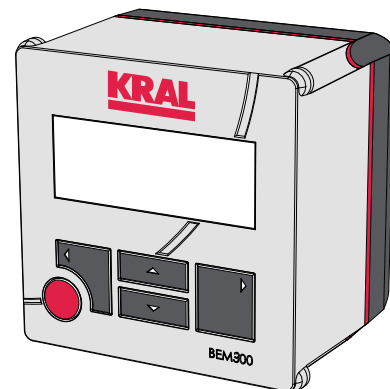


## Modbus communication



## Table of contents

Menu 1: Display – Variables .....	3
Menu 2: General settings.....	4
Menu 3: Volumeter – Variables .....	6
Menu 4: Constant density factor.....	6
Menu 7: Alarm variables V3.0 .....	7

## Menu 1: Display – Variables

Menu no.	Description	Address hex.	No. of words	Decimal places	Range of data value	Explanation of data value	General remarks
1.01	Flow rate Q	4006	2	1...3	I32	Rate unit	Only readable
1.02	Total T1	4100	2	1...3	I32	Total unit	Read- and resettable
	Total T2	4102	2	1...3	I32	Total unit	Read- and resettable
1.03	Reset coll. error message	4108	1	0	1...2	1 = no 2 = yes	For resetting via modbus write 1!
1.04	Serial number	4012	2	0	0...999999	No unit	Only readable
	Software	4020	1	3	U16	No unit	0.001...65.536
	Hardware	410A	1	3	U16	No unit	0.001...65.536
1.05	Brightness	411F	1	0	0...20	% of maximum	0...100 %
1.06	Contrast	4120	1	0	0...20	% of maximum	0...100 %
1.07	Language	4022	1	0	1...4	1 = German 2 = English 3 = French 4 = Spanish	Standard = 2

**Example** for 1 decimal (modbus 4186 =1)

Menu no.	Description	Data value decimal	Correspond to	
1.01	Flow rate Q	125	12.5	Rate units
1.02	Total T1	4294967276	-2.0	Total units

### Abbreviations

I32	Signed integer 32 bit = -2147483648...+2147483648; in case of overflow ( $>2^{31}$ or $<-2^{31}$ ) it shows -1
U32	Unsigned integer 32 bit = 0...4294967295
U16	Unsigned integer 16 bit = 0...65536, software and hardware version must be divided by 1000

### Remarks to overflow

In case of an overflow, all totals keep their minimum respective maximum value.

## Menu 2: General settings

Menu-no.	Description	Address hex.	No. of words	Decimal places	Range of data value	Explanation of data value	Standard value
2.01	Enable password	410C	1	0	1...2	1 = yes 2 = no	1
2.02	Select rate unit	4016	1	0	1...23	1 = l/sec 2 = l/min 3 = l/h 4 = kg/sec 5 = kg/min 6 = kg/h 7 = t/min 8 = t/h 9 = lb/sec 10 = lb/min 11 = lb/h 12 = USgal/sec 13 = USgal/min 14 = USgal/h 15 = UKgal/sec 16 = UKgal/min 17 = UKgal/h 18 = m <sup>3</sup> /min 19 = m <sup>3</sup> /h 20 = g/sec 21 = g/min 22 = ml/sec 23 = ml/min	1
2.03	Select total unit	4015	1	0	1...9	1 = l 2 = kg 3 = t 4 = lb 5 = galUS 6 = galUK 7 = m <sup>3</sup> 8 = g 9 = ml	1
2.04	Select density unit	4018	1	0	1...3	1 = kg/m <sup>3</sup> 2 = lb/galUS 3 = lb/galUK	1
2.05	Function analog output	410D	1	0	1...2	1 = 0...10 V 2 = 4...20 mA	1
2.06	Scale max. analog output 1	4028	2	1...3	0...1000000	Rate or total unit	1000
2.07	Averaging analog values	4115	1	0	0...10000	$Tr = x * 0.02s + P$	20
2.08	Scale pulse output	4112	2	1...3	0...1000000	Total unit	10
2.09	Display start message	411C	1	0	1...2	1 = no 2 = yes	1
2.10	Address modbus	411D	1	0	1...247	Address	1
2.11	Function pick up	411E	1	0	1...3	1 = NPN 2 = PNP 3 = Namur	2
2.12	Averaging display rate	401B	1	0	0...10000	$Tr = x * 0.02s + P$	20

