ProBeck-IPS Modbus

User Manual

Revision 1A-04
14th March 2014

EMIS SALES 2002 (Pty) Ltd
P.O.Box 2348
Rensburg
South-Africa
1439

Tel : (+27) 16 341 6134/5/6

www.emis.co.za

Content

Page
1. ABSTRACT 4
2. SPECIFICATIONS 5
2.1 Technical Specifications of ProBeck-IPS-Modbus 5
2.2 Functions supported 6
2.2.1 Read Coils 6
2.2.2 Read Discrete Input Register 6
2.2.3 Read Holding Registers 7
2.2.4 Read Input Registers 7
2.3 Listen mode only 25
2.2.5 Function Flag Table 1 26
2.2.6 Function Flag Table 2 30
2.2.7 Function Flag Table 3 32
3. DEFINITIONS AND TERMINOLOGY 34
4. OPERATING INSTRUCTIONS 35
4.1 Getting Started 35
4.1.1 Setting Up The ProBeck-IPS-Modbus 35
4.2 Monitoring Diagnostic On Front-End 35
4.3 DB 9 Connection 35
4.4 Synchronizing The RTC 35
5. DIAGRAMS 36
5.1 Block Diagram of ProBeck-IPS-Modbus 36

Revision History		
Date	**Revision**	**Description**
25 Feb 2014	1A-01	- Draft with predicted registers.
5 March 2014	1A-02	Added slot selected Addr 21-Slot Des Addr300-359

1. ABSTRACT

The ProBeck-IPS-Modbus acts as a translator between the Modbus SCADA and the ProBeck-IPS. It is advisable to read the ProBeck-IPS user manual, as some of the topics will require knowledge on the ProBeck-IPS. It is also advisable to have knowledge on Modbus. Modbus specification document can be found on the web from http://www.modbus.org/.

The communication protocol between the ProBeck-IPS-Modbus and SCADA is Modbus-RTU. Communication protocol between the ProBeck-IPS-Modbus and the ProBeck-IPS is an NewElec proprietary protocol. Enabling the PLC to communicate with the ProBeck-IPS via Modbus.

2. SPECIFICATIONS

2.1 Technical Specifications of ProBeck-IPS-Modbus

General Data	Mounting Positions	● Mounted inside of ProBeck-IPS.
	Allowed Ambient Temperature	● Operation : 0 ºC to +60 ºC
	Humidity	● < 87%
ProBeck-IPS-Modbus	Power Supply	● +5Vdc
	Consumption	● 20 mA
	Communication Mediums	● Modbus ● I2C
Modbus	Protocol	● Modbus-RTU
	Baud Rate	● 2400 bit/s ● 4800 bit/s ● 9600 bit/s ● 19200 bit/s ● 38400 bit/s ● 57600 bit/s
	Cable Length @ Baud Rate	● 1200 m @ 2400 bit/s to 38400 bit/s ● 1000 m @57.6Kbit/s
	Termination Resistor (Termination resistors must be connected at the beginning and end of bus)	● 150 Ohm (0.5W).
Indication Lights	Type	● Light Emitting Diode (LED)
	LED Indications	● SCADA Communication ◦ Red = No communication. ◦ Green = Receiving. ● Address Of Module ◦ Green Flash = 1 ◦ Red Flash = 10 ◦ Orange Flash = 100 ◦ Red Solid = I2C Error ◦ Orange Solid = Modbus Error

2.2 Functions supported

Following Modbus functions are supported:

Function		Function Name
Hex	Dec	
0x01	01	Read Coils. (See Chapter 2.2.1)
0x02	02	Read Discrete Inputs. (See Chapter 2.2.2)
0x03	03	Read Holding Registers. (See Chapter 2.2.4) (Address 0x4000)
0x04	04	Read Input Registers. (See Chapter 2.2.4) (Address 0x3000)
0x06	06	Write Single Register. (See Chapter 2.2.4) (Address 0x4000)
0x10	16	Write Multiple Registers. (See Chapter 2.2.4) (Address 0x4000)
0x11	17	Report Slave ID.

2.2.1 Read Coils

Following values can be read from the coil register:

Address	Bit Position	Name	Read Only
0	0	Relay 1 Status	Yes
	1	Relay 2 Status	Yes
	2	Relay 3 Status	Yes
	3	Relay 4 Status	Yes
	4	External Relay 5 Status	Yes
	5	External Relay 6 Status	Yes
	6	External Relay 7 Status	Yes
	7	External Relay 8 Status	Yes

2.2.2 Read Discrete Input Register

Following values can be read from the discrete input register:

Input Position	Name	Read Only
0	Field Input 1	Yes
1	Field Input 2	Yes
2	Field Input 3	Yes

3	Field Input 4	Yes
4	Field Input 5	Yes
5	Field Input 6	Yes
6	Field Input 7	Yes
7	Reserved	Yes
8	External Field Input 8	Yes
9	External Field Input 9	Yes
10	External Field Input 10	Yes
11	External Field Input 11	Yes
12	External Field Input 12	Yes
13	External Field Input 13	Yes
14	External Field Input 14	Yes
15	External Field Input 15	Yes
16 ~ 31	SCADA Mapped Bits	Yes
32 ~ 39	Analogue 1 Input	Yes
40 ~ 47	Analogue 2 Input	Yes

2.2.3 Read Holding Registers

Following values can be read from the holding register:

* Password needs to be unlocked with writing 0x5AA5 hexadecimal to register 2.

2.2.4 Read Input Registers

Following values can be read from the input register:

Addr	Bit Position	Name	Read Only
0	0 ~ 7	Hart Beat	Yes
	8 ~ 15	Thermal Capacity Remaining	Yes
1	0 ~ 15	SCADA mapped bits	Yes
2	0 ~ 15	Time Till Trip	Yes
3	0 ~ 15	Time Till Reset	Yes
4	0 ~ 15	Load Red Phase	Yes
5	0 ~ 15	Load White Phase	Yes
6	0 ~ 15	Load Blue Phase	Yes
7	0 ~ 15	Phase Voltage Red Phase	Yes
8	0 ~ 15	Phase Voltage White Phase	Yes
9	0 ~ 15	Phase Voltage Blue Phase	Yes
10	0 ~ 15	Load Sum	Yes
11	0 ~ 15	Line Voltage	Yes

Addr	Bit Position	Name	Read Only
12	0 ~ 15	Earth Leakage Level	Yes
13	0 ~ 7	Voltage Symmetry Level	Yes
	8 ~ 15	Current Unbalance Level	Yes
14	0 ~ 7	Frequency Level	Yes
	8 ~ 15	Power Factor Level	Yes
15	0 ~ 15	Insulation Level	Yes
16	0 ~ 7	Thermal Curve Selected	Yes
	8 ~ 15	Maximum Load Current Selected	Yes
17	0 ~ 7	RTD 2 Level	Yes
	8 ~ 15	RTD 1 Level	Yes
18	0 ~ 7	RTD 4 Level	Yes
	8 ~ 15	RTD 3 Level	Yes
19	0 ~ 7	Analogue Channel 2 In	Yes
	8 ~ 15	Analogue Channel 1 In	Yes
20	0 ~ 7	Analogue Channel 2 Out	Yes
	8 ~ 15	Analogue Channel 1 Out	Yes
21	0 ~ 7	Starts Per Hour Remaining	Yes
	8 ~ 15	Settings Slot selected 1 of 8	Yes
22	0	Alarm Flags A – Voltage Present	Yes
	1	Alarm Flags A – Over Voltage	Yes
	2	Alarm Flags A – Under Voltage	Yes
	3	Alarm Flags A – Voltage Symmetry	Yes
	4	Alarm Flags A – Insulation Lockout	Yes
	5	Alarm Flags A – Low Frequency	Yes
	6	Alarm Flags A – High Frequency	Yes
	7	Alarm Flags A – Earth Fault	Yes
	8	Alarm Flags A – In Service	Yes
	9	Alarm Flags A – Earth Leakage	Yes
	10	Alarm Flags A – Over Current	Yes
	11	Alarm Flags A – Running Stall	Yes
	12	Alarm Flags A – Unbalance	Yes
	13	Alarm Flags A – Single Phase	Yes
	14	Alarm Flags A – Minimum Load	Yes
	15	Alarm Flags A – Short Circuit	Yes
23	0	Alarm Flags B – RTD 1 Hi	Yes
	1	Alarm Flags B – RTD 1 Lo	Yes
	2	Alarm Flags B – RTD 2 Hi	Yes
	3	Alarm Flags B – RTD 2 Lo	Yes
	4	Alarm Flags B – RTD 3 Hi	Yes
	5	Alarm Flags B – RTD 3 Lo	Yes
	6	Alarm Flags B – RTD 4 Hi	Yes
	7	Alarm Flags B – RTD 4 Lo	Yes
	8	Alarm Flags B – Vectorial Stall	Yes

