

ISTRUZIONI PER L'INSTALLAZIONE E LA MANUTENZIONE (IT)
INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE (EN)
INSTRUCTIONS POUR L'INSTALLATION ET LA MAINTENANCE (FR)

DConnect Box

KIT Modbus

1. Introduzione

Questo manuale ha lo scopo di illustrare il corretto utilizzo dell'interfaccia MODBUS per BMS da applicare al dispositivo DConnect Box.

L'interfaccia aggiuntiva (60198693 - KIT adattatore DConnect BMS Modbus RTU RS485) permette di inserire all'interno di un sistema di supervisione MODBUS RTU tutte le pompe elettroniche e i quadri elettrici associabili al DConnect.

Questo manuale è rivolto a utenti aventi familiarità con i dispositivi Modbus. Il lettore dovrà possedere conoscenze base di tale protocollo e delle specifiche tecniche.

Si assume inoltre che sia già presente una rete Modbus RTU con un dispositivo "master".

1.1. Abbreviazioni e definizioni

BMS	Building Management System
DConnect	Sistema DAB per il controllo remoto delle pompe tramite cloud, via internet.
CRC	Cyclic Redundancy Check
RTU	Remote Terminal Unit
0x	Prefisso che identifica un numero esadecimale

Tabella 1

1.2. Specifiche Modbus

Specifiche Modbus	Descrizione	Note
Protocollo	Modbus RTU	È supportata solo la modalità "Slave"
Connessioni	Morsettiera	
Interfaccia fisica	RS485	
Indirizzo slave	Da 1 (default) a 247	
Velocità supportata	4800, 9600, 19200	
Start bit	1	
Data bit	8	
Stop bit	1	
Parità	None/nessuna	
Sample Rate	< 1 minuto in lettura, < 2 secondi in scrittura	

Tabella 2

1.3. Tipologia Rete Modbus

Il grafico seguente fornisce una rappresentazione grafica della tipologia di rete da realizzare tramite DConnect + BMS.

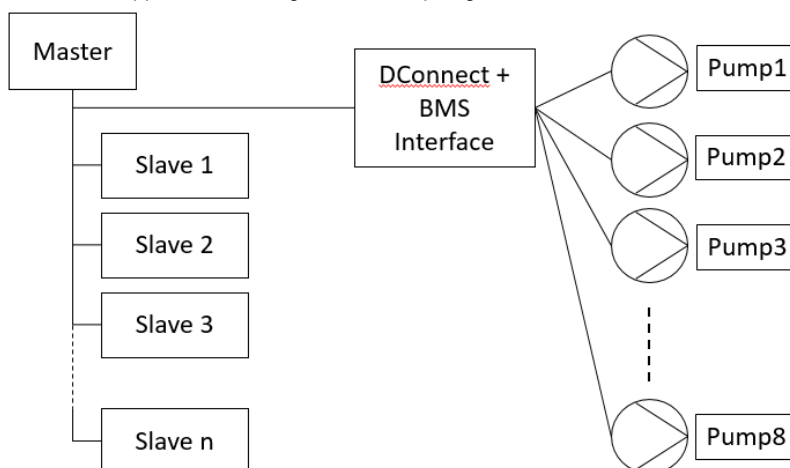


Figura 1

Il DConnect Box accessorizzato con il dispositivo aggiuntivo per MODBUS RTU, rappresenta l'interfaccia fra le pompe e il supervisore BMS: raccoglie le informazioni delle Pompe elettroniche DAB elencate nel paragrafo **3.6 Product Type** e le espone in un solo oggetto interrogabile da una centralina tramite Modbus RS485 RTU.

2. Configurazione Modbus

2.1. Aggiornamento DConnect Box

L'utilizzo dell'interfaccia Modbus RTU opzionale prevede l'**aggiornamento software del DConnect Box**. Per fare questo assicurarsi che sia presente una connessione ad Internet tramite Ethernet o WiFi. Si rimanda al sito internet <https://internetofpumps.com> per maggiori dettagli sull'installazione e sull'utilizzo del DConnect Box.

2.2. Cablaggio

Collegare l'accessorio di interfaccia ad una qualsiasi porta USB del DConnect Box. Si rimanda al manuale del DConnect Box in merito al collegamento delle pompe.

Collegare l'accessorio di interfaccia Modbus con il controllore Modbus RTU come segue.

La comunicazione Modbus tramite RS485- 2 wire prevede l'utilizzo di 2 cavi, A e B più un eventuale GND per la schermatura (shield). È consigliato l'utilizzo di un cavo con le seguenti caratteristiche:

Cavo suggerito per MODBUS RTU

Cavo twistato multicoppia 0,22 mm², 250 V, schermatura F/UTP, guaina in PVC.

Collegare il cavo rispettando la nomenclatura standard:

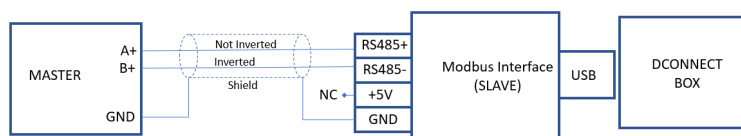


Figura 2



Prima di operare assicurarsi di staccare la tensione dalla linea di alimentazione e di utilizzare solo i cavi e gli accessori consigliati.

3. Registri Modbus RTU

Le funzioni supportate sono mostrate nella tabella seguente:

Type	code	Hex	Name
16-bit data (registers)	03	0x03	Read holding registers
	06	0x06	Write input register
	16	0x10	Preset Multiple Registers

Tabella 3

3.1. Tipo di messaggi Modbus

Di seguito vengono riportati i dettagli del messaggio Modbus utilizzato per il codice prodotto DAB in questione.

Gli offset da interrogare cambiano a seconda della famiglia di prodotto come indicato in tabella:

Family	Offset 0x
Active Driver Plus	0000
ADAC	1000
DConnect Box	2000
Ebox	3000
Esyline	4000
MCE-P	5000

Tabella 4

Si rimanda al paragrafo **3.5 System Status e Errori**.

3.2. Lettura Seriale Dispositivo

La lettura del seriale del dispositivo, utile in fase di identificazione del prodotto, viene effettuata tramite la Function Code 0x03 (Read Holding Register) a partire dal registro 0 di ogni famiglia di prodotto per 25 registri successivi.

Esempio: leggere il seriale di una Esybox.

Indirizzo Slave	Function Code	Dati	Registri successivi	CRC
01	03	4000	0025	CRC
DConnectBox Address	Read holding register	Offset Family + Offset Position + Offset Parameter 0x4000 + 0x0000 + 0x0000		

Tabella 5

3.3. Status

La tabella seguente elenca i registri Modbus RTU dei parametri della pompa (Function Code 0x03).

IMPORTANTE: la pompa restituisce valori corretti in conformità al sistema di misura selezionato (parametro “MS Measure System”)

La scelta del sistema di misura tramite il parametro “MS Measure System” può essere effettuata anche in locale, sulla pompa stessa. È auspicabile, quindi, che il sistema di misura venga impostato durante l'installazione del prodotto.

NOTA: fare riferimento ai manuali dei singoli prodotti per il significato dei parametri ed eventuali accessori necessari.

Offset	Parametro	Descrizione	Scala	Unità di misura	Tipo	Active Driver	ADAC-MCE	Esyline	Ebox	DConnect Box
1A	Product type	3.6 Product Type			R	•	•	•	•	
20	VP Pressure Bar		0.1	Bar	R	•	•	•	•	
21	VP Pressure Psi		1	Psi	R	•	•	•	•	
1C	SP Setpoint pressure Bar		0,1	Bar	RW	•	•	•	•	
1D	SP Setpoint pressure Psi		1	Psi	RW	•	•	•	•	
1E	RP Pressure fall to restart Bar		0,1	Bar	RW	•	•	•	•	
1F	RP Pressure fall to restart Psi		1	Psi	RW	•	•	•	•	
		0 StandBy 1 Go 2 Fault 3 Warning 4 Not configured 5 Function F1 6 Function F3 7 Function F4 8 Manual Disable 9 Startup 10 Stop manual menù 11 Go manual menù								
23	Pump status				R	•	•	•	•	
24	System status	3.5 System Status e Errori			R	•	•	•	•	
25	Latest error	3.5 System Status e Errori			R	•	•	•	•	
3A	P1 Aux1 setpoint Bar		0,1	Bar	R W	•	•	•		
3B	P1 Aux1 setpoint Psi		1	Psi	R W	•	•	•		
3C	P2 Aux2 setpoint Bar		0,1	Bar	R W	•	•	•		
3D	P2 Aux2 setpoint Psi		1	Psi	R W	•	•	•		
3E	P3 Aux3 setpoint Bar		0,1	Bar	R W	•	•	•		
3F	P3 Aux3 setpoint Psi		1	Psi	R W	•	•	•		
27	C1 Pump phase current		0,1	A	R	•	•	•		
28	PO Output power		0,001	kW	R	•	•	•		
29	HO Pump run hours		1	Hours	R	•	•	•		
		0 disabled / inactive 1 float NO / active 2 Float NC 3 P aux NO 4 P aux NC 5 Enable NO 6 Enable NC 7 En. NO reset								
40	I1 Input1 function				R	•	•	•		•

