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**SPECIFICHE MODBUS PER PRODOTTI ESYLINE (IT)**  
**MODBUS SPECIFICATIONS FOR ESYLINE PRODUCTS (GB)**  
**SPÉCIFICATIONS MODBUS POUR LES PRODUITS ESYLINE (FR)**  
**MODBUS-SPEZIFIKATIONEN FÜR ESYLINE-PRODUKTE (DE)**  
**ESPECIFICACIONES MODBUS PARA PRODUCTOS ESYLINE (ES)**  
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**ХАРАКТЕРИСТИКИ MODBUS ДЛЯ ИЗДЕЛИЙ ESYLINE (RU)**  
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**SPECIFIKATIONER FÖR MODBUS FÖR PRODUKTER ESYLINE (SE)**  
**SPECIFICAȚII MODBUS PENTRU PRODUSELE ESYLINE (RO)**  
**ΠΡΟΔΙΑΓΡΑΦΕΣ MODBUS ΓΙΑ ΤΑ ΠΡΟΪΟΝΤΑ ESYLINE (GR)**  
**ESYLINE ÜRÜNLERİ İÇİN MODBUS ÖZELLİKLERİ (TR)**  
**MODBUS TECHNIKAI ADATOK, ESYLINE TERMÉKEKHEZ (HU)**  
**MODBUS СПЕЦИФИКАЦИИ ЗА ESYLINE ПРОДУКТИ (BG)**  
**مواصفات "MODBUS" لمنتجات "ESYLINE" (AR)**



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**1. INTRODUCTION**

The purpose of this manual is to illustrate the correct use of the MODBUS interface for BMS to be applied to Esyline devices.



This manual is intended for users who are familiar with Modbus devices. The reader should have a basic knowledge of this protocol and of the technical specifications.

It is also assumed that there is already a Modbus RTU network with a "master" device.

**1.1 Abbreviations and definitions**

BMS	Building Management System
CRC	CyclicRedundancyCheck
RTU	Remote Terminal Unit
0x	Prefix identifying a hexadecimal number

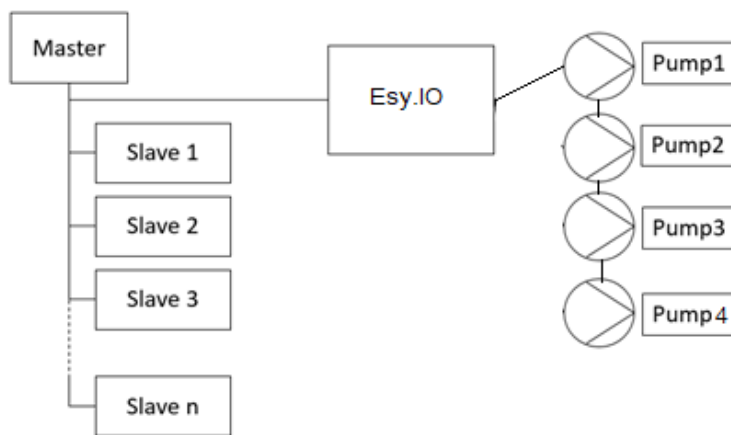
**2. MODBUS CONFIGURATION**

The following Esyline products require the Esy I/O accessory to be connected in a MODBUS RTU RS485 network:

- Esy MAX

**2.1 Type of Modbus Network with Esy I/O**

The following graph provides a graphic representation of the type of network to be created using Esy I/O + BMS.



The Esy I/O suitably connected to the pump will act as a gateway to the pump itself, allowing Modbus communication. The pump will allow the transfer of information and commands relating to its status and the status of any pump set to which it belongs.

For further information, refer to the Esy I/O product manual.

The parameters supported for MODBUS RTU communication via the ESY I/O accessory are described below.