Addr	Bit Position	Name	Read Only
	9	Alarm Flags B – Frozen Contact	Yes
	10 ~ 15	Alarm Flags B – Reserved	Yes
24	0 ~ 7	Alarm Flags C – Reserved	Yes
	8	Alarm Flags C – Analogue In 1 Hi	Yes
	9	Alarm Flags C – Analogue In 1 Lo	Yes
	10	Alarm Flags C – Analogue In 2 Hi	Yes
	11	Alarm Flags C – Analogue In 2 Lo	Yes
	12	Alarm Flags C – Analogue Out 1 Hi	Yes
	13	Alarm Flags C – Analogue Out 1 Lo	Yes
	14	Alarm Flags C – Analogue Out 2 Hi	Yes
	15	Alarm Flags C – Analogue Out 2 Lo	Yes
25	0 ~ 15	Reserved	Yes
26	0 ~ 15	Reserved	Yes
27	0	Trip Flags A – Over Voltage	Yes
	1	Trip Flags A – Under Voltage	Yes
	2	Trip Flags A – Voltage Symmetry	Yes
	3	Trip Flags A – Insulation Lockout	Yes
	4	Trip Flags A – Low Frequency	Yes
	5	Trip Flags A – High Frequency	Yes
	6	Trip Flags A – Earth Fault	Yes
	7	Trip Flags A – Starts Per Hour	Yes
	8	Trip Flags A – Over Current	Yes
	9	Trip Flags A – Running Stall	Yes
	10	Trip Flags A – Unbalance	Yes
	11	Trip Flags A – Single Phase	Yes
	12	Trip Flags A – Minimum Load	Yes
	13	Trip Flags A – Short Circuit	Yes
	14	Trip Flags A – Phase Rotation	Yes
	15	Trip Flags A – Earth Leakage	Yes
28	0	Trip Flags B – RTD 1 Hi	Yes
	1	Trip Flags B – RTD 1 Lo	Yes
	2	Trip Flags B – RTD 2 Hi	Yes
	3	Trip Flags B – RTD 2 Lo	Yes
	4	Trip Flags B – RTD 3 Hi	Yes
	5	Trip Flags B – RTD 3 Lo	Yes
	6	Trip Flags B – RTD 4 Hi	Yes
	7	Trip Flags B – RTD 4 Lo	Yes
	8	Trip Flags B – System Failure	Yes
	9	Trip Flags B – Vectorial Stall	Yes
	10	Trip Flags B – Frozen Contact	Yes
	11	Trip Flags B – Execution Fault	Yes
	12	Trip Flags B – Feedback Fault	Yes
	13	Trip Flags B – Unauthorized Current	Yes

Addr	Bit Position	Name	Read Only
	14	Trip Flags B – Vacuum Fail	Yes
	15	Trip Flags B – CT Not Connected	Yes
29	0	Trip Flags C – Earth Leakage Core Not Connected	Yes
	1	Trip Flags C – Pilot Open	Yes
	2	Trip Flags C – Pilot Short	Yes
	3	Trip Flags C – Pilot Communication Lost	Yes
	4	Trip Flags C – MMI Communication Lost	Yes
	5	Trip Flags C – RTD Communication Lost	Yes
	6	Trip Flags C – 4 – 20 Communication Lost	Yes
	7	Trip Flags C – IO Expander Communication Lost	Yes
	8	Trip Flags C – Analogue In 1 Hi	Yes
	9	Trip Flags C – Analogue In 1 Lo	Yes
	10	Trip Flags C – Analogue In 2 Hi	Yes
	11	Trip Flags C – Analogue In 2 Lo	Yes
	12	Trip Flags C – Analogue Out 1 Hi	Yes
	13	Trip Flags C – Analogue Out 1 Lo	Yes
	14	Trip Flags C – Analogue Out 2 Hi	Yes
	15	Trip Flags C – Analogue Out 2 Lo	Yes
30	0	Trip Flags D – Custom Trip Flag 1	Yes
	1	Trip Flags D – Custom Trip Flag 2	Yes
	2	Trip Flags D – Custom Trip Flag 3	Yes
	3	Trip Flags D – Custom Trip Flag 4	Yes
	4	Trip Flags D – Custom Trip Flag 5	Yes
	5	Trip Flags D – Custom Trip Flag 6	Yes
	6	Trip Flags D – Custom Trip Flag 7	Yes
	7	Trip Flags D – Custom Trip Flag 8	Yes
	8	Trip Flags D – Communication Module Comms Lost	Yes
	9 ~ 15	Reserved	Yes
31	0 ~ 15	Reserved	Yes
32	0	Logic Flags A – Timer A Output	Yes
	1	Logic Flags A – Timer B Output	Yes
	2	Logic Flags A – Real Time Clock Output	Yes
	3	Logic Flags A – Relay 1 Output	Yes
	4	Logic Flags A – Relay 2 Output	Yes
	5	Logic Flags A – Relay 3 Output	Yes
	6	Logic Flags A – Relay 4 Output	Yes
	7	Logic Flags A – Counter A Output	Yes
	8	Logic Flags A – Logic Function 1 Output	Yes
	9	Logic Flags A – Logic Function 2 Output	Yes
	10	Logic Flags A – Logic Function 3 Output	Yes
	11	Logic Flags A – Logic Function 4 Output	Yes
	12	Logic Flags A – Logic Function 5 Output	Yes
	13	Logic Flags A – Logic Function 6 Output	Yes

Addr	Bit Position	Name	Read Only
	14	Logic Flags A – Simulation Active	Yes
	15	Logic Flags A – Counter B Output	Yes
33	0	Logic Flags B – Starter Output 1	Yes
	1	Logic Flags B – Starter Output 2	Yes
	2	Logic Flags B – Starter Output 3	Yes
	3	Logic Flags B – Starter Output 4	Yes
	4	Logic Flags B – Starter Output 5	Yes
	5	Logic Flags B – Reserved	Yes
	6	Logic Flags B – Local Selection Bit lsb.	Yes
	7	Logic Flags B – Local Selection Bit msb	Yes
	8	Logic Flags B – Field Input 1	Yes
	9	Logic Flags B – Field Input 2	Yes
	10	Logic Flags B – Field Input 3	Yes
	11	Logic Flags B – Field Input 4	Yes
	12	Logic Flags B – Field Input 5	Yes
	13	Logic Flags B – Field Input 6	Yes
	14	Logic Flags B – Field Input 7	Yes
	15	Logic Flags B – Reserved	Yes
34	0	Logic Flags C – PLC Input Bit 8	Yes
	1	Logic Flags C – PLC Input Bit 9	Yes
	2	Logic Flags C – PLC Input Bit 10	Yes
	3	Logic Flags C – PLC Input Bit 11	Yes
	4	Logic Flags C – PLC Input Bit 12	Yes
	5	Logic Flags C – PLC Input Bit 13	Yes
	6	Logic Flags C – PLC Input Bit 14	Yes
	7	Logic Flags C – PLC Input Bit 15	Yes
	8	Logic Flags C – PLC Input Bit 0	Yes
	9	Logic Flags C – PLC Input Bit 1	Yes
	10	Logic Flags C – PLC Input Bit 2	Yes
	11	Logic Flags C – PLC Input Bit 3	Yes
	12	Logic Flags C – PLC Input Bit 4	Yes
	13	Logic Flags C – PLC Input Bit 5	Yes
	14	Logic Flags C – PLC Input Bit 6	Yes
	15	Logic Flags C – PLC Input Bit 7	Yes
35	0	Logic Flags D – Pre Start Warning Signal	Yes
	1	Logic Flags D – DC Break Active	Yes
	2	Logic Flags D – Transition Active	Yes
	3	Logic Flags D – Backspin Active	Yes
	4	Logic Flags D – PG input	Yes
	5	Logic Flags D – Latch Output B	Yes
	6	Logic Flags D – Pilot Local	Yes
	7	Logic Flags D – TC Warning Level	Yes
	8	Logic Flags D – Timer A Pulse Output	Yes

