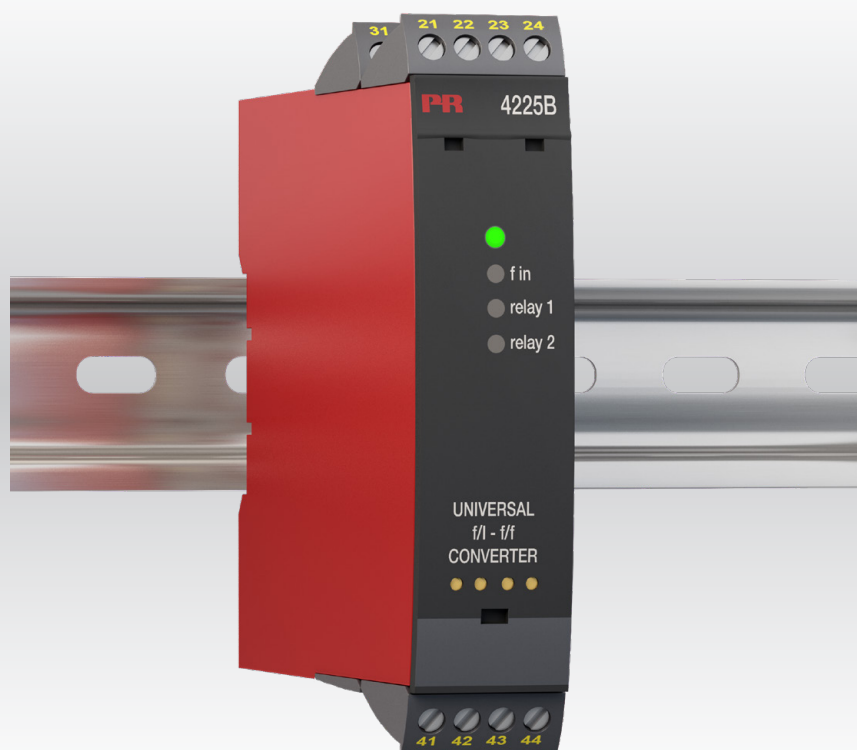


PERFORMANCE  
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# Configuration Manual

## 4225 / 4511

### *Modbus RTU configuration of 4225 Universal f/I-f/f converter*



TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

No. 4225MCM100-UK  
For 4511 devices from ser. no. 141590001

**PR**  
electronics

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Our unique range of single devices covering multiple applications is easily deployable as your site standard. Having one variant that applies to a broad range of applications can reduce your installation time and training, and greatly simplify spare parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, immunity to electrical noise and simple programming.



Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.



Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals, and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

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# Introduction

## This configuration manual

contains the necessary information for configuring a PR 4225 device which is connected to a PR 4511 Modbus RTU enabler.

## Modbus is a “master-slave” system,

where the “master” communicates with one or multiple “slaves”.

The master typically is a PLC (Programmable Logic Controller), DCS (Distributed Control System), HMI (Human Machine Interface), RTU (Remote Terminal Unit) or PC.

The three most common Modbus versions used are: MODBUS ASCII, MODBUS RTU and MODBUS/TCP.

In Modbus RTU, data is coded in binary, and requires only one communication byte per data byte. This is ideal for use over multi-drop RS485 networks, at speeds up to 115,200 bps.

The most common speeds are 9,600 bps and 19,200 bps.

Modbus RTU is the most widely used industrial protocol and is supported by the 4511.

## Modbus RTU

To communicate with a slave device, the master sends a message containing:

**Device Address - Function Code - Data - Error Check**

The **Device Address** is a number from 0 to 247.

Messages sent to address 0 (broadcast messages) will be accepted by all slaves, but numbers 1-247 are addresses of specific devices. With the exception of broadcast messages, a slave device always responds to a Modbus message so the master knows the message was received.

## 4511 Supported Modbus Function Codes

Command	Function code
Read Holding Registers*	03
Read Input Registers*	04
Write Single Register	06
Diagnostics	08
Write Multiple Registers	16

\*Holding Registers and Input Registers contain identical data in PR 4511.

The **Function Code** defines the command that the slave device is to execute, such as read data, accept data, report status. Some function codes have sub-function codes.

The **Data** defines addresses in the device’s memory map for read functions, contains data values to be written into the device’s memory, or contains other information needed to carry out the function requested.

The **Error Check** is a 16-bit numeric value representing the Cyclic Redundancy Check (CRC).

## Maximum number of registers which can be read or written at once

For a read command, the limit is 8 registers at a baud rate up to 38,400 bps, 16 registers @ 57,800 bps and 32 registers @ 115,200 bps.

For a write command, the limit is 123 registers at baud rates up to 115,200 bps.

## 4511 Modbus parameter settings

Automatic Baudrate Detection:	Can be configured YES or <b>NO</b>
Supported baudrates:	2400, 4800, 9600, <b>19.2k</b> , 38.4k, 57.6k, 115.2k bps
Parity Mode:	<b>Even</b> , Odd or None parity
Stop Bits:	<b>1</b> or 2 stop bits
Response delay:	0...1000 ms ( <b>0 ms = default</b> )
Modbus slave addressing range:	1 - 247 ( <b>247 = default address</b> )
Modbus Parameter Storage:	Saved in non-volatile memory in the 4511 device

(Factory Default Values are marked in **bold**)

## Modbus RTU segment line termination

A 120 Ohm resistor should be installed on both ends of a RS485 Modbus RTU segment loop to prevent signal echoes from corrupting data on the line.

# 4225A Parameter Lists

## 4225A Configuration Parameter List

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
GENERAL	DEVICE NUMBER	0	1	RO	UNSIGNED INTEGER	Defines the actual device type	4225 = 16933 (0x4225)
GENERAL	DEVICE VERSION	1	1	RO	UNSIGNED INTEGER	Product Version	0
GENERAL	SERIAL NUMBER	2	2	RO	UNSIGNED INTEGER	Device serial number	Range: 0...999999999
DISPLAY	TAG TEXT	4	3	R/W	ASCII CHAR	Tag of the device (6 characters)	Range: ASCII values from 32 to 90 (' ' to 'Z')
GENERAL	DEVICE VARIANT	7	1	RO	UNSIGNED INTEGER	Device variant	DEVVAR_4225A = 33
SENSOR	SENSOR TYPE	8	1	R/W	UNSIGNED INTEGER	Selected type of sensor	NAMUR = 0 SO = 1 PNP = 2 NPN = 3 TTL = 4 TACHO = 5 User-defined current (mA) = 6 User-defined voltage (V) = 7
SENSOR	TRIGGER CURRENT LOW	9	1	R/W	UNSIGNED INTEGER	Low trigger limit for user-defined current sensor (in mA/10)	Range: 0...98 (Representing 0.0...9.8 mA)
SENSOR	TRIGGER CURRENT HIGH	10	1	R/W	UNSIGNED INTEGER	High trigger limit for user-defined current sensor (in mA/10)	Range: 2...100 (Representing 0.2...10.0 mA)
SENSOR	TRIGGER VOLTAGE LOW	11	1	R/W	SIGNED INTEGER	Low trigger limit for user-defined voltage sensor (in V/100)	Range: -5...645 (Representing -0.05...6.45 V)
SENSOR	TRIGGER VOLTAGE HIGH	12	1	R/W	SIGNED INTEGER	High trigger limit for user-defined voltage sensor (in V/100)	Range: 0...650 (Representing 0.00...6.50 V)
SENSOR	INPUT IMPEDANCE	13	1	R/W	UNSIGNED INTEGER	Selected internal impedance of the sensor input connector	HIGH IMPEDANCE = 0 PULL UP = 1 PULL DOWN = 2
SENSOR	SENSOR SUPPLY	14	1	R/W	UNSIGNED INTEGER	Voltage level generated by the device to supply the sensor (in V/10)	Range: 50...170 (Representing 5.0...17.0 V)
INPUT	INPUT FUNCTION	15	1	R/W	UNSIGNED INTEGER	Mathematical function for input. Note: For period time input, low cut off has no effect.	None (linear) = 0 Low cut off (0.5 Hz) = 1 Square root function = 2
INPUT	INPUT UNIT	16	1	R/W	UNSIGNED INTEGER	Selected type of frequency measurement	Seconds (period time) = 0 rpm (frequency) = 1 Hertz (frequency) = 2
INPUT	INPUT PULSES PER REVOLUTION	17	1	READ/WRITE	UNSIGNED INTEGER	Number of pulses per revolution on input. (NOTE: Only in use for rpm input).	Range: 1...1000
INPUT	INPUT RANGE LOW	18	2	R/W	INTEGER	Low range value for input	<b>Range (for frequency input):</b> 0...99990000 mrpm* / mHz <b>Range (for period time input):</b> 10...999800000 µs
INPUT	INPUT RANGE HIGH	20	2	R/W	INTEGER	High range value for input	<b>Range (for frequency input):</b> 1...100000000 mrpm** / mHz <b>Range (for period time input):</b> 11...999900000 µs
INPUT	INPUT FILTER	22	1	R/W	UNSIGNED INTEGER	Enable 50 Hz low pass / BW-limiter filter on input	NO = 0 YES = 1  (INPUT FILTER is not available if input range is >50 Hz or <0.02 seconds, or if >3000 / (INPUT PULSES PER REVOLUTION) for rpm)
INPUT	ENABLE INPUT LIMIT LOW	23	1	R/W	UNSIGNED INTEGER	Enable low limit detection on input	NO = 0 YES = 1
INPUT	ENABLE INPUT LIMIT HIGH	24	1	R/W	UNSIGNED INTEGER	Enable high limit detection on input	NO = 0 YES = 1

\* for rpm frequency input, total number of pulses per second must be less than the upper valid value in Hz:

$$f_{MAX, \text{mrpm}} = (f_{MAX, \text{mHz}} / (\text{INPUT PULSES PER REVOLUTION}) * 60) - \text{dispRes}$$

Note: dispRes is the lowest displayable resolution size, when only the 4 most significant digits of the given value is presented.