Modbus specifications	Description	Notes
Protocol	Modbus RTU	Only "Slave" mode is supported
Connections	Terminal block	
Physical interface	RS485	
Slave address	From 1 (default) to 247	
Speed supported	2400, 4800, 9600, 19200, 38400, 57600, 115200	
Start bit	1	
Data bit	8	
Stop bit	1.2	
Parity	None, Even, Odd	
Sample Rate	< 1 minute in reading, < 2 seconds in writing	

Table 1: Modbus RTU parameters



For complete setup of ESY I/O, refer to the ESY I/O manual [https://dabpumps.com/qrcode/60202789\\_ESY-IO.pdf](https://dabpumps.com/qrcode/60202789_ESY-IO.pdf)

### 2.1.1 Firmware Update

The use of the Modbus interface requires a **software update of the ESY I/O and ESY.max to the latest available versions**. To do this, make sure that there is an Internet connection via WiFi or a direct connection via app. See the Internet site <https://internetofpumps.com> for further details on the installation and updating of the products.

## 3. MODBUS RTU REGISTERS

The supported functions are shown in the following table:

Type	code	Hex	Name
16-bit data (registers)	03	0x03	Read holding registers
	06	0x06	Write input register

### 3.1 Type of Modbus messages

Depending on the operating status of the slave, error messages may also be received. In particular, the device may return the following error messages:

Error code	Meaning
04	ESY I/O has not received a reply: Wireless network not present or esy.max switched off
01	Invalid function. This error is also used in case of a generic error
02	Address invalid or not available at the time of request
03	Invalid value. The indicated value is invalid and therefore has not been set

Any possible error response will be highlighted after the individual command has been processed.

### 3.2 Status

The following table lists the Modbus RTU registers of the pump parameters (Function Code 0x03).

**IMPORTANT:** The pump returns correct values according to the selected measuring system (parameter "MS Measure System"). In case of non-conformity, the system responds with the error code 02.

The measurement system can also be selected locally using the "MS Measure System" parameter on the pump itself. It is therefore advisable to set up the measurement system during product installation.

**NOTE:** refer to the manuals of the individual products for the meaning of the parameters and any necessary accessories.

Register	Parameter	Description	Error Code	Scale	Measuring unit	Type	Esy Max
0x00	System Status	See 3.2.1 System Status	--	--	--	R	•
0x01	Pump Numbers	Number of connected pumps	--	--	--	R	•
0x02	Pump Running Numbers	Number of pumps pumping	--	--	--	R	•
0x03	Pump Fault Number	Number of pumps in fault	--	--	--	R	•
0x04	NA-Active Inverter Number	Number of active inverters	--	--	--	R	•
0x05	NC-Contemporary Inverter	Maximum number of inverters active at the same time.	--	--	--	R	•
0x06	System Power	Power delivered by the pumping system	--	1	Watt	R	•
0x10	VP Sys Press Bar	System pressure in delivery	02	0.1	bar	R	•
0x11	VPin Sys Suct Press Bar	System pressure in suction	02	0.1	bar	R	•
0x12	VPr Remote Press Bar	Pressure read by the remote sensor. Responds with an error if deactivated	02	0.1	bar	R	•
0x13	System Flow Liter	Measured flow rate	02	1	l/min	R	•
0x19	VP Sys Press Psi	System pressure in delivery	02	1	Psi	R	•
0x1A	VPin Sys Suct Press Psi	System pressure in suction	02	1	Psi	R	•
0x1B	VPr Remote Press Psi	Pressure read by the remote sensor. Responds with an error if deactivated	02	1	Psi	R	•
0x1C	System Flow GAL	Measured flow rate	02	1	Gal/min	R	•
0x20	I1 Input 1 State	0-Open (not energ.), 1-Closed (energ.)	--	--	--	R	•
0x21	I2 Input 2 state	0-Open (not energ.), 1-Closed (energ.)	--	--	--	R	•
0x22	I3 Input 3 state	0-Open (not energ.), 1-Closed (energ.)	--	--	--	R	•
0x23	I4 Input 4 state	0-Open (not energ.), 1-Closed (energ.)	--	--	--	R	•
0x30	O1 Output 1 state	0-Open, 1-Closed	--	--	--	R	•
0x31	O2 Output 2 state	0-Open, 1-Closed	--	--	--	R	•
0x40	Pump 1 status	See 3.2.2 Pump Status	--	--	--	R	•
0x42	VP Pump 1 Press Bar	System pressure in delivery	02	0.1	bar	R	•
0x44	Pump 1 Flow Liter	Measured flow rate	02	1	l/min	R	•
0x49	VP Pump 1 Press Psi	System pressure in delivery	02	1	psi	R	•
0x4B	Pump 1 Flow Gal	Measured flow rate	02	1	gal/min	R	•
0x50	Pump 2 status	See 3.2.2 Pump Status	--	--	--	R	•
0x52	VP Pump 2 Press Bar	System pressure in delivery	02	0.1	bar	R	•
0x54	Pump 2 Flow Liter	Measured flow rate	02	1	l/min	R	•
0x59	VP Pump 2 Press Psi	System pressure in delivery	02	1	Psi	R	•
0x5B	Pump 2 Flow Gal	Measured flow rate	02	1	gal/min	R	•
0x60	Pump 3 status	See 3.2.2 Pump Status	--	--	--	R	•
0x62	VP Pump 3 Press Bar	System pressure in delivery	02	0.1	bar	R	•
0x64	Pump 3 Flow Liter	Measured flow rate	02	1	l/min	R	•
0x69	VP Pump 3 Press Psi	System pressure in delivery	02	1	psi	R	•
0x6B	Pump 3 Flow Gal	Measured flow rate	02	1	Gal/min	R	•
0x70	Pump 4 status	0 See 3.2.2 Pump Status	--	--	--	R	•