Addr	Bit Position	Name	Read Only
	9	Logic Flags D – Timer B Pulse Output	Yes
	10	Logic Flags D – Status Reporter Output	Yes
	11	Logic Flags D – Latch Output A	Yes
	12	Logic Flags D – Relay 5	Yes
	13	Logic Flags D – Relay 6	Yes
	14	Logic Flags D – Relay 7	Yes
	15	Logic Flags D – Relay 8	Yes
36	0	Logic Flags E – Pilot Test	Yes
	1	Logic Flags E – Pilot Run	Yes
	2	Logic Flags E – Reserved	Yes
	3	Logic Flags E – Reserved	Yes
	4	Logic Flags E – Comparator A Hi	Yes
	5	Logic Flags E – Comparator A Lo	Yes
	6	Logic Flags E – Comparator B Hi	Yes
	7	Logic Flags E – Comparator B Lo	Yes
	8	Logic Flags E – Field Input 8	Yes
	9	Logic Flags E – Field Input 9	Yes
	10	Logic Flags E – Field Input 10	Yes
	11	Logic Flags E – Field Input 11	Yes
	12	Logic Flags E – Field Input 12	Yes
	13	Logic Flags E – Field Input 13	Yes
	14	Logic Flags E – Field Input 14	Yes
	15	Logic Flags E – Field Input 15	Yes
37	0 ~ 15	Reserved	Yes
38	0 ~ 15	Counter A	Yes
39	0 ~ 15	Counter B	Yes
40	0 ~ 15	PilotOhms	Yes
41	0 ~ 15	Start Up Counter	Yes
42	0 ~ 15	Trip Counter	Yes
43	0 ~ 15	Motor Running Hour Counter	Yes
44	0 ~ 15	Load Running Hour Counter	Yes
45	0 ~ 15	Relay On Hour Counter	Yes
46	0 ~ 7	Current MLC	Yes
	8 ~ 15	CT Primary	Yes
47	0 ~ 15	CT Secondary	Yes
48	0 ~ 15	Modal Number	Yes
49	0 ~ 15	Active Power Used	Yes
50	0 ~ 15	Reactive Power Used	Yes
51	0 ~ 7	Start Up Date – Month	Yes
	8 ~ 15	Start Up Date – Year	Yes
52	0 ~ 7	Reserved	Yes
	8 ~ 15	Start Up Date – Day	Yes
53	0 ~ 7	Start Up Date – Minutes	Yes

Addr	Bit Position	Name	Read Only
	8 ~ 15	Start Up Date – Hours	Yes
54	0 ~ 7	Real Time Clock – Month	Yes
	8 ~ 15	Real Time Clock – Year	Yes
55	0 ~ 7	Reserved	Yes
	8 ~ 15	Real Time Clock – Day	Yes
56	0 ~ 7	Real Time Clock – Minutes	Yes
	8 ~ 15	Real Time Clock – Hours	Yes
57	0 ~ 15	Fault 1 No	Yes
58	0 ~ 15	Fault 1 Status + Year	Yes
59	0 ~ 15	Fault 1 Month + Date	Yes
60	0 ~ 15	Fault 1 Time	Yes
61	0 ~ 15	Fault 1 TF A + TF B	Yes
62	0 ~ 15	Fault 1 TF C + TF D	Yes
63	0 ~ 15	Fault 1 TF E + TF F	Yes
64	0 ~ 15	Fault 1 TF G + TF H	Yes
65	0 ~ 15	Fault 1 TF I + TF J	Yes
66	0 ~ 15	Fault 1 Run Hr	Yes
67	0 ~ 15	Fault 1 I Max + V min Hi	Yes
68	0 ~ 15	Fault 1 V min Lo + BrkClr	Yes
69	0 ~ 15	Fault 2 No	Yes
70	0 ~ 15	Fault 2 Status + Year	Yes
71	0 ~ 15	Fault 2 Month + Date	Yes
72	0 ~ 15	Fault 2 Time	Yes
73	0 ~ 15	Fault 2 TF A + TF B	Yes
74	0 ~ 15	Fault 2 TF C + TF D	Yes
75	0 ~ 15	Fault 2 TF E + TF F	Yes
76	0 ~ 15	Fault 2 TF G + TF H	Yes
77	0 ~ 15	Fault 2 TF I + TF J	Yes
78	0 ~ 15	Fault 2 Run Hr	Yes
79	0 ~ 15	Fault 2 I Max + V min Hi	Yes
80	0 ~ 15	Fault 2 V min Lo + BrkClr	Yes
81	0 ~ 15	Event No	Yes
82	0 ~ 15	Event 1 Status + Year	Yes
83	0 ~ 15	Event 1 Month + Date	Yes
84	0 ~ 15	Event 1 Time	Yes
85	0 ~ 15	Event 1 AF A + B	Yes
86	0 ~ 15	Event 1 AF C + D	Yes
87	0 ~ 15	Event 1 AF E + F	Yes
88	0 ~ 15	Event 1 AF G + H	Yes
89	0 ~ 15	Event 1 AF I + J	Yes
90	0 ~ 15	Event 1 TF A + B	Yes
91	0 ~ 15	Event 1 TF C + D	Yes
92	0 ~ 15	Event 1 TF E + F	Yes

Addr	Bit Position	Name	Read Only
93	0 ~ 15	Event 1 TF G + H	Yes
94	0 ~ 15	Event 1 TF I + J	
95	0 ~ 15	Event 1 Run Hr	
96	0 ~ 15	Event 1 I max +V Hi	
97	0 ~ 15	Event 1 V Lo	
98	0 ~ 7	Event Pointer	
	8 ~ 15	Fault Pointer	
99	0 ~ 15	Change Setting Slot Selected	No
100	0 ~ 15	PLC Inputs (Bits from SCADA to NC Relay)	No
101	0 ~ 7	Analogue Out Channel 1 (SCADA to NC Relay)	No
	8 ~ 15	Analogue Out Channel 2 (SCADA to NC Relay)	No
102	0 ~ 15	Setting Password.	No
103	0 ~ 7	Maximum Load 1 (4 ~ 100 %)	No *
	8 ~ 15	Maximum Load 0 (4 ~ 100 %)	No *
104	0 ~ 7	Thermal Class Curve 1 (3 ~ 40 Sec)	No *
	8 ~ 15	Thermal Class Curve 0 (3 ~ 40 Sec)	No *
105	0 ~ 15	CT Primary Ratio (1 ~ 1000)	No *
106	0 ~ 15	Modal Number	No *
107	0 ~ 7	CT Secondary Ratio (1 ~ 9)	No *
	8 ~ 15	Voltage Symmetry Trip Level. (60 ~ 100 %)	No *
108	0 ~ 15	Line Voltage Selection	No *
109	0 ~ 7	Voltage Low Trip Level (0 ~ 15 %)	No *
	8 ~ 15	Voltage High Trip Level (0 ~ 15 %)	No *
110	0 ~ 7	Unbalance Trip Time (1 ~ 10 Sec)	No *
	8 ~ 15	Unbalance Trip Level (0 ~ 50 %)	No *
111	0 ~ 7	Minimum Load Startup Delay Time (0 ~ 200 Sec)	No *
	8 ~ 15	Minimum Load Trip Time (1 ~ 10 Sec)	No *
112	0 ~ 7	Minimum Load Current Trip Level (10 ~ 100 %)	No *
	8 ~ 15	Minimum Load Reset Time 0 = Manual 1 = 10 Seconds 2 = 5 Minutes 3 = 10 Minutes 4 = 20 Minutes 5 = 30 Minutes 6 = 45 Minutes 7 = 1 Hour 8 = 3 Hours 9 = 6 Hours	No *
113	0 ~ 7	Earth Leakage Trip Type 0 = Instantaneous Time 1 = Inverse Definite Minimum Time	No *
	8 ~ 15	Minimum Load Power Factor Trip Level (10 ~ 100 %)	No *
114	0 ~ 15	Earth Leakage Trip Level (30 ~ 999 mA)	No *

