OPEN DRIVE

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Modbus protocoll

Modbus Protocol

INDEX

The OPEN drive products line is compatible with the protocol of the serial communication Modbus rtu. At a physical level , the supported standard is the RS485, see the drive installation manual for information about it. Specifications about the Modbus Protocol are available at the Internet address :

www.modicon.com/TECHPUBS/intr7.html

1. Application Configuration

1.1. *Node Configuration*

The drive configuration as Modbus node requires the correct configuration of the following parameters:

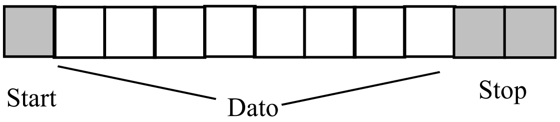
Name	Description	Range	Default
P92	Serial identification number	0÷255	1
P93	Serial baud rate	19,2 ; 38,4 ; 57,6	19,2 Kbit/s

By setting these parameters in real time, they will become instantly active :

Note: the communication mode in broadcast with address = 0 is not managed

2. Managed services

The drive represents the slave in the communication : this means that it is only able to answer to messages received if its address (settable in P92) corresponds with the one indicated in the message itself. If the address is wrong or there is an error of communication in CRC, the drive will not send any answer, as the protocol requires.
Every word transmitted is composed by 11 bit : 1 bit for start, 8 bit for the data and 2 bit for stop. The parity check is not supported.



The Modbus protocol requires a long functions series; our application requires less than these : in the following table you can find the implemented functions and their codification :

Code	Function	Description
01	Read Coil Status	Reading of digital input/output
03	Read Holding Registers	Reading of memorised data
15	Force Multiple Coils	Writing of digital inputs
16	Preset Multiple Registers	Writing of memorised data

Hereinafter you can find the description of the action and of the related address of each function.

2.1. 01 Read Coil Status

This function allows the user to read the status of the digital inputs and outputs.
It is important to underline that the standard management of the digital inputs requires that the RUN enable must be given both via terminal board and via serial line; all the other inputs instead can be commanded by one of the two ways just listed. The default RUN input from the serial line is high while all the others are low: in this way the user who is not using it, can have the total control of digital inputs from the terminal board.
Thanks to Read Coil Status function it is possible to read the status of the digital inputs and related outputs you are interested in, just specifying the correct address written in the following table :

starting address(hex)	Max number of data	Description
0300	32	Digital inputs
0320	32	Digital outputs

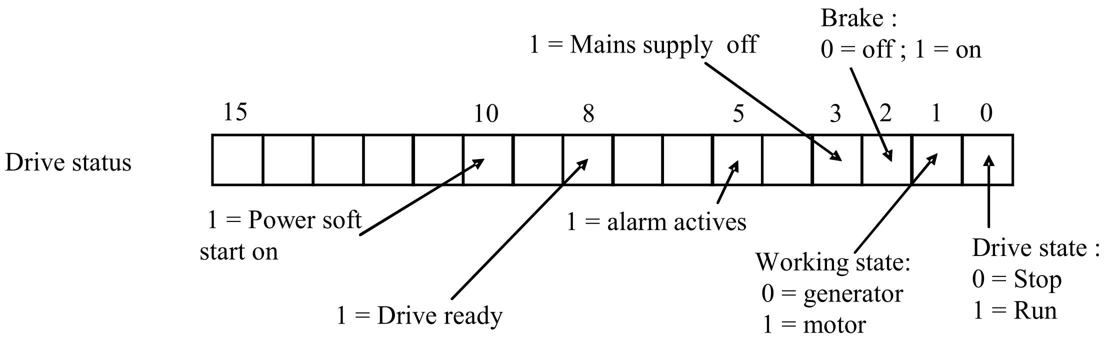
The order number of the inputs and the outputs is the one specified in the related tables (see specific description of the control's core)

2.2. 03 Read Holding Register

This function allows the user to read the values of all the Parameters, Connections, Internal Sizes and some status variables. Writing the correct address you can access these data (see the table under for the address) ; considering the internal representation you can rightly interpret the read data : as usual it is necessary to see the related tables in the specific description of the core :

starting address (hex)	Max number of data	Description
0000	200	Parameters table
00C8	100	Connections table
012C	100	Application Data table
0380	64	Internal sizes
0200	1	Drive status
0202	1	Drive alarms
0203	1	Alarm enabling

It is not possible to read more than 127 registers at a time due to the memory limits of the buffer.
The order number of the parameters, of the connections and of the internal sizes is the one related to the lists contained in the description of the control's core.
See the specific documentation for data area application.
The status variable is the same for all the implementations; hereinafter you can find the meaning of the most important bit :



referring to alarms and their enabling, the order number for the bit of the word corresponds to the number of the alarm itself. (e.g. A2= external enable corresponding to the bit 2 of drive alarms)

2.3. 15 (OF hex) Force Multiple Coils

This function enables to set the value of digital inputs via serial line. As previously said, the digital inputs via serial line are all parallel to the related digital inputs via terminal board except the RUN enable (where the two inputs are in series)

Starting address	Max data number	Digital inputs
Starting address(hex)	Max data number	Description
0340	32	Digital inputs

2.4. 16 (10 hex) Preset Multiple Registers

This function allows to set the value of the parameters, connections and to enable the alarms even if the corresponding keys are opened.
To correctly set these data it is required the right address (that you can find in the following table) and it is necessary to consider the internal data representation, referring to the specific descriptions of the core. The application area's meaning depends on the present application (see specific documentation):

starting address	Max data number	Description
0000	200	Parameters table
00C8	100	Connections table
012C	100	Applications data table
0203	1	Alarms enabling

If it is written a value not included in the range, the value will be ignored and the previous one will remain valid.

2.5. Exception Responses

The following exception codes in the answer are managed:

Code	Name	Description
01	Not managed function	The drive doesn't manage this Modbus function
02	Wrong data address	The address is not valid
03	Wrong data value	The data number required is too big