



Equipment Description	Motor Monitoring PCB Ethernet & RS485
iCsys Part Number:	109504

Document No.:	109504-ICS-SW-PRT-0001	Document Name.:	Register List
Published	Revision number	Revision reason	Revised by
02.06.2022	E	Added encoder settings	VHA
16.07.2019	D	Corrected humidity Unit	VHA
26.10.2018	C	Added Ethernet	VHA
16.10.2017	B	Register Changes	VHA
18.08.2017	A	Issued for release	VHA
18.08.2017	0	For Internal Review	VHA
Prepared		Checked	Approved
VHA		SHA	FTO

TABLE OF CONTENTS

1. INTRODUCTION.....	3
1.1. GENERAL NOTES	3
1.2. PURPOSE AND SCOPE	3
1.3. ABBREVIATIONS	3
1.4. SUPPLIER CONTACT INFORMATION	3
2. COMMUNICATION PROTOCOL.....	4
2.1. MODBUS RTU	4
2.2. MODBUS TCP/UDP	4
2.3. HEARTBEAT.....	4
2.4. DATA TYPES	4
3. REGISTERS.....	5
3.1. READ REGISTERS.....	5
3.1.1. HEADER	5
3.1.2. INPUTS	5
3.1.3. INPUT RAW VALUES	6
3.2. READ/WRITE REGISTERS.....	7
3.2.1. INPUT SETTINGS.....	7
3.2.2. ENCODER SETTINGS.....	7

1. INTRODUCTION

1.1. GENERAL NOTES

This document outlines and defines the Modbus Registers for communication with the iCsys Motor Monitoring Ethernet & RS485 circuit boards.

1.2. PURPOSE AND SCOPE

The purpose of this list is to give instructions to read sensor inputs and read/write parameters in the Motor Monitoring Ethernet & RS485 PCBs supplied by iCsys AS.

The manual is to be used by trained and competent personnel only.

1.3. ABBREVIATIONS

Abbreviation	Description
PCB	Printed Circuit Boards
EEPROM	Electric Erasable Read Only Memory

1.4. SUPPLIER CONTACT INFORMATION

iCsys AS
Postvegen 610
N-4351 Kleppe
Norway

+47 51 42 22 22

post@icsys.no

www.icsys.no

2. COMMUNICATION PROTOCOL

2.1. MODBUS RTU

The Modbus Slave Address and Baudrate is changed on Modbus write commands to register 4 and 7.

A 120-ohm termination resistor should be added in each end of the RS485 communication line.

Default Baudrate	115 200 bps
Data bits	8
Parity	None
Stop bits	2
Default Modbus Slave Address	1

2.2. MODBUS TCP/UDP

Default IP address	10.0.37.240
Default Modbus Node	1
Modbus port	502

2.3. HEARTBEAT

Heartbeat messages are sent once each second to Multicast IP 255.255.255.255 port 65000. These messages can be detected to see IP address if unknown.

2.4. DATA TYPES

The following table describes the data types used on iCsys boards. For 32bit values two Modbus registers is used where the first is the most significant.

Name	Size	Value Range
INT16	2 byte	-32,768 to 32,767
UINT16	2 byte	0 to 65,535
INT32	4 byte	-2,147,483,648 to 2,147,483,647
UINT32	4 byte	0 to 4,294,967,295
REAL32	4 byte	1.2E-38 to 3.4E+38

3. REGISTERS

3.1. READ REGISTERS

3.1.1. HEADER

Address	Description	Note	Data Type
0	PCB Type	27	UINT16
1	Serial Number		UINT16
2	Firmware Version		UINT16
3	Reserved		UINT16
4	Modbus Port (UDP/TCP)		UINT16
5	Reserved		UINT16
6	Reserved		UINT16
7	Slave Address	Modbus Slave Address This register is saved to Non-Volatile memory when changed	UINT16
8	Heartbeat	1Hz counter. Rolls over to zero after 65535	UINT16
9	Serial Baudrate (RTU)	The Baudrate is indicated by a single digit. Changes to this register will be stored: 0 = 9600 1 = 19200 2 = 28800 3 = 38400 4 = 57600 5 = 115200	UINT16

3.1.2. INPUTS

The PT100 inputs, Water Sensor, Encoder and vibration is factory calibrated. The Compensator Level and the phase voltages should be calibrated together with sensor and motor windings.

