

# 4650-PM

## MODBUS REGISTER LIST

LANGUAGE: ENGLISH



**LAND**  
**AMETEK®**



QUALITY CUSTOMER SOLUTIONS

# CONTENTS

<b>SINGLE SENSOR SYSTEM</b>	<b>3</b>
Read Multiple Holding Registers (Function 3)	3
Write Multiple Holding Registers (Function 16)	4
Basic alarm Status Register values	4
Additional Check Status Register values	4
Activate Checks Register values	4
<b>PROCEDURE FOR ACTIVATING CALIBRATION CYCLE</b>	<b>5</b>
Automatic method: write to activate checks register	5
Manual method: write to coils to control zero and span modes	6
<b>CONTROL UNIT SYSTEM REGISTER LIST</b>	<b>8</b>

## SINGLE SENSOR SYSTEM

Auto-detect sets up the following channel list in the control unit:

Channel	Channel Name	Description
1	Stack1 Dust	Stack1 Dust Reading
2	Stack1 Zero	Stack1 zero reading (from last run)
3	Stack1 Span	Stack1 span reading (from last run)
4	Stack1 Purge	Stack1 air purge reading {litres/minute}: diagnostic use only
5	Stack1 PcbT	Stack1 temperature of enclosure {°C} diagnostic use only
6	Stack1 TubeT	Stack1 temperature of inserted section {°C} diagnostic use only
7	Stack1 I	Stack1 laser current: diagnostic use only

Then the following modbus registers are available:

### Read Multiple Holding Registers (Function 3)

Modbus Register Number	Parameter	Register type
2049	Stack1 : basic alarm status	Short
2497	Stack1 Dust: instant reading	float
2499	Stack1 Zero	float
2501	Stack1 Span	float
2503	Stack1 Purge	float
2505	Stack1 PcbT	float
2507	Stack1 TubeT	float
2753	Stack1 Dust : average reading	float
3009	Stack1 Dust : calibration factor	float
3265	Stack1 Dust : warning alarm level	float
3521	Stack1 Dust : limit alarm level	float
3777	Stack1 Dust : average warning alarm level	float
4033	Stack1 Dust : average limit alarm level	float
4865	Stack1 : modbus address	short
5121	Stack1 : additional check status	short
7169	Stack1 : check phase	short

<b>Modbus Register Number</b>	<b>Parameter</b>	<b>Register type</b>
7425	Stack1 : plant run/stop (1= run,2=stop)	short
513*	Stack1 Dust : instant reading	float
515*	Stack1 : basic alarm status	Short
516*	Stack1 : additional check status	Short

\*these duplicate registers have been made available for convenience as an alternative to allow reading as a single

block (available from multicontroller software 8.60 onwards).

### **Write Multiple Holding Registers (Function 16)**

<b>Modbus Register Number</b>	<b>Zero based register offset</b>	<b>Parameter</b>	<b>Register type</b>
6913	6912	Stack1 Activate checks	short

### **Basic Alarm Status Register Values**

Instant Warning Alarm	Bit 0	1
Instant Limit Alarm	Bit 1	2
Average Warning Alarm	Bit 2	4
Average Limit Alarm	Bit 3	8
Communication Fault	Bit 4	16

### **Additional Check Status Register Values**

In Maintenance	Bit 0	1
Communication Fault	Bit 1	2
Low Purge Flow	Bit 2	4
In Measurement Phase of Check	Bit 3	8
Zero Fault	Bit 5	32
Span Fault	Bit 6	64
Zero check in progress	Bit 8	256
Span check in progress	Bit 9	512

### **Activate Checks Register values**

Activate Maintenance Zero check	bit 0	1
Activate Maintenance Span check	bit 1	2
Activate PS11 Calibration	bit 2	4

## PROCEDURE FOR ACTIVATING CALIBRATION CYCLE

### Automatic method: write to Activate Checks register

The modbus registers required for this method are shown below:

Modbus Register Number	Parameter	Register type
6913	Activate checks	short
5121	Additional Check status	Short

To initiate a calibration cycle write to the appropriate Activate Checks register using function code 16 (Write Multiple Holding Registers)

The activate checks register has the following bits defined so to activate a full PS11 calibration cycle you should write the value 4 to this register:

Activate PS11 Calibration	bit 2	4
<b>Activate Maintenance Zero</b>	bit 0	<b>1</b>
Activate Maintenance Span check	bit <b>1</b>	2

Once the calibration cycle has started you should monitor the following bits of the Additional Check Status register:

In PS11Calibration	Additional Check status: bit 11
Zero check in progress	Additional Check status: bit 8
Span check in progress	Additional Check status: bit 9
In Measurement Phase of Check	Additional Check status: bit 3