\*\* for rpm frequency input, total number of pulses per second must be less than the upper valid value in Hz:

$$f_{MAX, \text{mrpm}} = (f_{MAX, \text{mHz}} / (\text{INPUT PULSES PER REVOLUTION}) * 60)$$

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
INPUT	INPUT LIMIT LOW	25	2	R/W	INTEGER	Low limit value for input limit detection	See range for INPUT RANGE LOW (value must not exceed INPUT RANGE LOW)
INPUT	INPUT LIMIT HIGH	27	2	R/W	INTEGER	High limit value for input limit detection	See range for INPUT RANGE HIGH (value must not fall short of INPUT RANGE HIGH)
INPUT	SQUARE ROOT POINT LOW	29	1	R/W	UNSIGNED INTEGER	Low point for SQUARE ROOT input function (in 1/1000)	Range: 0...1000 (Representing 0.000...1.000)
INPUT	SQUARE ROOT POINT HIGH	30	1	R/W	UNSIGNED INTEGER	High point for SQUARE ROOT input function (in 1/1000)	Range: 0...1000 (Representing 0.000 .. 1.000)
INPUT	SQUARE ROOT LOW CUTOFF POINT	31	1	R/W	UNSIGNED INTEGER	Low cut-off point for SQUARE ROOT input function (in 1/1000)	Range: 0...500 (Representing 0.0...50.0%)
INPUT	SQUARE ROOT CUTOFF TYPE	32	1	R/W	UNSIGNED INTEGER	Selected square root cut-off mode	Disable cut-off = 0 Linear cut-off = 1 Zero cut-off = 2
DISPLAY	DISPLAY UNIT	33	1	R/W	UNSIGNED INTEGER	Units shown as display units for input	Acc. to table 1 (see page 20)
DISPLAY	DECIMAL POINT	34	1	R/W	UNSIGNED INTEGER	Decimal point place for display reading	XXXX = 0 X.XXX = 1 XX.XX = 2 XXX.X = 3
DISPLAY	DISPLAY LOW	35	1	R/W	INTEGER	Low display range for display reading of input	Range: -1999...9999
DISPLAY	DISPLAY HIGH	36	1	R/W	INTEGER	High display range for display reading of input	Range: -1999...9999
DISPLAY	DISPLAY RESPONSE TIME	37	1	R/W	INTEGER	Display response time (in s/10)	Range: 0...600 (Representing 0.0...60.0 s)
ANALOG OUTPUT	OUTPUT TYPE	38	1	R/W	UNSIGNED INTEGER	Output type	CURRENT = 1 VOLTAGE = 2
ANALOG OUTPUT	OUTPUT CURRENT MODE	39	1	R/W	UNSIGNED INTEGER	Mode for analog output current	Active = 0 Passive = 1
ANALOG OUTPUT	CURRENT OUTPUT RANGE	40	1	R/W	UNSIGNED INTEGER	Range for current output	0...20 mA = 0 4...20 mA = 1 4...20 mA (SIL) = 2 -10...10 mA* = 3 -20...20 mA* = 4 20...0 mA = 5 20...4 mA = 6 20...4 mA (SIL) = 7 10...-10 mA* = 8 20...-20 mA* = 9  *bipolar output not valid for passive output (OUTPUT CURRENT MODE = PASSIVE)
ANALOG OUTPUT	VOLTAGE OUTPUT RANGE	41	1	R/W	UNSIGNED INTEGER	Range for voltage output	0...5 V = 2 1...5 V = 3 0...10 V = 4 2...10 V = 5 -5...5 V = 6 -10...10 V = 7 5...0 V = 10 5...1 V = 11 10...0 V = 12 10...2 V = 13 5...-5 V = 14 10...-10 V = 15
ANALOG OUTPUT	ANALOG OUTPUT AT SENSOR ERROR	42	1	R/W	UNSIGNED INTEGER	Analog output level at sensor error	DOWN = 0 ZERO = 1 UP = 2 NONE = 3
ANALOG OUTPUT	ANALOG OUTPUT AT LOW INPUT ERROR	43	1	R/W	UNSIGNED INTEGER	Analog output level at input below configured input limit low	DOWN = 0 ZERO = 1 UP = 2 NONE = 3
ANALOG OUTPUT	ANALOG OUTPUT AT HIGH INPUT ERROR	44	1	R/W	UNSIGNED INTEGER	Analog output level at input beyond configured input limit high	DOWN = 0 ZERO = 1 UP = 2 NONE = 3
RELAY	RELAY UNIT	45	1	R/W	UNSIGNED INTEGER	Units for relay setpoint	Percent = 0 Display units = 1
RELAY	RELAY FUNCTION	57	1	R/W	UNSIGNED INTEGER	Relay function (setpoint, window, error etc.)	OFF = 0 POWER = 1 ERROR = 2 WINDOW = 3 SETPOINT = 4

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
RELAY	RELAY CONTACT	58	1	R/W	UNSIGNED INTEGER	Contact function (Normally Closed / Normally Open)	NC = 0 NO = 1
RELAY	RELAY SETPOINT LOW	59	1	R/W	INTEGER	Setpoint or low window setpoint, in either display values or 1/10% (percent)	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY	RELAY SETPOINT HIGH	60	1	R/W	INTEGER	High window setpoint, in either display values or 1/10% (percent)	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY	RELAY ACTION DIRECTION	61	1	R/W	UNSIGNED INTEGER	Activation direction, or activity inside / outside of window, in window mode.	DECREASING / ACTIVE OUTSIDE WINDOW = 0 INCREASING / ACTIVE INSIDE WINDOW = 1
RELAY	RELAY HYSTERESIS	62	1	R/W	UNSIGNED INTEGER	Hysteresis in either display values or 1/10% (percent)	0...(display range) 0...1000 (0.0...100.0%)
RELAY	RELAY ERROR ACTION	63	1	R/W	UNSIGNED INTEGER	Action on error	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY LOW INPUT ERROR ACTION	64	1	R/W	UNSIGNED INTEGER	Action on input below configured input limit low	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY HIGH INPUT ERROR ACTION	65	1	R/W	UNSIGNED INTEGER	Action on at input beyond configured input limit high	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY ON DELAY	66	1	R/W	UNSIGNED INTEGER	Relay ON time delay	Range: 0...3600s
RELAY	RELAY OFF DELAY	67	1	R/W	UNSIGNED INTEGER	Relay OFF time delay	Range: 0...3600s
OUTPUT	OUTPUT RESPONSE	86	1	R/W	UNSIGNED INTEGER	Analog / frequency output damping (in 1/10s)	Range: 0...600 (Representing 0.0..60.0 s)
OUTPUT	OUTPUT POWER ON DELAY	87	1	R/W	UNSIGNED INTEGER	Power-on delay, before applying outputs (in s)	Range: 0.9999
DISPLAY	DISPLAY CONTRAST	88	1	R/W	UNSIGNED INTEGER	Contrast on the LCD display	Range: 0..9
DISPLAY	DISPLAY BACKLIGHT	89	1	R/W	UNSIGNED INTEGER	Backlight intensity on LCD	Range: 0...9
DISPLAY	LINE 3 FUNCTION	90	1	R/W	UNSIGNED INTEGER	Information shown on line 3 of display in monitor mode (normal mode). Choose between the Analog Output value or the configured tag.	Output value TAG = 1 = 0
RELAY	ENABLE FAST SET	91	1	R/W	UNSIGNED INTEGER	Enable fast set of relay setpoints from monitor menu	NO = 0 YES = 1
RELAY	RELAY LATCH ENABLE	92	1	R/W	UNSIGNED INTEGER	Activate latch function for relay	NO = 0 YES = 1
INPUT	CALIB RANGE LOW	94	2	R/W	FLOAT	Actual process value for low calibration point in input values	Range: 0...999900000
INPUT	CALIB RANGE HIGH	96	2	R/W	FLOAT	Actual process value for high calibration point in input values	As CALIB RANGE LOW
INPUT	CALIB POINT LOW	98	2	R/W	FLOAT	Measured process value for low calibration point in input values. (Can be read from PRIMARY RAW VALUE)	As CALIB RANGE LOW
INPUT	CALIB POINT HIGH	100	2	R/W	FLOAT	Measured process value for high calibration point in input values. (Can be read from PRIMARY RAW VALUE)	As CALIB RANGE LOW
INPUT	USE CALIB	102	1	R/W	UNSIGNED INTEGER	Use the applied calibration values	NO = 0 YES = 1
GENERAL	HELPTXT LANGUAGE	103	1	R/W	UNSIGNED INTEGER	Language for the help texts shown on display	UK = 0 DK = 1 DE = 2 FR = 3 SE = 4 IT = 5 ES = 6
GENERAL	CHECKSUM	126	1	RO	UNSIGNED INTEGER	CRC16 checksum of the configuration	Range 0...65535

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
GENERAL	CONFIGURATION COUNTER	127	1	RO	UNSIGNED INTEGER	This counter will count the number of times the configuration has been changed. The counter is reset on power-up	Range 0..65535
GENERAL	ENABLE PASSWORD	1300	1	R/W	UNSIGNED INTEGER	Password-protect entry to configuration menu via display	NO = 0 YES = 1
GENERAL	PASSWORD	1400	1	R/W	UNSIGNED INTEGER	Password for entering configuration menu	Range: 0..9999