Offset	Parametro	Descrizione	Scala	Unità di misura	Tipo	Active Driver	ADAC-MCE	Esylene	Ebox	DConnect Box
		8 En. NC reset 9 Reset Fault 10 Low Press. NO 11 Low Press. NC 12 Low pr. NO MR 13 Low pr. NC MR								
41	I2 Input2 function	0 disabled / inactive 1 float NO / active 2 Float NC 3 P aux NO 4 P aux NC 5 Enable NO 6 Enable NC 7 En. NO reset 8 En. NC reset 9 Reset Fault 10 Low Press. NO 11 Low Press. NC 12 Low pr. NO MR 13 Low pr. NC MR			R	•	•	•		•
42	I3 Input3 function	0 inactive 1 active			R					•
43	I4 Input4 function	0 inactive 1 active			R					•
22	VF Flow	0 Absent 1 Present			R	•				
47	VF Flow Liter		1	liters /min	R			•		
48	VF Flow Gall		1	gall/min	R			•		
2C	Pump1	0 pump enable 1 pump disable			R					•
2D	P1 Output power		0,001	kW	R					•
2E	P1 Hours ON		1	hours	R					•
2F	P1 Phase current		0,1	A	R					•
31	Pump2	0 pump enable 1 pump disable			R					•
32	P2 Output power		0,001	kW	R					•
33	P2 Hours ON		1	hours	R					•
34	P2 Phase current		0,1	A	R					•
4A	Max Level	0 inactive 1 active			R					•
4B	High Level	0 inactive 1 active			R					•
4C	Medium Level	0 inactive 1 active			R					•
4D	Low Level	0 inactive 1 active			R					•
4E	Min Level	0 inactive 1 active			R					•
4F	Max press	0 inactive 1 active			R					•
50	High press	0 inactive 1 active			R					•

Offset	Parametro	Descrizione	Scala	Unità di misura	Tipo	Active Driver	ADAC-MCE	Esyline	Ebox	DConnect Box
51	Low press	0 inactive 1 active			R				•	
52	Min press	0 inactive 1 active			R				•	

Tabella 6

Note: R = Read / Parametro in lettura
W = Write / Parametro in scrittura
R W = Read and Write / Parametro in lettura o scrittura

3.4. Comandi

La tabella seguente elenca i registri Modbus RTU relativi ai “comandi” (Function Code 0x06).

Offset	Parametro	Descrizione	Scala	Unità di misura	Tipo	Active Driver	ADAC-MCE	Esyline	Ebox	DConnect Box
2B	Identify device (*)	1 Identify			W	•	•	•	•	•
1B	MS Measure system	0 International 1 Anglo-American			W	•	•	•	•	
1C	SP Setpoint pressure Bar		0,1	Bar	RW	•	•	•	•	
1D	SP Setpoint pressure Psi		1	Psi	RW	•	•	•	•	
1E	RP Pressure fail to restart Bar		0,1	Bar	RW	•	•	•	•	
1F	RP Pressure fail to restart Psi		1	Psi	RW	•	•	•	•	
26	Reset actual fault	1 Reset Actual Fault			W	•	•	•	•	
3A	P1 Aux1 Setpoint Bar		0,1	Bar	R W	•	•	•		
3B	P1 Aux1 SetpointPsi		1	Psi	R W	•	•	•		
3C	P2 Aux2 Setpoint Bar		0,1	Bar	R W	•	•	•		
3D	P2 Aux2 Setpoint Psi		1	Psi	R W	•	•	•		
3E	P3 Aux3 Setpoint Bar		0,1	Bar	R W	•	•	•		
3F	P3 Aux3 Setpoint Psi		1	Psi	R W	•	•	•		
44	O1 Output1 function	0 Disabled NC 1 Enabled NC 2 Fault NO 3 Fault NC			RW	•	•	•		•
45	O2 Output2 function	0 Disabled NC 1 Enabled NC 2 Run NO 3 Run NC			RW	•	•	•		•
49	Esybox enable/disable	1 Enable 2 Disable			RW			•		
30	Ebox pump1 enable/disable	0 disable, error 1 enable			RW				•	
35	Ebox pump2 enable/disable	0 disable, error 1 enable			RW				•	
60	Set ID Address (**)	1-247 (1 default)			W					•
61	Set BMS Baudrate (**)	2 4800 bps 3 9600 bps			W					•

Offset	Parametro	Descrizione	Scala	Unità di misura	Tipo	Active Driver	ADAC-MCE	Esyline	Ebox	DConnect Box
		4 19200 bps								
2C	Dconnect box reboot	0 reset solo micro 1 reset DConnect Box			W					●

Tabella 7

(*) tale comando identifica fisicamente l'apparato tramite lampeggio del display o suoni acustici nel caso del DConnect Box.

(**) tali comandi vanno eseguiti in successione affinché vengano attuati.

3.4.1. Modifica parametri da WebAPP

Per configurare il sistema in modo più intuitivo, semplice e veloce è possibile sfruttare la webAPP del DConnect, già utilizzata per l'aggiornamento del DConnect Box.

Per modificare i parametri tramite protocollo Modbus vedi l'esempio riportato nel paragrafo **3.8.1 Cambio Configurazione DConnect Box**.

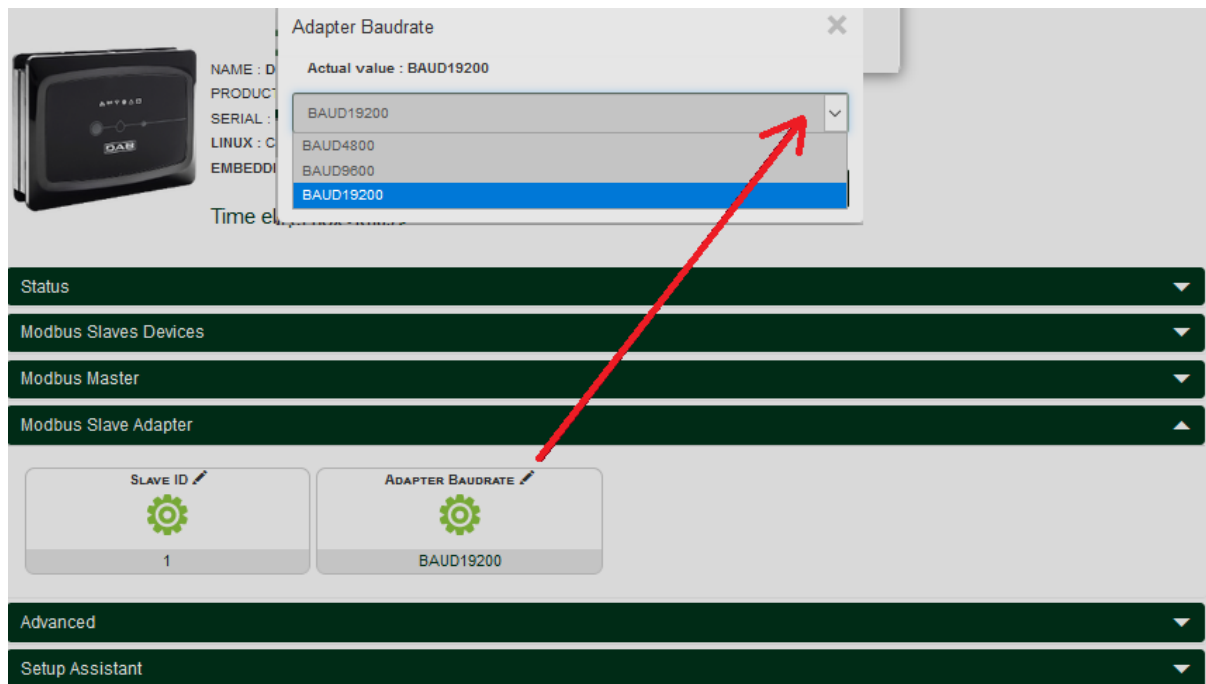


Figura 3

3.5. System Status e Errori

Errors	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Shot circuit HV	18,19,20	18,19,20	18,19	13,83,84	error
Voltage error	21,23,24,25,26,27,38	21,23,24,25,26,27	25,27,28,29,30,31	17,18,19,	error
Overload input	28,29,30	28,29,30	32,33,		error
Operation mode change				10	error
Keys error				12	error
V Selector error				14	error
Relay/contactorm alarm				25,79,80	error
Not configured				32	error
Too high start frequency				35,85,86	error
Locked pump				59,87,88	error