Menu-no.	Description	Address hex.	No. of words	Decimal places	Range of data value	Explanation of data value	Standard value
2.13	Function pulse inputs	4122	1	0	1...2	1 = Counter 2 = Encoder	1
2.14	Reset to factory settings	4123	1	0	1...2	1 = no 2 = yes	1
2.15	Number of decimal places	4186	1	0	1...3	For rate and total	1

### Description

<b>Tr</b>	Reaction time = time for a 61 % change in display or in analog value, when an abrupt frequency change was simulated. For a 99.9 % change in display, the Tr would be approximately 7 times more.
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### Remarks

To reset the factory settings via modbus first write a 1 and afterwards a 2 into the address 4123!  
(positive edge)

### Menu 3: Volumeter – Variables

Menu no.	Description	Address hex.	No. of words	Decimal places	Range of data value	Unit	Standard value
3.01	Frequency at <b>Qn</b>	4032	2	3	1...99999999	Hz	1000000
	K-factor	4034	2	3	1...99999999	P/l	1000

#### Example

Menu no.	Description	Data value decimal	Corresponds to:
3.01	Point 1 Frequency	4564	4.564 Hz
	Point 1 K-factor	71123	71.123 P/l

#### Description

<b>Qn</b>	Nominal flow rate of Volumeter
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### Menu 4: Constant density factor

Menu no.	Description	Address hex.	No. of words	Decimal places	Range of data value	Unit
4.01	Density	406C	2	<b>1 or 3</b>	1...99999999	kg/m <sup>3</sup> or lb/Usgal, lb/Ukgal

#### Example

Menu no.	Description	Data value	Equates to special unit:
4.01	Density	7 141	7,141 lb/Usgal

#### Description

<b>1 or 3</b>	The number of decimal depends on selection of density unit: kg/m <sup>3</sup> = 1 decimal; lb/Usgal + lb/Ukgal = 3 decimals
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#### Remarks

This density is a constant factor to calculate values with mass unit.

## Menu 7: Alarm variables V3.0

Menu no.	Description	Address hex.	No. of words	Range of data value	Explanation of data value
7.07	Alarm 6 Maximum flow rate exceeded. Check Volumeter!	4146	1	0...1	0 = Off / 1 = On
		4166	1	0...65535	Counter reading
7.09	Alarm 8 Analog output scale max. exceeded!	4148	1	0...1	0 = Off / 1 = On
		4168	1	0...65535	Counter reading
7.10	Alarm 9 Pulse output scale max. exceeded!	4149	1	0...1	0 = Off / 1 = On
		4169	1	0...65535	Counter reading
7.11	Alarm 10 Direction changes exceed 30/s. Check signals!	414A	1	0...1	0 = Off / 1 = On
		416A	1	0...65535	Counter reading
7.16	Alarm 15 Density unit changed. Check density value!	414F	1	0...1	0 = Off / 1 = On
		416F	1	0...65535	Counter reading
7.18	Alarm 17 Rate unit changed. Check analog output scale!	4151	1	0...1	0 = Off / 1 = On
		4171	1	0...65535	Counter reading
7.19	Alarm 18 Total unit changed. Check pulse output scale!	4152	1	0...1	0 = Off / 1 = On
		4172	1	0...65535	Counter reading

1. **Maximum flow rate**  
Corresponds to frequency in menu 3.01 at nominal flow of connected Volumeter + 5 %
2. **Reset all alarms**  
Write one word into address 4108: 1
3. **Reset alarm counter x**  
Write one word into address 4166...4172: 0