The timing of the different phases of the calibration cycle are shown in the table below:

Check Phase	Check Phase Name	Action performed at start of phase	Duration of phase (secs)	Check status flags set
0	Normal Mode	Quadrant in open position.		0
1	Upscale Check:	Rotate quadrant to Span position.	20	11+9
	Pre-Settling Phase	Allow to settle.		
2	Upscale Check : Measurement Phase	Take upscale readings during this phase	60	11+9+3
3	Upscale Check :	Rotate quadrant to Normal	10	11+8
	Post-Settling Phase	Allow to settle.		
4	Zero Check :	Turn off laser	10	11+8
	Pre-Settling Phase	Allow to settle.		
5	Zero Check : Measurement Phase	Take zero readings during this phase	60	11+8+3
6	Zero Check :	Turn back laser on.	10	11
	Post-Settling Phase	Allow to settle.		
0	Normal Mode	Quadrant in open position.		0

**Manual method: write to coils to control zero and span modes**

The Modbus coils required for this method are shown below:

Modbus coil number	Zero based coil offset	Coil Usage	Action
2	1	Place sensor in Zero Mode	O=Normal operation mode 1= Zero mode
3	2	Place sensor in Span/Upscale Mode	O=Normal operation mode 1= Span/upscale

These coils allow you to program your own calibration cycle as follows:

**To run a Zero Check:**

- Write 1 to the Zero Mode coil. This places the sensor in Zero mode
- Wait 10 seconds for the sensor to settle
- Read the zero result
- Write 0 to the Zero Mode coil. This places the sensor back in normal measurement mode
- Wait 10 seconds for the sensor to settle

**To run a Span Check:**

- Write 1 to the Span Mode coil. This places the sensor in Span mode
- Wait 20 seconds for the sensor to settle
- Read the Span result
- Write 0 to the Span Mode coil. This places the sensor back in normal measurement mode
- Wait 10 seconds for the sensor to settle

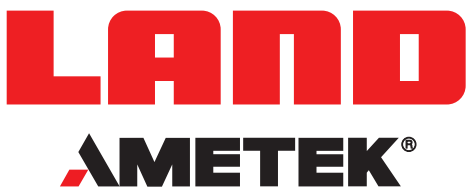
## CONTROL UNIT SYSTEM REGISTER LIST

The following register table can be used to read and modify system settings in the control unit.

<b>Modbus Register Number</b>	<b>Parameter</b>	<b>Register type</b>
1	Control Unit Identifier	Short
2	<b>Control Unit version number</b>	Short
4	Reset Latched Alarms (write 1 to reset)	Short
7	User Mode (0=Configure, =View only)	Short
8-10	Password	String[6]
15	Latch Alarms (0=Unlatched, =Latched)	Short
16	Language option	Short
17	Long term log rate (in seconds)	Short
18	Short term Jog rate (in seconds)	Short
19-26	Multi-calibration factors	Float[4]
27	RS485 1: Modbus Address	Short
28	RS485 1: Parity	Short
29	RS485 1: Stop Bits	Short
30	RS485 1: Baud Rate	Short
31-36	Real time clock value in BCD  second: minute: hour, Day/month/year	Short[6]
37-41	4-20mA output settings (1)  Channel ID  Zero  Span	Short  Float  Float
42-46	4-20mA output settings [2]	
47-51	4-20mA output settings [3]	

# 4650-PM

MODBUS REGISTER LIST



## CONTACT US



[www.ametek-land.com](http://www.ametek-land.com)



[land.enquiry@ametek.com](mailto:land.enquiry@ametek.com)



AMETEK Land's AMECare Performance Services ensure peak performance and maximum return on investment over the life of your equipment.

We deliver this by:

- Proactively maintaining your equipment to maximize availability.
- Optimizing solutions to meet your unique applications.
- Enhancing user skills by providing access to product and application experts.

AMETEK Land's global service network provides unparalleled after-sales services to ensure you get the best performance and value from your AMETEK Land products. Our dedicated service centre teams and on-site engineers are trained to deliver the highest standard of commissioning, maintenance and after-sales support.

Our worldwide network of Service Centres includes:

UNITED KINGDOM | USA | UAE | ITALY | INDIA | GERMANY | CHINA

[WWW.AMETEK-LAND.COM/SERVICES](http://WWW.AMETEK-LAND.COM/SERVICES)

For a full list of international offices, please visit our website [www.ametek-land.com](http://www.ametek-land.com)

Copyright © 2023 LAND Instruments International. Continuous product development may make it necessary to change these details without notice.

4650-PM Modbus Register List, Issue 1, 27 November 2023