Errors	Active Driver Plus	ADAC MCE-P	Esylene	Ebox	Type
Inconsistent fl. sw. status				70	error
Inconsistent lvl prb. status				71	error
Incons. pressostats status				72	error
Depth sensor				74	error
Internal error	1-16,17,22	1-16,17	1-16,17,20, 21,22,23,24,26	1-16,20,21,29, 38,39,50, 51,54,55,63	error
Warnings	Active Driver Plus	ADAC MCE-P	Esylene	Ebox	Type
Over temperature	33,34,35,36,37	33,34,35,36,37	35,36,37,38		warning
Low voltage LP	39	38	39,40,	23	warning
High voltage HP	40	39	41	24	warning
Over current	41,42	40,41	42,43	26,75,76	warning
Input voltage				22	warning
Dry run	45	47	49	34,81,82	warning
Hot pump PH	48	46	46		warning
Over power OP			44		warning
Pressure sensor BP	49, 50,51	48,49,50	50,51,52,	73	warning
Anti-cycling AY	56		57	53,89,90	warning
Pump oscillation PO		55			warning
Plant error WP		56			warning
Disconnected pump			53	27,77,78	warning
Fluid hot HL			54		warning
Over pressure			55	37	warning
Loss LK			56		warning
Min level				41,44	warning
Max level				42, 45	warning
Max pressure pressostat				64	warning
Min level float switch				65	warning
Min level probe				66	warning
Max level float switch				67	warning
Max level probe				68	warning
Min pressure pressostat				69	warning

Tabella 8

3.6. Product Type

Le tabelle seguenti rappresentano i "product type" per le famiglie di prodotti.

Il "product type" può essere ottenuto con il registro offset 001A.

FAMILY	VALUE	PRODUCT TYPE
Active Driver Plus	41	M/M 1.1 kW 8.5 A
	42	M/M 1.5 kW 11.0 A
	43	M/M 1.8 kW 14.0 A
	44	T/T 5.5 kW 13.3 A
	45	T/T 3.0 kW 7.5 A
	46	M/T 2.2 kW 10.5 A
	47	M/T 1.0 kW 4.7 A
	48	T/T 5.5 kW 13.3 A
	49	T/T 3.0 kW 7.5 A
	50	M/T 2.2 kW 10.5 A
	51	M/T 1.0 kW 4.7 A
	52	M/M 1.8 kW 14.0 A
	53	M/M 1.5 kW 11.0 A
	54	M/M 1.1 kW 8.5 A
ADAC / MCE-P	11	ADAC T/T 15
	12	ADAC T/T 11
	13	ADAC T/T 7.5
	14	ADAC T/T 5.5

FAMILY	VALUE	PRODUCT TYPE
	15	ADAC T/T 4.0
	16	ADAC T/T 3.0
	17	ADAC M/T 2.2
	18	ADAC M/T 1.5
	19	ADAC M/T 1.0
	20	MCE-P 150
	21	MCE-P 110
	22	MCE-P 55
	23	MCE-P 30
	24	MCE-P 22
	25	MCE-P 15
	26	MCE-P 11
Esyline	65	Esybox 1.5 kW NP
Ebox	77	EBOX Basic D
	78	EBOX Plus D

Tabella 9

3.7. Aggiunta di un nuovo prodotto e sostituzione

Ogni famiglia di prodotto può contenere virtualmente fino a 16 dispositivi. Una volta collegata al DConnect Box, una pompa riceverà un seriale univoco e occuperà la prima posizione libera delle 16 a disposizione. Tale posizione rimarrà occupata anche se la pompa verrà spenta o sostituita. Per riferire la pompa successiva della stessa famiglia presente nell'impianto occorrerà aggiungere un offset di 0x0100.

Esempio: Installazione composta da 3 MCE-P e un Active Driver Plus. Si suppone un guasto all'MCE-P in seconda posizione (offset 0x5100). Il nuovo MCE-P occuperà la prima posizione libera all'interno dei registri assegnati a quella famiglia, quindi avrà un offset di 0x5300.

N°	Famiglia	Offset originale	Sostituzione del MCE-P num 2
1	MCE-P	0x5000	0x5000
2	MCE-P	0x5100	-> Sostituzione -> 0x5300
3	MCE-P	0x5200	0x5200
4	Active Driver Plus	0x0000	0x0000

Tabella 10

NOTA: il DConnect Box gestisce fino ad un massimo di 8 pompe ma in base alla complessità dell'installazione tale numero potrebbe variare. Si consiglia di contattare il Customer Service DAB per un numero di pompe elevato.

3.8. Esempi

3.8.1. Cambio Configurazione DConnect Box

Per permettere il corretto funzionamento all'interno di un sistema di supervisione, occorre impostare l'indirizzo dello slave (il DConnect Box) e la velocità della seriale. Per evitare di perdere la comunicazione con il dispositivo, occorre scrivere i due registri in modo contiguo, utilizzando la Function Code 16 (Preset Multiple Registers).

Se l'operazione va a buon fine, un segnale acustico ("beep") verrà emesso dal DConnect Box. Vedi esempio seguente.

- Configurare un DConnectBox all'indirizzo Modbus 100 con velocità 19200 bps:

Indirizzo Slave	Function Code	Offset	Value	CRC
01	10	2060	0064	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0060	100 HEX = 0x0064	
01	10	2061	4	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0061	4 = 19200	

Tabella 11

* YYYY CRC16 calcolato.

- b. b. Successivamente modificare la baudrate a 9600 bps.

Indirizzo Slave	Function Code	Offset	Value	CRC
64	10	2060	0064	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0060	100 HEX = 0x0064	
64	10	2061	3	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0061	3 = 9600	

Tabella 12

* YYYY CRC16 calcolato.

3.8.2. Lettura parametri

Si consideri un impianto costituito da due ADAC e una Esysbox.

- a. Richiesta della pressione in Bar del **primo ADAC**:

Indirizzo Slave	Function Code	Dati	CRC
01	03	1020	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0000 + 0x0020	

Tabella 13

Nota: (MS_Measure System impostato come International)

- b. Richiesta della pressione in Psi del **secondo ADAC**:

Indirizzo Slave	Function Code	Dati	CRC
01	03	1120	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0100 + 0x0020	

Tabella 14

Nota: (MS_Measure System impostato come International)

- c. Richiesta della potenza di uscita della **Esysbox** (scala 0.001kW):

Indirizzo Slave	Function Code	Dati	CRC
01	03	4028	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x4000 + 0x000 + 0x0028	

Tabella 15

Nota: (MS_Measure System impostato come International)

* YYYY CRC16 calcolato.

3.8.3. Scrittura parametri

Si consideri lo stesso impianto costituito da due ADAC e una Esysbox.

- a. Impostazione del setpoint di pressione in Bar del **secondo ADAC** al valore **3.3 Bar**:

Indirizzo Slave	Function Code	Offset	Value	CRC
01	06	111C	0021	YYYY*

ITALIANO

DConnectBox Address	Write registers	input	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0100 + 0x001C	3.3 / 0.1 = 33 HEX = 0x0021	
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Tabella 16

Nota: (MS_Measure System impostato come International)

* YYYY CRC16 calcolato.

1. Introduction

This manual is intended to illustrate the correct use of the MODBUS interface for BMS to be applied to the DConnect Box device.

The additional interface (60198693 - DConnect BMS Modbus RTU RS485 adapter KIT) allows all the electronic pumps and electrical panels that can be associated with the DConnect to be inserted into a MODBUS RTU supervision system.