#### 4225A Process Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
DISPLAY VALUE INTEGER	1000	1	RO	INTEGER	The scaled display value (INTEGER version of DISPLAY VALUE)	Range: DISPLAY LOW...DISPLAY HIGH
MEASURE STATUS	1001	1	RO	UNSIGNED INTEGER	The actual measurement status	LOW INPUT LIMIT ERROR DETECTED bit 0 = 1 HIGH INPUT LIMIT ERROR DETECTED bit 1 = 1 OUTPUT UNDERRANGE bit 2 = 1 OUTPUT OVERRANGE bit 3 = 1 PROGRAMMING ONLY MODE bit 4 = 1 CONFIGURATION LOCKED bit 5 = 1 DIGITAL INPUT STATE bit 6 = 1 INPUT UNDERRANGE bit 7 = 1 INPUT OVERRANGE bit 8 = 1 SENSOR SHORTED bit 9 = 1 SENSOR BROKEN bit 10 = 1 SENSOR SUPPLY OVERLOAD bit 11 = 1 DIGITAL OUTPUT STATE bit 12 = 1 NOT USED bit 13 = 1 DISPLAY UNDERRANGE bit 14 = 1 DISPLAY OVERRANGE bit 15 = 1
SYSTEM ERROR STATUS	1002	1	RO	UNSIGNED INTEGER	The actual measurement status	INPUT ERROR bit 0 = 1 RAM ERROR bit 1 = 1 CONFIGURATION ERROR bit 2 = 1 INTERNAL FALSH ERROR bit 3 = 1 EXTERNAL FALSH ERROR bit 4 = 1 OUTPUT ERROR bit 5 = 1 OUTPUT SUPPLY ERROR bit 6 = 1 INPUT COMM. ERROR bit 7 = 1 EEPROM ERROR bit 8 = 1 CONFIGURATION WARNING: bit 9 = 1 NOT USED: bit 10 .. 15
RELAY STATE	1003	1	RW	INTEGER	The actual relay status calculated from INPUT VALUE	RELAY IS ON bit 1 = 1 RELAY WILL GO ON AFTER DELAY bit 3 = 1 RELAY IS LATCHED bit 5 = 1 RELAY CAN NOT RELEASE bit 7 = 1
INPUT VALUE	1004	2	RO	FLOAT	The measured, scaled and process calibrated input value (in Hz, rpm or s).	<b>Range (for frequency input):</b> 0.0...100000.0 Hz or rpm <b>Range (for period time input):</b> 0.000010...99.990000 s
DISPLAY VALUE	1006	2	RO	FLOAT	The scaled display value, derived from INPUT VALUE	Range: -1999.0000...9999.0000
RELATIVE INPUT	1008	2	RO	FLOAT	The relative input calculated from INPUT VALUE. 0.0...1.0 corresponds to the input selected range	Range: 0.0...1.0
ANALOG OUTPUT VALUE	1010	2	RO	FLOAT	Analog output value (in $\mu$ A or $\mu$ V)	<b>Range for voltage output:</b> -11500000.0...11500000.0 <b>Range for current output:</b> -23000.0...23000.0



## 4225A Simulation Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
SIMULATION CONTROL	2000	1	R/W	UNSIGNED INTEGER	Control register for simulation	Clear errors and reload config. bit 0 = 1 Simulate input bit 1 = 1 Simulate analog output bit 2 = 1 Front LEDs OFF bit 3 = 1 Simulate RELAY bit 5 = 1  <b>Reserved MUST BE SET TO "0"</b> bit 7
INPUT VALUE	2001	2	R/W	FLOAT	Simulated measured frequency value (in Hz or s)	<b>Range (for frequency input):</b> 0.0...120000.0 Hz or rpm <b>Range (for period time input):</b> 0.000010...99.990000 s
ANALOG OUTPUT VALUE	2005	2	R/W	FLOAT	Simulated analog output value (in $\mu$ A or $\mu$ V)	<b>Range for voltage output:</b> -11500000.0...11500000.0 <b>Range for current output:</b> -23000.0...23000.0
RELAY SIMULATION CONTROL	2008	1	R/W	UNSIGNED INTEGER	Control bits for relay simulation	SIMULATE RELAY OPEN bit 0 = 1 SIMULATE RELAY CLOSED bit 1 = 1 INVERT RELAY STATE bit 2 = 1 SIMULATE SETPOINT bit 3 = 1 RESET LATCH bit 4 = 1 NOT USED bit 5...7
RELAY SETPOINT	2010	1	R/W	INTEGER	Simulate setpoint, in either display values or 1/10% (percent). NOTE: If setpoint simulation causes the device to go to a special triggered action, such as initiating an error or latching a relay, this will remain active even after simulation has ended.	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
SIMULATION TIMEOUT	2011	1	R/W	UNSIGNED INTEGER	If this value is greater than zero, the counter decrements once every 5 ms. Upon reaching 0 SIMULATION CONTROL is cleared.	0...4000

## 4225A Fast Parameters

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
DEVICE NUMBER	6000	1	RO	UNSIGNED INTEGER	Remaps register 0	SEE ORIGINAL REGISTER DESCRIPTION
DEVICE VERSION	6001	1	RO	UNSIGNED INTEGER	Remaps register 1	SEE ORIGINAL REGISTER DESCRIPTION
DEVICE VARIANT	6002	1	RO	UNSIGNED INTEGER	Remaps register 7	SEE ORIGINAL REGISTER DESCRIPTION
CONFIGURATION CHECKSUM	6003	1	RO	UNSIGNED INTEGER	Remaps register 126	SEE ORIGINAL REGISTER DESCRIPTION
CONFIGURATION COUNTER	6004	1	RO	UNSIGNED INTEGER	Remaps register 127	SEE ORIGINAL REGISTER DESCRIPTION
MEASURE STATUS	6005	1	RO	UNSIGNED INTEGER	Remaps register 1001	SEE ORIGINAL REGISTER DESCRIPTION
SYSTEM ERROR STATUS	6006	1	RO	UNSIGNED INTEGER	Remaps register 1002	SEE ORIGINAL REGISTER DESCRIPTION
DISPLAY VALUE INTEGER	6007	1	RO	INTEGER	Remaps register 1000	SEE ORIGINAL REGISTER DESCRIPTION
ANALOG OUTPUT VALUE	6008	2	RO	FLOAT	Remaps register 1010	SEE ORIGINAL REGISTER DESCRIPTION
RELAY STATE	6012	1	RO	UNSIGNED INTEGER	Remaps register 1003	SEE ORIGINAL REGISTER DESCRIPTION
INPUT UNIT	6013	1	RO	UNSIGNED INTEGER	Remaps register 16	SEE ORIGINAL REGISTER DESCRIPTION
OUTPUT TYPE	6014	1	RO	UNSIGNED INTEGER	Remaps register 38	SEE ORIGINAL REGISTER DESCRIPTION
DISPLAY UNIT	6015	1	RO	UNSIGNED INTEGER	Remaps register 33	SEE ORIGINAL REGISTER DESCRIPTION
DECIMAL POINT	6016	1	RO	UNSIGNED INTEGER	Remaps register 34	SEE ORIGINAL REGISTER DESCRIPTION
TAG TEXT	6017	3	RO	ASCII CHAR	Remaps register 4	SEE ORIGINAL REGISTER DESCRIPTION

# 4225B Parameter Lists

## 4225B Configuration Parameter List

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
GENERAL	DEVICE NUMBER	0	1	RO	UNSIGNED INTEGER	Defines the actual device type	4225 = 16933 (0x4225)
GENERAL	DEVICE VERSION	1	1	RO	UNSIGNED INTEGER	Product Version	0
GENERAL	SERIAL NUMBER	2	2	RO	UNSIGNED INTEGER	Device serial number	Range: 0...99999999
DISPLAY	TAG TEXT	4	3	R/W	ASCII CHAR	Tag of the device (6 characters)	Range: ASCII values from 32 to 90 (' ' to 'Z')
GENERAL	DEVICE VARIANT	7	1	RO	UNSIGNED INTEGER	Device variant	DEVVAR_4225B = 34
SENSOR	SENSOR TYPE	8	1	R/W	UNSIGNED INTEGER	Selected type of sensor	NAMUR = 0 SO = 1 PNP = 2 NPN = 3 TTL = 4 TACHO = 5 User-defined current (mA) = 6 User-defined voltage (V) = 7
SENSOR	TRIGGER CURRENT LOW	9	1	R/W	UNSIGNED INTEGER	Low trigger limit for user-defined current sensor (in mA/10)	Range: 0...98 (Representing 0.0...9.8 mA)
SENSOR	TRIGGER CURRENT HIGH	10	1	R/W	UNSIGNED INTEGER	High trigger limit for user-defined current sensor (in mA/10)	Range: 2...100 (Representing 0.2...10.0 mA)
SENSOR	TRIGGER VOLTAGE LOW	11	1	R/W	SIGNED INTEGER	Low trigger limit for user-defined voltage sensor (in V/100)	Range: -5...645 (Representing -0.05...6.45 V)
SENSOR	TRIGGER VOLTAGE HIGH	12	1	R/W	SIGNED INTEGER	High trigger limit for user-defined voltage sensor (in V/100)	Range: 0...650 (Representing 0.00...6.50 V)
SENSOR	INPUT IMPEDANCE	13	1	R/W	UNSIGNED INTEGER	Selected internal impedance of the sensor input connector	HIGH IMPEDANCE = 0 PULL UP = 1 PULL DOWN = 2
SENSOR	SENSOR SUPPLY	14	1	R/W	UNSIGNED INTEGER	Voltage level generated by the device to supply the sensor (in V/10)	Range: 50...170 (Representing 5.0...17.0 V)
INPUT	INPUT FUNCTION	15	1	R/W	UNSIGNED INTEGER	Mathematical function for input. Note: For period time input, low cut off has no effect.	None (linear) = 0 Low cut off (0.5 Hz) = 1 Square root function = 2
INPUT	INPUT UNIT	16	1	R/W	UNSIGNED INTEGER	Selected type of frequency measurement	Seconds (period time) = 0 rpm (frequency) = 1 Hertz (frequency) = 2
INPUT	INPUT PULSES PER REVOLUTION	17	1	READ/WRITE	UNSIGNED INTEGER	Number of pulses per revolution on input. (NOTE: Only in use for rpm input).	Range: 1...1000
INPUT	INPUT RANGE LOW	18	2	R/W	INTEGER	Low range value for input	<b>Range (for frequency input):</b> 0...99990000 mrpm* / mHz <b>Range (for period time input):</b> 10...999800000 μs
INPUT	INPUT RANGE HIGH	20	2	R/W	INTEGER	High range value for input	<b>Range (for frequency input):</b> 1...100000000 mrpm** / mHz <b>Range (for period time input):</b> 11...999900000 μs
INPUT	INPUT FILTER	22	1	R/W	UNSIGNED INTEGER	Enable 50 Hz low pass / BW-limiter filter on input	NO = 0 YES = 1  (INPUT FILTER is not available if input range is >50 Hz or <0.02 seconds, or if >3000 / (INPUT PULSES PER REVOLUTION) for rpm)
INPUT	ENABLE INPUT LIMIT LOW	23	1	R/W	UNSIGNED INTEGER	Enable low limit detection on input	NO = 0 YES = 1
INPUT	ENABLE INPUT LIMIT HIGH	24	1	R/W	UNSIGNED INTEGER	Enable high limit detection on input	NO = 0 YES = 1