Addr	Bit Position	Name	Read Only
115	0 ~ 15	Earth Leakage Trip Time (100 ~ 1000 ms, 50ms increment)	No *
116	0 ~ 15	Running Stall Trip Level (110 ~ 300 %)	No *
117	0 ~ 15	Running Stall Trip Time (100 ~ 2000 ms)	No *
118	0 ~ 15	Short Circuit Trip Level	No *
119	0 ~ 15	Short Circuit Trip Time	No *
120	0 ~ 7	Thermal Capacity Reset Level (0 ~ 99 %)	No *
	8 ~ 15	Running Stall Hold-Off Time (0 ~ 200 Sec)	No *
121	0 ~ 7	Number Of Consecutive Starts (1 ~ 3)	No *
	8 ~ 15	Starts Per Hour (1 ~ 60)	No *
122	0 ~ 15	Starts Per Hour Alarm	
123	0	Control Byte B = Single Phase Enabled	No *
	1	Control Byte B = Running Stall Enabled	No *
	2	Control Byte B = Minimum Load Trip Type 0 = Load Trip Level 1 = Power Factor Trip Level	No *
	3	Control Byte B = Earth Leakage Enabled	No *
	4	Control Byte B = Vacuum Fail Enabled	No *
	5	Control Byte B = Isolation Lockout Enabled	No *
	6	Control Byte B = Frequency Trip Enabled	No *
	7	Control Byte B = Thermal Auto Calculate Reset Enabled	No *
	8	Control Byte A = Minimum Load Enabled	No *
	9	Control Byte A = Under Voltage Enabled	No *
	10	Control Byte A = Over Voltage Enabled	No *
	11	Control Byte A = Voltage Symmetry Enabled	No *
	12	Control Byte A = Fail Safe Selected	No *
	13	Control Byte A = Unbalance Enabled	No *
	14	Control Byte A = Phase Rotation Enabled	No *
	15	Control Byte A = Short Circuit Enabled	No *
124	0	Control Byte D = RTD 1 Enabled	No *
	1	Control Byte D = RTD 2 Enabled	No *
	2	Control Byte D = RTD 3 Enabled	No *
	3	Control Byte D = RTD 4 Enabled	No *
	4	Control Byte D = Analogue In 1 Enabled	No *
	5	Control Byte D = Analogue In 2 Enabled	No *
	6	Control Byte D = Analogue Out 1 Enabled	No *
	7	Control Byte D = Analogue Out 2 Enabled	No *
	8	Control Byte C = Starts Per Hour Enabled	No *
	9	Control Byte C = Voltage Phase Rotation RWB	No *
	10	Control Byte C = Vectorial Stall Enabled	No *
	11	Control Byte C = Auto Thermal Reset Enabled	No *
	12	Control Byte C = Relay 1 Not Main Trip	No *

Addr	Bit Position	Name	Read Only
	13	Control Byte C = External I/O Module Connected	No *
	14	Control Byte C = FLED Connected	No *
	15	Control Byte C = Reserved	No *
125	0 ~ 15	Reserved	No *
126	0 ~ 15	Reserved	No *
127	0 ~ 1	RTD Type 1 0 = PT 100 1 = PT 1000 2 = PTC 3 = NTC	No *
	2 ~ 3	RTD Type 2 0 = PT 100 1 = PT 1000 2 = PTC 3 = NTC	No *
	4 ~ 5	RTD Type 3 0 = PT 100 1 = PT 1000 2 = PTC 3 = NTC	No *
	6 ~ 7	RTD Type 4 0 = PT 100 1 = PT 1000 2 = PTC 3 = NTC	No *
	8 ~ 15	Starter Type 0 = Protection Relay 1 = Direct On line 2 = Reversal Direct On Line 3 = Star – Delta 4 = Reversal Star – Delta 5 = Dahlander 6 = Reversal Dahlander 7 = Pole Changing 8 = Reversal Pole Changing 9 = Soft Starter 10 = Reversal Soft Starter 11 = Oil Circuit Breaker Direct Online	No *
128	0 ~ 15	Field Input 1 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
129	0 ~ 15	Field Input 2 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
130	0 ~ 15	Field Input 3 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
131	0 ~ 15	Field Input 4 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
132	0 ~ 15	Field Input 5 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
133	0 ~ 15	Field Input 6 Delay (0 ~ 2000 ms, 50 ms incremental)	No *

Addr	Bit Position	Name	Read Only
134	0 ~ 15	Field Input 7 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
135	0 ~ 15	Field Input 8 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
136	0 ~ 15	Field Input 9 Delay (0 ~ 2000 ms, 50 ms incremental)	No *
137	0 ~ 15	Field Input 10 Delay (0 ~ 2000 ms,50 ms incremental)	No *
138	0 ~ 15	Field Input 11 Delay (0 ~ 2000 ms,50 ms incremental)	No *
139	0 ~ 15	Field Input 12 Delay (0 ~ 2000 ms,50 ms incremental)	No *
140	0 ~ 15	Field Input 13 Delay (0 ~ 2000 ms,50 ms incremental)	No *
141	0 ~ 15	Field Input 14 Delay (0 ~ 2000 ms,50 ms incremental)	No *
142	0 ~ 15	Field Input 15 Delay (0 ~ 2000 ms,50 ms incremental)	No *
143	0	Field Input 01 On Delay Enabled	No *
	1	Field Input 02 On Delay Enabled	No *
	2	Field Input 03 On Delay Enabled	No *
	3	Field Input 04 On Delay Enabled	No *
	4	Field Input 05 On Delay Enabled	No *
	5	Field Input 06 On Delay Enabled	No *
	6	Field Input 07 On Delay Enabled	No *
	7	Field Input 08 On Delay Enabled	No *
	8	Field Input 09 On Delay Enabled	No *
	9	Field Input 10 On Delay Enabled	No *
	10	Field Input 11 On Delay Enabled	No *
	11	Field Input 12 On Delay Enabled	No *
	12	Field Input 13 On Delay Enabled	No *
	13	Field Input 14 On Delay Enabled	No *
	14	Field Input 15 On Delay Enabled	No *
	15	Reserved	No *
144	0	Field Input 01 Off Delay Enabled	No *
	1	Field Input 02 Off Delay Enabled	No *
	2	Field Input 03 Off Delay Enabled	No *
	3	Field Input 04 Off Delay Enabled	No *
	4	Field Input 05 Off Delay Enabled	No *
	5	Field Input 06 Off Delay Enabled	No *
	6	Field Input 07 Off Delay Enabled	No *
	7	Field Input 08 Off Delay Enabled	No *
	8	Field Input 09 Off Delay Enabled	No *
	9	Field Input 10 Off Delay Enabled	No *
	10	Field Input 11 Off Delay Enabled	No *
	11	Field Input 12 Off Delay Enabled	No *
	12	Field Input 13 Off Delay Enabled	No *
	13	Field Input 14 Off Delay Enabled	No *
	14	Field Input 15 Off Delay Enabled	No *
	15	Reserved	No *
145	0 ~ 14	Custom Trip Bit 01 Input Pointer	No *
	15	Custom Trip Bit 01 Input Inverted	No *