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

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

1.1. Abbreviations and definitions

BMS	Building Management System
DConnect	DAB system for remote control of pumps via cloud, via internet.
CRC	Cyclic Redundancy Check
RTU	Remote Terminal Unit
0x	Prefix that identifies a hexadecimal number

Table 1

1.2. Modbus Specifications

Modbus Specifications	Description	Notes
Protocol	Modbus RTU	Only "Slave" mode is supported
Connections	Terminal block	
Physical interface	RS485	
Slave Address	1 (default) to 247	
Supported speed	4800, 9600, 19200	
Start bit	1	
Data bit	8	
Stop bits	1	
Parity	None/none	
Sample Rate	< 1 minute of reading, < 2 seconds writing time	

Table 2

1.3. Type: Modbus network

The following graph provides a graphical representation of the type of network to be implemented through DConnect + BMS.

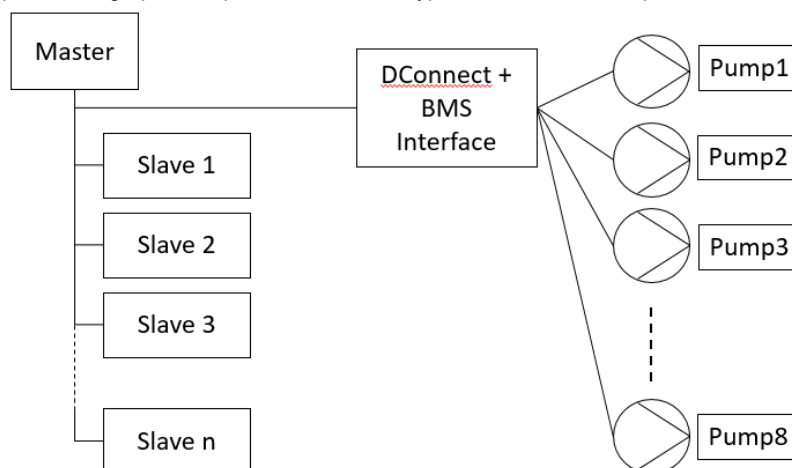


Figure 1

The DConnect Box equipped with the additional device for MODBUS RTU, represents the interface between the pumps and the BMS supervisor: it collects the information of the DAB electronic pumps listed in the paragraph **3.6 Product Type** and exposes them in a single object that can be queried by a control unit via Modbus RS485 RTU.

2. Modbus Configuration

2.1. DConnect Box Update

The use of the optional Modbus RTU interface involves **the software update of the DConnect Box**. To do this, make sure that there is an Internet connection via Ethernet or WiFi. Please refer to the <https://internetofpumps.com> website for more details on installing and using the DConnect Box.

2.2. Wiring

Connect the interface accessory to any USB port on the DConnect Box. Please refer to the DConnect Box manual for connecting the pumps.

Connect the Modbus interface appliance with the Modbus RTU controller as follows.

Modbus communication via RS485- 2 wire involves the use of 2 cables, A and B plus a possible GND for shielding. It is recommended to use a cable with the following characteristics:

Suggested cable for MODBUS RTU

Multipair twisted cable 0.22 mm², 250 V, F/UTP shielding, PVC sheath.

Connect the cable according to the standard nomenclature:

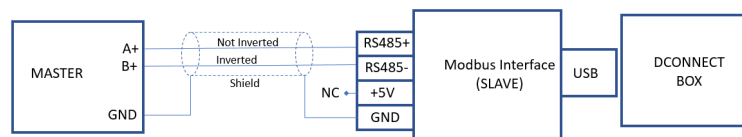


Figure 2



Before operating, be sure to disconnect the power from the power supply line and use only recommended cables and accessories.

3. Modbus RTU registers

Supported features are shown in the table below:

Type	tails	Hex	Name
16-bit data (registers)	03	0x03	Read holding registers
	06	0x06	Write input register
	16	0x10	Preset Multiple Registers

Table 3

3.1. Modbus message type

The details of the Modbus message used for the DAB product key in question are given below.

The offsets to be queried change depending on the product family as shown in the table:

Family	0x Offset
Active Driver Plus	0000
ADAC	1000
DConnect Box	2000
Ebox	3000
Esyline	4000
MCE-P	5000

Table 4

Please refer to paragraph **3.5 System Status and Errors**.

3.2. Device Serial Read

The reading of the serial number of the device, useful in the product identification phase, is carried out through the Function Code 0x03 (Read Holding Register) starting from register 0 of each product family for 25 successive registers.

Example: read the serial number of an Esybox.

Slave Address	Function Code	Data	Subsequent Logs	CRC
01	03	4000	0025	CRC
DConnectBox Address	Read holding register	Offset Family + Offset Position + Offset Parameter 0x4000 + 0x0000 + 0x0000		

Table 5

3.3. Status

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

IMPORTANT: the pump returns correct values in accordance with the selected measurement system ("MS Measure System" parameter)

The choice of the measuring system using the "MS Measure System" parameter can also be made locally, on the pump itself. It is therefore desirable that the measurement system be set up during product installation.

NOTE: Refer to the individual product manuals for the meaning of the parameters and any necessary accessories.

Offset	Parameter	Description	Ladder	Units of Measurement	Type	Active Driver	ADAC-MCE	Esylene	Ebox	DConnect Box
1A	Product type	3.6 Product Type			R	•	•	•	•	
20	VP Pressure Bar		0.1	Bar	R	•	•	•	•	
21	VP Pressure Psi		1	Psi	R	•	•	•	•	
1C	SP Setpoint pressure Bar		0.1	Bar	RW	•	•	•	•	
1D	SP Setpoint pressure Psi		1	Psi	RW	•	•	•	•	
1E	RP Pressure fall to restart Bar		0.1	Bar	RW	•	•	•	•	
1F	RP Pressure fall to restart Psi		1	Psi	RW	•	•	•	•	
23	Pump status	0 StandBy1 Go2 Fault3 Warning4 Not configured5 Function F16 Function F37 Function F48 Manual Disable9 Startup10 Stop manual menu11 Go manual menu			R	•	•	•	•	
24	System status	3.5 System Status and Errors			R	•	•	•	•	
25	Latest error	3.5 System Status and Errors			R	•	•	•	•	
3Rd	P1 Aux1 setpoint Bar		0,1	Bar	R W	•	•	•		
3B	P1 Aux1 setpoint Psi		1	Psi	R W	•	•	•		
3C	P2 Aux2 setpoint Bar		0,1	Bar	R W	•	•	•		
3-D	P2 Aux2 setpoint Psi		1	Psi	R W	•	•	•		
3E	P3 Aux3 setpoint Bar		0,1	Bar	R W	•	•	•		
3F	P3 Aux3 setpoint Psi		1	Psi	R W	•	•	•		
27	C1 Pump phase current		0,1	At	R	•	•	•		
28	PO Output power		0,0 01	Kw	R	•	•	•		
29	HO Pump run hours		1	Hours	R	•	•	•		
40	I1 Input1 function	0 disabled / inactive 1 float NO / active 2 Float NC 3 P aux NO 4 P aux NC 5 Enable NO 6 Enable NC			R	•	•	•		•

Offset	Parameter	Description	Ladder	Units of Measurement	Type	Active Driver	ADAC-MCE	Esylne	Ebox	DConnect Box
		7 En. NO reset 8 En. NC reset 9 Reset Fault 10 Low Press. NO 11 Low Press. NC 12 Low pr. NO MR 13 Low pr. NC MR								
41	I2 Input2 function	0 disabled / inactive 1 float NO / active 2 Float NC 3 P aux NO 4 P aux NC 5 Enable NO 6 Enable NC 7 En. NO reset 8 En. NC reset 9 Reset Fault 10 Low Press. NO 11 Low Press. NC 12 Low pr. NO MR 13 Low pr. NC MR			R	•	•	•		•
42	I3 Input3 function	0 inactive1 active			R					•
43	I4 Input4 function	0 inactive1 active			R					•
22	VF Flow	0 Absent1 Present			R	•				
47	VF Flow Liter		1	liters /min	R			•		
48	VF Flow Gall		1	gall/min	R			•		
2C	Pump1	0 pump enable1 pump disable			R					•
2D	P1 Output power		0,0 01	Kw	R					•
2E	P1 Hours ON		1	hours	R					•
2F	P1 Phase current		0,1	At	R					•
31	Pump2	0 pump enable1 pump disable			R					•
32	P2 Output power		0,0 01	Kw	R					•
33	P2 Hours ON		1	hours	R					•
34	P2 Phase current		0,1	At	R					•
4Th	Max Level	0 inactive1 active			R					•
4B	High Level	0 inactive1 active			R					•
4C	Medium Level	0 inactive1 active			R					•
4D	Low Level	0 inactive1 active			R					•
4E	Min Level	0 inactive1 active			R					•
4F	Max press	0 inactive1 active			R					•
50	High press	0 inactive1 active			R					•
51	Low press	0 inactive1 active			R					•
52	Min press	0 inactive1 active			R					•

Table 6

Notes: R = Read / Parameter on Read
W = Write / Parameter on Write
R W = Read and Write

3.4. Commands

The following table lists the Modbus RTU registers related to "commands" (Function Code 0x06).