\* for rpm frequency input, total number of pulses per second must be less than the upper valid value in Hz:

$$f_{MAX, mrpm} = (f_{MAX, mHz} / (\text{INPUT PULSES PER REVOLUTION}) * 60) - \text{dispRes}$$

Note: dispRes is the lowest displayable resolution size, when only the 4 most significant digits of the given value is presented.

\*\* for rpm frequency input, total number of pulses per second must be less than the upper valid value in Hz:

$$f_{MAX, mrpm} = (f_{MAX, mHz} / (\text{INPUT PULSES PER REVOLUTION}) * 60)$$

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
INPUT	INPUT LIMIT LOW	25	2	R/W	INTEGER	Low limit value for input limit detection	See range for INPUT RANGE LOW (value must not exceed INPUT RANGE LOW)
INPUT	INPUT LIMIT HIGH	27	2	R/W	INTEGER	High limit value for input limit detection	See range for INPUT RANGE HIGH (value must not fall short of INPUT RANGE HIGH)
INPUT	SQUARE ROOT POINT LOW	29	1	R/W	UNSIGNED INTEGER	Low point for SQUARE ROOT input function (in 1/1000)	Range: 0...1000 (Representing 0.000...1.000)
INPUT	SQUARE ROOT POINT HIGH	30	1	R/W	UNSIGNED INTEGER	High point for SQUARE ROOT input function (in 1/1000)	Range: 0...1000 (Representing 0.000 .. 1.000)
INPUT	SQUARE ROOT LOW CUTOFF POINT	31	1	R/W	UNSIGNED INTEGER	Low cut-off point for SQUARE ROOT input function (in 1/1000)	Range: 0...500 (Representing 0.0...50.0%)
INPUT	SQUARE ROOT CUTOFF TYPE	32	1	R/W	UNSIGNED INTEGER	Selected square root cut-off mode	Disable cut-off = 0 Linear cut-off = 1 Zero cut-off = 2
DISPLAY	DISPLAY UNIT	33	1	R/W	UNSIGNED INTEGER	Units shown as display units for input	Acc. to table 1 (see page 20)
DISPLAY	DECIMAL POINT	34	1	R/W	UNSIGNED INTEGER	Decimal point place for display reading	XXXX = 0 X.XXX = 1 XX.XX = 2 XXX.X = 3
DISPLAY	DISPLAY LOW	35	1	R/W	INTEGER	Low display range for display reading of input	Range: -1999...9999
DISPLAY	DISPLAY HIGH	36	1	R/W	INTEGER	High display range for display reading of input	Range: -1999...9999
DISPLAY	DISPLAY RESPONSE TIME	37	1	R/W	INTEGER	Display response time (in s/10)	Range: 0...600 (Representing 0.0...60.0 s)
RELAY	RELAY UNIT	45	1	R/W	UNSIGNED INTEGER	Units for relay setpoint	Percent = 0 Display units = 1
RELAY	RELAY 1 FUNCTION	46	1	R/W	UNSIGNED INTEGER	Relay function (setpoint, window, error etc.)	OFF = 0 POWER = 1 ERROR = 2 WINDOW = 3 SETPOINT = 4
RELAY	RELAY 1 CONTACT	47	1	R/W	UNSIGNED INTEGER	Contact function (Normally Closed / Normally Open)	NC = 0 NO = 1
RELAY	RELAY 1 SETPOINT LOW	48	1	R/W	INTEGER	Setpoint or low window setpoint, in either display values or 1/10% (percent)	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY	RELAY 1 SETPOINT HIGH	49	1	R/W	INTEGER	High window setpoint, in either display values or 1/10% (percent)	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY	RELAY 1 ACTION DIRECTION	50	1	R/W	UNSIGNED INTEGER	Activation direction, or activity inside / outside of window, in window mode.	DECREASING / ACTIVE OUTSIDE WINDOW = 0 INCREASING / ACTIVE INSIDE WINDOW = 1
RELAY	RELAY 1 HYSTERESIS	51	1	R/W	UNSIGNED INTEGER	Hysteresis in either display values or 1/10% (percent)	0...(display range) 0...1000 (0.0...100.0%)
RELAY	RELAY 1 ERROR ACTION	52	1	R/W	UNSIGNED INTEGER	Action on error	NONE (not valid for relay func. ERR) = 0 OPEN = 1 CLOSE = 2 HOLD (not valid for relay func. ERR) = 3
RELAY	RELAY 1 LOW INPUT ERROR ACTION	53	1	R/W	UNSIGNED INTEGER	Action on input below configured input limit low	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY 1 HIGH INPUT ERROR ACTION	54	1	R/W	UNSIGNED INTEGER	Action on at input beyond configured input limit high	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY 1 ON DELAY	55	1	R/W	UNSIGNED INTEGER	Relay ON time delay	Range: 0...3600s
RELAY	RELAY 1 OFF DELAY	56	1	R/W	UNSIGNED INTEGER	Relay OFF time delay	Range: 0...3600s
RELAY	RELAY 2 FUNCTION	57	1	R/W	UNSIGNED INTEGER	As RELAY 1 FUNCTION (See Legend NOTE 1)	
RELAY	RELAY 2 CONTACT	58	1	R/W	UNSIGNED INTEGER	As RELAY 1 CONTACT (See Legend NOTE 1)	
RELAY	RELAY 2 SETPOINT LOW	59	1	R/W	INTEGER	As RELAY 1 SETPOINT LOW (See Legend NOTE 1)	
RELAY	RELAY 2 SETPOINT HIGH	60	1	R/W	INTEGER	As RELAY 1 SETPOINT HIGH (See Legend NOTE 1)	

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
RELAY	RELAY 2 ACTION DIRECTION	61	1	R/W	UNSIGNED INTEGER	As RELAY 1 ACTION DIRECTION (See Legend NOTE 1)	
RELAY	RELAY 2 HYSTERESIS	62	1	R/W	UNSIGNED INTEGER	As RELAY 1 HYSTERESIS (See Legend NOTE 1)	
RELAY	RELAY 2 ERROR ACTION	63	1	R/W	UNSIGNED INTEGER	As RELAY 1 ERROR ACTION (See Legend NOTE 1)	
RELAY	RELAY 2 LOW INPUT ERROR ACTION	64	1	R/W	UNSIGNED INTEGER	As RELAY 1 LOW INPUT ERROR ACTION (See Legend NOTE 1)	
RELAY	RELAY 2 HIGH INPUT ERROR ACTION	65	1	R/W	UNSIGNED INTEGER	As RELAY 1 HIGH INPUT ERROR ACTION (See Legend NOTE 1)	
RELAY	RELAY 2 ON DELAY	66	1	R/W	UNSIGNED INTEGER	As RELAY 1 ON DELAY (See Legend NOTE 1)	
RELAY	RELAY 2 OFF DELAY	67	1	R/W	UNSIGNED INTEGER	As RELAY 1 OFF DELAY (See Legend NOTE 1)	
OUTPUT	OUTPUT POWER ON DELAY	87	1	R/W	UNSIGNED INTEGER	Power-on delay, before applying outputs (in s)	Range: 0...9999
DISPLAY	DISPLAY CONTRAST	88	1	R/W	UNSIGNED INTEGER	Contrast on the LCD display	Range: 0...9
DISPLAY	DISPLAY BACKLIGHT	89	1	R/W	UNSIGNED INTEGER	Backlight intensity on LCD	Range: 0...9
DISPLAY	LINE 3 FUNCTION	90	1	R/W	UNSIGNED INTEGER	Information shown on line 3 of display in monitor mode (normal mode). Choose between the Analog Output value or the configured tag.	Output value TAG = 0 = 1
RELAY	ENABLE FAST SET	91	1	R/W	UNSIGNED INTEGER	Enable fast set of relay setpoints from monitor menu	NO = 0 YES = 1
RELAY	RELAY LATCH ENABLE	92	1	R/W	UNSIGNED INTEGER	Activate latch function for RELAY	NO = 0 YES = 1
RELAY	RELAY LATCH ENABLE	93	1	R/W	UNSIGNED INTEGER	Activate latch function for relay	NO = 0 YES = 1
INPUT	CALIB RANGE LOW	94	2	R/W	FLOAT	Actual process value for low calibration point in input values	Range: 0...999900000
INPUT	CALIB RANGE HIGH	96	2	R/W	FLOAT	Actual process value for high calibration point in input values	As CALIB RANGE LOW
INPUT	CALIB POINT LOW	98	2	R/W	FLOAT	Measured process value for low calibration point in input values. (Can be read from PRIMARY RAW VALUE)	As CALIB RANGE LOW
INPUT	CALIB POINT HIGH	100	2	R/W	FLOAT	Measured process value for high calibration point in input values. (Can be read from PRIMARY RAW VALUE)	As CALIB RANGE LOW
INPUT	USE CALIB	102	1	R/W	UNSIGNED INTEGER	Use the applied calibration values	NO = 0 YES = 1
GENERAL	HELPTXT LANGUAGE	103	1	R/W	UNSIGNED INTEGER	Language for the help texts shown on display	UK = 0 DK = 1 DE = 2 FR = 3 SE = 4 IT = 5 ES = 6
GENERAL	CHECKSUM	126	1	RO	UNSIGNED INTEGER	CRC16 checksum of the configuration	Range 0...65535
GENERAL	CONFIGURATION COUNTER	127	1	RO	UNSIGNED INTEGER	This counter will count the number of times the configuration has been changed. The counter is reset on power-up	Range 0...65535
GENERAL	ENABLE PASSWORD	1300	1	R/W	UNSIGNED INTEGER	Password-protect entry to configuration menu via display	NO = 0 YES = 1
GENERAL	PASSWORD	1400	1	R/W	UNSIGNED INTEGER	Password for entering configuration menu	Range: 0...9999