Addr	Bit Position	Name	Read Only
146	0 ~ 14	Custom Trip Bit 02 Input Pointer	No *
	15	Custom Trip Bit 02 Input Inverted	No *
147	0 ~ 14	Custom Trip Bit 03 Input Pointer	No *
	15	Custom Trip Bit 03 Input Inverted	No *
148	0 ~ 15	Reset Mask A	No *
149	0 ~ 15	Reset Mask B	No *
150	0 ~ 15	Reset Mask C	No *
151	0 ~ 15	Reset Mask D	No *
152	0 ~ 15	Reset Mask E	No *
153	0 ~ 7	RTD 1 Trip Time	No *
	8 ~ 15	RTD 2 Trip Time	No *
154	0 ~ 7	RTD 3 Trip Time	No *
	8 ~ 15	RTD 4 Trip Time	No *
155	0 ~ 7	RTD 1 High Alarm Level	No *
	8 ~ 15	RTD 1 High Trip Level	No *
156	0 ~ 7	RTD 1 Lo Alarm Level	No *
	8 ~ 15	RTD 1 Lo Trip Level	No *
157	0 ~ 7	RTD 2 High Alarm Level	No *
	8 ~ 15	RTD 2 High Trip Level	No *
158	0 ~ 7	RTD 2 Lo Alarm Level	No *
	8 ~ 15	RTD 2 Lo Trip Level	No *
159	0 ~ 7	RTD 3 High Alarm Level	No *
	8 ~ 15	RTD 3 High Trip Level	No *
160	0 ~ 7	RTD 3 Lo Alarm Level	No *
	8 ~ 15	RTD 3 Lo Trip Level	No *
161	0 ~ 7	RTD 4 High Alarm Level	No *
	8 ~ 15	RTD 4 High Trip Level	No *
162	0 ~ 7	RTD 4 Lo Alarm Level	No *
	8 ~ 15	RTD 4 Lo Trip Level	No *
163	0 ~ 7	Analogue In 1 High Trip Level	No *
	8 ~ 15	Analogue In 1 High Alarm Level	No *
164	0 ~ 7	Analogue In 1 Lo Trip Level	No *
	8 ~ 15	Analogue In 1 Lo Alarm Level	No *
165	0 ~ 7	Analogue In 2 High Trip Level	No *
	8 ~ 15	Analogue In 2 High Alarm Level	No *
166	0 ~ 7	Analogue In 2 Lo Trip Level	No *
	8 ~ 15	Analogue In 2 Lo Alarm Level	No *
167	0 ~ 7	Analogue Out 1 High Trip Level	No *
	8 ~ 15	Analogue Out 1 High Alarm Level	No *
168	0 ~ 7	Analogue Out 1 Lo Trip Level	No *
	8 ~ 15	Analogue Out 1 Lo Alarm Level	No *
169	0 ~ 7	Analogue Out 2 High Trip Level	No *
	8 ~ 15	Analogue Out 2 High Alarm Level	No *

Addr	Bit Position	Name	Read Only
170	0 ~ 7	Analogue Out 2 Lo Trip Level	No *
	8 ~ 15	Analogue Out 2 Lo Alarm Level	No *
171	0 ~ 7	Logic Function 1 Mask	No *
	8 ~ 15	Reserved	No *
172	0 ~ 14	Logic Function 1 Input A Pointer	No *
	15	Logic Function 1 Input A Inverted	No *
173	0 ~ 14	Logic Function 1 Input B Pointer	No *
	15	Logic Function 1 Input B Inverted	No *
174	0 ~ 14	Logic Function 1 Input C Pointer	No *
	15	Logic Function 1 Input C Inverted	No *
175	0 ~ 7	Logic Function 2 Mask	No *
	8 ~ 15	Reserved	No *
176	0 ~ 14	Logic Function 2 Input A Pointer	No *
	15	Logic Function 2 Input A Inverted	No *
177	0 ~ 14	Logic Function 2 Input B Pointer	No *
	15	Logic Function 2 Input B Inverted	No *
178	0 ~ 14	Logic Function 2 Input C Pointer	No *
	15	Logic Function 2 Input C Inverted	No *
179	0 ~ 7	Logic Function 3 Mask	No *
	8 ~ 15	Reserved	No *
180	0 ~ 14	Logic Function 3 Input A Pointer	No *
	15	Logic Function 3 Input A Inverted	No *
181	0 ~ 14	Logic Function 3 Input B Pointer	No *
	15	Logic Function 3 Input B Inverted	No *
182	0 ~ 14	Logic Function 3 Input C Pointer	No *
	15	Logic Function 3 Input C Inverted	No *
183	0 ~ 7	Logic Function 4 Mask	No *
	8 ~ 15	Reserved	No *
184	0 ~ 14	Logic Function 4 Input A Pointer	No *
	15	Logic Function 4 Input A Inverted	No *
185	0 ~ 14	Logic Function 4 Input B Pointer	No *
	15	Logic Function 4 Input B Inverted	No *
186	0 ~ 14	Logic Function 4 Input C Pointer	No *
	15	Logic Function 4 Input C Inverted	No *
187	0 ~ 7	Logic Function 5 Mask	No *
	8 ~ 15	Reserved	No *
188	0 ~ 14	Logic Function 5 Input A Pointer	No *
	15	Logic Function 5 Input A Inverted	No *
189	0 ~ 14	Logic Function 5 Input B Pointer	No *
	15	Logic Function 5 Input B Inverted	No *
190	0 ~ 14	Logic Function 5 Input C Pointer	No *
	15	Logic Function 5 Input C Inverted	No *
191	0 ~ 7	Logic Function 6 Mask	No *

Addr	Bit Position	Name	Read Only
	8 ~ 15	Reserved	No *
192	0 ~ 14	Logic Function 6 Input A Pointer	No *
	15	Logic Function 6 Input A Inverted	No *
193	0 ~ 14	Logic Function 6 Input B Pointer	No *
	15	Logic Function 6 Input B Inverted	No *
194	0 ~ 14	Logic Function 6 Input C Pointer	No *
	15	Logic Function 6 Input C Inverted	No *
195	0 ~ 15	Timer A timeout (1 ~ 3000 Sec)	No *
196	0 ~ 14	Timer A Reset Input Pointer	No *
	15	Timer A Reset Input Inverted	No *
197	0 ~ 14	Timer A Start Input Pointer	No *
	15	Timer A Start Input Inverted	No *
198	0 ~ 15	Timer B timeout (1 ~ 3000 Sec)	No *
199	0 ~ 14	Timer B Reset Input Pointer	No *
	15	Timer B Reset Input Inverted	No *
200	0 ~ 14	Timer B Start Input Pointer	No *
	15	Timer B Start Input Inverted	No *
201	0 ~ 15	Counter A Count Limit	No *
202	0 ~ 14	Counter A Count Up Input Pointer	No *
	15	Counter A Count Up Input Inverted	No *
203	0 ~ 14	Counter A Reset Input Pointer	No *
	15	Counter A Reset Input Inverted	No *
204	0 ~ 14	Counter A Count Down Input Pointer	No *
	15	Counter A Count Down Input Inverted	No *
205	0 ~ 15	Counter B Count Limit	No *
206	0 ~ 14	Counter B Count Up Input Pointer	No *
	15	Counter B Count Up Input Inverted	No *
207	0 ~ 14	Counter B Reset Input Pointer	No *
	15	Counter B Reset Input Inverted	No *
208	0 ~ 14	Counter B Count Down Input Pointer	No *
	15	Counter B Count Down Input Inverted	No *
209	0 ~ 14	Pulse Generator Input Pointer	No *
	15	Pulse Generator Input Inverted	No *
210	0 ~ 14	Status Reporter Input Pointer	No *
	15	Status Reporter Input Inverted	No *
211	0 ~ 14	Latch A Reset Input Pointer	No *
	15	Latch A Reset Input Inverted	No *
212	0 ~ 14	Latch A Set Input Pointer	No *
	15	Latch A Set Input Inverted	No *
213	0 ~ 14	Latch B Reset Input Pointer	No *
	15	Latch B Reset Input Inverted	No *
214	0 ~ 14	Latch B Set Input Pointer	No *
	15	Latch B Set Input Inverted	No *