Offset	Parameter	Description	Ladder	Units of Measurement	Type	Active Driver	ADAC-MCE	Esylene	Ebox	DConnect Box
2B	Identify device (*)	1 Identify			W	•	•	•	•	•
1B	MS Measure system	0 International1 Anglo-American			W	•	•	•	•	
1C	SP Setpoint pressure Bar		0,1	Bar	RW	•	•	•	•	
1D	SP Setpoint pressure Psi		1	Psi	RW	•	•	•	•	
1E	RP Pressure fall to restart Bar		0,1	Bar	RW	•	•	•	•	
1F	RP Pressure fall to restart Psi		1	Psi	RW	•	•	•	•	
26	Reset actual fault	1 Reset Actual Fault			W	•	•	•	•	
3Rd	P1 Aux1 Setpoint Bar		0,1	Bar	R W	•	•	•		
3B	P1 Aux1 SetpointPsi		1	Psi	R W	•	•	•		
3C	P2 Aux2 Setpoint Bar		0,1	Bar	R W	•	•	•		
3-D	P2 Aux2 Setpoint Psi		1	Psi	R W	•	•	•		
3E	P3 Aux3 Setpoint Bar		0,1	Bar	R W	•	•	•		
3F	P3 Aux3 Setpoint Psi		1	Psi	R W	•	•	•		
44	O1 Output1 function	0 Disabled NC 1 Enabled NC 2 Fault NO 3 Fault NC			RW	•	•	•		•
45	O2 Output2 function	0 Disabled NC 1 Enabled NC 2 Run NO 3 Run NC			RW	•	•	•		•
49	Esyybox enable/disable	1 Enable 2 Disable			RW			•		
30	Ebox pump1 enable/disable	0 disable, error 1 enable			RW				•	
35	Ebox pump2 enable/disable	0 disable, error 1 enable			RW				•	
60	Set ID Address (**)	1-247 (1 default)			W					•
61	Baudrate BMS Set (**)	2 4800 bps 3 9600 bps 4 19200 bps			W					•
2C	Dconnect box reboot	0 micro only reset 1 x DConnect Box Reset			W					•

Table 7

(*) this command physically identifies the device by flashing the display or acoustic sounds in the case of the DConnect Box.

(**) these commands must be executed in succession in order for them to be implemented.

3.4.1. Edit parameters from WebAPP

To configure the system in a more intuitive, simple and fast way, it is possible to take advantage of the DConnect webAPP, already used for the update of the DConnect Box.

To change the parameters via Modbus protocol, see the example in the paragraph **3.8.1 DConnect Box Configuration Change**.

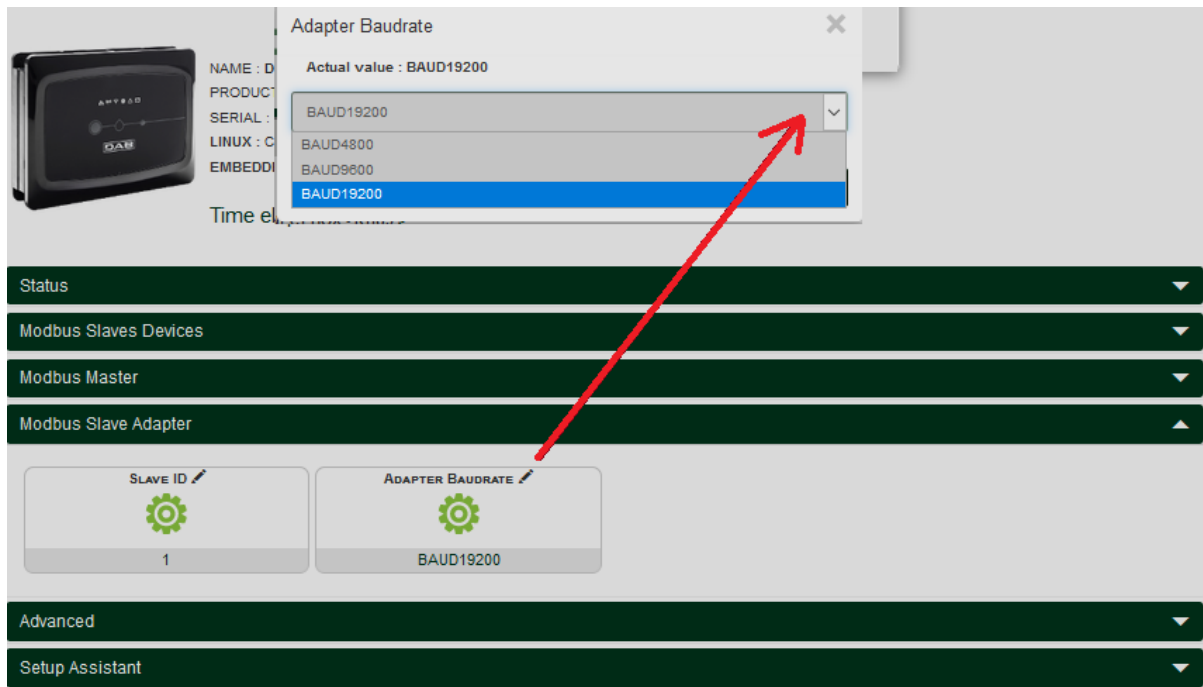


Figure 3

3.5. System Status and Errors

Errors	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Shot circuit HV	18,19,20	18,19,20	18,19	13,83,84	error
Voltage error	21,23,24,25,26,27,38	21,23,24,25,26,27	25,27,28,29,30,31	17,18,19,	error
Input overload	28,29,30	28,29,30	32,33,		error
Operation mode change				10	error
Keys error				12	error
V Selector error				14	error
Relay/contactorm alarm				25,79,80	error
Not configured				32	error
Too high start frequency				35,85,86	error
Locked pump				59,87,88	error
Inconsistent fl. Sw. status				70	error
Inconsistent lvl prb. status				71	error
Incons. pressostats status				72	error
Depth sensor				74	error
Internal error	1-16,17,22	1-16,17	1-16,17,20, 21,22,23,24,26	1-16,20,21,29, 38,39,50, 51,54,55,63	error
Warnings	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Over temperature	33,34,35,36,37	33,34,35,36,37	35,36,37,38		warning
Low voltage LP	39	38	39,40,	23	warning
High voltage HP	40	39	41	24	warning
Over current	41,42	40,41	42,43	26,75,76	warning
Input voltage				22	warning
Dry run	45	47	49	34,81,82	warning
Hot pump PH	48	46	46		warning
Over power OP			44		warning
Pressure sensor BP	49, 50,51	48,49,50	50,51,52,	73	warning
Anti-cycling AY	56		57	53,89,90	warning
Pump oscillation PO		55			warning
Plant error WP		56			warning
Disconnected pump			53	27,77,78	warning

Errors	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Fluid hot HL			54		warning
Over pressure			55	37	warning
Loss LK			56		warning
Min level				41,44	warning
Max level				42, 45	warning
Max pressure pressostat				64	warning
Min level float switch				65	warning
Min level probe				66	warning
Max level float switch				67	warning
Max level probe				68	warning
Min pressure pressostat				69	warning

Table 8

3.6. Product Type

The following tables represent the product types for product families.

The "product type" can be obtained with the 001A offset register.

FAMILY	VALUE	PRODUCT TYPE
Active Driver Plus	41	M/M 1.1 kW 8.5 A
	42	M/M 1.5 kW 11.0 A
	43	M/M 1.8 kW 14.0 A
	44	T/T 5.5 kW 13.3 A
	45	T/T 3.0 kW 7.5 A
	46	M/T 2.2 kW 10.5 A
	47	M/T 1.0 kW 4.7 A
	48	T/T 5.5 kW 13.3 A
	49	T/T 3.0 kW 7.5 A
	50	M/T 2.2 kW 10.5 A
	51	M/T 1.0 kW 4.7 A
	52	M/M 1.8 kW 14.0 A
	53	M/M 1.5 kW 11.0 A
	54	M/M 1.1 kW 8.5 A
ADAC / MCE-P	11	ADAC T/T 15
	12	ADAC T/T 11
	13	ADAC T/T 7.5
	14	ADAC T/T 5.5
	15	ADAC T/T 4.0
	16	ADAC T/T 3.0
	17	ADAC M/T 2.2
	18	ADAC M/T 1.5
	19	ADAC M/T 1.0
	20	MCE-P 150
	21	MCE-P 110
	22	MCE-P 55
	23	MCE-P 30
	24	MCE-P 22
	25	MCE-P 15
	26	MCE-P 11
Esyline	65	Esybox 1.5 kW NP
Ebox	77	EBOX Basic D
	78	EBOX Plus D

Table 9

3.7. Adding a new product and replacing it

Each product family can contain up to 16 devices virtually. Once connected to the DConnect Box, a pump will receive a unique serial number and will occupy the first free position of the 16 available. This position will remain occupied even if the pump is

turned off or replaced. To refer to the next pump of the same family in the system, it will be necessary to add an offset of 0x0100.