Address	Description	Note	Data Type
10	Input 1 Compensator Level	Indicated in percent multiplied by 10	INT16
11	Input 2 Water Sensor	Indicated in % Relative Humidity	INT16
12	Input 3 Encoder	Indicated in RPM	INT16
13	Input 4 Phase 1 Voltage	Indicated in Volt	INT16
14	Input 5 Phase 2 Voltage	Indicated in Volt	INT16
15	Input 6 Phase 3 Voltage	Indicated in Volt	INT16
16	Input 7 PT100 #1	Indicated in Celsius multiplied by 10	INT16
17	Input 8 PT100 #2	Indicated in Celsius multiplied by 10	INT16
18	Input 9 PT100 #3	Indicated in Celsius multiplied by 10	INT16
19	Input 10 PT100 #4	Indicated in Celsius multiplied by 10	INT16
20	Input 11 PT100 #5	Indicated in Celsius multiplied by 10	INT16
21	Input 12 Vibration Amplitude	Indicated in Milli-G (Process max and min is used to set bandpass filter)	INT16
22	Input 13 Vibration Frequency	Indicated in Hz	INT16

3.1.3. INPUT RAW VALUES

Address	Description	Note	Data Type
50	Input 1 Compensator Level	Raw Value from ADC	UINT16
51	Input 2 Water Sensor	Sensor Measured Frequency in Hz	UINT16
52	Input 3 Encoder	Pulses per Minute	INT16
53	Input 4 Phase 1 Voltage	Raw Value from ADC	UINT16
54	Input 5 Phase 2 Voltage	Raw Value from ADC	UINT16
55	Input 6 Phase 3 Voltage	Raw Value from ADC	UINT16
56	Input 7 PT100 #1	Raw Value from ADC	UINT16
57	Input 8 PT100 #2	Raw Value from ADC	UINT16
58	Input 9 PT100 #3	Raw Value from ADC	UINT16
59	Input 10 PT100 #4	Raw Value from ADC	UINT16
60	Input 11 PT100 #5	Raw Value from ADC	UINT16
61	Input 12 Vibration Amplitude	Milli-G	UINT16
62	Input 13 Vibration Frequency	Hz	UINT16

3.2. READ/WRITE REGISTERS

These registers are stored in non-volatile memory when changed.

3.2.1. INPUT SETTINGS

Address	Description	Note	Data Type
300	Input 1 Reserved		UINT16
301	Input 1 Raw Max	Raw value corresponding to Scaled Max value	UINT16
302	Input 1 Raw Min	Raw value corresponding to Scaled Min value	UINT16
303	Input 1 Scaled Max	A high reference for calibration of input scaling (typically sensor maximum)	INT16
304	Input 1 Scaled Min	A low reference for calibration of input scaling (typically zero)	INT16
305	Input 1 Reserved		UINT16
306	Input 1 Reserved		UINT16
307	Input 1 Reserved		UINT16
308	Input 1 Reserved		UINT16
309	Input 1 Reserved		UINT16
310-499	Input 2		

3.2.2. ENCODER SETTINGS

These input setting registers are only applicable for the encoder (speed) input

Address	Description	Note	Data Type
320	Encoder Show Raw Values	0 = Register 12 shows scaled RPM 1 = Register 12 shows the state of the digital inputs in bit 0 and 1.	UINT16
325	Encoder Dual/Single Input	0 = Dual input mode 1 = Single input mode	UINT16
326	Encoder Single Input A/B	Only applicable if register 325 is in "Single input mode" 0 = Use digital input A 1 = Use digital input B	UINT16