Addr	Bit Position	Name	Read Only
215	0 ~ 7	Pulse Generator Duty Cycle (1 ~ 99 %)	No *
	8 ~ 15	Pulse Generator Period (1 ~ 240 min)	No *
216	0 ~ 7	RTC Start Time Minutes	No *
	8 ~ 15	RTC Start Time Hours	No *
217	0 ~ 7	RTC Stop Time Minutes	No *
	8 ~ 15	RTC Stop Time Hours	No *
218	0 ~ 15	Comparator A Input	No *
219	0 ~ 15	Comparator A High High	No *
220	0 ~ 15	Comparator A High Low	No *
221	0 ~ 15	Comparator A Low High	No *
222	0 ~ 15	Comparator A Low Low	No *
223	0 ~ 15	Comparator B Input	No *
224	0 ~ 15	Comparator B High High	No *
225	0 ~ 15	Comparator B High Low	No *
226	0 ~ 15	Comparator B Low High	No *
227	0 ~ 15	Comparator B Low Low	No *
228	0 ~ 14	Relay 1 Input Pointer	No *
	15	Relay 1 Input Inverted	No *
229	0 ~ 14	Relay 2 Input Pointer	No *
	15	Relay 2 Input Inverted	No *
230	0 ~ 14	Relay 3 Input Pointer	No *
	15	Relay 3 Input Inverted	No *
231	0 ~ 14	Relay 4 Input Pointer	No *
	15	Relay 4 Input Inverted	No *
232	0 ~ 14	External Relay 5 Input Pointer	No *
	15	External Relay 5 Input Inverted	No *
233	0 ~ 14	External Relay 6 Input Pointer	No *
	15	External Relay 6 Input Inverted	No *
234	0 ~ 14	External Relay 7 Input Pointer	No *
	15	External Relay 7 Input Inverted	No *
235	0 ~ 14	External Relay 8 Input Pointer	No *
	15	External Relay 8 Input Inverted	No *
236	0 ~ 7	Thermal Capacity Warning Level	No *
	8 ~ 15	Reserved	No *
237	0 ~ 14	External Reset Input Pointer	No *
	15	External Reset Input Inverted	No *
238	0 ~ 14	Starter Input Select msb Input Pointer	No *
	15	Starter Input Select msb Input Inverted	No *
239	0 ~ 14	Starter Input Select lsb Input Pointer	No *
	15	Starter Input Select lsb Input Inverted	No *
240	0 ~ 14	Starter Local - Start Slow Forward Input Pointer	No *
	15	Starter Local - Start Slow Forward Input Inverted	No *
241	0 ~ 14	Starter Local - Start Fast Forward Input Pointer	No *

Addr	Bit Position	Name	Read Only
	15	Starter Local - Start Fast Forward Input Inverted	No *
242	0 ~ 14	Starter Local - Start Slow Reversal Input Pointer	No *
	15	Starter Local - Start Slow Reversal Input Inverted	No *
243	0 ~ 14	Starter Local - Start Fast Reversal Input Pointer	No *
	15	Starter Local - Start Fast Reversal Input Inverted	No *
244	0 ~ 14	Starter Local - Start Stop Input Pointer	No *
	15	Starter Local - Start Stop Input Inverted	No *
245	0 ~ 14	Starter Local - Start Interlock Input Pointer	No *
	15	Starter Local - Start Interlock Input Inverted	No *
246	0 ~ 14	Starter Remote - Start Slow Forward Input Pointer	No *
	15	Starter Remote - Start Slow Forward Input Inverted	No *
247	0 ~ 14	Starter Remote - Start Fast Forward Input Pointer	No *
	15	Starter Remote - Start Fast Forward Input Inverted	No *
248	0 ~ 14	Starter Remote - Start Slow Reversal Input Pointer	No *
	15	Starter Remote - Start Slow Reversal Input Inverted	No *
249	0 ~ 14	Starter Remote - Start Fast Reversal Input Pointer	No *
	15	Starter Remote - Start Fast Reversal Input Inverted	No *
250	0 ~ 14	Starter Remote - Start Stop Input Pointer	No *
	15	Starter Remote - Start Stop Input Inverted	No *
251	0 ~ 14	Starter Remote - Start Interlock Input Pointer	No *
	15	Starter Remote - Start Interlock Input Inverted	No *
252	0 ~ 14	Starter Auto - Start Slow Forward Input Pointer	No *
	15	Starter Auto - Start Slow Forward Input Inverted	No *
253	0 ~ 14	Starter Auto - Start Fast Forward Input Pointer	No *
	15	Starter Auto - Start Fast Forward Input Inverted	No *
254	0 ~ 14	Starter Auto - Start Slow Reversal Input Pointer	No *
	15	Starter Auto - Start Slow Reversal Input Inverted	No *
255	0 ~ 14	Starter Auto - Start Fast Reversal Input Pointer	No *
	15	Starter Auto - Start Fast Reversal Input Inverted	No *
256	0 ~ 14	Starter Auto - Start Stop Input Pointer	No *
	15	Starter Auto - Start Stop Input Inverted	No *
257	0 ~ 14	Starter Auto - Start Interlock Input Pointer	No *
	15	Starter Auto - Start Interlock Input Inverted	No *
258	0 ~ 7	Execution Timer (0 ~ 10 Sec)	No *
	8 ~ 15	Reserved	No *
259	0 ~ 14	Feedback Input Pointer	No *
	15	Feedback Input Inverted	No *
260	0 ~ 15	Pre Start Warning Timer (0 ~ 999 Sec)	No *
261	0 ~ 15	Feedback Timer (0 ~ 2000 ms, 50 ms Incremental)	No *
262	0 ~ 15	Backspin Timer (0 ~ 999 Sec)	No *
263	0 ~ 15	DC Break Timer (0 ~ 2000ms, 50 ms Incremental)	No *
264	0 ~ 15	Restart Timer (0 ~ 600 Sec)	No *
265	0 ~ 15	Star Max Timer (1 ~ 50 Sec)	No *