## 4225B Process Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
DISPLAY VALUE INTEGER	1000	1	RO	INTEGER	The scaled display value (INTEGER version of DISPLAY VALUE)	Range: DISPLAY LOW...DISPLAY HIGH
MEASURE STATUS	1001	1	RO	UNSIGNED INTEGER	The actual measurement status	LOW INPUT LIMIT ERROR DETECTED bit 0 = 1 HIGH INPUT LIMIT ERROR DETECTED bit 1 = 1 OUTPUT UNDERRANGE bit 2 = 1 OUTPUT OVERRANGE bit 3 = 1 PROGRAMMING ONLY MODE bit 4 = 1 CONFIGURATION LOCKED bit 5 = 1 DIGITAL INPUT STATE bit 6 = 1 INPUT UNDERRANGE bit 7 = 1 INPUT OVERRANGE bit 8 = 1 SENSOR SHORTED bit 9 = 1 SENSOR BROKEN bit 10 = 1 SENSOR SUPPLY OVERLOAD bit 11 = 1 DIGITAL OUTPUT STATE bit 12 = 1 NOT USED bit 13 = 1 DISPLAY UNDERRANGE bit 14 = 1 DISPLAY OVERRANGE bit 15 = 1
SYSTEM ERROR STATUS	1002	1	RO	UNSIGNED INTEGER	The actual measurement status	INPUT ERROR bit 0 = 1 RAM ERROR bit 1 = 1 CONFIGURATION ERROR bit 2 = 1 INTERNAL FALSH ERROR bit 3 = 1 EXTERNAL FALSH ERROR bit 4 = 1 OUTPUT ERROR bit 5 = 1 OUTPUT SUPPLY ERROR bit 6 = 1 INPUT COMM. ERROR bit 7 = 1 EEPROM ERROR bit 8 = 1 CONFIGURATION WARNING: bit 9 = 1 NOT USED: bit 10 .. 15
RELAY STATE	1003	1	RW	INTEGER	The actual relay status calculated from INPUT VALUE	RELAY 1 IS ON bit 0 = 1 RELAY 2 IS ON bit 1 = 1 RELAY 1 WILL GO ON AFTER DELAY bit 2 = 1 RELAY 2 WILL GO ON AFTER DELAY bit 3 = 1 RELAY 1 IS LATCHED bit 4 = 1 RELAY 2 IS LATCHED bit 5 = 1 RELAY 1 CAN NOT RELEASE bit 6 = 1 RELAY 2 CAN NOT RELEASE bit 7 = 1
INPUT VALUE	1004	2	RO	FLOAT	The measured, scaled and process calibrated input value (in Hz, rpm or s)	<b>Range (for frequency input):</b> 0.0...100000.0 Hz or rpm <b>Range (for period time input):</b> 0.000010...99.990000 s
DISPLAY VALUE	1006	2	RO	FLOAT	The scaled display value, derived from INPUT VALUE	Range: -1999.0000...9999.0000
RELATIVE INPUT	1008	2	RO	FLOAT	The relative input calculated from INPUT VALUE. 0.0...1.0 corresponds to the input selected range	Range: 0.0...1.0

## 4225B Simulation Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
SIMULATION CONTROL	2000	1	R/W	UNSIGNED INTEGER	Control register for simulation	Clear errors and reload config Simulate input Simulate analog output Front LEDs OFF Simulate RELAY  <b>Reserved MUST BE SET TO "0"</b>
						bit 0 = 1 bit 1 = 1 bit 2 = 1 bit 3 = 1 bit 5 = 1  bit 7
INPUT VALUE	2001	2	R/W	FLOAT	Simulated measured frequency value (in Hz or s)	<b>Range (for frequency input):</b> 0.0...120000.0 Hz or rpm <b>Range (for period time input):</b> 0.000010...99.990000 s
RELAY 1 SIMULATION CONTROL	2007	1	R/W	UNSIGNED INTEGER	Control bits for relay simulation	SIMULATE RELAY OPEN SIMULATE RELAY CLOSED INVERT RELAY STATE SIMULATE SETPOINT RESET LATCH NOT USED
						bit 0 = 1 bit 1 = 1 bit 2 = 1 bit 3 = 1 bit 4 = 1 bit 5...7
RELAY 2 SIMULATION CONTROL	2008	1	R/W	UNSIGNED INTEGER	As RELAY 1 SIMULATION	As RELAY 1 SIMULATION
RELAY 1 SETPOINT	2009	1	R/W	INTEGER	Simulate setpoint, in either display values or 1/10% (percent). NOTE: If setpoint simulation causes the device to go to a special triggered action, such as initiating an error or latching a relay, this will remain active even after simulation has ended.	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY 2 SETPOINT	2010	1	R/W	INTEGER	As RELAY 1 SETPOINT	As RELAY 1 SETPOINT
SIMULATION TIMEOUT	2011	1	R/W	UNSIGNED INTEGER	If this value is greater than zero, the counter decrements once every 5 ms. Upon reaching 0 SIMULATION CONTROL is cleared.	0...4000

## 4225B Fast Parameters

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
DEVICE NUMBER	6000	1	RO	UNSIGNED INTEGER	Remaps register 0	SEE ORIGINAL REGISTER DESCRIPTION
DEVICE VERSION	6001	1	RO	UNSIGNED INTEGER	Remaps register 1	SEE ORIGINAL REGISTER DESCRIPTION
DEVICE VARIANT	6002	1	RO	UNSIGNED INTEGER	Remaps register 7	SEE ORIGINAL REGISTER DESCRIPTION
CONFIGURATION CHECKSUM	6003	1	RO	UNSIGNED INTEGER	Remaps register 126	SEE ORIGINAL REGISTER DESCRIPTION
CONFIGURATION COUNTER	6004	1	RO	UNSIGNED INTEGER	Remaps register 127	SEE ORIGINAL REGISTER DESCRIPTION
MEASURE STATUS	6005	1	RO	UNSIGNED INTEGER	Remaps register 1001	SEE ORIGINAL REGISTER DESCRIPTION
ERROR STATUS	6006	1	RO	UNSIGNED INTEGER	Remaps register 1002	SEE ORIGINAL REGISTER DESCRIPTION
DISPLAY VALUE INTEGER	6007	1	RO	INTEGER	Remaps register 1000	SEE ORIGINAL REGISTER DESCRIPTION
RELAY STATE	6012	1	RO	UNSIGNED INTEGER	Remaps register 1003	SEE ORIGINAL REGISTER DESCRIPTION
INPUT UNIT	6013	1	RO	UNSIGNED INTEGER	Remaps register 16	SEE ORIGINAL REGISTER DESCRIPTION
DISPLAY UNIT	6015	1	RO	UNSIGNED INTEGER	Remaps register 33	SEE ORIGINAL REGISTER DESCRIPTION
DECIMAL POINT	6016	1	RO	UNSIGNED INTEGER	Remaps register 34	SEE ORIGINAL REGISTER DESCRIPTION
TAG TEXT	6017	3	RO	ASCII CHAR	Remaps register 4	SEE ORIGINAL REGISTER DESCRIPTION