Example: Installation consisting of 3 MCE-Ps and an Active Driver Plus. A failure of the MCE-P in the second position (offset 0x5100) is assumed. The new MCE-P will occupy the first free position within the registers assigned to that family, so it will have an offset of 0x5300.

N°	Family	Original Offset	Replacement of the CEF-P num 2
1	MCE-P	0x5000	0x5000
2	MCE-P	0x5100	0x5300
3	MCE-P	0x5200	0x5200
4	Active Driver Plus	0x0000	0x0000

Table 10

NOTE: the DConnect Box manages up to a maximum of 8 pumps but depending on the complexity of the installation this number may vary. It is advisable to contact DAB Customer Service for a large number of pumps.

3.8. Examples

3.8.1. DConnect Box Configuration Change

To allow correct operation within a supervision system, the slave address (the DConnect Box) and the serial speed must be set. To avoid losing communication with the device, the two registers must be written contiguously, using Function Code 16 (Preset Multiple Registers).

If successful, a beep will sound from the DConnect Box. See example below.

- a. Configure a DConnectBox at Modbus 100 with 19200 bps speed:

Slave Address	Function Code	Offset	Value	CRC
01	10	2060	0064	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0060	100 HEX = 0x0064	
01	10	2061	4	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0061	4 = 19200	

Table 11

* YYYY CRC16 calculated.

- b. Then change the baudrate to 9600 bps.

Slave Address	Function Code	Offset	Value	CRC
64	10	2060	0064	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0060	100 HEX = 0x0064	
64	10	2061	3	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0061	3 = 9600	

Table 12

* YYYY CRC16 calculated.

3.8.2. Parameter reading

Consider a system consisting of two ADACs and an Esysbox.

- a. Request for the pressure in Bar of the **first ADAC**:

Slave Address	Function Code	Data	CRC
01	03	1020	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0000 + 0x0020	

Table 13

Note: (MS_Measure System set as International)

- b. Pressure request in Psi of the **second ADAC**:

Slave Address	Function Code	Data	CRC
01	03	1120	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0100 + 0x0020	

Table 14

Note: (MS_Measure System set as International)

- c. Esysbox output **power requirement** (0.001kW scale):

Slave Address	Function Code	Data	CRC
01	03	4028	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x4000 + 0x000 + 0x0028	

Table 15

Note: (MS_Measure System set as International)

* YYYY CRC16 calculated.

3.8.3. Write parameters

Consider the same system consisting of two ADACs and an Esysbox.

- a. Setting the pressure setpoint in Bar of the **second ADAC** to the value **3.3 Bar**:

Slave Address	Function Code	Offset	Value	CRC
01	06	111C	0021	YYYY*
DConnectBox Address	Write input registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0100 + 0x001C	3.3 / 0.1 = 33 HEX = 0x0021	

Table 16

Note: (MS_Measure System set as International)

* YYYY CRC16 calculated.

1. Introduction

This manual is intended to illustrate the correct use of the MODBUS interface for BMS to be applied to the DConnect Box device.

The additional interface (60198693 - DConnect BMS Modbus RTU RS485 adapter KIT) allows all the electronic pumps and electrical panels that can be associated with the DConnect to be inserted into a MODBUS RTU supervision system.

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

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

1.1. Abbreviations and definitions

BMS	Building Management System
DConnect	DAB system for remote control of pumps via cloud, via internet.
CRC	Cyclic Redundancy Check
RTU	Remote Terminal Unit
0x	Prefix that identifies a hexadecimal number

Table 1

1.2. Modbus Specifications

Modbus Specifications	Description	Notes
Protocol	Modbus RTU	Only "Slave" mode is supported
Connections	Terminal block	
Physical interface	RS485	
Slave Address	1 (default) to 247	
Supported speed	4800, 9600, 19200	
Start bit	1	
Data bit	8	
Stop bits	1	
Parity	None/none	
Sample Rate	< 1 minute of reading, < 2 seconds writing time	

Table 2

1.3. Type: Modbus network

The following graph provides a graphical representation of the type of network to be implemented through DConnect + BMS.

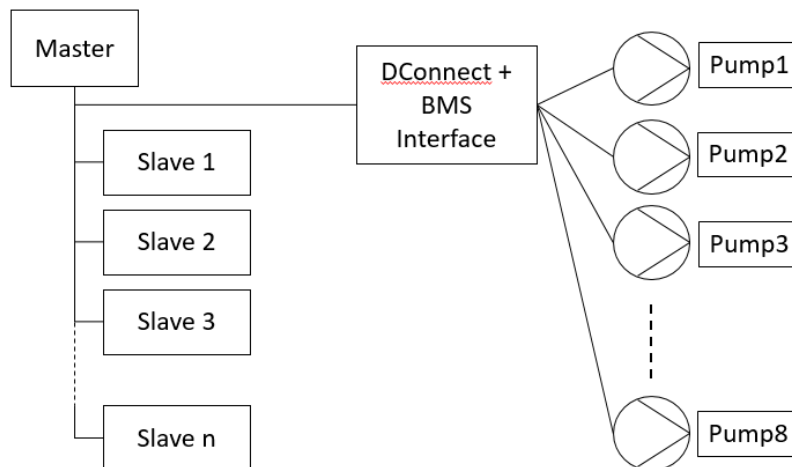


Figure 1

The DConnect Box equipped with the additional device for MODBUS RTU, represents the interface between the pumps and the BMS supervisor: it collects the information of the DAB electronic pumps listed in the paragraph **3.6 Product Type** and exposes them in a single object that can be queried by a control unit via Modbus RS485 RTU.

2. Modbus Configuration

2.1. DConnect Box Update

The use of the optional Modbus RTU interface involves **the software update of the DConnect Box**. To do this, make sure that there is an Internet connection via Ethernet or WiFi. Please refer to the <https://internetofpumps.com> website for more details on installing and using the DConnect Box.

2.2. Wiring

Connect the interface accessory to any USB port on the DConnect Box. Please refer to the DConnect Box manual for connecting the pumps.

Connect the Modbus interface appliance with the Modbus RTU controller as follows.

Modbus communication via RS485- 2 wire involves the use of 2 cables, A and B plus a possible GND for shielding. It is recommended to use a cable with the following characteristics:

Suggested cable for MODBUS RTU

Multipair twisted cable 0.22 mm², 250 V, F/UTP shielding, PVC sheath.

Connect the cable according to the standard nomenclature:

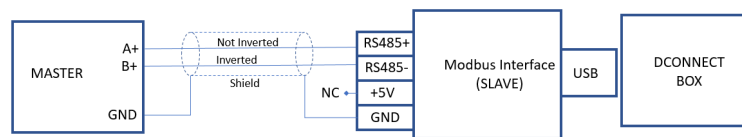


Figure 2



Before operating, be sure to disconnect the power from the power supply line and use only recommended cables and accessories.

3. Modbus RTU registers

Supported features are shown in the table below:

Type	tails	Hex	Name
16-bit data (registers)	03	0x03	Read holding registers
	06	0x06	Write input register
	16	0x10	Preset Multiple Registers

Table 3

3.1. Modbus message type

The details of the Modbus message used for the DAB product key in question are given below.

The offsets to be queried change depending on the product family as shown in the table:

Family	0x Offset
Active Driver Plus	0000
ADAC	1000
DConnect Box	2000
Ebox	3000
Esyline	4000
MCE-P	5000

Table 4

Please refer to paragraph **3.5 System Status and Errors**.

3.2. Device Serial Read

The reading of the serial number of the device, useful in the product identification phase, is carried out through the Function Code 0x03 (Read Holding Register) starting from register 0 of each product family for 25 successive registers.