Addr	Bit Position	Name	Read Only
266	0 ~ 15	Transition Timer (0 ~ 2000ms, 50 ms Incremental)	No *
267	0 ~ 15	Unauthorized Current Timer (0 ~ 2000ms, 50 ms Incremental)	No *
268	0 ~ 14	SCADA Custom Bit 00 Input Pointer	No *
	15	SCADA Custom Bit 00 Input Inverted	No *
269	0 ~ 14	SCADA Custom Bit 01 Input Pointer	No *
	15	SCADA Custom Bit 01 Input Inverted	No *
270	0 ~ 14	SCADA Custom Bit 02 Input Pointer	No *
	15	SCADA Custom Bit 02 Input Inverted	No *
271	0 ~ 14	SCADA Custom Bit 03 Input Pointer	No *
	15	SCADA Custom Bit 03 Input Inverted	No *
272	0 ~ 14	SCADA Custom Bit 04 Input Pointer	No *
	15	SCADA Custom Bit 04 Input Inverted	No *
273	0 ~ 14	SCADA Custom Bit 05 Input Pointer	No *
	15	SCADA Custom Bit 05 Input Inverted	No *
274	0 ~ 14	SCADA Custom Bit 06 Input Pointer	No *
	15	SCADA Custom Bit 06 Input Inverted	No *
275	0 ~ 14	SCADA Custom Bit 07 Input Pointer	No *
	15	SCADA Custom Bit 07 Input Inverted	No *
276	0 ~ 14	Reserved	No *
277	0 ~ 14	Reserved	No *
278	0 ~ 14	Reserved	No *
279	0 ~ 14	Reserved	No *
280	0 ~ 14	Reserved	No *
281	0 ~ 14	Reserved	No *
282	0 ~ 14	Reserved	No *
283	0 ~ 14	Reserved	No *
284	0 ~ 7	RTC Month	No *
	8 ~ 15	RTC Year	No *
285	0 ~ 7	Reserved	No *
	8 ~ 15	RTC Day	No *
286	0 ~ 7	RTC Minutes	No *
	8 ~ 15	RTC Hours	No *
287	0 ~ 15	Fault To Access	No
288	0 ~ 15	Events To Access	No
300 ~ 309	0 ~ 15	Slot 1 Text Description	Yes
310 ~ 319	0 ~ 15	Slot 2 Text Description	Yes
320 ~ 329	0 ~ 15	Slot 3 Text Description	Yes
330 ~ 339	0 ~ 15	Slot 4 Text Description	Yes

Addr	Bit Position	Name	Read Only
340 ~ 349	0 ~ 15	Slot 5 Text Description	Yes
350 ~ 359	0 ~ 15	Slot 6 Text Description	Yes
360 ~ 369	0 ~ 15	Slot 7 Text Description	Yes
370 ~ 379	0 ~ 15	Slot 8 Text Description	Yes

2.3 Listen mode only

Writing to address 0 will allow the ProBeck-IPS Modbus unit to listen to the message but not to reply to the message. This allows the Modbus master to write to the same register across all the Modbus slaves.

2.2.5 Function Flag Table 1

It is signals that can be routed to the inputs of the logic functions, timers, counters, status reporter, latch, starter control and relays.

Value	Name
0	Constant Zero
1	Constant One
2	In Service Flag
3	Voltage Present Flag
4	Over Current Alarm Flag
5	Short Circuit Alarm Flag
6	Running Stall Alarm Flag
7	Unbalance Alarm Flag
8	Single Phase Alarm Flag
9	Earth Fault Alarm Flag
10	Earth Leakage Alarm Flag
11	Minimum Load Alarm Flag
12	Over Voltage Alarm Flag
13	Under Voltage Alarm Flag
14	Voltage Symmetric Alarm Flag
15	High Frequency Alarm Flag
16	Low Frequency Alarm Flag
17	Isolation Lockout Alarm Flag
18	Frozen Contact Alarm Flag
19	Over Current Trip Flag
20	Short Circuit Trip Flag
21	Running Stall Trip Flag
22	Unbalance Trip Flag
23	Single Phase Trip Flag
24	Earth Fault Trip Flag
25	Earth Leakage Trip Flag
26	Minimum Load Trip Flag
27	Over Voltage Trip Flag
28	Under Voltage Trip Flag
29	Voltage Symmetric Trip Flag
30	High Frequency Trip Flag
31	Low Frequency Trip Flag

Value	Name
32	Insulation Lockout Trip Flag
33	Phase Rotation Trip Flag
34	Starts Per Hour Trip Flag
35	Frozen Contact Trip Flag
36	Trip Flag
37	Timer A Output
38	Inverted Timer A Output
39	Timer A Pulsed Output
40	Inverted Timer A Pulsed Output
41	Timer B Output
42	Inverted Timer B Output
43	Timer B Pulsed Output
44	Inverted Timer B Pulsed Output
45	RTC Output
46	Inverted RTC Output
47	Counter A Output
48	Inverted Counter A Output
49	Counter B Output
50	Inverted Counter B Output
51	Logical Function 1 Output
52	Inverted Logical Function 1 Output
53	Logical Function 2 Output
54	Inverted Logical Function 2 Output
55	Logical Function 3 Output
56	Inverted Logical Function 3 Output
57	Logical Function 4 Output
58	Inverted Logical Function 4 Output
59	Logical Function 5 Output
60	Inverted Logical Function 5 Output
61	Logical Function 6 Output
62	Inverted Logical Function 6 Output
63	Field Input 1
64	Field Input 2
65	Field Input 3
66	Field Input 4
67	Field Input 5
68	Field Input 6

Value	Name
69	Field Input 7
70	Field Input 8
71	Field Input 9
72	Field Input 10
73	Field Input 11
74	Field Input 12
75	Field Input 13
76	Field Input 14
77	Field Input 15
78	PLC Input Bit 1
79	PLC Input Bit 2
80	PLC Input Bit 3
81	PLC Input Bit 4
82	PLC Input Bit 5
83	PLC Input Bit 6
84	PLC Input Bit 7
85	PLC Input Bit 8
86	PLC Input Bit 9
87	PLC Input Bit 10
88	PLC Input Bit 11
89	PLC Input Bit 12
90	PLC Input Bit 13
91	PLC Input Bit 14
92	PLC Input Bit 15
93	PLC Input Bit 16
94	Restart Flag
95	Status Reporter Output
96	Latch A Output
97	Latch B Output
98	Pulse Generator Output
99	TC Warning Alarm
100	Execution Trip flag
101	Feedback trip flag
102	Unauthorized current trip flag
103	System failure trip flag
104	RTD 1 high warning flag
105	RTD 1 high alarm flag

Value	Name
106	RTD 1 high trip flag
107	RTD 1 low warning flag
108	RTD 1 low alarm flag
109	RTD 1 low trip flag
110	RTD 2 high warning flag
111	RTD 2 high alarm flag
112	RTD 2 high trip flag
113	RTD 2 low warning flag
114	RTD 2 low alarm flag
115	RTD 2 low trip flag
116	RTD 3 high warning flag
117	RTD 3 high alarm flag
118	RTD 3 high trip flag
119	RTD 3 low warning flag
120	RTD 3 low alarm flag
121	RTD 3 low trip flag
122	RTD 4 high warning flag
123	RTD 4 high alarm flag
124	RTD 4 high trip flag
125	RTD 4 low warning flag
126	RTD 4 low alarm flag
127	RTD 4 low trip flag
128	Analogue In 1 high warning flag
129	Analogue In 1 high alarm flag
130	Analogue In 1 high trip flag
131	Analogue In 1 low warning flag
132	Analogue In 1 low alarm flag
133	Analogue In 1 low trip flag
134	Analogue In 2 high warning flag
135	Analogue In 2 high alarm flag
136	Analogue In 2 high trip flag
137	Analogue In 2 low warning flag
138	Analogue In 2 low alarm flag
139	Analogue In 2 low trip flag
140	Analogue Out 1 high warning flag
141	Analogue Out 1 high alarm flag
142	Analogue Out 1 high trip flag

Value	Name
143	Analogue Out 1 low warning flag
144	Analogue Out 1 low alarm flag
145	Analogue Out 1 low trip flag
146	Analogue Out 2 high warning flag
147	Analogue Out 2 high alarm flag
148	Analogue Out 2 high trip flag
149	Analogue Out 2 low warning flag
150	Analogue Out 2 low alarm flag
151	Analogue Out 2 low trip flag
180	Starter Output 1
181	Starter Output 2
182	Starter Output 3
183	Starter Output 4
184	Starter Output 5
185	Pre Warning Flag
186	DC Break Flag
187	Transition Flag
188	Back Spin Flag

2.2.6 Function Flag Table 2

It is signals that can be routed to the inputs of the local and remote selection.