# 4225C Parameter Lists

## 4225C Configuration Parameter List

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
GENERAL	DEVICE NUMBER	0	1	RO	UNSIGNED INTEGER	Defines the actual device type	4225 = 16933 (0x4225)
GENERAL	DEVICE VERSION	1	1	RO	UNSIGNED INTEGER	Product Version	0
GENERAL	SERIAL NUMBER	2	2	RO	UNSIGNED INTEGER	Device serial number	Range: 0...999999999
DISPLAY	TAG TEXT	4	3	R/W	ASCII CHAR	Tag of the device (6 characters)	Range: ASCII values from 32 (' ' to 'Z')
GENERAL	DEVICE VARIANT	7	1	RO	UNSIGNED INTEGER	Device variant	DEVVAR_4225C = 35
SENSOR	SENSOR TYPE	8	1	R/W	UNSIGNED INTEGER	Selected type of sensor	NAMUR = 0 S0 = 1 PNP = 2 NPN = 3 TTL = 4 TACHO = 5 User-defined current (mA) = 6 User-defined voltage (V) = 7
SENSOR	TRIGGER CURRENT LOW	9	1	R/W	UNSIGNED INTEGER	Low trigger limit for user-defined current sensor (in mA/10)	Range: 0..98 (Representing 0.0..9.8 mA)
SENSOR	TRIGGER CURRENT HIGH	10	1	R/W	UNSIGNED INTEGER	High trigger limit for user-defined current sensor (in mA/10)	Range: 2...100 (Representing 0.2...10.0 mA)
SENSOR	TRIGGER VOLTAGE LOW	11	1	R/W	SIGNED INTEGER	Low trigger limit for user-defined voltage sensor (in V/100)	Range: -5...645 (Representing -0.05...6.45 V)
SENSOR	TRIGGER VOLTAGE HIGH	12	1	R/W	SIGNED INTEGER	High trigger limit for user-defined voltage sensor (in V/100)	Range: 0...650 (Representing 0.00...6.50 V)
SENSOR	INPUT IMPEDANCE	13	1	R/W	UNSIGNED INTEGER	Selected internal impedance of the sensor input connector	HIGH IMPEDANCE = 0 PULL UP = 1 PULL DOWN = 2
SENSOR	SENSOR SUPPLY	14	1	R/W	UNSIGNED INTEGER	Voltage level generated by the device to supply the sensor (in V/10)	Range: 50...170 (Representing 5.0...17.0 V)
INPUT	INPUT FUNCTION	15	1	R/W	UNSIGNED INTEGER	Mathematical function for input. Note: For period time input, low cut off has no effect.	None (linear) = 0 Low cut off (0.5 Hz) = 1 Square root function = 2
INPUT	INPUT UNIT	16	1	R/W	UNSIGNED INTEGER	Selected type of frequency measurement	Seconds (period time) = 0 rpm (frequency) = 1 Hertz (frequency) = 2
INPUT	INPUT PULSES PER REVOLUTION	17	1	READ/WRITE	UNSIGNED INTEGER	Number of pulses per revolution on input. (NOTE: Only in use for rpm input).	Range: 1...1000
INPUT	INPUT RANGE LOW	18	2	R/W	INTEGER	Low range value for input	<b>Range (for frequency input):</b> 0...99990000 mrpm* / mHz <b>Range (for period time input):</b> 10...999800000 µs
INPUT	INPUT RANGE HIGH	20	2	R/W	INTEGER	High range value for input	<b>Range (for frequency input):</b> 1...100000000 mrpm** / mHz <b>Range (for period time input):</b> 11...999900000 µs
INPUT	INPUT FILTER	22	1	R/W	UNSIGNED INTEGER	Enable 50 Hz low pass / BW-limiter filter on input	NO = 0 YES = 1  (INPUT FILTER is not available if input range is >50 Hz or <0.02 seconds, or if >3000 / (INPUT PULSES PER REVOLUTION) for rpm)
INPUT	ENABLE INPUT LIMIT LOW	23	1	R/W	UNSIGNED INTEGER	Enable low limit detection on input	NO = 0 YES = 1
INPUT	ENABLE INPUT LIMIT HIGH	24	1	R/W	UNSIGNED INTEGER	Enable high limit detection on input	NO = 0 YES = 1

\* for rpm frequency input, total number of pulses per second must be less than the upper valid value in Hz:

$$f_{MAX, \text{mrpm}} = (f_{MAX, \text{mHz}} / (\text{INPUT PULSES PER REVOLUTION}) * 60) - \text{dispRes}$$

Note: dispRes is the lowest displayable resolution size, when only the 4 most significant digits of the given value is presented.

\*\* for rpm frequency input, total number of pulses per second must be less than the upper valid value in Hz:

$$f_{MAX, \text{mrpm}} = (f_{MAX, \text{mHz}} / (\text{INPUT PULSES PER REVOLUTION}) * 60)$$



Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
INPUT	INPUT LIMIT LOW	25	2	R/W	INTEGER	Low limit value for input limit detection	See range for INPUT RANGE LOW (value must not exceed INPUT RANGE LOW)
INPUT	INPUT LIMIT HIGH	27	2	R/W	INTEGER	High limit value for input limit detection	See range for INPUT RANGE HIGH (value must not fall short of INPUT RANGE HIGH)
INPUT	SQUARE ROOT POINT LOW	29	1	R/W	UNSIGNED INTEGER	Low point for SQUARE ROOT input function (in 1/1000)	Range: 0...1000 (Representing 0.000...1.000)
INPUT	SQUARE ROOT POINT HIGH	30	1	R/W	UNSIGNED INTEGER	High point for SQUARE ROOT input function (in 1/1000)	Range: 0...1000 (Representing 0.000 .. 1.000)
INPUT	SQUARE ROOT LOW CUTOFF POINT	31	1	R/W	UNSIGNED INTEGER	Low cut-off point for SQUARE ROOT input function (in 1/1000)	Range: 0...500 (Representing 0.0...50.0%)
INPUT	SQUARE ROOT CUTOFF TYPE	32	1	R/W	UNSIGNED INTEGER	Selected square root cut-off mode	Disable cut-off = 0 Linear cut-off = 1 Zero cut-off = 2
DISPLAY	DISPLAY UNIT	33	1	R/W	UNSIGNED INTEGER	Units shown as display units for input	Acc. to table 1 (see page 20)
DISPLAY	DECIMAL POINT	34	1	R/W	UNSIGNED INTEGER	Decimal point place for display reading	XXXX = 0 X.XXX = 1 XX.XX = 2 XXX.X = 3
DISPLAY	DISPLAY LOW	35	1	R/W	INTEGER	Low display range for display reading of input	Range: -1999...9999
DISPLAY	DISPLAY HIGH	36	1	R/W	INTEGER	High display range for display reading of input	Range: -1999...9999
DISPLAY	DISPLAY RESPONSE TIME	37	1	R/W	INTEGER	Display response time (in s/10)	Range: 0...600 (Representing 0.0...60.0 s)
ANALOG OUTPUT	OUTPUT TYPE	38	1	R/W	UNSIGNED INTEGER	Output type	FREQUENCY = 0 CURRRENT = 1 VOLTAGE = 2
ANALOG OUTPUT	OUTPUT CURRENT MODE	39	1	R/W	UNSIGNED INTEGER	Mode for analog output current	Active = 0 Passive = 1
ANALOG OUTPUT	CURRENT OUTPUT RANGE	40	1	R/W	UNSIGNED INTEGER	Range for current output	0...20 mA = 0 4...20 mA = 1 4...20 mA (SIL) = 2 -10...10 mA* = 3 -20...20 mA* = 4 20...0 mA = 5 20...4 mA = 6 20...4 mA (SIL) = 7 10...-10 mA* = 8 20...-20 mA* = 9  *bipolar output not valid for passive output (OUTPUT CURRENT MODE = PASSIVE)
ANALOG OUTPUT	VOLTAGE OUTPUT RANGE	41	1	R/W	UNSIGNED INTEGER	Range for voltage output	0...5 V = 2 1...5 V = 3 0...10 V = 4 2...10 V = 5 -5...5 V = 6 -10...10 V = 7 5...0 V = 10 5...1 V = 11 10...0 V = 12 10...2 V = 13 5...-5 V = 14 10...-10 V = 15
ANALOG OUTPUT	ANALOG OUTPUT AT SENSOR ERROR	42	1	R/W	UNSIGNED INTEGER	Analog output level at sensor error	DOWN = 0 ZERO = 1 UP = 2 NONE = 3
ANALOG OUTPUT	ANALOG OUTPUT AT LOW INPUT ERROR	43	1	R/W	UNSIGNED INTEGER	Analog output level at input below configured input limit low	DOWN = 0 ZERO = 1 UP = 2 NONE = 3
ANALOG OUTPUT	ANALOG OUTPUT AT HIGH INPUT ERROR	44	1	R/W	UNSIGNED INTEGER	Analog output level at input beyond configured input limit high	DOWN = 0 ZERO = 1 UP = 2 NONE = 3
RELAY	RELAY UNIT	45	1	R/W	UNSIGNED INTEGER	Units for relay setpoint	Percent = 0 Display units = 1
RELAY	RELAY FUNCTION	57	1	R/W	UNSIGNED INTEGER	Relay function (setpoint, window, error etc.)	OFF = 0 POWER = 1 ERROR = 2 WINDOW = 3 SETPOINT = 4



Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
RELAY	RELAY CONTACT	58	1	R/W	UNSIGNED INTEGER	Contact function (Normally Closed / Normally Open)	NC = 0 NO = 1
RELAY	RELAY SETPOINT LOW	59	1	R/W	INTEGER	Setpoint or low window setpoint, in either display values or 1/10% (percent)	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY	RELAY SETPOINT HIGH	60	1	R/W	INTEGER	High window setpoint, in either display values or 1/10% (percent)	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
RELAY	RELAY ACTION DIRECTION	61	1	R/W	UNSIGNED INTEGER	Activation direction, or activity inside / outside of window, in window mode.	DECREASING / ACTIVE OUTSIDE WINDOW = 0 INCREASING / ACTIVE INSIDE WINDOW = 1
RELAY	RELAY HYSTERESIS	62	1	R/W	UNSIGNED INTEGER	Hysteresis in either display values or 1/10% (percent)	0...(display range) 0...1000 (0.0...100.0%)
RELAY	RELAY ERROR ACTION	63	1	R/W	UNSIGNED INTEGER	Action on error	NONE (not valid for relay func. ERR) = 0 OPEN = 1 CLOSE = 2 HOLD (not valid for relay func. ERR) = 3
RELAY	RELAY LOW INPUT ERROR ACTION	64	1	R/W	UNSIGNED INTEGER	Action on input below configured input limit low	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY HIGH INPUT ERROR ACTION	65	1	R/W	UNSIGNED INTEGER	Action on at input beyond configured input limit high	NONE = 0 OPEN = 1 CLOSE = 2 HOLD = 3
RELAY	RELAY ON DELAY	66	1	R/W	UNSIGNED INTEGER	Relay ON time delay	Range: 0...3600s
RELAY	RELAY OFF DELAY	67	1	R/W	UNSIGNED INTEGER	Relay OFF time delay	Range: 0...3600s
FREQ. OUTPUT	FREQUENCY OUTPUT TYPE	68	1	R/W	UNSIGNED INTEGER	Frequency output type: Programmable pulse is only available for: Frequency < 500Hz Pulses < 30k p/m No limitation for p/h and p/d	DC 50% = 0 Prog. Pulse = 1
FREQ. OUTPUT	FREQUENCY OUTPUT UNIT	69	1	R/W	UNSIGNED INTEGER	Frequency output unit	Hz = 0 p/m = 1 p/h = 2 p/d = 3
FREQ. OUTPUT	FREQUENCY LOW / PULSE LOW	40	2	R/W	UNSIGNED INTEGER	Frequency output low value in mHz or 1/1000's of pulses per min/hour/day	Range: 0...100000000 (Representing 0.0...100.0 kHz or 100,000 pulses per min/hour/day)
FREQ. OUTPUT	FREQUENCY HIGH / PULSE HIGH	72	2	R/W	UNSIGNED INTEGER	Frequency output high value in mHz or 1/1000's of pulses per min/hour/day	As FREQUENCY LOW / PULSE LOW As FREQUENCY LOW / PULSE LOW
FREQ. OUTPUT	CUTOFF FREQUENCY / PULSE	74	2	R/W	UNSIGNED INTEGER	Cutoff frequency in mHz or 1/1000's of pulses per min/hour/day	As FREQUENCY LOW / PULSE LOW As FREQUENCY LOW / PULSE LOW
FREQ. OUTPUT	PULSE TIME	76	1	R/W	UNSIGNED INTEGER	Pulse length in ms	Range: 1...1000 (Must be less than $(1/f_{max}) * 90\%$ ) ( $f_{max}$ is defined by the greatest of FREQUENCY LOW / PULSE LOW and FREQUENCY HIGH / PULSE HIGH)
FREQ. OUTPUT	INDICATE ERROR	77	1	R/W	UNSIGNED INTEGER	Use a specific frequency to indicate sensor error	NO = 0 YES = 1
FREQ. OUTPUT	FREQUENCY OUTPUT AT SENSOR ERROR	78	2	R/W	UNSIGNED INTEGER	Frequency to indicate sensor error in mHz or 1/1000's of pulses per min/hour/day	Range: 0... $f_{max} * 105\%$ (Must be less than $f_{max} * 700\%$ for FREQUENCY OUTPUT TYPE 50% DC) ( $f_{max}$ is defined by the greatest of FREQUENCY LOW / PULSE LOW and FREQUENCY HIGH / PULSE HIGH) Value must in any case never be greater than 115000000
FREQ. OUTPUT	FREQUENCY OUTPUT AT LOW INPUT ERROR	80	2	R/W	UNSIGNED INTEGER	Frequency to indicate an input below configured input limit low. Is set in mHz or 1/1000's of pulses per min/hour/day	As SENSOR ERROR FREQUENCY
FREQ. OUTPUT	FREQUENCY OUTPUT AT HIGH INPUT ERROR	82	2	R/W	UNSIGNED INTEGER	Frequency to indicate an input beyond configured input limit high. Is set in mHz or 1/1000's of pulses per min/hour/day	As SENSOR ERROR FREQUENCY
FREQ. OUTPUT	FREQUENCY OUTPUT CONTACT TYPE	84	1	R/W	UNSIGNED INTEGER	Selected contact type on frequency output	PNP = 0 NPN = 1 Push-pull = 2
FREQ. OUTPUT	FREQUENCY OUTPUT HIGH LEVEL VOLTAGE	85	1	R/W	UNSIGNED INTEGER	High-level voltage for frequency output contact (in V/100)	Range: 50...240 (Representing 5.0...24.0 V) (has no effect with NPN as FREQUENCY OUTPUT CONTACT TYPE)

Category	Parameter Name	Modbus Address	Register Size	Read/Write	Type	Description	Values
OUTPUT	OUTPUT RESPONSE	86	1	READ/WRITE	UNSIGNED INTEGER	Analog/Frequency output damping (in 1/10s)	Range: (Representing 0.0...60.0 s) 0...600
OUTPUT	OUTPUT POWER ON DELAY	87	1	R/W	UNSIGNED INTEGER	Power-on delay, before applying outputs (in s)	Range: 0...9999
DISPLAY	DISPLAY CONTRAST	88	1	R/W	UNSIGNED INTEGER	Contrast on the LCD display	Range: 0...9
DISPLAY	DISPLAY BACKLIGHT	89	1	R/W	UNSIGNED INTEGER	Backlight intensity on LCD	Range: 0...9
DISPLAY	LINE 3 FUNCTION	90	1	R/W	UNSIGNED INTEGER	Information shown on line 3 of display in monitor mode (normal mode). Choose between the Analog Output value or the configured tag.	Output value TAG = 0 = 1
RELAY	ENABLE FAST SET	91	1	R/W	UNSIGNED INTEGER	Enable fast set of relay setpoints from monitor menu	NO = 0 YES = 1
RELAY	RELAY LATCH ENABLE	93	1	R/W	UNSIGNED INTEGER	Activate latch function for relay	NO = 0 YES = 1
INPUT	CALIB RANGE LOW	94	2	R/W	FLOAT	Actual process value for low calibration point in input values	Range: 0...9999900000
INPUT	CALIB RANGE HIGH	96	2	R/W	FLOAT	Actual process value for high calibration point in input values	As CALIB RANGE LOW
INPUT	CALIB POINT LOW	98	2	R/W	FLOAT	Measured process value for low calibration point in input values. (Can be read from PRIMARY RAW VALUE)	As CALIB RANGE LOW
INPUT	CALIB POINT HIGH	100	2	R/W	FLOAT	Measured process value for high calibration point in input values. (Can be read from PRIMARY RAW VALUE)	As CALIB RANGE LOW
INPUT	USE CALIB	102	1	R/W	UNSIGNED INTEGER	Use the applied calibration values	NO = 0 YES = 1
GENERAL	HELPTXT LANGUAGE	103	1	R/W	UNSIGNED INTEGER	Language for the help texts shown on display	UK = 0 DK = 1 DE = 2 FR = 3 SE = 4 IT = 5 ES = 6
GENERAL	CHECKSUM	126	1	RO	UNSIGNED INTEGER	CRC16 checksum of the configuration	Range 0..65535
GENERAL	CONFIGURATION COUNTER	127	1	RO	UNSIGNED INTEGER	This counter will count the number of times the configuration has been changed. The counter is reset on power-up	Range 0..65535
GENERAL	ENABLE PASSWORD	1300	1	R/W	UNSIGNED INTEGER	Password-protect entry to configuration menu via display	NO = 0 YES = 1
GENERAL	PASSWORD	1400	1	R/W	UNSIGNED INTEGER	Password for entering configuration menu	Range: 0...9999

## 4225C Process Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
DISPLAY VALUE INTEGER	1000	1	RO	INTEGER	The scaled display value (INTEGER version of DISPLAY VALUE)	Range: DISPLAY LOW...DISPLAY HIGH
MEASURE STATUS	1001	1	RO	UNSIGNED INTEGER	The actual measurement status	LOW INPUT LIMIT ERROR DETECTED bit 0 = 1 HIGH INPUT LIMIT ERROR DETECTED bit 1 = 1 OUTPUT UNDERRANGE bit 2 = 1 OUTPUT OVERRANGE bit 3 = 1 PROGRAMMING ONLY MODE bit 4 = 1 CONFIGURATION LOCKED bit 5 = 1 DIGITAL INPUT STATE bit 6 = 1 INPUT UNDERRANGE bit 7 = 1 INPUT OVERRANGE bit 8 = 1 SENSOR SHORTED bit 9 = 1 SENSOR BROKEN bit 10 = 1 SENSOR SUPPLY OVERLOAD bit 11 = 1 DIGITAL OUTPUT STATE bit 12 = 1 NOT USED bit 13 = 1 DISPLAY UNDERRANGE bit 14 = 1 DISPLAY OVERRANGE bit 15 = 1
SYSTEM ERROR STATUS	1002	1	RO	UNSIGNED INTEGER	The actual measurement status	INPUT ERROR bit 0 = 1 RAM ERROR bit 1 = 1 CONFIGURATION ERROR bit 2 = 1 INTERNAL FALSH ERROR bit 3 = 1 EXTERNAL FALSH ERROR bit 4 = 1 OUTPUT ERROR bit 5 = 1 OUTPUT SUPPLY ERROR bit 6 = 1 INPUT COMM. ERROR bit 7 = 1 EEPROM ERROR bit 8 = 1 CONFIGURATION WARNING: bit 9 = 1 NOT USED: bit 10 .. 15
RELAY STATE	1003	1	RW	INTEGER	The actual relay status calculated from INPUT VALUE	RELAY IS ON bit 1 = 1 RELAY WILL GO ON AFTER DELAY bit 3 = 1 RELAY IS LATCHED bit 5 = 1 RELAY CAN NOT RELEASE bit 7 = 1
INPUT VALUE	1004	2	RO	FLOAT	The measured, scaled and process calibrated input value (in Hz, rpm or s)	<b>Range (for frequency input):</b> 0.0...100000.0 Hz or rpm <b>Range (for period time input):</b> 0.000010...99.990000 s
DISPLAY VALUE	1006	2	RO	FLOAT	The scaled display value, derived from INPUT VALUE	Range: -1999.0000...9999.0000
RELATIVE INPUT	1008	2	RO	FLOAT	The relative input calculated from INPUT VALUE. 0.0...1.0 corresponds to the input selected range	Range: 0.0...1.0
ANALOG OUTPUT VALUE	1010	2	RO	FLOAT	Analog output value (in $\mu$ A or $\mu$ V)	<b>Range for voltage output:</b> -11500000.0...11500000.0 <b>Range for current output:</b> -23000.0...23000.0
FREQUENCY OUTPUT VALUE	1012	2	RO	FLOAT	Frequency output value in mHz or 1/1000's of pulses per min/hour/day	Range: 0 .. 10500000 (Representing 0.0 .. 105.0 kHz or 105,000 pulses per min/hour/day)