Example: read the serial number of an Esybox.

Slave Address	Function Code	Data	Subsequent Logs	CRC
01	03	4000	0025	CRC
DConnectBox Address	Read holding register	Offset Family + Offset Position + Offset Parameter 0x4000 + 0x0000 + 0x0000		

Table 5

3.3. Status

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

IMPORTANT: the pump returns correct values in accordance with the selected measurement system ("MS Measure System" parameter)

The choice of the measuring system using the "MS Measure System" parameter can also be made locally, on the pump itself. It is therefore desirable that the measurement system be set up during product installation.

NOTE: Refer to the individual product manuals for the meaning of the parameters and any necessary accessories.

Offset	Parameter	Description	Ladder	Units of Measurement	Type	Active Driver	ADAC-MCE	Esylene	Ebox	DConnect Box
1A	Product type	3.6 Product Type			R	•	•	•	•	
20	VP Pressure Bar		0.1	Bar	R	•	•	•	•	
21	VP Pressure Psi		1	Psi	R	•	•	•	•	
1C	SP Setpoint pressure Bar		0.1	Bar	RW	•	•	•	•	
1D	SP Setpoint pressure Psi		1	Psi	RW	•	•	•	•	
1E	RP Pressure fall to restart Bar		0.1	Bar	RW	•	•	•	•	
1F	RP Pressure fall to restart Psi		1	Psi	RW	•	•	•	•	
23	Pump status	0 StandBy1 Go2 Fault3 Warning4 Not configured5 Function F16 Function F37 Function F48 Manual Disable9 Startup10 Stop manual menu11 Go manual menu			R	•	•	•	•	
24	System status	3.5 System Status and Errors			R	•	•	•	•	
25	Latest error	3.5 System Status and Errors			R	•	•	•	•	
3Rd	P1 Aux1 setpoint Bar		0,1	Bar	R W	•	•	•		
3B	P1 Aux1 setpoint Psi		1	Psi	R W	•	•	•		
3C	P2 Aux2 setpoint Bar		0,1	Bar	R W	•	•	•		
3-D	P2 Aux2 setpoint Psi		1	Psi	R W	•	•	•		
3E	P3 Aux3 setpoint Bar		0,1	Bar	R W	•	•	•		
3F	P3 Aux3 setpoint Psi		1	Psi	R W	•	•	•		
27	C1 Pump phase current		0,1	At	R	•	•	•		
28	PO Output power		0,0 01	Kw	R	•	•	•		
29	HO Pump run hours		1	Hours	R	•	•	•		
40	I1 Input1 function	0 disabled / inactive 1 float NO / active 2 Float NC 3 P aux NO 4 P aux NC 5 Enable NO 6 Enable NC			R	•	•	•		•

Offset	Parameter	Description	Ladder	Units of Measurement	Type	Active Driver	ADAC-MCE	Esylne	Ebox	DConnect Box
		7 En. NO reset 8 En. NC reset 9 Reset Fault 10 Low Press. NO 11 Low Press. NC 12 Low pr. NO MR 13 Low pr. NC MR								
41	I2 Input2 function	0 disabled / inactive 1 float NO / active 2 Float NC 3 P aux NO 4 P aux NC 5 Enable NO 6 Enable NC 7 En. NO reset 8 En. NC reset 9 Reset Fault 10 Low Press. NO 11 Low Press. NC 12 Low pr. NO MR 13 Low pr. NC MR			R	•	•	•		•
42	I3 Input3 function	0 inactive1 active			R					•
43	I4 Input4 function	0 inactive1 active			R					•
22	VF Flow	0 Absent1 Present			R	•				
47	VF Flow Liter		1	liters /min	R			•		
48	VF Flow Gall		1	gall/min	R			•		
2C	Pump1	0 pump enable1 pump disable			R					•
2D	P1 Output power		0,0 01	Kw	R					•
2E	P1 Hours ON		1	hours	R					•
2F	P1 Phase current		0,1	At	R					•
31	Pump2	0 pump enable1 pump disable			R					•
32	P2 Output power		0,0 01	Kw	R					•
33	P2 Hours ON		1	hours	R					•
34	P2 Phase current		0,1	At	R					•
4Th	Max Level	0 inactive1 active			R					•
4B	High Level	0 inactive1 active			R					•
4C	Medium Level	0 inactive1 active			R					•
4D	Low Level	0 inactive1 active			R					•
4E	Min Level	0 inactive1 active			R					•
4F	Max press	0 inactive1 active			R					•
50	High press	0 inactive1 active			R					•
51	Low press	0 inactive1 active			R					•
52	Min press	0 inactive1 active			R					•

Table 6

Notes: R = Read / Parameter on Read
W = Write / Parameter on Write
R W = Read and Write

3.4. Commands

The following table lists the Modbus RTU registers related to "commands" (Function Code 0x06).

Offset	Parameter	Description	Ladder	Units of Measurement	Type	Active Driver	ADAC-MCE	Esylene	Ebox	DConnect Box
2B	Identify device (*)	1 Identify			W	•	•	•	•	•
1B	MS Measure system	0 International1 Anglo-American			W	•	•	•	•	
1C	SP Setpoint pressure Bar		0,1	Bar	RW	•	•	•	•	
1D	SP Setpoint pressure Psi		1	Psi	RW	•	•	•	•	
1E	RP Pressure fall to restart Bar		0,1	Bar	RW	•	•	•	•	
1F	RP Pressure fall to restart Psi		1	Psi	RW	•	•	•	•	
26	Reset actual fault	1 Reset Actual Fault			W	•	•	•	•	
3Rd	P1 Aux1 Setpoint Bar		0,1	Bar	R W	•	•	•		
3B	P1 Aux1 SetpointPsi		1	Psi	R W	•	•	•		
3C	P2 Aux2 Setpoint Bar		0,1	Bar	R W	•	•	•		
3-D	P2 Aux2 Setpoint Psi		1	Psi	R W	•	•	•		
3E	P3 Aux3 Setpoint Bar		0,1	Bar	R W	•	•	•		
3F	P3 Aux3 Setpoint Psi		1	Psi	R W	•	•	•		
44	O1 Output1 function	0 Disabled NC 1 Enabled NC 2 Fault NO 3 Fault NC			RW	•	•	•		•
45	O2 Output2 function	0 Disabled NC 1 Enabled NC 2 Run NO 3 Run NC			RW	•	•	•		•
49	Esyybox enable/disable	1 Enable 2 Disable			RW			•		
30	Ebox pump1 enable/disable	0 disable, error 1 enable			RW				•	
35	Ebox pump2 enable/disable	0 disable, error 1 enable			RW				•	
60	Set ID Address (**)	1-247 (1 default)			W					•
61	Baudrate BMS Set (**)	2 4800 bps 3 9600 bps 4 19200 bps			W					•
2C	Dconnect box reboot	0 micro only reset 1 x DConnect Box Reset			W					•

Table 7

(*) this command physically identifies the device by flashing the display or acoustic sounds in the case of the DConnect Box.

(**) these commands must be executed in succession in order for them to be implemented.

3.4.1. Edit parameters from WebAPP

To configure the system in a more intuitive, simple and fast way, it is possible to take advantage of the DConnect webAPP, already used for the update of the DConnect Box.

To change the parameters via Modbus protocol, see the example in the paragraph **3.8.1 DConnect Box Configuration Change**.