Value	Name
0	Constant Zero
1	Constant One
2	Field Input 1
3	Field Input 2
4	Field Input 3
5	Field Input 4
6	Field Input 5
7	Field Input 6
8	Field Input 7
9	Field Input 8
10	Field Input 9
11	Field Input 10
12	Field Input 11

Value	Name
13	Field Input 12
14	Field Input 13
15	Field Input 14
16	Field Input 15
17	PLC Input Bit 1
18	PLC Input Bit 2
19	PLC Input Bit 3
20	PLC Input Bit 4
21	PLC Input Bit 5
22	PLC Input Bit 6
23	PLC Input Bit 7
24	PLC Input Bit 8
25	PLC Input Bit 9
26	PLC Input Bit 10
27	PLC Input Bit 11
28	PLC Input Bit 12
29	PLC Input Bit 13
30	PLC Input Bit 14
31	PLC Input Bit 15
32	PLC Input Bit 16

2.2.7 Function Flag Table 3

It is signals that can be routed to the inputs of the starter logic starts, stops and interlock.

Value	Name
0	Constant Zero
1	Constant One
2	In Service Flag
3	Timer A Output
4	Inverted Timer A Output
5	Timer A Pulsed Output
6	Inverted Timer A Pulsed Output
7	Timer B Output
8	Inverted Timer B Output
9	Timer B Pulsed Output
10	Inverted Timer B Pulsed Output
11	RTC Output
12	Inverted RTC Output
13	Counter A Output
14	Inverted Counter A Output
15	Counter B Output
16	Inverted Counter B Output
17	Logical Function 1 Output
18	Inverted Logical Function 1 Output
19	Logical Function 2 Output
20	Inverted Logical Function 2 Output
21	Logical Function 3 Output
22	Inverted Logical Function 3 Output
23	Logical Function 4 Output
24	Inverted Logical Function 4 Output
25	Logical Function 5 Output
26	Inverted Logical Function 5 Output
27	Logical Function 6 Output
28	Inverted Logical Function 6 Output
29	Field Input 1
30	Field Input 2
31	Field Input 3

Value	Name
32	Field Input 4
33	Field Input 5
34	Field Input 6
35	Field Input 7
36	Field Input 8
37	Field Input 9
38	Field Input 10
39	Field Input 11
40	Field Input 12
41	Field Input 13
42	Field Input 14
43	Field Input 15
44	PLC Input Bit 1
45	PLC Input Bit 2
46	PLC Input Bit 3
47	PLC Input Bit 4
48	PLC Input Bit 5
49	PLC Input Bit 6
50	PLC Input Bit 7
51	PLC Input Bit 8
52	PLC Input Bit 9
53	PLC Input Bit 10
54	PLC Input Bit 11
55	PLC Input Bit 12
56	PLC Input Bit 13
57	PLC Input Bit 14
58	PLC Input Bit 15
59	PLC Input Bit 16

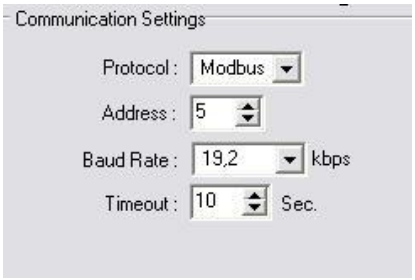
3. DEFINITIONS AND TERMINOLOGY

EEPROM	Electrical Erasable Programmable Read Only Memory (non volatile)
Flash memory	Similar to EEPROM (only block write - non volatile)
GSD	Generic station description file.
In service	When the current rise above 10% of full load current it is assumed that the motor is running.
Intrinsic safe	It is a protection technique for safe operation of electronic equipment in explosive atmospheres. The concept was developed for safe operation of process control instrumentation in hazardous areas. The theory behind intrinsic safety is to ensure that the available electrical and thermal energy in the system is always low enough that ignition of the hazardous atmosphere cannot occur.
LED	Light emitting diode (It is used as visual indicators)
Motor protection relay	It is an intelligent (computerized) unit monitoring an electric motor's current and voltage supply. In case of overloading, phase lost etc. the power supply of the motor will be interrupted by the protection relay to prevent damage to the motor.
PLC	Programmable Logic Controller.

4. OPERATING INSTRUCTIONS

4.1 Getting Started

4.1.1 Setting Up The ProBeck-IPS-Modbus



Following must be done via the ProBeck-IPS front-end:

- Connect the ProBeck-IPS front-end to the relay.
- Select the communication device as modbus.
- Set the address of the relay.
- Select the correct baudrate.
- Select the time out period to reset PLC inputs.
  - 0 seconds will lock the PLC bits after a communication failure.
  - 1 to 255 seconds will change the PLC bits back to zeros.
- Transmit settings to relay.

4.2 Monitoring Diagnostic On Front-End

The front-end will shows the following diagnostics under the **"Statistics"** tab:

1. Modbus module present.
2. Cyclic Time – Time intervals that a valid message is received.
3. Longest Cycle Time – Longest Rx interval.
4. Listen Mode – Is listen mode active.
5. Message Counter – Amount of messages received.
6. CRC counter – Amount of messages with a CRC problem.
7. Revision – Firmware revision of the Modbus module.

4.3 DB 9 Connection

On the DB9 pins Pin 2 must be connected to A and Pin 9 to B.

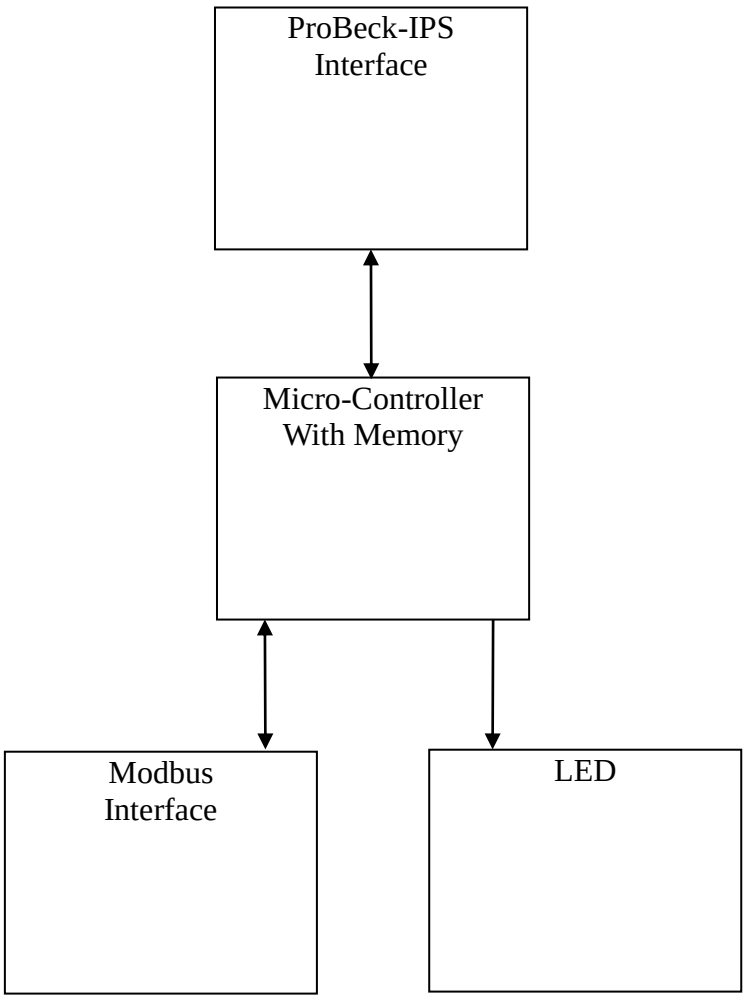
4.4 Synchronizing The RTC

Following steps can be taken to synchronize the RTC of the modbus slave units:

- Through out the process write to address 0 to talk to all the slaves.
- Unlock the holding registers by writing 0x5AA5 to holding register address 2.
- Then write the new RTC time to holding register address 103 to 105.

5. DIAGRAMS

5.1 Block Diagram of ProBeck-IPS-Modbus



--oo0oo--