MODULES

General information

This document explains the Modbus protocol for BCI401module. Modbus is a communication protocol open to all users and supported in common by many manufacturers. The Modbus protocol allows data and setup information to be transferred between a Modbus Master and a Modbus Slave.

50 words can be read at the same time (i.e. 100bytes).

Type:

R – register is read only

W – register is write only

RW – register is read/write

RWE (default value) – register is read from EEPROM, written to EEPROM, default value in brackets

RWN – register is continously stored to NVRAM

The supported Modbus functions are:

01 Read Coils – read bits

02 Read Discrete Inputs – read bits

03 Read Holding Registers – read words

04 Read Input Registers – read words

15 Write Multiple Coils – write bits

16 Write Multiple Registers – write words

MIDAM BCI401

4 digital inputs/counters module

Modbus map

name	address	type	description	note
count1	1 2	RWN	pulse count on input CNT1	register keeps its value after power loss
count2	3 4	RWN	pulse count on input CNT2, sync input for ¼ of hour count	register keeps its value after power loss
count3	5 6	RWN	pulse count on input CNT3	register keeps its value after power loss
count4	7 8	RWN	pulse count on input CNT4	register keeps its value after power loss
actual	9 10	RWN	pulse count on input CNT1 in current ¼ of hour; after pulse on input CNT2, value of register actual is copied to register last and registers actual and time ¼ are zeroed	register keeps its value after power loss and after power up, it continues in counting until next sync pulse
last	11 12	RWN	pulse count on input CNT1 in previous ¼ of hour	register keeps its value after power loss
time ¼	13 14	RWN	time in seconds in current ¼ hour	register keeps its value after power loss and after power up, it continues in counting until next sync pulse
inputs	15	R	input values	bit 0 – input 1 ... bit 3 – input 4
firmware version	1000	R	firmware version	FW version is always the same as this document version
module ID	1001	R	module identification number	module ID is F006hex
status LSB	1002 LSB	RW	module status – low byte bit 0 – enable write to EEPROM bit 1 – enable SW reset bit 4 – EEPROM initialization bit 5 – disable write to all RW registers	EEPROM initialization: 1) start device in init mode (address DIP switch is all high – 255 – at start) 2) set DIP switch to any other value than 255 3) set status LSB bit 4, initialization is indicated in status MSB bit 2 SW reset: set bit 1, then write any non-zero value to reg. 1002
status MSB	1002 MSB	R	module status – high byte bit 0 - 0 normal mode - 1 init mode bit 1 - 1 next write to EEPROM register causes writing of all data to EEPROM - 0 next write to register is to RAM only bit 2 – 1 – EEPROM initialized bit 3 – write to all RW registers disabled bit 4 – 0 bit 5 - SW reset enabled bit 6 - 0 bit 7 – 1	bit 1 ... indication that command given by bit 0 in status LSB was accepted bit 2 ... indication that command given by bit 4 in status LSB was accepted bit 3 ... indication that command given by bit 5 in status LSB was accepted bit 5 ... indication that command given by bit 1 in status LSB was accepted

IO MODULES

MIDAM BCI401

4 digital inputs/counters module

address	1003	RW (1)	modbus address of the module	registers change immediately, communication parameters change after restart (data must be written to EEPROM)
baud rate	1004	RWE (13)	10dec ... 1 200bps 11dec ... 2 400bps 12dec ... 4 800bps 13dec ... 9 600bps 14dec ... 19 200bps 15dec ... 38 400bps 16dec ... 57 600bps 17dec ... 115 200bps	
serial port settings	1005	RWE (0)	bits 0, 1 – parity 0 none 1 even 2 odd bit 2 – stopbits 0 one stopbit 1 two stopbits	
up time	1006 1007	R	time in seconds since last restart or power up	
serial number	1008 1009	RWE (unique)	module serial number, can be written if it is zero	not implemented yet
EEPROM writes	1010	R	EEPROM writes counter	counter 0 .... FFFEh, counting stops at value FFFEh
SW reset	1011	RW	if status LSB bit 1 (and status MSB bit 5) is set, writing non-zero value causes SW reset	
dip switch	1100	R	actual DIP switch value	