## 4225C Simulation Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
SIMULATION CONTROL	2000	1	R/W	UNSIGNED INTEGER	Control register for simulation	Clear errors and reload config. bit 0 = 1 Simulate input bit 1 = 1 Simulate analog output bit 2 = 1 Front LEDs OFF bit 3 = 1 Simulate RELAY bit 5 = 1  <b>Reserved MUST BE SET TO "0"</b> bit 7
INPUT VALUE	2001	2	R/W	FLOAT	Simulated measured frequency value (in Hz or s)	<b>Range (for frequency input):</b> 0.0...120000.0 Hz or rpm <b>Range (for period time input):</b> 0.000010...99.990000 s
FREQUENCY OUTPUT VALUE	2003	2	R/W	FLOAT	Simulated frequency output value in mHz or 1/1000's of pulses per min/hour/day	Range: 0 .. 105000000 (Representing 0.0...105.0 kHz or 105,000 pulses per min/hour/day)
ANALOG OUTPUT VALUE	2005	2	R/W	FLOAT	Simulated analog output value (in $\mu$ A or $\mu$ V)	<b>Range for voltage output:</b> -11500000.0...11500000.0 <b>Range for current output:</b> -23000.0...23000.0
RELAY SIMULATION CONTROL	2008	1	R/W	UNSIGNED INTEGER	Control bits for relay simulation	SIMULATE RELAY OPEN bit 0 = 1 SIMULATE RELAY CLOSED bit 1 = 1 INVERT RELAY STATE bit 2 = 1 SIMULATE SETPOINT bit 3 = 1 RESET LATCH bit 4 = 1 NOT USED bit 5...7
RELAY SETPOINT	2010	1	R/W	INTEGER	Simulate setpoint, in either display values or 1/10% (percent). NOTE: If setpoint simulation causes the device to go to a special triggered action, such as initiating an error or latching a relay, this will remain active even after simulation has ended.	DISPLAY LOW...DISPLAY HIGH 0...1000 (0.0...100.0%)
SIMULATION TIMEOUT	2011	1	R/W	UNSIGNED INTEGER	If this value is greater than zero, the counter decrements once every 5 ms. Upon reaching 0 SIMULATION CONTROL is cleared.	0...4000

## 4225C Fast Parameters

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
DEVICE NUMBER	6000	1	RO	UNSIGNED INTEGER	Remaps register 0	SEE ORIGINAL REGISTER DESCRIPTION
DEVICE VERSION	6001	1	RO	UNSIGNED INTEGER	Remaps register 1	SEE ORIGINAL REGISTER DESCRIPTION
DEVICE VARIANT	6002	1	RO	UNSIGNED INTEGER	Remaps register 7	SEE ORIGINAL REGISTER DESCRIPTION
CONFIGURATION CHECKSUM	6003	1	RO	UNSIGNED INTEGER	Remaps register 126	SEE ORIGINAL REGISTER DESCRIPTION
CONFIGURATION COUNTER	6004	1	RO	UNSIGNED INTEGER	Remaps register 127	SEE ORIGINAL REGISTER DESCRIPTION
MEASURE STATUS	6005	1	RO	UNSIGNED INTEGER	Remaps register 1001	SEE ORIGINAL REGISTER DESCRIPTION
ERROR STATUS	6006	1	RO	UNSIGNED INTEGER	Remaps register 1002	SEE ORIGINAL REGISTER DESCRIPTION
DISPLAY VALUE INTEGER	6007	1	RO	INTEGER	Remaps register 1000	SEE ORIGINAL REGISTER DESCRIPTION
ANALOG OUTPUT VALUE	6008	2	RO	FLOAT	Remaps register 1010	SEE ORIGINAL REGISTER DESCRIPTION
FREQUENCY OUTPUT VALUE	6010	2	RO	FLOAT	Remaps register 1012	SEE ORIGINAL REGISTER DESCRIPTION
RELAY STATE	6012	1	RO	UNSIGNED INTEGER	Remaps register 1003	SEE ORIGINAL REGISTER DESCRIPTION
INPUT UNIT	6013	1	RO	UNSIGNED INTEGER	Remaps register 16	SEE ORIGINAL REGISTER DESCRIPTION
OUTPUT TYPE	6014	1	RO	UNSIGNED INTEGER	Remaps register 38	SEE ORIGINAL REGISTER DESCRIPTION
DISPLAY UNIT	6015	1	RO	UNSIGNED INTEGER	Remaps register 33	SEE ORIGINAL REGISTER DESCRIPTION
DECIMAL POINT	6016	1	RO	UNSIGNED INTEGER	Remaps register 34	SEE ORIGINAL REGISTER DESCRIPTION
TAG TEXT	6017	3	RO	ASCII CHAR	Remaps register 4	SEE ORIGINAL REGISTER DESCRIPTION

**Table 1: Display units**

0	°C	10	mils	20	in/s	30	kHz	40	MPa	50	GW	60	mV	70	gal/h
1	°F	11	yd	21	ips	31	mHz	41	kPa	51	MW	61	Ω	71	t/h
2	K	12	m <sup>3</sup>	22	ft/s	32	p/m	42	hPa	52	kW	62	S	72	mol
3	%	13	l	23	in/min	33	p/h	43	bar	53	hp	63	μS	73	pH
4	m	14	s	24	ft/min	34	p/d	44	mbar	54	A	64	m <sup>3</sup> /min	74	[blank]
5	cm	15	min	25	in/h	35	t	45	kj	55	kA	65	m <sup>3</sup> /h		
6	mm	16	m/s	26	ft/h	36	kg	46	Wh	56	mA	66	l/s		
7	μm	17	mm/s	27	m/s <sup>2</sup>	37	g	47	MWh	57	μA	67	l/min		
8	ft	18	m/min	28	rpm	38	N	48	kWh	58	V	68	l/h		
9	in	19	m/h	29	Hz	39	Pa	49	W	59	kV	69	gal/min		

# 4511 Modbus Parameter Lists

## 4511 Modbus Configuration Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
ENABLE MODBUS	3000	1	R/W	INTEGER	Enable Modbus communication. If disabled, 4511 ignores all frames sent from the Modbus master and the only way to re-enable Modbus communication is by using the 4511 menu.	NO = 0 YES = 1
BAUDRATE	3001	1	R/W	INTEGER	The baud value used for Modbus communication	2400 BAUD = 0 4800 BAUD = 1 9600 BAUD = 2 19200 BAUD = 3 38400 BAUD = 4 57600 BAUD = 5 115200 BAUD = 6
ENABLE AUTOBAUD	3002	1	R/W	INTEGER	Enable automatic baudrate detection. If enabled, 4511 determines the baudrate automatically by listening to frames sent on the Modbus line.	NO = 0 YES = 1
PARITY	3003	1	R/W	INTEGER	Configures parity check on Modbus frames	NONE = 0 EVEN PARITY = 1 ODD PARITY = 2
STOP BITS	3004	1	R/W	INTEGER	Configures the number of stop bits in Modbus frames	ONE STOP BIT = 1 TWO STOP BITS = 2
ADDRESS	3005	1	R/W	INTEGER	Configures the Modbus address of the 4511 (Address 0 is broadcast address)	Range: 1...247
RESPONSE DELAY	3006	1	R/W	INTEGER	Configures minimum delay for Modbus response in ms	Range: 0...1000

## 4511 Additional Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
ROTATE DEVICE	3100	1	R/W	INTEGER	Enables the display and key buttons to be used normally when the host device is mounted upside down	NO = 0 YES = 1

## 4511 Modbus Status Parameter List

Parameter Name	Register Address	Register Size	Read/Write	Type	Description	Values
AUTOBAUD STATUS	4000	1	RO	INTEGER	Actual state of automatic baudrate detection	2400 BAUD = 0 4800 BAUD = 1 9600 BAUD = 2 19200 BAUD = 3 38400 BAUD = 4 57600 BAUD = 5 115200 BAUD = 6 SEARCHING = 7 ERROR = 8
IDENTIFY DEVICE	4001	1	R/W	INTEGER	Enables the device to flash the LCD background with approx. 4 Hz. <b>Value will automatically return to NO if not written within 10 seconds!</b>	NO = 0 YES = 1
MAXIMUM READ REGISTERS	4002	1	RO	INTEGER	Maximum allowed number of registers that can be read in one command, with the given/detected baudrate	Range: 8...32





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