Register	Parameter	Description	Error Code	Scale	Measuring unit	Type	Esy Max
0x72	VP Pump 4 Press Bar	System pressure in delivery	02	0.1	bar	R	•
0x74	Pump 4 Flow Liter	Measured flow rate	02	1	l/min	R	•
0x79	VP Pump 4 Press Psi	System pressure in delivery	02	1	psi	R	•
0x7B	Pump 4 Flow Gal	Measured flow rate	02	1	gal/min	R	•

Notes: R = Read / Reading parameter  
W = Write / Writing parameter  
RW = Read and Write / Reading or writing parameter  
• = Register available in the corresponding product

### 3.2.1 System Status

The command responds with a number that has the following meaning:

- 0: The system is working correctly
- 1: The system is not correctly aligned, the connection with all devices in the multi-inverter system could not be re-established.
- 2: Warning, there are 1 or more devices that require assistance.

### 3.2.2 Pump Status

The command responds with a number that has the following meaning:

- 0: pump disabled
- 1: pump in standby
- 2: active pump participating in pumping
- 3: pump set as standby pump
- 4: pump in error
- 5: the pump is not present in the pumping system

### 3.3 Controls

The following table lists the Modbus RTU registers of the “controls” (Function Code 0x06).

Register	Parameter	Description	Error Code	Scale	Measuring unit	Type	Esy Max
0x100	Reset Fault	Writing a number other than 0 requires a fault reset of all connected inverters	--	--	--	W	•
0x120	RP Pressure fall to Restart Bar	Restarting pressure	02	0.1	bar	RW	•
0x121	SP Setpoint Pressure Bar	Setpoint pressure	02	0.1	bar	RW	•
0x122	P1 Setpoint Aux 1 Bar	Auxiliary setpoint 1 pressure	02	0.1	bar	RW	•
0x123	P2 Setpoint Aux 2 Bar	Auxiliary setpoint 2 pressure	02	0.1	bar	RW	•
0x124	P3 Setpoint Aux 3 Bar	Auxiliary setpoint 3 pressure	02	0.1	bar	RW	•
0x125	P4 Setpoint Aux 4 Bar	Auxiliary setpoint 4 pressure	02	0.1	bar	RW	•
0x130	RP Pressure fall to Restart Psi	Restarting pressure	02	1	psi	RW	•
0x131	SP Setpoint Pressure Psi	Setpoint pressure	02	1	psi	RW	•
0x132	P1 Setpoint Aux 1 Psi	Auxiliary setpoint 1 pressure	02	1	psi	RW	•
0x133	P2 Setpoint Aux 2 Psi	Auxiliary setpoint 2 pressure	02	1	psi	RW	•