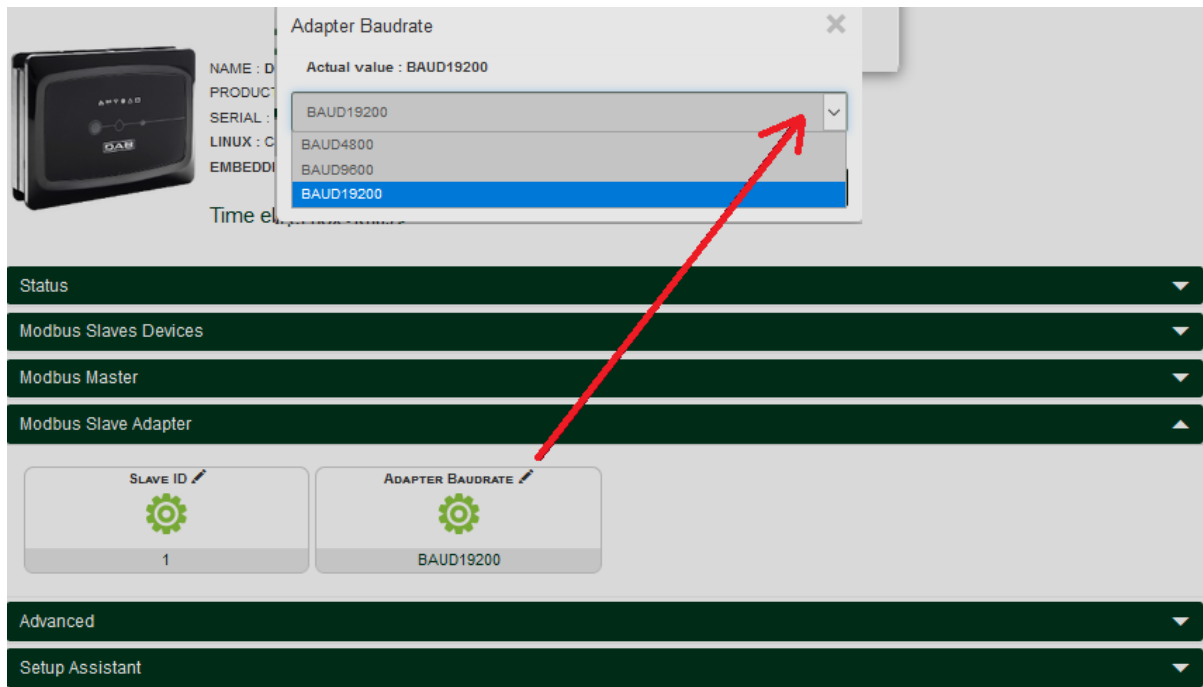


Figure 3

3.5. System Status and Errors

Errors	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Shot circuit HV	18,19,20	18,19,20	18,19	13,83,84	error
Voltage error	21,23,24,25,26,27,38	21,23,24,25,26,27	25,27,28,29,30,31	17,18,19,	error
Input overload	28,29,30	28,29,30	32,33,		error
Operation mode change				10	error
Keys error				12	error
V Selector error				14	error
Relay/contactors alarm				25,79,80	error
Not configured				32	error
Too high start frequency				35,85,86	error
Locked pump				59,87,88	error
Inconsistent fl. Sw. status				70	error
Inconsistent lvl prb. status				71	error
Incons. pressostats status				72	error
Depth sensor				74	error
Internal error	1-16,17,22	1-16,17	1-16,17,20, 21,22,23,24,26	1-16,20,21,29, 38,39,50, 51,54,55,63	error
Warnings	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Over temperature	33,34,35,36,37	33,34,35,36,37	35,36,37,38		warning
Low voltage LP	39	38	39,40,	23	warning
High voltage HP	40	39	41	24	warning
Over current	41,42	40,41	42,43	26,75,76	warning
Input voltage				22	warning
Dry run	45	47	49	34,81,82	warning
Hot pump PH	48	46	46		warning
Over power OP			44		warning
Pressure sensor BP	49, 50,51	48,49,50	50,51,52,	73	warning
Anti-cycling AY	56		57	53,89,90	warning
Pump oscillation PO		55			warning
Plant error WP		56			warning
Disconnected pump			53	27,77,78	warning

Errors	Active Driver Plus	ADAC MCE-P	Esyline	Ebox	Type
Fluid hot HL			54		warning
Over pressure			55	37	warning
Loss LK			56		warning
Min level				41,44	warning
Max level				42, 45	warning
Max pressure pressostat				64	warning
Min level float switch				65	warning
Min level probe				66	warning
Max level float switch				67	warning
Max level probe				68	warning
Min pressure pressostat				69	warning

Table 8

3.6. Product Type

The following tables represent the product types for product families.

The "product type" can be obtained with the 001A offset register.

FAMILY	VALUE	PRODUCT TYPE
Active Driver Plus	41	M/M 1.1 kW 8.5 A
	42	M/M 1.5 kW 11.0 A
	43	M/M 1.8 kW 14.0 A
	44	T/T 5.5 kW 13.3 A
	45	T/T 3.0 kW 7.5 A
	46	M/T 2.2 kW 10.5 A
	47	M/T 1.0 kW 4.7 A
	48	T/T 5.5 kW 13.3 A
	49	T/T 3.0 kW 7.5 A
	50	M/T 2.2 kW 10.5 A
	51	M/T 1.0 kW 4.7 A
	52	M/M 1.8 kW 14.0 A
	53	M/M 1.5 kW 11.0 A
	54	M/M 1.1 kW 8.5 A
ADAC / MCE-P	11	ADAC T/T 15
	12	ADAC T/T 11
	13	ADAC T/T 7.5
	14	ADAC T/T 5.5
	15	ADAC T/T 4.0
	16	ADAC T/T 3.0
	17	ADAC M/T 2.2
	18	ADAC M/T 1.5
	19	ADAC M/T 1.0
	20	MCE-P 150
	21	MCE-P 110
	22	MCE-P 55
	23	MCE-P 30
	24	MCE-P 22
	25	MCE-P 15
	26	MCE-P 11
Esyline	65	Esybox 1.5 kW NP
Ebox	77	EBOX Basic D
	78	EBOX Plus D

Table 9

3.7. Adding a new product and replacing it

Each product family can contain up to 16 devices virtually. Once connected to the DConnect Box, a pump will receive a unique serial number and will occupy the first free position of the 16 available. This position will remain occupied even if the pump is

turned off or replaced. To refer to the next pump of the same family in the system, it will be necessary to add an offset of 0x0100.

Example: Installation consisting of 3 MCE-Ps and an Active Driver Plus. A failure of the MCE-P in the second position (offset 0x5100) is assumed. The new MCE-P will occupy the first free position within the registers assigned to that family, so it will have an offset of 0x5300.

N°	Family	Original Offset	Replacement of the CEF-P num 2
1	MCE-P	0x5000	0x5000
2	MCE-P	0x5100	0x5300
3	MCE-P	0x5200	0x5200
4	Active Driver Plus	0x0000	0x0000

Table 10

NOTE: the DConnect Box manages up to a maximum of 8 pumps but depending on the complexity of the installation this number may vary. It is advisable to contact DAB Customer Service for a large number of pumps.

3.8. Examples

3.8.1. DConnect Box Configuration Change

To allow correct operation within a supervision system, the slave address (the DConnect Box) and the serial speed must be set. To avoid losing communication with the device, the two registers must be written contiguously, using Function Code 16 (Preset Multiple Registers).

If successful, a beep will sound from the DConnect Box. See example below.

- a. Configure a DConnectBox at Modbus 100 with 19200 bps speed:

Slave Address	Function Code	Offset	Value	CRC
01	10	2060	0064	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0060	100 HEX = 0x0064	
01	10	2061	4	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0061	4 = 19200	

Table 11

* YYYY CRC16 calculated.

- b. Then change the baudrate to 9600 bps.

Slave Address	Function Code	Offset	Value	CRC
64	10	2060	0064	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0060	100 HEX = 0x0064	
64	10	2061	3	YYYY *
DConnectBox Address default	Preset Multiple Registers	Offset Family + Offset Position + Offset Parameter 0x2000 + 0x0000 + 0x0061	3 = 9600	

Table 12

* YYYY CRC16 calculated.

3.8.2. Parameter reading

Consider a system consisting of two ADACs and an Esysbox.

- a. Request for the pressure in Bar of the **first ADAC**:

Slave Address	Function Code	Data	CRC
01	03	1020	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0000 + 0x0020	

Table 13

Note: (MS_Measure System set as International)

- b. Pressure request in Psi of the **second ADAC**:

Slave Address	Function Code	Data	CRC
01	03	1120	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0100 + 0x0020	

Table 14

Note: (MS_Measure System set as International)

- c. Esysbox output **power requirement** (0.001kW scale):

Slave Address	Function Code	Data	CRC
01	03	4028	YYYY *
DConnectBox Address	Read holding registers	Offset Family + Offset Position + Offset Parameter 0x4000 + 0x000 + 0x0028	

Table 15

Note: (MS_Measure System set as International)

* YYYY CRC16 calculated.

3.8.3. Write parameters

Consider the same system consisting of two ADACs and an Esysbox.

- a. Setting the pressure setpoint in Bar of the **second ADAC** to the value **3.3 Bar**:

Slave Address	Function Code	Offset	Value	CRC
01	06	111C	0021	YYYY*
DConnectBox Address	Write input registers	Offset Family + Offset Position + Offset Parameter 0x1000 + 0x0100 + 0x001C	3.3 / 0.1 = 33 HEX = 0x0021	

Table 16

Note: (MS_Measure System set as International)

* YYYY CRC16 calculated.

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