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Register	Parameter	Description	Error Code	Scale	Measuring unit	Type	Esy Max
0x134	P3 Setpoint Aux 3 Psi	Auxiliary setpoint 3 pressure	02	1	psi	RW	•
0x135	P4 Setpoint Aux 4 Psi	Auxiliary setpoint 4 pressure	02	1	psi	RW	•

Notes: R W = Read and Write / Reading or writing parameter

W = Write / Writing parameter

• = Register available in the corresponding product

**DAB PUMPS LTD.**

6 Gilbert Court  
Newcomen Way  
Severalls Business Park  
Colchester  
Essex  
C04 9WN - UK  
salesuk@dwtgroup.com  
Tel. +44 0333 777 5010

**DAB PUMPS BV**

'tHofveld 6 C1  
1702 Groot Bijgaarden - Belgium  
info.belgium@dwtgroup.com  
Tel. +32 2 4668353

**DAB PUMPS INC.**

3226 Benchmark Drive  
Ladson, SC 29456 - USA  
info.usa@dwtgroup.com  
Tel. 1- 843-797-5002  
Fax 1-843-797-3366

**OOO DAB PUMPS**

Novgorodskaya str. 1, block G  
office 308, 127247, Moscow - Russia  
info.russia@dwtgroup.com  
Tel. +7 495 122 0035  
Fax +7 495 122 0036

**DAB PUMPS POLAND SP. z.o.o.**

Ul. Janka Muzykanta 60  
02-188 Warszawa - Poland  
polska@dabpumps.com.pl

**DAB PUMPS (QINGDAO) CO. LTD.**

No.40 Kaituo Road, Qingdao Economic &  
Technological Development Zone  
Qingdao City, Shandong Province - China  
PC: 266500  
sales.cn@dwtgroup.com  
Tel. +86 400 186 8280  
Fax +86 53286812210

**DAB PUMPS IBERICA S.L.**

Calle Verano 18-20-22  
28850 - Torrejón de Ardoz - Madrid  
Spain  
Info.spain@dwtgroup.com  
Tel. +34 91 6569545  
Fax: + 34 91 6569676

**DAB PUMPS B.V.**

Albert Einsteinweg, 4  
5151 DL Drunen - Nederland  
info.netherlands@dwtgroup.com  
Tel. +31 416 387280  
Fax +31 416 387299

**DAB PUMPS SOUTH AFRICA**

Twenty One industrial Estate,  
16 Purlin Street, Unit B, Warehouse 4  
Olifantsfontein - 1666 - South Africa  
info.sa@dwtgroup.com  
Tel. +27 12 361 3997

**DAB PUMPS GmbH**

Am Nordpark 3  
41069 Mönchengladbach, Germany  
info.germany@dwtgroup.com  
Tel. +49 2161 47 388 0  
Fax +49 2161 47 388 36

**DAB PUMPS HUNGARY KFT.**

H-8800  
Nagykanizsa, Buda Ernő u.5  
Hungary  
Tel. +36 93501700

**DAB PUMPS DE MÉXICO, S.A. DE C.V.**

Av Amsterdam 101 Local 4  
Col. Hipódromo Condesa,  
Del. Cuauhtémoc CP 06170  
Ciudad de México  
Tel. +52 55 6719 0493

**DAB PUMPS OCEANIA PTY LTD**

426 South Gippsland Hwy,  
Dandenong South VIC 3175 – Australia  
info.oceania@dwtgroup.com  
Tel. +61 1300 373 677

**DAB PUMPS S.p.A.**

Via M. Polo, 14 - 35035 Mestrino (PD) - Italy  
Tel. +39 049 5125000 - Fax +39 049 5125950  
www.dabpumps.com